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REVISION OF NEW WORLD *PLAGIOGNATHUS* FIEBER, WITH COMMENTS ON THE PALEARCTIC FAUNA AND THE DESCRIPTION OF A NEW GENUS (HETEROPTERA: MIRIDAE: PHYLINAE)

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ABSTRACT

The diagnostic features of *Plagiognathus* are clarified, with characteristics of the male genitalia being used for the first time in diagnosing the Nearctic species. The North American species are revised, with a total of 86 native and 3 introduced species being recognized. Twenty-four species are described as new. Habitus, vesical, and antennal illustrations are provided for all of these species. The Palearctic fauna is discussed; vesical illustrations are provided for 10 of the 24 species placed in *Plagiognathus* in the most recent catalog.

Twenty-five new synonymies are created. Twenty-five species are transferred into *Plagiognathus* from other genera or removed from *Plagiognathus* and placed in other genera; in addition to the new combinations with definitive generic placement, 16 species are treated as incertae sedis. *Microphylellus* Reuter, *Chaetophylidea* Knight, and *Parapsallus* Wagner are treated as junior synonyms of *Plagiognathus. Plagiognathus reuterellus,* new name, is proposed to replace *Plagiognathus flavipes* Reuter, 1875, a junior secondary homonym. Six neotypes and one lectotype are designated in an effort to ensure stability in the application of names within *Plagiognathus.*

A new genus, *Tuxedo,* with *Microphylellus bicinctus* Van Duzee, as the type species, is described to accommodate five previously described taxa that do not belong to either *Microphylellus* or *Plagiognathus,* in which genera they were originally placed. The generic-group name *Zophocnemis* Kerzhner is elevated to generic status to accommodate its single included species, *bicolor* Jakolev, because that species does not fit the revised diagnosis for *Plagiognathus. Myochroocoris* Reuter is synonymized with *Atractotomus* Fieber, its single included species, *griseolus* Reuter from eastern North America, having all of the diagnostic characters of *Atractotomus.*

Specimens were broadly sampled from North American museums, with particular attention paid to the fauna west of the Great Plains. The eastern North American fauna is, nonetheless, treated in detail with the most extensive attempt yet to deal with the fauna of the South.

Many new host records are included, clarifying associations for some species, but still leaving the breeding habits of others in question.

INTRODUCTION

The present paper is part of a larger effort to improve the classification of the Phylinae worldwide (e.g., Schuh, 1974, 1984; Schuh and Schwartz, 1985, 1988; Schuh et al., 1995; Stonedahl, 1990). Recent work on the North American phyline fauna (Schuh, 1999, 2000; Stonedahl, 1990) has made it clear that no final treatment of the Nearctic phyline fauna would ever be possible without a detailed study of those species currently placed in the genera *Plagiognathus* Fieber and *Psallus* Fieber and clarification of the limits of those genera. This work deals with the diagnosis, relationships, and species-level taxonomy of *Plagiognathus.*

Fieber (1858) described *Plagiognathus* with four included species. He listed six species in his *Europäischen Hemiptera* (Fieber, 1861). Kirkaldy (1906) subsequently fixed the type as *Lygaeus arbustorum* (Fabricius, 1794). The first North American species described in the genus was *Plagiognathus obscurus* Uhler, 1872.

Several North American *Plagiognathus* species are among the most commonly collected Miridae. The frequency with which these species are encountered in collections is related to the fact that they breed on annual plants (sometimes on multiple species), are sometimes bivoltine, and frequently can be swept from ruderal herbaceous vegetation, especially in the East.

The concepts attached to several named North American *Plagiognathus* spp. have been stable for a century or more. Nonetheless, the only treatment of *Plagiognathus* in North America remotely resembling a revision is that of Knight (1923) in the *Hemiptera of Connecticut,* a work which concentrated on the fauna of the northeastern United States; the *Miridae of Illinois* (Knight, 1941) extended coverage to the Midwest and included additional species described by Knight between the appearance of these two summary works. Virtually nothing has been written on the western North American fauna, and no attempt has been made to assess the Holarctic fauna as a unit.

The present paper offers a diagnosis for *Plagiognathus* based on the Holarctic fauna. Treatment of the Nearctic species is based on the examination of more than 25,000 specimens. Known distributions for some taxa are significantly altered, and 24 new species are described. The holotypes of most previously described nominal species were examined and are listed in the locality data; for those few species where I did not examine types I have clearly indicated this fact.

Original descriptions and redescriptions of species in the present paper are based on the range of material available to me for examination. As such, the descriptions represent my ''theory'' or concept of each taxon. They are not based solely on the holotype. The included measurements were taken from at least five specimens (when available) representative of my species concepts.

The most recent diagnosis of *Plagiognathus* based on North American taxa appears to be that of Kelton (1980: 315), who stated that the bugs are:

> Elongate-oval, black and green species with simple, pale pubescence and spotted legs. Head oblique. Pronotum trapeziform, lateral margins angulate. Hemelytra shiny, pubescence black or pale, long and dense. Tibial spines black with spots at bases.

Kelton's diagnosis is so general that it could accommodate a very large number of phyline genera, and it includes no characters distinctive to *Plagiognathus.* It is also internally contradictory with regard to the type of pubescence.

Kelton's diagnosis, as quoted above, is essentially that of Knight (1923). Under this definition, species with simple setae on the dorsum and dark spots at the bases of the tibial spines (fig. 1H) are placed in *Plagiognathus.* Species with other types of vestiture and those with totally pale tibiae are, perforce, placed in other genera. The greatest confusion created by this rather uncritical approach to assigning species can be found in the genus *Psallus,* which up to now has been the repository for many North American species with flattened, somewhat scalelike setae on the dorsum, an attribute that cuts across phyletic lines, as persuasively shown, for example, in the work of Stonedahl (1990) on *Atractotomus* Fieber. No North American authors, including Kelton, have used the male genitalia to assess the adequacy of Knight's approach to diagnosing *Plagiognathus* and *Psallus* in the Nearctic. As indicated by the large number of new combinations listed below, the situation is much more complicated than the existing literature would admit.

There are many works dealing with *Plagiognathus* in the Palearctic, although none could be classed as revisions. Nonetheless, Kerzhner (1964, 1988), Wagner (1975), and others have described portions of the fauna and illustrated the male genitalia for most of the Palearctic species. Currently 24 species are included (Kerzhner and Josifov, 1999); Schuh et al. (1995) discussed a few species of questionable placement.

A typical diagnosis based on the Palearctic fauna is that of Wagner (1975: 14), which in translation reads as follows:

> Small, elongate-oval to oval species. Vestiture normal, pale or dark. Vertex round along its posterior border without margin or edge. Femora with dark spots often forming longitudinal rows. Tibiae dark at point of articulation with femur and with dark spots, these becoming gradually smaller towards the apex. Claws very slender, slightly curved. Pulvilli small. Head small, inclined, pointed, and projecting below the eyes. Apical part of vesica with 2 slender, slightly curved chitinous points [spines]. Secondary gonopore situated far from apex of vesica.

Although Wagner's diagnosis appears more consistent than Kelton's—both internally and in its ability accommodate all species with a common genitalic type—not all Palearctic species currently placed in *Plagiognathus* fit it well. For example, *Plagiognathus albus* Reuter and *Plagiognathus zuvandiensis* Putshkov both have what Wagner considered a *Plagiognathus* genitalic type, but the tibiae are not dark at the point of articulation with the femora and the tibial spines do not have dark spots at their bases (fig. 1G).

Not only has *Plagiognathus* in North America been poorly characterized, but its constituent species have at times been poorly diagnosed. Many species are very similar in size and coloration, and may vary as much within a given species as among species. The genitalia show some useful diagnostic features, but for many species they are nearly identical, even though externally the bugs may look quite different. Thus, the determi-

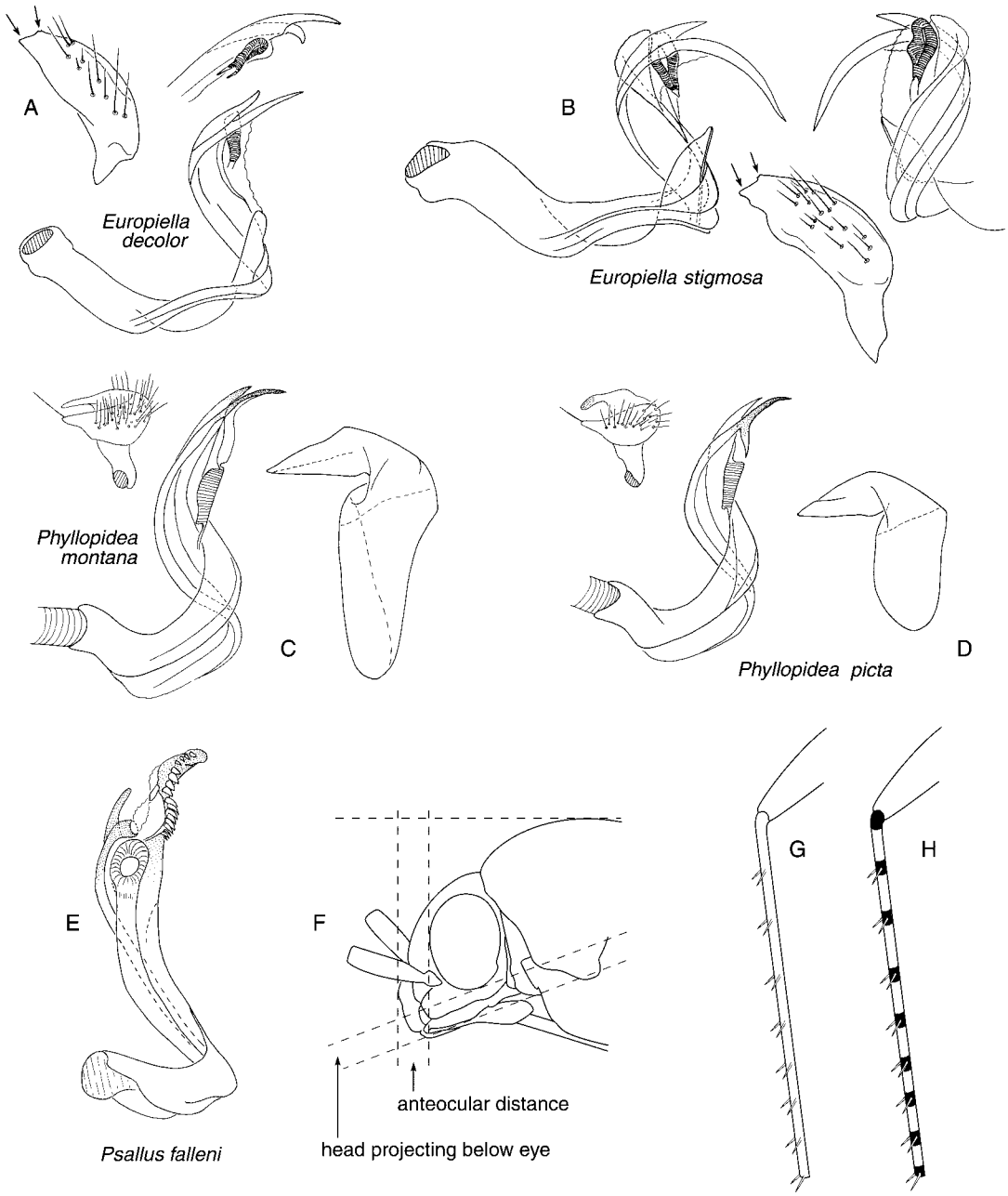

Fig. 1. Male genitalia of *Europiella* spp., *Phyllopidea* spp., and *Psallus falleni* Reuter. Measurement of anteocular distance and projection of head below eye. Tibia pale at articulartion with femur and with pale bases of spines (G). Tibia dark at articulartion with femur and with dark bases of spines (H).

nation of species limits is a critical element of the present work.

Kelton (1980) indicated that there were 27 species of *Plagiognathus* known in North America, 20 of which occurred in the Prairie provinces of Canada. His number for North America possibly represents an inadvertent error, as 76 species are listed in the most re-

cent catalog (Schuh, 1995), only one of which was described—by Kelton—after 1980.

Kelton (1959), in his study of male genitalia in the Miridae, illustrated four species of North American *Plagiognathus.* He also provided figures for *Microphylellus longirostris* Knight, 1923, and he indicated that the similarity in external appearance and genitalic structure of *longirostris* with species placed in *Plagiognathus* suggested a congeneric relationship. Unfortunately, Kelton (1959) did not examine the type species of either *Plagiognathus* or *Microphylellus,* and he did not carry to conclusion his comments concerning generic limits.

This, then, was the state of affairs for *Plagiognathus* when I began research for the present paper.

In the pages that follow, species are arranged alphabetically, first for the Nearctic, then for the Palearctic; species introduced into the Nearctic are listed with the native species. Diagnoses and descriptions (or redescriptions) are provided for all native Nearctic species; only diagnoses are provided for the introduced Palearctic species. Salient diagnostic characters are italicized in the diagnoses. This feature is included as a way of facilitating species recognition and as an adjunct to using the key. For the Nearctic fauna, the habitus, vesica of the male, and antennae are illustrated and a table of measurements is provided—all grouped together near the middle of the paper. Scanning micrographs of some structures for selected species are placed with the individual species.

For the Palearctic fauna I mention all valid species currently included in *Plagiognathus,* with more detailed discussion of those taxa for which I was able to secure what I believe to be reliably identified specimens. Diagnoses and descriptions are not provided, however, because I have examined a limited amount of material, sufficient only to confirm generic placement. Vesical illustrations are provided for the majority of Palearctic species. A credible revision of the Palearctic taxa would require examination of many European collections, something that was beyond the scope of this project. Nonetheless, the approach followed allows for refinement of the generic diagnosis and assessment of monophyly of the group.

Because this is a revision of just *Plagiognathus,* I refer to species in the text only as *arbustorum* or *obscurus,* for example; ordinarily the binomial form is not used.

Another aspect of nomenclature that may cause consternation on the part of some readers is the treatment of plant taxon names. My approach has been to transcribe information as I found it on the host labels, most of which lack the names of the authors of the host taxa; therefore, host names do not include authors' names. This would seem to be in conformity with the most recent edition of the International Code of Botanical Nomenclature (Greuter, 2000) which indicates that although the inclusion of authors' names may be desirable, their addition need not be enforced uncritically in papers not dealing with botanical taxonomy. Regarding plant family assignments, I have used standardized -aceae family endings and attempted to always place individual genera under the same family name, except in some cases involving the exact transcription of label data.

The references listed in the synonymies for *Plagiognathus* and its included species are not exhaustive because that information is already included in catalogs by Carvalho (1958), Henry and Wheeler (1988), Schuh (1995), and Kerzhner and Josifov (1999). Thus, only information necessary to document original descriptions, new combinations, new synonyms, and taxonomic position at the time of preparation of this paper is given.

The illustrations of the antennae in figures 15–19 are intended to show relative sizes and pattern of coloration. They lack certain details, such as the antennal vestiture and a pale apical annulus (probably the articulatory membrane) that occurs on antennal segment 1 in most species. Such items, although not illustrated, are mentioned in the descriptions.

Illustrations and descriptions of the male vesica in figures 1, 20–33, 39, and 40 follow conventions that allow for consistent comparisons. The vesica is always shown with the apical spines directed to the right and with the spines and adjoining distal portion of the vesica lying more or less flat. The vesica in many species will assume this posi-

tion naturally when placed in glycerine. In some species, however, the spines point almost directly at the observer when the vesica lies flat. In these cases the view illustrated is usually a compromise. Discovering the proper orientation of the vesica will allow for comparison of width and curvature of the basal portion, the width and point of termination of the *flange* (figs. 20, 22, 29, fl), and the shape of the anterior spine. Whereas the posterior spine is often more or less flat and two-dimensional, the anterior spine shows a much greater range of form; therefore, any attempt to compare its shape among species requires that the structure be oriented consistently.

Other taxonomic information is listed at the end of the paper. Included are the description of a new genus, the elevation of a subgenus to generic rank, the introduction of several new combinations, and the assignment of incertae sedis status to several species of questionable generic placement.

Label data for holotypes of new species are transcribed as they appear on the specimen labels. Label data for all other specimens were captured in a database and have been transformed to the degree necessary to achieve uniformity of presentation. Counties are given for localities in the United States where they were given on the label or could be determined; only the state of Connecticut is excepted, where no counties are listed. In some cases hosts are listed only by family, if the name of the host itself was omitted from the specimen label.

Some dates under ''Specimens Examined'' are given as ranges. These are always listed such that the days of the year are in succession, although the years themselves may not be. Therefore, even though there are certainly errors in the locality data, such apparent errors in the recording of dates are in fact intentional.

All measurements are given in millimeters. The method for determining the anteocular distance and the height of the head below the eye is shown in figure 1F.

Complete caption information for the habitus illustrations is listed in appendix 1.

Without experience and a relatively complete collection of specimens in reasonably good condition, identification of *Plagiognathus* specimens to species may be difficult. Even the male genitalia, which are so distinctive in many, if not most, phylines, are monotonously similar in a very large number of *Plagiognathus* species. Thus, whereas many species of Phylini can be identified on the basis of genitalic characters alone, identification of most North American *Plagiognathus* spp. will require that genitalic characters be used in concert with external morphological attributes.

PLAGIOGNATHUS FIEBER

Plagiognathus Fieber, 1858: 320 (n. gen.). Type species: *Lygaeus arbustorum* Fabricius, 1794. Fixed by subsequent designation.

Microphylellus Reuter, 1909: 76 (n. gen.). Type species: *Microphylellus modestus* Reuter, 1909. NEW SYNONYMY.

Gerhardiella Poppius, 1911: 84 (n. gen.). Type species: *Gerhardiella rubida* Poppius, 1911 (syn. by Carvalho, 1952: 65).

Plagiognathus (Parapsallus) Wagner, 1952: 187 (n. subgen.). Type species: *Capsus vitellinus* Scholtz, 1847. REVISED SYNONYMY.

Chaetophylidea Knight, 1968: 33 (n. gen.). Type species: *Plagiognathus moerens* Reuter, 1909. NEW SYNONYMY.

DIAGNOSIS: Distinguished by the form of the male genitalia with twisted vesica, two terminal blades, a narrow to broad ''flange'', and lanceolate right paramere (fig. 25: *grandis*). Appearance similar to *Europiella* species, but head usually more strongly projecting anteriorly and left paramere never ''bifid'' apically as in that group. Vesica in *Europiella* sometimes with two elongate, flattened apical blades as in *Plagiognathus*, but those uniquely modified in many species. Antennal segment 2 never sexually dimorphic, always slender and weakly tapered toward base in both sexes. Vestiture always with simple setae, sometimes intermixed with weakly to strongly flattened setae.

REDESCRIPTION: Elongate, more or less parallel-sided; total size ranging from very small to moderately large, range total length 2.33–5.75, range length apex clypeus–cuneal fracture 1.81–3.93. COLORATION: Frequently dark, castaneous to nearly black, sometimes with pale areas forming a more-or-less tesselate pattern, or one of linear striping; overall coloration sometimes orange, red, or al-

most entirely pale; antennae ranging from totally black to totally pale, segment 2 not infrequently dark proximally and pale distally; tibiae usually with pale background coloration, tibial spines commonly with dark spots at bases (fig. 1H) contrasting with tibial background coloration, tibiae sometimes entirely pale without dark spots at bases of spines (fig. 1G) or weakly to heavily darkened over entire surface. SURFACE AND VESTITURE: Impunctate, smooth, dull to moderately shining; vestiture always with at least some simple pale or dark setae, sometimes also with woolly, sericeous setae, often shining, silvery, or golden in appearance, and rarely with flattened scalelike setae appressed to body surface, as in *physocarpi* (fig. 36B–E). STRUCTURE: Head declivent, usually at least weakly projecting beyond anterior margin of eyes, clypeus visible from above or not; antennae relatively long, segment 2 usually as long as width of head across eyes (sometimes much longer), slender, with no obvious sexual dimorphism; labium reaching from near apex of middle coxae to well onto abdomen; claws slender, weakly and evenly curving, pulvillus relatively small, flaplike, and subbasal on claw; parempodia setiform. Abdomen relatively broad basally and tapering toward apex; genital capsule relatively large, conical. MALE GENITALIA: Vesica sigmoid, with one-half twist; two terminal blades at apex of vesica, the anterior blade usually longer than posterior; secondary gonopore ovoid, subtending terminal blades; straps of vesica contiguous with terminal blades; vesica often with a ''flange'' subtending secondary gonopore (figs. 20, 22, 29, fl). Left paramere boat-shaped (fig. 25: *grandis*); right paramere lanceolate (fig. 25: *grandis*); phallotheca rather sharply curving, attenuated apically, and without distinctive ornamentation (fig. 25: *grandis*).

DISCUSSION: The form of the male genitalia, while similar to that of some other phylines, appears to offer the most consistent character indicating the monophyly of *Plagiognathus.* Important attributes include: the sigmoid vesica; the half-twist of the body of the vesica; the form of the two apical blades; the position and form of the secondary gonopore; and the frequent presence of a narrow to broad flange (see figs. 20–33). Although the structure of the vesica is not invariate throughout the group, it nonetheless seems preferable at this point to define *Plagiognathus* in a more inclusive fashion, rather than producing a number of poorly characterized segregate genera.

Flattened apical vesical spines of a structure similar to that found in *Plagiognathus* also occur in the sympatric genus *Europiella* Reuter (fig. 1A, B) and also in *Phyllopidea* Knight from western North America (fig. 1C, D). The largely Southern Hemisphere group *Campylomma* Reuter also has paired apical spines of a similar structure to those found in *Plagiognathus* (e.g., see Schuh, 1984), but the vesica is not characteristically twisted as in *Plagiognathus* and always lacks the flange found in most *Plagiognathus* spp. The placement and structure of the secondary gonopore is somewhat different in *Europiella* than in *Plagiognathus.* Furthermore, the right paramere is lanceolate in *Plagiognathus* (fig. 25), whereas it is broadened apically in *Europiella* and has two ''tips'' or ''points'' (fig. 1A, B). The apical spines are shorter in *Phyllopidea* (fig. 1C, D) than in most *Plagiognathus* species; furthermore, the head in *Phyllopidea* is much more strongly dorsoventral in orientation than in *Plagiognathus,* and the dorsal vestiture is composed of suberect, black, bristlelike setae, a feature seen only in a few Nearctic *Plagiognathus* spp. *Phyllopidea* spp., like most *Europiella* spp., feed on *Artemisia* spp.; no Nearctic *Plagiognathus* species feed on *Artemisia,* although several are known to feed on other members of the Asteraceae; only two Palearctic species, *amurensis* Reuter and *yomogi* Miyamoto, appear to consistently feed on *Artemisia.*

The placement by Knight (1923) of several North American phyline species in *Psallus* Fieber—on the basis of their possessing flattened appressed setae—cannot be justified when male genitalic structure is also considered. The vesica of *Psallus falleni* Reuter (fig. 1E) illustrates the typical ''spined'', ''toothed'', or otherwise ornamented apical portion of the vesica, a feature found in all *Psallus* sensu stricto species, but dissimilar to the vesical structure of *Plagiognathus arbustorum* and its congeners. No true *Psallus* species are restricted to North America, and

those species that do occur there all appear to be truly Holarctic or introduced (Wheeler and Henry, 1992). *Psallus* sensu Knight is a polyphyletic group. Many North American phyline species originally placed in *Psallus* belong to *Plagiognathus,* and most of the rest belong to *Oligotylus* Van Duzee (Schuh, 1999). Whereas *Psallus* is extremely speciose in the Palearctic, species diversity in *Plagiognathus* is greatest in the Nearctic.

Microphylellus Reuter was diagnosed on the basis of the pale tibial coloration, whereas species placed in *Plagiognathus* had tibial spines with dark spots at their bases. The male genitalia of *Microphylellus modestus* Reuter, the type of the genus (fig. 27), are of the typical *Plagiognathus* type, and I therefore treat *Microphylellus* as a junior synonym of *Plagiognathus*; the only feature not ''typical'' of *Plagiognathus* in the classic sense is the pale tibiae. I transfer several additional species from *Microphylellus* to *Plagiognathus,* including some species that feed on conifers, even though the structure of their genitalia varies somewhat from that of *arbustorum* (fig. 21) and a great number of the native North American species. A limited number of species currently placed in *Microphylellus* are not congeneric with the type and belong to other genera. They are dealt with at the end of the present paper.

Knight (1968) erected the genus *Chaetophylidea* to receive *Plagiognathus moerens* Reuter. He noted that the general structure, including the pretarsus, was like that of *Plagiognathus* species, but that the vestiture, particularly on the head and pronotum, was bristlelike. The genitalia of *moerens* are of the *Plagiognathus* type (fig. 28). I am therefore treating *Chaetophylidea* as a junior synonym of *Plagiognathus.*

Wagner (1952) described the subgenus *Psallus* (*Parapsallus*) designating *Capsus vitellinus* Scholtz as the type. Since that time the status of *vitellinus* has shifted, with *Parapsallus* having been treated as part of *Psallus,* or *Plagiognathus,* or elevated to generic rank. In the present paper *vitellinus* is treated as a *Plagiognathus* species, because it has male genitalia of the *Plagiognathus* type (fig. 33), and most of its other characteristics fall within the range of variation seen in *Plagiognathus* as construed herein; *Parapsallus* is therefore treated as a junior synonym of *Plagiognathus.*

Wagner (1949) described the subgenus *Poliopterus* to accommodate some European phylines known to feed primarily on *Artemisia* spp. Schuh et al. (1995) pointed out that two of the species placed in *Poliopterus* by Wagner were treated as *Europiella* spp. by North American workers. Schuh et al. (1995) treated *Poliopterus* as a junior synonym of *Europiella,* thus making the latter group monophyletic. The species that Wagner (1949) placed in *Poliopterus* share some features with *Plagiognathus* (in the sense of *arbustorum,* the type). These include: the presence of two large apical spines on the vesica in most species; the pretarsus having elongate, slender, gently curving claws with a small subbasal pulvillus; similarities in structure of the scent gland evaporatory area (e.g., figs. 2B, 3B, 4C); and the metathoracic spiracle being sunken and generally having ''mushroom bodies'' only dorsad of it in a narrow line. In spite of these similarities, there is no evidence suggesting that *Plagiognathus* becomes paraphyletic if the *Europiella* species are not included. Indeed, both groups possess unique genitalic features.

Checklist of Species-Group Names Proposed in or Currently Used in *Plagiognathus* Fieber

Because of the large number of available names treated as junior synonyms, the large number of new synonyms, and the large number of new combinations presented in this paper, I am including the following checklist of names used in *Plagiognathus.* The checklist will serve to update information presented in the most recent world catalog of the Miridae (Schuh, 1995). A few taxa that have previously been placed in *Plagiognathus,* but were described in other genera and are removed from *Plagiognathus* in the present paper, are not included; their disposition will be found in the final section of the paper. Valid species in *Plagiognathus* are listed in boldface, junior synonyms are underlined, and species placed in other genera or incertae sedis are in italics. For species not originally described in *Plagiognathus,* the genus of original description is indicated in parentheses.

abrotani Wagner, 1949 = *Europiella decolor* (Uhler)
alashanensis Qi and Nonnaizab, 1993
albatus (Van Duzee, 1915) (*Psallus*)
albella Stichel, 1934 = *Europiella albipennis* (Fallen)
albellus Knight, 1953 (preoccupied) = *Americodema knighti* (Kerzhner and Schuh)
albicans Reuter, 1901 = *bipunctatus* Reuter
albifacies Knight, 1927
albocuneatus Knight, 1923 = *obscurus* Uhler
albonotatus Knight, 1923 = *fuscosus* (Provancher)
alboradialis Knight, 1923
albus Reuter, 1894
alnicenatus (Knight, 1923) (*Psallus*)
alpina Reuter, 1875, see *Europiella* Reuter
alyssi Pushkov, 1959 = *Lepidargyrus syriacus* (Wagner)
amorphae (Knight, 1930) (*Psallus*)
amurensis Reuter, 1883
amygdali (Linnavuori, 1965), see *Heterochlorillus* Putshkov
annulatus Stichel, 1934 = *fulvipennis* (Kirshbaum) (junior primary homonym)
annulatus Uhler, 1895
annulicornis Reuter, 1879, see *Badezorus* Distant
antennaria Stichel, 1934 = *Europiella artemisiae* (Becker)
apicatus Knight, 1923 = *albatus* (Van Duzee)
aquilinus, new species
arbustorum (Fabricius, 1794)
arenicola Wagner, 1941 = *Europiella albipennis* (Fallen)
assmanni Stichel, 1934 = *Europiella artemisiae* (Becker)
astericola (Knight, 1930) (*Psallus*)
atricornis Knight, 1926
beckeri Stichel, 1934 = *Europiella albipennis* (Fallen)
biplagiatus Stichel, 1958 = *chrysanthemi* (Wolff)
bipunctatus Stichel, 1934 = *chrysanthemi* (Wolff) (junior primary homonym)
bipunctatus Reuter, 1883
blatchleyi Reuter, 1912
breviceps Reuter, 1878, see *Eumecotarsus* Kerzhner
brevirostris Knight, 1923
brunneus (Provancher, 1872 (*Lygus*)
brunnipennis Meyer-Dur, 1843 = *arbustorum* (Fabricius)
canoflavida Qi and Nonnaizab, 1993, see *Europiella* Reuter
carinatus Knight, 1926 = *dispar* Knight
carneolus Knight, 1927, see *Pinophylus* Schwartz and Schuh, 2000
caryae Knight, 1923 = *albatus* (Van Duzee)
chloromelas (Gmelin, 1790) (*Cimex*) = *arbustorum* (Fabricius)
chrysanthemi (Wolff, 1804) (*Miris*)
cibbetsi, new species
cinerascens Reuter, 1904 = *chrysanthemi* (Wolff)
circumcinctus Stichel, 1934 = *fulvipennis* (Kirschbaum)
collaris (Matsumura, 1911) (*Chlamydatus*)
collinus Wagner, 1941 = *Europiella albipennis* (Fallen)
compar Knight, 1923 = *fuscosus* (Provancher)
concinna Reuter, 1875, see *Tuponia* Reuter
concoloris, new species
confusus Reuter, 1909, incertae sedis
cornicola Knight, 1923
crataegi Knight, 1929 = *dispar* Knight
crocinus Knight, 1927, incertae sedis
cruralis Van Duzee, 1917, see *Tuxedo,* new genus
cunctator Horvath, 1887 = *chrysanthemi* (Wolff)
cuneatus Knight, 1923 = *obscurus* Uhler
davisi Knight, 1923
debilis Blatchley, 1926 = *tinctus* Knight
decolor Lindberg, 1934 = *Psallus haematodes* (Gmelin)
delicatus (Uhler, 1887) (*Psallus*)
depallens Knight, 1929 = *salicicola* Knight
dimorphus, new species
dispar Knight, 1923
diversicornis Reuter, 1899 = *fulvipennis* (Kirschbaum)
diversus Van Duzee, 1917 = *Europiella artemisiae* (Becker)
elongatus (Knight, 1923) (*Microphylellus*) = *flavipes* (Provancher)
emarginatae, new species
extrema Reuter, 1901 = *Europiella decolor* (Uhler)
fasciatus Jakovlev, 1893 = *Psallus haematodes* (Gmelin)
femoralis (Geoffroy, 1785) (*Cimex*) = *chrysanthemi* (Wolff)
femorepunctatus (Goeze, 1778) (*Cimex*) = *chyrsanthemi* (Wolff)
fenderi, new species
fennicus Wagner = 1961, *vitellinus* (Scholtz)
flaveolus Knight, 1923 = *politus* Uhler
flavescens Knight, 1925 = *longipennis* (Uhler)
flavicornis Stichel, 1958 = *fulvipennis* (Kirschbaum) (junior primary of homonym)
flavicornis Knight, 1923
flavidus Knight, 1929
flavipes (Provancher, 1872) (*Capsus*)
flavipes Reuter, 1875 (preoccupied) = *Plagiognathus reuterellus* Schuh, new name
flavoscutellatus Knight, 1923
flavus Knight, 1964
fraternus Uhler, 1895 = *brunneus* (Provancher)
fulvaceus Knight, 1964

fulvidus Knight, 1923
fulvipennis (Kirschbaum, 1856) (*Capsus*)
fulvotinctus Knight, 1929 = *negundinis* Knight
fumidus (Uhler, 1895) (*Agalliastes*) = *Europiella decolor* (Uhler)
furvus Knight, 1927 = *albatus* (Van Duzee)
fusciflavus Knight, 1929 = *verticalis* Uhler
fusciloris Reuter, 1878
fuscipes Knight, 1929
fuscosus (Provancher), 1872 (*Lygus*)
fuscotibialis Knight, 1964 = *brunneus* (Provancher)
geminatus Knight, 1929, see *Cariniocoris* Henry
geranii Knight, 1964 = *shoshonea* Knight
gilva Kulik, 1965 = *Europiella livida* (Reuter)
gleditsiae Knight, 1929 = *Atractotomus griseolus* (Reuter)
gracilis Wagner, 1956 = *Europiella artemisiae* (Becker)
grandis Reuter, 1876
guttatipes (Uhler), 1895 (*Lygus*)
hallucinatus, new species
herbaalbae Wagner, 1969, see *Europiella* Reuter
hortensis (Meyer-Dur, 1843) (*Capsus*) = *arbustorum* (Fabricius)
ilicis Knight, 1925, see *Cariniocoris* Henry
infuscata (Fieber, 1861), see *Icodema* Reuter
inopinus Knight, 1926 = *albatus* (Van Duzee)
intrusus Knight, 1926 = *brevirostris* Knight
kiritshenkoi Kulik, 1975, see *Europiella* Reuter
larae Kerzhner, 1978 = *Europiella decolor* (Uhler)
laricicola Knight, 1923
lattini, new species
leucopus Kerzhner, 1979, see *Europiella* Reuter
lineatus Van Duzee, 1917
litoralis Wagner, 1949 = *Europiella decolor* (Uhler)
livida Reuter, 1906, see *Europiella* Reuter
lividella Kerzhner, 1979, see *Europiella* Reuter
longipennis (Uhler, 1895) (*Oncotylus*)
longirostris (Knight, 1923) (*Microphylellus*)
lonicerae, new species
louisianus, new species
lugubris (Hahn, 1835) (*Phytocoris*) = *arbustorum* (Fabricius)
luteus Knight, 1929
maculatus Stichel, 1934 = *chrysanthemi* (Wolff)
maculipennis (Knight, 1923) (*Microphylellus*)
maculosus Zhao, 1996
major Reuter, 1875 = *Psallus ocularis* (Mulsant and Rey)
mamorae Lindberg, 1940 = *Lepidargyrus lividus* (Reuter)
medicagus Arrand, 1958 = *brunneus* (Provancher)
melliferae, new species
mexicanus, new species
miyamotoi Kerzhner, 1988, see *Europiella* Reuter
modestus (Reuter, 1909) (*Microphylellus*)
moerens Reuter, 1909
moesta Reuter, 1906, see *Europiella* Reuter
monardellae, new species
morrisoni (Knight, 1923) (*Psallus*)
mundus Van Duzee, 1917
negundinis Knight, 1929
nicholi (Knight, 1964) (*Psallus*), see *Reuteroscopus* Kirkaldy
nigrescens Stichel, 1934 = *Europiella alpina* Reuter
nigricornis Hsiao, 1963 = *amurensis* Reuter
nigritibialis Knight, 1964 = *nigronitens* Knight
nigritus Knight, 1923 = *brevirostris* Knight
nigrocunealis Putshkov, 1975, see *Europiella* Reuter
nigrofemoratus Knight, 1923 = *obscurus* Uhler
nigrofuscus Stichel, 1934 = *arbustorum* (Fabricius)
nigrolineata Knight, 1923, see *Americodema* Henry, 1999
nigronitens Knight, 1923
nokhurensis Putshkov, 1976, incertae sedis
notodysmicos, new species
nubilis Knight, 1923 = *blatchleyi* Reuter
obscura Sahlberg, 1920 (preoccupied) = *Europiella artemisiae* (Becker)
obscuriceps (Stal, 1858) (*Eurymerocoris*)
obscurus Uhler, 1872
occipitalis Reuter, 1908, incertae sedis
olivaceus Reuter, 1880
oshensis Putshkov, 1976 = *arbustorum* (Fabricius)
ovatula Wagner, 1952, see *Europiella* Reuter
paddocki Knight, 1964, incertae sedis
pallescens Zheng and Li, 1991
pallidicornis Knight, 1923 = *fuscosus* (Provancher)
pallidipennis Reuter, 1906 = *collaris* Matsumura (junior primary homonym)
pallidipennis Sahlberg, 1868 = *Plesiodema pinetella* (Zetterstedt)
pallidus Reuter, 1900
paramundus, new species
parshleyi (Knight, 1923) (*Psallus*)
pemptos, new species
pesvariegatus (Goeze, 1778) (*Cimex*) = *arbustorum* (Fabricius)
phaceliae, new species
phlomidis Lindberg, 1934, see *Malacotes* Reuter
phoradendronae Knight, 1929, incertae sedis
physocarpi (Henry, 1981) (*Psallus*)
piceicola, new species
picticornis Horvath, 1898 = *bipunctatus* Reuter
pictipes (Van Duzee, 1918) (*Psallus*), see *Megalopsallus* Knight
pini Vinokurov, 1978

plagiathus Reuter, 1876
plessaeus (Geoffroy, 1785) (*Cimex*) = *arbustorum* (Fabricius)
pluto Van Duzee, 1917, incertae sedis
polhemorum, new species
politus Uhler, 1895
punctatipes Knight, 1923
puncticeps Reuter, 1876 = *Chlorillus pictus* (Fieber)
putonii Reuter, 1875 = *Monosynamma bohemanni* (Fallen)
raphani Wagner, 1963
reinhardi Johnston, 1935, incertae sedis
repetitus Knight, 1923
repletus Knight, 1923 = *albatus* (Van Duzee)
retovskii Reuter, 1885 = *Zophocnemis bicolor* (Jakovlev)
reuterellus Schuh, new name for *flavipes* Reuter
reuteri Westhoff, 1881 = *arbustorum* (Fabricius)
ribesi Kelton, 1982
rideri, new species
rileyi, new species
rosicola Knight, 1923
rosicoloides, new species
rubidus (Poppius, 1911) (*Gerhardiella*) = *grandis* Reuter
rubricans Provancher, 1887, see *Rhinocapsus* Uhler
rufinervis Jakovlev, 1880, see *Sacculifer* Kerzhner
salicicola Knight, 1929
salviae Knight, 1968
servadeii Wagner, 1972 = *Europiella artemisiae* (Becker)
schaffneri, new species
shepherdiae Knight, 1929
shoshonea Knight, 1964
similatus Henry and Wheeler, 1988 (unnecessary new name; proposed in error)
similis Knight, 1923 = *albatus* (Van Duzee)
simplex Stichel, 1956 = *Europiella alpina* Reuter
solani Matsumura, 1917 = *Europiella artemisiae* (Becker)
spilotus Fieber, 1858, see *Parachlorillus* Wagner
stitti Knight, 1964
strawinskii Sienkiewicz, 1986, see *Europiella* Reuter
strigifemur Wagner, 1964, see *Europiella* Reuter
subovatus Knight, 1929
suffuscipennis Knight, 1923
symphoricarpi (Knight, 1968) (*Microphylellus*) = *fulvaceus* Knight
syrticolae Knight, 1941
tamaninii Carapezza, 1998
tenellus Knight, 1929
texanus, new species
tiliae Knight, 1926 = *Plesiodema sericea* (Heidemann)
tinctus Knight, 1923
tomentosa Reuter, 1888, see *Europiella* Reuter
tsugae (Knight, 1923) (*Microphylellus*)
tumidifrons (Knight, 1923) (*Microphylellus*)
unimaculatus Stichel, 1956 = *Parachlorillus spilotus* (Fieber)
urticae Knight, 1964
vaulogeri Reuter, 1895
verticalis (Uhler, 1894) (*Macrotylus*)
vicarius Reuter, 1891 = *chrysanthemi* (Wolff)
viridescens (Gmelin, 1790) (*Cimex*) = *chrysanthemi* (Wolff)
viridulus (Fallen), 1807) (*Lygaeus*) = *chrysanthemi* (Wolff)
vitellinus (Scholtz, 1847) (*Capsus*)
viticola (Johnston, 1935) (*Sthenarus*)
vittiscutis Knight, 1923 = *albatus* (Van Duzee)
yomogi Miyamoto, 1969
zuvandiensis Putshkov, 1978

Relationships Within *Plagiognathus*

The establishment of a scheme of phylogenetic relationships for the species of *Plagiognathus* is beyond the scope of the present paper for at least three reasons. First, my intention in revising the Nearctic species was to determine the limits for a monophyletic group containing the type *Plagiognathus arbustorum* (Fabricius) and to therefore more adequately assign a substantial fraction of all species-group names currently applied to the North American Phylini. Second, the subtlety of variation in many features—particularly the male genitalia—make the preparation of a morphological character matrix sufficient to resolve detailed relationships within the group an unlikely prospect. Third, the sample of Palearctic material available to me was quite small.

This is not to say, however, that some apparently monophyletic groups of species cannot be recognized. Not all Nearctic species can be satisfactorily accommodated in species groups. Furthermore, I have not tried to place the Palearctic species in groups, with the exception of *Plagiognathus arbustorum*, because I do not have information for all of those species comparable to that available for the Nearctic fauna. What seems clear is that most Nearctic species groups do not also contain species from the Palearctic. Note, however, that on the basis of genitalic structure, *arbustorum*, the type, probably finds its closest relatives in the New World.

New World *Plagiognathus* species can be

grouped at four levels on the basis of available character information. I refer to these levels as cohorts, complexes, species groups, and species subgroups. Although some of the proposed groupings may not be monophyletic, others almost certainly are. The groupings are listed below, with the characteristics that seem to define them.

ARBUSTORUM COHORT

- vesica usually with a well-developed flange
- apical blades of the *arbustorum* type

OBSCURUS COMPLEX

- antennal segment 1 dark
- pale marking at the extreme base of the membrane

fuscosus species group

All species in this group (except *fuscosus*) were previously placed in *Psallus* Fieber, because of the weakly to strongly flattened setae on the dorsum. The vesica in all species is, nonetheless, of the typical *Plagiognathus* type.

- dorsum with simple setae intermixed with weakly to strongly flattened setae
- hind femora often almost entirely castaneous to black
- tibial spines with black spots at bases
- antennal segment 2 usually dark at extreme base, pale on remainder (*alnicenatus* and *astericola* sexually dimorphic, *morrisoni* and *parshleyi* with antennal segment 2 dark in males and females)
- dorsum entirely castaneous, some species with color forms with pale patches at base of corium and sometimes cuneus
- small to medium-sized species (except *parshleyi* moderately large)

alnicenatus (Knight)
amorphae (Knight)
astericola (Knight)
fuscosus (Provancher)
morrisoni (Knight)
parshleyi (Knight)
physocarpi (Henry)

obscurus species group

Some members of this group are among the most frequently encountered species of *Plagiognathus.* The pale and dark color pattern—in combination with the black antennal segments 1 and 2—allows for the placement of most species (and specimens) within this group. The most obvious exceptions are the totally dark forms of *brunneus*, *obscurus*, and *politus.* Unlike bivoltine *politus*, where the color forms appear to be strongly, if not exclusively, correlated with a particular generation, no such correlation is clear in the case of *brunneus* and *obscurus.*

- corium pale on basal one-third
- cuneus pale, at least at base, sometimes entirely
- antennal segment 2 entirely black
- tibial spines with black spots at bases
- size large (except for *subovatus*)
- vestiture of dorsum usually composed of only simple, shining setae

alboradialis Knight
brevirostris Knight
brunneus (Provancher)
dimorphus, new species
flavoscutellatus Knight
mundus Van Duzee
notodysmicos, new species
obscurus Uhler
paramundus, new species
politus Uhler
subovatus Knight

moerens species group

Although the linear pattern of coloration is diagnostic, *shoshonea,* and also apparently *lineatus*

(see discussion under the latter species for potential confusion with *brunneus*), may have totally dark-colored forms, which in the absence of pale and dark specimens can make the placement of specimens of these species questionable. Although *lineatus, shoshonea,* and *verticalis* have ''typical'' *Plagiognathus* male genitalia, those of *moerens* are distinctive, with very long apical vesical spines. The dorsal vestiture of *moerens* and *verticalis* is black and bristlelike, more conspicuously so in *moerens.*

- pale areas on hemelytra longitudinal, largely restricted to exocorium (and contiguous cuneus) and clavus
- pronotum with disc or posterior lobe often pale

lineatus Van Duzee
shoshonea Knight
moerens Reuter
verticalis (Uhler)

dispar species group

- legs, including hind femora, often almost entirely pale
- antennal segment 2 pale except at extreme base
- dorsum with recumbent, golden, shining setae
- dorsum mostly castaneous, more rarely with some pale patches

dispar Knight
louisianus, new species
rileyi, new species

delicatus species group

- antennal segment 2 partly to entirely pale
- dorsum at least partly pale, orange, or red, more rarely almost entirely dark

albatus (Van Duzee)(sometimes dorsum black)
cornicola Knight
delicatus (Uhler)
maculipennis Knight (tibial spines without dark spots at bases; antennal segment 1 pale)
salicicola Knight
tinctus Knight
viticola (Johnston) (tibial spines without dark spots at bases; antennal segment 1 pale)

laricicola species group

This is an assemblage of generally dull, brown to castaneous species without distinctive markings. With the exception of *fuscipes,* they all feed on conifers. The grouping is almost certainly artificial, in that no obvious character (or characters) holds the listed species together.

fenderi, new species
fuscipes Knight
laricicola Knight
pemptos, new species
piceicola, new species

MODESTUS COMPLEX

- hemelytra entirely dark without any pale markings (except eastern North American populations of *suffuscipennis* with pale hemelytra)

modestus species group

This assemblage contains most, but not all, of the species that have previously been placed in *Microphylellus* Reuter. Recognition of such a group does not, however, offer a justification for recognizing *Microphylellus* as a valid genus, because members of the group have male genitalia that are of the typical *Plagiognathus* type, and the presence of pale legs and tibiae without dark spots at the bases of the spines is an attribute that occurs elsewhere in *Plagiognathus.* If *Microphylellus* were recognized as valid, then *Plagiognathus* would have to be split into several additional genera and at least half of the species currently placed in *Microphylellus* by Knight (see Schuh, 1995) would have to be placed in other genera; some would remain unassignable to any described genera (see ''Species Incertae Sedis'' section).

Members of this group usually have the following attributes:

- femora, tibiae, trochanters, and usually coxae pale
- tibial spines with pale or very weakly darkened area at bases (this feature also occurs in some *delicatus*-group species, such as *maculipennis* Knight and *viticola* Johnston; the tibial

spines in *suffuscipennis* have small dark spots at bases, an attribute that led Knight [1923] to place the species in *Plagiognathus*)

- antennal segment 2 entirely pale (except *flavipes* (Provancher))

Two subgroups can be recognized:

modestus species subgroup

- antennal segment 1 usually mostly pale

flavipes (Provancher)
longirostris (Knight)
modestus (Reuter) (antennal segment 1 occasionally dark)

tsugae species subgroup

- antennal segment 1 dark
- anterior vesical spine erect, very broad, and weakly sclerotized
- feed on members of the Pinaceae

suffuscipennis Knight
tsugae (Knight)
tumidifrons (Knight)

davisi species group

This pair of species is very similar in appearance except for the size, coloration of the legs, and usually the coloration of the antennae. The nature of the dorsal vestiture, although hard to describe, is apparently distinctive.

- dorsum with suberect, shining, simple setae
- head distinctly projecting anterior to eyes

davisi Knight (antennae sometimes almost entirely dark)
syrticolae Knight

annulatus species group

This group of species is certainly not monophyletic, but rather represents those dark-colored species that cannot be placed in other groups.

- dark species without pale markings on hemelytra
- antennal segments 1 and 2 black (except *annulatus, flavicornis,* and *punctatipes*)

annulatus Uhler
emarginatae, new species
flavicornis Knight
negundinis Knight
nigronitens Knight
pintoi, new species
punctatipes Knight
repetitus Knight
rideri, new species
schaffneri, new species
texanus, new species
urticae Knight

GUTTATIPES COMPLEX

- antennal segments 1 and 2 mostly pale
- dorsum mostly pale

guttatipes species group
flavidus Knight
guttatipes (Uhler)
shepherdiae Knight

SALVIAE COMPLEX

- clypeus and adjacent face castaneous, contrasting with remainder of head
- possibly all use Lamiaceae as hosts

salviae species group
fulvidus Knight
melliferae, new species
mexicanus, new species
salviae Knight

Species unplaced within arbustorum cohort
arbustorum (Fabricius)
blatchleyi Reuter
monardellae, new species
stitti Knight

RIBESI COHORT
- *Ribes* feeders
- pale coloration
- apical vesical spines long, overlapping
- flange of vesica narrow

ribesi species group
cibbetsi, new species
luteus Knight
polhemorum, new species
ribesi Kelton

LATTINI COHORT
- suberect setae on dorsum
- antennal segment 2 dark basally and distally
- large, body elongate and slender
- apical vesical spines relatively short
- flange of vesica narrow

lattini species group
hallucinatus, new species
lattini, new species
rosicoloides, new species

CONCOLORIS COHORT
- apical vesical spines short
- dorsum uniformly pale
- apical vesical spines relatively short
- flange of vesica narrow

concoloris species group
concoloris, new species
flavus Knight
grandis Reuter
longipennis (Uhler)
lonicerae, new species
phaceliae, new species
tenellus Knight

Species unplaced to cohort or species group

The following species do not fit easily in any of the above groupings, either because of contradictions in the pattern of coloration or the details of genitalic morphology.

albifacies Knight
aquilinus, new species
atricornis Knight
fulvaceus Knight
rosicola Knight

BIOLOGY

Many *Plagiognathus* species are host-specific on woody plants and have one generation per year, a life history typical of the Phylini in general. However, some species feed on annual plants and some have more than one generation per year; these species—notably *Plagiognathus obscurus* Uhler and *Plagiognathus politus* Uhler—are the ones most frequently encountered by general collectors sweeping herbaceous vegetation, and they are therefore very common in collections. Hosts are not well documented for many North American *Plagiognathus* spp., irrespective of their feeding habits, which makes determining

species limits within the group more difficult than might otherwise be the case.

Although many species, such as *obscurus* and *politus*, are extremely common in collections, documenting the hosts and life histories of these and other *Plagiognathus* species will require a tremendous amount of additional fieldwork. One only has to examine the works of Knight (1923, 1941) on the faunas of Connecticut and Illinois to realize that the habits of many species were (and still remain) poorly understood. The fieldwork of A. G. Wheeler, Jr. and T. J. Henry, primarily in Pennsylvania, and that of L. A. Kelton in eastern Canada has added a tremendous amount of new information to what was available 60 years ago, as can be seen from examination of the species treatments in the present paper; nonetheless, the habits of some species still remain obscure. I had presumed that a modern treatment of the group, including the examination of material and host records ranging from the Hemiptera of Connecticut (Knight, 1923) to the present, would clarify the nature of host associations for most, if not all, species. Such has not been the case. Regardless, the following issues have been clarified.

It is now apparent that a significant number of *Plagiognathus* species feed on conifers. Previously, several of the conifer-feeding species from eastern North America had been placed in other genera, notably *Microphylellus*; virtually no species with such habits were known from the West. Now at least 8 species are known to feed exclusively on the Pinaceae. One would expect to see the discovery of additional conifer-feeders in the West with further collecting. Many of the species recorded here, as well as those described in *Plagiognathus*, but treated by Schwartz and Schuh (2000) as belonging to other genera, are seldom encountered, even by the specialist collector. Conifer-feeding in *Plagiognathus* appears to have arisen several times because species with such habits belong to several of the species groups delimited above. This can be easily seen by comparing species such as *concoloris, fenderi, laricicola*, and *tsugae*, all of which have well-documented hosts, but which certainly do not show close phylogenetic relationships to one another within *Plagiognathus.*

Host information as recorded in the present publication is what I found on the specimen labels. I have made only a very limited number of decisions concerning the admissibility of host label data. The picture that emerges—either as a consequence or as a matter of fact—is that for many species the breeding hosts are not obvious. What is clear, however, is that *Plagiognathus* spp. feed on a broad range of plant groups; they do not show the restrictions seen in recently revised groups such as *Oligotylus* Van Duzee (Schuh, 1999) and *Megalopsallus* Knight (Schuh, 2000).

The plant families and the numbers of *Plagiognathus* species feeding on them can be summarized as follows. Some *Plagiognathus* species feed on members of more than one plant family. Single specimen records are excluded.

Plant family	**Number of *Plagiognathus* species**
Aceraceae	2
Anacardiaceae	8
Apiaceae	5
Asclepiadaceae	1 (single host record)
Asteraceae	13
Berberidaceae	1
Betulaceae	9
Boraginaceae	1
Brassicaceae	2 (both as alternate hosts)
Caprifoliaceae	7
Cornaceae	3
Eleagnaceae	3
Ericaceae	5
Fabaceae	15
Fagaceae	7
Geraniaceae	1
Gesneriaceae	1 (single host record; males only)
Grossulariaceae	4
Hamamelidaceae	1 (single host record)
Hydrophyllaceae	3 (1 species from single host record)
Hydrangeaceae	1 (single host record)
Juglandaceae	2
Lamiaceae	7
Liliaceae	1 (single host record)
Malvaceae	2 (both as alternate hosts)
Myricaceae	2
Nyssaceae	2
Oleaceae	4 (1 species as alternate host)

Pinaceae	8	(other nonbreeding records not noted)
Platanaceae	1	
Ranunculaceae	2	
Rhamnaceae	1	(probably alternate host)
Rosaceae	16	(approximately)
Salicaceae	11	
Scrophulariaceae	3	
Ulmaceae	3	(approximately)
Urticaceae	2	
Verbenaceae	1	
Vitaceae	1	

Of the 39 plant families listed, probably eight represent nonbreeding records or plant groups that are rarely used as hosts.

Distribution

In the Nearctic, *Plagiognathus* is one of the most diverse groups of Miridae at latitudes above about 40 degrees north. This can be easily seen by examining Kelton's (1980) work on the Miridae of the Prairie provinces in which *Plagiognathus* spp. dominate the phyline fauna. My own fieldwork corroborates this general pattern, where much of the *Plagiognathus* material was collected at higher latitudes, and to a limited degree at higher altitudes (at lower latitudes). This pattern of latitudinal distribution is not quite so obvious in the Palearctic, but then the numbers of species there are much smaller.

What is apparent, in contrast to some other groups of Phylinae—such as *Chlamydatus* Curtis and *Europiella* Reuter—which are also most diverse at higher latitudes, is that there are no truly Holarctic species of *Plagiognathus.* Probably three species of *Chlamydatus* (*pulicarius* (Fallen), *pullus* (Reuter), *wilkinsoni* (Douglas and Scott)) (see Kelton, 1965) and at least two of *Europiella* (*artemisiae* (Becker), *decolor* (Uhler)) (see Schuh et al., 1995) are Holarctic. The three species of *Plagiognathus* that occur in both the Palearctic and Nearctic—*arbustorum* (Fabricius), *chrysanthemi* (Wolff), and *vitellinus* (Scholtz)—all appear to be introduction into North America (Wheeler and Henry, 1992). In the case of *arbustorum* this conclusion is supported by the very narrow distribution of the taxon in the Pacific Northwest, which is not continuous with the distribution of the species in the Palearctic. The situation with *chrysanthemi* may not be quite so clear-cut, but its introduced status is suggested by its breeding on introduced ruderals and its being limited to the Northeast and the Northwest. *Plagiognathus vitellinus* has achieved a relatively broad distribution in the Northeast and is known to breed on *Picea* and some other conifer species native to North America. It does not, however, belong to any of the species groups of *Plagiognathus* that occur only in North America, suggesting that it is not an indigenous species, an argument that can also be made for *chrysanthemi* (see also discussion of these taxa in Wheeler and Henry, 1992).

Furthermore, up to the time of completion of the present paper, *Plagiognathus* appeared to be largely restricted to eastern North America and, as noted above, to higher latitudes; however, such a characterization is clearly not accurate.

First, it is now clear that there is a substantial component of species restricted to the southern United States. The biologies of the species newly described from this area are not known, most of the available specimens having been taken at lights or without host data. With additional specialized collecting, we might expect to see even more species from this area, whereas diversity at higher latitudes in eastern North America appears to be quite well sampled.

Second, some taxa that would formerly have been characterized as being restricted to eastern North America are now known to have much wider distributions. These include *Plagionathus alboradialis* Knight, *P. brunneus* (Provancher), *P. fuscosus* (Provancher), *P. obscurus* Uhler, and *P. parshleyi* Knight. In all cases the distributional extensions are primarily at higher latitudes and in some cases also at higher altitudes at lower latitudes.

Third, the fauna of the western United States is now shown to be diverse and broad ranging in the region. Some species, such as those belonging to the *concoloris, lattini,* and *ribesi* species groups, are restricted to the West. Other western taxa, such as *P. fenderi,* new species and *P. notodysmicos,* new species, appear to have their closest relatives in Eastern North America.

Finally, examination of locality data in the present paper might suggest that *Plagiogna-*

thus in the New World is restricted to the United States and Canada. Although I have seen few specimens from Mexico, this is not for lack of looking. I examined substantial material from Mexico, much of it in the collections of Texas A&M University. Alas, very little in the way of *Plagiognathus* specimens was found. Whereas some Nearctic groups, such as *Megalopsallus* Knight (Schuh, 2000), show substantial southern range extensions onto the Mexican Plateau, *Plagiognathus* apparently does not. Therefore—at least for the moment—I consider the known distribution of *Plagiognathus* to be as much reality as artifact of collecting bias.

Key to Males of *Plagiognathus* spp. in North America

Organization of Key: The following key is broken into three parts as a way of simplifying identification of *Plagiognathus* specimens. For polymorphic species, or those for which the initial trichotomous division may be less than clearcut, the taxon will appear in more than one part of the key.

Color Variation: Coloration of the antennae, legs, and hemelytra is extremely useful in recognizing many species of *Plagiognathus.* Nonetheless, there is substantial variation within some species. In certain cases a given species will be keyed out more than once to account for such variation. In other cases individual specimens might not key out because it was not possible to construct a key which accounts for 100 percent of the variation observed in the taxon.

Vestiture: Characteristics of the vestiture are important in diagnosing some species. Thus, badly rubbed specimens may be virtually impossible to identify. The dorsal vestiture should be examined under moderately high magnification to distinguish among setal types. At lower magnifications, it is often impossible to distinguish between common setae and flattened setae and to determine whether both types occur on the same specimen.

Male Genitalia: I have attempted to use external characters in the key whenever possible. Nonetheless, identifying some specimens to genus, let alone species, may require examination of the male vesica. Reference to male genitalia is included in the key wherever it facilitates positive species identifications.

Females: As with many Miridae, identification of female *Plagiognathus* specimens is more difficult than identification of males. For those portions of the key where size and male genitalic characters are used to discriminate among species, identification of females will be least successful. In some cases coloration in the females is distinct from that of the males (as in *Plagiognathus alboradialis*), in which case positive association of males and females may be the only means of positively identifying the latter sex. Although the key is designed primarily for use with males, features of females are mentioned in the case of some sexually dimorphic species.

Hosts: Information on host associations is included in the key, and this may facilitate identification, but not to the same degree as is true in many other genera of Phylini. The use of hosts is complicated by the frequent absence of host information on labels, the polyphagous nature of some species, and the apparent habit of many adult *Plagiognathus* species to feed on food sources not utilized by the nymphs.

Key to Subparts of Key to Species

1. **Dorsum black, or almost totally infuscate** (fig. 5: *annulatus*), at most with a pale marking across the base of the cuneus, with this marking often as much on corium as cuneus; cuneus at most pale on basal one-third, never prominently pale over half or more of total length; basal one-fourth to one-third of endocorium never pale; clavus at most with faint longitudinal pale stripe; legs ranging from totally pale to totally black . . . . . part 1

– Dorsum sometimes largely brownish or blackish, but if so, then cuneus partly to completely pale, basal one-fourth to one-third of endocorium at least partially pale, and/or sometimes clavus with pale areas (fig. 10: *moerens*; *mundus*; *obscurus* 1, 2, 3); coloration otherwise ranging from partially pale to reddish to completely pale; coloration of legs variable 2

2. **Dorsum partially brown or black and partially pale,** forming a tesselate (checkerboard) or other pattern (fig. 10: *moerens*; *mundus*; *obscurus* 1, 2, 3); clavus with some darkening, usually along scutellar margin, only rarely completely pale (in *shoshonea*) . . . . . part 2
– **Dorsum usually largely pale** (figs. 8, 9: *guttatipes*; *luteus*), sometimes with some diffuse darker areas, these **often yellowish, orange, or red** (fig. 10: *mexicanus*; *monardellae*); if dorsum much darker, then coloration solid red or mottled red; clavus, if darkened, then distinctly red . . . . . part 3

PART 1

1. **Legs, including coxae, and labium mostly pale, yellow or yellow-white**; hind femora sometimes with discrete, large, dark spots, or more broadly darkened, in which case antennal segment 2 pale except at extreme base 2
– **Legs, including coxae, at least partially dark to almost entirely infuscate**; labium usually dark; femora often completely dark or at least partially infuscate 19
2. Relatively large species, average total length 3.43–3.95; tibial spines usually with dark spots at bases (fig. 1H) (except *longirostris* and *flavipes* with pale bases) 3
– Smaller species, average total length 2.55–3.45; tibial spines often lacking dark spots at bases 12
3. Tibial spines pale at bases (fig. 1G); femora entirely pale 4
– Tibial spines with at least small dark spots at bases; femora usually with some dark spots, blotches, or linear markings 5
4. Antennal segment 1 mostly pale, segment 2 dark except in rare cases (fig. 16); NE North America; ex *Aster* . . . . . *flavipes* (Provancher) (fig. 7)
– Antennal segments 1 and 2 entirely pale (fig. 17); NE North America . . . . . *longirostris* (Knight) (fig. 9)
5. Antennal segment 2 pale except at extreme base (fig. 18: *punctatipes*) 6
– Antennal segment 2 entirely dark (fig. 15: *brunneus*) or mostly dark with a broad, median, pale annulus (fig. 15: *annulatus*, female) 7
6. Dorsum uniformly castaneous, hemelytra devoid of pale markings; lateral corial margins distinctly convex; vesica as in fig. 30; NE North America . . . . . *punctatipes* Knight (fig. 12)
– Dorsum not entirely castaneous (fig. 5: *albatus* 3); corium narrowly but noticeably pale adjacent to extreme base of membrane, cuneus with a pale marking at base; lateral corial margins nearly straight and parallel; vesica as in figure 20; eastern North America . . . . . *albatus* (Van Duzee) (fig. 5)
7. Antennal segment 2 usually with a median pale annulus, this being much more pronounced in females than in males (fig. 15); femora usually with a dorsal, distal, black stripe; hind femora also with a black stripe distoventrally on mesial surface; usually on *Rosa* spp.; western United States . . . . . *annulatus* Uhler (fig. 5)
– Antennal segment 2 never with the pale annulus as above; femora seldom with dark stripes . . . 8
8. Transverse posterior portion of veins of membrane pale, in contrast to longitudinal veins and surrounding membrane; corium at least vaguely pale adjacent to extreme base of membrane . . . 9
– Veins of membrane entirely dark and not contrasting with surrounding membrane; corium entirely dark, with no pale marking adjacent to base of membrane 11
9. Vestiture of dorsum with some flattened, weakly scalelike, silvery setae, especially on pronotum (fig. 35C); cuneus with a quadrate white patch on basal one-half; widely distributed at higher latitudes; ex *Betula* spp . . . . . *parshleyi* (Knight) (fig. 11)
– Vestiture of dorsum only with golden, shining, simple setae; cuneus almost entirely dark 10
10. Flange on vesica very broad, reaching to about midpoint of gonopore (fig. 29); widespread; feeding primarily on annuals . . . . . *obscurus* Uhler (fig. 10)
– Flange on vesica not nearly so broad as above, at most barely attaining base of gonopore (fig. 28); midwestern United States; ex *Acer negundo* . . . . . *negundinis* Knight (fig. 10)
11. Hind femora with some large dark spots on outer surface, contrasting with pale background coloration; southern United States . . . . . *rideri*, new species (fig. 12)
– All femora nearly white and uniformly so; coloration of dorsum castaneous; vesica as in figure 32; Texas . . . . . *schaffneri*, new species (fig. 12)
12. Antennal segment 2 entirely pale, including extreme base (fig. 19: *tsugae*; *tumidifrons*); tibial spines pale at bases, lacking even very small dark areas (fig. 1G) 13

– Antennal segment 2 dark at least on basal portion (e.g., fig. 16: *dispar*), with this darkening often restricted to about basal one-fifth of segment, sometimes to extreme base, rarely nearly entire segment dark; tibial spines with at least a small dark area at base, sometimes this area large and conspicuous 15

13. All coxae largely dark (infuscate); NE North America; ex *Picea* spp. . . . . *tumidifrons* (Knight) (fig. 14)

– All coxae pale, except at extreme base 14

14. Tiny species, average total length 2.55; NE North America; ex *Tsuga* spp. . . . . *tsugae* (Knight) (fig. 13)

– Larger species, average total length 3.36; NE North America; ex deciduous trees . . . . . *modestus* (Reuter) (fig. 10)

15. Antennal segment 2 entirely dark, or with at most a pale median band 16

– Antennal segment 2 dark only at extreme base, sometimes very narrowly so 17

16. Antennal segment 2 with a faint, broad, pale, median annulus (fig. 15); interior western North America; ex *Rosa* spp . . . . . *annulatus* Uhler (fig. 5)

– Antennal segment 2 entirely dark (fig. 18); NE North America; ex Ericaceae . . . . . *repetitus* Knight (fig. 12)

17. Head conspicuously projecting anteriorly beyond eyes (fig. 3A); antennal segment 2 only slightly longer than width of head; mostly northern North America; ex *Potentilla* . . . . . *davisi* Knight (fig. 7)

– Head only slightly projecting beyond anterior margin of eyes; length of antennal segment 2 at least 1.25 times width of head 18

18. Costal vein castaneous, not contrasting with remainder of hemelytra; vesica with flange relatively broad and straight (fig. 23); eastern North America . . . . . *dispar* Knight (fig. 7)

– Costal vein pale, contrasting with general coloration of hemelytra; vesica with flange relatively narrow and curving (fig. 31); southern United States . . . . . *rileyi*, new species (fig. 12)

19. Antennal segment 2 in males entirely dark (e.g., fig. 15: *brunneus*), or at least infuscate and lighter colored distal portion not distinctly contrasting with darker basal portion; females sometimes with antennal segment 2 conspicuously pale 20

– Antennal segment 2 partially to totally and conspicuously pale in both sexes (*flavicornis*; *fuscosus*) 36

20. Larger species, average total length greater than 4.10; antennal segment 2 dark in both sexes 21

– Smaller species, average total length less than 3.70; antennal segment 2 sometimes becoming lighter colored distally, particularly in females 27

21. Cuneus pale at least at base and contrasting with most of remainder of dorsum (fig. 6: *brevirostris*) 22

– Cuneus, corium, and clavus unicolorous dark (fig. 6: *brunneus* 1) 24

22. Larger species, average total length 5.07; northern Rocky Mountains; ex *Geranium* . . . . . *shoshonea* Knight (fig. 13)

– Smaller species, average total length not exceeding 3.72 23

23. Labium relatively short, not quite reaching anterior margin of middle trochanters; flange on vesica narrow and not attaining base of secondary gonopore (fig. 21); eastern North America; ex *Thalictrum* . . . . . *brevirostris* Knight (fig. 6)

– Labium long, reaching to apex of hind trochanters; flange of vesica broad, uniquely serrate, and reaching nearly to apex of secondary gonopore (fig. 30); eastern North America . . . . . *politus* Uhler (fig. 11)

24. Vestiture on dorsum composed of simple, recumbent setae, golden, shining across pronotum, scutellum, and anteriorly on corium, setae dark on posterior half of corium; Texas . . . . . *texanus*, new species (fig. 12)

– Vestiture of dorsum weakly flattened, woolly, uniformly silvery, shining over entire dorsum 25

25. Ovate species with lateral margin of hemelytra, including cuneus, weakly to moderately convex; average total length 4.16; northern United States and Canada; frequently ex herbaceous Fabaceae . . . . . *brunneus* (Provancher) (fig. 6)

– Elongate, more or less parallel-sided; average total length at least 4.32 26

26. Vestiture of pronotum composed primarily of flattened, somewhat appressed, weakly scalelike,

silvery setae; dorsum intensely black; average total length 4.36; vesica as in figure 23; California, Sierra Nevada Mountains; ex *Prunus emarginatae* . . . . . *emarginatae*, new species (fig. 7)

– Vestiture of pronotum composed of silvery setae, but at most very weakly flattened and never appressed; body brownish, not intensely black; average total length 4.32; vesica as in figure 33; southern California; ex *Amorpha californica, Urtica* sp . . . . . *urticae* Knight (fig. 14)

27. Vestiture of dorsum composed of dark, reclining common setae *and* somewhat flattened, silvery, scalelike setae (see fig. 4D); antennal segment 2 pale on distal one-half in females 28

– Vestiture of dorsum composed of only simple, recumbent setae (see fig. 3C), often golden shining, but sometimes dark and barely shining; no apparent sexual dimorphism in coloration of antennal segment 2 29

28. Antennal segment 2 about 1.4 times as long as width of head; larger, more elongate species, average total length 3.46; vesica as in figure 28; NE North America; ex *Myrica, Comptonia* . . . . . *morrisoni* (Knight) (fig. 10)

– Length of antennal segment 2 about 1.25 times width of head; smaller, more stout-bodied species, average total length 2.97; vesica as in figure 21; E North America; ex *Aster* . . . . . *astericola* (Knight) (fig. 6)

29. All trochanters largely infuscate 30

– All trochanters mostly pale 34

30. Dorsal vestiture black, at most weakly shining; average total length 3.44; vesica as in figure 30; northwestern North America; ex *Abies, Picea* . . . . . *pemptos*, new species (fig. 11)

– Dorsal vestiture shining, golden at least on anterior one-half of pronotum 31

31. Antennal segment 2 not as dark distally as proximally (fig. 17); average total length 3.69; vesica as in figure 26; eastern North America; ex *Larix* . . . . . *laricicola* Knight (fig. 8)

– Antennal segment 2 uniformly black 32

32. Vestiture golden on anterior one-half of hemelytra, dark on posterior one-half; body usually intensely black; vesica as in figure 28; east of Rocky Mountains; ex *Helianthus* . . . . . *nigronitens* Knight (fig. 10)

– Vestiture of hemelytra uniformly golden; body generally castaneous 33

33. Antennal segment 2 only slightly longer than width of head; smaller species, average total length 3.12; vesica as in figure 32; Rocky Mountains; ex *Picea* . . . . *suffuscipennis* Knight (fig. 13)

– Antennal segment 2 about 1.5 times as long as width of head; larger species, average total length 3.87; vesica as in figure 30; southern Rocky Mountains; ex *Picea* . . . . . *piceicola*, new species (fig. 11)

34. Pronotum with some flattened, silvery, scalelike setae; vesica as in figure 20; eastern North America; ex *Alnus* . . . . . *alnicenatus* (Knight) (fig. 5)

– Pronotum never with flattened, silvery, scalelike setae 35

35. Hemelytra nearly unicolorous, blackish brown, weakly shining; vesica as in figure 25; montane western North America; ex *Potentilla* . . . . . *fuscipes* Knight (fig. 8)

– Hemelytra not unicolorous, generally castaneous with contrasting yellow-white areas on corium adjacent to extreme base of membrane, mesal margin of cuneus, and veins of membrane; dorsum dull; vesica as in figure 23; northwestern mountains; ex *Abies* . . . . . *fenderi*, new species (fig. 7)

36. Length of antennal segment 2 at least 1.56 times width of head; body broadly ovoid in both sexes; NE North America; probably ex *Myrica* . . . . . *flavicornis* Knight (fig. 7)

– Length of antennal segment 2 about 1.36 times width of head, or less; body form in males usually more nearly parallel-sided than above (but see some specimens of *fuscosus*) 37

37. Dorsum clothed with reclining, usually dark, common setae and flattened, woolly or distinctly scalelike, silvery setae 38

– Dorsum clothed only with reclining, common setae, usually golden and shining at least on anterior one-half of hemelytra 40

38. Silvery setae on dorsum distinctly flattened, scalelike, and appressed, particularly on pronotum 39

– Vestiture of dorsum with weakly flattened, silvery, shining, somewhat woolly setae intermixed with simple setae, never appressed to dorsum; vesica as in figure 25; widely distributed; ex *Salix, Spiraea*, etc. . . . . *fuscosus* (Provancher) (fig. 8)

39. Larger species, average total length 3.43; scalelike setae broad (fig. 36C–E); eastern North America; ex *Physocarpus* . . . . . *physocarpi* (Henry) (fig. 11)

– Smaller species, average total length 3.06; scalelike setae not as broad; vesica as in figure 20; eastern North America; ex *Amorpha* . . . . . *amorphae* (Knight) (fig. 5)
40. All femora largely yellowish and only partially infuscate; eastern North America . . . . . *dispar* Knight (fig. 7)
– At least middle and hind femora heavily and uniformly infuscate, except extreme basal and apical portions 41
41. Vestiture appearing somewhat bristlelike, silvery, shining; vesica as in figure 32; average total length 3.47; eastern North America; ex *Salix* spp . . . . . *syrticolae* Knight (fig. 13)
– Vestiture composed of recumbent, simple setae, golden on anterior one-half of hemelytra, dark on posterior one-half; vesica as in figure 28; average total length 3.05; eastern North America . . . . . *nigronitens* Knight (fig. 10)

PART 2

1. **Antennal segments 1 and 2 totally dark-colored** (usually black); most species relatively large, average total length 3.60 or greater 2
– **Antennal segments 1, 2, or both totally or partially pale**; most species relatively small, average total length less than 3.40 24
2. Clavus entirely dark or at most narrowly pale along claval suture (fig. 10: *mundus*; *notodysmicos*; *obscurus*) 3
– Clavus partially to entirely pale, and with pale areas always extending beyond a narrow band along claval suture (fig. 9: *lineatus*; fig. 10: *moerens*) 18
3. Cuneus entirely pale or only partially and weakly infuscate, contrasting with other much darker portions of dorsum (fig. 11: *paramundus*) (not distinctly contrasting in available specimens of *subovatus*) 4
– Cuneus either not entirely pale (fig. 6: *brunneus*) or darker and lighter portions of dorsum not strongly contrasting with one another 9
4. Labium reaching to middle trochanters or very slightly beyond 5
– Labium reaching to hind trochanters 6
5. Hind femur pale to weakly infuscate over entire length; dorsum dull; elongate, somewhat flattened species; northern California and Nevada; ex *Salix* . . . . . *paramundus*, new species (fig. 11)
– At least hind femur largely castaneous, pale at apex; dorsum moderately shining; large, heavy-bodied species; NE North America; ex *Thalictrum* spp. (Ranunculaceae) . . . . . *brevirostris* Knight (fig. 6)
6. Anterior pale portion of corium conspicuously continuing narrowly along claval suture and attaining base of membrane; vesica as in figure 29; SW United States . . . . . *notodysmicos*, new species (fig. 11)
– Anterior pale portion of corium not obviously continuing along claval suture toward membrane (e.g., fig. 10: *obscurus* 1) 7
7. Costal vein dark along dark adjacent areas of corium; vesica heavy-bodied with a broad flange (fig. 29); widely distributed . . . . . *obscurus* Uhler (fig. 10)
– Costal vein pale along entire length of corium; pale basal area of corium extending posteriorly along lateral surface of radial vein (fig. 5: *alboradialis*); vesica not as above 8
8. Antennal segment 2 very long, ratio average length antennal segment 2/average width head 1.94; vesica as in figure 20; northerly distribution; often on *Salix* . . . . . *alboradialis* Knight (fig. 5)
– Antennal segment 1 shorter, ratio average length antennal segment 2/average width head 1.62; vesica as in figure 22; above about 45 degrees N latitude . . . . . *brunneus* (Provancher) (fig. 6)
9. Mesoscutum and scutellum usually uniformly dark, mesoscutum sometimes lighter laterally; cuneus pale only at base; face and vertex black or heavily infuscate, except posterior margin of vertex 10
– Mesoscutum and scutellum usually at least partially pale, sometimes totally; if scutellum totally dark, then cuneus pale at base and apex; clypeus usually castaneous and polished (rarely lighter), remainder of face and vertex often pale, or at least lighter than clypeus; entire face (including clypeus) and vertex sometimes faded brown 15
10. Pale area anteriorly on corium always well developed, roughly triangular, elongated posteromesially along claval suture to at least midpoint of clavus 11
– Pale area anteriorly on corium much less extensive, never elongated posteromesially along claval suture 13

11. Larger species, average total length at least 4.20 12
– Smaller species; average total length 3.22; males subovate, lateral corial margins weakly convex; northern Great Plains . . . . . *subovatus* Knight (fig. 13)
12. Lateral corial margins nearly straight and parallel-sided; basal pale area of corium more or less evenly angled posteromesially; cuneus more than half pale; vesica as in figure 29, heavy bodied and strongly curving, flange broad and straight over much of length; widely distributed . . . . . *obscurus* Uhler (fig. 10)
– Lateral corial margins weakly but noticeably convex; basal pale area of corium sinuous along its posterior margin; vesica as in figure 22, body not as heavy as above, more broadly curving, flange curving; Canada and Rocky Mountains . . . . . *brunneus* (Provancher) (fig. 6)
13. Larger species, average total length at least 4.42 14
– Smaller species, average total length at most 3.46; eastern United States; ex *Comptonia, Myrica* . . . . . *morrisoni* (Knight) (fig. 10)
14. Hemelytra usually entirely dark, often black, except for roughly quadrate, white, contrasting macula at base of cuneus; base of corium sometimes also pale, but never spreading posteriorly along radial vein (fig. 11); New England to British Columbia, north to Alaska; ex *Betula* . . . . . *parshleyi* (Knight) (fig. 11)
– Hemelytra brownish, usually with small, diffuse, pale area at base spreading posteriorly along radial vein; pale area of cuneus usually more diffuse and not so strongly contrasting; western North America; ex *Shepherdia* . . . . . *dimorphus,* new species (fig. 7)
15. Length of antennal segment 2 at least 1.60 times width of head; pale anterior region of corium extending posteriorly along radial vein 16
– Length of antennal segment 2 no more than about 1.35 times width of head; markings on corium not so conspicuously pale and dark nor with pale marking along radial vein 17
16. Relatively narrow-bodied, average width of pronotum 1.16; vescica as in figure 28; northwestern North America; ex *Urtica* . . . . . *mundus* Van Duzee (fig. 10)
– Relatively broad-bodied, average width of pronotum 1.31; vesica as in figure 24; ex *Salix* spp.; NE North America . . . . . *flavoscutellatus* Knight (fig. 8)
17. Pronotum with only simple setae; ''flange'' of vesica uniquely serrate (fig. 30); widely distributed in eastern North America; breeds on annuals . . . . . *politus* Uhler (fig. 11)
– Pronotum with moderately flattened scalelike setae laterally and on pleuron; flange of vesica without serrate margin (fig. 20); NE North America; ex *Alnus* . . . . . *alnicenatus* (Knight) (fig. 5)
18. Clavus with a pale stripe along nearly entire length; exocorium pale along radial vien, this pale area contrasting with costal portion of exocorium and adjacent endocorium; scutellum usually dark 19
– Clavus entirely pale to uniformly light olive, or if partially dark then scutellum entirely pale (although mesoscutum sometimes at least partially dark) 21
19. Dorsum clothed with black, suberect, heavy, bristlelike setae; California; ex *Amsinckia* . . . . . *moerens* Reuter (fig. 10)
– Dorsum with recumbent, weakly flattened, silvery setae 20
20. Very large species, average total length 5.07; pale areas of dorsum yellowish, dark areas brownish; vesica as in figure 32; montane western North America; ex *Geranium* . . . . . *shoshonea* Knight (fig. 13)
– Smaller species, average total length 4.29; pale areas of dorsum olive, dark areas brownish black; vesica as in figure 26; northwestern North America . . . . . *lineatus* Van Duzee (fig. 9)
21. Head castaneous, except for pale posterior margin of vertex; veins of membrane largely infuscate, of same coloration as remainder of membrane; coastal British Columbia, Washington . . . . . *arbustorum* (Fabricus) (fig. 6)
– Vertex not castaneous; veins of membrane pale 22
22. Clypeus castaneous, constrasting with remainder of head; vesica as in figure 21; eastern North America; ex Asteraceae . . . . . *blatchleyi* Reuter (fig. 6)
– Clypeus and head, at and below base of clypeus, castaneous, contrasting with entirely pale vertex and frons 23
23. Larger species, average total length 4.11; southern California; ex *Salvia mellifera* . . . . . *melliferae,* new species (fig. 9)
– Smaller species, average total length 3.38; western margins of Great Basin; ex *Salvia* spp . . . . . *salviae* Knight (fig. 12)
24. Antennal segment 1 at least partially to entirely pale 25

– Antennal segment 1 totally and uniformly dark, except for pale apical annulus 27
25. Tibial spines with dark spots at bases; scutellum entirely pale; western Great Plains; ex *Shepherdia* . . . . . *shepherdiae* Knight (fig. 13)
– Tibial spines without dark spots at bases (fig. 1G), tibiae entirely pale; coloration of scutellum variable 26
26. Scutellum with a dark, mesial, longitudinal stripe; eastern North America; ex *Juglans, Quercus, Ulmus* . . . . . *maculipennis* (Knight) (fig. 9)
– Scutellum unicolorous, either pale or orange; eastern North America; ex *Vitus* . . . . . *viticola* (Johnston) (fig. 14)
27. Femora dark except for contrasting pale apex 28
– Femora entirely pale, or largely pale with dark spots or blotches 29
28. Base of corium and cuneus pale, contrasting with adjacent areas of hemelytra; widely distributed; ex *Salix, Spiraea* . . . . . *fuscosus* (Provancher) (fig. 8)
– Hemelytra uniformly colored, without contrasting pale and dark areas; eastern North America; ex *Cornus* . . . . . *cornicola* Knight (fig. 7)
29. Entire head, including clypeus, uniformly brown; eastern North America; ex *Picea* . . . . . *suffuscipennis* Knight (fig. 13)
– Vertex and often part of frons pale, if clypeus dark then contrasting with pale vertex 30
30. Relatively small species, average total length 3.25; antennal segment 2 short relative to width of head (average measurements 0.74/0.69); coloration of dorsum heavily tinged with orange; North America east of Rocky Mountains; ex *Gleditsia* . . . . . *delicatus* (Uhler) (fig. 7)
– Somewhat larger species, average total length 3.43 and greater; sometimes dorsum partially orange or red, but never broadly and predominantly so 31
31. Scutellum pale laterally with a dark, median, longitudinal stripe 32
– Scutellum largely unicolorous, ranging from pale to dark, sometimes broadly pale medially and dark laterally 33
32. Vesica relatively elongate, flange narrow, terminating just above base of secondary gonopore (fig. 27); Louisiana . . . . . *louisianus*, new species (fig. 9)
– Vesica relatively short and stout, flange broad, reaching to about midpoint of secondary gonopore (fig. 20); eastern North America . . . . . *albatus* (Van Duzee) (fig. 5)
33. Flange of vesica broad, terminating at about midpoint of secondary gonopore, vesica short and stout, apical spines relatively short (fig. 20); eastern North America; ex *Alnus, Betula, Carya, Juglans, Platanus* . . . . . *albatus* (Van Duzee) (fig. 5)
– Flange of vesica narrow, vesica relatively longer and more slender, anterior apical spines longer and more slender than above 34
34. Vesica as in figure 31, apical spines largely superposed; Arkansas . . *rileyi*, new species (fig. 12)
– Vesica as in figure 33, apical spines very long and slender, not superposed; eastern North America; ex *Salix* . . . . . *tinctus* Knight (fig. 13)

PART 3

1. Antennal segments 1 and 2 entirely pale or nearly so 2
– Antennal segments 1, 2, or both black, or at least mostly reddish; never pale as above 12
2. Membrane white with a dark marking just posterior to cuneus and membrane cells; ex *Ribes* 10
– Membrane without dark marking just posterior to cuneus and cells 3
3. Tibiae without black ''knee'' at articulation with femora; tibial spines without dark spots at bases (fig. 1G) 4
– Tibiae with black ''knee'' at articulation with femora (fig. 1H) 5
4. Coloration of dorsum usually somewhat mottled brown, sometimes pale green; vestiture of dorsum recumbent, short, golden; tiny, mean total length 2.83; eastern North America; ex *Vitus* . . . . . *viticola* (Johnston) (fig. 14)
– Coloration of dorsum golden; dorsal vestiture long, somewhat shaggy, pale on hemelytra; larger than above, mean total length 3.83; Arizona; ex *Philadelphus* . . . . . *tenellus* Knight (fig. 13)
5. Dorsum almost uniformly orange, sometimes tinged with green; veins of membrane orange, similar to remainder of dorsum; northeastern North America; ex *Picea, Larix* . . . . . *vitellinus* (Scholtz) (fig. 14)
– Dorsum pale or greenish, sometimes with diffuse darker markings 6

6. At least pronotum and anterior portion of hemelytra with some dark setae 7
– Dorsum with only pale setae 9
7. Dorsum pale green; vesica as in figure 22; northeastern and northwestern North America; on ruderal vegetation . . . . . *chrysanthemi* (Wolff) (fig. 6)
– Dorsum pale, sometimes greenish or orange, but never so intensely as above 8
8. Pale to greenish species; vesica as in figure 25; Midwest and Great Plains; ex *Glycyrrhiza* . . . . . *guttatipes* (Uhler) (fig. 8)
– Pale orange to red-orange species; vesica as in figure 27; coastal southern California; ex *Lonicera* . . . . . *lonicerae,* new species (fig. 9)
9. Dorsum with at least some fuscous markings on anterior lobe of pronotum and hemelytra; vesica as in figure 32; western Great Plains; ex *Shepherdia* . . . . . *shepherdiae* Knight (fig. 13)
– Dorsum uniformly pale; vesica as in figure 24; Great Plains; ex *Eleagnusflavidus* Knight (fig. 7)
10. All femora with black stripe on dorsal surface 11
– Femora without black stripe on dorsal surface; vesica as in figure 22; San Diego County, California, southern Nevada; ex *Ribes* . . . . . *cibbetsi,* new species (fig. 6)
11. Clypeus distinctly protuberant, visible from above; vesica as in figure 31; British Columbia to northern California; ex *Ribes* . . . . . *ribesi* Kelton (fig. 12)
– Clypeus not so strongly protuberant, not visible from above; vesica as in figure 30; Colorado; ex *Ribes* . . . . . *polhemorum,* new species (fig. 11)
12. Antennal segment 1 mostly pale, segment 2 dark; labium long, reaching onto abdomen 13
– Antennal segment 1 dark, segment 2 either mostly pale or mostly dark, or both segments 1 and 2 mostly reddish; labium usually reaching only to apex of hind coxae (but see *rosicola*) 14
13. Labium very long, reaching to about middle of abdomen; vesica as in figure 20; eastern North America; ex *Polymnia* . . . . . *albifacies* Knight (fig. 5)
– Labium somewhat shorter than above; vesica as in figure 30; southern California; ex *Phacelia* . . . . . *phaceliae,* new species (fig. 11)
14. Antennal segment 2 mostly pale, contrasting with dark antennal segment 1 15
– Antennal segments 1 and 2 more or less unicolorous, usually black, sometimes orange or red 21
15. Head, scutellum, and at least anterior lobe of pronotum dark, contrasting with much lighter, uniform, coloration of hemelytra; eastern North America; ex Pinaceae . . . . . *suffuscipennis* Knight (fig. 13)
– Dorsum of more or less uniform coloration, never with pronotum dark and hemelytra contrastingly pale 16
16. Hind femur with a black stripe distally on dorsal surface; uniformly bright orange species; head projecting anteriorly, anteocular distance 1.5 times diameter of antennal segment 1; SW United States; ex *Berberis* . . . . . *luteus* Knight (fig. 9)
– Hind femur never with a black stripe on dorsal surface; coloration variable, but never intensely and uniformly orange; anteocular distance variable, equal to or less than diameter of antennal segment 1 17
17. Tibiae without distinct black ''knee'' at point of articulation with femora (fig. 1G); calli infuscate, in contrast to orange or light brown coloration of remainder of pronotum; vesica as in figure 22; eastern United States; ex *Gleditsia triacanthos* . . . . . *delicatus* (Uhler) (fig. 7)
– Tibiae with distinct black ''knee'' at point of articulation with femora (fig. 1H) 18
18. Small species, maximum total length about 3.30; dorsum usually orange to brown; vesica as in figure 22; northeastern United States; ex *Cornus* . . . . . *cornicola* Knight (fig. 7)
– Larger species, minimum total length about 3.45; coloration ranging from pale to orange . . . 19
19. Large, elongate, nearly parallel-sided species; dorsum uniformly orange; vesica as in figure 24, apical spines relatively short; Arizona; ex *Lonicera* . . . . . *flavus* Knight (fig. 8)
– Generally smaller, somewhat more ovoid species; dorsum sometime with orange, but never uniformly so 20
20. Coloration of dorsum white to orange, with some darker markings; vesica as in figure 20, short, stout, with relatively stout apical spines angled relative to body of vesica; eastern North America; ex *Betula, Platanus, Ulmus,* etc . . . . . *albatus* (Van Duzee) (fig. 5)
– Coloration mostly cream with some slightly darker areas; vesica as in figure 31, apical spines long erect, of nearly equal length; eastern North America; ex *Salix* . . . . *salicicola* Knight (fig. 12)
21. Antennal segment 1 black, segment 2 entirely black or with pale median band 22

– Antennal segments 1 and 2 more or less uniformly orange or red, not contrasting with one another 37
22. Smaller species, total length less than 3.82 23
– Larger species, total length more than 3.81, usually greater than 4.0 25
23. Clypeus and adjacent face unicolorous with remainder of head; eastern United States . . . . . *atricornis* Knight (fig. 6)
– Clypeus and face shining castaneous at and below base of clypeus 24
24. Coloration of dorsum heavily orange; vesica as in figure 24; NE United States . . . . . *fulvidus* Knight (fig. 8)
– Coloration of dorsum sometimes partially orange, hemelytra usually pale; vesica as in figure 31; western Great Basin; ex *Salvia* . . . . . *salviae* Knight (fig. 12)
25. Antennal segment 2 long, at least 1.70 times as long as width of head across eyes 26
– Antennal segment 2 shorter, length approximately 1.50 times width of head, or less 32
26. Membrane with a fumose, quadrate patch posterior to cuneus; antennal segment 2 usually with a broad, pale, median annulus, often more obvious in females than in males; vestiture of dorsum suberect 27
– Membrane entirely fumose, or if not then darkened areas more diffuse than above; antennal segment 2 usually totally black 28
27. Calli infuscate; vesica as in figure 26; western Oregon; ex *Alnus, Corylus* . . . . . *lattini,* new species (fig. 9)
– Calli not infuscate; vesica as in figure 31; northern Rocky Mountains; ex *Alnus* . . . . . *rosicoloides*, new species (fig. 12)
28. Large, elongate species, average total length 5.75; vesica as in figure 26; southwestern United States . . . . . *longipennis* (Uhler) (fig. 9)
– Not so long, average total length 4.70 or less 29
29. Vesica as in figure 26; dorsum mostly pale, dirty white; elongate with corial margins nearly straight and parallel; average total length 4.66; Willamette Valley, Oregon; ex *Salix* . . . . . *hallucinatus*, new species (fig. 8)
– Vesical spines of the *arbustorum*-type as in figure 21; coloration pale to orange; average total length usually less than 4.50 30
30. Head projecting anteriorly, reaching well beyond anterior margin of eyes; labium very long, reaching to about middle of abdomen; pronotum unicolorous orange, never partially or entirely dark; vesica as in figure 31; eastern United States; ex *Rosa* . . . . . *rosicola* Knight (fig. 12)
– Head shorter, projecting only slightly anterior to eyes; labium reaching to about apex of hind coxae 31
31. Posterior lobe of pronotum pale, calli dark; vesica as in figure 32; Arizona . . . . . *stitti* Knight (fig. 13)
– At least posterior lobe of pronotum dark; vesica as in figure 21; eastern North America; ex *Ambrosia* . . . . . *blatchleyi* Reuter (fig. 6)
32. Dorsum and legs, including tibiae, dark reddish, tinged with black; Baja California Norte; ex *Salvia* . . . . . *mexicanus,* new species (fig. 10)
– Dorsum and legs not dark red 33
33. Entire dorsum uniformly light orange to orange; tibiae often blackish; northern California; ex *Abies* . . . . . *concoloris,* new species (fig. 7)
– Dorsum not entirely orange 34
34. Frons with distinct transverse markings; frons moderately protuberant, clypeus readily visible from above; vesica as in figure 33; California . . . . . *verticalis* (Uhler) (fig. 14)
– Frons without transverse markings; frons less protuberant, clypeus not visible from above . . 35
35. Coloration of head and dorsum almost uniformly pale, including pale, more or less unicolorous, mesoscutum and scutellum; northern California; ex *Monardella* . . . . . *monardellae,* new species (fig. 10)
– Coloration of dorsum not uniformly pale, at least head and/or scutellum darkened 36
36. Frons and vertex yellow-orange, unicolorous with pronotum; vesica as in figure 27; southern California; ex *Salvia* . . . . . *melliferae,* new species (fig. 9)
– Frons heavily infuscate, contrasting with much lighter vertex and posterior lobe of pronotum; vesica as in figure 21; British Columbia . . . . . *arbustorum* (Fabricus) (fig. 6)
37. Coloration of dorsum mottled bright carmine and cream (fig. 8); heavy-bodied species, ratio of length/width about 2.9:1; southwestern United States; ex *Rhus* . . . . . *grandis* Reuter (fig. 8)

– Dorsum uniformly orange or red-orange, never mottled as above 38
38. Antennal segment 1 dark except for pale terminal annulus; orangish species; vesica as in figure 21; southern Rocky Mountains; ex *Picea* . . . . . *aquilinus*, new species (fig. 6)
– Antennal segment 1 unicolorous with general coloration of dorsum and segment 2; reddish to dark reddish species; vesica as in figure 24; Great Basin; ex *Symphoricarpos* . . . . . *fulvaceus* Knight (fig. 8)

NEARCTIC SPECIES

Plagiognathus albatus (Van Duzee)

Figures 5, 15, 20

Psallus albatus Van Duzee, 1915: 116 (n. sp.).
Plagiognathus albatus Van Duzee, 1917a: 410 (n. comb.).
Plagiognathus albatus vittiscutis Knight, 1923: 445 (n. var.).
Plagiognathus albatus similis Knight, 1923: 445 (n. var.) NEW SYNONYMY.
Plagiognathus caryae Knight, 1923: 448 (n. sp.) NEW SYNONYMY.
Plagiognathus repletus Knight, 1923: 449 (n. sp.) NEW SYNONYMY.
Plagiognathus repletus apicatus Knight, 1923: 449 (n. var.).
Plagiognathus inopinus Knight, 1926: 11 (n. sp.; syn. by Henry, 1982: 338).
Plagiognathus similis furvus Knight, 1927: 12 (n. var.).

DIAGNOSIS: Recognized, in common with *maculipennis* and *tinctus*, by the mostly *pale antennal segment 2, generally pale costal vein on hemelytra*, and cuneus and basal portion of corium pale or mostly pale in contrast to the frequently much darker remainder of hemelytra. Distinguished from *maculipennis* by that species being relatively small, having antennal segment 1 pale, and having the tibiae pale at the articulation with femora, whereas *albatus* larger, having *antennal segment 1 dark*, and having the *tibiae dark at articulation with the femora*; also separated by subtle but constant differences in male genitalia (compare figs. 20 and 27). Distinguished from *tinctus* externally by the scutellum being unicolorous dark in that species (fig. 13), whereas the scutellum often pale laterally and dark mesially in *albatus* (fig. 5: *albatus* 1), but sometimes entirely dark (fig. 5: *albatus* 3, 4) or entirely pale (fig. 5, *albatus* 2), and by the form of the male genitalia, especially the apical vesical spines being much longer and more slender in *tinctus* (fig. 33) than in *albatus* (fig. 20).

REDESCRIPTION: *Male:* Medium-sized, elongate-ovoid; total length 3.46–4.03, length apex clypeus–cuneal fracture 2.46–2.75, width across pronotum 1.04–1.26. COLORATION (fig. 5): Background coloration of dorsum varying from almost totally pale, whitish, through largely castaneous, to nearly black with pale markings only on cuneus; membrane partially to entirely fumose, veins weakly fumose to pale; clypeus and most of face at and below level of antennal insertion deeply castaneous, highly polished; antennal segment 1 castaneous except for pale apical annulus, segment 2 castaneous at extreme base with remainder of segment pale (fig. 15), segments 3 and 4 pale; labium mostly pale except at base and apex; venter entirely castaneous; legs pale, yellowish, except for darker basal portion of hind coxa and some dark spots on hind femora; dorsal tibial spines with small dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining; face at and below level of antennal insertion highly polished and shining. Vestiture of dorsum composed of recumbent, pale to golden shining, simple setae. STRUCTURE: Hemelytra weakly convex laterally; frons weakly convex, slightly projecting beyond anterior margin of eyes, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by a distance equal to diameter of antennal segment 1; labium reaching between apices of middle and hind coxae. GENITALIA (fig. 20): Body of vesica relatively short, stout, more or less J-shaped, base of vesica falling somewhat below level of secondary gonopore, posterior apical spine straight, broad, forming an oblique angle relative to body of vesica, anterior spine slightly longer than posterior, angled near apex, nearly perpendicular to body of vesica; flange on vesica broad and reaching to about midpoint of secondary gonopore.

Female: Very similar to male in coloration but body more strongly ovoid in outline. To-

tal length 3.34–4.13, length apex clypeus–cuneal fracture 2.41–2.88, width across pronotum 0.99–1.21.

HOSTS: Most frequently collected on *Betula* spp. (Betulaceae), *Juglans* spp. (Juglandaceae), *Platanus* spp. (Platanaceae), and *Ulmus* (Ulmaceae). Also apparently breeds on *Rhus* sp. (Anacardiaceae) and *Nyssa* sp. (Nyssaceae). Records from other plant families, such as the Asteraceae and Pinaceae, likely are mere sitting records.

DISTRIBUTION: Eastern North America, from Quebec south to the Gulf Coast, west to central Texas and the foothills of the Colorado Rockies.

DISCUSSION: Van Duzee (1915) described *Psallus albatus* from sycamore (*Platanus occidentalis*). He later (Van Duzee, 1917a) transferred it to *Plagiognathus*. Knight (1923) described *Plagiognathus vittiscutis* as a variety of *albatus* (Van Duzee), noting that he had taken it only on *Juglans cinerea* (butternut). Below, on the same page, Knight described the variety *albatus similis*, recording it from Michigan (on *Alnus incana*) and Connecticut; he later (Knight, 1927) accorded *similis* species status. Knight (1923: 448) described *Plagiognathus caryae* from *Carya* spp. in upstate New York and Mississippi. He finally (p. 449) described *Plagiognathus repletus* from a single female specimen from upstate New York, noting its similarity with *vittiscutus*, but indicating that the labium was shorter in *repletus*. Knight (1926) based his description of *Plagiognathus inopinus* on specimens from Harrisburg, Pennsylvania, collected on sycamore.

Subsequent to their introduction, these names have been applied by Knight (1941) and others largely as if the nominal taxa were host specific. For example, Henry and Smith (1979) and Wheeler (1980) used *albatus* in reference to sycamore feeders, Henry and Smith (1979) used *caryae* for *Carya* feeders, and Wheeler et al. (1983) used *similis* for Betulaceae feeders. My evaluation suggests that in some cases attribution of species status on the basis of host plants alone disregards variation seen within populations occurring on a given plant species.

After having examined a large amount of material, including the types (paratypes of *albatus*), from localities broadly distributed across eastern North America, and with a significant amount of associated host information, I have concluded that there is no justification for using more than one name, which must be *albatus* on the basis of priority. The taxon shows substantial color variation, and that variation can be as great among specimens taken from a single host as across hosts. Specimens known to have bred on sycamore have been assigned to the *albatus* type if largely pale and to the *inopinus* type if mostly black. The *vittiscutis* type is heavily tinged with orange, usually with extensive, intense, and well-defined castaneous areas; the scutellum usually has a median longitudinal dark stripe and is pale laterally. Although a limited number of specimens might cause one to conclude that these color types were discrete, a broader sample makes it clear that variation in pigmentation of the scutellum and hemelytra is extreme for populations breeding on most known hosts, and that that variation is not discrete.

The labium shows some variation in length and the vesica shows some structural variability (see fig. 20), but I was not able to discern any consistent pattern in this variation.

SPECIMENS EXAMINED: CANADA.—**Manitoba:** Boissevain, July 15, 1953–July 16, 1953, Brooks and Kelton, *Ulmus* sp. (Ulmaceae), 11♂, 11♀ (CNC). Boissevain, July 16, 1953, Brooks and Kelton, 4♂ (CNC). **New Brunswick:** Fredericton, June 28, 1976, L. A. Kelton, 1♀ (CNC). Kouchibouguac Natl. Park, July 26, 1977, D. J. Brown, *Rhododendron* sp. (Ericaceae), 3♂, 4♀ (CNC). **Nova Scotia:** Kentville, July 15, 1966, L. A. Kelton, 1♂, 1♀ (CNC). Woodville, July 20, 1966, L. A. Kelton, *Alnus* sp. (Betulaceae), 1♂, 3♀ (CNC). **Ontario:** Aldershot, July 14, 1958, L. A. Kelton, 1♀ (CNC). Burtch, July 11, 1961, L. A. Kelton, 3♂, 1♀ (CNC). Carp, August 7, 1962, L. A. Kelton, *Juglans* sp., (Juglandaceae), 2♀ (CNC). Dundas, July 16, 1962, Kelton and Thorpe, *Pinus banksiana* (Pinaceae), 2♀ (CNC). Erie View, July 4, 1962, G. Thorpe, *Juglans* sp. (Juglandaceae), 1♀ (CNC). Erie View, July 4, 1962, L. A. Kelton, *Juglans* sp. (Juglandaceae), 5♂, 9♀ (CNC). Forrestville, July 4, 1962, G. Thorpe, *Juglans* sp. (Juglandaceae), 20♂, 10♀ (CNC). Hespeler,

August 25, 1961, Kelton and Brumpton, 1♀ (CNC). Ipperwash, July 11, 1962, Kelton and Thorpe, 1♀ (CNC). Jordan, July 17, 1961, L. A. Kelton, 3♂, 4♀ (CNC). Kingsville, June 19, 1962, Kelton and Thorpe, *Juglans* sp. (Juglandaceae), 7♀ (CNC). Leamington, June 19, 1962, Kelton and Thorpe, *Juglans* sp. (Juglandaceae), 1♀ (CNC). Leamington, June 19, 1962, Kelton and Thorpe, *Juglans* sp. (Juglandaceae), 14♂, 15♀ (CNC). London, June 22, 1952, R. H. N. Smith, *Juglans* sp. (Juglandaceae), 2♂, 4♀ (CNC). Mt. Pleasant, July 10, 1958–July 14, 1962, L.A. Kelton, 3♂, 1♀ (CNC). Niagara Falls, June 17, 1978, T. J. Henry, *Quercus* sp. (Fagaceae), 2♂, 5♀ (USNM). Niagara Lake, June 21, 1931, W. L. Putnam, *Juglans nigra* (Juglandaceae), 2♀ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 4♂, 5♀ (CNC). Ottawa, July 1, 1920, H. G. Crawford, 1♂ (CNC). Port Rowan, July 12, 1962, H. Blanchard, 1♂ (CNC). Port Rowan, July 4, 1962, L. A. Kelton, 1♂, 1♀ (CNC). Port Ryerse, July 15, 1962, Kelton and Brumpton, 1♂ (CNC). Rockaway, June 21, 1962, Kelton and Thorpe, *Juglans nigra* (Juglandaceae), 5♀ (CNC). Selkirk, July 9, 1962, Kelton and Brumpton, 1♀ (CNC). St. Lawrence Is. Natl. Park, Grenadier Is. Center, July 8, 1975, E. Wilson, *Solidago* sp. (Asteraceae), 1♂ (CNC). Stanford, July 12, 1961, L. A. Kelton, 1♂ (CNC). Stirling, June 26, 1962, G. Thorpe, *Juglans* sp. (Juglandaceae), 2♂ (CNC). Vineland Station, July 13, 1940, W. L. Putnam, *Juglans nigra* (Juglandaceae), 3♂, 3♀ (CNC). Woodslee, July 7, 1962, G. Thorpe, *Platanus* sp. (Platanaceae), 1♀ (CNC). Woodstock, July 10, 1962, Kelton and Thorpe, 1♀ (CNC). **Prince Edward Island:** Charlottetown, July 11, 1966, L. A. Kelton, *Ulmus* sp. (Ulmaceae), 1♂, 2♀ (CNC). **Quebec:** Chicoutimi, July 24, 1915, G. Beaulieu, 2♀ (CNC). Fabre, July 12, 1963, W. Gagne, 1♀ (CNC). Laniel, July 20, 1962, W. Gagne, *Alnus* sp. (Betulaceae), 1♀ (CNC). Missiquoir, S. Bolton, July 5, 1927, G. S. Walley, 1♂ (CNC). **Saskatchewan:** Saskatoon, July 20, 1955, A. R. Brooks, *Ulmus* sp. (Ulmaceae), 2♂, 8♀ (CNC). USA.—**Alabama:** *Baldwin Co.:* Gulf Shores State Park, May 17, 1985, E. G. Riley and D. A. Rider, 2♂ (DAR). **Arkansas:** *Pulaski Co.:* Little Rock, May 5, 1943, Stahevitch, 1♂ (LACM). *Washington Co.:* No specific locality, July 8, 1963, 2♂, 1♀ (USNM). **Colorado:** *Arapahoe Co.:* Highline Canal at Belleview Ave., June 25, 1981, D. A. Polhemus, 1♂ (JTP). **Connecticut:** Union, Bigelow State Park, June 17, 1970, F. P. Maroney, 1♂ (AMNH). **Florida:** *Alachua Co.:* No specific locality, April 19, 1955, 1♂ (AMNH). *Hillsborough Co.:* Tampa, May 29, 1987, J. E. Eger, 1♂, 3♀ (TAMU). **Georgia:** *Fulton Co.:* Thomasville, June 4, 1926, ex Juglandaceae, 1♂ (CAS). Thomasville, June 4, 1926, 3♂, 4♀ (CAS). **Illinois:** *Alexander Co.:* Cairo, July 15, 1931, Mohr and Burks, 1♀ (USNM). *Bear Lake Co.:* Alton, July 27, 1934, DeLong and Ross, 2♀ (AMNH). *McHenry Co.:* Harvard, June 11, 1933, Mohr and Townsend, 1♂ (AMNH). Harvard, June 11, 1933, Mohr and Townsend, 2♀ (USNM). *Saline Co.:* Harrisburg, June 25, 1932, Ross, Dozier, and Park, *Betula nigra* (Betulaceae), 1♀ (AMNH). *Stephenson Co.:* Freeport, July 4, 1917, 1♀ (AMNH). *Winnebago Co.:* Rockford, July 5, 1932, Dozier and Mohr, *Platanus* sp. (Platanaceae), 2♂ (AMNH). **Indiana:** *Cass Co.:* Logansport, June 13, 1976, T. J. Henry, *Platanus occidentalis* (Platanaceae), 1♀ (PDA). *Howard Co.:* NW Howard County, June 23, 1986, D. A. Rider, 1♀ (DAR). **Iowa:** *Boone Co.:* Ledges State Park, June 9, 1956, J. C. Schaffner, 1♂, 1♀ (TAMU). *Dickinson Co.:* 5 mi W of Milford, June 13, 1963, J. C. Schaffner, 2♂, 2♀ (TAMU). Iowa Lakeside Lab., June 27, 1963, J. C. Schaffner, 1♂ (TAMU). Silver Lake, T100N R38W, July 8, 1963, J. C. Schaffner, 1♀ (TAMU). *Emmet Co.:* Fort Defiance State Park, July 11, 1963, J. C. Schaffner, *Juglans nigra* (Juglandaceae), 3♀ (TAMU). *Henry Co.:* 5 mi SW of Mt. Pleasant, June 30, 1976–July 1, 1976, J. C. Schaffner, 2♀ (TAMU). *Lee Co.:* Fort Madison, July 12, 1927, Harris, Johnston, 1♂ (TAMU). *Scott Co.:* Pleasant Valley, July 4, 1928, G. S. Walley, 3♂, 1♀ (CNC). *Story Co.:* Ames, August 10, 1962, J. C. Schaffner, 1♂ (TAMU). Ames, July 2, 1928, L. J., 2♀ (TAMU). Ames, June 14, 1927–June 16, 1930, H. G. Johnston, 11♂, 14♀ (TAMU). Ames, June 17, 1927–June 28, 1931, H. M. Harris, 2♂, 3♀ (TAMU). Ames, June 21, 1964, H. H. Knight, 13♂, 24♀ (USNM). Ames, June 24, 1951, J. A. Slater, 31♂

(AMNH). Ames, June 25, 1949, J. A. Slater, ex Platanaceae, 4♂, 2♀ (AMNH). Ames, June 9, 1925, H. H. Knight, 3♀ (USNM). *Woodbury Co.:* Sioux City, June 22, 1921, C. N. Ainslie, 1♂ (USNM). **Kansas:** *Butler Co.:* Leon, June 20, 1940, L. C. Kuitert, 1♀ (KU). *Douglas Co.:* No specific locality, June 14, 1928, P. B. Lawson, 1♂, 2♀ (KU). No specific locality, June 21, 1924, P. B. Lawson, 1♀ (KU). *Leavenworth Co.:* No specific locality, June 28, 1924, R. H. Beamer, 1♂, 1♀ (KU). *Wyandotte Co.:* Rosedale, June 23, 1924, B. P. Breakey, 1♀ (KU). **Kentucky:** *Rowan Co.:* Morehead, June 7, 1985, A. G. Wheeler, Jr., *Betula nigra* (Betulaceae), 1♂, 2♀ (PDA). **Louisiana:** *East Baton Rouge Co.:* LSU Campus, May 8, 1986–June 3, 1985, D. A. Rider, 19♂, 5♀ (DAR). *St. Landry Co.:* Port Barre, May 2, 1981, L. D. Newsom, 1♂, 3♀ (LSU). **Maryland:** *Montgomery Co.:* 4 mi S of Ashton, May 19, 1985, G. F. Hevel, 4♂ (USNM). Plummers Island, July 20, 1926, H. H. Knight, holotype male (USNM). *Prince Frederic Co.:* Plum Point, June 20, 1914, W. L. McAtee, 1♂ (USNM). **Massachusetts:** *Suffolk Co.:* Boston, Arnold Arboretum, May 24, 1974, T. J. Henry, *Nyssa sylvatica* (Nyssaceae), 1♀ (AMNH). Boston, Arnold Arboretum, May 24, 1974, T. J. Henry, *Nyssa sylvatica* (Nyssaceae), 2♂, 1♀ (PDA). **Michigan:** *Berrien Co.:* New Buffalo, June 5, 1920, R. F. Hussey, holotype female (*similis*) (USNM). **Minnesota:** *Ramsey Co.:* St. Anthony Park, June 6, 1923, H. H. Knight, 1♀ (USNM). **Mississippi:** *Adams Co.:* Natchez, May 15, 1931, H. G. Johnston, 2♂ (TAMU). *Holmes Co.:* Tchula, May 18, 1931, H. G. Johnston, 1♂ (TAMU). *Marion Co.:* Columbia, May 12, 1931, H. G. Johnston, *Betula nigra* (Betulaceae), 11♂ (TAMU). *Pontotoc Co.:* Pontotoc, May 27, 1931, H. G. Johnston, *Acer pseudoplatanus* (Aceraceae), 2♂, 2♀ (TAMU). *Stone Co.:* Wiggins, May 5, 1931, H. G. Johnston, *Carya illinoensis* (Juglandaceae), 8♂, 11♀ (TAMU). *Unknown Co.:* A. and M. C., May 29, 1931, 1♂ (TAMU). **Missouri:** *Buchanan Co.:* Saint Joseph, June 28, 1943, R. C. Froeschner, 1♀ (USNM). *Jackson Co.:* Kansas City, June 6, 1900, F. Rogers, 1♂ (KU). *Lafayette Co.:* Concordia, July 8, 1964, L. and C. O'Brien, 1♂ (UCB). *Monroe Co.:* Union Covered Bridge, June 14, 1984, R. L. Blinn, *Platanus occicentalis* (Platanaceae), 2♀ (DAR). *Vernon Co.:* 4 mi W of Montevallo, June 14, 1966–June 24, 1966, J. C. Schaffner, *Juglans nigra* (Juglandaceae), 3♂, 12♀ (TAMU). 4 mi W of Montevallo, June 30, 1964, J. C. Schaffner, *Platanus occidentalis* (Platanaceae), 1♂ (TAMU). **New York:** *Cattaraugus Co.:* Gowanda, August 2, 1907, E. P. Van Duzee, 2♂, 4♀ (CAS). Salamanca, July 24, 1911, E. P. Van Duzee, 1♂, 1♀ (CAS). *Erie Co.:* Hamburg, July 1, 1911, E. P. Van Duzee, paratypes: 5♂, 4♀ (CAS). *Genesee Co.:* Batavia, July 14, 1916, H. H. Knight, 1♂ (TAMU). Batavia, June 18, 1915, H. H. Knight, 1♂ (USNM). *Livingston Co.:* Conesus Lake, July 16, 1916, H. H. Knight, holotype female (*apicatus*) (USNM). *Nassau Co.:* Flower Hill near Rt 25A on Ridge Drive East, July 10, 1986, M. D. Schwartz, *Platanus occidentalis* (Platanaceae), 2♂, 6♀ (AMNH). *Queens Co.:* Corona Heights, jct Van Doren St. and 108th St., June 3, 1986, M. D. Schwartz, *Platanus occidentalis* (Platanaceae), 19♂, 33♀ (AMNH). Corona Hts., Van Doren St and 108th St., June 3, 1986, M. D. Schwartz, *Platanus occidentalis* (Platanaceae), 3♂ (CNC). Flushing Meadow, Corona Park near zoo, July 13, 1985, M. D. Schwartz, *Platanus occidentalis* (Platanaceae), 14♂, 7♀ (AMNH). Flushing Meadow, Corona Park, July 13, 1985, M. D. Schwartz, *Platanus occidentalis* (Platanaceae), 3♂ (CNC). *Rockland Co.:* Stony Point Battlefield State Park, July 2, 1988, M. D. Schwartz, *Platanus occidentalis* (Platanaceae), 1♂, 1♀ (AMNH). Stony Point Battlefield State Park, July 2, 1988, M. D. Schwartz, *Platanus occidentalis* (Platanaceae), 1♀ (CNC). *Suffolk Co.:* Cold Spring Beach, July 4, 1919, H. M. Parshley, 1♀ (CAS). Gardiner's Island, July 4, 1924, F. M. Schott, 1♀ (AMNH). *Tompkins Co.:* Ithaca, Cornell Plantations, June 25, 1982, A. G. Wheeler, Jr., *Juglans ailanthifolia* (Juglandaceae), 3♂, 3♀ (PDA). Ithaca, Cornell University, July 7, 1979, A. G. Wheeler, Jr., *Juglans cinerea* (Juglandaceae), 10♂, 7♀ (PDA). Ithaca, July 1, 1920, H. H. Knight, 1♀ (USNM). Ithaca, July 2, 1920, H. H. Knight, paratypes (*caryae*): 2♂ (CAS, USNM). Ithaca, June 20, 1920, H. H. Knight, holotype male (*vittiscutis*) (USNM). Ithaca,

June 22, 1920, H. H. Knight, *Carya cordiformis,* holotype male (*caryae*) (USNM). Ithaca, June 23, 1920, H. H. Knight, 2♂ (CAS, USNM). *Ulster Co.:* 4 mi NNW of Kerhonkson, Cherrytown, July 1, 1971, P. and B. Wygodzinsky, 1♂ (AMNH). *Westchester Co.:* White Plains, June 28, 1919, J. R. de la Torre Bueno, 2♂, 2♀ (CAS). **North Carolina:** *Buncombe Co.:* Swannanoa, 3000 ft, July 15, 1919, R. W. Leiby, 1♂ (USNM). *Madison Co.:* Mars Hills, Mars Hills College, July 11, 1988, T. J. Henry and A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 1♂ (USNM). *Martin Co.:* Williamstown, June 15, 1985, A. G. Wheeler, Jr., *Carya* sp. (Juglandaceae), 1♀ (PDA). *Mecklenburg Co.:* near Matthews, Rt 51 1 mi W of Rt 16, May 24, 1975, A. G. Wheeler, Jr., *Platanus occidentalis* (Platanaceae), 1♀ (PDA). near Matthews, Rt 51 1 mi W of Rt 16, May 3, 1974, A. G. Wheeler, Jr., *Carya ovata* (Juglandaceae), 1♀ (PDA). Pineville, May 26, 1980, A. G. Wheeler, Jr., *Carya illinoensis* (Juglandaceae), 7♀ (PDA). *Union Co.:* Monroe, May 10, 1987, A. G. Wheeler, Jr., *Nyssa sylvatica* (Nyssaceae), 8♂, 8♀ (PDA). Rt 74 near Indian Trail, May 25, 1980, A. G. Wheeler, Jr., *Nyssa sylvatica* (Nyssaceae), 2♂, 5♀ (PDA). **Ohio:** *Hamilton Co.:* Cincinnati, July 16, 1947, P. R. Lowry, 1♀ (TAMU). **Oklahoma:** *Pushmataha Co.:* Tuskahoma, May 23, 1928, R. H. Beamer, 1♂ (KU). **Pennsylvania:** *Bradford Co.:* near Centerville, Kinsman Nursery, June 25, 1972, A. G. Wheeler, Jr., *Juglans* sp. (Juglandaceae), 1♀ (PDA). *Bucks Co.:* Montgomeryville, June 30, 1977, T. J. Henry, *Rhus* sp. (Anacardiaceae), 1♂ (PDA). *Centre Co.:* Bear Meadows, June 25, 1988, A. G. Wheeler, Jr., *Alnus* sp. (Betulaceae), 7♂, 7♀ (PDA). State College, June 10, 1977, Schuh, Henry, Wheeler, *Platanus* sp. (Platanaceae), 1♂, 4♀ (AMNH). State College, June 10, 1977, Schuh, Henry, Wheeler, *Viburnum* sp. (Caprifoliaceae), 2♀ (AMNH). State College, June 6, 1977, Schuh, Henry, Wheeler, *Crataegus* sp. (Rosaceae), 2♀ (AMNH). University Park, Penn State Campus, June 1, 1977, A. G. Wheeler, Jr., *Platanus acerifolia* (Platanaceae), 2♀ (PDA). Univesity Park, Penn State Campus, June 7, 1979, A. G. Wheeler, Jr., *Rhododendron* sp. (Ericaceae), 1♂ (PDA). *Dauphin Co.:* Harrisburg, Cameron Street, July 4, 1974, Henry and Stinner, *Platanus acerifolia* (Platanaceae), 1♂ (AMNH). Harrisburg, Cameron Street, June 4, 1974, B. Stinner, *Platanus acerifolia* (Platanaceae), 9♂ (PDA). Harrisburg, Cameron Street, June 4, 1974, B. Stinner, *Platanus occidentalis* (Platanaceae), 8♂ (PDA). Harrisburg, East Harrisburg Cemetery, June 11, 1977, Schuh, Henry, Wheeler, *Platanus* sp. (Platanaceae), 7♂, 12♀ (AMNH). Harrisburg, East Harrisburg Cemetery, June 20, 1977, A. G. Wheeler, Jr., *Platanus acerifolia* (Platanaceae), 16♂ (PDA). Harrisburg, June 27, 1920, Champlain, holotype male (*inopinus*) (USNM). Harrisburg, near Rockville, July 19, 1979, T. J. Henry, *Betula nigra* (Betulaceae), 1♂, 3♀ (PDA). Harrisburg, William Penn High School, June 4, 1974, B. R. Stinner, *Platanus occidentalis* (Platanaceae), 8♂ (PDA). Harrisburg, William Penn High School, June 7, 1974, B. R. Stinner, *Betula nigra* (Betulaceae), 2♂ (PDA). *Erie Co.:* Erie, Rt 19 and I-90, July 25, 1978, A. G. Wheeler, Jr., *Pinus sylvestris* (Pinaceae), 8♀ (TAMU). Fairview, Fairview Nurseries, June 28, 1977, T. J. Henry, *Platanus occidentalis* (Platanaceae), 5♂, 11♀ (PDA). Near Erie, I-90 and Rt 97, July 7, 1976, A. G. Wheeler, Jr., *Rhus typhina* (Anacardiaceae), 8♂, 5♀ (PDA). *Monroe Co.:* Delaware Water Gap, A. T. Slosson, 5♂, 2♀ (AMNH). *Northampton Co.:* Bethlehem, Holy Savior Cemetery, July 31, 1973, *Platanus* sp. (Platanaceae), 1♀ (PDA). *Philadelphia Co.:* Bartram's Garden, May 20, 1980, A. G. Wheeler, Jr., *Carya cordiformis* (Juglandaceae), 1♂, 4♀ (PDA). *Wayne Co.:* Abrahamsville, Sunnybrook Nursery, August 10, 1973, A. G. Wheeler, Jr., *Juglans cinerea* (Juglandaceae), 1♀ (PDA). Near Calicoon, New York, Curtis Nursery, June 18, 1974, A. G. Wheeler, Jr., *Juglans cinerea* (Juglandaceae), 2♂ (PDA). **South Carolina:** *Greenville Co.:* Greenville, May 29, 1976, R. S. Peigler, 1♀ (TAMU). *Oconee Co.:* Seneca, May 6, 1976, R. S. Peigler, 1♂ (TAMU). *Richland Co.:* Columbia, May 13, 1988, A. G. Wheeler, Jr., *Quercus phellos* (Fagaceae), 1♀ (USNM). **Tennessee:** *Henderson Co.:* S of Lexington, Beech Road, May 20, 1985, A. G. Wheeler, Jr., *Betula nigra* (Betulaceae), 3♂, 2♀ (PDA). **Texas:** *Bandera Co.:* 5 mi SE of Medina, May 2, 1983, J. C. Schaffner, 1♀ (TAMU). *Bastrop Co.:* 5 mi W of Bas-

trop, May 10, 1964, J. C. Schaffner, 1♀ (TAMU). *Bosque Co.:* Laguna Park, May 2, 1975, J. C. Schaffner, 1♂ (TAMU). Walnut Springs, May 2, 1975, J. C. Schaffner, 4♀ (TAMU). *Brazos Co.:* Bryan, May 1, 1965–May 13, 1970, J. C. Schaffner, 38♂ (TAMU). College Station, April 26, 1937, H. J. Reinhard, 1♂ (TAMU). College Station, April 28, 1966, J. C. Schaffner, *Carya illinoensis* (Juglandaceae), 3♂, 11♀ (TAMU). College Station, April 29, 1983, T. J. Henry and A. G. Wheeler, Jr., 1♀ (PDA). College Station, May 2, 1964, J.C. Schaffner, 1♂ (TAMU). College Station, May 23, 1931, J. C. Gaines, 1♀ (TAMU). College Station, May 5, 1928–May 18, 1933, H. G. Johnston, 12♂, 11♀ (TAMU). College Station, May 5, 1928, H. G. Johnston, 1♂ (USNM). College Station, October 25, 1963, J. C. Schaffner, 1♂ (TAMU). *Edwards Co.:* 22 mi S of Rocksprings, April 30, 1982, J. C. Schaffner, 2♂, 1♀ (TAMU). *Erath Co.:* Stephenville, April 21, 1972, J. C. Schaffner, *Carya illinoensis* (Juglandaceae), 5♂, 4♀ (TAMU). *Gillespie Co.:* Enchanter Rock State Natural Area, May 1, 1988, C. B. Barr and M. L. Israel, 11♂ (LSU). L. B. J. National Historic Park, May 15, 1989, R. Anderson, 1♀ (TAMU). *Gonzales Co.:* Palmetto State Park, May 30, 1983, D. A. Rider, 1♂ (DAR). *Hamilton Co.:* Hamilton, May 18, 1978, B. Cutler, 2♂, 2♀ (TAMU). *Kerr Co.:* Kerrville, June 20, 1996, W. F. Chamberlain, 1♂ (TAMU). Kerrville, May 15, 1990–June 1, 1993, W. F. Chamberlain, 9♂, 9♀ (TAMU). *Kimble Co.:* 6.5 mi S of London, Llano River crossing, May 13, 1997, Gillogly, Schaffner, 9♂, 15♀ (TAMU). Junction, April 29, 1983, J. C. Schaffner, 1♀ (TAMU). *Leon Co.:* 5.5 mi N of Flynn, May 14, 1997, A. R. Gillogly, 1♂ (TAMU). *Sutton Co.:* 16 mi W of Sonora, May 11, 1997, Gillogly, Schaffner, 1♂ (TAMU). *Tom Green Co.:* San Angelo, May 17, 1975, M. C. Gruetzmacher, 11♂, 4♀ (TAMU). San Angelo, May 20, 1975, M. C. Gruetzmacher, 1♀ (TAMU). *Travis Co.:* vicinity of Long Hollow Creek, April 23, 1994, M. Quinn, E. Riley, R. Wharton, *Ulmus crassifolia* (Ulmaceae), 1♂ (TAMU). *Unknown Co.:* Navasota, April 19, 1949, M. Polhemus, 2♂, 12♀ (AMNH). Seguin, May 9, 1964, J. C. Schaffner, 2♂, 2♀ (TAMU). *Uvalde Co.:* 11 mi N of Sabinal, May 1, 1983, J. C. Schaffner, *Carya illinoensis* (Juglandaceae), 1♂ (TAMU). Uvalde, April 24, 1978, T. J. Henry and R. T. Schuh, 23♂, 2♀ (AMNH). *Val Verde Co.:* 2.7 mi W of Comstock, April 16, 1985, J. C. Schaffner, 1♂ (TAMU). 22.5 mi N of Comstock, Devil's River crossing, May 11, 1997, Gillogly, Schaffner, 22♂, 19♀ (TAMU). 28 mi N of Comstock, May 10, 1997, Gillogly, Schaffner, 7♂, 8♀ (TAMU). *Wood Co.:* nr. Hawkins, jct Hwy 14 and 2869, May 9, 1999, A. Gillogly, W. Godwin, E., Riley, 2♂ (TAMU). **Virginia:** *Albemarle Co.:* Charlottesville, University of Virginia, May 23, 1986, A. G. Wheeler, Jr., *Celtis occidentalis* (Ulmaceae), 1♂ (PDA). *Fall Church Co.:* Falls Church, June 7, 1900, N. Banks, 1♀ (AMNH). *Newport News Co.:* Newport News, May 25, 1986, A G. Wheeler, Jr., *Carya cordiformis* (Juglandaceae), 4♀ (PDA). **Washington, D.C.:** July 10, 1889, 1♀ (USNM). July 16, 1899, O. Heidemann, 1♂, 1♀ (CAS). N. Banks, ex Platanaceae, 2♀ (AMNH). National Arboretum, June 14, 1981, T. J. Henry, *Betula nigra* (Betulaceae), 1♂, 1♀ (USNM). National Arboretum, June 14, 1981, T. J. Henry, *Betula nigra* (Betulaceae), 2♀ (USNM). **West Virginia:** *Nicholas Co.:* Rt 39, 10 mi N of county line, June 24, 1978, *Platanus occidentalia* (Platanaceae), 1♂ (PDA).

Plagiognathus albifacies Knight
Figures 5, 15, 20

Plagiognathus albifacies Knight, 1927: 11 (n. sp.).

DIAGNOSIS: Recognized by the relatively large, elongate, somewhat cylindrical body, the *labium long and reaching to about middle of abdomen,* the *reclining to suberect dorsal vestiture,* and *antennal segment 1 mostly pale* except for dark tapered basal portion (fig. 15). Vesica of the male distinctive for its elongate, slender, J-shaped body with its relatively short, slender, more or less erect, apical spines (fig. 20). Size, shape, and length of labium similar to *rosicola,* but that species having antennal segment 1 uniformly black and the general body coloration conspicuously orange (fig. 12).

REDESCRIPTION: *Male:* Moderately large, elongate; total length 4.15–4.66, length apex

clypeus–cuneal fracture 3.00–3.28, width across pronotum 1.16–1.33. COLORATION (fig. 5): General coloration, including most of venter and appendages, often pale, whitish to vaguely yellowish, but sometimes ranging to much darker, with dorsum partially to mostly brown, and venter sometimes totally brown; head always mostly pale, clypeus partially to completely castaneous, polished and shining, contrasting with remainder of head; membrane almost uniformly fumose, veins pale; antennal segment 1 often largely pale except tapered basal portion highly polished and shining in contrast to dull remainder of segment, base of mesial spine black, sometimes much of antennal segment 1 infuscate, segments 2–4 black (fig. 15); labium mostly pale; femora pale with dark spots, in darker specimens hind femur usually with a dark stripe on dorsal surface; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of pale, reclining to suberect, relatively short, simple setae. STRUCTURE: Body transversely rounded rather than flattened; corial margin weakly convex; head declivent, projecting ventrally, frons weakly swollen, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1; labium very long, reaching to about middle of pregenital abdominal segments. GENITALIA (fig. 20): Vesica J-shaped, body long and slender; apical spines both nearly erect, slender, short relative to total length of vesica.

Female: Coloration and shape very similar to male. Total length 4.15–4.66, length apex clypeus–cuneal fracture 3.00–3.28, width across pronotum 1.16–1.33.

HOST: *Polymnia* spp. (Asteraceae).

DISTRIBUTION: Illinois and Tennessee east to Virginia and north to Ontario.

DISCUSSION: Holotype from Urbana, Illinois, is a somewhat tattered male.

SPECIMENS EXAMINED: CANADA.—**Ontario:** Canboro, June 10, 1962, H. Blanchard, 1♀ (CNC). USA.—**Illinois:** *Champaign Co.:* Urbana, August 24, 1930, H. H. Knight, *Hydrophyllum* sp. 2♂, 2♀ (USNM). Urbana, August 25, 1930, H. H. Knight, *Polymnia* sp. (Asteraceae), 2♂, 2♀ (AMNH). Urbana, July 14, 1922, P. A. Glick, holotype male (USNM). **Indiana:** *Cass Co.:* 4 mi W of Logansport, July 8, 1975, T. J. Henry, *Polymnia canadensis* (Asteraceae), 3♂, 12♀ (PDA). **Maryland:** *Montgomery Co.:* Plummers Island, August 1, 1906, W. L. McAtee, paratype: 1♂ (USNM). Plummers Island, August 23, 1902, O. Heidemann, W. L. McAtee, 1♂, 1♀ (USNM); Paratypes: 1♂, 1♀ (USNM). Plummers Island, August 23, 1903, O. Heidemann, 1♀ (CAS). **Tennessee:** *Davidson Co.:* Long Hunter State Park, May 29, 1985, A. G. Wheeler, Jr., *Polymnia* sp. (Asteraceae), 4♂, 2♀ (PDA). Long Hunter State Recreation Area, April 19, 1991, A. G. Wheeler, Jr., *Polymnia canadensis* 1♂, 1♀ (USNM). **Virginia:** *Wythe Co.:* New River, Foster Falls, July 7, 1985, A. G. Wheeler, Jr., *Polymnia canadensis* (Asteraceae), 5♂, 7♀ (PDA).

Plagiognathus alboradialis Knight
Figures 5, 15, 20

Plagiognathus alboradialis Knight, 1923: 439 (n. sp.).

DIAGNOSIS: Recognized by large size, elongate, slender body form, *anterior pale portion of corium extending down radial vein*, mostly pale costal vein and cuneus, and length of *antennal segment 2 about 1.9 times width of head.* General appearance very similar to the much more commonly collected *obscurus*; distributions of these species broadly overlapping, in latter taxon anterior pale area of corium never extending down radial vein, and antennal segment 2 only about 1.7 times as long as width of head. Pattern of coloration in *alboradialis* (fig. 5) similar to *flavoscutellatus*, *mundus*, and *paramundus* in pale anterior portion of corium extending down radial vein; scutellum often pale laterally in *alboradialis* and apparently always so in *paramundus.* Former attribute also occurring in *flavoscutellatus* and latter known to occur in some populations of *obscurus* (fig. 10: *obscurus* 3). Distributions of *alboradialis* and *paramundus* not overlapping, clavus entirely dark in *alboradialis* but narrowly pale along claval suture in *paramundus*, and structure of genitalia distinctive

for two species, with the posterior spine being slightly more slender and nearly as long as the anterior in *alboradialis* (fig. 20), and being slightly broader and reaching only to the level of the subapical bend of the anterior spine in *paramundus* (fig. 29); scutellum never pale medially as in *flavoscutellatus* (fig. 8).

REDESCRIPTION: *Male:* Elongate, more or less parallel-sided, large; total length 4.66–4.99, length apex clypeus–cuneal fracture 3.25–3.38, width across pronotum 1.20–1.31. COLORATION (fig. 5): Background coloration of dorsum castaneous, disc of pronotum sometimes weakly pale, scutellum sometimes pale laterally, corium pale on basal one-fourth, this area extending posteriorly along the radial vein to about midpoint of corium, costal vein almost entirely pale, cuneus usually entirely pale, corium narrowly pale adjacent to extreme base of membrane; membrane fumose, veins pale; all antennal segments castaneous to black except for pale, narrow, apical annulus on segment 1 (fig. 15); segment 1 and apex of labium castaneous, remainder pale; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs mostly pale yellowish, extreme base of coxae usually infuscate, femora with numerous dark spots; tibiae pale, dorsal spines with dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, moderately shining. Face at and below base of clypeus more highly polished than remainder of body surface. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Lateral corial margins nearly straight; frons weakly convex, clypeus visible from above; anteocular distance nearly 2 times diameter of antennal segment 1; head projecting below eyes by 2 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 20): Body of vesica relatively stout and broadly curving, more or less U-shaped, base of vesica not quite reaching to level of secondary gonopore, posterior apical spine long, nearly straight, erect relative to body of vesica, anterior not as long as posterior, weakly angled relative to body of vesica, and angled near apex in lateral view; flange narrow and short, falling well below base of secondary gonopore and not extending beyond strap.

Female: Body shorter, broader, and much more strongly ovoid than in male (fig. 5). Vertex and most of pronotum pale, scutellum always pale laterally, leaving a dark, longitudinal, median stripe; hemelytra usually much more extensively pale than in male (fig. 5). Total length 4.31–4.70, length apex clypeus–cuneal fracture 2.98–3.26, width across pronotum 1.19–1.31.

HOSTS: *Salix* spp. (Salicaceae); also recorded from *Rubus* sp. (Rosaceae).

DISTRIBUTION: New England and New York north to Nova Scotia, west to Colorado, Wyoming, and Idaho, and north to Alaska.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Canmore, August 28, 1952, A. R. Brooks, 1♂ (CNC). Eisenhower Jct, August 5, 1970, L. A. Kelton, 2♂ (CNC). Elkwater Lake, July 20, 1956, O. Peck, 4♀ (CNC). Elkwater Park near campground stream, 3990 ft, July 16, 1990, M. D. Schwartz, *Salix* sp. (Salicaceae), 1♂ (CNC). Elkwater Park, July 13, 1952–July 21, 1952, L. A. Konotopetz and A. R. Brooks, 22♂, 11♀ (CNC). Elkwater Park, July 20, 1956, O. Peck, 7♂ (CNC). Jasper, August 29, 1970, L. A. Kelton, 1♂, 1♀ (CNC). Kananaskis Hiway, July 25, 1975, L. A. Kelton, *Salix* sp. (Salicaceae), 5♂, 3♀ (CNC). Lake Louise, August 3, 1970, L. A. Kelton, 1♀ (CNC). McMurray, August 16, 1953, G. E. Ball, 2♂, 3♀ (CNC). Nordegg, July 3, 1921, J. McDunnough, 1♀ (CNC). Slave Lake, August 14, 1924, O. Bryant, 1♂ (USNM). Waterton, July 26, 1972, L. A. Kelton, 1♂, 1♀ (CNC). **Labrador:** Cartwright, August 2, 1955, F. E. Sterns, 1♂, 1♀ (CNC). **Manitoba:** 10 mi W of Roblin on Rt 5, July 15, 1954, Brooks and Wallis, 2♂, 1♀ (CNC). Boissevain, July 20, 1953, Brooks and Kelton, 1♂ (CNC). Brandon, July 18, 1958, R. L. Hurley, 2♂ (CNC). Churchill, August 6, 1952, J. R. Chillcott, 1♀ (CNC). Falcon Lake, June 25, 1972, L. A. Kelton, 2♂ (CNC). Horton, July 25, 1953, Brooks and Kelton, 1♂, 4♀ (CNC). Oak Lake, July 1, 1953, Brooks and Kelton, 1♀ (CNC). Russell, July 21, 1954, Brooks and Wallis, 1♂ (CNC). Turtle Mt. Forest Reserve, Internation Peace Gardens, July 17, 1958, J. G. Chillcott, 1♂ (CNC). Turtle Mt., July 22, 1953, Brooks and Kelton, 12♂, 18♀

(CNC). Virden, July 8, 1953, Brooks and Kelton, 1♂ (CNC). **New Brunswick:** Bathurst, June 28, 1966, L. A. Kelton, *Rubus* sp. (Rosaceae), 7♂, 3♀ (CNC). Cambellton, June 29, 1966, L. A. Kelton, *Rubus* sp. (Rosaceae), 8♂, 7♀ (CNC). Edmunston, July 1, 1966, L. A., Kelton, *Salix* sp. (Salicaceae), 2♂ (CNC). Fundy National Park, July 6, 1966, L. A. Kelton, 1♂ (CNC). Petersville, July 5, 1966, L. A. Kelton, 1♂ (CNC). Woodstock, June 22, 1966, L. A. Kelton, 1♀ (CNC). **Newfoundland:** Spruce Brook, August 8, 1912, 2♂, 9♀ (AMNH). **Northwest Territories:** Aklvik, July 16, 1931, Bryant, 1♂ (CAS). **Nova Scotia:** Kentville, July 3, 1966, L. A. Kelton, 1♂ (CNC). Kentville, July 7, 1924, R. P. Gorham, 1♂ (CNC). Mt. Uniacke, July 12, 1966, L. A. Kelton, 3♂ (CNC). Truro, July 12, 1913, R. Matheson, 1♂ (USNM). **Ontario:** Collingwood, June 13, 1962, Kelton and Thorpe, 1♂ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, 3♀ (CNC). Mazinaw Lake, June 20, 1974, D. G. Reid, 1♂ (CNC). Norway Point, Lake of Bays, June 28, 1922, J. McDunnough, 1♂ (CNC). Parry Sound, July 10, 1915, paratype: 1♂ (USNM). Thessalon, July 11, 1965, W. Gagne, 2♂ (UCB). **Quebec:** Duchesnay, July 5, 1953, R. Lambert, 1♂ (CNC). Fabre, July 12, 1963, W. Gagne, 1♀ (CNC). Frelighsburg, June 21, 1972, L. A. Kelton, 1♂ (CNC). Great Whale River, August 29, 1949, J. R. Vockeroth, 1♀ (CNC). Knowlton, July 11, 1929, L. J. Milne, 1♂ (CNC). Lac Mondor, Ste. Flore, July 6, 1951, E. G. Munroe, 2♂ (CNC). Laniel, July 1, 1963–July 16, 1963, W. Gagne, 37♂, 18♀ (CNC). Mt. Albert, July 11, 1954, W. J. Brown, 1♂ (CNC). Quinze Lake, August 18, 1907, W. J. Palmer, 1♂ (CAS). Yarms, July 23, 1955, C. H. Mann, 1♀ (CNC). *Kamouraska Co.:* Parke Reserve, July 11, 1957, G. E. Shewell, 2♂, 2♀ (CNC). *Missisquoi Co.:* Mt. Pinacle, 8 km E of Frelighsburg, 400 m, June 20, 1991, M. D. Schwartz, 1♂ (CNC). **Saskatchewan:** Elbow, July 1, 1960, A. R. Brooks, 1♂ (CNC). Kenosee, July 19, 1958, A. and J. Brooks, 10♂, 12♀ (CNC). Lake Madge, July 12, 1954, Brooks and Wallis, 2♂, 2♀ (CNC). Prince Albert, July 23, 1959, A. and J. Brooks, 3♂ (CNC). Saskatoon, June 26, 1951, L. A. Konotopetz, 2♂, 2♀ (CNC). White Forest, July 24, 1950, L. A. Konotopetz, 1♂ (CNC). USA.—**Alaska:** Fort Yukon, July 15, 1951, R. I. Sailer, 2♂ (USNM). **Colorado:** *Jackson Co.:* 1 mi E of Gould, August 11, 1969, J. C. Schaffner, 1♂ (TAMU). *Larimer Co.:* 46 mi W of Fort Collins, Bennett Crk. Pic. Grd., Pingree Pk. Rd., July 14, 1986, R. T. Schuh and J. T. Polhemus, 1♀ (AMNH). **Idaho:** *Blaine Co.:* Bellveue, July 30, 1932, W. E. Shull, 2♂ (USNM). **Maine:** *Cumberland Co.:* Portland, July 9, 1909, E. P. Van Duzee, 1♀ (CAS). *Oxford Co.:* near Bethel, July 7, 1900, B. Banks, 3♂, 4♀ (AMNH). *Piscataquis Co.:* Traveller Mountain, July 27, 1910, paratype: 1♂ (CAS). Capens, July 20, 1907, paratype: 1♂ (CAS). *Washington Co.:* Calais, July 10, 1900, 1♀ (CAS). Eastport, July 15, 1909, paratypes: 1♂, 2♀ (CAS). Machias, July 22, 1909, paratype: 4♂, 2♀ (CAS). Princeton, July 12, 1907, paratypes: 1♂, 1♀ (CAS). **Massachusetts:** *Norfolk Co.:* Wellesley, July 11, 1909, E. P. Van Duzee, 1♂ (CAS). **Minnesota:** *Itasca Co.:* Deer Lake, June 15, 1986, D. A. Rider, 3♂, 1♀ (DAR). **Montana:** *Gallatin Co.:* Bozeman, July 21, 1985, R. Styles, 1♂ (DAR). **New Hampshire:** *Carroll Co.:* Crawford Notch, July 23, 1900, N. Banks, 1♂ (AMNH). *Coos Co.:* Bretton Woods, June 30, 1909, E. P. Van Duzee, 1♂ (CAS). Glen House, July 15, 1915, paratypes: 6♂, 2♀ (CAS). Mount Washington, Halfway House, July 18, 1915, paratype: 1♂ (CAS). Mount Washington, July 4, 1915, 2♀ (CAS). Pinkham Notch, July 6, 1900, N. Banks, 1♂ (AMNH). *Grafton Co.:* Hubbard Brook Exp. Forest, July 10, 1975, M. Schwartz, 1♀ (AMNH). **New York:** *Erie Co.:* Elma, June 25, 1911, E. P. Van Duzee, 1♀ (CAS). Hamburg, July 23, 1905, E. P. Van Duzee, 1♂ (CAS). *Essex Co.:* Lake Placid, July 19, 1962, J. R. Vockeroth, 1♂ (CNC). Lake Placid, September 22, 1902, E. P. Van Duzee, 1♂ (CAS). Whiteface Mountain, August 22, 1916, H. H. Knight, 1♀ (CAS). *Genesee Co.:* Batavia, June 25, 1915, H. H. Knight, paratypes: 2♂ (CAS). *Hamilton Co.:* Speculator, July 20, 1909, E. P. Van Duzee, 1♂ (CAS). *St. Lawrence Co.:* Cranberry Lake, July 11, 1917, C. J. Drake, 1♂, 1♀ (TAMU). **North Dakota:** *Ransom Co.:* 4 mi NW of McLeod, June 25, 1992, D. A. Rider, 1♂ (DAR). *Traill Co.:* No specific locality, August 9, 1923, A.

A. Nichol, 2♀ (USNM). **Vermont:** *Washington Co.:* Montpelier, June 23, 1900, C. W. Johnson, 1♂ (AMNH). Montpelier, June 25, 1906, paratypes: 1♂, 1♀ (CAS). **Wyoming:** *Park Co.:* Yellowstone National Park, July 20, 1920, A. A. Nichol, 1♂ (USNM).

Plagiognathus alnicenatus (Knight), new combination
Figures 5, 15, 20

Psallus alnicenatus Knight, 1923: 466 (n. sp.).
Psallus parshleyi fuscatus Knight, 1923: 466 (n. var.). NEW SYNONYMY.

DIAGNOSIS: Recognized by the medium to moderately large size, *elongate body form, pronotum with flattened scalelike setae dorsolaterally and on pleuron, brownish, mottled coloration of the dorsum,* the frequent occurrence of *pale markings on the pronotal disc and laterally on the scutellum* (fig. 5), and *antennal segment 2 entirely dark* or at least largely infuscate; coxae and trochanters usually entirely pale. Costal vein pale only when other areas of dorsum also pale. Flange on vesica very broad. Sexual dimorphism relatively strong in most populations. Similar to *astericola, morrisoni,* and *parshleyi* in presence of scalelike setae on pronotum and dark coloration of antennal segment 2. Similar in size to *parshleyi,* but distinguished by the more brownish coloration of the dorsum and the scutellum frequently being pale laterally. Larger than *astericola* and *morrisoni,* and those species never with scutellum pale laterally.

REDESCRIPTION: *Male:* Elongate, nearly parallel-sided to elongate ovoid, of moderately large size; total length 3.36–4.28, length apex clypeus–cuneal fracture 2.27–2.82, width across pronotum 1.04–1.21. COLORATION (fig. 5): Dorsum generally brown, of variable intensity, often with pale on disc of pronotum, scutellum pale laterally, basal one-third to one-half of endocorium and most of clavus pale, corium narrowly pale adjacent to extreme base of membrane, and basal one-half or more of cuneus pale; membrane fumose, veins pale; face highly polished and appearing more deeply castaneous at and below base of clypeus; posterior margin of vertex always pale; antennal segment 1 castaneous except for pale apical annulus, segment 2 entirely dark (fig. 15), segments 3 and 4 infuscate; labium, except segment 1, pale to weakly infuscate; venter mostly brown, metathoracic scent-gland evaporatory area mostly pale; legs, including most of coxae, pale or light brown, hind femora more heavily infuscate, all femora with some dark spots; dorsal tibial spines with dark spots at bases and tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull. Vestiture of dorsum composed of recumbent, golden, shining, simple setae, sometimes appearing weakly woolly; pronotum with moderately flattened scalelike setae dorsolaterally and on pleuron. STRUCTURE: Body elongate, nearly parallel-sided to very elongate ovoid; frons only weakly convex as viewed from above, clypeus visible; anteocular distance equal to diameter of antennal segment 1, head projecting below eyes by diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 20): Body of vesica relatively stout, more or less J-shaped, base of vesica falling well below level of secondary gonopore, posterior apical spine elongate, nearly straight, obliquely angled relative to body of vesica, anterior spine conspicuously longer than posterior, distinctly bent subapically, at about 45° angle to body of vesica, angle between spines acute; flange on vesica moderately broad, reaching to about base of gonopore, underlying strap conspicuously visible and extending to about midpoint of gonopore.

Female: Very similar to male in coloration, although body shorter, broader, and much more strongly ovate (fig. 5); antennal segment 2 usually obviously pale on distal two-thirds (fig. 15), in contrast to male; abdomen with large pale areas in specimens with pale coloration on dorsum. Total length 3.11–3.66, length apex clypeus–cuneal fracture 2.13–2.59, width across pronotum 1.00–1.16.

HOST: Breeds on *Alnus* spp. (Betulaceae). Records from the Pinaceae almost certainly do not represent breeding hosts.

DISTRIBUTION: Well documented from Pennsylvania west to Illinois and north to Manitoba and Nova Scotia. Also recorded

from Florida, although not from intervening localities.

DISCUSSION: Knight's (1923) placement of this species in *Psallus* was based on the presence of flattened setae, particularly on the lateral margins of the pronotum and the propleuron. The structure of the male genitalia, however, clearly places *alnicenatus* in *Plagiognathus*.

Knight (1923) described *Plagiognathus fuscatus* as a variety of *Psallus parshleyi* on the basis of three specimens from Minnesota, placing it in *Psallus* because of what he deemed to be the distinctive nature of the vestiture. He later (Knight, 1941) treated *fuscatus* as a valid species, recording the host as *Alnus rugosa* (alder). Comparison of Knight's types and paratypes of *alnicenatus* in the National Museum of Natural History, Washington, D.C., with topotypical material of *fuscatus* identified by Knight suggests that the two nominal species are the same, based on the coloration of antennal segment 2 and the nature of the scalelike setae on the pronotum and propleuron. The hosts, as recorded by Knight (1923, 1941), are the same for the two nominal species. The genitalia of *alnicenatus* and those of specimens from Eichorn, Illinois, identified by Knight as *fuscatus* are nearly identical.

SPECIMENS EXAMINED: CANADA.—**Manitoba:** Riding Mt. Natl. Park, July 21, 1972, L. A. Kelton, 1♂ (CNC). **New Brunswick:** Kouchibouguac Natl. Park, July 27, 1977, D. J. Brown, *Alnus* sp. (Betulaceae), 28♂, 25♀ (CNC). **Nova Scotia:** Kentville, July 15, 1966, L. A. Kelton, 1♀ (CNC). Truro, August 4, 1917, paratype: 1♂ (CAS). Woodville, July 20, 1966, L. A. Kelton, *Alnus* sp. (Betulaceae), 1♂, 2♀ (cbc). Woodville, July 20, 1966, L. A. Kelton, *Alnus* sp. (Betulaceae), 7♂, 11♀ (CNC). **Ontario:** Corkery, July 4, 1962, D. Brown, *Alnus* sp. (Betulaceae), 1♂ (CNC). Corkery, July 4, 1962, D. Brown, *Alnus* sp. (Betulaceae), 6♂, 2♀ (CNC). Ipperwash, July 11, 1962, Kelton and Thorpe, 1♂, 1♀ (CNC). Lac Brule, August 6, 1951, O. Peck, *Alnus* sp. (Betulaceae), 2♀ (CNC). Otter Lake, July 26, 1962, Kelton and Thorpe, *Alnus* sp. (Betulaceae), 1♀ (CNC). Otter Lake, July 26, 1962, Kelton and Thorpe, *Alnus* sp. (Betulaceae), 20♂, 14♀ (CNC). Parry Sound, July 26, 1962, Kelton and Thorpe, 1♀ (CNC). Stittsville, August 9, 1962, D. Brown, *Alnus* sp. (Betulaceae), 7♀ (CNC). Stittsville, July 26, 1961, G. Brumpton, 2♀ (CNC). Sturgeon Falls, July 27, 1962, Kelton and Thorpe, *Alnus* sp. (Betulaceae), 3♀ (CNC). Thessalon, August 15, 1965, W. Gagne, 2♂ (UCB). **Prince Edward Island:** Charlottetown, August 7, 1976, L. A. Kelton, *Alnus* sp. (Betulaceae), 1♂, 2♀ (CNC). **Quebec:** Chicoutimi, July 24, 1915, G. Beaulieu, 1♀ (USNM). Chicoutimi, July 24, 1915, G. Beaulieu, 5♂ (CNC). Fabre, July 12, 1963, W. Gagne, 1♂ (CNC). Lac Megantic, August 3, 1961, G. Brumpton, 3♀ (CNC). Ladysmith, July 23, 1958, L. A. Kelton, *Picea* sp. (Pinaceae), 2♂ (CNC). Laniel, July 20, 1963, W. Gagne, *Alnus* sp. (Betulaceae), 13♂, 10♀ (CNC). Levis, August 6, 1961, G. Brumpton, 1♀ (CNC). Magog, August 2, 1961, G. Brumpton, 4♂, 4♀ (CNC). Old Chelsea, August 10, 1962, G. Thorpe, *Alnus* sp. (Betulaceae), 4♀ (CNC). St. Agathe, August 9, 1961, G. Brumpton, 2♀ (CNC). USA.—**Connecticut:** Storrs, June 30, 1964, J. A. Slater, 8♂ (AMNH). **Florida:** *Liberty Co.:* W of Bristol along Apalachicola River, May 8, 1981, T. J. Henry, *Alnus serrulata* (Betulaceae), 8♂, 1♀ (USNM). **Illinois:** *Hardin Co.:* Eichorn, Hick's Branch, June 24, 1932, Mohr, Dozier, Park, *Alnus rugosa* (Betulaceae), 1♂, 2♀ (AMNH). Eichorn, Hick's Branch, June 24, 1932, Ross, Dozier, Park, *Alnus rugosa* (Betulaceae), 1♀ (USNM). **Maine:** *Waldo Co.:* Lincolnville, August 23, 1900, E. B. Bryant, 1♂ (AMNH). **Massachusetts:** *Hampden Co.:* Chester, August 8, 1912, H. M. Parshley, 1♀ (CAS). *Norfolk Co.:* Sharon, July 20, 1909, E. P. Van Duzee, 1♂ (CAS). Wellesley, June 7, 1910, E. P. Van Duzee, 1♂ (CAS). **Minnesota:** *Lake Co.:* Beaver Bay, August 20, 1920, H. H. Knight, 4♀ (USNM). Cramer, August 10, 1922, H. H. Knight, 1♂ (USNM). *Winona Co.:* Kings Bluff, June 30, 1922, H. H. Knight, 1♀ (USNM). **New Hampshire:** *Coos Co.:* Gorham, July 18, 1929, G. S. Walley, 1♀ (CNC). **New York:** *St. Lawrence Co.:* Cranberry Lake, July 26, 1917, H. H. Knight, paratype: 1♂ (USNM). *Suffolk Co.:* East Quogue, Quogue Wildlife Refuge, July 19, 1988, M. D. Schwartz, *Picea* sp. (Pinaceae), 1♂ (AMNH). *Tompkins Co.:* Ithaca, July 1,

1920–July 8, 1920, H. H. Knight, 2♂, 1♀ (USNM). Ithaca, July 1, 1920, H. H. Knight, paratypes: 10♂, 10♀ (USNM). Ithaca, July 8, 1920, H. H. Knight, paratypes: 2♂, 2♀ (USNM). Ithaca, Ringwood Road, August 1, 1982, A. G. Wheeler, Jr., *Alnus* sp. (Betulaceae), 2♂, 4♀ (PDA). McLean Bogs, July 3, 1920, 6♂, 6♀ (USNM). McLean Bogs, July 3, 1920, H. H. Knight, paratypes: 1♂, 1♀ (CAS). McLean Bogs, July 3, 1920, H. H. Knight, paratypes: 10♂, 10♀ (USNM); holotype male (USNM). McLean, July 27, 1916, H. H. Knight, 1♂ (USNM). McLean, July 27, 1916, H. H. Knight, paratypes: 10♂, 10♀ (USNM). **Pennsylvania:** *Centre Co.:* State College, July 28, 1963, D. J. Burdick, 1♂, 1♀ (UCB).

