



**Revision of *Europiella* Reuter in North America, with the Description of a New Genus (Heteroptera: Miridae: Phylinae)**

Author: SCHUH, RANDALL T.

Source: American Museum Novitates, 2004(3463) : 1-58

Published By: American Museum of Natural History

URL: [https://doi.org/10.1206/0003-0082\(2004\)463<0001:ROERIN>2.0.CO;2](https://doi.org/10.1206/0003-0082(2004)463<0001:ROERIN>2.0.CO;2)

---

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](http://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

# AMERICAN MUSEUM *Novitates*

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY  
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, NY 10024

Number 3463, 58 pp., 13 figures, 1 table

December 30, 2004

## Revision of *Europiella* Reuter in North America, with the Description of a New Genus (Heteroptera: Miridae: Phylinae)

RANDALL T. SCHUH<sup>1</sup>

### ABSTRACT

The New World species of *Europiella* Reuter are revised. Three species from western North America are described as new. A key and illustrations of the habitus and male genitalia for the 13 recognized Nearctic species are provided. Scanning electron micrographs are given for structural details of four species. Detailed locality and host data are offered for all species. *Europiella albipubescens* Knight, 1968 is transferred to *Knightopiella*, new genus. *Europiella lividella* (Kerzhner, 1979) is returned to *Plagiognathus* Fieber.

### INTRODUCTION

Schuh et al. (1995) created numerous new synonymies and integrated the taxonomy of the Palearctic and Nearctic faunas for the predominantly *Artemisia*-feeding genus *Europiella* Reuter. The present paper treats the Nearctic fauna in detail, presenting diagnoses and descriptions for all species, including three previously undescribed species, a key to species, and detailed locality and host information.

Because some *Europiella* spp. feed on relatively common, widely distributed plant

species, they are frequently present in large numbers in collections. As outlined by Schuh et al. (1995), generic placement, species concepts, and species identifications have a history of inconsistency in this group; the present paper represents a further attempt to resolve difficulties encountered in past taxonomies. A detailed revisionary treatment of the Palearctic fauna, although highly desirable, is not attempted here because I lacked