Plagiognathus amorphae (Knight), new combination
Figures 5, 15, 20

Psallus amorphae Knight, 1930: 125 (n. sp.).

DIAGNOSIS: Recognized by *small size, dark coloration* of body and all femora (fig. 5), *antennal segment 2 pale* except at extreme base (in both sexes) (fig. 15), and *silvery, scalelike setae on dorsum,* thoracic pleuron, and pregenital abdominal venter intermixed with reclining, dark, simple setae. Coloration and type of dorsal vestiture most similar to *physocarpi,* but that species always larger than *amorphae.* Similar in size and type of vestiture to *astericola* and *morrisoni,* but distinguished from them by largely pale antennal segment 2 in both sexes, whereas segment 2 dark in males of *astericola* and dark in both sexes of *morrisoni.* Further distinguished from *astericola* and *morrisoni* by head projecting well beyond anterior margin of eyes in those species, whereas head not so strongly projecting in *amorphae*. Distinguished from *alnicenatus* and *parshleyi* by their generally larger size, dark antennal segment 2, and scalelike setae being restricted to the pronotum.

REDESCRIPTION: *Male:* Elongate, small; total length 2.29–3.21, length apex clypeus–cuneal fracture 2.02–2.20, width across pronotum 0.91–1.01. COLORATION (fig. 5): Almost entirely castaneous to nearly black, except metathoracic scent-gland evaporatory area mostly pale; membrane and veins fumose; antennal segment 1 dark except for pale apical annulus, segment 2 black only at extreme base, remainder of segment pale (fig. 15), segments 3 and 4 pale, metathoracic scent-gland evaporatory area pale, background coloration of tibiae pale, spines with dark bases, and tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum, pleuron, and abdominal venter laterally composed of recumbent, silvery, simple setae (which may appear very weakly flattened) intermixed with silvery, shining, flattened, weakly scalelike setae, the scalelike appearance especially prominent on pronotum and pleuron. STRUCTURE: Body nearly parallel-sided, lateral corial margins only very weakly convex; frons very weakly convex, clypeus not visible from above; anteocular distance about 0.5 times diameter of antennal segment 1, head projecting below eye by 0.75 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 20): Body of vesica slender, U-shaped, base of vesica reaching nearly to level of secondary gonopore, apical spines elongate, slender, weakly curving, more or less parallel, anterior spine longer than posterior; flange on vesica moderately broad, reaching to about base of gonopore.

Female: Body form much more strongly ovoid than in males (fig. 5); antennal segment 2 slightly tapered toward base, segment 1 with dark basal portion more extensive than in male and covering one-third of segment length. Total length 2.80–3.01, length apex clypeus–cuneal fracture 1.97–2.13, width across pronotum 0.94–1.02.

HOSTS: *Amorpha* spp. (Fabaceae).

DISTRIBUTION: Eastern United States, from South Dakota and Minnesota in the north, south to North Carolina and Florida, and west to the foothills of the Rocky Mountains in Colorado.

DISCUSSION: Knight (1930) described *amorphae* in *Psallus* on the basis of the silvery, somewhat woolly vestiture on the dorsum. The genitalia, however, are clearly those of a *Plagiognathus* species.

SPECIMENS EXAMINED: USA.—**Arkansas:** *Mississippi Co.:* No specific locality, May 30, 1963, 1♂ (USNM). **Colorado:** *Douglas*

Co.: Chatfield State Park, July 8, 1977, D. A. and J. T. Polhemus, 1♂, 1♀ (JTP). Head of Highline Canal, July 10, 1979, J. T. Polhemus, 5♂, 4♀ (JTP). Waterton, June 20, 1982, D. A. Polhemus, 6♂, 29♀ (JTP). **Florida:** *Unknown Co.:* St. Johns Bluff, May 8, 1927, E.D. Ball, 3♀ (USNM). **Illinois:** *Mason Co.:* Havana, June 20, 1936, Mohr and Burks, 1♀ (USNM). *Ogle Co.:* Grand Detour, Castle Rock, July 2, 1932, Dozier and Mohr, 1♀ (AMNH). **Iowa:** *Clay Co.:* Peterson, July 23, 1981, D. A. Polhemus, 1♂, 5♀ (JTP). *Clinton Co.:* Clinton, July 23, 1928, G. S. Walley, 9♂, 9♀ (CNC). Clinton, June 23, 1928, C.J. Drake, 1♂, 2♀ (USNM). *Dickinson Co.:* Cayler Prairie, July 11, 1963, J.C. Schaffner, 1♂, 2♀ (USNM). *Story Co.:* Ames, July 9, 1925–July 23, 1928, G.O. Hendrickson, 1♂, 4♀ (USNM). *Unknown Co.:* Seargent Bluff, July 26, 1928, G. O. Hendrickson, 1♂ (USNM). **Minnesota:** *Clay Co.:* Blazing Star SNA, July 24, 1995, C. Locken and L. Decock, 1♂ (DAR). *Hennepin Co.:* Fort Snelling, July 10, 1924, H. H. Knight, 1♀ (AMNH). Fort Snelling, July 10, 1924, H. H. Knight, 1♀ (USNM). *Ramsey Co.:* No specific locality, July 8, 1922, H. H. Knight, *Amorpha fruticosa* (Fabaceae), 25♂, 25♀ (USNM). No specific locality, June 19, 1921, H. H. Knight, ex Asteraceae, paratypes: 1♂, 2♀ (USNM). Red Rock, Mississippi River, July 11, 1923, H. H. Knight, 10♂, 10♀ (USNM). St. Anthony Park, July 10, 1924, H. H. Knight, paratypes: 2♂ (USNM). St. Anthony Park, July 10, 1924, H. H. Knight, 1♂ (USNM). *Washington Co.:* Grey Cloud Island, July 20, 1920, H. H. Knight, 2♂ (USNM). *Winona Co.:* No specific locality, July 1, 1922, H. H. Knight, paratypes: 1♂, 2♀ (USNM); holotype male (USNM). No specific locality, July 1, 1922, H. H. Knight, *Amorpha canescens* (Fabaceae), 10♂, 10♀ (USNM); Paratypes: 35♂, 35♀ (USNM). **Missouri:** *St. Louis Co.:* St. Louis, June 3, 1939, R.C. Froeschner, 1♀ (USNM). **Nebraska:** *Gosper Co.:* Johnson Lake St. Rec. Area, June 28, 1980, K. Schmidt, *Amorpha fruticosa* (Fabaceae), 29♂, 24♀ (AMNH). **North Carolina:** *Stanly Co.:* Morrow Mt. State Park, June 19, 1958, D. A. Young, 2♂ (USNM). **South Dakota:** *Custer Co.:* Custer, July 27, 1927, H. H. Knight, 7♂, 6♀ (USNM). **Tennessee:** *Dyer Co.:* Rt 78 N of Dyersburg, June 2, 1985, A. G. Wheeler, Jr., *Amorpha* sp. (Fabaceae), 2♂ (PDA). **Texas:** *Dallas Co.:* near Prairie, May 19, 1937, H. C. Knutson, 1♂ (USNM).

Plagiognathus annulatus Uhler
Figures 5, 15, 21

Plagiognathus annulatus Uhler, 1895: 51 (n. sp.).

DIAGNOSIS: Recognized by the unicolorous dark, nearly *black, shining body* (fig. 5) covered with recumbent, shining, golden setae, the pale, almost white legs, and tibial spines with dark spots at bases, the tibia black at articulation with femur, antennal segment 1 black, and *antennal segment 2 in females black basally and distally with a broad yellow band in middle, often entirely black in males* (fig. 15), antennal segments 3 and 4 pale to moderately infuscate. Similar to *punctatipes, rideri, schaffneri,* and specimens of *obscurus* with a uniformly dark dorsum, in the dark coloration of the dorsum and the generally pale coloration of the legs, but those species neither so conspicuously black nor having antennal segment 2 (in females) dark proximally and distally with a pale median annulus.

REDESCRIPTION: *Male:* Moderately large, elongate, more or less parallel-sided; total length 3.27–4.09, length apex clypeus–cuneal fracture 2.41–2.94, width across pronotum 0.94–1.27. COLORATION (fig. 5): Dorsum and head castaneous to blackish, posterior margin of vertex vaguely pale; membrane and veins strongly fumose, except veins white along posterior margin of cells and membrane pale at angle between posterior margin of cells and posteromesal margin of cuneus; antennal segment 1 dark except pale apical annulus, segment 2 frequently entirely dark, sometimes dark proximally and distally with a more or less conspicuous pale median annulus (fig. 15); segments 3 and 4 pale to moderately infuscate; labium infuscate basally and apically, pale medially; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs, including coxae, mostly pale, nearly yellow-white, middle and hind coxae often castaneous on basal one-half, femora often with a dark stripe dorsodistally, hind femur with a dark stripe distally on medioventral surface; dor-

sal tibial spines with obvious dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Entire body surface weakly granular, smooth, shining, corium and clavus weakly rugulose. Dorsal vestiture composed of reclining, golden, simple setae. STRUCTURE: Frons weakly convex, clypeus visible from above; anteocular distance about 1.3 times diameter of antennal segment 1; head projecting below eye by 1.6 times diameter of antennal segment 1; labium reaching to near apex of hind coxae. GENITALIA (fig. 21): Vesica elongate, relatively slender, rather broadly curving, base falling well below level of secondary gonopore; posterior apical spine relatively short, slender, nearly erect relative to body of vesica, anterior spine longer than posterior, angled near apex, and more strongly angled relative to body of vesica; flange relatively narrow, weakly projecting beyond body of vesica, terminating at base of secondary gonopore.

Female: Body slightly more strongly ovoid than in male (fig. 5); antennal segment 2 conspicuously pale medially (fig. 15). Total length 3.49–4.16, length apex clypeus–cuneal fracture 2.48–2.99, width across pronotum 1.03–1.26.

HOSTS: *Rosa* spp. and *Potentilla* sp. (Rosaceae). The record from *Cornus* sp. is almost certainly just a sitting record.

DISTRIBUTION: Interior western North America from Alberta west to British Columbia, south to Nevada and Colorado.

DISCUSSION: Uhler (1895) described *annulatus* from a single female specimen from Steamboat Springs, Colorado. I have been unable to find any specimens in the National Museum of Natural History collections with these data. To prevent further confusion concerning the identity of this taxon, I am designating a neotype (male). The specimen bears the following label data and is deposited in the National Museum of Natural History, Washington, D.C.:

> Steamboat Springs, COLO., July 14, 1964, 6700 ft., H. H. Knight; *Plagiognathus annulatus* Uhler, det. H. H. Knight; NEOTYPE *Plagiognathus annulatus* Uhler, det R. T. Schuh.

Knight (1923) recorded *annulatus* from Denver, Colorado, Huntington and New Haven, Connecticut. He also described two new varieties, *cuneatus* and *nigrofemoratus.* It seems clear from examination of the types of these varieties, as well as from other available material, that the records of *annulatus* published by Knight from the eastern United States are not *annulatus* of Uhler, but rather are specimens of *obscurus* with an almost totally dark dorsum. All specimens assignable to *annulatus* from the western United States have a black stripe distally on the lower inner surface of the hind femur, and most have black stripes dorsally on all femora. These specimens usually agree closely with the description of Uhler (1895) in having the middle third of antennal segment 2 pale, whereas this is never the case in eastern specimens. Equally convincing, the western specimens have a rather slender, elongate vesica with a narrow ''flange'' subtending the secondary gonopore, whereas eastern specimens identified as *annulatus* by Knight have a short, very robust vesica, with a broad ''flange'' subtending the secondary gonopore; this latter type is the vesica of *obscurus* Uhler (see also discussion under *obscurus*).

As here conceived, *annulatus* shows substantial variation in size. There is apparently no geographic pattern to these differences, however, and other characteristics, such as coloration of antennal segment 2 and structure of the male genitalia, suggest that a single taxon is involved.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Lundbreck, July 7, 1970, L. A. Kelton, 1♂ (CNC). Lundbreck, July 7, 1970, L. A. Kelton, 4♀ (CNC). **British Columbia:** Elko, E Kootenay, July 9, 1949, H. B. Leech, 1♂ (CAS). Summerland, June 24, 1975, L. A. Kelton, *Rosa* sp. (Rosaceae), 1♀ (CNC). USA.—**California:** *Mono Co.:* West Walker Canyon, July 9, 1934, E. P. Van Duzee, 1♂, 1♀ (CAS). *Nevada Co.:* Boca, July 23, 1970, R. M. Bohart, 1♀ (UCD). **Colorado:** *Costilla Co.:* Fort Garland, July 6, 1982, D. A. and J. T. Polhemus, *Rosa* sp. (Rosaceae), 1♂, 2♀ (JTP). *Denver Co.:* Denver, July 12, 1900, E. P. Van Duzee, 1♀ (CAS). Denver, July 16, 1909, W. J. Gerhard, 1♂ (USNM). *Dolores Co.:* 19 mi NE of Dolores, West Dolores River, 7600 ft, July 22, 1976, L. and N. Herman, 2♀ (AMNH). *Eagle Co.:* Vail, June 23, 1986, J. T. Polhemus, 1♂ (JTP). Vail, June

26, 1977, J. T. Polhemus, 1♂, 1♀ (JTP). *El Paso Co.:* Colorado Springs, August 1, 1900, E. S. Tucker, 1♂ (USNM). *Gunnison Co.:* Stueben Creek, 7500 ft, July 5, 1961, 2♀ (USNM). *Hinsdale Co.:* 11 mi N of Lake City, August 6, 1997, J. C. Schaffner, 3♂, 3♀ (TAMU). *Larimer Co.:* Fort Collins, June 4, 1902, 1♂ (USNM). *Montrose Co.:* 18 mi SE of Naturita, July 8, 1980, J. T. and D. A. Polhemus, 1♀ (JTP). *Pitkin Co.:* Aspen, July 24, 1919, 1♀ (AMNH). *Routt Co.:* Steamboat Springs, 6700 ft, July 14, 1964, H. H. Knight, 1♀ (CNC). Steamboat Springs, July 14, 1964, H. H. Knight, 8♂, 4♀ (USNM). *Saguache Co.:* 17 mi S of US 50 on Colorado Rt 114, August 31, 1980, D. A. and J. T. Polhemus, 1♂ (JTP). *Summit Co.:* S end of Green Mountain Reservoir, August 12, 1973, S. Szerlip, 1♀ (UCB). **Idaho:** *Bannock Co.:* 3 mi E of McCammon, June 29, 1966, J. Haddock, *Cornus* sp. (Cornaceae), 2♀ (UCB). *Blaine Co.:* 6 mi NW of Carey, Little Wood River, June 30, 1966, W. Gagne and J. Haddock, 3♂, 1♀ (UCB). *Franklin Co.:* Mink Creek, July 6, 1935, C. F. Smith, 1♂ (USU). *Latah Co.:* Moscow, July 10, 1932, T. A. Brindley, 6♂, 7♀ (USNM). *Madison Co.:* Rexburg, 4864 ft, July 22, 1922, C. Wakeland, 2♂, 1♀ (USNM). **Montana:** *Gallatin Co.:* 15 mi S of Big Sky on Rt 191, Teepee Creek, 6600 ft, August 10, 1986, Schuh, Schwartz, and Stonedahl, *Potentilla fruticosa* (Rosaceae), 3♂, 2♀ (AMNH). *Granite Co.:* 6 mi S of Drummond on Rt 10A, Hall, 4200 ft, August 9, 1986, Schuh, Schwartz, and Stonedahl, *Rosa* sp. (Rosaceae), 2♀ (AMNH). **Nevada:** *Elko Co.:* Carlin, July 11, 1968, G. E. Bohart, 4♂ (USU). *Lyon Co.:* 5.2 mi S of Sweetwater Summit on Rt 22, Toiyabe Natl. Forest, 6460 ft, July 11, 1980, G. M. Stonedahl, *Rosa* sp. (Rosaceae), 7♂, 11♀ (AMNH). 5.7 mi S of Sweetwater Summit on Rt 22, Toiyabe Natl. Forest, 2015 m, July 11, 1980, R. T. Schuh and G. M. Stonedahl, *Rosa* sp. (Rosaceae), 10♂, 27♀ (AMNH). *Washoe Co.:* Sparks, June 28, 1927, E. P. Van Duzee, 2♂, 2♀ (CAS). **Oregon:** *Malheur Co.:* 12 mi E of Juntura, June 18, 1963, K. Goeden, 1♀ (AMNH). *Unknown Co.:* Dixie, July 8, 1931, R. H. Beamer, 1♂ (KU). **Utah:** *Box Elder Co.:* Willard Basin, July 5, 1966, G. F. Knowlton, 1♂ (USU). *Cache Co.:* Blacksmith Fork Canyon, July 29, 1976, G. F. Knowlton, 2♂, 1♀ (USU). Cove, July 5, 1973, G. F. Knowlton, 3♂, 1♀ (UCD). Logan Canyon, July 15, 1958, Knowlton, 1♂ (CNC). Logan, July 17, 1973, G. F. Knowlton, 1♀ (UCD). Logan, July 8, 1973, G. F. Knowlton, 2♂, 3♀ (USU). Newton, July 3, 1954, W. R. Walker, 1♂ (USU). *Duchesne Co.:* Uinta Mountains, Ashley National Forest, Hades Campground, 7400 ft, August 17, 1986, Schwartz and Stonedahl, *Rosa* sp. (Rosaceae), 1♂, 1♀ (AMNH). *Emery Co.:* Emery, August 16, 1929, R. H. Beamer, 1♂ (KU). *Rich Co.:* Garden City, July 7, 1977–July 23, 1975, G. F. Knowlton, 4♂, 3♀ (USU). Randolph, July 10, 1974, G. F. Knowlton, 1♂ (USU). *Sanpete Co.:* Mt. Pleasant, August 7, 1904, E. G. Titus, 1♂ (USU). Spring City, June 28, 1933, G. F. Knowlton, 1♀ (USNM). *Unknown Co.:* Barclay, July 2, 1931, R. H. Beamer, 1♂ (KU). *Utah Co.:* American Fork, July 22, 1922, E. P. Van Duzee, 2♀ (CAS). **Washington:** *Whitman Co.:* Pullman, July 2, 1918, A. C. Burrill, 1♀ (USNM). *Yakima Co.:* Yakima, July 3, 1930, A. R. Rolfs, 1♂, 1♀ (USNM). Yakima, June 20, 0191, A. R. Rolfs, 5♂, 9♀ (TAMU). **Wyoming:** *Teton Co.:* Jackson, July 15, 1961, J. E. R. Stainer, 1♂ (CNC).

Plagiognathus aquilinus, new species
Figures 6, 15, 21

HOLOTYPE: Male: ''[USA] COLO[rado]., Eagle Co., nr. Vail, June 20, 1981, J. T. Polhemus, *Picea* sp. (spruce)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by large size, generally *red-orange coloration* of the dorsum and appendages (fig. 6) (except antennal segment 1 completely dark), *darkened calli, reclining, black, bristlelike setae on pronotum and anterolateral margins of hemelytra,* and reddish recumbent setae on hemelytra. Similar in coloration of dorsum to *fulvaceus* and *mexicanus,* but calli at most weakly darkened in those species, *fulvaceus* without black setae on dorsum, and *mexicanus* with antennal segment 2 entirely black rather than mostly red-orange. Vesica distinctive, with erect, apical spines slightly decurved before apices (fig. 21).

DESCRIPTION: *Male:* Relatively large; total

length 4.27–5.15, length apex clypeus–cuneal fracture 2.89–3.39, width across pronotum 1.21–1.38. COLORATION (fig. 6): General coloration of dorsum, including most of venter and appendages, dull reddish; venter slightly darker; membrane weakly fumose with a faint, transverse, fumose marking posterior to cuneus and membrane cells; veins of membrane reddish; antennal segment 1 castaneous except for pale apical annulus, segment 2 infuscate at base (fig. 15), remainder reddish, segments 3 and 4 infuscate; frons and face below base of clypeus variably infuscate; femora with some dark spots; dorsal tibial spines without dark spots at bases; tibiae not darkened at articulation with femora. SURFACE AND VESTITURE: Dorsum smooth, mostly dull; hemelytra transversely rugulose. Vestiture of dorsum composed of reclining, black, bristlelike setae on pronotum and anterolateral margins of hemelytra and reddish recumbent setae on hemelytra. STRUCTURE: Relatively broad-bodied, flattened; frons weakly tumid, clypeus not visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1; labium reaching to apex of hind coxae. GENITALIA (fig. 21): Vesica, including apical spines more or less sigmoid, body relatively broad, base falling well below base of secondary gonopore; apical spines erect, decurved subapically, anterior spines distinctly shorter than posterior; no flange on vesica.

Female: Shorter and more strongly ovoid than male; coloration similar to male (fig. 6); antennae almost totally pale, in contrast to male (fig. 15). Total length 3.62–3.85, length apex clypeus–cuneal fracture 2.53–2.70, width across pronotum 1.08–1.24.

ETYMOLOGY: From the Latin, *aquilinus,* of eagles, in allusion to its occurrence in Eagle County, Colorado.

HOST: *Picea* sp. (Pinaceae).

DISTRIBUTION: Rocky Mountains of Colorado and New Mexico.

DISCUSSION: I have seen three additional female specimens from ''Flagstaff, Ariz., Mt. Humphreys, August 16, 1967, L. A. Kelton, on *Abies concolor*'' (CNC). They are darker than the holotype and paratypes from Colorado, but are otherwise similar in appearance. In view of the very limited amount of material of *aquilinus,* and the absence of male genitalia for the Arizona specimens, I do not have confidence in assigning them to *aquilinus.* The scanty amount of available information on this distinctive taxon, as well as the possibility that more than one species might be involved, suggests that additional collecting on conifers in the southern Rockies and adjacent Arizona may yield additional evidence of diversification in *Plagiognathus.*

PARATYPES: USA.—**Colorado:** *Clear Creek Co.:* Mt. Goliath area, 11,200 ft, August 21, 1986, R. T. Schuh and J. T. Polhemus, *Pinus aristata* (Pinaceae), 1♂, 2♀ (AMNH). *Eagle Co.:* near Vail, July 20, 1981, J. T. Polhemus, *Picea sp.* (Pinaceae), paratypes: 1♂, 3♀ (AMNH, JTP). **New Mexico:** *Otero Co.:* Cloudcroft, 9100 ft, July 5, 1968, L. A. Kelton, 1♂, (CNC).

Plagiognathus arbustorum (Fabricius)
Figures 6, 15, 21

Lygaeus arbustorum Fabricius, 1794: 175 (n. sp.).
Plagiognathus arbustorum: Fieber, 1858: 320 (n. comb.).

DIAGNOSIS: Recognized by the generally *ochre-colored dorsum* (fig. 6), the entirely black antennae (fig. 15), and the *orange lateral angles of the mesoscutum*; setae on dorsum black and weakly bristlelike. Potentially confused with darker specimens of *chrysanthemi, concoloris,* and *flavus,* but the first of those species usually much greener and with antennal segment 2 mostly pale; the latter two usually more orange in general coloration and with the apical blades of the vesica relatively shorter than those in *arbustorum* and with the flange on the vesica very narrow and inconspicuous.

Male: Total length 3.93–4.57, length apex clypeus–cuneal fracture 2.71–3.06, width across pronotum 1.13–1.27. GENITALIA (fig. 21): Body of vesica relatively slender on basal portion, broadly curving, base falling somewhat below level of secondary gonopore; posterior apical spine long and slender, longer than anterior, obliquely angled relatively to body of vesica, anterior spine more strongly angled; flange well developed, mod-

erately broad, terminating at about base of secondary gonopore.

Female: Total length 3.81–3.95, length apex clypeus–cuneal fracture 2.74–2.88, width across pronotum 1.19–1.23.

HOSTS: *Urtica dioica* (Urticaceae); unidentified Asteraceae; *Sarothamnus scoparius* (Fabaceae) (see Kelton, 1982b).

DISTRIBUTION: Widely distributed in the western Palearctic and Central Asia. Introduced into the Pacific Northwest of North America; known from coastal localities in Washington and British Columbia.

DISCUSSION: This species would appear to be a relatively recent introduction into the Pacific Northwest. The earliest collection record of *arbustorum* appears to be that of Kelton (1982b), who found it feeding on various roadside plants at Langley, British Columbia, on July 17, 1959. (See also ''Distribution'' in generic discussion section.) The known distribution has not been extended greatly since that first report.

SPECIMENS EXAMINED: USA.—**Washington:** *King Co.:* Fort Lawton Park, 200 ft, August 28, 1986, M. D. Schwartz, *Urtica dioica* (Urticaceae), 1♂ (AMNH). Seattle, Discovery Park, June 22, 1994, M. D. Schwartz, 1♂ (CNC). Seattle, University of Washington, July 22, 1981, J. T. Polhemus, 4♂ (JTP). *Skagit Co.:* Samish River near Rt 9, 200 ft, July 21, 2000, R. T. Schuh and G. M. Stonedahl, 2♂, 2♀, ex Asteraceae (AMNH).

Plagiognathus astericola (Knight), new combination
Figures 6, 15, 21

Psallus astericola Knight, 1930: 125 (n. sp.).

DIAGNOSIS: Recognized by the relatively *small size, black coloration* of body and all femora (fig. 6), *antennal segment 2 entirely dark in males* (pale on about apical one-half in females) (fig. 15), and the silvery, flattened, *weakly scalelike setae on the dorsum,* pleuron, and abdominal venter *intermixed with reclining, dark, simple setae.* Similar in coloration of the antennae and type of vestiture to *alnicenatus, morrisoni,* and *parshleyi*; distinguished from them by the smaller size and antennal segment 2 being pale in females but dark in both sexes of the other three.

REDESCRIPTION: *Male:* Elongate, nearly parallel-sided, small; total length 2.84–3.05, length apex clypeus–cuneal fracture 2.00–2.13, width across pronotum 0.91–0.96. COLORATION (fig. 6): Almost entirely castaneous to nearly black, except metathoracic scent-gland evaporatory area mostly pale; membrane fumose, veins fumose except pale along posterior margin of cells; tibial background coloration pale, dorsal tibial spines with dark spots at bases, tibiae broadly dark at articulation with femur. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, faintly shining. Vestiture of dorsum, pleuron, and abdominal venter laterally composed of flattened, scalelike, silvery setae intermixed with dark simple setae. STRUCTURE: More or less parallel-sided, lateral corial margins only very weakly convex; frons weakly convex, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 21): Body of vesica moderately stout, J-shaped, base of vesica well below level of secondary gonopore, apical spines only moderately elongate, posterior spine nearly straight, forming an oblique angle with body of vesica, anterior spine longer than posterior, weakly angled subapically, forming about 45° angle with body of vesica; flange narrow, reaching to about base of gonopore.

Female: Body form much more strongly ovoid than in males; antennal segment 1 with basal one-third dark, remainder pale (fig. 15). Total length 2.79–2.99, length apex clypeus–cuneal fracture 1.93–2.14, width across pronotum 0.92–0.99.

HOST: *Aster sericeus* (Asteraceae) (Knight, 1941).

DISTRIBUTION: In the present study recorded from Iowa and North Dakota.

DISCUSSION: Knight (1930) described *astericola* in *Psallus,* on the basis of the silvery, scalelike vestiture of the dorsum. The genitalia are clearly those of a *Plagiognathus* species, however. My concept of this species is based on examination of a large number of paratypes designated by the author.

SPECIMENS EXAMINED: USA.—**Arkansas:** *Benton Co.:* 1.5 mi N of Decatur on Hwy 59,

May 24, 1986, C. B. Barr, 1♂, 1♀ (LSU). **Iowa:** *Story Co.:* Ames, June 1, 1925, H. H. Knight, 4♀ (USNM). Ames, June 2, 1925–June 9, 1925, H. H. Knight, *Aster sericeus* (Asteraceae), paratypes: 25♂, 25♀ (USNM). *Woodbury Co.:* Sioux City, June 12, 1950, J. A. Slater and J. Laffoon, 2♂, 1♀ (USNM). Sioux City, June 12, 1950, Slater and Laffoon, 15♂, 24♀ (AMNH). **North Dakota:** *Traill Co.:* No specific locality, July 19, 1923, A. A. Nichol, 1♂ (USNM).

Plagiognathus atricornis Knight
Figures 6, 15, 21

Plagiognathus atricornis Knight, 1926: 9 (n. sp.).

DIAGNOSIS: Recognized by the relatively *small* size and *pale* coloration (fig. 6), entirely *black antennae* (fig. 15) with the second segment 1.4 times as long as the width of the head, the *large dark eyes,* and the narrow vertex being about one-third the total width of the head. Compared with *chrysanthemi* by Knight (1926), but that species always greenish and with antennal segment 2 mostly pale rather than entirely black. Similar in size and coloration of the body to *cibbetsi, polhemorum,* and *ribesi,* but those species with antennae mostly pale, occurring only in western North America, and always feeding on *Ribes,* whereas *atricornis* appears to breed exclusively on *Betula nigra* in eastern North America.

REDESCRIPTION: *Male:* Relatively small, nearly parallel-sided; total length 3.03–3.73, length apex clypeus–cuneal fracture 2.39–2.64, width across pronotum 1.01–1.06. COLORATION (fig. 6): General coloration, including venter and appendages, pale, greenish; membrane pale to weakly fumose; veins of membrane pale; antennae black except for pale apical annulus on segment 1 (fig. 15); apex of labium infuscate; femora with some dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, moderately shining. Vestiture of dorsum composed primarily of recumbent, pale, simple setae with dark setae on lateral margins of pronotum and basal costal margin of hemelytra. STRUCTURE: Body flattened, moderately broad; eyes large, bulging, vertex narrow, occupying about one-third width of head; frons nearly straight across in dorsal view, clypeus not visible from above; anteocular distance 0.3 times diameter of antennal segment 1; head projecting below level of eye by 0.6 times diameter of antennal segment 1; labium reaching to apex of middle coxae. GENITALIA (fig. 21): Vesica sigmoid, appearing strongly twisted, base falling well below level of secondary gonopore; anterior spine somewhat contorted, much shorter and somewhat broader than posterior, both spines twisted and strongly angled relative to body of vesica.

Female: Elongate ovoid, eyes much smaller and vertex relatively broader than in male. Total length 3.53, length apex clypeus–cuneal fracture 2.42, width across pronotum 1.08.

HOST: *Betula nigra* (Betulaceae).

DISTRIBUTION: Known from Pennsylvania south to Georgia and west to Iowa and Missouri.

DISCUSSION: Sexual dimorphism in the head is much more pronounced in this species than in most *Plagiognathus* spp. The eyes in the male are very large and protuberant, with the vertex being relatively narrow. By contrast, the eyes in the female are smaller, not protuberant, and the vertex is relatively broader. Although there is no evidence that *atricornis* is not a native species, the vesica shows its greatest similarity to that of *chrysanthemi.*

SPECIMENS EXAMINED: USA.—**Georgia:** *Clarke Co.:* Athens, June 26, 1955, R. Davis, 1♂ (PDA). **Iowa:** *Lee Co.:* Donnellson, September 3, 1927, H. G. Johnston, 2♂ (USNM). *Monroe Co.:* Albia, July 15, 1927, Harris and Johnston, 1♀ (USNM). **Maryland:** *Prince Georges Co.:* Bladensburg, July 23, 1890, P. R. Uhler, 1♀ (USNM). **Missouri:** *Newton Co.:* Neosho, June 22, 1943, R. C. Froeschner, 1♂ (USNM). **Pennsylvania:** *Dauphin Co.:* Harrisburg, near Rockville, July 16, 1979, T. J. Henry, *Betula nigra* (Betulaceae), 3♂ (PDA). *Snyder Co.:* Pt. Trevorton, July 26, 1918, J. G. Sanders, 2♀ (USNM); holotype male (USNM). **West Virginia:** *Braxton Co.:* Burnsville exit, Rt 79 along Little Kanawha River, June 23, 1979, A. G. Wheeler, Jr., *Betula nigra* (Betulaceae), 2♂ (PDA).

Plagiognathus blatchleyi Reuter
Figures 6, 15, 21

Plagiognathus blatchleyi Reuter, 1912: 61 (n. sp.).
Plagiognathus blatchleyi nubilis Knight, 1923: 444 (n. var.).

DIAGNOSIS: Recognized by the relatively *large* size, *heavy bodied* appearance, *pale background coloration* of the dorsum, *posterior lobe of the pronotum almost uniformly brown* and anterior lobe pale or greenish (fig. 6), and the *black antennae.* Sometimes dorsum almost entirely orange. Similar in coloration, size, and body form to pale color phase of *politus* (fig. 11), but anterior lobe of pronotum and cuneus usually mostly dark in *politus* whereas these areas usually, although not always, pale in *blatchleyi. Plagiognathus blatchleyi* and *politus* unequivocally distinguished by the form of the male genitalia, the flange of the vesica being serrate distally in *politus* (fig. 31) and smooth in *blatchleyi* (fig. 21).

REDESCRIPTION: *Male:* Large, heavy bodied; total length 3.76–4.44, length apex clypeus–cuneal fracture 2.54–3.02, width across pronotum 1.13–1.40. COLORATION (fig. 6): General coloration pale, yellowish to faintly greenish; posterior lobe of pronotum, posterior two-thirds of clavus, and posterior one-third of corium usually brown, the pronotum most consistently so; clypeus at least partially castaneous, polished, and contrasting with remainder of head; membrane variably fumose, veins pale and at least weakly contrasting with membrane coloration; antennae black (fig. 15) except for pale apical annulus on segment 1, basal tapered portion of segment 1 highly polished and shining in contrast to dull remainder; labium weakly infuscate over much of length; femora usually pale as much of body, sometimes partially dark, always with some small dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at femoral articulation; prosternum and sometimes genital capsule largely brown to dark brown. SURFACE AND VESTITURE: Dorsum smooth, weakly shining. Vestiture of pronotum composed of reclining, golden, shining, simple setae, with some dark setae along anterior and lateral margins, hemelytra with recumbent, golden, shining, simple setae. STRUCTURE: Body relatively heavy, broad, and deep; pronotum steeply declining anteriorly; head transverse, short, not projecting anteriorly, clypeus at most barely visible from above; anteocular distance 0.3 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium long, reaching to apex of hind coxae or slightly beyond. GENITALIA (fig. 21): Vesica relatively short and stout, body broad; apical spines angled relative to body of vesica, anterior more strongly than posterior; flange broad, terminating past midpoint of secondary gonopore.

Female: Coloration as in male; body more strongly ovoid. Total length 4.01–4.33, length apex clypeus–cuneal fracture 2.79–3.07, width across pronotum 1.35–1.54.

HOSTS: *Ambrosia trifida, Verbesina alternifolia* (Asteraceae).

DISTRIBUTION: Recorded from Ontario west to Manitoba and Colorado, south to Texas, and east to Virginia.

DISCUSSION: Reuter (1912) described *blatchleyi* on the basis of material collected at Hamburg, New York, by E. P. Van Duzee. He apparently saw both male and female specimens, inasmuch as he provided measurements for both sexes. His description was not rendered in sufficient detail to allow unequivocal recognition of the species. I have not seen any specimens that appear to have been examined by Reuter. Therefore, my treatment of synonymy for this taxon is based on what I believe to be authoritative identifications and the examination of material used by Knight (1923) in preparing his description of *nubilis.* Knight (1923) did not indicate if he actually saw Reuter's material. He recorded *nubilis* as occurring only in New York. I would judge that his description of *blatchleyi* was not simply translated from that of Reuter, because it is not identical to Reuter's, nor are his measurements identical to those of Reuter.

I examined two specimens deposited in the United States National Museum of Natural History, the female specimen of which bears the handwritten label (of Uhler?): ''*Macrotylus blatchleii* Uhl., Ind''. The male bears the labels ''26'' and ''PR Uhler Collection'', and ''*Plagiognathus blatchleyi* Reuter, det H.

H. Knight''. The male genitalia are those of *Plagiognathus rosicola* Knight.

I have concluded from the above-cited information that the potential exists for confusion regarding the identity of *Plagiognathus blatchleyi.* As noted in the diagnosis, *blatchelyi* (as here conceived) can easily be confused with *politus.* To make matters more complicated, the two species can apparently be found feeding on the same host at the same time, as suggested by a long series of specimens collected by H. H. Knight on *Ambrosia trifida* (Asteraceae) at St. Paul, Minnesota, on September 3, 1923, which contained large numbers of both sexes of both *blatchleyi* and *politus.* Until contradictory information comes to light, however, I have accepted Knight's (1923) conclusions concerning the identity of *blatchleyi* and his conclusion that *nubilis* is only a color variant of the taxon examined by Reuter.

SPECIMENS EXAMINED: CANADA.—**Manitoba:** Morris, August 15, 1953, A. R. Brooks, 5♂, 3♀ (CNC). Winnipeg, August 14, 1953, A. and J. Brooks, *Ambrosia trifida* (Asteraceae), 16♂, 32♀ (CNC). **Ontario:** Ojibway, August 30, 1961, J. Brumpton, 2♂, 2♀ (CNC). Rainy River, August 3, 1960, Kelton and Whitney, *Ambrosia* sp. (Asteraceae), 4♂, 9♀ (CNC). USA.—**Colorado:** *Larimer Co.:* Fort Collins, August 13, 1898, 1♂ (USNM). Fort Collins, July 16, 1900, E. P. Van Duzee, 2♂, 2♀ (CAS). **Connecticut:** 4.5 mi S of Salisbury, Mt. Riga State Park, July 25, 1970, J. Slater and J. Harrington, 2♀ (AMNH). Cheshire, June 20, 1959, J. A. Slater, 1♀ (AMNH). Storrs, July 7, 1956, R. M. Baranowski, 1♀ (AMNH). **Illinois:** *McHenry Co.:* Chemung, August 13, 1937, Ross and Burks, 1♀ (USNM). *Vermilion Co.:* Oakwood, October 6, 1930, Frison, *Ambrosia* sp. (Asteraceae), 1♂, 1♀ (AMNH). **Indiana:** *Howard Co.:* NW Howard County, August 16, 1983–August 17, 1985, D. A. Rider, 11♂, 4♀ (DAR). NW Howard County, August 17, 1985, D. A. Rider, 2♂, 1♀ (LSU). **Iowa:** *Story Co.:* Ames, July 5, 1942, 1♂, 1♀ (USNM). Ames, September 1, 1967, H. H. Knight, 4♂, 6♀ (USNM). **Maryland:** *Unknown Co.:* Cabin Junction Bridge, October 20, 1901, 1♀ (USNM). **Massachusetts:** *Essex Co.:* Beach Bluff, August 31, 1914, H. M. Parshley, paratype (*nubilis*): 1♂ (USNM). *Hampshire Co.:* Northampton, August 13, 1918, H. M. Parshley, 1♂ (CAS). **Minnesota:** *Ramsey Co.:* St. Paul, September 3, 1923, H. H. Knight, *Ambrosia trifida* (Asteraceae), 28♂, 40♀ (USNM). St. Paul, September 5, 1923, H. H. Knight, *Ambrosia trifida* (Asteraceae), 1♂ (CNC). **Missouri:** *Lacleade Co.:* Sleeper, September 19, 1942, E. H. Froeschner, 1♀ (USNM). *St. Louis Co.:* Webster Groves, September 25, 1925, Scatterthwait, 1♂ (USNM). *Unknown Co.:* Kimmswich, September 17, 1944, R. C. Froeschner, 1♀ (AMNH). **New Jersey:** *Gloucester Co.:* Westville, September 1, 1925, J. C. Lutz, 1♂ (USNM). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 1♀ (AMNH). *Cattaraugus Co.:* Ashford, July 22, 1946, L. D. Beamer, 1♂ (KU). *Erie Co.:* Elma, August 25, 1912, E. P. Van Duzee, 1♂, 1♀ (CAS). Hamburg, June 28, 1896, E. P. Van Duzee, 1♀ (CAS). Lancaster, August 1, 1886, E. P. Van Duzee, 1♂, 1♀ (USNM). *Genesee Co.:* Batavia, July 31, 1915, H. H. Knight, 1♀ (USNM). *Tompkins Co.:* Ithaca, July 1, 1915, H. H. Knight, 1♀ (USNM). Ithaca, July 1, 1915, H. H. Knight, holotype male (*nubilis*) (USNM). Ithaca, July 25, 1945, R. H. Beamer, 1♀ (KU). Ithaca, July 26, 1916, H. H. Knight, 3♂, 3♀ (USNM). *Westchester Co.:* White Plains, September 5, 1920, J. R. Torre-Bueno, 1♀ (USNM). **North Dakota:** *Traill Co.:* No specific locality, August 14, 1923, A. A. Nichol, 1♀ (USNM). No specific locality, July 19, 1933–August 9, 1927, A. A. Nichol, 9♂, 4♀ (USNM). **Ohio:** *Clark Co.:* Springfield, August 24, 1916, W. S. Adkins, paratypes (*nubilis*): 2♂ (USNM). *Franklin Co.:* Columbus, June 20, 1905, E. P. Van Duzee, 2♂, 2♀ (CAS). *Gallia Co.:* Grove City, August 23, 1915, C. J. Drake, paratype (*nubilis*): 1♂ (USNM). *Meigs Co.:* Apple Grove, August 17, 1915, C. J. Drake, paratype (*nubilis*): 1♂ (USNM). **Pennsylvania:** *Westmoreland Co.:* Greensberg, September 4, 1905, 3♂, 3♀ (PDA). **Tennessee:** *Anderson Co.:* Clinton, August 21, 1916, W. S. Adkins, 1♂ (USNM). **Texas:** *Bexar Co.:* Lackland Air Force Base, October 17, 1983, T. Lockley, *Ambrosia trifida* (Asteraceae), 1♂ (USNM). *Brazos Co.:* College Station, November 7, 1979, W. C. Dickson, 1♂, 1♀ (TAMU). College Station,

October 13, 1975, R. R. Murray, 1♂ (TAMU). College Station, October 3, 1928, S. E. Jones, 1♂, 1♀ (TAMU). College Station, September 30, 1933, H. G. Johnston, 2♂, 8♀ (TAMU). **Virginia:** *Fairfax Co.:* Great Falls, August 10, 1906, 1♀ (USNM). Great Falls, August 10, 1906, 1♀ (USNM). **Washington, D.C.:** 1♀ (CAS). No specific locality, September 5, 1910, 1♀ (USNM). **West Virginia:** *Pendleton Co.:* mouth of Seneca River, south branch of Potomac River, 1300 ft, July 27, 1977, N. L. Herman, 10♂, 9♀ (AMNH). *Pocahontus Co.:* Rt 219 N of Slatyfork, August 15, 1982, *Verbesina alternifolia* (Asteraceae), 2♂, 3♀ (PDA).

Plagiognathus brevirostris Knight
Figures 6, 15, 21

Plagiognathus brevirostris Knight, 1923: 441 (n. sp.).
Plagiognathus nigritus Knight, 1923: 441 (n. sp.). NEW SYNONYMY.
Plagiognathus intrusus Knight, 1926: 12 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Recognized by the large, *heavy body* (fig. 6), moderately shaggy vestiture, entirely black antennae, and the *labium relatively short and not attaining the middle trochanters.* Pattern of coloration of *obscurus* type, with base of corium pale and all or most of cuneus usually pale (fig. 6); rarely entire dorsum dark. Most similar in appearance to *flavoscutellatus,* being large and heavy bodied, but labium somewhat shorter than in *flavoscutellatus,* never reaching to middle trochanters, scutellum never pale medially (although occasionally pale laterally), and femora always dark, rather than being pale with dark spots.

REDESCRIPTION: *Male:* Elongate, heavy bodied, large; total length 3.87–4.68, length apex clypeus–cuneal fracture 2.89–3.18, width across pronotum 1.16–1.43. COLORATION (fig. 6): Background coloration of dorsum castaneous; corium pale on basal one-third, the posterior margin of this area nearly straight and perpendicular to costal margin; costal vein usually pale, sometimes dark; cuneus usually entirely pale, although sometimes only anterior one-half pale, pale area usually with a distinct orange cast; corium narrowly pale adjacent to extreme base of membrane; rarely entire dorsum castaneous to nearly black; membrane fumose, veins pale; all antennal segments black (fig. 15) except for pale, narrow, apical annulus on segment 1; labium entirely castaneous; venter entirely castaneous, including metathoracic scent-gland evaporatory area; coxae and femora mostly castaneous, femora with a narrow pale apical area; tibiae pale, spines with dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Face at and below level of antennal insertion more highly polished than remainder of body surface. Vestiture of dorsum composed of relatively long, golden, shining, simple setae with a somewhat shaggy appearance. STRUCTURE: Body appearing more or less parallel-sided, lateral corial margins nearly straight; frons weakly convex, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium not quite reaching middle trochanters. GENITALIA (fig. 21): Body of vesica only moderately stout, broadly curving, very broadly J-shaped, base of vesica falling well below level of secondary gonopore, posterior apical spine nearly straight and erect relative to body of vesica, anterior spine largely superposed over posterior, distinctly longer than it, and rather strongly angled near apex in lateral view; flange very narrow, not extending beyond strap, terminating slightly below base of secondary gonopore.

Female: Body shorter, broader, and much more strongly ovoid than in male (fig. 6). Scutellum sometimes pale laterally, leaving a dark, median, longitudinal stripe; hemelytra usually more extensively pale than in male, the posterior margin of the pale anterior portion of corium angled toward apex of clavus (fig. 6). Total length 3.80–4.53, length apex clypeus–cuneal fracture 2.65–3.33, width across pronotum 1.32–1.42.

HOSTS: Among specimens examined, documented breeding hosts appear to be *Thalictrum* spp. (Ranunculaceae), a conclusion supported by the work of Wheeler et al. (1983). The records from *Lathyrus* (Fabaceae) and *Rhododendron maximum* (Erica-

ceae) may or may not represent breeding hosts.

DISTRIBUTION: Known from Newfoundland west to British Columbia and south to Colorado, Illinois, and West Virginia.

DISCUSSION: Under Knight's conception of *brevirostris,* the species always had some pale areas on the hemelytra, and the cuneus was always entirely pale, usually orange. It appears, however, that although those attributes hold for most specimens, in some populations specimens may be almost entirely dark. The number of such specimens is limited, and Knight appears to have described them as new on at least two separate occasions.

Knight (1923) described the species *brevirostris* and *nigritus* on the same page, in that order. He noted that both could be distinguished from other *Plagiognathus* species by the short labium, which did not attain the hind margin of the middle coxae; Knight distinguished them from one another on the basis of coloration. As the name suggests, *nigritus* is mostly black, whereas *brevirostris* has the anterior portion of the corium pale and the cuneus entirely orange in most specimens. The holotype and only known specimen of *nigritus,* from Thompson, Connecticut, is deposited in the National Museum of Natural History, Washington, D.C. It is completely devoid of vestiture and is almost completely covered with glue or grease. As a consequence, characteristics in addition to the labium, important for distinguishing taxa, are not available. The labium is short, as in *brevirostris.* The vesica, which is protruding from the phallotheca of the holotype, clearly indicates that the specimen represents a *Plagiognathus* species and conforms with the structure seen in dissected specimens of *brevirostris.*

Knight (1926) described the species *intrusus* on the basis of four specimens from Cranberry Lake and McLean, localities in upstate New York. I have examined the holotype male and a female paratype of this nominal taxon which is within the size range of *brevirostris.* The labium is relatively short, reaching to the posterior margin of the prosternum. The vestiture of the dorsum is very similar to that of what can be construed as typical *brevirostris,* i.e., shaggy in appearance.

I have examined two additional dark specimens with a short labium from Ft. Collins, Colorado. The male genitalia are very similar, if not identical, to those of specimens from the northeastern United States that conform to Knight's conception of *brevirostris.* On the basis of these observations, I am treating *intrusus* and *nigritus* as junior synonyms of *brevirostris.*

SPECIMENS EXAMINED: CANADA.—**British Columbia:** Smithers, July 5, 1924, E. R. Buckell, 1♂ (USNM). **Manitoba:** 30 mi N of Roblin, July 14, 1954, Brooks and Wallis, *Lathyrus* sp. (Fabaceae), 1♂, 1♀ (CNC). 5 mi NE of Rt. 59 off of Rt 209, July 7, 1990, M. D. Schwartz, 1♂ (CNC). **Newfoundland:** Badger, July 31, 1980, L. A. Kelton, 21♂, 24♀ (CNC). Spruce Brook, 1♀ (USNM). Spruce Brook, August 8, 1912, 2♂, 3♀ (AMNH); 1♀ (CAS). **Ontario:** Marmora, July 10, 1952, J. R. Vockeroth, 4♂, 2♀ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 3♀ (CNC). Simcoe, July 20, 1915, H. G. Crawford, 1♂ (USNM). Sundridge, July 13, 1961, G. Brumpton, 1♂ (CNC). **Quebec:** Cap Rouge, July 10, 1953, O. Peck, 2♂ (CNC). Knowlton, July 9, 1927, G. S. Walley, 1♀ (CNC). Lac Megantic, August 3, 1961, G. Brumpton, 1♀ (CNC). Ladysmith, August 6, 1931, G. S. Walley, 1♀ (CNC). Laniel, July 10, 1963, L. A. Kelton, 1♂ (CNC). Magog, August 2, 1961, G. Brumpton, 1♂, 1♀ (CNC). Val David, Lac Paquin, April 30, 1999, M. D. Schwartz, 2♂, 1♀ (CNC). *Kamouraska Co.:* Parke Reserve, August 15, 1951, W. R. M. Mason, 1♂ (CNC). Parke Reserve, July 9, 1957–July 21, 1957, G. E. Shewell, *Rhododendron maximum* (Ericaceae), 8♂, 2♀ (CNC). **Saskatchewan:** Christopher Lake, July 13, 1959, A. and J. Brooks, 1♀ (CNC). USA.—**Colorado:** *Larimer Co.:* Fort Collins, August 13, 1898, 1♂ (USNM). Fort Collins, July 13, 1900, E. P. Van Duzee, 2♂ (CAS). **Connecticut:** Litchfield, July 22, 1920, P. Garman, paratype: 1♂ (USNM). Storrs, July 16, 1954, J. A. Slater, 1♂, 2♀ (AMNH). Thompson, July 11, 1905, H. L. Viereck, holotype male (*nigritus*) (USNM). **Illinois:** *Boone Co.:* Belvidere, June 27, 1955, J. A. Slater, 1♀ (AMNH). *Lake Co.:* Antioch, July 10,

1933, Mohr and Townsend, 1♂, 1♀ (USNM). Antioch, July 5, 1932, Frison et al., 2♂ (USNM). **Maine:** *Hancock Co.:* Mount Desert Island, July 28, 1926, 1♂ (AMNH). *Washington Co.:* Machias, July 22, 1909, paratypes: 2♂ (CAS, USNM). **Michigan:** *Cheboygan Co.:* Douglas Lake, July 12, 1927, H. B. Hungerford, 1♂, 1♀ (KU). *Clare Co.:* No specific locality, June 27, 1959, R. R. Dreisbach, 1♀ (USNM). *Midland Co.:* No specific locality, R. R. Dreisbach, 1♀ (USNM). *Ontonogon Co.:* No specific locality, June 28, 1955, R. B. Dreisbach, 1♂ (USNM). *Washtenaw Co.:* Fleming Creek, June 28, 1920, R. F. Hussey, paratype: 1♂ (USNM). **New Hampshire:** *Coos Co.:* Glen House, July 15, 1915, paratypes: 1♂, 1♀ (USNM). **New Mexico:** *Otero Co.:* 2 mi E of Cloudcroft, August 18, 1979, Schaffner, Delorme, McHugh, 1♀ (TAMU). 4 mi E of Cloudcroft, July 17, 1979–August 18, 1979, Delorme, McHugh, Schaffner, 34♂, 60♀ (TAMU). **New York:** *Orange Co.:* Fort Montgomery, July 12, 1914, F. M. Schott, 1♂ (AMNH). Pine Island, September 8, 1910, 1♂ (AMNH). *Tompkins Co.:* Ithaca, July 1, 1920, H. H. Knight, holotype male (USNM). Ithaca, July 1, 1920, H. H. Knight, paratypes: 1♂, 2♀ (USNM). Ludlowville, Salmon Creek, July 8, 1979, A. G. Wheeler, Jr., *Thalictrum* sp. (Ranunculaceae), 1♂, 3♀ (PDA). *Ulster Co.:* Cranberry Lake, July 31, 1920, C. J. Drake, holotype male (*intrusus*) (USNM). **Pennsylvania:** *Bradford Co.:* Troy, July 12, 1985, A. G. Wheeler, Jr., *Thalictrum* sp. (Ranunculaceae), 4♀ (PDA). *Schuykill Co.:* 2 mi W of Tamaqua on Rt 208, July 18, 1985, A. G. Wheeler, Jr., *Thalictrum* sp. (Ranunculaceae), 1♀ (PDA). *Susquehanna Co.:* 3.9 mi NE of Ararat on Rt 171, June 28, 1985, A. G. Wheeler, Jr., *Thalictrum polygamum* (Ranunculaceae), 3♂, 3♀ (PDA). **Vermont:** *Windsor Co.:* Norwich, July 8, 1908, 1♀ (CAS). **West Virginia:** *Tucker Co.:* Rt 32, Canaan Road at Blackwater River, June 26, 1977, A. G. Wheeler, Jr., *Thalictrum* sp. (Ranunculaceae), 5♂, 7♀ (PDA).

Plagiognathus brunneus (Provancher)
Figures 2, 6, 15, 22

Lygus brunneus Provancher, 1872: 104 (n. sp.; treated as syn. of *Plagiognathus obscurus* Uhler by Kelton, 1968: 1073).

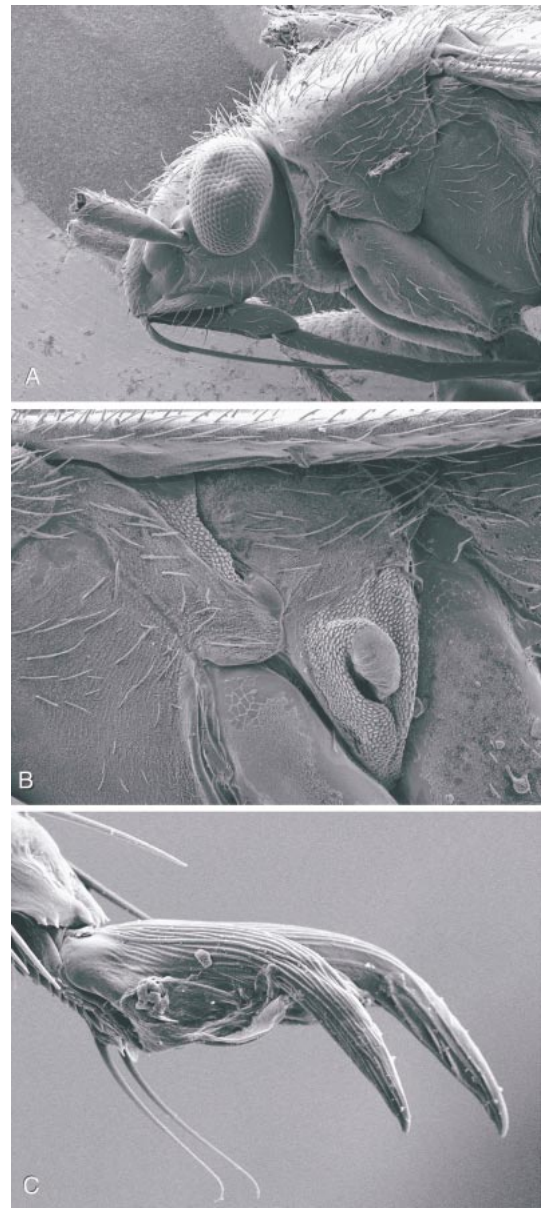

Fig. 2. *Plagiognathus brunneus*, male, scanning micrographs. **A.** Lateral view of head. **B.** Metathoracic spiracle and metathoracic scent-gland evaporatory area. **C.** Pretarsus.

Plagiognathus fraternus Uhler, 1895: 51 (n. sp.; treated as syn. of *Plagiognathus obscurus* Uhler by Knight, 1941: 33). REVISED SYNONYMY.

Plagiognathus medicagus Arrand, 1958: 498 (n. sp.). NEW SYNONYMY.

Plagiognathus fuscotibialis Knight 1964: 143 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Pattern of coloration of *obscurus* type, *base of corium pale and all or most of cuneus usually pale with a white cast* (fig. 6: *brunneus* 2); less commonly entire dorsum dark (fig. 6: *brunneus* 1). Distinguished from *obscurus* by *silvery, slightly woolly appearance of dorsal vestiture* and pale anterior area of corium often not extending posteriorly along clavus in males as commonly seen in *obscurus*. Unequivocally distinguished from *obscurus* only by form of vesica, in *brunneus body of vesica only moderately stout, broadly curving, and with base of vesica falling slightly below base of gonopore* (fig. 22); in *obscurus* body of vesica much stouter and more strongly curved with base of vesica falling above level of base of gonopore (fig. 29). Furthermore, flange broader—and broader over a greater length—in *obscurus* than in *brunneus* (see also Discussion below).

REDESCRIPTION: *Male:* Elongate ovoid, relatively stout-bodied, moderately large; total length 3.93–4.49, length apex clypeus–cuneal fracture 2.66–3.11, width across pronotum 1.22–1.29. COLORATION (fig. 6): Background coloration of dorsum blackish to castaneous, sometimes entirely so, more commonly with some pale areas, these being distinctly whitish; corium often pale on basal one-third, the posterior margin of this area usually jagged and more or less perpendicular to costal margin, although less commonly nearly straight and slanting posteriorly to form an acute angle with clavus; costal vein dark to weakly pale; cuneus usually pale on basal one-third to one-half, occasionally more narrowly; corium narrowly pale at extreme base of membrane; pronotum and scutellum apparently always entirely dark; posterior margin of vertex pale; membrane largely fumose, veins pale, membrane pale between posterior margin of small cell and posteromesal margin of cuneus; all antennal segments castaneous to black (fig. 15), segment 1 with a pale apical annulus, segments 3 and 4 sometimes appearing only weakly infuscate; labium entirely castaneous; venter entirely castaneous, including metathoracic scent-gland evaporatory area; coxae and trochanters largely pale in specimens with pale areas on dorsum, femora pale at least basally, moderately to heavily infuscate distally with some darker spots; tibiae with pale background coloration in lighter colored specimens, infuscate in specimens with completely dark dorsum; dorsal tibial spines with dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to very weakly shining. Face at and below level of antennal insertion more highly polished than remainder of body surface. Vestiture of dorsum composed of weakly woolly, shining, silvery setae. STRUCTURE: Elongate ovoid, relatively stout, lateral corial margins obviously convex; frons weakly convex, clypeus barely visible from above; anteocular distance 1.5 times diameter of antennal segment 1 (fig. 2A); head projecting below eye by diameter of antennal segment 1 (fig. 2A); labium reaching to at least apex of middle coxae or slightly beyond; metathoracic scent-gland evaporatory area and spiracle as in figure 2B. Pretarsus as in figure 2C. GENITALIA (fig. 22): Body of vesica moderately stout, broadly curving, very broadly J-shaped, base of vesica falling somewhat below level of secondary gonopore; posterior apical spine long, weakly curving, and erect relative to body of vesica, anterior spine partially superposed over posterior, slightly longer than it, and angled near apex in lateral view; flange moderately broad, curving, extending to near midpoint of secondary gonopore.

Female: Body slightly shorter, broader, and more strongly ovoid than in male; pale areas of hemelytra slightly more extensive than in male, posterior margin of pale anterior portion of corium often more strongly angled toward apex of clavus. Total length 4.01–4.28, length apex clypeus–cuneal fracture 2.81–3.06, width across pronotum 1.20–1.32.

HOSTS: Known to occur on a variety of plant groups, but most frequently found breeding on the Fabaceae and Rosaceae.

DISTRIBUTION: Widely distributed across northern North America, from Quebec and the Northwest Territory in the east to Alaska in the west, south to northern Arizona and New Mexico in the west and to Pennsylvania and West Virginia in the east.

DISCUSSION: The distributions of *brunneus*, and the very similar appearing *obscurus*,

overlap broadly between approximately 43° and 50° north latitude and in some lower latitude areas, primarily in the montane West. It is in these areas of distributional overlap that the greatest difficulty will be encountered in providing accurate identifications. Where host information is available, this may be helpful.

Provancher (1872) described *Lygus brunneus* from Quebec. This taxon was synonymized with *obscurus* Uhler by Kelton (1968). Comparison of the male genitalia in *brunneus* and *obscurus* (as conceived in the present paper) indicates that the two names apply to different taxa. The vesicae are clearly distinct, with that of *brunneus* differing from *obscurus* by having a much narrower flange, not being so stout, and being less strongly curved, with the base not curving up to the height of the secondary gonopore (fig. 22). Contrary to Kelton, I am therefore treating *brunneus* as a valid taxon.

Knight (1941) synonymized *Plagiognathus fraternus* Uhler with *obscurus.* Comparison of the male genitalia of the lectotype of *Lygus brunneus* Provancher from ''Quebec'' (deposited in the Laval Museum, Quebec; see Kelton, 1968) with those *fraternus* specimens from Steamboat Springs, Colorado, on which Uhler based his original description indicates that the two taxa are synonymous. Further comparison of *brunneus* with topotypic paratypes of *Plagiognathus medicagus* Arrand (1958) indicates that these two taxa are the same. Thus, on the basis of priority, both *fraternus* and *medicagus* are junior synonyms of *brunneus.*

To ensure taxonomic stability among these difficult-to-distinguish taxa, I have designated one of Uhler's specimens from the National Museum of Natural History, Washington, D.C., as the lectotype of *fraternus.* It bears the following labels:

> ''Colo., 1341'', ''1341, USA: Colorado, Steamboat Springs, July, C. F. Baker coll.'', ''Lectotype *Plagiognathus fraternus* Uhler, det R. T. Schuh''

Knight (1964) described *Plagiognathus fuscotibialis* from Wyoming. He compared it only with *Plagiognathus laricicola* Knight. Comparison of Knight's *fuscotibialis* holotype and paratypes with the specimens cited above as representing *brunneus*—as well as with a substantial amount of other material—indicates that these two nominal taxa are apparently the same. Contrary to the assertions of Arrand (1958) about the stability of the pattern of coloration in *medicagus,* it appears that some populations of this species (here named *brunneus*) have very little in the way of pale areas on the dorsum, and that the tibiae may be dark, irrespective of the coloration of the dorsum. Although Knight recorded no hosts for *fuscotibialis,* I have examined large numbers of specimens from Wyoming collected on *Lupinus,* suggesting a possible host affinity with members of the Fabaceae, as is also evident in Arrand's use of the name *medicagus.* On the basis of these arguments, I am treating *fuscotibialis* also as a junior synonym of *brunneus* (see also discussion under *lineatus* Van Duzee).

I have examined specimens from Alaska and northern British Columbia that I have assigned to this species, even though they are not ''typical'' of most populations seen at lower latitudes; the main differences are that the pattern of pigmentation on the hemelytra is usually more diffuse, and none of the specimens is completely black, as is quite often seen in more southern populations. These specimens might also be assignable to *lineatus,* as I have seen ''typical'' *lineatus* specimens from Alaska and the Yukon. These two nominal taxa have vesicae that are very similar in form and they are therefore difficult to separate on that basis alone.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Little Smokey River, 6 mi S of Guy, August 4, 1965, J. and W. Ivie, 1♀ (AMNH). Nordegg, July 31, 1921, J. McDunnough, 1♀ (USNM). Wild Hay River at Hwy 40, August 29, 1975, D. D. Wilder, 1♂, 4♀ (CAS). **British Columbia:** 10 mi N of Kitimat, July 15, 1979, G. G. E. Scudder, 1♂, 1♀ (CNC). 159 km S of Dease Lake, Cassiar Hwy, July 22, 1983, G. G. E. Scudder, 1♂ (UBC). 2 km S of Toad River, August 1, 1982, G. G. E. Scudder, 1♂ (UBC). 7 mi S of Nelson, August 6, 1969, Oman, 2♂, 1♀ (OSU). Alaska Hwy, km 1204, July 30, 1982, G. G. E. Scudder, 1♀ (UBC). Bella Coola, July 17, 1978, G. G. E. Scudder, 1♂, 1♀ (UBC). Cache Creek, 450–500m, June 1, 1978, N. L. H. Krauss, 2♂ (AMNH). Cormier Creek, July 29, 1979, G. G. E. Scudder, 1♂ (UBC).

Courtenay, Vancouver Island, 0–50m, June 1, 1978, N. L. H. Krauss, 1♂, 2♀ (AMNH). Cranbrook, 900–1000m, June 1, 1978, N. Krauss, 2♂ (AMNH). E Osoyoos, June 5, 1961, G. G. E. Scudder, 1♂ (UBC). Echo Lake, July 30, 1979, G. G. E. Scudder, 1♀ (UBC). Grand Forks, June 1, 1993, G. G. E. Scudder, 1♂ (UBC). Kinaskan Lake, July 22, 1983, G. G. E. Scudder, 1♂ (UBC). Kitimat, July 15, 1979, G. G. E. Scudder, 1♀ (UBC). Merritt, August 3, 1931, J. Nottingham, 2♀ (KU). Merritt, August 3, 1931, R. H. Beamer, 1♀ (KU). Mt. Cheam, August 16, 2000, D. J. M. Quiring, 1♂ (UBC). Oliver, May 16, 1956, N. H. Anderson, 1♂ (UBC). Prince George, 560–600m, July 1, 1974, N. L. H. Krauss, 2♀ (AMNH). Prophet River Prov. Campground, Alaska Hwy, DC 221, August 13, 1978, P. H. Arnaud, Jr., 1♀ (CAS). Rock Creek, July 8, 1957, J. Arrand, 1♂ (UBC). Rogers Pass, Selkirk Mts., July 1, 1908, J. C. Bradley, 1♂, 1♀ (CAS). Salmon River, Glenemma, July 15, 1949, H. B. Leech, 1♀ (CAS). Shuswap Lake, July 30, 1940, R. L. Usinger, 1♀ (UCB). Smithers, 450–500 m, June 22, 1978, N. L. H. Krauss, 2♂, 1♀ (AMNH). Spuzzum, June 21, 1962, E. Ball, Jr., 2♂, 1♀ (CAS). **Manitoba:** Deepdale Man., August 1, 1937, R. H. Beamer, 1♀ (KU). **Northwest Territories:** Aklavik, July 16, 1931, Bryant, 1♀ (CAS). Mackenzie, Hay River (town), August 8, 1965, J. and W. Ivie, 2♂, 5♀ (AMNH). Yellowknife, August 1, 1970, N. L. H. Krauss, 2♂ (USNM). **Ontario:** 15 mi NW of Ignace, July 25, 1965, J. and W. Ivie, 1♀ (AMNH). 2 mi N of Dryden, July 25, 1965, J. and W. Ivie, 1♂ (AMNH). Kearney, July 28, 1911, E. P. Van Duzee, 1♂ (CAS). Presque Isle Prov. Pk., August 14, 1991, M. D. Schwartz, *Solidago* sp. (Asteraceae), 5♂, 8♀ (CNC). **Quebec:** Cascapedia R. Gaspe, 30 mi N of New Richmond, August 1, 1983, W. Middlekauff, 3♀ (CAS). La Trappe, August 30, 1934, J. Ouellet, 1♀ (TAMU). No specific locality, July 22, 1900, 1♂, 1♀ (CAS). Quinze Lake, August 18, 1907, W. J. Palmer, 1♂, 3♀ (CAS). **Saskatchewan:** Gorrick, July 26, 1956, J. C. Arrand, paratypes (*medicagus*): 3♂ (CNC). **Yukon Territory:** 10 km E of Dawson, July 16, 1983, G. G. E. Scudder, 1♂ (UBC). 7 km E of Rancheria, August 5, 1981, C. S. Guppy, 1♂ (UBC). Carcross, July 29, 1982, G. G. E. Scudder, 1♀ (UBC). Haines Junction, July 19, 1981, C. S. Guppy, 1♂ (UBC). Kluane Lake, mile 1054 on Alaska Hwy, July 20, 1979, G. G. E. Scudder, 1♂ (UBC). Kluane Natl. Park, Slims River flats, July 21, 1979, G. G. E. Scudder, 1♂ (UBC). Kluane, July 4, 1979, S. C. Cannings, 1♂ (UBC). Pine Lake, km 1626 on Alaska Hwy, July 9, 1983, G. G. E. Scudder, 1♂ (UBC). S Canol Road, km 218, Lapie Creek, July 19, 1983, G. G. E. Scudder, 1♂ (UBC). Silver City, July 23, 1979, G. G. E. Scudder, 1♂, 1♀ (UBC). Strawberry Creek, August 6, 1981, C. S. Guppy, Tom Creek, August 4, 1981, C. S. Guppy, 1♂ (UBC). Watson Lake, July 29, 1979, G. G. E. Scudder, 1♀ (UBC). USA.— **Alaska:** 14 mi S of Circle City, July 18, 1948, C. O. Esselbaugh, 2♂, 2♀ (USNM). 20 mi W of Chitina, July 11, 1948, R. I. Sailer, 3♂, 3♀ (USNM). 3 mi S of Tok, July 14, 1948, R. I. Sailer, 1♂ (USNM). Anchorage roadside, July 21, 1977, J. T. Mundahl, 1♂ (AMNH). Anchorage, August 3, 1958, Lindroth, 2♀ (USNM). Anchorage, August 8, 1954, R. G. Hunt, 1♀ (KU). Anchorage, Fish Creek Flats, July 16, 1948, F. S. Blanton, 14♂, 12♀ (USNM). Anchorage, July 16, 1948, F. S. Blanton, 5♂, 5♀ (USNM). Big Delta, July 16, 1948, R. I. Sailer, 3♂, 3♀ (USNM). Big Delta, July 17, 1954, R. Coleman, 1♂, 1♀ (USNM). Circle, July 18, 1948, R. I. Sailer, 1♂, 1♀ (USNM). Copper Center, July 23, 1948, F. S. Blanton, *Aster* or *Achillea* (Asteraceae), 10♂, 10♀ (USNM). Fairbanks, July 25, 1948, C. O. Esselbaugh, 20♂, 20♀ (USNM). Fairbanks, July 4, 1948–August 15, 1948, S. Lienk, 10♂, 12♀ (AMNH). Fairbanks, Univ. of Alaska campus, July 12, 1979, K. Sorensen, 1♂ (UCB). Fort Yukon, July 18, 1951, R. I. Sailer, 10♂, 11♀ (USNM). Fort Yukon, July 3, 1953, R. I. Sailer, 1♀ (USNM). Gardiner Creek Camp, Alaska Highway, DC-4253, August 5, 1978, P. H. Arnaud, Jr., 1♂ (CAS). Juneau, Univ. of Alaska, July 24, 1980, 1♀ (OSU). Kenai Peninsula, 1 mi S jct Hwy 4 and Homer Rd., June 30, 1957, F. W. Preston, 7♂, 4♀ (KU). Kenai Peninsula, 1 mi S jct Hwy 4 and Kenai Rd., June 30, 1957, G. W. Byers, 1♀ (KU). Knik Lake, NW of Wasilla, July 18, 1978, P. H. Arnaud, Jr., 1♀ (CAS). Matanuska, July 14, 1944, J. Chamberlain, 1♀ (USNM). Muncaster Creek, July 6, 1983, G. G. E.

Scudder, 1♂, 1♀ (CNC). Olnes, on road to Livengood, July 11, 1949, S. Lienk, 3♂ (USNM). Palmer, August 1, 1948, R. I. Sailer, 6♂, 7♀ (USNM). Palmer, July 18, 1948, F. S. Blanton, *Achillea* sp. (Asteraceae), 2♂, 8♀ (USNM). Salcha River, mile 1464 Alaska Hwy, June 17, 1957, M. Shauffter, 1♀ (KU). Seward Highway, 15 mi SE of Anchorage, 200 ft, July 3, 1957, G. W. Byers, 1♂ (KU). Taylor Highway, 83 mi N of Tetlin Junction, August 10, 1957, E. L. Kessel, 1♀ (CAS). Willow, July 18, 1948, F. S. Blanton, 3♀ (USNM). Yeltakaska Creek, July 6, 1983, G. G. E. Scudder, 1♀ (UBC). **Arizona:** *Yavapai Co.:* 2 mi NE of Sheeps Crossing, White Mountains, Greer Rec. Area, June 26, 1980, J. D. Pinto, 1♀ (UCR). **California:** *Humboldt Co.:* Dinsmores, June 16, 1940–June 25, 1939, B. P. Bliven, 4♂, 15♀ (CAS). Laribee Valley, June 26, 1938, B. P. Bliven, 2♂ (CAS). **Colorado:** *Arapahoe Co.:* Cherry Creek State Park, July 8, 1977, J. T. and D. A. Polhemus, 1♂ (JTP). *Boulder Co.:* Boulder, August 1, 1997, J. C. Schaffner, 1♀ (TAMU). Mt. Flagstaff, 2280 m, June 20, 1988, Peigler, Weissmann, *Physocarpus monogynus* (Rosaceae), 1♂ (TAMU). S of St. Vrain Can., August 16, 1973, G. F. Knowlton and W. J. Hanson, 1♂, 1♀ (USU). *Costilla Co.:* Fort Garland, Ute Creek Ranch, August 11, 1925, H. H. Knight, 1♂, 5♀ (USNM). *Douglas Co.:* Chatfield State Park, July 12, 1979, J. T. Polhemus, 1♀ (JTP). Waterton, July 2, 1981, J. T. Polhemus, 1♂ (JTP). Waterton, June 25, 1981, J. T. Polhemus, 1♂ (JTP). *Eagle Co.:* near Minturn, Hornsilver Campground, August 23, 1984, D. A. Polhemus, *Potentilla* sp. (Rosaceae), 1♂, 2♀ (JTP). Vail, June 23, 1986, J. T. Polhemus, 1♂ (JTP). *Gilpin Co.:* Pinecliffe, August 12, 1973, J. C. Schaffner, 1♀ (TAMU). *Gunnison Co.:* 2 mi N of Gothic, 9300 ft, August 13, 1987, T. J. Henry, 1♂ (USNM). 8 mi SW of McClure Pass, August 8, 1975, J. C. Schaffner, 1♂, 1♀ (TAMU). Gothic, August 2, 1962, Jon Shephard, 1♀ (OSU). *Jackson Co.:* 1 mi E of Gould, August 11, 1969–August 14, 1969, J. C. Schaffner, 15♂, 16♀ (TAMU). 2 mi E of Gould, August 5, 1975, J. C. Schaffner, *Potentilla* sp. (Rosaceae), 17♂, 26♀ (TAMU). 2 mi S of Gould, August 13, 1968, Oman, 1♀ (OSU). 4 mi N of Gould, August 5, 1975, J. C. Schaffner, *Artemesia cana* (Asteraceae), 1♂, 1♀ (TAMU). Columbine Lodge, August 16, 1966, G. F. Knowlton, 4♀ (USU). Lindland, August 11, 1965, G. F. Knowlton, 2♀ (USU). Rabbit Ears Pass, 9500 ft, August 14, 1966–August 17, 1966, G. F. Knowlton, 1♂, 7♀ (USU). Rabbit Ears Pass, August 11, 1965, G. F. Knowlton, 3♂, 4♀ (USU). Rabbit Ears Pass, August 3, 1947, R. H. Beamer, 3♂, 1♀ (KU). *Jefferson Co.:* Evergreen, June 27, 1988, Peigler, Weissmann, 2♂ (TAMU). Indian Hills, 7000 ft, July 11, 1986, R. T. Schuh and J. T. Polhemus, *Geranium viscosissimum* (Geraniaceae), 4♂ (AMNH). Indian Hills, 7300 ft, August 6, 1987, T. J. Henry, 3♂, 4♀ (USNM). Upper Beaver Br. Gulch, August 12, 1981, D. A. Polhemus, 1♂ (JTP). *La Plata Co.:* 5 mi W of Durango, August 15, 1973, J. C. Schaffner, 1♂ (TAMU). *Larimer Co.:* 3 mi S of Estes Park, August 2, 1997–August 4, 1997, J. C. Schaffner, *Scrophularia* sp. (Scrophulariaceae), 18♂, 64♀ (TAMU). 40 mi W of Fort Collins, Bennett Creek Picnic Grd., Pingree Park Rd., 7400 ft, July 14, 1986, R. T. Schuh and J. T. Polhemus, 2♂, 2♀ (AMNH). Cameron Pass, August 10, 1964, G. F. Knowlton, 1♀ (USU). Estes Park, August 8, 1974, M. and T. M. Favreau, 2♀ (AMNH). Estes Park, July 10, 1964, H. H. Knight, 8♂, 3♀ (USNM). Glen Haven, July 19, 1946–July 22, 1946, P. B. Lawson, 4♂, 3♀ (KU). Pingree Park, August 15, 1924, Drake and Hottes, 4♂, 3♀ (USNM). Pingree Park, August 16, 1930, T. A. Brindley, 4♂, 2♀ (TAMU). Pingree Park, August 20, 1935, G. F. Knowlton, 2♂, 1♀ (USU). Pingree Park, August 21, 1923, R. L. Webster, 7♂, 4♀ (USNM). Rocky Mountain National Park, August 17, 1973, G. F. Knowlton and W. J. Hanson, 1♂, 1♀ (USU). Rocky Mountain National Park, Moraine Valley, 8000 ft, July 8, 1966, J. and S. Slater, 1♀ (AMNH). *Rio Grande Co.:* 10 mi SW of Baxterville, August 20, 1969, H. R. Burke, 1♀ (TAMU). *Routt Co.:* Milner, August 11, 1965, G. F. Knowlton, 3♂ (USU). Steamboat Springs [Baker collection numbers 1029, 1229, 1387, 1581, 2030], C. F. Baker, 3♂, 2♀ (USNM). Steamboat Springs, 6700 ft, July 12, 1964, H. H. Knight, 13♂, 12♀ (USNM). Steamboat Springs, July 15, 1942, 4♂, 2♀ (KU). **Connecticut:** Storrs, July 4, 1969, M. Sweet, *Chrysanthemum leucanthe-*

mum (Asteraceae), 1♀ (TAMU). Storrs, July 7, 1956, R. M. Baranowski, 1♀ (AMNH). **Idaho:** *Benewah Co.:* 3.5 mi SE of Emida on Palouse Divide Road, July 9, 1979, G. Stonedahl, *Agastache urticifolia* (Lamiaceae), 11♂, 5♀ (AMNH). vicinity of Emida, St. Joe Natl. Forest, T43N R52W, 3000 ft, August 5, 1986, Schuh, Schwartz, and Stonedahl, 2♂, 8♀ (AMNH). *Franklin Co.:* Cub River Canyon, June 5, 1966, G. F. Knowlton, 3♂, 1♀ (USU). Cub River Canyon, Thomas Spring, June 29, 1979, G. F. Knowlton, 1♂, 1♀ (USU). Cub River Canyon, Willow Flat, July 25, 1980, Hanson and Knowlton, 2♂, 1♀ (USU). Dayton, 4747 ft, July 18, 1931, R. E. Miller, 1♂ (USNM). Strawberry Canyon, 0.5 mi N of mp 18 on Rt 36, T13S R41E Sec 1, 8000 ft, July 19, 1981, M. Schwartz, *Pinus contorta* (Pinaceae), 1♀ (AMNH). Thomas Spring, June 28, 1974, G. F. Knowlton, 1♂ (USU). *Idaho Co.:* 10.2 mi WSW of Lolo Pass, Powell Pasture, 3600 ft, July 22, 1978, N. L. Herman, 1♂, 1♀ (AMNH). *Kootenai Co.:* Post Falls, July 13, 1929, R. A. Flock, 1♀ (UCR). *Latah Co.:* Moscow, July 2, 1940, R. L. Usinger, 1♂, 1♀ (UCB). Moscow, May 22, 1936–July 10, 1932, T. A. Brindley, 14♂, 22♀ (USNM). Palouse River, 5 mi E of Harvard, July 3, 1966, W. Gagne and J. Haddock, 1♂, 2♀ (UCB). *Shoshone Co.:* 3 mi NW of Clarkia on Rt 3, Cedar Creek Rec. Area, 2700 ft, August 6, 1986, Schuh, Schwartz, and Stonedahl, 1♂, 1♀ (AMNH). Wardner, July 21, 1929, R. A. Flock, 1♀ (UCR). **Iowa:** *Warren Co.:* 1.5 mi E of Hartford, July 5, 1976–July 6, 1976, J. C. Schaffner, 7♂, 2♀ (TAMU). **Maine:** *Piscataquis Co.:* Capens, July 12, 1907, 1♂ (CAS). Skowhegan, August 10, 1964, P. and B. Wygodzinsky, 2♀ (AMNH). *Washington Co.:* 8 km S of Millbridge, July 22, 1990, W. E. Steiner, 2♂, 2♀ (USNM). **Massachusetts:** *Franklin Co.:* Greenfield, along Green River, July 23, 1992, R. W. Jones, 5♂, 12♀ (TAMU). Greenfield, August 22, 1934, P. A. McKinstry, 1♀ (KU). **Michigan:** *Cheboygan Co.:* Cheboygan, July 6, 1939, R. Sailer, 1♀ (KU). Douglas Lake, July 10, 1927–July 23, 1927, H. B. Hungerford, 1♂, 5♀ (KU). Douglas Lake, July 18, 1929, H. B. Hungerford, 1♂ (KU). No specific locality, July 20, 1942, H. B. Hungerford, 2♀ (KU). No specific locality, July 27, 1933, H. B. Hungerford, 1♂ (KU). No specific locality, July 7, 1942–July 11, 1942, E. L. Todd, 1♂, 1♀ (KU). No specific locality, July 9, 1931–July 14, 1931, H. B. Hungerford, 1♂, 1♀ (KU). No specific locality, June 20, 1949–July 10, 1950, J. D. Lattin, 4♂, 3♀ (OSU). No specific locality, June 26, 1939–July 6, 1939, H. B. Hungerford, 3♂, 2♀ (KU). No specific locality, June 28, 1943, H. B. Hungerford, 3♂, 1♀ (KU). No specific locality, June 29, 1938, H. B. Hungerford, 1♂ (KU). *Luce Co.:* Soo Junction N., July 31, 1938, H. B. Hungerford, 1♂, 1♀ (KU). *Mackinac Co.:* Mackinac Island, August 4, 1929, H. B. Hungerford, 1♂ (KU). **Minnesota:** *Cook Co.:* Grand Marais, August 13, 1922, H. H. Knight, 13♂, 17♀ (USNM). *Lake Co.:* 30 mi N of Two Harbors, August 20, 1920, H. H. Knight, 1♂, 4♀ (USNM). Cramer, August 10, 1922, H. H. Knight, 4♂, 3♀ (USNM). *Ramsey Co.:* St. Anthony Park, July 5, 1923, H. H. Knight, 1♂, 2♀ (USNM). **Montana:** *Flathead Co.:* Glacier National Park, July 28, 1946, G. F. Knowlton, 3♂ (USU). Glacier National Park, West Glacier, August 15, 1969, R. S. Roberts, 1♀ (USU). *Gallatin Co.:* 12 mi E of Bozeman, July 21, 1983, J. D. Pinto, 8♂, 4♀ (UCR). 15 mi N of West Yellowstone on Rt 287, July 26, 1982, S. E. Cummings, 1♀ (UNHP). 26 mi S of Bozeman Hot Springs on Rt 191, Moose Flat Campground, 5700 ft, August 10, 1986, Schuh, Schwartz, Stonedahl, 1♂ (AMNH). Bridger Range, 5500 ft, August 16, 1915, 1♂ (USNM). *Missoula Co.:* Lolo Hot Springs, August 9, 1969, Oman, 1♂, 1♀ (OSU). *Park Co.:* 15 mi S of Livingston, July 22, 1983, J. D. Pinto, 1♂, 2♀ (UCR). 2 mi E of Cooke City on Rt 212, Soda Butte Campground, Gallatin Natl. Forest, 7700 ft, August 11, 1986, Schuh, Schwartz, and Stonedahl, 1♂ (AMNH). 2 mi E of Cooke City on Rt 212, Soda Butte Campground, Gallatin Natl. Forest, 7700 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, 6♂, 6♀ (AMNH). **Nevada:** *Elko Co.:* Secret Pass, 17 mi S of I-80 on Rt 229, 6250 ft, June 26, 1983, Schuh and Schwartz, *Purshia tridentata* (Rosaceae), 2♀ (AMNH). **New Hampshire:** *Carroll Co.:* Notchland, August 20, 1934, M. E. Griffith, 1♀ (KU). Notchland, August 20, 1934, R. H. Beamer, 1♂ (KU). *Coos Co.:* Bretton Woods,

August 21, 1934, P. A. McKinstry, 1♂, 2♀ (KU). Bretton Woods, August 21, 1934, R. H. Beamer, Jr., 1♂, 4♀ (KU). Bretton Woods, August 31, 1934, J. D. Beamer, 1♂, 1♀ (KU). Bretton Woods, August 31, 1934, M. E. Griffith, 1♂, 5♀ (KU). Bretton Woods, August 31, 1934, R. H. Beamer, 3♂, 7♀ (KU). Crawfords, September 28, 1916, H. M. Parshley, 2♀ (CAS). Mount Washington, 2500 ft, September 24, 1907, Bryant, 1♀ (CAS). **New Mexico:** *Otero Co.:* 2 mi E of Cloudcroft, August 18, 1979, Schaffner, Delorme, McHugh, 1♀ (TAMU). 3 mi E of Cloudcroft, July 19, 1976, J. D. Pinto, *Scrophularia* sp. (Scrophulariaceae), 8♂, 7♀ (AMNH, UCR). 4 mi E of Cloudcroft, July 17, 1979, Delorme, McHugh, Schaffner, 1♂, 1♀ (TAMU). **New York:** *Delaware Co.:* Cadosia, area along Apex Road, July 18, 1982, K. R. Valley, *Eupatorium perfoliatum* (Asteraceae), 1♂ (PDA). *Essex Co.:* Lake Placid, July 30, 1946, R. H. Beamer, 1♂ (KU). *Genesee Co.:* Bergen, July 24, 1946, L. D. Beamer, 1♀ (KU). *Hamilton Co.:* Raquette Lake, July 26, 1946, R. H. Beamer, 3♂, 2♀ (KU). *Oneida Co.:* near Sangerfield on Rt 20, September 6, 1975, A. G. Wheeler, Jr., *Solidago* sp. (Asteraceae), 1♀ (PDA). *Sullivan Co.:* DeBruce, August 23, 1912, 1♀ (AMNH). *Tompkins Co.:* Ithaca, July 7, 1920, H. H. Knight, 1♂ (USNM). **Oregon:** *Baker Co.:* Unity, July 13, 1991, W. F. Chamberlain, 1♀ (TAMU). *Jackson Co.:* Mt. Ashland, 4 1/2 mi below ski lodge, 5500 ft, September 24, 1968, J. D. Lattin, 1♀ (OSU). *Klamath Co.:* Eagle Ridge, Klamath Lake, 1♂ (CAS). Eagle Ridge, Klamath Lake, May 30, 1924, C. L. Fox, 2♀ (CAS). Upper Klamath Lake, Dennie Creek, July 3, 1954, Joe Schuh, 1♂ (OSU). *Lincoln Co.:* Yaquina Head, lighthouse, July 5, 1979, G. Stonedahl, *Stachys mexicana* (Lamiaceae), 1♀ (OSU). *Multnomah Co.:* Portland, July 3, 1917, W. M. Giffard, 1♀ (CAS). *Union Co.:* 4.5 mi E of Tollgate, Woodland Campground, 5000 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, 2♂, 2♀ (AMNH). 4.5 mi E of Tollgate, Woodland Campground, 5000 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, *Potentilla fruticosa* (Rosaceae), 3♂, 2♀ (AMNH). *Unknown Co.:* Summit Prairie, July 23, 1939, Schuh and Gray, 1♀ (AMNH). *Wallowa Co.:* 18 mi S of Joseph, June 18, 1979, *Balsamorhiza* sp. (Asteraceae), 1♂ (AMNH). *Wasco Co.:* 2 mi S of Simnasho, 2900 ft, June 6, 1972, Lattin, 2♀ (OSU). Rowena Crest, May 4, 1973, Oman, 1♂ (OSU). *Wheeler Co.:* 4 mi SW of Fossil, June 5, 1979, P. W. Oman, *Balsamorhiza* sp. (Asteraceae), 1♀ (OSU). Slide Mountain, 9.5 mi E of Rt 26 on FS Rd 2630, July 19, 1979, Schwartz, *Pinus contorta* (Pinaceae), 1♀ (AMNH). *Yamhill Co.:* top of Bald Mountain, July 13, 1958, K. M. Fender, 1♂ (OSU). **Pennsylvania:** *Blair Co.:* Altoona Cemetery, July 7, 1976, T. J. Henry, *Rhus glabra* (Anacardiaceae), 1♀ (PDA). *Crawford Co.:* Meadville, July 9, 1971, A. G. Wheeler, Jr., ex Fabaceae, 1♀ (PDA). *Erie Co.:* Erie, Paul's Nursery, July 26, 1978, A. G. Wheeler, Jr., *Achillea millefolium* (Asteraceae), 1♀ (PDA). *Jefferson Co.:* Sigel, August 21, 1973, 1♀ (PDA). **South Dakota:** *Custer Co.:* Custer, July 27, 1927, H. H. Knight, 2♀ (USNM). *Lawrence Co.:* Black Hills, 5000 ft, July 20, 1928, A. A. Nichol, 4♂, 2♀ (USNM). Roubaix, 5000–6000 ft, August 25, 1957, R. F. Koontz, 1♂ (OSU). **Utah:** *Box Elder Co.:* Clear Creek, July 5, 1974, W. J. Hanson, 1♀ (USU). Snowville, July 14, 1953, W. G. Firestone, 1♀ (USU). Willard Basin, 9200 ft, July 26, 1979, G. F. Knowlton, 1♂ (USU). *Cache Co.:* Ant Valley, July 21, 1976, G. F. Knowlton, 1♂ (USU). Blacksmith Fork Canyon, July 3, 1971, G. F. Knowlton, 2♂ (OSU). Franklin Basin, August 7, 1975–August 27, 1975, G. F. Knowlton, 1♂, 4♀ (USU). Franklin Basin, August 7, 1975, G. F. Knowlton, 2♂, 1♀ (UCD). Logan Canyon, 6500 ft, August 8, 1970, F. Fitz, *Delphinium occidentale* (Ranunculaceae), 2♂ (USU). Logan Canyon, July 13, 1977, W. J. Hanson, 1♀ (USU). Logan Canyon, July 18, 1971, G. F. Knowlton, 1♂, 1♀ (USU). Logan Canyon, July 26, 1973, G. F. Knowlton, 1♂ (USU). Logan Canyon, June 9, 1949, S. L. Wood, 1♂ (USU). Tony Grove Canyon, August 6, 1976, G. F. Knowlton, 1♀ (USU). Tony Grove Canyon, July 22, 1978, G. F. Knowlton and R. K. Cazier, 1♀ (USU). Tony Grove Canyon, July 30, 1974, G. F. Knowlton, 1♂, 3♀ (USU). Tony Grove Junction, August 21, 1984, 1♀ (USU). Tony Grove Lake, July 17, 1973, G. F. Knowlton, 1♂, 1♀ (USU). Tony Grove Lake, July 27, 1973, G. F. Knowlton, 2♂, 2♀ (USU). Tony Grove Lake, July 30,

1974, G. F. Knowlton, 1♀ (USU). *Davis Co.:* No specific locality, August 3, 1963, 1♂ (USU). *Duchesne Co.:* Rock Creek, July 28, 1970, J. L. Petty, 1♀ (USU). Uinta Mountains, Ashley National Forest, Hades Campground, 7400 ft, August 17, 1986, Schwartz and Stonedahl, *Rosa* sp. (Rosaceae), 2♂, 6♀ (AMNH). *Juab Co.:* Mt. Nebo Loop, July 3, 1972, G. F. Knowlton and W. J. Hanson, 1♂ (USU). *Rich Co.:* Allen Canyon, July 10, 1974, G. F. Knowlton, 1♂ (USU). Garden City, July 25, 1978, G. F. Knowlton, 1♀ (USU). Laketown, July 23, 1963, G. F. Knowlton, 1♀ (USU). Monte Cristo, August 12, 1943, G. F. Knowlton and D. R. Maddock, 1♂ (USU). Monte Cristo, August 21, 1942, G. F. Knowlton and S. L. Wood, 1♂ (USU). Monte Cristo, August 21, 1943, G. F. Knowlton and R. S. Roberts, 1♂ (USNM). Monte Cristo, July 10, 1974, G. F. Knowlton, 2♂ (USU). Monte Cristo, July 19, 1979, G. F. Knowlton, 1♂ (USU). *Salt Lake Co.:* Wasatch Mts., Little Cottonwood Canyon, Snowbird Ski Resort, 10,500 ft, August 19, 1986, M. D. Schwartz, 1♀ (AMNH). *Sanpete Co.:* Ephraim Canyon, 9000–9500 ft, August 13, 1975, G. F. Knowlton, 5♂, 4♀ (USU). Ephraim Canyon, August 13, 1975, G. F. Knowlton, 1♀ (UCD). Left Fork Huntington Creek, Summit on Rt 31, T14S R6W, 9700 ft, August 8, 1981, M. D. Schwartz, *Populus* sp. (Salicaceae), 1♀ (AMNH). *Summit Co.:* 17 mi E of Kamas, August 5, 1971, W. J. Hanson, 1♂ (USU). 3 mi SE of Bear River R.S., August 5, 1971, Hanson and Knowlton, 1♀ (USU). *Tooele Co.:* 13 mi SW of Grantsville, Loop Camp, 7400 ft, July 2, 1960, F. Rindge, 3♂ (AMNH). 13 mi SW of Grantsville, Loop Camp, 7400 ft, July 4, 1960, F., P. and B. Rindge, 1♂ (AMNH). *Utah Co.:* Mt. Timpanogos, August 6, 1969, G. F. Knowlton, 2♂, 2♀ (USU). Mt. Timpanogos, July 9, 1922, E. P. Van Duzee, 1♂ (CAS). *Wasatch Co.:* 12 mi SE of Heber, July 20, 1967, H. R. Burke, 1♀ (TAMU). 30 mi SE of Kamas on Rt 35, Uintah Natl. Forest, Wolf Creek Campground, T4S R10W Sec 7, 9000 ft, August 15, 1986, Schwartz and Stonedahl, 1♀ (AMNH). *Weber Co.:* 13 mi S of Monte Cristo, July 7, 1977, G. F. Knowlton, 1♂ (USU). Huntsville, Ogeen Canyon, July 21, 1922, E. P. Van Duzee, 1♀ (CAS). **Washington:** *Ferry Co.:* Republic, August 6, 1931, L. D. Anderson, 1♂ (KU). *King Co.:* Northbend, July 8, 1920–July 11, 1920, E. P. Van Duzee, 3♂, 4♀ (CAS). Seattle, August 6, 1928, R. A. Flock, 1♂ (UCR). *Klickitat Co.:* 1 mi SE of Wahkiakas, May 10, 1973, P. W. Oman, 1♂ (OSU). *Okanogan Co.:* 8 mi WNW of Republic (Ferry Co.), Sweat Creek, 3600 ft, July 20, 1978, N. Herman, 1♂, 1♀ (AMNH). *Pierce Co.:* Buckley, July 6, 1935, J. Russell, 1♀ (KU). Buckley, July 6, 1935, R. H. Beamer, 2♂ (KU). Du Pont, July 5, 1935, R. H. Beamer, 1♂ (KU). North Fort Lewis, July 4, 1944–July 5, 1944, P. H. Arnaud, Jr., 10♂, 4♀ (CAS). Paradise, Mt. Rainier, June 22, 1940, R. L. Usinger, 2♀ (UCB). Puyallup, July 5, 1927, W. W. Baker, 1♂, 1♀ (USNM). *Unknown Co.:* Clear Lake, July 11, 1931, F. P. Dean, 2♂, 4♀ (USNM). *Whatcom Co.:* 2 mi SW of Lynden, July 14, 1966–July 16, 1966, W. Gagne and J. Haddock, 13♂, 23♀ (UCB). *Whitman Co.:* Colfax, July 10, 1925, C. L. Fox, 11♂, 13♀ (CAS). *Yakima Co.:* Tampico, June 1, 1932, A. R. Rolfs, 7♂ (USNM). **West Virginia:** *Tucker Co.:* Blackwater Falls State Park near Davis, August 12, 1979, A. G. Wheeler, Jr., *Chrysanthemum leucanthemum* (Asteraceae), 8♀ (PDA). Canaan Valley, Rt 32 near Blackwater River, August 12, 1979, A. G. Wheeler, Jr., *Spiraea alba* (Rosaceae), 1♀ (PDA). Dolly Sods Wilderness Area, July 17, 1978, A. G. Wheeler, Jr., *Achillea millefolium* (Asteraceae), 1♂, 2♀ (PDA). **Wyoming:** *Big Horn Co.:* 24 mi W of Burgess Jct on road to radar station, 9000–9200 ft, August 12, 1986, Schuh, Schwartz, Stonedahl, *Lupinus argenteus* (Fabaceae), 35♂, 40♀ (AMNH). Granite Pass, 7500 ft, July 6, 1979, G. W. Byers, 2♂ (KU). *Crook Co.:* Sundance, July 20, 1927, H. H. Knight, 2♂, 2♀ (USNM). *Fremont Co.:* Wind River Mts., 2.5 mi SW Shoshone Natl. Forest boundary on Rt 131, August 14, 1986, Schwartz and Stonedahl, 1♂ (AMNH). *Johnson Co.:* 14 mi W of Buffalo, Clear Creek, July 8, 1959, G. W. Byers, 2♂, 1♀ (KU). *Lincoln Co.:* Salt River Pass, August 7, 1974, G. F. Knowlton and W. J. Hanson, 3♂, 4♀ (USU). *Park Co.:* Shoshone Natl. Forest, August 14, 1927, H. H. Knight, 1♂, 1♀ (USNM). Shoshone Natl. Forest, August 14, 1927, H. H. Knight, paratypes (*fuscotibialis*): 2♂ (USNM); holotype male (*fuscotibialis*) (USNM). Yellowstone National

Park, July 20, 1920, A. A. Nichol, 1♂, 10♀ (USNM). *Sheridan Co.:* Sheridan, August 2, 1927, H. H. Knight, 1♂ (USNM). *Shoshone Co.:* 19 mi E of Cooke City on Rt 212, 8000 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, *Lupinus* sp. (Fabaceae), 1♂, 2♀ (AMNH). 6.9 mi E of Cooke City on Rt 212, Fox Creek Campground, 7250 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, *Lupinus* sp. (Fabaceae), 2♂, 1♀ (AMNH). *Teton Co.:* Grand Teton National Park, near Kelly, July 24, 1982, S. C. Williams, 3♂ (CAS). Grand Teton National Park, Teton Science School near Kelly, July 24, 1982, S. C. Williams, 1♂, 4♀ (CAS).

Plagiognathus chrysanthemi (Wolff)
Figures 6, 15, 22

Miris chrysanthemi Wolff, 1804: 157 (n. sp.).
Plagiognathus chrysanthemi: Reuter, 1883: 452 (n. comb.).

DIAGNOSIS: Recognized by the greenish to greenish-yellow dorsum (fig. 6) with black, weakly bristlelike setae and antennal segment 2 mostly pale with a dark base (fig. 15). Easily confused with *guttatipes*, but distinguished by the form of the male genitalia; distributions also nonoverlapping. Also similar in coloration to *cibbetsi* and *polhemorum* (figs. 6, 11), both those species with pale setae on the dorsum. Vesica with basal portion very strongly curved and with apical spines sinuously curving (fig. 22). Coloration of dorsum also similar to that of *ribesi*, but that species with a strong black transverse marking on membrane and with a black stripe on the dorsal surface of all femora (fig. 12).

Male: Total length 3.60–4.18, length apex clypeus–cuneal fracture 2.53–2.81, width across pronotum 1.02–1.16. GENITALIA (fig. 22): Vesica strongly sigmoid, body relatively broad, base reaching to near level of secondary gonopore; apical spines elongate, parallel, appearing intertwined, at acute angle relative to body of vesica, anterior spine longer than posterior; flange narrow, terminating at about base of secondary gonopore.

Female: Total length 3.18–3.52, length apex clypeus–cuneal fracture 2.24–2.50, width across pronotum 1.03–1.11.

HOSTS: Recorded from a variety of herbaceous annuals in North America.

DISTRIBUTION: Widely distributed in the Palearctic. Recorded from Nova Scotia west to Ontario, south to New York and Michigan. In the west known from British Columbia south and east into Oregon, Idaho, Montana, and northern California.

DISCUSSION: Although I have not confirmed identifications from all of the localities listed by Wheeler and Henry (1992), and I believe their record from San Diego, California, represents a misidentification, material examined for this study extends the confirmed distribution of *chrysanthemi* much farther inland in the Pacific Northwest than was previously known to be the case.

SPECIMENS EXAMINED: CANADA.—**British Columbia:** Hope, 80–90 m, July 21, 1977, N. L. H. Krauss, 4♀ (AMNH). Hope, 80–90 m, July 21, 1977, N. L. H. Krauss, 6♂ (AMNH). Terrace, 60–70 m, June 23, 1978, N. L. H. Krauss, 7♂, 2♀ (AMNH). Vancouver Island, Campbell River, June 20, 1978, N. L. H. Krauss, 1♂, 1♀ (AMNH). **New Brunswick:** St. Andrews, August 2, 1957, G. E. Shewell, 1♂, 1♀ (CNC). **Nova Scotia:** Lockport, July 21, 1958, J. R. Vockeroth, 1♂ (CNC). Truro, September 8, 1920, H. M. Parshley, 1♂ (CAS). **Ontario:** Norway Point, Lake of Bays, July 14, 1920, J. McDunnough, 1♀ (CAS). Ottawa, July 13, 1912, E. P. Van Duzee, 2♂, 3♀ (CAS). Thessalon, July 1, 1965, W. Gagne, ex Asteraceae, 1♂, 4♀ (UCB). **Quebec:** 20 mi NW of Montreal, near St. Rose, Ile Jesus, August 19, 1956, J. D. Lattin, 3♀ (OSU). La Trappe, July 23, 1921, J. Ouellet, 1♂ (TAMU). Lac Nominque, August 1, 1930, D. Davenport, 4♂ (AMNH). Lauzon, July 13, 1919, J. Ouellet, 2♂ (TAMU). Montreal, July 8, 1912, E. P. Van Duzee, 1♂ (CAS). St. Remi, July 1, 1918, J. Ouellet, 2♂ (TAMU). USA.—**California:** *Del Norte Co.:* 1 mi S of Crescent City, 6 m, July 11, 1979, R. T. and Joe Schuh, 3♀ (AMNH). 35 mi NE of Crescent City on road to Bear Basin, July 10, 1979, R. T. Schuh and Joe Schuh, *Chrysanthemum leucanthemum* (Asteraceae), 6♂, 28♀ (AMNH). 6 mi N of Crescent City, 15 m, July 12, 1979, R. T. and Joe Schuh, 1♀ (AMNH). Jed. Smith Park, July 22, 1973, Bliven, 1♂ (CAS). *Humboldt Co.:* Eureka, Elk River, July 30, 1972, Bliven, 1♂ (CAS). *Stanislaus Co.:* Del Puerto Canyon, Frank

Raines Park, 1120 ft, May 15, 1971, C. B. Phillip, 1♂, 1♀ (CAS). **Connecticut:** 4.5 mi N of Salisbury, Mt. Riga State Park, July 25, 1970, J. Slater and J. Harrington, 2♂, 2♀ (AMNH). East Suffield, Connecticut River, July 21, 1970, F. D. Maroney, 1♀ (AMNH). Haystack Mt. State Park, July 25, 1970, J. Slater and J. Harrington, 2♀ (AMNH). **Idaho:** *Benewah Co.:* 2 mi W of Santa at Jct. Rts 3 & 6, Picnic Area, 2800 ft, August 6, 1986, Schuh, Schwartz, Stonedahl, 27♂, 14♀ (AMNH). 3.5 mi SE of Emida on Palouse Divide Rd., July 9, 1979, G. Stonedahl, *Agastache urticifolia* (Lamiaceae), 1♀ (AMNH). 4 mi E of Emida on Charlie Creek Rd., July 9, 1979, G. Stonedahl, *Verbascum thapsi* (Scrophulariaceae), 5♂, 7♀ (AMNH). Vicinity of Emida, St. Joe Natl. Forest, T43N R52W, 3000 ft, August 5, 1986, Schuh, Schwartz, Stonedahl, 13♂, 21♀ (AMNH). *Shoshone Co.:* 3 mi NW of Clarkia on Rt 3, Cedar Creek Rec. Area, 2700 ft, August 6, 1986, Schuh, Schwartz, Stonedahl, 1♂, 2♀ (AMNH). **Maine:** *Cumberland Co.:* Portland, July 9, 1909, E. P. Van Duzee, 5♂, 1♀ (CAS). *Hancock Co.:* Bar Harbor, C. W. Johnson, 1♂ (AMNH). Mount Desert Island, July 10, 1929, 2♂ (AMNH). Southwest Harbor, July 14, 1918, H. M. Parshley, 1♂ (CAS). *Penobscot Co.:* Orono, June 15, 1922, M. R. and R. J. Sim, 1♂ (PDA). *Piscataquis Co.:* Traveller Mountain, July 29, 1910, H. M. Parshley, 1♂ (CAS). *Unknown Co.:* Capens, July 12, 1907, H. M. Parshley, 1♂ (CAS). Muddybemps, August 20, 1922, M. R. and R. J. Sim, 1♂, 1♀ (PDA). Rogue Bluff, August 15, 1907, H. M. Parshley, 1♂ (CAS). *Washington Co.:* Eastport, July 15, 1909, Parshley, 4♂, 4♀ (CAS). Princeton, July 12, 1907, Parshley, 1♂, 3♀ (CAS). **Michigan:** *Cheboygan Co.:* Douglas Lake Biological Station, June 26, 1954, M. G. Naumann, 1♀ (KU). No specific locality, July 5, 1950, J. D. Lattin, 2♂, 1♀ (OSU). **Montana:** *Glacier Co.:* 5 mi N of East Glacier Park on Rt 49, Blackfeet Indian Reservation, August 3, 1994, M. D. Schwartz, 1♂ (CNC). *Missoula Co.:* E of Lolo Pass Summit on Rt 12, 5000 ft, August 8, 1986, Schuh, Schwartz, Stonedahl, 1♂ (AMNH). **New Hampshire:** *Belknap Co.:* Gilford, July 22, 1973, J. Amaral, 1♂ (TAMU). *Coos Co.:* Gorham, July 20, 1954, J. A. Slater, 5♀ (AMNH). Mount Washington, 5500–6000 ft, July 26, 1891, A. P. Morse, 1♂ (CAS). Mount Washington, alpine garden, July 15, 1982, D. S. Chandler, 1♀ (UNHP). Mount Washington, E.P. Van Duzee, 1♂ (CAS). Mount Washington, July 20, 1915, H. M. Parshley, 3♂ (CAS). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 22♂, 12♀ (AMNH). *Cayuga Co.:* S of Locke on Rt 38, July 11, 1981, A. G. Wheeler, Jr., 1♀ (PDA). *Chemung Co.:* Elmira, July 18, 1981, A. G. Wheeler, Jr., 2♂, 1♀ (PDA). Wellsburg, June 27, 1982, A. G. Wheeler, Jr., 1♂, 2♀ (PDA). *Cortland Co.:* Cortland, July 11, 1981, A. G. Wheeler, Jr., 1♀ (PDA). *Delaware Co.:* Cadosia, July 8, 1981, K. R. Valley, 1♂ (PDA). *Genesee Co.:* Bergen, July 21, 1982, A. G. Wheeler, Jr., 1♀ (PDA). *Monroe Co.:* Greece, July 31, 1982, A. G. Wheeler, Jr., 1♀ (PDA). *Onondaga Co.:* Solvay, June 26, 1982, A. G. Wheeler, Jr., 2♂, 1♀ (PDA). *Rensselaer Co.:* Brainard, July 11, 1966, P. and B. Wygodzinsky, 1♀ (AMNH). *Tioga Co.:* Rt 84 near Spencer, July 19, 1981, A. G. Wheeler, Jr., 1♂ (PDA). *Tompkins Co.:* 8.5 mi W of Ithaca, June 30, 1978, A. G. Wheeler, Jr., 1♀ (PDA). Ithaca, Cornell University, June 27, 1982, A. G. Wheeler, Jr., *Lamium maculata* (Lamiaceae), 2♂, 3♀ (PDA). Ithaca, Inlet, July 19, 1980, A. G. Wheeler, Jr., 1♀ (PDA). Ithaca, June 30, 1920, H. H. Knight, 1♂ (TAMU). *Warren Co.:* Hague, August 24, 1915, 1♂ (AMNH). Hague, July 18, 1915, 1♂ (AMNH). **Oregon:** *Benton Co.:* 1 mi W of Philomath, June 8, 1958, B. D. Ainscough, 2♂ (OSU). 5 mi NW of Corvallis, July 11, 1981, P. Oman, 4♂ (OSU). 7 mi N of Corvallis, Camp Adair, June 23, 1962, J. D. Lattin, 1♂ (OSU). Corvallis, July 3, 1962, J. D. Lattin, 1♂ (OSU). Corvallis, Willamette River, August 18, 1960, J. D. Lattin, 1♂ (OSU). Finley Wildlife Refuge, June 27, 1977, G. Eulenson, ex Poaceae, 1♀ (OSU). Hyslop Farm, June 17, 1961, 4♂, 2♀ (OSU). Mary's Peak below campground, 3500 ft, August 17, 1978, G. Stonedahl, 1♂, 10♀ (OSU). Mary's Peak summit meadow at campground, 3600 ft, September 8, 1971, J. D. Lattin, 2♂, 1♀ (OSU). Mary's Peak summit meadow, 3700 ft, August 10, 1971, J. D. Lattin, 2♂, 3♀ (OSU). Mary's Peak, 3800 ft, August 18,

1970, Oman, 1♂, 4♀ (OSU). Mary's Peak, 4000 ft, July 29, 1966, W. Gagne and J. Haddock, 6♂, 12♀ (UCB). Mary's Peak, August 7, 1968, P. Oman, 1♂, 5♀ (OSU). Mary's Peak, N spur at top, 3500 ft, August 10, 1971, J. D. Lattin, 3♀ (OSU). Mary's Peak, Saddle below campground, July 22, 1981, J. D. Lattin, 1♀ (OSU). Mary's Peak, top meadow, July 3, 1965, D. L. and L. M. Mays, 2♂ (OSU). McDonald Forest Oak Creek Lab, June 24, 1979, G. Stonedahl, *Achillea millefolium* (Asteraceae), 3♂, 8♀ (AMNH). No specific locality, July 11, 1961, E. A. Dickason, ex Fabaceae, 3♂ (OSU). *Clackamas Co.:* 1 mi E of Springwater, July 1, 1957, J. D. Lattin, 2♀ (OSU). 1 mi S of Government Camp, July 25, 1966, W. Gagne and J. Haddock, 3♂, 5♀ (UCB). Oregon City, June 12, 1957, J. D. Lattin, ex Poaceae, 4♂, 3♀ (OSU). Sandy, June 22, 1954, G. F. Knowlton, 1♂ (KU). *Clatsop Co.:* 2.5 mi W of Hwy 101 on Hwy 26, June 14, 1979, G. Stonedahl, 2♂ (AMNH). 5 mi S of Astoria, Astoria Br. Exp. Stn., July 10, 1958, John D. Lattin, 1♂, 2♀ (OSU). Astoria Exp. Stn., July 10, 1958, J. D. Lattin, ex Poaceae, 1♀ (OSU). Cannon Beach, June 18, 1969, Oman, 1♂, 3♀ (OSU). Clatsop Spit South Jetty Road, July 20, 1971, Rawers, 1♀ (OSU). Saddle Mountain, 2300–2700 ft, August 11, 1970, Lattin and Oman, 2♂, 2♀ (OSU). Seaside, June 16, 1965, G. F. Knowlton, 1♂, 1♀ (USU). *Coos Co.:* Coos Bay, June 14, 1978, N. L. H. Krauss, 2♂ (AMNH). *Curry Co.:* 15 mi N of Brookings, 60 m, July 11, 1979, R. T. and Joe Schuh, *Rhododendron occidentale* (Ericaceae), 1♀ (AMNH). 21 mi N of Gold Beach just S of Humbug State Park, 95 m, July 12, 1979, R. T. and Joe Schuh, 9♂, 10♀ (AMNH). 8 mi E of Gold Beach, via Hunter Creek Road, 700 ft, June 26, 1978, Nancy L. Herman, 3♂, 2♀ (AMNH). 8.5 mi S of Gold Beach, June 26, 1978, Nancy L. Herman, 6♂, 1♀ (AMNH). *Douglas Co.:* 12 mi S of Tiller, 720 m, July 12, 1979, R. T. and Joe Schuh, 20♂, 11♀ (AMNH). 35 mi W of Winston, 190 m, July 12, 1979, R. T. and Joe Schuh, 2♂, 4♀ (AMNH). 5 mi S of Roseburg on I-5, June 12, 1979, R. T. Schuh, *Rosa* sp. (Rosaceae), 2♂, 4♀ (AMNH). S of Roseburg at Round Prairie Exit on I-5, June 12, 1979, Schwartz, 2♂, 2♀ (AMNH). *Hood River Co.:* 1.5 mi E of Cascade Locks, Herman Creek, July 10, 1978, Nancy Herman, 3♂, 4♀ (AMNH). Near Parkdale, W fork Hood River, 1100 ft, July 10, 1978, Nancy L. Herman, 2♂, 1♀ (AMNH). *Jackson Co.:* 0.5 mi S of Siskiyou Summit on Old Rt 99, 1350 m, June 26, 1979, R. T. and Joe Schuh, 1♂ (AMNH). 0.5 mi S of Siskiyou Summit, Old Siskiyou Rd., 4300 ft, June 27, 1979, M.D. Schwartz, *Quercus garryana* (Fagaceae), 1♀ (AMNH). Gold Hill, June 22, 1975, W.J. Hanson and G. F. Knowlton, 5♂, 4♀ (USU). just E of Pinehurst, 1340 m, June 27, 1979, R. T. and Joe Schuh, 1♂, 3♀ (AMNH). *Klamath Co.:* 1 mi E of Cascade Mts. summit on Highway 66, June 26, 1979, G. Stonedahl, *Mimulus guttatus* (Scrophulariaceae), 1♀ (OSU). 2 mi N of Fort Klamath, 1340 m, June 29, 1979, R. T. Schuh, 1♂ (AMNH). T27S R9E Sec. 1, July 17, 1979, J. D. Lattin, 2♂, 1♀ (OSU). *Lane Co.:* 12 mi N of Florence, Cape Creek, June 28, 1967, Kenneth Goeden, ex Asteraceae, 3♂, 1♀ (OSU). Eugene, July 7, 1972, E. E. Ball, Jr., 1♂, 1♀ (CAS). *Lincoln Co.:* 10 mi ESE of Waldport, Canal Creek, August 8, 1968, J. D. Lattin, 1♂ (OSU). *Linn Co.:* 11 mi NE of Blue River, H. J. Andrews Exp. Forest,, 1750–3000 ft, June 13, 1979, R. T. Schuh, *Pseudotsuga menziesii* (Pinaceae), 4♂, 1♀ (AMNH). 36 mi E of Sweet Home, Tombstone Prairie, 4200 ft, September 12, 1956, J. D. Lattin, 4♀ (OSU). 7 mi NE of Albany, June 5, 1957, J. D. Lattin, 3♂ (OSU). Grass Mountain summit, 3625 ft, September 18, 1971, J. D. Lattin, 1♂ (OSU). H. J. Andrews Experimental Forest, 1 mi. N Frissel Pt., July 28, 1961, G. Stonedahl, *Lupinus* sp. (Fabaceae), 2♂, 2♀ (AMNH). Horse Butte, July 9, 1977, G. Eulensen, 4♂, 1♀ (OSU). Peterson Butte, South Slope, June 16, 1977, G. Eulenson, 16♂ (OSU). *Multnomah Co.:* Linnton, July 16, 1959, J. D. Lattin, 1♂ (OSU). Portland, June 22, 1954, G. F. Knowlton, 1♀ (AMNH). *Polk Co.:* 1 mi E of Independence, July 10, 1957, J.D. Lattin, 2♂ (OSU). 5 mi NW of Valsetz, N Fork Siletz River,, June 30, 1973, J. D. Lattin, 2♂, 2♀ (OSU). *Washington Co.:* 2 mi NW of Banks, June 18, 1969, P. Oman, 9♂ (OSU). 4 mi N of Buxton, July 9, 1991, W. F. Chamberlain, 1♂ (TAMU). Buxton, July 23, 1965–August 3, 1970, W. F. Chamberlain, 3♂ (TAMU). *Yamhill Co.:* 4 mi W of

Amity, July 23, 1958, E. A. Dickason, ex Fabaceae, 1♂ (OSU). 6 mi E of McMinnville, Willamette River, June 8, 1958, K.M. Fender, 1♂, 1♀ (OSU). top of Bald Mountain, July 13, 1958, K. M. Fender, 31♂, 25♀ (OSU). **Pennsylvania:** *Armstrong Co.:* Elderton on Rt 210, June 6, 1972, A. G. Wheeler, Jr., *Coronilla varia* (Fabaceae), 3♂ (PDA). *Centre Co.:* Snow Shoe, July 2, 1971, A. G. Wheeler, Jr., ex Fabaceae, 1♂, 1♀ (PDA). *Erie Co.:* Rt 19 at I-90, July 25, 1978, A. G. Wheeler, Jr., *Achillea millefolium* (Asteraceae), 1♀ (PDA). *Lebanon Co.:* 4 mi S of Schuykill County line on I-81, June 13, 1988, A. G. Wheeler, Jr., *Coronilla varia* (Fabaceae), 1♂ (PDA). *Luzerne Co.:* Newport Township, June 24, 1969, C. L. Semmel, 1♂ (PDA). *Northumberland Co.:* Shamokin, June 13, 1995, A. G. Wheeler, Jr., *Melilotus officinalis* (Fabaceae), 1♀ (PDA). *Perry Co.:* Midway exit on Rt 322, July 12, 1973, J. F. Stimmel, *Coronilla varia* (Fabaceae), 1♂, 1♀ (PDA). Watts exit on Rt 322, June 26, 1991, A. G. Wheeler, Jr., 1♀ (PDA). *Pike Co.:* Shohola Township, June 24, 1969, 1♀ (PDA). *Schuykill Co.:* near Frackville, I-81 at Rt 61, July 11, 1975, A. G. Wheeler, Jr., *Coronilla varia* (Fabaceae), 1♀ (PDA). *Union Co.:* S of Watsontown, I-80 near Jct Rt 405, June 22, 1988, A. G. Wheeler, Jr., *Coronilla varia* (Fabaceae), 1♂ (PDA). *Warren Co.:* Russellville, June 12, 1986, A. G. Wheeler, Jr., *Coronilla varia* (Fabaceae), 2♀ (PDA). **Rhode Island:** *Washington Co.:* Middlebridge Road over Pettasquamscutt River, June 16, 1981, K. and R. Schmidt, 2♂, 8♀ (AMNH). **Vermont:** *Rutland Co.:* Killington Park, August 23, 1898, A. P. Morse, 1♀ (AMNH). **Washington:** *Grays Harbor Co.:* Quinault, July 7, 1978, J. Schuh, 8♂, 10♀ (AMNH). *Island Co.:* Whidbey Island Freeland, June 2, 1979, M.D. Schwartz, *Kohleria cristata* (Gesneriaceae), 8♂ (AMNH). *Jefferson Co.:* Brinnon, July 20, 1975, T. L. Whitworth, 1♂ (USU). *Lewis Co.:* 6.4 mi W of Randle, near Stiltner Creek, 1200 ft, July 12, 1978, Nancy L. Herman, 8♀ (AMNH). Randle, July 22, 1949, J. R. White, 1♂ (KU). *Okanogan Co.:* 8 mi WNW of Republic (Ferry Co.), Sweat Creek, 3600 ft, July 20, 1978, Nancy Herman, 1♀ (AMNH). *Pacific Co.:* 10 mi NE of Raymond, July 3, 1993, W. F. Chamberlain, 2♂ (TAMU). 10.5 mi N of Hwy 101 on Peninsula Rd., June 14, 1979, G. Stonedahl, 3♂, 2♀ (AMNH). Naselle, July 3, 1993, W. F. Chamberlain, 1♂ (TAMU). *Pierce Co.:* Fort Lewis, June 19, 1951, H. F. Robinson, 6♂, 2♀ (UCD). Fort Lewis, June 26, 1944, Paul H. Arnaud, Jr., 17♂, 18♀ (CAS). Pleasant Valley, July 22, 1978, T. L. Whitworth, 1♀ (USU). White R. Campground, 2650 ft, July 12, 1978, Joe Schuh, 1♀ (AMNH). *Skagit Co.:* Larrabee State Park, July 15, 1966, W. Gagne and J. Haddock, 11♂, 18♀ (UCB). Lyman, July 13, 1971, L. Eighme, 1♂ (PUC). *Whatcom Co.:* 2 mi SW of Lynden, July 14, 1966, W. Gagne and J. Haddock, 3♂, 4♀ (UCB). Green Lake, July 14, 1966, W. Gagne and J. Haddock, 1♂ (UCB).

Plagiognathus cibbetsi, new species
Figures 6, 15, 22

HOLOTYPE: Male: ''USA: California: San Diego Co.: Cibbets Flat Cmpgrd on Kimball Crk Rd, 1280 m, April 29, 1985, R. T. Schuh, *Ribes indecorum* Eastw. (Saxifragaceae)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the relatively *small size, pale, somewhat yellowish, coloration* (figs. 6), the *antennae pale except for dark base of spine on segment 1 and extreme base of segment 2* (fig. 15), and the *structure of the male genitalia* (fig. 22). Similar to *polhemorum* (fig. 11) and *ribesi* (fig. 12) in pale coloration, presence of a dark blotch on membrane posterior to cuneus, and relatively small size, but those species more greenish, with blotch on membrane darker and more obvious, and with dark stripe on dorsal surface of all femora. Similar to *luteus* in uniform coloration and general structure of vesica in male, but that species strongly bright orange with antennal segment 1 black.

DESCRIPTION: *Male:* Weakly ovoid, small; total length 3.13–3.33, length apex clypeus–cuneal fracture 2.11–2.48, width across pronotum 1.01–1.10. COLORATION (fig. 6): General coloration pale, yellowish, translucent; membrane pale with a faint fumose marking posterior to cuneus and membrane cells; spine on interior surface of antennal segment 1 and extreme base of segment 2 dark (fig. 15); labium infuscate at apex; mid-

dle and hind femora with some dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, shining, translucent. Vestiture of dorsum composed of reclining pale, golden-shining, simple setae with some darker setae on pronotum. STRUCTURE: Body flattened, relatively broad, lateral corial margins weakly but distinctly convex; frons weakly tumid, clypeus visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching apex of hind coxae. GENITALIA (fig. 22): Vesica, including apical spines, sigmoid, of moderately and more or less uniform thickness over length of body, base of vesica reaching to base of secondary gonopore; apical spines elongate, relatively slender, anterior spine smoothly curving, posterior spine much shorter than anterior; flange on vesica relatively short and at most moderately broad.

Female: Very similar in shape and proportions to male (fig. 7). Total length 3.10–3.40, length apex clypeus–cuneal fracture 2.21–2.42, width across pronotum 1.04–1.14.

ETYMOLOGY: Named for its occurrence at Cibbets Flat Campground, San Diego County, California.

HOSTS: *Ribes* spp. (Grossulariaceae).

DISTRIBUTION: Mountains of southern California and southern Nevada.

PARATYPES: USA.—**California:** *San Diego Co.:* Cibbets Flat Campground on Kimball Creek Road, 1280 m, April 29, 1985, R. T. Schuh, *Ribes indecorum* (Grossulariaceae), 5♂, 5♀ (AMNH). **Nevada:** *Clark Co.:* Charleston Peak, July 20, 1982, J. T. Polhemus, *Ribes* sp. (Grossulariaceae), 10♂, 10♀ (AMNH, JTP).

Plagiognathus concoloris, new species
Figures 7, 16, 22

HOLOTYPE: Male: ''[USA] CA[lifornia]: Siskiyou Co., 2 mi. W McCloud, VI-26–1981, 3750′, coll. J. D. Lattin, *Abies concolor*''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the *large size, light orange or greenish orange coloration* of dorsum (fig. 7), the *black antennae* (fig. 16), the heavily infuscate to *nearly black tibiae and tarsi* of all legs, and vesica with short spines and a very narrow flange (fig. 22). Similar in size and coloration of dorsum to *flavus* and *lonicerae* (figs. 8, 9), but those species with antennal segment 2 and legs mostly pale and unicolorous with dorsum. Structure of genitalia similar to that of *flavus* and *lonicerae,* with a heavy, sigmoid vesica with relatively short apical spines and a narrow flange. Among other large, mostly pale western species, similar to *longipennis* and *phaceliae* in having antennal segment 2 dark and in having the apical vesical spines relatively short.

DESCRIPTION: *Male:* Large, nearly parallel-sided; total length 4.43–5.26, length apex clypeus–cuneal fracture 3.08–3.51, width across pronotum 1.36–1.46. COLORATION (fig. 7): General coloration, including most of venter, pale orange, sometimes rather strongly greenish; membrane weakly fumose with a darker, transverse, fumose marking posterior to cuneus and membrane cells, veins of membrane orange; antennae entirely castaneous to black (fig. 16); labium infuscate over entire length; all femora weakly to moderately infuscate with some darker spots; tibiae and tarsi heavily infuscate, dark spots at bases of tibial spines indistinct; tibiae black at femoral articulation. SURFACE AND VESTITURE: Dorsum smooth, moderately shining. Vestiture of dorsum composed of recumbent, pale to golden, shining, simple setae with some darker suberect setae on pronotum. STRUCTURE: Body somewhat flattened, moderately broad; frons weakly tumid, clypeus readily visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below level of eye by 1.3 times diameter of antennal segment 1; labium relatively short, not quite reaching apex of middle coxae. GENITALIA (fig. 22): Vesica, including apical spines, sigmoid, body relatively heavy, base falling well below base of secondary gonopore; apical spines relatively short, weakly curving, anterior spine much longer than posterior; flange very narrow.

Female: More strongly ovoid than male; coloration similar to male. Total length 3.84–

4.51, length apex clypeus–cuneal fracture 2.60–3.12, width across pronotum 1.18–1.46.

ETYMOLOGY: Named for its occurrence on *Abies concolor*.

HOSTS: *Abies concolor, A. amabilis* (Pinaceae).

DISTRIBUTION: Southern Oregon and Sierra Nevada Mountains of California.

PARATYPES: USA.—**California:** *Alpine Co.:* just W of Monitor Pass on Rt 89, 2550 m, July 27, 1999, M. D. Schwartz, *Abies concolor* (Pinaceae), 1♂, 1♀ (CNC). *Kern Co.:* Greenhorn Summit on Rt 155, 1860 m, July 16, 1999, M. D. Schwartz, *Abies concolor* (Pinaceae), 3♂, 11♀ (AMNH, CNC). S of Spout Spring on Rt 155, Slick Rock Creek, 1700 m, July 26, 1999, M. D. Schwartz, *Abies concolor* (Pinaceae), 4♂, 23♀ (AMNH, CNC). 14 mi W of Wofford Heights on Rt 155, 1830 m, July 28, 1999, M. D. Schwartz, *Abies concolor* (Pinaceae), 3♂, (AMNH). *Madera Co.:* Biledo Meadows, July 27, 1946, R. L. Usinger, *Abies concolor* (Pinaceae), 5♂, (UCB). *Mariposa Co.:* Fish Camp Post Office, in meadow, 1521 m, July 24, 1999, M. D. Schwartz, *Abies concolor* (Pinaceae), 1♂, (CNC). Yosemite National Park, August 1, 1940, L. C. Kuitert, 1♀ (KU). *Nevada Co.:* Hobart Mills, Sagehen, August 3, 1962, C. A. Toschl, 3♀ (UCB). *Plumas Co.:* near Chester, July 5, 1932, R. L. Usinger, *Abies sp.* (Pinaceae), 1♂, (UCB). *Siskiyou Co.:* 2 mi W of McCloud, 3750 ft, June 26, 1981, J. D. Lattin, *Abies concolor* (Pinaceae), 1♂, 1♀ (OSU). 2 mi W of McCloud, 3750 ft, June 26, 1981, J. D. Lattin, *Abies concolor* (Pinaceae), 2♂, 3♀ (OSU). 6.9 mi S of Medicine Lake on Powder Hill Road, July 19, 1985, G. M. Stonedahl and J. D. McIver, *Abies sp.* (Pinaceae), 1♀ (AMNH). Willow Creek Mountain, Shovel Creek Meadow, August 10, 1962, W. Peters and J. Schuh, 4♂, 7♀ (OSU). *Tehama Co.:* Childs Meadow, August 20, 1954, B. P. Bliven, 8♂, 8♀ (AMNH, CAS). Deer Creek, July 18, 1954, B. P. Bliven, 8♂, 13♀ (AMNH, CAS). *Tulare Co.:* Sequoia National Park, August 6, 1940, L. C. Kuitert, 3♂, 4♀ (KU). *Tuolumne Co.:* Strawberry, August 2, 1960, M. E. Erwin, 1♂, (UCB). Strawberry, July 14, 1962, J. T. Doyen, 2♀ (UCB). Strawberry on Rt 108, above S Fork of Stanislaus River, 1590 m, July 27, 1999, M. D. Schwartz, *Abies concolor* (Pinaceae), 3♂, (AMNH). *Unknown Co.:* Illilouette Falls, 5816 ft, July 29, 1946, T. O. Thatcher, *Abies concolor* (Pinaceae), 1♂, (UCB). **Oregon:** *Jackson Co.:* Moon Prairie, July 29, 1962, J. D. Vertrees, 1♀ (OSU). *Klamath Co.:* 4 mi S of Four Mile Lake, August 11, 1956, J. Schuh, *Abies amabilis* (Pinaceae), 2♂, 7♀ (OSU).

Plagiognathus cornicola Knight
Figures 7, 16, 22

Plagiognathus cornicola Knight, 1923: 450 (n. sp.).

DIAGNOSIS: Recognized by the relatively small size, the coloration of *dorsum ranging from orange to nearly black, calli darkened* in lighter colored specimens (fig. 7), antennal segment 1 almost totally black, antennal segment 2 black at base and remainder of segment frequently infuscate (fig. 16), the relatively *large black spots at the bases of the tibial spines,* and the relatively *long, slender vesica without a flange* (fig. 22). Distinguished from *delicatus* and *viticola* by tibial spines having moderately large black spots at bases and tibiae being black at articulation with femur, whereas tibiae pale at articulation with femur in those species and tibial spines with small black spots at bases in *delicatus* and pale bases in *viticola.* Also vesica relatively slender and elongate with base falling well below level of gonopore in *cornicola* (fig. 22), whereas body of vesica much shorter, stouter, and apical spines longer in *delicatus* (fig. 22) and *viticola* (fig. 33). Coloration often totally dark in *cornicola,* whereas in *delicatus* coloration of dorsum usually dominated by orange (fig. 7).

REDESCRIPTION: *Male:* Relatively small, stout-bodied; total length 2.95–3.27, length apex clypeus–cuneal fracture 2.02–2.13, width across pronotum 0.97–1.12. COLORATION (fig. 7): Dorsum varying from somewhat mottled orange-brown (fig. 7: *cornicola* male) to uniformly castaneous (fig. 7: *cornicola* female); calli darker than remainder of pronotum in lighter colored specimens; membrane fumose, veins pale; clypeus darker than surrounding areas of face; antennal segment 1 castaneous except for pale apical

annulus, segment 2 greatly variable, sometimes dark at extreme base with remainder pale, or with a pale mesial band, or completely dark, the last case most common in completely castaneous specimens, segments 3 and 4 weakly infuscate; labium varying from mostly pale to entirely castaneous; venter of variable coloration, ranging from mottled orange to almost entirely dark, metathoracic scent-gland evaporatory area apparently always pale; legs varying from entirely pale, including coxae, to having dark coxae, trochanters, and femora; tibiae always with pale background coloration and relatively heavy dark spots at the bases of the tibial spines. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of reclining, pale, golden, shining, simple setae; clypeus more highly polished than remainder of face. STRUCTURE: Body elongate, hemelytra nearly parallel-sided; frons weakly convex, slightly projecting beyond anterior margin of eyes, clypeus barely visible from above; anteocular distance 0.5 times diameter of antennal segment 1; head projecting below eye by distance equal to diameter of antennal segment 1; labium reaching to about apex of middle coxae or slightly beyond. GENITALIA (fig. 22): Body of vesica relatively long, slender, forming a very broad J, base of vesica falling well below level of secondary gonopore, posterior apical spine long, nearly straight and erect relative to body of vesica, anterior spine only slightly longer than posterior, nearly straight, and only weakly angled relative to body of vesica; no vesical flange.

Female: Very similar to male in coloration, but body more strongly ovoid in outline (fig. 7). Total length 2.95–3.15, length apex clypeus–cuneal fracture 2.05–2.21, width across pronotum 0.95–1.16.

HOST: *Cornus* spp. (Cornaceae). Records from other plant groups do not appear to represent breeding hosts.

DISTRIBUTION: Ontario and New York in the north, west to Indiana, and south to Texas and Florida.

DISCUSSION: Knight (1923) described this species from specimens taken in Massachusetts, New York, and Virginia. He did not, at that time or later (Knight, 1941), indicate except in his key how *cornicola* could be distinguished from *delicatus,* which is very similar in appearance to lighter colored, usually northern, populations of *cornicola.* The most reliable external distinguishing character seems to be the much larger and more conspicuous dark spots at bases of the tibial spines in *cornicola,* with these being obsolete in *delicatus.* The genitalia are distinctive, the vesica in *cornicola* being much longer and more slender than that of *delicatus* and with shorter apical spines (fig. 22).

SPECIMENS EXAMINED: CANADA.—**Ontario:** Aylmer, July 3, 1962, H. Blanchard, *Cornus* sp. (Cornaceae), 2♂, 7♀ (CNC). Aylmer, July 3, 1962, H. Blanchard, *Cornus* sp. (Cornaceae), 3♂ (CNC). Belleville, July 10, 1967, C. C. Loan, *Cornus racemosa* (Cornaceae), 5♂, 17♀ (CNC). Burtch, July 11, 1961, L. A. Kelton, *Cornus* sp. (Cornaceae), 11♂, 5♀ (CNC). Copenhagen, July 3, 1962, G. Thorpe, *Cornus* sp. (Cornaceae), 4♂, 3♀ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, *Cornus* sp. (Cornaceae), 1♂ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, *Cornus* sp. (Cornaceae), 5♂, 15♀ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂ (CNC). Exeter, July 12, 1962, Kelton and Thorpe, 1♂ (CNC). Exeter, July 12, 1962, Kelton and Thorpe, *Cornus* sp. (Cornaceae), 2♂, 6♀ (CNC). Frankford, July 26, 1962, L. A. Kelton, *Lonicera* sp. (Caprifoliaceae), 1♂, 2♀ (CNC). Haggersville, July 9, 1962, Kelton and Thorpe, *Crataegus* sp. (Rosaceae), 2♂, 6♀ (CNC). Hepworth, June 30, 1962, G. Thorpe, *Cornus* sp. (Cornaceae), 9♂, 12♀ (CNC). Ipperwash, July 11, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♀ (CNC). Kemble, July 1, 1962, H. Blanchard, 1♂ (CNC). Kingsville, June 18, 1962, Kelton and Thorpe, *Cornus* sp. (Cornaceae), 1♂, 9♀ (CNC). Kingsville, June 18, 1962, Kelton and Thorpe, *Crataegus* sp. (Rosaceae), 1♂, 2♀ (CNC). Kingsville, June 19, 1962, Kelton and Thorpe, *Cornus* sp. (Cornaceae), 1♂, 1♀ (CNC). Lambeth, June 29, 1961, Kelton and Brumpton, 1♂ (CNC). Mt. Vernon, July 10, 1962, Kelton and Thorpe, 1♂ (CNC). Norfolk, June 26, 1934, J. A. Hall, 1♂ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 1♀ (CNC). Parkhead, June 30, 1962, G. Thorpe, *Thuja occidentalis* (Cupressaceae),

1♀ (CNC). Port Burwell, July 3, 1962, Kelton and Thorpe, 1♂ (CNC). Selkirk, July 9, 1962, Kelton and Brumpton, 1♂, 6♀ (CNC). St. Lawrence Is. Natl. Park, Grenadier Is. Center, July 9, 1975, E. Wilson, *Cornus* sp. (Cornaceae), 4♂ (CNC). Vienna, July 18, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂ (CNC). USA.—**Arkansas:** *Independence Co.:* 15 mi W of Batesville, May 30, 1970, V. V. Board, 3♂, 1♀ (TAMU). **Florida:** *Jackson Co.:* Ft. Caverns St. Pk., May 19, 1985, E. G. Riley and D. A. Rider, 2♂, 4♀ (DAR). **Indiana:** *Howard Co.:* NW Howard County, June 23, 1986, D. A. Rider, 1♂ (DAR). *Kosciusko Co.:* 1 mi E of Wawasee, July 12, 1964, L. and C. O'Brien, 1♀ (UCB). *Lagrange Co.:* Dallas Lake, July 1, 1984, D. A. Rider, 1♀ (DAR). **Louisiana:** *Baton Rouge Co.:* LSU Campus, May 5, 1985–May 31, 1985, D. A. Rider, 3♂, 8♀ (DAR). *East Baton Rouge Co.:* LSU Campus, May 5, 1985, D. A. Rider, 13♂, 11♀ (LSU). *Feliciana Co.:* Tunica Hills W of Weyanoke, May 18, 1985, C. B. Barr, 1♂, 2♀ (LSU). *St. Landry Co.:* 1 mi N of Port Barre on Hwy 103, April 27, 1986, E. G. Riley and D. A. Rider, 1♂, 1♀ (DAR). Thistlewaite WMA, April 27, 1986, E. G. Riley and D. A. Rider, 1♂ (DAR). Thistlewaite WMA, April 27, 1986, E. G. Riley and D. A. Rider, 1♂ (LSU). **Massachusetts:** *Franklin Co.:* Greenfield along Green River, July 23, 1992, R. W. Jones, 1♀ (TAMU). *Suffolk Co.:* Boston, Arnold Arboretum, July 13, 1921, H. Morrison, paratype: 1♂ (USNM). **Mississippi:** *Pontotoc Co.:* Pontotoc, May 27, 1931, H. G. Johnston, 9♂, 10♀ (TAMU). *Tupelo Co.:* Tupelo, May 26, 1931, H. G. Johnston, 4♂, 2♀ (TAMU). **Missouri:** *Holt Co.:* Big Lake St. Pk., April 17, 1983, R. L. Blinn, 1♂, 1♀ (DAR). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 26♂, 33♀ (AMNH). *Cayuga Co.:* Rt 38 S of Locke, July 11, 1981, A. G. Wheeler, Jr., 1♀ (PDA). *Genesee Co.:* Batavia, July 4, 1914, H. H. Knight, paratypes: 3♂, 1♀ (CAS, USNM). *Greenbrier Co.:* Rt 92 at Alvon, June 25, 1978, A. G. Wheeler, Jr., *Cornus amomum* (Cornaceae), 2♂ (PDA). *Tompkins Co.:* 8.5 mi NW of Ithaca, July 30, 1978, A. G. Wheeler, Jr., *Cornus* sp. (Cornaceae), 1♂, 3♀ (PDA). Ithaca, Cornell University, July 11, 1978, A. G. Wheeler, Jr., *Cornus* sp. (Cornaceae), 1♂ (PDA). **Pennsylvania:** *Blair Co.:* Altoona, Rt 764, June 17, 1974, A. G. Wheeler, Jr., *Cornus* sp. (Cornaceae), 2♂, 1♀ (PDA). *Dauphin Co.:* 7 mi N of Harrisburg, June 21, 1974, A. G. Wheeler, Jr., *Kalmia latifolia* (Ericaceae), 1♀ (PDA). Harrisburg, Wildwood Park, July 7, 1900, W. Reinich, 1♂ (PDA). Middle Paxton Township, Rt 443, Fishing Creek Valley School, July 5, 1979, A. G. Wheeler, Jr., *Cornus stolonifera* (Cornaceae), 4♂, 3♀ (PDA). *Erie Co.:* Fairview, Fairview High School, July 7, 1976, A. G. Wheeler, Jr., *Cornus* sp. (Cornaceae), 1♀ (PDA). Rt 97 N of Waterford, July 20, 1988, A. G. Wheeler, Jr., *Cornus* sp. (Cornaceae), 2♂, 1♀ (PDA). *Luzerne Co.:* Rice Township, Andy Pond, July 14, 1979, A. G. Wheeler, Jr., *Cornus stolonifera* (Cornaceae), 1♂ (PDA). *Montgomery Co.:* Harleysville, County Line Nursery, May 14, 1974, A. G. Wheeler, Jr., *Viburnum setigerum* (Caprifoliaceae), 1♀ (PDA). *Northumberland Co.:* near Milton, J & J Nursery, June 24, 1981, A. G. Wheeler, Jr., *Cornus rugosa* (Cornaceae), 1♂, 2♀ (PDA). **Tennessee:** *Knox Co.:* Knoxville, University of Tennessee campus, May 27, 1985, A. G. Wheeler, Jr., *Cornus* sp. (Cornaceae), 1♂, 2♀ (PDA). **Texas:** *Bastrop Co.:* Bastrop State Park, May 8, 1966, J. C. Schaffner, 1♂, 1♀ (TAMU). *Bosque Co.:* 3 mi W of Laguna Park, April 21, 1972, J. C. Schaffner, 6♂, 9♀ (TAMU). *Brazos Co.:* 12 mi S of College Station, May 15, 1970, V. V. Board, 1♂, 1♀ (TAMU). College Station, April 16, 1933, H. G. Johnston, 1♂ (TAMU). *Erath Co.:* Stephenville, April 21, 1972, J. C. Schaffner, 1♀ (TAMU). *Gonzales Co.:* Palmetto State Park, April 22, 1970–May 4, 1970, V. V. Board, 16♂, 16♀ (TAMU). Palmetto State Park, May 4, 1970, Board, Schaffner, 11♂, 18♀ (TAMU). *Kerr Co.:* 10 mi SW of Kerrville, May 8, 1983, W. F. Chamberlain, 1♂ (TAMU). *Victoria Co.:* Victoria, April 24, 1983, T. J. Henry and A. G. Wheeler, Jr., *Cornus* sp. (Cornaceae), 2♂, 1♀ (PDA). *Williamson Co.:* Taylor, April 27, 1968, J. E. Hafernik, 1♂ (TAMU). **West Virginia:** *Nicholas Co.:* Rt 39, 10 mi N of county line, June 24, 1978, A. G. Wheeler, Jr., *Cornus florida* (Cornaceae), 2♂, 3♀ (PDA).

Plagiognathus davisi Knight
Figures 3, 7, 16, 22

Plagiognathus davisi Knight, 1923: 452 (n. sp.).

DIAGNOSIS: Recognized by the *suberect, silvery, shining vestiture of dorsum* appearing somewhat bristly (fig. 3C), the small eyes (fig. 3A), the *transversely rugose pronotum,* antennal segment 2 usually mostly pale except at extreme base (fig. 16) and only slightly longer than the width of head, the *entirely pale legs,* and the *head projecting well beyond anterior margin of eyes* (fig. 3A). Most similar in the form of the head, coloration and length of antennal segment 2, and dorsal vestiture to *syrticolae,* but distinguished by its smaller size, pale legs, and form of male genitalia (compare figs. 22 and 32). Antennal segment 1 usually mostly pale in *davisi,* whereas always completely dark in *syrticolae* (figs. 16, 19).

REDESCRIPTION: *Male:* Elongate, nearly parallel-sided, small; total length 3.10–3.54, length apex clypeus–cuneal fracture 2.27–2.49, width across pronotum 1.02–1.11. COLORATION (fig. 7): Dorsum deeply and uniformly castaneous, never with pale markings; membrane and veins fumose, except veins along posterior margin of cells pale; antennal segment 1 usually pale except for castaneous basal ring and dark spots at bases of mesial spine, sometimes mostly dark, segment 2 usually dark only at extreme base and weakly darkened at apex with remainder of segment pale (fig. 16), sometimes remainder of segment weakly infuscate, segments 3 and 4 pale; labial segment 1 castaneous, remainder of labium varying from pale to largely infuscate; venter, including metathoracic scent-gland evaporatory area, entirely castaneous; legs pale, white to golden, coxae sometimes partially infuscate basally and hind femora with some dark markings; tibial spines with small dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Calli demarcated along posterior margin; pronotum distinctly transversely rugose. Vestiture of dorsum composed of suberect, silvery, shining simple setae, forming distinctive somewhat bristly appearance (fig. 3C, D). STRUCTURE: Body elongate, nearly parallel-sided; eyes relatively small (fig. 3A); clypeus prominent, head distinctly protruding anteriorly, anteocular distance 2.0 times diameter of antennal segment 1 (fig. 3A); head projecting below eye by 2.0 times diameter of antennal segment 1 (fig. 3A); labium reaching to about apex of hind coxae; metathoracic scent-gland evaporatory area and spiracle as in figure 3B; pretarsus as in figure 3E. GENITALIA (fig. 22): Body of vesica more or less J-shaped, base of vesica falling slightly below level of secondary gonopore, posterior apical spine relatively broad, rather strongly curving, obliquely angled relative to body of vesica, anterior spine barely longer than posterior and at nearly right angle to body of vesica; flange on vesica relatively narrow, not quite reaching base of gonopore.

Female: Very similar to male in coloration but body much more strongly ovoid in outline. Total length 2.87–3.28, length apex clypeus–cuneal fracture 2.11–2.31, width across pronotum 1.04–1.09.

HOSTS: *Potentilla* spp. (Rosaceae). Recorded occurrences from other plants are most likely just sitting records.

DISTRIBUTION: Across Canada from Ontario to British Columbia; south in the Rocky Mountain system to New Mexico, and in the eastern United States known from Iowa and Minnesota.

SPECIMENS EXAMINED: CANADA.—**British Columbia:** 3 mi W of Rock Creek, June 7, 1959, E. E. MacDougal, *Potentilla* sp. (Rosaceae), 7♂, 4♀ (CNC). 7 mi W of Bridgeville, June 28, 1966, W. Gagne and J. Haddock, 2♂ (UCB). Rock Creek, June 7, 1959, L. A. Kelton and R. E. Leech, *Potentilla milligrama* (Rosaceae), 10♀ (CNC). **Manitoba:** 10 mi W of Roblin, June 15, 1954, Brooks and Wallis, 2♂ (CNC). 30 mi W of Roblin, July 13, 1954, Brooks and Wallis, 2♂, 8♀ (CNC). 5 km N of Spirit Sands, Spruce Wood Prov. Park, July 8, 1990, M. D. Schwartz, *Hamamelis virginiana* (Hamamelidaceae), 1♂ (CNC). Aweme, June 10, 1919, N. Cridle, 1♂, 1♀ (CNC). W of Carberry, 1.0 km SE of jct Hwys 1 and 361, July 8, 1990, M. D. Schwartz, 1♀ (AMNH). **Ontario:** Middleville, August 7, 1980, D. J. E. Brown, 1♂, 1♀ (CNC). **Saskatchewan:** Broadview, July 10, 1957, A. R. Brooks, 1♂,

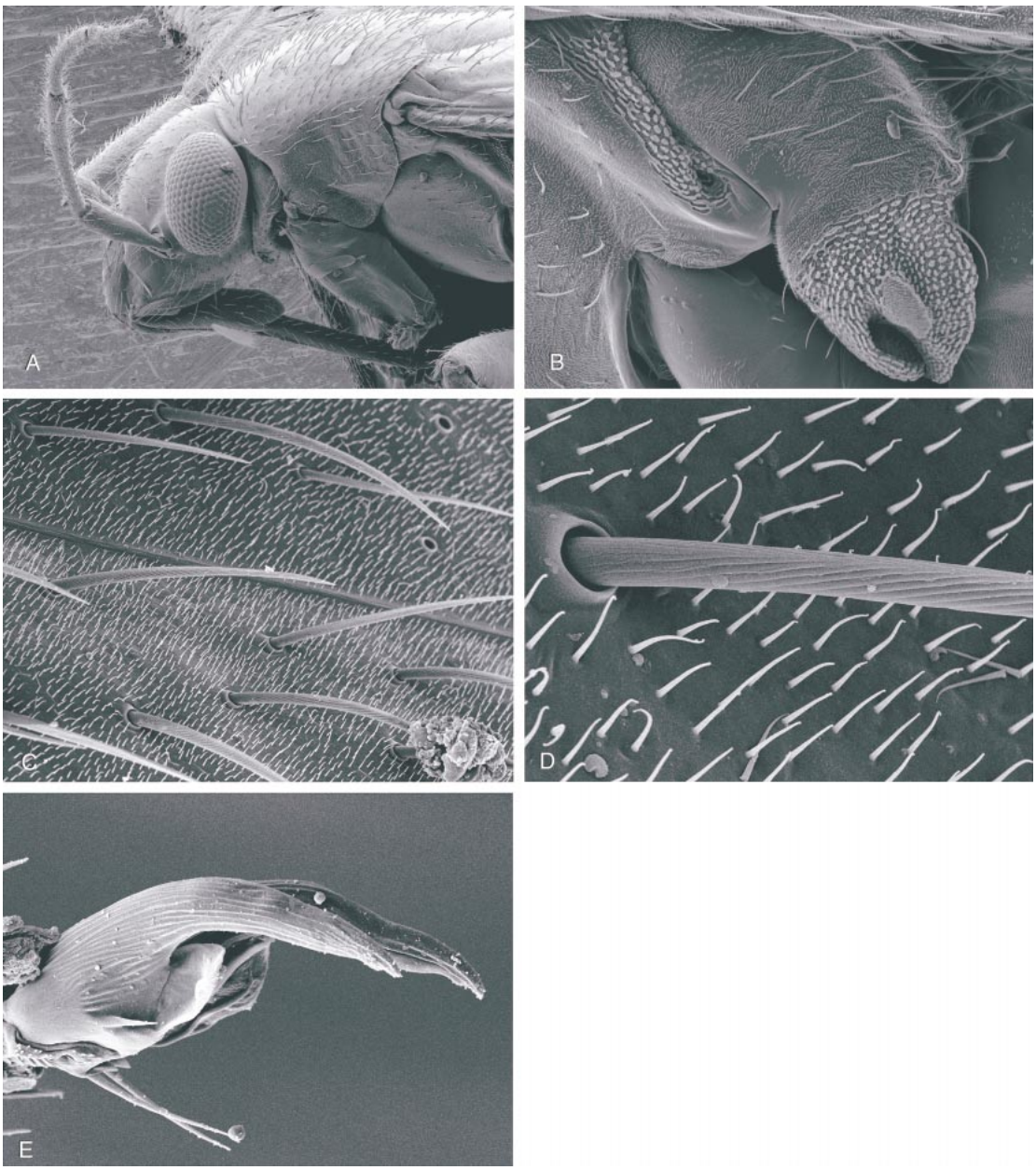

Fig. 3. *Plagiognathus davisi*, male, scanning micrographs. **A.** Lateral view of head. **B.** Metathoracic spiracle and metathoracic scent-gland evaporatory area. **C.** Hemelytral vestiture. **D.** Detail of hemelytral vestiture. **E.** Pretarsus.

1♀ (CNC). Christopher Lake, July 15, 1959, A. and J. Brooks, 1♀ (CNC). Lebret, July 5, 1951, L. A. Konotopetz, 1♀ (CNC). Prince Albert, July 23, 1959, A. and J. Brooks, 1♀ (CNC). USA.—**Colorado:** *Boulder Co.:* 4 mi NW of Boulder, June 8, 1961, B. H. Poole, 1♀ (CNC). Boulder, 5500 ft, June 9, 1961, B. H. Poole, 2♂ (CNC). Nederland, Science Lodge, 9000 ft, July 29, 1960, J. R. Stainer, 1♀ (CNC). *Douglas Co.:* Waterton, June 10, 1982, D. A. Polhemus, *Potentilla* sp. (Rosaceae), 8♂, 5♀ (JTP). *Gilpin Co.:*

Pinecliffe, July 9, 1949, R. H. Beamer, 1♂ (KU). *Larimer Co.:* 40 mi W of Fort Collins, Bennett Crk. Pic. Grd., Pingree Pk. Rd., 7400 ft, July 14, 1986, R. T. Schuh and J. T. Polhemus, 3♂, 3♀ (AMNH). Fort Collins, 16 mi NW Buckhorn Mt., June 22, 1966, 1♂ (TAMU). Rocky Mountain National Park, 8500 ft, July 20, 1965, M. H. Sweet, 1♀ (TAMU). *Unknown Co.:* Little Beaver Creek, July 11, 1937, R. H. Beamer, 1♂ (KU). **Iowa:** *Boone Co.:* Pilot Mound, June 1, 1957–June 10, 1962, J. C. Schaffner, *Potentilla arguta* (Rosaceae), 20♂, 12♀ (TAMU). Pilot Mound, June 13, 1953, J. C. Schaffner, 2♂, 9♀ (AMNH). Pilot Mound, June 19, 1962, H. H. Knight, *Potentilla arguta* (Rosaceae), 1♀ (CNC). Pilot Mound, June 30, 1962, H. H. Knight, *Potentilla arguta* (Rosaceae), 1♂, 1♀ (USNM). *Story Co.:* Ames, August 30, 1953, J. C. Schaffner, 1♂ (TAMU). Ames, July 10, 1943, H. H. Knight, 1♂ (USNM). Ames, July 14, 1926, G. H., 1♀ (CNC). Ames, June 28, 1951, J. L. Laffoon, 1♂ (AMNH). **Maine:** *Butler Co.:* Augusta, June 26, 1941, A. E. Brower, 1♂ (USNM). **Minnesota:** *Ramsey Co.:* No specific locality, June 15, 1923, H. H. Knight, *Ulmus* sp. (Ulmaceae), 3♂, 3♀ (USNM). **Montana:** *Gallatin Co.:* Earthquake Lake, July 26, 1966, W. Gagne and J. Haddock, 1♀ (PDA). **New Mexico:** *Otero Co.:* Cloudcroft, June 27, 1949, L. J. Lipovsky, 1♂, 2♀ (KU). *Taos Co.:* Tres Ritos, July 25, 1968, J. C. Schaffner, *Potentilla fruticosa* (Rosaceae), 4♂, 2♀ (TAMU). **New York:** *Unknown Co.:* Pine Island, June 20, 1912, W. T. Davis, holotype female (USNM). **Wyoming:** *Park Co.:* Yellowstone National Park, August 9, 1927, H. H. Knight, 1♂ (CNC).

Plagiognathus delicatus (Uhler)
Figures 7, 16, 22

Psallus delicatus Uhler, 1887: 34 (n. sp.).
Gerhardiella delicatus: Van Duzee, 1916b: 243 (n. comb.).
Plagiognathus delicatus: Knight, 1923: 433 (n. comb.).

DIAGNOSIS: Recognized by the relatively small size, coloration of *dorsum dominated by orange, calli usually darkened* (fig. 7), antennal segment 1 black, segment 2 usually pale, sometimes black basally (fig. 16), *tibial spines with tiny dark spots at bases, tibiae pale at articulation with femur,* and the *vesica being relatively short and stout* with a relatively broad flange and long apical spines (fig. 22). Distinguished from *cornicola* by the tibiae being pale at articulation with the femora and the tibial spines with tiny black spots at bases, whereas in *cornicola* tibiae dark at articulation with femur and black spots at bases of tibial spines larger. Also, vesica in *delicatus* relatively stout with long apical spines and with base nearly reaching level of gonopore (fig. 22), whereas vesica in *cornicola* longer and more slender (fig. 22). Coloration almost always heavily orange, whereas *cornicola* mostly dark brown or castaneous in some populations. Similar in coloration also to *viticola* (fig. 14), but that species smaller with all antennal segments entirely pale (fig. 19) and tibial spines without dark spots at bases.

REDESCRIPTION: *Male:* Moderately small, relatively stout-bodied; total length 3.14–3.40, length apex clypeus–cuneal fracture 2.12–2.24, width across pronotum 1.05–1.14. COLORATION (fig. 7): Coloration of dorsum always somewhat mottled, varying from orange or red-orange to brown; calli usually darker than remainder of pronotum; membrane pale to very weakly fumose, veins pale; antennal segment 1 usually dark except for pale apical annulus, segment 2 variable, either dark at extreme base with remainder pale, or completely pale (fig. 16), segments 3 and 4 pale to infuscate; clypeus castaneous, contrasting with adjacent areas of head; labium varying from mostly pale to weakly infuscate; venter mottled with pale and orange or brown, metathoracic scent-gland evaporatory area pale; legs varying from almost entirely pale, including coxae, to having coxae, trochanters, and femora weakly infuscate or orange; femora with some dark spots; tibiae always with pale background coloration and small, but obvious, dark spots at the bases of the tibial spines; tibiae pale at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, pale, golden, shining, simple setae. STRUCTURE: Elongate-ovoid, lateral corial margins weakly convex; frons weakly convex, slightly projecting beyond anterior mar-

gin of eyes, clypeus barely visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by 0.5 times diameter of antennal segment 1; antennal segment 2 short, only slightly longer than width of head; labium relatively short, not quite reaching apex of middle coxae. GENITALIA (fig. 22): Body of vesica relatively stout, very strongly curving, U-shaped, base of vesica reaching level of secondary gonopore; posterior apical spine long, nearly straight and weakly angled relative to body of vesica, anterior spine distinctly longer than posterior, angled near apex, and more strongly angled relative to body of vesica than posterior spine; vesical flange moderately developed, reaching to base of secondary gonopore.

Female: Very similar to male in coloration but body more strongly ovoid in outline. Total length 3.06–3.30, length apex clypeus–cuneal fracture 2.12–2.34, width across pronotum 1.10–1.19.

HOST: *Gleditsia triacanthos* (Fabaceae). All other records are nonbreeding.

DISTRIBUTION: Eastern North America, as far west as the foothills of the Rocky Mountains in Colorado.

DISCUSSION: This species was originally placed by Uhler in *Psallus*, but it has subsequently been placed in *Plagiognathus* by most authors, and the form of the male genitalia confirms that placement. Concerning the origins of this taxon, as he knew it, Uhler said only that ''A dark variety of this species has been captured in the highlands of Georgia''. The type locality has therefore been treated as Georgia. Knight (1923, 1941) recorded *delicatus* as occurring on *Gleditsia triacanthos* from Illinois east to Virginia and north to New York. Wheeler and Henry (1976) discussed the occurrence of *delicatus* on *Gleditsia*. I have not seen material of *delicatus* from as far south as Georgia. Nonetheless, I am using the name *delicatus* in the sense of Knight (1923, 1941) and Wheeler and Henry (1976), because clearly the taxon feeding on *Gleditsia* is distinct from the one commonly found on *Cornus*. The distribution is now known to extend as far west as the area around Denver, Colorado.

No material exists in the USNM collections that can be documented as having been examined by Uhler in the preparation of his description of *delicatus*. I am therefore designating a neotype (male) to promote stability of concept for this taxon. It bears the following label data and is deposited in the United States National Museum of Natural History:

> USA: VA: Montgomery Co., Blacksburg, Va. Polytech. Inst., 3 Je 1989, A. G. Wheeler, Jr.; *Gleditsia triacanthos*; Neotype *Psallus delicatus* Uhler, det R. T. Schuh

Populations from the Northeast are heavily weighted towards female specimens, whereas those from farther west, including Kansas and Colorado, show an almost equal distribution of males and females.

SPECIMENS EXAMINED: CANADA.—**Ontario:** Fonthill, June 8, 1962, Kelton and Thorpe, ex Fabaceae, 1♂ (CNC). Niagara Falls, June 8, 1962, Kelton and Thorpe, *Gleditsia* sp. (Fabaceae), 6♂, 9♀ (CNC). Pt. Pelee, June 23, 1931, G. S. Walley, 20♂, 30♀ (CNC). USA.—**Colorado:** *Arapahoe Co.:* Englewood, June 9, 1985, J. T. and D. A. Polhemus, *Gleditsia triacanthos* (Fabaceae), 14♂, 4♀ (JTP). *Douglas Co.:* Chatfield State Park, June 3, 1992, J. T. Polhemus, 2♀ (JTP). Waterton, June 19, 1984, D. A. Polhemus, 1♂, 3♀ (JTP). **Illinois:** *Hardin Co.:* Elizabethtown, May 27, 1932, H. L. Dozier, 1♀ (AMNH). *Jackson Co.:* Grand Tower, May 12, 1932, Frison, Ross, and Mohr, 1♂, 1♀ (AMNH). **Iowa:** *Story Co.:* Ames, June 14, 1927, H. H. Knight, 1♂, 1♀ (TAMU). Ames, June 21, 1964, H. H. Knight, 2♀ (USNM). Ames, June 3, 1955, H. H. Knight, 2♂, 1♀ (USNM). Ames, June 9, 1927–July 3, 1931, H. M. Harris, 2♂, 2♀ (TAMU). **Kansas:** *Douglas Co.:* Lawrence vicinity, May 15, 1971, V. P. Gapud, 3♂, 6♀ (KU). *Riley Co.:* Manhattan, May 12, 1917, P. L. Nixon, 2♂ (PDA). **Louisiana:** *Baton Rouge Co.:* Baton Rouge, April 26, 1986–May 8, 1988, D. A. Rider, E. G. Riley, 6♂, 1♀ (DAR). LSU Campus, April 9, 1986–May 9, 1986, D. A. Rider, 4♂ (DAR). *East Baton Rouge Co.:* 1.2 mi S of Central, E of LA Rt 3035, May 19, 1988, C. B. Barr, 1♂ (LSU). Baton Rouge, April 21, 1987, E. G. Riley, 1♂ (LSU). LSU Campus, May 16, 1985, D. A. Rider, 1♂ (LSU). *Natchez Co.:* Red Dirt Wildlife Man. Area, April 29, 1985, D. A. Rider, 2♂ (DAR). *St. Landry Co.:* 1 mi N of Port Barre

on Hwy 103, April 27, 1986, E. G. Riley and D. A. Rider, 3♀ (DAR, LSU). **Maryland:** *Montgomery Co.:* Rockville, Rt 28, May 11, 1985, T. J. Henry and A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 4♂, 3♀ (USNM). *Prince Georges Co.:* College Park, University of Maryland, June 4, 1988, T. J. Henry, *Gleditsia triacanthos* (Fabaceae), 5♀ (USNM). **Missouri:** *Boone Co.:* Columbia, May 20, 1981, R. L. Blinn, *Gleditsia triacanthos* (Fabaceae), 1♂, 1♀ (DAR). **New York:** *Genesee Co.:* Batavia, July 1, 1915, H. H. Knight, 3♀ (CAS). *Nassau Co.:* East Meadow near Rt 25 on Bluebird Drive, June 18, 1986, M. D. Schwartz, *Gleditsia triacanthos* (Fabaceae), 21♀ (AMNH). Sagamore Hill Natl. Hist. Site, June 24, 1984, M. D. Schwartz, *Gleditsia triacanthos* (Fabaceae), 33♀ (AMNH). *Queens Co.:* Corona Heights, jct Van Doren St. and 108th St., June 3, 1986, M. D. Schwartz, *Quercus palustris* (Fagaceae), 1♀ (AMNH). *Suffolk Co.:* Cold Spring Harbor, Long Island, July 2, 1920, P. Butler, 1♀ (CAS). **Pennsylvania:** *Allegheny Co.:* Coraopolis, Morten Nursery, May 26, 1976, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 1♀ (AMNH). *Centre Co.:* State College, June 10, 1977, Schuh, Henry, Wheeler, *Gleditsia triacanthos* (Fabaceae), 62♀ (AMNH). State College, University Drive, June 1, 1977, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 1♂, 2♀ (PDA). *Cumberland Co.:* Allen, May 27, 1975, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 3♂, 3♀ (PDA). Camp Hill, June 7, 1983, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 4♂, 3♀ (PDA). *Dauphin Co.:* Harrisburg, East Harrisburg Cemetery, June 19, 1975, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 3♂, 3♀ (PDA). Harrisburg, East Harrisburg Cemetery, June 9, 1975, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 1♀ (AMNH). Harrisburg, Latsha, June 9, 1978, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 1♂ (PDA). Hershey, May 25, 1976, T. J. Henry, *Gleditsia triacanthos* (Fabaceae), 1♂, 3♀ (PDA). Hershey, May 28, 1976, T. J. Henry, *Gleditsia triacanthos* (Fabaceae), 1♀ (AMNH). Hershey, St. Joan of Arc School, June 1, 1975, T. J. Henry, *Gleditsia triacanthos* (Fabaceae), 4♂, 18♀ (PDA). *Erie Co.:* Fariview, Fairview Nurseries, June 5, 1974, T. J. Henry and A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 2♂, 6♀ (PDA). *Indiana Co.:* Indiana, July 7, 1963, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 1♀ (PDA). **Texas:** *Brazos Co.:* Bryan, April 27, 1966, J. C. Schaffner, 3♂ (TAMU). College Station, April 21, 1933, H. J. Reinhard, 1♂, 1♀ (USNM). College Station, April 25, 1970, R. C. Phelps, 1♂ (TAMU). College Station, May 1, 1935–May 18, 1937, H. G. Johnston, 4♀ (TAMU). *Collins Co.:* 7 mi E of Blue Ridge, May 3, 1998, J. C. Schaffner, 1♀ (TAMU). *Hill Co.:* 2 mi W of West, April 21, 1972, J. C. Schaffner, *Gleditsia triacanthos* (Fabaceae), 1♀ (TAMU). *McClennan Co.:* 3 mi W of West, May 3, 1971, J. C. Schaffner, 1♀ (TAMU). **Virginia:** *Montgomery Co.:* Blacksburg, Virginia Polytechnic Inst., June 3, 1989, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 2♂, 3♀ (USNM). **Washington, D.C.:** May 17, 1915, O. Heidemann, 3♀ (PDA).

Plagiognathus dimorphus, new species
Figures 7, 16, 23

HOLOTYPE: Male: ''USA: Wyoming: Shoshone Co.: Fox Crk. Cmpgrd., 6.9 mi E Cooke City on Rt. 212, 7250 ft., Aug. 11, 1986, Schuh, Schwartz, and Stonedahl, ex *Shepherdia canadensis* (L.) Nutt. (Elaeagnaceae)''. Deposited in the American Museum of Natural History, New York.

DIAGNOSIS: Recognized by the moderately *large size,* elongate, somewhat *flattened, nearly parallel-sided body form,* totally dark antennae, generally brownish, rather than castaneous to blackish coloration of dorsum, and the *diffuse pale area at base of corium running posteriorly from base of wing a short distance along radial vein* (fig. 7). Pattern of coloration on dorsum in *dimorphus* not as distinct as in most *Plagiognathus* species and sexual dimorphism stronger than in most, *females being shorter and much more strongly ovoid than males* (fig. 7). Body of vesica and flange similar in conformation to *obscurus* (compare figs. 23 and 29), but these species easily distinguished on basis of external attributes. Possibly confused with *paramundus,* but that species with scutellum pale laterally with a dark, median, longitudinal stripe, with the hemelytra more exten-

sively pale, and with a relatively narrow flange on the vesica (fig. 11).

DESCRIPTION: *Male:* Elongate, more or less parallel-sided, large; total length 3.78–4.80, length apex clypeus–cuneal fracture 2.51–3.06, width across pronotum 1.11–1.36. COLORATION (fig. 7): Background coloration of dorsum brown; vertex, and sometimes frons, pale; pronotum often partially to largely pale, but calli always dark; corium with a narrow pale area running down basal one-fourth of radial vein; costal vein mostly dark; cuneus pale on basal one-third; corium narrowly pale at extreme base of membrane; membrane fumose, veins mostly pale except along posterior margin of cells, membrane pale at angle between posterior margin of small cell and posteromesial margin of cuneus; all antennal segments castaneous to black (fig. 16), except for pale, narrow, apical annulus on segment 1; labium castaneous; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs mostly pale to very weakly infuscate, extreme base of coxae usually infuscate; femora with numerous dark spots; tibiae pale, spines with dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to weakly shining. Vestiture of dorsum composed of recumbent, brown, golden, shining, simple setae. STRUCTURE: Lateral corial margins very weakly convex; frons moderately convexly rounded as viewed from above, clypeus visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 23): Body of vesica stout and broadly curving, more or less U-shaped, base of vesica not quite reaching to level of secondary gonopore; posterior apical spine long, weakly curving, forming an oblique angle relative to body of vesica, anterior spine slightly longer than posterior, nearly straight in lateral view, angle relative to body of vesica not quite perpendicular; flange broad, nearly straight, long, reaching past midpoint of secondary gonopore.

Female: Body shorter, broader, and more strongly ovoid than in male (fig. 7). Pronotum and hemelytra more extensively pale than in male; mesoscutum and scutellum sometimes largely pale (fig. 7). Total length 3.81–3.99, length apex clypeus–cuneal fracture 2.64–2.72, width across pronotum 1.16–1.28.

ETYMOLOGY: Named for the strong sexual dimorphism.

HOSTS: *Shepherdia canadensis* (Elaeagnaceae). Records from *Salix* spp. probably represent sitting occurrences.

DISTRIBUTION: Alaska and Yukon in the north, south through Montana, Wyoming, Utah, and Colorado.

PARATYPES: CANADA.—**Alberta:** Kananaskis, Highwood/Cataract Zone, picnic area of Rt 40, July 24, 1994, M. D. Schwartz, 2♀ (CNC). Kananaskis, Peter Longhead Prov. Park, July 24, 1994, M. D. Schwartz, *Salix* sp. (Salicaceae), 1♀ (CNC). **British Columbia:** Ft. Nelson, August 19, 1983, L. A. Kelton, ♀ (CNC). Hedley, July 22, 1970, L. A. Kelton, *Shepherdia canadensis* (Elaeagnaceae), 4♂, 5♀ (CNC). Langley, July 17, 1959, L. A. Kelton, 1♂ (CNC). 11 mi NW of Osoyoos, 4 km SE of Mt. Kobau Summit, M. D. Schwartz, *Alnus rugosa,* 3♀ (CNC). Terrace, July 9, 1960, W. R. Richards, 1♀ (CNC). Toad River, 2 mi N of Wood Creek, August 1, 1982, G. G. E. Scudder, 4♂ (UBC). Yahk, August 8, 1973, L. A. Kelton, 3♂ (CNC). **Yukon Territory:** Carcross, July 29, 1982, G. G. E. Scudder, 3♂, 13♀ (UBC). Carmacks, July 17, 1982, L. A. Kelton, *Shepherdia canadensis* (Elaeagnaceae), 6♂, 2♀ (CNC). 14 mi SE of Dawson, 1300 ft, P. J. Skitsko, August 6, 1962, *Populus* sp. (Salicaceae), 1♀ (CNC). Duke River, Burwash Landing, July 25, 1979, S. G. Cannings, 1♀ (UBC). Engineer Creek, Dempster Hwy, July 23, 1983, L. A. Kelton, *Shepherdia canadensis* (Elaeagnaceae), 8♂, 1♀ (CNC). Tagish, July 17, 1983, L. A. Kelton, 1♂ (CNC). Tatchun, August 18, 1982, L. A. Kelton, *Shepherdia canadensis* (Elaeagnaceae), 16♂, 11♀ (CNC). Tatchun Creek, July 19, 1982, G. G. E. Scudder, 1♂, 2♀ (UBC). Whitehorse, July 16, 1982, 1♀ (CNC). USA.—**Alaska:** Tok, July 22, 1982, L. A. Kelton, *Shepherdia canadensis* (Elaeagnaceae), 18♂, 15♀ (CNC). **Colorado:** *Jackson Co.:* 2 mi W of Gould, 9000 ft, August 13, 1968, Oman, 1♂ (OSU). Gould, August 12, 1968, L. A. Kelton, *Shepherdia* sp. (Elaeagnaceae),

35♂, 31♀ (CNC). *Jefferson Co.:* Upper Beaver Br. Gulch, August 12, 1981, D. A. Polhemus, 4♂, 2♀ (JTP). *Larimer Co.:* 46 mi W of Fort Collins, Fish Creek Picnic Grounds, Pingree Park Road, 7700 ft, July 14, 1986, R. T. Schuh and J. T. Polhemus, *Shepherdia canadensis* (Elaeagnaceae), 10♂, 13♀ (AMNH). **Montana:** *Park Co.:* Rt 212 at Wyoming border, 7750 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, *Shepherdia canadensis* (Elaeagnaceae), 15♂, 24♀ (AMNH, USNM). *Teton Co.:* 30 mi NW of Choteau on Rt 189, West Fork of Teton River, 5600 ft, August 2, 1994, M. D. Schwartz, *Salix* sp. (Salicaceae), 1♂, 1♀ (CNC). **Utah:** *Box Elder Co.:* Raft River Mts., 5 mi SW of Clear Creek Campground, 6200–8000 ft, July 31, 1981, M. D. Schwartz, *Shepherdia canadensis* (Elaeagnaceae), 28♂, 33♀ (AMNH, USNM). **Wyoming:** *Fremont Co.:* Wind River Mts., Shoshone Natl. Forest, Papoagie Cmpgrd on Rt 131, August 14, 1986, Schwartz and Stonedahl, *Shepherdia canadensis* (Elaeagnaceae), 18♂, 30♀ (AMNH). *Shoshone Co.:* 6.9 mi E of Cooke City on Rt 212, Fox Creek Campground, 7250 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, *Shepherdia canadensis* (Elaeagnaceae), 48♂, 55♀ (AMNH, USNM); holotype male (AMNH).

Plagiognathus dispar Knight
Figures 7, 16, 23

Plagiognathus punctatipes dispar Knight, 1923: 451 (n. var.).
Plagiognathus crategi Knight, 1929c: 264 (n. sp.; syn. with *dispar* by Froeschner, 1949: 133).
Plagiognathus carinatus Knight, 1926: 10 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Recognized by the *elongate body form, antennal segment 2 usually pale except at extreme base, castaneous coloration of the dorsum* with only the posterior margin of the vertex pale, the corium narrowly pale adjacent to the extreme base of the membrane, the base of the cuneus pale (fig. 7), the femora usually pale with some dark blotches, the *tibiae dark at articulation with femora,* and the vesica of the male with a heavy body, broad flange, and divergent apical spines (fig. 23). Similar in coloration of the dorsum, antennae, and legs to *punctatipes* and *rileyi* as well as dark specimens of *cornicola.* Distinguished from *punctatipes* by the more slender body form, the tibiae being dark at the articulation with the femora, and the frequent presence of pale markings at base of cuneus and sometimes elsewhere on the dorsum; distinguished from *rileyi* by the less robust body form, and unequivocally by the form of the male genitalia, especially the flange and the apical spines (compare figs. 7 and 31). Appearance and coloration also similar to dark-colored specimens of *cornicola,* but easily distinguished from that species by broader and more strongly curving heavy-bodied vesica with a very broad flange (compare figs. 22 and 23).

REDESCRIPTION: *Male:* Elongate, of moderate size; total length 3.32–3.86, length apex clypeus–cuneal fracture 2.26–2.67, width across pronotum 1.04–1.20. COLORATION (fig. 7): Dorsum generally castaneous, except posterior margin of vertex, corium narrowly pale adjacent to extreme base of membrane, and base of cuneus usually narrowly pale; membrane fumose, veins pale; face highly polished and deeply castaneous at and below base of clypeus; antennal segment 1 castaneous except for pale apical annulus, segment 2 dark at extreme base, remainder of segment pale (fig. 16), segments 3 and 4 pale; labium, except segment 1, pale; venter mostly brown to castaneous, metathoracic scent-gland evaporatory area pale; legs, including coxae, usually pale, often golden, except hind femora with some dark spots, and sometimes moderately infuscate; dorsal tibial spines with at most faint dark spots at bases (but see Discussion below); tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Body form elongate-ovoid; frons weakly convex as viewed from above, clypeus visible; anteocular distance slightly greater than diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 23): Body of vesica more or less J-shaped, base of vesica reaching to near level of secondary gono-

pore, posterior apical spine elongate, nearly straight, relatively broad, obliquely angled relatively to body of vesica, anterior spine elongate, nearly straight and at nearly right angles to body of vesica; flange on vesica moderately broad, reaching to base of gonopore.

Female: Very similar to male in coloration and body form, but more strongly ovoid. Total length 3.15–3.68, length apex clypeus–cuneal fracture 2.27–2.62, width across pronotum 1.03–1.24.

HOSTS: Recorded as breeding on woody species, including primarily members of the Fagaceae, Juglandaceae, and Rosaceae. Many other records may simply be sitting occurrences.

DISTRIBUTION: Eastern North America, from Nova Scotia to Saskatchewan in the north, south to Texas.

DISCUSSION: Knight (1926) described *Plagiognathus carinatus* as occurring on *Diospyros* (persimmon) in Virginia. He referred to antennal segment 2 as ''brownish to black, black at base'', but in his discussion noted that in some specimens the segment was more yellowish than black. Knight compared these latter specimens with *Plagiognathus punctatipes.* Comparison of the male genitalia of a Knight paratype from the type locality indicates that the genitalia of *carinatus* are essentially the same as those of *dispar.* The most obvious potential difference between these two nominal species is size, with most specimens readily attributable to *carinatus* being slightly larger than what might be thought of as typical *dispar*; also most *carinatus* specimens have tibial spines with dark spots at bases whereas typical *dispar* specimens have the tibial spines with at most faint dark spots at bases. Even though Knight based the name of his species on what he observed to be a carination along the anterior margin of the dorsal angle of the left paramere, there is nothing about the left paramere in *carinatus* that sets it apart from any other species I am placing in *Plagiognathus.* In the absence of any convincing evidence to the contrary, I am treating *carinatus* as a junior synonym of *dispar.*

SPECIMENS EXAMINED: CANADA.—**Manitoba:** Boissevain, July 15, 1953, Brook and Kelton, 1♂ (CNC). Boissevain, July 16, 1953, Brooks and Kelton, 3♂, 3♀ (CNC). Virden, July 13, 1953, Brooks and Kelton, 1♂ (CNC). **New Brunswick:** Woodstock, June 22, 1966, L. A. Kelton, 1♀ (CNC). **Nova Scotia:** Kentville, July 15, 1966, L. A. Kelton, 1♂ (CNC). Kentville, July 3, 1976, L. A. Kelton, 4♂, 1♀ (CNC). Mt. Uniacke, July 13, 1966, L. A. Kelton, 1♀ (CNC). **Ontario:** Dunnville, July 16, 1962, H. Blanchard, 2♀ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, 1♀ (CNC). Erie View, July 4, 1962, G. Thorpe, *Juglans* sp. (Juglandaceae), 1♀ (CNC). Goderich, July 2, 1962, H. Blanchard, 1♀ (CNC). Jordan, July 17, 1961, L. A. Kelton, 1♀ (CNC). Kingsville, June 19, 1962, Kelton and Thorpe, *Crataegus* sp. (Rosaceae), 6♀ (CNC). Leamington, June 19, 1962, Kelton and Thorpe, *Juglans* sp. (Juglandaceae), 2♂, 3♀ (CNC). London, June 22, 1952, E. H. N. Smith, 1♂ (CNC). Mt. Pleasant, July 10, 1958, L. A. Kelton, 3♂, 1♀ (CNC). Nepean, Piney Forest, July 27, 1991, M. D. Schwartz, 1♂ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 1♀ (CNC). Rockaway, June 21, 1962, Kelton and Thorpe, 1♀ (CNC). St. Lawrence Is. Natl. Park, McDonald Is., July 14, 1976, A. Carter, 1♀ (CNC). Tillsonburg, July 11, 1958, L. A. Kelton, 1♀ (CNC). Wardsville, July 14, 1955, L. A. Kelton, 1♀ (CNC). Waverley, June 29, 1962, G. Thorpe, 1♀ (CNC). **Quebec:** Fabre, July 12, 1963, W. Gagne, *Rhamnus* sp. (Rhamnaceae), 7♀ (CNC). Laniel, July 18, 1962, W. Gagne, 1♂ (CNC). **Saskatchewan:** Saskatoon, July 20, 1955, A. R. Brooks, 12♀ (CNC). USA.—**Connecticut:** Storrs, July 16, 1954, J. A. Slater, 1♀ (AMNH). **Illinois:** *Mason Co.:* Havana, May 27, 1935, Mohr and Burke, 1♀ (AMNH). *Will Co.:* Frankfort, June 8, 1933, Mohr and Townsend, 1♀ (CNC). Frankfort, June 8, 1933, Mohr and Townsend, *Fraxinus* sp. (Oleaceae), 1♂, 2♀ (AMNH). Frankfort, June 8, 1933, Mohr and Townsend, *Fraxinus* sp. (Oleaceae), 1♂, 2♀ (USNM). Joliet, June 9, 1933, Mohr and Townsend, 1♂ (CNC). Joliet, June 9, 1933, Mohr and Townsend, 1♂ (USNM). **Iowa:** *Clinton Co.:* Clinton, June 28, 1926, C. J. Drake, 1♂ (USNM). *Henry Co.:* 5 mi SW of Mt. Pleasant, June 20, 1976, J. C. Schaffner, 2♀ (TAMU). *Story Co.:* Ames, July 1, 1929, H. M. Harris, 1♂, 1♀ (TAMU). Ames, July 2, 1928, H. H.

Knight, *Crataegus* sp. (Rosaceae), holotype male (*crataegi*) (USNM). Ames, June 13, 1951, J. A. Slater, *Juglans nigra* (Juglandaceae), 2♂ (AMNH). Ames, June 15, 1927, H. G. Johnston, 4♂ (TAMU). Ames, June 21, 1964, H. H. Knight, 3♂, 6♀ (USNM). Ames, June 25, 1927, H. G. Johnston, 3♂, 7♀ (TAMU). *Warren Co.:* 3 mi NE of Hartford, June 3, 1994, J. C. Schaffner, *Gleditsia triacanthos* (Fabaceae), 6♀ (TAMU). **Louisiana:** *East Baton Rouge Co.:* Baton Rouge, May 27, 1988, D. A. Rider, 7♂, 1♀ (DAR). **Maine:** *Unknown Co.:* Ceratunk, August 8, 1950, ex Pinaceae, 1♀ (USNM). **Maryland:** *Montgomery Co.:* Plummers Island, June 7, 1914, W. L. McAtee, 1♀ (USNM). *Prince Georges Co.:* Beltsville, July 3, 1926, H. H. Knight, 2♂, 1♀ (USNM). **Massachusetts:** *Middlesex Co.:* Holliston, July 4, 1900, N. Banks, 1♀ (AMNH). **Minnesota:** *Ramsey Co.:* No specific locality, July 18, 1920, H. H. Knight, 1♂ (USNM). No specific locality, June 18, 1920, H. H. Knight, 1♂ (USNM). St. Anthony Park, June 16, 1921, H. H. Knight, 2♂, 3♀ (USNM). **Mississippi:** *Adams Co.:* Natchez, May 15, 1931, H. G. Johnston, 10♂, 18♀ (TAMU). *Prentiss Co.:* Booneville, May 26, 1931, H. G. Johnston, 8♂, 8♀ (TAMU). **Missouri:** *Barry Co.:* Roaring River State Park, August 2, 1907, E. P. Van Duzee, 1♀ (CAS). *Vernon Co.:* 4 mi W of Montevallo, June 14, 1966, J. C. Schaffner, 1♂, 4♀ (TAMU). **New Jersey:** *Sussex Co.:* Rt 4519 at Blakeslees Bridge, May 27, 1984, K. Schmidt, 2♂ (AMNH). **New York:** *Genesee Co.:* Batavia, July 14, 1916, H. H. Knight, 1♀ (CNC), holotype male (*dispar*) (USNM). Batavia, July 28, 1923, H. H. Knight, 1♂, 3♀ (USNM). Batavia, July 31, 1916, H. H. Knight, paratypes: 1♂, 1♀ (CAS). *Hamilton Co.:* Blue Mountain Lake, July 27, 1948, R. H. Beamer, 1♀ (KU). *Monroe Co.:* Honeoye Falls, July 27, 1916, H. H. Knight, 2♂, 1♀ (USNM). *Nassau Co.:* Flower Hill near Rt 25A on Ridge Drive East, June 15, 1986, M. D. Schwartz, *Malus* sp. (Rosaceae), 17♂, 18♀ (AMNH). *Rockland Co.:* Stony Point Battlefield State Park, July 2, 1988, M. D. Schwartz, 1♀ (AMNH). Tuxedo, July 9, 1928, C. H. Curran, 2♂ (AMNH). *Tompkins Co.:* Ithaca, Cornell Plantations, June 25, 1982, A. G. Wheeler, Jr., *Viburnum* sp. (Caprifoliaceae), 3♀ (PDA). Ithaca, Cornell University, June 11, 1978, A. G. Wheeler, Jr., *Fagus sylvatica* (Fagaceae), 3♂, 3♀ (PDA). Ithaca, June 23, 1920–July 2, 1920, H. H. Knight, ex Rosaceae, 10♂, 5♀ (USNM). Ithaca, Treman, June 10, 1978, A. G. Wheeler, Jr., *Carya* sp. (Juglandaceae), 1♂, 1♀ (PDA). *Westchester Co.:* Hartsdale, July 5, 1924, *Fagus americanus* (Fagaceae), 1♀ (USNM). **North Carolina:** *Mecklenburg Co.:* near Matthews, Rt 51 1 mi W of Rt 16, May 14, 1978, A. G. Wheeler, Jr., *Ulmus alata* (Ulmaceae), 1♂ (PDA). **Oklahoma:** *La Flore Co.:* No specific locality, May 24, 1928, R. H. Beamer, 7♂, 1♀ (KU). **Pennsylvania:** *Berks Co.:* Rt 662 N of Moselem, June 13, 1975, K. R. Valley, *Juglans nigra* (Juglandaceae), 1♀ (PDA). *Centre Co.:* State College, June 10, 1977, Schuh, Henry, Wheeler, *Viburnum* sp. (Caprifoliaceae), 5♂, 12♀ (AMNH). State College, June 6, 1977, Schuh, Henry, Wheeler, *Crataegus* sp. (Rosaceae), 12♂, 27♀ (AMNH). University Park, Penn State Campus, June 6, 1979, A. G. Wheeler, Jr., *Rhododendron* sp. (Ericaceae), 2♀ (PDA). *Dauphin Co.:* East Hanover Township, Crooked Hill Road, June 3, 1975, A. G. Wheeler, Jr., *Juglans nigra* (Juglandaceae), 7♂, 7♀ (PDA). Harrisburg, June 23, 1921, Champlain, 1♂ (USNM). Harrisburg, near Rockville, July 18, 1979, T. J. Henry, *Juglans nigra* (Juglandaceae), 1♀ (PDA). Harrisburg, William Penn High School, June 7, 1974, B. R. Stinner, *Fagus sylvatica* (Fagaceae), 25♂, 30♀ (PDA). *Indiana Co.:* near Pine Flats, June 7, 1979, A. G. Wheeler, Jr., *Nyssa sylvatica* (Nyssaceae), 2♂, 2♀ (PDA). *Perry Co.:* Howe Township, June 14, 1979, T. J. Henry, *Juglans nigra* (Juglandaceae), 4♂ (PDA). *Union Co.:* Lewisburg, Bucknell University Campus, June 5, 1974, T. J. Henry and A. G. Wheeler, Jr., *Juglans nigra* (Juglandaceae), 2♂, 2♀ (PDA). *Wayne Co.:* Abrahamsville, Sunnybrook Nursery, August 19, 1973, A. G. Wheeler, Jr., *Juglans cinerea* (Juglandaceae), 1♀ (PDA). **South Carolina:** *Greenville Co.:* Greenville, May 9, 1976–May 28, 1979, R. S. Peigler, 2♂, 1♀ (TAMU). *Pickens Co.:* Clemson College, May 22, 1944, D. Dunavan, *Malus* sp. (Rosaceae), 1♂ (CLEMSON). **Tennessee:** *Ruth Co.:* MTSU campus, May 28, 1985, A. G. Wheeler, Jr., *Juglans nigra* (Juglandaceae),

1♂, 5♀ (PDA). **Texas:** *Brazos Co.:* Bryan, May 10, 1966, J. C. Schaffner, 2♂, 2♀ (TAMU). **Virginia:** *Dinwiddie Co.:* DeWitt, June 2, 1917, H. H. Knight, paratypes (*carinatus*): 6♂, 4♀ (CAS), holotype male (*carinatus*) (USNM). *Falls Church Co.:* Falls Church, May 24, 1900, N. Banks, 1♂, 1♀ (AMNH). **Washington, D.C.:** N. Banks, 1♂, 1♀ (AMNH). **West Virginia:** *Mineral Co.:* W of Burlington on Rt 220–50, June 19, 1979, A. G. Wheeler, Jr., *Carya ovata* (Juglandaceae), 1♂ (PDA). *Pocahontas Co.:* Buckeye, June 24, 1972, A. G. Wheeler, Jr., *Juglans nigra* (Juglandaceae), 1♂, 2♀ (PDA).

Plagiognathus emarginatae, new species
Figures 7, 16, 23

HOLOTYPE: Male: ''USA: CA[alifornia]: Alpine Co.: N of Ebbetts Pass, Pacific Crest Nat'l Scenic Trail, Toiyabe Nat'l Forest on Rt 4, 8000′, 5.7.94, M. D. Schwartz, *Prunus emarginata* (Dougl.) Walpers''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by its relatively *large* size, *elongate,* nearly parallel-sided body form, brown to *nearly black* coloration, and *silvery, shining, weakly scalelike vestiture* of dorsum intermixed posteriorly on the corium with recumbent, dark, simple setae (fig. 7). Most similar in size, coloration, and body conformation among western species to *urticae* (fig. 14), but that species having only simple, silvery, unflattened setae on the dorsum. Also possibly confused with totally dark specimens of *brunneus, lineatus,* and *shoshonea,* although silvery vestiture in those species uniformly distributed across entire dorsum.

DESCRIPTION: *Male:* Elongate, nearly parallel-sided, moderately large; total length 4.15–4.47, length apex clypeus–cuneal fracture 2.98–3.02, width across pronotum 1.25–1.35. COLORATION (fig. 7): General coloration usually nearly black, never with additional pale markings, although posterior margin of vertex weakly pale and posterior margin of veins of membrane pale with an adjoining small, triangular pale patch at posterior inner angle of cuneus; antennal segment 1 entirely dark, without pale apical annulus, segment 2 dark (fig. 16), segments 3 and 4 weakly infuscate; labium largely castaneous; venter, including metathoracic scent-gland evaporatory area, entirely castaneous; coxae, trochanters, and femora castaneous, or largely so; dorsal tibial spines with black spots at bases; tibiae black at articulation with femora; tibiae sometimes mostly black on proximal one-half of dorsal surface, much of ventral surface pale or nearly so. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of rather densely placed, flattened, weakly scalelike, silvery, shining setae intermixed with dark, simple setae on posterior half of corium. STRUCTURE: Frons weakly bulging and only slightly projecting beyond anterior margin of eyes in dorsal view, clypeus visible from above; anteocular distance 1.6 times diameter of antennal segment 1; head projecting below level of eye by diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 23): Body of vesica vaguely J-shaped, base of vesica falling somewhat below level of secondary gonopore, posterior apical spine relatively short, nearly straight, almost erect relative to body of vesica, anterior spine much longer than posterior and forming nearly a right angle with body of vesica; flange on vesica moderately broad, reaching to about basal one-third of secondary gonopore.

Female: Very similar to male in coloration but body conspicuously ovoid in outline. Total length 3.67–4.10, length apex clypeus–cuneal fracture 2.68–2.96, width across pronotum 1.15–1.26.

ETYMOLOGY: Named for its occurrence on *Prunus emarginata.*

HOSTS: *Prunus emarginata, P. subcordata* (Rosaceae); *Ceanothus velutinus* (Rhamnaceae).

DISTRIBUTION: Sierra Nevada Mountains of California.

DISCUSSION: A single male specimen from Sisson, California, July 26, 1918, E. P. Van Duzee (CAS) has scalelike setae similar to those found in the specimens recorded as paratypes for *emarginatae.* It differs from all other known specimens of this taxon in having the base of the corium and the base of the cuneus white and in having the trochan-

ters and adjoining portions of the coxae and femora pale.

PARATYPES: USA.—**California:** *Alpine Co.:* N of Ebbetts Pass, Pacific Crest Natl. Scenic Trail, Toiyabe Natl. Forest, Rt4, July 5, 1994, M. D. Schwartz, *Prunus emarginata* (Rosaceae), 1♂, 6♀ (AMNH, CNC). Just W of Minitor Pass on Rt 89, 2550 m, July 27, 1999, M. D. Schwartz, *Ceanothus velutinus* (Rhamnaceae), 1♂, 5♀ (AMNH, CNC). *El Dorado Co.:* Kyburz, July 10, 1965, H. H. Knight, 4♂, 5♀ (USNM). *Fresno Co.:* Huntington Lake, 7000 ft, July 8, 1919, E. P. Van Duzee, 1♂, 1♀ (CAS). *Modoc Co.:* Likely, July 1, 1975, E. Paddock, 1♂, (CAFA). *Siskiyou Co.:* Mt. Shasta City Park, Big Springs Creek, June 22, 1985, C. B. Barr, 1♂, 1♀ (LSU). *Tuolumne Co.:* Deadman Creek just E of vista point on Rt 108, 2800 m, July 27, 1999, M. D. Schwartz, *Prunus subcordata* (Rosaceae), 6♂, 1♀ (AMNH, CNC).

OTHER SPECIMENS: Sisson, July 26, 1918, E. P. Van Duzee, 1 ♂ (CAS).

Plagiognathus fenderi, new species
Figures 7, 16, 23

HOLOTYPE: Male: ''[USA] ORE[gon]. Yamhill Co., Top of Bald Mtn., 13 July 1958, K. M. Fender''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by *medium size,* generally dark coloration, including antennae and femora; corium between apex of clavus and base of membrane narrowly pale and *base of cuneus narrowly pale,* the membrane strongly fumose with entirely pale veins (fig. 7); dorsal *vestiture composed of silvery, shining, slightly flattened and weakly woolly setae*; *anteocular distance nearly 2 times diameter of antennal segment 1.* Similar in size and coloration to *fuscipes, laricicola, pemptos, piceicola,* and *suffuscipennis* specimens from the Rocky Mountain system; separated from all of those species by the anteocular distance being nearly 2 times diameter of antennal segment 1 rather than about 0.5 times; *pemptos* easily distinguished by its possession of nearly black, nonshining setae on the dorsum and veins of the membrane pale only along the posterior margin of the cells. Femora in *fuscipes* not so heavily darkened and that species feeding on *Potentilla* rather than *Abies*; *piceicola* and *suffuscipennis* with golden simple setae on dorsum and *suffuscipennis* without pale marking at base of cuneus and on the corium at the base of the membrane.

DESCRIPTION: *Male:* Medium sized, moderately elongate; total length 3.28–4.00, length apex clypeus–cuneal fracture 2.36–2.90, width across pronotum 1.02–1.16. COLORATION (fig. 7): General coloration of dorsum castaneous, corium narrowly pale adjacent to extreme base of membrane, and cuneus pale at base; clavus sometimes narrowly pale along all or part of claval suture; membrane mostly fumose with contrastingly pale veins; vertex tending toward pale, face at and below base of clypeus castaneous, polished and shining; antennae castaneous (fig. 16) except for pale apical annulus on segment 1; venter, coxae, and most of femora castaneous; trochanters and apex of all femora pale, yellow; dorsal tibial spines with dark spots at bases coalescing with one another, giving the appearance of banding when tibiae viewed from dorsal surface; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull. Vestiture of dorsum composed of silvery, shining, slightly flattened and weakly woolly setae. STRUCTURE: Body moderately elongate, corial margins weakly convex; frons conspicuously tumid and bulging beyond anterior margin of eyes in dorsal view, clypeus projecting and mostly visible in dorsal view; anteocular distance almost 2 times diameter of antennal segment 1; head projecting below level of eye by 1.5 times diameter of antennal segment 1; labium long, reaching just beyond apices of hind coxae. GENITALIA (fig. 23): Body of vesica relatively elongate, broadly curving basally, base falling well below level of secondary gonopore; posterior apical spine elongate, straight, weakly angled relative to body of vesica, anterior spine weakly angled relative to body of vesica, longer than posterior, rather sharply angled subapically; flange projecting only slightly beyond body of vesica, terminating just above base of secondary gonopore.

Female: Body more strongly ovoid than in male; coloration similar to male. Total length

3.44–3.67, length apex clypeus–cuneal fracture 2.44–2.69, width across pronotum 1.03–1.13.

ETYMOLOGY: Named for K. M. Fender, collector of several of the available specimens, including the holotype.

HOSTS: *Abies procera* (Pinaceae).

DISTRIBUTION: Oregon, Idaho, Montana, south to northern California and Utah.

PARATYPES: USA.—**California:** *Placer Co.:* 1.6 km SW of Tahoe City, Granlibakken Ski Res., August 5, 1983, T. W. Davies, 1♂, (CAS). *Tuolumne Co.:* Strawberry, August 8, 1929, P. W. Oman, L. D. Anderson, 5♂, 5♀ (KU, AMNH). **Idaho:** *Latah Co.:* Moscow, July 4, 1932, T. A. Brindley, 6♂, 4♀ (USNM). **Montana:** *Mineral Co.:* Haugan, August 9, 1931, R. H. Beamer, 1♀ (KU). **Oregon:** *Benton Co.:* Mary's Peak, Saddle below campground, July 22, 1981, J. D. Lattin, 1♀ (OSU). Mary's Peak, 3000 ft, July 17, 1968, P. W. Oman, 1♂, (OSU). *Klamath Co.:* Lake of the Woods, 4950 ft, July 18, 1930, H. A. Scullen, 2♂, 1♀ (USNM). Upper Klamath Lake, Dennie Creek, July 3, 1954, Joe Schuh, 1♂, (AMNH). *Linn Co.:* 11 mi NE of Blue River, H. J. Andrews Experimental Forest, T15S R5E Sec 24, 3850 ft, July 20, 1979, G. M. Cooper, *Abies procera* (Pinaceae), 1♂ (OSU). *Umatilla Co.:* Meacham, July 14, 1931, H. T. Peters, 1♂, (KU). *Union Co.:* La Grande, June 26, 1926, E. W. Davis, 2♂, 3♀ (USNM). *Yamhill Co.:* top of Bald Mountain, July 13, 1958, K. M. Fender, 1♂, (OSU). **Utah:** *Utah Co.:* American Fork, American Fork Canyon, C. Jorgensen, 1♀ (AMNH).

Plagiognathus flavicornis Knight
Figures 7, 16, 24

Plagiognathus flavicornis Knight, 1923: 436 (n. sp.).

DIAGNOSIS: Recognized by the *castaneous coloration of dorsum* (fig. 7), dorsal vestiture of recumbent, *dark, simple setae, antennal segment 2 being dark at base—but only one-tenth the length of segment—and pale distally* (fig. 16), and *trochanters dark.* Similar in size and coloration to dark-colored *fuscosus* specimens; separated by greater length of antennal segment 2 relative to the width of head (table 1), antennal segment 2 only very narrowly dark at base, and by the dorsum having only dark or weakly golden, recumbent, simple setae. Trochanters almost entirely pale in *fuscosus,* but largely dark in *flavicornis.* Coloration of antennae, size, and dorsal vestiture of simple setae similar to *dispar* and *punctatipes* but the femora in those species pale with dark spots.

REDESCRIPTION: *Male:* Relatively broad-bodied, of moderate size, greatest width at about level of apex of claval commissure; total length 3.18–3.64, length apex clypeus–cuneal fracture 2.20–2.56, width across pronotum 1.02–1.12. COLORATION (fig. 7): Dorsum entirely castaneous, except frons and sometimes vertex lighter, base of cuneus or adjacent corium narrowly pale; membrane fumose, veins fumose except pale along posterior margin of cells; antennal segment 1 castaneous except for a pale apical annulus, segment 2 black on basal one-tenth, remainder of segment pale (fig. 16), segments 3 and 4 infuscate; labium mostly castaneous; venter castaneous except ventral margin of propleuron pale; coxae, trochanters, and femora (except for pale apex) castaneous; tibiae pale, dorsal tibial spines with heavy dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, dark to weakly shining, simple setae. STRUCTURE: Body appearing rather broad as viewed from above, lateral corial margins distinctly convex and declining laterally, giving dorsum a rounded appearance; frons moderately tumid and more or less distinctly bulging beyond anterior margin of eyes in dorsal view, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 2 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 24): Body of vesica relatively stout and strongly curving, more or less U-shaped, base of vesica reaching to about level of secondary gonopore; posterior apical spine long, more or less erect, weakly curving, anterior spine more strongly angled relative to body of vesica, attenuated, and only weakly and gradually angled near apex;

flange on vesica moderately broad, reaching to about midpoint of gonopore.

Female: Very similar to male in coloration and body form. Total length 3.42–3.63, length apex clypeus–cuneal fracture 2.36–2.51, width across pronotum 1.14–1.19.

HOST: *Myrica gale* (Myricaceae) (Knight, 1923). Specimens examined during the present study have labels indicating their occurrence on Pinaceae, Poaceae, and Salicaceae. I am inclined to believe this species is a *Myrica* feeder.

DISTRIBUTION: Quebec and Ontario south to Massachusetts and New York.

DISCUSSION: This taxon is remarkably similar in general appearance to dark specimens of *fuscosus,* and the two can be easily confused if the vestiture is rubbed. *Plagiognathus flavicornis* is much less common in collections than *fuscosus,* however, and would appear to be more strongly host specific.

SPECIMENS EXAMINED: CANADA.—**Ontario:** Barrhaven, 2 km W Woodie Dr. on Robertson Rd., July 18, 1991, M. D. Schwartz, *Larix laricina* (Pinaceae), 1♀ (CNC). Ottawa, July 12, 1919, J. McDunnough, 1♀ (CNC). Ottawa, July 30, 1912, Beaulieu, paratype: 1♂ (CNC). Perth, July 1, 1980, D. J. E. Brown, 1♂ (CNC). Tillsonburg, July 14, 1955, L. A. Kelton, ex Salicaceae, 2♂, 7♀ (CNC). **Quebec:** Gatineau National Park, Harrington, July 30, 1981, D. J. E. Brown, ex Poaceae, 4♂, 18♀ (CNC). La Trappe, July 5, 1923, J. Ouellet, 1♀ (TAMU). Ladysmith, July 24, 1958, L. A. Kelton, 1♂ (CNC). USA.—**Massachusetts:** *Barnstable Co.:* Woods Hole, July 15, 1918, C. E. Olsen, 1♀ (USNM). *Dukes Co.:* Oak Bluffs, August 3, 1918, C. E. Olsen, paratype: 1♂ (USNM). *Essex Co.:* Beach Bluff, August 18, 1914, H. M. Parshley, 2♀ (CAS). Swampscott, August 1, 1914, H. M. Parshley, 1♀ (CAS). *Middlesex Co.:* Hollliston, July 6, 1900, N. Banks, 1♀ (AMNH). **Michigan:** *Livingston Co.:* No specific locality, July 25, 1943, R. R. Dreisbach, 1♀ (USNM). **New York:** *Albany Co.:* Rensselaerville, July 17, 1944, Kendeigh, 1♂ (USNM). *Genesee Co.:* Batavia, July 11, 1914–August 2, 1915, H. H. Knight, paratypes: 2♂, 1♀ (CAS, USNM); holotype male (USNM). **Vermont:** *Windsor Co.:* Woodstock, A. P. Morse, 2♀ (AMNH).

Plagiognathus flavidus Knight
Figures 7, 16, 24

Plagiognathus shepherdiae flavidus Knight, 1929b: 71 (n. var.).

Plagiognathus flavidus: Kelton, 1980: 318 (n. status).

DIAGNOSIS: Recognized by the relatively large size, *pale coloration* (fig. 7), *pale setae on dorsum, labium relatively long and reaching to apex of hind coxae,* and *antennal segments 1 and 2 often almost entirely pale* (fig. 16), segment 1 sometimes partially to largely dark, with segment 2 then also dark at base. Pale coloration of the body and antennae most similar to *guttatipes, shepherdiae,* and *tenellus.* Distinguished from *guttatipes* by that species always with dark rather than pale setae on the dorsum and feeding on *Glycyrrhiza* (Fabaceae) as opposed to members of the Elaeagnaceae as in *flavidus.* Separated from *shepherdiae* by the presence of some longitudinal dark markings on the hemelytra of that species and from *tenellus* by the tibial spines in that species lacking black spots at bases and the tibiae being pale at the femoral articulation.

REDESCRIPTION: *Male:* Relatively large, elongate ovoid; total length 4.09–4.54, length apex clypeus–cuneal fracture 2.79–3.10, width across pronotum 1.22–1.33. COLORATION (fig. 7): Dorsum, venter, and appendages pale-orange to yellowish, portions of venter sometimes weakly to heavily infuscate; membrane pale to weakly fumose, veins pale; antennal segment 1 varying from totally pale to mostly dark, at least spine on mesial surface always with a dark spot at base, segment 2 often dark at base and sometimes at least partially infuscate distally (fig. 16), segments 3 and 4 usually appearing infuscate; apex of labium weakly to strongly infuscate; femora with some dark spots; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, pale, simple setae. STRUCTURE: Corial margins weakly convex; frons weakly tumid, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.3 times

diameter of antennal segment 1; labium reaching to near apex of hind coxae. GENITALIA (fig. 24): Body of vesica relatively broad, stout, strongly curving basally, base reaching to about base of secondary gonopore; apical spines relatively long, tapering, moderately angled relative to body of vesica; flange broad, terminating at about midpoint of secondary gonopore.

Female: More strongly ovoid than male. Total length 3.83–4.15, length apex clypeus–cuneal fracture 2.78–2.91, width across pronotum 1.24–1.36.

HOSTS: *Elaeagnus commutata, Shepherdia argentea, S. canadensis* (Elaeagnaceae). The record from *Salix* sp. is probably a sitting occurrence.

DISTRIBUTION: Ontario west to Alberta and south to Colorado.

DISCUSSION: Knight (1929b) described *flavidus* as a variety of *shepherdiae.* Although he collected them on the same host, *Shepherdia argentea,* he did not collect them at the same locality, and he noted a constant color difference between the two. Although *shepherdiae* and *flavidus* may occupy the same host, the genitalia are distinctive, and the similarity of appearance between the two taxa is not nearly so close as it is between *flavidus* and *guttatipes.*

SPECIMENS EXAMINED: CANADA.—**Alberta:** Cardston, July 22, 1993, R. S. McClay, *Elaeagnus commutata* (Elaeagnaceae), 1♂, 1♀ (CNC). Elkwater Park, July 18, 1952, L. A. Konotopetz, 1♀ (CNC). Grand Prairie, July 26, 1961, A. R. Brooks, 1♀ (CNC). Jasper Natl. Park, August 6, 1952, L. A. Konotopetz, *Shepherdia canadensis* (Elaeagnaceae), 1♂, 4♀ (CNC). Lundbreck, July 20, 1973, L. A. Kelton, 2♂, 8♀ (CNC). Lundbreck, July 7, 1970–July 29, 1973, L. A. Kelton, 1♂, 2♀ (CNC). **Manitoba:** Bald Head Hills, 13 mi. N of Glenboro, June 21, 1958, J. F. McAlpine, 3♂, 7♀ (CNC). Carberry, July 30, 1953, Brooks and Kelton, 1♂, 1♀ (CNC). Carberry, July 30, 1953, Brooks and Kelton, *Elaeagnus* sp. (Elaeagnaceae), 4♂, 4♀ (CNC). Riding Mt. Natl. Park, July 21, 1972, L. A. Kelton, 2♀ (CNC). **Ontario:** Newry, July 12, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂ (CNC). **Saskatchewan:** Attons Lake, Cut Knife, July 8, 1940, A. R. Brooks, 1♂ (CNC). Elbow, August 8, 1951, A. R. Brooks, *Shepherdia* sp. (Elaeagnaceae), 1♂, 1♀ (CNC). Harris, July 3, 1952, A. R. Brooks, *Elaeagnus* sp. (Elaeagnaceae), 2♂, 5♀ (CNC). Prince Albert, July 23, 1959, A. and J. Brooks, 1♂, 3♀ (CNC). Saskatoon, July 22, 1929, K. M. King, 1♀ (CNC). Torch River, August 12, 1950, L. A. Konotopetz, *Shepherdia canadensis* (Elaeagnaceae), 3♀ (CNC). White Fox, July 25, 1950, L. A. Konotopetz, *Shepherdia canadensis* (Elaeagnaceae), 2♂, 5♀ (CNC). USA.—**Colorado:** *Las Animas Co.:* S of Cuchara on Rt 12, 9200 ft, August 19, 1986, R. T. Schuh and J. T. Polhemus, *Shepherdia canadensis* (Elaeagnaceae), 1♂, 4♀ (PDA). **South Dakota:** *Jackson Co.:* Interior, July 25, 1927, H. H. Knight, 1♀ (USNM). *Lyman Co.:* Kennebec, July 24, 1927, H. H. Knight, paratypes (*flavidus*): 10♂, 10♀ (USNM); holotype male (USNM). Kennebec, July 24, 1927, H. H. Knight, paratypes: 2♂ (USNM). *Union Co.:* 13 mi S of Jefferson, June 11, 1949, Slater and Laffoon, 1♂ (AMNH).

Plagiognathus flavipes (Provancher), new combination
Figures 7, 16, 24

Capsus flavipes Provancher, 1872: 104 (n. sp.).
Microphylellus flavipes: Kelton, 1980: 1075 (n. comb.).
Microphylellus elongatus Knight, 1923: 458 (n. sp.). NEW SYNONYMY.
Microphylellus nigricornis Knight, 1923: 457 (n. sp.; syn. by Kelton, 1968:1075).

DIAGNOSIS: Recognized by the generally dark, castaneous to nearly *black, coloration* of the *elongate, slender body* (fig. 7), the entirely pale white legs, and the distally *pale antennal segment 1 and dark antennal segment 2* (fig. 16). Similar in coloration and appearance to *longirostris* (fig. 9) and *modestus* (fig. 10), but separated from the both by having antennal segment 2 entirely dark and from the latter by the more elongate body form.

REDESCRIPTION: *Male:* Elongate, relatively slender, of moderate size; total length 3.47–3.95, length apex clypeus–cuneal fracture 2.40–2.65, width across pronotum 1.00–1.14. COLORATION (fig. 7): General coloration of dorsum castaneous; head generally castaneous, vertex slightly lighter; membrane

and veins strongly fumose; antennal segment 1 dark on extreme base, remainder pale, antennal segment 2 entirely dark (fig. 16), segments 3 and 4 pale; labium pale, except basal two-thirds of segment 1 and apex castaneous; venter entirely castaneous; legs, except extreme base of coxae, pale, tibial spines with at most very weak dark spots at bases, bases of most spines pale. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, dark, simple setae. STRUCTURE: Nearly parallel-sided, corial margin only weakly convex; body form more or less cylindrical; head dorsoventral in orientation, clypeus not visible from above; anteocular distance about equal to diameter of antennal segment 1; head projecting below eye by 2 times diameter of segment 1; labium reaching to about apices of hind coxae or slightly beyond. GENITALIA (fig. 24): Body of vesica weakly J-shaped, relatively slender, apical spines erect, anterior spine conspicuously longer than posterior; flange narrow, curving, not reaching margin of vesica.

Female: Similar in coloration and general structure to male; body form somewhat broader. Total length 3.74–4.00, length apex clypeus–cuneal fracture 2.67–2.73, width across pronotum 1.11–1.15.

HOSTS: *Aster macrophyllus* and possibly other *Aster* spp. Records from other plant groups are probably sitting occurrences.

DISTRIBUTION: Known from Quebec and New Hampshire west to Minnesota. Also recorded from Louisiana. The apparent host-specificity of this taxon may preclude its frequent capture.

DISCUSSION: My concept of *flavipes* follows that of Kelton (1968) and his examination of type material for taxa described by Provancher. I have treated Kelton's identifications of the ordinarily distinctive species as authoritative. This species was placed in *Microphylellus* by previous authors, including Knight and Kelton, because the bases of the tibial spines are pale. The male genitalia, however, are of the typical *Plagiognathus* type. The move to *Plagiognathus* makes *flavipes* (Provancher) the senior homonym of *Plagiognathus flavipes* Reuter from Europe (see *Plagiognathus reuterellus,* new name under Palearctic Species).

Knight (1923) described *elongatus* as similar in size and form to *nigricornis* Knight (= *Plagiognathus flavipes* (Provancher)), but with antennal segment 2 yellow, and larger and more elongate than *modestus.* Examination of the collections in the National Museum of National History, Washington, D.C., indicates that the holotype is missing from the pin, as is a female specimen which Knight designated as the allotype. Based on a dissected paratype male from Batavia, New York, most of whose body is missing, and a paratype female from the same locality, this nominal species is similar in appearance and coloration to *longirostris,* but the labium is shorter and not surpassing the hind coxae; the vesica of the male is similar in form to that of *flavipes,* but antennal segment 2 is pale rather than dark. The only indication of a host for *elongatus* is from Knight (1923), who recorded the species from *Acer saccharum.* Of all additional material I have examined for the present study, only 3 females fit Knight's conception of *elongatus.* These specimens are from Norway Point, Lake of Bays, Ontario, Canada, June 28, 1922, J. McDunnough (CNC).

On the basis of the discussion above, I find it difficult to fix the identity of *elongatus.* It is possible that the taxon has just never been collected in significant numbers, but this seems unlikely because of the extremely common nature of its host, at least as recorded by Knight. In my view, it is most likely that this nominal species is just *flavipes* with antennal segment 2 pale, in view of the similar structure of the male genitalia and length of the labium. I am therefore treating *elongatus* as a junior synonym.

SPECIMENS EXAMINED: CANADA.—**Ontario:** 7 mi E of Griffith, July 9, 1991, J. R. Vockeroth, 2♂, 1♀ (CNC). Bala, July 19, 1932, G. S. Walley, 1♀ (CNC). Black Sturgeon Lake, August 15, 1956, Lindberg, 9♂, 2♀ (CNC). Corkery, July 4, 1962, D. Brown, 1♀ (CNC). Kapuskasing, July 18, 1961, G. Brumpton, 1♂ (CNC). Lake Temagami, August 12, 1946, W. J. Palmer, 1♂ (CAS). Mazinaw Lake, June 30, 1974, D. G. Reid, *Aster macrophyllus* (Asteraceae), 13♂, 3♀ (CNC). New Liskeard, July 19, 1961, G. Brumpton,

1♂ (CNC). North Bay, June 19, 1963, W. Gagne, 1♀ (CNC). Norway Point, Lake of Bays, June 28, 1922, J. McDunnough, 3♀ (CNC). One Sided Lake, June 27, 1980, Kelton and Whitney, 1♂, 4♀ (CNC). Ottawa, June 29, 1912, E. P. Van Duzee, 2♂, 2♀ (CAS). Pass Lake, August 14, 1960, Kelton and Whitney, *Prunus* sp. (Rosaceae), 1♀ (CNC). Smoky Falls, Mattagami River, July 3, 1934, G. S. Walley, 1♂ (CNC). St. Lawrence Is. Natl. Park, August 15, 1976, W. Reid, 1♂ (CNC). **Quebec:** Beechgrove, June 29, 1962, J. R. Vockeroth, 1♀ (CNC). Cap Rouge, July 14, 1933, O. Peck, 1♂ (CNC). Cap Rouge, July 4, 1953, R. Lambert, 2♂ (CNC). Lac Mondor, Ste. Flore, June 24, 1951, E. G. Munroe, 2♂ (CNC). Laniel, July 10, 1963, W. Gagne, 1♂, 3♀ (CNC). Laniel, June 26, 1963–July 17, 1963, L. A. Kelton, W. Gagne, ex Asteraceae, 45♂, 13♀ (CNC). Lescelles, June 25, 1951, E. H. N. Smith, 1♀ (CNC). Old Chelsea, June 11, 1959, J. R. Vockeroth, 5♂ (CNC). Quebec City, June 26, 1937, J. I. Beaulne, 1♀ (CNC). USA.—**Louisiana:** *Baton Rouge Co.:* LSU Campus, April 26, 1986–May 2, 1985, D. A. Rider, 1♂, 1♀ (DAR). **Minnesota:** *Itasca Co.:* Deer Lake, June 15, 1986, D. A. Rider, *Quercus* sp. (Fagaceae), 1♂, 2♀ (DAR). **New Hampshire:** *Coos Co.:* Pinkham Notch, July 6, 1900, N. Banks, 1♂ (AMNH). **New York:** *Genesee Co.:* Batavia, June 25, 1915, H. H. Knight, paratypes (*elongatus*): 1♂, 1♀ (CNC, USNM). *Tompkins Co.:* Ithaca, July 7, 1920, H. H. Knight, 1♀ (CAS). Ithaca, July 7, 1920, H. H. Knight, *Aster macrophyllus* (Asteraceae), paratypes: 2♂ (CNC); holotype male (*nigricornis*) (USNM). Ithaca, July 7, 1920, H. H. Knight, *Aster macrophyllus* (Asteraceae), paratypes: 2♂, 1♀ (CAS, USNM).

Plagiognathus flavoscutellatus Knight
Figures 8, 16, 24

Plagiognathus flavoscutellatus Knight, 1923: 440 (n. sp.).

DIAGNOSIS: Recognized by the large, *heavy body*, entirely black antennae, and the moderately long labium reaching to near the apex of the hind coxae, the *scutellum pale at least at apex and often entirely so,* and the *anterior pale area of the corium extending posteriorly along radial vein* (fig. 8). Pattern of coloration of *obscurus* type, with base of corium pale and cuneus at least partially pale. Most similar in appearance to *brevirostris,* being large and heavy bodied, but labium longer than in *brevirostris,* reaching to near apex of hind coxae, scutellum always pale at apex and often entirely so, and femora pale with dark spots rather than mostly dark. Extension of pale basal area of corium posteriorly along radial vein also seen in *alboradialis, mundus,* and *paramundus.*

REDESCRIPTION: *Male:* Elongate, relatively heavy-bodied, large; total length 4.03–4.50, length apex clypeus–cuneal fracture 3.01–3.15, width across pronotum 1.26–1.34. COLORATION (fig. 8): Background coloration of dorsum castaneous; corium pale, yellowish to light orange, on basal one-third, the posterior margin of this area jagged and extending posteriorly along the radial vein; costal vein usually pale, less commonly dark; cuneus at least basally, and adjacent area of corium, pale; corium narrowly pale at extreme base of membrane; scutellum ranging from pale only at apex to entirely so; vertex and frons pale, area below base of clypeus mostly castaneous; membrane fumose, veins pale; all antennal segments castaneous to black (fig. 16) except for pale, narrow, apical annulus on segment 1; labium entirely castaneous; venter mostly castaneous, metathoracic scent-gland evaporatory area often at least partially pale; coxae mostly castaneous, trochanters and femora pale, yellowish to orange, femora with numerous dark spots; tibiae pale, yellowish to orange, dorsal spines with small dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to very weakly shining. Face at and below base of clypeus more highly polished than remainder of body surface. Vestiture of dorsum composed of reclining, relatively long, golden, shining, simple setae. STRUCTURE: More or less parallel-sided, lateral corial margins very weakly convex; frons weakly convex, clypeus barely visible from above; anteocular distance 0.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching almost to apex of hind coxae. GENITALIA (fig. 24): Body of vesica

only moderately stout, broadly curving, very broadly J-shaped, base of vesica at about level of base of secondary gonopore; posterior apical spine long, smoothly curving, anterior spine slightly longer than posterior and more strongly angled relative to body of vesica; flange very narrow, not extending beyond margin of vesica, terminating at base of secondary gonopore.

Female: Body slightly broader and more strongly ovoid than in male. Coloration very similar to that of male. Total length 4.13–4.44, length apex clypeus–cuneal fracture 2.92–3.20, width across pronotum 1.31–1.35.

HOSTS: Recorded from *Salix longifolia* by Knight (1923). Specimens examined for this study indicate its occurrence on a variety of *Salix* spp. Records from other groups probably represent sitting occurrences.

DISTRIBUTION: Known from Nova Scotia west to Minnesota and south to Iowa and Ohio.

SPECIMENS EXAMINED: CANADA.—**Nova Scotia:** Ingonish, July 30, 1976, L. A. Kelton, 4♂, 2♀ (CNC). Truro, August 2, 1917, 1♀ (CAS). **Ontario:** Bayfield, June 22, 1962, H. Blanchard, 1♂ (CNC). Dashwood, July 10, 1962, Kelton and Thorpe, 1♀ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 13♂, 3♀ (CNC). Exeter, July 12, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂, 1♀ (CNC). Grand Bend, July 11, 1962, Kelton and Thorpe, 2♂, 1♀ (CNC). Jordan, July 17, 1961, L. A. Kelton, 2♂ (CNC). Kingsville, July 7, 1962, G. Thorpe, *Salix* sp. (Salicaceae), 4♂, 7♀ (CNC). Lake Placid, 2000 ft, July 19, 1962, J. R. Vockeroth, 1♂ (CNC). Mt. Pleasant, July 10, 1958, L. A. Kelton, *Salix* sp. (Salicaceae), 1♂, 1♀ (CNC). Newry, July 12, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♀ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 1♂ (CNC). Orangeville, July 24, 1962, Kelton and Thorpe, 1♂, 1♀ (CNC). Ottawa, July 21, 1914, G. Beaulieau, 1♂, 3♀ (CNC). Shipka, July 10, 1962, Kelton and Thorpe, 3♀ (CNC). St. Catherines, September 3, 1961, L. A. Kelton, 1♂ (CNC). Strathroy, July 9, 1925, H. F. Hudson, 1♂ (CNC). Tillsonburg, June 20, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂, 1♀ (CNC). Vienna, July 18, 1962, Kelton and Thorpe, 1♂ (CNC). Vineland, July 10, 1961, L. A. Kelton, 1♂ (CNC). Vittoria, July 13, 1962, H. Blanchard, *Rubus* sp. (Rosaceae), 1♂ (CNC). Windsor, July 7, 1962, G. Thorpe, *Salix* sp. (Salicaceae), 1♂, 1♀ (CNC). **Quebec:** Hull, July 19, 1924, J. I. Beaulne, paratypes: 1♂, 1♀ (CNC). USA.—**Connecticut:** Colebrook, Colebrook Resevoir, August 21, 1970, F. P. Maroney, 1♂ (AMNH). East Hartford, Tunxis State Forest, July 20, 1970, F. P. Maroney, 1♀ (AMNH). Ridgefield, Titicus Hamlet, September 2, 1970, F. P. Maroney, 1♀ (AMNH). Rt 67 N of Southbury, Powerline Tri., September 1, 1970, F. P. Maroney, 1♂ (AMNH). **Illinois:** *Clark Co.:* West Union, June 26, 1932, Ross, Dozier, Park, 1♂ (AMNH). **Indiana:** *Cass Co.:* 2 mi E of Logansport, East 13th Street Bridge, July 11, 1976, T. J. Henry, *Salix interior* (Salicaceae), 1♀ (PDA). 2 mi E of Walton, July 4, 1979, T. J. Henry, *Salix nigra* (Salicaceae), 4♀ (USNM). *Tippecanoe Co.:* No specific locality, June 10, 1939, D. W. LaHue, 1♀ (PDA). **Iowa:** *Boone Co.:* Ledges State Park, July 19, 1925, H. H. Knight, *Salix longifolia* (Salicaceae), 1♂, 1♀ (TAMU). Ledges State Park, July 19, 1925, H. H. Knight, *Salix longifolia* (Salicaceae), 2♂, 2♀ (USNM). Ledges State Park, June 22, 1962, J. C. Schaffner, *Salix* sp. (Salicaceae), 1♂, 6♀ (TAMU). No specific locality, June 22, 1962, J. C. Schaffner, *Salix* sp. (Salicaceae), 2♂, 4♀ (TAMU). *Clinton Co.:* Clinton, June 23, 1925, G. S. Walley, 1♂, 2♀ (CNC). DeWitt, June 21, 1928, G. S. Walley, 2♂, 1♀ (CNC). *Scott Co.:* Pleasant Valley, June 23, 1928, G. S. Walley, 1♀ (CNC). *Story Co.:* Ames, June 24, 1930, H. M. Harris, 1♀ (TAMU). Ames, September 24, 1949, W. Downes, 1♂ (AMNH). **Michigan:** *Berrien Co.:* Berrien Springs, St. Joseph River, July 16, 1914, 1♀ (AMNH). **Minnesota:** *Ramsey Co.:* No specific locality, July 18, 1922, H. H. Knight, paratypes: 1♂, 1♀ (CAS). **New York:** *Tompkins Co.:* Ithaca, Cornell University, July 2, 1978, A. G. Wheeler, Jr., *Salix* sp. (Salicaceae), 1♀ (PDA). Ithaca, July 6, 1979–July 8, 1979, A. G. Wheeler, Jr., *Salix interior* (Salicaceae), 21♂, 21♀ (PDA). **Ohio:** *Summit Co.:* Barberton, August 13, 1936, L. J. Lipovsky, 1♂ (KU). **Pennsylvania:** *Dauphin Co.:* Harrisburg near Rockville, July 18, 1979, T. J. Henry, *Betula nigra* (Betulaceae), 3♂, 2♀ (PDA). *Monroe Co.:*

Delaware Water Gap, E. P. Van Duzee, 1♀ (AMNH). **Vermont:** *Windsor Co.:* Norwich, July 8, 1908, 1♀ (AMNH). **Wisconsin:** *Walworth Co.:* East Troy, August 10, 1935, P. B. Lawson, 2♀ (KU).

Plagiognathus flavus Knight
Figures 8, 16, 24

Plagiognathus flavus Knight, 1964: 146 (n. sp.).

DIAGNOSIS: Recognized by the relatively *large size,* generally pale to *pale orange coloration* (fig. 8), including legs, and *antennal segment 2 pale with a dark base.* Similar in size and coloration of dorsum to *concoloris* (fig. 7) and *lonicerae* (fig. 9), but both of those species with black setae on pronotum, the former with antennae and tibiae heavily infuscate to nearly black and strongly contrasting with the dorsum and the latter with antennal segment 1 mostly pale on proximal one-half. Structure of genitalia similar to that of *concoloris* and *lonicerae,* with a heavy, sigmoid vesica with relatively short apical spines (compare figures 22, 24, and 27).

REDESCRIPTION: *Male:* Large, elongate, nearly parallel-sided; total length 4.09–4.70, length apex clypeus–cuneal fracture 2.78–3.04, width across pronotum 1.17–1.34. COLORATION (fig. 8): General coloration, including most of venter and appendages, pale to pale orange; membrane weakly fumose, veins yellowish; antennal segment 1 black except for pale apical annulus, segment 2 black basally and otherwise pale or weakly infuscate (fig. 16), segments 3 and 4 dark; apex of labium infuscate; femora with some small dark spots; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum, including entire pronotum, composed of recumbent, simple setae unicolorous with dorsum. STRUCTURE: Body flattened, relatively broad; frons weakly tumid, clypeus barely visible from above; anteocular distance less than 0.3 times diameter of antennal segment 1; head projecting below eye by 0.3 times diameter of antennal segment 1; labium relatively short, not quite reaching apex of middle coxae. GENITALIA (fig. 24): Vesica, including apical spines, sigmoid in shape, body relatively heavy, base falling well below base of secondary gonopore; apical spines relatively short, angled relative to body of vesica, anterior spine nearly straight, more or less cylindrical, and much longer than posterior; flange very narrow.

Female: More strongly ovoid than male; coloration similar to male. Total length 3.97–4.24, length apex clypeus–cuneal fracture 2.72–2.91, width across pronotum 1.25–1.33.

HOST: *Lonicera albiflora* (Caprifoliaceae).

DISTRIBUTION: Arizona.

SPECIMENS EXAMINED: USA.—**Arizona:** *Gila Co.:* 8 mi SW jct Rts 87 and 188 (off Rt 87), Tonto Natl. Forest, 4000 ft, May 27, 1983, R. Schuh and G. Stonedahl, 30♂, 49♀ (AMNH). Pinal Mt., June 1, 1941, Loyd L. Stitt, holotype male (USNM).

Plagiognathus fulvaceus Knight
Figures 8, 16, 24

Plagiognathus fulvaceus Knight, 1964: 144 (n. sp.).

Microphylellus symphoricarpi Knight, 1968: 30 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Recognized by *moderately large* size, generally dull *reddish coloration* (including all appendages [fig. 8], although antennal segment 1 sometimes partially to completely dark and segment 2 often dark at base), and *vestiture of dorsum reclining, golden,* shining, and somewhat shaggy. Similar to *aquilinus* (fig. 6) and *mexicanus* (fig. 10) in the red coloration, but those species with black setae on the dorsum and *mexicanus* with all antennal segments black. Also potentially confused with *concoloris* and *lonicerae,* but those species larger and not so strongly reddish and with dark setae on pronotum. Vesica (fig. 24) distinctive, similar in form to that of *albifacies* (fig. 20), long, relatively slender, broadly curving, and with relatively short, slender, erect, weakly curving apical spines.

REDESCRIPTION: *Male:* Medium-sized, nearly parallel-sided; total length 3.90–4.75, length apex clypeus–cuneal fracture 2.40–3.08, width across pronotum 1.12–1.25. COLORATION (fig. 8): General coloration of dorsum, including most of venter and appendages, dull reddish; venter slightly darker; membrane weakly fumose, pale at angle

between posterior margin of cells and posteromesal margin of cuneus; veins of membrane reddish; antennal segment 1 varying from entirely reddish to entirely castaneous, segment 2 frequently infuscate at base and apex (fig. 16), segments 3 and 4 castaneous; apex of labium infuscate; femora with some dark spots; tibial spines without dark spots at bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum shaggy, composed of densely placed, reclining, golden, shining, simple setae. STRUCTURE: Body elongate, flattened, nearly parallel-sided; frons weakly tumid, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below level of antennal insertion by diameter of antennal segment 1; labium reaching to apex of middle coxae. GENITALIA (fig. 24): Vesica, including apical spines, more or less J-shaped, body relatively slender, broadly curving, base falling near base of secondary gonopore; apical spines erect, slender, nearly cylindrical, weakly curving, and of nearly equal length; flange very narrow.

Female: More strongly ovoid than male; coloration similar to male; frons more strongly protuberant. Total length 2.89–4.26, length apex clypeus–cuneal fracture 2.11–2.86, width across pronotum 1.04–1.31.

HOSTS: *Symphoricarpos longiflorus, S. oreophilus, S.* sp. (Caprifoliaceae); *Vaccinium* sp. (Ericaceae).

DISTRIBUTION: Known from Nevada, Utah, and western Colorado.

DISCUSSION: Knight (1964) described *fulvaceus* and *symphoricarpi* in separate genera. Comparison of Knight's original material with additional specimens, and dissection of the male genitalia, indicates that these two nominal taxa are the same. The name *fulvaceus* has priority.

SPECIMENS EXAMINED: USA.—**Colorado:** *Montezuma Co.:* Dolores, August 15, 1925, H. H. Knight, holotype male (USNM). *Rio Blanco Co.:* 10 mi S of Buford, Hill Creek Campground, August 6, 1978, J. T. Polhemus, 2♂, 7♀ (JTP). **Nevada:** *Clark Co.:* Charleston Peak, 7500 ft, July 22, 1982, J. T. Polhemus, 2♂, 1♀ (JTP). No specific locality, July 18, 1929, C. C. Searl, 1♀ (SDNH). *Nye Co.:* 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir, R42E S11 & 23, 6000 ft, June 30, 1983, Schuh and Schwartz, *Symphoricarpos longiflorus* (Caprifoliaceae), 5♂, 5♀ (AMNH). Atomic Test Site, 2 mi W of Tippapah Hwy on Mine Mt. Road, 4400 ft, June 7, 1983, Schuh, Schwartz, Stonedahl, *Symphoricarpos oreophilus* (Caprifoliaceae), 12♂, 31♀ (AMNH). Mercury, 17 M, June 16, 1965, H. Knight and J. Merino, *Symphoricarpos longiflorus* (Caprifoliaceae), paratypes (*symphoricarpi*): 2♂ (CNC); holotype male (*symphoricarpi*) (USNM). **Utah:** *Cache Co.:* Tony Grove Canyon, August 17, 1976, Knowlton and Hanson, 2♂ (USU). *Daggett Co.:* 9 mi S of Dutch John, Uinta Mts., 0.2 mi N of jct Rts 44 & 260, 7500 ft, August 2, 1981, M. D. Schwartz, *Vaccinium* sp. (Ericaceae), 7♂, 6♀ (AMNH). *Duchesne Co.:* Left Fork Indian Canyon Summit on Rt 33, T7S R8W, 9100 ft, August 9, 1981, M. D. Schwartz, *Vaccinium* sp. (Ericaceae), 1♂, 1♀ (AMNH). *Garfield Co.:* near Bryce Canyon National Park, July 10, 1986, R. S. Peigler and T. B. Allen, 1♂ (TAMU). *San Juan Co.:* 2.7 mi W of Rt 95 on Rt 263, T37S R17E, 6000 ft, June 18, 1983, R. T. Schuh and M. D. Schwartz, *Symphoricarpos oreophilus* (Caprifoliaceae), 6♂, 10♀ (AMNH). *Sanpete Co.:* 13 mi E of Fairview on Rt 31, T14S R6E, 7500 ft, August 8, 1981, M. D. Schwartz, *Symphoricarpos* sp. (Caprifoliaceae), 2♂, 4♀ (AMNH). *Wasatch Co.:* Dock Flat, 1 mi NE of Rt 40, T28S R12W Sec 9, 8000 ft, August 14, 1982, M. D. Schwartz, 5♀ (AMNH).

Plagiognathus fulvidus Knight
Figures 8, 16, 24

Plagiognathus fulvidus Knight, 1923: 447 (n. sp.).

DIAGNOSIS: Recognized by the *relatively small* size, *orange coloration* of the dorsum (fig. 8), entirely *black antennae* (fig. 16), and the *face at and below base of clypeus castaneous, polished, and contrasting with coloration of vertex and remainder of frons.* Similar to *delicatus* and some specimens of *cornicola* in size and orange coloration, but differing in castaneous clypeus and adjoining face and entirely dark antennae. Similar to *melliferae, mexicanus,* and *salviae* in coloration and texture of lower portion of face,

but easily separated by those species occurring only in the American West rather than the Northeast and by details of coloration and genitalic structure as indicated in the descriptions.

REDESCRIPTION: *Male:* Relatively small, elongate-ovoid; total length 3.27–3.82, length apex clypeus–cuneal fracture 2.26–2.70, width across pronotum 1.04–1.22. COLORATION (fig. 8): Coloration of dorsum generally orange; most of endocorium darker, weakly castaneous; membrane weakly fumose, veins pale; clypeus and adjacent areas of face always castaneous, contrasting with remainder of head; antennae entirely dark (fig. 16) except for pale apical annulus on segment 1; labium mostly pale with castaneous apex; venter mostly castaneous; legs, including coxae, orange, femora with some dark spots; dorsal tibial spines dark with small dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of reclining, pale, golden, shining, common setae. STRUCTURE: Corial margin very weakly convex; frons weakly convex, slightly projecting beyond anterior margin of eyes, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 0.6 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 24): Body of vesica very short and stout, base of vesica falling well below level of secondary gonopore; apical spines relatively stout, strongly angled relative to body of vesica, anterior more strongly than posterior; flange broad, terminating at about midpoint of gonopore.

Female: Ovoid body form and orange general coloration very similar to male. Total length 3.60–3.89, length apex clypeus–cuneal fracture 2.55–2.76, width across pronotum 1.13–1.28.

HOST: Unknown.

DISTRIBUTION: Known from the eastern United States, ranging from Maine to North Carolina.

DISCUSSION: The many features of *fulvidus* that are shared with mint-feeding species *melliferae, mexicanus,* and *salviae* suggest that a search for the host plant of the first-named species might be productively focused on members of the Lamiaceae.

SPECIMENS EXAMINED: USA.—**Connecticut:** East River, July 30, 1910, C. R. Ely, 1♀ (USNM); holotype male (USNM). Sound Beach, July 23, 1910, 1♂ (AMNH). **Maine:** *Oxford Co.:* Paris, July 10, 1914, C. A. Frost, 1♂ (CAS). **Maryland:** *Anne Arundel Co.:* Odenton, July 10, 1918–July 12, 1914, W. L. McAtee, 2♀ (USNM). Odenton, July 4, 1913–July 12, 1914, W. L. McAtee, 1♂, 1♀ (USNM). **Massachusetts:** *Essex Co.:* Ipswich, May 22, 1909, E. P. Van Duzee, 1♂ (CAS). *Norfolk Co.:* Wellesley, July 11, 1909, E. P. Van Duzee, 4♂ (CAS). **New Jersey:** *Bergen Co.:* Ramsey, July 19, 1908, 1♀ (USNM). **New York:** *Cattaraugus Co.:* Gowanda, August 2, 1907, E. P. Van Duzee, 1♂ (CAS). *Kings Co.:* Flatbush, July 28, 1893–July 9, 1895, J. L. Zabriskic, 2♀ (AMNH). **North Carolina:** *Gaston Co.:* Tryon, July 20, 1900, W. F. Fiske, 1♀ (USNM). **Pennsylvania:** *Monroe Co.:* Delaware Water Gap, A. T. Slosson, 1♀ (AMNH).

Plagiognathus fuscipes Knight
Figures 8, 16, 25

Plagiognathus fuscipes Knight, 1929c: 268 (n. sp.).

DIAGNOSIS: Recognized by the *moderate size, generally dark coloration* of body and antennae (fig. 8), corium adjacent to extreme base of membrane and base of cuneus narrowly and vaguely pale, *the weakly infuscate legs, weakly transversely rugose pronotum,* and the silvery shining vestiture on the dorsum. Similar in size and coloration to *fenderi, laricicola, pemptos, piceicola,* and *suffuscipennis.* Separated from all of these species by the transversely rugulose posterior lobe of the pronotum (fig. 8). Separated from *fenderi* by anteocular distance in that species being nearly 2 times diameter of antennal segment 2 rather than about equal to diameter. Separated from *pemptos* by the dull black setae on the dorsum of that species. Separated from the remaining species by their darker colored femora and by their habit of feeding on conifers rather than on *Potentilla.* The structure of the vesica will also help to separate all of these species.

REDESCRIPTION: *Male:* Elongate-ovoid to

nearly parallel-sided, of moderate size; total length 3.53–4.16, length apex clypeus–cuneal fracture 2.44–2.87, width across pronotum 0.99–1.18. COLORATION (fig. 8): Dorsum and venter dark brown or blackish brown, posterior margin of vertex tending toward pale; corium narrowly and weakly pale adjacent to extreme basal area of membrane; base of cuneus narrowly and weakly pale; legs not so dark as body, usually moderately infuscate with some darker spots on femora; membrane smoky, vein on posterior margin of cells pale; all antennal segments blackish brown (fig. 16); labium castaneous; dorsal tibial spines with dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining; posterior lobe of pronotum weakly transversely rugose. Vestiture of dorsum composed of recumbent, silvery, shining, simple setae, appearing somewhat woolly. STRUCTURE: Body elongate-ovoid, corial margin usually at least weakly convex; frons moderately tumid and weakly bulging beyond anterior margin of eyes in dorsal view, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below level of eye by 1.6 times diameter of antennal segment 1; labium just surpassing apex of hind coxae. GENITALIA (fig. 25): Body of vesica moderately elongate, base falling well below level of secondary gonopore; apical spines long and nearly erect relative to body of vesica, anterior spine longer than posterior and distinctly bent subapically; flange narrow, terminating just below midpoint of secondary gonopore.

Female: Body usually more strongly ovoid than in male; coloration as in male. Total length 3.17–3.47, length apex clypeus–cuneal fracture 2.19–2.51, width across pronotum 0.94–1.06.

HOSTS: *Potentilla fruticosa* and *Potentilla* sp. (probably all records from *P. fruticosa*) (Rosaceae). All records from other plant groups are probably just sitting occurrences.

DISTRIBUTION: Distributed in Canada from Ontario to British Columbia and the Yukon, occurring farther south in Minnesota, South Dakota, widely in the Rocky Mountain system, and also known from the Wallowa Mountains of northeastern Oregon.

DISCUSSION: The species is known from relatively high latitudes and altitudes, almost always being collected on *Potentilla fruticosa.* A very few specimens I have identified as *fuscipes* have the base of the corium pale.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Canmore, July 27, 1952, A. R. Brooks and L. A. Konotopetz, *Potentilla fruticosa* (Rosaceae), 3♂, 3♀ (CNC). Coleman, July 26, 1952, L. A. Konotopetz, *Potentilla fruticosa* (Rosaceae), 1♂ (CNC). Elkwater Park, around marina, 3990 ft, July 16, 1990, M. D. Schwartz, *Potentilla fruticosa* (Rosaceae), 30♂, 30♀ (CNC). Elkwater Park, July 29, 1952–August 16, 1952, L. A. Konotopetz, A. R. Brooks, *Potentilla fruticosa* (Rosaceae), 21♂, 4♀ (CNC). Elkwater, at Marina, Cypress Hills Provincial Park, September 2, 1993, M. D. Schwartz, *Potentilla fruticosa* (Rosaceae), 1♂, 6♀ (CNC). Fisher Creek A. F. S., July 26, 1973, L. A. Kelton, 1♀ (CNC). Kananaskis Hiway, July 25, 1973, L. A. Kelton, ex Fabaceae, 4♂ (CNC). Lundbreck, July 7, 1970, L. A. Kelton, 1♀ (CNC). Stettler, August 3, 1957, A. and J. Brooks, *Potentilla fruticosa* (Rosaceae), 2♂ (CNC). Waterton Park, July 26, 1972, L. A. Kelton, 10♂ (CNC). **British Columbia:** Grand Forks, June 6, 1950, H. R. MacCarthy, *Balsamorhiza* sp. (Asteraceae), 1♂ (CNC). Oliver, May 17, 1959, R. E. Leech, 1♂ (CNC). **Manitoba:** 10 mi W of Roblin, August 20, 1954, Brooks and Wallis, *Potentilla fruticosa* (Rosaceae), 10♂, 21♀ (CNC). Braintree, June 30, 1972, L. A. Kelton, *Potentilla* sp. (Rosaceae), 15♂, 5♀ (CNC). Carberry, July 29, 1953, Brooks and Kelton, *Potentilla* sp. (Rosaceae), 8♂, 14♀ (CNC). Riding Mt. Natl. Park, July 20, 1972, L. A. Kelton, *Potentilla* sp. (Rosaceae), 7♂, 5♀ (CNC). **Ontario:** Black Lake, August 29, 1951, J. F. McAlpine, *Potentilla fruticosa* (Rosaceae), 1♀ (CNC). Corkery, July 31, 1963, D. Brown, *Pinus sylvestris* (Pinaceae), 1♀ (CNC). Forest, July 17, 1962, Kelton and Brumpton, *Cornus* sp. (Cornaceae), 1♂, 4♀ (CNC). Howdenvale, September 7, 1961, Kelton and Brumpton, *Potentilla* sp. (Rosaceae), 1♂, 16♀ (CNC). Oakland, July 17, 1962, Kelton and Thorpe, *Potentilla* sp. (Rosaceae), 37♂, 46♀ (CNC). **Saskatchewan:** Christopher Lake, July 15, 1959, A. and J. Brooks, 6♂, 2♀ (CNC). Cypress Hills, Sep-

tember 19, 1951, A. R. Brooks, *Potentilla fruticosa* (Rosaceae), 1♂, 10♀ (CNC). Love, August 6, 1951, J. C. Arrand, *Potentilla fruticosa* (Rosaceae), 1♂ (CNC). Prince Albert, September 2, 1954, Brooks and Wallis, 1♂ (CNC). Rockglen, July 31, 1955, A. R. Brooks, 3♀ (CNC). White Fox, August 6, 1951, J. C. Arrand, *Potentilla fruticosa* (Rosaceae), 4♂, 5♀ (CNC). Willow Bunch, July 30, 1955, A. R. Brooks, 3♂, 5♀ (CNC). **Yukon Territory:** Whitehorse, July 16, 1982, L. A. Kelton, *Astragalus* sp. (Fabaceae), 2♀ (CNC). USA.—**Arizona:** *Apache Co.:* Greer, August 1, 1940, L. L. Stitt, 1♀ (USNM). McNary, July 26, 1940, L. L. Stitt, 2♂, 5♀ (USNM). **Colorado:** *Costilla Co.:* Veta Pass, August 9, 1925, H. H. Knight, *Potentilla fruticosa* (Rosaceae), paratypes: 2♂, 1♀ (USNM); holotype male (USNM). *Eagle Co.:* Vail Pass below Shrine Pass, 9900 ft, August 11, 1987, T. J. Henry, *Potentilla fruticosa* (Rosaceae), 8♂, 15♀ (USNM). *Gilpin Co.:* Rollinsville, Roosevelt Natl. Forest, August 1, 1968, L. A. Kelton, *Potentilla* sp. (Rosaceae), 11♂, 13♀ (CNC). *Gunnison Co.:* 2 mi W of Gunnison on Rt 50, Neversink Picnic Area, 7600 ft, July 17, 1986, R. T. Schuh, *Salix* sp. (Salicaceae), 1♂, 1♀ (AMNH). *Larimer Co.:* 3 mi S of Estes Park, August 2, 1997, J. C. Schaffner, *Potentilla fruticosa* (Rosaceae), 8♂, 9♀ (TAMU). Rocky Mountain National Park, Fall River Road, 9500 ft, August 16, 1968, L. A. Kelton, *Potentilla* sp. (Rosaceae), 8♂, 8♀ (CNC). Rocky Mountain National Park, Grand Lake Entrance, August 18, 1968, L. A. Kelton, 1♀ (CNC). *Pitkin Co.:* Aspen, White River Natl. Forest, August 24, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂, 2♀ (CNC). *Summit Co.:* Loveland Pass, W slope, 9850 ft, August 8, 1961, B. H. Poole, 4♂, 9♀ (CNC). **Idaho:** *Shoshone Co.:* 3 mi NW of Clarkia on Rt 3, Cedar Creek Rec. Area, 4700 ft, August 3, 1986, Schuh, Schwartz, Stonedahl, 1♀ (AMNH). **Minnesota:** *Cook Co.:* Beaver Dam, August 12, 1922, H. H. Knight, 2♂, 3♀ (USNM). **Montana:** *Deer Lodge Co.:* Georgetown Lake on Rt 10A, 6500 ft, August 9, 1986, Schuh, Schwartz, Stonedahl, *Potentilla fruticosa* (Rosaceae), 13♂, 36♀ (AMNH). Silver Lake, 14 mi W of Anaconda on Rt 10A, 6400 ft, August 9, 1986, Schuh, Schwartz, Stonedahl, *Potentilla fruticosa* (Rosaceae), 11♂, 27♀ (AMNH). *Flathead Co.:* 17 mi E of Kalispell, Jewel Basin Hiking Area, 6000 ft, July 25, 1994, M. D. Schwartz, 1♂ (CNC). *Gallatin Co.:* 15 mi S of Big Sky on Rt 191, Teepee Creek, 6600 ft, August 10, 1986, Schuh, Schwartz, Stonedahl, *Potentilla fruticosa* (Rosaceae), 1♂, 2♀ (AMNH). *Granite Co.:* 15 mi S of Drummond on Rt 10A, 5000 ft, August 9, 1986, Schuh, Schwartz, Stonedahl, *Pinus contorta* (Pinaceae), 1♀ (AMNH). *Jefferson Co.:* 10 mi E of Butte on I-90, Homestake Rest Stop, Deerlodge Natl. Forest, T2N R6W, September 9, 1986, M. D. Schwartz, *Potentilla fruticosa* (Rosaceae), 3♂, 34♀ (AMNH). *Teton Co.:* 6 mi NW of Choteau on Canyon Road off Rt 89, Eureka Reserv. Fishing Access, 4000 ft, August 2, 1994, M. D. Schwartz, *Potentilla fruticosa* (Rosaceae), 14♂, 23♀ (CNC). **Oregon:** *Baker Co.:* 20 mi E of Medical Springs, Wallowa Mts., W Eagle Meadow, 4700 ft, August 3, 1986, Schuh, Schwartz, Stonedahl, *Picea engelmanni* (Pinaceae), 1♀ (AMNH). *Umatilla Co.:* 2 mi W of Tollgate, 4600 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, *Holodiscus discolor* (Rosaceae), 2♂ (AMNH). *Union Co.:* 4.5 mi E of Tollgate, Woodland Campground, 5000 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, *Potentilla fruticosa* (Rosaceae), 1♂ (AMNH). **South Dakota:** *Lawrence Co.:* Englewood, Black Hills, August 5, 1972, L. A. Kelton, 3♂ (CNC). **Utah:** *Duchesne Co.:* Uinta Mountains, Ashley National Forest, Hades Campground, 7400 ft, August 17, 1986, Schwartz and Stonedahl, *Potentilla* sp. (Rosaceae), 5♂, 9♀ (AMNH).

Plagiognathus fuscosus (Provancher)
Figures 4, 8, 16, 25

Lygus fuscosus Provancher, 1872: 105 (n. sp.).
Plagiognathus fuscosus Provancher, 1887: 153 (n. comb.).
Plagiognathus politus pallidicornis Knight, 1923: 435 (n. var.; syn. by Kelton, 1968: 1075).
Plagiognathus albonotatus Knight, 1923: 437 (n. sp.). NEW SYNONYMY.
Plagiognathus albonotatus compar Knight, 1923: 438 (n. var.).

DIAGNOSIS: Recognized by *antennal segment 2 being mostly pale with the basal one-*

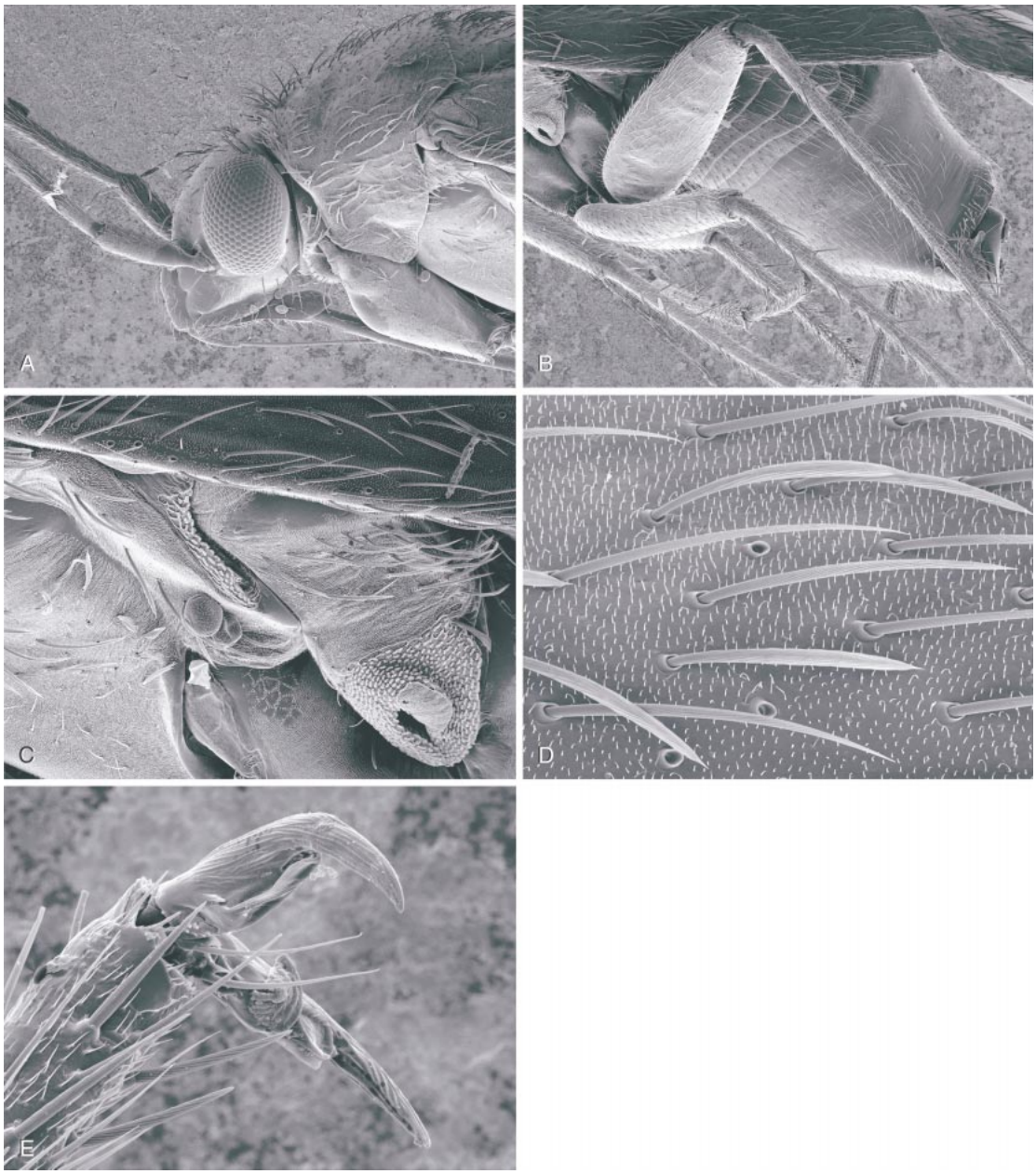

Fig. 4. *Plagiognathus fuscosus,* male, scanning micrographs. **A.** Lateral view of head. **B.** Lateral view of abdomen. **C.** Metathoracic spiracle and metathoracic scent-gland evaporatory area. **D.** Hemelytral vestiture. **E.** Pretarsus.

fourth dark (fig. 16), the dorsal vestiture composed of *reclining, dark, common setae intermixed with silvery, shining, weakly woolly setae* (fig. 4D), and the *trochanters pale.* Coloration variable, with two more or less discrete forms, one with dorsum entirely dark (fig. 8: *fuscosus* 2), the second with the base of the corium and part or all of the cuneus pale, with the pronotal disc and part of the scutellum also pale (fig. 8: *fuscosus* 1).

Dark form very similar to *flavicornis* in size, coloration, and body conformation; separated by *flavicornis* having antennal segment 2 longer relative to width of head and more narrowly black at base (fig. 16) than in *fuscosus* and with the vestiture composed of only simple, mostly dark, setae. Specimens with pale areas on hemelytra most similar in general appearance to *brunneus, obscurus,* and *subovatus,* but readily distinguished by antennal segment 2 being entirely black in all of them, and *brunneus* and *obscurus* being consistently larger. Potentially confused with *P. albatus* on coloration of dorsum, but vestiture distinct, *albatus* with only simple setae; furthermore, *albatus* always more elongate in both sexes, and hind femur usually largely pale whereas femora castaneous on distal one-half in *fuscosus.*

REDESCRIPTION: *Male:* Elongate-ovoid, of moderate size; total length 3.22–3.60, length apex clypeus–cuneal fracture 2.29–2.49, width across pronotum 0.99–1.11. COLORATION (fig. 8): Dorsum entirely castaneous, *or* base of corium and part or all of cuneus pale, with disc of pronotum and scutellum laterally also sometimes pale; membrane fumose, veins pale; antennal segment 1 castaneous except for pale apical annulus, segment 2 black on basal one-fourth, remainder of segment pale (fig. 16), segments 3 and 4 pale; labium mostly castaneous; venter entirely castaneous; metathoracic scent-gland evaporatory area varying from partially to almost totally pale; coxae dark at least basally, often pale distally, trochanters usually pale, femora entirely castaneous in dark-colored specimens, at least hind femur broadly dark on distal one-half in all specimens; tibiae pale, articulation with femora dark, dorsal spines with dark bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum, thoracic pleuron, and abdominal venter laterally composed of recumbent, dark, simple setae intermixed with silvery, shining, recumbent, weakly woolly setae (fig. 4D). STRUCTURE: Body varying from more or less parallel-sided, with weakly convex corial margins, to much more broadly ovate; frons very weakly tumid, clypeus visible from above; anteocular distance 2 times diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1 (fig. 4A); labium reaching to about apex of middle coxae or slightly beyond; metathoracic scent-gland evaporatory area and spiracle as in figure 4C; pretarsus as in figure 4E; abdomen in lateral view as in figure 4B. GENITALIA (fig. 25): Body of vesica relatively stout and strongly curving, more or less U-shaped, base of vesica not quite reaching to level of secondary gonopore; posterior apical spine elongate, nearly straight, weakly angled relative to body of vesica, anterior spine more strongly angled relative to body of vesica, attenuated, and in lateral view only weakly and gradually angled near apex; flange on vesica moderately broad, reaching to about midpoint of gonopore.

Female: Very similar to male in coloration; body usually more strongly ovoid. Total length 3.24–3.57, length apex clypeus–cuneal fracture 2.30–2.52, width across pronotum 1.08–1.17.

HOSTS: Most frequently found on Rosaceae (primarily *Spiraea* spp.) and Salicaceae (*Salix* spp.). May breed on other plant groups, but many other recorded occurrences probably represent only sitting records.

DISTRIBUTION: Widely distributed in eastern North America from southern Canada to the Gulf and from the Atlantic coast to Alberta and Colorado. Also known from a limited number of localities in Washington, Idaho, Oregon, and northern California.

DISCUSSION: My concept of *fuscosus* follows that of Kelton (1968) and his examination of Provancher type material; in the case of ''typical'' *fuscosus* specimens, I have treated his determinations as authoritative. Kelton (1968) synonymized Knight's variety *politus pallidicornis* with *fuscosus* Provancher, a decision with which I concur. Until now, additional synonymy appears to have been overlooked. Knight (1923) described a taxon widely distributed in the eastern United States under the name *albonotatus.* He recorded specimens from *Spiraea salicifolia.* The taxon was recorded by Kelton (1980) from many localities in the Canadian prairie provinces on *Spiraea alba* and *Salix* spp. Comparison of Kelton's *albonotatus* material with specimens he identified as *fuscosus,* indicates that many localities and dates of col-

lection are duplicated for the two species. Furthermore, in addition to the similar coloration of antennal segment 2, the vestiture of the dorsum is composed of two types of setae in both nominal taxa and the genitalia are indistinguishable. Kelton (1980) recorded *fuscosus* from *Salix interior, Lathyrus venosus, Spiraea alba, Potentilla fruticosa,* and *Symphoricarpos occidentalis.* Kelton's labeling indicates that at least in some cases representatives of both ''species'' were collected on the same hosts at the same localities on the same days. Although it is possible that two species could coexist under such circumstances, because all aspects of morphology—except pigementation of the dorsum—are in agreement, I am treating *albonotatus* as a junior synonym of *fuscosus.*

SPECIMENS EXAMINED: CANADA.—**Alberta:** Castor, August 7, 1957, A. and J. Brooks, 1♀ (CNC). Elkwater Park, July 13, 1952, A. R. Brooks, *Salix* sp. (Salicaceae), 2♂ (CNC). Grande Prairie, August 26, 1961, A. R. Brooks, 3♂, 2♀ (CNC). Lethbridge, July 29, 1930, J. H. Pepper, 2♀ (CNC). Manyberries, July 25, 1952, L. A. Konotopetz, 1♂ (CNC). Peace River, July 10, 1962, A. R. Brooks, 3♂, 2♀ (CNC). Rycroft, August 7, 1961, A. R. Brooks, 1♂, 1♀ (CNC). Stettler, August 3, 1957, A. and J. Brooks, 1♀ (CNC). Wainwright, July 27, 1957, A. and J. Brooks, 2♂, 4♀ (CNC). **British Columbia:** 7 mi S of Nelson, August 6, 1969, P. Oman, 2♂ (OSU). Agassiz, August 15, 1927, H. H. Ross, 3♂ (CNC). Courtenay, Vancouver Island, 0–50 m, July 1, 1978, N. L. H. Krauss, 1♂ (AMNH). Duncan, July 28, 1929, W. Downes, 1♂ (USNM). Glenemma, Salmon River, July 15, 1949, H. B. Leech, 2♂ (CAS). Meyer Flats, Oliver, June 29, 1959, L. A. Kelton, 9♂, 1♀ (CNC). Mission City, July 10, 1953, G. J. Spencer, 1♀ (CNC). Morris, August 3, 1931, R. H. Beamer, 1♂, 1♀ (KU). Parksville, August 17, 1970, L. A. Kelton, 1♂ (CNC). Peat Bog at Pitt Meadows, July 9, 1953, G. J. Spencer, 9♂, 7♀ (CNC). Quesnel, July 21, 1947, J. C. Spencer, 1♂ (CNC). Royal Oak, July 16, 1959, L. A. Kelton, 2♀ (CNC). Terrace, July 27, 1960, W. R. Richards, 1♂, 7♀ (CNC). Victoria, August 6, 1929, W. Downes, 1♂ (USNM). **Manitoba:** 10 mi W of Roblin, August 2, 1954, Brooks and Wallis, *Potentilla* sp. (Rosaceae), 3♂, 8♀ (CNC). 2 mi E of Douglas, July 27, 1958, J. G. Chillcott, 1♀ (CNC). 5 mi SW of Shilo, August 2, 1958, J. G. Chillcott, 5♂, 2♀ (CNC). 8.4 km W of Russell on Rt 16, July 18, 1990, M. D. Schwartz and R. Foottit, 1♂ (CNC). Assiniboine River Valley at crossing of Rt 16, July 18, 1990, M. D. Schwartz, 1♀ (CNC). Assinibone River Valley at Rt 16, July 18, 1990, M. D. Schwartz, 2♂, 2♀ (CNC). Boissevain, July 20, 1953, Brooks and Kelton, 6♂, 2♀ (CNC). Carberry, July 29, 1953–August 12, 1953, Brooks and Kelton, *Spiraea* sp. (Rosaceae), 9♂, 28♀ (CNC). Melita, July 25, 1958, A. and J. Brooks, 1♂ (CNC). Millwood, July 19, 1954, Brooks and Wallis, 8♂, 7♀ (CNC). Riding Mt. Natl. Park, July 21, 1972, L. A. Kelton, 1♂ (CNC). Russell, July 21, 1954, Brooks and Wallis, 1♂, 2♀ (CNC). Sandilands Provincial Forest, just off hiway, July 19, 1990, M. D. Schwartz, *Vicia* sp. (Fabaceae), 1♂, 4♀ (CNC). Sourris, July 27, 1953, A. R. Brooks, 16♂, 2♀ (CNC). St. Lazare, August 19, 1954, Brooks and Wallis, 1♂ (CNC). Turtle Mt., July 21, 1953, Brooks and Kelton, 1♂ (CNC). Virden, July 14, 1953, Brooks and Kelton, 3♂ (CNC). Winnipeg, August 9, 1958, A. and J. Brooks, 1♀ (CNC). **New Brunswick:** Grand Lake, August 19, 1959, J. A. Slater, 2♀ (AMNH). Kouchibouguac Natl. Park, July 20, 1977–August 8, 1977, D. J. Brown, *Spiraea* sp. (Rosaceae), 22♂, 21♀ (CNC). St. Andrews, August 9, 1957, G. E. Shewell, 3♂, 2♀ (CNC). **Nova Scotia:** Bible Hill, July 12, 1966, L. A. Kelton, *Rubus* sp. (Rosaceae), 20♂, 1♀ (CNC). Halifax, July 22, 1976, L. A. Kelton, *Pinus sylvestris* (Pinaceae), 3♂ (CNC). Ingonish, July 30, 1976, L. A. Kelton, *Salix* sp. (Salicaceae), 12♂, 6♀ (CNC). Kentville, July 15, 1966, L. A. Kelton, *Spiraea* sp. (Rosaceae), 1♂ (CNC). Kentville, July 26, 1924, B. P. Gorham, *Spiraea* sp. (Rosaceae), 4♂, 1♀ (CNC). Lockport, August 2, 1958, J. R. Vockeroth, 1♀ (CNC). Mt. Uniacke, July 13, 1966, L. A. Kelton, 18♂, 1♀ (CNC). N. E. Mangree CBI, July 23, 1966, L. A. Kelton, *Salix* sp. (Salicaceae), 1♀ (CNC). Woodville, July 20, 1966, L. A. Kelton, *Larix* sp. (Pinaceae), 3♂ (CNC). **Ontario:** 14 mi E of Kenora, August 9, 1960, Kelton and Whitney, 1♀ (CNC). Albury, June 27, 1962, G. Thorpe, 1♂ (CNC).

Alfred, June 19, 1979, D. Brown, 1♂, 8♀ (CNC). Algongin Prov. Park, July 19, 1991, J. R. Vockeroth, 2♀ (CNC). Aylmer, July 3, 1962, H. Blanchard, 5♂ (CNC). Belleville, July 24, 1964, C. C. Loan, *Spiraea latifolia* (Rosaceae), 1♂, 3♀ (CNC). Black Hawk, August 3, 1960, Kelton and Whitney, 3♂, 4♀ (CNC). Burtch, July 11, 1961–July 9, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 5♂ (CNC). Chalk River, July 20, 1961, G. Brumpton, 1♀ (CNC). Consecon, June 27, 1962, H. Blanchard, 1♂ (CNC). Constance Bay, Pine Forest, July 18, 1991, M. D. Schwartz, 1♀ (CNC). Corkery, July 4, 1962, D. Brown, *Alnus* sp. (Betulaceae), 3♀ (CNC). Dashwood, July 12, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 6♂, 8♀ (CNC). Dryden, August 12, 1960, Kelton and Whitney, 2♂ (CNC). Dundas, July 16, 1962, Kelton and Thorpe, 1♀ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 9♂, 12♀ (CNC). Edwards, Patterson's Farm, June 23, 1991, M. D. Schwartz, 1♂ (CNC). Elmvale, June 13, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 4♂, 1♀ (CNC). Erin, September 5, 1961, L. A. Kelton, *Salix* sp. (Salicaceae), 1♀ (CNC). Exeter, July 12, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 2♂, 1♀ (CNC). Footes Bay, July 25, 1962, Kelton and Thorpe, *Spiraea* sp. (Rosaceae), 2♀ (CNC). Foxboro, July 24, 1973, D. G. Reid, *Solidago* sp. (Asteraceae), 1♀ (CNC). Frederick, July 2, 1962, H. Blanchard, 2♀ (CNC). Grand Bend, July 11, 1962, Kelton and Thorpe, 1♀ (CNC). Guelph, June 19, 1961, G. Brumpton, 1♀ (CNC). Hamilton, July 6, 1955, L. A. Kelton, 1♀ (CNC). Hepworth, June 30, 1962, G. Thorpe, 5♂ (CNC). Innes Point, 10 km NW of Ottawa, June 28, 1991, M. D. Schwartz, *Potentilla* sp. (Rosaceae), 1♂, 3♀ (CNC). Innes Point, 10 km NW of Ottawa, Ottawa River, June 28, 1991, M. D. Schwartz, *Potentilla* sp. (Rosaceae), 9♂ (CNC). Lake of Bays, Norway Point, July 15, 1922, J. McDunnough, 6♂, 4♀ (CNC). Marmora, July 5, 1952, J. R. Vockeroth, *Spiraea* sp. (Rosaceae), 9♂ (CNC). Marmora, July 7, 1952, C. Boyle, et al., *Spiraea* sp. (Rosaceae), 3♂, 5♀ (CNC). Merivale, August 22, 1932, G. S. Walley, 2♂ (CNC). Middleville, August 7, 1980, D. J. E. Brown, 1♂ (CNC). Moose Hill, August 16, 1960, Kelton and Whitney, *Salix* sp. (Salicaceae), 1♂, 2♀ (CNC). Mt. Pleasant, July 10, 1958–July 29, 1961, L. A. Kelton, *Salix* sp. (Salicaceae), 8♂, 3♀ (CNC). Nepean, Piney Forest, June 28, 1991, M. D. Schwartz, 2♂, 2♀ (CNC). Niagara Falls, July 7, 1955, L. A. Kelton, 1♀ (CNC). North Bay, July 14, 1961, G. Brumpton, 2♂ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, *Solidago* sp. (Asteraceae), 5♂, 1♀ (CNC). Oakland, July 17, 1962, Kelton and Thorpe, *Potentilla milligrama* (Rosaceae), 3♀ (CNC). One Sided Lake, August 1, 1960, Kelton and Whitney, 3♂, 3♀ (CNC). Ottawa, July 15, 1957, J. E. H. Martin, 2♂, 1♀ (CNC). Parkhead, June 30, 1962, G. Thorpe, *Thuja occidentalis* (Cupressaceae), 1♂ (CNC). Peterboro, July 16, 1962, C. Boyle, 1♀ (CNC). Pitopiko River picnic area on Rt 11 between Longiac and Hearst, July 21, 1990, M. D. Schwartz, 1♂ (CNC). Queenston, July 8, 1955, L. A. Kelton, 1♀ (CNC). Rockaway, June 21, 1962, Kelton and Thorpe, 1♂ (CNC). Rockaway, June 21, 1962, Kelton and Thorpe, 3♂ (CNC). Shawanaga, July 26, 1962, Kelton and Thorpe, *Myrica* sp. (Myricaceae), 2♂ (CNC). Shawanoga, July 26, 1962, L. A. Kelton, 1♂ (CNC). Sioux Narrows, August 6, 1960, Kelton and Whitney, 1♀ (CNC). St. Lawrence Is. Natl. Park, Beaurivage Is., August 7, 1976, W. Reid, 2♂ (CNC). Stittsville, July 12, 1979, D. Brown, 4♂, 5♀ (CNC). Stittsville, July 26, 1961, G. Brumpton, *Salix* sp. (Salicaceae), 5♂, 9♀ (CNC). Sturgeon Falls, July 27, 1962, Kelton and Thorpe, *Alnus* sp. (Betulaceae), 9♂, 2♀ (CNC). Thessalon, August 14, 1965, W. Gagne, *Salix* sp. (Salicaceae), 1♀ (CAS). Tillsonburg, June 20, 1962–July 14, 1955, Kelton and Thorpe, *Salix* sp. (Salicaceae), 19♂, 19♀ (CNC). Vermillion Bay, August 11, 1960, Kelton and Whitney, *Salix* sp. (Salicaceae), 1♀ (CNC). Vienna, July 18, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 8♂ (CNC). Waterford, July 17, 1962, Kelton and Thorpe, 12♂, 1♀ (CNC). Woodstock, July 10, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 48♂, 28♀ (CNC). **Prince Edward Island:** Cavendish National Park, July 9, 1966, L. A. Kelton, 11♂, 1♀ (CNC). Charlottetown, August 7, 1976, L. A. Kelton, *Alnus* sp. (Betulaceae), 1♂ (CNC). **Quebec:** Aylmer, August 22, 1933, J. A. Adams, 1♀ (CNC). Beechgrove,

June 29, 1962, G. Brumpton, 1♂ (CNC). Bolton Pass, August 3, 1929, L. J. Milne, 1♀ (CNC). Cap Chat, July 27, 1954, J. E. H. Martin, 2♀ (CNC). Cap Rouge, July 8, 1953, O. Peck, 1♂ (CNC). Carteris, July 24, 1958, C. H. Mann, 1♂ (CNC). Fabre, July 5, 1963, L. A. Kelton, 3♂, 1♀ (CNC). Gatineau National Park, Harrington, July 2, 1981, D. J. E. Brown, 1♂, 1♀ (CNC). Kazubazua, August 18, 1927, G. S. Walley, 1♂, 1♀ (CNC). Knowlton, July 22, 1929, Milne and Walley, 14♂, 14♀ (CNC). Lac Megantic, August 3, 1961, G. Brumpton, 1♂, 1♀ (CNC). Lac Mondor, Ste. Flore, August 3, 1951, E. G. Munroe, 1♀ (CNC). Laniel, July 6, 1963–July 25, 1963, L. A. Kelton, W. Gagne, 12♂, 3♀ (CNC). Laniel, July 6, 1963, L. A. Kelton, 1♂ (CNC). Magog, August 2, 1961, G. Brumpton, 4♀ (CNC). Montreal, August 15, 1905, Beaulieu, 1♀ (CNC). Montreal, August 19, 1956, Slater and Davis, 1♂ (AMNH). Otter Lake, August 6, 1931, G. S. Walley, 1♂, 4♀ (CNC). Perth, July 11, 1980, L. A. Kelton, 1♀ (CNC). Quyon, July 22, 1958, L. A. Kelton, *Salix* sp. (Salicaceae), 4♂, 1♀ (CNC). Roberval, July 28, 1911, G. Beaulieu, 1♀ (CNC). S.-Eust'e, July 22, 1918, J. Ouellet, 1♀ (TAMU). Shawville, August 6, 1958, L. A. Kelton, 4♂ (CNC). St. Agathe, August 9, 1961, G. Brumpton, 2♀ (CNC). St. Jean, August 8, 1961, G. Brumpton, 1♂ (CNC). Sutton, August 5, 1961, G. Brumpton, 2♀ (CNC). Thurso, August 20, 1958, L. A. Kelton, 1♂, 3♀ (CNC). Trinity Bay, August 18, 1929, W. J. Brown, 3♂, 6♀ (CNC). Trinity Bay, August 20, 1929, W. J. Brown, 1♀ (UCB). *Missisquoi Co.:* Mt. Pinacle, 8 km E of Freilighsburg, 400–500 m, June 21, 1991, M. Sharkey, 1♂ (CNC). **Saskatchewan:** 186 km N of Regina on Rt 11, 3.3 km E of Rt 11, July 10, 1990, M. D. Schwartz, *Rosa* sp. (Rosaceae), 1♂ (CNC). 45.8 km N of Stoughton on Rt 47, July 8, 1990, M. D. Schwartz, *Rosa* sp. (Rosaceae), 1♂ (CNC). Amsterdam, August 22, 1954, Brooks and Wallis, 3♂, 4♀ (CNC). Broadview, August 13, 1954, Brooks and Wallis, 1♀ (CNC). Dunedin, June 18, 1951, A. R. Brooks, 1♂, 3♀ (CNC). Elbow, August 1, 1951, A. R. Brooks, *Spiraea* sp. (Rosaceae), 5♂, 7♀ (CNC). Esterhazy, July 26, 1954, Brooks and Wallis, 6♂, 2♀ (CNC). Fort Walsh Natl. Hist. Park, September 3, 1993, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 1♀ (CNC). Hudson Bay, August 25, 1954, Brooks and Wallis, 1♂ (CNC). Hudson Bay, August 26, 1954, Brooks and Wallis, 5♂, 2♀ (CNC). Kandahar, July 29, 1954, Brooks and Wallis, 11♂, 6♀ (CNC). Lumsden, August 7, 1954, Brooks and Wallis, 4♂, 3♀ (CNC). Nipewin, August 15, 1950, L. A. Konotopetz, *Medicago sativa* (Fabaceae), 1♀ (CNC). Rockglen, August 3, 1955, C. D. Miller, 1♂, 3♀ (CNC). Rutland, July 29, 1940, A. R. Brooks, 1♀ (CNC). Saskatoon, July 9, 1957–July 25, 1950, A. R. Brooks, 5♂, 12♀ (CNC). Struon, July 19, 1951, L. A. Konotopetz, 1♂ (CNC). Torch River, August 14, 1950, L. A. Konotopetz, *Lathyrus venosus* (Fabaceae), 2♂, 12♀ (CNC). Torquay, August 11, 1955, A. R. Brooks, 1♀ (CNC). Val Marie, August 8, 1955, A. R. Brooks, 3♂, 2♀ (CNC). Willow Bunch, July 30, 1955, C. D. Miller, 16♂, 24♀ (CNC). Wood Mountain, August 5, 1955, A. R. Brooks, 4♂, 7♀ (CNC). USA.—**Alabama:** *Blount Co.:* 1 mi SW of Blount Springs, just S of Hwy 31, May 20, 1986, C. B. Barr, 1♀ (LSU). **California:** *Mendocino Co.:* 4 mi W of Eel River Ranger Station, Mendocino National Forest, June 10, 1972, J. Doyen, *Alnus* sp. (Betulaceae), 1♀ (UCB). *Siskiyou Co.:* 1 mi NW of Bartle, July 20, 1966, P. A. Opler, 1♀ (UCB). **Colorado:** *Boulder Co.:* S of St. Vrain Can., August 16, 1973, G. F. Knowlton and W. Hanson, 1♂ (USU). *Douglas Co.:* Waterton, August 8, 1987, T. J. Henry, 1♂ (USNM). Waterton, July 2, 1981–August 17, 1982, D. A. and J. T. Polhemus, *Salix interior* (Salicaceae), 5♂, 5♀ (JTP). *Jefferson Co.:* Waterton, Platte River, 5500 ft, July 11, 1986, R. T. Schuh and J. T. Polhemus, *Salix interior* (Salicaceae), 8♂, 12♀ (AMNH). *Ouray Co.:* 2 mi W of Ridgway, July 22, 1967, H. R. Burke, 1♂ (TAMU). *Weld Co.:* 1 mi N of Masters along S Platte River, August 9, 1987, J. T. and D. A. Polhemus, *Salix interior* (Salicaceae), 1♀ (JTP). **Connecticut:** 3 mi SE of Sandy Hook, September 17, 1966, C. W. O'Brien, 1♀ (UCB). 4.5 mi N of Salisbury, Mt. Riga State Park, July 25, 1970, J. Slater and J. Harrington, 1♂ (AMNH). East Hartford, Tunxis State Forest, July 20, 1970, F. P. Maroney, 1♂ (AMNH). Mansfield Center, July 28, 1962, 1♀ (AMNH). New Canaan, July 8, 1951, M.

Statham, 1♀ (AMNH). Norfold, Haystack Mt. State Park, July 25, 1970, J. Slater and J. Harrington, 1♀ (AMNH). North Norfolk, Campbell Falls State Park, August 6, 1970, F. P. Maroney, 1♀ (AMNH). S of Meriden, June 15, 1920, H. Johnson, 1♀ (CAS). Salisbury, Mt. Riga State Park, August 25, 1970, F. P. Maroney, 1♀ (AMNH). Storrs, July 29, 1954, F. B. Lewis, 1♀ (AMNH). **Idaho:** *Idaho Co.:* Lochsa River Valley, E of Wilderness Acc. Cmpd (milepost 127), 2400 ft, August 1, 1987, G. M. Stonedahl, *Salix* sp. (Salicaceae), 1♀ (AMNH). milepost 123 E of Lovell, Wilderness Access Campground, 2200 ft, August 7, 1986, Schuh, Schwartz, Stonedahl, *Salix* sp. (Salicaceae), 6♂, 8♀ (AMNH). **Iowa:** *Clinton Co.:* Clinton, June 23, 1928, G. S. Walley, 1♂ (CNC). *Henry Co.:* 6 mi SE of Mt. Pleasant, T71N R7W, June 16, 1962, J. C. Schaffner, 2♀ (TAMU). **Louisiana:** *East Baton Rouge Co.:* Baton Rouge, April 26, 1986, E. G. Riley, 1♂, 1♀ (DAR). *Feliciana Co.:* Tunica Hills W of Weyanoke, May 18, 1985, C. B. Barr, 2♀ (LSU). **Maine:** *Hancock Co.:* Mount Desert Island, July 30, 1922, *Spiraea* sp. (Rosaceae), 1♀ (USNM). Southwest Harbor, C. W. Johnson, 1♂ (AMNH). *Kennebec Co.:* Monmouth, July 15, 1910, C. A. Frost, 1♀ (CAS). *Lincoln Co.:* Southport, August 4, 1901, 1♀ (AMNH). *Penobscot Co.:* Orono, July 5, 1911, 1♀ (CAS). *Piscataquis Co.:* Baxter State Park, July 18, 1986, C. B. Barr, 1♀ (LSU). *Washington Co.:* 8 km S of Milbridge, July 22, 1990, Steiner and Landvoight, 2♀ (USNM). Machias, July 26, 1909, C. W. Johnson, 2♂, 1♀ (CAS). **Massachusetts:** *Berkshire Co.:* Washington, August 8, 1912, 1♀ (CAS). *Essex Co.:* Pigeon Cove, July 28, 1916, C. E. Olsen, 3♀ (USNM). *Middlesex Co.:* Holliston, August 12, 1900, N. Banks, 1♀ (AMNH). *Norfolk Co.:* Wellesley, July 11, 1909, E. P. Van Duzee, 1♀ (CAS). **Michigan:** *Cheboygan Co.:* Douglas Lake, August 4, 1924, H. B. Hungerford, 1♀ (KU). No specific locality, June 21, 1938, H. B. Hungerford, 3♂, 6♀ (KU). **Minnesota:** *Carlton Co.:* Elkhorn Creek, August 18, 1920, H. H. Knight, 1♀ (USNM). *Lac Qui Parle Co.:* Madison, June 25, 1921, H. H. Knight, 1♀ (USNM). *Lake Co.:* Cramer, August 10, 1922, H. H. Knight, 2♂, 1♀ (USNM). **Missouri:** *Barry Co.:* Roaring River State Park, June 15, 1954, J. W. Green, 1♀ (CAS). *Maries Co.:* Vichy, June 17, 1939, R. C. Froeschner, 1♀ (USNM). **Montana:** *Granite Co.:* 6 mi S of Drummond on Rt 10A, Hall, August 9, 1986, Schuh, Schwartz, Stonedahl, *Rosa* sp. (Rosaceae), 5♀ (AMNH). *Park Co.:* No specific locality, 6000 ft, August 14, 1926, A. A. Nichol, 2♀ (USNM). *Yellowstone Co.:* No specific locality, July 16, 1920, A. A. Nichol, 1♀ (USNM). **New Hampshire:** *Coos Co.:* Mount Washington, Lake of the Clouds, 5000 ft, August 9, 1954, Becker, Munroe, Mason, 1♂ (CNC). *Grafton Co.:* Hanover, July 8, 1908, 1♂ (CAS). *Strafford Co.:* Durham, August 12, 1948, L. D. Beamer, 2♀ (KU). **New York:** *Cattaraugus Co.:* Gowanda, August 2, 1907, E. P. Van Duzee, 1♂ (CAS). *Delaware Co.:* Hobart, Gun House Hill, August 10, 1963, L. W. All, *Spiraea latifolia* (Rosaceae), 2♂ (PDA). *Essex Co.:* Lake Placid, 690 m, July 4, 1991, M. D. Schwartz, 4♂ (CNC). Lake Placid, July 19, 1962, J. R. Vockeroth, 2♂ (CNC). Lake Placid, July 4, 1991, M. D. Schwartz, *Picea glauca* (Pinaceae), 1♂, 1♀ (CNC). Whiteface Mountain, 4600 ft, July 19, 1962, J. R. Vockeroth, 1♀ (CNC). Whiteface Mountain, August 22, 1916, H. H. Knight, 1♀ (CNC). *Genesee Co.:* Batavia, July 12, 1914, H. H. Knight, 1♂, 1♀ (CAS). Batavia, July 31, 1913, H. H. Knight, 1♀ (USNM). *Hamilton Co.:* 7 mi S of Long Lake (town), August 26, 1956, J. C. Schaffner, 3♂, 2♀ (TAMU). *Rensselaer Co.:* Brainard, July 11, 1969, P. and B. Wygodzinsky, 1♀ (AMNH). *Rockland Co.:* Nyack, Memorial Park, June 12, 1988, M. D. Schwartz, *Tilia americana* (Tiliaceae), 1♀ (AMNH). Rockland Lake State Park, June 26, 1988, M. D. Schwartz, *Rosa* sp. (Rosaceae), 1♀ (AMNH). Sparkill Memorial Park, June 21, 1988, M. D. Schwartz, *Rosa* sp. (Rosaceae), 1♀ (AMNH). Sparkill Memorial Park, June 21, 1988, M. D. Schwartz, *Salix amygdaloides* (Salicaceae), 32♂, 38♀ (CNC). Stony Point Battlefield State Park, July 2, 1988, M. D. Schwartz, 1♀ (AMNH). *Tompkins Co.:* Ithaca, Cornell University, July 7, 1979, A. G. Wheeler, Jr., *Fagus sylvatica* (Fagaceae), 1♂ (PDA). Ithaca, June 27, 1920, H. H. Knight, holotype male (*pallidicornis*) male (USNM). McLean, July 25, 1948, R. H. Beamer, 1♂ (KU). Mc-

Lean, July 27, 1916, H. H. Knight, 1♂, 1♀ (USNM). McLean, July 27, 1916, H. H. Knight, holotype male (*albonotatus*) (USNM). *Unknown Co.:* Otter Lake, July 25, 1948, R. H. Beamer, 2♀ (KU). **North Carolina:** *Stanly Co.:* Morrow Mt. State Park, June 19, 1958, D. A. Young, 1♀ (USNM). *Wake Co.:* Raleigh, May 18, 1973, D. L. Stephen, *Rubus* sp. (Rosaceae), 1♂ (USNM). **North Dakota:** *Barnes Co.:* No specific locality, D. A. Mundal, *Euphorbia esula* (Euphorbiaceae), 1♂ (DAR). *Grand Forks Co.:* No specific locality, July 13, 1964, R. J. Janer, 1♂ (DAR). *Traill Co.:* No specific locality, August 4, 1923, A. A. Nichol, 1♀ (USNM). **Oklahoma:** *Adair Co.:* Stilwell, Adair Recreation Area, May 24, 1986, C. B. Barr, 1♂ (LSU). **Oregon:** *Klamath Co.:* 13 mi W of Keno on Rt 66, 4600 ft, June 27, 1979, M. D. Schwartz, 1♀ (AMNH). Lake of the Woods, 4900 ft, September 23, 1975, Joe Schuh, *Spiraea douglasii* (Rosaceae), 14♀ (OSU). **Pennsylvania:** *Centre Co.:* Bear Meadows, July 21, 1961, J. A. Chemsak, 1♂, 1♀ (UCB). State College, Rt 322, July 6, 1976, T. J. Henry, *Rhus glabra* (Anacardiaceae), 2♂, 2♀ (PDA). *Dauphin Co.:* Fishing Creek Valley, Frog Hollow Road, June 21, 1979, T. J. Henry and A. G. Wheeler, Jr., *Salix* sp. (Salicaceae), 3♂, 4♀ (PDA). Middle Paxton Township, Rt 443, Fishing Creek Valley School, June 24, 1982, A. G. Wheeler, Jr., *Rhus typhina* (Anacardiaceae), 2♂ (PDA). Middle Paxton Township, Rt 443, Fishing Creek Valley School, June 30, 1979, A. G. Wheeler, Jr., *Rhus typhina* (Anacardiaceae), 1♂ (PDA). *Erie Co.:* Girard, Elk Creek Nursery, July 9, 1976, A. G. Wheeler, Jr., *Spiraea* sp. (Rosaceae), 2♂, 2♀ (PDA). N of Waterford on Rt 97, July 20, 1988, A. G. Wheeler, Jr., *Spiraea* sp. (Rosaceae), 1♂, 7♀ (PDA). *Indiana Co.:* near Pine Flats, June 7, 1979, A. G. Wheeler, Jr., *Viburnum dentatum* (Caprifoliaceae), 1♀ (PDA). *Pike Co.:* Lake Wallenpawpack, July 27, 1963, E. E. Simon, 1♀ (PDA). *Schuykill Co.:* 5 mi S of Frackville on Rt 81, July 1, 1986, A. G. Wheeler, Jr., *Aronia arbutifolia* (Rosaceae), 1♀ (PDA). **South Carolina:** *Oconee Co.:* Mountain Rest, June 26, 1952, W. F. Chamberlain, 1♀ (TAMU). **South Dakota:** *Jackson Co.:* Interior, July 25, 1927, H. H. Knight, 4♂ (USNM). **Tennessee:** *Davidson Co.:* SE of Nashville, Beechwood Road, May 12, 1988, M. D. Schwartz, *Lonicera* sp. (Caprifoliaceae), 13♂, 1♀ (AMNH). **Vermont:** *Windsor Co.:* Mount Ascutney, July 11, 1908, 1♀ (CAS). Spingfield, June 22, 1934, R. H. Beamer, 1♀ (KU). **Washington:** *Snohomish Co.:* Monroe, July 1, 1905, E. P. Van Duzee, 3♀ (CAS). *Yakima Co.:* Yakima, June 20, 1931, A. R. Rolfs, 1♂ (TAMU). **West Virginia:** *Grant Co.:* N of Petersburg on Rt 220, June 9, 1984, A. G. Wheeler, Jr., *Aster* sp. (Asteraceae), 2♂, 4♀ (PDA). *Tucker Co.:* Canaan Valley, Rt 32 near Blackwater River, August 12, 1979, A. G. Wheeler, Jr., *Spiraea alba* (Rosaceae), 2♂, 13♀ (PDA).

Plagiognathus grandis Reuter
Figures 8, 17, 25

Plagiognathus grandis Reuter, 1876b: 91 (n. sp.).
Gerhardiella rubidus Poppius, 1911: 85 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Recognized by the *large size*, very *broad body*, and somewhat *mottled carmine coloration* of the dorsum (fig. 8). Unlike any other *Plagiognathus* species in coloration and its heavy body. Vesica with short apical spines (fig. 25), similar in structure to *concoloris, flavus, longipennis, lonicerae,* and *phaceliae.*

REDESCRIPTION: *Male:* Large, heavy-bodied; total length 4.55–5.18, length apex clypeus–cuneal fracture 3.07–3.55, width across pronotum 1.58–1.75. COLORATION (fig. 8): General coloration, including venter and femora, mottled carmine, less commonly nearly solid carmine or more broadly pale; membrane moderately fumose, veins pale; antennal segment 1 intensely dark at base, sometimes lighter distally and with a pale apical annulus, segment 2 dark at base and sometimes infuscate distally, lighter mesially (fig. 17), segments 3 and 4 moderately infuscate; labium mostly carmine, apex infuscate; dorsal tibial spines with small dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum smooth, polished, and shining. Vestiture of dorsum composed of relatively short, pale, recumbent, scattered, simple setae. STRUCTURE: Heavy-bodied, stout, hemelytra nearly parallel-sided; frons weakly

tumid, clypeus not visible from above; anteocular distance 1.3 times diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1; labium reaching apex of hind coxae. GENITALIA (fig. 25): Vesica, including apical spines, sigmoid, body relatively heavy, base falling near base of secondary gonopore; apical spines mostly overlapping, anterior spine slightly longer than posterior; flange very narrow.

Female: Coloration as in male; body somewhat more ovoid. Total length 4.76–5.09, length apex clypeus–cuneal fracture 3.33–3.56, width across pronotum 1.63–1.81.

HOSTS: *Rhus microphylla, R. triloba* (Anacardiaceae).

DISTRIBUTION: Known from North Dakota in the north to Zacatecas, Mexico, in the south, from Utah and eastern Arizona in the west to west Texas in the east.

DISCUSSION: Comparison of a substantial amount of material identified as *grandis* and *rubidus*, ranging from Mexico to North Dakota and west to Arizona, indicates that a single species is involved. I am therefore treating *rubidus* as a junior synonym of *grandis*. I was unable to locate the types of *grandis* and *rubidus* during the course of this study. Nonetheless, the identity of this taxon, including the synonymy listed above, seems reasonably certain, based on all of the identified material I have examined.

SPECIMENS EXAMINED: MEXICO.—**Chihuahua:** Chihuahua, 4600 ft, May 29, 1964, L. A. Kelton, 9♂, 15♀ (CNC). **Zacatecas:** Tropic of Cancer on Hwy 54, 1958 m, July 4, 1984, Carroll, Schaffner, Friedlander, 1♂ (TAMU). USA.—**Arizona:** *Cochise Co.:* 0.5 mi E of Portal, 1450 m, June 12, 1980, R. T. Schuh, K. and R. Schmidt, *Rhus microphylla* (Anacardiaceae), 11♂, 24♀ (AMNH). 2.7 mi NW of Portal, 1600 m, June 13, 1980, R. T. Schuh, K. and R. Schmidt, *Rhus microphylla* (Anacardiaceae), 17♂, 31♀ (AMNH). 8 mi W of Bisbee on Rt 92, 4700 ft, June 3, 1983, R.T. Schuh, *Rhus microphylla* (Anacardiaceae), 38♂, 28♀ (AMNH). Portal, June 15, 1980, R. T. Schuh, K. and R. Schmidt, 1♀ (AMNH). *Gila Co.:* 5.2 mi S of Globe, May 13, 1999, J. C. Schaffner, 1♀ (TAMU). Globe, Pinal Creek, 4000 ft, June 6, 1953, A. and H. Dietrich, 1♀ (CU). *Yavapai Co.:* Ash Fork, June 30, 1991, W. F. Chamberlain, 2♂, 1♀ (TAMU). **Colorado:** *Denver Co.:* Denver, July 15, 1909, W. J. Gerhard, 2♂ (CAS). *Douglas Co.:* Waterton, June 25, 1981, J. T. Polhemus, 3♂, 1♀ (AMNH). *Jefferson Co.:* Waterton, Platte River, 5350 ft, July 11, 1986, J. T. Polhemus, 1♀ (AMNH). *Larimer Co.:* Fort Collins, July 15, 1900, E. P. Van Duzee, 1♂ (CAS). *Unknown Co.:* Macedonia, July 1, 1931, R. H. Beamer, 1♀ (KU). Natural Fort, 9 mi S of Cheyenne, Wyoming, August 16, 1968, P. Oman, 1♂, 1♀ (CNC). **New Mexico:** *Otero Co.:* 2 mi SW of Mayhill, July 17, 1979, Dolorme, McHugh, Schaffner, *Rhus microphylla* (Anacardiaceae), 2♀ (TAMU). **North Dakota:** *Ramsey Co.:* Roosevelt Natl. Mem. Park, N. Unit, June 30, 1973, L. A. Kelton, *Rhus* sp. (Anacardiaceae), 8♂, 1♀ (CNC). **Texas:** *Cameron Co.:* Big Bend Natl. Park, Tornillo Flat, May 20, 1959, Howden and Becker, 2♂, 1♀ (CNC). *Frio Co.:* 10 mi N of Pearsall, April 23, 1976, G. V. Manley, 3♂, 1♀ (TAMU). 2 mi N of Pearsall, May 8, 1976, J. C. Schaffner, 26♂, 39♀ (TAMU). 2 mi S of Moore, May 8, 1976, J. C. Schaffner, 1♀ (TAMU). *Jeff Davis Co.:* Fort Davis, May 31, 1959, Howden and Becker, 1♀ (CNC). *Kerr Co.:* Kerrville, May 12, 1990, W. F. Chamberlain, 13♂, 13♀ (TAMU). *Mason Co.:* 14 mi SW of Mason, June 12, 1997, J. C. Schaffner, 1♂ (TAMU). *Pecos Co.:* Longfellow, July 1, 1930, J. O. Martin, 1♂, 1♀ (CAS). *Rutherford Co.:* Marathon, June 10, 1930, J. O. Martin, 9♂, 17♀ (CAS). *Val Verde Co.:* 15 mi E of Juno, May 27, 1976, G. V. Manley, 2♂ (TAMU). 28 mi N of Comstock, May 10, 1997, Gillogly and Schaffner, 24♂, 1♀ (TAMU). **Utah:** *Cache Co.:* Logan, July 10, 1903, 2♀ (USU). *Salt Lake Co.:* Salt Lake City, July 1, 1922, E. P. Van Duzee, 2♂, 5♀ (CAS). *Sanpete Co.:* 2.1 mi NE of Fairview on Rt 1, Cottonwood Creek, T13S R5E, 6750 ft, July 12, 1981, M. D. Schwartz, *Rhus triloba* (Anacardiaceae), 1♂, 4♀ (AMNH). *Sevier Co.:* 11 mi W of Sevier on I-70, 6400 ft, July 15, 1980, G. Stonedahl, *Rhus* sp. (Anacardiaceae), 3♀ (AMNH). *Uintah Co.:* 5–10 mi SW of Bonanza, 5000–5600 ft, July 5, 1982, M. D. Schwartz, *Rhus triloba* (Anacardiaceae), 2♀ (AMNH). Dinosaur National Monument (boundary on road to quarry), July 8, 1982, M. D. Schwartz, *Rhus triloba*

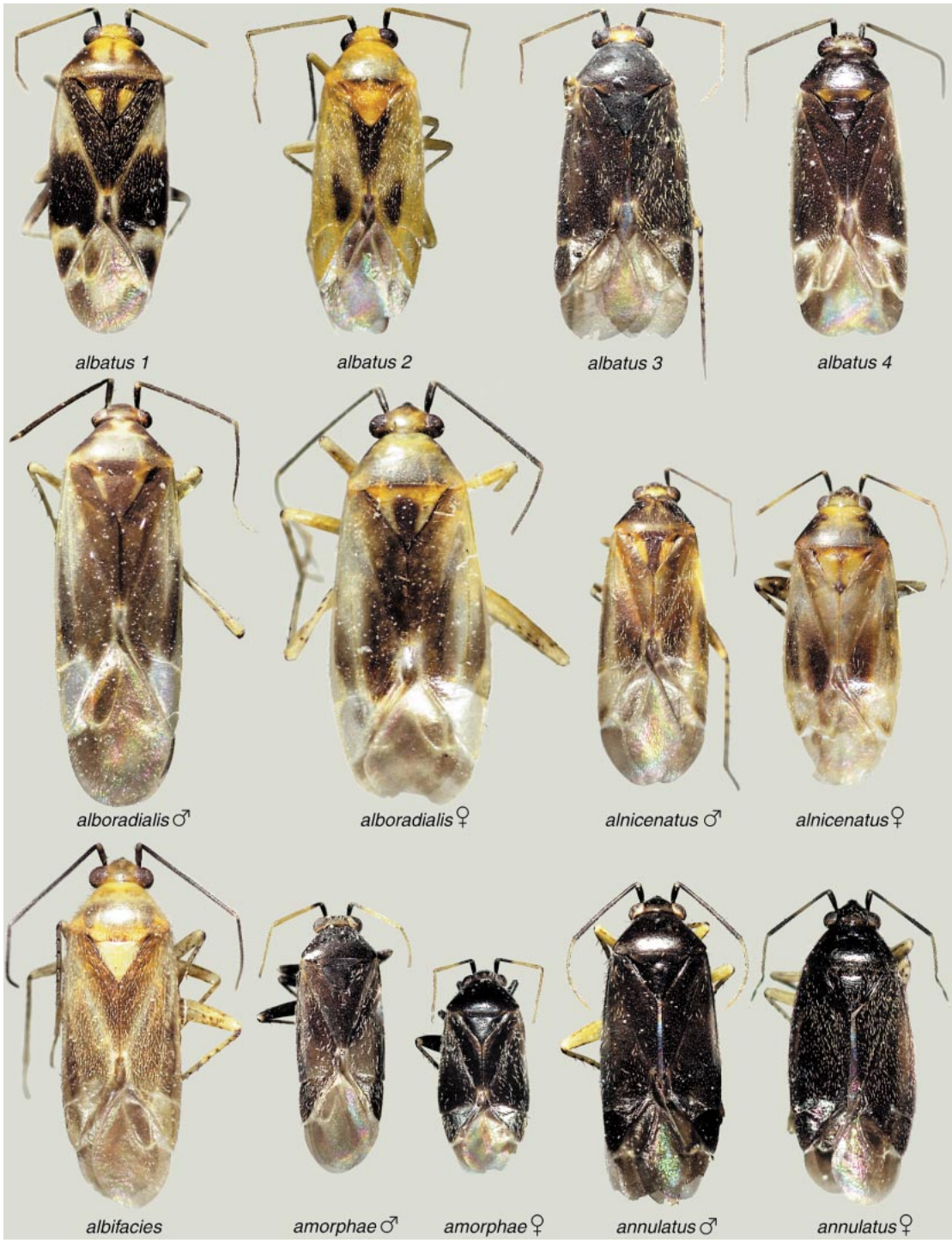

Fig. 5. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 263 for localities).

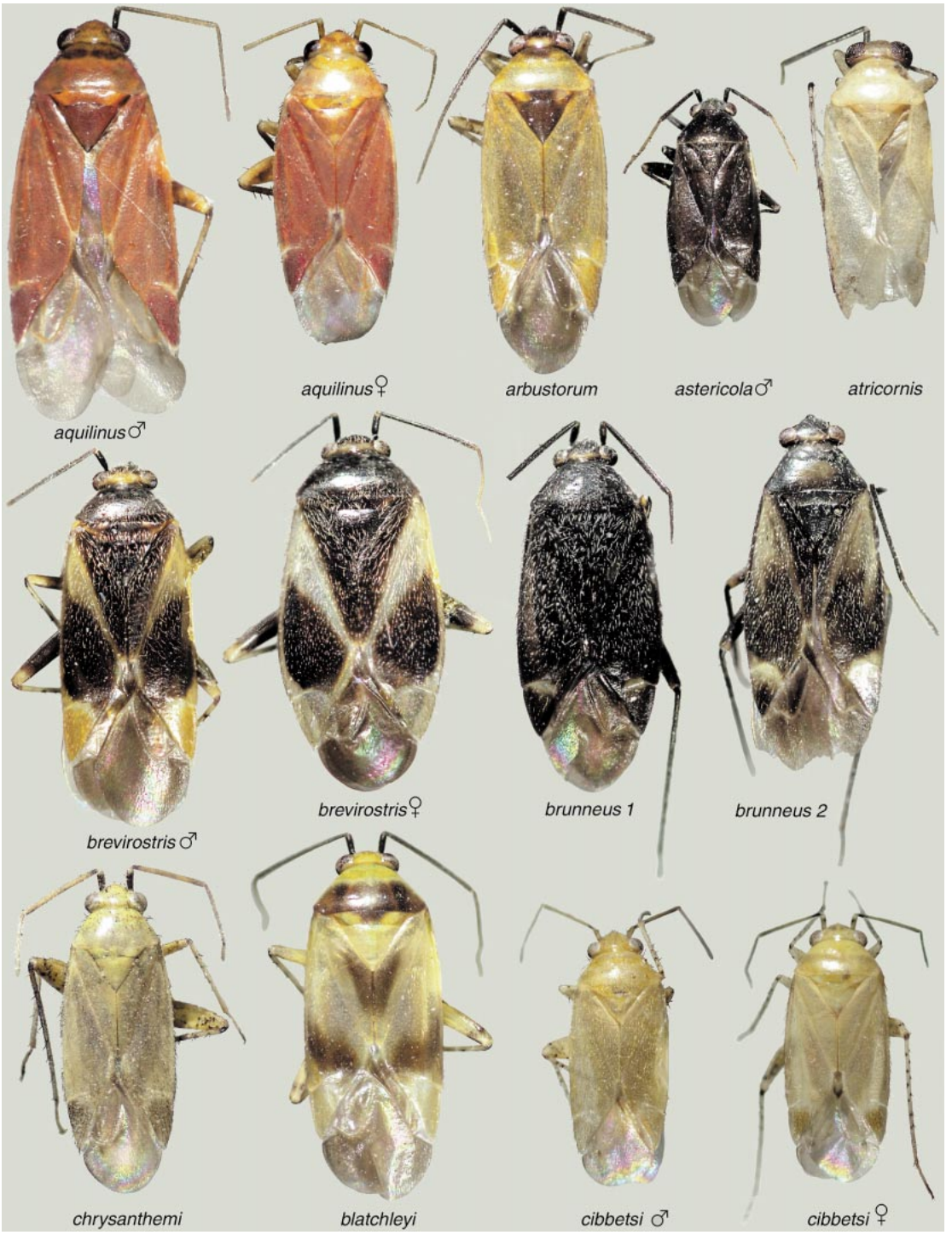

Fig. 6. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 263 for localities).

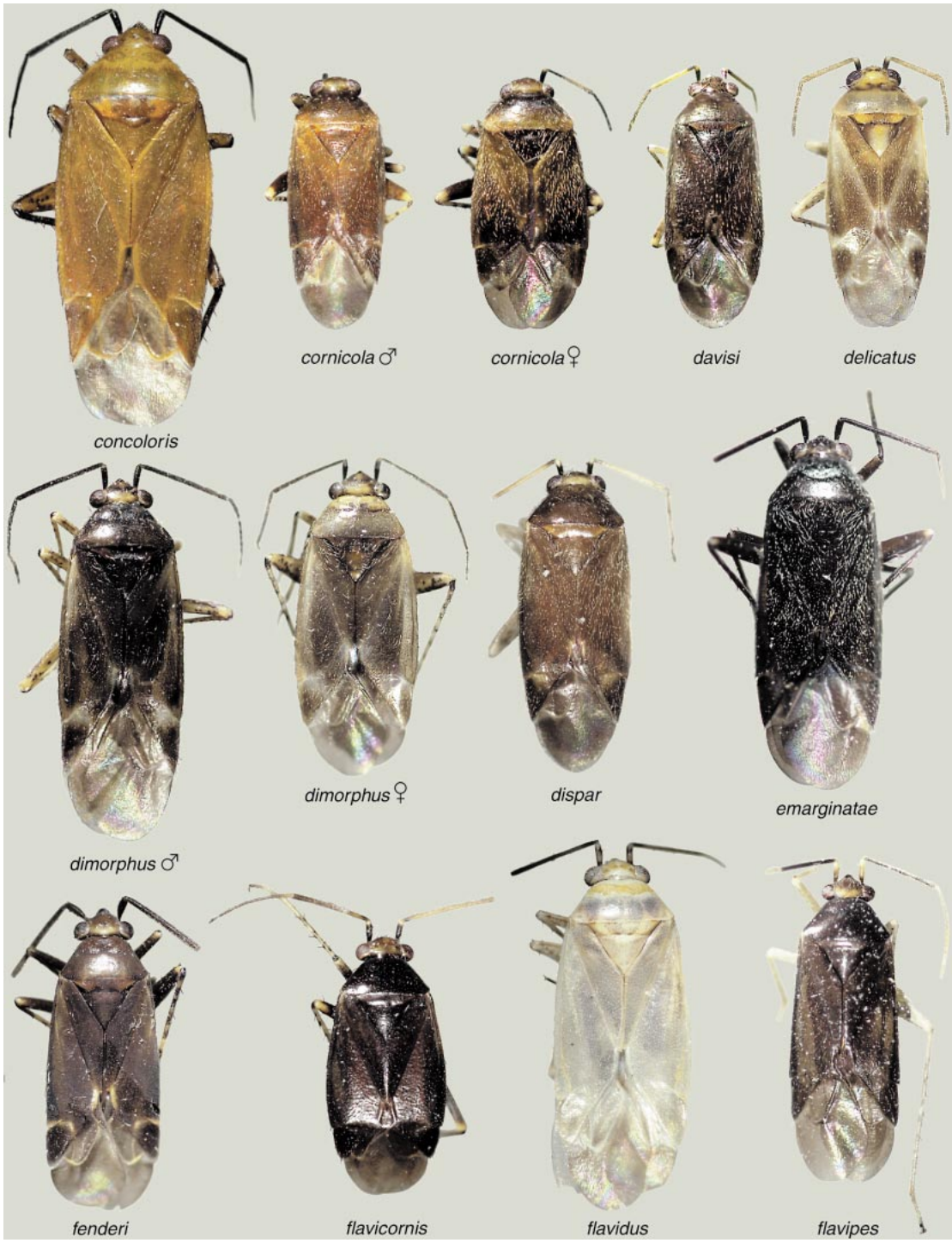

Fig. 7. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 263 for localities).

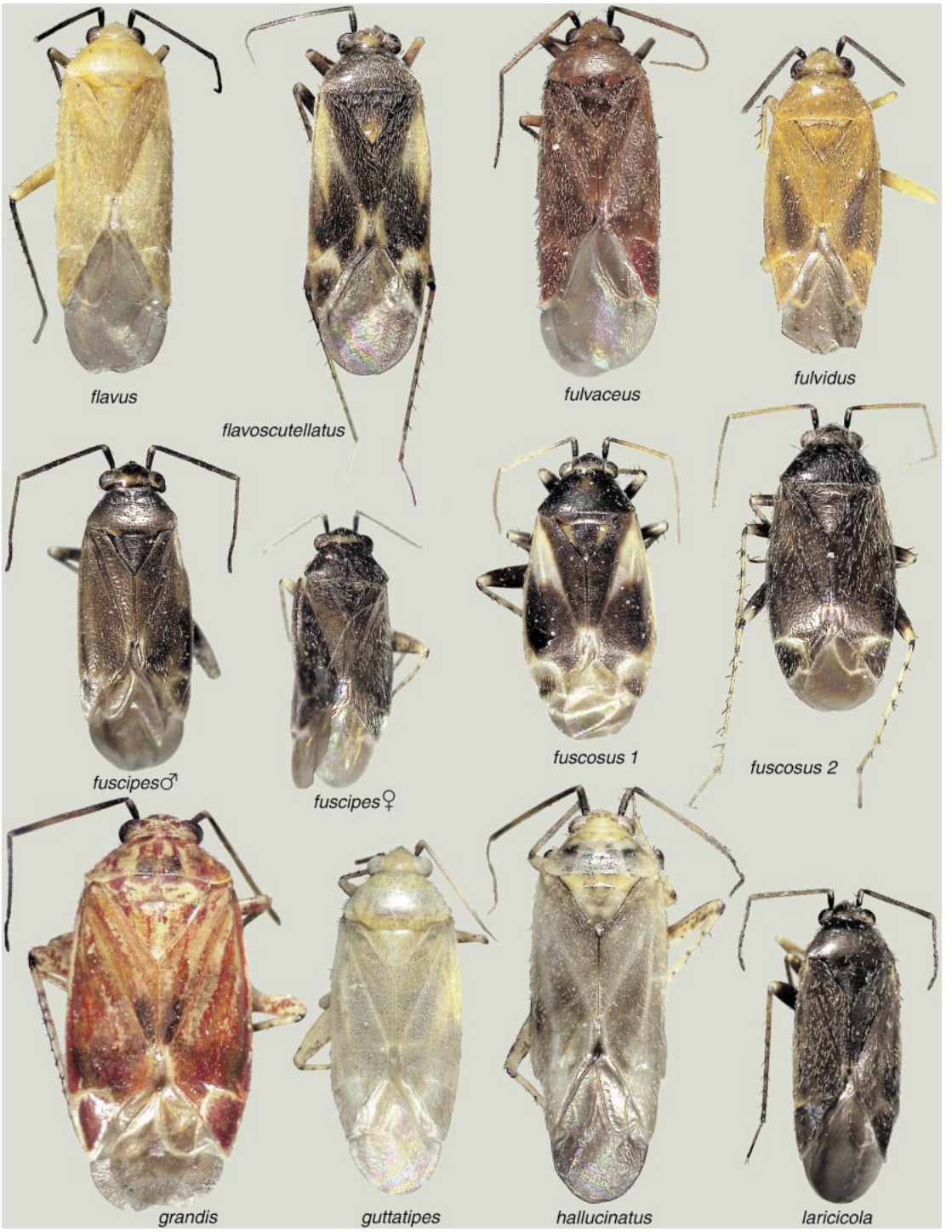

Fig. 8. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 263 for localities).

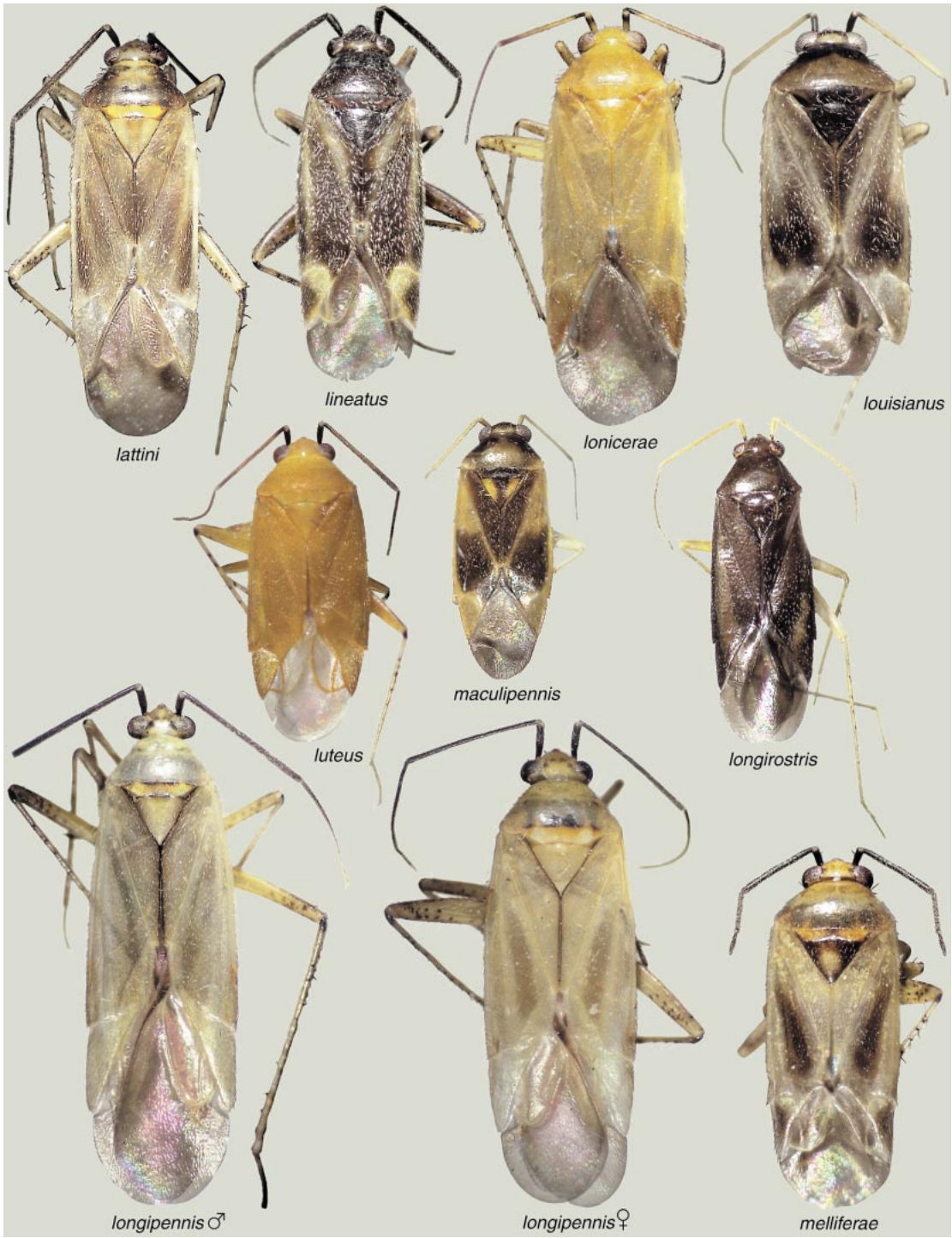

Fig. 9. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 263 for localities).

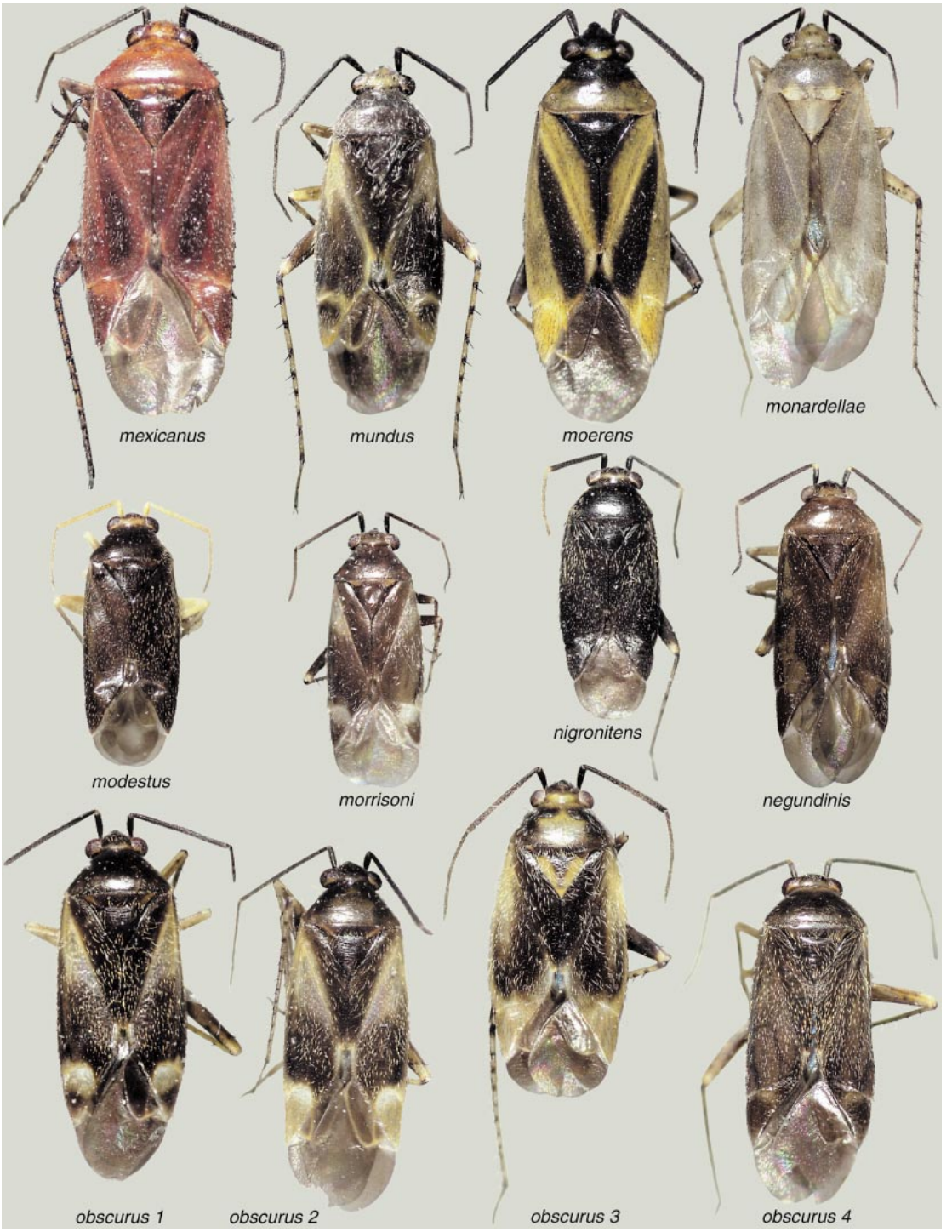

Fig. 10. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 263 for localities).

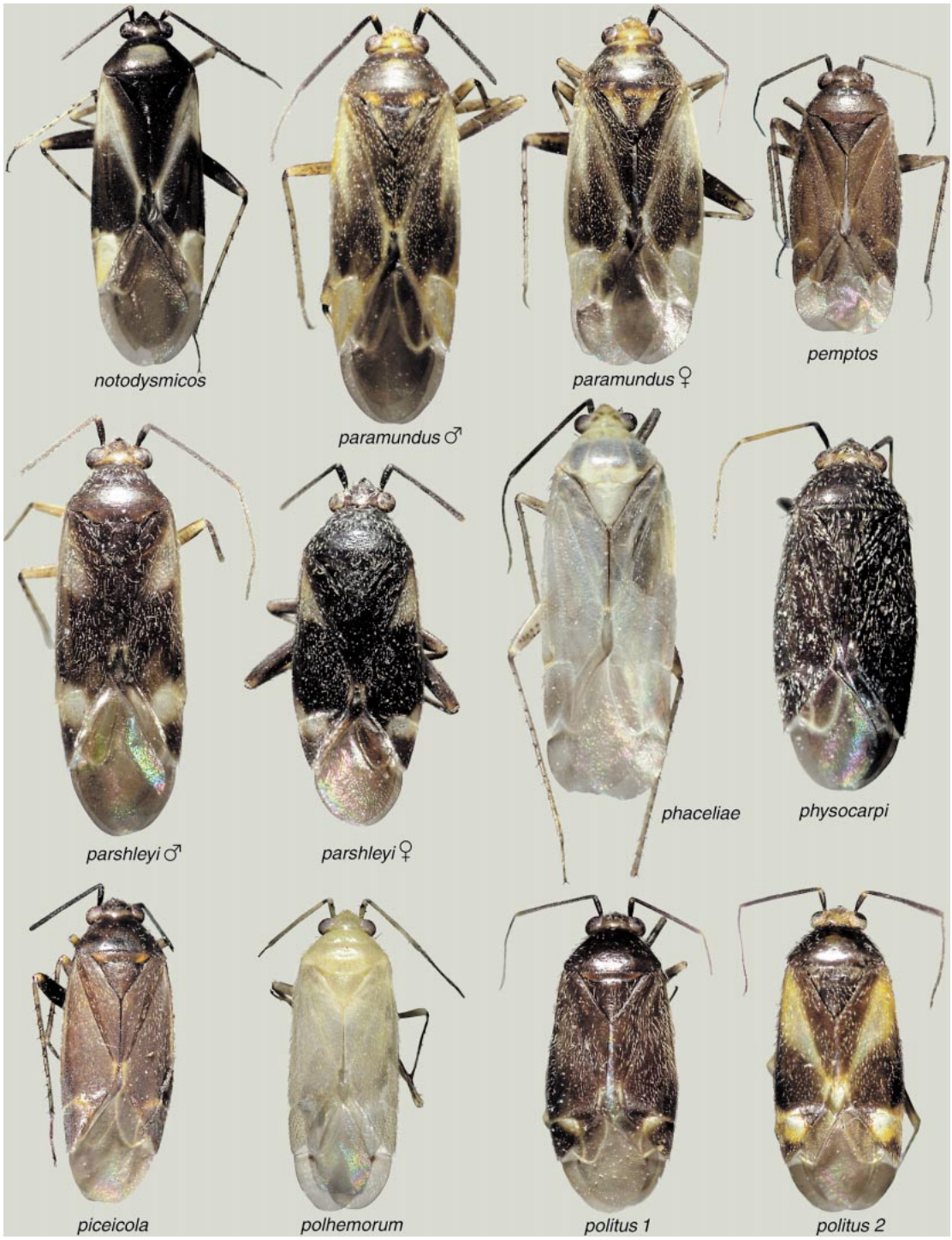

Fig. 11. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 263 for localities).

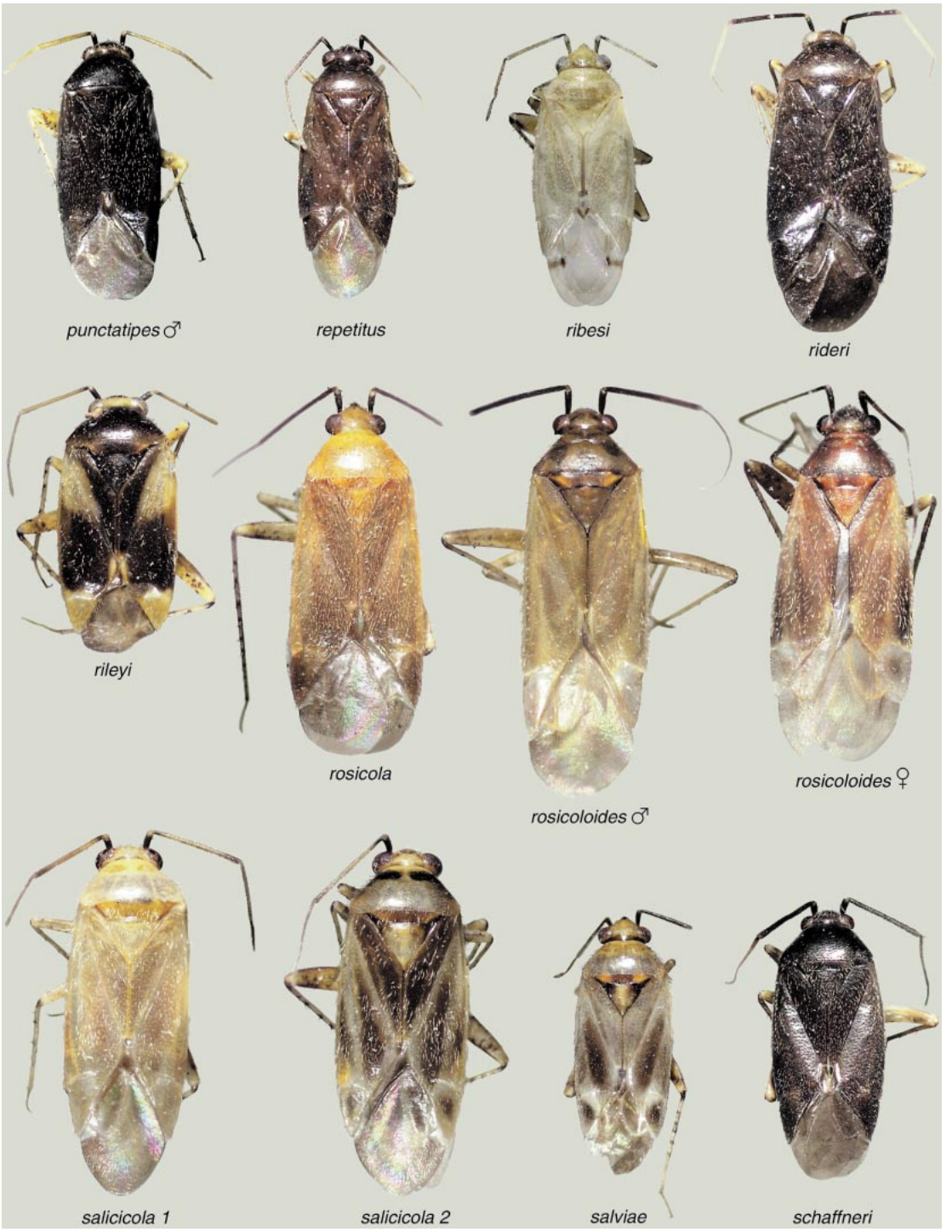

Fig. 12. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 264 for localities).

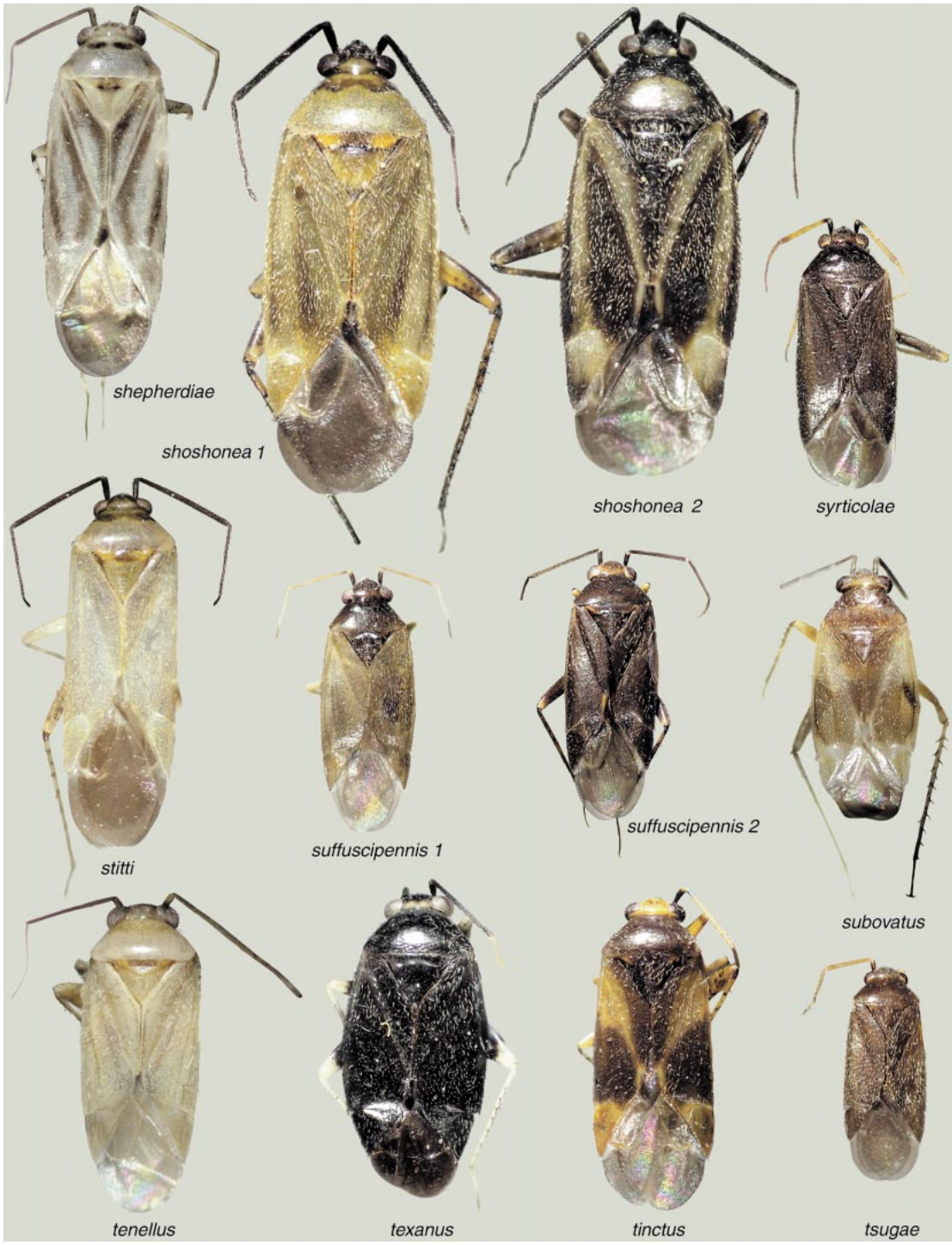

Fig. 13. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 264 for localities).

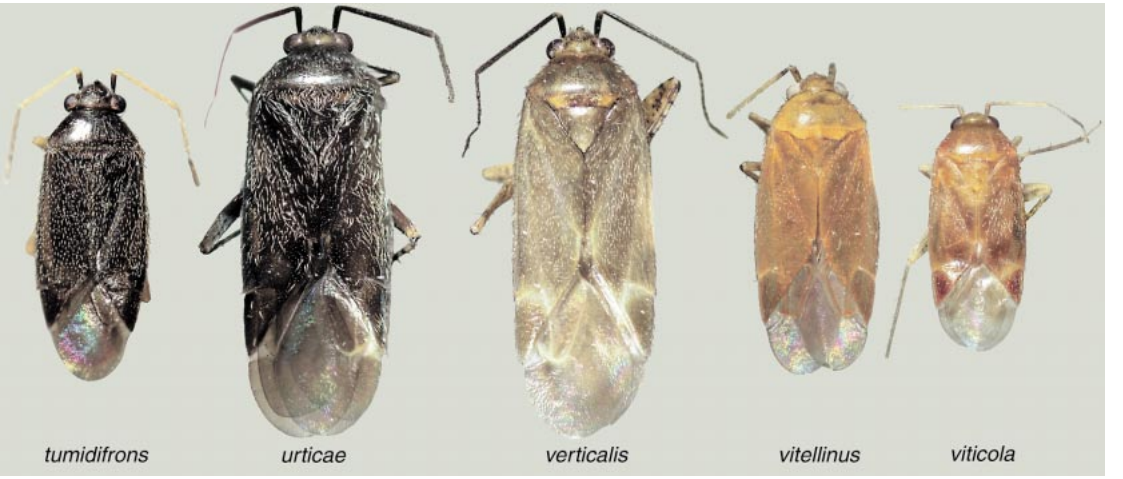

Fig. 14. Habitus figures of Nearctic *Plagiognathus* spp. (see p. 264 for localities).

Fig. 15. Antennal segments 1 and 2 of Nearctic *Plagiognathus* spp.

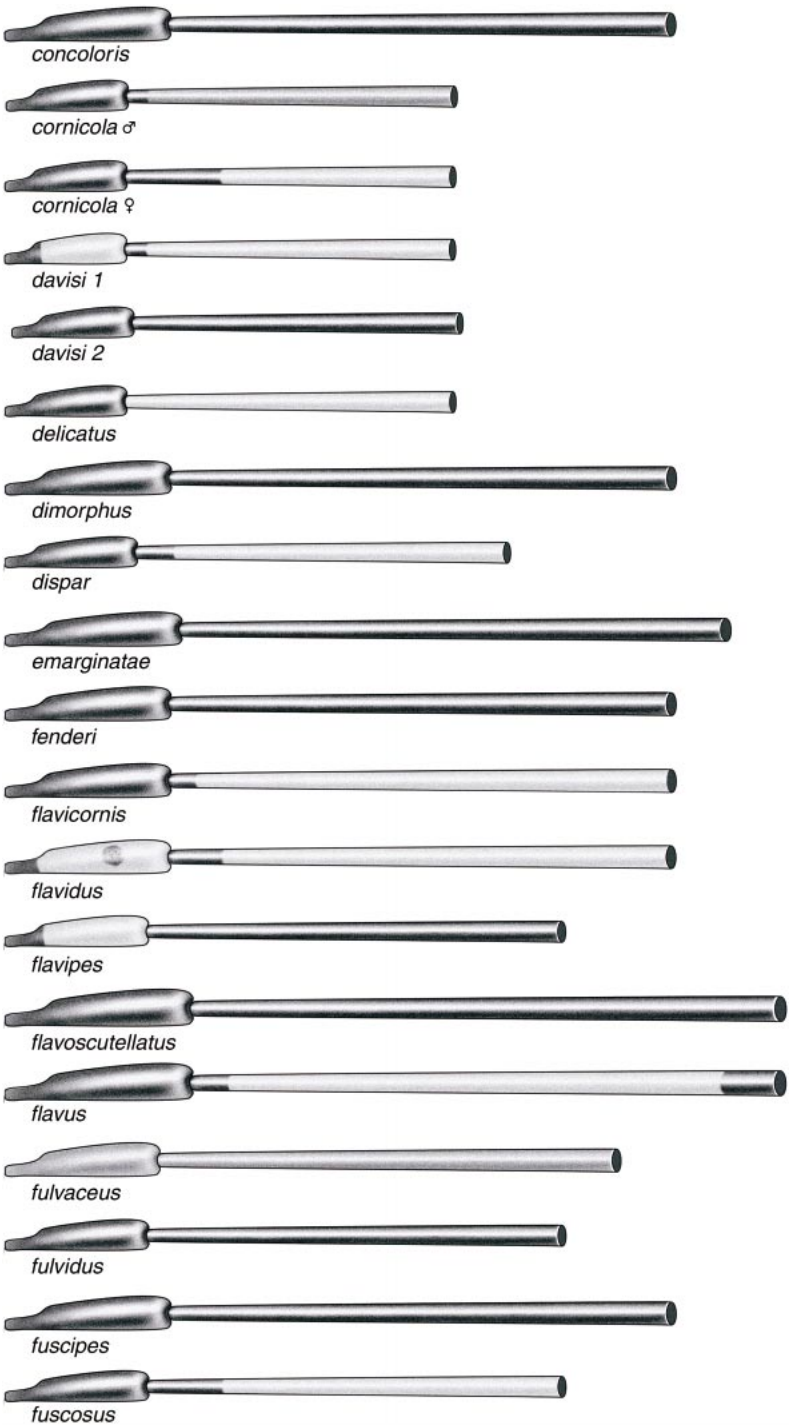

Fig. 16. Antennal segments 1 and 2 of Nearctic *Plagiognathus* spp.

Fig. 17. Antennal segments 1 and 2 of Nearctic *Plagiognathus* spp.

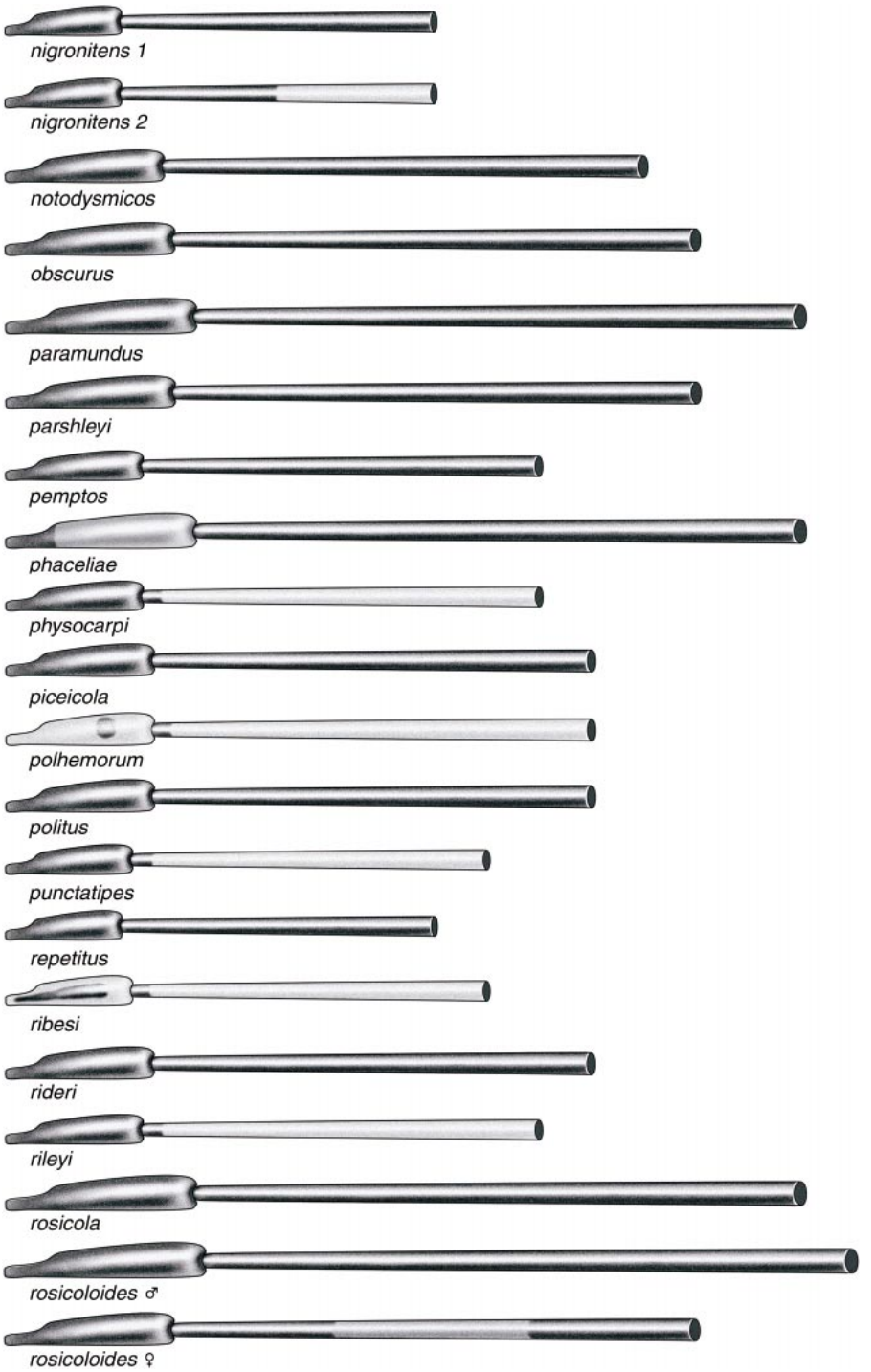

Fig. 18. Antennal segments 1 and 2 of Nearctic *Plagiognathus* spp.

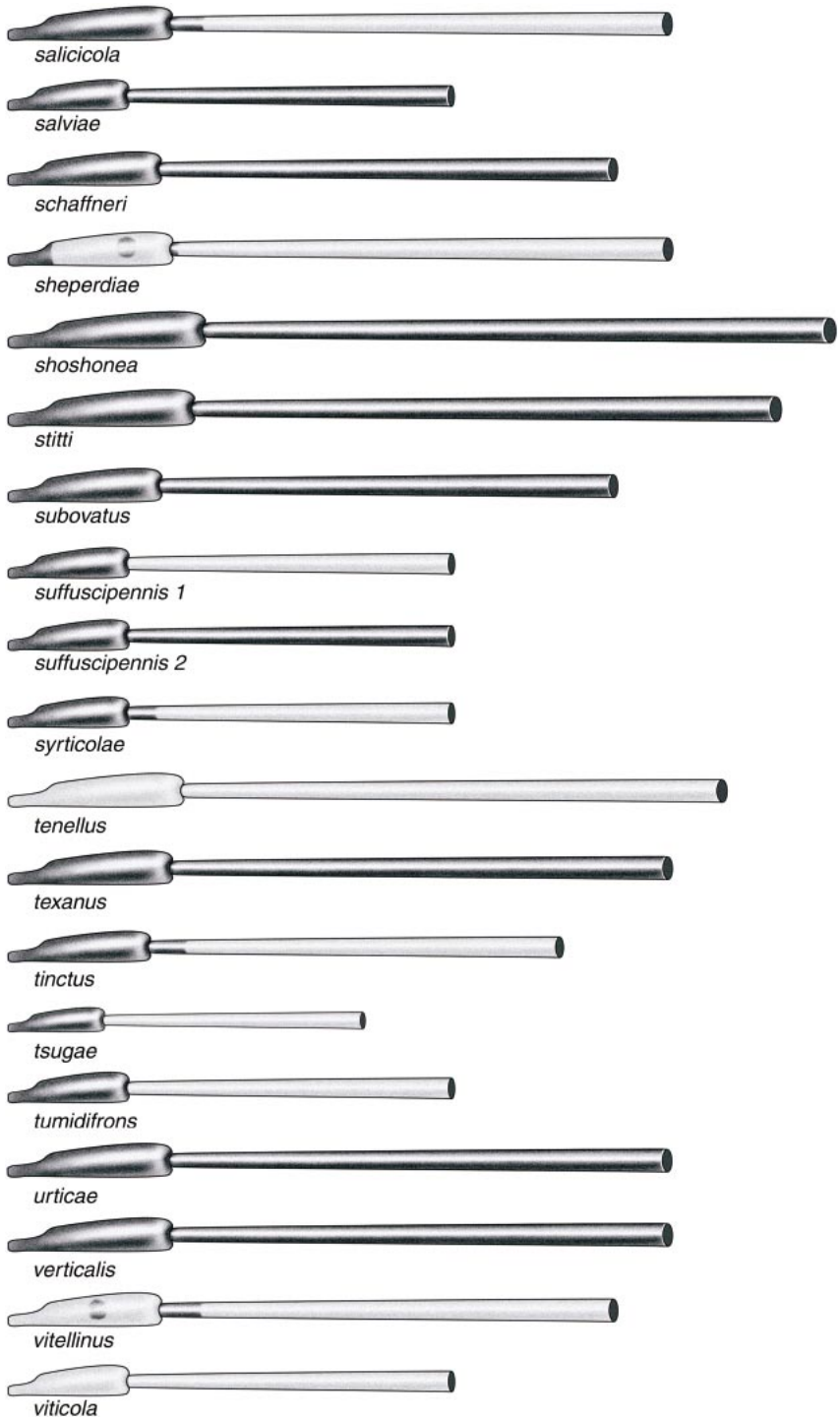

Fig. 19. Antennal segments 1 and 2 of Nearctic *Plagiognathus* spp.

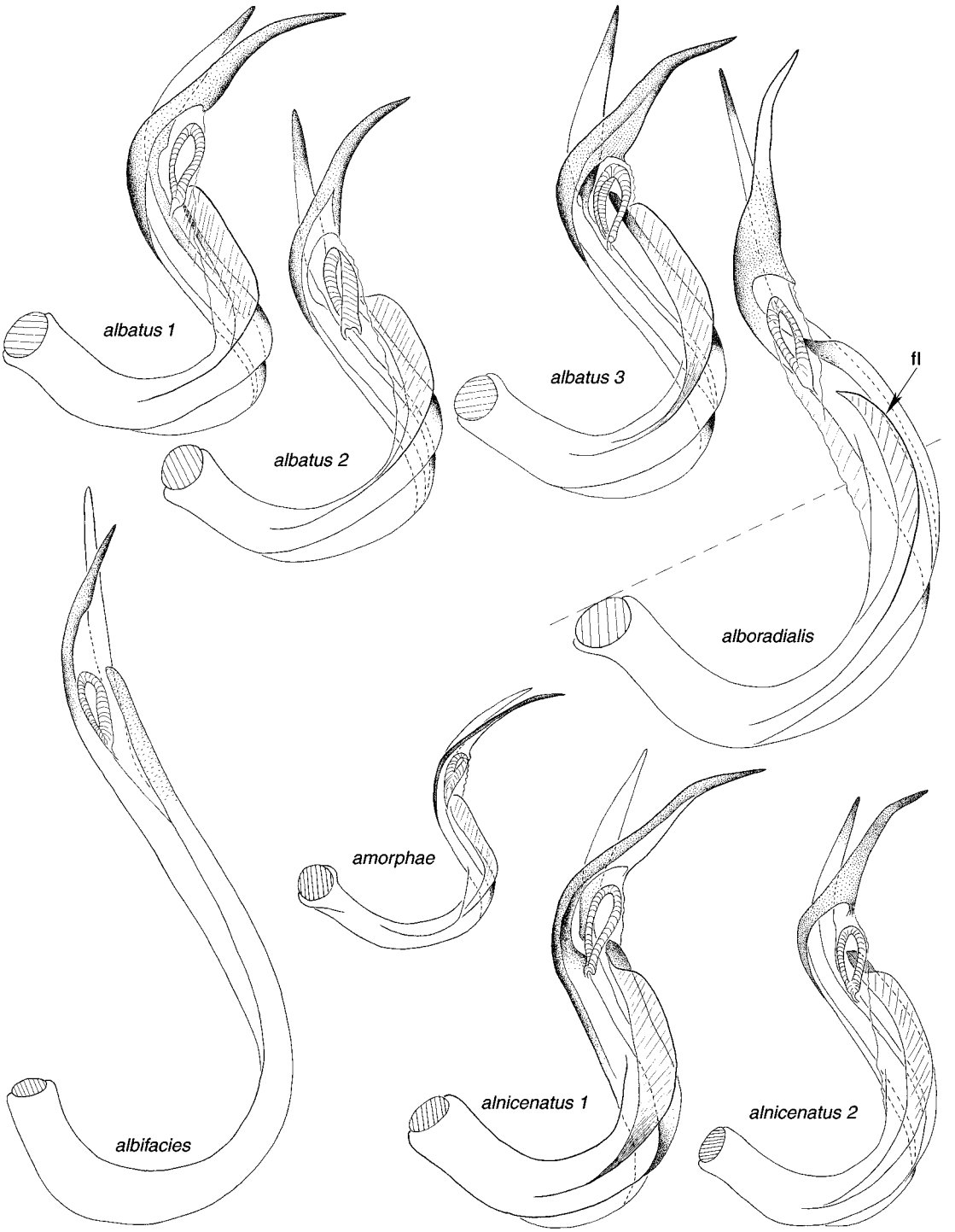

Fig. 20. Male genitalia of Nearctic *Plagiognathus* spp. fl = flange.

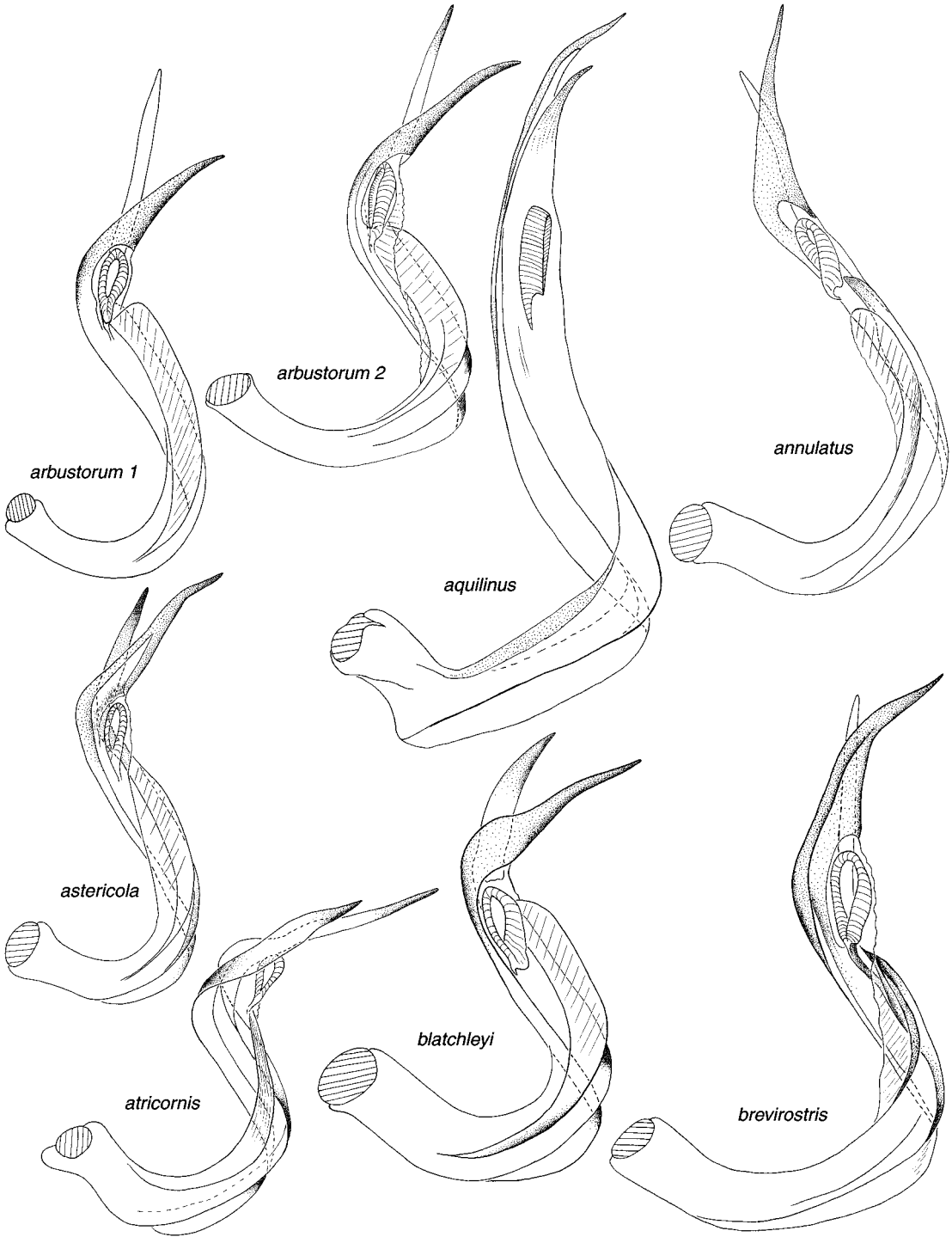

Fig. 21. Male genitalia of Nearctic *Plagiognathus* spp.

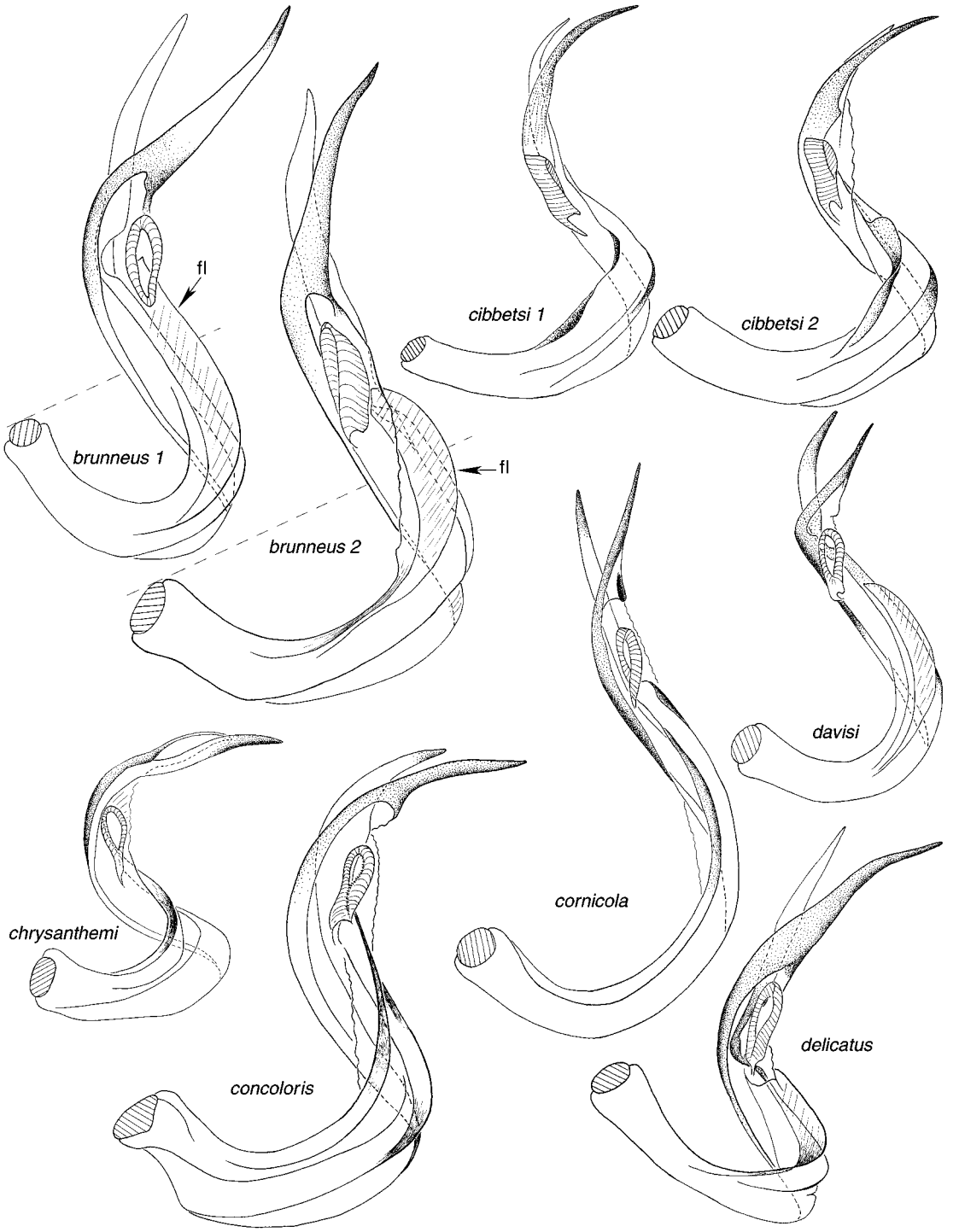

Fig. 22. Male genitalia of Nearctic *Plagiognathus* spp. fl = flange.

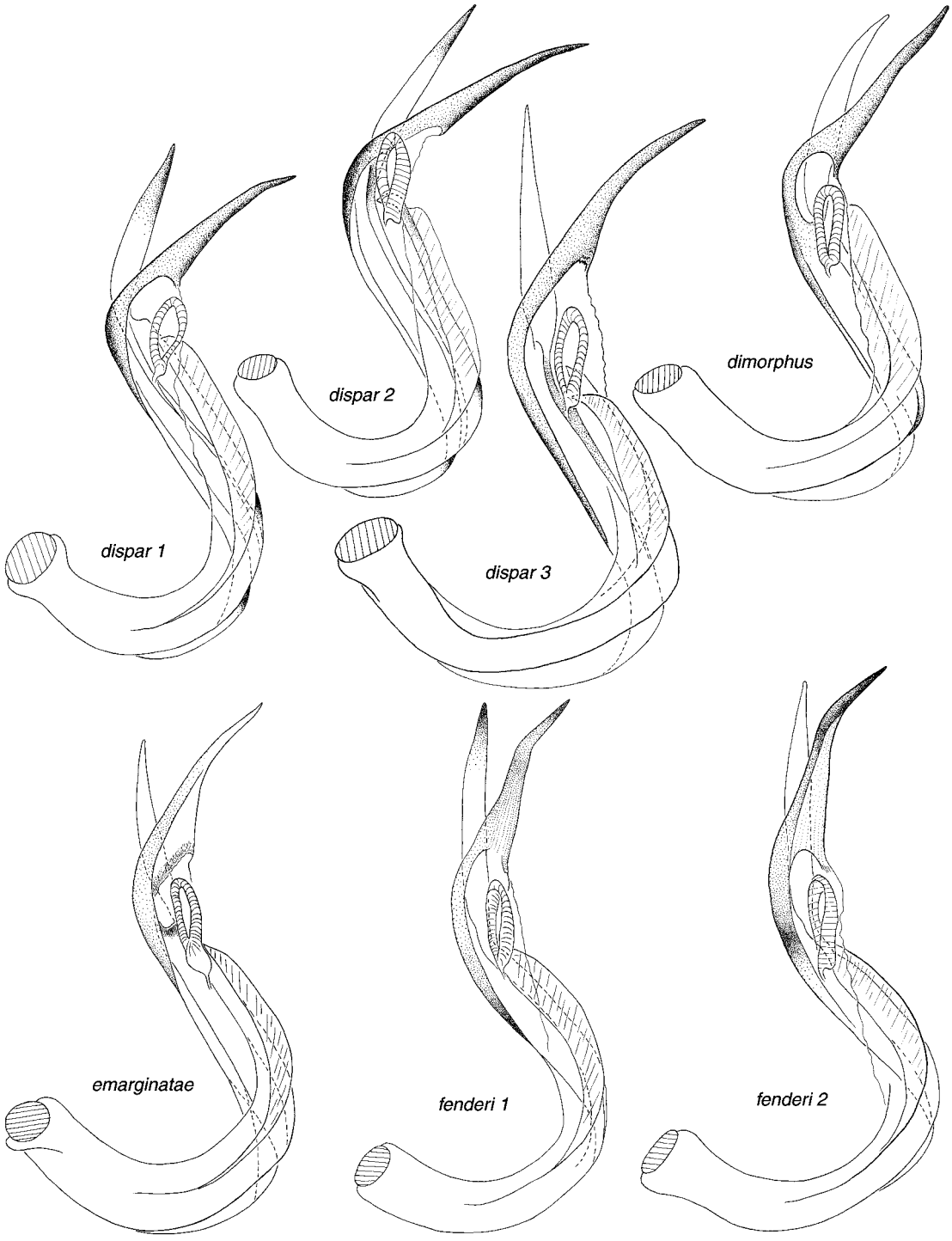

Fig. 23. Male genitalia of Nearctic *Plagiognathus* spp.

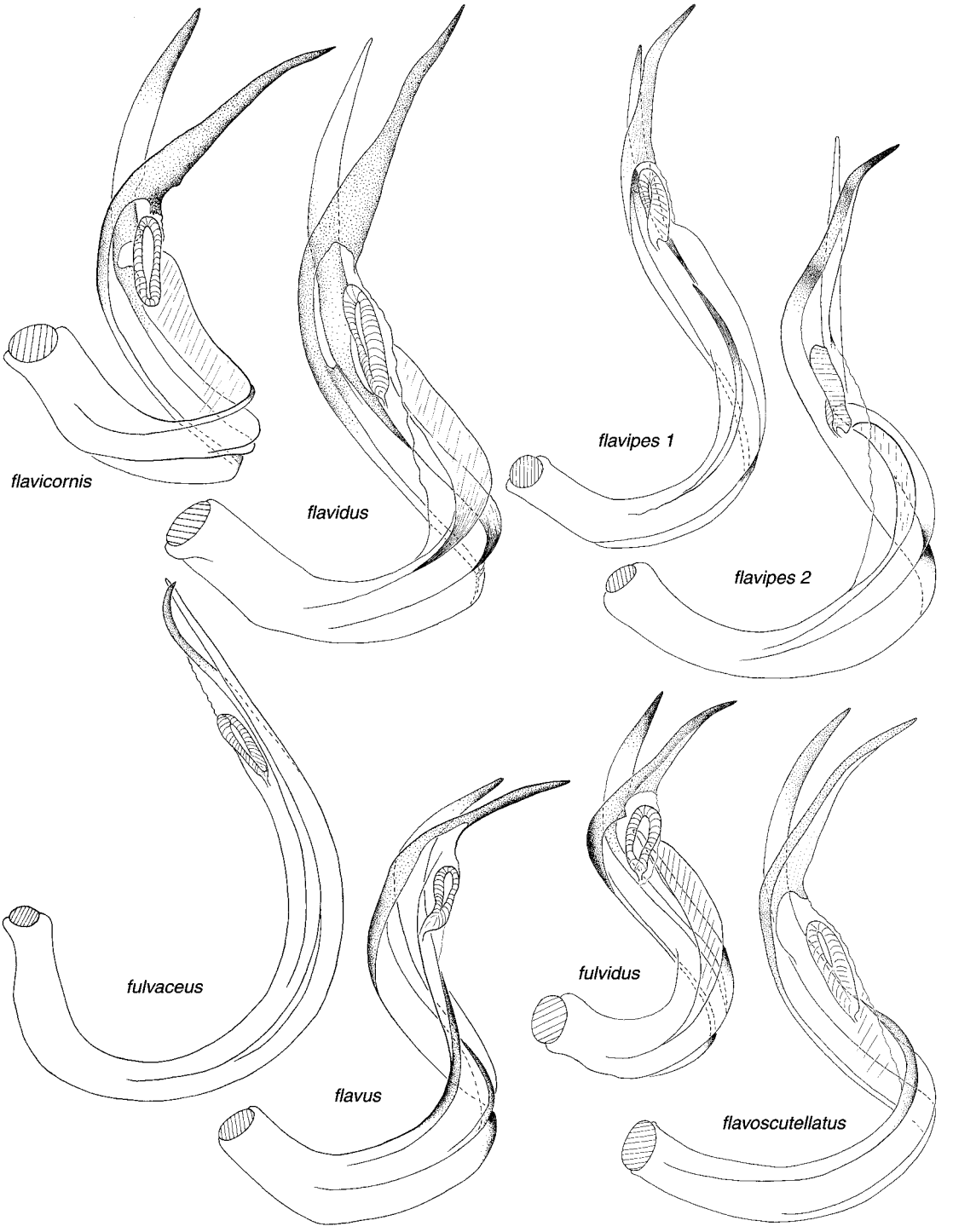

Fig. 24. Male genitalia of Nearctic *Plagiognathus* spp.

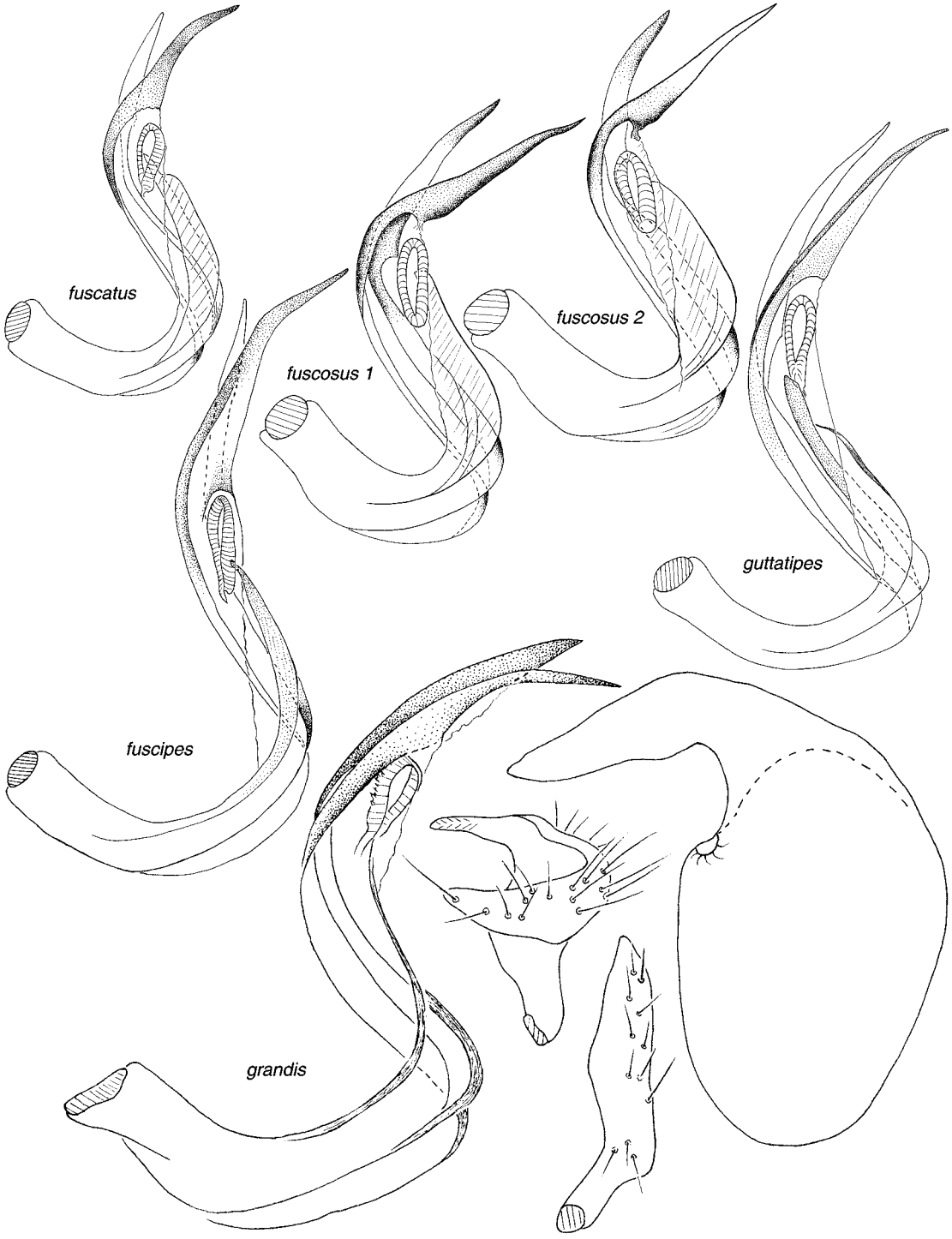

Fig. 25. Male genitalia of Nearctic *Plagiognathus* spp.

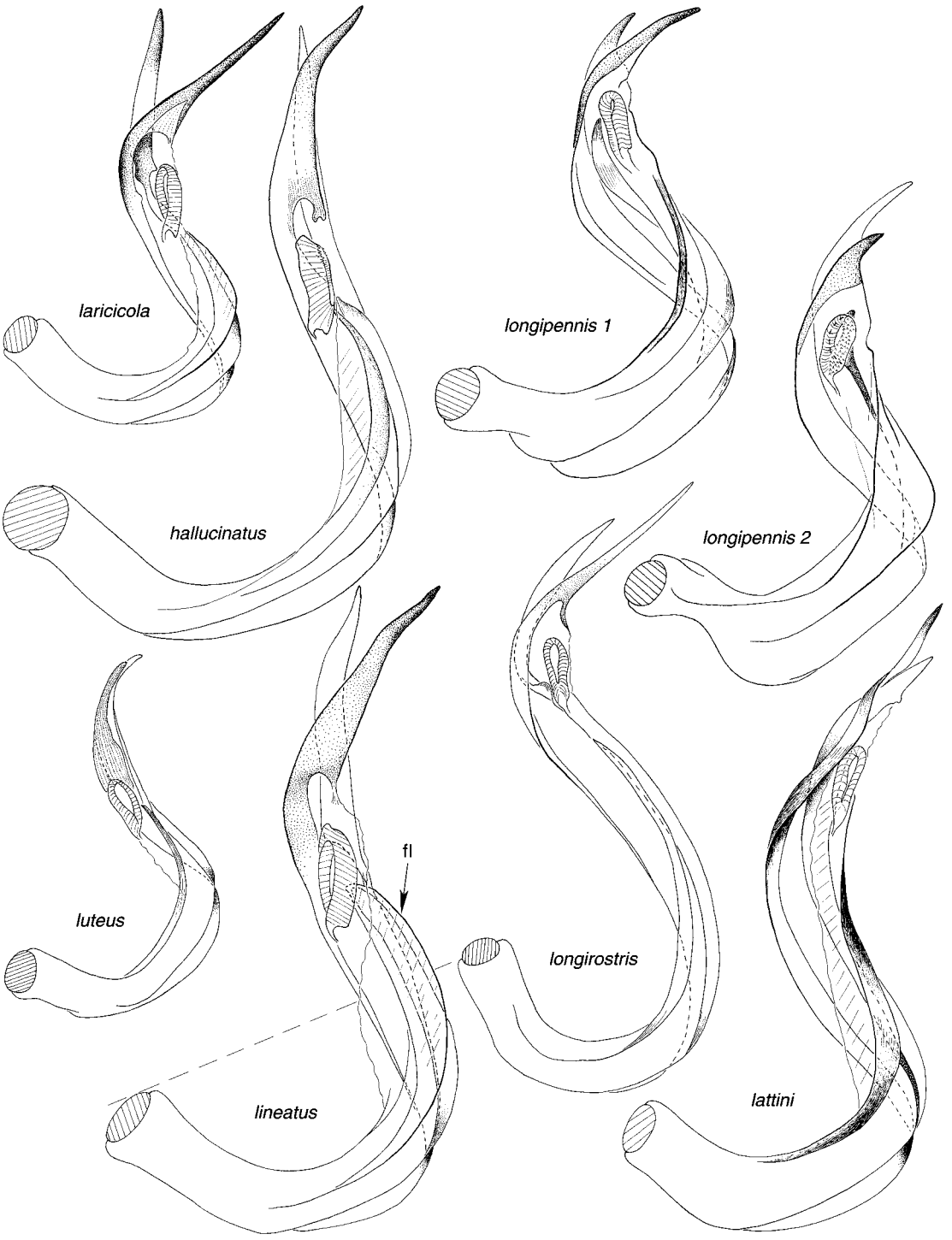

Fig. 26. Male genitalia of Nearctic *Plagiognathus* spp. fl = flange.

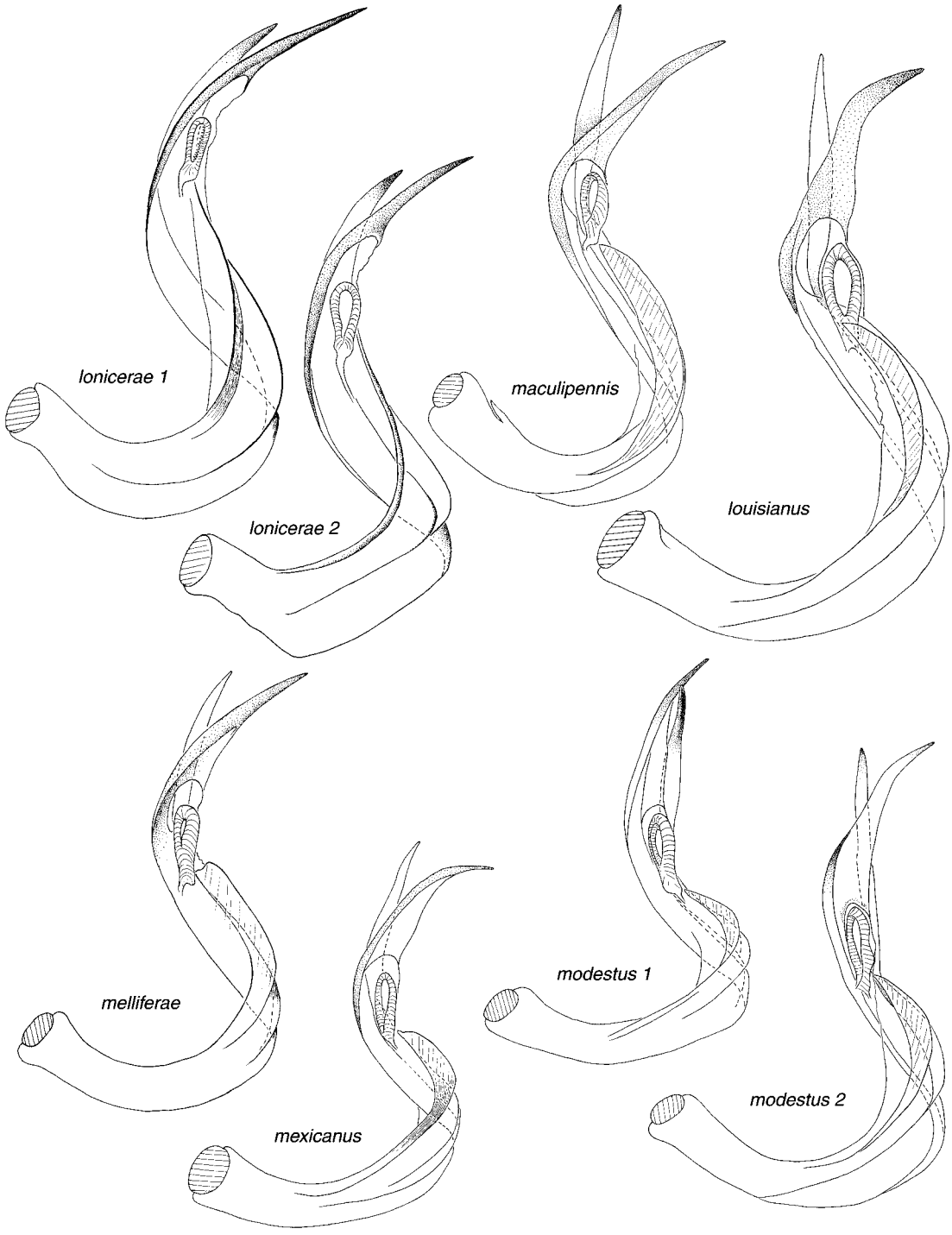

Fig. 27. Male genitalia of Nearctic *Plagiognathus* spp.

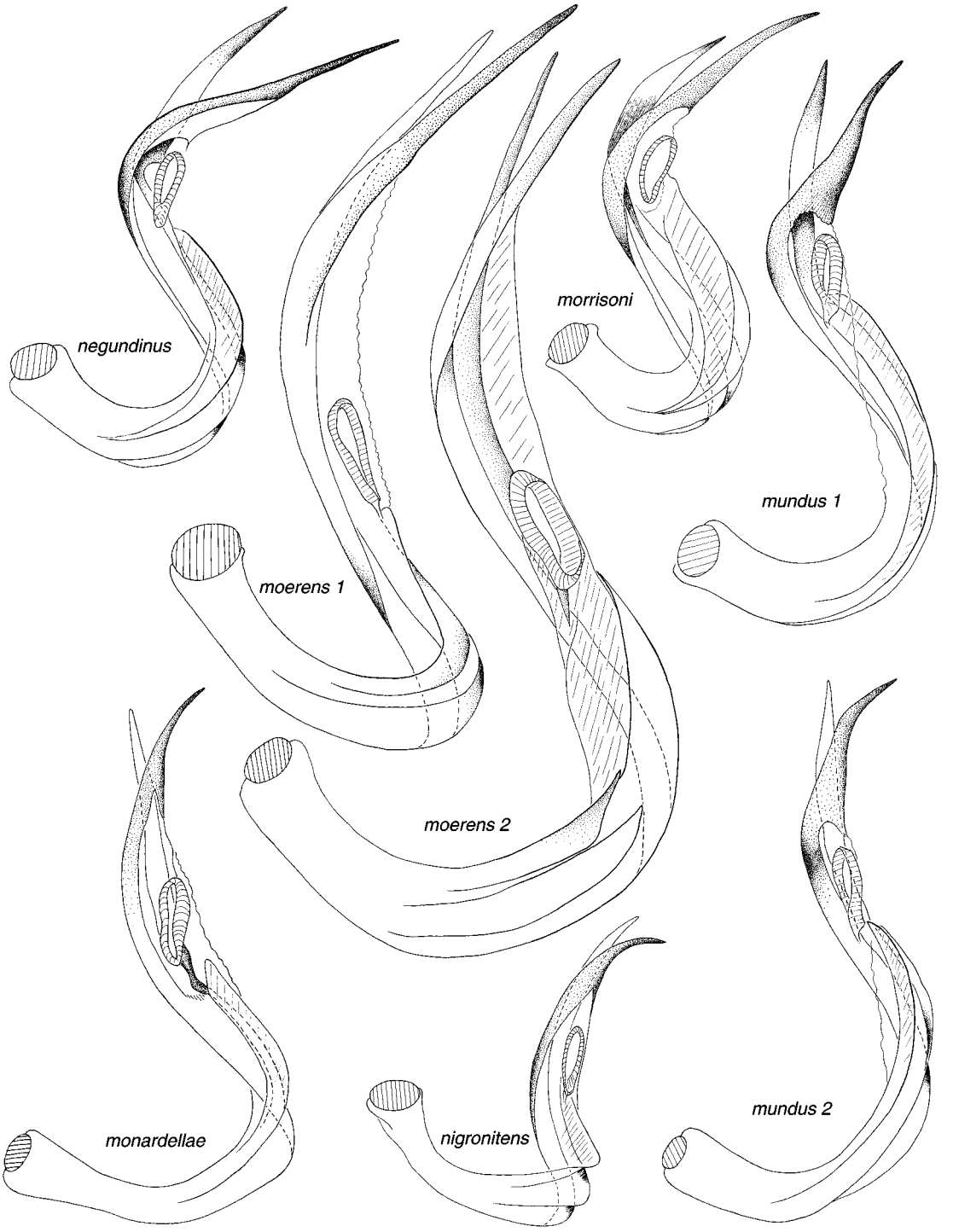

Fig. 28. Male genitalia of Nearctic *Plagiognathus* spp.

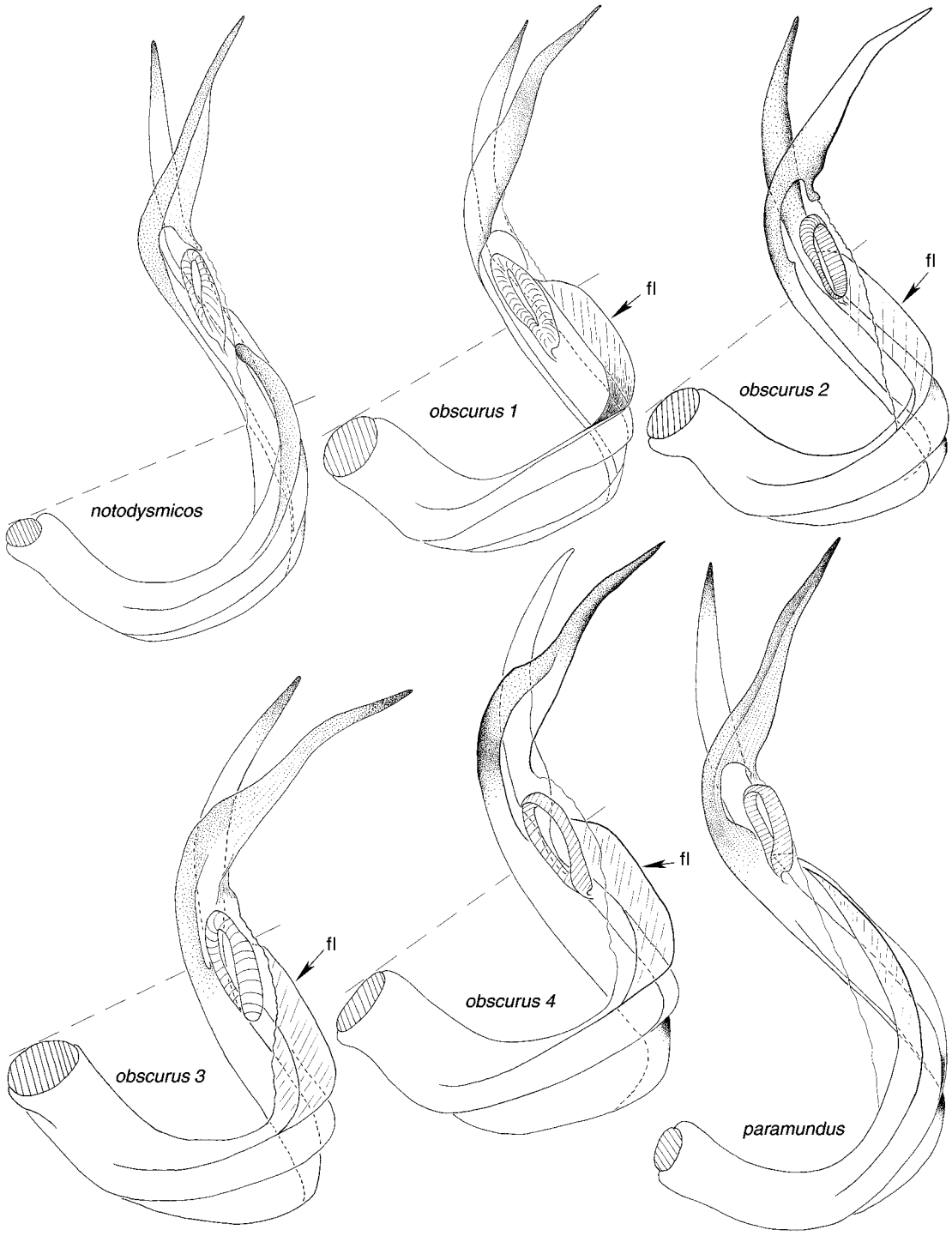

Fig. 29. Male genitalia of Nearctic *Plagiognathus* spp. fl flange.

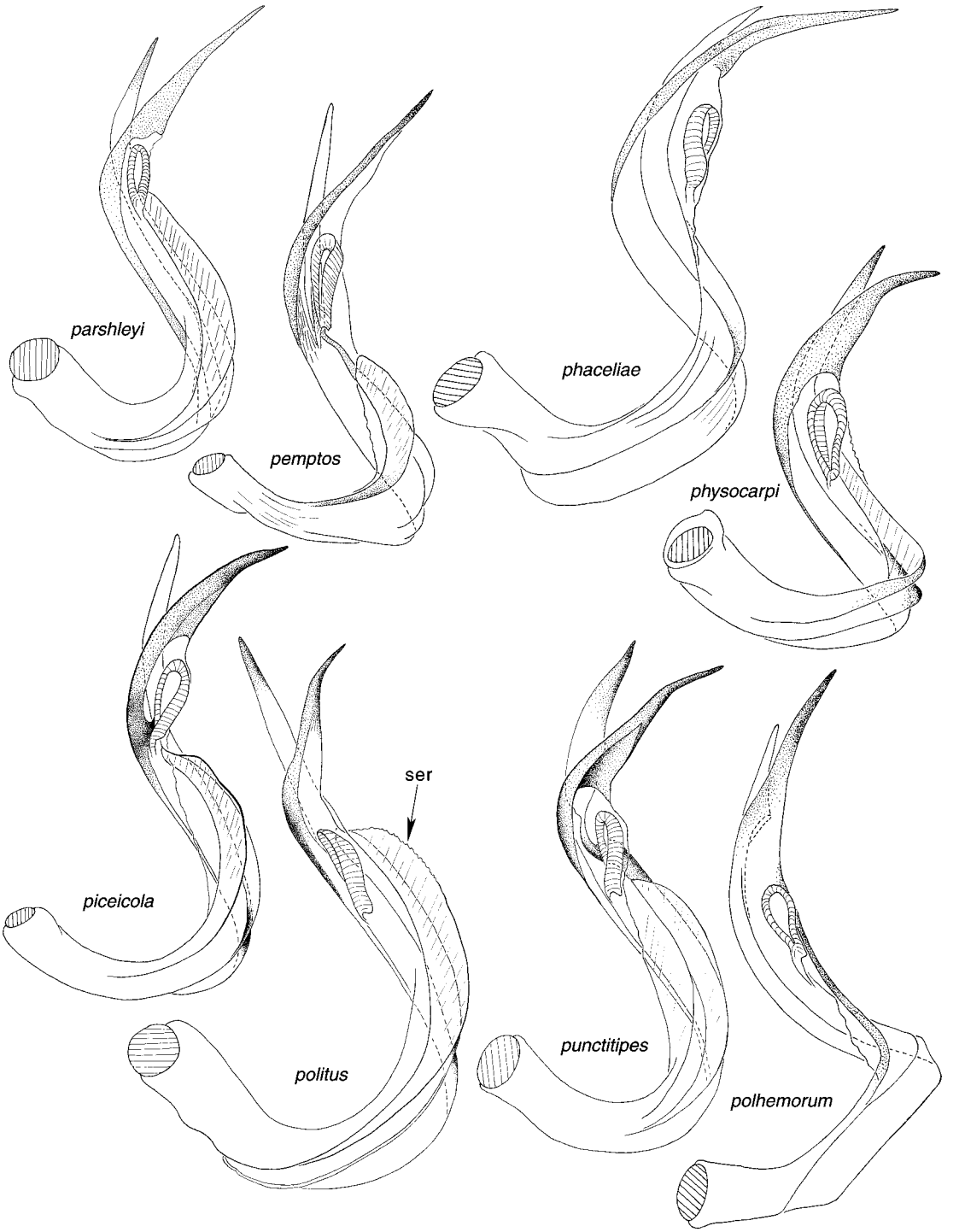

Fig. 30. Male genitalia of Nearctic *Plagiognathus* spp. ser = serrate.

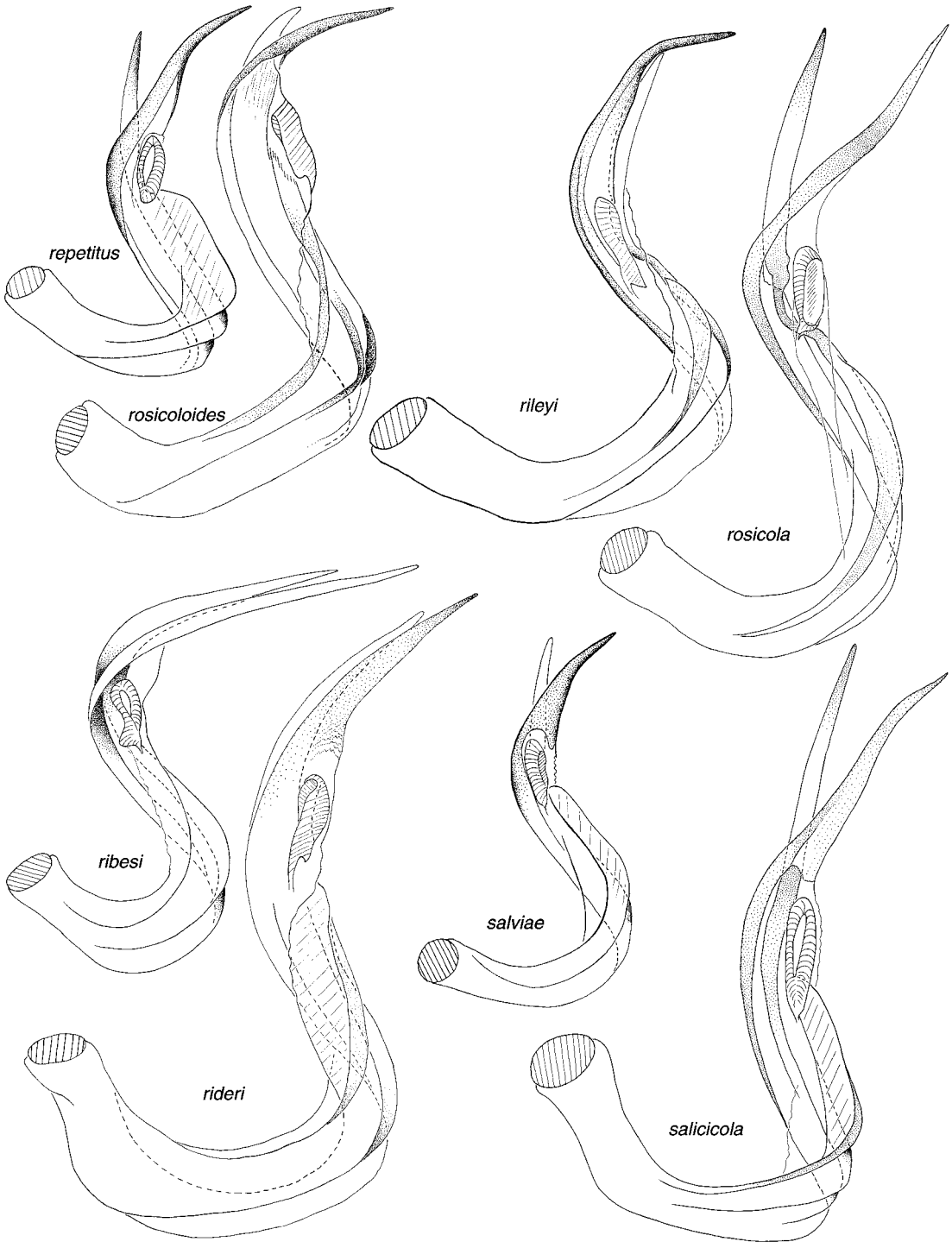

Fig. 31. Male genitalia of Nearctic *Plagiognathus* spp.

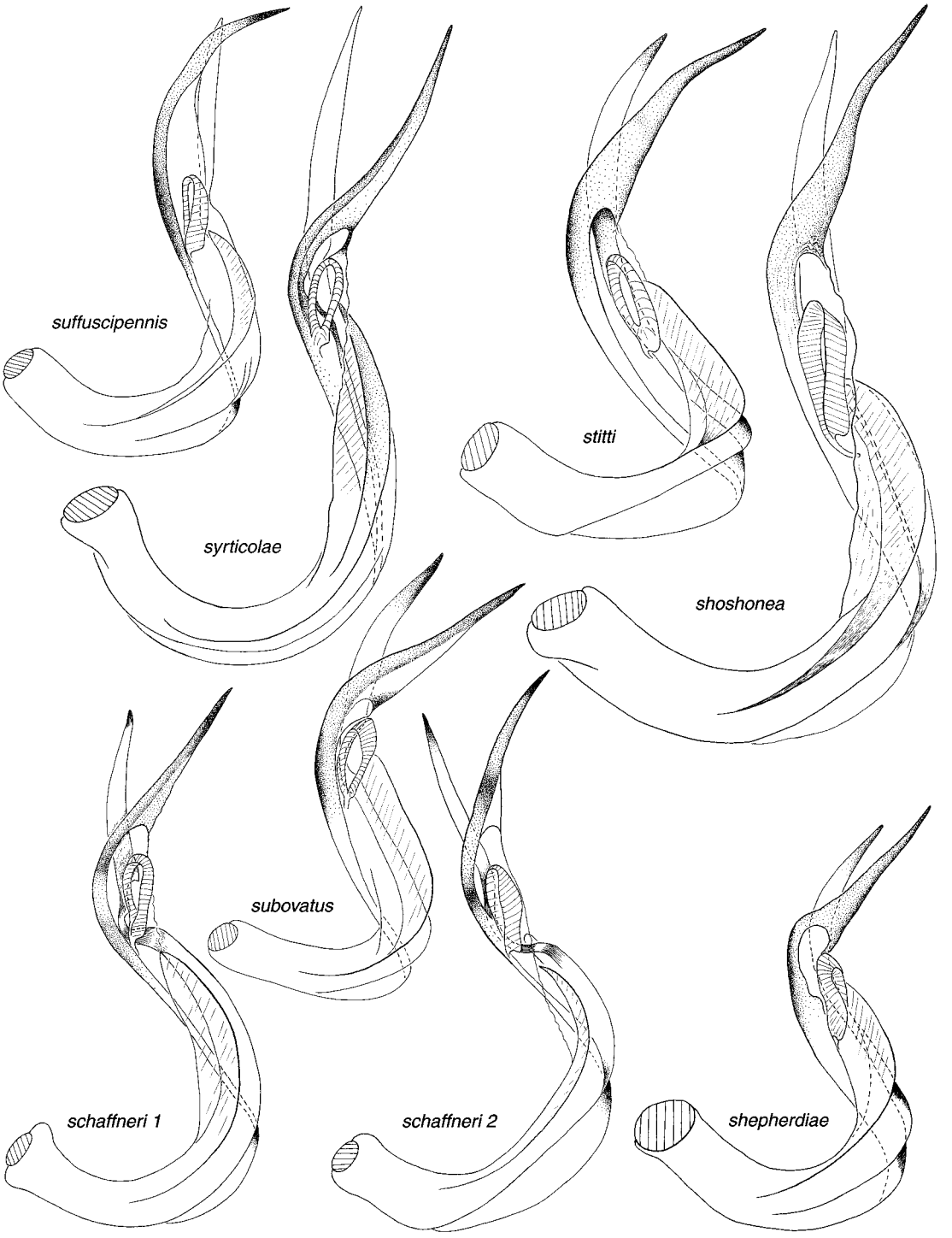

Fig. 32. Male genitalia of Nearctic *Plagiognathus* spp.

Fig. 33. Male genitalia of Nearctic *Plagiognathus* spp.

TABLE 1

Measurements of *Plagiognathus* spp.

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
albatus									
M (N = 9)	**Mean**	**3.75**	**2.64**	**0.47**	**0.20**	**1.15**	**0.74**	**0.31**	**1.07**
	SD	0.17	0.09	0.03	0.03	0.07	0.03	0.01	0.13
	Range	0.56	0.28	0.10	0.08	0.22	0.08	0.04	0.41
	Min	3.46	2.46	0.43	0.16	1.04	0.69	0.29	0.91
	Max	4.03	2.75	0.53	0.24	1.26	0.77	0.33	1.32
F (N = 9)	**Mean**	**3.63**	**2.60**	**0.49**	**0.23**	**1.12**	**0.71**	**0.35**	**1.01**
	SD	0.22	0.15	0.05	0.05	0.07	0.02	0.02	0.09
	Range	0.80	0.46	0.15	0.14	0.22	0.07	0.06	0.31
	Min	3.34	2.41	0.43	0.16	0.99	0.67	0.33	0.82
	Max	4.13	2.88	0.58	0.31	1.21	0.74	0.39	1.13
albifacies									
M (N = 5)	**Mean**	**4.34**	**3.11**	**0.56**	**0.29**	**1.28**	**0.81**	**0.34**	**1.52**
	SD	0.24	0.12	0.05	0.03	0.07	0.03	0.02	0.13
	Range	0.51	0.29	0.10	0.08	0.16	0.08	0.05	0.33
	Min	4.15	3.00	0.52	0.24	1.16	0.77	0.32	1.35
	Max	4.66	3.28	0.62	0.32	1.33	0.85	0.37	1.68
F (N = 5)	**Mean**	**4.33**	**3.14**	**0.61**	**0.31**	**1.35**	**0.79**	**0.39**	**1.39**
	SD	0.29	0.14	0.05	0.03	0.09	0.03	0.01	0.10
	Range	0.79	0.37	0.13	0.08	0.21	0.07	0.03	0.24
	Min	3.99	2.96	0.54	0.27	1.28	0.74	0.37	1.29
	Max	4.78	3.33	0.67	0.35	1.49	0.82	0.40	1.53
alboradialis									
M (N = 5)	**Mean**	**4.89**	**3.32**	**0.58**	**0.29**	**1.26**	**0.78**	**0.38**	**1.52**
	SD	0.14	0.06	0.03	0.03	0.05	0.02	0.01	0.07
	Range	0.33	0.13	0.06	0.05	0.10	0.07	0.02	0.17
	Min	4.66	3.25	0.54	0.26	1.20	0.75	0.37	1.44
	Max	4.99	3.38	0.61	0.32	1.31	0.81	0.39	1.61
F (N = 5)	**Mean**	**4.54**	**3.14**	**0.55**	**0.28**	**1.27**	**0.78**	**0.41**	**1.34**
	SD	0.15	0.10	0.04	0.02	0.05	0.01	0.01	0.05
	Range	0.39	0.27	0.09	0.04	0.12	0.02	0.03	0.11
	Min	4.31	2.98	0.52	0.26	1.19	0.77	0.39	1.27
	Max	4.70	3.26	0.61	0.31	1.31	0.79	0.42	1.38
alnicenatus									
M (N = 6)	**Mean**	**3.97**	**2.61**	**0.47**	**0.20**	**1.12**	**0.71**	**0.29**	**0.99**
	SD	0.36	0.21	0.07	0.04	0.07	0.02	0.02	0.07
	Range	0.92	0.55	0.16	0.09	0.16	0.06	0.04	0.20
	Min	3.36	2.27	0.38	0.17	1.04	0.68	0.27	0.87
	Max	4.28	2.82	0.55	0.26	1.21	0.73	0.31	1.07
F (N = 7)	**Mean**	**3.36**	**2.37**	**0.45**	**0.19**	**1.08**	**0.68**	**0.34**	**0.91**
	SD	0.22	0.18	0.04	0.04	0.06	0.02	0.02	0.08
	Range	0.56	0.45	0.11	0.12	0.15	0.06	0.04	0.24
	Min	3.11	2.13	0.41	0.13	1.00	0.64	0.32	0.78
	Max	3.66	2.59	0.51	0.24	1.16	0.70	0.36	1.03
amorphae									
M (N = 5)	**Mean**	**3.06**	**2.09**	**0.40**	**0.17**	**0.96**	**0.65**	**0.26**	**0.76**
	SD	0.11	0.07	0.02	0.03	0.04	0.01	0.01	0.03
	Range	0.29	0.18	0.05	0.08	0.10	0.04	0.02	0.07
	Min	2.92	2.02	0.38	0.12	0.91	0.63	0.25	0.72
	Max	3.21	2.20	0.43	0.20	1.01	0.67	0.27	0.79

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
amorphae (continued)									
F (N = 5)	**Mean**	**2.90**	**2.04**	**0.41**	**0.18**	**0.98**	**0.63**	**0.32**	**0.68**
	SD	0.09	0.07	0.01	0.02	0.03	0.02	0.01	0.04
	Range	0.21	0.16	0.02	0.05	0.08	0.04	0.03	0.12
	Min	2.80	1.97	0.40	0.15	0.94	0.61	0.31	0.63
	Max	3.01	2.13	0.42	0.19	1.02	0.65	0.34	0.75
annulatus									
M (N = 8)[a]	**Mean**	**3.72**	**2.65**	**0.53**	**0.34**	**1.10**	**0.72**	**0.35**	**1.03**
	SD	0.33	0.20	0.10	0.10	0.11	0.04	0.01	0.09
	Range	0.82	0.53	0.29	0.30	0.33	0.12	0.03	0.24
	Min	3.27	2.41	0.45	0.21	0.94	0.67	0.33	0.90
	Max	4.09	2.94	0.74	0.51	1.27	0.79	0.36	1.14
F (N = 7)	**Mean**	**3.88**	**2.80**	**0.55**	**0.38**	**1.16**	**0.74**	**0.38**	**1.00**
	SD	0.26	0.19	0.05	0.06	0.07	0.03	0.01	0.09
	Range	0.66	0.51	0.15	0.19	0.23	0.08	0.03	0.24
	Min	3.49	2.48	0.46	0.26	1.03	0.69	0.36	0.86
	Max	4.16	2.99	0.61	0.45	1.26	0.77	0.40	1.10
aquilinus									
M (N = 3)	**Mean**	**4.56**	**3.08**	**0.57**	**0.25**	**1.27**	**0.83**	**0.39**	**1.13**
	SD	0.51	0.27	0.03	0.02	0.10	0.06	0.03	0.09
	Range	0.88	0.49	0.05	0.04	0.18	0.11	0.05	0.17
	Min	4.27	2.89	0.55	0.23	1.21	0.79	0.37	1.07
	Max	5.15	3.39	0.60	0.27	1.38	0.90	0.42	1.24
F (N = 3)	**Mean**	**3.77**	**2.61**	**0.51**	**0.24**	**1.16**	**0.81**	**0.41**	**0.92**
	SD	0.13	0.08	0.05	0.03	0.08	0.01	0.00	0.04
	Range	0.23	0.17	0.09	0.06	0.16	0.02	0.01	0.08
	Min	3.62	2.53	0.46	0.20	1.08	0.80	0.40	0.89
	Max	3.85	2.70	0.55	0.27	1.24	0.82	0.41	0.97
arbustorum									
M (N = 5)	**Mean**	**4.23**	**2.90**	**0.46**	**0.19**	**1.23**	**0.81**	**0.37**	**1.22**
	SD	0.23	0.13	0.14	0.12	0.06	0.02	0.01	0.09
	Range	0.63	0.35	0.33	0.32	0.14	0.05	0.03	0.21
	Min	3.93	2.71	0.22	0.00	1.13	0.78	0.35	1.11
	Max	4.57	3.06	0.55	0.32	1.27	0.82	0.38	1.32
F (N = 5)	**Mean**	**3.88**	**2.82**	**0.53**	**0.26**	**1.22**	**0.79**	**0.39**	**1.11**
	SD	0.07	0.06	0.03	0.02	0.02	0.03	0.02	0.05
	Range	0.14	0.14	0.07	0.05	0.05	0.05	0.06	0.12
	Min	3.81	2.74	0.50	0.23	1.19	0.77	0.36	1.07
	Max	3.95	2.88	0.57	0.28	1.23	0.82	0.42	1.18
astericola									
M (N = 5)	**Mean**	**2.97**	**2.07**	**0.44**	**0.18**	**0.93**	**0.63**	**0.31**	**0.75**
	SD	0.08	0.05	0.01	0.03	0.02	0.02	0.01	0.03
	Range	0.21	0.13	0.03	0.07	0.05	0.04	0.02	0.07
	Min	2.84	2.00	0.43	0.14	0.91	0.61	0.30	0.73
	Max	3.05	2.13	0.46	0.21	0.96	0.64	0.32	0.79
F (N = 5)	**Mean**	**2.88**	**2.02**	**0.45**	**0.19**	**0.96**	**0.64**	**0.34**	**0.71**
	SD	0.08	0.08	0.02	0.03	0.03	0.02	0.01	0.02
	Range	0.20	0.21	0.05	0.09	0.07	0.04	0.02	0.05
	Min	2.79	1.93	0.43	0.16	0.92	0.63	0.33	0.68
	Max	2.99	2.14	0.48	0.25	0.99	0.67	0.35	0.73

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
atricornis									
M (N = 5)	**Mean**	**3.52**	**2.50**	**0.50**	**0.24**	**1.04**	**0.75**	**0.25**	**1.15**
	SD	0.28	0.10	0.04	0.02	0.02	0.02	0.01	0.12
	Range	0.70	0.26	0.11	0.04	0.05	0.03	0.02	0.30
	Min	3.03	2.39	0.45	0.22	1.01	0.74	0.24	1.07
	Max	3.73	2.64	0.55	0.26	1.06	0.77	0.26	1.37
F (N = 1)	**Mean**	**3.53**	**2.42**	**0.49**	**0.22**	**1.08**	**0.71**	**0.33**	**1.01**
blatchleyi									
M (N = 5)	**Mean**	**4.20**	**2.85**	**0.54**	**0.21**	**1.30**	**0.78**	**0.33**	**1.33**
	SD	0.27	0.19	0.03	0.03	0.11	0.04	0.02	0.10
	Range	0.68	0.48	0.09	0.07	0.27	0.09	0.03	0.25
	Min	3.76	2.54	0.49	0.18	1.13	0.74	0.32	1.18
	Max	4.44	3.02	0.57	0.25	1.40	0.82	0.35	1.42
F (N = 5)	**Mean**	**4.21**	**2.92**	**0.58**	**0.19**	**1.45**	**0.78**	**0.39**	**1.23**
	SD	0.14	0.10	0.04	0.01	0.07	0.02	0.01	0.05
	Range	0.32	0.28	0.10	0.03	0.19	0.05	0.02	0.13
	Min	4.01	2.79	0.55	0.18	1.35	0.75	0.38	1.16
	Max	4.33	3.07	0.64	0.21	1.54	0.80	0.41	1.29
brevirostris									
M (N = 7)	**Mean**	**4.47**	**3.06**	**0.48**	**0.22**	**1.32**	**0.82**	**0.37**	**1.36**
	SD	0.28	0.11	0.07	0.05	0.09	0.01	0.01	0.05
	Range	0.81	0.29	0.19	0.14	0.27	0.02	0.03	0.12
	Min	3.87	2.89	0.37	0.14	1.16	0.80	0.35	1.28
	Max	4.68	3.18	0.56	0.28	1.43	0.83	0.38	1.40
F (N = 5)	**Mean**	**4.06**	**2.89**	**0.86**	**0.31**	**1.35**	**0.81**	**0.41**	**1.23**
	SD	0.30	0.27	0.74	0.12	0.04	0.03	0.02	0.12
	Range	0.73	0.69	1.71	0.27	0.10	0.07	0.05	0.26
	Min	3.80	2.65	0.48	0.19	1.32	0.76	0.39	1.11
	Max	4.53	3.33	2.18	0.47	1.42	0.83	0.43	1.37
brunneus									
M (N = 7)	**Mean**	**4.16**	**2.87**	**0.54**	**0.27**	**1.25**	**0.80**	**0.38**	**1.20**
	SD	0.18	0.14	0.04	0.04	0.03	0.02	0.01	0.07
	Range	0.56	0.45	0.12	0.12	0.07	0.08	0.03	0.16
	Min	3.93	2.66	0.46	0.20	1.22	0.77	0.37	1.12
	Max	4.49	3.11	0.58	0.32	1.29	0.85	0.40	1.28
F (N = 7)	**Mean**	**4.13**	**2.90**	**0.55**	**0.29**	**1.29**	**0.83**	**0.42**	**1.11**
	SD	0.10	0.09	0.03	0.03	0.04	0.02	0.01	0.05
	Range	0.26	0.25	0.09	0.07	0.12	0.05	0.04	0.11
	Min	4.01	2.81	0.50	0.25	1.20	0.80	0.39	1.06
	Max	4.28	3.06	0.59	0.32	1.32	0.85	0.43	1.16
brunneus (far northern)									
M (N = 5)	**Mean**	**4.33**	**3.08**	**0.57**	**0.36**	**1.25**	**0.80**	**0.39**	**1.30**
	SD	0.28	0.15	0.04	0.08	0.05	0.02	0.01	0.05
	Range	0.76	0.38	0.12	0.21	0.14	0.06	0.02	0.10
	Min	3.91	2.86	0.5	0.30	1.17	0.78	0.38	1.26
	Max	4.68	3.24	0.62	0.50	1.31	0.84	0.40	1.35
F (N = 5)[b]	**Mean**	**4.00**	**2.90**	**0.57**	**0.28**	**1.26**	**0.80**	**0.40**	**1.19**
	SD	0.14	0.11	0.05	0.03	0.05	0.02	0.01	0.04
	Range	0.33	0.28	0.12	0.07	0.13	0.06	0.02	0.08
	Min	3.82	2.71	0.49	0.24	1.20	0.76	0.39	1.15
	Max	4.15	2.99	0.61	0.31	1.33	0.82	0.41	1.23

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
chrysanthemi									
M (N = 5)	**Mean**	**3.87**	**2.67**	**0.49**	**0.26**	**1.08**	**0.75**	**0.35**	**1.13**
	SD	0.23	0.14	0.02	0.04	0.05	0.02	0.01	0.09
	Range	0.58	0.28	0.06	0.10	0.14	0.05	0.02	0.26
	Min	3.60	2.53	0.46	0.19	1.02	0.74	0.34	1.01
	Max	4.18	2.81	0.52	0.29	1.16	0.78	0.36	1.27
F (N = 5)	**Mean**	**3.43**	**2.43**	**0.47**	**0.25**	**1.08**	**0.76**	**0.39**	**0.94**
	SD	0.14	0.11	0.04	0.04	0.04	0.00	0.01	0.06
	Range	0.34	0.26	0.10	0.08	0.09	0.01	0.03	0.14
	Min	3.18	2.24	0.43	0.21	1.03	0.76	0.37	0.84
	Max	3.52	2.50	0.53	0.29	1.11	0.76	0.41	0.98
cibbetsi									
M (N = 10)	**Mean**	**3.35**	**2.32**	**0.43**	**0.21**	**1.07**	**0.73**	**0.37**	**0.86**
	SD	0.15	0.10	0.03	0.05	0.03	0.02	0.01	0.02
	Range	0.49	0.37	0.08	0.20	0.09	0.05	0.04	0.06
	Min	3.13	2.11	0.38	0.13	1.01	0.72	0.34	0.83
	Max	3.62	2.48	0.46	0.32	1.10	0.76	0.38	0.89
F (N = 10)	**Mean**	**3.31**	**2.35**	**0.47**	**0.24**	**1.12**	**0.75**	**0.39**	**0.84**
	SD	0.15	0.08	0.04	0.05	0.04	0.01	0.02	0.02
	Range	0.44	0.24	0.13	0.17	0.13	0.05	0.04	0.07
	Min	3.10	2.21	0.42	0.14	1.04	0.73	0.37	0.80
	Max	3.54	2.45	0.55	0.31	1.17	0.77	0.42	0.86
concoloris									
M (N = 5)	**Mean**	**4.83**	**3.27**	**0.59**	**0.25**	**1.40**	**0.80**	**0.37**	**1.15**
	SD	0.35	0.19	0.04	0.03	0.04	0.02	0.02	0.08
	Range	0.83	0.43	0.12	0.06	0.10	0.06	0.05	0.20
	Min	4.43	3.08	0.55	0.22	1.36	0.77	0.34	1.06
	Max	5.26	3.51	0.66	0.28	1.46	0.82	0.39	1.26
F (N = 5)	**Mean**	**4.22**	**2.86**	**0.52**	**0.21**	**1.35**	**0.79**	**0.42**	**1.06**
	SD	0.31	0.24	0.12	0.05	0.12	0.02	0.02	0.10
	Range	0.67	0.52	0.30	0.14	0.29	0.05	0.05	0.25
	Min	3.84	2.60	0.33	0.13	1.18	0.76	0.39	0.90
	Max	4.51	3.12	0.62	0.27	1.46	0.81	0.44	1.15
cornicola									
M (N = 5)	**Mean**	**3.14**	**2.07**	**0.41**	**0.15**	**1.04**	**0.67**	**0.30**	**0.74**
	SD	0.13	0.06	0.02	0.02	0.05	0.01	0.00	0.07
	Range	0.32	0.11	0.05	0.04	0.14	0.02	0.01	0.18
	Min	2.95	2.02	0.39	0.13	0.97	0.66	0.30	0.68
	Max	3.27	2.13	0.44	0.17	1.12	0.68	0.31	0.87
F (N = 5)	**Mean**	**3.05**	**2.14**	**0.45**	**0.19**	**1.07**	**0.66**	**0.34**	**0.67**
	SD	0.09	0.08	0.04	0.03	0.08	0.01	0.02	0.02
	Range	0.20	0.16	0.09	0.07	0.21	0.03	0.03	0.04
	Min	2.95	2.05	0.42	0.15	0.95	0.65	0.32	0.65
	Max	3.15	2.21	0.50	0.22	1.16	0.68	0.36	0.69
davisi									
M (N = 5)	**Mean**	**3.36**	**2.38**	**0.45**	**0.28**	**1.07**	**0.65**	**0.30**	**0.72**
	SD	0.21	0.10	0.03	0.05	0.04	0.02	0.01	0.06
	Range	0.44	0.22	0.09	0.12	0.08	0.04	0.01	0.14
	Min	3.10	2.27	0.42	0.21	1.02	0.63	0.30	0.64
	Max	3.54	2.49	0.51	0.33	1.11	0.67	0.31	0.79
F (N = 5)	**Mean**	**3.06**	**2.18**	**0.43**	**0.21**	**1.06**	**0.65**	**0.33**	**0.73**
	SD	0.16	0.08	0.03	0.08	0.02	0.02	0.01	0.03
	Range	0.42	0.20	0.07	0.19	0.05	0.04	0.04	0.08
	Min	2.87	2.11	0.40	0.15	1.04	0.64	0.31	0.69
	Max	3.28	2.31	0.47	0.34	1.09	0.68	0.34	0.77

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
delicatus									
M (N = 7)	**Mean**	**3.25**	**2.20**	**0.41**	**0.18**	**1.10**	**0.69**	**0.30**	**0.74**
	SD	0.08	0.04	0.05	0.04	0.04	0.01	0.02	0.03
	Range	0.26	0.12	0.14	0.12	0.09	0.04	0.07	0.11
	Min	3.14	2.12	0.32	0.15	1.05	0.67	0.25	0.67
	Max	3.40	2.24	0.46	0.26	1.14	0.71	0.32	0.78
F (N = 7)	**Mean**	**3.19**	**2.20**	**0.46**	**0.18**	**1.13**	**0.69**	**0.34**	**0.69**
	SD	0.09	0.09	0.02	0.03	0.03	0.02	0.01	0.07
	Range	0.23	0.22	0.06	0.08	0.09	0.06	0.03	0.19
	Min	3.06	2.12	0.44	0.15	1.10	0.66	0.32	0.57
	Max	3.30	2.34	0.50	0.23	1.19	0.72	0.35	0.77
dimorphus									
M (N = 6)	**Mean**	**4.42**	**2.89**	**0.51**	**0.24**	**1.24**	**0.81**	**0.39**	**1.15**
	SD	0.36	0.20	0.03	0.03	0.09	0.03	0.02	0.09
	Range	1.02	0.55	0.10	0.08	0.26	0.10	0.06	0.27
	Min	3.78	2.51	0.45	0.20	1.11	0.75	0.36	1.01
	Max	4.80	3.06	0.54	0.28	1.36	0.86	0.41	1.29
F (N = 5)	**Mean**	**3.92**	**2.69**	**0.53**	**0.27**	**1.21**	**0.80**	**0.41**	**1.07**
	SD	0.06	0.03	0.04	0.02	0.04	0.02	0.01	0.09
	Range	0.17	0.08	0.10	0.03	0.12	0.04	0.03	0.21
	Min	3.81	2.64	0.49	0.26	1.16	0.78	0.40	0.98
	Max	3.99	2.72	0.59	0.29	1.28	0.82	0.43	1.19
dispar									
M (N = 10)	**Mean**	**3.54**	**2.44**	**0.47**	**0.21**	**1.09**	**0.69**	**0.32**	**0.85**
	SD	0.17	0.12	0.04	0.05	0.05	0.02	0.02	0.07
	Range	0.54	0.40	0.13	0.15	0.16	0.05	0.06	0.23
	Min	3.32	2.26	0.38	0.14	1.04	0.66	0.3	0.75
	Max	3.86	2.67	0.51	0.29	1.20	0.71	0.35	0.98
F (N = 10)	**Mean**	**3.46**	**2.43**	**0.46**	**0.21**	**1.14**	**0.69**	**0.35**	**0.8**
	SD	0.16	0.11	0.03	0.04	0.07	0.02	0.01	0.04
	Range	0.53	0.35	0.08	0.15	0.21	0.07	0.04	0.14
	Min	3.15	2.27	0.41	0.14	1.03	0.65	0.33	0.72
	Max	3.68	2.62	0.50	0.29	1.24	0.72	0.37	0.86
emarginatae									
M (N = 4)	**Mean**	**4.36**	**3.00**	**0.59**	**0.23**	**1.31**	**0.83**	**0.36**	**1.28**
	SD	0.14	0.02	0.03	0.03	0.04	0.10	0.01	0.05
	Range	0.32	0.05	0.06	0.07	0.09	0.2	0.02	0.09
	Min	4.15	2.98	0.56	0.18	1.25	0.77	0.35	1.23
	Max	4.47	3.02	0.61	0.25	1.35	0.98	0.37	1.33
F (N = 5)	**Mean**	**3.94**	**2.83**	**0.60**	**0.28**	**1.22**	**0.76**	**0.37**	**1.12**
	SD	0.16	0.11	0.01	0.03	0.04	0.03	0.01	0.06
	Range	0.43	0.28	0.03	0.06	0.11	0.06	0.03	0.16
	Min	3.67	2.68	0.59	0.24	1.15	0.74	0.36	1.05
	Max	4.10	2.96	0.62	0.31	1.26	0.80	0.39	1.21
fenderi									
M (N = 5)	**Mean**	**3.68**	**2.62**	**0.50**	**0.27**	**1.09**	**0.71**	**0.35**	**1.11**
	SD	0.33	0.23	0.06	0.08	0.06	0.02	0.01	0.09
	Range	0.72	0.53	0.15	0.18	0.14	0.05	0.03	0.23
	Min	3.28	2.36	0.42	0.19	1.02	0.68	0.34	0.99
	Max	4.00	2.90	0.57	0.37	1.16	0.73	0.37	1.22
F (N = 5)	**Mean**	**3.55**	**2.57**	**0.51**	**0.27**	**1.10**	**0.71**	**0.37**	**1.00**
	SD	0.09	0.09	0.05	0.03	0.04	0.02	0.01	0.03
	Range	0.23	0.26	0.10	0.09	0.10	0.05	0.02	0.09
	Min	3.44	2.44	0.46	0.22	1.03	0.68	0.36	0.94
	Max	3.67	2.69	0.55	0.31	1.13	0.73	0.38	1.03

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
flavicornis									
M (N = 5)	**Mean**	**3.34**	**2.34**	**0.45**	**0.22**	**1.08**	**0.71**	**0.36**	**1.15**
	SD	0.18	0.14	0.06	0.04	0.04	0.01	0.01	0.04
	Range	0.47	0.36	0.16	0.09	0.1	0.04	0.03	0.11
	Min	3.18	2.20	0.38	0.18	1.02	0.68	0.35	1.08
	Max	3.64	2.56	0.54	0.27	1.12	0.72	0.38	1.20
F (N = 5)	**Mean**	**3.52**	**2.42**	**0.47**	**0.22**	**1.16**	**0.74**	**0.39**	**1.06**
	SD	0.09	0.06	0.03	0.04	0.02	0.01	0.01	0.04
	Range	0.22	0.15	0.06	0.10	0.05	0.02	0.03	0.11
	Min	3.42	2.36	0.44	0.15	1.14	0.73	0.38	0.98
	Max	3.63	2.51	0.50	0.26	1.19	0.75	0.41	1.09
flavidus									
M (N = 5)	**Mean**	**4.27**	**2.92**	**0.52**	**0.24**	**1.28**	**0.86**	**0.41**	**1.13**
	SD	0.20	0.12	0.05	0.03	0.04	0.03	0.01	0.04
	Range	0.45	0.3	0.10	0.06	0.11	0.07	0.02	0.10
	Min	4.09	2.79	0.48	0.21	1.22	0.81	0.40	1.08
	Max	4.54	3.10	0.58	0.27	1.33	0.88	0.43	1.18
F (N = 5)[b]	**Mean**	**3.99**	**2.86**	**0.55**	**0.28**	**1.29**	**0.85**	**0.44**	**1.08**
	SD	0.13	0.05	0.02	0.05	0.04	0.03	0.03	0.09
	Range	0.32	0.12	0.06	0.12	0.11	0.06	0.06	0.20
	Min	3.83	2.78	0.52	0.21	1.24	0.82	0.39	1.01
	Max	4.15	2.91	0.59	0.33	1.36	0.87	0.46	1.21
flavipes									
M (N = 5)	**Mean**	**3.75**	**2.55**	**0.48**	**0.25**	**1.06**	**0.64**	**0.32**	**0.98**
	SD	0.18	0.11	0.02	0.04	0.06	0.01	0.02	0.06
	Range	0.48	0.25	0.06	0.09	0.14	0.03	0.04	0.13
	Min	3.47	2.40	0.44	0.19	1.00	0.63	0.30	0.90
	Max	3.95	2.65	0.51	0.28	1.14	0.66	0.34	1.03
F (N = 5)	**Mean**	**3.84**	**2.71**	**0.55**	**0.29**	**1.14**	**0.67**	**0.35**	**1.03**
	SD	0.11	0.02	0.02	0.03	0.02	0.02	0.03	0.05
	Range	0.26	0.06	0.05	0.09	0.04	0.04	0.06	0.12
	Min	3.74	2.67	0.52	0.24	1.11	0.65	0.32	0.95
	Max	4.00	2.73	0.58	0.33	1.15	0.69	0.38	1.07
flavoscutellatus									
M (N = 5)	**Mean**	**4.34**	**3.07**	**0.56**	**0.26**	**1.31**	**0.82**	**0.34**	**1.37**
	SD	0.18	0.07	0.02	0.02	0.03	0.03	0.01	0.08
	Range	0.47	0.15	0.07	0.06	0.08	0.07	0.03	0.22
	Min	4.03	3.01	0.54	0.24	1.26	0.79	0.33	1.28
	Max	4.50	3.15	0.60	0.30	1.34	0.86	0.36	1.50
F (N = 5)	**Mean**	**4.30**	**3.01**	**0.57**	**0.26**	**1.33**	**0.82**	**0.39**	**1.24**
	SD	0.12	0.11	0.05	0.04	0.02	0.01	0.01	0.06
	Range	0.31	0.28	0.12	0.11	0.04	0.02	0.02	0.13
	Min	4.13	2.92	0.49	0.22	1.31	0.81	0.38	1.17
	Max	4.44	3.2	0.61	0.33	1.35	0.83	0.40	1.30
flavus									
M (N = 5)	**Mean**	**4.37**	**2.96**	**0.51**	**0.21**	**1.29**	**0.79**	**0.35**	**1.32**
	SD	0.24	0.10	0.02	0.04	0.06	0.02	0.02	0.10
	Range	0.61	0.26	0.05	0.08	0.17	0.06	0.05	0.27
	Min	4.09	2.78	0.47	0.18	1.17	0.77	0.33	1.17
	Max	4.70	3.04	0.52	0.27	1.34	0.82	0.38	1.43
F (N = 5)	**Mean**	**4.08**	**2.84**	**0.54**	**0.23**	**1.30**	**0.79**	**0.38**	**1.21**
	SD	0.11	0.07	0.03	0.02	0.04	0.02	0.01	0.03
	Range	0.26	0.19	0.09	0.06	0.09	0.04	0.02	0.06
	Min	3.97	2.72	0.50	0.20	1.25	0.78	0.37	1.17
	Max	4.24	2.91	0.59	0.26	1.33	0.82	0.39	1.23

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
fulvaceus									
M (N = 5)	**Mean**	**4.38**	**2.79**	**0.43**	**0.20**	**1.19**	**0.76**	**0.36**	**1.04**
	SD	0.33	0.25	0.04	0.04	0.06	0.04	0.01	0.14
	Range	0.84	0.68	0.11	0.09	0.13	0.09	0.02	0.34
	Min	3.90	2.40	0.37	0.14	1.12	0.73	0.35	0.83
	Max	4.75	3.08	0.48	0.23	1.25	0.81	0.37	1.17
F (N = 5)	**Mean**	**3.57**	**2.46**	**0.45**	**0.23**	**1.15**	**0.75**	**0.39**	**0.90**
	SD	0.56	0.32	0.06	0.03	0.11	0.04	0.03	0.14
	Range	1.37	0.75	0.15	0.08	0.27	0.10	0.08	0.34
	Min	2.89	2.11	0.36	0.19	1.04	0.70	0.35	0.78
	Max	4.26	2.86	0.51	0.27	1.31	0.80	0.43	1.12
fulvidus									
M (N = 6)	**Mean**	**3.56**	**2.53**	**0.54**	**0.25**	**1.14**	**0.72**	**0.34**	**0.93**
	SD	0.18	0.17	0.04	0.03	0.06	0.02	0.01	0.05
	Range	0.54	0.44	0.10	0.09	0.19	0.04	0.03	0.14
	Min	3.27	2.26	0.49	0.2	1.04	0.70	0.32	0.89
	Max	3.82	2.70	0.59	0.29	1.22	0.74	0.36	1.03
F (N = 3)	**Mean**	**3.73**	**2.67**	**0.58**	**0.28**	**1.20**	**0.73**	**0.38**	**0.91**
	SD	0.15	0.11	0.04	0.06	0.07	0.01	0.02	0.05
	Range	0.29	0.20	0.08	0.13	0.15	0.02	0.03	0.09
	Min	3.60	2.55	0.54	0.23	1.13	0.72	0.37	0.86
	Max	3.89	2.76	0.62	0.36	1.28	0.74	0.40	0.95
fuscipes									
M (N = 10)	**Mean**	**3.81**	**2.64**	**0.50**	**0.26**	**1.10**	**0.76**	**0.36**	**1.10**
	SD	0.24	0.14	0.04	0.02	0.06	0.02	0.02	0.09
	Range	0.63	0.43	0.11	0.06	0.18	0.06	0.06	0.27
	Min	3.53	2.44	0.44	0.23	0.99	0.72	0.32	0.97
	Max	4.16	2.87	0.56	0.30	1.18	0.78	0.38	1.24
F (N = 5)	**Mean**	**3.30**	**2.34**	**0.46**	**0.26**	**1.01**	**0.73**	**0.36**	**0.91**
	SD	0.12	0.12	0.03	0.06	0.05	0.01	0.01	0.05
	Range	0.30	0.32	0.06	0.14	0.11	0.03	0.02	0.13
	Min	3.17	2.19	0.43	0.21	0.94	0.71	0.36	0.85
	Max	3.47	2.51	0.49	0.35	1.06	0.74	0.37	0.98
fuscosus									
M (N = 10)	**Mean**	**3.36**	**2.39**	**0.46**	**0.22**	**1.07**	**0.71**	**0.35**	**0.95**
	SD	0.14	0.07	0.03	0.03	0.04	0.02	0.01	0.06
	Range	0.39	0.21	0.08	0.10	0.13	0.07	0.03	0.18
	Min	3.22	2.29	0.43	0.17	0.99	0.66	0.33	0.89
	Max	3.60	2.49	0.52	0.27	1.11	0.73	0.36	1.06
F (N = 10)	**Mean**	**3.39**	**2.44**	**0.49**	**0.24**	**1.12**	**0.72**	**0.36**	**0.96**
	SD	0.10	0.07	0.03	0.03	0.03	0.02	0.01	0.02
	Range	0.32	0.22	0.11	0.09	0.10	0.09	0.04	0.09
	Min	3.24	2.30	0.45	0.19	1.08	0.69	0.35	0.91
	Max	3.57	2.52	0.56	0.28	1.17	0.78	0.39	1.00
grandis									
M (N = 5)	**Mean**	**4.79**	**3.29**	**0.59**	**0.26**	**1.65**	**0.97**	**0.44**	**1.52**
	SD	0.26	0.20	0.08	0.04	0.07	0.05	0.02	0.09
	Range	0.64	0.48	0.17	0.09	0.19	0.12	0.04	0.21
	Min	4.55	3.07	0.51	0.21	1.58	0.92	0.42	1.40
	Max	5.18	3.55	0.68	0.30	1.76	1.05	0.46	1.61
F (N = 5)[b]	**Mean**	**4.87**	**3.42**	**0.68**	**0.30**	**1.75**	**1.00**	**0.51**	**1.29**
	SD	0.13	0.11	0.03	0.02	0.07	0.02	0.01	0.05
	Range	0.33	0.23	0.07	0.04	0.18	0.04	0.02	0.12
	Min	4.76	3.33	0.64	0.28	1.63	0.98	0.50	1.23
	Max	5.09	3.56	0.71	0.32	1.81	1.02	0.52	1.35

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
guttatipes									
M (N = 5)	**Mean**	**4.00**	**2.73**	**0.51**	**0.22**	**1.27**	**0.78**	**0.37**	**1.08**
	SD	0.15	0.11	0.04	0.03	0.04	0.01	0.01	0.03
	Range	0.36	0.27	0.09	0.06	0.10	0.02	0.02	0.08
	Min	3.83	2.58	0.47	0.19	1.22	0.78	0.35	1.04
	Max	4.18	2.86	0.57	0.25	1.32	0.79	0.38	1.12
F (N = 5)	**Mean**	**3.77**	**2.67**	**0.53**	**0.29**	**1.24**	**0.76**	**0.40**	**1.02**
	SD	0.11	0.07	0.02	0.05	0.03	0.01	0.01	0.14
	Range	0.25	0.16	0.05	0.13	0.08	0.03	0.03	0.31
	Min	3.62	2.62	0.51	0.25	1.22	0.75	0.38	0.95
	Max	3.88	2.78	0.56	0.38	1.29	0.77	0.41	1.26
hallucinatus									
M (N = 5)	**Mean**	**4.66**	**3.23**	**0.53**	**0.21**	**1.34**	**0.82**	**0.37**	**1.44**
	SD	0.30	0.12	0.03	0.03	0.07	0.02	0.02	0.06
	Range	0.81	0.31	0.08	0.08	0.17	0.04	0.06	0.15
	Min	4.20	3.08	0.48	0.17	1.24	0.80	0.35	1.40
	Max	5.01	3.39	0.56	0.26	1.41	0.85	0.41	1.54
F (N = 5)	**Mean**	**4.43**	**3.12**	**0.57**	**0.28**	**1.32**	**0.82**	**0.40**	**1.19**
	SD	0.12	0.07	0.07	0.04	0.04	0.02	0.01	0.07
	Range	0.30	0.18	0.16	0.10	0.10	0.05	0.03	0.19
	Min	4.24	3.02	0.50	0.23	1.26	0.79	0.39	1.09
	Max	4.54	3.20	0.66	0.33	1.36	0.84	0.42	1.28
laricicola									
M (N = 5)	**Mean**	**3.69**	**2.54**	**0.45**	**0.21**	**1.08**	**0.71**	**0.34**	**0.98**
	SD	0.31	0.20	0.03	0.02	0.08	0.03	0.02	0.11
	Range	0.81	0.47	0.07	0.05	0.19	0.07	0.04	0.25
	Min	3.25	2.31	0.41	0.19	0.99	0.67	0.33	0.85
	Max	4.06	2.77	0.48	0.23	1.17	0.74	0.36	1.10
F (N = 5)	**Mean**	**3.59**	**2.52**	**0.47**	**0.24**	**1.10**	**0.73**	**0.37**	**1.00**
	SD	0.12	0.08	0.02	0.03	0.03	0.02	0.01	0.09
	Range	0.31	0.21	0.04	0.07	0.09	0.04	0.03	0.19
	Min	3.43	2.39	0.44	0.21	1.05	0.71	0.35	0.90
	Max	3.74	2.60	0.49	0.28	1.14	0.75	0.38	1.10
lattini									
M (N = 5)	**Mean**	**4.82**	**3.18**	**0.52**	**0.26**	**1.18**	**0.77**	**0.36**	**1.55**
	SD	0.25	0.11	0.06	0.06	0.05	0.02	0.02	0.05
	Range	0.51	0.24	0.13	0.15	0.13	0.04	0.06	0.12
	Min	4.54	3.04	0.44	0.18	1.12	0.75	0.34	1.48
	Max	5.05	3.28	0.57	0.33	1.25	0.79	0.40	1.61
F (N = 3)	**Mean**	**4.24**	**2.96**	**0.55**	**0.27**	**1.21**	**0.79**	**0.39**	**1.23**
	SD	0.17	0.10	0.04	0.04	0.05	0.04	0.02	0.06
	Range	0.33	0.20	0.07	0.09	0.09	0.07	0.04	0.12
	Min	4.06	2.85	0.51	0.24	1.16	0.74	0.36	1.17
	Max	4.39	3.05	0.58	0.32	1.26	0.81	0.41	1.30
lineatus									
M (N = 5)	**Mean**	**4.35**	**3.04**	**0.57**	**0.30**	**1.25**	**0.82**	**0.39**	**1.29**
	SD	0.20	0.09	0.03	0.03	0.07	0.02	0.03	0.09
	Range	0.46	0.24	0.07	0.07	0.16	0.06	0.06	0.20
	Min	4.09	2.90	0.54	0.28	1.18	0.79	0.36	1.18
	Max	4.55	3.14	0.61	0.34	1.34	0.85	0.41	1.38
F (N = 5)	**Mean**	**4.29**	**3.10**	**0.61**	**0.34**	**1.28**	**0.82**	**0.43**	**1.21**
	SD	0.35	0.23	0.04	0.05	0.07	0.03	0.02	0.16
	Range	0.78	0.53	0.10	0.12	0.15	0.09	0.04	0.34
	Min	3.94	2.86	0.57	0.28	1.20	0.78	0.41	1.04
	Max	4.72	3.39	0.66	0.40	1.35	0.86	0.45	1.39

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
longipennis									
M (N = 6)	**Mean**	**5.75**	**3.76**	**0.56**	**0.33**	**1.29**	**0.85**	**0.33**	**1.74**
	SD	0.14	0.11	0.06	0.04	0.06	0.02	0.01	0.07
	Range	0.34	0.32	0.15	0.11	0.16	0.06	0.03	0.21
	Min	5.60	3.62	0.49	0.27	1.21	0.82	0.32	1.63
	Max	5.94	3.93	0.64	0.37	1.36	0.88	0.35	1.83
F (N = 5)	**Mean**	**5.14**	**3.52**	**0.58**	**0.34**	**1.32**	**0.83**	**0.40**	**1.56**
	SD	0.09	0.06	0.04	0.04	0.04	0.01	0.01	0.07
	Range	0.25	0.17	0.10	0.11	0.09	0.04	0.02	0.17
	Min	5.03	3.44	0.54	0.29	1.27	0.81	0.39	1.50
	Max	5.28	3.61	0.64	0.40	1.35	0.84	0.42	1.67
longirostris									
M (N = 5)	**Mean**	**3.78**	**2.61**	**0.49**	**0.24**	**1.07**	**0.67**	**0.32**	**1.20**
	SD	0.19	0.08	0.02	0.06	0.03	0.02	0.01	0.06
	Range	0.44	0.22	0.05	0.15	0.09	0.04	0.03	0.13
	Min	3.46	2.52	0.47	0.16	1.03	0.64	0.30	1.13
	Max	3.90	2.73	0.52	0.31	1.12	0.68	0.33	1.26
F (N = 5)	**Mean**	**3.56**	**2.57**	**0.54**	**0.30**	**1.06**	**0.66**	**0.33**	**1.08**
	SD	0.15	0.13	0.02	0.02	0.05	0.02	0.01	0.05
	Range	0.31	0.29	0.04	0.06	0.12	0.04	0.03	0.13
	Min	3.39	2.44	0.51	0.27	1.00	0.65	0.31	1.03
	Max	3.71	2.72	0.56	0.33	1.12	0.68	0.34	1.16
lonicerae									
M (N = 10)	**Mean**	**4.64**	**3.08**	**0.55**	**0.23**	**1.30**	**0.82**	**0.34**	**1.28**
	SD	0.29	0.16	0.05	0.03	0.07	0.05	0.02	0.08
	Range	0.99	0.58	0.16	0.11	0.22	0.16	0.06	0.24
	Min	4.01	2.76	0.47	0.17	1.17	0.72	0.3	1.14
	Max	5.00	3.34	0.63	0.29	1.39	0.88	0.36	1.38
F (N = 5)	**Mean**	**4.15**	**2.87**	**0.54**	**0.23**	**1.29**	**0.82**	**0.39**	**1.11**
	SD	0.21	0.13	0.02	0.02	0.06	0.03	0.01	0.09
	Range	0.48	0.31	0.04	0.04	0.16	0.08	0.03	0.24
	Min	3.94	2.72	0.52	0.21	1.22	0.79	0.38	0.98
	Max	4.42	3.03	0.57	0.25	1.38	0.87	0.40	1.22
louisianus									
M (N = 5)	**Mean**	**4.00**	**2.87**	**0.53**	**0.20**	**1.28**	**0.80**	**0.31**	**1.17**
	SD	0.14	0.10	0.02	0.03	0.03	0.02	0.02	0.03
	Range	0.36	0.25	0.05	0.07	0.06	0.04	0.04	0.08
	Min	3.77	2.76	0.50	0.17	1.25	0.78	0.29	1.13
	Max	4.13	3.02	0.55	0.24	1.31	0.82	0.33	1.21
F (N = 5)	**Mean**	**4.11**	**2.88**	**0.54**	**0.20**	**1.31**	**0.78**	**0.35**	**1.10**
	SD	0.12	0.07	0.05	0.03	0.02	0.01	0.02	0.05
	Range	0.31	0.16	0.13	0.06	0.04	0.02	0.05	0.13
	Min	3.93	2.80	0.47	0.17	1.28	0.77	0.33	1.05
	Max	4.24	2.96	0.60	0.24	1.32	0.79	0.38	1.18
luteus									
M (N = 5)	**Mean**	**3.53**	**2.43**	**0.45**	**0.21**	**1.05**	**0.71**	**0.32**	**1.15**
	SD	0.10	0.05	0.03	0.03	0.05	0.03	0.01	0.06
	Range	0.25	0.15	0.07	0.07	0.13	0.07	0.04	0.14
	Min	3.43	2.37	0.43	0.18	0.97	0.68	0.31	1.09
	Max	3.68	2.52	0.49	0.25	1.10	0.76	0.34	1.22
F (N = 5)	**Mean**	**3.38**	**2.35**	**0.47**	**0.23**	**1.06**	**0.68**	**0.34**	**0.97**
	SD	0.09	0.06	0.02	0.02	0.05	0.01	0.02	0.04
	Range	0.22	0.13	0.05	0.05	0.13	0.03	0.04	0.09
	Min	3.28	2.29	0.44	0.20	1.00	0.66	0.32	0.90
	Max	3.50	2.42	0.49	0.25	1.13	0.70	0.36	1.00

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
maculipennis									
M (N = 5)	**Mean**	**3.35**	**2.37**	**0.45**	**0.17**	**1.10**	**0.69**	**0.32**	**0.74**
	SD	0.17	0.07	0.05	0.04	0.03	0.02	0.02	0.39
	Range	0.46	0.18	0.12	0.11	0.08	0.06	0.03	0.91
	Min	3.10	2.31	0.39	0.12	1.08	0.66	0.30	0.03
	Max	3.56	2.49	0.51	0.23	1.16	0.72	0.33	0.94
F (N = 5)	**Mean**	**3.07**	**2.22**	**0.43**	**0.20**	**1.04**	**0.66**	**0.34**	**0.75**
	SD	0.23	0.15	0.04	0.02	0.07	0.02	0.03	0.03
	Range	0.64	0.41	0.09	0.05	0.19	0.06	0.06	0.08
	Min	2.76	2.01	0.38	0.18	0.95	0.62	0.31	0.71
	Max	3.40	2.42	0.48	0.24	1.14	0.68	0.36	0.79
melliferae									
M (N = 5)	**Mean**	**4.11**	**2.79**	**0.54**	**0.22**	**1.36**	**0.82**	**0.35**	**0.93**
	SD	0.16	0.08	0.04	0.03	0.03	0.02	0.01	0.04
	Range	0.39	0.22	0.10	0.09	0.09	0.04	0.03	0.09
	Min	3.99	2.70	0.47	0.17	1.31	0.80	0.34	0.88
	Max	4.37	2.92	0.57	0.26	1.40	0.84	0.36	0.97
F (N = 5)	**Mean**	**3.70**	**2.65**	**0.55**	**0.24**	**1.33**	**0.81**	**0.38**	**0.87**
	SD	0.14	0.13	0.02	0.03	0.04	0.01	0.02	0.02
	Range	0.34	0.34	0.06	0.06	0.10	0.02	0.04	0.06
	Min	3.54	2.44	0.53	0.20	1.26	0.80	0.36	0.84
	Max	3.89	2.78	0.58	0.26	1.36	0.83	0.40	0.90
mexicanus									
M (N = 5)	**Mean**	**4.52**	**3.09**	**0.58**	**0.29**	**1.34**	**0.82**	**0.37**	**1.19**
	SD	0.08	0.05	0.02	0.04	0.05	0.02	0.02	0.06
	Range	0.19	0.13	0.06	0.08	0.13	0.04	0.04	0.13
	Min	4.41	3.05	0.56	0.25	1.26	0.81	0.35	1.13
	Max	4.61	3.17	0.62	0.33	1.39	0.85	0.39	1.26
F (N = 5)	**Mean**	**4.23**	**3.03**	**0.60**	**0.34**	**1.38**	**0.82**	**0.42**	**1.15**
	SD	0.07	0.05	0.03	0.03	0.05	0.02	0.01	0.02
	Range	0.17	0.15	0.06	0.07	0.13	0.05	0.04	0.05
	Min	4.15	2.95	0.57	0.30	1.33	0.80	0.41	1.12
	Max	4.32	3.10	0.64	0.37	1.46	0.85	0.44	1.18
modestus									
M (N = 5)	**Mean**	**3.29**	**2.29**	**0.41**	**0.19**	**1.03**	**0.67**	**0.3**	**0.85**
	SD	0.16	0.14	0.05	0.04	0.07	0.04	0.01	0.05
	Range	0.32	0.30	0.13	0.11	0.15	0.08	0.03	0.12
	Min	3.11	2.13	0.33	0.15	0.96	0.63	0.28	0.78
	Max	3.43	2.43	0.46	0.26	1.11	0.72	0.31	0.90
F (N = 5)	**Mean**	**3.16**	**2.22**	**0.45**	**0.21**	**1.04**	**0.64**	**0.34**	**0.79**
	SD	0.13	0.14	0.03	0.03	0.03	0.02	0.01	0.03
	Range	0.33	0.34	0.08	0.08	0.07	0.04	0.04	0.07
	Min	2.99	2.02	0.42	0.17	1.00	0.63	0.32	0.75
	Max	3.32	2.37	0.50	0.25	1.07	0.66	0.36	0.82
moerens									
M (N = 10)	**Mean**	**4.60**	**3.29**	**0.62**	**0.32**	**1.38**	**0.90**	**0.42**	**1.43**
	SD	0.33	0.22	0.05	0.03	0.07	0.03	0.01	0.15
	Range	1.12	0.85	0.16	0.10	0.23	0.08	0.05	0.56
	Min	3.84	2.81	0.55	0.27	1.23	0.85	0.40	1.11
	Max	4.96	3.66	0.70	0.37	1.46	0.93	0.44	1.67
F (N = 10)	**Mean**	**4.47**	**3.20**	**0.62**	**0.35**	**1.36**	**0.89**	**0.44**	**1.26**
	SD	0.17	0.17	0.07	0.05	0.08	0.03	0.01	0.08
	Range	0.59	0.58	0.21	0.17	0.25	0.09	0.03	0.27
	Min	4.19	2.97	0.53	0.26	1.26	0.85	0.42	1.14
	Max	4.78	3.55	0.74	0.43	1.52	0.94	0.45	1.41

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
monardellae									
M (N = 3)	**Mean**	**4.16**	**2.79**	**0.49**	**0.26**	**1.13**	**0.72**	**0.36**	**1.02**
	SD	0.19	0.10	0.02	0.01	0.02	0.02	0.02	0.01
	Range	0.35	0.19	0.04	0.02	0.04	0.03	0.04	0.03
	Min	3.95	2.68	0.47	0.24	1.11	0.70	0.34	1.00
	Max	4.30	2.87	0.50	0.26	1.15	0.73	0.38	1.03
F (N = 5)	**Mean**	**3.80**	**2.66**	**0.51**	**0.28**	**1.16**	**0.74**	**0.39**	**0.94**
	SD	0.09	0.07	0.03	0.01	0.04	0.02	0.01	0.04
	Range	0.23	0.16	0.08	0.04	0.09	0.06	0.03	0.12
	Min	3.70	2.57	0.49	0.26	1.11	0.71	0.38	0.88
	Max	3.93	2.73	0.56	0.29	1.20	0.77	0.41	0.99
morrisoni									
M (N = 5)	**Mean**	**3.46**	**2.40**	**0.44**	**0.23**	**1.02**	**0.69**	**0.33**	**0.97**
	SD	0.23	0.12	0.04	0.04	0.05	0.02	0.01	0.06
	Range	0.56	0.34	0.09	0.09	0.12	0.05	0.02	0.14
	Min	3.30	2.22	0.40	0.20	0.97	0.66	0.32	0.92
	Max	3.85	2.57	0.49	0.29	1.09	0.71	0.34	1.06
F (N = 5)	**Mean**	**3.13**	**2.18**	**0.42**	**0.20**	**0.98**	**0.66**	**0.34**	**0.89**
	SD	0.17	0.15	0.03	0.04	0.05	0.02	0.01	0.06
	Range	0.45	0.37	0.08	0.10	0.12	0.04	0.03	0.15
	Min	2.92	2.05	0.38	0.13	0.93	0.64	0.33	0.82
	Max	3.36	2.42	0.47	0.23	1.06	0.69	0.36	0.97
mundus									
M (N = 6)	**Mean**	**4.13**	**2.84**	**0.55**	**0.26**	**1.16**	**0.77**	**0.36**	**1.25**
	SD	0.28	0.20	0.08	0.05	0.06	0.03	0.02	0.10
	Range	0.75	0.52	0.24	0.11	0.16	0.07	0.04	0.24
	Min	3.85	2.63	0.48	0.22	1.09	0.74	0.33	1.15
	Max	4.60	3.15	0.71	0.33	1.25	0.81	0.38	1.39
F (N = 7)	**Mean**	**3.89**	**2.73**	**0.53**	**0.27**	**1.17**	**0.77**	**0.40**	**1.13**
	SD	0.29	0.20	0.05	0.06	0.09	0.04	0.02	0.08
	Range	0.92	0.60	0.17	0.14	0.25	0.11	0.05	0.22
	Min	3.33	2.37	0.46	0.21	1.03	0.72	0.38	1.02
	Max	4.25	2.97	0.62	0.35	1.28	0.83	0.43	1.24
negundinis									
M (N = 5)	**Mean**	**3.95**	**2.79**	**0.54**	**0.25**	**1.22**	**0.75**	**0.36**	**1.21**
	SD	0.14	0.04	0.03	0.05	0.03	0.02	0.02	0.04
	Range	0.34	0.10	0.07	0.12	0.06	0.05	0.06	0.08
	Min	3.75	2.74	0.51	0.19	1.20	0.73	0.33	1.16
	Max	4.09	2.84	0.57	0.31	1.26	0.78	0.39	1.24
F (N = 2)	**Mean**	**3.79**	**2.73**	**0.56**	**0.30**	**1.24**	**0.72**	**0.38**	**1.01**
	SD	0.13	0.04	0.00	0.01	0.01	0.05	0.01	0.10
	Range	0.18	0.06	0.00	0.02	0.02	0.07	0.02	0.15
	Min	3.70	2.70	0.56	0.29	1.24	0.69	0.38	0.94
	Max	3.88	2.76	0.56	0.31	1.25	0.75	0.39	1.08
nigronitens									
M (N = 5)	**Mean**	**3.05**	**2.09**	**0.44**	**0.18**	**0.98**	**0.69**	**0.32**	**0.7**
	SD	0.12	0.09	0.03	0.01	0.04	0.03	0.01	0.05
	Range	0.33	0.23	0.09	0.03	0.10	0.07	0.03	0.11
	Min	2.84	1.96	0.38	0.16	0.92	0.64	0.31	0.66
	Max	3.17	2.19	0.48	0.19	1.02	0.71	0.33	0.77
F (N = 5)	**Mean**	**2.93**	**2.08**	**0.45**	**0.2**	**0.97**	**0.68**	**0.34**	**0.68**
	SD	0.12	0.06	0.03	0.02	0.02	0.02	0.02	0.06
	Range	0.33	0.16	0.07	0.06	0.04	0.04	0.04	0.16
	Min	2.78	1.98	0.41	0.17	0.94	0.66	0.32	0.59
	Max	3.1	2.14	0.48	0.23	0.98	0.71	0.36	0.75

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
notodysmicos									
M (N = 4)	**Mean**	**4.27**	**2.76**	**0.48**	**0.25**	**1.19**	**0.73**	**0.32**	**1.13**
	SD	0.24	0.20	0.06	0.04	0.08	0.04	0.01	0.13
	Range	0.53	0.46	0.15	0.08	0.18	0.10	0.03	0.30
	Min	3.93	2.47	0.40	0.21	1.07	0.68	0.31	0.94
	Max	4.46	2.93	0.54	0.29	1.25	0.78	0.34	1.24
F (N = 4)	**Mean**	**4.04**	**2.73**	**0.52**	**0.31**	**1.20**	**0.73**	**0.35**	**1.05**
	SD	0.19	0.16	0.02	0.06	0.05	0.02	0.00	0.08
	Range	0.43	0.36	0.03	0.14	0.12	0.04	0.01	0.17
	Min	3.79	2.49	0.50	0.24	1.15	0.71	0.35	0.95
	Max	4.22	2.86	0.53	0.38	1.28	0.75	0.36	1.12
obscurus									
M (N = 13)[c]	**Mean**	**4.01**	**2.82**	**0.49**	**0.22**	**1.20**	**0.74**	**0.35**	**1.22**
	SD	0.33	0.18	0.05	0.05	0.06	0.04	0.02	0.08
	Range	1.33	0.67	0.16	0.18	0.19	0.12	0.06	0.24
	Min	3.23	2.43	0.40	0.12	1.10	0.69	0.32	1.12
	Max	4.56	3.10	0.56	0.31	1.28	0.81	0.38	1.36
F (N = 14)[d]	**Mean**	**3.90**	**2.73**	**0.48**	**0.22**	**1.22**	**0.75**	**0.38**	**1.09**
	SD	0.24	0.14	0.04	0.03	0.05	0.03	0.02	0.04
	Range	0.72	0.44	0.17	0.11	0.21	0.11	0.07	0.15
	Min	3.52	2.48	0.38	0.15	1.11	0.68	0.33	1.00
	Max	4.24	2.92	0.56	0.26	1.32	0.79	0.40	1.14
paramundus									
M (N = 6)	**Mean**	**4.52**	**3.07**	**0.57**	**0.25**	**1.25**	**0.78**	**0.36**	**1.44**
	SD	0.31	0.18	0.06	0.02	0.08	0.02	0.02	0.06
	Range	0.93	0.51	0.16	0.06	0.21	0.07	0.05	0.16
	Min	3.97	2.73	0.45	0.22	1.11	0.74	0.34	1.36
	Max	4.90	3.24	0.61	0.28	1.32	0.81	0.39	1.52
F (N = 6)	**Mean**	**4.18**	**2.94**	**0.56**	**0.25**	**1.29**	**0.79**	**0.40**	**1.16**
	SD	0.18	0.11	0.04	0.03	0.04	0.02	0.02	0.03
	Range	0.47	0.34	0.13	0.09	0.10	0.07	0.06	0.08
	Min	3.94	2.78	0.49	0.2	1.22	0.76	0.37	1.13
	Max	4.41	3.12	0.62	0.29	1.32	0.82	0.44	1.22
parshleyi									
M (N = 6)	**Mean**	**4.64**	**3.04**	**0.54**	**0.27**	**1.24**	**0.79**	**0.34**	**1.27**
	SD	0.08	0.05	0.04	0.02	0.03	0.02	0.01	0.06
	Range	0.23	0.12	0.10	0.07	0.09	0.05	0.03	0.16
	Min	4.48	2.98	0.51	0.24	1.19	0.76	0.33	1.16
	Max	4.71	3.10	0.61	0.31	1.28	0.82	0.35	1.33
F (N = 5)	**Mean**	**4.03**	**2.79**	**0.52**	**0.27**	**1.24**	**0.77**	**0.38**	**1.14**
	SD	0.12	0.10	0.03	0.05	0.06	0.03	0.02	0.05
	Range	0.29	0.25	0.07	0.12	0.16	0.08	0.04	0.13
	Min	3.88	2.65	0.50	0.19	1.14	0.73	0.36	1.06
	Max	4.18	2.90	0.57	0.30	1.30	0.81	0.41	1.19
pemptos									
M (N = 5)	**Mean**	**3.44**	**2.38**	**0.44**	**0.24**	**1.05**	**0.72**	**0.37**	**0.90**
	SD	0.13	0.12	0.03	0.01	0.05	0.03	0.01	0.04
	Range	0.32	0.29	0.07	0.03	0.11	0.08	0.03	0.11
	Min	3.24	2.18	0.41	0.22	0.98	0.67	0.35	0.86
	Max	3.55	2.47	0.48	0.26	1.10	0.75	0.38	0.97
F (N = 5)	**Mean**	**3.34**	**2.35**	**0.45**	**0.25**	**1.06**	**0.72**	**0.37**	**0.87**
	SD	0.07	0.05	0.01	0.02	0.01	0.02	0.01	0.04
	Range	0.18	0.13	0.01	0.06	0.04	0.05	0.03	0.10
	Min	3.28	2.29	0.45	0.22	1.05	0.70	0.36	0.82
	Max	3.46	2.42	0.46	0.28	1.08	0.74	0.39	0.92

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
phaceliae									
M (N = 5)	**Mean**	**4.88**	**3.30**	**0.59**	**0.29**	**1.25**	**0.74**	**0.31**	**1.45**
	SD	0.11	0.11	0.05	0.06	0.15	0.10	0.06	0.06
	Range	0.30	0.27	0.13	0.13	0.37	0.25	0.14	0.15
	Min	4.75	3.19	0.54	0.20	1.03	0.56	0.21	1.38
	Max	5.05	3.46	0.66	0.33	1.40	0.81	0.35	1.53
F (N = 2)	**Mean**	**4.20**	**2.96**	**0.55**	**0.30**	**1.34**	**0.77**	**0.35**	**1.24**
	SD	0.04	0.07	0.02	0.01	0.03	0.01	0.02	0.06
	Range	0.06	0.09	0.03	0.02	0.04	0.02	0.03	0.08
	Min	4.17	2.92	0.54	0.29	1.31	0.76	0.34	1.20
	Max	4.23	3.01	0.57	0.31	1.36	0.78	0.37	1.28
physocarpi									
M (N = 5)	**Mean**	**3.43**	**2.40**	**0.46**	**0.19**	**1.10**	**0.69**	**0.34**	**0.91**
	SD	0.05	0.08	0.01	0.03	0.03	0.02	0.01	0.03
	Range	0.13	0.19	0.03	0.07	0.06	0.04	0.02	0.07
	Min	3.39	2.33	0.45	0.16	1.06	0.67	0.34	0.86
	Max	3.52	2.52	0.48	0.22	1.12	0.70	0.36	0.94
F (N = 2)	**Mean**	**3.45**	**2.47**	**0.47**	**0.25**	**1.17**	**0.72**	**0.37**	**0.99**
	SD	0.05	0.10	0.10	0.00	0.01	0.02	0.03	0.05
	Range	0.07	0.14	0.14	0.00	0.02	0.03	0.04	0.07
	Min	3.41	2.41	0.40	0.25	1.16	0.70	0.35	0.95
	Max	3.48	2.54	0.54	0.25	1.17	0.73	0.39	1.02
piceicola									
M (N = 5)	**Mean**	**3.87**	**2.65**	**0.45**	**0.24**	**1.12**	**0.73**	**0.35**	**1.10**
	SD	0.25	0.20	0.02	0.05	0.08	0.02	0.02	0.07
	Range	0.67	0.54	0.05	0.11	0.20	0.05	0.06	0.20
	Min	3.55	2.39	0.42	0.20	0.98	0.70	0.31	0.99
	Max	4.22	2.93	0.47	0.31	1.18	0.75	0.37	1.18
F (N = 5)	**Mean**	**3.64**	**2.54**	**0.46**	**0.25**	**1.11**	**0.73**	**0.36**	**1.00**
	SD	0.11	0.10	0.03	0.05	0.03	0.02	0.02	0.05
	Range	0.28	0.27	0.07	0.12	0.09	0.04	0.05	0.14
	Min	3.53	2.36	0.42	0.19	1.06	0.71	0.33	0.94
	Max	3.81	2.63	0.49	0.31	1.15	0.75	0.38	1.08
polhemorum									
M (N = 5)	**Mean**	**3.83**	**2.54**	**0.42**	**0.16**	**1.16**	**0.77**	**0.36**	**1.00**
	SD	0.23	0.12	0.04	0.05	0.04	0.01	0.01	0.04
	Range	0.53	0.31	0.08	0.14	0.08	0.01	0.02	0.11
	Min	3.49	2.34	0.38	0.11	1.12	0.76	0.36	0.93
	Max	4.02	2.65	0.46	0.24	1.20	0.77	0.37	1.04
F (N = 4)	**Mean**	**3.47**	**2.39**	**0.43**	**0.18**	**1.14**	**0.77**	**0.39**	**0.90**
	SD	0.12	0.14	0.04	0.05	0.04	0.02	0.01	0.02
	Range	0.29	0.32	0.09	0.11	0.09	0.04	0.01	0.05
	Min	3.31	2.26	0.38	0.14	1.08	0.75	0.38	0.89
	Max	3.60	2.58	0.47	0.25	1.18	0.79	0.39	0.94
politus									
M (N = 6)	**Mean**	**3.72**	**2.53**	**0.48**	**0.17**	**1.22**	**0.75**	**0.32**	**1.00**
	SD	0.30	0.15	0.04	0.04	0.09	0.03	0.03	0.09
	Range	0.66	0.33	0.12	0.12	0.23	0.08	0.07	0.22
	Min	3.46	2.41	0.42	0.11	1.10	0.71	0.30	0.90
	Max	4.12	2.75	0.54	0.23	1.33	0.80	0.36	1.12
F (N = 6)	**Mean**	**3.71**	**2.55**	**0.50**	**0.20**	**1.26**	**0.75**	**0.36**	**0.89**
	SD	0.21	0.11	0.06	0.03	0.09	0.03	0.02	0.14
	Range	0.55	0.25	0.16	0.08	0.20	0.09	0.07	0.40
	Min	3.43	2.42	0.38	0.14	1.16	0.70	0.33	0.62
	Max	3.98	2.67	0.54	0.22	1.36	0.79	0.40	1.01

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
punctatipes									
M (N = 5)	**Mean**	**3.49**	**2.45**	**0.50**	**0.22**	**1.18**	**0.71**	**0.36**	**0.83**
	SD	0.06	0.06	0.02	0.03	0.03	0.01	0.01	0.03
	Range	0.15	0.16	0.06	0.09	0.07	0.03	0.02	0.06
	Min	3.39	2.38	0.47	0.18	1.14	0.69	0.34	0.79
	Max	3.54	2.54	0.53	0.26	1.22	0.72	0.36	0.85
F (N = 5)	**Mean**	**3.60**	**2.56**	**0.54**	**0.29**	**1.20**	**0.73**	**0.37**	**0.85**
	SD	0.09	0.12	0.02	0.02	0.02	0.02	0.02	0.04
	Range	0.25	0.32	0.05	0.06	0.05	0.04	0.06	0.11
	Min	3.48	2.42	0.52	0.24	1.18	0.71	0.35	0.79
	Max	3.72	2.74	0.57	0.30	1.23	0.75	0.41	0.90
repetitus									
M (N = 5)	**Mean**	**3.06**	**2.14**	**0.42**	**0.24**	**0.91**	**0.64**	**0.32**	**0.73**
	SD	0.19	0.10	0.03	0.04	0.02	0.02	0.02	0.01
	Range	0.50	0.25	0.08	0.10	0.04	0.06	0.05	0.04
	Min	2.78	2.02	0.39	0.19	0.90	0.61	0.29	0.70
	Max	3.29	2.27	0.47	0.29	0.94	0.67	0.34	0.74
F (N = 5)	**Mean**	**2.98**	**2.14**	**0.44**	**0.25**	**0.96**	**0.66**	**0.35**	**0.77**
	SD	0.10	0.09	0.04	0.07	0.04	0.02	0.01	0.05
	Range	0.27	0.24	0.11	0.16	0.09	0.04	0.04	0.12
	Min	2.87	2.02	0.37	0.15	0.93	0.64	0.34	0.70
	Max	3.13	2.26	0.48	0.32	1.02	0.68	0.38	0.82
ribesi									
M (N = 5)	**Mean**	**3.34**	**2.21**	**0.40**	**0.22**	**1.00**	**0.70**	**0.35**	**0.86**
	SD	0.12	0.10	0.02	0.03	0.02	0.01	0.01	0.06
	Range	0.29	0.21	0.05	0.09	0.06	0.03	0.02	0.13
	Min	3.14	2.11	0.37	0.16	0.97	0.69	0.34	0.78
	Max	3.43	2.31	0.42	0.25	1.03	0.71	0.36	0.91
F (N = 5)	**Mean**	**3.13**	**2.15**	**0.42**	**0.24**	**1.01**	**0.69**	**0.37**	**0.77**
	SD	0.24	0.12	0.02	0.05	0.06	0.03	0.01	0.04
	Range	0.61	0.30	0.04	0.12	0.11	0.06	0.03	0.08
	Min	2.79	1.99	0.40	0.19	0.95	0.66	0.35	0.73
	Max	3.39	2.29	0.44	0.31	1.06	0.73	0.38	0.81
rideri									
M (N = 5)	**Mean**	**3.77**	**2.61**	**0.43**	**0.19**	**1.17**	**0.68**	**0.31**	**1.06**
	SD	0.24	0.13	0.05	0.08	0.03	0.01	0.02	0.04
	Range	0.67	0.32	0.11	0.19	0.08	0.02	0.04	0.11
	Min	3.42	2.41	0.37	0.08	1.13	0.67	0.29	0.99
	Max	4.08	2.73	0.48	0.28	1.21	0.69	0.33	1.10
F (N = 5)	**Mean**	**3.52**	**2.48**	**0.42**	**0.19**	**1.13**	**0.66**	**0.34**	**0.98**
	SD	0.14	0.12	0.02	0.09	0.02	0.02	0.01	0.05
	Range	0.36	0.32	0.06	0.20	0.05	0.05	0.02	0.11
	Min	3.35	2.31	0.40	0.12	1.11	0.63	0.33	0.94
	Max	3.71	2.63	0.46	0.32	1.16	0.68	0.35	1.05
rileyi									
M (N = 5)	**Mean**	**3.43**	**2.45**	**0.39**	**0.17**	**1.19**	**0.71**	**0.32**	**0.99**
	SD	0.06	0.11	0.05	0.08	0.07	0.02	0.01	0.06
	Range	0.16	0.24	0.14	0.21	0.17	0.04	0.03	0.15
	Min	3.37	2.34	0.32	0.11	1.08	0.70	0.31	0.94
	Max	3.53	2.58	0.47	0.32	1.25	0.74	0.33	1.09
F (N = 4)	**Mean**	**3.16**	**2.45**	**0.45**	**0.20**	**1.15**	**0.71**	**0.35**	**0.90**
	SD	0.14	0.16	0.04	0.04	0.04	0.01	0.03	0.02
	Range	0.32	0.35	0.09	0.09	0.08	0.03	0.06	0.04
	Min	3.02	2.22	0.38	0.15	1.10	0.69	0.33	0.88
	Max	3.34	2.57	0.48	0.23	1.18	0.72	0.39	0.92

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
rosicola									
M (N = 9)	**Mean**	**4.34**	**3.04**	**0.58**	**0.32**	**1.27**	**0.78**	**0.35**	**1.45**
	SD	0.17	0.11	0.05	0.04	0.03	0.02	0.01	0.07
	Range	0.55	0.33	0.13	0.12	0.09	0.07	0.02	0.24
	Min	4.05	2.89	0.51	0.25	1.23	0.73	0.34	1.32
	Max	4.60	3.22	0.63	0.37	1.33	0.79	0.36	1.56
F (N = 9)	**Mean**	**4.36**	**3.14**	**0.60**	**0.33**	**1.35**	**0.80**	**0.39**	**1.40**
	SD	0.15	0.08	0.03	0.02	0.03	0.02	0.01	0.08
	Range	0.40	0.26	0.09	0.08	0.10	0.06	0.03	0.27
	Min	4.16	2.98	0.57	0.29	1.31	0.76	0.38	1.26
	Max	4.56	3.25	0.66	0.37	1.41	0.81	0.41	1.53
rosicoloides									
M (N = 5)	**Mean**	**4.94**	**3.20**	**0.49**	**0.30**	**1.18**	**0.76**	**0.36**	**1.57**
	SD	0.08	0.08	0.02	0.06	0.04	0.02	0.02	0.04
	Range	0.17	0.21	0.05	0.16	0.11	0.04	0.06	0.09
	Min	4.86	3.12	0.47	0.23	1.13	0.74	0.32	1.52
	Max	5.03	3.33	0.52	0.39	1.23	0.78	0.38	1.62
F (N = 5)	**Mean**	**4.33**	**2.94**	**0.52**	**0.30**	**1.14**	**0.75**	**0.40**	**1.28**
	SD	0.35	0.21	0.06	0.04	0.06	0.01	0.02	0.05
	Range	0.85	0.52	0.12	0.09	0.12	0.04	0.05	0.13
	Min	3.99	2.71	0.45	0.25	1.07	0.74	0.38	1.23
	Max	4.85	3.23	0.57	0.34	1.19	0.77	0.44	1.36
salicicola									
M (N = 5)	**Mean**	**4.08**	**2.79**	**0.52**	**0.22**	**1.24**	**0.82**	**0.32**	**1.18**
	SD	0.17	0.11	0.04	0.04	0.06	0.04	0.01	0.12
	Range	0.40	0.30	0.11	0.10	0.14	0.10	0.03	0.28
	Min	3.98	2.63	0.46	0.18	1.19	0.78	0.31	1.05
	Max	4.37	2.93	0.57	0.28	1.33	0.88	0.34	1.33
F (N = 5)	**Mean**	**3.95**	**2.84**	**0.56**	**0.24**	**1.30**	**0.80**	**0.37**	**1.09**
	SD	0.10	0.09	0.04	0.03	0.08	0.03	0.02	0.06
	Range	0.26	0.25	0.10	0.09	0.21	0.08	0.04	0.16
	Min	3.85	2.69	0.5	0.20	1.16	0.75	0.35	1.00
	Max	4.11	2.94	0.6	0.29	1.37	0.83	0.39	1.16
salviae									
M (N = 5)	**Mean**	**3.38**	**2.36**	**0.47**	**0.25**	**1.10**	**0.69**	**0.33**	**0.76**
	SD	0.23	0.13	0.04	0.04	0.05	0.03	0.01	0.10
	Range	0.56	0.31	0.08	0.09	0.13	0.07	0.02	0.23
	Min	3.17	2.22	0.42	0.21	1.03	0.67	0.32	0.66
	Max	3.73	2.53	0.50	0.30	1.15	0.74	0.33	0.89
F (N = 5)	**Mean**	**3.22**	**2.29**	**0.43**	**0.25**	**1.09**	**0.68**	**0.35**	**0.71**
	SD	0.08	0.08	0.03	0.04	0.03	0.01	0.01	0.10
	Range	0.18	0.21	0.08	0.11	0.06	0.02	0.03	0.23
	Min	3.13	2.19	0.40	0.21	1.06	0.67	0.33	0.62
	Max	3.32	2.40	0.48	0.32	1.12	0.69	0.36	0.86
schaffneri									
M (N = 8)	**Mean**	**3.44**	**2.41**	**0.51**	**0.18**	**1.20**	**0.73**	**0.34**	**1.06**
	SD	0.20	0.14	0.06	0.02	0.07	0.03	0.02	0.08
	Range	0.63	0.47	0.17	0.07	0.22	0.07	0.06	0.23
	Min	3.10	2.21	0.44	0.15	1.10	0.69	0.30	0.93
	Max	3.73	2.68	0.61	0.22	1.32	0.75	0.36	1.16
F (N = 5)	**Mean**	**3.59**	**2.56**	**0.55**	**0.20**	**1.32**	**0.75**	**0.38**	**0.99**
	SD	0.08	0.07	0.02	0.03	0.04	0.02	0.01	0.07
	Range	0.21	0.16	0.05	0.08	0.09	0.05	0.03	0.17
	Min	3.50	2.52	0.53	0.16	1.27	0.72	0.36	0.89
	Max	3.70	2.67	0.58	0.24	1.37	0.77	0.40	1.06

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
shepherdiae									
M (N = 5)	**Mean**	**4.36**	**2.87**	**0.53**	**0.23**	**1.24**	**0.86**	**0.39**	**1.16**
	SD	0.24	0.17	0.02	0.05	0.08	0.04	0.02	0.09
	Range	0.57	0.40	0.04	0.10	0.20	0.08	0.05	0.21
	Min	4.12	2.71	0.51	0.18	1.16	0.82	0.37	1.08
	Max	4.68	3.11	0.55	0.28	1.36	0.90	0.41	1.29
F (N = 5)	**Mean**	**4.00**	**2.78**	**0.53**	**0.25**	**1.26**	**0.86**	**0.43**	**1.07**
	SD	0.15	0.09	0.04	0.04	0.05	0.02	0.00	0.03
	Range	0.38	0.23	0.09	0.10	0.13	0.05	0.01	0.08
	Min	3.78	2.68	0.49	0.22	1.20	0.83	0.42	1.03
	Max	4.16	2.91	0.58	0.32	1.33	0.88	0.43	1.11
shoshonea									
M (N = 5)	**Mean**	**5.07**	**3.53**	**0.65**	**0.33**	**1.47**	**0.86**	**0.43**	**1.47**
	SD	0.21	0.15	0.03	0.04	0.03	0.03	0.01	0.11
	Range	0.53	0.36	0.08	0.10	0.07	0.09	0.03	0.25
	Min	4.74	3.31	0.63	0.29	1.43	0.83	0.42	1.32
	Max	5.27	3.67	0.71	0.39	1.50	0.92	0.44	1.56
F (N = 5)	**Mean**	**4.72**	**3.36**	**0.63**	**0.32**	**1.47**	**0.87**	**0.44**	**1.33**
	SD	0.08	0.03	0.03	0.03	0.07	0.02	0.03	0.11
	Range	0.20	0.08	0.08	0.08	0.16	0.05	0.08	0.32
	Min	4.59	3.31	0.59	0.28	1.40	0.84	0.41	1.18
	Max	4.79	3.40	0.67	0.35	1.56	0.89	0.49	1.50
stitti									
M (N = 1)	**Mean**	**4.40**	**2.88**	**0.49**	**0.19**	**1.28**	**0.76**	**0.35**	**1.30**
subovatus									
M (N = 1)	**Mean**	**3.23**	**2.33**	**0.51**	**0.20**	**1.10**	**0.72**	**0.34**	**1.06**
F (N = 1)	**Mean**	**3.51**	**2.49**	**0.52**	**0.23**	**1.17**	**0.76**	**0.38**	**0.92**
suffuscipennis									
M (N = 5)	**Mean**	**3.12**	**2.15**	**0.40**	**0.25**	**0.94**	**0.67**	**0.33**	**0.78**
	SD	0.09	0.08	0.02	0.01	0.03	0.01	0.01	0.04
	Range	0.24	0.21	0.06	0.02	0.08	0.03	0.03	0.11
	Min	3.03	2.07	0.38	0.24	0.90	0.66	0.32	0.73
	Max	3.26	2.28	0.44	0.26	0.98	0.69	0.35	0.84
F (N = 5)	**Mean**	**3.10**	**2.21**	**0.42**	**0.25**	**0.98**	**0.69**	**0.36**	**0.81**
	SD	0.12	0.09	0.01	0.02	0.04	0.02	0.01	0.07
	Range	0.23	0.22	0.04	0.04	0.10	0.05	0.03	0.18
	Min	2.96	2.09	0.40	0.23	0.91	0.67	0.34	0.75
	Max	3.20	2.30	0.43	0.27	1.01	0.71	0.37	0.93
syrticolae									
M (N = 4)	**Mean**	**3.47**	**2.42**	**0.47**	**0.20**	**1.09**	**0.70**	**0.33**	**0.78**
	SD	0.06	0.05	0.03	0.03	0.04	0.01	0.00	0.02
	Range	0.14	0.11	0.06	0.07	0.09	0.02	0.01	0.04
	Min	3.40	2.37	0.44	0.17	1.05	0.69	0.32	0.75
	Max	3.54	2.48	0.50	0.24	1.15	0.71	0.33	0.79
F (N = 5)	**Mean**	**3.25**	**2.33**	**0.44**	**0.23**	**1.03**	**0.68**	**0.34**	**0.67**
	SD	0.13	0.12	0.06	0.04	0.04	0.02	0.02	0.06
	Range	0.35	0.32	0.14	0.10	0.10	0.04	0.04	0.14
	Min	3.09	2.18	0.36	0.17	0.99	0.67	0.31	0.60
	Max	3.44	2.51	0.51	0.27	1.08	0.71	0.35	0.74

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
tenellus									
M (N = 3)	**Mean**	**3.83**	**2.61**	**0.49**	**0.21**	**1.25**	**0.88**	**0.35**	**1.24**
	SD	0.12	0.09	0.01	0.00	0.05	0.02	0.02	0.10
	Range	0.23	0.15	0.03	0.00	0.09	0.04	0.04	0.20
	Min	3.70	2.51	0.48	0.21	1.20	0.86	0.33	1.15
	Max	3.94	2.66	0.51	0.21	1.29	0.90	0.37	1.36
F (N = 1)	**Mean**	**3.74**	**2.53**	**0.45**	**0.17**	**1.26**	**0.85**	**0.40**	**1.02**
texanus									
M (N = 5)	**Mean**	**3.75**	**2.60**	**0.54**	**0.17**	**1.28**	**0.79**	**0.34**	**1.13**
	SD	0.13	0.07	0.05	0.03	0.02	0.02	0.01	0.02
	Range	0.33	0.19	0.13	0.07	0.05	0.05	0.02	0.04
	Min	3.58	2.51	0.49	0.14	1.25	0.77	0.33	1.11
	Max	3.90	2.71	0.61	0.21	1.31	0.82	0.35	1.15
F (N = 5)	**Mean**	**3.63**	**2.60**	**0.53**	**0.18**	**1.31**	**0.80**	**0.39**	**1.07**
	SD	0.11	0.08	0.03	0.04	0.03	0.02	0.00	0.03
	Range	0.27	0.20	0.07	0.09	0.07	0.04	0.01	0.07
	Min	3.50	2.50	0.49	0.13	1.27	0.78	0.38	1.05
	Max	3.77	2.70	0.56	0.23	1.34	0.82	0.39	1.12
tinctus									
M (N = 5)	**Mean**	**3.52**	**2.42**	**0.49**	**0.20**	**1.15**	**0.71**	**0.30**	**0.93**
	SD	0.11	0.09	0.02	0.04	0.02	0.02	0.04	0.06
	Range	0.26	0.25	0.06	0.10	0.06	0.04	0.10	0.14
	Min	3.43	2.30	0.47	0.15	1.11	0.70	0.24	0.86
	Max	3.69	2.54	0.53	0.24	1.17	0.74	0.34	1.01
F (N = 5)	**Mean**	**3.55**	**2.46**	**0.49**	**0.21**	**1.15**	**0.71**	**0.34**	**0.90**
	SD	0.09	0.07	0.05	0.02	0.05	0.01	0.01	0.04
	Range	0.23	0.17	0.12	0.05	0.13	0.02	0.02	0.11
	Min	3.46	2.39	0.44	0.19	1.07	0.70	0.33	0.84
	Max	3.69	2.56	0.57	0.23	1.20	0.73	0.35	0.95
tsugae									
M (N = 5)	**Mean**	**2.64**	**1.80**	**0.33**	**0.18**	**0.79**	**0.54**	**0.29**	**0.59**
	SD	0.24	0.14	0.03	0.02	0.07	0.02	0.01	0.04
	Range	0.64	0.34	0.08	0.05	0.19	0.04	0.03	0.12
	Min	2.33	1.65	0.29	0.15	0.68	0.51	0.28	0.53
	Max	2.96	1.99	0.37	0.20	0.87	0.55	0.30	0.65
F (N = 5)	**Mean**	**2.75**	**1.95**	**0.36**	**0.23**	**0.85**	**0.60**	**0.33**	**0.64**
	SD	0.22	0.16	0.03	0.06	0.04	0.06	0.04	0.04
	Range	0.58	0.36	0.08	0.14	0.11	0.12	0.07	0.10
	Min	2.46	1.81	0.32	0.19	0.81	0.55	0.29	0.60
	Max	3.04	2.17	0.40	0.32	0.92	0.67	0.37	0.70
tumidifrons									
M (N = 5)	**Mean**	**3.09**	**2.20**	**0.40**	**0.29**	**0.94**	**0.67**	**0.36**	**0.75**
	SD	0.10	0.08	0.02	0.05	0.04	0.01	0.02	0.03
	Range	0.22	0.19	0.06	0.10	0.09	0.03	0.05	0.06
	Min	2.99	2.12	0.38	0.23	0.90	0.65	0.33	0.73
	Max	3.21	2.32	0.44	0.34	0.99	0.69	0.38	0.79
F (N = 5)	**Mean**	**2.95**	**2.11**	**0.38**	**0.25**	**0.95**	**0.66**	**0.36**	**0.76**
	SD	0.29	0.22	0.04	0.05	0.07	0.05	0.03	0.08
	Range	0.73	0.57	0.10	0.13	0.17	0.12	0.08	0.18
	Min	2.47	1.77	0.33	0.19	0.84	0.56	0.31	0.64
	Max	3.20	2.34	0.42	0.32	1.01	0.69	0.39	0.82

TABLE 1—(*Continued*)

Species		Length				Width			
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head	InterOcDi	AntSeg2
urticae									
M (N = 5)	**Mean**	**4.32**	**2.87**	**0.52**	**0.20**	**1.24**	**0.76**	**0.35**	**1.14**
	SD	0.10	0.10	0.02	0.03	0.04	0.02	0.02	0.06
	Range	0.26	0.27	0.05	0.07	0.10	0.06	0.05	0.14
	Min	4.21	2.73	0.49	0.18	1.20	0.74	0.33	1.06
	Max	4.47	3.00	0.54	0.25	1.30	0.80	0.38	1.20
F (N = 5)	**Mean**	**3.65**	**2.63**	**0.52**	**0.23**	**1.21**	**0.74**	**0.37**	**0.91**
	SD	0.07	0.10	0.05	0.05	0.04	0.01	0.01	0.03
	Range	0.16	0.27	0.12	0.12	0.09	0.03	0.02	0.06
	Min	3.55	2.49	0.45	0.16	1.18	0.73	0.36	0.87
	Max	3.71	2.76	0.57	0.28	1.27	0.76	0.38	0.93
verticalis									
M (N = 6)	**Mean**	**4.43**	**2.99**	**0.51**	**0.28**	**1.19**	**0.77**	**0.36**	**1.17**
	SD	0.36	0.24	0.07	0.05	0.07	0.03	0.02	0.06
	Range	1.09	0.66	0.18	0.13	0.19	0.07	0.05	0.17
	Min	3.90	2.65	0.40	0.22	1.06	0.72	0.34	1.11
	Max	4.99	3.30	0.58	0.35	1.24	0.78	0.39	1.28
F (N = 6)	**Mean**	**3.96**	**2.78**	**0.52**	**0.28**	**1.22**	**0.77**	**0.40**	**1.05**
	SD	0.23	0.19	0.04	0.03	0.11	0.03	0.01	0.07
	Range	0.59	0.46	0.12	0.10	0.28	0.09	0.03	0.19
	Min	3.64	2.49	0.47	0.21	1.07	0.71	0.39	0.95
	Max	4.23	2.96	0.59	0.31	1.34	0.81	0.42	1.14
vitellinus									
M (N = 5)	**Mean**	**3.26**	**2.23**	**0.47**	**0.18**	**1.09**	**0.71**	**0.32**	**1.02**
	SD	0.27	0.14	0.04	0.05	0.09	0.03	0.01	0.17
	Range	0.64	0.31	0.10	0.13	0.22	0.07	0.04	0.47
	Min	2.86	2.03	0.41	0.12	0.92	0.67	0.30	0.77
	Max	3.50	2.34	0.50	0.25	1.15	0.73	0.34	1.23
F (N = 5)	**Mean**	**3.19**	**2.22**	**0.43**	**0.20**	**1.08**	**0.68**	**0.38**	**0.88**
	SD	0.12	0.04	0.02	0.04	0.04	0.01	0.02	0.05
	Range	0.26	0.10	0.04	0.10	0.12	0.03	0.04	0.12
	Min	3.04	2.16	0.41	0.15	1.02	0.66	0.36	0.84
	Max	3.30	2.27	0.45	0.25	1.14	0.70	0.40	0.95
viticola									
M (N = 5)	**Mean**	**2.83**	**1.94**	**0.40**	**0.12**	**0.99**	**0.61**	**0.30**	**0.73**
	SD	0.15	0.07	0.06	0.02	0.02	0.01	0.01	0.04
	Range	0.30	0.17	0.12	0.06	0.05	0.04	0.03	0.09
	Min	2.68	1.83	0.33	0.09	0.97	0.59	0.29	0.69
	Max	2.98	1.99	0.46	0.15	1.02	0.63	0.31	0.77
F (N = 6)	**Mean**	**2.72**	**1.86**	**0.39**	**0.12**	**0.98**	**0.59**	**0.33**	**0.70**
	SD	0.08	0.04	0.05	0.01	0.02	0.02	0.02	0.06
	Range	0.22	0.10	0.14	0.04	0.06	0.05	0.04	0.16
	Min	2.63	1.81	0.33	0.10	0.97	0.57	0.31	0.66
	Max	2.85	1.92	0.47	0.14	1.02	0.62	0.35	0.81

[a]N = 7 for antennal segment 2 measurement.
[b]N = 4 for antennal segment 2 measurement.
[c]N = 12 for antennal segment 2 measurement.
[d]N = 13 for antennal segment 2 measurement.

(Anacardiaceae), 1♀ (AMNH). Fort Duchesne, July 8, 1932, F. K. Steffers, 1♂ (USU). *Unknown Co.:* Antelope, July 1, 1931, R. T. Beamer, 1♂, 1♀ (KU). *Utah Co.:* 0.1 mi E of Covered Bridge Canyon on Rt 6/89, T8S R3E, 6000 ft, July 12, 1981, M. D. Schwartz, *Rhus triloba* (Anacardiaceae), 4♂, 9♀ (AMNH). American Fork, June 26, 1936, H. F. Thornton, 1♀ (USU). Pleasant Grove, June 20, 1937, G. F. Knowlton, 1♂ (USU). Rock Canyon, July 3, 1962, G. L. Jensen, *Rhus triloba* (Anacardiaceae), 2♀ (UCB). *Washington Co.:* Snow Canyon State Park, T41S R16W, 4000 ft, May 22, 1981, M. D. Schwartz, *Rhus microphylla* (Anacardiaceae), 5♂, 17♀ (AMNH). *Weber Co.:* Ogden, August 7, 1963, G. F. Knowlton, 2♀ (USU). **Wyoming:** *Platte Co.:* Wheatland, July 14, 1937, R. H. Beamer, 1♂ (KU).

Plagiognathus guttatipes (Uhler)
Figures 8, 17, 25

Lygus guttatipes Uhler, 1895: 35 (n. sp.).
Plagiognathus guttatipes: Knight, 1917: 639 (n. comb.).

DIAGNOSIS: Recognized by the moderately large size, *pale to greenish coloration* (fig. 9), *dark setae on dorsum, antennal segments almost entirely pale with segment 1 sometimes dark at extreme base* (fig. 17), and the *labium relatively short,* at most reaching to apex of middle coxae. May be confused with *chrysanthemi* on the basis of coloration and dorsal vestiture, but easily distinguished by the form of the male genitalia; distributions also nonoverlapping. Pale coloration of the body and antennae similar to *flavidus, shepherdiae,* and *tenellus.* Distinguished from *flavidus* by that species always with pale rather than dark setae on the dorsum, having a relatively long labium reaching to the apex of the hind coxae, and feeding on members of the Elaeagnaceae rather than *Glycyrrhiza* (Fabaceae). Separated from *shepherdiae* by the presence of some longitudinal dark markings on the hemelytra of that species and from *tenellus* by the tibial spines in that species lacking black spots at bases and the tibiae being pale at the femoral articulation.

REDESCRIPTION: *Male:* Moderately large, elongate-ovoid; total length 3.83–4.18, length apex clypeus–cuneal fracture 2.58–2.86, width across pronotum 1.22–1.81. COLORATION (fig. 9): Dorsum, venter, and appendages pale yellowish to greenish; membrane pale to weakly fumose, veins pale; antennal segment 1 sometimes dark on tapered basal portion (fig. 17); apex of labium infuscate; femora with some dark spots; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, dark, simple setae. STRUCTURE: Corial margin weakly convex; frons very weakly tumid, clypeus barely visible from above; anteocular distance 0.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to near apex of middle coxae. GENITALIA (fig. 25): Body of vesica not particularly broad, strongly curving basally, base falling well below base of secondary gonopore; apical spines moderately long, tapering, nearly parallel, forming a smooth curve with body of vesica; flange relatively broad, terminating well below base of secondary gonopore.

Female: Body more strongly ovoid than in male. Total length 3.62–3.88, length apex clypeus–cuneal fracture 2.62–2.78, width across pronotum 1.22–1.29.

HOSTS: *Glycyrrhiza lepidota, G.* sp. (Fabaceae).

DISTRIBUTION: Most records from the high plains of Canada south through Colorado. Recorded as far east as Iowa. California records, although appearing questionable on the basis of distribution alone, morphologically fit this taxon well. No host record is available for these specimens.

DISCUSSION: Uhler (1895) described *Plagiognathus guttatipes* from ''Manitou'', located on the front range of the Rocky Mountains. He indicated that he had seen four specimens. Apparently no lectotype has ever been designated. Examination of the collections of the National Museum of Natural History, Washington, D.C., revealed only a single specimen with the correct locality data. I am therefore designating it as the lectotype, an action that will remove any possible confusion about how this species is separated

from the very similar appearing *Plagiognathus flavidus.*

SPECIMENS EXAMINED: CANADA.—**Alberta:** Drumheller, June 18, 1957, Brooks and McNay, 2♂, 2♀ (CNC). Irvine, July 9, 1952, L. A. Konotopetz, 1♀ (CNC). Mayberries, July 25, 1952, L. A. Konotopetz, *Glycyrrhiza lepidota* (Fabaceae), 5♂, 9♀ (CNC). McMurray, July 11, 1953, W. J. Brown, 1♂ (CNC). Peace River, July 10, 1961, A. R. Brooks, 1♂ (CNC). Wainwright, July 27, 1957, A. and J. Brooks, 1♂, 1♀ (CNC). **Manitoba:** Aweme, July 25, 1930, B. M. White, 1♂ (CNC). Aweme, July 25, 1930, R. M. White, 1♀ (CNC). Boissevain, July 16, 1953, Brooks and Kelton, 2♂, 1♀ (CNC). Brandon, August 9, 1958, R. B. Madge, 1♀ (CNC). Carberry, July 30, 1953, Brooks and Kelton, 2♂, 3♀ (CNC). Gladstone, August 14, 1958, A. and J. Brooks, 1♀ (CNC). Horton, July 26, 1955, Brooks and Kelton, 1♀ (CNC). Russell, July 17, 1954, Brooks and Wallis, 1♂, 8♀ (CNC). Russell, July 21, 1954, Brooks and Wallis, *Glycyrrhiza* sp. (Fabaceae), 1♂, 1♀ (CNC). Turtle Mt. Forest Reserve, Internation Peace Gardens, August 7, 1958, R. L. Hurley, 1♂ (CNC). Virden, July 9, 1953, Brooks and Kelton, 4♂, 2♀ (CNC). Winnipeg, 1♀ (CNC). **Saskatchewan:** Elbow, August 1, 1951–August 16, 1951, A. R. Brooks, *Glycyrrhiza* sp. (Fabaceae), 5♂, 12♀ (CNC). Elbow, August 16, 1951, A. R. Brooks, *Glycyrrhiza* sp. (Fabaceae), 1♂ (CNC). Elstow, July 11, 1951, A. R. Brooks, *Glycyrrhiza* sp. (Fabaceae), 9♂, 4♀ (CNC). Elstow, July 11, 1951, L. A. Konotopetz, *Glycyrrhiza* sp. (Fabaceae), 1♂ (CNC). Esterhazy, August 14, 1954, Brooks and Wallis, 1♀ (CNC). Holdfast, August 4, 1925, K. M. King, 2♂, 1♀ (CNC). Indian Head, July 10, 1954, Brooks and Wallis, 1♀ (CNC). Labret, July 15, 1958, A. and J. Brooks, 1♀ (CNC). Limerick, July 10, 1923, K. M. King, 1♂ (CNC). Lumsden, August 5, 1954, Brooks and Wallis, 2♂, 1♀ (CNC). Mossbank, July 10, 1923, K. M. King, 1♂, 1♀ (CNC). Roadene, July 5, 1921, K. M. King, 2♂, 1♀ (CNC). Rutland, August 2, 1940, A. R. Brooks, 2♀ (CNC). Saskatoon, July 25, 1950, A. R. Brooks, 7♂, 7♀ (CNC). Stockholm, July 27, 1954, Brooks and Wallis, 1♂ (CNC). Torquay, August 14, 1955, A. R. Brooks, 1♀ (CNC). Val Marie, August 8, 1955, A. R. Brooks, 1♂, 2♀ (CNC). Willow Bunch, July 29, 1955, A. R. Brooks, 2♂, 9♀ (CNC). Wiseton, July 28, 1925, N. J. Atkinson, 1♂ (CNC). Wood Mountain, August 5, 1955, A. R. Brooks, 2♂, 1♀ (CNC). USA.—**California:** *Inyo Co.:* Big Pine, June 9, 1929, E. P. Van Duzee, 2♂, 1♀ (CAS). Bishop, June 21, 1929, E. P. Van Duzee, 1♂, 2♀ (CAS). Lone Pine, June 8, 1929, E. P. Van Duzee, 12♂, 9♀ (CAS). *Sacramento Co.:* Sacramento, June 3, 1920, E. P. Van Duzee, 7♂, 9♀ (CAS). **Colorado:** *Arapahoe Co.:* Cherry Creek State Park, Cottonwood Creek, July 28, 1977, J. T. Polhemus, 1♀ (JTP). Highline Canal at Belleview Ave., June 25, 1981, D. A. Polhemus, 1♀ (JTP). *Denver Co.:* Denver, July 12, 1900, E. P. Van Duzee, 2♀ (CAS). *Douglas Co.:* Chatfield State Park, June 18, 1978, J. T. Polhemus, 1♂ (JTP). Waterton, Head of Hiline, July 18, 1979, J. T. Polhemus, 4♂, 9♀ (JTP). Waterton, June 23, 1982–July 10, 1982, D. A. Polhemus, 2♂, 2♀ (JTP). *Gunnison Co.:* 8 mi SW of McClure Pass, August 8, 1975, J. C. Schaffner, *Astragalus pattersonii* (Fabaceae), 4♂, 6♀ (TAMU). *Larimer Co.:* Fort Collins, July 29, 1898, 1♂ (CAS). *Teller Co.:* Manitou, 6620 ft, August 1, 1990, E. S. Tucker, holotype male (USNM). **Idaho:** *Custer Co.:* Challis, July 7, 1926, R. W. Haegele, 1♂ (USNM). **Iowa:** *Story Co.:* Ames, July 10, 1953, H. H. Knight, 1♂ (CNC). Ames, July 15, 1951, J. A. Slater, 7♂, 8♀ (AMNH). **Minnesota:** *Norman Co.:* No specific locality, August 1, 1923, A. A. Nichol, 1♂, 1♀ (USNM). **New Mexico:** *Unknown Co.:* Coyote, July 24, 1967, H. R. Burke, 1♀ (TAMU). **North Dakota:** *Ramsey Co.:* Devil's Lake, July 19, 1920, T. H. Hubbell, 1♀ (USNM). *Ransom Co.:* T134N R53W, A. Annex, July 9, 1992, D. Rider, G. Fauske, C. Locken, 1♂ (DAR). *Traill Co.:* No specific locality, July 19, 1923, A. A. Nichol, 1♂ (USNM). **South Dakota:** *Brookings Co.:* White, July 26, 1922, H. C. Severin, 1♀ (CNC). *Lawrence Co.:* Deadwood, July 29, 1927, H. H. Knight, 2♂ (USNM). *Union Co.:* 3 mi S of Jefferson, June 11, 1949, Slater and Laffoon, 1♂ (AMNH). **Wyoming:** *Park Co.:* Shoshone Natl. Forest, August 15, 1927, H. H. Knight, 1♂ (CNC). *Sheridan Co.:* Arvada, July 31,

1927, H. H. Knight, 1♂, 1♀ (USNM). Sheridan, Metz, 1♂ (HELSINKI).

Plagiognathus hallucinatus, new species
Figures 8, 17, 26

HOLOTYPE: Male: ''OR[egon] Linn Co., S. F. Santiam R., 1/2 mi. upstream Labanon, VI-19–1979, coll. G. Stonedahl, ex *Salix* sp''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the relatively *large* size, *elongate* body form, generally pale, somewhat yellow-white coloration of the dorsum with a *longitudinal pattern of light brownish markings,* uniformly fumose membrane with yellowish veins (fig. 8), and *form of the male genitalia* (fig. 26). Similar in size and overall appearance to *lattini* (fig. 9) and *rosicoloides* (fig. 12), but coloration more whitish, tibial spines with small dark spots at bases rather than pale, and male genitalia distinctive.

DESCRIPTION: *Male:* Relatively large, elongate; total length 4.20–5.01, length apex clypeus–cuneal fracture 3.08–3.39, width across pronotum 1.24–1.41. COLORATION (fig. 8): General coloration yellow white with some slightly darker brownish markings; thoracic venter and much of genital capsule dark brown; face with some weak, transverse, brown markings, face at and below level of base of clypeus infuscate to castaneous, polished, shining; scutellum with a dark stripe on midline; endocorium mostly brownish, remainder of corium and clavus mostly pale; membrane fumose, veins yellowish; antennal segments 1 and 2 black (fig. 17); labium infuscate; legs, including all coxae, pale, femora with some dark spots; dorsal tibial spines with dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, pronotum weakly shining, hemelytra dull. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Lateral corial margins weakly convex; frons very weakly swollen, clypeus barely visible from above; anteocular distance 1.3 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 26): Body of vesica elongate, broadly and smoothly curving, weakly sigmoid, base of vesica falling somewhat below level of secondary gonopore; apical spines moderately long, more or less erect, superposed, anterior spine rather strongly bent subapically; flange narrow.

Female: Body much more strongly ovoid than in male; coloration usually lighter than in male, linear patterning of hemelytra less evident. Total length 4.24–4.54, length apex clypeus–cuneal fracture 3.02–3.20, width across pronotum 1.26–1.36.

ETYMOLOGY: From the Latin, to dream or wander in mind, in reference to my original misidentification of this species.

HOSTS: *Salix* spp. (Salicaceae).

DISTRIBUTION: Recorded only from the Willamette Valley of northwestern Oregon.

PARATYPES: USA.—**Oregon:** *Benton Co.:* Corvallis, behind Crystal Lake Cemetery, July 27, 1979, G. Stonedahl, *Salix sp.* (Salicaceae), 1♂, 1♀ (AMNH). *Linn Co.:* 0.5 mi E of Labanon (upstream), Santiam River, June 19, 1979, G. Stonedahl, *Salix sp.* (Salicaceae), 8♂, 11♀ (AMNH, OSU, USNM). *Yamhill Co.:* 6 mi E of McMinnville, Willamette River, June 8, 1958, K. M. Fender, 1♂, (OSU). Wheatland Ferry, July 11, 1957, K. McKay-Fender, 1♂, 3♀ (AMNH).

Plagiognathus laricicola Knight
Figures 8, 17, 26

Plagiognathus laricicola Knight, 1923: 452 (n. sp.).

DIAGNOSIS: *Medium-sized* species, *dorsum dark brown* (fig. 9), *legs moderately infuscate,* and *antennae largely dark* in most specimens, although segment 2 sometimes black only at extreme base and somewhat pale distally (fig. 17). Similar in size and coloration to *fenderi, fuscipes, pemptos, piceicola,* and *suffuscipennis.* Separated from *fenderi* by the much smaller anteocular distance and the nonoverlapping distributions. Separated from *fuscipes* by the labium in that species surpassing the apex of the hind coxae rather than reaching only to apex of middle coxae, the form of the male genitalia, and the *Potentilla* host preference in that species. Separated from *pemptos* by the dull black setae on the dorsum of that species. Separated

from *suffuscipennis* by the pale hemelytra of that species in eastern North America where the ranges of the two species overlap, and by the smaller size of *suffuscipennis.* Separated from *piceicola* by the form of the male genitalia and the nonoverlapping ranges.

REDESCRIPTION: *Male:* Elongate-ovoid species of moderate size; total length 3.25–4.06, length apex clypeus–cuneal fracture 2.31–2.77, width across pronotum 0.99–1.17. COLORATION (fig. 9): Dorsum and venter dark brown or blackish brown, posterior margin of vertex and costal veins often tending toward pale; corium weakly pale adjacent to extreme basal area of membrane; corium narrowly pale at cuneal fracture; membrane fumose, except vein demarcating posterior margin of cells pale; antennal segment 1 dark, segment 2 dark in most specimens, although sometimes black only at extreme base and somewhat lighter colored distally (fig. 17), segments 3 and 4 dark; femora moderately infuscate to almost entirely dark, with some dark spots; dorsal tibial spines with small dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Corial margins weakly convex; frons moderately tumid and weakly bulging beyond anterior margin of eyes in dorsal view, clypeus not visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 26): Body of vesica relatively stout, base falling at about level of base of secondary gonopore; apical spines moderately long, posterior spines nearly erect relative to body of vesica, anterior spine longer than posterior and at nearly right angles to body of vesica; flange narrow, terminating at base of secondary gonopore.

Female: Body usually more strongly ovoid than in male; coloration as in male. Total length 3.43–3.74, length apex clypeus–cuneal fracture 2.39–2.60, width across pronotum 1.05–1.14.

HOSTS: *Larix decidua, L. laricina* (Pinaceae).

DISTRIBUTION: Eastern North America, in Canada as far west as Alberta, farther south as far west as Iowa and south into Illinois and Virginia.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Nordegg, August 4, 1921, J. McDunnough, *Larix* sp. (Pinaceae), 3♂, 1♀ (CNC); 3♀ (CNC). **Manitoba:** Carberry, July 27, 1953, Brooks and Kelton, 2♀ (CNC). Pine Falls, July 12, 1962, 2♂, 4♀ (CNC). Seldon's Cor., July 10, 1964, 4♀ (CNC). **New Brunswick:** Berwick, August 2, 1966, L. A. Kelton, *Larix* sp. (Pinaceae), 12♂, 13♀ (CNC). Edmunston, July 25, 1966, L. A. Kelton, *Larix* sp. (Pinaceae), 5♂, 12♀ (CNC). Fredericton, June 28, 1976, L. A. Kelton, 1♀ (CNC). Kouchibouguac Natl. Park, July 21, 1977–July 29, 1977, D. J. Brown, *Larix* sp. (Pinaceae), 28♂, 30♀ (CNC). Moncton, June 25, 1966, L. A. Kelton, 4♂, 1♀ (CNC). **Nova Scotia:** Kentville, July 15, 1966, L. A. Kelton, *Larix* sp. (Pinaceae), 5♂, 12♀ (CNC). Woodville, July 20, 1968, L. A. Kelton, *Larix* sp. (Pinaceae), 3♂, 3♀ (CNC). **Ontario:** Bala, July 19, 1932, W. S. Walley, 4♂, 4♀ (CNC). Bells Corners, 2 km W of Moodie Dr. on Robertson Rd., July 16, 1991, M. D. Schwartz, *Larix laricina* (Pinaceae), 10♂, 34♀ (CNC). Black Hawk, August 3, 1960, Kelton and Whitney, *Larix* sp. (Pinaceae), 1♀ (CNC). Ipperwash, July 11, 1962, Kelton and Thorpe, *Larix* sp. (Pinaceae), 6♂, 24♀ (CNC). Mt. Pleasant, July 10, 1958, L. A. Kelton, 1♀ (CNC). St. Lawrence Is. Natl. Park, McDonald Is., July 14, 1976, W. Reid, 1♂ (CNC). Sturgeon Falls, July 27, 1962, Kelton and Thorpe, *Larix* sp. (Pinaceae), 37♂, 24♀ (CNC). Tillsonburg, July 11, 1958, L. A. Kelton, 2♀ (CNC). **Prince Edward Island:** Scotch Fort, July 10, 1966, L. A. Kelton, *Larix* sp. (Pinaceae), 29♂, 11♀ (CNC). **Quebec:** Charteris, July 24, 1955, C. H. Mann, 1♂ (CNC). Fabre, July 5, 1963, L. A. Kelton, *Larix* sp. (Pinaceae), 22♂, 19♀ (CNC). Ladysmith, July 24, 1958, L. A. Kelton, 1♂ (CNC). Laniel, July 6, 1963, L. A. Kelton, *Larix* sp. (Pinaceae), 5♂, 2♀ (CNC). Magog, July 2, 1961, G. Brumpton, 2♂ (CNC). Mt. Albert, July 25, 1954, W. J. Brown, 1♀ (CNC). Otter Lake, July 24, 1958, L. A. Kelton, 1♂ (CNC). Trinity Bay, August 20, 1929, W. J. Brown, 1♂ (AMNH). **Saskatchewan:** Prince

Albert, July 23, 1959, A. and J. Brooks, 3♂, 7♀ (CNC). USA.—**Illinois:** *Lake Co.:* Antioch, July 5, 1932, Frison et al., 1♂, 2♀ (AMNH). **Iowa:** *Story Co.:* Ames, June 17, 1927, H. H. Knight, 1♂ (USNM). **Kansas:** *Douglas Co.:* Lawrence, Twilight, E. S. Tucker, 1♂ (AMNH). **Maine:** *Penobscot Co.:* Orono, July 5, 1911, paratype: 1♂ (CAS). *Washington Co.:* Princeton, July 12, 1909, 2♀ (CAS). **Massachusetts:** *Essex Co.:* Danvers, July 3, 1914, 1♂ (AMNH). **Missouri:** *Jackson Co.:* Atherton, June 27, 1915, C. F. Adams, 1♂ (AMNH). Kansas City, June 16, 1900, F. Rogers, 1♀ (KU). **New York:** *Essex Co.:* Lake Placid, Patch Lane, 540 m, July 4, 1991, M. D. Schwartz, *Larix laricina* (Pinaceae), 16♂, 43♀ (CNC). *Rockland Co.:* Tuxedo, July 5, 1918, C. H. Curran, 1♂, 2♀ (AMNH). *St. Lawrence Co.:* Cranberry Lake, July 10, 1920, C. J. Drake, *Larix laricina* (Pinaceae), 2♂ (TAMU). *Tompkins Co.:* Ithaca, Cornell University, July 1, 1978, A. G. Wheeler, Jr., *Larix* sp. (Pinaceae), 1♂, 2♀ (PDA). Ithaca, June 27, 1920, *Larix* sp. (Pinaceae), paratypes: 5♂, 3♀ (CAS, USNM). Ithaca, June 27, 1920, H. H. Knight, paratype: 1♂ (CNC); holotype male (USNM). **Pennsylvania:** *Clinton Co.:* Tamarack, Rt 194, August 23, 1973, T. J. Henry and A. G. Wheeler, Jr., *Larix decidua* (Pinaceae), 1♀ (PDA). *Dauphin Co.:* Harrisburg, Cameron Street, June 4, 1974, T. J. Henry, *Platanus acerifolia* (Platanaceae), 1♂ (PDA). Harrisburg, Crooked Hill Road, June 27, 1973, W. Blosser, *Larix decidua* (Pinaceae), 1♂, 2♀ (PDA). Harrisburg, East Harrisburg Cemetery, May 22, 1977, A. G. Wheeler, Jr., *Larix decidua* (Pinaceae), 4♂, 4♀ (PDA). Harrisburg, May 30, 1973, A. G. Wheeler, Jr., *Pseudotsuga taxifolia* (Pinaceae), 1♂ (PDA). Hershey Hotel, June 12, 1973, A. G. Wheeler, Jr., *Larix decidua* (Pinaceae), 2♂, 1♀ (PDA). Susquehanna Township, Crooked Hill Road, May 22, 1974, T. J. Henry and A. G. Wheeler, Jr., *Larix decidua* (Pinaceae), 2♂, 1♀ (PDA). *Indiana Co.:* Indiana, Oakland Cemetery, June 15, 1979, A. G. Wheeler, Jr., *Larix decidua* (Pinaceae), 2♂, 4♀ (PDA). *Montgomery Co.:* Dresher, Mfg. Golf Club, May 31, 1973, A. G. Wheeler, Jr. and J. Stimmel, *Larix decidua* (Pinaceae), 2♀ (PDA). **Virginia:** *Giles Co.:* Sinking Creek, 1850 ft, June 25, 1969, G. W. Byers, 1♀ (KU).

Plagiognathus lattini, new species
Figures 9, 17, 26

HOLOTYPE: Male: ''OR[egon] Lincoln Co., Grass Mtn., 2900′, VII-29–1979, coll. G. Stonedahl, ex *Alnus rubra*''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the relatively *large* size, *elongate* body form (fig. 9), long *antennal segment 2 infuscate at base and apex* (fig. 17), pale costa and cuneus, *membrane with a large, quadrate, fumose patch posterior to cuneus and cells,* and the *form of the male genitalia* (fig. 26), especially the distinctive nature of the apical spines. Similar in appearance to *hallucinatus* and *rosicoloides,* but male genitalia distinctive; also distinguished by the dark spots at bases of the tibial spines in the former species and the calli not infuscate in the latter.

DESCRIPTION: *Male:* Large, elongate, nearly parallel-sided; total length 4.54–5.05, length apex clypeus–cuneal fracture 3.04–3.28, width across pronotum 1.12–1.25. COLORATION (fig. 9): General coloration brownish or yellowish; thoracic and abdominal venter mostly dark brown; vertex, anterior margin of pronotum, costal vein, and cuneus pale; corium with weak, longitudinal, pale markings along costa, radius, and claval suture; mesoscutum often orange laterally; membrane weakly fumose with a large, quadrate, darker marking posterior to cuneus and membrane cells; veins of membrane yellowish; antennal segment 1 black except for pale apical annulation, segment 2 usually black basally and apically with the intervening area pale or weakly infuscate (fig. 17), segments 3 and 4 infuscate; labium pale basally, infuscate apically; legs, including all coxae, pale, femora with some dark spots; dorsal tibial spines without dark spots at bases; tibiae weakly darkened at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to very weakly shining. Vestiture of dorsum composed of reclining, golden, shining, simple setae; vestiture of antennal segments 2–4 suberect. STRUCTURE: Body slender; frons weakly tumid, clypeus barely visible

from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 2 times diameter of antennal segment 1; labium reaching apex of hind coxae. GENITALIA (fig. 26): Body of vesica relatively broad, more or less sigmoid, base of vesica distant from level of secondary gonopore; apical spines relatively short, more or less erect, appearing intertwined; flange narrow.

Female: Body much more strongly ovoid than in male; coloration usually lighter than in male, linear patterning of hemelytra less evident. Total length 4.06–4.39, length apex clypeus–cuneal fracture 2.85–3.05, width across pronotum 1.16–1.26.

ETYMOLOGY: Named for J. D. Lattin, collector of many of the known specimens and the person who nurtured the beginnings of my career as a heteropterist during my undergraduate years at Oregon State University.

HOSTS: *Alnus rubra, Corylus cornuta, Corylus* sp. (Betulaceae).

DISTRIBUTION: Known only from the Willamette Valley of northwestern Oregon.

PARATYPES: USA.—**Oregon:** *Benton Co.:* Corvallis, June 26, 1926, C. J. Drake, 1♂, 1♀ (USNM). Mary's Peak, 4000 ft, July 28, 1966, W. Gagne and J. Haddock, 1♀ (UCB). Corvallis, August 24, 1932, H. A. Scullen, 1♀ (USNM). 15 mi SW of Alsea, Lobster Valley, July 18, 1981, J. D. Lattin and G. M. Stonedahl, *Corylus cornuta* (Betulaceae), 5♂, 1♀ (AMNH, OSU). 4 mi W of Philomath on Hwy 20, July 26, 1979, G. M. Stonedahl, 1♀ (OSU). *Lincoln Co.:* Grass Mountain, 2900 ft, July 29, 1979, G. M. Stonedahl, *Alnus rubra* (Betulaceae), 1♂, 1♀ (OSU). *Polk Co.:* Independence, June 16, 1934, N. P. Larson, 1♂, (USNM).

Plagiognathus lineatus Van Duzee
Figures 9, 17, 26

Plagiognathus lineatus Van Duzee, 1917b: 282 (n. sp.).

DIAGNOSIS: Recognized by the *moderately large* size, the *exocorium and clavus usually partly to mostly pale, contrasting with the endocorium, and forming a linear pattern of coloration* (fig. 9), the dull surface of dorsum, the pronotum often partly pale, the antennae entirely black (fig. 17), and the *vestiture of the dorsum recumbent, weakly woolly, silvery, shining.* Pattern of coloration similar to that of *moerens* (fig. 10) and *shoshonea* (fig. 13); distinguished from *moerens* by the dull surface of the dorsum and the shining, weakly woolly vestiture rather than black bristles and polished dorsum of that species; most easily separated from *shoshonea* by the much larger size of that species. Some specimens totally dark and very similar in appearance to dark specimens of *brunneus* (see Discussion below).

REDESCRIPTION: *Male:* Elongate-ovoid, moderately large; total length 4.09–4.55, length apex clypeus–cuneal fracture 2.90–3.14, width across pronotum 1.18–1.34. COLORATION (fig. 9): Background coloration of dorsum weakly castaneous to blackish, sometimes entirely dark, more commonly with some pale areas as indicated; vertex usually obviously pale; disc of pronotum usually partially to broadly pale; exocorium ranging from pale at base to totally pale; clavus usually with longitudinal marking submarginal to claval suture and covering entire length; cuneus ranging from pale at base to entirely pale; corium narrowly pale adjacent to extreme base of membrane; membrane fumose with pale veins; antennae entirely castaneous (fig. 17); labium castaneous; venter castaneous, metathoracic scent-gland evaporatory area sometimes partially to mostly pale; coxae dark on basal one-half, distal one-half and trochanters pale; femora heavily infuscate over most of surface; tibiae moderately infuscate, dorsal spines with weakly contrasting dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to very weakly shining. Vestiture of dorsum composed of recumbent, silvery, shining, weakly woolly setae. STRUCTURE: Body moderately elongate, lateral corial margins very weakly convex; frons distinctly tumid as viewed from above, clypeus visible from above; anteocular distance 1.3 times diameter of antennal segment 1; head projecting below level of eye by about 2 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 26): Vesica long, body moderately stout, forming an open curve, base of vesica falling well below level of secondary gono-

pore; posterior apical spine moderately long, relatively broad, angled subapically, nearly erect relative to body of vesica; anterior spine slightly longer than posterior, angled subapically, more strongly angled relative to body of vesica than posterior; flange moderately broad, curving over entire length, terminating at about midpoint of secondary gonopore.

Female: Body more strongly ovoid than in male; pattern of coloration as in male. Total length 4.09–4.55, length apex clypeus–cuneal fracture 2.90–3.14, width across pronotum 1.18–1.34.

HOSTS: Recorded from a variety of apparent hosts, including *Balsamorhiza* (Asteraceae), *Lupinus* (Fabaceae), *Potentilla* (Rosaceae), and *Stachys* (Lamiaceae).

DISTRIBUTION: In the north ranging from Alaska to Alberta, south into western Montana and Utah and west to northwestern Oregon.

DISCUSSION: My concept of *lineatus* is based on examination of the two male paratypes listed under Specimens Examined. The genitalia of *lineatus* are very similar in form to those of *brunneus* (and also *shoshonea*). Indeed, I have assigned some totally dark specimens to *lineatus* solely on the basis of their association with ''typical'' *lineatus* specimens as determined by locality and host data, but which on the basis of morphology I could not distinguish from dark specimens of *brunneus.* My decision to recognize *lineatus* as distinct from *brunneus* is based on the existence of large numbers of specimens that have the distinct linear pattern of pale markings on the dorsum and which as a group appear to be largely, although not totally, allopatric with *brunneus,* which occurs primarily in the Rocky Mountain system, whereas *lineatus* is known primarily from the Columbia River drainage.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Eisenhower Jct., August 5, 1970, R. T. Schuh, 2♀ (CNC). **British Columbia:** 1 km S of Seltat Creek, July 19, 1979, G. G. E. Scudder, 2♀ (UBC). 43 km E of Stewart, Stromm Creek, July 22, 1983, G. G. E. Scudder, 1♂ (UBC). Bella Coola, July 17, 1978, G. G. E. Scudder, 1♂, 1♀ (UBC). Echo Lake, July 30, 1979, G. G. E. Scudder, 1♂, 2♀ (UBC). Exstew, August 1, 1979, G. G. E. Scudder, 1♀ (UBC). Hodder Lake, July 22, 1983, G. G. E. Scudder, 7♂, 5♀ (UBC). Kinaskan Lake, July 22, 1983, G. G. E. Scudder, 1♀ (UBC). Kitimat, July 15, 1979, G. G. E. Scudder, 1♂, 4♀ (UBC). Mezidian Lake, July 30, 1979, G. G. E. Scudder, 1♂, 3♀ (UBC). Mt. Cheam, August 16, 2000, D. J. M. Quiring, 1♂ (UBC). Nicholson, Horse Creek, July 1, 1982, G. G. E. Scudder, 1♀ (UBC). Pleasant Camp, July 19, 1979–August 12, 1979, S. G. Cannings, *Epilobium latifolium* (Onagraceae), 3♂, 2♀ (UBC). Shames, July 17, 1979, G. G. E. Scudder, 2♂, 1♀ (UBC). Terrace, July 10, 1960, W. R. Richards, 1♀ (UBC). Valemont, June 23, 1995, G. G. E. Scudder, 1♂ (UBC). **Northwest Territories:** Inuvik, July 25, 1983, L. A. Kelton, *Salix* sp. (Salicaceae), 3♀ (CNC). **Yukon Territory:** Rampart House, July 21, 1951, J. E. H. Martin, 1♀ (CNC). USA.—**Alaska:** Anchorage, July 18, 1954, R. S. Bigelow, 1♀ (CNC). Anchorage, Otter Lake, July 25, 1948, E. P. Marks, 2♂, 1♀ (USNM). Dyea, July 6, 1989, R. J. Cannings, 1♂ (UBC). Haines, July 6, 1983, G. G. E. Scudder, 1♀ (UBC). Matanuska, July 10, 1944, J. Chamberlain, 1♀ (USNM). Muncaster Creek, July 6, 1983, G. G. E. Scudder, 2♂, 5♀ (UBC). Palmer, August 1, 1948, R. I. Sailer, 1♂ (USNM). Palmer, June 18, 1948, F. S. Blanton, *Achillea* sp. (Asteraceae), 1♂ (USNM). Skagway, July 5, 1980, R. J. Cannings, 2♂, 4♀ (UBC). Yeltakaska Creek, July 6, 1983, G. G. E. Scudder, 3♂ (UBC). **Idaho:** *Franklin Co.:* Cub River Canyon, July 3, 1965, G. F. Knowlton, 1♀ (USU). Dayton, 4747 ft, July 25, 1937, R. E. Miller, 1♀ (CNC). Williams Canyon, mp 20 on Rt 36, T12S R42 Sec 30, 8000 ft, July 19, 1981, M. D. Schwartz, 1♂, 4♀ (AMNH). *Fremont Co.:* 3.8 mi N of Ashton, 5500 ft, July 11, 1973, Oman and Musgrave, 1♀ (OSU). *Latah Co.:* Genesee, May 30, 1936, T. A. Brindley, 1♂, 1♀ (USNM). Moscow, July 17, 1942, T. A. Brindley, 1♂ (USNM). Moscow, May 30, 1936–July 11, 1936, T. A. Brindley, 1♂, 1♀ (USNM). *Oneida Co.:* Black Pine Canyon, June 25, 1974, G. F. Knowlton, 1♂ (USU). Twin Springs, July 17, 1972, G. E. Bohart, 1♀ (USU). **Montana:** *Gallatin Co.:* 26 mi S of Bozeman, hot springs on Rt 191, 5700 ft, August 10, 1996, Schwartz and Stonedahl, 1♂, 3♀ (AMNH). **Oregon:** *Ben-*

ton Co.: Corvallis, July 9, 1944, H. H. Crowell, 2♂ (USNM). Helmick State Park, June 27, 1960, E. A. Dickason, 1♂ (OSU). Mary's Peak, 14 mi W Corvallis, July 25, 1959–August 10, 1956, J. D. Lattin, 2♂, 4♀ (OSU). Mary's Peak, 4000 ft, July 29, 1966, W. Gagne and J. Haddock, 1♂, 2♀ (OSU). *Crook Co.:* 23 mi E of Prineville on Rt 26, June 26, 1986, G. M. Stonedahl, *Lupinus* sp. (Fabaceae), 14♂, 20♀ (AMNH). *Grant Co.:* 11 mi N of Seneca, May 14, 1973, Oman and Musgrave, 1♀ (OSU). 13 mi S of Dale, 3400 ft, June 14, 1973, Oman and Musgrave, 1♂, 2♀ (OSU). *Hood River Co.:* 10 mi S of Mt. Hood at Clinger Springs, 4300 ft, July 8, 1978, N. L. Herman, 1♂ (AMNH). *Jefferson Co.:* 10 mi N of Warm Springs, May 26, 1964, K. Goeden, 1♂ (OSU). 15 mi NW of Warm Springs, May 19, 1997, W. F. Chamberlain, 7♂, 1♀ (TAMU). 3 mi E of Madras, June 6, 1962, K. M. Fender, 7♂, 6♀ (OSU). 34 mi E of Sweet Home, Lost Prairie, 3400 ft, July 12, 1968, J. D. Lattin, 3♂, 8♀ (OSU). *Lincoln Co.:* Yaquina Head, lighthouse, July 5, 1979, M. D. Schwartz and G. M. Stonedahl, *Stachys mexicana* (Lamiaceae), 8♂, 9♀ (OSU). *Linn Co.:* 38 mi E of Sweet Home, Lost Prairie, 3800 ft, July 29, 1958, J. D. Lattin, 1♂, 1♀ (OSU). Tombstone Prairie, 35 mi E of Sweet Home, 4200 ft, September 12, 1956, J. D. Lattin, 1♂, 5♀ (OSU). Tombstone Prairie, July 19, 1972, G. Eulenson, 3♂, 3♀ (OSU). Tombstone Prairie, T13S R6E, 4200 ft, September 5, 1963, K. Goeden, 5♂, 5♀ (OSU). *Multnomah Co.:* Portland, July 3, 1917, W. M. Giffard, 1♂, 2♀ (CAS); Paratypes: 2♂ (CAS). *Union Co.:* 4.5 mi E of Tollgate, Woodland Campground, 5000 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, *Potentilla fruticosa* (Rosaceae), 6♂, 20♀ (AMNH). *Wallowa Co.:* 25.5 mi E of Tollgate, 4300 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, 2♂, 9♀ (AMNH). Joseph, June 13, 1973, Oman and Musgrave, 19♂, 40♀ (OSU). *Wasco Co.:* 2 mi S of Simnasho, 2900 ft, June 6, 1972, J. D. Lattin, 1♂, 1♀ (OSU). 9 mi E of The Dalles, May 18, 1972, J. D. Lattin, 6♂, 3♀ (OSU). Mosier, May 5, 1939, Schuh and Gray, 1♂ (OSU). Rowena Crest, May 4, 1973, P. W. Oman, 11♂, 12♀ (OSU). *Wheeler Co.:* 4 mi SE of Fossil, June 5, 1979, P. W. Oman, *Balsamorhiza* sp. (Asteraceae), 5♂, 5♀ (OSU). *Yamhill Co.:* top of Bald Mountain, July 13, 1958, K. M. Fender, 2♂, 3♀ (OSU). **Utah:** *Cache Co.:* Tony Grove Lake, 8100 ft, August 12, 1981, G. F. Knowlton, 1♀ (USU). *Rich Co.:* Allen Canyon, July 10, 1974, G. F. Knowlton, 1♂ (USU). **Washington:** *Asotin Co.:* 3 mi N of Anatone, June 5, 1970, P. W. Oman, 2♂, 4♀ (OSU). *Benton Co.:* Hanford Site ALE, Rattlesnake Ridge, June 10, 1994, R. S. Zack, 2♂, 2♀ (CNC). Hanford Site ALE, Rattlesnake Ridge, spring, June 10, 1994, R. S. Zack, 3♂, 1♀ (CNC). Hanford Site ALE, T11N R25E Sec 20–21, May 4, 1994, R. S. Zack, 1♂ (CNC). Hanford Site ALE, T11N R26E Sec 8, 1200 ft, May 4, 1994, R. Zack, 3♂, 1♀ (OSU). *Chelan Co.:* Blewett Pass, May 24, 1931, F. P. Dean, 1♀ (TAMU). *Clallam Co.:* Forks, July 2, 1920, E. P. Van Duzee, 16♂, 16♀ (CAS). *Grant Co.:* 2 mi W of Moses Lake, May 12, 1973, P. W. Oman, 5♂, 5♀ (OSU). *Klickitat Co.:* 1.4. mi E of Bingen, May 12, 1978, Oman and Lattin, 1♂ (OSU). 13 mi W of Goldendale, May 10, 1973, P. W. Oman, 3♂, 1♀ (OSU). 2 mi NW of Lyle, May 5, 1973, P. W. Oman, 4♂, 5♀ (OSU). 3 mi S of Husum, May 24, 1977, P. W. Oman, 4♂, 4♀ (OSU). 3.7 mi SE of Wahkiakas, May 10, 1973, Musgrave, 5♂, 4♀ (OSU). 5 mi NE of Lyle on Rt 122, May 10, 1973, Musgrave, 2♂, 1♀ (OSU). Maryhill, April 28, 1938, K. Gray, 2♂, 1♀ (OSU). *Okanagan Co.:* 1 mi E of Wahkiakas, May 10, 1973, Musgrave, 1♂, 2♀ (OSU). *Pierce Co.:* North Fort Lewis, July 5, 1944, P. H. Arnaud, Jr., 2♂ (CAS). *Whitman Co.:* Colfax, July 19, 1925, C. L. Fox, 2♂, 1♀ (CAS). Uniontown, 2690 ft, July 14, 1936, B. F. Coon, 1♂ (USNM). *Yakima Co.:* Tampico, June 1, 1932, A. R. Rolfs, 1♀ (TAMU). Tampico, May 10, 1926, 2♂ (USNM). Yakima, June 1, 1931, A. R. Rolfs, 1♂ (OSU). Yakima, June 1, 1931, A. R. Rolfs, 3♂, 7♀ (TAMU).

Plagiognathus longipennis (Uhler)
Figures 9, 17, 26

Oncotylus longipennis Uhler, 1895: 48 (n. sp.).
Plagiognathus longipennis: Carvalho, 1958: 103 (n. comb.).
Plagiognathus flavescens Knight, 1925: 33 (n. sp.) NEW SYNONYMY.

DIAGNOSIS: Recognized by the *very long*,

slender body (fig. 9), the somewhat exerted, *anteriorly projecting head* with the clypeus plainly visible from above (fig. 9, and the *long slender femora*. Vesica (fig. 26) similar in form to *concoloris, flavus, grandis, lonicerae,* and *phaceliae,* being sigmoid with a stout body and relatively short apical spines. Distinguished from all of those species by the more elongate body and the more strongly projecting head.

REDESCRIPTION: *Male:* Very large, elongate; total length 5.60–5.94, length apex clypeus–cuneal fracture 3.62–3.93, width across pronotum 1.21–1.36. COLORATION (fig. 9): General coloration of dorsum ranging from pale orange to grayish green; most of endocorium usually weakly infuscate; mesoscutum often tinged with orange; membrane fumose, veins orangish or greenish; antennae black (fig. 17) except for pale apical annulus of segment 1; labium infuscate at least apically; venter of thorax and abdomen ranging from totally pale to heavily infuscate; coloration of legs as for dorsum, femora with some dark spots and weak infuscation; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, very weakly shining. Vestiture of dorsum, including entire pronotum, composed of suberect, simple setae, most unicolorous with dorsum, some slightly darker. STRUCTURE: Body very elongate, nearly parallel-sided; head exerted, projecting anteriorly, posterior margin of eyes removed from anterior margin of pronotum; frons strongly tumid, clypeus conspicuous from above; anteocular distance 1.6 times diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1; labium not quite reaching apex of hind coxae. GENITALIA (fig. 26): Vesica, including apical spines, sigmoid, body relatively heavy, base falling well below base of secondary gonopore; apical spines relatively short, anterior spine more strongly angled relative to body of vesica, longer than more or less clawlike posterior spine; no flange on vesica (see Discussion below).

Female: Very elongate ovoid, membrane not extending so far beyond apex of cuneus as in male (fig. 9); coloration similar to male. Total length 5.03–5.28, length apex clypeus–cuneal fracture 3.44–3.61, width across pronotum 1.27–1.35.

HOSTS: Apparently breeds on a variety of hosts, including woody perennials as well as herbaceous species; most common among these appears to be *Ribes* (Grossulariaceae). Frequently collected by sweeping in alpine meadows.

DISTRIBUTION: Higher elevations in western North America, ranging from eastern Washington and Idaho in the north, east to Colorado, and south to Arizona and Texas.

DISCUSSION: Uhler (1895) described the taxon *longipennis* from moderately high elevations in northern Colorado. After searching for *longipennis* in the collections of the National Museum of Natural History, Washington, D.C., only three specimens could be found that are labeled in such a way that they might have been examined by Uhler. None, however, possess labels that correspond to what Uhler published in association with his original description. I am therefore designating a male specimen as neotype as a means of fixing the identity of this species. It has the following data and is deposited in the National Museum of Natural History:

> USA: COLORADO: Mesa Co.: Grand Mesa N.F., Island Lake Cmpgrd. on Rt. 65, 10,000 ft., August 15, 1986, R. T. Schuh, *Ribes* sp. (Saxifragaceae).

This species was apparently first placed in *Plagiognathus* by Carvalho (1958) in his world catalog. Knight (1925) described the species *flavescens* from an elevation of 9000 feet on Mt. Lemon in southern Arizona. Dissection of the male genitalia of numerous specimens of ''flavescens'' and ''longipennis'' produced results not seen in other *Plagiognathus* species. It appears that the posterior apical blade of the vesica may change position depending on the treatment of the genitalia, as illustrated in figure 26. The straps of the vesica sometimes become partially dissociated initially, but after standing in glycerine for some time return to a more or less normal position, at which time the relative positions of the anterior and posterior blades may be changed. The genitalic variation shows no apparent geographic pattern, the two ''apparent'' types occurring over the entire range of the species. Further-

more, I have not been able to find other differences that allow for the recognition of more than one taxon. The more southerly populations (Rustler Park, Arizona; Cloudcroft, New Mexico; Mount Lemon, Arizona) are more yellow-orange and have the venter of the thorax and abdomen almost entirely pale in the males, whereas in most Colorado populations the venter in males is nearly black; the venter in the females is ordinarily pale across the entire range of the species. On the basis of these comparisons, which include specimens examined by Uhler and Knight, as well as many others, I have concluded that *flavescens* is the same as *longipennis*, the latter having priority.

SPECIMENS EXAMINED: USA.—**Arizona:** *Apache Co.:* McKays Peak, White Mountains, July 10, 1940, Gertsch and Hook, 2♀ (AMNH). *Cochise Co.:* 24 mi W of Tombstone, April 16, 1965, F. D. Parker, 3♂ (UCD). Chiricahua Mountains, 8000–9500 ft, July 11, 1968, V. D. Roth, 3♂, 2♀ (AMNH). Chiricahua Mountains, July 8, 1932, R. H. Beamer, 1♀ (KU). Chiricahua Mountains, Rustler's Peak, July 4, 1940–July 5, 1940, L. C. Kuitert, 1♂, 2♀ (KU). Chiricahua Mountains, Rustler's Peak, July 5, 1940, D. E. Hardy, 3♂, 2♀ (KU). Chiricahua Mountains, Rustler's Peak, July 5, 1940, L. J. Lipovsky, 1♀ (KU). Chiricahua Mountains, Rustler's Peak, July 5, 1940, R. H. Beamer, 1♀ (KU). Chiricahua Mountains, Trail: Rustler Park to Fly Peak, 8–9000 ft, August 31, 1976, J. D. Pinto, 1♂, 4♀ (UCR). Portal, Chiricahua Mts., July 30, 1967, L. A. Kelton, *Achillea millefolium* (Asteraceae), 1♂, 1♀ (CNC). Rustler Park, Chiricahua Mountains, 2600 m, June 17, 1980, R. T. Schuh, K. and R. Schmidt, *Helenium hoopesii* (Asteraceae), 9♂, 2♀ (AMNH). Rustler Park, Chiricahua Mountains, July 27, 1955, W. J. Gertsch and E. Ordway, 1♂, 1♀ (AMNH). Rustler Park, Chiricahua Mountains, July 7, 1968, L. A. Kelton, *Lupinus* sp. (Fabaceae), 19♂, 26♀ (CNC). *Coconino Co.:* Flagstaff, Mt. Humphreys, August 16, 1967, L. A. Kelton, 7♂, 23♀ (CNC). N. Rim Grand Canyon, Pt. Imperial, August 1, 1967, D. C. Rentz, 2♂, 1♀ (UCB). San Francisco Mts. (50 Strokes), 10,300 ft, August 15, 1925, 3♂ (UCB). San Francisco Mts., Coconino Natl. Forest, 9650 ft, July 14, 1968, L. A. Kelton, 4♂, 1♀ (CNC). San Francisco Mts., June 25, 1950, J. G. Rozen, 1♂ (KU). San Francisco Mts., Spruce Woods (Spruce Cabin), 10,300 ft, August 15, 1925, 1♂ (UCB). *Graham Co.:* Graham Mountains, July 6, 1955, Ordway and Statham, 1♂, 1♀ (AMNH). Pinaleno Mts., Shannon Camp Ground, August 22, 1975–August 17, 1976, J. D. Pinto, 2♂, 3♀ (UCR). *Greenlee Co.:* 0.5 mi NW of Greenlee on Hwy 191, 9160 ft, August 19, 1998, J. C. Schaffner, 6♂, 16♀ (TAMU). Hannagan, Apache Natl. Forest, July 10, 1968, L. A. Kelton, 2♂ (CNC). *Pima Co.:* Mt. Lemon, 0.4 mi N of Ski Valley, 8340 ft, August 16, 1998, J. C. Schaffner, 2♀ (TAMU). Mt. Lemon, Santa Catalina Mts., 7000 ft, July 26, 1924, E. P. Van Duzee, 1♂, 11♀ (CAS). Mt. Lemon, Santa Catalina Mts., 9000 ft, July 27, 1917, H. H. Knight, paratypes (*flavescens*): 3♂, 3♀ (CAS, USNM); holotype male (*flavescens*) (USNM). Mt. Lemon, Santa Catalina Mts., 9000 ft, July 27, 1917, H. H. Knight, 1♂ (USNM). Mt. Lemon, Santa Catalina Mts., August 3, 1967, L. A. Kelton, *Rubus* sp. (Rosaceae), 1♂, 1♀ (CNC). Santa Catalina Mountains, July 16, 1950, L. D. Beamer, 1♂, 1♀ (KU). *Santa Cruz Co.:* Madera Canyon, Santa Rita Mountains, August 16, 1940, Gertsch and Hook, 1♂ (AMNH). *Yavapai Co.:* 2 mi NE of Sheeps Crossing, White Mountains, Greer Rec. Area, June 26, 1980, J. D. Pinto, 3♂, 1♀ (UCR). **California:** *Riverside Co.:* 6 mi S of Valle Vista, T6S R1E Sec. 9, 2300–2400 ft, June 24, 1977, J. D. Pinto and S. Frommer, *Lonicera* sp. (Caprifoliaceae), 2♀ (UCR). Coyote Wash, P.L. Boyd, DRC, April 5, 1978, R. W. Brooks, *Phacelia distans* (Hydrophyllaceae), 3♂, 2♀ (UCD). Deep Canyon, Coyote Creek, April 5, 1975, R. E. Carlstrom, 1♂ (UCR). **Colorado:** *Archuleta Co.:* 16 mi N of Pagosa Springs, June 24, 1964, H. R. Burke, 3♂, 4♀ (TAMU). Pagosa Springs, July 22, 1968, L. A. Kelton, 1♂, 2♀ (CNC). Rt 160, 5 mi N of Pagosa Springs, June 27, 1980, K. and R. Schmidt, *Thalictrum* sp. (Ranunculaceae), 2♀ (AMNH). Rt 160, 5 mi N of Pagosa Springs, June 27, 1980, K. and R. Schmidt, *Thalictrum* sp. (Ranunculaceae), 7♂, 24♀ (AMNH). *Boulder Co.:* Eldorado, Snow Line Camp, June 30, 1948, W. F. Chamberlain, 1♂ (TAMU). Nederland, Science Lodge, 9500

ft, August 6, 1961, J. R. Stainer, 2♂, 3♀ (CNC). Rainbow Lakes, Roosevelt Natl. Forest, 9800 ft, August 3, 1968, L. A. Kelton, 1♀ (CNC). Ward, Roosevelt Natl. Forest, July 30, 1968, L. A. Kelton, 1♂ (CNC). *Clear Creek Co.:* Georgetown, July 11, 1973, J. R. Vockeroth, *Pedicularis greyi* (Scrophulariaceae), 14♂, 8♀ (CNC). Green Lake, Guanella Pass, 9900 ft, September 6, 1982, D. A. and J. T. Polhemus, 4♀ (JTP). Mt. Evans, 12,000 ft, August 3, 1961, W. R. M. Mason, 5♂, 3♀ (CNC). Mt. Evans, Doolittle Ranch, 9800 ft, July 21, 1961–August 10, 1961, B. H. Poole, J. R. Stainer, 16♂, 15♀ (CNC). West Chicago Creek, Arapaho Natl. Forest, 9800 ft, July 28, 1968, L. A. Kelton, 21♂, 33♀ (CNC). *Conejos Co.:* 3 mi N of Cumbres, Trujillo Mdw. Camp, 10,000 ft, August 5, 1961, F., P. and J. Rindge, 1♀ (AMNH). Elk Creek Recreation Area, August 22, 1969, J.C. Schaffner, 1♂, 2♀ (TAMU). *Dolores Co.:* 27 mi NE of Dolores (Montezuma Co.) near Fish Creek (2.7 mi up from main road), July 24, 1976, N. L. Herman, 1♀ (AMNH). Cottonwood Spring (21 mi NE of Dolores, Montezuma Co.), 7800 ft, July 23, 1976, N. L. Herman, 1♂ (AMNH). West Dolores River (19 mi NE of Delores, Montezuma Co.), 7600 ft, July 22, 1976, N. L. Herman, 1♂ (AMNH). *Eagle Co.:* Shrine Pass Road., nr Vail, August 12, 1987, D. A. Rider, 1♂, 1♀ (DAR). Vail, 4 mi S of Piney Lake, August 2, 1982, C. N. McKinnon, 1♀ (JTP). *Gilpin Co.:* 1 mi E of Rollins Pass, 10,000 ft, August 16, 1969, J. C. Schaffner, 14♂, 21♀ (TAMU). *Grand Co.:* Grand Lake, August 6, 1947, L. D. Beamer, 2♂ (KU). Winter Park, August 21, 1986, H. R. Burke, 5♀ (TAMU). *Gunnison Co.:* Gothic, August 2, 1962, J. Shepard, 2♀ (OSU). Gothic, July 19, 1963, O. R. Taylor, 3♀ (AMNH). McClure Pass, August 8, 1975, J. C. Schaffner, 26♂, 46♀ (TAMU). *Hinsdale Co.:* Engineer Pass, SW of Lake City, 11,000 ft, August 30, 1980, D. A. and J. T. Polhemus, 1♂ (JTP). *Jackson Co.:* 1 mi E of Gould, August 11, 1969–August 14, 1969, J. C. Schaffner, 4♂, 2♀ (TAMU). 2 mi E of Gould, August 5, 1975, J. C. Schaffner, *Vicia americana* (Fabaceae), 16♂, 20♀ (TAMU). Gould, 9200 ft, August 12, 1968, L. A. Kelton, 2♀ (CNC). Muddy Pass, 8800 ft, August 15, 1961, J. E. R. Stainer, 3♀ (CNC). Muddy Pass, July 5, 1972, D. Anderson, 1♂, 1♀ (USU). Muddy Pass, Routt Natl. Forest, 8600 ft, August 21, 1968, L. A. Kelton, 2♀ (CNC). Rabbit Ears Pass, August 11, 1965, G. F. Knowlton, 1♂ (USU). Rabbit Ears Pass, July 7, 1961, J. G. Chillcott, 9♂, 5♀ (CNC). *Jefferson Co.:* Upper Beaver Br. Gulch, August 12, 1981, D. A. Polhemus, 1♀ (JTP). *La Plata Co.:* La Plata, San Francisco Natl. Forest, 8500 ft, July 19, 1968, L. A. Kelton, *Ribes* sp. (Grossulariaceae), 7♂, 11♀ (CNC). *Larimer Co.:* 40 mi W of Fort Collins, Bennett Creek Picnic Ground, Pingree Park Rd., 7400 ft, July 14, 1986, R. T. Schuh and J. T. Polhemus, 7♂, 3♀ (AMNH). 46 mi W of Fort Collins, Fish Creek Picnic Ground, Pingree Park Rd., 7700 ft, July 14, 1986, R. T. Schuh and J. T. Polhemus, 7♂, 8♀ (AMNH). Chambers Lake, August 16, 1966, Knowlton, 1♂ (USU). Glen Haven, August 3, 1947, P. B. and E. R. Lawson, 2♂ (KU). Glen Haven, July 28, 1946, P. B. Lawson, 1♀ (KU). Pingree Park, August 16, 1930, T. A. Brindley, 1♂, 8♀ (TAMU). Pingree Park, August 19, 1924, 1♂ (KU). Rocky Mountain National Park, Fall River Road, 9500 ft, August 16, 1968, L. A. Kelton, 7♂, 10♀ (CNC). Rocky Mountain National Park, Grand Lake Entrance, August 18, 1968, L. A. Kelton, 3♂, 2♀ (CNC). *Las Animas Co.:* Cuchara Pass Summit on Rt 12, 9990 ft, August 19, 1986, R. T. Schuh and J. T. Polhemus, 1♂, 1♀ (AMNH). Monument Park, 8650 ft, August 28, 1982, D. A. and J. T. Polhemus, 1♂ (JTP). *Mesa Co.:* Grand Mesa National Forest, Island Lake Campground on Rt 65, 10,000 ft, August 15, 1986, R. T. Schuh, *Ribes* sp. (Grossulariaceae), 24♂, 34♀ (AMNH). *Mesa Mesa Co.:* Jumbo, Grand Mesa Natl. Forest, August 25, 1968, L. A. Kelton, 5♂, 6♀ (CNC). *Mineral Co.:* 5 mi N of Wolf Creek Pass, August 20, 1969, J. C. Schaffner, 1♀ (TAMU). *Montrose Co.:* 18 mi SE of Naturita, July 8, 1980, J. T. and D. A. Polhemus, 1♂ (JTP). *Ouray Co.:* 6 mi S of Ouray, August 15, 1973, J. C. Schaffner, 10♂, 8♀ (TAMU). Ouray, 8500 ft, July 11, 1919, 3♀ (AMNH). Red Mountain Pass, 11,000 ft, August 9, 1979, J. D. Pinto, 7♂, 6♀ (UCR). Ridgway, 7000 ft, July 10, 1919, 1♀ (AMNH). Summit Road, Ouray, 10,000 ft, July 13, 1919, 4♀ (AMNH). *Pitkin Co.:* Aspen, 8000 ft, July 24, 1919, 1♀ (AMNH).

Rio Blanco Co.: South Fork Campground, 12 mi S of Buford, August 6, 1978, J. T. Polhemus, 1♀ (JTP). *Routt Co.:* Walton Creek, Routt Natl. Forest, August 23, 1968, L. A. Kelton, *Delphinium* sp. (Ranunculaceae), 2♂, 2♀ (CNC). *San Juan Co.:* Molas Lake Pass, San Juan Natl. Forest, August 26, 1972, L. A. Kelton, 2♀ (CNC). San Juan National Forest, 1.8 mi N of Coal Bank Hill Summit On Rt 550, 10,500 ft, August 15, 1986, R. T. Schuh, 4♂, 6♀ (AMNH). *Summit Co.:* Frisco, August 14, 1981, D. A. Polhemus, 1♂, 1♀ (JTP). Loveland Pass, W slope, 9850 ft, August 3, 1961, Chillcott and Mann, 19♂, 18♀ (CNC). *Unknown Co.:* Rico, August 2, 1900, 1♀ (USNM). **Idaho:** *Franklin Co.:* Beaver Creek, July 14, 1977, G. F. Knowlton, 1♂, 1♀ (USU). **Nevada:** *White Pine Co.:* Connors Pass, July 30, 1975, W. F. Chamberlain, 1♂ (TAMU). **New Mexico:** *Catron Co.:* 18 mi E of Alma, Bursum Camp, 9000 ft, July 8, 1961–July 14, 1961, F., P. and J. Rindge, 5♂, 8♀ (AMNH). *Colfax Co.:* 5 mi W of Ute Park, Cimarron Canyon, June 25, 1964, H. R. Burke, 1♂, 2♀ (TAMU). Palo Flechado Pass, 9107 ft, July 22, 1968–July 24, 1968, J. C. Schaffner, 2♂, 1♀ (TAMU). *Dona Ana Co.:* Las Cruces, July 1, 1932, R. H. Beamer, 4♂, 2♀ (KU). *Lincoln Co.:* Sierra Blanca, Ski Apache, 9600 ft, June 30, 1998, E. Riley, 1♂, 2♀ (TAMU). *Otero Co.:* 2 mi E of Cloudcroft, July 17, 1979, Delorme, Mc Hugh, Schaffner, 3♂, 11♀ (TAMU). 3 mi E of Cloudcroft, July 19, 1976, J. D. Pinto, *Geranium* sp. (Geraniaceae), 3♂, 7♀ (UCR). 4 mi E of Cloudcroft, July 17, 1979–August 18, 1979, Delorme, McHugh, Schaffner, 13♂, 20♀ (TAMU). 4 mi E of Cloudcroft, September 26, 1979, Murray, Schaffner, 1♀ (TAMU). Cloudcroft, 9100 ft, July 5, 1968, L. A. Kelton, *Acacia* sp. (Fabaceae), 13♂, 18♀ (CNC). Cloudcroft, June 16, 1902, E. P. Van Duzee, 1♂ (CAS). Cloudcroft, June 27, 1940, D. E. Hardy, 14♂, 6♀ (KU). Cloudcroft, June 27, 1940, E. E. Kenaga, 6♂, 4♀ (KU). Cloudcroft, June 27, 1940, L. C. Kuitert, 2♂, 3♀ (KU). Cloudcroft, June 27, 1940, R. H. Beamer, 9♂, 3♀ (KU). Cloudcroft, June 28, 1922, R. H. Beamer, 1♀ (KU). *San Miguel Co.:* Beulah, June 29, 1902, E. P. Van Duzee, 1♂ (CAS). *Santa Fe Co.:* 8 mi NE of Santa Fe, Hyde State Park, 8700 ft, July 31, 1964, F., P., and M. Rindge, 2♂ (AMNH). *Socorro Co.:* 28 mi SW of Magdalena, Bear Trap Camp, 8500 ft, July 4, 1965–July 10, 1965, F., P. and M. Rindge, 1♂, 1♀ (AMNH). *Taos Co.:* Columbine Park Recreation Area, July 24, 1968, J. C. Schaffner, 1♂, 6♀ (TAMU). Tres Ritos, July 25, 1968, J. C. Schaffner, 9♂, 27♀ (TAMU). *Unknown Co.:* Highrolls, June 30, 1902, E. P. Van Duzee, 1♂ (CAS). **Oregon:** *Union Co.:* 4.5 mi E of Tollgate Woodland Campground, 5000 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, *Alnus rhombifolia* (Betulaceae), 2♂ (AMNH). **Texas:** *Dallam Co.:* Dalhart, July 15, 1965, H. R. Burke, 3♂, 8♀ (TAMU). **Utah:** *Grand Co.:* Warner Ranger Station, 28 mi ESE of Moab, 9200 ft, July 30, 1960–August 2, 1960, F., P. and B. Rindge, 2♂ (AMNH). *Kane Co.:* Duck Creek, July 15, 1965, G. F. Knowlton, 1♀ (USU). *Rich Co.:* Monte Cristo, 9000 ft, July 14, 1977, G. F. Knowlton, 1♂ (USU). No specific locality, July 30, 1964, G. F. Knowlton, 1♂ (USU). *San Juan Co.:* 5 mi W of Monticello, Dalton Springs Camp, 8500 ft, July 12, 1963, F., P. and M. Rindge, 2♀ (AMNH). *Sanpete Co.:* Ephraim Canyon, 9000–9500 ft, August 13, 1975, G. F. Knowlton, 2♂, 1♀ (USU). *Summit Co.:* 17 mi E of Kamas, August 5, 1971, W. J. Hanson and G. F. Knowlton, 1♂, 2♀ (USU). *Utah Co.:* Alpine Loop, July 25, 1973, W. J. Hanson, 2♀ (USU). American Fork Canyon, August 6, 1969, G. F. Knowlton, 1♂, 1♀ (USU). American Fork Canyon, July 31, 1954, G. L. Nielsen, 2♀ (USU). *Wasatch Co.:* 30 mi SE of Kamas on Rt 34, Uintah Natl. Forest, Wolf Creek Campground, T4S R10W Sec 7, 9000 ft, August 15, 1986, Schwartz and Stonedahl, 4♂, 15♀ (AMNH). **Washington:** *Pierce Co.:* Du Pont, July 5, 1935, R. H. Beamer, 1♂ (KU).

Plagiognathus longirostris (Knight), new combination
Figures 9, 17, 26

Microphylellus longirostris Knight, 1923: 458 (n. sp.).

DIAGNOSIS: Recognized by the castaneous to nearly *black, elongate body* (fig. 9), entirely pale white legs (fig. 9), pale antennae with segment 1 dark only at extreme base

(fig. 17), and *rostrum reaching well onto the abdomen.* Most similar in general appearance and coloration to *flavipes* (fig. 7) and *modestus* (fig. 10), but antennal segment 2 pale rather than dark as in *flavipes*; differing from *modestus* by the more strongly projecting head and longer rostrum reaching well onto the abdomen.

REDESCRIPTION: *Male:* Elongate, relatively slender, of moderate size; total length 3.46–3.90, length apex clypeus–cuneal fracture 2.52–2.73, width across pronotum 1.03–1.12. COLORATION (fig. 9): General coloration of dorsum castaneous; head often more deeply castaneous at and below level of antennal insertion than remainder of body, and more highly polished; membrane and veins strongly fumose; antennal segments 1–4 pale, except extreme base of segment 1 castaneous (fig. 17); labium pale, except basal two-thirds of segment 1 and apex castaneous; venter entirely castaneous; legs, including coxae and trochanters, pale; tibial spines without dark spots at bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of weakly reclining, relatively long, dark, simple setae. STRUCTURE: Nearly parallel-sided, corial margin only weakly convex; body form more or less tubular; head not projecting anteriorly, clypeus not visible from above; anteocular distance about 1.5 times diameter of antennal segment 1; head projecting below eye by 2 times diameter of antennal segment 1; labium slightly to distinctly surpassing apices of hind coxae. GENITALIA (fig. 26): Body of vesica distinctly J-shaped, relatively slender, apical spines at nearly right angle to body of vesica, anterior spine nearly straight and conspicuously longer than posterior; flange very narrow and terminating well below secondary gonopore.

Female: Similar in coloration and general structure to male; body somewhat broader. Total length 3.39–3.71, length apex clypeus–cuneal fracture 2.44–2.72, width across pronotum 1.00–1.12.

HOSTS: Most commonly found breeding on *Corylus* spp. (Betulaceae); also known to breed on *Hamamelis virginiana* (Hamamelidaceae).

DISTRIBUTION: Northeastern North America, known as far west as Manitoba and Iowa and as far south as Kansas and Illinois.

DISCUSSION: The species was placed in *Microphylellus* by Knight (1923) on the basis of coloration of the legs, which have tibial spines with pale bases. The male genitalia are, however, of the typical *Plagiognathus* type.

SPECIMENS EXAMINED: CANADA.—**Manitoba:** 8 km N of Spirit Sands, Spruce Wood Prov. Park (16 km S of Carberry), July 8, 1990, M. D. Schwartz, *Hamamelis virginiana* (Hamamelidaceae), 25♂, 31♀ (CNC). Carberry, July 29, 1953, Brooks and Kelton, 2♀ (CNC). Oak Lake, July 9, 1953, Brooks and Kelton, 1♂, 1♀ (CNC). Pilot Mound, July 31, 1958, A. and J. Brooks, 1♀ (CNC). **Ontario:** Hamilton, July 6, 1955, L. A. Kelton, 1♂ (CNC). Tillsonburg, July 11, 1958, L. A. Kelton, *Corylus* sp. (Betulaceae), 18♂, 8♀ (CNC). Tillsonburg, July 14, 1955, L. A. Kelton, *Corylus* sp. (Betulaceae), 3♀ (CNC). Tillsonburg, July 18, 1962, Kelton and Thorpe, *Corylus* sp. (Betulaceae), 7♂, 23♀ (CNC). Tillsonburg, October 19, 1962, Kelton and Thorpe, 3♀ (CNC). USA.—**Connecticut:** Storrs, July 16, 1954–July 31, 1954, J. A. Slater, 1♂, 1♀ (AMNH). Storrs, July 16, 1954, J. A. Slater, 3♂ (AMNH). **Illinois:** *Calhoun Co.:* Hardin, June 5, 1932, H. L. Dozier, 2♂ (AMNH). *Clark Co.:* Dolson, Rocky Branch, June 25, 1932, Frison and Mohr, 1♂ (AMNH). **Iowa:** *Clayton Co.:* Strawberry Point, July 27, 1927, Harris and Johnston, 2♂ (CNC). *Story Co.:* Ames, July 15, 1932, F. Andre, 1♀ (UCB). **Kansas:** *Douglas Co.:* No specific locality, May 30, 1949, R. H. Beamer, *Corylus americana* (Betulaceae), 2♂ (KU). **Massachusetts:** *Middlesex Co.:* Holliston, July 3, 1900–July 13, 1900, N. Banks, 16♂, 20♀ (AMNH). Woburn, July 11, 1907, 1♀ (CAS). **Minnesota:** *Hennepin Co.:* Fort Snelling, July 10, 1924, H. H. Knight, 1♂ (CAS). *Ramsey Co.:* St. Anthony Park, June 23, 1921, H. H. Knight, 1♂ (USNM). *Winona Co.:* Kings Bluff, June 30, 1922, H. H. Knight, 1♀ (CAS). Kings Bluff, June 30, 1922, H. H. Knight, paratype: 1♂ (CNC). No specific locality, July 1, 1922, H. H. Knight, paratype: 1♂ (USNM). **New Jersey:** *Bergen Co.:* Ramsey, July 26, 1917, 1♂ (AMNH). **New York:** *Cattaraugus Co.:* Gowanda, August 2, 1907, E. P. Van Duzee,

1♀ (CAS). *Rockland Co.:* Tuxedo, July 8, 1928, C. H. Curran, 1♂ (AMNH). *Tompkins Co.:* Ithaca, July 2, 1920, H. H. Knight, paratype: 1♂ (USNM); holotype male (USNM). *Westchester Co.:* White Plains, July 24, 1915, 1♀ (CNC). **Pennsylvania:** *Dauphin Co.:* Middle Paxton Township, Rt 443, Fishing Creek Valley School, July 13, 1980, A. G. Wheeler, Jr., *Corylus americana* (Betulaceae), 1♂ (PDA). *Luzerne Co.:* Rice Township, Andy Pond, July 14, 1979, A. G. Wheeler, Jr., *Corylus americana* (Betulaceae), 1♀ (PDA). **Wisconsin:** *Bayfield Co.:* 5.5 mi W of Ino, August 16, 1973, G. F. Hevel, 2♀ (USNM). *Polk Co.:* No specific locality, July 1, 1900, Baker, 1♂ (CAS).

Plagiognathus lonicerae, new species
Figures 9, 17, 27

HOLOTYPE: Male: ''USA: Calif[ornia].: Santa Barbara Co.: Upper Oso Cmpgrd off Rt 154, 310 m, May 7, 1985, RT Schuh & BM Massie, *Lonicera johnstonii* Keck. (Caprifoliaceae)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by *large size,* generally *pale orange* to red-orange coloration, including all legs (fig. 9), and antennal segment 1 usually pale at base and *antennal segment 2 conspicuously dark only at base* (fig. 17). Similar in size and coloration of dorsum to *flavus* (fig. 8) and *concoloris* (fig. 7), but the former with only pale setae on pronotum and the latter with antennae and tibiae heavily infuscate to nearly black and strongly contrasting with dorsum. Structure of genitalia (fig. 27) similar to *concoloris, flavus, grandis, longipennis,* and *phaceliae,* with a heavy, sigmoid vesica with relatively short apical spines.

DESCRIPTION: *Male:* Large, elongate, nearly parallel-sided; total length 4.10–5.00, length apex clypeus–cuneal fracture 2.76–3.34, width across pronotum 1.17–1.39. COLORATION (fig. 9): General coloration, including most of venter and appendages, orange to pale-orange; membrane moderately fumose with a lighter circular area posterior to cuneus and cells, veins pale orange; antennal segment 1 pale basally and dark on apical one-third with a pale apical annulus, segment 2 always dark at base and sometimes infuscate distally (fig. 17), segments 3 and 4 infuscate; apex of labium infuscate; femora with some dark spots; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, simple setae unicolorous with dorsum with darker suberect setae on pronotum and anterolaterally on hemelytra. STRUCTURE: Body elongate, flattened, moderately broad; frons weakly tumid, clypeus barely visible from above; anteocular distance 0.3 times diameter of antennal segment 1; head projecting below eye by 0.3 times diameter of antennal segment 1; labium relatively short, not quite reaching apex of middle coxae. GENITALIA (fig. 27): Vesica, including apical spines, sigmoid, body relatively heavy, base falling well below base of secondary gonopore; apical spines relatively short, angled relative to body of vesica, anterior spine nearly straight, cylindrical, and much longer than posterior; flange narrow.

Female: Smaller and more strongly ovoid than male; coloration often lighter than in male. Total length 3.94–4.42, length apex clypeus–cuneal fracture 2.72–3.03, width across pronotum 1.22–1.38.

ETYMOLOGY: Named for its occurrence on *Lonicera* spp.

HOSTS: *Lonicera johnstonii, L. subspicata* (Caprifoliaceae).

DISTRIBUTION: Coastal counties of California.

PARATYPES: USA.—**California:** *Humboldt Co.:* Blocksburg, June 24, 1951–July 20, 1952, B. P. Bliven, 6♂, 6♀ (CAS). Dyerville, August 19, 1962, B. P. Bliven, 1♂ (CAS). Willow Creek, May 28, 1938, B. P. Bliven, 1♂ (UCB). *Los Angeles Co.:* No specific locality, 1♂ (CAS). Tanbark Flat, June 30, 1950, A. T. Clay, 1♀ (UCB). *Mendocino Co.:* 4 mi W of Eel River Ranger Station, Mendocino National Forest, 1450 ft, June 9, 1972, 9♂, 3♀ (UCB). Piercy on Hwy 101, July 11, 1948, B. P. Bliven, 1♀ (CAS). *Monterey Co.:* Bryson, May 18, 1920, E. P. Van Duzee, 2♂ (CAS). *Orange Co.:* Cleveland Natl. Forest, Lower San Juan Campground on Hwy 74, 405 m, May 12, 1978, J. D. Pinto and R. T. Schuh, *Lonicera subapicata* (Ca-

prifoliaceae), 21♂, 20♀ (AMNH, USNM). *Riverside Co.:* 5.5 mi W of Radec, June 18, 1980, J. D. Pinto, 6♂, 6♀ (UCR). 6 mi S of Valle Vista, T6S R1E Sec. 9, 2300–2400 ft, June 24, 1977, J. D. Pinto and S. Frommer, *Lonicera* sp. (Caprifoliaceae), 5♀ (UCR). *San Diego Co.:* No specific locality, May 13, 1914, E. P. Van Duzee, 1♂ (CAS). *Santa Barbara Co.:* Upper Oso Campground off Rt 154, 310 m, May 7, 1985, R. T. Schuh and B. M. Massie, *Lonicera johnstonii* (Caprifoliaceae), 39♂, 27♀ (AMNH, USNM). *Santa Clara Co.:* Santa Cruz Mts., 1♀ (CAS). *Ventura Co.:* Tule Creek, July 14, 1965–July 27, 1965, P. M. Jump, 1♂, 3♀ (LACM). *Yolo Co.:* Rumsey, May 24, 1962, B. P. Bliven, 8♀ (CAS).

Plagiognathus louisianus, new species
Figures 9, 17, 27

HOLOTYPE: Male: ''[USA] LA [Louisiana]: E. Baton Rouge Par., Baton Rouge, 13-V-1986, Coll. E. G. Riley''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the *moderately large size,* pale antennal segments 2, 3, and 4, only antennal segment 2 being dark at base, the *dense covering of pale, shining, recumbent setae on the dorsum,* the generally pale coxae, trochanters and femora, and the *dorsum with extensive pale areas,* the *scutellum usually pale laterally with a dark median, longitudinal stripe* or, less commonly, entirely dark or pale (fig. 9). Most similar in size and coloration to *albatus* (fig. 5) and *punctatipes* (fig. 12), but easily separated from *punctatipes* by the entirely castaneous dorsum and the tibiae being pale at the articulation with the femora in that species, and from *albatus* by the structure of the male genitalia and the somewhat more robust body form in *louisianus.*

DESCRIPTION: *Male:* Moderately large, robust; total length 3.77–4.13, length apex clypeus–cuneal fracture 2.76–3.02, width across pronotum 1.25–1.31. COLORATION (fig. 9): Dorsum varying from pale or weakly golden to brown; anterior lobe of pronotum, at least midline of scutellum, and posterior one-half of corium mostly brown, remainder of dorsum, including costal margin of wing, mostly pale to golden; vertex pale, frons partially pale, face polished and deeply castaneous at and below level of antennal insertion; antennal segment 1 castaneous except for conspicuous pale apical annulus, segment 2 dark at extreme base, remainder of segment pale (fig. 17), segments 3 and 4 pale; labium pale except basal two-thirds of segment 1 and apex; venter castaneous, including metathoracic scent-gland evaporatory area; legs, including coxae, pale, femora with faint darker spots; dorsal tibial spines with small dark spots at bases; tibiae weakly dark at point of articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of rather densely placed, recumbent, faintly golden, shining, simple setae. STRUCTURE: Body relatively broad, hemelytra nearly parallel-sided; frons nearly straight across as viewed from above, clypeus at most barely visible from above; anteocular distance less than 0.5 times diameter of antennal segment 1; head barely projecting below level of eye; labium reaching to about apex of hind coxae. GENITALIA (fig. 27): Body of vesica more or less U-shaped, base of vesica reaching to near level of secondary gonopore; posterior apical spine nearly straight, weakly angled relative to body of vesica, anterior spine only moderately elongate, weakly angled relative to body of vesica, and sharply bend subapically; flange narrow, not surpassing body of vesica, and just surpassing base of gonopore.

Female: Very similar to male in coloration but more strongly ovoid. Total length 3.93–4.24, length apex clypeus–cuneal fracture 2.80–2.96, width across pronotum 1.28–1.32.

HOST: Unknown.

DISTRIBUTION: Louisiana.

ETYMOLOGY: Named for its occurrence in Louisiana.

PARATYPES: USA.—**Louisiana:** *East Baton Rouge Parish:* Baton Rouge, April 26, 1986—May 13, 1986, E. G. Riley, 1♂, 2♀ (DAR). Baton Rouge, LSU campus, May 9, 1986—May 31, 1985, D. A. Rider, 4♂, 3♀ (AMNH, DAR). *St. Landry Parish:* Thistlewaite WMA, June 27, 1986, E. G. Riley and D. A. Rider, 5♂, 12♀ (AMNH, DAR, USNM, LSU).

Plagiognathus luteus Knight
Figures 9, 17, 26

Plagiognathus luteus Knight, 1929b: 72 (n. sp.).

DIAGNOSIS: Recognized by *moderate size,* intense, uniform, *orange coloration* (fig. 9), and *antennal segment 1 black* (fig. 17). Size and coloration of body similar to *vitellinus* (fig. 14), but easily separated by black antennal segment 1.

REDESCRIPTION: *Male:* Elongate, of medium size; total length 3.43–3.68, length apex clypeus–cuneal fracture 2.37–2.52, width across pronotum 0.97–1.10. COLORATION (fig. 9): General coloration intensely and uniformly orange; membrane pale, whitish, with orange veins; antennal segment 1 black, except for pale apical annulus, segment 2 dark at base and infuscate near apex (fig. 17), segments 3 and 4 infuscate; labium infuscate at apex; hind femora usually with a black stripe near apex on dorsal surface; dorsal tibial spines with dark spots at bases; tibiae black at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, dull. Vestiture of dorsum composed of recumbent pale, golden, shining, simple setae. STRUCTURE: Corial margins nearly straight; frons weakly swollen, clypeus visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to about apex of hind coxae or slightly beyond. GENITALIA (fig. 26): Vesica, including apical spines, sigmoid, relatively slender and of more or less uniform thickness over length of body, base of vesica falling below base of secondary gonopore; apical spines only moderately elongate, relatively slender, superposed, smoothly curving, anterior spine slightly shorter than posterior; flange narrow.

Female: Body form more compact and strongly ovoid than in male; coloration similar to male although often not so intensely orange. Total length 3.28–3.50, length apex clypeus–cuneal fracture 2.29–2.42, width across pronotum 1.00–1.13.

HOSTS: *Berberis fremontii, B. haematocarpa* (Berberidaceae).

DISTRIBUTION: Interior southern California and Arizona.

SPECIMENS EXAMINED: USA.—**Arizona:** *Coconino Co.:* Williams, June 12, 1925, A. A. Nichol, *Berberis fremontii* (Berberidaceae), paratypes: 3♂, 3♀ (USNM); holotype male (USNM). *Gila Co.:* 12 mi W of Payson, 3200 ft, May 1, 1981, D. A. and J. T. Polhemus, 1♀ (AMNH). 15 mi W of Payson along Verde River, 3000 ft, April 30, 1981, D. A. and J. T. Polhemus, *Berberis haematocarpa* (Berberidaceae), 1♂, 1♀ (AMNH). 17 mi N of Globe, Jones Water Campground, 4300 ft, May 30, 1983, R. T. Schuh and G. M. Stonedahl, *Berberis fremontii* (Berberidaceae), 14♀ (AMNH). 6 mi S of jct of Rts 87 and 188 (Rt 87 at Forest Service Road 171), 3300 ft, May 29, 1983, R. T. Schuh and G. M. Stonedahl, *Berberis fremontii* (Berberidaceae), 1♂, 3♀ (AMNH). East Verde River at Mazatzal Wild, April 30, 1981, D. A. and J. T. Polhemus, 3♂, 2♀ (PDA). Mazatzal Wild along E. Verde River, April 30, 1981, D. A. and J. T. Polhemus, *Berberis haematocarpa* (Berberidaceae), 1♂, 1♀ (AMNH). Mazatzal Wild along E. Verde River, April 30, 1981, D. A. and J. T. Polhemus, *Berberis haematocarpa* (Berberidaceae), 3♂, 3♀ (TAMU). *Navajo Co.:* 15–20 mi SW of Show Low, 5200–6000 ft, May 30, 1983, Schuh, Stonedahl, Massie, *Berberis fremontii* (Berberidaceae), 5♀ (AMNH). *Yavapai Co.:* 22.7 mi S of Ash Fork on Rt 89, June 4, 1983, G. M. Stonedahl, *Berberis fremontii* (Berberidaceae), 25♂, 14♀ (AMNH). Ash Fork, June 20, 1991, W. F. Chamberlain, 5♂ (TAMU). **California:** *Kern Co.:* Mojave, June 7, 1930, R. L. Usinger, 1♂ (UCB).

Plagiognathus maculipennis (Knight), new combination
Figures 9, 17, 27

Microphylellus maculipennis Knight, 1923: 456 (n. sp.).
Microphylellus maculipennis var. *fuscicornis* Knight, 1923: 457 (n. var.). REVISED SYNONYMY.
Microphylellus fuscicornis Kelton, 1980: 311 (n. status).

DIAGNOSIS: Recognized by the *pale antennal segments 1 and 2* (fig. 17), generally *pale costal vein on hemelytra, and cuneus and basal portion of corium pale* or mostly pale in contrast to much darker remainder of hem-

elytra, the *scutellum with a dark, median, longitudinal stripe and pale laterally* (fig. 9), the *tibial spines without dark spots at bases, and the tibiae being pale at the articulation with the femora.* Distinguished from *albatus* (fig. 5: *albatus* 1) with a dark median stripe on the scutellum by the pale antennal segment 1, the tibial spines without black spots at bases, and the tibiae pale at articulation with femora. Distinguished from *tinctus* (fig. 13) and *viticola* (fig. 14) by the scutellum being unicolorous in those species.

REDESCRIPTION: *Male:* Moderately small, moderately broad-bodied; total length 3.10–3.56, length apex clypeus–cuneal fracture 2.31–2.49, width across pronotum 1.08–1.16. COLORATION (fig. 9): Background coloration of dorsum brown to castaneous; posterior margin of vertex, pronotal disc, scutellum laterally, anterior half of corium (and adjacent clavus narrowly), costal vein, and usually most of cuneus pale; membrane mostly fumose, veins pale; antennae pale except for tapered basal portion of segment 1 (fig. 17); labium mostly pale except at base and apex; venter, including metathoracic scent-gland evaporatory area, entirely castaneous; legs entirely pale, yellowish, except for darker basal portion of hind coxae; tibial spines without dark spots at bases; tibiae pale at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, pale, shining, relatively short, simple setae; face at and below level of antennal insertion more highly polished and shining than above. STRUCTURE: Body relatively broad, hemelytra nearly parallel-sided; frons weakly convex, slightly projecting beyond anterior margin of eyes, clypeus not visible from above; anteocular distance less than 0.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 27): Body of vesica relatively stout, more or less J-shaped, base of vesica falling somewhat below level of secondary gonopore, posterior apical spine straight, erect relative to body of vesica, anterior spine only slightly longer than posterior, distinctly angled near apex, superposed over posterior spine and only weakly angled relative to body of vesica; flange on vesica moderately broad and slightly surpassing base of secondary gonopore.

Female: Very similar to male in coloration but body more strongly ovoid in outline. Total length 2.76–3.40, length apex clypeus–cuneal fracture 2.01–2.42, width across pronotum 0.95–1.14.

HOSTS: Confirmed breeding records include *Quercus* spp. (Fagaceae) and *Fraxinus* sp. (Oleaceae).

DISTRIBUTION: Known from Prince Edward Island west to Manitoba in the north, and south into Louisiana, Texas, and Coahuila, Mexico

DISCUSSION: This species was placed in *Microphylellus* on the basis of tibial coloration. The male genitalia, however, are of the typical *Plagiognathus* type, and are very similar to those of *albatus*, as is the coloration of the body. Kelton (1980: 311) elevated *fuscicornis* to species status without pointing out that he was doing so, noting that *fuscicornis* was slightly larger than *maculipennis*, had a longer labium, and had spots on the hind femur. My examination of most of the material used by Kelton, including examination of the male genitalia, indicates no consistent differences between these two nominal species under his conception, and I am therefore treating them as the same. The head of the holotype of *fuscicornis* is missing, making it impossible to verify the coloration of the antennae; the coloration of the legs, however, is typical of *maculipennis*, with no dark spots at the bases of the tibiae.

SPECIMENS EXAMINED: CANADA.—**Manitoba:** 31 km N of Tolstoi, July 7, 1990, M. D. Schwartz, *Quercus macrocarpa* (Fagaceae), 1♂ (CNC). 8 km N of Spirit Sands, Spruce Wood Prov. Park (16 km S of Carberry), July 8, 1990, M. D. Schwartz, *Hamamelis virginiana* (Hamamelidaceae), 1♂ (CNC). Boissevain, July 16, 1953, Brooks and Kelton, 1♀ (CNC). Carberry, July 31, 1953, Brooks and Kelton, 2♂, 2♀ (CNC). Horton, July 25, 1953, Brooks and Kelton, 2♂ (CNC). Horton, July 28, 1958, A. and J. Brooks, 1♀ (CNC). Oak Lake, July 9, 1953, Brooks and Kelton, *Quercus* sp. (Fagaceae), 3♂, 9♀ (CNC). Russell, July 17, 1954, Brooks and Wallis, *Quercus* sp. (Fagaceae), 2♂, 1♀ (CNC). Sourris, July 23, 1953, A. R.

Brooks, 1♂ (CNC). Turtle Mt., July 21, 1953, Brooks and Kelton, 1♂, 1♀ (CNC). Virden, July 13, 1953, Brooks and Kelton, 6♂, 6♀ (CNC). Westbourne, July 25, 1954, Brooks and Wallis, 1♀ (CNC). **Ontario:** Selkirk, July 9, 1961, Kelton and Brumpton, 1♀ (CNC). **Prince Edward Island:** Charlottetown, July 11, 1966, L. A. Kelton, *Ulmus* sp. (Ulmaceae), 1♀ (CNC). MEXICO.—**Coahuila:** 12.4 mi S of Saltillo, July 4, 1985, Jones, Schaffner, 1♂ (TAMU). USA.—**Illinois:** *Pulaski Co.:* Mounds, May 23, 1932, H. L. Dozier, 1♀ (AMNH). **Iowa:** *Cerro Gordo Co.:* Mason City, June 27, 1927, Harris and Johnston, 1♂ (CNC). *Dickinson Co.:* Iowa Lakeside Lab., June 15, 1963, J. C. Schaffner, *Quercus macrocarpa* (Fagaceae), 3♀ (TAMU). Iowa Lakeside Lab., June 9, 1963–June 17, 1963, J. C. Schaffner, *Fraxinus pennsylvanica* (Oleaceae), 8♂, 11♀ (TAMU). *Warren Co.:* 3 mi NE of Hartford, June 3, 1994, J. C. Schaffner, *Gleditsia triacanthos* (Fabaceae), 1♂ (TAMU). **Louisiana:** *East Baton Rouge Co.:* LSU Campus, May 8, 1988, D. A. Rider, 2♂ (DAR). *St. Landry Co.:* Thistlewaite WMA, April 27, 1986, E. G. Riley and D. A. Rider, 17♂, 5♀ (DAR, AMNH). *Washington Co.:* Lee Memorial Forest, Sheridan, May 19, 1986, C. B. Barr, 1♂ (LSU). **Maine:** *Kennebec Co.:* Monmouth, June 29, 1905, holotype male (*fuscicornis*) (USNM). **Minnesota:** *Ramsey Co.:* St. Anthony Park, June 11, 1919–June 23, 1922, H. H. Knight, paratypes: 2♂, 2♀ (CNC). St. Anthony Park, June 11, 1923, H. H. Knight, paratypes: 2♂, 2♀ (CAS, USNM). *Rice Co.:* Faribault, June 12, 1922, H. H. Knight, 1♂ (USNM). **North Dakota:** *Stutsman Co.:* Arrowhead National Wildlife Refuge, July 20, 1993, D. A. Rider, 1♀ (DAR). **Texas:** *Brazos Co.:* Bryan, April 13, 1965–April 12, 1974, J. C. Schaffner, 82♂, 11♀ (TAMU). Bryan, April 25, 1965–April 27, 1966, J. C. Schaffner, 2♂, 2♀ (AMNH). Bryan, March 26, 1990–March 31, 1990, H. R. Burke, 2♂ (TAMU). College Station, April 12, 1984, J. C. Schaffner, 1♂, 3♀ (TAMU). College Station, April 21, 1964–April 29, 1964, J. C. Schaffner, 3♂, 2♀ (TAMU). College Station, April 29, 1983, T. J. Henry and A. G. Wheeler, Jr., *Quercus stellata* (Fagaceae), 4♂, 8♀ (PDA). College Station, May 1, 1929, H. G. Johnston, 1♂ (USNM). College Station, May 13, 1933, H. G. Johnston, 1♀ (TAMU). *Robertson Co.:* 8 mi E of Hearne, April 1, 1991, M. Hallmark, 1♂ (TAMU). *Unknown Co.:* 15 mi S of Llano, April 21, 1997, W. F. Chamberlain, 1♀ (TAMU).

Plagiognathus melliferae, new species
Figures 9, 17, 27

HOLOTYPE: Male: ''[USA] CAL[ifornia]. Riverside Co., Menifee Vly. (hills on W. end) 33°39′N 117°13′W. 1800′ el. V-14–1978, J. D. Pinto, on *Salvia mellifera*''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the *moderately large* size, the mostly pale but *varied coloration of the dorsum* (fig. 9), the *entirely black antennae* (fig. 17), and the *face at and below base of clypeus castaneous, polished, and contrasting with coloration of vertex and remainder of frons.* Similar to *fulvidus, mexicanus,* and *salviae* in coloration and texture of lower portion of face. Separated from *salviae* (fig. 12) by that species being much smaller and occurring in the western Great Basin and adjacent areas rather than in coastal southern California. Separated from *mexicanus* (fig. 10) by the uniformly dark red coloration and coastal northern Baja California distribution of that species, and from *fulvidus* (fig. 8) by the orange coloration and occurrence in the northeastern United States.

DESCRIPTION: *Male:* Moderately large, elongate-ovoid; total length 3.99–4.37, length apex clypeus–cuneal fracture 2.70–2.92, width across pronotum 1.31–1.40. COLORATION (fig. 9): Head, pronotum, and mesoscutum suffused with orange, much of remainder of dorsum pale; scutellum, endocorium, and cuneus mostly brown; membrane weakly fumose, veins pale; face castaneous and shining at and below base of clypeus; antennae entirely black (fig. 17); venter almost entirely castaneous; labium mostly castaneous; coxae mostly infuscate, remainder of legs dirty yellow; femora with some dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, simple setae unicolorous with dor-

sum with darker suberect setae on pronotum and anterolaterally on hemelytra. STRUCTURE: Body elongate, nearly parallel sided; frons very weakly tumid, clypeus not visible from above; anteocular distance 0.3 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching apex of hind coxae. GENITALIA (fig. 27): Vesica more or less J-shaped, base falling well below base of secondary gonopore; apical spines moderately long and slender, angled relative to body of vesica, anterior spine nearly straight, cylindrical, and longer than posterior; flange on vesica moderately broad.

Female: More strongly ovoid than male; coloration as in male. Total length 3.54–3.89, length apex clypeus–cuneal fracture 2.44–2.78, width across pronotum 1.26–1.36.

ETYMOLOGY: Named for its occurrence on *Salvia mellifera.*

HOSTS: *Salvia mellifera, S. vaseyi* (Lamiaceae).

DISTRIBUTION: Coastal southern California.

PARATYPES: USA.—**California:** *Los Angeles Co.:* Mint Canyon, May 25, 1937–May 26, 1937, E. P. Van Duzee, 18♂, 18♀ (CAS). *Riverside Co.:* Bautista Canyon, May 30, 1976, J. D. Pinto, 1♂, (UCR). Menifee Valley, hills on W end, 560 m, May 11, 1978–May 14, 1978, J. D. Pinto and R. T. Schuh, *Salvia mellifera* (Lamiaceae), 41♂, 29♀ (AMNH, UCR, USNM). *San Diego Co.:* Anza-Borrego Desert State Park, Palm Canyon Trail, 600 ft, May 17, 1982, M. D. Schwartz, *Salvia vaseyi* (Lamiaceae), 8♂, 22♀ (AMNH). *Shasta Co.:* Cayton, July 9, 1913, E. P. Van Duzee, 1♀ (CAS).

Plagiognathus mexicanus, new species
Figures 10, 17, 27

HOLOTYPE: Male: ''MEX[ico]: Baja Cal[ifornia] Norte: 44.5 km E Rt 1 to Parq. San Pedro Martir, 720 m, April 14, 1985, RT Schuh & BM Massie, *Salvia* sp. (Lamiaceae)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by *moderate size, reddish to somewhat blackish coloration* (including legs) (fig. 10), black antennae (fig. 17), the face at and below base of clypeus castaneous, polished, and contrasting with coloration of vertex and remainder of frons, and the *vestiture of black, recumbent, simple setae.* Similar to *fulvidus, melliferae,* and *salviae* in coloration and texture of lower portion of face. Separated from *salviae* (fig. 12) by that species being much smaller and of generally pale coloration. Separated from *melliferae* (fig. 9) by the largely pale to orangish coloration of that species, and from *fulvidus* (fig. 8) by the small size, orange coloration, and occurrence in the northeastern United States. Similar in coloration of dorsum also to *fulvaceus,* but that species with antennal segment 2 mostly orange to pale, and dorsum densely covered with golden shining setae.

DESCRIPTION: *Male:* Relatively large, elongate; total length 4.41–4.61, length apex clypeus–cuneal fracture 3.05–3.17, width across pronotum 1.26–1.39. COLORATION (fig. 10): General coloration of dorsum and legs deep red, sometimes tinged with black; face castaneous and shining at and below base of clypeus; venter darker than dorsum, nearly black; membrane fumose, angle between posteromesial margin of cuneus and posterior margin of cells pale; veins of membrane reddish; antennal segments 1 and 2 intensely black, segments 3 and 4 heavily infuscate; entire labium deep red to castaneous; femora with numerous dark spots; dorsal tibial spines with dark spots at bases; tibiae black at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of reclining black setae. STRUCTURE: Body elongate, weakly ovoid; frons weakly tumid, clypeus not visible from above; anteocular distance equal to diameter of antennal segment 1, head projecting below eye by diameter of antennal segment 1; labium reaching to apex of hind coxae. GENITALIA (fig. 27): Vesica, including anterior apical spines, sigmoid, body broadly curving, base falling near base of secondary gonopore; posterior apical spine elongate, nearly straight, weakly angled relative to body of vesica, anterior spine strongly curving on apical one-half and at nearly right angle to body of vesica; flange moderately broad, terminating just above base of secondary gonopore.

Female: More strongly ovoid than male;

coloration similar to male; frons more strongly protuberant. Total length 4.15–4.32, length apex clypeus–cuneal fracture 2.95–3.10, width across pronotum 1.33–1.46.

ETYMOLOGY: Named for its occurrence in Baja California, Mexico.

HOST: *Salvia* sp. (Lamiaceae).

DISTRIBUTION: Northern Baja California, Mexico.

PARATYPES: MEXICO.—**Baja California Norte:** 44.5 km E of Rt 1 toward Parque San Pedro Martir, 720 m, April 24, 1985, R. T. Schuh and B. M. Massie, 17♂, 19♀ (AMNH, UNAM, USNM).

Plagiognathus modestus (Reuter), new combination
Figures 10, 17, 27

Microphylellus modestus Reuter, 1912: 62 (n. sp.).

DIAGNOSIS: Recognized by the *castaneous to nearly black general coloration of dorsum, entirely pale, nearly white, legs, and pale antennae except for extreme base of antennal segment 1* (fig. 10) (although segment 1 sometimes entirely dark). Most similar in general appearance and coloration to *flavipes* (fig. 7) and *longirostris* (fig. 9), but easily separated from both by the *less elongate body form,* from the former by antennal segment 2 being pale rather than dark as in that species, and from the latter by the shorter rostrum reaching only between the middle and hind trochanters.

REDESCRIPTION: *Male:* Elongate ovoid, of moderate size; total length 3.11–3.43, length apex clypeus–cuneal fracture 2.13–2.43, width across pronotum 0.96–1.11. COLORATION (fig. 10): General coloration of dorsum castaneous; membrane and veins fumose; antennal segment 1 dark on extreme base, more rarely dark over nearly entire segment, antennal segments 2, 3, and 4 entirely pale (fig. 17); labium pale except basal two-thirds of segment 1 and apex; venter entirely castaneous; legs, except extreme base of coxae, pale; tibial spines without dark spots at bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, dark, simple setae. STRUCTURE: Moderately elongate, lateral corial margins weakly rounded; body form moderately flattened; head not strongly projecting, anteocular distance slightly less than diameter of antennal segment 1; head projecting below eye by distance about equal to diameter of antennal segment 1; clypeus not visible from above; labium reaching between apices of middle and hind coxae. GENITALIA (fig. 27): Body of vesica distinctly twisted and sigmoid, relatively short, apical spines erect, anterior spine only modestly longer than posterior; flange curving, reaching to base of secondary gonopore.

Female: Similar in coloration and general structure to male; body form more distinctly ovoid. Total length 2.99–3.32, length apex clypeus–cuneal fracture 2.02–2.37, width across pronotum 1.00–1.07.

HOSTS: Known to breed on a variety of woody perennials.

DISTRIBUTION: Widely distributed in eastern North America, ranging as far west as Iowa and eastern Kansas.

DISCUSSION: Comparison of the male genitalia of *modestus* with those of *Plagiognathus arbustorum* and many other *Plagiognathus* spp. indicates that *modestus* is clearly not distinct from them. This conclusion was presaged by Kelton (1959) in his observations on the genitalia of *longirostris* (Knight), which, like *modestus,* was placed in *Microphylellus* (see also generic Discussion).

SPECIMENS EXAMINED: CANADA.—**Manitoba:** 31 km N of Tolstoi on Rt 59, July 7, 1990, M. D. Schwartz, *Quercus macrocarpa* (Fagaceae), 2♀ (CNC). Aweme, July 9, 1930, R. M. White, 1♀ (CNC). Carberry, July 29, 2000–August 12, 1955, Brooks and Kelton, 5♀ (CNC). Millwood, July 19, 1954, Brooks and Wallis, 2♂, 2♀ (CNC). Oak Lake, July 9, 1953, Brooks and Kelton, *Quercus* sp. (Fagaceae), 8♂, 11♀ (CNC). Russell, July 17, 1954–July 21, 1954, Brooks and Wallis, *Quercus* sp. (Fagaceae), 10♂, 12♀ (CNC). Russell, July 17, 1954, Brooks and Wallis, 1♂ (CNC). Sourris, July 23, 1953, A. R. Brooks, 2♂, 1♀ (CNC). Virden, July 10, 1953, Brooks and Kelton, *Quercus* sp. (Fagaceae), 3♂, 12♀ (CNC). Westbourne, July 25, 1954, Brooks and Wallis, 1♂ (CNC). **New Brunswick:** Woodstock, July 22, 1966, L. A. Kelton, 2♂ (CNC). **Nova Scotia:** Kentville, July 15, 1966–July 3,

1975, L. A. Kelton, *Spiraea* sp. (Rosaceae), 1♂, 2♀ (CNC). Kentville, July 3, 1976, L. A. Kelton, 1♀ (CNC). Mt. Uniacke, July 12, 1966, L. A. Kelton, 2♀ (CNC). **Ontario:** Aldershot, June 14, 1958, L. A. Kelton, 1♀ (CNC). Bridgenorth, June 23, 1962, G. Thorpe, *Ulmus americana* (Ulmaceae), 1♂, 9♀ (CNC). Burtch, July 11, 1961, L. A. Kelton, 8♂, 3♀ (CNC). Carboro, June 26, 1961, Kelton and Brumpton, 1♂ (CNC). Cayuga, June 25, 1961, Kelton and Brumpton, 1♂, 2♀ (CNC). Dunnville, July 9, 1962, G. Thorpe, *Ulmus americana* (Ulmaceae), 10♂, 24♀ (CNC). Fort Frances, June 18, 1960, Kelton and Whitney, 2♂, 1♀ (CNC). Guelph, June 26, 1915, H. G. Crawford, 1♀ (CNC). Haggersville, July 9, 1962, Kelton and Thorpe, 1♀ (CNC). Jordan, July 17, 1961, L. A. Kelton, 1♀ (CNC). Jordan, July 17, 1961, L. A. Kelton, *Crataegus* sp. (Rosaceae), 1♀ (CNC). Kingsville, July 19, 1962, Kelton and Thorpe, 1♂, 1♀ (CNC). Lambeth, June 29, 1961, Kelton and Brumpton, 1♀ (CNC). Leamington, July 19, 1962, Kelton and Thorpe, *Rhus* sp. (Anacardiaceae), 15♂, 8♀ (CNC). London, July 22, 1952, F. H. N. Smith, 4♀ (CNC). Marmora, July 20, 1952, J. R. Vockeroth, *Salix* sp. (Salicaceae), 1♀ (CNC). Meaford, June 13, 1962, Kelton and Thorpe, 1♂ (CNC). Midland, June 14, 1962, Kelton and Thorpe, 1♀ (CNC). Newry, July 12, 1962, Kelton and Thorpe, 1♀ (CNC). Niagara Falls, June 17, 1978, T. J. Henry, *Quercus* sp. (Fagaceae), 1♂ (USNM). Niagara Glen, July 4, 1926, G. S. Walley, 1♀ (CNC). Ottawa, Central Experimental Farm, June 3, 1991, M. D. Schwartz, *Lonicera japonica* (Caprifoliaceae), 1♀ (CNC). Ottawa, July 1, 1914, G., Beaulieu, 3♂ (CNC). Ottawa, June 18, 1951–June 30, 1951, McAlpine, Smith, Vockeroth, 5♂, 5♀ (CNC). Ottawa, June 29, 1912, E. P. Van Duzee, 1♀ (CAS). Ottawa, June 30, 1956, J. R. Vockeroth, *Elaeagnus* sp. (Elaeagnaceae), 1♂ (CNC). Ottawa, near C.E.F. Island Park Drive, June 3, 1991, M. D. Schwartz, *Lonicera japonica* (Caprifoliaceae), 12♂, 4♀ (CNC). Pelee Island, July 3, 1931, G. S. Walley, 1♂ (CNC). Point Pelee, July 28, 1961, Kelton and Brumpton, 1♂, 1♀ (CNC). Port Burwell, July 3, 1962, G. Thorpe, 1♂ (CNC). Port Burwell, July 3, 1962, G. Thorpe, *Rhus* sp. (Anacardiaceae), 5♂, 7♀ (CNC). Rockaway, July 21, 1962, Kelton and Thorpe, 1♂, 2♀ (CNC). Rondeau Park, July 5, 1962, G. Thorpe, 3♀ (CNC). Selkirk, July 9, 1961, Kelton and Brumpton, 1♀ (CNC). Simcoe, June 13, 1931, G. S. Walley, 1♂ (CNC). Stanford, July 12, 1961, L. A. Kelton, 1♀ (CNC). Trenton, June 25, 1911, Evans, 1♂, 2♀ (CNC). Vineland, August 10, 1961, L. A. Kelton, 1♀ (CNC). Vineland, June 9, 1962, Kelton and Thorpe, *Matricaria* sp. (Asteraceae), 1♂ (CNC). **Quebec:** Aylmer, June 13, 1920, H. G. Crawford, 1♀ (CNC). Knowlton, July 11, 1929, L. J. Milne, 1♂ (CNC). Knowlton, July 9, 1927, G. S. Walley, 1♀ (CNC). Ladysmith, July 24, 1958, L. A. Kelton, 1♂ (CNC). Laniel, July 1, 1963, L. A. Kelton, 2♀ (CNC). Yarms, July 23, 1958, L. A. Kelton, 1♀ (CNC). **Saskatchewan:** Esterhazy, July 25, 1954, Brooks and Wallis, 1♂, 1♀ (CNC). USA.—**Arkansas:** *Pulaski Co.:* Little Rock, May 5, 1943, Stahevitch, 1♂ (LACM). *Washington Co.:* No specific locality, May 16, 1963, *Quercus alba* (Fagaceae), 1♀ (USNM). **Connecticut:** Darien, June 10, 1912, E. P. Van Duzee, 1♂ (CAS). Middletown, June 17, 1909, H. M. Parshley, 1♂ (CAS). **Illinois:** *Champaign Co.:* Urbana, Crystal Lake Park, May 28, 1934, Ross and Mohr, 2♂, 2♀ (AMNH). **Iowa:** *Boone Co.:* Ledges State Park, June 5, 1962, J. C. Schaffner, 1♂ (TAMU). *Dickinson Co.:* Iowa Lakeside Lab., June 12, 1963, J. C. Schaffner, *Fraxinus pennsylvanica* (Oleaceae), 5♂, 6♀ (TAMU). *Henry Co.:* Oakland Mills State Park, May 31, 1963, J. C. Schaffner, *Quercus alba* (Fagaceae), 4♂, 1♀ (TAMU). *Linn Co.:* Cedar Rapids, May 31, 1994, J. C. Schaffner, 10♂, 3♀ (TAMU). *Story Co.:* Ames, July 13, 1925, H. H. Knight, 6♂, 1♀ (TAMU). Ames, June 3, 1955–June 25, 1929, H. H. Knight, 1♂, 2♀ (USNM). Ames, May 28, 1951, J. A. Slater, *Carya ovata* (Juglandaceae), 1♂, 1♀ (AMNH). *Warren Co.:* 3 mi NE of Harford, June 3, 1994, J. C. Schaffner, *Gleditsia triacanthos* (Fabaceae), 6♂, 3♀ (TAMU). 3 mi NE of Hartford, June 3, 1994, J. C. Schaffner, 1♂ (TAMU). **Kansas:** *Douglas Co.:* No specific locality, June 1, 1940, R. H. Beamer, 4♂, 5♀ (KU). No specific locality, June 22, 1919, W. E. Hoffman, 1♀ (KU). **Louisiana:** *East Baton Rouge Co.:* 1.2 mi S of Central, E of LA Rt

3035, April 29, 1986, C. B. Barr, 1♂ (LSU). *East Feliciana Co.:* Idlewild Exp. Sta., April 28, 1984, E. G. Riley, 1♂ (DAR). *St. Landry Co.:* Thistlewaite WMA, June 27, 1986, E. G. Riley and D. A. Rider, 8♂, 3♀ (DAR). **Maine:** *Oxford Co.:* Near Bethel, July 7, 1900, N. Banks, 1♀ (AMNH). *Unknown Co.:* Capens, July 12, 1907, 1♀ (CAS). *Washington Co.:* Machias, June 26, 1906, H. M. Parshley, 1♂ (CAS). **Massachusetts:** *Barnstable Co.:* Barnstable, July 4, 1900, C. W. Johnson, 1♂ (AMNH). *Essex Co.:* Beach Bluff, June 21, 1914, H. M. Parshley, 1♂ (CAS). *Middlesex Co.:* Malden, June 1, 1895, E. H. Sprague, 1♂ (AMNH). *Norfolk Co.:* Dover, July 5, 1919, A. P. Morse, 1♂ (AMNH). Wellesley, July 11, 1909, E. P. Van Duzee, 1♀ (CAS). **Michigan:** *Emmet Co.:* No specific locality, July 16, 1950, J. D. Lattin, 1♂ (AMNH). **Minnesota:** *Itasca Co.:* Deer Lake, June 15, 1986, D. A. Rider, 2♂, 5♀ (DAR). *Ramsey Co.:* No specific locality, July 11, 1923, H. H. Knight, 1♀ (CNC). No specific locality, June 15, 1923, H. H. Knight, 3♂ (USNM). St. Anthony Park, June 11, 1919–June 23, 1922, H. H. Knight, 2♂ (USNM). St. Anthony Park, June 3, 1921, H. H. Knight, 3♂, 4♀ (USNM). St. Anthony Park, June 4, 1921, W. E. Hoffmann, 7♂, 3♀ (USNM). *Rice Co.:* Faribault, June 12, 1922, H. H. Knight, 6♂, 5♀ (USNM). **Mississippi:** *Tupelo Co.:* Tupelo, May 20, 1931, H. G. Johnston, 1♂ (TAMU). **Missouri:** *Jackson Co.:* Kansas City, June 1, 1900–June 5, 1900, F. Rogers, 1♂, 1♀ (USNM). *Platte Co.:* Platte City, May 29, 1936, R. H. Beamer, 1♂, 1♀ (KU). **New Hampshire:** *Coos Co.:* Gorham, July 19, 1929, G. S. Walley, 1♀ (CNC). *Grafton Co.:* Franconia, A. T. Slosson, 1♂ (AMNH). **New York:** *Erie Co.:* Hamburg, June 11, 1904, E. P. Van Duzee, 1♀ (CAS). *Genesee Co.:* Batavia, July 14, 1916, H. H. Knight, 1♀ (CNC). *Livingston Co.:* Portage, June 27, 1915, H. H. Knight, 1♀ (USNM). *Rockland Co.:* Nyack, Memorial Park, June 12, 1988, M. D. Schwartz, *Pyrus* sp. (Rosaceae), 2♂, 3♀ (AMNH). Tappan, Oak Tree Road, June 20, 1988, M. D. Schwartz, ex Rosaceae, 6♂, 2♀ (AMNH). *Tompkins Co.:* Ithaca, June 23, 1920, H. H. Knight, 1♂, 1♀ (USNM). *Westchester Co.:* Crugers, June 19, 1912, 1♀ (AMNH). **North Carolina:** *Mecklenburg Co.:* Near Matthews, Rt 51 1 mi W of Rt 16, April 16, 1978, A. G. Wheeler, Jr., *Quercus stellata* (Fagaceae), 10♂, 11♀ (PDA). Near Matthews, Rt 51 1 mi W of Rt 16, May 25, 1975, A. G. Wheeler, Jr., *Quercus stellata* (Fagaceae), 1♂ (AMNH). **Pennsylvania:** *Centre Co.:* State College, Penn State, June 15, 1995, A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 1♀ (PDA). *Dauphin Co.:* Harrisburg, drive in on Rt 22, June 9, 1975, A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 2♂, 3♀ (PDA). Harrisburg, June 7, 1971, G. R. Sleeman, *Liriodendron tulipifera* (Magnoliaceae), 1♀ (PDA). Hershey, June 1, 1975, A. G. Wheeler, Jr., *Celtis occidentalis* (Ulmaceae), 1♂, 2♀ (PDA). Hershey, Park Blvd. Near MHHS, May 18, 1974, A. G. Wheeler, Jr., *Celtis occidentalis* (Ulmaceae), 3♂, 4♀ (PDA). Lower Paxton Township, June 2, 1975, A. G. Wheeler, Jr., *Rhodotypos scandens* (Rosaceae), 2♂ (PDA). *Philadelphia Co.:* Bartram's Garden, May 20, 1980, A. G. Wheeler, Jr., *Celtis occidentalis* (Ulmaceae), 1♂, 1♀ (PDA). Philadephia, Olney, June 20, 1941, J. C. Lutz, 1♀ (USNM). **South Carolina:** *Pickens Co.:* Clemson College, May 20, 1936, 3♂, 1♀ (CLEMSON). **Tennessee:** *Davidson Co.:* SE Nashville, Beechwood Road, May 12, 1988, M. D. Schwartz, *Lonicera* sp. (Caprifoliaceae), 2♀ (AMNH). **Texas:** *Bosque Co.:* Laguna Park, May 2, 1975, J. C. Schaffner, 6♂, 15♀ (TAMU). *Brazos Co.:* Bryan, April 6, 1966–May 8, 1966, J. C. Schaffner, 66♂, 8♀ (TAMU). Bryan, March 31, 1990, H. R. Burke, ex Fagaceae, 3♂, 3♀ (TAMU). Bryan, May 6, 1965, J. C. Schaffner, 1♂ (AMNH). College Station, April 12, 1984, J. C. Schaffner, 6♂, 2♀ (TAMU). College Station, April 23, 1930, N. J. Reinhard, 2♂, 1♀ (AMNH). College Station, April 29, 1983, T. J. Henry and A. G. Wheeler, Jr., 2♂, 3♀ (PDA). *Burnet Co.:* Inks Lake State Park, April 13, 1985, P. Kovarik, R. Jones, C. Agnew, 1♂ (TAMU). Inks Lake State Park, April 20, 1968, J. C. Schaffner, 1♂ (TAMU). *Comal Co.:* 5 mi W of Sattler on Canyon Lake, April 17, 1983, J. C. Schaffner, 1♂ (TAMU). *Erath Co.:* Stephenville, April 21, 1972, J. C. Schaffner, 1♂ (TAMU). *Gonzales Co.:* Palmetto State Park, April 19, 1969, J. C. Schaffner, 1♂ (TAMU). Palmetto State Park, May 4, 1970, Board and Schaffner, 1♂

(TAMU). *Grimes Co.:* S of Anderson on Rt 244, April 30, 1983, T. J. Henry and A. G. Wheeler, Jr., 2♂ (PDA). *Kerr Co.:* Hunt, May 1, 1966, J. C. Schaffner, 1♂ (TAMU). *Kimble Co.:* 6.5 mi S of London, Llano River crossing, May 13, 1977, Gillogly and Schaffner, 1♂ (TAMU). *Limestone Co.:* Old Union Community, April 19, 1998, J. C. Schaffner, 3♂, 1♀ (TAMU). *Llano Co.:* 3 mi NW of Valley Spring, April 20, 1985, J. C. Schaffner, 2♂ (TAMU). *Mason Co.:* 8.5 mi S of Mason, Llano River crossing, May 13, 1997, Gilogly and Schaffner, 2♂ (TAMU). *San Patricio Co.:* Welder Wildlife Refuge, near Sinton, April 19, 1983, T. J. Henry and A. G. Wheeler, Jr., *Ulmus crassifolia* (Ulmaceae), 2♂, 1♀ (USNM). *Smith Co.:* Tyler State Park, May 9, 1988, R. S. Anderson, 1♂, 3♀ (TAMU). **Vermont:** *Bennington Co.:* Bennington, June 22, 1915, H. M. Parshley, 1♀ (CAS). *Chittenden Co.:* Burlington, June 22, 1906, E. P. Van Duzee, 1♂ (CAS). **Virginia:** *Albemarle Co.:* Charlottesville, University of Virginia, May 24, 1986, A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 1♂, 2♀ (PDA). *Fairfax Co.:* Great Falls, June 7, 1900, N. Banks, 1♀ (AMNH). *Montgomery Co.:* Blacksburg, Virginia Polytechnic Inst., June 3, 1989, A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 1♂, 2♀ (USNM). **Washington, D.C.:** June 5, 1902, O. Heidemann, 1♂ (CAS). **Wisconsin:** *Wood Co.:* on Hwy 13, July 7, 1947, R. D. Shenefelt, 1♀ (USNM).

Plagiognathus moerens Reuter, revised combination
Figures 10, 17, 28

Plagiognathus moerens Reuter, 1909: 80 (n. sp.).
Chaetophylidea moerens: Knight, 1968: 33 (n. comb.).

DIAGNOSIS: Recognized by the medium to large size, *linear pattern of coloration* with exocorium and clavus mostly opaque, pale, olive-colored, contrasting with dark endocorium (fig. 10), pronotum varying from entirely black to totally pale (olive), antennae entirely black (fig. 17), dorsal *vestiture of recumbent, black, bristlelike setae,* and surface of dorsum weakly polished (fig. 10). Linear pattern of coloration similar to *lineatus* (fig. 9) and *shoshonea* (fig. 13); easily distinguished from those species by the black, bristlelike setae on the dorsum and by the distinctive structure of the male genitalia (fig. 28), the vesica lacking a flange and with very long, evenly attenuated apical spines.

REDESCRIPTION: *Male:* Elongate-ovoid, moderate to large size; total length 3.84–4.96, length apex clypeus–cuneal fracture 2.81–3.66, width across pronotum 1.23–1.46. COLORATION (fig. 10): Background coloration of dorsum deeply castaneous to blackish with longitudinal, opaque, pale (olive) areas; posterior margin of vertex pale at least at midpoint, sometimes across entire width, posterior lobe of pronotum often pale, costal margin of hemelytra dark or pale, exocorium almost totally pale, clavus pale except narrowly along scutellum and claval commissure, cuneus pale; corium narrowly pale adjacent to extreme base of membrane; membrane fumose, veins demarcating small cell and angle between posterior margin of small cell and posteromesial margin of cuneus pale; antennae entirely castaneous to black (fig. 17); labium castaneous; venter entirely castaneous, metathoracic scent-gland evaporatory area sometimes partially pale; coxae dark, except occasionally pale at articulation with trochanters; trochanters dark; fore- and middle femora weakly infuscate, hind femur heavily infuscate; tibiae weakly infuscate, hind tibiae sometimes more strongly so, spines of fore and middle tibiae without dark bases, spines of hind tibiae with small dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, moderately shining. Vestiture of dorsum composed of nearly erect, black, bristlelike setae. STRUCTURE: Lateral corial margins weakly convex; frons distinctly tumid, clypeus visible from above; anteocular distance 2 times diameter of antennal segment 1; head projecting below eye by about 1.5 times diameter of antennal segment 1; labium reaching slightly beyond apex of hind coxae. GENITALIA (fig. 28): Entire vesica very long, body of vesica relatively stout and strongly curving, more or less J-shaped, base of vesica falling slightly below level of secondary gonopore; apical spines long, of similar length, tapering gradually from gonopore to apex; no flange on vesica.

Female: Body shorter and more strongly ovoid than in male; pronotum and hemelytra more extensively pale than in male. Total length 3.84–4.96, length apex clypeus–cuneal fracture 2.81–3.66, width across pronotum 1.23–1.46.

HOSTS: *Amsinckia* spp. (Boraginaceae), *Phacelia* spp. (Hydrophyllaceae), and other herbaceous annuals.

DISTRIBUTION: From Idaho and Washington in the north, south through California and into Arizona.

DISCUSSION: Knight (1968) placed *moerens* Reuter in the new genus *Chaetophylidea* on the basis of its bristlelike vestiture. The vestiture is a generally variable attribute in *Plagiognathus,* and the situation in *moerens* certainly falls within the total range of variation. Because other attributes of *moerens,* including the male genitalia, fall well within the range of variation seen for the genus as conceived in this paper, I am treating *Chaetophylidea* as a junior synonym of *Plagiognathus.*

SPECIMENS EXAMINED: USA.—**Arizona:** *Gila Co.:* Rye, 3500 ft, April 18, 1982, D. A. and J. T. Polhemus, 1♀ (JTP). *Maricopa Co.:* Reavis Ranch Trail, 3600 ft, April 19, 1982, D. A. and J. T. Polhemus, 1♂ (JTP). *Pinal Co.:* Superior, April 16, 1928, A. A. Nichol, 1♂ (CNC). *Yavapai Co.:* 2 mi NW of Wickenburg on Rt 93, 625 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Amsinckia intermedia* (Boraginaceae), 60♂, 69♀ (AMNH). **California:** *Alameda Co.:* Corral Hollow, April 8, 1956, J. M. Burns, 1♂ (UCB). *Amador Co.:* Sutter Creek, April 24, 1985, 3♂, 6♀ (AMNH). *Clear Lake Co.:* Clear Lake, April 15, 1953, H. T. Osborn, *Brassica* sp. (Brassicaceae), 2♀ (UCD). No specific locality, May 10, 1952, J. D. Lattin, 2♂ (AMNH). *Fresno Co.:* 12 mi W of Coalinga, April 8, 1951, E.G. Linsley, 1♂, 2♀ (UCB). 18 air mi SW of Mendota, Ciervo Hills, March 16, 1975, J. Powell and P.A. Rude, *Amsinckia* sp. (Boraginaceae), 13♂, 8♀ (UCB). 5 mi S of Coalinga, Jacaitos Canyon, March 17, 1975, J. Powell, 2♂ (UCB). Fresno, April 10, 1963, Chester Latif, 1♀ (UCB). W of Herndon, San Joaquin River, April 3, 1970, J. Powell, *Amsinckia* (Boraginaceae), 1♂ (UCB). *Humboldt Co.:* Dinsmores, June 7, 1942, B. P. Bliven, 6♂, 4♀ (CAS). *Kern Co.:* 1 mi E of Woody, May 3, 1964, P. Rude, 2♂, 5♀ (UCB). 1 mi NW of Tupman, March 19, 1975, J. A. Powell, *Amsinckia* sp. (Boraginaceae), 2♂, 4♀ (UCB). 5 mi N of Lost Hills P.O., March 21, 1975, J. A. Powell, 1♂, 1♀ (UCB). 5 mi NE of Mojave, April 15, 1962, D. H. Janzen, *Amsinckia* sp. (Boraginaceae), 6♂, 1♀ (UCB). 5 mi S of Democrat Springs, April 25, 1952, G. A. Marsh, 11♂, 12♀ (UCB). 7 mi SW of Maricopa, March 20, 1975, J. A. Powell, *Amsinckia* sp. (Boraginaceae), 2♂ (UCB). Arvin, April 2, 1954, R. van den Bosch, 1♀ (UCR). Arvin, April 8, 1936, G. L. Smith, 1♂, 1♀ (UCB). Bakersfield, April 28, 1938, B. P. Bliven, 11♂, 14♀ (CAS). Cuyama Valley, April 8, 1932, E. P. Van Duzee, *Amsinckia* sp. (Boraginaceae), 6♂, 6♀ (CAS). Edison, April 1, 1948, 2♀ (UCR). Havilah, 3000 ft, April 28, 1964, J. Powell, *Plagiobothrys nothofulvus* (Boraginaceae), 2♂ (UCB). Maricopa, April 9, 1966, L. and C. W. O'Brien, 1♀ (UCB). Woody, NE of Bakersfield, April 16, 1961, B. P. Bliven, 6♂, 7♀ (CAS). *Lake Co.:* 5 mi NW of Middletown, June 4, 1963, W. Turner, 1♂ (UCB). Clear Lake Oaks, April 15, 1953, R. P. Allen, 1♂, 2♀ (CAFA). Clear Lake, May 10, 1952, J. D. Lattin, *Raphanus* sp. (Brassicaceae), 3♂, 3♀ (OSU). *Los Angeles Co.:* 5 mi E of Llano, May 13, 1975, J. C. Hall, 1♀ (UCR). Calabasas, April 23, 1965, S. Seminoff, 1♂, 1♀ (CAFA). Claremont, Baker, 2♂, 1♀ (UCB, HELSINKI). Claremont, C. F. Baker, 29♂, 18♀ (CAS). Lancaster, June 8, 1962, M. E. Irwin, 1♂ (UCD). Mint Canyon, May 25, 1937, E. P. Van Duzee, 1♂ (CAS). No specific locality, March 22, 1939, K. E. Stager, 1♂, 2♀ (LACM). San Clemente Island, E face Mt. Thirst, March 22, 1972, J. Powell, *Amsinckia intermedia* (Boraginaceae), 3♂, 2♀ (UCB). Solemint, Mint Canyon, April 28, 1955, W. R. Richards, 12♂, 7♀ (CNC). *Madera Co.:* 4 mi NE of Madera, March 24, 1965, J. Powell, 1♂, 2♀ (UCB). *Mendocino Co.:* Hopland Field Sta., Kelsey Cab. Orchard area, 2500–2800 ft, May 14, 1977, T. and V. Keeler-Wolf, 4♂ (UCB). Hopland Field Station, April 28, 1977, R. L. Hanson, 1♂ (UCD). *Merced Co.:* 12 mi SE of Merced, April 13, 1964, R. P. Allen, 1♂ (CAFA). *Modoc Co.:* Waner Mts., Davis Creek, July 10, 1922, C. L. Fox, 1♂, 1♀ (CAS). *Mon-*

terey Co.: 3 air mi NE of Arroyo Seco guard station, Paloma Creek, 900 ft, May 4, 1975, 3♂, 3♀ (UCB). 5 mi NE of Arroyo Seco Guard Station, 800 ft, April 21, 1967, J.A. Powell, *Amsinckia* sp. (Boraginaceae), 5♂, 1♀ (UCB). 6 mi W of Greenfield, Wiley Ranch, 1200 ft, May 2, 1975, S. L. Szerlip, J. A. Powell, and R. Wharton, *Amsinckia* sp. (Boraginaceae), 17♂, 16♀ (UCB). Greenfield, March 12, 1967, P. Opler, 1♀ (UCB). Jolon, May 11, 1959, T. R. Haig, 2♂, 1♀ (UCD). San Ardo, April 29, 1953, R. P. Allen, *Amsinckia* sp. (Boraginaceae), 4♂, 1♀ (CAFA). San Ardo, March 24, 1931, E. P. Van Duzee, 24♂, 8♀ (CAS). Summit of Carmel Divide, milepost 30.0, April 19, 1980, Russell and Schwartz, *Hymenopappus filifolius* (Asteraceae), 27♂, 14♀ (AMNH). *Orange Co.:* Orange, 1♀ (LACM). *Riverside Co.:* 12 mi NW of Oak Grove on Hwy 79, April 5, 1969, S. Frommer et al., 9♂, 3♀ (UCR). 3 mi NW of Murietta, May 13, 1978, J. D. Pinto, *Amsinckia* sp. (Boraginaceae), 4♀ (UCR). 3 mi W of Murriettta, Tenaja Road, 365 m, May 12, 1978, J. D. Pinto and R. T. Schuh, *Amsinckia* sp. (Boraginaceae), 8♂, 36♀ (AMNH). 4 mi E of Elsinore, Red Rock Canyon, April 13, 1965, J. A. Powell, 7♂, 3♀ (UCB). 5 mi S of Sage, April 16, 1965, J. Powell, 2♂ (UCB). 6 mi SE of Corona, April 12, 1965, C. A. Toschi, 1♂ (UCB). 8 mi SE of Hemet, Bautista Canyon, May 1, 1974, J. D. Pinto, 1♂ (UCR). Big Springs Mts. near UCR campus, January 1, 1976, A. T. Mayor, 1♂ (UCR). Cactus Valley, T65 R1E Sec 8, April 29, 1980, J. N. Chandler, 1♂, 1♀ (UCR). Elsinore, March 3, 1974, C. Linn, 1♀ (UCR). Gavilan Hills, March 19, 1961, G. A. Gorelick, *Amsinckia intermedia* (Boraginaceae), 1♂ (UCB). H. James Reserve, vicinity of Lake Fulmor, 5322 ft, May 22, 1976, B. A. Bowers, 1♀ (UCR). Lake Mathews, April 15, 1952, A. L. Melander, 1♂ (UCR). Lewis Valley, May 1, 1979, C. W. Melton, 2♂, 1♀ (UCR). Menifee Valley, hills on W end, 1800 ft, April 10, 1980–April 21, 1983, J. D. Pinto, *Cryptantha* sp. (Boraginaceae), 5♂, 1♀ (UCR). Millard Canyon, April 20, 1968, C. Beesley, *Penstemon* sp. (Scrophulariaceae), 1♀ (UCR). Reche Canyon, May 12, 1963, E. I. Schlinger, 7♂, 1♀ (UCR). Riverside, March 18, 1965, M. E. Irwin, 1♂ (UCR). Riverside, March 28, 1935, H. L. McKenzie, *Amsinckia douglasiana* (Boraginaceae), 7♂, 8♀ (UCD). Sage, April 15, 1965, J. Doyen, 4♂ (UCB). Temecula, April 23, 1951–May 11, 1959, E. I. Schlinger, E. J. Taylor, 6♂, 1♀ (UCD). The Gavilan, May 17, 1951, E. I. Schlinger, 1♂ (UCD). *Sacramento Co.:* Citrus Heights, May 3, 1967, G. J. Keuter, 1♀ (CAS). Folsom, May 19, 1955, P.D. Hurd, *Cryptantha* sp. (Boraginaceae), 1♂ (UCB). *San Benito Co.:* 10 mi S of Pinnacles Junction, California Hwy 25, April 16, 1966, C. W. O'Brien, 15♂, 18♀ (UCB). 5 mi S of Bitterwater, April 1, 1959, C. W. O'Brien, 1♂ (UCB). Big Panoche Creek, Fresno County line, April 21, 1967, P. A. Opler, *Amsinckia* (Boraginaceae), 11♂, 11♀ (UCB). Mercy Hot Springs, April 6, 1951, E. J. Taylor, 9♀ (UCD). Pinnacles National Monument, April 19, 1980, M. D. Schwartz, 3♂, 4♀ (AMNH). Pinnacles National Monument, April 24, 1948, J. W. MacSwain, 1♂ (UCB). Pinnacles Post Office, April 6, 1951, E. J. Taylor, 3♂, 2♀ (UCD). *San Bernardino Co.:* 3 airline mi SE of New Idria, Clear Creek, 4000 ft, April 24, 1964, J. Powell, 2♂ (UCB). Apple Valley, May 12, 1955, W. R. M. Mason, 1♀ (CNC). Phelan, May 18, 1975, J. C. Hall, 8♀ (UCR). *San Diego Co.:* 2 mi NE of Lakeside, March 29, 1961, J. A. Powell, *Lotus scoparius* (Fabaceae), 8♂, 14♀ (UCB). Mt. Laguna, July 5, 1963, H. L. Griffin, 1♀ (UCB). No specific locality, May 13, 1913, E. P. Van Duzee, 4♀ (CAS). *San Luis Obispo Co.:* 1 mi S of Cholame, April 30, 1963, P. H. Arnaud, Jr., 5♂, 5♀ (CAS). 10 mi SE of Creston, April 25, 1968, J. Doyen and J. Powell, 11♂, 6♀ (UCB). 10 mi W of Simmler, May 3, 1962, R. L. Langston, 3♂ (UCB). 12 mi E of Simmler, Tembler Range, 3200 ft, April 25, 1964, J. Powell, 2♀ (UCB). 12 mi NE of Pozo, La Panza Camp, April 29, 1962, J. K. Drew and P.D. Hurd, *Cryptantha muricata* (Boraginaceae), 2♀ (UCB). 3 mi E of Pozo, May 1, 1962, P. D. Hurd, 2♂ (UCB). 3 mi N of Nacimiento Dam, April 14, 1967, P. Opler, 3♂, 2♀ (UCB). 3 mi N of Nacimiento, San Antonio Dam, April 14, 1967, P. A. Rude, 17♂, 13♀ (UCB). 5 mi NE of Santa Margarita, Jct. 58 & 229, April 12, 1967, P. A. Rude, 2♂ (UCB). 5.6 mi SW of Shandon, April 24, 1962, R.L. Langston, 1♀ (UCB). 6 mi SE of

Creston, April 26, 1968, J. A. Chemsak, 1♀ (UCB). Atascadero, April 22, 1932, E. P. Van Duzee, 3♂, 3♀ (CAS). Cholame, April 11, 1960, E. G. Linsley, *Phacelia* sp. (Hydrophyllaceae), 1♂ (UCB). La Panza Camp, April 26, 1968, J. Powell, 1♀ (UCB). Nacimiento Dam, April 14, 1967, P. A. Rude, 10♂, 7♀ (UCB). Pozo, April 28, 1962, C. A. Tosch, J. A. Powell, and J. K. Drew, 9♂, 20♀ (UCB). Simmler, March 20, 1940, J. W. Tilden, 1♂, 1♀ (CAS). SW of San Luis Obispo, Arroyo Grande Creek, 160 m, May 8, 1985, R. T. Schuh and B. M. Massie, 3♂ (AMNH). Templeton, March 22, 1931, E. P. Van Duzee, 2♂ (CAS). *San Mateo Co.:* Half Moon Bay State Beach, April 11, 1980, J. D. Pinto, 1♂ (UCR). *Santa Barbara Co.:* Cuyama, March 30, 1954, H. T. Osborn, *Amsinckia* sp. (Boraginaceae), 2♂, 1♀ (CAFA). Santa Cruz Island, Central Valley, April 23, 1975, B. A. Bowers, 1♂ (UCR). *Santa Clara Co.:* Mt. Hamilton, April 15, 1947, G. Bohart, *Gilia* sp. (Polemoniaceae), 1♂ (UCB). Pacheco Pass on Rt 152, 1380 ft, April 19, 1980, Russell and Schwartz, *Hymenopappus filifolius* (Asteraceae), 3♂, 2♀ (AMNH). San Antonio Valley, April 20, 1948, Ray F. Smith, 1♂ (UCB). *Shasta Co.:* 7 mi S of Cottonwood, May 1, 1971, Oman, 2♂, 4♀ (OSU). *Stanislaus Co.:* Del Puerto Canyon, N Fork Del Puerto Creek, 1000 ft, April 13, 1980, N. Hostettler, 1♂ (UCB). *Tehama Co.:* 21 mi NW of Red Bluff on Rt 36, April 26, 1980, Russell and Schwartz, 1♂ (AMNH). *Trinity Co.:* Hayfork, 2300 ft, May 19, 1973, S. L. Szerlip, *Phacelia heterophylla* (Hydrophyllaceae), 2♀ (UCB). Junction City, May 17, 1978, T. R. Haig, 1♂ (CAFA). *Tulare Co.:* 10.3 mi N of Lemon Cove, J21, March 25, 1981, M. D. Schwartz, *Amsinckia* sp. (Boraginaceae), 12♂, 3♀ (AMNH). 11 mi NW of California Hot Springs, May 14, 1963, C. A. Toschi, 1♀ (UCB). 4 mi NE of Lemon Cove, May 13, 1963, J. Powell and S. W. Earnshaw, 2♀ (UCB). 6 mi N of Kaweah, April 28, 1979, J. Powell, 3♂, 1♀ (UCB). Lake Kaweak, Hwy 198, March 25, 1986, C. B. Barr, *Amsinckia* sp. (Boraginaceae), 1♂, 3♀ (LSU). Lemon Cove, March 29, 1951, R.L. Usinger, *Amsinckia* sp. (Boraginaceae), 1♂, 8♀ (UCB). Potwisha, 3 mi NE Ash Mountain Headquarters, 2000 ft, May 4, 1979, J. Powell, *Amsinckia* (Boraginaceae), 1♀ (UCB). *Tuolumne Co.:* 3 mi NE of Tuolumne, N Fork Tuolumne River, May 1, 1961, R. M. Brown, 5♀ (CAS). *Ventura Co.:* N end of Casitas Reservoir, March 15, 1967, P. A. Opler, 5♂, 5♀ (UCB). Piru, April 13, 1939, R. M. Bohart, 3♂ (UCB). Piru, April 20, 1932, E. P. Van Duzee, 1♀ (CAS). Quatal Canyon, NE Ventura Co., April 29, 1968, J. Powell, 4♂, 2♀ (UCB). *Yolo Co.:* Davis, June 6, 1942, E. I. Schlinger, 1♂ (UCD). *Yuba Co.:* 3 mi N of Smartville, Sierra Foothill Field Station, 1300–1500 ft, May 2, 1980, W. Buegler, 1♂, 1♀ (UCB). **Idaho:** *Clearwater Co.:* Orofino, 1016 ft, June 17, 1935, 1♂ (CNC). *Nez Perce Co.:* Lewiston, 550 ft, May 11, 1935, W. E. Schull, 1♀ (CNC). Top of Lewiston Grade, June 30, 1975, J. Powell, *Achillea* sp. (Asteraceae), 2♂ (UCB). **Oregon:** *Gilliam Co.:* 8 mi E of Olex, May 22, 1962, E. A. Dickason, 1♂ (OSU). *Jackson Co.:* 3 mi N of McLeod, McLeod State Park, Rogue River, 1550 ft, May 22, 1960, J. D. Lattin, 1♂, 1♀ (OSU). 3.2 mi S of Ruch, May 11, 1969, P. W. Oman, 1♀ (OSU). 8 mi N of Medford, TouVelle State Park, Rogue River, 1350 ft, May 21, 1960, J. D. Lattin, 4♂, 4♀ (OSU). north of Medord, Sam's Valley, May 9, 1969, P. W. Oman, 1♂, 1♀ (OSU). TouVelle Park, May 2, 1970, Oman, 1♂ (OSU). *Josephine Co.:* 7 mi S of Grants Pass, Applegate River, May 18, 1962, 2♂, 3♀ (OSU). *Sherman Co.:* 5 mi W of Biggs Junction, Deschutes and Columbia Rivers, May 18, 1972, J. D. Lattin, 2♂, 2♀ (OSU). *Umatilla Co.:* Cayuse, April 23, 1939, J. Schuh and K. Gray, 1♂ (OSU). Milton-Athena, May 29, 1938, K. Gray and J. Schuh, 1♂ (OSU). *Unknown Co.:* Marlin, May 9, 1969, P. W. Oman, 1♀ (OSU). *Wasco Co.:* 5 mi E of Mosier, Mayer State Park, 550 ft, May 23, 1959, 1♀ (OSU). 5 mi N of Dufur, May 5, 1938, K. Gray and J. Schuh, 1♂ (OSU). 5 mi W of The Dalles, May 7, 1971, J. Sawbridge, 5♂, 2♀ (OSU). 9 mi E of The Dalles, May 13, 1972, Musgrave, 2♂ (OSU). The Dalles, April 30, 1938, K. Gray, 1♂ (OSU). **Washington:** *Benton Co.:* Hanford Site ALE, Snively Ranch, May 4, 1994, R. S. Zack, 1♂, 1♀ (CNC).

Plagiognathus monardellae, new species
Figures 10, 17, 28

HOLOTYPE: Male: ''[USA] CALIFORNIA: Siskiyou Co., 6.9 mi S of Medicine Lk. on

Powder Hill Rd., 19 July 1985, collectors GM Stonedahl and JD McIver, ex: *Monardella odoratissima* (Labiatae)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the *moderately large* size, *pale grayish-green* coloration (fig. 10), *black antennae* (17), *relatively small eyes,* ovoid body form, form of the male genitalia (fig. 28), and the preference for *Monardella* as the host. Similar in size and coloration of the dorsum to *phaceliae* (fig. 11), but that species with antennal segment 1 almost entirely pale and the remaining segments at most moderately infuscate (fig. 17). Also possibly confused with *flavidus* and *guttatipes* on the coloration of the dorsum, but those species with largely pale antennae.

DESCRIPTION: *Male:* Moderately large; total length 3.95–4.30, length apex clypeus–cuneal fracture 2.68–2.87, width across pronotum 1.11–1.15. COLORATION (fig. 10): General coloration, including most of venter and appendages, pale gray-green or yellow-green; membrane weakly fumose, veins pale; antennae black (fig. 17) except for pale apical annulus on segment 1; apex of labium infuscate; thoracic sternum dark; abdominal venter variably infuscate; femora with some dark spots; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, pale, weakly golden, simple setae with some darker suberect setae on pronotum and anterolaterally on hemelytra. STRUCTURE: Body ovoid; frons moderately tumid as viewed from above, clypeus visible from above; anteocular distance 1.3 times diameter of antennal segment 1; head projecting below eye by 1.6 times diameter of antennal segment 1; labium reaching to near apex of hind coxae. GENITALIA (fig. 28): Vesica more or less J-shaped, body relatively slender, base falling well below base of secondary gonopore; posterior apical spine elongate, slender, straight, very weakly angled relative to body of vesica, anterior spine smoothly curving and only slightly longer than posterior; flange developed, terminating at level of base of secondary gonopore.

Female: Shorter and more strongly ovoid than male; coloration similar to male. Total length 3.70–3.93, length apex clypeus–cuneal fracture 2.57–2.73, width across pronotum 1.11–1.20.

ETYMOLOGY: Named for its occurrence on *Monardella* spp.

HOST: *Monardella odoratissima* (Lamiaceae).

DISTRIBUTION: Known only from the type locality in Siskiyou County, northern California.

PARATYPES: USA.—**California:** *Siskiyou Co.:* 6.9 mi S of Medicine Lake on Powder Hill Road, July 19, 1985, G. M. Stonedahl and J. D. McIver, 3♂, 12♀ (AMNH).

Plagiognathus morrisoni (Knight), new combination
Figures 10, 17, 28

Psallus morrisoni Knight, 1923: 464 (n. sp.).

DIAGNOSIS: Recognized by the *moderate size and mostly dark coloration* (fig. 10), *antennal segment 2 entirely dark* (fig. 17), and the *silvery, flattened, weakly scalelike setae on the dorsum,* pleuron, and abdominal venter intermixed with recumbent, shining, silvery, simple setae. Similar in coloration of the antennae and type of vestiture to *alnicenatus* (fig. 5), *astericola* (fig. 5), and *parshleyi* (fig. 11); distinguished from *astericola* by its slightly larger size, from *alnicenatus* by its blacker coloration and smaller size, and from *parshleyi* by its smaller size and dark femora. The bases of the corium and the cuneus are frequently pale in *morrisoni*

REDESCRIPTION: *Male:* Elongate, more or less parallel-sided, of moderate size; total length 3.30–3.85, length apex clypeus–cuneal fracture 2.22–2.57, width across pronotum 0.97–1.09. COLORATION (fig. 10): Almost entirely castaneous to nearly black; base of corium and base of cuneus frequently pale; corium narrowly pale adjacent to extreme base of membrane; membrane fumose, veins mostly pale; antennae black (fig. 17) except for pale apical annulus on segment 1; labium mostly pale, trochanters and adjoining areas of coxae and femora pale; femora narrowly pale at apex; tibial background coloration pale, dorsal tibial spines with dark spots at bases, spots frequently coalescing to form a banded appearance; tibiae black at femoral articulation. SURFACE AND VES-

TITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum, pleuron, and abdominal venter laterally composed of flattened, silvery, scalelike setae intermixed with recumbent, silvery, shining, simple setae. STRUCTURE: Lateral corial margins only very weakly convex; frons weakly convex, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 2 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 28): Body of vesica short, stout, broadly J-shaped, base of vesica falling well below level of secondary gonopore, apical spines forming a nearly right angle with body of vesica, anterior spine nearly straight; flange broad, reaching to about midpoint of secondary gonopore.

Female: Body form much more strongly ovoid than in males; antennal segment 2 slightly narrower than in male, weakly pale distally. Total length 2.92–3.36, length apex clypeus–cuneal fracture 2.05–2.42, width across pronotum 0.93–1.06.

HOST: Breeds on the Myricaceae, including species of *Comptonia* and *Myrica.*

DISTRIBUTION: Northeastern North America.

DISCUSSION: This species was described in *Psallus* by Knight (1923) because of the weakly scalelike setae on the dorsum. In all other attributes, including the male genitalia, it clearly belongs to *Plagiognathus.*

SPECIMENS EXAMINED: CANADA.—**New Brunswick:** Kouchibouguac Natl. Park, July 26, 1977, D. J. Brown, 1♂ (CNC). **Nova Scotia:** Ingonish, July 30, 1976, L. A. Kelton, *Salix* sp. (Salicaceae), 4♂ (CNC). **Ontario:** 25 mi E of Kenora, August 10, 1960, Kelton and Whitney, *Myrica* sp. (Myricaceae), 10♂, 13♀ (CNC). Constance Bay, August 24, 1932, G. S. Walley, *Myrica* sp. (Myricaceae), 14♂, 28♀ (CNC). Constance Bay, Pine Forest, July 18, 1991, M. D. Schwartz, *Comptonia peregrina* (Myricaceae), 3♂, 20♀ (CNC). Effingham, August 11, 1961, L. A. Kelton, 1♀ (CNC). Effingham, near Fonthill, June 23, 1955, O. Peck, 1♀ (CNC). Marmora, July 29, 1952, C. D. F. Miller, *Myrica* sp. (Myricaceae), 5♂, 9♀ (CNC). Muskoka, July 1, 1888, E. P. VanDuzee, 1♂ (USNM). North Bay, July 14, 1961, G. Brumpton, 1♂ (CNC). Norway Point, Lake of Bays, June 28, 1922, J. McDunnough, 3♂ (CNC). Shawanaga, July 26, 1962, Kelton and Thorpe, *Myrica* sp. (Myricaceae), 6♂, 11♀ (CNC). Trenton, July 22, 1901, Evans, 1♀ (CNC). Waterford, July 17, 1962, Kelton and Thorpe, 1♂ (CNC). **Quebec:** Kazubazua, August 17, 1927, G. S. Walley, 33♂, 42♀ (CNC). Laniel, July 6, 1963, L. A. Kelton, 8♂, 1♀ (CNC). Leclerville, August 7, 1961, G. Brumpton, 1♂ (CNC). Moosonee, July 18, 1934, G. S. Walley, 1♂ (CNC). New Richmond, August 6, 1954, J. E. H. Martin, 1♂, 1♀ (CNC). Schwarz, August 6, 1931, G. S. Walley, 5♂, 3♀ (CNC). Shawville, August 6, 1958, L. A. Kelton, 18♂, 13♀ (CNC). **Saskatchewan:** Fort a la Corne, July 17, 1925, K. M. King, 1♂ (CNC). USA.—**Connecticut:** Mansfield Center, August 9, 1956, J. A. Slater, 2♂ (AMNH). **Maine:** *Penobscot Co.:* Orono, August 3, 1906, ex Myricaceae, 2♂ (USNM). **Massachusetts:** *Suffolk Co.:* Boston, Arnold Arboretum, July 27, 1921, H. Morrison, paratypes: 1♂, 2♀ (USNM). Boston, Arnold Arboretum, July 27, 1921, Harold Morrison, *Comptonia* sp. (Myricaceae), paratypes:2♂, 10♀ (USNM); holotype male (USNM). Hyde Park, October 21, 1915, H. M. Parshley, *Solidago* sp. (Asteraceae), paratype: 1♂ (CAS). **Minnesota:** *Lake Co.:* Cramer, August 10, 1922, H. H. Knight, *Myrica gale* (Myricaceae), 12♂, 18♀ (USNM). Gabro Lake Portage, August 31, 1920, H. H. Knight, 3♂, 3♀ (USNM). *Pine Co.:* Willow River, August 7, 1922, H. H. Knight, 19♂, 21♀ (USNM). Willow River, August 7, 1922, H.H. Knight, *Myrica asplenifolia* (Myricaceae), 15♂, 15♀ (USNM). **New York:** *St. Lawrence Co.:* Cranberry Lake, August 19, 1920, C. J. Drake, 2♂ (USNM). **Pennsylvania:** *Centre Co.:* 1 mi W of Philipsburg on Rt 322, August 26, 1981, A. G. Wheeler, Jr., ex Myricaceae, 2♀ (PDA). *Dauphin Co.:* Enterline, July 15, 1921, T. L. Guyton, 1♂, 1♀ (USNM). *Lackawanna Co.:* Springbrook, August 25, 1945, R. I. Sailer, *Myrica asplenifolia* (Myricaceae), 3♂, 8♀ (USNM). *Luzerne Co.:* Stoddartsville, 480 m, July 18, 1998, M. D. Schwartz, 6♂, 4♀ (CNC). *Schuykill Co.:* 4 mi N of Rt 209 on I-80, August 11, 1973, A. G. Wheeler, Jr., *Comptonia peregrina*

(Myricaceae), 2♂, 1♀ (AMNH). I-81 4 mi N of Rt 209, August 11, 1973, A. G. Wheeler, Jr., *Comptonia peregrina* (Myricaceae), 3♂, 11♀ (PDA). *Unknown Co.:* Drumgold, July 16, 1920, T. L. Guyton, 1♂ (USNM). Pine Grove Forest, August 17, 1920, J. O. Pepper, 1♀ (USNM).

Plagiognathus mundus Van Duzee
Figures 10, 17, 28

Plagiognathus mundus Van Duzee, 1917b: 281 (n. sp.).

DIAGNOSIS: Recognized by its moderately large size, moderately elongate body form, yellowish to very weakly *greenish appearance of pale areas on dorsum,* anterior *pale portion of corium extending posteriorly down radial vein, often pale vertex, pronotal disc, and scutellum* (fig. 10), and relatively narrow and curving flange of vesica terminating near base of secondary gonopore (fig. 28). Possibly most easily confused with *paramundus* (fig. 11) by the far western distribution, dull appearance of the dorsum, and extension of pale anterior area of corium posteriorly along radial vein. Most specimens easily separated from *paramundus* by scutellum in that species being almost always pale laterally with a dark median stripe whereas when scutellum pale in *mundus* never with a median, longitudinal, dark stripe. Extension of pale basal area of corium posteriorly along radial vein also seen in *alboradialis* and *flavoscutellatus.*

REDESCRIPTION: *Male:* Parallel-sided to very elongate ovoid, moderately large; total length 3.85–4.60, length apex clypeus–cuneal fracture 2.63–3.15, width across pronotum 1.09–1.25. COLORATION (fig. 10): Background coloration of dorsum chocolate brown to castaneous, pale areas of dorsum with a distinctly yellowish or greenish cast; posterior margin of vertex broadly pale; disc of pronotum and much of scutellum frequently pale; corium pale basally, the area sometimes extensive, always extending posteriorly along radial vein and often along claval suture; clavus frequently pale along entire length, either along claval suture or just mesad of claval suture; costal vein ranging from entirely dark to entirely pale; cuneus and corium pale across cuneal fracture; membrane fumose, veins pale to orange, strongly contrasting with membrane; all antennal segments castaneous to black (fig. 17), antennal segment 1 with a narrow apical annulus; labium castaneous; venter mostly castaneous, including much of metathoracic scent-gland evaporatory area; coxae and femora ranging from mostly pale yellowish to largely castaneous, hind femora always infuscate at least on distal half; tibiae pale to moderately infuscate, dorsal spines with large dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, usually dull. Face more highly polished than remainder of body surface. Vestiture of dorsum composed of recumbent, silvery, shining, very weakly flattened setae. STRUCTURE: General form somewhat slender; frons very weakly convex, clypeus barely visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 28): Body of vesica only moderately stout and broadly curving, more or less J-shaped, base of vesica falling well below level of secondary gonopore; posterior apical spine long, nearly straight, almost erect relatively to body of vesica; anterior spine only slightly longer than posterior, weakly angled relative to body of vesica, and nearly straight in lateral view; flange narrow, curving, terminating slightly above base of secondary gonopore.

Female: Body distinctly shorter and more strongly ovoid than in male. Vertex, pronotum, and scutellum more extensively pale than in male. Total length 3.33–4.25, length apex clypeus–cuneal fracture 2.37–2.97, width across pronotum 1.03–1.28.

HOSTS: Although recorded from other plants, appears to breed primarily on *Urtica* spp. (Urticaceae).

DISTRIBUTION: Western North America, from Idaho and Washington in the north, south into Utah and the Central Valley of California.

DISCUSSION: My concept of *mundus* is based on the examination of the 20 paratypes listed under Specimens Examined.

SPECIMENS EXAMINED: USA.—**California:** *Alameda Co.:* Niles Canyon, June 13, 1917,

W. M. Giffard, paratypes: 8♂, 9♀ (CAS). *Alpine Co.:* SE of Markleesville on Rt 89, Toiyabe Natl. Forest, 6750 ft, July 5, 1994, M. D. Schwartz, *Urtica holosericea* (Urticaceae), 10♂, 6♀ (AMNH). *Butte Co.:* Chico, Bidwell Park, May 17, 1987–May 31, 1987, S. H. Dreistadt, *Ulmus procera* (Ulmaceae), 2♂, 1♀ (USNM). Oroville, June 24, 1927, H. H. Kelfer, *Salix* sp. (Salicaceae), 1♀ (CAS). Oroville, May 8, 1951, 1♂ (UCB). *Contra Costa Co.:* Moraga, May 4, 1976–June 28, 1977, D. G. Dennig, 2♂, 4♀ (UCB, UCD). No specific locality, June 14, 1917, W. M. Giffard, paratypes: 3♂ (CAS). *Del Norte Co.:* Klamath, July 18, 1934, E. P. Van Duzee, 1♀ (CAS). *Fresno Co.:* 2 km W of Kaiser Pass on USFS 80, 2600 m, July 25, 1999, M. D. Schwartz, 1♂, 3♀ (CNC). 5 km S of Big Creek on USFS 80, Huntington Lake Road, 1600 m, July 25, 1999, M. D. Schwartz, *Lupinus* sp. (Fabaceae), 8♂, 16♀ (AMNH, CNC). Shaver Lake Point, at weir on Stevenson Creek, 1600 ft, July 25, 1999, M. D. Schwartz, 1♂, 1♀ (CNC). *Humboldt Co.:* Beatrice, August 10, 1952, B. P. Brunson, 5♂, 12♀ (CAS). Beatrice, June 21, 1959, Kelton and Madge, 9♂, 9♀ (CNC). Bridgeville, June 20, 1959, Kelton and Madge, 1♀ (CNC). Eureka, June 22, 1959, Kelton and Madge, 1♂ (CNC). Shively, June 21, 1959, Kelton and Madge, 1♂ (CNC). *Kern Co.:* Fort Tejon, July 18, 1975, J. Doyen, ex Urticaceae, 1♂ (UCB). *Marin Co.:* Muir Woods, July 15, 1917, W. M. Giffard, 2♂, 5♀ (CAS). *Mono Co.:* 4 mi E of Monitor Pass on Rt 89, July 15, 1966, J. Powell, 1♂, 3♀ (UCB). *Sacramento Co.:* Sacramento, American River, June 15, 1985, C. B. Barr, 2♀ (LSU). *Shasta Co.:* 5 mi N of Cassel, July 15, 1947, C. A. Hanson, 1♂ (UCB). Millville, June 16, 1959, Kelton and Madge, 1♀ (CNC). *Siskiyou Co.:* Hornbrook, June 14, 1959, Kelton and Madge, 1♂, 1♀ (CNC). *Trinity Co.:* Deer Creek, August 2, 1973, T. Griswold, 4♂ (PUC). *Tulare Co.:* 5 mi W of Three Rivers, Terminus Res. Camp, June 16, 1971, M. H. Sweet, 9♂, 1♀ (TAMU). **Idaho:** *Bannock Co.:* 3 mi E of McCammon, June 29, 1966, W. Gagne and J. Haddock, 1♂ (UCB). *Blaine Co.:* 20 mi N of Shoshone, Big Wood River, July 1, 1966, W. Gagne and J. Haddock, *Urtica* sp. (Urticaceae), 14♂, 9♀ (UCB). **Nevada:** *Eureka Co.:* 23 mi W of Carlin, Humboldt River, W. Gagne, 2♂ (UCB). **Oregon:** *Jackson Co.:* Siskiyou Summit, Old Road, 1260 m, July 22, 1999, M. D. Schwartz, *Phacelia* sp. (Hydrophyllaceae), 1♀ (CNC). *Klamath Co.:* Geary Ranch at Wocus Bay, 1280 m, July 10, 1979, R. T. and Joe Schuh, *Urtica lyalli* (Urticaceae), 8♂, 13♀ (AMNH). Klamath Falls, Algoma, July 19, 1946, Joe Schuh, 2♂, 1♀ (OSU). *Morrow Co.:* 26 mi E of Heppner, July 12, 1960, P. Oman, 2♀ (OSU). **Utah:** *Box Elder Co.:* Willard Basin, July 15, 1964, G. F. Knowlton, 1♂ (USU). *Cache Co.:* Ricks Spring, July 24, 1943, G. F. Knowlton, 1♂ (USU). *Utah Co.:* American Fork Canyon, July 21, 1954, 1♂ (USU). **Washington:** *King Co.:* Seattle, July 7, 1917, W. M. Giffard, 1♂ (CAS).

Plagiognathus negundinis Knight
Figures 10, 17, 28

Plagiognathus negundinis Knight, 1929c: 263 (n. sp.).

Plagiognathus negundinis fulvotinctus Knight, 1929c: 264 (n. var.)

DIAGNOSIS: Recognized by *dorsum, venter, and antennal segments 1 and 2 being entirely castaneous* (figs. 10, 17), *legs pale with some dark markings*, and the *elongate, nearly parallel-sided* body form. Similar to *rideri* (fig. 12) and specimens of *obscurus* (fig. 10: *obscurus* 4) with almost totally dark dorsum. Distinguished from *obscurus* by the narrowly pale area of the corium adjacent to the extreme base of the membrane and the at least faintly pale base of the cuneus in that species. Veins and membrane completely and intensely dark in *rideri*; membrane not so strongly darkened in *negundinis* and *obscurus* and veins pale along posterior margin of cells in both species. Vesica of *negundinis* distinct from that of both *obscurus* and *rideri* (compare figs. 28, 29, 31). Also similar in appearance to *dispar* (fig. 7), but antennal segment 2 in that species mostly pale.

REDESCRIPTION: *Male:* Moderately large, elongate, nearly parallel-sided; total length 3.75–4.09, length apex clypeus–cuneal fracture 2.74–2.84, width across pronotum 1.20–1.26. COLORATION (fig. 10): Dorsum castaneous, vertex tending toward pale; membrane and veins fumose, except veins pale

along posterior margin of cells; antennal segment 1 castaneous with pale apical annulus, segments 2, 3, and 4 castaneous; labium pale; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs, including coxae, pale yellow-white; hind femora with some dark spots; dorsal tibial spines with obvious dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Entire body surface smooth, moderately shining. Vestiture of dorsum composed of recumbent, weakly golden, simple setae. STRUCTURE: Relatively slender, corial margin nearly straight; frons weakly convex, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to near apex of hind coxae. GENITALIA (fig. 28): Vesica strongly curving, sigmoid, base falling somewhat below level of base of secondary gonopore; apical spines long, posterior spine relatively broad at base, tapering to apex, weakly angled relative to body of vesica, anterior spine at right angle to body of vesica, substantially longer than posterior, apical portion narrow; flange moderately broad, extending beyond main body of vesica, terminating at base of secondary gonopore.

Female: Body more strongly ovoid than in male; coloration as in male. Total length 3.70–3.88, length apex clypeus–cuneal fracture 2.70–2.76, width across pronotum 1.24–1.25.

HOST: *Acer negundo* (Aceraceae).

DISTRIBUTION: Known from limited localities ranging from Quebec to Saskatchewan in the north, and from Iowa and Texas farther south.

DISCUSSION: Knight (1929c) described the variety *negundinis fulvotinctus,* designating a female as the type. Although the coloration of the legs and antennae are very much like that of most of the specimens that Knight treated as typical *negundinis,* much of the anterior half of the corium and the cuneus is pale. I continue to treat this name as a color variant under *negundinis,* although it does not easily fit my concept of the species; without recourse to the male genitalia, resolution of this issue is made more difficult.

SPECIMENS EXAMINED: CANADA.—**Ontario:** St. Ann's, June 9, 1962, Kelton and Thorpe, 1♂ (CNC). Tillsonburg, June 20, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂ (CNC). **Quebec:** Mt. Albert, July 25, 1954, W. J. Brown, 1♀ (CNC). **Saskatchewan:** Saskatoon, July 17, 1951, A. R. Brooks, 1♀ (CNC). Saskatoon, July 20, 1955, A. R. Brooks, 1♂ (CNC). Saskatoon, June 2, 1958, A. R. Brooks, *Acer negundo* (Aceraceae), 1♂, 1♀ (CNC). Saskatoon, June 6, 1956, A. R. Brooks, *Acer negundo* (Aceraceae), 1♀ (CNC). USA.—**Iowa:** *Story Co.:* Ames, June 10, 1928, H. M. Harris, 1♀ (TAMU). Ames, June 19, 1927–June 20, 1928, H. H. Knight, paratypes: 20♂, 20♀ (USNM); holotype male (USNM). **Minnesota:** *Hennepin Co.:* Fort Snelling, July 10, 1924, H. H. Knight, holotype male (*fulvotinctus*) (USNM). **Texas:** *Travis Co.:* Zilker Park, April 3, 1985, P. W. Kovarik, *Acer negundo* (Aceraceae), 5♂, 5♀ (TAMU).

Plagiognathus nigronitens Knight
Figures 10, 18, 28

Plagiognathus nigronitens Knight, 1923: 435 (n. sp.).
Plagiognathus nigritibialis Knight, 1964: 148 (n. sp.). NEW SYNONYMY.
Plagiognathus nicholi Knight 1964: 147 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Recognized by *small* size and generally *black* coloration (fig. 10), including body, antennae (fig. 18), and most of legs. Most similar in size, general appearance, and coloration to *amorphae* (fig. 5), *astericola* (fig. 6), and possibly *morrisoni* (fig. 10); easily separated by those species having appressed, weakly scalelike setae on dorsum, thoracic pleuron, and venter of pregenital abdominal segments, whereas *nigronitens* with golden, shining, recumbent, simple setae on pronotum, scutellum, and anterior one-half of corium and clavus and dark, recumbent, simple setae on posterior one-half of corium. *Plagiognathus nigronitens* and males of *astericola* with antennal segment 2 entirely black; *nigronitens* sometimes with antennal segment 2 white on distal one-fourth to one-third as in *amorphae* (fig. 10) (see Discussion below).

REDESCRIPTION: *Male:* Relatively small, elongate ovoid; total length 2.84–3.17,

length apex clypeus–cuneal fracture 1.96–2.19, width across pronotum 0.92–1.02. COLORATION (fig. 10): General coloration nearly black, posterior margin of vertex weakly pale to pale; membrane and veins fumose, posterior margin of veins and adjoining small, triangular patch at posteromesial margin of cuneus pale; antennal segment 1 entirely dark, without obvious pale apical annulus, segment 2 dark or pale on apical one-half (fig. 18) (see Discussion below), segments 3 and 4 pale; labium castaneous; venter, including metathoracic scent-gland evaporatory area, entirely castaneous to nearly black; coxae, trochanters, and all but apex of femora castaneous; dorsal tibial spines with black spots at bases; tibiae black at articulation with femora; tibiae sometimes mostly black on proximal one-half of dorsal surface, much of ventral surface pale or nearly so. SURFACE AND VESTITURE: Dorsum weakly transversely rugulose, dull to very weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae on pronotum, scutellum, and anterior one-half of corium, posterior half of corium with dark, dull, simple setae. STRUCTURE: Body relatively broad, flattened; frons nearly straight across in dorsal view, barely projecting beyond anterior margin of eyes, clypeus not visible from above; anteocular distance 0.5 times diameter of antennal segment 1; head projecting below eye by 0.6 times diameter of antennal segment 1; labium short, not quite reaching apex of middle coxae. GENITALIA (fig. 28): Body of vesica strongly curving, base of vesica reaching level of secondary gonopore; posterior apical spine smoothly curving, anterior spine slightly longer than posterior and more strongly curving subapically; flange moderately broad, reaching to about base of secondary gonopore.

Female: Coloration as in male; body more strongly ovoid. Total length 2.78–3.10, length apex clypeus–cuneal fracture 1.98–2.14, width across pronotum 0.94–0.98.

HOSTS: Apparently breeds on *Helianthus* spp. and *Solidago* spp. (Asteraceae), although also recorded from a variety of other plants.

DISTRIBUTION: Widely distributed in eastern North America, although not known from the Maritime Provinces or from the Gulf Coast.

DISCUSSION: Most specimens assigned to *nigronitens* have antennal segment 2 entirely black. Specimens recorded from Jasper County, Indiana, Douglas County, Kansas, Benton County, Missouri, and Magnolia, North Carolina, have the distal half of antennal segment 2 pale and are consistently smaller than those with antennal segment 2 entirely black. The genitalia of specimens with the two types of antennal coloration are substantially similar, however, and for this reason I am not treating them as separate species. This situation merits closer examination in the field.

Knight (1964) stressed the variation in length of the labium as important in discriminating his new species *nicholi* and *nigritibialis*; there is some variation in the length of the labium, but my observations suggest that it is not consistent with other characteristics, such as overall size or antennal coloration. For these reasons I have chosen to treat all specimens as pertaining to a single species. Other external features and the male genitalia indicate that *nicholi* Knight is the same as *nigronitens* Knight. Comparison of the holotype of *nigritibialis* Knight with the holotype and other specimens of *nigronitens* indicates that the coloration of the tibiae in this species can be quite variable, with the hind tibiae being heavily infuscate over much of their length in the holotype of *nigronitens.*

SPECIMENS EXAMINED: CANADA.—**Alberta:** Drumheller, August 11, 1957, A. and J. Brooks, 1♂ (CNC). **Manitoba:** Aweme, July 17, 1930, R. M. White, 2♀ (CNC). Bincarth, July 18, 1954, Brooks and Wallis, 1♂, 3♀ (CNC). Boissevain, July 17, 1953, Brooks and Kelton, 17♂, 15♀ (CNC). Elva, July 8, 1948, R. D. Bird, 1♂ (CNC). Horton, July 25, 1953, Brooks and Kelton, 1♀ (CNC). Horton, July 28, 1958, A. and J. Brooks, 2♂ (CNC). Pine Mound, July 31, 1958, A. and J. Brooks, 1♀ (CNC). Turtle Mt. Forest Reserve, Internation Peace Gardens, July 17, 1958, R. L. Hurley, 1♀ (CNC). Turtle Mt., July 17, 1953, Brooks and Kelton, 5♂, 12♀ (CNC). Turtle Mt., July 28, 1953, Brooks and Kelton, 3♀ (CNC). Virden, July 10, 1953, Brooks and Kelton,

Solidago glycyrrhiza (Asteraceae), 12♂, 16♀ (CNC). Virden, July 12, 1953, Brooks and Kelton, 2♂ (CNC). **Ontario:** Exeter, July 12, 1962, Kelton and Thorpe, 1♀ (CNC). Fuller, July 4, 1964–July 12, 1971, D. G. Reid and C. C. Loan, *Solidago canadensis* (Asteraceae), 12♂, 5♀ (CNC). Gore Bay, July 10, 1961, G. Brumpton, 2♂, 1♀ (CNC). Lakefield, June 28, 1962, G. Thorpe, 1♀ (CNC). Leamington, June 26, 1921, G. S. Walley, 2♂, 2♀ (CNC). Marmora, July 10, 1952, J. R. Vockeroth, 1♂, 4♀ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 1♂ (CNC). Oakland, July 17, 1962, Kelton and Thorpe, 6♂, 9♀ (CNC). Orillia, June 29, 1962, G. Thorpe, *Salix* sp. (Salicaceae), 1♂, 2♀ (CNC). Ottawa, July 1, 1914, G. Beaulieu, 4♂, 3♀ (CNC). Ottawa, July 3, 1912, E. P. Van Duzee, 1♂ (CNC). Pt. Elgin, July 2, 1962, G. Thorpe, 1♂ (CNC). Queenston, July 8, 1955, L. A. Kelton, 1♀ (CNC). Simcoe, July 2, 1915, N. G. Crawford, 1♀ (CNC). Sundridge, July 13, 1961, G. Brumpton, 4♂, 5♀ (CNC). Tillsonburg, July 14, 1955, L. A. Kelton, 5♂, 5♀ (CNC). Vienna, July 18, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂, 2♀ (CNC). Waterford, July 17, 1962, Kelton and Thorpe, 2♂, 1♀ (CNC). **Quebec:** Cap Rouge, July 10, 1953, R. Lambert, 1♀ (CNC). Otter Lake, July 24, 1958, L. A. Kelton, 1♂ (CNC). Quyon, July 22, 1958, L. A. Kelton, *Salix* sp. (Salicaceae), 1♀ (CNC). Shawville, July 22, 1958, L. A. Kelton, 1♂ (CNC). Thurso, August 20, 1958, L. A. Kelton, 1♂ (CNC). **Saskatchewan:** Estevan, July 23, 1958, A. and J. Brooks, 1♂, 1♀ (CNC). Lebret, July 5, 1951, A. R. Brooks, 4♂, 3♀ (CNC). Wood Mountain, August 5, 1955, A. R. Brooks, 1♂, 3♀ (CNC). USA.—**Colorado:** *Archuleta Co.:* Pagosa Springs, C. H. Baker, 1♂ (USNM). *Costilla Co.:* Fort Garland, July 6, 1982, D. A. and J. T. Polhemus, 1♂ (JTP). Fort Garland, Ute Creek Ranch, August 11, 1925, H. H. Knight, 1♂, 5♀ (USNM). Fort Garland, Ute Creek Ranch, August 11, 1925, H. H. Knight, paratypes (*nicholi*): 2♂ (CNC). *Douglas Co.:* Waterton, Head of Hiline, June 16, 1978, J. T. Polhemus, 1♂ (JTP). Waterton, June 4, 1981–June 16, 1981, D. A. Polhemus, 3♂, 4♀ (JTP). *Jefferson Co.:* Red Rocks Park, July 7, 1983, D. A. Polhemus, *Helianthus* sp. (Asteraceae), 3♂, 8♀ (JTP). *Larimer Co.:* Estes Park, July 10, 1964, H. H. Knight, 4♂, 4♀ (USNM). Fort Collins, June 12, 1900, 2♀ (USNM). **Connecticut:** Mansfield Center, June 21, 1959–July 14, 1967, J. A. Slater, 5♂, 4♀ (AMNH). **Illinois:** *Jackson Co.:* Fountain Bluff, May 15, 1932, Frison, Ross, Mohr, 1♀ (AMNH). *Scott Co.:* Princeton, Cattail Bog, July 2, 1937, Mohr and Burke, 1♂ (AMNH). **Indiana:** *Cass Co.:* Logansport, July 5, 1979, T. J. Henry, 2♂, 5♀ (USNM). *Jasper Co.:* No specific locality, July 6, 1935, A. W. Tripp, 1♂, 1♀ (USNM). **Iowa:** *Boone Co.:* No specific locality, June 22, 1962, J. C. Schaffner, 1♂ (TAMU). *Dickinson Co.:* Silver Lake, T100N R38W, July 8, 1963, J. C. Schaffner, 5♂, 3♀ (TAMU). **Kansas:** *Douglas Co.:* 6 mi NE of Lawrence, Rockefeller Tract, June 15, 1976, T. W. Oldham, 6♀ (TAMU). *Linn Co.:* No specific locality, 862 ft, July 1, 1915, R. H. Beamer, 2♀ (KU). *Riley Co.:* near Manhattan, July 1, 1965, J. Cornell and H. D. Blocker, 2♂ (OSU). **Maryland:** *Wicomico Co.:* Johnson Wildlife Refuge, June 20, 1981, T. J. Henry, 1♂, 14♀ (USNM). **Massachusetts:** *Essex Co.:* Beach Bluff, July 24, 1914, H. M. Parshley, 1♀ (CAS). Danvers, July 3, 1900, paratype: 1♂ (CAS). *Hampden Co.:* Springfield, July 13, 1905, paratype: 1♂ (CAS). *Middlesex Co.:* Holliston, N. Banks, 1♀ (AMNH). **Minnesota:** *Hennepin Co.:* Minneapolis, July 5, 1922, Arthur Hartig, 1♂, 3♀ (USNM). No specific locality, July 12, 1919, H. H. Knight, paratypes: 2♂, 2♀ (USNM). *Norman Co.:* No specific locality, June 20, 1922, A. A. Nichol, paratypes (*nicholi*): 1♂, 1♀ (CNC); holotype (*nicholi*) (USNM). **Mississippi:** *Alcorn Co.:* Corinth, May 25, 1931, H. G. Johnston, 3♂, 9♀ (TAMU). *Prentiss Co.:* Booneville, May 26, 1931, H. G. Johnston, 2♀ (TAMU). *Stone Co.:* Wiggins, April 25, 1931, H. G. Johnston, 5♂, 10♀ (TAMU); holotype male (*nigritibialis*) (USNM). **Missouri:** *Benton Co.:* Jct Hwys 65 & 32, June 17, 1982–June 4, 1983, R. L. Blinn, *Helianthis mollis* (Asteraceae), 4♂, 2♀ (USNM). *Vernon Co.:* 4 mi E of Milo, July 13, 1966, J. C. Schaffner, 1♂ (USNM). 4 mi E of Milo, June 13, 1960, J. C. Schaffner, 4♂, 5♀ (TAMU). Osage Prairie, June 4, 1983, R. L. Blinn, *Helianthus mollis* (Asteraceae), 1♂, 3♀ (DAR). **New Jersey:** *Bergen Co.:* Ram-

sey, July 6, 1912, 1♀ (AMNH). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 2♂ (PDA). Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 2♂, 9♀ (AMNH). Rensselaerville, July 17, 1944, Kendeigh, 1♀ (USNM). *Allegany Co.:* Alfred University, July 31, 1988, A. G. Wheeler, Jr., *Lonicera* sp. (Caprifoliaceae), 4♀ (PDA). *Delaware Co.:* Cadosia, July 6, 1974, K. R. Valley, *Pastinaca sativa* (Apiaceae), 2♂ (PDA). *Genesee Co.:* Batavia, July 27, 1915, H. H. Knight, 2♀ (CNC, USNM). Batavia, July 27, 1915, H. H. Knight, paratypes: 2♂, 2♀ (CAS); holotype male (USNM). *Monroe Co.:* Honeoye Falls, July 23, 1915, M. D. Leondard, 1♀ (PDA). *Oneida Co.:* near Sangerfield on Rt 20, September 6, 1973, A. G. Wheeler, Jr., *Solidago* sp. (Asteraceae), 1♀ (PDA). *St. Lawrence Co.:* Cranberry Lake, July 8, 1920, R. J. Sim, 1♀ (PDA). *Suffolk Co.:* Oyster Bay, Planting Fields Arboretum, July 1, 1982, A. G. Wheeler, Jr., 3♂, 1♀ (PDA). *Tompkins Co.:* Ithaca, Cornell University, June 27, 1982–July 8, 1979, A. G. Wheeler, Jr., 7♂, 4♀ (PDA). Michigan Hollow, May 25, 1974, A. G. Wheeler, Jr., *Alnus* sp. (Betulaceae), 1♂ (PDA). **North Carolina:** *Unknown Co.:* Magnolia, May 26, 1964, J. F. Cornell, 1♀ (USNM). **North Dakota:** *Benson Co.:* No specific locality, July 17, 1941, 1♂ (DAR). *Oliver Co.:* 2 mi E of Hensler, July 20, 1978, L. A. Schutz and J. W. Smith, 4♂, 5♀ (DAR). **Pennsylvania:** *Bedford Co.:* Pleasantville, July 2, 1980, A. G. Wheeler, Jr., *Achillea millefolium* (Asteraceae), 2♂ (PDA). *Berks Co.:* Leesport, July 1, 1970, 1♂, 1♀ (PDA). *Butler Co.:* Butler, Eisler Nurseries, July 13, 1978, 2♂, 1♀ (PDA). *Centre Co.:* Scotia Barrens, July 9, 1979–June 25, 1988, K. R. Valley, A. G. Wheeler, Jr., 3♂, 2♀ (PDA). *Cumberland Co.:* Mount Holly Springs, July 7, 1964, F. B. Negley, 1♀ (PDA). *Dauphin Co.:* Dauphin, July 4, 1900, 1♂ (PDA). E of Harrisburg at Nye and Willoughby Rds, June 10, 1975, A. G. Wheeler, Jr., *Vitis* sp. (Vitaceae), 1♂ (PDA). Harrisburg, East Harrisburg Cemetery, June 4, 1979, A. G. Wheeler, Jr., *Azalea* sp. (Ericaceae), 1♂ (PDA). Harrisburg, June 26, 1967, G. B. Sleesman, 3♂, 4♀ (PDA). Hershey, June 1, 1975, A. G. Wheeler, Jr., *Nepeta cataria* (Lamiaceae), 1♂ (PDA). Middle Paxton Township, Rt 443, Fishing Creek Valley School, June 22, 1978, A. G. Wheeler, Jr., *Potentilla* sp. (Rosaceae), 3♂, 1♀ (PDA). *Erie Co.:* Girard, Elk Creek Nursery, July 9, 1976, A. G. Wheeler, Jr., *Althaea rosea* (Malvaceae), 1♂, 1♀ (PDA). *Luzerne Co.:* Newport Township, July 10, 1969, C. L. Semmel, 3♀ (PDA). Rice Township, Andy Pond, July 14, 1979, A. G. Wheeler, Jr., *Rosa* sp. (Rosaceae), 1♀ (PDA). *Pike Co.:* Shohola Township, July 11, 1969, C. L. Semmel, 1♂ (PDA). *Unknown Co.:* Patton, July 6, 1906, M Wirtner, 1♂ (PDA). *Westmoreland Co.:* Charter Oak, July 2, 1917, H. B. Kirk, 2♀ (PDA). Greensburg, July 22, 1903, M. Wirtner, 1♂ (PDA). Greensburg, July 3, 1901, 1♂, 1♀ (PDA). **South Dakota:** *Roberts Co.:* 11 mi SE of Rosholt, Lake Traverse, July 3, 1974, B. Tollefson, 2♀ (UCB). *Unknown Co.:* Copa, June 1, 1921, H. C. Severin, 2♀ (USNM). **Texas:** *Dallas Co.:* No specific locality, April 23, 1938, R. K. Fletcher, 1♂, 1♀ (TAMU). No specific locality, July 1, 1936, S. Jones, 1♂ (USNM). **Virginia:** *James City Co.:* Williamsburg, May 24, 1986, A. G. Wheeler, Jr., 1♂ (PDA). **West Virginia:** *Greenbrier Co.:* Alvon on Rt 92, July 25, 1978, A. G. Wheeler, Jr., *Populus tremuloides* (Salicaceae), 1♀ (PDA). *Jefferson Co.:* No specific locality, August 23, 1980, T. L. Mason, Jr., 1♀ (PDA). Shepherd College, May 30, 1980, A. G. Wheeler, Jr., 1♀ (PDA). *Mineral Co.:* Paterson Creek Road near Grant County line, June 10, 1970, A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 1♂, 1♀ (PDA). *Tucker Co.:* Blackwater River, Canaan Valley, Rt 22, July 17, 1977, T. J. Henry, 1♀ (USNM). Dolly Sods Wilderness Area, June 17, 1978, A. G. Wheeler, Jr., *Achillea millefolium* (Asteraceae), 1♀ (PDA). **Wisconsin:** *Dunn Co.:* Colfax, August 9, 1916, J. G. Saunders, 1♂ (PDA).

Plagiognathus notodysmicos, new species
Figures 11, 18, 29

HOLOTYPE: Male: ''[USA] Pagosa Sprs., Colo[rado], Aug. 12, 1925, H. H. Knight''. Deposited in the United States National Museum of Natural History, Washington, D.C.

DIAGNOSIS: Recognized by *basal half of corium being intensely yellow white, extend-*

ing narrowly along posterior portion of claval suture and *cuneus intensely and entirely yellow-white, opaque* (fig. 11). Most similar in pattern of coloration and elongate parallel-sided body shape to *Plagiognathus obscurus,* but distinguished by narrowly pale corium along the posterior half of clavus, and by entirely pale, opaque cuneus, a pattern occurring only rarely in *obscurus.* Vesica of *notodysmicos* (fig. 29) lacking broad flange of *obscurus* and body of vesica not so robust (fig. 29).

DESCRIPTION: *Male:* Elongate, nearly parallel-sided, moderately large; total length 3.93–4.46, length apex clypeus–cuneal fracture 2.47–2.93, width across pronotum 1.07–1.25. COLORATION (fig. 11): Background coloration of dorsum brown to castaneous, corium intensely yellow-white on basal one-half, the posterior margin of this area jagged and extending narrowly along remaining posterior portion of the claval suture; cuneus entirely and intensely yellow-white, opaque; pronotum often pale on disc; posterior margin of vertex pale; face at and below base of clypeus intensely castaneous; membrane fumose, veins fumose except opaque white along posterior margin of cells, membrane pale at angle between posterior margin of cells and posteromesial margin of cuneus; all antennal segments castaneous to black (fig. 18), segment 1 with pale apical annulus; labium castaneous; venter entirely castaneous, including metathoracic scent-gland evaporatory area; coxae castaneous on proximal one-half, pale distally, trochanters pale, femora pale on proximal one-third, weakly infuscate on remainder with some darker spots; tibiae with pale background coloration, dorsal tibial spines with conspicuous dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, polished, moderately shining. Face at and below base of clypeus more highly polished than remainder of body surface. Vestiture of dorsum composed of recumbent, shining, simple setae, pale on pale areas, dark on dark areas. STRUCTURE: Elongate, dorsum appearing flattened; frons moderately convex, clypeus visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by a distance 1.3 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 29): Body of vesica moderately stout, broadly curving, J-shaped, base of vesica falling distinctly below level of base of secondary gonopore; posterior apical spine moderately long, nearly straight and nearly erect relative to body of vesica; anterior spine more strongly angled relative to body of vesica, only slightly longer than posterior spine, and nearly straight in lateral view; flange narrow, broadly curving, extending to base of secondary gonopore.

Female: Body shape and coloration very similar to that of male. Total length 3.79–4.22, length apex clypeus–cuneal fracture 2.49–2.86, width across pronotum 1.15–1.28.

ETYMOLOGY: From the Greek *notos,* south, and *dysmikos,* western, alluding to its distribution.

HOSTS: Unknown.

DISTRIBUTION: Known from Arizona, New Mexico, and Colorado.

DISCUSSION: The general appearance of this species is very much like that of *Plagiognathus obscurus,* although *notodysmicos* has an opaque white aspect to the pale marking on the dorsum unlike that ordinarily seen in *obscurus.* The two taxa appear to be largely, if not totally, allopatric. Nothing is known of the habits of *notodysmicos,* although it would appear that most of the known specimens have been collected inadvertently through sweeping or other techniques; the single specimen from Stonewall, Colorado, was collected sweeping in a meadow. The vesica of *notodysmicos* is unlike that of *obscurus,* especially in the narrow flange and much more slender body, removing any doubt about the fact that two taxa are involved.

PARATYPES: USA.—**Arizona:** *Coconino Co.:* Oak Creek Canyon, 6000 ft, F. H. Snow, 1♂, (AMNH). *Yavapai Co.:* 2 mi NE of Sheeps Crossing, White Mountains, Greer Rec. Area, June 26, 1980, J. D. Pinto, 1♂, 1♀ (UCR). **Colorado:** *Archuleta Co.:* Pagosa Springs, July 5, 1937, C. L. Johnston, 1♂, 1♀ (KU). Pagosa Springs, August 12, 1925, H. H. Knight, 1♂ (USNM). 16 mi N of Pagosa Springs, June 24, 1964, H. R. Burke, 1♂, (TAMU). *Las Animas Co.:* 1 mi

E of Stonewall, Fire Dept., 7400 ft, August 18, 1986, R. T. Schuh, 1♀ (AMNH). *Montezuma Co.:* Dolores, August 15, 1925, H. H. Knight, 1♀ (USNM). **New Mexico:** *Lincoln Co.:* Ruidoso, June 26, 1940, R. H. Beamer, 1♂ (KU). *San Miguel Co.:* Beulah, August 17, 1915, H. Skinner, 2♂ (USNM). *Sandoval Co.:* Jemez Springs, July 1, 1941, R. H. Beamer, 1♂, 1♀ (KU).

Plagiognathus obscurus Uhler
Figures 10, 18, 29, 34

Plagiognathus obscurus Uhler, 1872: 418 (n. sp.).
Plagiognathus annulatus: Knight, 1923: 442 (misidentification).
Plagiognathus obscurus albocuneatus Knight, 1923: 438 (n. var.).
Plagiognathus annulatus cuneatus Knight, 1923: 442 (n. var.). NEW SYNONYMY.
Plagiognathus annulatus nigrofemoratus Knight, 1923: 443 (n. var.). NEW SYNONYMY.

DIAGNOSIS: Base of *corium pale and at least basal portion* of cuneus usually pale (fig. 10: *obscurus* 1, 2), a pattern of coloration also occurring in several other large, widespread, frequently collected species of *Plagiognathus*; less commonly entire dorsum dark (fig. 10: *obscurus* 4). Distinguished from *brunneus* (fig. 6) by neat appearance of *golden, shining setae on dorsum,* generally yellowish cast of pale areas on dorsum, and pale anterior area of corium angled along posterior margin and usually extending posteriorly along clavus in males (fig. 10). In *brunneus* (fig. 6), pale anterior area of corium whitish rather than yellowish, posterior margin of area often nearly transverse, irregular and not angled posteriorly along clavus, and setae on dorsum silvery. *Plagiognathus obscurus* usually with pronotum and scutellum entirely dark; however, some populations with pronotum pale on disc and with scutellum pale laterally (fig. 10: *obscurus* 3). Unequivocally distinguished from *brunneus* only by form of vesica, *obscurus* with *body of vesica very stout and strongly curved, forming a distinct ''U''*, with base of vesica falling above level of base of secondary gonopore (fig. 29); body of vesica in *brunneus* (fig. 22) only moderately stout, with open curve at base and with base of vesica falling slightly below base of gonopore. Furthermore, flange broad—and broad over much of length—and nearly straight along most of exposed length in *obscurus,* whereas flange in *brunneus* smoothly curving over entire length (see also Discussion below).

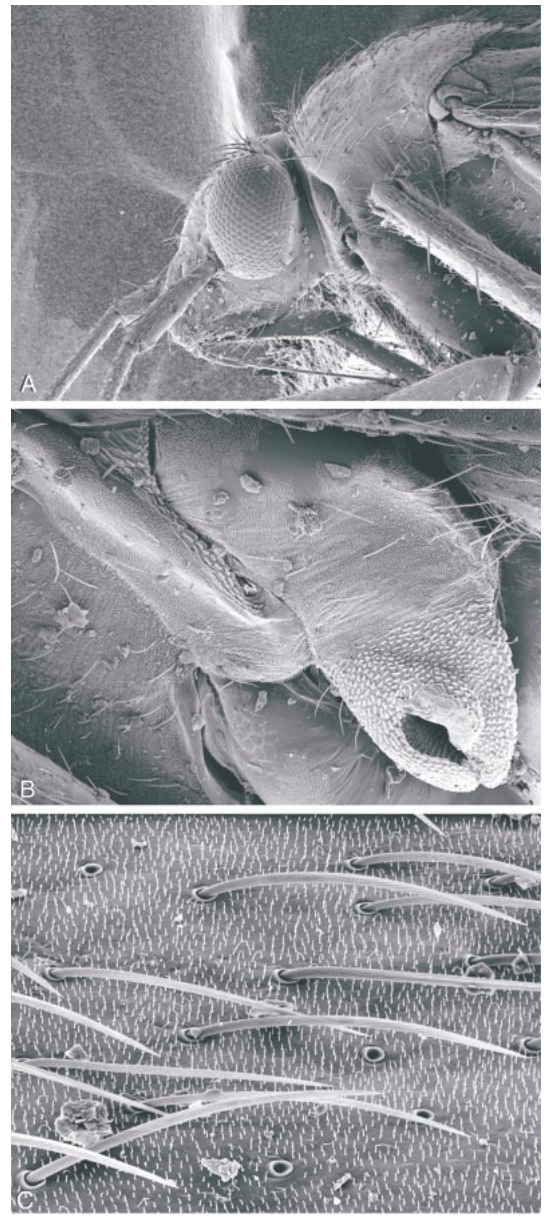

Fig. 34. *Plagionathus obscurus,* male, scanning micrographs. **A.** Lateral view of head. **B.** Metathoracic spiracle and metathoracic scent-gland evaporatory area. **C.** Hemelytral vestiture.

Plagiognathus notodysmicos (fig. 11) very

similar in size and general pattern of coloration to *obscurus*; *notodysmicos* distinguished by the opaque quality of the white areas on the corium and the cuneus (fig. 11) and by the form of the male genitalia, *notodysmicos* (fig. 29) having the flange on the vesica very narrow relative to that of *obscurus* and terminating at the base of the secondary gonopore. The distributions of the two species also appear to be largely nonoverlapping.

Plagiognathus obscurus also similar to *alboradialis, flavoscutellatus,* and *paramundus* in general coloration, but pale area of corium extending posteriorly along radial vein in those species, whereas this is so in only some western populations of *obscurus* (see fig. 10: *obscurus* 3). Antennal segment 2 longer in *alboradialis* and *paramundus* than in *obscurus*; body broader in *flavoscutellatus* than in *obscurus.* Color pattern of hemelytra in *obscurus* similar to that of *brevirostris,* but the latter with labium reaching at most to apex of middle coxae, whereas labium always longer in *obscurus.*

Specimens of *obscurus* with dorsum completely dark, separated from *annulatus* (fig. 5) by that species having no pale markings on the hemelytra and having antennal segment 2 with a broad, pale, median annulus, this being especially pronounced in females; *obscurus* always with corium narrowly pale adjacent to extreme base of membrane and at least very narrowly pale at cuneal fracture and with antennal segment 2 entirely dark. Furthermore, *annulatus* very nearly black, whereas *obscurus* brown to castaneous.

REDESCRIPTION: *Male:* Elongate, usually nearly parallel-sided, moderately large to large; total length 3.23–4.56, length apex clypeus–cuneal fracture 2.43–3.10, width across pronotum 1.10–1.28. COLORATION (fig. 10): Background coloration of dorsum brown to castaneous, sometimes entirely so with pale on corium only narrowly along cuneal fracture and narrowly adjacent to extreme base of membrane; more commonly dorsum with some pale areas, these being weakly to distinctly yellowish on basal one-third to one-half of corium, posterior margin of this area usually angled posteriorly towards apex of clavus and basal one-third to entire cuneus; costal vein dark to weakly pale; corium always narrowly pale adjacent to extreme base of membrane; membrane fumose, veins usually pale; posterior margin of vertex pale; pronotum and scutellum usually entirely dark, but disc of pronotum pale and scutellum pale laterally in some populations, especially in the far west and north; all antennal segments castaneous to black (fig. 18), although segments 3 and 4 sometimes appearing only weakly infuscate and antennal segment 1 with a pale apical annulus; labial segment 1 castaneous, remainder of labium mostly pale; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs usually largely pale, although femora sometimes moderately infuscate and always with dark spots; tibiae with pale background coloration, dorsal tibial spines with obvious dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly to moderately shining. Face at and below level of antennal insertion more highly polished than remainder of body surface. Vestiture of dorsum composed of recumbent, golden, shining, relatively short, simple setae (fig. 34C). STRUCTURE: Body appearing flattened, usually nearly parallel-sided; frons weakly convex, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1 (fig. 34A); labium reaching to apex of middle coxae or slightly beyond; metathoracic scent-gland evaporatory area and spiracle as in figure 34B. GENITALIA (fig. 29): Body of vesica stout, tightly curving, U-shaped, base falling at about level of base of secondary gonopore, posterior apical spine moderately long, weakly curving, and erect relatively to body of vesica, anterior spine more strongly angled relative to body of vesica, longer than posterior spine, and angled near apex in lateral view; flange very broad, nearly straight along exposed margin, extending to midpoint of secondary gonopore.

Female: Body slightly shorter, broader, and more strongly ovoid than in male; pale areas of hemelytra slightly more extensive than in male. Total length 3.52–4.24, length apex clypeus–cuneal fracture 2.48–2.92, width across pronotum 1.11–1.32.

HOSTS: Apparently breeds on annuals. Although this is the most commonly collected *Plagiognathus* sp., the number of definitive host records for it is very small.

DISTRIBUTION: Broadly distributed in eastern North America west into the foothills of the Rockies, and in the west from northern Utah to northern California north to southern British Columbia.

DISCUSSION: No specimen has ever been designated as the type of *Plagiognathus obscurus.* Uhler (1872) stated in association with his original description that ''the present specimens were brought from Colorado'', although he made it clear that the species was widely distributed in the eastern United States. Uhler was not specific about a locality in Colorado. The Uhler specimens labeled ''Colo.'' in the National Museum in Washington, D.C., all have collecting dates later than 1872. Thus, none can serve as potential lectotypes of *obscurus.* To fix the concept of *obscurus,* I have selected a neotype (male). It bears the following label data and is deposited in the United States National Museum of Natural History, Washington, D.C.:

> 5 mi. W. Milford, Dickinson Co., Iowa, July 18, 1963, J. C. Schaffner; Neotype *Plagiognathus obscurus* Uhler, det. R. T. Schuh

Although the concept of *Plagiognathus obscurus* in eastern North America is well known to many heteropterists, and has been relatively stable for decades, closer examination suggests that the situation is more complex than had previously been thought.

Several names have been introduced into the literature which seem to apply to *obscurus.* Among these is *albocuneatus* Knight, 1923, which was described as a variety of *obscurus.* Knight (1923) also used the name *annulatus* Uhler for specimens from the eastern United States that have pale legs and a generally black or uniformly very dark body; he (Knight, 1923) furthermore introduced the names *cuneatus* and *nigrofemoratus* for what he considered color varieties of *annulatus,* observing that the former might represent a distinct species.

Examination of male genitalia indicates that ''true'' *obscurus* has a short, heavy-bodied vesica with a very broad flange subtending the secondary gonopore and overlapping about half of it. The base of the vesica is curved such that it reaches to the height of the gonopore. This type of vesica is found in specimens from localities broadly distributed in eastern North America as well as in specimens from lesser numbers of known localities as far west as British Columbia and as far south as northern California. Although the genitalia in most *Plagiognathus* spp. are rather similar, the structure of the vesica in *obscurus* is distinctive and quite easy to recognize. This vesical type is found in *albocuneatus* Knight, *annulatus* sensu Knight, and in the varieties *cuneatus* Knight and *nigrofemoratus* Knight. I am therefore treating all of these nominal taxa as synonymous, with *obscurus* having priority.

Knight described *annulatus cuneatus* from the northeastern United States. This color variant is apparently much more common in the South than in the North, as evidenced by the large numbers of specimens I examined in the Texas A&M collections which were taken primarily in Texas and Mississippi. Nonetheless, a series of specimens from Ames, Iowa, a much more northerly locality, collected on *Heracleum maximum* (Apiaceae) contains both the typical *obscurus* and *cuneatus* forms.

The distributions of *obscurus* and *brunneus,* two common and easily confused species in collections, overlap above about 43 north latitude and in some areas of the montane West. It is in those areas that the greatest difficulty will be encountered in providing accurate identifications. In the case of some specimens, dissection of the male genitalia will be required to verify identity.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Slave Lake, August 14, 1924, O. Bryant, 3♂, 4♀ (USNM). **British Columbia:** 7 mi W of Bridesville, July 9, 1966, W. Gagne and J. Haddock, 1♂, 1♀ (UCB). Duncan, July 28, 1919, W. Downes, 3♂ (CAS). Elko, E Kootenay, July 9, 1949, H. B. Leech, 1♀ (CAS). Glenemma, Salmon River, July 15, 1949, H. B. Leech, 2♂ (CAS). Merritt, August 3, 1931, R. H. Beamer, 1♀ (KU). Selkirk Mts., July 1, 1918, J. C. Bradley, 1♂ (CAS). Shuswap Lake, July 30, 1930, R. L. Usinger, 2♂ (UCB). Shuswap Lake, Salmon Arm, July 14, 1949, H. B. Leech, 2♂ (CAS). Terrace, June 23, 1978, N. L. H. Krauss, 2♂

(AMNH). Victoria, July 31, 1918, W. Downes, 2♂ (USNM). **Manitoba:** Swan River, August 2, 1937, R. H. Beamer, 2♂ (KU). **Newfoundland:** Spruce Brook, August 8, 1912, 1♂ (AMNH). Spruce Brook, August 8, 1912, 10♂ (AMNH). **Nova Scotia:** Truro, September 8, 1920, H. M. Parshley, 1♂ (CAS). **Ontario:** Ottawa, July 3, 1912, E. P. Van Duzee, 1♂ (CAS). Toronto, July 1, 1978–July 2, 1978, R. S. Peigler, 30♂, 10♀ (TAMU). **Quebec:** 30 mi N of New Richmond, Cascapedia River, Gaspe, August 1, 1983, W. Middlekauff, 4♂ (CAS). Joliette, July 10, 1900, J. Ouellet, 1♂, 1♀ (TAMU). La Potardiere, Parc de la Gaspesie, Camping de la Riviere, 650 m, July 17, 1995, M. C. Schwartz, *Lathyrus* sp. (Fabaceae), 8♂, 4♀ (CNC). La Potardiere, Parc de la Gaspesie, Secteur Mont Albert, 650 m, July 17, 1995, M. D. Schwartz, *Melilotus* sp. (Fabaceae), 10♂, 8♀ (CNC). USA.—**Alabama:** *Madison Co.:* near Huntsville, Green Mountain, May 29, 1995, D. A. Rider, 1♂, 3♀ (DAR). **California:** *Del Norte Co.:* 1 mi S of Crescent City, July 11, 1979, R. T. and Joe Schuh, *Spiraea douglasii* (Rosaceae), 4♂, 10♀ (AMNH). *Siskiyou Co.:* 9 mi E of McCloud, Ash Creek Ranger Station, 3500 ft, June 10, 1974, J. Doyen, 1♂ (UCB). **Colorado:** *Archuleta Co.:* 14 mi NE of Pagosa Springs, August 16, 1969, H. M. Ohlendorf, 1♂, 1♀ (TAMU). 16 mi N of Pagosa Springs, June 24, 1964, H. R. Burke, 1♂ (TAMU). Pagosa Springs, August 12, 1925, H. H. Knight, 4♂ (USNM). *Boulder Co.:* 2 mi W of Boulder, August 8, 1973, J. C. Schaffner, 1♂ (TAMU). 6 mi W of Boulder, August 12, 1973, J. C. Schaffner, 2♂ (TAMU). *Denver Co.:* Denver, July 12, 1900, E. P. Van Duzee, 2♂ (CAS). *Gunnison Co.:* 2 mi W of Gunnison, 7600 ft, July 17, 1986, R. T. Schuh, 1♂ (AMNH). *Jackson Co.:* 2 mi E of Gould, August 5, 1975, J. C. Schaffner, 2♂ (TAMU). 3 mi N of Gould, August 18, 1968, P. W. Oman, 1♀ (OSU). *Jefferson Co.:* Deer Creek Canyon, 6500 ft, July 11, 1986, R. T. Schuh and J. T. Polhemus, *Pinus ponderosa* (Pinaceae), 1♂ (AMNH). North Turkey Creek Park near Tenders, 6200 ft, July 16, 1983, D. A. and J. T. Polhemus, 1♂ (JTP). Red Rocks Park near Morrison, 5600 ft, July 15, 1983, R. T. Schuh and D. A. Polhemus, 1♀ (AMNH). Waterton, Platte River, 5350 ft, July 11, 1986, R. T. Schuh and J. T. Polhemus, *Salix interior* (Salicaceae), 2♀ (AMNH). *La Plata Co.:* 5 mi W of Durango, August 15, 1973, J. C. Schaffner, 1♂ (TAMU). *Larimer Co.:* 3 mi S of Estes Park, August 2, 1997, J. C. Schaffner, 1♂ (TAMU). Glen Haven, July 22, 1946, P. B. Lawson, 50♂, 47♀ (KU). Pingree Park, August 15, 1924, Drake and Hottes, 1♂, 1♀ (USNM). *Montrose Co.:* 15 mi SW of Montrose, August 13, 1987, T. J. Henry, 2♂ (USNM). *Pitkin Co.:* Aspen, July 24, 1919, 1♂ (AMNH). *Rio Blanco Co.:* Meeker, July 20, 1919, 1♀ (AMNH). *Rio Grande Co.:* 10 mi SW of Baxterville, August 20, 1969, H. R. Burke, 2♂, 2♀ (TAMU). *Saguache Co.:* 17 mi S of US 50 on Colorado Rt 114, August 30, 1980, D. A. and J. T. Polhemus, 1♂ (JTP). *Summit Co.:* S end of Green Mountain Reservoir, August 12, 1973, S. Szerlip, 1♂ (UCB). **Connecticut:** East Hartford, Tunxis State Forest, July 20, 1970, F. P. Maroney, 5♂ (AMNH). Storrs, July 23, 1954, J. A. Slater, 5♂ (AMNH). **Georgia:** *Clarke Co.:* Athens, May 18, 1974, C. W. Fisher, 1♂ (TAMU). *Union Co.:* Suches, May 31, 1945, P. W. Fattig, 1♂ (USNM). **Idaho:** *Benewah Co.:* 2 mi W of Santa at Jct. Rts 3 & 6, Picnic Area, 2800 ft, August 6, 1986, Schuh, Schwartz, Stonedahl, *Symphoricarpos* sp. (Caprifoliaceae), 5♀ (AMNH). *Blaine Co.:* Bellevue, July 30, 1932, W. E. Shull, 1♂ (USNM). *Bonneville Co.:* 5 mi SE of Palisades, Big Elk Creek Campground, July 21, 1988, R. Wharton, 2♂, 3♀ (TAMU). *Franklin Co.:* Cub River Canyon, August 13, 1974, G. F. Knowlton, 1♂, 1♀ (OSU). Cub River Canyon, July 21, 1982, G. F. Knowlton, 1♂ (USU). Willow Flat, August 24, 1973, G. F. Knowlton and R. K. Cazier, 2♂, 1♀ (USU). *Fremont Co.:* St. Anthony, August 23, 1948, E. I. Schlinger, 1♀ (UCD). *Kootenai Co.:* Lake Coeur d'Alene, July 15, 1925, E. H. Nast, 1♀ (CAS). *Latah Co.:* 5 mi E of Harvard, Palouse River, July 3, 1966, W. Gagne and J. Haddock, 1♀ (UCB). *Oneida Co.:* Rock Creek, July 23, 1971, G. F. Knowlton, 1♂ (USU). *Shoshone Co.:* 3 mi NW of Clarkia on Rt 3, Cedar Creek Rec. Area, 2700 ft, August 6, 1986, Schuh, Schwartz, and Stonedahl, 9♀ (AMNH). 3 mi NW of Clarkia on Rt 3, Cedar Creek Rec. Area, 2700 ft, August

6, 1986, Schuh, Schwartz, Stonedahl, 3♂, 6♀ (AMNH). *Unknown Co.:* Wheatland, July 7, 1930, R. L. Usinger, 3♂, 5♀ (UCB). **Indiana:** *Noble Co.:* Sylvan Lake, June 30, 1984, D. A. Rider, 1♂ (DAR). **Iowa:** *Dickinson Co.:* 5 mi W of Milford, June 13, 1963–June 18, 1963, J. C. Schaffner, 12♂, 7♀ (TAMU). Iowa Lakeside Lab., July 9, 1963, J. C. Schaffner, 1♀ (TAMU). Iowa Lakeside Lab., June 17, 1963, J. C. Schaffner, *Fraxinus pennsylvanica* (Oleaceae), 1♀ (TAMU). Iowa Lakeside Lab., June 17, 1963, J. C. Schaffner, *Quercus macrocarpa* (Fagaceae), 1♂ (TAMU). *Emmet Co.:* Fort Defiance State Park, July 11, 1963, J. C. Schaffner, 2♀ (TAMU). *Story Co.:* Ames, June 10, 1928, H. M. Harris, 1♀ (TAMU). Ames, June 11, 1962–June 21, 1962, J. C. Schaffner, *Heracleum maximum* (Apiaceae), 28♂, 13♀ (TAMU). Ames, June 14, 1926, H. M. Harris, 1♂ (TAMU). Ames, June 18, 1927–July 5, 1927, H. G. Johnston, 5♂, 6♀ (TAMU). Ames, June 24, 1927, H. M. Harris, 1♂ (TAMU). Ames, June 25, 1947, H. H. Knight, 2♂, 3♀ (USNM). *Tama Co.:* Traer, June 30, 1931, G.C.D. and H. M. H., 2♀ (TAMU). *Unknown Co.:* No specific locality, June 16, 1932, Barker, 1♀ (TAMU). *Warren Co.:* 1.5 mi E of Hartford, July 5, 1976–July 6, 1976, J. C. Schaffner, 4♂ (TAMU). **Kentucky:** *Boone Co.:* Big Bone Lick State Park, June 22, 1982, R. Wharton, 1♂ (TAMU). **Maine:** *Aroostook Co.:* Fort Kent, August 19, 1910, H. M. Parshley, 1♂ (CAS). *Piscataquis Co.:* Baxter State Park, July 18, 1986, C. B. Barr, 7♂, 6♀ (LSU). *Waldo Co.:* Liberty, July 17, 1910, H. M. Parshley, 1♂ (CAS). *Washington Co.:* Machias, July 19, 1909, H. M. Parshley, 5♂ (CAS). **Massachusetts:** *Berkshire Co.:* Hartsville, Lake Buel, July 7, 1930, J. R. de la Torre-Bueno, 2♂ (KU). *Essex Co.:* Danvers, August 3, 1915, H. M. Parshley, 1♂, 1♀ (CAS). *Norfolk Co.:* Wellesley, July 11, 1909, E. P. Van Duzee, 4♂, 2♀ (CAS). **Michigan:** *Cheboygan Co.:* No specific locality, July 10, 1950, H. B. Hungerford, 2♂ (KU). **Minnesota:** *Cook Co.:* Cascade River, August 14, 1922, H. H. Knight, 2♂ (USNM). *Hubbard Co.:* Camp Wilderness, July 23, 1995, G. Fauske, 6♂ (DAR). *St. Louis Co.:* Ash Lake, July 18, 1972, W. F. Chamberlain, 1♂ (TAMU). *Swift Co.:* 3.5 mi SW of Appleton, Lake Lac Qui Parle, July 21, 1974, B. Tollefson, 1♂, 1♀ (UCB). **Mississippi:** *Adams Co.:* Natchez, May 15, 1931, H. G. Johnston, *Aster* sp. (Asteraceae), 11♂, 8♀ (TAMU). *Grenada Co.:* Grenada, May 20, 1931, H. G. Johnston, 1♂, 2♀ (TAMU). *Holmes Co.:* Tchula, May 18, 1931, H. G. Johnston, 1♂, 1♀ (TAMU). *Lafayette Co.:* Oxford, May 22, 1931, H. G. Johnston, 3♂, 1♀ (TAMU). *Leake Co.:* Carthage, May 2, 1931, H. G. Johnston, 3♂, 2♀ (TAMU). *Marion Co.:* Columbia, May 12, 1931, H. G. Johnston, *Carpinus caroliniana* (Betulaceae), 1♂, 5♀ (TAMU). *Pontotoc Co.:* Pontotoc, May 27, 1931, H. G. Johnston, *Carya* sp. (Juglandaceae), 1♂, 1♀ (TAMU). *Stone Co.:* Wiggins, May 29, 1931, J. P. Kislanko, 1♂ (TAMU). Wiggins, May 5, 1931, H. G. Johnston, 1♂, 1♀ (TAMU). *Unknown Co.:* West Valley, May 12, 1931, H. G. Johnston, *Ulmus* sp. (Ulmaceae), 2♂, 4♀ (TAMU). **Montana:** *Flathead Co.:* 15 mi W of North Glacier Natl. Park, August 7, 1969, P. W. Oman, 1♂, 7♀ (OSU). *Gallatin Co.:* Bozeman, August 13, 1931, R. H. Beamer, 1♂, 1♀ (KU). Three Forks, July 23, 1983, J. D. Pinto, 2♂, 2♀ (UCR). *Granite Co.:* 6 mi S of Drummond on Rt 10A, Hall, 4200 ft, August 9, 1986, Schuh, Schwartz, and Stonedahl, *Rosa* sp. (Rosaceae), 1♀ (AMNH). Drummond, August 11, 1931, J. O. Nottingham, 1♀ (KU). *Jefferson Co.:* Whitehall, August 13, 1931, M. W. Sanderson, 1♀ (KU). *Lincoln Co.:* 10 mi SE of Fortine, July 15, 1988, R. Wharton, 1♂ (TAMU). *Missoula Co.:* Lolo Hot Springs, August 7, 1969, P. W. Oman, 1♂, 7♀ (OSU). Missoula, July 31, 1920, A. A. Nichol, 1♂ (USNM). *Ravalli Co.:* Darby, August 2, 1932, 1♂ (TAMU). **Nebraska:** *Gosper Co.:* Johnson Lake St. Rec. Area, June 30, 1980, K. and R. Schmidt, 5♀ (AMNH). **New Hampshire:** *Belknap Co.:* Gilford, July 22, 1973, J. Amaral, 1♂, 1♀ (TAMU). *Coos Co.:* Glen House, July 15, 1915, H. M. Parshley, 3♂ (CAS). Mount Washington, Halfway House, July 28, 1915, H. M. Parshley, 2♂ (CAS). *Unknown Co.:* Crawfords, August 3, 1929, H. M. Parshley, 5♂ (CAS). **New Jersey:** *Sussex Co.:* Baleville, June 21, 1981, R. Schmidt, 5♀ (AMNH). **New Mexico:** *Lincoln Co.:* Alto, June 24, 1923, K. C. Doering, 1♂ (KU). Coyote, July 24, 1967, H. R. Burke, 1♀

(TAMU). *Mora Co.:* Guadalupita Canyon, 4 mi N of Coyote Creek State Park, July 24, 1998, W. Godwin, 1♂ (TAMU). *Otero Co.:* 2 mi E of Cloudcroft, July 17, 1979–August 18, 1979, Delorme, McHugh, Schaffner, 7♂, 5♀ (TAMU). Cloudcroft, July 27, 1940, D. E. Hardy, 2♂ (KU). Lincoln National Forest, Slide Group Campground, August 20, 1982, R. Turnbow, 1♀ (TAMU). *Rio Arriba Co.:* Chama, August 16, 1987, R. S. Peigler, 2♂, 6♀ (TAMU). *San Miguel Co.:* Sapello, July 25, 1950, 1♀ (KU). *Santa Fe Co.:* 8 mi N of Santa Fe, July 25, 1967, H. R. Burke, 1♂ (TAMU). *Taos Co.:* Columbine Park Recreation Area, July 24, 1968, J. C. Schaffner, *Betula occidentalis* (Betulaceae), 1♂, 1♀ (TAMU). **New York:** *Cattaraugus Co.:* Rock City, July 5, 1915, H. H. Knight, 3♂ (USNM). *Genesee Co.:* Batavia, August 10, 1915, H. H. Knight, 1♂ (CAS). Batavia, July 31, 1915, H. H. Knight, 1♂, 2♀ (USNM). *Hamilton Co.:* 7 mi S of Long Lake (town), August 26, 1956, J. C. Schaffner, 2♂, 5♀ (TAMU). *Livingston Co.:* Portage, July 27, 1915, H. H. Knight, 1♂ (USNM). *St. Lawrence Co.:* Cranberry Lake, July 1, 1919, C. J. Drake, 1♂ (TAMU). *Tompkins Co.:* Ithaca, July 8, 1920, H. H. Knight, holotype male (*cuneatus*) (USNM). Ithaca, July 8, 1920, H. H. Knight, holotype male (*nigrofemoratus*) (USNM). Ithaca, June 27, 1920–July 7, 1920, H. H. Knight, 15♂, 5♀ (USNM). Ringwood, July 25, 1928, V. A. Little, 3♂, 3♀ (TAMU). *Unknown Co.:* Wanakesa (The Plains), August 3, 1920, C. J. Drake, 1♀ (TAMU). **North Carolina:** *Buncombe Co.:* Swannanoa, 3000 ft, July 15, 1919, R. W. Leiby, 3♂ (USNM). **North Dakota:** *Emmons Co.:* Linton, July 23, 1937, R. H. Beamer, 1♂, 1♀ (KU). *Pembina Co.:* 9 mi SE of Walhalla, August 15, 1993, D. Cuthrell, 1♂ (DAR). **Ohio:** *Summit Co.:* Barberton, June 22, 1937, L. J. Lipovsky, 1♂ (KU). **Oregon:** *Benton Co.:* Corvallis, behind Crystal Lake Cemetery, July 27, 1979, G. M. Stonedahl, *Salix* sp. (Salicaceae), 3♂, 1♀ (AMNH). Corvallis, July 30, 1959, J. D. Lattin, 1♂ (OSU). Corvallis, OSU campus, Cordley Hall, July 2, 1979, G. M. Stonedahl, *Corylus cornuta* (Betulaceae), 1♂ (AMNH). *Clackamas Co.:* Milwaukie, July 12, 1940, Joe Schuh, 1♀ (OSU). near Boring/Sandy, August 4, 1980, P. W. Oman, 1♂ (OSU). *Curry Co.:* 15 mi N of Brookings, 60 m, July 11, 1979, R. T. Schuh and Joe Schuh, *Rhododendron occidentale* (Ericaceae), 5♂, 8♀ (AMNH). Brookings, July 6, 1951, B. Malkin, 1♂ (CAS). *Jefferson Co.:* Allen Spring, Metolius River, July 27, 1960, K. M. Fender, 1♂, 1♀ (OSU). *Multnomah Co.:* Portland, August 12, 1920, A. A. Nichol, 4♂, 1♀ (USNM). Portland, July 30, 1032, 1♀ (OSU). *Polk Co.:* 6 mi E of Independence, July 10, 1957, J. D. Lattin, 1♂ (OSU). *Umatilla Co.:* Pendleton, July 14, 1931, R. H. Beamer, 1♂, 1♀ (KU). *Unknown Co.:* Skappoose, July 31, 1935, K. Gray, 1♂ (OSU). *Washington Co.:* 5 mi N of North Plains, August 10, 1960, J. D. Lattin, 1♀ (OSU). *Yamhill Co.:* Dayton, Dorsey's Gravel Bar, July 22, 1963, K. M. Fender, 2♂ (OSU). Grand Island, June 30, 1958, K. M. Fender, 1♂ (OSU). **Pennsylvania:** *Dauphin Co.:* Harrisburg, July 5, 1978, E. U. Balsbaugh, Jr., 2♂, 4♀ (DAR). *Monroe Co.:* Long Pond, July 18, 1998, M. D. Schwartz, *Spiraea* sp. (Rosaceae), 5♂, 5♀ (CNC). *Northampton Co.:* Wind Gap, July 9, 1954, J. W. Green, 2♀ (CAS). **South Carolina:** *Greenville Co.:* Greenville, June 2, 1977–June 4, 1977, R. S. Peigler, *Rhus glabra* (Anacardiaceae), 1♂, 2♀ (TAMU). Greenville, May 27, 1977, R. S. Peigler, 1♂ (TAMU). **South Dakota:** *Custer Co.:* Custer, July 27, 1927, H. H. Knight, 2♂ (USNM). **Tennessee:** *Hawkins Co.:* Church Hill, May 26, 1985, T. J. Henry and A. G. Wheeler, Jr., 4♂ (USNM). **Texas:** *Brazos Co.:* College Station, April 22, 1930, S. E. Jones, 1♂, 1♀ (TAMU). College Station, April 24, 1930, H. G. Johnston, 10♂, 5♀ (TAMU). College Station, Central Park, April 25, 1987, T. P. Friedlander, *Cirsium horridulum* (Asteraceae), 1♂, 5♀ (TAMU). Little Brazos River, Hwy 21, May 20, 1970, V. V. Board, 1♀ (TAMU). *Gonzales Co.:* Palmetto State Park, April 15, 1972, J. C. Schaffner, 5♂, 6♀ (TAMU). Palmetto State Park, April 17, 1965, J. C. Schaffner, 5♂, 3♀ (TAMU). Palmetto State Park, April 18, 1970, J. C. Schaffner, *Urtica* sp. (Urticaceae), 65♂, 48♀ (TAMU). Palmetto State Park, April 19, 1969, V. V. Board, 1♂ (TAMU). Palmetto State Park, April 22, 1970–May 4, 1970, V. V. Board, 6♂, 15♀ (TAMU). Palmetto State Park, April 25, 1971, J. C. Schaffner, 2♂, 9♀ (TAMU). Pal-

metto State Park, April 9, 1967, J. C. Schaffner, 2♀ (TAMU). Palmetto State Park, May 4, 1970, Board, Schaffner, 6♂, 8♀ (TAMU). *Limestone Co.:* Old Union Community, April 19, 1998, J. C. Schaffner, 2♂ (TAMU). *Nacogdoches Co.:* 2 mi W of Nacogdoches, April 18, 1972, V. V. Board, 20♂, 6♀ (TAMU). *Smith Co.:* Tyler State Park, May 9, 1988, R. S. Anderson, 1♂, 1♀ (TAMU). *Travis Co.:* Austin, April 29, 1989, R. Wharton, 1♂ (TAMU). **Utah:** *Cache Co.:* Franklin Basin, August 7, 1975, G. F. Knowlton, 1♀ (UCD). Franklin Basin, July 20, 1982, G. F. Knowlton, 2♂ (USU). Logan, July 15, 1922, E. P. Van Duzee, 1♂ (CAS). Tony Grove Canyon, July 30, 1974, G. F. Knowlton, 10♂, 5♀ (USU). *Duchesne Co.:* Uinta Mountains, Ashley National Forest, Hades Campground, 7400 ft, August 17, 1986, Schwartz and Stonedahl, ex Rosaceae, 6♀ (AMNH). *Salt Lake Co.:* Wasatch Mts, Hidden Peak, August 13, 1987, D. A. Rider, 2♀ (DAR). *Summit Co.:* 17 mi E of Kamas, August 5, 1971, Hanson and Knowlton, 2♂ (USU). *Unknown Co.:* Rock Springs, July 24, 1943, Knowlton and Maddock, 1♂ (USU). *Utah Co.:* Alpine Loop, July 25, 1973, W. J. Hanson, 2♂ (USU). Diamond Fork Canyon, Palmyra Camp, July 25, 1957, A. H. Barnum, 1♂, 1♀ (TAMU). Provo, July 20, 1967, H. R. Burke, 4♂, 2♀ (TAMU). Vivian Park, July 7, 1922, E. P. Van Duzee, 1♂ (CAS). *Wasatch Co.:* Uintah Natl. Forest, Buckboard Creek at Rt 35, T4S R9E Sec 17, 8000 ft, August 16, 1986, Schwartz and Stonedahl, 5♂, 1♀ (AMNH). *Wayne Co.:* near Torrey, July 12, 1968, W. J. Hanson, 1♂ (USU). **Vermont:** *Orange Co.:* Bradford, July 23, 1973–July 29, 1973, J. Amaral, 2♂, 3♀ (TAMU). *Orleans Co.:* Newport, July 13, 1891, A. P. Morse, 1♂ (CAS). **Virginia:** *Roanoke Co.:* Roanoke, June 12, 1991, E. G. Riley, 1♂ (TAMU). **Washington:** *Chelan Co.:* 13.4 mi W of Chelan, May 19, 1973, P. W. Oman, 1♂ (OSU). *Columbia Co.:* Lewis and Clark Park, June 10, 1959, G. W. Byers, 2♂ (KU). *King Co.:* Northbend, July 9, 1920, E. P. Van Duzee, 1♂ (CAS). *Okanogan Co.:* 15 mi NW of Omak, Salmon Creek, July 7, 1966, W. Gagne and J. Haddock, 1♂ (UCB). *Pierce Co.:* Puyallup, July 5, 1935, J. Russell, 2♀ (KU). *Skagit Co.:* Conway, July 28, 1931, R. H. Beamer, 1♂, 5♀ (KU). *Snohomish Co.:* Monroe, July 1, 1905, E. P. Van Duzee, 1♂ (CAS). *Whitman Co.:* Pullman, August 29, 1909, J. A. Hyslop, 1♀ (USNM). **Wisconsin:** *Dodge Co.:* Beaver Dam, May 31, 1911, W. E. Snyder, 3♂ (CAS). **Wyoming:** *Albany Co.:* 40 mi NE of Laramie, July 13, 1937, R. H. Beamer, 2♂ (KU). North Fork of Sybille Creek at Hwy 34, 6000 ft, July 30, 1964, H. B. Leech, 1♀ (CAS). *Carbon Co.:* 10 mi E of Medicine Bow, July 27, 1960, L. A. Stange, 1♂ (UCD). *Cody Co.:* Valley, A-Z Ranch, August 1, 1971, S. Frommer, 1♀ (UCR). *Lincoln Co.:* 12 mi SE of Smoot, August 7, 1974, Knowlton and Hanson, 1♂ (USU). *Niobrara Co.:* Lusk, July 14, 1937, R. H. Beamer, 1♂ (KU).

Plagiognathus paramundus, new species
Figures 11, 18, 29

HOLOTYPE: Male: ''[USA] Oregon: Lake Co., 16 mi. S of Adel, July 3, 1979, 1675 m., R. T. Schuh and B. M. Massie; ex *Salix* sp. (Salicaceae)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the large size, moderately elongate body form, *pale anterior portion of corium extending posteriorly along radial vein,* mostly pale costal vein and cuneus, *scutellum always pale laterally with a dark median stripe, clavus narrowly pale along claval suture* (fig. 11), and length of antennal segment 2 about 1.9 times the width of head. Pattern of coloration in *paramundus* similar to *alboradialis* (fig. 5), *flavoscutellatus* (fig. 8), and *mundus* (fig. 10), especially anterior pale portion of the corium extending posteriorly along radial vein, and scutellum apparently always pale laterally in *paramundus,* but only occasionally so in *alboradialis.* Distributions of *alboradialis* and *paramundus* apparently nonoverlapping. Clavus narrowly pale along claval suture in *paramundus* whereas clavus totally dark in *alboradialis,* and structure of genitalia distinctive for the two species, with the posterior spine being slightly more slender and nearly as long as the anterior in *alboradialis,* and being slightly broader and reaching only to the level of the subapical bend of the anterior spine in *paramundus.* Scutellum in *mundus* never with a dark median stripe as in *para-*

mundus, although frequently broadly pale. Body in *flavoscutellatus* heavier than in *paramundus* and distributions nonoverlapping.

DESCRIPTION: *Male:* Elongate, more or less parallel-sided, large; total length 3.97–4.90, length apex clypeus–cuneal fracture 2.73–3.24, width across pronotum 1.11–1.32. COLORATION (fig. 11): Background coloration of dorsum brown, frons and vertex pale, disc of pronotum at least partially pale, corium pale on basal one-fourth, this area extending posteriorly along the radial vein to about midpoint of corium, costal vein almost entirely pale, cuneus entirely pale, corium narrowly pale adjacent to extreme base of membrane; all antennal segments castaneous to black (fig. 18), except segment 1 with pale apical annulus; labium mostly castaneous; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs mostly pale yellowish, extreme base of coxae usually infuscate, femora with numerous dark spots, tibiae pale, dorsal spines with dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull. Vestiture of dorsum composed of recumbent, golden, shining, relatively short, simple setae. STRUCTURE: Body nearly parallel-sided, lateral corial margins weakly convex; frons weakly convex, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by distance equal to diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 29): Body of vesica relatively long, J-shaped, base of vesica falling well below level of secondary gonopore; posterior apical spine long, nearly erect relative to body of vesica, anterior spine not substantially longer than posterior, angled at about 45° relative to body of vesica; flange narrow, not surpassing margin of body of vesica, terminating at about base of secondary gonopore.

Female: Body shorter, broader, and much more strongly ovoid than in male (fig. 11). Pronotum more extensively pale than in male, including pale anterior margin, with only calli dark; hemelytra usually more extensively pale than in male, this sometimes extending onto clavus. Total length 3.94–4.41, length apex clypeus–cuneal fracture 2.78–3.12, width across pronotum 1.22–1.32.

ETYMOLOGY: Named for its similarity of appearance to *Plagiognathus mundus* Van Duzee.

HOST: *Salix* sp. (Salicaceae).

DISTRIBUTION: Known from localities in California, Nevada, and Oregon in the northwestern United States.

PARATYPES: USA.—**California:** *Costra Costa Co.:* Moraga, June 30, 1977, D. G. Denning, 1♂ (UCD). *Mendocino Co.:* Hopland Field Station, May 22, 1976, D. G. Denning, 9♂, 6♀ (UCD). *Nevada Co.:* Truckee, July 6, 1927, E. P. Van Duzee, 1♀ (CAS). *Placer Co.:* Emigrant Gap, July 20, 1966, E. L. Smith, 1♀ (UCD). Tahoe Vista, July 20, 1966, E. L. Smith, 1♂, 1♀ (UCD). *Shasta Co.:* Old Station, June 26, 1947, E. E. Seibert, *Salix sp.* (Salicaceae), 2♂ (UCB). *Sierra Co.:* Little Truckee River, July 10, 1966, P. R. Schultz, 2♀ (UCD). *Siskiyou Co.:* Bear Basin, 7000 ft, August 9, 1967, L. Eighme, 1♂ (PUC). **Nevada:** *Eureka Co.:* 23 mi W of Carlin, Humboldt River, June 23, 1966, W. Gagne and J. Haddock, 2♂ (UCB). *Washoe Co.:* Nixon, June 29, 1927, E. P. Van Duzee, 2♂ (CAS). Reno, June 27, 1927, E. P. Van Duzee, 1♂ (CAS). Sparks, June 28, 1927, E. P. Van Duzee, 34♂, 30♀ (CAS). **Oregon:** *Lake Co.:* 16 mi S of Adel, 1675 m, July 3, 1979, R. T. Schuh and B. M. Massie, *Salix sp.* (Salicaceae), 13♂, 11♀ (AMNH).

Plagiognathus parshleyi (Knight), new combination
Figures 11, 18, 30, 35

Psallus parshleyi Knight, 1923: 465 (n. sp.).

DIAGNOSIS: Recognized by *moderately large size,* parallel-sided body form (fig. 11), *narrowly scalelike setae on the pronotum* (fig. 35C), and the frequent presence of dark stripe on the dorsal surface of hind femur. Frequently dorsum almost entirely dark, but always with a consistent *quadrate pale marking on the basal half of the cuneus* (fig. 11); sometimes basal one-third of corium also pale (fig. 11). Similar to *morrisoni* (fig. 10) in coloration and in having scalelike setae on the pronotum, but always larger, having lighter colored femora than *morrisoni,* and feeding on Betulaceae rather than Myrica-

ceae. Also similar in size and appearance to *obscurus* (fig. 10) and *notodysmicos* (fig. 11), but differing from both in having narrowly scalelike silvery setae on the pronotum and golden simple setae on the hemelytra rather than golden, shining, simple setae on the entire dorsum. Vesica (fig. 30) similar in form to that of *obscurus* (fig. 29), but base not coming as close to attaining level of secondary gonopore as in *obscurus,* and flange terminating nearer to base of secondary gonopore than in *obscurus.*

REDESCRIPTION: *Male:* Elongate, nearly parallel-sided, relatively large; total length 4.48–4.71, length apex clypeus–cuneal fracture 2.98–3.10, width across pronotum 1.19–1.28. COLORATION (fig. 11): Background coloration of dorsum castaneous; vertex, and sometimes frons, not so dark as remainder of dorsum; cuneus always with a white quadrate marking on basal one-third to one-half; corium sometimes pale on basal one-third, the posterior margin of this area nearly perpendicular to the costal margin of the hemelytron; costal vein dark to weakly pale; corium narrowly and vaguely pale adjacent to extreme base of membrane; membrane fumose, veins fumose except on posterior margin of cells; all antennal segments castaneous to black (fig. 18), segment 1 with a pale apical annulus and segments 3 and 4 sometimes appearing only weakly infuscate; labium varying from entirely castaneous to largely pale; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs usually largely pale, although coxae and femora sometimes mostly infuscate; femora always with some dark spots and dorsal surface frequently with a dark longitudinal stripe; tibiae with pale to weakly infuscate background coloration, dorsal tibial spines with obvious dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to weakly shining. Pronotum, scutellum, and adjacent areas of hemelytra with flattened, narrowly scalelike, silvery, shining setae; remainder of dorsum with golden, shining, simple setae. STRUCTURE: Body slender, nearly parallel-sided; frons weakly convex, clypeus barely visible from above; anteocular distance 2.0 times diameter of antennal segment 1, head projecting below eye by 1.5 times diameter of antennal segment 1 (fig. 35A); labium reaching to apex of middle coxae; metathoracic scent-gland evaporatory area and spiracle as in figure 35B; pretarsus as in figure 35D. GENITALIA (fig. 30): Body of vesica stout, tightly curving, J-shaped, base of vesica falling well below level of base of secondary gonopore; posterior apical spine only moderately long, weakly curving and weakly angled relative to body of vesica, anterior spine more nearly perpendicular to body of vesica, conspicuously longer than posterior spine, nearly straight and uniformly attenuated in lateral view; flange broad, nearly straight along exposed margin, extending somewhat above base of secondary gonopore.

Female: Body shorter, broader, and more strongly ovoid than in male (fig. 11). Total length 3.88–4.18, length apex clypeus–cuneal fracture 2.65–2.90, width across pronotum 1.14–1.30.

HOSTS: Recorded by Knight (1923) from *Betula pumila* (Betulaceae). Records from the present study indicate breeding on *Alnus* spp. and *Betula* spp. (Betulaceae). The specimens from the western United States all lack host data, but they come from areas where birch might be expected to grow.

DISTRIBUTION: Broadly distributed at high latitudes, extending as far south as New Mexico in mountainous portions of the West, and to Illinois in the East.

DISCUSSION: This species was placed in *Psallus* by Knight (1923) because of its weakly scalelike vestiture. The genitalia, however, are typically *Plagiognathus.* The pattern and regularity of coloration are quite distinctive in *parshleyi,* and therefore the species is comparatively easy to recognize. Compared to most of the large *Plagiognathus* spp., however, it is relatively uncommon in collections. This may be because it appears to breed only on *Alnus* and *Betula* spp., and is not swept from ruderal plant species by general collectors the way *brunneus, obscurus,* and *politus* are.

Specimens from the western United States that I have identified as *parshleyi* usually have the legs, including the coxae, darker than in the eastern specimens I have examined. The darker femora make it difficult to recognize western specimens on the basis of

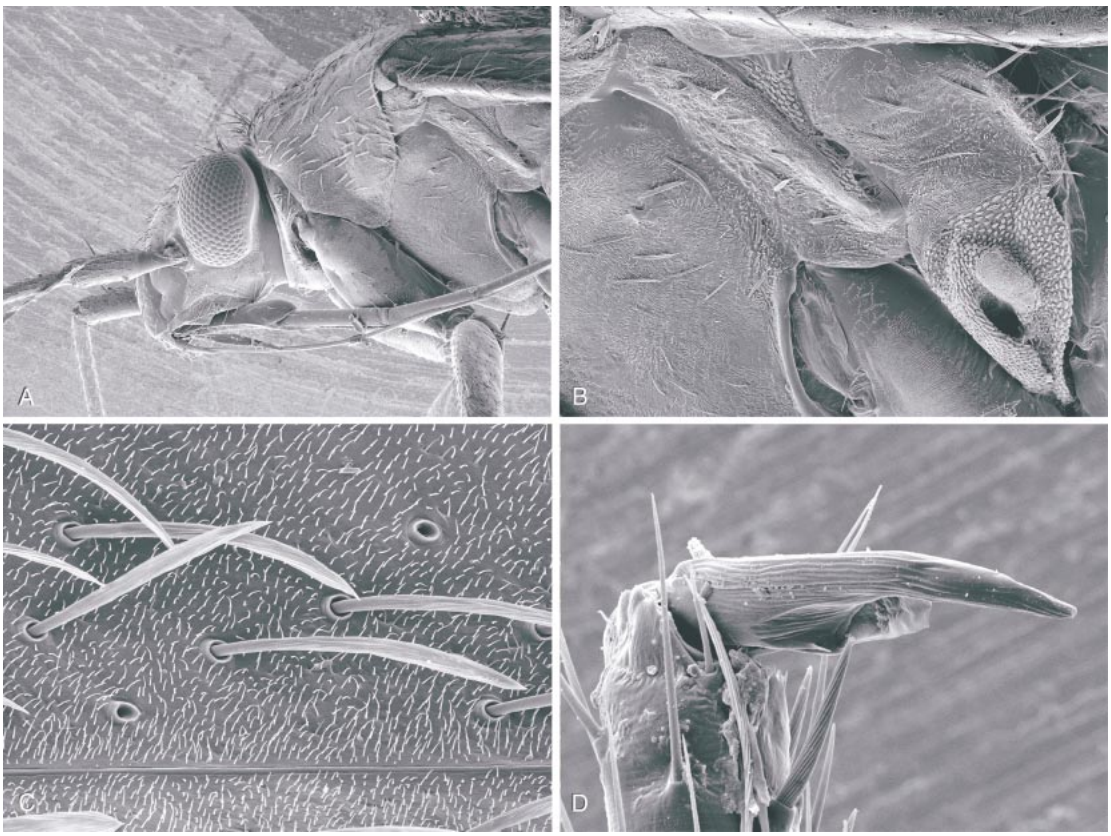

Fig. 35. *Plagionathus parshleyi,* male, scanning micrographs. **A.** Lateral view of head. **B.** Metathoracic spiracle and metathoracic scent-gland evaporatory area. **D.** Hemelytral vestiture. **E.** Pretarsus.

the longitudinal stripes on the dorsal surface of the femur, a character which may not be particularly reliable, anyway, as it appears that the muscle bundle in the femur sometimes is stuck to the inner surface of the femur, giving it a dark appearance. Consequently, specimens of other species may possess this attribute of ''coloration'' that Knight deemed diagnostic for *parshleyi.*

SPECIMENS EXAMINED: CANADA.—**Alberta:** Coleman, August 26, 1952, L. A. Konotopetz, 1♀ (CNC). Grande Prairie, July 26, 1961, A. R. Brooks, 3♂ (CNC). High Prairie, July 16, 1961, A. R. Brooks, 2♂ (CNC). Jasper Natl. Park, August 7, 1952, L. A. Konotopetz, 1♂ (CNC). Kananaskis Road, July 27, 1974, L. A. Kelton, 1♂ (CNC). **Labrador:** Goose Bay, August 11, 1948, W. E. Beckel, 1♀ (CNC). **Manitoba:** Aweme, August 9, 1923, N. Criddle, 1♀ (CNC). Aweme, August 9, 1927, N. Criddle, 3♂ (CNC). **New Brunswick:** Fredericton, July 1, 1970, C. M. Yoshimoto, 1♂ (CNC). Fredericton, June 21, 1960, I. W. Varty, *Betula lutea* (Betulaceae), 1♂ (CNC). Kouchibouguac Natl. Park, July 27, 1977, D. J. Brown, *Alnus* sp. (Betulaceae), 1♂, 6♀ (CNC). **Newfoundland:** Badger, July 31, 1980, L. A. Kelton, *Alnus* sp. (Betulaceae), 5♂, 11♀ (CNC). Terra Nova Natl. Park, July 23, 1980, L. A. Kelton, 1♂ (CNC). **Nova Scotia:** Annapolis, October 9, 1923, R. P. Gorham, 1♀ (CNC). Bridgetown, August 9, 1966, L. A. Kelton, 1♀ (CNC). Halifax, August 10, 1980, L. A. Kelton, 3♂, 2♀ (CNC). Ingonish, July 30, 1976, L. A. Kelton, 1♂ (CNC). Kings County, September 8, 1936, 1♂ (CNC). **Ontario:** 20 mi W of Ignace, August 12, 1960, Kelton and Thorpe, 1♂ (CNC). Footes Bay, July 23, 1962, Kelton and Thorpe, 1♀ (CNC). Otter Lake, July 26, 1962, Kelton and Thorpe, 1♂ (CNC). Wa-

terford, July 17, 1962, Kelton and Thorpe, 1♀ (CNC). **Quebec:** Forestville, August 8, 1950, R. de Ruette, 1♂ (CNC). Kirks Ferry, August 10, 1950, B. P. Beirne, 2♂ (CNC). Knowlton, August 2, 1929, G. S. Walley, 1♀ (CNC). Lac Mondor, Ste. Flore, July 8, 1951, E. G. Munroe, 2♂, 3♀ (CNC). Laniel, July 10, 1963, W. Gagne, 1♂ (CNC). Magog, August 2, 1961, G. Brumpton, 1♂ (CNC). **Saskatchewan:** Amsterdam, August 22, 1954, Brooks and Wallis, 1♀ (CNC). Garrick, August 9, 1951, J. C. Arrand, *Betula glandulosa* (Betulaceae), 2♂, 12♀ (CNC). Hudson Bay, August 25, 1954, Brooks and Wallis, 1♂, 6♀ (CNC). Saskatoon, July 6, 1951, A. R. Brooks, 1♂ (CNC). Waskesiu Lake, July 21, 1939, A. R. Brooks, 2♂ (CNC). **Yukon Territory:** Dempster Hwy, km 140.5, 900 m, July 27, 1980, Wood and Lafontaine, 1♀ (CNC). Eagle Plain, July 26, 1983, L. A. Kelton, *Betula* sp. (Betulaceae), 6♂ (CNC). Tombstone, July 28, 1983, L. A. Kelton, *Betula* sp. (Betulaceae), 3♂ (CNC). USA.—**Alaska:** 15 mi W of Nebesna, July 13, 1948, R. I. Sailer, 3♂, 3♀ (USNM). Chicken, July 22, 1982, L. A. Kelton, *Betula glandulosa* (Betulaceae), 1♂ (CNC). Chicken, July 22, 1982, L. A. Kelton, *Betula glandulosa* (Betulaceae), 4♂, 3♀ (CNC). Fairbanks, August 15, 1948, S. Lienk, 1♂ (AMNH). **California:** *Mono Co.:* Bridgeport, July 8, 1934, E. P. Van Duzee, 1♀ (CAS). **Colorado:** *Larimer Co.:* Glen Haven, July 27, 1946, P. B. Lawson, 1♀ (KU). Rist Canyon, July 22, 1898, 1♂ (USNM). *Pitkin Co.:* Avalanche, White River Natl. Forest, August 23, 1968, L. A. Kelton, 1♂ (CNC). **Connecticut:** Mansfield Center, August 9, 1956, J. A. Slater, 1♂, 1♀ (AMNH). Mt. Carmel, July 26, 1961, A. Decaprio, 1♂ (AMNH). Storrs, July 29, 1954, J. A. Slater, 1♀ (AMNH). **Idaho:** *Franklin Co.:* Thomas Spring, June 28, 1974, G. F. Knowlton, 2♂ (USU). **Illinois:** *Lake Co.:* Antioch, July 5, 1932, Frison et al., 1♂ (AMNH). Antioch, July 5, 1932, Frison et al., 1♂, 1♀ (USNM). Antioch, July 5, 1932, Frison, 1♂, 2♀ (AMNH). **Maine:** *Hancock Co.:* Mount Desert Island, Eagle Lake, July 18, 1917, C. W. Johnson, 1♀ (USNM). *Washington Co.:* Whiting, July 18, 1958, J. A. Slater, 1♀ (AMNH). **Massachusetts:** *Berkshire Co.:* Hartsville, Lake Buel, July 13, 1930, J. R. de la Torre-Bueno, 1♂ (KU). *Essex Co.:* Beach Bluff, July 22, 1917, H. M. Parshley, 3♀ (CAS). Beach Bluff, July 23, 1917, H. M. Parshley, paratype: 1♂ (CNC). Beach Bluff, July 23, 1917, H. M. Parshley, *Betula* sp. (Betulaceae), paratypes: 1♂, 2♀ (USNM). *Franklin Co.:* Greenfield, along Green River, July 23, 1992, R. W. Jones, 1♂ (TAMU). *Worcester Co.:* Southbridge, July 16, 1900, H. M. Parshley, 1♂ (CAS). **Michigan:** *Cheboygan Co.:* Cheboygan, June 26, 1939, R. Sailer, 1♀ (KU). *Luce Co.:* Soo Junction, July 31, 1938, H. B. Hungerford, 1♀ (KU). **Minnesota:** *Hennepin Co.:* No specific locality, August 2, 1920, H. H. Knight, *Betula pumila* (Betulaceae), 1♀ (CAS). No specific locality, August 2, 1920, H. H. Knight, *Betula gladulifera* (Betulaceae), 2♀ (USNM). *Ramsey Co.:* St. Anthony Park, August 7, 1924, H. H. Knight, 1♀ (USNM). St. Anthony Park, July 4, 1921, H. H. Knight, paratype: 1♂ (USNM). **Nevada:** *Washoe Co.:* Sparks, June 28, 1927, E. P. Van Duzee, 1♀ (CAS). **New Hampshire:** *Coos Co.:* Gorham, August 12, 1900, N. Banks, 2♀ (AMNH). Gorham, July 15, 1929, G. S. Walley, 1♂ (CNC). Mount Washington, 1♂ (AMNH). *Merrimack Co.:* Boscawen, September 12, 1946, R. H. Beamer, 1♂ (KU). **New Mexico:** *Taos Co.:* Columbine Park Recreation Area, July 24, 1968, J. C. Schaffner, 7♂, 18♀ (TAMU). **New York:** *Rockland Co.:* Tuxedo, July 5, 1928, 1♂ (AMNH). *St. Lawrence Co.:* Cranberry Lake, July 23, 1924, E. A. Hartley, 1♂ (USNM). *Suffolk Co.:* Bayshore, July 4, 1912, C. E. Olsen, 2♂ (CAS). Bayshore, July 4, 1915, C. E. Olson, 1♀ (USNM). Bayshore, July 4, 1915, C. E. Olsen, paratype: 1♂ (USNM). Cold Spring Harbor, July 11, 1920, H. M. Parshley, 1♀ (CAS). **Pennsylvania:** *Luzerne Co.:* Wilkes-Barre, Rts 115 & 315, June 17, 1974, A. G. Wheeler, Jr., *Betula populifolia* (Betulaceae), 2♂, 2♀ (PDA). *Schuykill Co.:* 2.5 mi N of Rt 51 on I-81, June 20, 1974, T. J. Henry, *Betula populifolia* (Betulaceae), 1♂ (AMNH). I 81 ca. 2.5 mi N of Rt 61, June 20, 1974, A. G. Wheeler, Jr., *Betula populifolia* (Betulaceae), 1♂ (PDA). **Utah:** *Cache Co.:* Green Canyon, August 2, 1973, G. F. Knowlton, 2♂ (USU). Logan Canyon, July 10, 1933–July 21, 1969, G. F. Knowlton, 3♂, 1♀ (USU). Logan Canyon, July 21, 1959, G. F. Knowlton, 1♂

(USU). *Emery Co.:* Emery, August 16, 1929, P. W. Oman, 2♂, 4♀ (KU). **Washington:** *Yakima Co.:* Toppenish, July 8, 1935, R. H. Beamer, 1♂ (KU).

Plagiognathus pemptos, new species
Figures 11, 18, 30

HOLOTYPE: Male: ''USA: MONTANA: Park Co.: Colter Cmpgrd., 2 mi. E of Cooke City on Rt. 212, 8000 ft., Aug. 11, 1986, Schuh, Schwartz, and Stonedahl, *Picea engelmannii* Parry (Pinaceae)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the *moderately small size,* the generally *dark coloration, including appendages,* often including tibiae, the *weakly, transversely rugose posterior lobe of the pronotum,* and the *dark, nonshining vestiture on dorsum* (fig. 11). Similar in size and coloration to *laricicola* (fig. 8), *piceicola* (fig. 11), and *suffuscipennis* (fig. 13: *suffuscipennis* 2) from the Rocky Mountain system, but those species easily separated by their possession of golden, shining, simple setae on the dorsum; distribution of *laricicola* nonoverlapping. Also similar in size and general coloration to *fenderi* (fig. 7), but that species separated by the somewhat shaggy, silvery, shining vestiture, anteocular distance nearly 2 times diameter of antennal segment 1, and the conspicuously pale veins in the membrane.

DESCRIPTION: *Male:* Moderately small, ovoid; total length 3.24–3.55, length apex clypeus–cuneal fracture 2.18–2.47, width across pronotum 0.98–1.10. COLORATION (fig. 11): General coloration, including appendages, dark brown or blackish brown; posterior margin of vertex at least vaguely pale; membrane fumose, vein demarcating posterior margin of cells pale; corium weakly pale adjacent to extreme basal area of membrane; corium narrowly and weakly pale at cuneal fracture; antennae dark (fig. 18) except antennal segment 1 with a pale apical annulus; metathoracic scent-gland evaporatory area sometimes at least partially pale; portions of legs generally not so intensely dark as body; tibiae moderately to heavily infuscate, tibial spines with dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining; posterior lobe of pronotum weakly transversely rugulose. Vestiture of dorsum composed of recumbent, dark, dull, simple setae. STRUCTURE: Body elongate ovoid, broadest point somewhat anterior to cuneal fracture; frons moderately tumid and weakly bulging beyond anterior margin of eyes in dorsal view, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1; labium reaching to near apex of hind coxae. GENITALIA (fig. 30): Body of vesica relatively short and stout, apical spines oriented 45° to body of vesica, posterior vesical spine nearly straight and erect relative to body of vesica, anterior spine longer than posterior and obliquely angled relative to body of vesica; flange curving, projecting beyond body of vesica, terminating well below base of secondary gonopore.

Female: Body more strongly ovoid than in male; coloration as in male. Total length 3.28–3.46, length apex clypeus–cuneal fracture 2.29–2.42, width across pronotum 1.05–1.08.

ETYMOLOGY: Named for its original informal designation as ''new species number five''. From the Greek *pemptos,* fifth.

HOSTS: *Abies* spp. and *Picea* spp. (Pinaceae). Available records from *Pinus* spp. do not suggest that members of that genus serve as breeding hosts.

DISTRIBUTION: Montane western North America, ranging from Alberta in the north to Arizona in the south.

PARATYPES: CANADA.—**Alberta:** Banff National Park, Banff-Jasper Hwy, August 25, 1970, L. A. Kelton, *Picea* sp. (Pinaceae), 15♀ (CNC). Banff National Park, Banff-Jasper Hwy, August 25, 1970, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂, 1♀ (CNC). Kananaskis Road, July 27, 1974, L. A. Kelton, 1♂, 1♀ (CNC). **British Columbia:** Glacier National Park, July 15, 1970, L. A. Kelton, 1♂, 1♀ (CNC). Glacier National Park, Rogers Pass, July 31, 1970, L. A. Kelton, *Picea* sp. (Pinaceae), 3♂, 7♀ (CNC). Kinaskan Lake, July 22, 1983, G. G. E. Scudder, 2♀ (CNC). Oliver, July 19, 1970, L. A. Kelton, 1♂ (CNC). Osoyoos, Anarchist Mt., July 13, 1970, L. A. Kelton, 3♂, 1♀ (CNC). Ross-

land, July 11, 1970, L. A. Kelton, 2♂, 4♀ (CNC). Stanley, August 22, 1932, W. G. Mathers, 1♀ (CNC). Yoho Natl. Park, July 16, 1970, L. A. Kelton, 1♂ (CNC). USA.—**Arizona:** *Apache Co.:* 2 mi N of Alpine, August 16, 1982, J. C. Schaffner, *Picea pungens* (Pinaceae), 1♂, 2♀ (TAMU). **Colorado:** *Chaffee Co.:* Monarch Pass, San Isabel National Forest, 10,500 ft, August 28, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 2♂, 2♀ (CNC). *Clear Creek Co.:* Below Mt. Goliath, 11,200 ft, August 21, 1982, D. A. and J. T. Polhemus, 1♂ (JTP). below Mt. Goliath, 11,200 ft, August 21, 1986, D. A. and J. T. Polhemus, *Abies lasiocarpa* (Pinaceae), 7♂, 13♀ (JTP). Echo Lake, Arapaho National Forest, July 28, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 3♂, 4♀ (CNC). Juniper Pass picnic grounds, 11,000 ft, August 7, 1987, T. J. Henry, *Picea engelmanni* (Pinaceae), 7♂ (USNM). Mt. Goliath area, 11,200 ft, August 21, 1986, R. T. Schuh and J. T. Polhemus, *Pinus aristata* (Pinaceae), 3♂ (AMNH). *Gilpin Co.:* East Portal, Roosevelt Natl. Forest, August 31, 1972, L. A. Kelton, *Picea* sp. (Pinaceae), 2♂, 7♀ (CNC). *Gunnison Co.:* Kebler Pass, Gunnison National Forest, 10,000 ft, August 27, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 2♀ (CNC). *Jackson Co.:* Muddy Pass, Routt Natl. Forest, 8600 ft, August 19, 1968, L. A. Kelton, 1♂ (CNC). *Larimer Co.:* Fall River Road, Rocky Mountain National Park, 9500 ft, August 16, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂ (CNC). *Mesa Co.:* Jumbo, Grand Mesa Natl. Forest, 9800 ft, August 25, 1968, L. A. Kelton, 2♂ (CNC). *Pitkin Co.:* Aspen, White River Natl. Forest, August 24, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 12♂, 12♀ (CNC). *Routt Co.:* Meadows, Routt National Forest, August 20, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂, 6♀ (CNC). *San Juan Co.:* Silverton, 9600 ft, August 11, 1900, F. M. Carpenter, 1♀ (AMNH). *Summit Co.:* 5.6 mi W of Jct Hwy 91 on I-70, August 14, 1980, G. Stonedahl, *Picea engelmanni* (Pinaceae), 1♂, 2♀ (AMNH). **Idaho:** *Caribou Co.:* 8 mi E of Wayan, 1 mi E of milepost 101 on Rt 34, 6000 ft, July 30, 1981, M. D. Schwartz, *Abies lasiocarpa* (Pinaceae), 7♂, 3♀ (AMNH). 8 mi E of Wayan, 1 mi E of milepost 101 on Rt 34, 6000 ft, July 30, 1981, M. D. Schwartz, *Picea engelmanni* (Pinaceae), 4♂, 4♀ (AMNH). *Franklin Co.:* Strawberry Canyon, 0.5 mi N of milepost 18 on Rt 36, T13S, R41E Sec 1, 8000 ft, July 19, 1981, M. Schwartz, *Pinus contorta* (Pinaceae), 1♀ (AMNH). Williams Canyon, milepost 20 on Rt 36, T12S R42 Sec 30, 8000 ft, July 19, 1981, M. D. Schwartz, *Abies lasiocarpa* (Pinaceae), 3♂, 2♀ (AMNH). *Idaho Co.:* Lochsa River Valley, E of Wldrnss Acc. Campground (milepost 127), 2400 ft, August 1, 1987, G. M. Stonedahl, *Picea sitchensis* (Pinaceae), 1♀ (AMNH). **Montana:** *Gallatin Co.:* Moose Flat Campground, 26 mi S Bozeman Hot Springs, Rt 191, 5700 ft, August 10, 1986, Schuh, Schwartz and Stonedahl, *Pinus contorta* (Pinaceae), 2♀ (AMNH). *Park Co.:* 2 mi E of Cooke City on Rt 212, Colter Campground, Gallatin Natl. Forest, 8000 ft, August 1, 1994, M. D. Schwartz, *Abies lasiocarpa* (Pinaceae), 3♂, 5♀ (CNC). 2 mi E of Cooke City on Rt 212, Soda Butte Campground, Gallatin Natl. Forest, 7700 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, 1♂ (AMNH). Colter Campground, 2 mi E Cooke City on Rt 212, 8000 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, *Abies lasiocarpa* (Pinaceae), 9♂, 4♀ (AMNH, USNM). Colter Campground, 2 mi E Cooke City on Rt 212, 8000 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, *Picea engelmanni* (Pinaceae), 2♂, 10♀ (AMNH). Rt 212 at Wyoming border, 7750 ft, August 11, 1986, Schuh, Schwartz, Stonedahl, *Abies lasiocarpa* (Pinaceae), 2♂ (AMNH). **Oregon:** *Baker Co.:* 20 mi E of Medical Springs, Wallowa Mts, W. Eagle Meadow, 4700 ft, August 3, 1986, Schuh, Schwartz, Stonedahl, *Picea engelmanni* (Pinaceae), 37♂, 41♀ (AMNH, USNM). *Benton Co.:* Mary's Peak, R7W T12S Sec. 19, SE¼, 3250 ft, August 3, 1979–September 9, 1979, G. M. Cooper, *Abies procera* (Pinaceae), 3♀ (AMNH). *Clackamas Co.:* Mt. Hood, 1 mi below Tim Ld., September 9, 1976, J. D. Lattin, 1♀ (OSU). *Hood River Co.:* 3.2 mi N of Barlow Pass Summit Mt. Hood, R9E T3S Sec. 15, NW¼, 4460 ft, September 5, 1979, G. M. Cooper, *Abies procera* (Pinaceae), 1♂, 1♀ (AMNH). *Union Co.:* 4.5 mi E of Tollgate, Woodland Campground, 5000 ft, August 4, 1986, Schuh, Schwartz and Stonedahl, 2♀ (AMNH). *Wallowa Co.:* Wallowa-Whitman

Natl. Forest, Miram Lake Trail, 5590–7370 ft, August 18, 1979, M. D. Schwartz, *Pinus contorta* (Pinaceae), 3♀ (AMNH). Wallowa-Whitman Natl. Forest, T4S, R44E, Sec. 6, Lostine Canyon Trail, 5584 ft, August 19, 1979, M. D. Schwartz, *Abies* sp. (Pinaceae), 3♂, 3♀ (AMNH). **Utah:** *Box Elder Co.:* Raft River Mts., 5 mi SW of Clear Creek Campground, 6200–8000 ft, July 31, 1981, M. D. Schwartz, *Abies lasiocarpa* (Pinaceae), 2♂, 1♀ (AMNH). *Cache Co.:* 14 mi S on Forest Service Road 055 off UT Rt 89, T13N R4E S15, 8000–9000 ft, July 25, 1981, Schwartz, *Abies lasiocarpa* (Pinaceae), 1♂ (AMNH). *Wasatch Co.:* 30 mi SE of Kamas on Rt 35, Uintah Natl. Forest, Wolf Creek Campground, T4S R10W Sec 7, 9000 ft, August 15, 1986, Schwartz and Stonedahl, *Abies lasiocarpa* (Pinaceae), 1♀ (AMNH). 30 mi SE of Kamas on Rt 35, Uintah Natl. Forest, Wolf Creek Campground, T4S R10W Sec 7, 9000 ft, August 15, 1986, Schwartz and Stonedahl, *Picea engelmanni* (Pinaceae), paratypes: 3♂, 1♀ (AMNH). **Washington:** *Chelan Co.:* Wenatchee National Forest, Larch Lakes, 5500 ft, August 24, 1979, Schwartz, *Abies* sp. (Pinaceae), 4♂, 5♀ (OSU). *Okanogan Co.:* Washington Pass Meadow, 5400 ft, August 11, 1978, Lattin, paratypes:4♂, 10♀ (OSU). *Yakima Co.:* 3 mi E of Dog Lake on Hwy 12, August 23, 1979, G. Stonedahl, *Abies amabilis* (Pinaceae), 1♀ (AMNH).

Plagiognathus phaceliae, new species
Figures 11, 18, 30

HOLOTYPE: Male: ''[USA] CAL[ifornia]. Riverside Co., Deep Canyon Res. Ctr., 3.2 mi. W. Palm Desert, 17 March 1979, G. C. Eickwort, *Phacelia distans*''. Deposited in the Cornell University Insect Collection, Ithaca, New York.

DIAGNOSIS: Recognized by the *large* size, *pale grayish-green coloration* (fig. 11), the largely *pale antennal segment 1 and dark antennal segment 2* (fig. 18), the vesica with relatively short apical spines and no flange (fig. 30), and the preference for *Phacelia* as the host. Similar in size and coloration of the dorsum to *monardellae* (fig. 10), but that species with all antennal segments entirely black.

DESCRIPTION: *Male:* Large, elongate, relatively slender; total length 4.75–5.05, length apex clypeus–cuneal fracture 3.19–3.46, width across pronotum 1.03–1.40. COLORATION (fig. 11): General coloration, including most of venter and appendages, pale gray-green; membrane at most very weakly fumose, veins pale; antennal segment 1 always dark on tapered basal portion, remainder of segment lighter in color and with a pale apical annulus, segments 2, 3, and 4 castaneous (fig. 18); labium weakly infuscate; thoracic sternum dark; thoracic pleuron and abdominal venter variably infuscate; femora with some dark spots; dorsal tibial spines with tiny dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, pale, simple setae with darker suberect setae on pronotum and anterolaterally on hemelytra. STRUCTURE: Body elongate, nearly parallel-sided; frons moderately tumid as viewed from above, clypeus visible; anteocular distance 1.3 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium long, reaching beyond hind coxae onto abdomen. GENITALIA (fig. 30): Vesica sigmoid, body relatively heavy, base falling somewhat below base of secondary gonopore; posterior apical spine short, erect, extending only moderate distance past secondary gonopore, anterior spine much longer, slender, and angled just before midpoint; no flange.

Female: Shorter and more strongly ovoid than male; coloration similar to male. Total length 4.17–4.23, length apex clypeus–cuneal fracture 2.92–3.01, width across pronotum 1.31–1.36.

ETYMOLOGY: Named for its occurrence on *Phacelia* spp.

HOST: *Phacelia distans* (Hydrophyllaceae).

DISTRIBUTION: Interior deserts of southern California.

PARATYPES: USA.—**California:** *Riverside Co.:* 3.2 mi W of Palm Desert, Deep Canyon Research Center, March 17, 1979, G. C. Eickwort, *Phacelia distans* (Hydrophyllaceae), 4♂ (AMNH, CU). 4 mi S of Palm Desert, Boyd Desert Research Center, April 7, 1963, G. Tamski, 2♂, 1♀ (UCR). *San Di-*

ego Co.: Anza-Borrego Desert State Park, Borrego Springs, April 1, 1978, D. Faulkner, 1♂, 1♀ (SDNH).

Plagiognathus physocarpi (Henry), new combination
Figures 11, 18, 36

Psallus physocarpi Henry, 1981: 399 (n. sp.).

DIAGNOSIS: Recognized by *moderate size, dark coloration* of body and all femora (fig. 11), *antennal segment 2 pale* except at extreme base (in both sexes) (fig. 18), and silvery, *strongly flattened, scalelike setae on dorsum* (fig. 36C–E), thoracic pleuron, and much of abdomen intermixed with reclining, dark or shining, simple setae (fig. 36C). Coloration and type of dorsal vestiture most similar to *amorphae* (fig. 5), but that species smaller than *phyoscarpi.* Also similar in type of vestiture to *astericola* (fig. 6) and *morrisoni* (fig. 10), but distinguished from them by largely pale antennal segment 2 in both sexes, whereas segment 2 dark in males of *astericola* and dark in both sexes of *morrisoni.* Further distinguished from *astericola* and *morrisoni* by head projecting well beyond anterior margin of eyes in those species, whereas head not so strongly projecting in *physocarpi.* Distinguished from *alnicenatus* (fig. 5) and *parshleyi* (fig. 11) by the generally dark antennal segment 2 and the scalelike setae being restricted to the pronotum in both of those species.

REDESCRIPTION: *Male:* Elongate-ovoid, of moderate size; total length 3.39–3.52, length apex clypeus–cuneal fracture 2.33–2.52, width across pronotum 1.06–1.12. COLORATION (fig. 11): Dorsum entirely castaneous, except corium adjacent to extreme base of membrane narrowly pale; membrane fumose with contrasting pale veins; antennal segment 1 castaneous except for pale apical annulus, segment 2 dark at base, remainder of segment pale (fig. 18), segments 3 and 4 pale; labium castaneous; venter entirely castaneous; metathoracic scent-gland evaporatory area totally pale; coxae, trochanters, and femora castaneous except femora pale at apex. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum and venter composed of recumbent, dark or shining, simple setae intermixed with silvery, strongly flattened, scalelike setae (fig. 36B–E). STRUCTURE: Body elongate-ovoid, lateral corial margins weakly convex; frons weakly tumid, clypeus visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 2 times diameter of antennal segment 1 (fig. 36A); labium very long, reaching beyond apex of hind coxae and well onto abdomen; metathoracic scent-gland evaporatory area and spiracle as in figure 36B; pretarsus as in figure 36F. GENITALIA (fig. 30): Body of vesica relatively stout and strongly curving, more or less U-shaped, base of vesica reaching to about level of secondary gonopore, posterior apical spine elongate, nearly straight, weakly angled relative to body of vesica, anterior spine curving and rather strongly angled near apex in lateral view; flange moderately broad, reaching to about midpoint of gonopore.

Female: Very similar to male in coloration and body form. Total length 3.41–3.48, length apex clypeus–cuneal fracture 2.41–2.54, width across pronotum 1.16–1.17.

HOST: *Physocarpus opulifolius* (Rosaceae) (Wheeler and Hoebeke, 1985).

DISTRIBUTION: Northeastern North America.

SPECIMENS EXAMINED: CANADA.—**Ontario:** Goderich, July 2, 1962, G. Thorpe, *Anethum* sp. (Apiaceae), 1♀ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 3♂ (CNC). USA.—**Michigan:** *Clare Co.:* No specific locality, July 23, 1959, R. R. Dreisbach, 1♂ (USNM). *Gladwin Co.:* No specific locality, June 25, 1959, R. R. Dreisbach, 1♀ (USNM). *Midland Co.:* No specific locality, July 4, 1947, R. R. Dreisbach, 1♂ (USNM). No specific locality, June 28, 1958, R. R. Dreisbach, 4♀ (USNM). **New York:** *Tompkins Co.:* Ludlowville, Salmon Creek Road, July 3, 1979, E. R. Hoebeke, paratypes: 4♂, 1♀ (PDA). Ludlowville, Salmon Creek, August 4, 1979, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 2♀ (PDA). **Pennsylvania:** *Bedford Co.:* Schellsburg, July 2, 1980, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), paratypes: 3♂ (PDA). *Bucks Co.:* near Jamison, 5 Spruce Farm, July 12, 1979, J. F. Stimmel, *Picea abies* (Pinaceae), 1♀ (PDA). *Dauphin Co.:* Middle

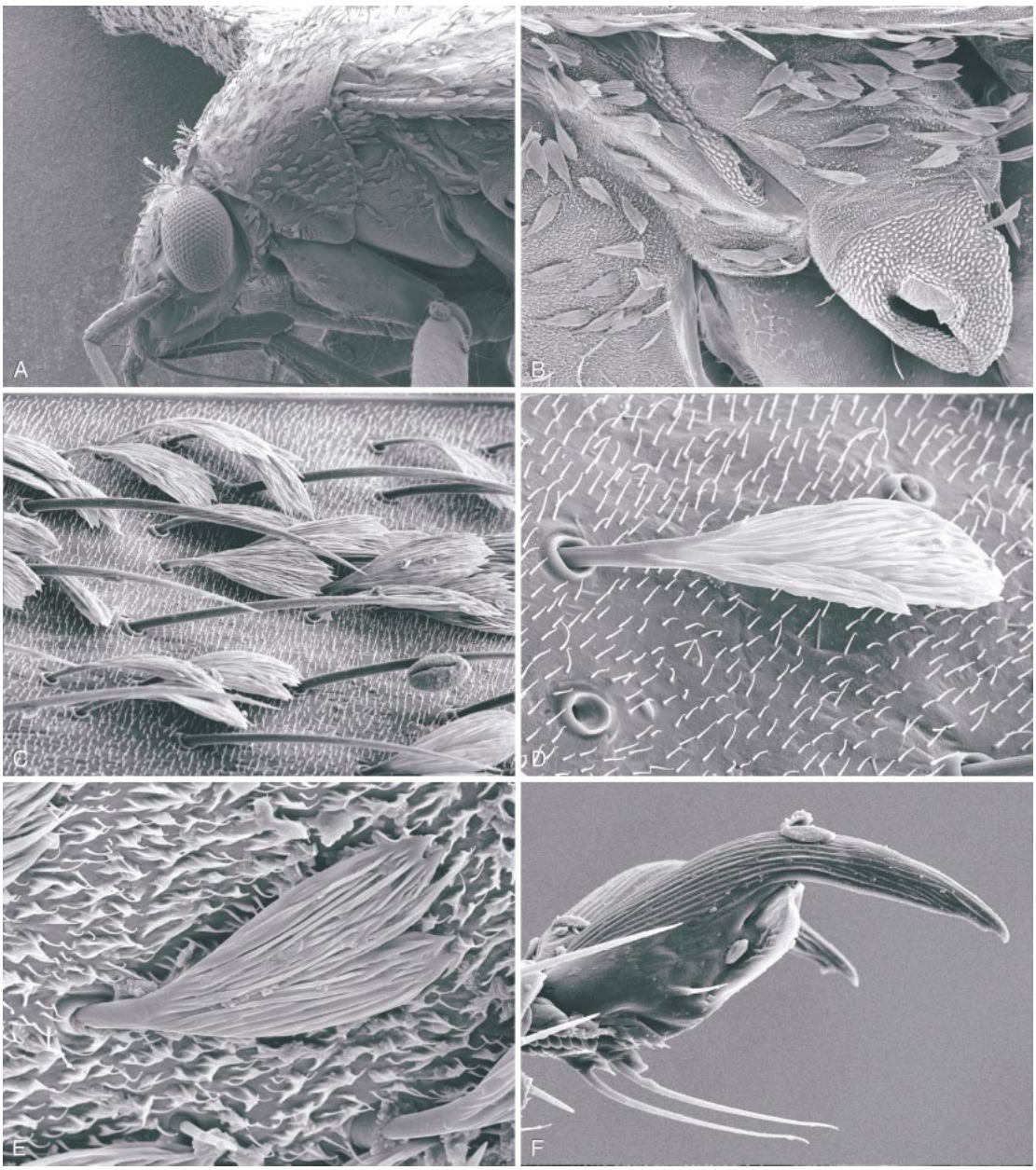

Fig. 36. *Plagionathus physocarpi*, male, scanning micrographs. **A.** Lateral view of head. **B.** Metathoracic spiracle and metathoracic scent-gland evaporatory area. **C.** Hemelytral vestiture. **D.** Detail of hemelytral vestiture. **E.** Detail of vestiture on metathoracic pleuron. **F.** Pretarsus.

Paxton Township, Rt 443, Fishing Creek Valley School, July 3, 1979, A. G. Wheeler, Jr. and T. J. Henry, *Physocarpus opulifolius* (Rosaceae), 9♀ (USNM). Middle Paxton Township, Rt 443, Fishing Creek Valley School, June 27, 1979–June 28, 1979, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), paratypes: 9♂, 2♀ (PDA). West Hanover Township at Middle Paxton line on Rt 443, June 21, 1979–July 5, 1979, A. G.

Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 2♂, 2♀ (PDA); Paratypes: 4♂, 7♀ (PDA). *Somerset Co.:* E of Jennerstown, August 1, 1984, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 4♀ (PDA). *Westmoreland Co.:* New Stanton, July 9, 1983, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 2♀ (PDA).

Plagiognathus piceicola, new species
Figures 11, 18, 30

HOLOTYPE: Male: ''[USA] Cloudcroft, N[ew] M[exico], 5.VII.1968, 9100′, L. A. Kelton, on *Picea*''. Deposited in the Canadian National Insect Collection, Ottawa.

DIAGNOSIS: Recognized by moderate size, generally *castaneous* coloration, including antennae and legs, the veins of the membrane entirely pale (fig. 11), the neatly arranged *vestiture of golden, shining, simple setae on dorsum* (fig. 11), and the structure of the vesica (fig. 30). Similar in size and coloration to *fenderi, fuscipes, laricicola, pemptos,* and *suffuscipennis*; *fenderi* (fig. 7) with anteocular distance about 2 times diameter of antennal segment 1 and with distinct pale markings on dorsum; femora in *fuscipes* (fig. 8) not so heavily darkened, vestiture of dorsum more woolly in appearance and more silvery, and apical blade of vesica much longer; *laricicola* (fig. 8) known only from eastern North America and restricted to *Larix*; *pemptos* (fig. 11) easily separated by its possession of nearly black, nonshining setae on the dorsum and veins of the membrane pale only along the posterior margin of the cells; most difficult to distinguish from populations of *suffuscipennis* (fig. 13: *suffuscipennis* 2) occurring in the Rocky Mountains, but separated by the smaller size of that species and by the structure of the vesica (compare figs. 30 for *piceicola* and 32 for *suffuscipennis*).

DESCRIPTION: *Male:* Elongate, weakly flattened, of moderate size; total length 3.55–4.22, length apex clypeus–cuneal fracture 2.39–2.93, width across pronotum 0.98–1.18. COLORATION (fig. 11): General coloration, including appendages, castaneous, particularly cuneus sometimes more reddish; corium narrowly and weakly pale adjacent to extreme basal area of membrane; corium and cuneus narrowly and weakly pale at cuneal fracture; membrane smoky, veins entirely pale, yellowish to reddish; antennae castaneous (fig. 18), antennal segment 1 with a reddish apical annulus; femora pale apically; tibiae pale to weakly infuscate, tibial spines with dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, at most very weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Corial margins very weakly convex; frons moderately tumid and weakly bulging beyond anterior margin of eyes in dorsal view, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below level of eye by 1.5 times diameter of antennal segment 1; labium reaching between apices of middle and hind coxae. GENITALIA (fig. 30): Body of vesica broadly curving, posterior apical spine erect relative to body of vesica, anterior spine longer than posterior, smoothly curving, and relatively broad; flange projecting only slightly beyond body of vesica, terminating at base of secondary gonopore.

Female: Body more strongly ovoid than in male; coloration usually somewhat lighter. Total length 3.53–3.81, length apex clypeus–cuneal fracture 2.36–2.63, width across pronotum 1.06–1.15.

ETYMOLOGY: Named for its occurrence on *Picea.*

HOST: *Picea* sp. (Pinaceae).

DISTRIBUTION: Known from higher altitudes in northern Arizona and in New Mexico.

PARATYPES: USA.—**Arizona:** *Apache Co.:* Big Lake, Apache Natl. Forest, August 12, 1967, L. A. Kelton, 1♀ (CNC). *Coconino Co.:* San Francisco Mts, Coconino Natl. Forest, 9650 ft, July 14, 1968, L. A. Kelton, 4♂, 2♀ (CNC). *Greenlee Co.:* Hannagan, Apache Natl. Forest, 9000 ft, July 10, 1968, L. A. Kelton, *Pseudotsuga menziesii* (Pinaceae), 2♂ (CNC). **New Mexico:** *Otero Co.:* Cloudcroft, 9100 ft, July 5, 1968, L. A. Kelton, on *Picea*, 16♂, 16♀ (AMNH, CNC).

Plagiognathus polhemorum, new species
Figures 11, 18, 30

Plagiognathus ribesi Kelton 1982a: 169 (in part; specimens from Colorado misidentified).

HOLOTYPE: Male: ''[USA:] Colo[rado]: Douglas Co., Waterton, VI-14–81, D. A. Polhemus, on *Ribes cereum* (Squaw Currant)''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the medium size, *pale* somewhat greenish coloration (fig. 11), *black stripe on dorsal margin of all femora, antennal segment 1 without a black stripe on outer surface* (fig. 18), and the *form of the male genitalia* (fig. 30). Distinguished from *ribesi* (fig. 12) by not having a black stripe on outer surface of antennal segment 1 and by the much less extensive fumose patch on the membrane. Similar to *cibbetsi* (figs. 6) and *luteus* (fig. 9) in uniform coloration and general structure of vesica in male, but *cibbetsi* more yellowish and without black stripe on dorsal surface of femora; *luteus* similar in size but intensely orange with antennal segment 1 black and a short black stripe on dorsal margin of hind femur only.

DESCRIPTION: *Male:* Elongate, nearly parallel-sided, of moderate size; total length 3.49–4.02, length apex clypeus–cuneal fracture 2.34–2.65, width across pronotum 1.12–1.20. COLORATION (fig. 11): General coloration pale, weakly greenish, translucent; membrane pale with a distinct fumose marking posterior to cuneus and cells; base of spine on interior surface of antennal segment 1 and extreme base of segment 2 black (fig. 18); labium infuscate at apex; all femora with a black stripe along almost entire length of dorsal surface, hind femur with a short black stripe distally on medioventral surface; dorsal tibial spines with dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, shining, weakly translucent. Vestiture of dorsum composed of reclining pale, golden-shining, simple setae with some very slightly darker setae on pronotum. STRUCTURE: Body flattened, relatively broad, corial margins nearly straight and parallel; frons weakly tumid, clypeus barely visible from above; anteocular distance 0.3 times diameter of antennal segment 1; head projecting below eye by about diameter of antennal segment 1; labium reaching apex of hind coxae. GENITALIA (fig. 30): Body of vesica as in figure 30, base of vesica not reaching to base of secondary gonopore; apical spines relatively short, nearly straight, and strongly tapered toward apex, posterior spine distinctly shorter than anterior; flange narrow.

Female: Body more obviously ovoid than in male; coloration as in male. Total length 3.31–3.60, length apex clypeus–cuneal fracture 2.26–2.58, width across pronotum 1.08–1.18.

ETYMOLOGY: Named for J. T. and D. A. Polhemus, collectors of many of the known specimens.

HOSTS: *Ribes cereum* (Grossulariaceae).

DISTRIBUTION: Colorado.

PARATYPES: USA.—**Colorado:** *Douglas Co.:* Waterton, June 11, 1981–June 24, 1982, J. T. Polhemus, *Ribes cereum* (Grossulariaceae), 12♂, 16♀ (AMNH, PDA, USNM, CNC). *Jefferson Co.:* Red Rocks Park near Morrison, 5600 ft, July 15, 1983, R. T. Schuh and D. A. Polhemus, 2♀ (AMNH).

Plagiognathus politus Uhler
Figures 11, 18, 30

Plagiognathus politus Uhler, 1895: 52 (n. sp.).
Plagiognathus politus flaveolus Knight, 1923: 434 (n. var.).

DIAGNOSIS: Recognized unequivocally by the *serrate margin of the vesical flange* (fig. 30); *dorsum convexly rounded, pronotum declivent*; and *dorsum clothed with recumbent, golden, shining, simple setae* (fig. 11). Occurring as distinctive early- and late-season color morphs: early-season morph with dorsum, antennae, and all but apex of femora castaneous, cuneus with a pale lunate marking at base and posterior margin of vertex pale (fig. 11: *politus* 1); late-season morph with scutellum golden, often with midline of scutellum and additional areas of dorsum, including base of corium and cuneus, also golden; femora partially to largely golden (fig. 11: *politus* 2). Early-season morph very similar in coloration of dorsum (including lunate pale marking at base of cuneus) and femora to *fuscosus* (fig. 8), but antennal segment 2 largely pale in *fuscosus* (fig. 16) and dorsal vestiture composed of weakly flattened as well as common setae (fig. 4D), and the overall size usually smaller. Late-season morph similar in coloration to *flavoscutellatus* (fig. 8), but that species usually much larger and having a much narrower ves-

ical flange lacking the serrations found in *politus.* Also, late-season form similar in coloration to *blatchleyi,* but anterior pronotal lobe usually dark in *politus* and always pale in *blatchleyi* (see also Discussion under *blatchleyi*).

REDESCRIPTION: *Male:* Relatively broad-bodied, moderately large; total length 3.46–4.12, length apex clypeus–cuneal fracture 2.41–2.75, width across pronotum 1.10–1.33. COLORATION (fig. 11): Dorsum castaneous with a lunate pale marking at base of cuneus, corium narrowly pale adjacent to extreme base of membrane, and posterior margin of vertex pale, **or** scutellum and often disk of pronotum and areas of hemelytra, including pale areas mentioned above, golden; antennal segments 1 and 2 castaneous except for pale apical annulus on segment 1 (fig. 18), segments 3 and 4 infuscate; labial segments 1 and 2 castaneous, remainder of lighter coloration; venter mostly castaneous; ventral margin of pronotum, area surrounding mesothoracic spiracle, and at least part of metathoracic scent-gland evaporatory area pale; coxae, trochanters, and femora castaneous in dark colored specimens; tibiae mostly pale, spines with dark bases; tibiae dark at articulation with femora; in specimens with golden areas on dorsum, much of venter and legs golden or pale. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, moderately shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Dorsal surface of body noticeably convexly rounded, hemelytra declining laterally; hemelytra broadest at point just anterior to cuneal fracture; frons nearly straight across between eyes in dorsal view, head dorsoventral in orientation, clypeus not visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 30): Body of vesica relatively stout and strongly curving, more or less U-shaped, base of vesica reaching to level of secondary gonopore; posterior apical spine elongate, nearly straight, erect relative to body of vesica, anterior spine obliquely angled relative to body of vesica, about equal in length to posterior, rather sharply bent subapically; flange very broad, reaching near apex of secondary gonopore, serrate along margin at level of gonopore.

Female: Very similar to male in coloration; body not quite so elongate in appearance. Total length 3.43–3.98, length apex clypeus–cuneal fracture 2.42–2.67, width across pronotum 1.16–1.36.

HOSTS: Recorded from a variety of plants, but probably breeding primarily on the Asteraceae. Also known to feed at least in part on animal material, as recorded by Wheeler (1971).

DISTRIBUTION: Widely distributed in eastern North America, with no records from the high plains of Canada, despite extensive collecting there by Brooks and Kelton. Because of its otherwise complete absence from west of the Front Range of the Rocky Mountains, the single record from Lone Pine, California, might be considered suspect and possibly the result of mislabeling.

DISCUSSION: This is one of the most commonly encountered species of *Plagiognathus* in eastern North America. As noted by Knight (1941), the species routinely has two generations per year, each of which has its own distinctive coloration, the early generation being almost totally castaneous, the later being heavily marked with gold.

This species was described on the basis of a single specimen from Fort Collins, Colorado, collected on July 24 by C. F. Baker. Modern authors, including Knight, have apparently not verified whether any specimen from Uhler's collection in the United States National Museum of Natural History actually represents the holotype and indeed I have not found any either. The concept of the species, nonetheless, has been agreed upon by most authors. I am designating a neotype (male) to ensure continued stability in the use of this name. It bears the following label data and is deposited in the United States National Museum of Natural History, Washington, D.C.

> St. Anthony Pk., Minn., August 2, 1924, H. H. Knight; H. H. Knight Collection 1976; Neotype *Plagiognathus politus* Uhler, det. R. T. Schuh

SPECIMENS EXAMINED: CANADA.—**Nova Scotia:** Kentville, July 10, 1976, L. A. Kelton, *Trifolium* sp. (Fabaceae), 1♂ (CNC).

Ontario: Aldershot, July 6, 1955–July 14, 1958, L. A. Kelton, 15♂, 9♀ (CNC). Amherstburg, July 6, 1962, Kelton and Brumpton, 4♂, 4♀ (CNC). Ancaster, July 1, 1954–July 2, 1954, J. E. H. Martin, 24♂, 13♀ (CNC). Ancaster, July 21, 1955, L. A. Kelton, 3♂, 12♀ (CNC). Appin, June 19, 1962, Kelton and Brumpton, 1♂ (CNC). Aylmer, July 19, 1955, L. A. Kelton, *Ambrosia* sp. (Asteraceae), 3♂, 14♀ (CNC). Bells Corners, August 7, 1962, D. Brown, *Ulmus* sp. (Ulmaceae), 1♂ (CNC). Brantford, July 21, 1955, L. A. Kelton, 1♀ (CNC). Bryanston, June 20, 1962, Kelton and Brumpton, 1♂ (CNC). Burtch, July 11, 1961, L. A. Kelton, 9♂, 6♀ (CNC). Caledonia, July 12, 1955, L. A. Kelton, 1♂, 5♀ (CNC). Camden (East Ontario), June 27, 1974, D. G. Reid, 1♀ (CNC). Cayuga, July 12, 1955, L. A. Kelton, 2♂ (CNC). Cayuga, July 15, 1961, L. A. Kelton, 3♂, 4♀ (CNC). Cayuga, June 1, 1954, R. Lambert, 1♂ (CNC). Cayuga, June 26, 1961, Kelton and Brumpton, 1♀ (CNC). Chambers Corn, July 10, 1962, H. Blanchard, 2♀ (CNC). Chatham, August 30, 1935, W. E. Lindsay, 1♀ (CNC). Chatham, July 16, 1928–August 3, 1928, A. B. Baird, 3♀ (CNC). Chatham, September 1, 1948, D. A. Arnott, *Trifolium* sp. (Fabaceae), 3♂, 2♀ (CNC). Chatterton, July 24, 1956–July 28, 1956, J. C. Martin, 1♂, 2♀ (CNC). Clear Creek, July 4, 1964, Kelton and Brumpton, 1♀ (CNC). Clinton, September 7, 1961, L. A. Kelton, *Ambrosia* sp. (Asteraceae), 17♂, 9♀ (CNC). Coboura, July 11, 1981, D. J. E. Brown, 1♀ (CNC). Copenhagen, July 3, 1962, G. Thorpe, 1♀ (CNC). Copetown, July 16, 1961, Kelton and Brumpton, *Picea* sp. (Pinaceae), 1♀ (CNC). Dundas, July 16, 1962, Kelton and Thorpe, 3♂, 4♀ (CNC). Dunnville, August 3, 1957, R. Lambert, 1♂ (CNC). Dunnville, July 9, 1962, G. Thorpe, 1♂, 2♀ (CNC). Eden, July 2, 1962, H. Blanchard, 1♀ (CNC). Edwards, Patterson's Farm, June 23, 1991, M. D. Schwartz, 4♂, 9♀ (CNC). Effingham, August 2, 1961, L. A. Kelton, 1♀ (CNC). Effingham, July 12, 1955, L. A. Kelton, 5♂, 21♀ (CNC). Eramosa, September 5, 1961, Kelton and Brumpton, 1♂, 7♀ (CNC). Fonthill, September 8, 1947, J. H. H. Phillips, *Prunus* sp. (Rosaceae), 1♀ (CNC). Footes Bay, July 25, 1962, Kelton and Thorpe, *Spiraea* sp. (Rosaceae), 1♀ (CNC). Fort Erie, July 10, 1955, L. A. Kelton, 2♂, 3♀ (CNC). Fuller, August 1, 1972, D. G. Reid, *Solidago canadensis* (Asteraceae), 1♀ (CNC). Fuller, July 2, 1971–July 28, 1971, D. G. Reid, *Solidago* sp. (Asteraceae), 8♂, 2♀ (CNC). Fuller, July 8, 1967, *Solidago* sp. (Asteraceae), 1♀ (CNC). Goderich, July 2, 1962, G. Thorpe, *Anethum* (Apiaceae), 1♀ (CNC). Goderich, July 2, 1962, H. Blanchard, 2♂, 1♀ (CNC). Grand Bend, September 6, 1954, C. D. F. Miller, 3♂ (CNC). Grassie, June 21, 1962, Kelton and Thorpe, 1♂ (CNC). Haggersville, August 23, 1961, Kelton and Brumpton, 1♀ (CNC). Haggersville, July 9, 1962, Kelton and Thorpe, *Ambrosia* sp. (Asteraceae), 8♂, 15♀ (CNC). Hamilton, July 16, 1967, L. A. Kelton, 1♀ (CNC). Hamilton, June 27, 1968, L. A. Kelton, *Ambrosia* sp. (Asteraceae), 13♂, 16♀ (CNC). Hamilton, July 6, 1955, L. A. Kelton, 5♂, 3♀ (CNC). Harrow, August 30, 1961, J. Brumpton, 1♂ (CNC). Ipperwash, July 11, 1962, Kelton and Thorpe, 1♀ (CNC). Jordan, July 17, 1961, L. A. Kelton, *Crataegus* sp. (Rosaceae), 11♂, 6♀ (CNC). Jordan, June 7, 1962, Kelton and Thorpe, 1♂ (CNC). Kinburn, July 18, 1957, J. E. H. Martin, 1♂ (CNC). Kincardine, September 7, 1961, Kelton and Brompton, 2♂, 1♀ (CNC). Kingsville, July 17, 1955, L. A. Kelton, 11♂, 10♀ (CNC). Kingsville, July 7, 1962, G. Thorpe, 1♂, 2♀ (CNC). Kingsville, June 18, 1962–June 19, 1962, Kelton and Thorpe, *Crataegus* sp. (Rosaceae), 14♂, 5♀ (CNC). Kintore, July 10, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 2♂, 1♀ (CNC). Leamington, June 26, 1931–July 2, 1931, G. S. Walley, 15♂, 9♀ (CNC). Leamington, June 29, 1961, G. Brumpton, 1♂ (CNC). Leamington, September 12, 1961–September 13, 1961, Kelton and Brumpton, *Ambrosia* sp. (Asteraceae), 7♂, 10♀ (CNC). Marmora, April 4, 1952–July 16, 1952, E. H. N. Smith, *Medicago sativa* (Fabaceae), 2♀ (CNC). Marmora, July 3, 1952–July 18, 1952, J. R. McGillis, 2♂, 4♀ (CNC). Marmora, July 5, 1952–July 24, 1952, J. R. Vockeroth, 4♂, 1♀ (CNC). Marmora, July 8, 1952–July 14, 1952, C. Boyle, 3♂, 3♀ (CNC). Marmora, September 10, 1952, J. F. McAlpine, *Rhus aromatica* (Anacardiaceae), 1♂ (CNC). McGregor, July 7, 1962, G. Thorpe, 1♂ (CNC). Montecello Hill, June 28, 1968, L.

A. Kelton, 3♀ (CNC). Mt. Pleasant, August 22, 1961, L. A. Kelton, 8♂, 8♀ (CNC). Mt. Pleasant, July 10, 1958, L. A. Kelton, *Salix* sp. (Salicaceae), 10♂, 19♀ (CNC). Mt. Vernon, July 10, 1962, Kelton and Thorpe, 2♂ (CNC). Nepean, Piney Forest, July 18, 1991–August 28, 1991, M. D. Schwartz, 2♂, 7♀ (CNC). Newry, July 12, 1962, Kelton and thorpe, *Salix* sp. (Salicaceae), 1♂, 2♀ (CNC). Niagara Falls, August 10, 1961, L. A. Kelton, *Erigeron* sp. (Asteraceae), 3♂, 8♀ (CNC). Niagara Falls, July 7, 1955, L. A. Kelton, 5♂, 6♀ (CNC). Norway Point, Lake of Bays, July 26, 1919, J. McDunnough, 1♂ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 1♀ (CNC). Oakland, July 17, 1962, Kelton and Thorpe, 1♀ (CNC). Ojibway, August 30, 1961, J. Brumpton, 5♂, 2♀ (CNC). Ottawa, July 11, 1957, J. E. H. Martin, 2♂, 2♀ (CNC). Ottawa, June 28, 1957–September 22, 1952, E. H. N. Smith, *Medicago* sp. (Fabaceae), 3♂ (CNC). Pelee Island, July 3, 1931, G. S. Walley, 23♂, 14♀ (CNC). Pelee Island, September 12, 1961, Kelton and Brumpton, 15♂, 19♀ (CNC). Port Burwell, July 3, 1962, G. Thorpe, 3♂, 3♀ (CNC). Port Burwell, July 3, 1962, H. Blanchard, 6♂, 4♀ (CNC). Port Rowan, July 12, 1962, H. Blanchard, 2♂, 1♀ (CNC). Port Rowan, July 13, 1955, L. A. Kelton, 1♂, 1♀ (CNC). Port Rowan, July 4, 1962, L. A. Kelton, 1♀ (CNC). Pt. Anne, April 9, 1948, J. C. Martin, 1♂ (CNC). Pt. Pelee, July 6, 1962, Kelton and Thorpe, 1♂ (CNC). Pt. Pelee, July 9, 1931, G. S. Walley, 4♂, 2♀ (CNC). Pt. Pelee, June 28, 1961, Kelton and Brumpton, 1♂ (CNC). Pt. Pelee, September 11, 1961, L. A. Kelton, 1♂ (CNC). Pt. Pelee, September 9, 1954, R. M. Mason, 1♀ (CNC). Queenston, July 23, 1963, L. A. Kelton, 2♂, 7♀ (CNC). Queenston, July 8, 1955, L. A. Kelton, 3♂, 5♀ (CNC). Rockaway, June 21, 1962, Kelton and Thorpe, 7♂, 2♀ (CNC). Selkirk, July 9, 1962, Kelton and Brumpton, *Abies* sp. (Pinaceae), 2♂, 3♀ (CNC). Selkirk, July 9, 1962, Kelton and Brumpton, *Nepeta* sp. (Lamiaceae), 1♂, 5♀ (CNC). Selkirk, July 9, 1962, Kelton and Brumpton, *Rubus* sp. (Rosaceae), 2♂, 3♀ (CNC). Shipka, July 10, 1962, Kelton and Thorpe, *Ulmus americana* (Ulmaceae), 1♂, 9♀ (CNC). Simcoe, July 13, 1955, L. A. Kelton, 1♂, 1♀ (CNC). Simcoe, July 2, 1915, 1♀ (CNC). Simcoe, July 20, 1915, H. G. Crawford, 1♀ (CNC). Smithville, June 10, 1962, Kelton and Brumpton, *Rubus* sp. (Rosaceae), 1♀ (CNC). South Gloucester, Blossom Park, Greenbelt, June 9, 1991, M. D. Schwartz, 1♀ (CNC). Spencerville, August 31, 1939–September 9, 1939, G. H. Hammond, 3♀ (CNC). St. Catharines, August 8, 1961–September 9, 1961, L. A. Kelton, 24♂, 12♀ (CNC). St. Catharines, July 18, 1963, L. A. Kelton, 3♀ (CNC). St. Catharines, July 9, 1955, L. A. Kelton, 9♂, 23♀ (CNC). St. Lawrence Islands Natl. Park, Aubrey Island, September 15, 1976, W. Reid, 2♂ (CNC). St. Lawrence Islands Natl. Park, Thwartway Island, July 25, 1976, W. Reid, 1♂ (CNC). St. Thomas, July 19, 1955, L. A. Kelton, 2♂ (CNC). Stanford, July 12, 1961, L. A. Kelton, 11♂, 14♀ (CNC). Stirling, June 26, 1962, G. Thorpe, 2♂, 3♀ (CNC). Stittsville, August 9, 1962, D. Brown, *Salix* sp. (Salicaceae), 1♀ (CNC). Strathroy, July 19, 1925–July 20, 1925, H. F. Hudson, 1♂, 3♀ (CNC). Thornhill, August 15, 1961, L. A. Kelton, 1♂, 8♀ (CNC). Tillsonburg, July 14, 1955–July 11, 1958, L. A. Kelton, *Artemisia* sp. (Asteraceae), 15♂, 25♀ (CNC). Tillsonburg, July 3, 1962, H. Blanchard, 2♂, 4♀ (CNC). Tillsonburg, June 18, 1962–June 20, 1962, Kelton and Thorpe, 2♂, 2♀ (CNC). Trenton, June 27, 1911, Evans, 1♂ (CNC). Trenton, September 11, 1910, Evans, 1♂ (CNC). Turkey Point, July 12, 1962, H. Blanchard, 1♀ (CNC). Vienna, July 15, 1961, L. A. Kelton, 2♂ (CNC). Vienna, July 18, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂, 3♀ (CNC). Vineland, July 11, 1955–July 22, 1963, L. A. Kelton, 10♂, 7♀ (CNC). Virgil, August 8, 1961, L. A. Kelton, 3♂, 17♀ (CNC). Virgil, July 9, 1955, L. A. Kelton, 3♂, 7♀ (CNC). Vittoria, July 13, 1962, H. Blanchard, *Rubus* sp. (Rosaceae), 1♂ (CNC). Vittoria, July 14, 1962, G. Brumpton, *Salix* sp. (Salicaceae), 1♀ (CNC). Windsor, July 7, 1962, G. Thorpe, *Quercus* sp. (Fagaceae), 1♀ (CNC). Woodslee, August 31, 1961, G. Brumpton, 1♀ (CNC). Woodslee, July 7, 1962, G. Thorpe, *Platanus* sp. (Platanaceae), 1♂, 1♀ (CNC). **Quebec:** Fabre, July 5, 1963, L. A. Kelton, 1♂ (CNC). Gatineau National Park, North End, June 25, 1981, D. J. E. Brown, 1♀ (CNC). Hemmingford, August 29, 1916, J. I. Beaulne, 2♂, 5♀

(CNC). Hull, June 16, 1955, L. A. Kelton, 1♂ (CNC). Knowlton, June 26, 1929–August 12, 1929, G. S. Walley, 1♂, 2♀ (CNC). La Trappe, August 28, 1933, J. Ouellet, 1♂, 1♀ (TAMU). Montreal, Beaulieu, August 15, 1905, 1♀ (CNC). Quyon, July 22, 1953, L. A. Kelton, 2♂ (CNC). USA.—**Alabama:** *Garland Co.:* near Fountain Lake on Rt 7, June 11, 1987, T. J. Henry and A. G Wheeler, Jr., *Salix* sp. (Salicaceae), 1♂ (USNM). **Arkansas:** *Marion Co.:* Yellville, September 11, 1926, H. H. Knight, 3♂ (USNM). *Pulaski Co.:* Little Rock, May 5, 1943, Stahevitch, 1♂ (LACM). *Sebastian Co.:* Huntington, June 15, 1948, B.T. McDermott, 1♂ (KU). **California:** *Inyo Co.:* Lone Pine, July 28, 1940, D. E. Hardy, 1♂ (KU). **Colorado:** *Arapohoe Co.:* Highline Canal at Belleview Ave., June 25, 1981, D. A. Polhemus, 1♂ (JTP). *Denver Co.:* Denver, June 15, 1916, E. C. Jackson, 1♂ (USNM). *El Paso Co.:* Colorado Springs, 5915 ft, E. S. Tucker, 1♂ (KU). *Weld Co.:* No specific locality, July 2, 1978, G. E. Bohart, 2♂ (UCB). **Connecticut:** 5.5 mi N of Stamford, July 15, 1970, W. Ford, 1♂ (AMNH). Cheshire, September 16, 1966, L. and C. W. O'Brien, 3♂ (UCB). Colebrook, Colebrook Resevoir, August 21, 1970, F. P. Maroney, 2♂ (AMNH). Eagleville, June 22, 1977, D. Laston, 1♂ (AMNH). East Hartford, Tunxis State Forest, July 20, 1970, F. P. Maroney, 1♂ (AMNH). East Suffield, Connecticut River, July 21, 1970, F. P. Maroney, 2♂ (AMNH). Eastford, July 17, 1976, J. A. Slater, 1♂ (AMNH). Hall Meadow State Park, Torrington, August 4, 1970, F. P. Maroney, 1♂ (AMNH). Hartford Res., West Hartford, July 23, 1970, F. P. Maroney, 4♂ (AMNH). New Haven, August 23, 1934, M. E. Griffith, 1♂ (KU). New Haven, July 20, 1964, B. H. Walden, 1♂ (CAS). New Haven, July 6, 1914, M. P. Zappe, 1♂ (CAS). New Haven, September 4, 1911, C. E. Olsen, 7♂ (CAS). Pachaug State Forest, August 24, 1964, J. A. Slater, 1♂ (AMNH). Poquonock, Farmington River, July 22, 1970, F. P. Maroney, 34♂ (AMNH). Rocky Hill, August 18, 1970, F. P. Maroney, 2♂ (AMNH). Somers, LaChance Farm, July 8, 1965, 1♂ (AMNH). Sound Beach, July 23, 1910, 1♂ (AMNH). Storrs, July 12, 1955, R. M. Baranowski, 3♂ (AMNH). Storrs, July 23, 1954, R. M. Baranowski, 4♂ (AMNH). Storrs, July 6, 1964, 3♂ (AMNH). Storrs, June 28, 1977, D. Leston, 3♂ (AMNH). Trumbull, Easton Reservoir, September 8, 1970, F. P. Maroney, 1♂ (AMNH). Waterbury, September 13, 1969, C. W. O'Brien, 1♂ (UCB). West Hartford, M. D. C. Lab, July 17, 1970, W. Ford, 1♂ (AMNH). Windsor, July 6, 1965, D. E. Leonard, 5♂ (AMNH). **Georgia:** *Towns Co.:* Hiawassee, August 19, 1957, L. A. Kelton, 1♂ (CNC). **Illinois:** Urbana, August 25, 1930, H. H. Knight, 2♂ (AMNH). *Cumberland Co.:* Greenup, August 20, 1962, L. D. Anderson, 1♂ (UCR). *Henderson Co.:* Oquawka, June 13, 1932, H. L. Dozier, 1♂ (AMNH). *La Salle Co.:* Ottawa, June 1, 1942, F. C. Werner, 2♂ (AMNH). *Piatt Co.:* Monticello, August 16, 1932, T. H. Frison, 1♂ (AMNH). *Pope Co.:* Herod, June 24, 1932, Ross, Dozier, and Park, 1♂ (AMNH). *Pulaski Co.:* Mounds, September 18, 1931, C. W. Johnson, 1♂ (AMNH). *Randolf Co.:* Chester, June 30, 1939, D. E. Hardy, 1♂ (KU). *Scott Co.:* Bluffs, August 29, 1951, A. T. McClay, 30♂ (UCD). *Warren Co.:* Roseville, September 1, 1943, R. I. Sailer, 1♂ (USNM). **Indiana:** *Kosciusko Co.:* 2 mi N of Warsaw, September 1, 1966, C. W. O'Brien, 1♂ (UCB). *Marion Co.:* No specific locality, October 6, 1928, W. S. B., 7♂ (UCB). *Tippecanoe Co.:* Lafayette, August 14, 1969, L. B. O'Brien, 1♂ (UCB). *Wayne Co.:* 14 km W of Richmond, July 4, 1966, Paul H. Arnaud, Jr., 1♂ (CAS). **Iowa:** *Adair Co.:* Adair, July 25, 1960, P. M. Marsh, 1♂ (UCD). *Boone Co.:* Ledges State Park, July 22, 1928, G. S. Walley, 2♀ (CNC). Ledges State Park, June 26, 1953, J. C. Schaffner, 1♀ (TAMU). No specific locality, June 22, 1962, J. C. Schaffner, *Asclepias syriaca* (Asclepiadaceae), 7♂, 3♀ (TAMU). Pilot Mound, August 30, 1960, J. C. Schaffner, 3♂, 3♀ (TAMU). *Clinton Co.:* Clinton, June 23, 1928, G. S. Walley, 2♂ (CNC). DeWitt, June 21, 1928, G. S. Walley, 4♂ (CNC). *Dickinson Co.:* 5 mi W of Milford, June 18, 1963, J. C. Schaffner, 5♂, 3♀ (TAMU). Cayler Prairie, June 11, 1963–June 30, 1963, J. C. Schaffner, *Salix* sp. (Salicaceae), 3♂, 1♀ (TAMU). Iowa Lakeside Lab., June 15, 1963–June 27, 1963, J. C. Schaffner, *Fraxinus pennsylvanica* (Oleaceae), 3♂, 1♀ (TAMU). Iowa Lakeside Lab., June 15, 1963–June 27, 1963, J. C.

Schaffner, *Quercus macrocarpa* (Fagaceae), 3♂, 2♀ (TAMU). *Henry Co.:* 3 mi NW of Salem, T70N, R7W, Sec. 9, June 16, 1962, J. C. Schaffner, *Erigeron* sp. (Asteraceae), 1♂, 1♀ (TAMU). 5 mi SW of Mt. Pleasant, June 30, 1976–July 1, 1976, J. C. Schaffner, 6♂, 12♀ (TAMU). 6 mi SE of Mt. Pleasant, T71N R7W Sec. 28, June 16, 1962, J. C. Schaffner, *Melilotus alba* (Fabaceae), 4♂, 2♀ (TAMU). 7 mi SW of Mt. Pleasant, July 4, 1964, J. C. Schaffner, 1♂, 2♀ (TAMU). 7 mi W of Mt. Pleasant, July 2, 1976, J. C. Schaffner, 3♂, 7♀ (TAMU). Mt. Pleasant, September 19, 1932, C. Hall, 1♀ (TAMU). Mt. Pleasant, September 27, 1928, Bruhn, 1♀ (TAMU). Olds, August 27, 1963, S. G. Wellso, 1♀ (TAMU). *Johnson Co.:* 2 mi W of Solon, August 29, 1966, C. W. O'Brien, 1♂ (UCB). Iowa City, July 25, 1971, L. A. Kelton, *Robinia* sp. (Fabaceae), 3♀ (CNC). *Muscatine Co.:* Wilton, July 8, 1927, Harris and Johnston, 2♀ (TAMU). *Polk Co.:* Mitchellville, Thomas Mitchell Co. Park, June 29, 1980, K. and R. Schmidt, 66♂ (AMNH). *Scott Co.:* Pleasant Valley, July 5, 1928, G. S. Walley, 20♂, 11♀ (CNC). *Story Co.:* Ames, August 23, 1952, J. C. Schaffner, 1♂, 1♀ (TAMU). Ames, August 28, 1953–September 2, 1953, J. C. Schaffner, 8♂, 10♀ (TAMU). Ames, July 7, 1930, H. G. Johnston, 1♀ (TAMU). Ames, June 11, 1962, J. C. Schaffner, *Heracleum maximum* (Apiaceae), 4♂, 4♀ (TAMU). Ames, June 21, 1929, H. M. Harris, 1♂ (TAMU). Ames, June 21, 1971–September 25, 1967, H. H. Knight, 22♂, 38♀ (USNM). Ames, June 25, 1927–July 5, 1927, H. G. Johnston, 13♂, 5♀ (TAMU). Ames, June 25, 1962, J. C. Schaffner, *Ambrosia trifida* (Asteraceae), 2♂, 1♀ (TAMU). Ames, Pleat Bog Valley, July 22, 1928, G. S. Walley, 6♂, 6♀ (CNC). Ames, September 24, 1949, W. Downes, 1♂ (OSU). Ames, September 25, 1927, H. M. Harris, 2♀ (TAMU). Ames, September 30, 1928, H. M. Harris, 2♀ (TAMU). Ames, September 9, 1931, H. M. Harris, 1♂, 2♀ (TAMU). *Van Buren Co.:* Farmington, July 14, 1927, Harris and Johnston, 1♂ (CNC). *Warren Co.:* 1.5 mi E of Hartford, July 5, 1976–July 6, 1976, J. C. Schaffner, 21♂, 21♀ (TAMU). **Kansas:** *Atchison Co.:* No specific locality, July 17, 1924, R. H. Beamer, 11♂ (KU). *Butler Co.:* Leon, June 20, 1940, L. J. Lipovski, 10♂ (KU). *Decatur Co.:* No specific locality, July 15, 1925, R. H. Beamer, 1♂ (KU). *Doniphan Co.:* No specific locality, August 22, 1921, V. J. Brown, 1♂ (KU). No specific locality, July 20, 1924, R. H. Beamer, 2♂ (KU). *Douglas Co.:* Lawrence vicinity, September 1, 1969, V. P. Gapud, 4♂ (KU). Lawrence, September 21, 1951, A. A. Hubert, 1♂ (KU). Lawrence, September 4, 1941, R. H. Beamer, 1♂ (KU). No specific locality, 900 ft, 33♂ (KU). No specific locality, July 9, 1924, P. B. Lawson, 5♂ (KU). No specific locality, June 14, 1928, P. B. Lawson, 1♂ (KU). No specific locality, June 26, 1975, T. W. Oldham, 3♂ (TAMU). No specific locality, October 18, 1944, R. H. Beamer, 2♂ (KU). Sibleyville, September 30, 1952, A. A. Hubert, 1♂ (KU). *Leavenworth Co.:* No specific locality, June 24, 1924, E. P. Breakey, 1♂ (KU). *Linn Co.:* No specific locality, 862 ft, R. H. Beamer, 1♂ (KU). *Mc Pherson Co.:* No specific locality, June 28, 1923, R. H. Beamer, 1♂ (KU). *Miami Co.:* No specific locality, R. H. Beamer, 10♂ (KU). *Montgomery Co.:* Coffeyville, June 24, 1939, L. W. Hepner, 2♂ (KU). No specific locality, 798 ft, R. H. Beamer, 1♂ (KU). *Morris Co.:* No specific locality, July 31, 1923, R. H. Beamer, 1♂ (KU). *Republic Co.:* No specific locality, July 10, 1925, Howard Deny, 2♂ (KU). *Rice Co.:* No specific locality, July 3, 1923, L. C. Woodruff, 2♂ (KU). *Saline Co.:* No specific locality, July 13, 1923, R. H. Beamer, 1♂ (KU). *Wyandotte Co.:* No specific locality, June 22, 1924, R. H. Beamer, 1♂ (KU). **Maine:** *Lincoln Co.:* Whitefield, N. Banks, 2♂ (AMNH). *Penobscot Co.:* Orono, July 14, 1905, 1♂ (CAS). **Maryland:** *Cecil Co.:* Conowingo, September 18, 1950, W. F. Chamberlain, 1♂ (TAMU). *Frederick Co.:* Middletown, June 13, 1985, A. G. Wheeler, Jr., 1♂ (PDA). *Lanham Co.:* Lanham, June 25, 1967, Paul Oman, 3♂ (OSU). *Montgomery Co.:* Great Falls, July 4, 1963, D. C. and K. A. Rentz, 1♂ (CAS). Plummers Island, August 31, 1989, W. E. Steiner, 1♂ (USNM). Silver Spring, June 25, 1967, Paul Oman, 2♂ (OSU). *Prince Georges Co.:* College Park, September 21, 1966, L. and C. W. O'Brien, 2♂ (UCB). *Unknown Co.:* Wolfville, June 26, 1914, 1♂ (USNM). *Washington Co.:* Clear Spring Exit on I-70, June 19, 1979, A. G. Wheeler, Jr., *Achillea millefol-*

ium (Asteraceae), 1♀ (TAMU). Hagerstown, August 23, 1915, H. L. Parker, 3♂, 5♀ (USNM). Hagerstown, July 7, 1916, H. L. Parker, 1♂ (CAS). **Massachusetts:** *Barnstable Co.:* Woods Hole, C. W. Johnson, 1♂ (AMNH). *Essex Co.:* Beach Bluff, July 10, 1915, H. M. Parshley, 6♂ (CAS). Beach Bluff, June 22, 1914, H. M. Parshley, 28♂ (CAS). Marblehead, July 24, 1914, H. M. Parshley, 1♂ (CAS). Saugus, September 2, 1915, H. M. Parshley, 1♂ (CAS). Saugus, September 5, 1914, H. M. Parshley, 4♂ (CAS). Swampscott, August 19, 1914, H. M. Parshley, 1♂ (CAS). Swampscott, July 13, 1915, H. M. Parshley, 3♂ (CAS). *Franklin Co.:* Northfield, August 10, 1898, F. Bowditch, 1♂ (AMNH). Sunderland, Mt. Toby, September 23, 1917, H. M. Parshley, 3♂ (CAS). *Hampshire Co.:* Northampton, August 13, 1918, H. M. Parshley, 1♂ (CAS). *Middlesex Co.:* Auburndale, C. W. Johnson, 3♂ (AMNH). Framingham, August 15, 1914, C. A. Frost, 1♂ (CAS). Holliston, N. Banks, 33♂ (AMNH). Lexington, N. Banks, 7♂ (AMNH). Sherborn, August 14, 1915, C. A. Frost, 1♂ (CAS). Sherborn, September 7, 1919, A. P. Morse, 12♂ (AMNH). *Norfolk Co.:* Brookline, June 11, 1905, H. M. Parshley, 1♂ (CAS). Cohasset, September 21, 1914, H. M. Parshley, 3♂ (CAS). Dedham, C. W. Johnson, 2♂ (AMNH). Needham, September 3, 1911, 2♂ (CAS). Wellesley, July 11, 1909, E. P. Van Duzee, 1♂ (CAS). Wellesley, September 6, 1900, 1♂ (CAS). *Suffolk Co.:* Boston, June 17, 1914, H. M. Parshley, 1♂ (CAS). Forest Hills, September 19, 1914, H. M. Parshley, 1♂ (CAS). Forest Hills, September 30, 1915, H. M. Parshley, 2♂ (CAS). *Worcester Co.:* Petersham, 1♂ (AMNH). **Michigan:** *Emmet Co.:* No specific locality, August 10, 1950, Doris Gardner, 1♂ (OSU). *Ingham Co.:* East Lansing, September 14, 1965, E. D. Evans, 3♂ (AMNH). Mason, September 12, 1958, H. D. Niemczyk, 2♂, 2♀ (USNM). *Van Buren Co.:* Lawton, Huzzy's Lake, July 22, 1984, J. A. Jackman, 1♀ (TAMU). **Minnesota:** *Ramsey Co.:* 4 mi W of St. Anthony Park, June 30, 1964, J. C. Schaffner, 1♀ (TAMU). St. Anthony Park, August 2, 1924, H. H. Knight, 1♂, 1♀ (TAMU). St. Anthony Park, August 2, 1924, H. H. Knight, 23♂, 54♀ (USNM). St. Paul, September 3, 1923, H. H. Knight, *Ambrosia trifida* (Asteraceae), 5♂, 2♀ (USNM). **Mississippi:** *Adams Co.:* Natchez, May 15, 1931, H. G. Johnston, 4♂, 6♀ (TAMU). Natchez, May 15, 1931, H. G. Johnston, *Aster* sp. (Asteraceae), 4♂, 7♀ (TAMU). *Lowndes Co.:* Columbus, June 20, 1929, H. G. Johnston, 1♂, 1♀ (TAMU). *Oktibbeha Co.:* Starkville, June 13, 1929, H. G. Johnston, 1♂, 1♀ (TAMU). *Tallahatchie Co.:* Charleston, August 31, 1925, H. M. Harris, 1♀ (TAMU). **Missouri:** *Boone Co.:* Columbia, September 24, 1966, F. D. Parker, 1♂ (UCD). Rt 1, 0.6 mi S of jct of Hwy N, September 2, 1982, R. L. Blinn, *Ambrosia trifida* (Asteraceae), 7♂, 3♀ (USNM). *Franklin Co.:* Meramec State Park, June 30, 1968, L. A. Kelton, 1♂ (CNC). *Jackson Co.:* Atherton, June 13, 1915, C. F. Adams, 6♂ (CAS). Kansas City, F. Rogers, 2♂ (KU). Kansas City, Willow Creek, I-435 and Wormill Rd., June 11, 1977, H. N. Greenbaum, 1♂ (TAMU). *Jasper Co.:* Joplin, June 30, 1968, L. A. Kelton, 3♂, 6♀ (CNC). *Vernon Co.:* 4 mi W of Montevallo, June 24, 1966, J. C. Schaffner, 1♂ (TAMU). *Wayne Co.:* Williamsville, July 7, 1955, E. C. Becker, 1♀ (CNC). **Montana:** *Toole Co.:* Shelby City Campground, July 7, 1972, G. C. Gaumer, 1♀ (TAMU). **Nebraska:** *Cass Co.:* Rest Area on I-80, 2 mi W of Platte Rd., June 29, 1980, K. Schmidt, 2♂ (AMNH). *Hall Co.:* Grand Island, July 8, 1964, H. H. Knight, 2♀ (USNM). *Nance Co.:* 14 mi SE of Fullerton, August 27, 1966, L. B. O'Brien, 1♂ (UCB). *Nemaha Co.:* Peru, Peru State College, August 22, 1975, A. G. Wheeler, Jr., *Ambrosia trifida* (Asteraceae), 1♂, 7♀ (PDA). *Red Willow Co.:* Indianola, A. P. Morse, 2♂ (AMNH). **New Hampshire:** *Carroll Co.:* Notchland, August 20, 1934, M. E. Griffith, 1♂ (KU). *Coos Co.:* Bretton Woods, August 31, 1934, J. D. Beamer, 1♂ (KU). Mount Washington, A. T. Slosson, 2♂ (AMNH). *Rockingham Co.:* Hampton, October 22, 1922, S. Albert Shaw, 1♂ (CAS). **New Jersey:** *Bergen Co.:* Closter, June 26, 1962, S. J. Hessel and J. A. Woods, 1♂ (AMNH). Closter, September 17, 1972, J. G. Rozen, 1♂ (AMNH). Mahwah, July 3, 1962, Rozen, Statham, Woods, and Hessel, 1♂ (AMNH). Ramsey, August 23, 1921, 1♂ (AMNH). Ramsey, July 20, 1917, 2♂ (AMNH). Ramsey, July 6, 1912, 1♂ (AMNH). Ramsey,

September 3, 1917, 2♂ (AMNH). Ramsey, September 7, 1918, 1♂ (AMNH). Rutherford, E. L. Dickerson, 1♂ (AMNH). Sicomac, September 8, 1922, T. M. Schott, 2♂ (AMNH). *Mercer Co.:* Mercerville, August 24, 1910, 1♂ (AMNH). Princeton, September 18, 1966, C. W. O'Brien, 2♂ (UCB). *Middlesex Co.:* 2 mi SW of New Brunswick, September 8, 1966, C. W. O'Brien, 2♂ (UCB). New Brunswick, 8♂ (AMNH). New Brunswick, September 25, 1943, 1♂ (AMNH). *Passaic Co.:* Bearfort Mountains, September 30, 1965, P. and B. Wygodzinsky and J. A. Woods, 1♂ (AMNH). Paterson, 1♂ (AMNH). *Somerset Co.:* Somerville, July 12, 1922, Schott, 1♂ (AMNH). *Sussex Co.:* Baleville, June 21, 1981, Robert Schmidt, ex Asteraceae, 2♂, 2♀ (AMNH). *Unknown Co.:* Milltown, 1♂ (AMNH). **New Mexico:** *Lincoln Co.:* White Mountains, 8200 ft, Ruidoso Natl. Forest, 1♂ (USU). *Otero Co.:* 3 mi E of Cloudcroft, July 19, 1976, John D. Pinto, 15♂ (UCR). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 1♂ (AMNH). *Bronx Co.:* Mosholu, July 12, 1919, 1♂ (AMNH). Mosholu, July 9, 1891, 10♂ (AMNH). Mosholu, September 9, 1910, 23♂ (AMNH). Van Cortlandt Park, Bronx, July 4, 1962, S. J. Hessel, 2♂ (AMNH). *Cattaraugus Co.:* Gowanda, August 29, 1907, E. P. Van Duzee, 1♂ (CAS). *Cayuga Co.:* Aurora, July 21, 1909, V. L. Zabriski, 2♂ (AMNH). *Chautauqua Co.:* Fredonia, July 21, 1946, L. D. Beamer, 1♂ (KU). *Coumbia Co.:* Chatham, August 30, 1904, A. P. Morse, 38♂ (AMNH). *Erie Co.:* Buffalo, August 24, 1898, E. P. Van Duzee, 2♂ (CAS). Elma, August 25, 1912, E. P. Van Duzee, 1♂ (CAS). Hamburg, July 1, 1906, E. P. Van Duzee, 1♂ (CAS). Hamburg, July 5, 1904, E. P. Van Duzee, 4♂ (CAS). Hamburg, July 9, 1905, E. P. Van Duzee, 1♂ (CAS). Hamburg, June 21, 1908, E. P. Van Duzee, 4♂ (CAS). Hamburg, June 26, 1898, E. P. Van Duzee, 8♂ (CAS). Hamburg, June 28, 1896, E. P. Van Duzee, 2♂ (CAS). Hamburg, September 6, 1909, E. P. Van Duzee, 4♂ (CAS). Holland, July 22, 1946, R. H. Beamer, 1♂ (KU). Lancaster, July 25, 1946, L. D. Beamer, 2♂ (KU). *Essex Co.:* Whiteface Mountain, 4600–4872 ft, July 19, 1962, J. R. Vockeroth, 1♂ (CNC). *Genesee Co.:* Batavia, July 5, 1914, H. H. Knight, 1♂ (CNC). Batavia, September 2, 1915, H. H. Knight, 1♂ (CAS). *Kings Co.:* Flatbush, July 2, 1895, V. L. Zabriski, 2♂ (AMNH). Flatbush, Long Island, June 26, 1893, V. L. Zabriski, 1♂ (AMNH). Flatbush, Long Island, September 5, 1892, 1♂ (AMNH). Flatbush, September 14, 1897, V. L. Zabriski, 3♂ (AMNH). Parkville, Long Island, May 30, 1891, Beutenmulier, 2♂ (AMNH). Water Works, Flatbush, Long Island, July 10, 1893, V. L. Zabriski, 1♂ (AMNH). Water Works, Flatbush, Long Island, September 18, 1892, V. L. Zabriski, 3♂ (AMNH). *Nassau Co.:* Old Brookville, 140 ft, August 21, 1973, M. Schwartz, 1♂ (AMNH). Sea Cliff, Long Island, N. Banks, 1♂ (AMNH). Sea Cliff, Long Island, N. Banks, 4♂ (AMNH). *New York Co.:* Inwood Park, New York City, July 19, 1970, T. Gidaspow, 1♂ (AMNH). *Oneida Co.:* near Sangerfield on Rt 20, September 6, 1975, A. G. Wheeler, Jr., *Solidago* sp. (Asteraceae), 1♂ (PDA). *Orange Co.:* Fort Montgomery, September 16, 1923, F. M. Schott, 1♂ (AMNH). Goshen, September 7, 1910, 2♂ (AMNH). Pine Island, September 8, 1910, 20♂ (AMNH). Pine Island, September 9, 1914, 3♂ (AMNH). *Orleans Co.:* No specific locality, June 27, 1928, V. A. Little, 1♂ (TAMU). *Rockland Co.:* 5 mi NW of Tuxedo Park, July 3, 1962, Rozen, Statham, Woods, and Hessel, 1♂ (AMNH). Suffern, September 17, 1910, 4♂ (AMNH). *Suffolk Co.:* Amagansett, Long Island, September 15, 1910, William T. Davis, 1♂ (AMNH). Cold Spring Harbor, Long Island, August 5, 1920, Parshley, 1♂ (CAS). Cold Spring Harbor, Long Island, July 4, 1914, H. M. Parshley, 2♂ (CAS). Greenport, Long Island, September 18, 1946, 4♂, 4♀ (USNM). *Tompkins Co.:* Ithaca, Cornell Plantations off Judd Falls Road, May 26, 1974, T. J. Henry and A. G. Wheeler, Jr., *Cornus stolonifera* (Cornaceae), 1♂ (PDA). Ithaca, July 27, 1920, H. H. Knight, 7♂, 3♀ (USNM). Ithaca, N. Banks, 1♂ (AMNH). Ithaca, September 4, 1973, M. Schwartz, 1♂ (AMNH). Ludlowville, September 1, 1980, L. L. Pechuman, *Bidens* sp. (Asteraceae), 4♂, 4♀ (PDA). Ring Wood, July 25, 1928, V. A. Little, 2♂ (TAMU). *Unknown Co.:* Big Island, September 8, 1910, 9♂ (AMNH). Taugannock Falls, August 10, 1928, V. A. Little, 1♀ (TAMU). *Warren Co.:* Hague, July 17, 1915,

3♂ (AMNH). Lake George, August 21, 1893, V. L. Zabriski, 12♂ (AMNH). Lake George, September 3, 1908, V. L. Zabriski, 1♂ (AMNH). *Westchester Co.:* Bryn Mawr Park, September 16, 1910, 2♂ (AMNH). Chappaqua, June 29, 1919, 1♂ (AMNH). White Plains, June 28, 1919, J. R. T. B., 1♂ (CAS). Yonkers, July 9, 1891, Beutenmuller, 2♂ (AMNH). **North Carolina:** *Highlands Co.:* Whiteface Cove near Highlands, August 17, 1957, L. A. Kelton, 2♂, 3♀ (CNC). *Jackson Co.:* Tuckasegee, August 31, 1957, L. A. Kelton, 1♀ (CNC). *Macon Co.:* Bridal Veil Falls, June 20, 1967, H. Greenbaum, 1♂ (KU). Franklin, 2000 ft, June 17, 1957, J. R. Vockeroth, 2♂ (CNC). Franklin, August 16, 1957, L. A. Kelton, 3♀ (CNC). Highlands, August 11, 1957–August 29, 1957, L. A. Kelton, 52♂, 48♀ (CNC). Highlands, August 21, 1957–August 29, 1957, W. R. Richards, 12♂, 5♀ (CNC). *Madison Co.:* Hot Springs, A. T. Slosson, 1♂ (AMNH). *Mecklenburg Co.:* Near Matthews, Rt 51 1 mi W of Rt 16, September 3, 1973, A. G. Wheeler, Jr., *Oenothera biennis* (Onagraceae), 1♀ (TAMU). *Swain Co.:* Great Smoky Mountains, Willets, 2000 ft, August 24, 1930, N. Banks, 1♂ (AMNH). *Unknown Co.:* Red Hill, August 14, 1957, L. A. Kelton, *Salix* sp. (Salicaceae), 1♂ (CNC). *Watauga Co.:* Blowing Rock to Linville, 3000–4000 ft, September 8, 1930, N. Banks, 1♂ (AMNH). *Yancey Co.:* Black Mountains, 5♂ (AMNH). Black Mountains, summit, July 25, 1906, W. Beutenmuller, 1♂ (AMNH). Valley of Black Mountains, July 5, 1906, W. Beutenmuller, 18♂ (AMNH). **North Dakota:** *Traill Co.:* No specific locality, August 14, 1923, A. A. Nichol., 1♂ (USNM). No specific locality, August 19, 1923, A. A. Nichol, 7♂, 4♀ (USNM). **Ohio:** *Franklin Co.:* Columbus, Mock Park, July 14, 1984, S. M. Clark, 1♂ (TAMU). Worthington, July 15, 1951, R. C. Ballard, 1♂ (PUC). *Licking Co.:* Blackhand Gorge State Nature Preserve, July 14, 1988, P. W. Kovarik, 1♂ (TAMU). *Lorain Co.:* Amherst, July 1, 1933, H. J. Reinhard, 3♂, 2♀ (TAMU). *Sandusky Co.:* Rt 81 off Rt 51, 3 mi W of Green Springs, July 14, 1974, P. S. B., 2♂ (CAS). *Stark Co.:* Massillon, August 21, 1962, Lawrence K. Ertle, 1♂ (USU). *Summit Co.:* Akron, June 23, 1987, P. W. Kovarik, 1♀ (TAMU). Barberton, August 23, 1986, L. J. Lipovski, 52♂ (KU). Barberton, June 22, 1937, L. J. Lipovski, 1♂ (KU). No specific locality, June 22, 1936, Louis J. Lipovski, 2♂ (KU). No specific locality, L. J. Lipovsky, 11♂ (KU). **Pennsylvania:** *Allegheny Co.:* Pittsburgh, July 5, 1915, S. L. Mason, 2♂ (CAS). *Bedford Co.:* Breezewood, July 15, 1983, R. S. Miller, 1♂ (TAMU). E of Bedford on Rt 30, August 30, 1979, A. G. Wheeler, Jr., *Eupatorium fistulosum* (Asteraceae), 1♀ (PDA). *Berks Co.:* Gibralter, September 7, 1971, A. G. Wheeler, Jr., *Coronilla varia* (Fabaceae), 1♂ (PDA). Leesport, July 1, 1970, 7♂, 6♀ (PDA). N of Moselem on Rt 666, June 11, 1974, A. Gnagey, 1♂ (PDA). Virginville, June 6, 1968, P. Vaurie, 1♂ (AMNH). *Blair Co.:* Altoona Cemetery, July 7, 1976, T. J. Henry, *Rhus glabra* (Anacardiaceae), 1♂, 2♀ (PDA). Altoona on Rt 764, June 27, 1974, A. G. Wheeler, Jr. et al., *Cornus* sp. (Cornaceae), 4♂, 3♀ (PDA). Near Martinsburg, George Bridenbough Nursery, June 27, 1974, A. G. Wheeler, Jr., *Elaeagnus angustifolia* (Elaeagnaceae), 3♀ (PDA). Williamsburg, J. B. Farm, July 17, 1973, B. Stinner, *Corylus americana* (Betulaceae), 1♂, 2♀ (PDA). *Bucks Co.:* Horseshoe Bend, Neshaminy Creek NE of Jamison, July 4, 1965, Wilton Ivie, 1♂ (AMNH). Jamison, June 26, 1968, Wilton Ivie, 1♂ (AMNH). *Butler Co.:* Butler, Eisler Nurseries, July 9, 1976, R. Henry, *Tamarix* sp. (Tamaricaceae), 4♀ (PDA). *Centre Co.:* Bellefonte, September 12, 1973, A. G. Wheeler, Jr., *Quercus palustris* (Fagaceae), 2♀ (PDA). Spring Mills, Penn Nursery, September 14, 1971, D. Stehr, *Robinia pseudoacacia* (Fabaceae), 1♀ (PDA). State College, Rt 322, July 6, 1976, T. J. Henry, *Rhus glabra* (Anacardiaceae), 3♀ (PDA). State College, University Drive, September 12, 1973, A. G. Wheeler, Jr., 1♂, 1♀ (PDA). Woodward, July 2, 1971, A. G. Wheeler, Jr., 1♀ (PDA). *Chester Co.:* Marshalton, Fethcroft Nursery, June 11, 1974, A. G. Wheeler, Jr., *Tanacetum vulgare* (Asteraceae), 3♂, 4♀ (PDA). *Columbia Co.:* Bloomsburg, September 30, 1914, 1♂ (AMNH). *Cumberland Co.:* Hagerstown, September 5, 1973, D. Stehr, *Abutilon theoprasti* (Malvaceae), 1♂, 6♀ (PDA). Newville, Conifer Hill Nursery, July 12, 1972, *Pinus strobus* (Pinaceae), 2♂, 2♀ (PDA). Pennsylvania Turnpike, 9 mi E

of Rt 997, July 2, 1980, A. G. Wheeler, Jr., 1♂ (PDA). *Dauphin Co.:* 7 mi E of Harrisburg, July 17, 1971, E. E. Simons, 1♂ (PDA). 7 mi N of Harrisburg, August 16, 1973, T. J. Henry and A. G. Wheeler, Jr., *Vernonia* sp. (Asteraceae), 1♂ (PDA). Conewago Township, Cedar Road, May 11, 1974, A. G. Wheeler, Jr., *Robinia pseudoacacia* (Fabaceae), 1♂ (PDA). Devonshire Heights, August 29, 1958, 1♀ (PDA). East Hanover Township, Crooked Hill Road, May 22, 1974, T. J. Henry and A. G. Wheeler, Jr., *Ulmus occidentalis* (Ulmaceae), 1♂ (PDA). Harrisburg, Agriculture Building, June 19, 1974, T. J. Henry, *Sambucus canadensis* (Caprifoliaceae), 1♂ (PDA). Harrisburg, Cameron Street, June 20, 1974, B. Stimmel, *Sambucus canadensis* (Caprifoliaceae), 2♂ (PDA). Harrisburg, Farmshow Road, June 29, 1971, D. Tritt, 1♂ (PDA). Harrisburg, June 29, 1900, W. Reinick, 2♂ (PDA). Harrisburg, Wildwood Park, July 19, 1900, W. Reinick, 1♂ (PDA). Hummelstown, June 29, 1919, 1♀ (PDA). Lower Paxton Township, June 2, 1975, A. G. Wheeler, Jr., *Rhodotypos scandens* (Rosaceae), 1♂ (PDA). Nyes and Willoughby Roads, June 16, 1975, T. J. Henry and A. G. Wheeler, Jr., *Vitis* sp. (Vitaceae), 1♂ (PDA). *Delaware Co.:* No specific locality, W.J. Gerhard, 4♂ (CAS). *Erie Co.:* Fairview on Rt 98, August 22, 1973, T. J. Henry and A. G. Wheeler, Jr., *Helianthus* sp. (Asteraceae), 1♂ (PDA). Fairview, Fairview Nurseries, August 22, 1973, T. J. Henry and A. G. Wheeler, Jr., *Ambrosia* sp. (Asteraceae), 1♂ (PDA). Presque Isle, July 21, 1920, E. M. Craighead, 1♂ (PDA). *Fayette Co.:* Royal, A&J Nursery, July 8, 1973, D. Trelka, *Pinus sylvestris* (Pinaceae), 1♀ (PDA). *Franklin Co.:* Chambersburg, August 17, 1921, J. R. Stehr, 1♂, 4♀ (PDA). Marion, July 22, 1922–August 17, 1922, J. R. Stehr, 2♀ (PDA). Quincy, August 20, 1971, R. Colburn, 2♂ (PDA). *Lancaster Co.:* Elizabethtown, July 1, 1974, A. G. Wheeler, Jr., *Tilia cordata* (Tiliaceae), 1♂ (PDA). Near Millersville, Herr Nursery, August 15, 1974, T. J. Henry, *Abelia* sp. (Caprifoliaceae), 1♂ (PDA). Rt 441, Falmouth Access Area, August 16, 1979, A. G. Wheeler, Jr., *Cassia fasiculata* (Fabaceae), 1♂ (PDA). *Lebanon Co.:* I-80 E of Grantville exit, June 20, 1974, T. J. Henry and A. G. Wheeler, Jr, *Sambucus canadensis* (Caprifoliaceae), 1♂ (PDA). *Monroe Co.:* Delaware Water Gap, H. G. Barber, 1♂, 1♀ (USNM). *Northampton Co.:* Easton, June 28, 1954, J. W. Green, 6♂ (CAS). Easton, September 15, 1956, J. W. Green, 26♂ (CAS). Wind Gap, July 9, 1954, J. W. Green, 7♂ (CAS). *Northumberland Co.:* 2 mi NE of Sunbury, June 18, 1975, A. G. Wheeler, Jr., *Kalmia latifolia* (Lamiaceae), 3♂ (PDA). *Perry Co.:* Amity Hall, May 31, 1979, A. G. Wheeler, Jr., *Rosa multiflora* (Rosaceae), 1♂ (PDA). Near Livermore on Rt 15, June 5, 1974, A. G. Wheeler, Jr., *Verbascum thapsi* (Scrophulariaceae), 1♂ (PDA). *Sullivan Co.:* 4 mi N of LaPorte on Rt 220, August 8, 1974, A. G. Wheeler, Jr., *Spiraea latifolia* (Rosaceae), 1♂ (PDA). *Unknown Co.:* Marysville, August 25, 1900, 1♀ (PDA). Marysville, August 25, 1900, W. Reinick, 2♂ (PDA). *Venago Co.:* Sugar Creek, August 21, 1973, T. J. Henry and A. G. Wheeler, Jr., *Oenothera* sp. (Onagraceae), 3♀ (PDA). *Washington Co.:* Taylorstown exit off Hwy 70, July 3, 1966, Paul H. Arnaud Jr., 27♂ (CAS). *Wayne Co.:* Honesdale, October 3, 1913, C. E. Olsen, 1♂ (AMNH). Near Calicoon, New York, Curtis Nursery, June 18, 1974, A. G. Wheeler, Jr., *Gleditsia triacanthos* (Fabaceae), 1♂, 3♀ (PDA). *Westmoreland Co.:* Charter Oak, July 11, 1917, J. B. Kirk, 1♀ (PDA). *York Co.:* Dillsburg, Cooke Farm, September 15, 1971, D. Stehr, *Coronilla varia* (Fabaceae), 1♂ (PDA). Manchester, Dauber's Farm, July 3, 1973, Lehnian and Null, 1♂ (PDA). York, Walker Nursery, June 19, 1975, K. R. Valley, *Spiraea* sp. (Rosaceae), 1♂, 2♀ (PDA). **Rhode Island:** *Unknown Co.:* No specific locality, Parshley, 1♂ (CAS). *Washington Co.:* Kingston, 1♂ (CAS). **South Carolina:** *Greenville Co.:* Greenville, July 14, 1976, R. S. Peigler, 1♂ (TAMU). Greenville, June 7, 1984, R. S. Peigler, 1♀ (TAMU). Greenville, May 27, 1977, R. S. Peigler, 1♂ (TAMU). Taylors, May 28, 1977, R. S. Peigler, 2♂ (TAMU). Tigerville, August 20, 1930, R.H. Beamer, 1♂ (KU). **South Dakota:** *Brookings Co.:* Brookings, June 17, 1921, H. C. Severin, 1♂ (CAS). *Roberts Co.:* Lake Traverse, 12 mi SE of Sisseton, July 19, 1974, Blair Tollefson, 1♂ (UCB). **Tennessee:** *Montgomery Co.:* Clarksville, July 4, 1939, J. D. Beamer, 3♂ (KU). *Unknown Co.:* 6 mi W of

North Carolina border, 1200 ft, September 15, 1930, N. Banks, 2♂ (AMNH). **Texas:** *Bandera Co.:* Lost Maples State National Area, May 25, 1985, P. W. Kovarik and R. W. Jones, 1♂ (TAMU). *Brazos Co.:* Bryan, May 6, 1965–May 10, 1975, J. C. Schaffner, 59♂, 65♀ (TAMU). College Station, May 10, 1933, H. G. Johnston, 1♂ (TAMU). College Station, May 6, 1975, J. C. Schaffner, 2♀ (TAMU). College Station, October 1, 1927, H. G. Johnston, 1♀ (TAMU). Little Brazos River, Hwy 21, May 20, 1970, V. V. Board, 2♂ (TAMU). *Burleson Co.:* No specific locality, May 11, 1964, Jackson, 1♂, 1♀ (TAMU). Somerville Lake, April 29, 1969, V. V. Board, 1♂ (TAMU). *DeKalb Co.:* 6 mi SE of Jefferson, May 31, 1998, W. F. Chamberlain, 1♂ (TAMU). *Gonzales Co.:* 0.5 mi E of Harwood, May 13, 1969, V. V. Board, 2♂, 1♀ (TAMU). Palmetto State Park, April 19, 1969, V. V. Board, 1♂ (TAMU). Palmetto State Park, April 22, 1970–May 4, 1970, V. V. Board, 8♂, 3♀ (TAMU). Palmetto State Park, May 4, 1970, Board and Schaffner, 18♂, 6♀ (TAMU). *Kerr Co.:* Kerrville, June 2, 1997, G. M. Chamberlain, 1♀ (TAMU). Kerrville, June 20, 1996, W. F. Chamberlain, 3♀ (TAMU). Kerrville, May 11, 1992, W. F. Chamberlain, 1♀ (TAMU). Kerrville, May 12, 1994, G. M. Chamberlain, 1♂ (TAMU). Kerrville, May 18, 1993, W. F. Chamberlain, 2♂, 1♀ (TAMU). Kerrville, May 3, 1998–May 11, 1998, G. M. Chamberlain, 2♂, 1♀ (TAMU). Kerrville, May 31, 1997–June 1, 1997, W. F. Chamberlain, 1♂, 1♀ (TAMU). *Milam Co.:* Gause 3 mi N at Sugar Loaf Mt., May 27, 1995, W. Godwin, H. Howden, A. Howden, 1♀ (TAMU). *Real Co.:* 4 mi S of Garven Store, April 9, 1995, W. F. Chamberlain, 1♂ (TAMU). *Travis Co.:* Shelberg Tract near Cypress Creek arm of Lake Travis, May 8, 1994, J. C. Schaffner, 3♂, 12♀ (TAMU). Vicinity of Long Hollow Creek, May 7, 1994, J. C. Schaffner, 9♂, 1♀ (TAMU). Vicinity of Long Hollow Creek, May 7, 1994, M. Quinn, E. Riley, R. Wharton, *Quercus buckleyi* (Fagaceae), 1♀ (TAMU). *Uvalde Co.:* Garner State Park, May 5, 1961, 1♀ (TAMU). *Wood Co.:* 6 mi NW of Hawkinson, Highway 14, May 23, 1998, W. Godwin, 1♂, 1♀ (TAMU). **Vermont:** *Grand Isle Co.:* South Hero, A. P. Morse, 2♂ (AMNH). *Orange Co.:* Bradford, July 23, 1973, J. Amaral, 2♂, 1♀ (TAMU). *Windham Co.:* Brattleboro, June 15, 1908, H. M. Parshley, 1♂ (CAS). *Windsor Co.:* Springfield, August 22, 1934, R. H. Beamer, 1♂ (KU). Woodstock, A. P. Morse, 1♂ (AMNH). **Virginia:** *Arlington Co.:* Glencarlyn, N. Banks, 3♂ (AMNH). *Clarke Co.:* 3 mi E of Berryville, Shenandoah River, July 24, 1977, N. L. Herman, 1♂ (AMNH). *Fairfax Co.:* Great Falls, N. Banks, 1♂ (AMNH). *Falls Church Co.:* Falls Church, N. Banks, 21♂ (AMNH). *Giles Co.:* Stinking Creek, 1850 ft, June 25, 1969, George W. Byers, 1♂ (KU). *Patrick Co.:* Woolwine, September 1, 1946, R. H. Beamer, 1♂ (KU). **Washington, D. C.:** June 25, 1905, E. P. Van Duzee, 1♂ (CAS). **West Virginia:** *Jefferson Co.:* No specific locality, August 22, 1980, T. L. Mason, 6♂, 9♀ (PDA). *Mineral Co.:* Patterson Creek Road N of Grant County line, June 10, 1979, A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 1♂ (PDA). *Nicholas Co.:* Craigsville, June 24, 1978, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♀ (TAMU). *Pocahontus Co.:* N of Slatyfork on Rt 219, August 15, 1982, *Verbesina alternifolia* (Asteraceae), 2♀ (TAMU). *Preston Co.:* Cathedral State Park, July 29, 1989, C. L. Staines, 2♂, 2♀ (USNM). *Randolf Co.:* No specific locality, August 8, 1975, L. Butler, 1♀ (TAMU). *Unknown Co.:* Aurora, August 21, 1904, O. Heidemann, 1♂ (CU). *Wood Co.:* No specific locality, July 25, 1971–July 27, 1971, L. H. Rolston, 3♀ (TAMU). **Wisconsin:** *Milwaukee Co.:* Milwaukee, August 22, 1960, E. P. Brakey, 3♂ (KU).

Plagiognathus punctatipes Knight
Figures 12, 18, 30, 37

Plagiognathus punctatipes Knight, 1923: 450 (n. sp.).

DIAGNOSIS: Recognized by the generally *castaneous coloration, ovoid body, neatly arranged, recumbent, golden, shining vestiture of dorsum* (figs. 12, 37B), *pale antennal segment 2* except at extreme base (fig. 18), femora mostly pale with some dark blotches, and *tibiae pale at articulation with femora.* Distinguished from the similar-appearing species *dispar* (fig. 7) and *rileyi* (fig. 12) by the more strongly ovoid body form, the uniformly castaneous dorsum totally lacking in pale orna-

mentation, and the tibiae pale at articulation with the femora.

REDESCRIPTION: *Male:* Ovoid, of moderate size; total length 3.39–3.54, length apex clypeus–cuneal fracture 2.38–2.54, width across pronotum 1.14–1.22. COLORATION (fig. 12): Dorsum deeply and uniformly castaneous, never with pale markings; membrane fumose, veins vaguely pale; face more highly polished at and below base of clypeus than elsewhere; antennal segment 1 castaneous except for pale apical annulus, segment 2 dark at extreme base, remainder of segment pale, segments 3 and 4 pale; labium often largely infuscate, segment 1 usually castaneous; venter, including metathoracic scent-gland evaporatory area, entirely castaneous; legs, including coxae, pale, golden, except coxae sometimes partially infuscate basally and hind femora with some dark spots; dorsal tibial spines with small dark spots at bases; tibiae pale at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, distinctly although not strongly shining. Vestiture of dorsum composed of neatly arranged, recumbent, golden, shining, simple setae (fig. 37B). STRUCTURE: Body ovoid, corial margins distinctly convex; frons weakly convex as viewed from above, clypeus barely visible; anteocular distance no greater than diameter of antennal segment 1; head projecting below eye by 2 times diameter of antennal segment 1 (fig. 37A); labium reaching to about apex of middle coxae; pretarsus as in figure 37C. GENITALIA (fig. 30): Body of vesica more or less J-shaped, base of vesica falling slightly below level of secondary gonopore, posterior apical spine relatively broad, weakly curvilinear, obliquely angled relative to body of vesica, anterior spine elongate and at nearly right angle to body of vesica; flange on vesica relatively narrow, reaching to base of gonopore.

Female: Very similar to male in coloration and body form. Total length 3.48–3.72, length apex clypeus–cuneal fracture 2.42–2.74, width across pronotum 1.18–1.23.

HOSTS: Known to breed on *Physocarpus opulifolius* (Rosaceae) (Wheeler and Hoebeke, 1985) and *Viburnum* spp. (Caprifoliaceae). Recorded from several of other plant groups, but with little evidence of breeding.

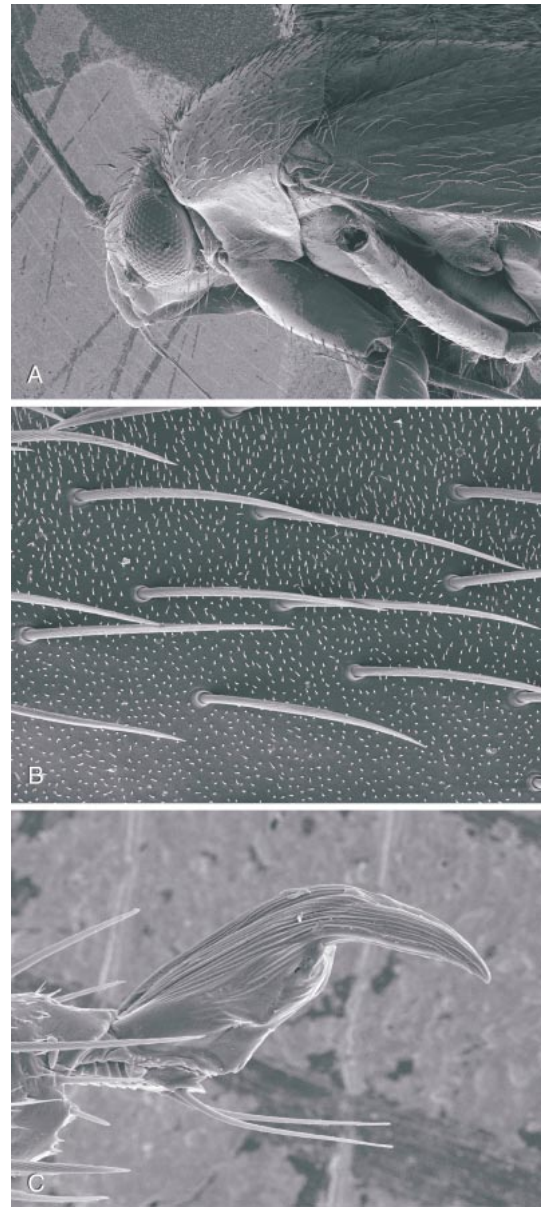

Fig. 37. *Plagionathus punctatipes*, male, scanning micrographs. **A.** Lateral view of head. **B.** Hemelytra vestiture. **C.** Pretarsus.

DISTRIBUTION: Northeastern North America, as far west as Illinois and as far south as West Virginia.

SPECIMENS EXAMINED: CANADA.—**New Brunswick:** Kouchibouguac Natl. Park, July 26, 1977, D. J. Brown, 1♂ (CNC). **Nova Scotia:** Kentville, July 15, 1966–July 10,

1976, L. A. Kelton, *Quercus* sp. (Fagaceae), 2♂, 2♀ (CNC). **Ontario:** Fort Frances, July 30, 1960, Kelton and Whitney, 1♀ (CNC). Goderich, July 2, 1962, G. Thorpe, *Anethum* sp. (Apiaceae), 1♀ (CNC). Guelph, July 19, 1903, 1♀ (CNC). Pitopiko River Picnic Area on Rt 11 between Longiac and Hearst, July 21, 1990, M. D. Schwartz, *Viburnum edule* (Caprifoliaceae), 44♂, 49♀ (AMNH). Port Burwell, July 3, 1962, G. Thorpe, 1♀ (CNC). Pt. Pelee, June 24, 1925, G. S. Walley, 1♀ (CNC). Thamesford, June 29, 1961, Kelton and Brumpton, 1♂ (CNC). USA.—**Illinois:** *Champaign Co.:* Urbana, Crystal Lake Park, May 28, 1934, Ross and Mohr, 2♀ (USNM). *McHenry Co.:* Harvard, June 11, 1933, Mohr and Townsend, 2♀ (USNM). *Ogle Co.:* Grand Detour, Castle Rock, July 2, 1932, Dozier and Mohr, 1♂, 1♀ (USNM). **Michigan:** *Gladwin Co.:* No specific locality, June 25, 1959, R. R. Dreisbach, 1♀ (USNM). **New York:** *Genesee Co.:* Batavia, July 14, 1916, H. H. Knight, 1♀ (USNM). *Tompkins Co.:* Ithaca, Cornell University, July 1, 1978, A. G. Wheeler, Jr., *Carya glabra* (Juglandaceae), 1♀ (PDA). Ithaca, June 27, 1920, H. H. Knight, paratypes: 1♂, 2♀ (USNM). Ithaca, June 27, 1920, H. H. Knight, paratypes: 2♂, 1♀ (USNM); holotype male (USNM). Ludlowville, June 4, 1977–June 15, 1977, L. L. Pechuman, *Physocarpus opulifolius* (Rosaceae), 5♂, 2♀ (PDA). Ludlowville, Salmon Creek Road, July 3, 1979, E. R. Hoebeke, 2♀ (PDA). *Westchester Co.:* Armonk, Calder Ecology Study Center, June 11, 1979, K. Schmidt, *Physocarpus* sp. (Rosaceae), 1♂, 3♀ (AMNH). **Pennsylvania:** *Allegheny Co.:* Bloomfield, June 7, 1919, T. L. Guyton, 1♂ (USNM). *Bedford Co.:* Chaneysville, June 8, 1984, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 1♂ (PDA). *Beford Co.:* Schellsburg, July 2, 1980, A. G. Wheeler, Jr., *Pastinaca sativa* (Apiaceae), 5♀ (PDA). *Blair Co.:* McKee, June 7, 1979, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 2♀ (PDA). *Dauphin Co.:* East Hanover Township, Crooked Hill Road, June 22, 1975, A. G. Wheeler, Jr., *Juglans nigra* (Juglandaceae), 1♀ (PDA). West Hanover Township at Middle Paxton line on Rt 443, July 3, 1979, T. J. Henry, *Physocarpus opulifolius* (Rosaceae), 6♀ (PDA). West Hanover Township at Middle Paxton line on Rt 443, June 24, 1982, A. G. Wheeler, Jr., *Rhus typhina* (Anacardiaceae), 1♂, 2♀ (PDA). West Hanover Township at Middle Paxton line on Rt 443, June 6, 1979–June 13, 1984, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 2♂, 3♀ (PDA). *Franklin Co.:* Chambersburg, July 8, 1960, J. N. Knull, 3♂ (USNM). *Fulton Co.:* near Hustontown, June 8, 1984, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 1♂ (PDA). *Indiana Co.:* Indiana, June 8, 1979, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 1♂, 1♀ (PDA). *Juniata Co.:* Mifflintown, June 2, 1987, A. G. Wheeler, Jr., *Physocarpus opulifolius* (Rosaceae), 3♀ (PDA). **West Virginia:** *Mineral Co.:* Patterson Creek Road N of Grant County line, June 19, 1979, A. G. Wheeler, Jr., *Ulmus americana* (Ulmaceae), 1♀ (PDA).

Plagiognathus repetitus Knight
Figures 12, 18, 31

Plagiognathus repetitus Knight, 1923: 453 (n. sp.).

DIAGNOSIS: Recognized by the *small* size, unicolorous, *brown* to castaneous dorsum (fig. 12), *vestiture of recumbent golden, weakly shining, simple setae* (fig. 12), *golden legs* (including coxae) with hind femur sometimes very weakly infuscate, tibia black at articulation with femur, tibial spines with dark spots at bases, and *antennal segments 1 and 2 dark* (fig. 18). Similar to *fuscipes* (fig. 8), although that species larger, at least weakly pale on corium adjacent to extreme base of cuneus and at cuneal fracture, and usually with femora at least partially infuscate. General appearance very much like many *Sthenaridea* spp. Breeds on Ericaceae.

REDESCRIPTION: *Male:* Relatively small, ovoid; total length 2.78–3.13, length apex clypeus–cuneal fracture 2.02–2.27, width across pronotum 0.90–0.94. COLORATION (fig. 12): Dorsum and venter brown to castaneous; membrane fumose, including veins; all antennal segments dark brown (fig. 18); legs largely golden, femora with dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture

of dorsum composed of recumbent, weakly golden, shining, simple setae. STRUCTURE: Body elongate-ovoid, conspicuously broadest at point just anterior to cuneal fracture; head exserted from anterior margin of pronotum, eyes appearing weakly protuberant; frons tumid, bulging beyond anterior margin of eyes in dorsal view, clypeus visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium just surpassing apex of middle coxae. GENITALIA (fig. 31): Body of vesica short and stout, strongly curving, base of vesica reaching to just below level of secondary gonopore; posterior apical spines relatively short, nearly erect relative to body of vesica, anterior spine much longer than posterior, curving apically, and forming an oblique angle with body of vesica; flange broad, straight over much of length, reaching to base of secondary gonopore.

Female: Body somewhat more strongly ovoid than in male; coloration as in male. Total length 2.87–3.13, length apex clypeus–cuneal fracture 2.02–2.26, width across pronotum 0.93–1.02.

HOSTS: *Kalmia angustifolia*, *Ledum* sp., *Vaccinium* sp., and possibly *Rhododendron* (Ericaceae). The biology of this species was reviewed by Wheeler (1996).

DISTRIBUTION: Eastern North America, from Virigina north into Canada.

SPECIMENS EXAMINED: CANADA.—**Nova Scotia:** Truro, July 26, 1917, paratype: 1♂ (CAS). **Ontario:** Ignace, August 12, 1960, Kelton and Whitney, 1♀ (CNC). One Sided Lake, August 2, 1960, Kelton and Whitney, 1♀ (CNC). Shawanaga, July 26, 1962, Kelton and Thorpe, *Ledum* sp. (Ericaceae), 10♂, 10♀ (CNC). **Quebec:** Cascapedia, August 16, 1933, W. J. Brown, 1♂, 8♀ (CNC). Fabre, July 5, 1963, L. A. Kelton, 4♂ (CNC). Lac Brule, August 9, 1945, O. Peck, *Vaccinium* sp. (Ericaceae), 3♀ (CNC). Laniel, July 24, 1963, W. Gagne, 2♂, 6♀ (CNC). Laniel, July 6, 1963, L. A. Kelton, 5♂ (CNC). Parke Reserve, July 21, 1957, G. E. Shewell, *Rhododendron maximum* (Ericaceae), 1♀ (CNC). Thunder River, August 15, 1930, W. J. Brown, 1♂ (CNC). USA.—**Massachusetts:** *Essex Co.:* Beach Bluff, July 5, 1914, H. M. Parshley, 1♀ (CAS). Pigeon Cove, July 28, 1916, C. E. Olsen, 1♀ (USNM). *Plymouth Co.:* Wareham, July 21, 1927, H. J. Franklin, 2♂ (USNM). **Michigan:** *Berrien Co.:* E. K. Warren Preserve, Sawyer Dunes, July 10, 1920, R. F. Hussey, 1♂, 1♀ (USNM). *Cheboygan Co.:* No specific locality, July 8, 1935, M. Sanderson, 1♀ (USNM). **New York:** *Essex Co.:* Whiteface Mountain, August 22, 1916, H. H. Knight, 1♀ (USNM). Whiteface Mountain, August 22, 1916, H. H. Knight, paratype: 1♂ (CAS); holotype male (USNM). *St. Lawrence Co.:* Wanakena, August 12, 1920, C. J. Drake, 4♀ (USNM). **Pennsylvania:** *Monroe Co.:* Long Pond, Scrub Oak–Pitch Pine Barrens, July 15, 1990, A. G. Wheeler, Jr., *Kalmia angustifolia* (Ericaceae), 1♂, 1♀ (PDA). *Schuykill Co.:* 4.8 mi S of Frackville on Rt 81, June 28, 1984, A. G. Wheeler, Jr., *Kalmia angustifolia* (Ericaceae), 1♂, 1♀ (PDA). 5 mi S of Frackville on Rt 81, June 13, 1986, A. G. Wheeler, Jr., *Vaccinium* sp. (Ericaceae), 1♂, 2♀ (PDA). 5.5 mi S of Rt 61 along I-81, June 24, 1974, A. G. Wheeler, Jr., *Kalmia angustifolia* (Ericaceae), 1♂, 2♀ (PDA).

Plagiognathus ribesi Kelton
Figures 12, 18, 31

Plagiognathus ribesi Kelton 1982a: 169 (n. sp.).

DIAGNOSIS: Recognized by its moderately *small* size, pale somewhat *greenish* coloration (fig. 12), *black stripe on dorsal margin of all femora,* and *black stripe on the outer surface of antennal segment 1* (fig. 18). Distinguished from *polhemorum* (fig. 11) by black stripe on outer surface of antennal segment 1. Similar to *cibbetsi* (fig. 6) and *luteus* (fig. 9) in pale coloration and general structure of vesica in male, but *cibbetsi* more yellowish, with fainter blotch on membrane, and without black stripe on dorsal surface of femora and outer surface of antennal segment 1; *luteus* distinguished by being strongly bright orange with antennal segment 1 black and having a short black stripe on dorsal margin of hind femur only.

REDESCRIPTION: *Male:* Elongate-ovoid, moderately small; total length 3.14–3.43, length apex clypeus–cuneal fracture 2.11–2.31, width across pronotum 0.97–1.03. COLORATION (fig. 12): General coloration pale, weakly greenish, translucent; mem-

brane pale with a conspicuous, transverse, fumose marking posterior to cuneus and membrane cells; outer surface of antennal segment 1, spine on interior surface of antennal segment 1, and extreme base of segment 2 black (fig. 18); labium infuscate at apex; all femora with a black stripe along almost entire length of dorsal surface; hind femora with a short black stripe distally on medioventral surface; dorsal tibial spines with dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, shining, semitranslucent. Vestiture of dorsum composed of reclining pale to weakly darkened, golden, shining, simple setae. STRUCTURE: Body flattened, moderately broad, lateral corial margins weakly convex; frons weakly tumid, clypeus visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching apex of hind coxae. GENITALIA (fig. 31): Body of vesica relatively broad, curving, base of vesica not reaching to base of secondary gonopore; apical spines very long and slender, nearly straight, and only weakly tapering toward apex, posterior spine distinctly shorter than anterior; vesica without obvious flange.

Female: Body much more strongly ovoid than in male; coloration as in male. Total length 2.79–3.39, length apex clypeus–cuneal fracture 1.99–2.29, width across pronotum 0.95–1.06.

HOSTS: *Ribes* spp. (Grossulariaceae).

DISTRIBUTION: British Columbia south to northern California.

DISCUSSION: Kelton (1982a) described this species from Summerland and Rock Creek, British Columbia. Specimens from both localities were collected on *Ribes.* He also included among designated paratypes a series of specimens from Waterton, Douglas County, Colorado, taken on *Ribes cereum.* The male genitalia and coloration of antennal segment 1 in the Colorado specimens are distinct, and the specimens identified as *ribesi* by Kelton are included under the species *polhemorum,* described as new above.

Kelton noted that adult specimens of *ribesi* were observed feeding on aphids.

SPECIMENS EXAMINED: CANADA.—**British Columbia:** Summerland, July 2, 1974, L. A. Kelton, *Ribes* sp. (Grossulariaceae), paratypes: 2♂, 2♀ (CNC). USA.—**California:** *Mono Co.:* Mammoth Camp, D. Pierce, 1♂, 3♀ (LACM). *Placer Co.:* Juniper Creek, 7300 ft, August 2, 1969, W. Gagne, *Ribes cereum* (Grossulariaceae), 1♀ (UCB). *Shasta Co.:* 2 mi E of Lake Eiler, July 22, 1947, R. L. Usinger, *Ribes* sp. (Grossulariaceae), 5♂, 6♀ (UCB). *Siskiyou Co.:* 2.5 mi N of Medicine Lake on Medicine Lake Rd, July 19, 1985, G. M. Stonedahl and J. D. McIver, *Ribes cereum* (Grossulariaceae), 14♂, 12♀ (AMNH). 6.9 mi S of Medicine Lake on Powder Hill Road, July 19, 1985, G. M. Stonedahl and J. D. McIver, *Ribes cereum* (Grossulariaceae), 7♂, 9♀ (AMNH). 8.5 mi S of Lava Beds Natl. Monument toward Medicine Lake, 7000 ft, July 27, 1986, R. T. Schuh, *Ribes cereum* (Grossulariaceae), 9♂, 16♀ (AMNH). Bray, June 30, 1935, R. H. Beamer, 1♂, 2♀ (KU). Etna, July 1, 1970, F. D. Horn, *Ribes* sp. (Grossulariaceae), 8♀ (CAFA). just S of Lava Beds Natl. Mon. on Medicine Lake Road, July 17, 1985, G. M. Stonedahl and J. D. McIver, *Ribes cereum* (Grossulariaceae), 13♂, 26♀ (AMNH). **Oregon:** *Crook Co.:* 0.5 mi W of Ochoco Natl. Forest on Rt 26, T14S R18E Sec 11, June 22, 1979, R. T. Schuh, *Ribes* sp. (Grossulariaceae), 4♂, 1♀ (AMNH). Ochoco Natl. Forest, T14S R18E Sec 11, June 22, 1979, M. D. Schwartz, *Ribes cereum* (Grossulariaceae), 3♂, 5♀ (OSU). *Jackson Co.:* 5 mi NE of Union Creek, August 16, 1968, P. Oman, *Ribes* sp. (Grossulariaceae), 11♂, 7♀ (OSU). *Klamath Co.:* 5 mi S of LaPine, P. Oman, *Ribes* sp. (Grossulariaceae), 6♂, 15♀ (OSU). Chiloquin, Rt 97, July 4, 1982, G. M. Stonedahl and T. J. Henry, *Ribes* sp. (Grossulariaceae), 4♂, 2♀ (AMNH). **Washington:** *Okanogan Co.:* 15 mi NW of Omak, Salmon Creek, July 7, 1966, W. Gagne and J. Haddock, *Ribes* sp. (Grossulariaceae), 13♂, 6♀ (UCB). 8 mi WNW of Republic, Sweet Creek, 3600 ft, July 20, 1978, N. Herman, 1♀ (AMNH).

Plagiognathus rideri, new species
Figures 12, 18, 31

HOLOTYPE: Male: ''[USA:] LA[Louisiana]: St. Landry Par., Thistlethwaite WMA, 27-IV-

1986, E. G. Riley & D. A. Rider''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by *dorsum, venter, and antennal segments 1 and 2 being entirely castaneous* (figs. 12, 18), *legs pale with some dark markings,* and the *elongate* body form. *Smoothly curving, nearly superposed apical spines of vesica* distinctive for *rideri* (fig. 31). Similar to *negundinis* (fig. 10) and specimens of *obscurus* with almost totally dark dorsum (fig. 10: *obscurus* 4). Distinguished from *obscurus* by the narrowly pale area of the corium adjacent to the extreme base of the membrane and the at least faintly pale base of the cuneus in that species. Veins and membrane completely and intensely dark in *rideri*; membrane not so strongly darkened in *negundinis* and *obscurus* and veins pale along posterior margin of cells in both of those species. Superposed apical spines of vesica also easily distinguish *rideri* from other similar-appearing species mentioned above.

DESCRIPTION: *Male:* Moderately large, corial margins nearly straight; total length 3.42–4.08, length apex clypeus–cuneal fracture 2.41–2.73, width across pronotum 1.13–1.21. COLORATION (fig. 12): Dorsum usually castaneous, sometimes at least partially deep olive, vertex and frons somewhat lighter, clypeus and adjacent areas of face highly polished and nearly black; membrane heavily infuscate, veins entirely dark; antennal segment 1 castaneous except for pale apical annulus, segment 2 castaneous (fig. 18), segments 3 and 4 pale, yellowish; labium largely pale, segment 1 and apex partially infuscate; venter entirely castaneous, including metathoracic scent-gland evaporatory area; legs, including at least distal one-half of coxae, entirely pale yellow-white; femora with some dark spots, forefemur with a dark stripe on dorsal surface; tibial spines with obvious dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Entire body surface smooth, dull to weakly shining. Vestiture of dorsum composed of reclining, dark, simple setae. STRUCTURE: Elongate, hemelytra somewhat broader at cuneus than at base; frons weakly convex, not projecting beyond anterior margin of eyes, clypeus partially visible from above; head projecting below eye by diameter of antennal segment 1; labium reaching to near apex of hind coxae. GENITALIA (fig. 31): Vesica strongly and broadly curving, U-shaped, base falling just below level of secondary gonopore; apical spines moderately long, superposed, smoothly curving, anterior spine longer than posterior; flange relatively narrow, terminating at base of secondary gonopore.

Female: Body slightly more strongly ovoid than in male; coloration as in male. Total length 3.35–3.71, length apex clypeus–cuneal fracture 2.31–2.63, width across pronotum 1.11–1.16.

ETYMOLOGY: Named for David A. Rider, collector of the holotype and other known specimens.

HOST: Possibly breeding on *Rhus typhina* (Anacardiaceae).

DISTRIBUTION: Southern United States.

PARATYPES: USA.—**Alabama:** *Winston Co.:* Bankhead Natl. Forest, Sipsey Fork at Hwy 33 NE of Double Springs, May 16, 1988, C. B. Barr, 1♂ (LSU). **Arkansas:** *Garland Co.:* Ouachita Natl. Forest, Iron Springs Campground, May 17, 1986, C. B. Barr, *Salix sp.* (Salicaceae), 2♂ (LSU). **Louisiana:** *East Baton Rouge Parish:* 1.2 mi S of Central, E of LA Rt 3035, April 26, 1986, C. B. Barr, 5♂, 3♀ (AMNH, LSU). *Natchez Parish:* 8 mi E of Kisatche, April 28, 1985, E. G. Riley, 1♂ (DAR). *St. Landry Parish:* 3 mi E of Washington, April 27, 1986, E. G. Riley and D. A. Rider, 1♀ (LSU). Thistlewaite WMA, April 27, 1986, E. G. Riley and D. A. Rider, 1♀ (LSU). Thistlewaite WMA, April 27, 1986, E. G. Riley and D. A. Rider, 6♂, 14♀ (AMNH, DAR). *West Feliciana Parish:* Tunica Hills W of Weyanoke, May 8, 1986, C. B. Barr, 3♀ (LSU). **South Carolina:** *Newberry Co.:* Newberry, May 15, 1988, A. G. Wheeler, Jr., 1♂ (USNM). **Tennessee:** *Cannon Co.:* 1.5 mi E of Woodbury on Rt 705, May 28, 1985, T. J. Henry and A. G. Wheeler, Jr., *Rhus typhina* (Anacardiaceae), 1♂ (USNM). **Texas:** *Angelina Co.:* Upland Island Wilderness Area, Graham Creek bottomland, April 9, 1999, W. Godwin, 7♂, 7♀ (AMNH, TAMU). *San Jacinto Co.:* Big Creek Scenic Area, May 12, 1985, P. W. Kovarik, 1♂ (TAMU). *Wood Co.:* ca. 18 mi N of Hawkins, May 9, 1999, W. Godwin and E. Riley, 3♀ (TAMU). Jct Hwy 14

and 2869 nr Hawkins, May 9, 1999, A. Gillogly, W. Godwin, E. Riley, 1♀ (TAMU).

Plagiognathus rileyi, new species
Figures 12, 18, 31

HOLOTYPE: Male: ''[USA] Ark[ansas]: Washington Co.: Devil's Den St. Pk., VII-1-2-1984, E. G. and M. A. Riley''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the *chocolate brown coloration* of part or most of the dorsum, the *yellowish costal vein* (fig. 12), *antennal segment 2 pale except at extreme base* (fig. 18), the legs yellow with some dark blotches, and the *form of the male genitalia* (fig. 31). Specimens with mostly dark-colored dorsum most similar to *dispar* (fig. 7) and *punctatipes* (fig. 12) in coloration of dorsum, antennae, and legs. Distinguished from those species by yellow costal vein contrasting with dark areas of hemelytra, and distinctive form of male genitalia, especially by the superposition of the anterior and posterior spines (fig. 31). Some specimens of *rileyi* with basal half of corium yellow, in strong contrast to posterior one-half, and possibly confused with *fuscosus* (fig. 8) and *obscurus* (fig. 10); distinguished from the former by the presence of only simple, golden setae on the dorsum and from the latter by the mostly pale antennal segment 2.

DESCRIPTION: *Male:* Elongate, nearly parallel-sided, moderately large, heavy-bodied; total length 3.37–3.53, length apex clypeus–cuneal fracture 2.34–2.58, width across pronotum 1.08–1.25. COLORATION (fig. 12): Darker forms with dorsum mostly chocolate brown, except head above level of clypeus, costal vein, corium narrowly adjacent to extreme base of membrane, and base of cuneus pale, yellow; lighter forms with basal one-half of corium pale, yellow; membrane intensely fumose, veins generally pale; face highly polished at and below level of antennal insertion, clypeus deeply castaneous; antennal segment 1 castaneous except for pale apical annulus, segment 2 castaneous at extreme base, remainder of segment pale (fig. 18), segments 3 and 4 pale; labium pale except at base and apex; venter, including metathoracic scent-gland evaporatory area, entirely castaneous; hind coxae often dark on proximal half, pale on distal half, remainder of legs pale, yellowish, except for some dark spots on femora and conspicuous dark spots at bases of dorsal tibial spines; tibiae dark at point of articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, at most weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Body moderately broad, more or less parallel-sided; frons very weakly convex as viewed from above, clypeus not visible; anteocular distance about 0.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 31): Body of vesica very broadly U-shaped, base of vesica falling near level of secondary gonopore; posterior apical spine nearly straight, tapering, obliquely angled relative to body of vesica, anterior spine largely superposed over posterior spine, rather sharply bent at level of apex of posterior spine; flange on vesica very narrow, just barely reaching to base of gonopore.

Female: Very similar to male in coloration, body form more broadly ovoid. Total length 3.02–3.34, length apex clypeus–cuneal fracture 2.22–2.57, width across pronotum 1.10–1.18.

ETYMOLOGY: Named for E. G. Riley, collector of the holotype and other known specimens.

HOST: Unknown.

DISTRIBUTION: Known from Oklahoma, Missouri, and Arkansas.

PARATYPES: USA.—**Arkansas:** *Washington Co.:* Devil's Den St. Pk., July 1, 1984, E. G. and M. A. Riley, 6♂, 5♀ (AMNH, DAR, LSU). **Missouri:** *Newton Co.:* Hickory Creek, Alt US Hwy 71, 3.3 mi NE jct US 71, May 24, 1986, C. B. Barr, 1♂ (LSU). **Oklahoma:** *LeFlore Co.:* Rock Creek at US Hwy 59, 2 mi N of jct Hwy 112, May 25, 1986, J. E. Barr, 1♀ (LSU).

Plagiognathus rosicola Knight
Figures 12, 18, 31, 38

Plagiognathus rosicola Knight, 1923: 446 (n. sp.).

DIAGNOSIS: Recognized by the *very long labium* extending to about the middle of the abdomen, *dorsal vestiture reclining to sub-*

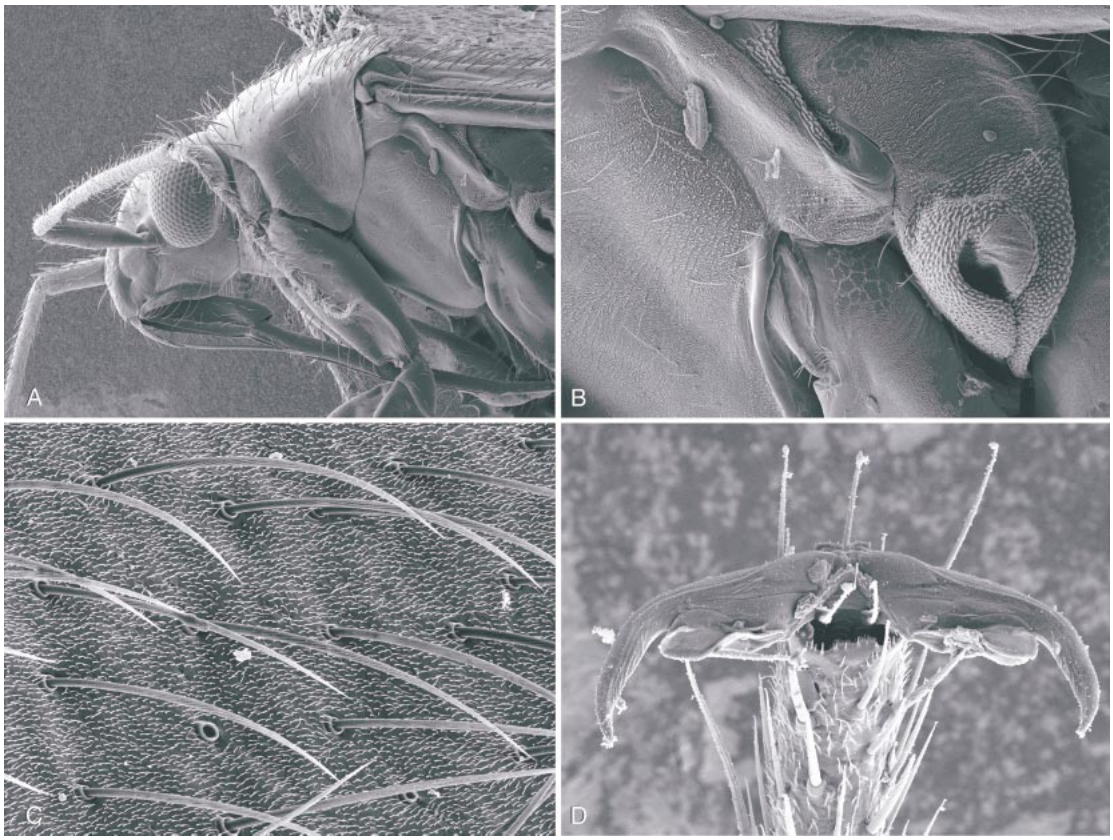

Fig. 38. *Plagionathus rosicola,* male, scanning micrographs. **A.** Lateral view of head. **B.** Metathoracic spiracle and metathoracic scent-gland evaporatory area. **C.** Hemelytral vestiture. **D.** Pretarsus.

erect, anteocular distance almost 2 times diameter of antennal segment 1 (fig. 38A), and the usually *red-orange general coloration* (fig. 12) with the *clypeus and maxillary plate contrastingly castaneous and polished.* Most similar in coloration to *fulvaceus* (fig. 8) and *concoloris* (fig. 7), but easily distinguished from those species by the very long labium, more slender body form, and occurrence in eastern North America. Similar to *albifacies* (fig. 5) in the long labium and semierect dorsal vestiture, but distinguished by that species having the clypeus and adjoining face mostly pale, having antennal segment 1 mostly pale, having a less strongly projecting head, and by its occurrence on *Polymnia* rather than on *Rosa.*

REDESCRIPTION: *Male:* Moderately large, elongate; total length 4.05–4.60, length apex clypeus–cuneal fracture 2.89–3.22, width across pronotum 1.23–1.33. COLORATION (fig. 12): General coloration, including most of venter and appendages, orange to reddish-orange; clypeus and maxillary plate castaneous and contrasting with remainder of head; membrane heavily fumose, narrowly pale adjacent to posteromesal margin of cuneus and including vein on posterior margin of small cell; antennae black except for pale apical annulus on segment 1 and narrow pale annulus at base of segment 2 (fig. 18); labium usually castaneous near base and apex; femora with numerous dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, relatively long, simple setae unicolorous with dorsum (fig. 38C). STRUCTURE: Body moderately slender, nearly parallel-sided; head distinctly projecting anteriorly, clypeus visible from above;

anteocular distance 2.0 times diameter of antennal segment 1; head projecting below eye by at least 1.5 times diameter of antennal segment 1 (fig. 38A); labium very long, reaching to anterior margin of genital capsule in some specimens; metathoracic scent-gland evaporatory area and spiracle as in figure 38B; pretarsus as in figure 38D. GENITALIA (fig. 31): Vesica relatively large, body moderately broad; apical spines weakly angled relative to body of vesica, elongate and relatively slender; flange narrow, barely extending past body of vesica and terminating well below base of secondary gonopore.

Female: Body ovoid, broader than in male; coloration sometimes not so intensely orange as in male. Total length 4.16–4.56, length apex clypeus–cuneal fracture 2.98–3.25, width across pronotum 1.31–1.41.

HOSTS: *Rosa carolina, R.* spp. (Rosaceae).

DISTRIBUTION: Eastern North America, ranging from Prince Edward Island in the north, south to South Carolina, and west to Illinois.

DISCUSSION: My concept of this species is based on the examination of paratypes listed under Specimens Examined, and on other material that I consider to be authoritatively identified.

SPECIMENS EXAMINED: CANADA.—**Ontario:** Amherstburg, July 6, 1962, Kelton and Brumpton, 1♂ (CNC). Kingsville, July 7, 1962, G. Thorpe, 1♂ (CNC). **Prince Edward Island:** Cavendish National Park, July 9, 1966, L. A. Kelton, 1♂ (CNC). USA.–**Arkansas:** *Washington Co.:* Fayetteville, June 15, 1987, T. J. Henry and A. G. Wheeler, Jr., *Rosa* sp. (Rosaceae), 6♀ (USNM). **Connecticut:** Storrs, July 10, 1954, J. A. Slater, 13♂, 25♀ (AMNH). **Illinois:** *Champaign Co.:* Urbana, June 25, 1942, J. A. Slater, 1♀ (AMNH). *Lawrence Co.:* Pinkstaff, June 14, 1911, *Rosa* sp. (Rosaceae), paratype: 1♂ (USNM). **Indiana:** *Howard Co.:* NW Howard County, June 23, 1986, D. A. Rider, 1♂, 1♀ (DAR). **Maryland:** *Montgomery Co.:* Plummers Island, June 30, 1905, paratypes: 3♂, 3♀ (CAS). **Missouri:** *Atchison Co.:* Langdon, July 4, 1904, 1♂ (USNM). *Boone Co.:* Columbia, June 19, 1941, R. C. Froeschner, 1♂ (USNM). **New Jersey:** *Morris Co.:* Madison, July 11, 1898, H. G. Barber, 1♂ (USNM). **New York:** *Bronx Co.:* Mosholu, July 9, 1891, Beutenmuller, 2♂ (AMNH). *Chemung Co.:* Elmira, April 15, 1912, E. P. Van Duzee, 1♂ (CAS). *Erie Co.:* Hamburg, July 23, 1905, E. P. Van Duzee, 1♂ (CAS). *Niagara Co.:* Niagara Falls, August 17, 1907, E. P. Van Duzee, 1♂ (CAS). **Pennsylvania:** *Dauphin Co.:* Linglestown Road, Hoover School, July 2, 1975, A. G. Wheeler, Jr., *Rosa carolina* (Rosaceae), 1♂, 6♀ (PDA). *Erie Co.:* Fairview, Fairview Nurseries, July 8, 1976, A. G. Wheeler, Jr., *Rosa* sp. (Rosaceae), 3♀ (PDA). N of Waterford on Rt 97, July 20, 1988, A. G. Wheeler, Jr., *Rosa* sp. (Rosaceae), 4♂, 7♀ (PDA). *Montgomery Co.:* Dresher, July 19, 1978, A. G. Wheeler, Jr., *Rosa* sp. (Rosaceae), 1♂ (PDA). Horsham, July 19, 1978, A. G. Wheeler, Jr., *Rosa* sp. (Rosaceae), 1♂, 5♀ (PDA). **South Carolina:** *Pickens Co.:* Clemson College, June 10, 1936, 1♂ (CLEMSON). **Tennessee:** *Gibson Co.:* Rutherford, May 28, 1985, T. J. Henry, *Rosa* sp. (Rosaceae), 10♂, 1♀ (USNM).

Plagiognathus rosicoloides, new species
Figures 12, 18, 31

HOLOTYPE: Male: ''Lake Louise, Alta[Alberta]. [CANADA], 3 August 1970, L. A. Kelton''. Deposited in the Canadian National Insect Collection, Ottawa.

DIAGNOSIS: Recognized by the *large* size, *elongate* body form (fig. 12), *membrane with a large quadrate, fumose patch posterior to cuneus and cells,* and the *form of the male genitalia* (fig. 31). Most similar in size and general appearance to *lattini* (fig. 9), but fresh specimens with a more reddish cast, male genitalia distinctive and the coloration of antennal segment 2 (see also Discussion below).

DESCRIPTION: *Male:* Large, elongate, nearly parallel-sided; total length 4.86–5.03, length apex clypeus–cuneal fracture 3.12–3.33, width across pronotum 1.13–1.23. COLORATION (fig. 12): General coloration brownish or reddish; thoracic and abdominal venter mostly dark brown; dorsum without distinctive markings; mesoscutum often orange laterally; membrane moderately fumose with a darker quadrate marking posterior to cuneus and membrane cells; veins of membrane yellowish; antennal segment 1 black

except for pale apical annulus, segment 2 often entirely black, sometimes with pale area mesially (fig. 18), segments 3 and 4 dark; labium pale to weakly infuscate basally, more strongly infuscate apically; legs, including all coxae, pale to weakly infuscate, femora with some dark spots; dorsal tibial spines without dark spots at bases; tibiae very weakly darkened at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae; vestiture of antennal segments 2–4 suberect. STRUCTURE: Body slender; frons weakly tumid, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching between apices of middle and hind coxae. GENITALIA (fig. 31): Body of vesica relatively broad, more or less sigmoid, base of vesica distant from level of secondary gonopore; apical spines relatively short, at nearly right angle to body of vesica, anterior spine much long and more slender than posterior; flange narrow.

Female: Body much more strongly ovoid than in male (fig. 12); antennal segment 2 mostly pale, dark only at base (fig. 19). Total length 3.99–4.85, length apex clypeus–cuneal fracture 2.71–3.23, width across pronotum 1.07–1.19.

ETYMOLOGY: Named for its similarity of appearance to *Plagiognathus rosicola* Knight.

HOSTS: *Alnus rhombifolia, Alnus* sp. (Betulaceae); *Ribes* sp. (Grossulariaceae); and *Salix* sp. (Salicaceae).

DISTRIBUTION: Western North America from British Columbia and Alberta south to Oregon.

DISCUSSION: Antennal segment 2 is often completely dark in males of *rosicoloides* but less commonly shows the broad, pale, median annulation found in *lattini.* The females of both species, however, ordinarily have antennal segment 2 largely pale.

Although *rosicoloides* has been recorded from a number of plant species, I would predict that careful documentation will show the breeding host to be *Alnus.*

PARATYPES: CANADA.—**Alberta:** Banff National Park, Banff-Japser Hwy, August 25, 1970, L. A. Kelton, 1♂ (CNC). Lake Louise, August 3, 1970, L. A. Kelton, 25♂, 14♀ (AMNH, CNC). Lake Louise, August 3, 1970, L. A. Kelton, 3♂, 1♀ (CNC). **British Columbia:** Glacier National Park, July 15, 1970, L. A. Kelton, 6♂, 9♀ (CNC). Kootenay Pass, August 8, 1970, L. A. Kelton, 2♀ (UBC). Manning Prov. Park, Blackwall, July 23, 1970, L. A. Kelton, 1♀ (UBC). **Yukon Territory:** Porcupine River at Dave Lord Creek, July 17, 1981, S. G. Cannings, 1♂ (UBC). Rose Lake, July 28, 1981, C. S. Guppy, 4♂, 2♀ (UBC). USA.—**Montana:** *Glacier Co.:* 11 mi SW of East Glacier Park on Rt 2, Marias Pass, 5280 ft, August 2, 1994, M. D. Schwartz, 1♀ (CNC). **Oregon:** *Baker Co.:* Wallowa Mountains, Eagle Creek Meadow Campground on Forest Service Road 77, T5S R43E Sec 32, July 29, 1997, M. D. Schwartz, *Salix sp.* (Salicaceae), 2♀ (CNC). *Union Co.:* 0.1 mi NE of Tollgate Shopping Center on Hwy 204, August 17, 1979, M. D. Schwartz, *Picea sp.* (Pinaceae), 1♀ (AMNH). 4.5 mi E of Tollgate, Woodland Campground, 5000 ft, August 4, 1986, Schuh, Schwartz, Stonedahl, *Alnus rhombifolia* (Betulaceae), 3♀ (AMNH). **Washington:** *Pierce Co.:* Mount Rainier, Yakima Park, 4000 ft, August 26, 1932, A. R. Rolfs, 4♂, 10♀ (USNM). *Yakima Co.:* Mount Adams, April 3, 1930, A. R. Rolfs, 1♀ (USNM).

Plagiognathus salicicola Knight
Figures 12, 19, 31

Plagiognathus salicicola Knight, 1929b: 69 (n. sp.).

Plagiognathus salicicola depallens Knight, 1929b: 70 (n. var.)

DIAGNOSIS: Recognized by the *pale orange or light-brown background coloration of the dorsum* (fig. 12: *salicola* 1), often with darker longitudinal markings on the hemelytra (fig. 12: *salicola* 2), antennal segment 2 mostly pale with a dark base (fig. 19), elongate ovoid body, and the *calli darkened* and contrasting with much of remainder of pronotum. Similar to *albatus* (fig. 5) and *tinctus* (fig. 13) in having antennal segment 2 pale except at extreme base, and further to *albatus* in having much of the dorsum pale or weakly

darkened; distinguished by its larger size, partly to totally pale coloration of the venter, and male genitalic structure (fig. 32). Pattern of coloration also similar to *shepherdiae* (fig. 13), but that species with antennal segment 1 mostly pale and feeding on members of the Elaeagnaceae rather than the Salicaceae.

REDESCRIPTION: *Male:* Moderately large, elongate ovoid; total length 3.98–4.37, length apex clypeus–cuneal fracture 2.63–2.93, width across pronotum 1.19–1.33. COLORATION (fig. 12): Background coloration of dorsum pale, cream to light orange, sometimes entirely so, or with brown on calli, clavus, endocorium, exocorium, and discal area of cuneus; membrane weakly fumose, veins pale; face almost entirely pale in pale specimens, clypeus and maxillary plate castaneous, contrasting with surrounding areas of head in specimens with dark markings on dorsum; antennal segment 1 castaneous except for pale apical annulus, segment 2 pale except for extreme basal portion (fig. 19), segments 3 and 4 pale to weakly infuscate; labium pale to weakly infuscate; venter mostly pale, with some darker markings in specimens with dark markings on dorsum; legs generally pale, yellowish; femora with some dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at articulation with femur. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, pale, shining, common setae. STRUCTURE: Body elongate-ovoid; frons weakly convex, slightly projecting beyond anterior margin of eyes, clypeus not visible from above; anteocular distance 0.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 31): Body of vesica relatively stout, strongly curving basally and more or less U-shaped; apical spines elongate, relatively slender, and nearly erect relative to body; flange moderately broad and terminating distad of base of secondary gonopore.

Female: Very similar to male in coloration and body shape. Total length 3.85–4.11, length apex clypeus–cuneal fracture 2.69–2.94, width across pronotum 1.16–1.37.

HOSTS: *Salix* spp. (Salicaceae).

DISTRIBUTION: Northeastern North America south and west as far as Iowa, Ohio, and Pennsylvania.

DISCUSSION: Specimens of this species and of *tinctus* have at times been confused. Indeed, they have apparently been collected on the same *Salix* species at the same time, or at least at the same locality on the same day. As indicated in the diagnosis, however, the two are easily distinguished on the basis of external as well as genitalic characters.

SPECIMENS EXAMINED: CANADA.—**Ontario:** Dunnville, July 9, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 6♂, 2♀ (CNC). Fergus, July 24, 1962, Kelton and Thorpe, *Achillea* sp. (Asteraceae), 1♂ (CNC). Kingsville, July 7, 1962, G. Thorpe, *Salix* sp. (Salicaceae), 2♂, 1♀ (CNC). McGregor, July 7, 1962, G. Thorpe, *Salix* sp. (Salicaceae), 2♂, 1♀ (CNC). Norwich, July 19, 1962, Kelton and Thorpe, 1♂ (CNC). Tillsonburg, July 20, 1955, L. A. Kelton, 6♀ (CNC). USA.—**Indiana:** *Cass Co.:* 2 mi E of Walton, July 4, 1979, T. J. Henry, *Salix nigra* (Salicaceae), 1♂, 1♀ (USNM). **Iowa:** *Boone Co.:* Ledges State Park, July 19, 1925, H. H. Knight, *Salix longifolia* (Salicaceae), 1♂, 4♀ (USNM). *Story Co.:* Ames, July 26, 1928, H. H. Knight, paratype (depallens): 1♂ (USNM). **Louisiana:** *East Baton Rouge Co.:* LSU Campus, June 1, 1985, D. A. Rider, 1♀ (LSU). **Michigan:** *Ingham Co.:* East Lansing, July 16, 1991, Henry and Wheeler, 1♀ (USNM). **Minnesota:** *Hennepin Co.:* No specific locality, July 12, 1919, H. H. Knight, *Salix longifolia* (Salicaceae), paratypes (depallens): 1♂, 5♀ (USNM). *Ramsey Co.:* No specific locality, July 11, 1925, H. H. Knight, *Salix longifolia* (Salicaceae), 1♂, 1♀ (USNM). St. Anthony Park, August 2, 1924, H. H. Knight, 1♀ (USNM). St. Anthony Park, August 2, 1924, H. H. Knight, 6♀ (USNM); holotype male (*depallens*) (USNM). **Ohio:** *Auglaise Co.:* St. Marys, July 17, 1927, S. A. Watson, holotype male (USNM). *Montgomery Co.:* 20 mi W of Springfield on I-70, July 4, 1970, T. J. Henry, *Salix nigra* (Salicaceae), 1♂ (USNM). **Pennsylvania:** *Erie Co.:* near Erie, I-90 and Rt 97, June 24, 1975, A. G. Wheeler, Jr., *Salix nigra* (Salicaceae), 4♀ (PDA).

Plagiognathus salviae Knight
Figures 12, 19, 31

Plagiognathus salviae Knight, 1968: 30 (n. sp.).

DIAGNOSIS: Recognized by the *moderately small size,* the mostly *pale yellowish coloration of the dorsum* (fig. 12), the *entirely black antennae* (fig. 19), and the *face at and below base of clypeus castaneous, polished, and contrasting with coloration of vertex and remainder of frons.* Similar to *fulvidus* (fig. 8), *melliferae* (fig. 9), and *mexicanus* (fig. 10) in coloration and texture of lower portion of face. Separated from *melliferae* by that species being much larger and occurring in coastal southern California rather than in the western Great Basin. Separated from *mexicanus* by the uniformly dark red coloration and coastal northern Baja California distribution of that species, and from *fulvidus* by its orange coloration and occurrence in the northeastern United States.

REDESCRIPTION: *Male:* Elongate ovoid, moderately small; total length 3.17–3.73, length apex clypeus–cuneal fracture 2.22–2.53, width across pronotum 1.03–1.15. COLORATION (fig. 12): Dorsum mostly pale, head, pronotum, and scutellum often more strongly yellowish or suffused with orange, endocorium sometimes weakly brown; membrane weakly fumose, veins pale; face castaneous and shining at and below base of clypeus; antennae entirely black (fig. 19); venter almost entirely brown to castaneous; labium mostly castaneous; coxae mostly infuscate, remainder of legs pale to yellowish, femora with some dark spots; dorsal tibial spines with dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent simple setae unicolorous with dorsum with darker suberect setae on pronotum and anterolaterally on hemelytra. STRUCTURE: Frons tumid, clypeus visible from above; anteocular distance 2.0 times diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1; labium long, slightly exceeding apex of hind coxae. GENITALIA (fig. 31): Vesica more or less J-shaped, basal portion very broadly curving, base falling well below base of secondary gonopore; apical spines weakly elongate, angled relative to body of vesica, anterior spine weakly bent subapically and longer than posterior; flange moderately broad, terminating slightly above base of secondary gonopore.

Female: Similar to male in shape and coloration. Total length 3.13–3.32, length apex clypeus–cuneal fracture 2.19–2.40, width across pronotum 1.06–1.12.

HOST: *Salvia* spp. (Lamiaceae).

DISTRIBUTION: Western Great Basin and Mojave Desert areas of western North America.

SPECIMENS EXAMINED: USA.—**California:** *Kern Co.:* near Walker Pass, 5000 ft, May 30, 1981, J. T. Polhemus, 1♂, 5♀ (JTP). *San Bernardino Co.:* 12.5 mi SE of Ivanpah, Ivanpah Road, May 25, 1977, J. D. Pinto, *Salvia dorrii* (Lamiaceae), 6♂, 4♀ (UCR). 8 mi SE of Ivanpah, Lanfair Valley, May 25, 1977, S. Frommer, 12♂, 7♀ (UCR). *Siskiyou Co.:* 4 mi NW of Lava Beds Natl. Monument Headquarters, 4200 ft, June 26, 1979, J. D. Lattin, *Salvia carnosa* (Lamiaceae), 2♂, 1♀ (OSU). 4 mi NW of Lava Beds Natl. Monument Headquarters, 4200 ft, June 26, 1979, M. D. Schwartz, *Salvia carnosa* (Lamiaceae), 2♂, 2♀ (OSU). Lava Beds Natl. Monument, Sconchin Flow, 1315 m, June 26, 1979, R. T. and Joe Schuh, *Salvia* sp. (Lamiaceae), 12♂, 6♀ (AMNH). **Nevada:** *Nye Co.:* Atomic Test Site, Rock V. on Jackass Flats Rd., 3300 ft, June 6, 1983, Schuh, Schwartz, Stonedahl, 1♂ (AMNH). Mercury, 12 M, 401 M, June 11, 1965, H. H. Knight and J. Merino, *Salvia dorrii* (Lamiaceae), paratypes:10♂, 10♀ (USNM). Mercury, 19 M, June 22, 1965, H. Knight and J. Merino, holotype male (USNM).

Plagiognathus schaffneri, new species
Figures 12, 19, 32

HOLOTYPE: Male: ''[USA] 2 mi. w. Iredell, Bosque Co., Texas, May 6, 1970, J. C. Schaffner''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the ovoid body of generally *castaneous coloration* (fig. 12), recumbent, *golden, shining vestiture on the pronotum and anterior half of hemelytra with dark setae posteriorly, antennal segments 1*

and 2 entirely dark (fig. 19), *legs entirely pale yellowish,* and *tibial spines without dark spots at bases.* Similar to *punctatipes* (fig. 12), *rideri* (fig. 12) and some specimens of *obscurus* (fig. 10: *obscurus* 4) from eastern North America in the dark coloration of the dorsum and the generally pale coloration of the legs; separated from *obscurus, punctatipes,* and *rideri* by the presence of some dark spots on hind femora in those species, and antennal segment 2 in *punctatipes* almost entirely pale. Also similar to *annulatus* in dark coloration of body with pale appendages, but that species with a black stripe distally on the medioventral surface of the hind femur and with a pale medial annulus on antennal segment 2. Differing from all of the above species by the dorsal vestiture being golden and shining on the pronotum, scutellum, and anterior half of the hemelytra and dark and dull on the posterior half of hemelytra.

DESCRIPTION: *Male:* Elongate ovoid; total length 3.46–3.73, length apex clypeus–cuneal fracture 2.42–2.68, width across pronotum 1.17–1.32. COLORATION (fig. 12): Dorsum castaneous, never with additional pale markings; membrane and veins smoky; antennal segment 1 castaneous except for pale apical annulus, segment 2 castaneous, segments 3 and 4 pale to moderately infuscate; labium with segment 1 and apex infuscate, remainder pale; venter, including metathoracic scent-gland evaporatory area, entirely castaneous; legs, including coxae, pale, golden; tibial spines without dark spots at bases; tibiae pale at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent simple setae, golden shining on pronotum, scutellum, and anterior half of corium and clavus, dark on posterior one-half of corium and clavus. STRUCTURE: Relatively broad-bodied; frons weakly convex as viewed from above, clypeus not visible; anteocular distance 0.5 times diameter of antennal segment 1; head projecting below level of eye by diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 32): Body of vesica more or less J-shaped, base of vesica falling substantially below level of secondary gonopore; posterior apical spine relatively broad, weakly curving, nearly erect relative to body of vesica, anterior spine narrow and at nearly right angle to body of vesica; flange on vesica narrow, not reaching to base of secondary gonopore or overlapping body of vesica.

Female: Coloration as in male; body broader and more strongly ovoid. Total length 3.50–3.70, length apex clypeus–cuneal fracture 2.52–2.67, width across pronotum 1.27–1.37.

ETYMOLOGY: Named for J. C. Schaffner, collector of the holotype and other known specimens.

HOST: Unknown.

DISTRIBUTION: Known only from Texas.

PARATYPES: USA.—**Texas:** *Bosque Co.:* 2 mi W of Iredell, May 12, 1969–May 6, 1970, J. C. Schaffner, 3♂, 8♀ (TAMU). *Brazos Co.:* 8 mi S of College Station, Peach Creek at Hwy 6, April 13, 1987, R. Anderson, 4♂, 2♀ (TAMU). College Station, April 16, 1966, P. M. Wagner, 2♂, 1♀ (TAMU). College Station, April 9, 1965–May 2, 1969, J. C. Schaffner, 15♂, 18♀ (AMNH, TAMU). College Station, March 24, 1971–March 29, 1971, V. V. Board, 4♂ (TAMU). College Station, Nuclear Reactor Pond, April 20, 1970, V. V. Board, 5♂, 3♀ (TAMU). Koppe Bridge, April 20, 1966, J. C. Schaffner, 1♂, 1♀ (TAMU). *Burleson Co.:* Somerville Lake, April 29, 1969, V. V. Board, 1♂, 5♀ (TAMU). *Burnet Co.:* Inks Lake State Park, April 4, 1999, M. Yoder, 3♂ (TAMU). *Fannin Co.:* Selfs, May 14, 1978, J. K. Weaver, 2♂ (TAMU). *Gonzales Co.:* Palmetto State Park, April 13, 1970–April 22, 1970, V. V. Board, 10♂, 6♀ (AMNH, TAMU). Palmetto State Park, April 17, 1965–May 13, 1968, J. C. Schaffner, 11♂, 3♀ (TAMU). Palmetto State Park, April 19, 1969, Board and Schaffner, 1♀ (TAMU). *Grimes Co.:* 3 mi W of Roan's Prairie, May 2, 1970, V. V. Board, 2♂ (TAMU). *Lavaca Co.:* 10 mi N of Hallettsville, April 18, 1964, H. R. Burke, 1♀ (TAMU). *Milam Co.:* 5 mi E of Thorndale on Rt 79, May 5, 1983, T. J. Henry, 1♂, 4♀ (USNM). *Nacogdoches Co.:* 2 mi W of Nacogdoches, April 18, 1972, V. V. Board, 1♀ (TAMU).

Plagiognathus shepherdiae Knight
Figures 13, 19, 32

Plagiognathus shepherdiae Knight, 1929b: 70 (n. sp.).

DIAGNOSIS: Recognized by the *large* size, pale *grayish* coloration, contrasting brown calli, and the presence of *longitudinal light brown markings on the clavus and corium* (fig. 13). Pale coloration of the body and antennae most similar to *flavidus* (fig. 7), *guttatipes* (fig. 8), and *tenellus* (fig. 13). Distinguished from all of those species by their lack of longitudinal dark markings on the hemelytra and from *tenellus* also by the tibial spines in that species lacking black spots at bases and the tibiae being pale at the femoral articulation.

REDESCRIPTION: *Male:* Relatively large, very elongate-ovoid; total length 4.12–4.68, length apex clypeus–cuneal fracture 2.71–3.11, width across pronotum 1.16–1.36. COLORATION (fig. 13): General coloration, including most of venter and appendages, pale gray, with some brown markings as follows: clypeus mostly brown, frons often with brown transverse striate markings, calli always brown, hemelytra with elongate brown markings on clavus, endocorium, and exocorium, and cuneus with a central brown spot; membrane at least partly fumose, especially just posterior to cells, veins pale; antennal segment 1 always dark on tapered basal portion and at base of mesial spine, remainder of segment pale, antennal segment 2 pale except dark at extreme base (fig. 19), segments 3 and 4 pale; apex of labium infuscate; thoracic sternum and longitudinal subspiracular line on abdomen brown; femora with numerous dark spots; tibial spines with dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to very weakly shining. Vestiture of dorsum composed of recumbent, pale to silvery, very weakly flattened setae. STRUCTURE: Body appearing flattened; frons weakly tumid as viewed from above, clypeus partly visible; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 0.5 times diameter of antennal segment 1; labium relatively short, not quite reaching to apex of middle coxae. GENITALIA (fig. 32): Vesica more or less U-shaped, body relatively heavy, base reaching to about base of secondary gonopore; posterior apical spine of moderate length, tapered, strongly angled relative to body of vesica, anterior spine somewhat longer, slender, and at right angle to body of vesica; flange moderately broad and reaching just past midpoint of secondary gonopore.

Female: Shorter and more strongly ovoid than male; coloration similar to male. Total length 3.78–4.16, length apex clypeus–cuneal fracture 2.68–2.91, width across pronotum 1.20–1.33.

HOST: *Shepherdia argentea* (Elaeagnaceae).

DISTRIBUTION: Known from the high plains of Colorado and Montana.

SPECIMENS EXAMINED: USA.—**Colorado:** *Archuleta Co.:* Pagosa Springs, August 12, 1925, H. H. Knight, paratypes: 5♂, 5♀ (USNM); holotype male (USNM). *Dolores Co.:* 29 mi SW of Norwood, July 7, 1980, J. T. and D. A. Polhemus, 8♂, 5♀ (JTP). *Montezuma Co.:* Dolores, August 2, 1900, E. D. Ball, 4♂, 1♀ (USNM). Mancos, August 13, 1925, H. H. Knight, paratypes: 2♂ (USNM). **Montana:** *Teton Co.:* 6 mi NW of Choteau on Canyon Road off Rt 89, Eureka Reserv. Fishing Access, 4000 ft, August 2, 1994, M. D. Schwartz, *Shepherdia argentea* (Elaeagnaceae), 3♂, 11♀ (AMNH).

Plagiognathus shoshonea Knight
Figures 13, 19, 32

Plagiognathus shoshonea Knight, 1964: 142 (n. sp.).
Plagiognathus geranii Knight, 1964: 142 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Recognized by the *very large* size and heavy body, the *exocorium and clavus usually mostly pale and contrasting with the endocorium, forming a linear pattern of coloration* (less frequently dorsum entirely dark or entirely pale, yellowish), the dull surface of dorsum, the pronotum at least partly pale (fig. 13), the antennae entirely black (fig. 19), and the *vestiture of the dorsum recumbent, weakly woolly, golden, shining* (fig. 13). Pattern of coloration similar to that of *lineatus* (fig. 9) and *moerens* (fig. 10); distinguished from *moerens* by the dull surface of the dorsum and the shining, weakly woolly vestiture rather than black bristles; most easily separated from *lineatus* by the much larger size of *shoshonea*.

REDESCRIPTION: *Male:* Elongate-ovoid,

very large; total length 4.74–5.27, length apex clypeus–cuneal fracture 3.31–3.67, width across pronotum 1.43–1.50. COLORATION (fig. 13): Background coloration of dorsum weakly castaneous to blackish, sometimes entirely dark or entirely pale yellowish, more commonly with some pale areas as indicated; posterior margin of vertex usually obviously pale; disc of pronotum usually partially to broadly pale (sometimes also anterior margin, or entire pronotum, pale); exocorium usually pale except along costal vein; clavus usually almost entirely pale with longitudinal marking covering entire length; cuneus ranging from pale at base to entirely pale; corium narrowly pale adjacent to extreme base of membrane; membrane heavily fumose, veins pale, angle between posterior margin of cells and posteromesial margin of cuneus usually pale; antennae entirely castaneous (fig. 19); labium castaneous; venter entirely castaneous, metathoracic scent-gland evaporatory area sometimes partially pale; basal two-thirds of coxae dark, distal one-third and trochanters pale or weakly infuscate; femora weakly to heavily infuscate, darker in darker specimens, lighter in lighter specimens; tibiae moderately to heavily infuscate, dorsal spines with weakly contrasting dark bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to very weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, weakly woolly setae. STRUCTURE: Dorsum flattened, broad, lateral corial margins distinctly convex; frons distinctly tumid as viewed from above, clypeus visible from above; anteocular distance 1.6 times diameter of antennal segment 1; head projecting below eye by 1.6 times diameter of antennal segment 1; labium reaching to about apex of hind coxae or slightly beyond. GENITALIA (fig. 32): Body of vesica relatively stout and broadly curving, base of vesica falling somewhat below secondary gonopore; posterior apical spine long, nearly straight, and erect relatively to body of vesica; anterior spine slightly longer than posterior, obliquely angled relative to body of vesica, distinctly bent subapically in lateral view; flange on vesica curving over entire length, terminating at about midpoint of secondary gonopore.

Female: Body shape and coloration very similar to male. Total length 4.59–4.79, length apex clypeus–cuneal fracture 3.31–3.40, width across pronotum 1.40–1.56.

HOSTS: *Geranium* spp. (Geraniaceae).

DISTRIBUTION: Montane regions in the Rocky Mountain system, ranging from British Columbia and Alberta in the north to Nevada and Colorado in the south.

DISCUSSION: Knight (1964) described the species *Plagiognathus shoshonea* and *Plagiognathus geranii* on facing pages. He noted that *geranii* was allied to *shoshonea* but that it differed by having antennal segment 2 shorter and not equal to the width of the head. Knight recorded the holotype and additional specimens of *P. geranii* from Stonewall, Colorado, as occurring on *Geranium* sp. Kelton (1980) subsequently recorded *shoshonea* from Canada on *Geranium bicknellii.*

After having examined most of the material on which Knight based his descriptions, as well as a substantial number of additional specimens with host data, I conclude that only a single species is involved, based on similarity of appearance, indistinguishable male genitalia, and apparent preference for feeding on *Geranium.* My measurement data, in conjunction with the analysis of other characters, offer no support for Knight's theory that two species can be recognized on the basis of the length of antennal segment 2. I am therefore treating *Plagiognathus shoshonea* as the senior synonym on the basis of page priority.

The male genitalia of *shoshonea* are very similar to those of *brunneus* and *lineatus.* Very dark specimens of these species can be difficult to separate, even after dissection. Nonetheless, *shoshonea* can be consistently separated from the other two on the basis of size and host association, and on that basis appears to be largely, if not totally, allopatric with *lineatus.* See also Discussion under *brunneus* and *lineatus.*

SPECIMENS EXAMINED: CANADA.—**Alberta:** Cypress Hills Provincial Park, Murray Hill Road, 4700 ft, July 18, 1990, M. D. Schwartz, *Geranium* sp. (Geraniaceae), 4♂ (CNC). Cypress Hills, July 21, 1936, J. H. Pepper, 1♀ (CNC). Elkwater Lake, July 19, 1956, O. Peck, 5♂, 5♀ (CNC). Elkwater

Park, July 8, 1952–July 14, 1952, A. R. Brooks and L. A. Konotopetz, *Geranium* sp. (Geraniaceae), 10♂, 8♀ (CNC). Frank, July 18, 1952, L. A. Konotopetz, 1♂ (CNC). Kananaskis Road, July 20, 1975, L. A. Kelton, *Geranium* sp. (Geraniaceae), 25♂, 11♀ (CNC). Lethbridge, July 18, 1930, J. H. Pepper, 1♂ (UCB). Lethbridge, July 18, 1930, J. H. Pepper, 2♂, 1♀ (CNC). Lundbreck, July 20, 1973, L. A. Kelton, 1♂ (CNC). Medicine Hat, July 10, 1929, J. H. Pepper, 1♂, 2♀ (CNC). Milk River, July 9, 1930, J. H. Pepper, 12♂ (CNC). Nordegg, August 6, 1923, J. McDunnough, 1♀ (USNM). Waterton Lakes, July 4, 1923, J. McDunnough, 2♂, 1♀ (CNC). Waterton Natl. Park, July 4, 1970, L. A. Kelton, 1♂, 1♀ (CNC). Waterton Park, July 26, 1972, L. A. Kelton, *Geranium* sp. (Geraniaceae), 9♂, 6♀ (CNC). Waterton, July 10, 1923, E. H. S. Strickland, 1♂ (CNC). **British Columbia:** Aspen Grove, July 10, 1975, L. A. Kelton, 2♂ (CNC). Nicola, July 10, 1962, G. J. Spencer, 2♂, 1♀ (USNM). Vernon, M. H. Ruhmann, 1♂ (CAS). USA.—**Arizona:** *Maricopa Co.:* Surprise, April 4, 1980, Roy Fritz, 1♂ (USU). **Colorado:** *Boulder Co.:* 8 mi W of Boulder, August 12, 1973, J. C. Schaffner, 1♂ (TAMU). Boulder, 5500 ft, June 15, 1961, J. R. Stainer, 2♂ (CNC). Boulder, July 21, 1903, E. P. Van Duzee, 4♂, 4♀ (CAS). Boulder, July 8, 1949, R. H. Beamer, 1♂ (KU). S St. Vrain Canyon, August 16, 1963, G. F. Knowlton and W. J. Hanson, 1♂ (USU). *Clear Creek Co.:* 11 mi W of Idaho Springs, 9000 ft, August 11, 1968, P. Oman, 1♂, 2♀ (OSU). Chicago Creek, 8800 ft, August 5, 1961, B. H. Poole, 59♂ (CNC). *Douglas Co.:* Perry Park, July 13, 1977, D. A. and J. T. Polhemus, 3♀ (AMNH). *Eagle Co.:* Vail, June 26, 1977, J. T. Polhemus, 2♂, 1♀ (AMNH). *Gilpin Co.:* Pinecliffe, July 9, 1949, L. D. Beamer, 1♂, 2♀ (KU). *Gunnison Co.:* Gothic, July 19, 1963, O. R. Taylor, 1♀ (AMNH). *Hinsdale Co.:* 11 mi N of Lake City, August 6, 1997, J. C. Schaffner, 3♂, 6♀ (TAMU). *Jackson Co.:* Columbine Lodge, August 16, 1966, G. F. Knowlton, 1♀ (USU). Muddy Pass, 8800 ft, August 15, 1961, J. E. R. Stainer, 4♂, 14♀ (CNC). Muddy Pass, July 5, 1972, D. Anderson, 2♂, 5♀ (USU). Muddy Pass, Routt Natl. Forest, August 21, 1968, L. A. Kelton, 2♂ (CNC). Rabbit Ears Pass, August 11, 1965, G. F. Knowlton, 1♂ (USU). *Jefferson Co.:* 15 mi NW of Deckers, August 8, 1969, J. C. Schaffner, 2♂, 2♀ (TAMU). Indian Hills, 7000 ft, July 11, 1986, R. T. Schuh and J. T. Polhemus, *Geranium viscosissimum* (Geraniaceae), 2♂, 2♀ (AMNH). Red Rocks Park near Morrison, 5600 ft, July 15, 1983, R. T. Schuh and D. A. Polhemus, *Geranium viscosissimum* (Geraniaceae), 6♂, 26♀ (AMNH). *Larimer Co.:* 40 mi W of Fort Collins, Bennett Creek Picnic Ground, Pingree Park Rd., 7400 ft, July 14, 1986, R. T. Schuh and J. T. Polhemus, 3♂ (AMNH). Fort Collins, July 16, 1903, E. P. Van Duzee, 1♂ (CAS). Fort Collins, July 17, 1900, 1♀ (CAS). Fort Collins, June 22, 1899, 2♂, 1♀ (USNM). *Las Animas Co.:* Trinidad, Stonewall, 8500 ft, August 7, 1925, C. J. Drake, 1♀ (TAMU); holotype male (*geranii*) (USNM). *Teller Co.:* Manitou, July 25, 1903, E. P. Van Duzee, 2♀ (CAS). *Unknown Co.:* Little Beaver, July 18, 1898, 1♂, 2♀ (KU). **Idaho:** *Bear Lake Co.:* Ovid, August 3, 1978, G. F. Knowlton, 2♂, 1♀ (USU). *Franklin Co.:* Cub River Canyon, July 12, 1958, G. F. Knowlton, 2♂ (KU). Cub River Canyon, June 6, 1966–July 25, 1964, G. F. Knowlton, 10♂, 7♀ (USU). Cub River Canyon, Thomas Spring, July 15, 1978, G. F. Knowlton, 4♂, 1♀ (USU). Cub River Canyon, Willow Flat, July 25, 1980, G. F. Knowlton and W. J. Hanson, 2♂, 1♀ (USU). Willow Flat, July 15, 1978, G. F. Knowlton, 1♂ (USU). *Fremont Co.:* 20 mi N of Ashton, Mac's Inn, July 29, 1982, 3♂ (UNHP). *Latah Co.:* Moscow, July 10, 1932, T. A. Brindley, 1♂, 1♀ (CNC). Moscow, July 10, 1932, T. A. Brindley, 1♂, 1♀ (AMNH). *Oneida Co.:* Black Pine Canyon, June 25, 1974, G. F. Knowlton, 1♀ (USU). Salyer Cow Camp, June 22, 1972–July 23, 1971, G. F. Knowlton, 4♂, 1♀ (USU). **Montana:** *Flathead Co.:* 40 mi E of Glacier National Park, June 30, 1930, E. P. Van Duzee, 1♂, 1♀ (CAS). *Gallatin Co.:* 12 mi E of Bozeman, July 21, 1983, John D. Pinto, 1♂ (UCR). 15 mi N of West Yellowstone on Rt 287, July 26, 1982, S. E. Cummings, 1♂, 1♀ (UNHP). 23 mi NNW of West Yellowstone, Beaver Creek, 6500 ft, July 24, 1978, Nancy L. Herman, 6♂, 9♀ (AMNH). Earthquake Lake, June 26, 1966, W. Gagne and J. Haddock, 1♂ (UCB). Moose Flat Campground,

26 mi S Bozeman Hot Springs, Rt 191, 5700 ft, August 10, 1986, Schuh, Schwartz, Stonedahl, 1♂, 5♀ (AMNH). *Glacier Co.:* Browning, August 26, 1951, L. A. Konotopetz, 12♂, 20♀ (CNC). East Glacier Park, 5 mi N on Rt 49, Looking Glass Hill, August 3, 1994, M. D. Schwartz, *Geranium viscosissimum* (Geraniaceae), 6♂ (CNC). Two Medicine, July 18, 1973, W. F. Chamberlain, 2♂ (TAMU). *Granite Co.:* 15 mi S of Clinton, 4100 ft, June 26, 1971, J. R. Powers, 2♂ (UCB). Philipsburg, August 3, 1961, G. D. Kinzer, 1♀ (USNM). *Madison Co.:* 15 mi S of Virginia City, West Fork Camp, July 23, 1982, S. E. Cummings, 3♀ (UNHP). *Park Co.:* 2 mi E of Cooke City on Rt 212, Colter Campground, Gallatin Natl. Forest, 8000 ft, August 11, 1986, Schwartz and Stonedahl, *Pinus contorta* (Pinaceae), 1♂, 1♀ (AMNH). 2 mi E of Cooke City on Rt 212, Soda Butte Campground, Gallatin Natl. Forest, 7800 ft, August 1, 1994, M. D. Schwartz, *Geranium* sp. (Geraniaceae), 1♂ (CNC). *Pondera Co.:* Dupuyer, August 17, 1949, W. J. and J. W. Gertsch, 1♀ (AMNH). *Ravalli Co.:* Hamilton, June 9, 1956, T. Miura, 1♂ (KU). *Unknown Co.:* Beaver Creek, 6300 ft, August 15, 1913, S. J. Hunter, 3♂, 17♀ (KU). **Nevada:** *Elko Co.:* 7 mi SE of Lamoille, Ruby Mountains, July 17, 1961, J. F. Lawrence, 1♀ (UCB). Ruby Mts., Lomoille Canyon, E of Powerhouse Picnic Area, 6200 ft, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Geranium viscosissimum* (Geraniaceae), 15♂, 15♀ (AMNH). **Oregon:** *Union Co.:* Hilgard Jct State Park, July 4, 1964, W. F. Chamberlain, 2♀ (TAMU). *Wallowa Co.:* Joseph, June 13, 1973, Oman and Musgrave, 1♀ (OSU). **Utah:** *Box Elder Co.:* Mantua, July 8, 1962, G. F. Knowlton, 4♂, 1♀ (UCD). Snowville, July 7, 1953, W. G. Firestone, 1♂, 1♀ (USU). Willard Basin, July 5, 1966, G. F. Knowlton, 1♀ (USU). *Cache Co.:* 14 mi S on Forest Service Road 055 off UT St. Rt 89, T13N R4E Sec 15, July 25, 1981, M. D. Schwartz, *Geranium* sp. (Geraniaceae), 2♂, 1♀ (AMNH). Ant Valley, August 21, 1976, G. F. Knowlton, 1♂, 2♀ (UCD). Ant Valley, July 6, 1973–September 9, 1975, G. F. Knowlton, G. E. Bohart, 8♂, 8♀ (USU). Beaver Creek, July 7, 1976, G. F. Knowlton, 1♀ (USU). Blacksmith Fork Canyon, July 26, 1972, G. F. Knowlton, 6♂, 2♀ (OSU). Blacksmith Fork Canyon, June 19, 1985–July 10, 1974, G. F. Knowlton, 1♂, 2♀ (USU). Blacksmith Fork Canyon, September 25, 1948, Wilford J. Hanson, 1♀ (USU). Elk Valley, July 29, 1976, G. F. Knowlton, 5♂, 1♀ (USU). Franklin Basin, July 15, 1978–August 7, 1975, G. F. Knowlton, 6♂, 6♀ (USU). Herd Hollow, June 16, 1972, D. Anderson, 1♀ (USU). Hyrum, June 28, 1969, G. F. Knowlton, 2♂, 1♀ (USU). Logan Canyon, July 15, 1958, G. Knowlton, 4♂, 8♀ (CNC). Logan Canyon, June 17, 1981–July 31, 1975, G. F. Knowlton, W. J. Hanson, R. K. Cazier, 16♂, 13♀ (USU). Logan, July 11, 1978, G. F. Knowlton, 1♂ (USU). Paradise, June 26, 1969, G. F. Knowlton, 2♂, 1♀ (USU). Tony Grove Canyon, August 6, 1976, G. F. Knowlton and W. Hanson, 3♂, 2♀ (USU). Tony Grove Lake, 8100 ft, July 27, 1973–August 26, 1976, G. F. Knowlton, 2♂, 2♀ (USU). Wellsville, July 1, 1948, R. S. Bailey, 1♂ (USU). West Hodges Canyon, June 23, 1978, G. F. Knowlton, 3♂, 2♀ (USU). *Elder Co.:* Clear Creek Canyon, Raft River Mountains, July 5, 1974, Bohart, Hanson, Knowlton, 3♂, 3♀ (USU). *Rich Co.:* Garden City, July 7, 1977–July 23, 1963, G. F. Knowlton, 3♂, 2♀ (USU). Monte Cristo, July 10, 1974, G. F. Knowlton, 5♂, 1♀ (USU). Monte Cristo, July 21, 1976, G. F. Knowlton, 4♂, 2♀ (USU). Monte Cristo, July 7, 1968, W. J. Hanson, 1♂ (USU). Randolph, July 10, 1974, G. F. Knowlton, 1♀ (USU). *Sanpete Co.:* 13 mi E of Fairview on Rt 31, T14S R6E, 7500 ft, August 8, 1981, M. D. Schwartz, *Symphoricarpos* sp. (Caprifoliaceae), 1♀ (AMNH). *Sevier Co.:* Sevier, June 27, 1927, G. F. Knowlton, 1♂ (USU). *Unknown Co.:* Barclay, July 2, 1931, R. H. Beamer, 1♂ (KU). Brigham Canyon, June 25, 1931, G. F. Knowlton, 1♂, 1♀ (USU). *Wasatch Co.:* 18 mi SE of Heber on Rt 40, Daniels Canyon, August 2, 1954, Paul S. Bartholomew, 1♀ (CAS). Daniels Canyon, July 11, 1972, G. F. Knowlton and W. J. Hanson, 2♀ (USU). *Wayne Co.:* Caineville, July 18, 1966, G. F. Knowlton, 1♂, 1♀ (USU). *Weber Co.:* 13 mi S of Monte Cristo, July 7, 1977, G. F. Knowlton, 5♂, 1♀ (USU). 8 mi S of Monte Cristo, July 26, 1972, G. F. Knowlton, 4♂ (USU). 8 mi S of Monte Cristo, July 7, 1944, G. F. Knowlton, 1♂ (USU). Huntsville, July 2, 1965, G. F. Knowlton, 1♂

(USU). Huntsville, Ogeen Canyon, July 21, 1922, E. P. Van Duzee, 1♀ (CAS). Liberty, July 2, 1965, G. F. Knowlton, 1♀ (USU). **Washington:** *Klickitat Co.:* Klikitat V., W. T. [Western Territory], Thorpe's, July 10, 1882, 3♂, 2♀ (AMNH). Satus Pass, July 9, 1935, R. H. Beamer, 1♀ (KU). *Whitman Co.:* Pullman, April 1, 1920, 1♂, 1♀ (USNM). **Wyoming:** *Big Horn Co.:* Big Horn Mountains, 6500 ft, August 17, 1927, H. H. Knight, 2♀ (CNC). *Lincoln Co.:* 8 mi SE of Smoot, August 7, 1974, W. J. Hanson, 1♀ (USU). Salt River Pass, 15 mi S of Afton on Rt 89, 7630 ft, July 21, 1981, M. D. Schwartz, 1♂, 5♀ (AMNH). *Park Co.:* National Park [Yellowstone], July 25, 1891, O. Heidemann, 1♂, 3♀ (CAS). Shoshone Natl. Forest, August 7, 1927–August 14, 1927, H. H. Knight, paratype: 1♂ (USNM); holotype male (USNM). Yellowstone National Park, August 8, 1927, H. H. Knight, paratype: 1♂ (AMNH). *Sublette Co.:* Bondurant, August 4, 1949, R. H. Beamer, 1♂ (KU). *Teton Co.:* Grand Teton National Park, near Kelly, July 25, 1982, S. C. Williams, 2♂ (CAS). Jackson, 7000 ft, July 13, 1920, 1♂, 1♀ (AMNH). Jackson, August 15, 1961, J. E. R. Stainer, 1♂ (CNC). Togwotee Pass, 9650 ft, August 16, 1961, J. E. R. Stainer, 1♂ (CNC).

Plagiognathus stitti Knight
Figures 13, 19, 32

Plagiognathus stitti Knight, 1964: 145 (n. sp.).

DIAGNOSIS: Recognized by the relatively *large* size, *mostly pale coloration* of the dorsum with contrasting *brown head and calli*, the strongly fumose membrane, and parallel-sided body form (fig. 13). Vesica (fig. 32) very similar to *obscurus* in the conformation of the body, width and extent of the flange, and the length and shape of the apical spines.

REDESCRIPTION: *Male:* Moderately large, elongate, nearly parallel-sided; total length 4.40, length apex clypeus–cuneal fracture 2.88, width across pronotum 1.28. COLORATION (fig. 13): Most of dorsum pale, including posterior margin of vertex, yellow-white, somewhat translucent; remainder of head, calli, and venter of thorax and abdomen brown; membrane fumose, veins at posterior margin of cells pale; antennae black except for pale apical annulus on segment 1; labium infuscate at base and apex, otherwise pale; coloration of legs pale, as for dorsum; femora with some small dark spots; dorsal tibial spines with small dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, very weakly shining. Vestiture of dorsum, including entire pronotum, composed of recumbent, simple, golden, shining setae. STRUCTURE: Body flattened; head declivent, frons moderately tumid, clypeus at most barely visible from above; anteocular distance 0.3 times diameter of antennal segment 1; head projecting below eye by 1.3 times diameter of antennal segment 1; labium reaching apex of hind coxae and possibly slightly beyond. GENITALIA (fig. 32): Body of vesica relatively broad, strongly curving basally, base reaching to about level of secondary gonopore; apical spines long, relatively broad, posterior spine smoothly curving, anterior spine bent subapically and forming nearly a right angle with body of vesica; flange broad, extending to midpoint of secondary gonopore.

Female: Not measured.

HOST: Unknown.

DISTRIBUTION: Known only from the type locality in Arizona.

DISCUSSION: The redescription is based on a single paratype male. Knight (1964) indicated that L. L. Stitt, the collector of the only known specimens of this taxon, had collected the host plant but did not put the name on the insect specimens. Why Knight mentions this issue is not clear to me, because he did not place host labels on the specimens either, nor did he make mention of the identity of the host in his description of the new species.

SPECIMENS EXAMINED: USA.—**Arizona:** *Apache Co.:* Greer, August 1, 1941, Lloyd L. Stitt, paratypes: 2♂, 4♀ (USNM); holotype male (USNM).

Plagiognathus subovatus Knight
Figures 13, 19, 32

Plagiognathus subovatus Knight, 1929c: 266 (n. sp.).

DIAGNOSIS: Recognized by the relatively *small size, anterior one-half of corium and all of cuneus pale, pronotal disc and part of scutellum also pale (fig. 13). Dorsal vestiture*

composed of reclining, golden, shining common setae; *antennal segment two entirely dark* (fig. 19). Similar in general appearance to *fuscosus* (fig. 8) specimens with pale markings on the dorsum and to some specimens of *albatus* (fig. 5), but distinguished from *fuscosus* by the presence of only simple setae on the dorsum and from both species by the entirely dark antennal segment 2. Males of *subovatus* also more strongly ovoid than those of *albatus.*

REDESCRIPTION: *Male:* Relatively small, ovoid; total length 3.23, length apex clypeus–cuneal fracture 2.33, width across pronotum 1.10. COLORATION (fig. 13): Background coloration brown to castaneous, basal one-third to one-half of corium, cuneus, and costal vein pale; disc of pronotum at least partially pale; membrane largely fumose with a large, round, pale area centrally and veins mostly pale; antennal segments 1 and 2 castaneous except for pale apical annulus on segment 1 (fig. 19) (segments 3 and 4 missing in available specimens); labium dark basally, mostly pale apically; coloration of abdominal venter not known because all available males dissected; metathoracic scent-gland evaporatory area varying from partially to almost totally pale; coxae, trochanters, and femora largely pale, hind femora weakly infuscate on distal one-half; tibiae pale, dorsal spines with small dark bases, tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, golden, shining, simple setae. STRUCTURE: Ovoid, lateral corial margins distinctly convex; frons very weakly tumid, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by 1.6 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 32): Body of vesica relatively short, not very strongly curving, weakly J-shaped, base of vesica falling well below level of secondary gonopore; posterior apical spine elongate, tapering, somewhat bent medially, and weakly angled relative to body of vesica, anterior spine longer than posterior, at nearly right angle to body of vesica, attenuated; flange very broad, reaching to about midpoint of gonopore.

Female: Very similar to male in coloration and body shape. Abdominal venter mostly pale. Total length 3.51, length apex clypeus–cuneal fracture 2.49, width across pronotum 1.17.

HOSTS: Unknown.

DISTRIBUTION: Known only from the plains of Iowa, Minnesota, and the Dakotas.

DISCUSSION: Knight (1929c) described *Plagiognathus subovatus* from St. Paul, Minnesota, on the basis of limited material. Some of Knight's Minnesota specimens were collected at light and as a consequence no information is available concerning the host. I dissected a male, identified by Knight, from Brookings, South Dakota, as *subovatus.* The genitalia are similar to those of *fuscosus.* Knight (1929c) compared *subovatus* to *P. albonotatus* Knight (= *fuscosus* (Provancher)), indicating the similarity of coloration, but noting that antennal segment 2 was dark in *subovatus,* whereas it is largely pale in *fuscosus*; as noted in the diagnosis *subovatus* also differs from *fuscosus* in form of the dorsal vestiture.

SPECIMENS EXAMINED: USA.—**Iowa:** *Dickinson Co.:* Lakeside Lab., July 18, 1959, J. L. Laffoon, 1♂ (USNM). **Minnesota:** *Ramsey Co.:* St. Anthony Park, July 6, 1921–July 10, 1921, H. H. Knight, 1♀ (USNM); Paratypes: 1♂, 2♀ (USNM); holotype male (USNM). **North Dakota:** *Traill Co.:* No specific locality, August 4, 1923, A. A. Nichol, 1♂ (USNM). **South Dakota:** *Brookings Co.:* Brookings, July 22, 1930, B. C. Severin, 1♂, 1♀ (USNM). *Kingsburg Co.:* Arlington, July 10, 1921, 1♂ (USNM). *Roberts Co.:* 11 mi SE of Rosholt, Lake Traverse, July 12, 1974, B. Tollefson, 2♀ (AMNH, UCB).

Plagiognathus suffuscipennis Knight
Figures 13, 19, 32

Plagiognathus suffuscipennis Knight, 1923: 454 (n. sp.).

DIAGNOSIS: Recognized by the usually *tan coloration of hemelytra contrasting with the castaneous head, pronotum, and scutellum,* posterior half of pronotum sometimes more or less unicolorous with hemelytra (fig. 13: *suffuscipennis* 1); hemelytra in Rocky Moun-

tain populations dark as rest of dorsum (fig. 13: *suffuscipennis* 2). Most similar in size, general appearance, and structure of male genitalia to *tsugae* (fig. 13) and *tumidifrons* (fig. 14), but those two species with dorsum unicolorous castaneous and with distinctive genitalia.

REDESCRIPTION: *Male:* Elongate ovoid, size relatively small; total length 3.03–3.26, length apex clypeus–cuneal fracture 2.07–2.28, width across pronotum 0.90–0.98. COLORATION (fig. 13): Head, pronotum, and scutellum castaneous, posterior lobe of pronotum often much lighter and nearly unicolorous with hemelytra; hemelytra tan in eastern populations, castaneous in Rocky Mountain populations; antennal segment 1 castaneous except for a pale apical annulus, segments 2, 3, and 4 entirely pale, or at least contrastingly lighter than segment 1 (fig. 19) in eastern populations, all segments castaneous in Rocky Mountain populations; labium ranging from mostly pale to largely infuscate; venter entirely castaneous; coxae castaneous except at articulation with trochanter; remainder of legs pale to very weakly infuscate; femora sometimes with weakly contrasting brown spots; tibial spines with at most faint dark spots at bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, moderately long, neat, pale, weakly shining, simple setae. STRUCTURE: Body appearing somewhat flattened, lateral corial margins moderately convexly rounded; frons moderately tumid and weakly bulging beyond anterior margin of eyes in dorsal view, clypeus barely visible; head weakly projecting anteriorly, anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 32): Body of vesica short and relatively stout, apical spines erect, anterior spine flattened, sharply angled near apex, posterior spine elongate, conical, straight.

Female: Very similar to male in general structure and coloration. Total length 2.96–3.20, length apex clypeus–cuneal fracture 2.09–2.30, width across pronotum 0.91–1.01.

HOSTS: *Picea* spp. (Pinaceae).

DISTRIBUTION: Eastern North America from Ontario south to Tennessee, west to the Rocky Mountain system from Alaska south to Arizona and New Mexico.

DISCUSSION: This species was compared by Knight (1923) with *Plesiodema pinetellum* (Zetterstedt). Comparison of the male genitalia of *suffuscipennis*, *tsugae*, and *tumidifrons*—all three of which were described in the same publication—indicates that the three form a group based on distinctive structure of the vesica, even though the general vesical structure is of the *Plagiognathus* type. The bases of the tibial spines of *suffuscipennis* may be weakly darkened, although in some cases they are entirely pale.

The specimens I have identified as *suffuscipennis*—on the basis of vesical structure—from the Rocky Mountain system have antennal segment 2 almost totally dark, whereas those from the eastern United States are somewhat smaller and have antennal segment 2 entirely pale in most cases.

SPECIMENS EXAMINED: CANADA.—**Alberta:** Coal Valley, August 31, 1970, L. A. Kelton, *Picea* sp. (Pinaceae), 7♂, 22♀ (CNC). Drumheller, June 18, 1957, Brooks and MacNay, 4♂, 1♀ (CNC). High Prairie, July 17, 1961, A. R. Brooks, *Picea* sp. (Pinaceae), 6♀ (CNC). **British Columbia:** 5.5 km W of Paulson Pass on Rt 3, August 31, 1993, M. D. Schwartz, *Picea glauca* (Pinaceae), 2♂ (CNC). Glacier Natl. Park, August 26, 1989, G. G. E. Scudder, 1♀ (CNC). **Manitoba:** E of Braintree, June 30, 1972, L. A. Kelton, 1♀ (CNC). Falcon Lake, July 20, 1978, L. A. Kelton, *Abies* sp. (Pinaceae), 1♀ (CNC). Pine Falls, August 2, 1962, *Picea* sp. (Pinaceae), 5♂, 4♀ (CNC). Riding Mt. Natl. Park, July 21, 1972, L. A. Kelton, *Picea glauca* (Pinaceae), 1♂, 5♀ (CNC). Turtle Mt., July 17, 1953, Brooks and Kelton, *Picea* sp. (Pinaceae), 2♂, 7♀ (CNC). University of Manitoba campus, near Red River, July 6, 1990, M. D. Schwartz, *Picea glauca* (Pinaceae), 2♂, 9♀ (CNC). **New Brunswick:** Berwick, August 2, 1966, L. A. Kelton, 2♂ (CNC). Edmunston, July 25, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 2♂, 8♀ (CNC). Fredericton, June 28, 1976, L. A. Kelton, 1♂, 8♀ (CNC). Kouchibouguac Natl. Park, July 22, 1977, D. J. Brown, *Picea* sp. (Pinaceae), 6♂, 5♀ (CNC). **Nova Scotia:** Big In-

tervale, July 23, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 1♀ (CNC). Cape Breton Natl. Park, July 22, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 12♂, 14♀ (CNC). Halifax, July 22, 1976, L. A. Kelton, *Picea* sp. (Pinaceae), 4♂, 4♀ (CNC). Ingonish, August 2, 1976, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂, 3♀ (CNC). Ingonish, July 30, 1976, L. A. Kelton, *Picea* sp. (Pinaceae), 2♂, 3♀ (CNC). Kentville, July 10, 1976, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂, 1♀ (CNC). Middleton, August 9, 1966, L. A. Kelton, *Pinus resinosa* (Pinaceae), 1♀ (CNC). **Ontario:** 20 mi N of Red Lake, August 11, 1960, Kelton and Whitney, *Picea* sp. (Pinaceae), 2♂, 5♀ (CNC). 20 mi W of Ignace, August 12, 1960, Kelton and Whitney, 3♂, 6♀ (CNC). 5 mi E of Thessalon off Rt 17, Round Barn Road, July 2, 1990, M. D. Schwartz, *Picea glauca* (Pinaceae), 2♂, 2♀ (CNC). 5 mi E of Willard, August 10, 1960, Kelton and Whitney, 2♂ (CNC). Biscotasing, July 24, 1931, Karl Schedl, 1♂ (CNC). Black Hawk, August 3, 1960, Kelton and Whitney, *Picea* sp. (Pinaceae), 22♂, 18♀ (CNC). Capetown, July 16, 1962, Kelton and Brumpton, *Picea* sp. (Pinaceae), 2♂ (CNC). Dryden, August 12, 1960, Kelton and Whitney, 1♀ (CNC). Dundas, July 16, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 1♂, 4♀ (CNC). Fergus, July 24, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 6♂, 6♀ (CNC). Greensville, July 26, 1962, L. A. Kelton, *Picea* sp. (Pinaceae), 8♂ (CNC). Ignace, August 12, 1960, Kelton and Whitney, 3♂, 4♀ (CNC). Jerseyville, July 16, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 2♂, 8♀ (CNC). Kintore, July 10, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 3♂, 8♀ (CNC). Lambeth, July 29, 1961, Kelton and Brumpton, 1♂ (CNC). Mer Bleue, August 9, 1932, G. S. Walley, 7♂, 4♀ (CNC). Niagara Falls, July 7, 1955, L. A. Kelton, 1♂, 1♀ (CNC). One Sided Lake, August 2, 1960, Kelton and Whitney, 1♂ (CNC). Ottawa, Central Experimental Farm, July 7, 1991–June 19, 1991, M. D. Schwartz, *Picea glauca* (Pinaceae), 10♂, 4♀ (CNC). Pautois Creek on Hwy 17, July 1, 1990, M. D. Schwartz, *Picea glauca* (Pinaceae), 2♀ (CNC). Queenston, July 8, 1955, L. A. Kelton, 1♂, 3♀ (CNC). Raith, August 13, 1960, Kelton and Whitney, 2♀ (CNC). Sault Ste. Marie, July 27, 1960, Kelton and Whitney, *Picea* sp. (Pinaceae), 6♂, 12♀ (CNC). Sturgeon Falls, July 27, 1962, Kelton and Thorpe, 1♂, 1♀ (CNC). **Quebec:** Laniel, July 16, 1963, L. A. Kelton, *Picea* sp. (Pinaceae), 10♂, 5♀ (CNC). Laniel, July 20, 1963, W. Gagne, *Picea* sp. (Pinaceae), 24♂, 18♀ (CNC). **Saskatchewan:** Prince Albert, July 23, 1959, A. and J. Brooks, *Picea* sp. (Pinaceae), 1♂, 1♀ (CNC). USA.—**Alaska:** Eagle, July 11, 1936, F. Grinnell, 1♀ (LACM). **Arizona:** *Apache Co.:* 2 mi N of Alpine, August 16, 1982, J. C. Schaffner, *Picea pungens* (Pinaceae), 1♀ (TAMU). Eagar, Apache Natl. Forest, August 12, 1967, L. A. Kelton, 5♂, 10♀ (CNC). **Colorado:** *Archuleta Co.:* Pagosa Springs, July 22, 1968, L. A. Kelton, 6♂, 6♀ (CNC). *Clear Creek Co.:* Idaho Springs, July 30, 1968, L. A. Kelton, 1♂ (CNC). Squaw Pass, Arapahoe Natl. Forest, July 27, 1968, L. A. Kelton, *Pinus contorta* (Pinaceae), 2♀ (CNC). *Gilpin Co.:* Rollinsville, Roosevelt Natl. Forest, August 5, 1968, L. A. Kelton, 1♂, 1♀ (CNC). *Jackson Co.:* 1 mi E of Gould, August 11, 1969, J. C. Schaffner, 1♂ (TAMU). Gould, 9200 ft, August 12, 1968, L. A. Kelton, *Picea* sp. (Pinaceae), 15♂, 27♀ (CNC). *Larimer Co.:* Chambers Lake, Roosevelt Natl. Forest, 9200 ft, August 11, 1968, L. A. Kelton, *Pinus contorta* (Pinaceae), 4♂, 15♀ (CNC). Rocky Mountain National Park, Fall River Road, 9500 ft, August 16, 1968, L. A. Kelton, 6♂, 10♀ (CNC). Rocky Mountain National Park, Grand Lake Entrance, August 18, 1968, L. A. Kelton, *Picea engelmanni* (Pinaceae), 1♀ (CNC). Rocky Mountain National Park, Milner Pass, 10,500 ft, August 18, 1968, L. A. Kelton, 1♀ (CNC). *Mineral Co.:* 5 mi N of Wolf Creek Pass, August 20, 1969, J. C. Schaffner, 3♀ (TAMU). *Pitkin Co.:* Aspen, White River Natl. Forest, August 24, 1968, L. A. Kelton, 4♂, 5♀ (CNC). *Saguache Co.:* 1 mi E of North Pass, August 19, 1969, J. C. Schaffner, *Picea pungens* (Pinaceae), 6♂, 5♀ (TAMU). **Idaho:** *Benewah Co.:* 4 mi W of Emida on Hwy 6, July 9, 1979, G. M. Stonedahl, *Abies amabilis* (Pinaceae), 1♂ (OSU). near Emida, St. Joe Natl. Forest, T42N R53W, 3000 ft, August 5, 1986, Schuh, Schwartz, Stonedahl, 1♂, 1♀ (AMNH). *Caribou Co.:* 8 mi E of Wayan, 1 mi E of mp 101 on Rt 34, 6000 ft, July 30, 1981, M. D. Schwartz, *Picea engelmanni*

(Pinaceae), 3♀ (AMNH). *Idaho Co.:* Lochsa River Valley, E of Wilderness Access Campground (milepost 127), 2400 ft, August 1, 1987, G. M. Stonedahl, *Picea sitchensis* (Pinaceae), 2♀ (AMNH). **Illinois:** *Jo Daviess Co.:* Galena, June 30, 1932, Dozier and Mohr, *Picea* sp. (Pinaceae), 1♂ (AMNH). *Mercer Co.:* Keithsburg, June 15, 1932, H. L. Dozier, *Picea* sp. (Pinaceae), 1♀ (AMNH). **Iowa:** *Henry Co.:* Mt. Pleasant, June 20, 1966, J. C. Schaffner, *Picea* sp. (Pinaceae), 11♂, 13♀ (TAMU). *Story Co.:* Ames, June 13, 1962, J. C. Schaffner, *Picea pungens* (Pinaceae), 1♂, 1♀ (USNM). Ames, June 25, 1949, J. A. Slater, ex Pinaceae, 1♀ (AMNH). **Maine:** *Kennebec Co.:* Augusta, July 1, 1947, A. E. Brower, 1♀ (USNM). **Michigan:** *Cheboygan Co.:* No specific locality, July 27, 1950, J. D. Lattin, 1♂, 5♀ (AMNH). **Minnesota:** *Cook Co.:* Beaver Dam, August 12, 1922, H. H. Knight, *Picea mariana* (Pinaceae), paratypes: 5♂, 5♀ (USNM). **New Hampshire:** *Cheshire Co.:* Mount Monadnock State Park, July 22, 1954, J. A. Slater, 1♀ (AMNH). **New Mexico:** *Taos Co.:* Tres Ritos, July 25, 1968, J. C. Schaffner, 9♂, 15♀ (TAMU). **New York:** *Essex Co.:* Lake Placid, July 4, 1991, M. D. Schwartz, *Picea glauca* (Pinaceae), 1♂ (CNC). *Monroe Co.:* Rochester Junction, July 18, 1914, M. D. Leonard, paratype: 1♂ (USNM); holotype male (USNM). *Nassau Co.:* East Meadow near Rt 25, June 16, 1986, M. D. Schwartz, *Picea abies* (Pinaceae), 2♂, 8♀ (CNC). Flower Hill near Rt 25A on Ridge Drive East, June 10, 1986, M. D. Schwartz, *Picea glauca* (Pinaceae), 2♂, 3♀ (CNC). *Suffolk Co.:* Bayshore, Brentwood Road, June 22, 1985, M. D. Schwartz, *Picea* sp. (Pinaceae), 1♂, 1♀ (CNC). Caumselt State Park, July 30, 1985, M. D. Schwartz, *Picea glauca* (Pinaceae), 1♂, 1♀ (CNC). East Quogue, Quogue Wildlife Refuge, July 19, 1988, M. D. Schwartz, *Picea* sp. (Pinaceae), 1♂, 2♀ (CNC). **Oregon:** *Hood River Co.:* T3S R9E Sec 18, 4300 ft, September 13, 1979, J. D. Lattin, *Picea engelmanni* (Pinaceae), 1♂ (OSU). **Pennsylvania:** *Allegheny Co.:* Pittsburgh, North Park, July 18, 1989, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♀ (PDA). *Blair Co.:* Altoona, Pleasant Valley Nursery, July 11, 1972, S. M. George, *Picea abies* (Pinaceae), 1♂ (PDA). Duncansville, Hillside Nursery, July 25, 1972, S. M. George, *Pinus mugo* (Pinaceae), 1♀ (PDA). *Bucks Co.:* Morrisville, Shires Nursery, June 16, 1972, Haussert and Stearns, *Picea* sp. (Pinaceae), 3♀ (PDA). Southhampton, Ulmill Creek Nursery, June 26, 1972, Semmel, *Picea abies* (Pinaceae), 1♀ (PDA). *Centre Co.:* State College, Autoport Motel, June 9, 1973, A. G. Wheeler, Jr., *Picea* sp. (Pinaceae), 3♂ (PDA). *Chester Co.:* Marshalton, Fethcroft Nursery, June 11, 1974, A. G. Wheeler, Jr., *Abies fraseri* (Pinaceae), 2♀ (PDA). *Clearfield Co.:* DuBois, Nelson Tree Nursery, July 20, 1972, 7♀ (PDA). DuBois, R. Nelson Tree Nursery, July 20, 1972, 5♂ (PDA). *Clinton Co.:* Lock Haven, St. Mary's Cemetery, July 5, 1973, T. Killian, *Picea abies* (Pinaceae), 1♀ (PDA). *Cumberland Co.:* Allen, July 19, 1972, F. Negley, *Picea* sp. (Pinaceae), 1♀ (PDA). Camp Hill, June 25, 1972, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♀ (PDA). *Dauphin Co.:* 3 mi S of Hershey, June 9, 1977, Schuh, Henry, Wheeler, *Picea glauca* (Pinaceae), 2♀ (AMNH). Harrisburg, Agriculture Building, July 6, 1972, T. J. Henry, 1♂, 1♀ (PDA). Harrisburg, East Harrisburg Cemetery, June 11, 1973, T. J. Henry, *Picea* sp. (Pinaceae), 1♂, 2♀ (PDA). Harrisburg, William Penn High School, June 4, 1974, B. R. Stinner, *Pseudotsuga taxifolia* (Pinaceae), 1♂ (AMNH). *Erie Co.:* Fairview, Black Hills, July 11, 1972, F. Negley, *Picea* sp. (Pinaceae), 2♀ (PDA). Union City, July 19, 1972, H. G. Wolff, *Picea* sp. (Pinaceae), 3♂, 1♀ (PDA). *Indiana Co.:* 14 mi E of Indiana, Carino Nurseries, June 27, 1972, *Picea* sp. (Pinaceae), 1♂, 2♀ (PDA). Fleming's Trailer Park, June 28, 1972, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (PDA). Indiana, Oakland Cemetery, June 15, 1973, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (PDA). Strongstown, Carino's Nursery, July 14, 1972, T. J. Henry, *Picea* sp. (Pinaceae), 1♂ (PDA). *Lancaster Co.:* Lancaster, Huber's Nursery, June 13, 1973, W. Blosser, *Picea glauca* (Pinaceae), 1♂, 1♀ (PDA). *Lebanon Co.:* Rt 22 at I-81 exit (Rt 934), June 24, 1974, T. J. Henry, *Picea glauca* (Pinaceae), 1♀ (PDA). *Montgomery Co.:* Lansdale, St. John's Church, June 24, 1976, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂, 3♀ (PDA). *Schuykill Co.:* Barnesville, Skeeth's

Nursery, June 12, 1972, Semmel, *Picea* sp. (Pinaceae), 1♀ (PDA). *Washington Co.:* Burgettstown, Iannetti's Nursery, June 21, 1973, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♀ (PDA). **South Dakota:** *Lawrence Co.:* Englewood, Black Hills, August 5, 1971, L. A. Kelton, 1♀ (CNC). **Tennessee:** *Knox Co.:* Knoxville, May 27, 1985, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂, 1♀ (PDA). **Utah:** *Duchesne Co.:* Uinta Mountains, Ashley National Forest, Hades Campground, 7400 ft, August 17, 1986, Schwartz and Stonedahl, *Picea pungens* (Pinaceae), 3♀ (AMNH). **Virginia:** *Roanoke Co.:* Hollins College, May 5, 1985, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂ (PDA). **Washington:** *Okanogan Co.:* Washington Pass Meadow, 5400 ft, August 11, 1978, J. D. Lattin, 1♂ (OSU). *Yakima Co.:* 3 mi E of Dog Lake on Hwy 12, August 23, 1979, G. M. Stonedahl, *Abies amabilis* (Pinaceae), 2♂, 1♀ (OSU). **West Virginia:** *Greenbrier Co.:* White Sulphur Springs, June 25, 1978, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂, 3♀ (PDA). *Kanawha Co.:* Charleston, April 12, 1977, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂ (PDA). *Pendleton Co.:* Franklin, June 10, 1979, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 4♂, 1♀ (PDA). *Randolph Co.:* Elkins, June 9, 1979, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 3♂, 9♀ (PDA).

Plagiognathus syrticolae Knight
Figures 13, 19, 32

Plagiognathus syrticolae Knight, 1941: 31 (n. sp.).

DIAGNOSIS: Recognized by the *suberect, silvery, shining vestiture of dorsum appearing somewhat bristly,* the *small eyes,* the *transversely rugose pronotum* (fig. 13), antennal segment 2 mostly pale to weakly infuscate except at extreme base and only slightly longer than the width of head (fig. 19), and the *coxae, trochanters, and femora infuscate to castaneous.* Most similar in the form of the dorsal vestiture to *davisi* (fig. 7), but distinguished by its larger size, dark femora, and form of male genitalia (fig. 32). Antennal segment 1 always completely dark in *syrticolae,* whereas usually mostly pale in *davisi.*

REDESCRIPTION: *Male:* Elongate, nearly parallel-sided, of moderate size; total length 3.40–3.54, length apex clypeus–cuneal fracture 2.37–2.48, width across pronotum 1.05–1.15. COLORATION (fig. 13): Dorsum deeply and uniformly castaneous, never with additional pale markings; membrane and veins fumose; antennal segment 1 entirely castaneous, segment 2 dark at extreme base, remainder of segment pale to weakly infuscate (fig. 19), segments 3 and 4 pale to weakly infuscate; labium largely castaneous; venter, including metathoracic scent-gland evaporatory area, castaneous; coxae, trochanters, and femora castaneous, or largely so, tibiae yellow, tibial spines with small dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Calli demarcated along posterior margin; pronotum distinctly transversely rugose. Vestiture of dorsum composed of suberect, shining simple setae, forming a distinctive, somewhat bristly appearance. STRUCTURE: Body elongate, nearly parallel-sided; eyes relatively small; frons weakly bulging, clypeus prominent; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by nearly 2 times diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 32): Body of vesica more or less J-shaped, base of vesica falling well below level of secondary gonopore; posterior apical spine long, relatively broad, nearly straight and erect relative to body of vesica, anterior spine about same length as posterior, weakly curving backward, and forming a very weak angle relative to body of vesica; flange narrow, reaching to middle of secondary gonopore.

Female: Similar to male in coloration but body more strongly ovoid in outline. Total length 3.09–3.44, length apex clypeus–cuneal fracture 2.18–2.51, width across pronotum 0.99–1.08.

HOST: *Salix* spp. (Salicaceae).

DISTRIBUTION: Known from a limited number collections from Illinois, New York, and New Hampshire.

DISCUSSION: My concept of this species is based on the examination of paratypes designated by the author from the type locality.

Although Knight (1941) indicated that the date of collection was July 6, 1932, all specimens I have seen are labeled as having been collected on July 8, 1932.

SPECIMENS EXAMINED: USA.—**Illinois:** *Lake Co.:* Waukegan, July 8, 1932, Frison et al., paratypes: 5♀ (USNM). **New Hampshire:** *Coos Co.:* Gorham, July 21, 1929, G. S. Walley, *Salix sp.* (Salicaceae), 6♂, 9♀ (AMNH, CNC). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 1♂ (AMNH).

Plagiognathus tenellus Knight
Figures 13, 19, 33

Plagiognathus tenellus Knight, 1929b: 73 (n. sp.).

DIAGNOSIS: Recognized by its moderate size, uniformly *orangish yellow coloration of body and appendages* (fig. 13), dark *tibial spines without dark spots at bases,* and *tibiae pale at articulation with femora.* Vesica (fig. 33) short, compact, sigmoid, with relatively short apical spines at angle to body of vesica; anterior vesical spine cylindrical, longer than posterior (fig. 33); no flange. Pale coloration of the body and antennae most similar to *flavidus* (fig. 7), *guttatipes* (fig. 8), and *shepherdiae* (fig. 13). Distinguished from all of those species by their having tibial spines with black spots at bases and the tibiae being dark at the femoral articulation.

REDESCRIPTION: *Male:* Medium-sized, relatively broad, but elongate, nearly parallel-sided; total length 3.70–3.94, length apex clypeus–cuneal fracture 2.51–2.66, width across pronotum 1.20–1.29. COLORATION (fig. 13): Uniformly orangish yellow, including antennae (fig. 19), legs, and membrane; dorsal tibial spines without dark spots at bases, although tibial spines dark; tibiae pale at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, moderately shining. Vestiture of dorsum composed of reclining pale, shining, simple setae. Dorsal tibial spines long. STRUCTURE: Lateral corial margins nearly straight and parallel; frons weakly tumid, clypeus not visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below level of eye by 0.3 times diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 33): Vesica, including apical spines, sigmoid in shape, body of vesica relatively short, compact, broad, and stout, base of vesica falling somewhat below base of secondary gonopore; apical spines of moderate length, angled relatively to body of vesica, anterior spine cylindrical and somewhat longer than posterior; no flange.

Female: Body more strongly ovoid than in male. Total length 3.74, length apex clypeus–cuneal fracture 2.53, width across pronotum 1.26.

HOST: *Philadephus rugosus* (Hydrangeaceae) (Knight, 1929b).

DISTRIBUTION: Arizona and Colorado.

SPECIMENS EXAMINED: USA.—**Arizona:** *Cochise Co.:* Chiricahua Mountains, 6200 ft, June 20, 1928, A. A. Nichol, *Philadelphus rugosus* (Hyrdrangeaceae), paratypes: 4♂, 2♀ (USNM). *Coconino Co.:* Grand Canyon, top of Bright Angel Trail, August 2, 1917, H. H. Knight, paratypes: 2♂, 2♀ (USNM); holotype male (USNM). **Colorado:** *Montezuma Co.:* Mancos, August 13, 1925, C. J. Drake, (USNM); 1♀ (USNM).

Plagiognathus texanus, new species
Figures 13, 19, 33

HOLOTYPE: Male: ''[USA] TEXAS: Wood Co., Pine Mills, May 6, 1994, Will Godwin''. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by the moderate size and generally *shining black coloration of the dorsum* (fig. 13), the *black coxae and femora with the distal one-fourth of the femora white, antennae entirely dark* (fig. 19), the scent-gland evaporatory area white, and the dorsal vestiture of recumbent, golden, shining, simple setae on the pronotum, scutellum, and anterior one-half of the hemelytra and of dark dull setae posteriorly on corium, clavus, and cuneus. Rather broadly ovoid body form, relatively large size, and dark coloration of dorsum similar to *punctatipes* (fig. 12) and *schaffneri* (fig. 12); separated from both of those species by the femora being dark with only the apex pale rather than entirely pale. Possibly confused with dark specimens of *brevirostris, brunneus,* and *shoshonea,* but those species with northern and/or montane distributions and lacking the

strongly contrasting black and white coloration.

DESCRIPTION: *Male:* Size moderate, ovoid; total length 3.58–3.90, length apex clypeus–cuneal fracture 2.51–2.71, width across pronotum 1.25–1.31. COLORATION (fig. 13): General coloration black, including membrane, veins, and venter; posterior margin of vertex white; antennal segments 1 and 2 black (fig. 19), 3 and 4 pale; strongly contrasting white on the ventral margin of propleuron, posterior margin of mesopleuron, scent-gland evaporatory area, coxotrochanteral articulation, distal one-fourth of femora, and tibiae; tarsi pale, tending to infuscate distally; tibial spines black, their bases at most only very narrowly dark. SURFACE AND VESTITURE: Entire body surface smooth, weakly granular and moderately shining. Vestiture of dorsum composed of recumbent, simple setae, golden setae on pronotum, scutellum and anterior half of hemelytra, with dark dull setae posteriorly on corium, clavus, and cuneus. STRUCTURE: Broad-bodied, frons nearly straight across in dorsal view, clypeus not visible from above; head not projecting beyond anterior margin of eyes; anteocular distance negligible, face not projecting beyond anterior margin of eyes; head projecting below eye by 2 times diameter of antennal segment 1; labium slightly surpassing apex of hind coxae. GENITALIA (fig. 33): Body of vesica roughly J-shaped, base falling well below secondary gonopore; posterior apical spine very slightly curving, erect relatively to body of vesica, anterior spine strongly bent and angled relative to body; flange relatively narrow, apex falling at base of secondary gonopore.

Female: Body shape and coloration very similar to male. Total length 3.50–3.77, length apex clypeus–cuneal fracture 2.50–2.70, width across pronotum 1.27–1.34.

ETYMOLOGY: Named for its occurrence in Texas.

HOST: Unknown.

DISTRIBUTION: Known from Texas and Georgia.

PARATYPES: USA.—**Georgia:** *Cobb Co.:* Kennesaw Mt., May 20, 1943, P. W. Fattig, 1♂, (USNM). *Pike Co.:* Zebulon, May 17, 1947, P. W. Fattig, 1♀ (USNM). **Texas:** *Wood Co.:* 6 mi NW of Hawkins on Hwy 14, May 23, 1998, W. Godwin, 1♀ (TAMU). Ca. 18 mi N of Hawkins, May 9, 1999, W. Godwin, 1♂, 1♀ (TAMU). Near Hawkins, jct Hwys 14 and 2869, May 9, 1999, W. Godwin, 1♂ (TAMU). Pine Mills, May 6, 1994, Will Godwin, 10♂, 8♀ (AMNH, TAMU).

Plagiognathus tinctus Knight
Figures 13, 19, 33

Plagiognathus albonotatus tinctus Knight, 1923: 437 (n. var.).

Plagiognathus tinctus Knight, 1929b: 70 (n. status).

Plagiognathus debilis Blatchley, 1926: 941 (n. sp.; syn. by Knight, 1929b: 70).

DIAGNOSIS: Recognized, in common with *maculipennis* and *albatus,* by mostly *pale antennal segment 2* (fig. 19), generally *pale costal vein on hemelytra, and cuneus and basal portion of corium pale or mostly pale in contrast to much darker remainder of hemelytra* (fig. 13). Distinguished from *maculipennis* (fig. 9) by antennal segment 1 being pale in that species and dark in *tinctus.* Further distinguished from *maculipennis* and *albatus* (fig. 5) by scutellum being pale laterally and dark mesially in those species, whereas *scutellum unicolorous dark* in *tinctus*; *apical vesical spines much longer and more slender* in *tinctus* (fig. 33) than in other two species (figs. 20, 27).

REDESCRIPTION: *Male:* Relatively broad-bodied, of medium size; total length 3.43–3.69, length apex clypeus–cuneal fracture 2.30–2.54, width across pronotum 1.11–1.17. COLORATION (13): Background coloration of dorsum castaneous, lighter colored areas often tinged with red-orange, including mesoscutum laterally, anterior one-half of corium and adjacent clavus, and cuneus; costal vein of hemelytra pale and lighter than adjacent corium; clypeus and sometimes adjacent face castaneous, darker than, and contrasting with, surrounding areas of head; antennal segment 1 castaneous except for pale apical annulus, segment 2 pale except for extreme basal portion (fig. 19), segments 3 and 4 pale; labium pale to weakly infuscate, except base and apex darker; venter, including metathoracic scent-gland evaporatory area, castaneous; legs generally pale, yellowish,

except for darker basal portion of coxae; femora with some dark spots; tibial spines with small dark spots at bases; tibiae dark at articulation with femora. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, pale, golden, shining, relatively short, simple setae; face more highly polished at and below level of antennal insertion than above. STRUCTURE: Elongate ovoid; frons weakly convex, slightly projecting beyond anterior margin of eyes, clypeus barely visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below level of eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 33): Body of vesica relatively stout, sigmoid, base of vesica not recurved and falling below level of secondary gonopore, posterior apical spine long, slender, nearly straight, perpendicular to body of vesica, anterior spine much longer than posterior, also perpendicular to body of vesica; flange relatively narrow, reaching to about base of secondary gonopore.

Female: Similar to male in coloration but body more strongly ovoid in outline. Total length 3.46–3.69, length apex clypeus–cuneal fracture 2.39–2.56, width across pronotum 1.07–1.20.

HOSTS: *Salix* spp. (Salicaceae).

DISTRIBUTION: Eastern North America, ranging from New Brunswick west to Minnesota and south to Louisiana.

DISCUSSION: Knight (1929b) discussed the synonymy of *debilis* with *tinctus,* and the fact that the two nominal species shared the same host. I have not seen the type of *debilis* and therefore have not verified the synonymy of *debilis* with *tinctus* through the comparison of type material, but rather I have relied on Knight's comparison.

SPECIMENS EXAMINED: CANADA.—**New Brunswick:** Sheffield, June 24, 1966, L. A. Kelton, *Salix* sp. (Salicaceae), 1♂ (CNC). **Ontario:** Burtch, July 11, 1961, L. A. Kelton, 1♀ (CNC). Dunnville, July 9, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 18♂, 42♀ (CNC). Exeter, July 12, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 2♀ (CNC). Selkirk, July 9, 1962, Kelton and Brumpton, 1♂ (CNC). Thornhill, August 15, 1961, L. A. Kelton, 1♀ (CNC). Tillsonburg, June 20, 1962–July 2, 1962, G. Thorpe, *Salix* sp. (Salicaceae), 1♂, 2♀ (CNC). Vienna, July 18, 1962, Kelton and Thorpe, *Salix* sp. (Salicaceae), 1♂, 2♀ (CNC). **Quebec:** Mt. Albert, 400–700 ft, July 25, 1954, W. J. Brown, 1♀ (CNC). Mt. Pleasant, July 10, 1958, L. A. Kelton, *Salix* sp. (Salicaceae), 1♂ (CNC). USA.—**Illinois:** *Clark Co.:* Marshall, June 14, 1933, Frison and Ross, 1♀ (USNM). **Indiana:** *Cass Co.:* 2 mi E of Walton, July 4, 1979, T. J. Henry, *Salix nigra* (Salicaceae), 2♂ (USNM). *Howard Co.:* NW Howard County, June 23, 1986, D. A. Rider, 1♂ (DAR). **Iowa:** *Woodbury Co.:* Sioux City, June 28, 1950, C. Ainslie, 1♀ (USNM). **Louisiana:** *East Baton Rouge Co.:* LSU Campus, May 4, 1988, D. A. Rider, 1♂ (DAR). **Maryland:** *Montgomery Co.:* Plummers Island, June 7, 1914, W. L. McAtee, 1♀ (USNM). *Prince Frederic Co.:* Plum Point, June 21, 1914, W. L. McAtee, 1♂ (USNM). *Prince Georges Co.:* New Carrolton, May 31, 1983, T. J. Henry, 2♂, 2♀ (USNM). **Massachusetts:** *Bristol Co.:* Seekonk Pond, June 15, 1981, K. and R. Schmidt, *Salix* sp. (Salicaceae), 1♀ (AMNH). **Minnesota:** *Ramsey Co.:* No specific locality, July 11, 1925, H. H. Knight, *Salix longifolia* (Salicaceae), 1♀ (CNC). St. Anthony Park, August 2, 1924, H. H. Knight, 10♂, 8♀ (USNM). **Mississippi:** *Adams Co.:* Natchez, May 15, 1931, H. G. Johnston, 6♂, 7♀ (TAMU). **Missouri:** *Barry Co.:* Roaring River State Park, June 15, 1954, J. W. Green, 1♀ (CAS). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, 1♂ (AMNH). *Tompkins Co.:* Ithaca, July 4, 1979, A. G. Wheeler, Jr., *Salix interior* (Salicaceae), 5♂ (PDA). Ithaca, Six-Mile, July 2, 1978, A. G. Wheeler, Jr., *Salix nigra* (Salicaceae), 2♀ (PDA). **North Carolina:** *Madison Co.:* Hot Springs, E. P. Van Duzee, 1♀ (CAS). *Rockingham Co.:* Rt 220, 2.3 mi S of Virginia state line, June 3, 1983, A. G. Wheeler, Jr., *Salix* sp. (Salicaceae), 1♂ (PDA). **Pennsylvania:** *Bedford Co.:* Rt 220, 0.8 mi N of Maryland state line, June 8, 1979, A. G. Wheeler, Jr., *Salix humilis* (Salicaceae), 2♂, 1♀ (PDA). *Dauphin Co.:* Harrisburg, July 8, 1917, J. G. Sanders, 1♂ (USNM). Harrisburg, June 20, 1920, Champlain, 1♀ (PDA). Harrisburg, June 20, 1920,

Champlain, holotype male (USNM). Harrisburg, June 23, 1920, Champlain, paratype: 1♂ (CAS). Harrisburg, Wildwood Park, July 7, 1900, W. Reinick, 1♀ (PDA). Rt 322 at Rt 443, June 21, 1979, *Salix* sp. (Salicaceae), 1♀ (PDA). *Erie Co.:* Fairview, Fairview Nurseries, July 7, 1976, A. G. Wheeler, Jr., *Salix* sp. (Salicaceae), 1♂ (PDA). near Erie, I-90 and Rt 97, June 25, 1975–July 7, 1975, A. G. Wheeler, Jr., *Salix nigra* (Salicaceae), 7♂, 15♀ (PDA). *Monroe Co.:* Delaware Water Gap, E. P. Van Duzee, 1♀ (CAS). **Tennessee:** *Knox Co.:* Knoxville, May 27, 1985, A. G. Wheeler, Jr., *Salix nigra* (Salicaceae), 1♂, 1♀ (PDA).

Plagiognathus tsugae (Knight), new combination
Figures 13, 19, 33

Microphylellus tsugae Knight, 1923: 456 (n. sp.).

DIAGNOSIS: Recognized by the *very small size, entirely castaneous coloration of the body, and pale legs* (fig. 13). Most similar in general appearance and structure of the male genitalia to *suffuscipennis* (fig. 13) and *tumidifrons* (fig. 14). Easily separated from *suffuscipennis* by the tan hemelytra in the eastern populations of that species, and from *tumidifrons* by the slightly larger size, strongly swollen frons, and castaneous coxae of that species and the detailed structure of vesica (fig. 33).

REDESCRIPTION: *Male:* Elongate, nearly parallel-sided, very small; total length 2.33–2.96, length apex clypeus–cuneal fracture 1.65–1.99, width across pronotum 0.68–0.87. COLORATION (fig. 13): Dorsum entirely castaneous; membrane and veins fumose; antennal segment 1 castaneous except for a pale apical annulus, segments 2, 3, and 4 entirely pale (fig. 19); labium ranging from mostly pale to weakly infuscate; venter entirely castaneous; legs entirely pale, except extreme basal area of coxae castaneous; tibial spines without dark spots at bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, moderately long, neat, golden, shining, simple setae. STRUCTURE: Dorsum moderately convexly rounded, body elongate and nearly parallel-sided; frons moderately tumid and weakly bulging beyond anterior margin of eyes in dorsal view, clypeus at most barely visible; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium somewhat variable in length, reaching from just past apex of middle coxae to about apex of hind coxae. GENITALIA (fig. 33): Body of vesica short and relatively stout, apical spines erect, anterior spine very strongly flattened, sharply angled near apex, posterior spine elongate, conical, straight.

Female: Similar to male in coloration; body form more conspicuously ovoid. Total length 2.46–3.04, length apex clypeus–cuneal fracture 1.81–2.17, width across pronotum 0.81–0.92.

HOSTS: *Tsuga* spp. (Pinaceae).

DISTRIBUTION: Most collections from the Northeast, ranging from the Maritime Provinces south to North Carolina.

DISCUSSION: The species was placed in *Microphylellus* by Knight (1923) because the bases of the tibial spines are always pale. The genitalia are very similar in structure to those of *suffuscipennis* Knight and *tumidifrons* (Knight), with all three being of the *Plagiognathus* type, although distinctive within the genus. I have therefore transferred *tsugae* to *Plagiognathus.*

SPECIMENS EXAMINED: CANADA.—**New Brunswick:** Fredericton Laboratory, August 15, 1949, D. G. Cameron, *Betula lutea* (Betulaceae), 1♂ (CNC). **Nova Scotia:** Kentville, July 3, 1976, L. A. Kelton, 1♂, 1♀ (CNC). **Ontario:** Tillsonburg, July 11, 1958, 1♀ (CNC). Waterford, July 17, 1962, Kelton and Thorpe, *Tsuga* sp. (Pinaceae), 1♂, 2♀ (CNC). **Quebec:** Knowlton, July 22, 1929, L. J. Milne, 3♀ (CNC). USA.—**Connecticut:** Storrs, July 16, 1954, J. A. Slater, 1♀ (AMNH). Storrs, July 16, 1964, J. A. Slater, 1♀ (AMNH). **New York:** *Albany Co.:* Rensselaerville, Huyck Preserve, July 29, 1977, R. T. Schuh, 1♂, 1♀ (AMNH). Rensselaerville, Huyck Preserve, June 29, 1977, R. T. Schuh, *Tsuga canadensis* (Pinaceae), 13♂, 8♀ (AMNH). *Cattaraugus Co.:* Gowanda, August 2, 1907, E. P. Van Duzee, 1♀ (CAS). *Erie Co.:* Hamburg, July 1, 1906, E. P. Van Duzee, 3♂, 1♀ (CAS). *Hamilton Co.:* Raquette Lake, July 26, 1946, R. H. Beamer, 1♀ (KU). *Nassau Co.:* Muttontown Park and

Preserve, East Norwich, July 14, 1985, M. D. Schwartz, *Juniperus virginiana* (Cupressaceae), 1♂ (AMNH). Roslyn, cemetery on Rt 25A, June 20, 1985, M. D. Schwartz, *Tsuga canadensis* (Pinaceae), 6♂, 20♀ (AMNH, CNC). Roslyn, Fine Arts Museum and Gardens on Rt 25A, June 10, 1986, M. D. Schwartz, *Tsuga canadensis* (Pinaceae), 32♂, 32♀ (AMNH, CNC). *Rockland Co.:* South Nyack, Ross Avenue, June 18, 1988, M. D. Schwartz, *Tsuga canadensis* (Pinaceae), 2♂, 1♀ (CNC). South Nyack, Ross Avenue, June 18, 1988, M. D. Schwartz, *Tsuga canadensis* (Pinaceae), 6♂, 27♀ (AMNH). *Tompkins Co.:* Ithaca, Cornell University, July 7, 1979, A. G. Wheeler, Jr., 1♂ (PDA). McLean Bogs, July 3, 1920, H. H. Knight, paratypes: 2♂, 1♀ (USNM, CAS); holotype male (USNM). McLean Bogs, July 3, 1920, H. H. Knight, paratypes: 3♂ (CNC). *Westchester Co.:* Lewisboro, June 17, 1977, M. Favreau, *Tsuga canadensis* (Pinaceae), 20♂, 8♀ (AMNH). **North Carolina:** *Macon Co.:* Highlands, 3800 ft, June 25, 1957, J. R. Vockeroth, 1♂, 2♀ (CNC). Highlands, June 25, 1957, J. R. Vockeroth, *Castanea pumila* (Fagaceae), 7♂, 10♀ (CNC). **Pennsylvania:** *Adam Co.:* Gettysburg Cemetery, June 19, 1973, T. J. Henry, *Tsuga* sp. (Pinaceae), 4♀ (PDA). *Chester Co.:* N of Centerville, Baptist Church, June 15, 1978, D. B. Christie, *Tsuga canadensis* (Pinaceae), 1♀ (PDA). *Dauphin Co.:* 3 mi S of Hershey, June 9, 1977, Schuh, Henry, Wheeler, *Picea glauca* (Pinaceae), 1♀ (AMNH). Clarks's Valley, 10 mi N of Jct Rt 225, July 10, 1975, A. G. Wheeler, Jr., *Tsuga canadensis* (Pinaceae), 1♂ (PDA). Harrisburg, Agriculture Building, June 10, 1978, A. G. Wheeler, Jr., *Tsuga canadensis* (Pinaceae), 1♂ (PDA). Harrisburg, East Harrisburg Cemetery, June 11, 1977, Schuh, Henry, Wheeler, *Picea pungens* (Pinaceae), 1♂ (AMNH). Harrisburg, East Harrisburg Cemetery, June 9, 1975–June 11, 1977, T. J. Henry, *Tsuga canadensis* (Pinaceae), 10♂, 12♀ (PDA). *Fayette Co.:* Royal, A&J Nursery, June 25, 1953, D. G. Trelka, *Tsuga canadensis* (Pinaceae), 1♂, 1♀ (PDA). *Indiana Co.:* 10 mi E of Indiana, Pikes Peak Nursery, June 28, 1972, A. G. Wheeler, Jr., *Tsuga* sp. (Pinaceae), 1♀ (PDA). 10 mi E of Indiana, Pikes Peak Nursery, June 29, 1972, A. G. Wheeler, Jr., 1♂ (AMNH). Strongstown, Carino's Nursery, July 23, 1971, A. G. Wheeler, Jr., ex Pinaceae, 1♀ (AMNH). Strongstown, Carino's Nursery, July 28, 1971, *Tsuga* sp. (Pinaceae), 1♂, 4♀ (PDA). *Monroe Co.:* Saylorsburg, near lake, July 7, 1985, M. D. Schwartz, *Tsuga canadensis* (Pinaceae), 1♂ (AMNH). Stroudsburg, LaBar's Nursery, June 10, 1976, A. G. Wheeler, Jr., *Tsuga* sp. (Pinaceae), 1♂ (PDA). Stroudsburg, LaBar's Nursery, June 26, 1973, A. G. Wheeler, Jr., *Tsuga canadensis* (Pinaceae), 2♀ (PDA). *Montgomery Co.:* Philadelphia, Forest Hills Cemetery, June 7, 1973, J. F. Stimmel, *Tsuga canadensis* (Pinaceae), 6♂ (PDA). *Northumberland Co.:* near Milton, J & J Nursery, June 24, 1981, A. G. Wheeler, Jr., *Tsuga canadensis* (Pinaceae), 2♂, 1♀ (PDA). near Northumberland, June 16, 1983, A. G. Wheeler, Jr., *Tsuga canadensis* (Pinaceae), 1♂ (PDA). *Philadelphia Co.:* Philadelphia, Forest Hills Cemetery, June 7, 1973, A. G. Wheeler, Jr., *Tsuga canadensis* (Pinaceae), 2♀ (PDA). *Unknown Co.:* Rockville, June 7, 1918, J. G. Sanders, 2♀ (PDA). *Washington Co.:* Washington, 628 N Main Street, June 12, 1973, D. G. Trelka, *Tsuga canadensis* (Pinaceae), 2♂, 3♀ (PDA). **Vermont:** *Windsor Co.:* Woodstock, July 22, 1909, A. P. Morse, 2♂, 3♀ (AMNH). **Virginia:** *Arlington Co.:* Arlington, Bonair Park, June 28, 1978, A. G. Wheeler, Jr., *Tsuga canadensis* (Pinaceae), 1♂ (PDA). *Unknown Co.:* Princeton Gap, 1♀ (AMNH).

Plagiognathus tumidifrons (Knight), new combination
Figures 14, 19, 33

Microphylellus tumidifrons Knight, 1923: 455 (n. sp.).

DIAGNOSIS: Recognized by the *small size, castaneous coloration of body* (fig. 14), *dark antennal segment 1 with remaining segments pale* (fig. 19), and generally *pale legs with only the coxae dark.* Most similar in general appearance and structure of male genitalia to *suffuscipennis* (fig. 13) and *tsugae* (fig. 13). Easily separated from *suffuscipennis* by the tan hemelytra in eastern populations of that species, and from *tsugae* by the smaller size, less strongly swollen frons, and pale coxae

of that species and the detailed structure of vesica (fig. 33).

REDESCRIPTION: *Male:* Elongate ovoid, small; total length 2.99–3.21, length apex clypeus–cuneal fracture 2.12–2.32, width across pronotum 0.90–0.99. COLORATION (fig. 14): Dorsum entirely castaneous; membrane and veins fumose; antennal segment 1 castaneous except for a pale apical annulus, segments 2, 3, and 4 entirely pale, yellowish (fig. 19); labium ranging from mostly pale to weakly infuscate; venter usually entirely castaneous, sometimes extensively lighter; coxae castaneous, remainder of legs pale; tibial spines without dark spots at bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of recumbent, moderately long, neat, golden, shining, simple setae. STRUCTURE: Body weakly flattened, lateral corial margins weakly convex; frons moderately tumid and more or less distinctly bulging beyond anterior margin of eyes in dorsal view, clypeus usually barely visible from above; anteocular distance 0.5 times diameter of antennal segment 1; head projecting below eye by 1.5 times diameter of antennal segment 1; labium reaching to about apex of hind coxae. GENITALIA (fig. 33): Body of vesica short and relatively stout, apical spines erect, anterior spine very strongly flattened, weakly sclerotized, curving near apex, posterior spine elongate, conical, nearly straight.

Female: Very similar to male in coloration and body form. Total length 2.47–3.20, length apex clypeus–cuneal fracture 1.77–2.34, width across pronotum 0.84–1.01.

HOSTS: *Picea* spp. (Pinaceae).

DISTRIBUTION: Eastern North America, ranging from Newfoundland south to Virginia and Tennessee and west to Michigan.

DISCUSSION: This species was placed in *Microphylellus* by Knight (1923) because the bases of the tibial spines are pale. As noted above, the genitalia are of the *Plagiognathus* type, being very similar in structure to those of *suffuscipennis* and *tsugae*. I have therefore transferred *tumidifrons* to *Plagiognathus.*

SPECIMENS EXAMINED: CANADA.—**Alberta:** High Prairie, June 22, 1961, A. R. Brooks, 1♂ (CNC). Jasper Natl. Park, Yellowhead Hwy, August 27, 1970, L. A. Kelton, *Picea* sp. (Pinaceae), 1♀ (CNC). Jasper, August 29, 1970, L. A. Kelton, 1♂, 1♀ (CNC). **Manitoba:** Carberry, July 29, 1953, Brooks and Kelton, 3♂, 1♀ (CNC). E of Braintree, June 30, 1972, L. A. Kelton, *Picea* sp. (Pinaceae), 10♂, 28♀ (CNC). East Braintree, June 20, 1972, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂, 1♀ (CNC). Horton, July 28, 1958, A. and J. Brooks, 2♂ (CNC). Riding Mt. Natl. Park, July 21, 1972, L. A. Kelton, *Picea glauca* (Pinaceae), 9♂, 15♀ (CNC). Turtle Mt., July 17, 1953, Brooks and Kelton, *Picea* sp. (Pinaceae), 30♂, 13♀ (CNC). **New Brunswick:** Berwick, August 2, 1966, L. A. Kelton, 1♀ (CNC). Edmunston, June 29, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 9♂, 13♀ (CNC). Fredericton, June 28, 1976, L. A. Kelton, 1♀ (CNC). Fredericton, Univ. of New Brunswick, June 27, 1993, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (USNM). Kouchibouguac N. P., July 23, 1977, D. J. Brown, *Picea* sp. (Pinaceae), 15♂, 23♀ (CNC). Kouchibouguac Natl. Park, June 23, 1978, L. A. Kelton, *Picea* sp. (Pinaceae), 10♂, 6♀ (CNC). Petersville, July 5, 1966, L. A. Kelton, 4♂, 2♀ (CNC). Shemoque, July 7, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 2♂, 5♀ (CNC). St. Anne, July 4, 1991, *Picea glauca* (Pinaceae), 1♂, 1♀ (CNC). **Newfoundland:** Spruce Brook, August 8, 1912, 1♂ (AMNH). **Nova Scotia:** Big Intervale, July 23, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 5♀ (CNC). Cape Breton Natl. Park, July 22, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 1♂, 1♀ (CNC). Ingonish, July 30, 1976, L. A. Kelton, *Picea* sp. (Pinaceae), 1♀ (CNC). Kentville, July 3, 1976–July 14, 1976, L. A. Kelton, *Picea* sp. (Pinaceae), 26♂, 50♀ (CNC). Truro, July 26, 1917, holotype female (USNM). **Ontario:** 4 mi SW of Almonte alvore, June 26, 1990, M. D. Schwartz, *Picea glauca* (Pinaceae), 1♂ (AMNH). 4 mi SW of Almonte alvore, June 28, 1990, M. D. Schwartz, *Picea glauca* (Pinaceae), 11♂, 13♀ (CNC). 5 mi E of Thessalon off Rt 17, Round Barn Road, July 2, 1990, M. D. Schwartz, *Picea glauca* (Pinaceae), 13♂, 10♀ (CNC). Almonte, June 28, 1978, D. J. E. Brown, 2♀ (CNC). Bell's Corners, June 25, 1935–July 7, 1961, G. S. Walley, D. Brown, 2♂ (CNC). Calabogie, July 21, 1979, D. Brown, 3♂, 9♀ (CNC). Calabogie, June 21, 1979, D. Brown, *Picea* sp.

(Pinaceae), 1♂, 1♀ (CNC). Chalk River, June 29, 1900, 2♀ (CNC). Delhi, June 14, 1962, G. Brumpton, 1♀ (CNC). Hilton Beach, July 8, 1961, G. Brumpton, 1♀ (CNC). Kintore, July 10, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 1♀ (CNC). Marathon, June 28, 1961, D. Brown, *Picea* sp. (Pinaceae), 2♂, 7♀ (CNC). Midland, June 13, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 23♂, 20♀ (CNC). Norway Point, Lake of Bays, July 28, 1922, J. McDunnough, 1♂ (CNC). One Sided Lake, August 2, 1960, Kelton and Whitney, 1♀ (CNC). Ottawa, Central Experimental Farm, June 19, 1991, M. D. Schwartz, *Picea glauca* (Pinaceae), 6♂, 7♀ (CNC). Ottawa, Central Experimental Farm, June 23, 1999, M. D. Schwartz, *Picea glauca* (Pinaceae), 26♀ (AMNH, CNC). Ottawa, July 30, 1960, Kelton and Whitney, 1♂ (CNC). Pautois Creek on Hwy 17, July 1, 1990, M. D. Schwartz, *Picea glauca* (Pinaceae), 3♂, 2♀ (CNC). Penetang, June 14, 1962, Kelton and Thorpe, *Picea* sp. (Pinaceae), 11♂, 16♀ (CNC). Point Pelee, July 28, 1961, Kelton and Brumpton, 1♂ (CNC). Red Lake, August 11, 1960, Kelton and Whitney, *Picea* sp. (Pinaceae), 1♀ (CNC). Road to St. Josephs Island, 3 km E of jct. rts 17 & 548, July 2, 1990, M. D. Schwartz, *Achillea* sp. (Asteraceae), 2♂, 2♀ (CNC). Sault Ste. Marie, July 27, 1960, Kelton and Whitney, *Picea* sp. (Pinaceae), 7♂, 17♀ (CNC). Stanford, July 12, 1961, L. A. Kelton, 1♂ (CNC). Stittsville, July 4, 1973, D. Brown, 1♂ (CNC). Thessalon, July 1, 1965, W. Gagne, *Picea* sp. (Pinaceae), 6♂, 8♀ (UCB). Tillsonburg, June 20, 1962, Kelton and Thorpe, 1♂ (CNC). Trenton, June 24, 1906, Evan, 1♀ (CNC). **Prince Edward Island:** Brackley Beach, July 10, 1966, L. A. Kelton, 1♀ (CNC). Cavendish National Park, July 9, 1966, L. A. Kelton, *Picea* sp. (Pinaceae), 18♂, 22♀ (CNC). Davay House Can. Natl. Park, July 20, 1930, G. S. Walley, 1♀ (CNC). Scotch Fort, July 10, 1966, L. A. Kelton, *Larix* sp. (Pinaceae), 1♂ (CNC). **Quebec:** Aylmer, July 1, 1935, G. S. Walley, *Picea* sp. (Pinaceae), 6♂, 11♀ (CNC). Baie-de-Gaspe-Nord, Forillon Natl. Park, Penouille Beach parking lot, 10 m, July 20, 1995, M. D. Schwartz, *Picea glauca* (Pinaceae), 2♂, 2♀ (CNC). Fabre, July 12, 1963, L. A. Kelton, *Picea* sp. (Pinaceae), 16♂, 20♀ (CNC). Gatineau National Park near Hopkins Hole, June 11, 1991, M. D. Schwartz, *Picea mariana* (Pinaceae), 3♂, 8♀ (AMNH). Greenfield, June 20, 1937, O. Peck, 1♂ (CNC). Ladysmith, July 24, 1958, L. A. Kelton, 2♂, 5♀ (CNC). Laniel, July 3, 1963, L. A. Kelton, *Picea* sp. (Pinaceae), 13♂, 35♀ (CNC). Shawville, July 23, 1958, L. A. Kelton, 1♀ (CNC). Wakefield, June 27, 1925, J. McDunnough, 1♀ (CNC). **Saskatchewan:** Wolseley, June 24, 1952, *Picea* sp. (Pinaceae), 4♂, 1♀ (CNC). USA.—**Connecticut:** Mansfield Center, July 17, 1953, J. A. Slater, 1♀ (AMNH). Storrs, June 17, 1954, J. A. Slater, *Picea* sp. (Pinaceae), 1♂, 9♀ (AMNH). **Michigan:** *Cheboygan Co.:* No specific locality, July 10, 1950, J. D. Lattin, 1♀ (AMNH). *Iosco Co.:* No specific locality, July 3, 1948, R. Dreisbach, 1♀ (AMNH). **New Jersey:** *Sussex Co.:* Baleville, June 21, 1981, R. Schmidt, *Picea* sp. (Pinaceae), 1♀ (AMNH). **New York:** *Essex Co.:* Lake Placid, July 4, 1991, M. D. Schwartz, *Picea glauca* (Pinaceae), 3♂, 1♀ (CNC). *Jefferson Co.:* Watertown, June 10, 1989, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (USNM). *Rockland Co.:* South Nyack, Ross Avenue, June 11, 1988, M. D. Schwartz, *Picea pungens* (Pinaceae), 35♂, 30♀ (CNC). *Suffolk Co.:* Bayshore, Brentwood Road, June 27, 1985, M. D. Schwartz, *Picea glauca* (Pinaceae), 1♂, 1♀ (AMNH). *Tompkins Co.:* Ithaca, Cornell University, July 1, 1978, A. G. Wheeler, Jr., *Pinus mugo* (Pinaceae), 3♂ (PDA). *Westchester Co.:* Armonk, Calder Ecology Study Center, June 11, 1979, K. Schmidt, 1♂, 2♀ (AMNH). Lewisboro, June 17, 1977, M. Favreau, *Picea menziesii* (Pinaceae), 3♂, 2♀ (AMNH). Lewisboro, June 17, 1977, M. Favreau, *Picea* sp. (Pinaceae), 2♂, 12♀ (AMNH). **Pennsylvania:** *Blair Co.:* Altoona, Pleasant Valley Nursery, July 11, 1972, S. M. George, *Picea abies* (Pinaceae), 3♀ (PDA). Duncansville, Hillside Nursery, July 25, 1972, McDonald and Stearns, *Picea* sp. (Pinaceae), 2♀ (PDA). *Bucks Co.:* Danboro, Colonial Village Motel on Rt 611, June 7, 1972, K. R. Valley, *Picea abies* (Pinaceae), 1♀ (PDA). Morrisville, Snipes Nursery, June 16, 1972, Hauser and Staines, *Picea pungens* (Pinaceae), 1♂, 2♀ (PDA). Neshaming, Albright Nursery, June 9, 1972, Hauser, *Picea* sp. (Pinaceae), 1♀

(PDA). *Carbon Co.:* near Weatherly, Dolinsky Nursery, June 11, 1976, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (PDA). *Centre Co.:* State College, University Drive, June 19, 1973, B. Staines, *Pinus sylvestris* (Pinaceae), 1♂ (PDA). *Chester Co.:* Unionville, June 1, 1987–June 7, 1972, Christie, Hauser, Wheeler, *Picea* sp. (Pinaceae), 6♀ (PDA). Unionville, Lemon Tree Farm, June 7, 1972, Christie and Hauser, *Picea pungens* (Pinaceae), 2♂ (PDA). *Clearfield Co.:* DuBois, Nelson Tree Nursery, July 20, 1972, 1♀ (PDA). *Crawford Co.:* Blooming Valley, Blooming Valley Nursery, July 10, 1972, Negley and Wolff, *Picea abies* (Pinaceae), 1♀ (PDA). Cochranton, July 12, 1972, Negley and Wolff, *Picea pungens* (Pinaceae), 2♀ (PDA). *Cumberland Co.:* Conifer Hills, June 21, 1972, B. Stinner, *Picea abies* (Pinaceae), 1♀ (PDA). Rt 11 between Middlesex and Carlisle, May 6, 1978, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂, 3♀ (PDA). *Dauphin Co.:* 3 mi S of Hershey, June 9, 1977, Schuh, Henry, Wheeler, *Picea glauca* (Pinaceae), 1♂, 8♀ (AMNH). 4 mi S of Hershey, Conewago Township on Rt 743, June 11, 1973, T. J. Henry, *Picea abies* (Pinaceae), 2♀ (AMNH). 4 mi S of Hershey, Conewago Township on Rt 743, June 11, 1973, T. J. Henry, *Picea abies* (Pinaceae), 3♂, 3♀ (PDA). Harrisburg, Crooked Hill Road, June 5, 1973, W. Blosser, *Picea abies* (Pinaceae), 2♀ (PDA). Harrisburg, East Harrisburg Cemetery, May 31, 1973–June 7, 1973, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 7♂, 4♀ (PDA). Harrisburg, June 12, 1972, A. G. Wheeler, Jr., *Picea pungens* (Pinaceae), 3♀ (PDA). Hershey, June 8, 1975, A. G. Wheeler, Jr., *Pseudotsuga menziesii* (Pinaceae), 1♀ (AMNH). *Indiana Co.:* 10 mi E of Indiana, Pikes Peak Nursery, June 28, 1972, A. G. Wheeler, Jr., *Picea engelmanni* (Pinaceae), 1♂, 2♀ (PDA). 14 mi E of Indiana, Carino Nurseries, June 27, 1972, A. G. Wheeler, Jr., *Picea engelmanni* (Pinaceae), 5♂, 6♀ (PDA). Strongstown, Carino's Nursery, July 14, 1972, *Picea glauca* (Pinaceae), 7♀ (PDA). *Juniata Co.:* Port Royal, Goodman's, May 15, 1973, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♀ (PDA). *Luzerne Co.:* near White Haven, Kunkle's Nursery, June 11, 1976, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (PDA). *Lycoming Co.:* Williamsport, Wildwood Cemetery, June 21, 1973, T. J. Henry, *Pinus sylvestris* (Pinaceae), 1♀ (PDA). *Montgomery Co.:* Dresher, May 21, 1973, A. G. Wheeler, Jr., *Picea pungens* (Pinaceae), 1♂ (PDA). Lansdale, St. John's Church, June 24, 1976, A. G. Wheeler, Jr., 1♀ (PDA). Philadelphia, Forest Hills Cemetery, June 7, 1973, J. F. Stimmel, *Picea glauca* (Pinaceae), 1♂ (PDA). Telford, June 15, 1972, D. Christie, *Picea* sp. (Pinaceae), 4♀ (PDA). *Northampton Co.:* Bath, on Rt 1, June 15, 1972, Semmel, *Picea* sp. (Pinaceae), 3♂, 1♀ (PDA). *Philadelphia Co.:* Philadelphia, Roosevelt Memorial Cemetery, June 13, 1973, Hauser, *Picea glauca* (Pinaceae), 1♀ (PDA). *Schuykill Co.:* Barnesville, Skeeth's Nursery, June 12, 1972, Semmel, *Picea* sp. (Pinaceae), 3♀ (PDA). N. Brunswick Township, Griesmer Farm, June 20, 1972, *Pinus sylvestris* (Pinaceae), 3♂, 2♀ (PDA). *Somerset Co.:* Addison, Holiday Nursery, July 5, 1973, Wolff, *Picea glauca* (Pinaceae), 1♀ (PDA). *Union Co.:* Lewisburg, Maple Hill Farms, June 4, 1993, V. R. Wagner, *Picea pungens* (Pinaceae), 2♂ (PDA). *Washington Co.:* McMurray, Kurtz's, June 7, 1973, D. G. Trelka, *Picea* sp. (Pinaceae), 1♀ (AMNH). McMurray, Kurtz's, June 7, 1973, D. G. Trelka, *Picea* sp. (Pinaceae), 3♂, 2♀ (PDA). S of West Finley, June 11, 1973, D. Trelka, *Picea abies* (Pinaceae), 1♀ (PDA). *Wayne Co.:* near Abrahamsville, Sunnybrook Nursery, June 18, 1974, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (PDA). *York Co.:* Manchester, Dauber's Farm, June 20, 1972, *Picea* sp. (Pinaceae), 1♀ (PDA). **Tennessee:** *Knox Co.:* Knoxville, May 27, 1985, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂ (PDA). *Sullivan Co.:* Kingsport, May 26, 1985, T. J. Henry and A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂, 3♀ (USNM). **Virginia:** *Alemarle Co.:* Charlottesville, University of Virginia, May 21, 1988, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♀ (USNM). *Roanoke Co.:* Hollins, Hollins College, May 5, 1985, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂ (PDA). **West Virginia:** *Jefferson Co.:* Shepherdstown, June 1, 1980, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♂ (PDA). *Pocahontas Co.:* Cranberry Glades Visitor Center, June 25, 1978, A. G. Wheeler, *Picea glauca* (Pinaceae), 2♂, 4♀ (PDA).

Plagiognathus urticae Knight
Figures 14, 19, 33

Plagiognathus urticae Knight, 1964: 148 (n. sp.).

DIAGNOSIS: Recognized by its relatively *large* size, *elongate* nearly *parallel-sided* body form, dark *brown* coloration (fig. 14), and *vestiture of silvery, shining, recumbent, somewhat shaggy, simple setae.* Most similar in size, coloration, and body conformation among western species to *emarginatae* (fig. 7), but that species with weakly scalelike setae on the dorsum. Also possibly confused with totally dark specimens of *brunneus, lineatus,* and *shoshonea,* but body form always somewhat broader and not so distinctly parallel-sided in those species.

REDESCRIPTION: *Male:* Moderately large, elongate, nearly parallel-sided; total length 4.21–4.47, length apex clypeus–cuneal fracture 2.73–3.00, width across pronotum 1.20–1.30. COLORATION (fig. 14): General coloration dark brown; posterior margin of vertex and mesoscutum mostly olive; membrane fumose, veins pale at least on posterior margin of cells and an adjoining small, triangular patch at posterior inner angle of cuneus pale; antennae entirely dark (fig. 19); labium castaneous; venter of thorax and abdomen castaneous, most of metathoracic scent-gland evaporatory area and area surrounding mesothoracic spiracle pale; coxae, trochanters, and femora castaneous, or largely so; dorsal tibial spines with black spots at bases; tibiae black at articulation with femora, sometimes more extensively so on dorsal surface. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, weakly shining. Vestiture of dorsum composed of rather densely placed, silvery, shining, recumbent, somewhat shaggy, simple setae. STRUCTURE: Body elongate, nearly parallel-sided; frons weakly bulging and only slightly projecting beyond anterior margin of eyes in dorsal view, clypeus barely visible from above; anteocular distance equal to diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to about apex of middle coxae. GENITALIA (fig. 33): Body of vesica more or less J-shaped, base of vesica falling well below level of secondary gonopore, posterior apical spine weakly curving, almost erect relative to body of vesica, anterior spine slightly longer than posterior, not straight, and forming nearly a right angle with body of vesica; flange moderately broad, reaching to about basal one-third of secondary gonopore.

Female: Similar to male in coloration but body conspicuously ovoid in outline. Total length 3.55–3.71, length apex clypeus–cuneal fracture 2.49–2.76, width across pronotum 1.18–1.27.

HOSTS: *Amorpha californica* (Fabacaeae); *Urtica gracilis holosericea* (Urticaceae).

DISTRIBUTION: Southern California.

DISCUSSION: Described from a male (holotype) and female (allotype) only. Allotype labelled as having been collected on *Urtica gracilis holosericea.*

SPECIMENS EXAMINED: USA.—**California:** *Los Angeles Co.:* Los Angeles, September 1, 1908, 1♂ (CAS); Paratype: 1♂ (CAS). San Gabriel River, April 7, 1936, E. L. Paddock, 1♀ (USNM); holotype male (USNM). *San Bernardino Co.:* 2 mi E of Camp Angelus, June 28, 1978, J. D. Pinto, *Amorpha californica* (Fabaceae), 19♂, 10♀ (AMNH). Kilpecker Creek, San Bernardino Mts, 5600 ft, July 11, 1964, E. I. Schlinger, 1♂ (UCR).

Plagiognathus verticalis (Uhler)
Figures 14, 19, 33

Macrotylus verticalis Uhler, 1894: 272 (n. sp.).
Plagiognathus fusciflavus Knight, 1929c: 267 (n. sp.). NEW SYNONYMY.

DIAGNOSIS: Recognized by *medium to moderately large* body size, the *uneven brownish coloration of the dorsum* with some lighter, diffuse, mostly *longitudinal markings* (fig. 14), the *tumid frons with dark transverse striae,* the brown calli, and the *black, suberect, bristlelike setae on the pronotum* and costal margin of the hemelytra. Also body appearing slender and transversely convexly rounded as viewed from above. Possibly confused with *lineatus* (fig. 9) because of the longitudinal markings, and also with *moerens* (fig. 10) on the basis of bristlelike setae, distribution, and occurrence on ruderal vegetation, but distinguished because both of those species with frons entirely dark and lacking obvious striate markings, *lineatus* lacking black bristlelike setae on dorsum,

and *moerens* with black setae over entire dorsum and with distinctive genitalia.

REDESCRIPTION: *Male:* Elongate, medium-sized to moderately large; total length 3.90–4.99, length apex clypeus–cuneal fracture 2.65–3.30, width across pronotum 1.06–1.24. COLORATION (fig. 14): General coloration uneven brown; vertex and frons mostly pale, frons with brown, transverse striae; calli darker than remainder of pronotum; hemelytra with a diffuse longitudinal pattern of brown and pale; membrane fumose, veins pale; antennae black except for pale apical annulus on segment 1 (fig. 19); labium and entire venter brown; femora with numerous dark spots on dirty yellow background; dorsal tibial spines with dark spots at bases; tibiae dark at femoral articulation. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, dull to very weakly shining. Dorsum clothed with recumbent, pale to golden, simple setae, much of pronotum and costal margin of hemelytra with suberect, black, bristlelike setae. STRUCTURE: Body elongate, relatively slender, nearly parallel-sided, with dorsum transversely convexly rounded, body appearing somewhat cylindrical; frons bulging as viewed from above, clypeus mostly visible; anteocular distance 1.3 times diameter of antennal segment 1; head projecting below level of eye by diameter of antennal segment 1; labium relatively long, reaching just past apex of hind coxae. GENITALIA (fig. 33): Vesica more or less J-shaped, body relatively slender, base falling just below base of secondary gonopore; posterior apical spine long, slender, erect relative to body of vesica, anterior spine slightly longer, slender, smoothly curving, and weakly angled relative to body of vesica; flange extending past body, terminating at base of secondary gonopore.

Female: Shorter and more strongly ovoid than male; coloration similar to male. Total length 3.64–4.23, length apex clypeus–cuneal fracture 2.49–2.96, width across pronotum 1.07–1.34.

HOSTS: Recorded as occurring on a variety of herbaceous, mostly annual, plant species.

DISTRIBUTION: Western North America, ranging from British Columbia and Idaho in the north, south to Baja California. The record from British Columbia (Bowser) is from Schwartz and Scudder (2000) as *fusciflavus* Knight; I did not examine their specimens.

DISCUSSION: This is one of the most commonly collected species of *Plagiognathus* in California, and as the locality data indicate, it has been collected at only a limited number of localities outside the state. It is obviously most frequently collected by sweeping roadside or other ruderal vegetation, an observation that would explain why it is common in collections.

My identification of this species is based on three males and one female deposited in the California Academy of Sciences bearing the locality label ''S. Francisco, Cal.'' They are also labeled as ''paratype'' (probably by Van Duzee, judging from the yellow-orange labels) and as ''Uhler type''. Two apparent discrepancies exist with regard to the labeling of these specimens and their candidacy as Uhler types. First, Uhler indicated that ''Several specimens are in the collection, labelled 'Cal. 2.' '' He went on to say that varieties occurred in San Diego and other places in California and that he had seen specimens from southern Baja California. It is therefore not clear whether he actually examined the specimens which were at some point labelled as ''Uhler type''. Obviously, also, if these specimens were examined by Uhler, they could not be paratypes.

Van Duzee (1914) had some doubts about the identity of *verticalis* when he commented that Uhler's description was ''very inadequate''. Later, Van Duzee (1916b) placed *verticalis* in the orthotyline genus *Pseudopsallus*; he noted that the types were from California.

Nothing appears to have been written on *verticalis* since the works of Uhler and Van Duzee. I have examined most, if not all, of the phyline Miridae from the collections of the California Academy of Sciences and from the National Museum of Natural History, with the latter institution being the repository of the Uhler collection. I have not encountered any specimens that bear the label ''Cal. 2''.

Plagiognathus verticalis, as here conceived, is distinct from all other North American *Plagiognathus* species and conforms in most respects to the way most previous authors have used the name. I have not desig-

nated a lectotype, on the chance that additional searching may produce a different conclusion concerning this taxon and whether the above-mentioned specimens represent material examined by Uhler.

Knight (1929c) described the species *Plagiognathus fusciflavus* from LaGrande, in northeastern Oregon. Examination of the holotype male and paratype female indicates that this species is the same as the taxon I am calling *verticalis* Uhler, corresponding closely in the linear pattern of the markings on the hemelytra, the dark clypeus and maxillary plate, the dark calli, and the pale veins of the membrane; both specimens examined by Knight are badly rubbed and devoid of setae on the dorsum. Furthermore, the type locality for *fusciflavus* is within the range of specimens I have otherwise identified as *verticalis.*

SPECIMENS EXAMINED: MEXICO.—**Baja California Norte:** 14.2 mi S of Tecate, May 29, 1980, Brown and Faulkner, 3♀ (SDNH). 18.2 mi E of San Telmo, May 23, 1980, Brown and Faulkner, 2♂, 7♀ (SDNH). 22 km W of Parque Sierra San Pedro Martir, 1150 m, April 25, 1985, R. T. Schuh and B. M. Massie, *Adenostoma fasciculatum* (Rosaceae), 1♂ (AMNH). 38 km E of Rt 1 toward Parque San Pedro Martir, 400 m, April 24, 1985, R. T. Schuh and B. M. Massie, *Viguiera laciniata* (Asteraceae), 14♂, 12♀ (AMNH). 5.2 mi E of Tecate, May 28, 1981, Brown and Faulkner, 1♂, 1♀ (SDNH). 7 km W of Parque Sierra San Pedro Martir, 1720 m, April 25, 1985, R. T. Schuh and B. M. Massie, *Ceanothus cuneatus* (Rhamnaceae), 2♂, 8♀ (AMNH). Ensenada, May 9, 1936, C. E. Norland, 1♂, 1♀ (LACM). San Quentin, May 13, 1938, C. E. Norland, 1♂, 3♀ (LACM). Santa Marta, May 23, 1980, Brown and Faulkner, 2♀ (SDNH). Santo Domingo, May 12, 1938, C. E. Norland, 1♂ (LACM). Tecate, 3.4 mi S of El Condor, May 15, 1982, M. D. Schwartz, *Lupinus* sp. (Fabaceae), 8♂, 3♀ (AMNH). USA.—**California:** *Alameda Co.:* 12 mi S of Livermore, Arroyo Mocho, June 7, 1969, P. Opler, ex Apiaceae, 8♂, 6♀ (UCB). *Amador Co.:* Fiddletown, May 29, 1960, W. E. Simonds, 1♂ (CAFA). Plymouth, May 29, 1960, W. E. Simonds, *Calochortus* sp. (Liliaceae), 4♂ (CAFA). *Butte Co.:* Pentz, May 22, 1928, H. H. Keifer, 4♀ (CAS). *Calaveras Co.:* 4 mi S of Railway Flat, 2800 ft, May 18, 1969, E. G. Linsley, 1♂ (UCB). 4.8 km S of West Point, July 21, 1980, Stanley C. Williams, 1♀ (CAS). Angels Camp, May 22, 1930, E. P. Van Duzee, 2♂ (CAS). Mokelumne Hill, May 18, 1931, R. L. Usinger, 28♂, 47♀ (UCB). *Del Norte Co.:* Little Grayback, 4600 ft, July 24, 1969, J. Powell, 1♂, 2♀ (UCB). *El Dorado Co.:* 2 mi N of Kelsey, June 23, 1967, W. J. Turner, 8♂, 4♀ (UCB). 2 mi N of Placerville, June 7, 1962, John T. Doyen, 1♀ (UCB). 3 mi S of Camino, July 3, 1948, P. D. Hurd, 1♀ (UCB). 3 mi W of Placerville, June 5, 1962, J. T. Doyen, 2♀ (UCB). Camino, June 30, 1949, W. F. Chamberlain, 1♀ (TAMU). Chile Bar, July 5, 1948, R. A. Smith, 1♀ (UCB). Greenwood, June 21, 1967, P. F. Warner, 4♂, 4♀ (UCB). Riverton, June 5, 1968, S. Paul Welles, 7♂, 3♀ (UCB). Snowline Camp, July 30, 1948, P. D. Hurd, 1♂, 3♀ (UCB). Snowline Camp, June 30, 1948, W. F. Chamberlain, 1♂ (TAMU). *Fresno Co.:* 5 mi W of Avery, May 17, 1990, R. S. Miller, 1♂, 3♀ (TAMU). Dunlap, May 29, 1949, W. Dwight Pierce, *Delphinium* sp. (Ranunculaceae), 2♂, 3♀ (LACM). San Benito, Big Panoche Creek, April 21, 1967, J. Powell, 1♂, 2♀ (UCB). *Humboldt Co.:* Dinsmores, June 18, 1939, Brunson P. Bliven, 10♂, 20♀ (CAS). Dyerville, July 28, 1963, 1♂ (CAS). Laribee Valley, July 3, 1938, Brunson P. Bliven, 1♀ (CAS). *Kern Co.:* Cerro Noroeste, SW Kern County, 8200 ft, July 15, 1965, J. Powell, 1♂ (UCB). *Lake Co.:* 2 mi S of Middletown, April 4, 1963, W. Turner, 1♀ (UCB). 5 mi NW of Middletown, June 4, 1963, P. F. Warner, 2♀ (UCB). Blue Lake, June 3, 1954, S. M. Fidal, 1♀ (UCD). E of Clear Lake on State Hwy, June 16, 1936, Brunson P. Bliven, 2♂ (CAS). Lake Pillsbury, June 8, 1977, W. W. Middlekauff, 2♂, 1♀ (UCB). Middle Creek, June 7, 1932, R. L. Usinger, *Eriodictyon californicum* (Hydrophyllaceae), 3♂, 2♀ (UCB). N fork Cache Creek on Highway 20, May 17, 1961, D. R. Miller, 1♂, 1♀ (UCD). *Lassen Co.:* Susanville, June 20, 1975, T. R. Haig, 1♂, 2♀ (CAFA). *Los Angeles Co.:* 22 mi S of Palmdale, 3000 ft, May 30, 1981, J. T. Polhemus, 4♂, 9♀ (JTP). 5 mi N of Escondido Beach, 1500 ft, March 16, 1967, J. Powell, *Gilia achillaefolia* (Polemoniaceae), 1♂

(UCB). Beverly Glen, June 13, 1957, R. X. Schick, 1♂ (LACM). Claremont, C. F. Baker, 1♂ (CAS). Claremont, May 15, 1954, J. D. Hall, 2♂, 4♀ (UCD). Griffith Park Bird Sanctuary, L. J. Muchmore, 1♀ (LACM). Lancaster, May 19, 1937, E. P. Van Duzee, 2♀ (CAS). Mint Canyon, May 25, 1937, E. P. Van Duzee, 1♀ (CAS). Mint Canyon, Oaks, April 20, 1932, E. P. Van Duzee, 1♀ (CAS). No specific locality, April 1, 1900, Koebele Collection, 2♂, 1♀ (CAS). Pasadena, May 25, 1909, Grinell, 2♂, 9♀ (CAS). Pebbly Beach Canyon, Santa Catalina Island, March 31, 1968, J. Powell, 1♀ (UCB). Santa Monica Mountains, 2♂, 1♀ (LACM). Santa Monica Mountains, May 15, 1966, B. Stabile, 2♀ (LACM). Tanbark Flat, June 17, 1956–June 25, 1952, A. S. Menke, B. Tinglof, 3♂, 1♀ (LACM). Tanbark Flat, June 18, 1956, C. L. Whey, 2♂, 2♀ (UCB). Tanbark Flat, June 24, 1952, J. K. Hester, 3♂, 1♀ (UCD). Tapia Park, April 9, 1966, 1♂ (LACM). Temescal Canyon, April 12, 1979, 1♀ (LACM). *Madera Co.:* 4 mi W of Bass Lake, 3000 ft, July 1, 1946, H. P. Chandler, 1♂ (UCB). Biledo Meadows, July 27, 1946, T. O. Thatcher, 1♀ (UCB). Coarsegold, 2000 ft, June 29, 1946, H. P. Chandler, 1♂ (UCB). *Marin Co.:* Pt. Reyes, June 16, 1935, E. P. Van Duzee, 1♀ (CAS). *Mariposa Co.:* 1.9 mi W of Mt. Bullion, May 30, 1959, G. I. Stage, 2♂ (UCB). 3 mi SW of Miami Ranger Station, 4000 ft, June 29, 1946, H. P. Chandler, 4♂, 1♀ (CAS). 6 mi SW of Mt. Bullion, May 30, 1959, G. I. Stage, 4♀ (CAS). *Mendocino Co.:* 10 mi W of Covelo, June 28, 1961, D. C. Rentz, 2♂ (CAS). 2 mi S of Hopland, June 19, 1958, T. R. Haig, 1♀ (UCD). 4 mi S of Hopland, May 9, 1961, R. L. Langston, 1♀ (UCB). 4 mi W of Eel River R. S., Mendocino National Forest, June 12, 1972, J. Doyen, 16♂, 13♀ (UCB). 7 mi W of Eel River R. S., Mendocino National Forest, 1450 ft, June 10, 1972, J. Powell, 6♂, 2♀ (UCB). Eel River R. S., Mendocino National Forest, June 13, 1972, J. Powell, *Aesculus californica* (Hippocastanaceae), 4♀ (UCB). Hopland, May 9, 1926, E. P. Van Duzee, 2♀ (USNM). Hopland, May 9, 1926, E. P. Van Duzee, 1♂, 6♀ (CAS). Navarro, June 1, 1967, W. W. Middlekauff and D. C. Rentz, 1♂, 2♀ (UCB). Ukiah, June 8, 1931, R. L. Usinger, *Verbena* sp. (Verbenaceae), 6♂, 9♀ (UCB). *Modoc Co.:* 2.5 mi S of Rt 139 toward Lookout, 1440 m, July 6, 1979, R. T. and Joe Schuh, *Lupinus* sp. (Fabaceae), 3♂, 2♀ (AMNH). 21.6 mi NW of Canby, 1440 m, July 1, 1979, R. T. Schuh and B. M. Massie, *Wyethia helianthoides* (Asteraceae), 13♂, 23♀ (AMNH). 24.7 mi NW of Canby, 1375 m, July 1, 1979, R. T. Schuh and B. M. Massie, 2♀ (AMNH). 8 mi S of Rt 139 toward Lookout, 1420 m, July 6, 1979, R. T. and Joe Schuh, *Sidalcea* sp. (Malvaceae), 6♂, 5♀ (AMNH). Adin Pass, July 8, 1977, T. R. Haig, 1♀ (CAFA). Fandango Pass Summit, Warner Mts., 1890 m, July 3, 1979, R. T. Schuh and B. M. Massie, 1♂, 1♀ (AMNH). *Monterey Co.:* 6 mi W of Greenfield, Wiley Ranch, 1200 ft, May 3, 1975, 2♂, 1♀ (UCB). Bradley, April 23, 1917, E. P. Van Duzee, 1♂ (CAS). Bryson, April 26, 1917, E.P. Van Duzee, 7♂ (CAS). Bryson, May 18, 1920, E. P. Van Duzee, 8♂, 1♀ (CAS). Paloma Creek, 3 air mi NE of Arroyo Seco Guard Station, 900 ft, May 5, 1975, W. W. Middlekauff, 1♂ (UCB). Paraiso Springs, June 2, 1932, L. S. Stein, 1♀ (CAS). Pleyto, May 21, 1920, E. P. Van Duzee, 1♀ (CAS). *Napa Co.:* 5 mi E of Conn Dam, June 5, 1964, J. Powell, *Eriophyllum lanatum* (Asteraceae), 1♂ (UCB). Samuel Spring, May 18, 1955, E. I. Schlinger, 1♂, 2♀ (UCD). *Nevada Co.:* 1 mi W of Hobart Mills, Prosser Creek, 5800 ft, June 17, 1966, W. Gagne, 1♀ (UCB). 2 mi N of Cisco, July 27, 1962, J. T. Doyen, 1♂ (UCB). 8 mi S of Grass Valley, May 18, 1920, E. P. Van Duzee, 1♂ (CAS). Nevada City, June 17, 1936, Brunson P. Bliven, 1♂, 4♀ (CAS). Sagehen Creek, July 5, 1953, K. R. Daily, 3♂, 1♀ (UCD). *Orange Co.:* Lower Santa Ana Canyon, Green River Camp, May 9, 1933, E. P. Van Duzee, 6♂, 3♀ (CAS). *Placer Co.:* Squaw Valley, July 15, 1961, E. Ball, 2♀ (CAS). *Plumas Co.:* Butte Lake, July 5, 1932, R. L. Usinger, 2♂, 4♀ (UCB). Caribou, July 6, 1932, R. L. Usinger, 5♂, 10♀ (UCB). Clio, July 8, 1952, M. Cazier and R. Schrammel, 1♀ (AMNH). Frenchman Reservoir, 5000 ft, June 18, 1966, W. Gagne, 1♀ (UCB). Keddie, June 20, 1941, Fred H. Rindge, 1♂, 1♀ (UCB). *Riverside Co.:* 10.5 mi SE of Santa Margarita, May 16, 1980, J. D. Pinto, 2♀ (UCR). 5 mi S of Sage, April 15, 1965, C. A. Toschi, 1♂ (UCB). 8 km N of Mareno Bad Lands,

1200 ft, May 19, 1981, N. J. Gunther, 1♀ (UCR). 8 mi SE of Hemet, Bautista Canyon, May 1, 1974, J. D. Pinto, 1♂, 1♀ (UCR). Cactus Valley, T65 R1E Sec 8, April 29, 1980, J. N. Chandler, 2♂, 1♀ (UCR). Deep Canyon, September 23, 1963, E. Schlinger and M. Irwin, 1♂ (UCR). Menifee Valley, hills on W end, 1800 ft, April 26, 1977–May 14, 1978, J. D. Pinto, *Salvia mellifera* (Lamiaceae), 14♂, 6♀ (UCR). Menifee Valley, hills on W end, 1800 ft, May 11, 1978, J. D. Pinto and R. T. Schuh, 4♂, 8♀ (AMNH). Milepost 23.75 on Rt 60, April 21, 1980, Russell and Schwartz, 1♂ (AMNH). Quail Valley, Coastal Sage Scrub Community, May 19, 1977, J. D. Pinto, *Brassica* sp. (Brassicaceae), 1♂, 6♀ (AMNH). Riverside, May 8, 1962, Joyce Kleinjan, 2♂, 1♀ (UCR). San Jacinto Mountains, 5000 ft, June 7, 1908, F. Grinnell, Jr., 3♀ (CAS). San Jacinto Mountains, April 26, 1953, A. Fukushima, 1♂ (LACM). San Jacinto Mountains, Hemet Reservoir, May 23, 1940, R. L. Usinger, *Lupinus* sp. (Fabaceae), 1♂, 2♀ (UCB). San Jacinto Mountains, Pinon Flat, May 31, 1940, R. Husbands, 1♂ (UCB). Vandevanter Flat, San Jacinto Mountains, June 4, 1945, C. D. Michener, 1♂ (UCB). *Sacramento Co.:* Carmichael, May 26, 1946, 1♂ (SDNH). Folsom, May 30, 1933, H. H. Keifer, *Wyethia* sp. (Asteraceae), 1♂ (CAFA). Orangevale, May 25, 1930, H. H. Kelfer, *Lupinus* sp. (Fabaceae), 5♂, 4♀ (LACM). *San Benito Co.:* 3.8 mi on New Idria Rd. from Panoche Rd. (17.9 mi. off I-5), May 21, 1978, F. C. Andrews, 1♀ (CAFA). *San Bernardino Co.:* 4 mi E of Mentone, 750 m, May 11, 1978, R. T. Schuh and J. D. Pinto, *Phacelia distans* (Hydrophyllaceae), 2♂ (AMNH). Bonanza Mine, Providence Mountains, E. P. Van Duzee, 1♂ (CAS). Kramer Hills, April 25, 1957, J. Powell, 1♂ (UCB). San Timoteo, May 6, 1948, R. A. Flock, *Adenostoma* sp. (Rosaceae), 2♂ (UCR). *San Diego Co.:* 5 mi NE of Santa Ysabel, July 8, 1964, J. E. Prine, 2♀ (UCB). 8.2 mi E of Dulzura on Rt 94 at milepost 36.50, May 15, 1982, R. T. Schuh and B. M. Massie, *Artemisia californica* (Asteraceae), 4♀ (AMNH). Borrego Springs, April 1, 1960, M. Wasbauer, *Phacelia* sp. (Hydrophyllaceae), 4♂ (CAFA). Mt. Laguna, June 21, 1963, J. Powell, 1♂ (UCB). No specific locality, April 23, 1920, E. P. Van Duzee, 12♂, 14♀ (CAS). No specific locality, May 13, 1913, E. P. Van Duzee, 1♂ (CAFA). No specific locality, May 13, 1913, E. P. Van Duzee, 1♂ (CAFA). Pine Valley, June 13, 1927, C. C. Searl, 3♂ (SDNH). *San Francisco Co.:* No specific locality, paratypes: 3♂, 1♀ (CAS). San Francisco, May 13, 1927, C. L. Fox, 1♀ (USNM). San Francisco, Sand Dunes, May 23, 1947, C. L. Fox, 1♀ (CAS). *San Luis Obispo Co.:* 1 mi S of Cholame, April 30, 1963, H. B. Leech and P. H. Arnaud, Jr., 1♂ (CAS). 10 mi SE of Creston, April 25, 1968, J. Powell, 4♂, 3♀ (UCB). 18.5 mi E of Arroyo Grande, Huasna Valley, 1100 ft, May 9, 1985, R. T. Schuh and B. M. Massie, *Salvia* sp. (Lamiaceae), 6♀ (AMNH). 3 mi W of Paso Robles, April 28, 1968, P. A. Opler, 4♂, 1♀ (UCB). 35 mi E of Santa Margarita, San Juan Creek, May 17, 1975, G. L. Parsons, 1♂ (OSU). 5 mi NE of Santa Margarita, May 16, 1980, J. D. Pinto, 1♀ (UCR). 5 mi S of Oceano, Oso Flaco Lake, May 11, 1965, J. Powell, 1♂, 1♀ (UCB). 6 air mi NE of Pozo, Black Mountain, 3300–3600 ft, May 1, 1962, C. A. Toschi, 1♂ (UCB). Arroyo Grande Creek SW of San Luis Obispo, 160 m, May 8, 1985, R. T. Schuh and B. M. Massie, 1♂, 4♀ (AMNH). La Panza Camp, April 25, 1968, Paul A. Opler, 5♂, 2♀ (UCB). near Atascadero, Morro Road, May 15, 1962, Brunson P. Bliven, 1♂, 2♀ (CAS). Ontario Hot Springs, April 22, 1922, E. P. Van Duzee, 18♂, 11♀ (CAS). Pozo, May 1, 1962, J. K. Drew, 1♂ (UCB). Shandon, May 14, 1961, Brunson P. Bliven, 1♂, 1♀ (CAS). *Santa Barbara Co.:* 1 mi S of Buellton, May 11, 1965, J. Powell, 2♂, 2♀ (UCB). Jalama Beach, April 23, 1966, J. Powell, 17♂, 6♀ (UCB). Los Prietos, April 23, 1966, R. L. Langston, 2♂ (UCB). Santa Cruz Island, Canyon Del Medio, May 1, 1969, D. S. Horning, 2♂, 5♀ (UCD). Upper Central Valley, Santa Cruz Island, April 26, 1966, J. Slater, *Platystemon californicus* (Papaveraceae), 1♀ (UCB). Upper Oso Campground off Rt 154, 310 m, May 7, 1985, R. T. Schuh and B. M. Massie, *Salvia leucophylla* (Lamiaceae), 6♂, 11♀ (AMNH). *Shasta Co.:* Castle Crag, June 25, 1941, Schuh and Grey, 1♀ (OSU). Hat Creek P. O., July 2, 1955, E. E. Lindquist, 2♀ (UCB). Hat Creek, July 4, 1955, D. L. Dahlsten, 1♀ (UCD). *Sierra Co.:* Downieville, July 8,

1952, M. Cazier, W. Gertsch, and R. Schrammel, 4♂, 8♀ (AMNH). *Siskiyou Co.:* 1 mi W of Bartle, 1220 m, July 7, 1979, R. T. and Joe Schuh, *Monardella odoratissima* (Lamiaceae), 7♂, 5♀ (AMNH). 12.3 mi N of St. Hwy 89 on Powder Hill Road, July 19, 1985, G. M. Stonedahl and J. D. McIver, *Chrysothamnus viscidiflorus* (Asteraceae), 1♂ (AMNH). *Solano Co.:* Vacaville, May 15, 1932, R. L. Usinger, 4♂ (UCB). *Sonoma Co.:* 2 mi E of Healdsburg, May 18, 1966, J. Powell, 2♀ (UCB). Hanleys, Mt. St. Helena, May 3, 1947, T. O. Thatcher, 3♀ (UCB). *Stanislaus Co.:* 2 mi W of Kyburz, June 11, 1966, W. Gagne, 2♀ (UCB). Del Puerto Canyon, Frank Raines Park, 1120 ft, May 15, 1971, C. B. Philip, 1♀ (CAS). Del Puerto Canyon, May 29, 1971, J. Marsh, 1♂ (UCD). Del Puerto Canyon, N Fork Del Puerto Creek, 1000 ft, June 12, 1975, R. Kawin, 2♀ (UCB). *Tehama Co.:* Red Bluff, Samson Slough, April 29, 1984, D. S. Chandler, 1♂ (UNHP). *Trinity Co.:* Carrville, 2400–2500 ft, June 4, 1934, G. and R. Bohart, 1♀ (CAS). Hayfork Ranger Station, 2300 ft, May 18, 1973, A. Chemsak, 1♀ (UCB). Snowslide Park, 7100 ft, July 30, 1972, T. Griswold, 1♀ (PUC). *Tulare Co.:* 4 mi NE of Lemon Cove, May 13, 1963, J. Powell, 4♂, 1♀ (UCB). 5 mi W of Three Rivers, Terminus Res. Camp, June 16, 1971, M. H. Sweet, 1♂, 1♀ (TAMU). Aukland, May 9, 1962, Brunson P. Bliven, 6♂, 2♀ (CAS). Badger, May 28, 1961, Brunson P. Bliven, 5♂, 9♀ (CAS). California Hot Springs, June 9, 1930, E. R. Lesch, 1♂, 1♀ (CAS). Isabella, May 6, 1931, E. C. Van Dyke, 1♀ (CAS). Sequoia National Park, May 28, 1949, W. Dwight Pierce, *Calochortus luteus* (Liliaceae), 2♀ (LACM). *Tuolumne Co.:* 6 mi NE of Sonora, June 19, 1982, P. Oman, 2♀ (OSU). Sonora, May 21, 1969, A. E. and M. M. Michelbacher, 1♂, 1♀ (UCB). *Ventura Co.:* Blue Point Campground, vic. Piru Creek, May 7, 1966, Saul and Suzy Frommer, 2♂ (UCR). N end of Casitas Reservoir, March 15, 1967, P. A. Opler, 1♀ (UCB). Piru, April 20, 1932, E. P. Van Duzee, 13♂, 10♀ (CAS). Santa Paula, E. O. Essig, 1♂ (CAS). Santa Susana, May 27, 1930, 1♂, 1♀ (CAFA). *Yolo Co.:* 2 mi N of Rumsey, June 2, 1973, R. Harris, 1♀ (UCD). Davis, April 27, 1951, E. I. Schlinger, *Artemisia vulgaris* (Asteraceae), 1♀ (UCD). *Yuba Co.:* Camp Far West Reservoir Dam, May 6, 1980, J. A. Powell, 1♂ (UCB). Dry Creek, Spenceville Wildlife Area, May 6, 1980, M. Buegler, 1♂, 1♀ (UCB). **Idaho:** *Oneida Co.:* Holbrook Summit, June 18, 1967, G. F. Knowlton, 1♂ (USU). Ireland Canyon, June 15, 1972, G. F. Knowlton, 1♂ (USU). Sayler Cow Camp, July 23, 1991, W. J. Hanson, 1♀ (USU). **Nevada:** *Humboldt Co.:* 14–16 mi N of Paradise Valley, 7100 ft, July 10, 1966, F., P., and M. Rindge, 1♂ (AMNH). *Ormsby Co.:* No specific locality, 7♂ (HELSINKI). No specific locality, July 1, 1900, C. F. Baker, 4♂, 2♀ (CAS). No specific locality, July 1, 1900, C. F. Baker, 5♂, 2♀ (HELSINKI). **Oregon:** *Baker Co.:* 9 mi E of Halfway, June 7, 1970, Oman, 1♂ (OSU). *Coos Co.:* 7.3 mi E of Bandon, 15 m, July 12, 1979, R. T. and Joe Schuh, 1♀ (AMNH). *Grant Co.:* 11 mi N of Seneca, May 14, 1973, Oman and Musgrave, 1♂ (OSU). *Jackson Co.:* 0.5 mi S of Siskiyou Summit on old Rt 99, 1350 m, June 26, 1979, R. T. and Joe Schuh, *Artemisia cana* (Asteraceae), 9♂, 8♀ (AMNH). 0.5 mi S of Siskiyou Summit on old Rt 99, 1350 m, June 27, 1979, G. Stonedahl, *Phacelia hastata* (Hydrophyllaceae), 3♂, 7♀ (AMNH). 0.5 mi S of Siskiyou Summit on Old Rt 99, 1350 m, June 27, 1979, J. D. Lattin, 1♀ (OSU). 0.5 mi S of Siskiyou Summit on Old Rt 99, 1350 m, June 27, 1979, M. D. Schwartz, *Phacelia* sp. (Hydrophyllaceae), 21♂, 29♀ (AMNH). 12–15 mi E of Ashland, Dead Indian Road, 4500–4900 ft, July 17, 1930, H. A. Scullen, 1♂ (USNM). 12–15 mi E of Ashland, Dead Indian Road, 4500–4900 ft, June 7, 1970, H. A. Scullen, 1♂ (OSU). 29 mi ESE of Eagle Point, 4450 ft, June 23, 1978, Nancy L. Herman, 1♂ (AMNH). Fish Camp Post Office, in meadow, 1521 m, July 24, 1999, M. D. Schwartz, *Lupinus* sp. (Fabaceae), 2♂, 7♀ (CNC). just E of Pinehurst, 1340 m, June 27, 1979, R. T. and Joe Schuh, *Eriophyllum lanatum* (Asteraceae), 7♂, 10♀ (AMNH). Siskiyou Summit on I-5, July 4, 1982, G. M. Stonedahl and T. J. Henry, *Phacelia hastata* (Hydrophyllaceae), 6♂, 2♀ (AMNH). Siskiyou Summit, old Siskiyou Hwy and Frontage Road, 4310 ft, July 1, 1994, M. D. Schwartz, *Phacelia* sp. (Hydrophyllaceae), 4♂, 6♀ (CNC). Siskiyou, June

14, 1959, Kelton and Madge, 8♂, 7♀ (CNC). *Klamath Co.:* 13 mi W of Keno on Rt 66, 4600 ft, June 27, 1979, M. D. Schwartz, 1♂, 1♀ (AMNH). Chiloquin, Rt 97, July 4, 1982, G. M. Stonedahl and T. J. Henry, *Plectritis* sp. (Valerianaceae), 5♂ (AMNH). *Lake Co.:* 5.7 of E of jct Rts. 395 and 140, Warner Mt. Pass, 1765 m, July 3, 1979, R. T. Schuh and B. Massie, 1♂, 1♀ (AMNH). Warner Canyon near Lakeview roadside, 2 mi E of Hwy 395, 5450 ft, July 19, 1971, J. D. Lattin, 9♂, 3♀ (OSU). *Union Co.:* La Grande, June 26, 1926, E. W. Davis, 1♀ (USNM); holotype male (*fusciflavus*) (USNM). *Yamhill Co.:* Dayton, Dorsey's Gravel Bar, July 22, 1963, K. M. Fender, 2♂ (OSU). Wheatland Ferry, July 11, 1957, K. McKay-Fender, 1♂ (OSU). **Utah:** *Emery Co.:* Woodside, July 14, 1954, G. F. Knowlton, 1♂, 1♀ (KU). **Washington:** *Grays Harbor Co.:* Copalis Beach, July 6, 1978, Joe Schuh, 8♂, 3♀ (AMNH).

Plagiognathus vitellinus (Scholtz), revised combination
Figures 14, 19, 33

Capsus vitellinus Scholtz, 1847: 130 (n. sp.).
Psallus vitellinus: Fieber, 1861: 307 (n. comb.).
Plagiognathus Parapsallus vitellinus: Wagner, 1952: 187 (n. comb.).
Parapsallus vitellinus: Kerzhner and Josifov, 1999: 385 (cat.).

DIAGNOSIS: Recognized by relatively *small* size with average total length 3.26, *uniform orange coloration* (fig. 14) of dorsum, *pale coloration of antennal segment 1*, narrow dark band at base of antennal segment 2 with remainder of segment pale (fig. 19), and generally pale coloration of legs, the femora with some weak dark blotches and tibial spines with distinct, although not particularly large, dark spots at bases. Distinguished from *delicatus* (fig. 7) and lighter colored *cornicola* (fig. 7) specimens by pale coloration of antennal segment 1. Distinguished from *viticola* (fig. 14) by uniformly orange coloration of dorsum and black spots at bases of tibial spines.

Male: Total length 2.86–3.50, length apex clypeus–cuneal fracture 2.03–2.34, width across pronotum 0.92–1.15. GENITALIA (fig. 33): Body of vesica relatively broad on basal one-half, more slender distally; posterior apical spine much longer than anterior, strongly bent subapically, spines more or less parallel just distad of secondary gonopore and at more or less right angles to body of vesica; flange apparently not developed.

Female: Total length 3.04–3.30, length apex clypeus–cuneal fracture 2.16–2.27, width across pronotum 1.02–1.14.

HOSTS: Many records from *Picea* spp. (Pinaceae) in North America indicate that this is the preferred breeding host. Also recorded from other pinaceous genera, but possibly not breeding there. Nonpinaceous occurrences certainly do not represent breeding records.

DISTRIBUTION: Widely distributed in the Palearctic. Introduced into northeastern North America, where it is known from Maine west to Iowa and south to Virginia and Maryland.

DISCUSSION: This taxon was first recorded from North America by Henry and Wheeler (1973), who documented its widespread occurrence in Pennsylvania, with *Picea* spp. most frequently serving as the host. Wheeler and Henry (1992) confirmed a wider distribution for the taxon extending its range from Maine to Virginia. Henry and Wheeler (1973) noted that *vitellinus* was probably introduced on nursery stock. The earliest known collection in North America, based on specimens I have examined, is 1972.

SPECIMENS EXAMINED: USA.—**Delaware:** *Kent Co.:* Dover, May 28, 1984, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 2♂, 3♀ (PDA). **Iowa:** *Linn Co.:* Cedar Rapids, May 31, 1994, J. C. Schaffner, *Picea abies* (Pinaceae), 12♂, 12♀ (TAMU). *Warren Co.:* 3 mi NE of Hartford, June 3, 1994, J. C. Schaffner, *Gleditsia triacanthos* (Fabaceae), 6♂, 3♀ (TAMU). **Maryland:** *Washington Co.:* Hagerstown, May 23, 1986, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 3♂ (PDA). **New Jersey:** *Cumberland Co.:* Vineland, May 29, 1979, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 2♂, 5♀ (PDA). *Ocean Co.:* Lakehurst, June 15, 1980, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♀ (PDA). **New York:** *Nassau Co.:* East Meadow near Rt 25 on Bluebird Drive, May 28, 1986, M. D. Schwartz, *Picea abies* (Pinaceae), 3♂, 6♀ (AMNH). Roslyn, Fine Arts Museum and Gardens on Rt 25A, June 13, 1986, M. D.

Schwartz, *Picea abies* (Pinaceae), 3♂, 4♀ (AMNH). *Rockland Co.:* Nyack, Memorial Park, June 12, 1988, M. D. Schwartz, *Picea abies* (Pinaceae), 12♂, 10♀ (AMNH). South Nyack, Ross Avenue, June 18, 1988, M. D. Schwartz, *Picea* sp. (Pinaceae), 4♂, 8♀ (AMNH). *Suffolk Co.:* East Quogue, Quogue Wildlife Refuge, July 19, 1988, M. D. Schwartz, *Picea* sp. (Pinaceae), 2♀ (AMNH). **Pennsylvania:** *Blair Co.:* Altoona, Fanella's Nursery, July 17, 1973, A. G. Wheeler, Jr., *Pseudotsuga* sp. (Pinaceae), 2♀ (PDA). Newry, June 5, 1978, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♀ (PDA). *Bucks Co.:* Jamison, 5 Spruce Farm, June 7, 1973, J. F. Stimmel, *Picea abies* (Pinaceae), 2♀ (PDA). *Cambria Co.:* Ebensburg, May 12, 1976, A. G. Wheeler, Jr., *Picea pungens* (Pinaceae), 1♀ (PDA). *Centre Co.:* State College, June 10, 1973, A. G. Wheeler, Jr., *Picea rubens* (Pinaceae), 1♀ (PDA). *Chester Co.:* Unionville, July 1, 1987, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♂ (PDA). Unionville, June 1, 1987, A. G. Wheeler, Jr., *Picea pungens* (Pinaceae), 3♀ (PDA). *Crawford Co.:* Blooming Valley, Blooming Valley Nursery, July 12, 1972, F. Negley, *Picea abies* (Pinaceae), 1♂, 1♀ (PDA). *Cumberland Co.:* Camp Hill, West Shore C.C., May 8, 1974, A. G. Wheeler, Jr., 2♀ (PDA). Camp Hill, West Shore C.C., May 8, 1974, A. G. Wheeler, Jr., *Pseudotsuga* sp. (Pinaceae), 2♂ (PDA). Conifer Hills, June 21, 1973, B. Stinner, *Picea abies* (Pinaceae), 1♀ (PDA). *Dauphin Co.:* Harrisburg, East Harrisburg Cemetery, June 4, 1973, A. G. Wheeler, Jr., *Picea* sp. (Pinaceae), 3♂, 5♀ (PDA). Harrisburg, East Harrisburg Cemetery, May 22, 1977, A. G. Wheeler, Jr., *Larix decidua* (Pinaceae), 2♂ (PDA). Harrisburg, May 30, 1973, A. G. Wheeler, Jr., *Pseudotsuga taxifolia* (Pinaceae), 4♀ (PDA). Hershey, June 8, 1975, A. G. Wheeler, Jr., *Pseudostuga menziesii* (Pinaceae), 3♂, 3♀ (PDA). *Erie Co.:* Erie, Johnston's Nursery, July 25, 1978, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 1♀ (PDA). Fairview, Black Hills, July 11, 1972, F. Negley, *Picea* sp. (Pinaceae), 1♂ (PDA). *Indiana Co.:* Indiana, Oakland Cemetery, June 15, 1973, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 2♂, 3♀ (PDA). Strongstown, Carino's Nursery, July 7, 1972, *Picea* sp. (Pinaceae), 3♀ (PDA). *Lancaster Co.:* Lancaster, Huber's Nursery, June 13, 1973, W. Blosser, *Picea abies* (Pinaceae), 1♂, 1♀ (PDA). *Lebanon Co.:* Rt 22 at I-81 exit (Rt 934), June 24, 1974, T. J. Henry, *Picea glauca* (Pinaceae), 1♂ (PDA). *Montgomery Co.:* Merion Station, Barnes Arboretum, June 2, 1982, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 6♂, 2♀ (PDA). Near Dresher, Mfg. Golf Club, May 24, 1973, A. G. Wheeler, Jr., *Larix decidua* (Pinaceae), 1♂, 1♀ (PDA). Philadelphia, Forest Hills Cemetery, June 7, 1973, J. F. Stimmel, *Picea abies* (Pinaceae), 1♂, 2♀ (PDA). *Washington Co.:* Burgettstown, Iannetti's Nursery, June 5, 1973, D. Trelka, *Picea pungens* (Pinaceae), 2♂, 11♀ (PDA). McMurray, June 9, 1973, D. Trelka, *Picea glauca* (Pinaceae), 1♀ (PDA). N of Washington, Eberley's Nursery, June 6, 1973, D. Trelka, *Picea abies* (Pinaceae), 1♂, 6♀ (PDA). S of West Finley, June 11, 1973, D. Trelka, *Picea abies* (Pinaceae), 1♂ (PDA). **Virginia:** *Montgomery Co.:* Blacksburg, Virginia Polytechnic Inst., June 3, 1989, A. G. Wheeler, Jr., *Picea glauca* (Pinaceae), 3♂, 8♀ (USNM). *Roanoke Co.:* Hollins, Hollins College, May 5, 1985, A. G. Wheeler, Jr., *Picea abies* (Pinaceae), 1♀ (PDA). **West Virginia:** *Berkeley Co.:* No specific locality, May 27, 1981, T. L. Mason, 2♂, 1♀ (PDA).

Plagiognathus viticola (Johnston), new combination
Figures 14, 19, 33

Sthenarus viticola Johnston, 1935: 16 (n. sp.).

DIAGNOSIS: Recognized by the *small size, orange coloration* (fig. 14) of dorsum tinged with brown, and *entirely pale antennae and tibiae.* Similar in coloration of dorsum to *cornicola* and *delicatus*, but distinguished from them by the smaller size, the entirely pale antennae, and the tibial spines without dark spots at bases.

REDESCRIPTION: *Male:* Small, delicate; total length 2.68–2.98, length apex clypeus–cuneal fracture 2.68–2.98, width across pronotum 0.97–1.02. COLORATION (fig. 14): Coloration of dorsum very weakly mottled, varying from pale greenish to orange or golden brown, the last being the most common; calli almost always darker than remainder of pronotum; antennae entirely pale (fig. 19); clypeus usually castaneous, sometimes

much of face below antennal insertions also castaneous; labium pale except at base and apex; venter brown, including metathoracic scent-gland evaporatory area; legs almost entirely pale, including coxae; femora often with some dark spots; tibiae pale over entire length; tibial spines without dark spots at bases. SURFACE AND VESTITURE: Dorsum weakly granular, smooth, moderately shining. Vestiture of dorsum composed of recumbent, pale, golden, shining, simple setae. STRUCTURE: Body elongate ovoid, hemelytra declivent laterally, dorsum noticeably convex; pronotum declivent anteriorly; frons nearly straight across between eyes, head strongly declivent, clypeus never visible from above; anteocular distance 1.5 times diameter of antennal segment 1; head projecting below eye by diameter of antennal segment 1; labium reaching to apex of hind coxae. GENITALIA (fig. 33): Body of vesica relatively stout, very strongly curving, U-shaped, base of vesica falling somewhat below level of secondary gonopore; posterior apical spine longer, weakly curving and forming a weak angle relative to body of vesica, anterior spine much longer than posterior, curving toward apex, and nearly perpendicular to body of vesica; vesical flange moderately developed, reaching to about base of secondary gonopore.

Female: Very similar to male in coloration but body more strongly ovoid in outline. Total length 2.63–2.85, length apex clypeus–cuneal fracture 1.81–1.92, width across pronotum 0.97–1.02.

HOSTS: *Vitis* spp. (Vitacae).

DISTRIBUTION: Known from widely scattered localities in the eastern United States, from Pennsylvania and Illinois in the north to Mississippi and Texas in the south.

DISCUSSION: This species was described in *Sthenarus* and has been maintained there by subsequent authors; my concept of it is based on the examination of a single paratype and other material that I consider to be authoritatively identified. Examination of the male genitalia clearly indicates that *viticola* is a *Plagiognathus* species, however.

SPECIMENS EXAMINED: USA.—**Illinois:** *Hardin Co.:* Elizabethtown, June 22, 1932, Ross, Dozier, and Park, 1♀ (USNM). **Mississippi:** *Alcorn Co.:* Corinth, May 25, 1931, H. G. Johnston, paratype: 1♂ (USNM). **Pennsylvania:** *Dauphin Co.:* near Clark's Ferry, June 8, 1983, A. G. Wheeler, Jr., *Vitis labrusca* (Vitaceae), 5♂, 3♀ (PDA). Nyes and Willoughby Roads, May 25, 1977–June 10, 1975, T. J. Henry, *Vitis* sp. (Vitaceae), 4♂, 12♀ (PDA). **Tennessee:** *McNairy Co.:* E of Eastview on Rt 57, May 31, 1985, A. G. Wheeler, Jr., *Vitis* sp. (Vitaceae), 1♂, 1♀ (PDA). **Texas:** *Brazos Co.:* 3 mi NE of Edge, May 25, 1984, T. L. Harrison, 1♂ (CNC). *Travis Co.:* Shelberg Tract near Cypress Creek arm of Lake Travis, May 8, 1994, J. C. Schaffner, 1♀ (CNC).

PALEARCTIC SPECIES

The following *Plagionathus* species are those listed by Kerzhner and Josifov (1999) for the Palearctic fauna, but not those that are also known to occur in North America. My examination of the Palearctic fauna has been made primarily to determine generic limits in *Plagiognathus.* I have concentrated on presenting standardized illustrations of the male genitalia (where available) because these are the structures that are most helpful in placement of species to genus.

For more complete synonymies for these taxa see Schuh (1995) and Kerzhner and Josifov (1999). For distributional summaries see Kerzhner and Josifov (1999).

Plagiognathus alashanensis Qui and Nonnizab

Plagiognathus alashensis Qui and Nonnaizab, 1993: 29, 34.

No specimens of this northern Chinese species have been examined by me. Nonetheless, the figures of the male genitalia provided by the authors in association with the original description indicate that the taxon is certainly a *Plagiognathus* species.

HOST: *Salix* sp. (Salicaceae) (Qi and Nonnizab, 1993).

Plagiognathus albus Reuter

Plagiognathus albus Reuter, 1894: 147 (n. sp.).

Ribes (1978) first examined the male genitalia of this species. His illustrations conform to the genitalic type that I have treated

as diagnostic for *Plagiognathus,* with two flattened, elongate, apical spines. I examined, although did not dissect, a male and a female specimen, collected by J. Ribes near Vinuesa in the Spanish province of Soria; these are part of the same material on which Ribes (1978) based his genitalic illustrations. The coloration is entirely pale, including the legs; the tibial spines are black, but have at most faintly darkened spots at the bases.

HOST: *Thymus mastichina* (Lamiaceae) (Ribes, 1978).

Plagiognathus amurensis Reuter
Figure 39

Plagiognathus amurensis Reuter, 1883: 454, 513 (n. sp.).

The first modern authors to study this species were Josifov and Kerzhner (1972) as part of their work on the Heteroptera of Korea. They illustrated the genitalia, as did Li and Zheng (1991) in their work on *Plagiognathus* spp. from China. Although illustrations from both publications clearly indicate that the authors were working with a *Plagiognathus* sp., neither is comparable with the figures I have provided for the North American fauna. Thus, I include an illustration of the vesica (fig. 39), based on material from Russia, Primorsky Krai, Khaganskii District, Andreevka.

HOST: *Artemisia vulgaris* (Asteraceae) (Kerzhner, 1988).

Plagiognathus bipunctatus Reuter
Figure 39

Plagiognathus bipunctatus Reuter, 1883: 451 (n. sp.).

The coloration and vestiture of this widespread species are similar to those of *chrysanthemi,* being pale green and black, respectively. There has been little question about the generic placement of the taxon; the male genitalia are consistent with those of most species I have placed in *Plagiognathus* (fig. 39).

HOST: *Mentha* sp. (Lamiaceae) (Linnavuori, 1993).

Plagiognathus collaris (Matsumura)
Figure 39

Chlamydatus collaris Matsumura, 1911: 40 (n. sp.).

I have examined specimens of this species from Russia, Sakhalin Island, Novoalexandrosk, determined by I. M. Kerzhner. The male genitalia are illustrated in figure 39. They are of the type for other species herein placed in *Plagiognathus.*

HOSTS: Kerzhner (1978) recorded this species from a variety of plants, including *Geranium* sp. (Geraniaceae), *Filipendula* sp. and *Rosa rugosa* (Rosaceae), and Apiaceae.

Plagiognathus fulvipennis (Kirschbaum)
Figure 39

Capsus fulvipennis Kirschbaum, 1856: 336 (n. sp.).

I have examined specimens of this species from the Crimean region of the Ukraine, determined by I. M. Kerzhner. The male genitalia are illustrated in figure 39. They are similar in form to those of *P. chrysanthemi.*

HOSTS: *Echium* sp. (Boraginaceae) (Wagner, 1975); *Echium* sp., *Galium* sp. (Rubiaceae) (Taminini, 1981); *Echium vulgare* (Kerzhner, 1964).

Plagiognathus fusciloris Reuter

Plagiognathus fusciloris Reuter, 1878: 78 (n. sp.).

This species was originally described by Reuter on the basis of a single female from France. I have not seen any authentically identified material. The male genitalia, as illustrated by Wagner (1975), indicate that it is a *Plagiognathus* species, however.

HOST: *Gypsophila struthium* (Caryophyllaceae) (Ribes et al., 1997)

Plagiognathus maculosus Zhao

Plagiognathus maculosus Zhao, 1996: 352 (n. sp.).

I have not seen a copy of the paper in which this species from China was described.

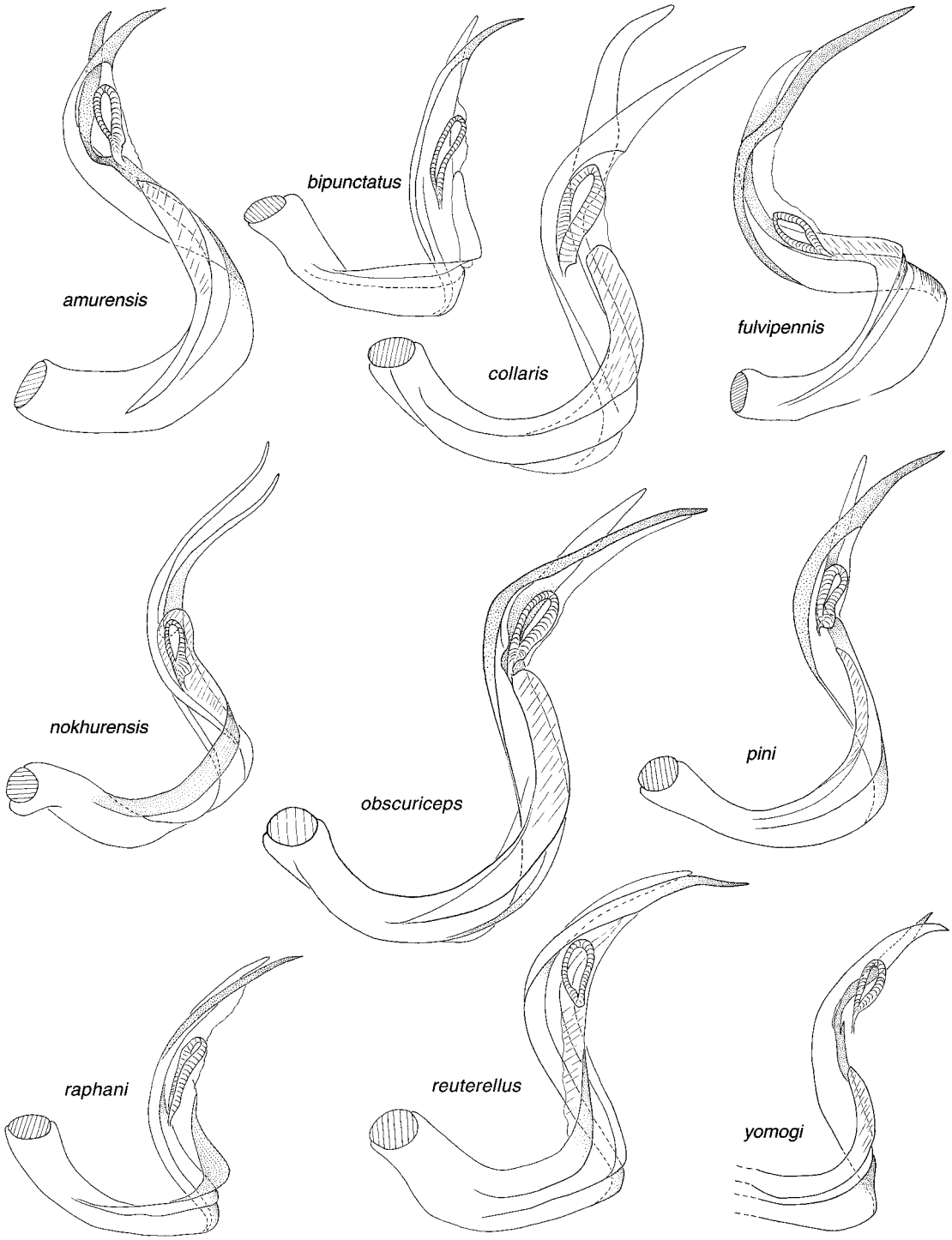

Fig. 39. Male genitalia of Palearctic *Plagiognathus* spp.

Plagiognathus nokhurensis Putshkov, incertae sedis
Figure 39

Plagiognathus nokhurensis Putshkov, 1976: 1042 (n. sp.).

I have examined paratypes of this species kindly provided by I. M. Kerzhner; they are from the Kopetdag Mountains of Turkmenistan. The male genitalia, as shown in figure 39, are not of the typical *Plagiognathus* type, especially the area of the vesica surrounding the secondary gonopore and also the details of the chitinous straps of the vesica. In fact, the vesica of *nokhurensis* is very similar to that found in two undescribed species from the southwestern United States that feed on species of *Arctostaphylos* (Ericaceae), especially in the long, almost filamentous, apical processes. I am treating *nokhurensis* as incertae sedis, because it does not appear to belong to *Plagiognathus* under the present conception of that group.

HOST: *Lonicera olgae* (Caprifoliaceae) (Putshkov, 1976).

Plagiognathus obscuriceps (Stål)
Figure 39

Eurymerocoris obscuriceps Stål, 1858: 190 (n. sp.).

This species was originally described from Siberia; I have examined specimens from Russia, Yakutia, River Amgu, identifed by I. M. Kerzhner. The genitalia (fig. 39) are of the typical *Plagiognathus* type and appear to conform to the illustration provided by Qi and Nonnizab (1993).

HOST: *Salix* sp. (Salicaceae) (Lindberg, 1928).

Plagiognathus olivaceus Reuter

Plagiognathus olivaceus Reuter, 1880: 23 (n. sp.).

I have examined three specimens of this species from Sines, Portugal, that were collected and identified by Eckerlein. I did not dissect the male genitalia; however, the figures provided by Wagner (1955) would clearly place this taxon in *Plagiognathus.*

HOSTS: *Thymus vulgaris* (Wagner, 1955); *Lavandula stoechas* (Eckerlein material) (Lamiaceae).

Plagiognathus pallescens Zheng and Li

Plagiognathus pallescens Zheng and Li, 1991: 89, 91 (n. sp.).

Schuh et al. (1995) commented on possible confusion concerning the identity of this species from south China, noting that the two male paratypes they examined were not conspecific. One of the specimens examined by Schuh et al. (1995) was apparently conspecific with those dissected by Zheng and Li (1991), in that the genitalia conformed to the figure provided by the latter authors. The genitalia are *Plagiognathus*-like, based on my interpretation of the figure of Zheng and Li. Nonetheless, as is the case with some other Palearctic species currently placed in *Plagiognathus,* further study of this taxon will help to clarify whether it is correctly placed.

HOST: Unknown.

Plagiognathus pallidus Reuter

Plagiognathus pallidus Reuter, 1900: 257 (n. sp.).

Since the time of its original description by Reuter on the basis of a single female, this Algerian species has apparently not been re-collected. Wagner (1975) indicated that confirmation of the placement of *pallidus* would have to await examination of the male genitalia.

HOST: Unknown.

Plagiognathus pini Vinokurov
Figure 39

Plagiognathus pini Vinokurov, 1978: 335 (n. sp.).

This species was described on the basis of material from the Russian Far East. The genitalia of a specimen from Russia, Magadan, Jack London Lake, identified by I. M. Kerzhner, are illustrated in figure 39 and are of the typical *Plagiognathus* type.

HOST: *Pinus pumila* (Pinaceae).

Plagiognathus plagiathus Reuter

Plagiognathus plagiathus Reuter, 1876a: 54 (n. sp.).

I have not examined specimens of this Italian species. Illustrations of the male genitalia provided by Wagner (1975) indicate that this is clearly a *Plagiognathus* sp.

HOST: Unknown.

Plagiognathus raphani Wagner
Figure 39

Plagiognathus raphani Wagner, 1963: 78 (n. sp.).

I have examined four specimens from Cyprus that are apparently *P. raphani*, based on the idenfication of Eckerlein. The vesica, as illustrated in figure 39, is similar to that of *tamaninii* Carapezza, as is the left paramere, which has a small bump at the base of the shaft. The right paramere, however, lacks the large ''hump'' shown in the figures of Carapezza (1998) for *tamaninii.* The figures provided by Wagner (1963) are not oriented in such a way as to to be easily compared with those of Carapezza or me, but they nonetheless conform reasonably well to the specimens I am treating as *raphani.*

HOST: *Raphanus* sp. (Brassicaceae) (Wagner, 1975).

Plagiognathus reuterellus, new name
Figure 39

Plagiognathus flavipes Reuter, 1875: 57 (n. sp.).

The transfer of *Capsus flavipes* Provancher to *Plagiognathus* makes *flavipes* Reuter a junior secondary homonyn. I therefore propose the new name, *Plagiognathus reuterellus,* for *flavipes* Reuter.

This taxon was placed in *Poliopterus* (= *Europiella*) by Wagner (1952), but as indicated by Schuh et al. (1995), the genitalia (fig. 39) are of the typical *Plagiognathus* type. The specimens I have examined and illustrated were collected in Spain (?) by J. Ribes at Conreria (Marasme), on *Lonicera* (Caprifoliaceae).

ETYMOLOGY: Named for O. M. Reuter, who originally described the species.

HOST: *Lonicera* sp. (Wagner, 1975; specimens examined).

Plagiognathus tamaninii Carapezza

Plagiognathus tamaninii Carapezza, 1998: 33 (n. sp.).

Although I have not seen specimens of this species from Cyprus, the male genitalia as illustrated by Carapezza (1998) clearly indicate its placement in *Plagiognathus.*

Plagiognathus vaulogeri Reuter

Plagiognathus vaulogeri Reuter, 1895: 141 (n. sp.).

This species was originally described from Algeria and has apparently never been recollected. Although Wagner (1975) apparently examined the material studied by Reuter, he did not illustrate the male genitalia.

HOST: Unknown.

Plagiognathus yomogi Miyamoto
Figure 39

Plagiognathus yomogi Miyamoto, 1969: 88 (n. sp.).

The illustrations provided by Miyamoto (1969) and my examination of the male genitalia (fig. 39) of specimens from Russia, Primorsky Krai, Khaganskii District, Andreevka, indicate that this is clearly a *Plagiognathus* species. The coloration and general appearance of the specimens are very similar to those of *Plagiognathus annulatus* Uhler from North America.

HOSTS: *Artemisia* spp. (Asteraceae) (Miyamoto, 1969; Yasunaga, 1999).

Plagiognathus zuvandiensis Putshkov

Plagiognathus zuvandiensis Putshkov, 1978: 645 (n. sp.).

This species was described from the Talysh Mountains of Azerbaijan. The figures of the male genitalia provided by Putshkov (1978) confirm its placement in *Plagiognathus.* I have examined, but not dissected, two paratypes, which have a uniform orange coloration devoid of dark markings; the tibial spines also lack black spots at bases.

HOST: Unknown.

TAXA REMOVED FROM *PLAGIOGNATHUS*

Atractotomus griseolus (Reuter), new combination
Figure 40

Myochroocoris griseolus Reuter, 1909: 77 (n. sp.).
Plagiognathus gleditsiae Knight, 1929c: 265 (n. sp.). NEW SYNONYMY.

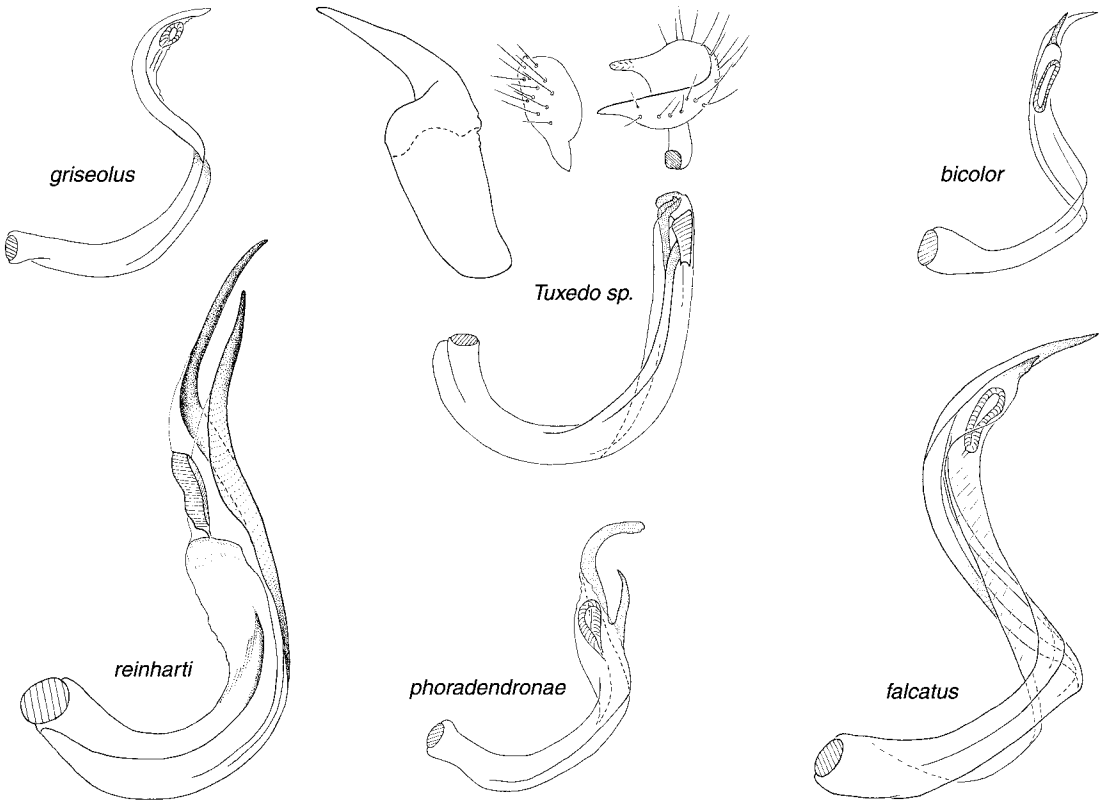

Fig. 40. Male genitalia of species transferred out of *Plagiognathus* and species incertae sedis.

Reuter (1909) described *Myochroocoris griseolus* from an unspecified locality in Texas on the basis of two male and three female specimens; they were deposited in the Naturhistorisches Museum Wien. Subsequently, Knight (1929c) described *Plagiognathus gleditsiae* from College Station, Texas, on the basis of 10 females taken on *Gleditsia triacanthos.* Knight noted that *gleditsiae* was allied to *Plagiognathus delicatus* (Uhler), but was distinguished from it by the wider head and shorter rostrum. Comparison of Reuter's syntypes of *griseolus* with specimens of *gleditsiae,* including the holotype, indicates that these two nominal taxa are the same; *griseolus* is the senior synonym on the basis of priority.

Although this taxon is superficially similar in appearance to *P. delicatus,* the structure of the male genitalia (fig. 40) makes it clear that whereas *delicatus* obviously belongs to *Plagiognathus, griseolus* is much more closely allied with *Atractotomus*; also, the sexually dimorphic antennae are an obvious feature of most *Atractotomus* species, but unknown in *Plagiognathus.* I have not located scalelike setae on the specimens I have examined, but it is already known that such setae occur in very limited numbers in some species easily assignable to *Atractotomus* on the basis of other characters (Stonedahl, 1990). Furthermore, few if any spicules appear to be present distally on the dorsal surface of the hind femur. This latter attribute was also considered as synapomorphic for *Atractotomus* by Stonedahl (1990). Further study may show that *griseolus* belongs to another generic group. For the meantime, however, its placement in *Atractotomus* is far superior to leaving it in *Plagiognathus* or as incertae sedis.

To ensure the uniform application of this name, I have selected one of the males of *griseolus* as the lectotype, and affixed the following label:

Lectotype, *Myochroocoris griseolus* Reuter, det. R. T. Schuh, 2001

The synonymy of *Myochroocoris griseolus* Reuter with *Plagiognathus gleditsiae* Knight, and the transfer of that species to *Atractotomus,* makes *Myocrhoocoris* a junior synonym of *Atractotomus* **new synonymy.**

Europiella artemisiae (Becker)

Plagiognathus diversus Van Duzee 1917b: 283 (n. sp.). NEW SYNONYMY.

This taxon is a junior synonym of *Europiella artemisiae* (Becker), as determined by examination of eight male and female paratypes from Santa Cruz County, California, San Joaquin County, California, and Niles Canyon, Alameda County, California, that are deposited in the California Academy of Sciences.

Europiella decolor (Uhler)

Agalliastes fumidus Uhler, 1895:54 (n. sp.) NEW SYNONYMY.

In his original description, Uhler (1895: 55) said that he had seen a single male from Steamboat Springs, Colorado, collected by C. F. Baker on July 15. I encountered a single specimen in the National Museum of Natural History, Washington, D.C., bearing a handwritten label ''*Plagiognathus fumidus* Uhler''; it also bears the printed label ''type''. Apparently on the basis of this specimen Kelton (1965:1142) transferred *fumidus* to *Plagiognathus.* The above-mentioned specimen cannot, however, be the holotype of *fumidus* because it is a female and because it fits the original description very poorly; indeed, Uhler's description of *fumidus* in almost every detail fits his concept of *Europiella decolor.* Furthermore, Uhler described *fumidus* in *Agalliastes,* the genus in which he also described *Europiella decolor.* Other Uhler species placed in *Plagiognathus* in the present paper were described by Uhler in *Plagiognathus,* observations offering additional justification for treating *fumidus* as the same as *Europiella decolor* Uhler.

To create an unequivocal concept for *fumidus,* I am designating as neotype a specimen identifiable as *Europiella decolor,* which fits the original description of *fumidus* much better than does the specimen labeled as the ''type'', especially because the mesoscutum in *Europilla decolor* and many other members of the genus is ''yellow on either side'', as indicated by Uhler for *fumidus.* This male specimen is deposited in the National Museum of Natural History, Washington, D.C., and bears the following label data:

> USA: COLORADO: Rio Blanco Co.: 30 mi. N Rifle on Rt. 13, 6800 ft., August 14, 1986, coll.: Randall T. Schuh; *Artemisia ludoviciana* var. *incompta* (Nutt.) Cronq. (Asteraceae); Neotype *Agalliastes fumidus* Uhler, det R. T. Schuh.

Europiella senjoenis (Linnavuori), new combination

Psallus senjoensis Linnavuori, 1961: 167 (n. sp.).
Psallus senjoensis: Kerzhner and Josifov, 1999: 420 (catalog; note indicating correct placement in *Plagiognathus*).
Plagiognathus senjoensis: Yasunaga, 1999: 186 (n. comb.).

The generic placement of this species has been somewhat confused. Nonetheless, the genitalic figures originally provided by Linnavuori (1961) and subsequent illustrations of the taxon (e.g., Yasunaga, 1999) make it clear that this is a *Europiella* sp., especially regarding the form of the left paramere, with the structure of the vesica being very similar to that of *Europiella artemisiae* (Becker) and *Europiella decolor* (Uhler).

Tuxedo, new genus
Figure 40

TYPE SPECIES: *Chlamydatus bicinctus* Van Duzee, 1914.

DIAGNOSIS: Recognized by the mostly castaneous background coloration of the dorsum with one or two large white maculae on the hemelytra. Sexual dimorphism moderate to very pronounced, male with long to very long hemelytra, parallel-sided; females ovate. Antennal segment 2 sexually dimorphic, cylindrical and slightly enlarged in males, more slender and tapered toward base in females. Male genitalia (fig. 40) with vesica more or less J-shaped, very weakly twisted; secondary gonopore very close to apex, with an adjacent sclerotized rod. Most similar in coloration, sexual dimorphism (including antennae), and structure of male

genitalia to *Coniferocoris* Schwartz and Schuh. Distinguished by the polished and shining dorsum, the strongly contrasting black and white coloration in at least the males of most species, and the fact that *Coniferocoris* spp. are restricted to members of the Pinaceae whereas *Tuxedo* spp. all feed on angiosperms.

DESCRIPTION: *Male*: Macropterous, of small to moderate size, delicate, elongate, nearly parallel-sided. COLORATION: Dorsum reddish or castaneous, with distinctive contrasting white or cream-colored maculae on corium-clavus and cuneus or less frequently only on cuneus. SURFACE AND VESTITURE: Dorsal body surface polished and shining, impunctate. Dorsal vestiture of recumbent simple, often shining, setae. STRUCTURE: Head short, barely protruding beyond anterior margin of eyes, only slightly projecting below ventral margin of eyes; antennal segment 2 cylindrical, not tapered, about the same diameter as antennal segment 1; labium reaching to about apex of hind coxae; abdomen slender, genital capsule relatively small. GENITALIA (fig. 40): Vesica more or less J-shaped, very weakly twisted; secondary gonopore very close to apex, with an adjacent sclerotized rod; phallotheca with apical portion elongate and slender, at nearly right angle to body of structure; left paramere boat-shaped; right paramere lanceolate.

Female: Ovate, body form more compact than in male; submacropterous, hemelytra just covering abdomen; coloration similar to male, but sometimes showing dimorphism; surface and vestiture as in male; antennal segment 2 sexually dimorphic, more slender and strongly tapered toward base in female than in male.

ETYMOLOGY: Named for the distinctive black and white color pattern found in most species. From American English.

DISCUSSION: The species listed below appear to form a monophyletic group whose distribution is restricted to far western North America, ranging from Oregon south to northern Baja California, Mexico, and east as far as the Wasatch Range in Utah and eastern Arizona. All appear to feed on woody perennials, including species of *Ceanothus, Cercocarpus, Quercus,* and others.

In the present treatment I have made no attempt to determine issues of synonymy among the described nominal species, but establish only that they might be treated as congeneric. Material I have examined suggests that there are at least 12 species assignable to *Tuxedo*; more detailed study may increase that number.

The structure of the genitalia appears to be quite constant across species. The overall size and type of coloration are similar to species placed in the genus *Sejanus* Distant, from the Indo-West Pacific (see Schuh, 1984) and might also be compared to species of *Psallovius* Henry from North America. The form of the male genitalia and the type of sexual dimorphism is most similar to that of species placed in *Coniferocoris* Schwartz and Schuh. The shining dorsum, the bold black and white coloration in the males of most species, and the habit of feeding on angiosperms (rather than Pinaceae) in most species of distinguish *Tuxedo* spp. from those of *Coniferocoris,* however.

Tuxedo bicinctus (Van Duzee), new combination

Chlamydatus bicinctus Van Duzee, 1914: 30 (n. sp.).

Examination of large numbers of paratypes from San Diego Co., California, deposited in the California Academy of Sciences, indicates that this is a *Tuxedo* species.

Tuxedo cruralis (Van Duzee), new combination

Plagiognathus diversus cruralis Van Duzee, 1917b: 283 (n. var.).

This taxon was originally described as a variety of *Plagiognathus diversus* Van Duzee (= *Europiella artemisiae* (Becker)). Examination of specimens from the California Academy of Sciences, including a paratype and others identified by Van Duzee as *cruralis,* indicates that it is neither a species of *Europiella* nor of *Plagiognathus.* The taxon is correctly placed in *Tuxedo.*

Tuxedo flavicollis (Knight), new combination

Microphylellus flavicollis Knight, 1929a: 43 (n. sp.).

HOLOTYPE: Female: ''Tampico, Wash., May 10, 1926, E. W. Davis Col.'' Deposited in the National Museum of Natural History, Wahington, D.C.

Examination of the holotype of this taxon (and a paratype from Humboldt, Co., California) indicates that it is a *Tuxedo* sp. As with several other species described by Knight, it is unfortunate that the holotype of this species is a female, and moreover that it is in poor condition. It is quite possible that the holotype and the examined paratype do not represent the same species. It may, however, be possible to fix the identity of the type because it comes from the northern limits of the distribution of the group where diversity is lowest.

Tuxedo minor (Knight), new combination

Microphylellus minor Knight, 1929a: 42 (n. sp.).

HOLOTYPE: male: ''Fresno, Calif., June 20, 1926, C. J. Drake''. Deposited in the National Museum of Natural History, Washington, D.C.

Examination of the holotype, as well as the allotype female from the type locality, indicates that this is a species of *Tuxedo.* As the name would suggest, this is a relatively small species, but the color pattern is distinctive for the group.

Tuxedo nicholi (Knight), new combination

Microphylellus nicholi Knight, 1929a: 42 (n. sp.).

HOLOTYPE: Male: ''S. Catalina Mts., Alt. 3200, Ariz., Apr. 25, 1926, A. A. Nichol''. Deposited in the National Museum of Natural History, Washington, D.C.

Examination of the holotype, and paratypes from the type locality, indicates that this is a species of *Tuxedo.*

Zophocnemis Kerzhner, revised status

Plagiognathus (*Zophocnemis*) Kerzhner, 1962: 385 (n. subgen.).

TYPE SPECIES: *Psallus bicolor* Jakovlev, 1880.

Kerzhner (1962) recognized the distinctive nature of *Psallus bicolor* Jakovlev among other species which at that time were placed in *Plagiognathus*; he created for it the subgenus *Zophocnemis.* Schuh et al. (1995) stated that *bicolor* had typical *Plagiognathus* male genitalia, and that they were therefore placing the species in that genus. A closer comparative examination indicates that *bicolor* is not what might be called ''typical'' of *Plagiognathus*; indeed, the small size, delicate secondary gonopore, and weakly developed apical spines suggest a possible relationship closer to the *Atractotomus* group of genera (see Schuh, 2000). Furthermore, the short, rather broad head, the flattened body, and the flattened abdomen and small genital capsule are not typical of *Plagiognathus* species. For these reasons I am elevating *Zophocnemis* to generic status.

Zophocnemis bicolor (Jakovlev)
Figure 40

Psallus bicolor Jakovlev, 1880: 219 (n. sp.).

The male genitalia of *bicolor* are smaller and much more delicate than in nearly all species I am assigning to *Plagiognathus,* as seen in figure 40, which is based on specimens from the Crimean region of the Ukraine.

HOST: *Acroptilon pincris* (Asteraceae) (Kerzhner, 1964:998).

SPECIES INCERTAE SEDIS

Plagiognathus alpinus (Van Duzee), new combination

Microphylellus alpinus Van Duzee, 1916b: 242 (n. sp.).

The synonymy of *Microphylellus* with *Plagiognathus* leaves the placement of this species from California in question.

Plagiognathus biobioensis (Carvalho), new combination

Microphylellus biobioensis Carvalho, 1984: 176 (n. sp.).

The synonymy of *Microphylellus* with *Plagiognathus* leaves the placement of this species from Chile in question. The genitalic illustrations provided by Carvalho (1984) indicate clearly that *biobioensis* is not a *Plagiognathus* species.

Plagiognathus brevicornis (Knight), new combination

Microphylellus brevicornis Knight, 1929a: 41 (n. sp.).

HOLOTYPE: female: ''Santa Cruz Riv., Pima Co., Ariz., Apr. 20, 1926, A. A. Nichol''. Deposited in the National Museum of Natural History.

The synonymy of *Microphylellus* with *Plagiognathus* leaves the placement of this species from Arizona in question. Because the type is a female, and because my studies so far have provided no obvious association with males that can be dissected, it is difficult to say what the affinities of this rather nondescript, pale species may be.

Plagiognathus confusus Reuter

Plagiognathus confusus Reuter, 1909: 80 (n. sp.).

Reuter (1909) described *Plagiognathus confusus* from Nevada. I have not seen any specimens identified as *confusus* and at this time am uncertain how to apply the name.

Plagiognathus crocinus Knight

Plagiognathus crocinus Knight, 1927: 12 (n. sp.).

HOLOTYPE: Female: ''Bluemont, Va., July 1, 1914, WL McAtee Collector''. Deposited in the National Museum of Natural History, Washington, D.C.

The species was apparently described on the basis of a single female. The holotype is in the National Museum of Natural History, Washington, D.C. The general coloration, including all appendages, is yellow-orange; the clavus is narrowly darkened along the scutellum and claval commissure. The tibiae are yellowish and have no dark spots at the bases of the tibial spines although the spines themselves are dark. The structure of the head is *Plagiognathus*-like, but the list of attributes given makes association with any described species difficult on the basis of the single female specimen.

Plagiognathus mineus (Knight), new combination

Microphylellus mineus Knight, 1929a: 41 (n. sp.).

HOLOTYPE: Female: ''Agric. Exp. Station, Gainesville, Fla., No 2415, J. R. W.'' Deposited in the National Museum of Natural History, Washington, D.C.

The synonymy of *Microphylellus* with *Plagiognathus* leaves the placement of this species from Florida in question. The holotype, with the exception of four legs, is missing from the pin.

Plagiognathus minuendus (Knight), new combination

Microphylellus minuendus Knight, 1927: 10 (n. sp.).

HOLOTYPE: Female: ''Plum Point, June 21, 14 Md.'' Deposited in the National Museum of Natural History, Washington, D.C.

The synonymy of *Microphylellus* with *Plagiognathus* leaves the placement of this species from Maryland in question. The holotype female is almost uniformly light orange in coloration, except for the clypeus adjacent to the labrum and the maxillary plates. The body is very broad and convexly rounded, including the pronotum. The head is much narrower than the strongly declivent pronotum, short, and distinctly hypognathus. Except for the coloration, the general appearance is similar to that of *Monalocoris americanus* Wagner and Slater. During the course of this study I have not examined any taxon with associated females that would seem to conform to *minuendus.*

Plagiognathus occipitalis Reuter

Plagiognathus occipitalis Reuter, 1908: 182 (n. sp.).

This taxon was described from Tombillo, Chile, on the basis of a single female specimen. There is no evidence that this taxon actually belongs in *Plagiognathus.* I have not seen any specimens and its correct placement awaits study of the specimen originally examined by Reuter.

Plagiognathus paddocki Knight

Plagiognathus paddocki Knight, 1964: 146 (n. sp.).

HOLOTYPE: Male: ''Santiago Can. Cal., April 14, 1935, E. L. Paddock, *Quercus agri-*

folia''. Deposited in the National Museum of Natural History, Washington, D.C.

Examination of the holotype and the male genitalia of other apparently conspecific specimens indicates that this is not a *Plagiognathus* species, nor does it appear to belong to any described genus.

Plagiognathus phoradendronae Knight, incertae sedis
Figure 40

Plagiognathus phoradendronae Knight 1929b: 73 (n. sp.).

HOLOTYPE: Male: ''Chiricahua Mts., Alt. 6200, Ariz., 20 June, 1928, A. A. Nichol''. Deposited in the National Museum of Natural History, Washington, D.C.

Examination of the male genitalia of a paratype male from the collections of the U.S. National Museum of Natural History indicates that this is not a *Plagiognathus* species. The size and conformation of the body are quite similar to *Phymatopsallus,* although the genitalia are not of that type (fig. 40).

Plagiognathus pluto Van Duzee

Plagiognathus diversus pluto Van Duzee, 1917b: 284 (n. var.).

This taxon was originally described as a variety of *Plagiognathus diversus* Van Duzee on the basis of two male and three females specimens from Santa Cruz County, California. Judging from the brief description, this is probably a *Tuxedo* species, although further inquiry will be required to determine the correct application of the name.

Plagiognathus reinhardi Johnston
Figure 40

Plagiognathus reinhardi Johnston, 1935: 16 (n. sp.).

This small red species, which breeds on *Crataegus* spp. in the southern United States, has been placed in *Plagiognathus* on the basis of superficial appearance. Several features mitigate against such placement, however. Notable among these are the antennae, in which the second antennal segment is sexually dimorphic, being cylindrical and moderately enlarged in the male and more slender and tapered toward the base in the female. This type of antennal conformation occurs in no species that I have placed in *Plagiognathus.* Furthermore, the vesica in the male, although having two apical projections, is unlike that of any other species that I have placed in *Plagiognathus.* For these reasons, I am treating *reinhardi* as incertae sedis.

Psallus guttulosus Reuter

Psallus guttulosus Reuter, 1876b: 89 (n. sp.).

This taxon was originally described by Reuter (1876b), apparently on the basis of a single specimen from Texas. It was placed in *Plagiognathus* by Knight (1941) because it possesses a single type of pubescence, as he put it. Examination of the male genitalia of many specimens identified as *guttulosus* and fitting Reuter's description of this species indicates that the taxon is neither a member of *Psallus* nor *Plagiognathus.* Its final placement will have to await additional revisionary work on the North American Phylinae.

Reuteroscopus falcatus Van Duzee
Figure 40

Reuteroscopus falcatus Van Duzee, 1917b: 278 (n. sp.).
Microphylellus adustus Knight, 1929a: 40 (n. sp.). NEW SYNONYMY.
Microphylellus adustus binotatus Knight, 1929a: 40 (n. sp.). NEW SYNONYMY.

HOLOTYPE: *Microphylellus adustus* Knight: Female: ''Fort Garland, Colo[rado]., Ute Creek Ranch, August 11, 1925, H. H. Knight''. Deposited in the National Museum of Natural History, Washington, D.C.

HOLOTYPE: *Microphylellus adustus binotatus* Knight: male: ''Montesano, Wn. [Washington], 29 June 1927, Wm. W. Baker''. Deposited in the National Museum of Natural History, Washington, D.C.

This species has been recorded from California, Washington, and Colorado. The structure of the male genitalia indicates that it belongs to neither *Plagiognathus* nor *Reuteroscopus.* The vesica, although similar in general form to that of *Plagiognathus,* has only a single, rather short, apical spine. Although I have not examined the holotype of

falcatus, comparison of the holotypes of *Microphylellus adustus* and *M. a. binotatus* in the United States National Museum of Natural History with authoritatively identified specimens of *falcatus* indicates that these three nominal taxa are the same, with *falcatus* having priority.

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APPENDIX 1

Fig. 5. *albatus* (1) (male: Louisiana: East Baton Rouge Parish: LSU Campus); *albatus* (2) (male: New York: Rockland Co.: Stony Point Battlefield State Park); *albatus* (3) (male: Pennsylvania: Dauphin Co.: Harrisburg, near Rockville); *albatus* (4) (male: Pennsylvania: Dauphin Co.: Harrisburg); *alboradialis* (male and female: Quebec: Laniel); *alnicenatus* (male: Quebec: Laniel); *alnicenatus* (female: Ontario: Otter Lake); *albifacies* (male: Maryland: Montgomery Co.: Plummers Island); *amorphae* (male and female: Colorado: Douglas Co.: Waterton); *annulatus* (male and female: Nevada: Lyon Co.: 5.2 mi S of Sweetwater Summit on Hwy 22).

Fig. 6. *aquilinus* (holotype male and paratype female: Colorado: Eagle Co.: near Vail); *arbustorum* (male: British Columbia: Aldergrove); *astericola* (male: Iowa: Woodbury Co.: Sioux City); *atricornis* (male: Missouri: Newton Co.: Neosho); *blatchleyi* (male: Manitoba: Winnipeg); *brevirostris* (male and female: Connecticut: Storrs); *brunneus* (1) (male: Wyoming: Big Horn Co.: ca. 24 mi W of Burgess Jct on road to radar station); *brunneus* (2) (male: Oregon: Baker Co.: Wallowa Mts., Whitman Natl. Forest, West Eagle Creek Meadow Campground on Forest Service Road 77); *chrysanthemi* (male: Idaho: Benewah Co.: vicinity of Emida, St. Joe Natl. Forest); *cibbetsi* (holotype male: California: San Diego Co.: Cibbets Flat Campground on Kimball Creek Road); *cibbetsi* (paratype female: Nevada: Clark Co.: Charlseton Peak).

Fig. 7. *concoloris* (holotype male: California: Siskiyou Co.: 2 mi W of McCloud); *cornicola* (male and female: New York: Albany Co.: Rensselaerville, Huyck Preserve); *davisi* (male: Colorado: Larimer Co.: 40 mi W of Fort Collins, Bennett Creek Picnic Ground); *delicatus* (male: Kansas: Douglas Co.: Lawrence vicinity); *dimorphus* (holotype male and paratype female: Wyoming: Shoshone Co.: Fox Creek Campground, 6.9 mi E of Cooke City); *dispar* (male: Pennsylvania: Centre Co.: State College; female: Louisiana: Baton Rouge Parish: Baton Rouge); *emarginatae* (holotype male: California: Alpine Co.: N of Ebbetts Pass, Pacific Crest Natl. Scenic Trail); *fenderi* (holotype male: Oregon: Yamhill Co.: top of Bald Mountain); *flavicornis* (male: Ontario: Tillsonburg); *flavidus* (male: Saskatchewan: Cut Knife, Attons Lake); *flavipes* (male: Quebec: Laniel).

Fig. 8. *flavoscutellatus* (male: Iowa: Clinton Co.: DeWitt); *flavus* (male: Arizona: Gila Co.: 8 mi SW jct Rts 87 and 188, Tonto Natl. Forest); *fulvaceus* (male: Utah: Duchesne Co.: Left Fork Indian Canyon Summit on Rt 33); *fulvidus* (male: Connecticut: Hamden); *fuscipes* (male and female: Montana: Jefferson Co.: Homestake Reststop, 10 mi E of Butte on I-90, Deerlodge Natl. Forest); *fuscosus* (1) (male: Saskatchewan: Katepwa); *fuscosus* (2) (male: New York: Rockland Co.: Rockland Lake State Park; *grandis* (male: Utah: Washington Co.: Snow Canyon State Park); *guttatipes* (male: Saskatchewan: Wood Mountain); *hallucinatus* (male: Oregon: Linn Co.: south fork Santiam River, 0.5 mi upstream from Lebanon); *laricicola* (male: New York: Essex Co.: Lake Placid).

Fig. 9. *lattini* (holotype male: Oregon: Lincoln Co.: Grass Mountain); *lineatus* (male: Oregon: Union Co.: 4.5 mi E of Tollgate, Woodland Campground); *longipennis* (male: Colorado: Mesa Co.: Grand Mesa Natl. Forest, Island Lake Campground on Rt 65; female: Arizona: Cochise Co.: Portal, Chiricahua Mountains); *longirostris* (male: Manitoba: 5 km N of Spirit Sands, Spruce Wood Provincial Park); *lonicerae* (holotype male: California: Santa Barbara Co.: Upper Oso Campground off Rt 154); *louisianus* (holotype male: Louisiana: East Baton Rouge Parish: Baton Rouge); *luteus* (male: Arizona: Gila Co.: along E. Verde River at Mazatzal); *maculipennis* (male: Louisiana: St. Landry Parish: Thistlewaite WMA); *melliferae* (holotype male: California: Riverside Co.: Menifee Valley, hills on W end).

Fig. 10. *mexicanus* (holotype male: Baja California Norte: 44.5 km E of Rt 1 to Parque Sierra San Pedro Martir); *modestus* (male: Texas: Brazos Co.: Bryan); *moerens* (male: California: San Luis Obispo Co.: Cuyama River, 1 mi W Cottonwood Canyon Road on Rt 166); *monardellae* (holotype male: California: Siskiyou Co.: 6.9 mi S of Medicine Lake on Powder Hill Road); *morrisoni* (male: Quebec: Kazubazua); *mundus* (male: California: Alpine Co.: SE of Markleeville on Rt 89) *negundinis* (male: Iowa: Story Co.: Ames); *nigronitens* (male: Manitoba: Virden); *obscurus* (1) (male: New Jersey: Sussex Co.: Baleville); *obscurus* (2) (male: Utah: Duchesne Co.: Uintah Mountains, Ashley Natl. Forest, Hades Campground); *obscurus* (3) (male: California: Del Norte Co.: 1 mi S of Crescent City); *obscurus* (4) (male: Tennessee: Hawkins Co.: Church Hill).

Fig. 11. *notodysmicos* (holotype male: Colorado: Archuleta Co.: Pagosa Springs); *paramundus* (holotype male and paratype female: Oregon: Lake Co.: 16 mi S of Adel); *parshleyi* (male: Minnesota: Ramsey Co.: St. Anthony Park; female: Utah: Emery Co.: Emery); *pemptos* (male: Wasatch Co.: Uintah Natl. Forest, Wolf Creek Campground); *phaceliae* (holotype male: California: Riverside Co.: Deep Canyon Res. Center, 3.2 mi W of Palm Desert); *physocarpi* (male: Pennsyl-

vania: Dauphin Co.: Rt 443, W Hanover Twp near Middle Paxton Twp line); *piceicola* (holotype male: New Mexico: Otero: Cloudcroft); *polhemorum* (holotype male: Colorado: Douglas Co.: Waterton); *politus* (1) (male: Washington, D.C.); *politus* (2) (male: Minnesota: Ramsey Co.: St. Anthony Park).

Fig. 12. *punctatipes* (male: Ontario: Pitopiko River Picnic Area on Rt 11 between Longlac and Hearst); *repetitus* (male: Ontario: Shawanaga); *ribesi* (male: California: Siskiyou Co.: S boundary Lava Beds Natl. Monument on Medicine Lake Road); *rideri* (male: Louisiana: St. Landry Parish: Thistlethwaite WMA); *rileyi* (holotype male: Arkansas: Washington Co.: Devil's Den State Park); *rosicola* (male: Illinois: Lawrence Co.: Pinkstaff); *rosicoloides* (holotype male: Alberta: Lake Louise; paratype female: British Columbia: Pine Valley Park Lodge, 1.1 km NE of Rt 97); *salicicola* (1) (male: Minnesota: Ramsey County); *salicicola* (2) (male: Ontario: McGregor); *salviae* (male: California: Siskiyou Co.: Lava Beds Natl. Monument, Sconchin Flow); *schaffneri* (holotype male: Texas: Bosque Co.: 2 mi W of Iredell).

Fig. 13. *shepherdiae* (male: Colorado: Dolores Co.: 29 mi SW of Norwood); *shoshonea* (1) (male: Colorado: Jefferson Co.: Red Rocks Park near Morrison); *shoshonea* (2) (male: Nevada: Elko Co.: Ruby Mountains, Lomoille Canyon, just E of Powerhouse Picnic Area); *stitti* (male: Arizona: Apache Co.: Greer); *subovatus* (male: South Dakota: Brookings Co.: Brookings); *suffuscipennis* (1) (male: Iowa: Henry Co.: Mt. Pleasant); *suffuscipennis* (2) (Colorado: Jefferson Co.: Deer Creek Canyon); *syrticolae* (male: New Hampshire: Coos Co.: Gorham); *tenellus* (paratype male: Arizona: Coconino Co.: Grand Canyon); *texanus* (male: Texas: Wood Co.: Pine Mills); *tinctus* (male: Pennsylvania: Monroe Co.: Delaware Water Gap); *tsugae* (male: North Carolina: Macon Co.: Highlands).

Fig. 14. *tumidifrons* (male: New York: Westchester Co.: Lewisboro); *urticae* (male: California: San Bernardino Co.: 2 mi E of Camp Angelus); *verticalis* (male: California: Riverside Co.: Menifee Valley, hills on W end); *vitellinus* (male: New York: Nassau Co.: Roslyn); *viticola* (male: Connecticut: Storrs).

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Junior synonyms are italicized, page references to main descriptions for valid names are boldfaced, and page references to figures are italicized.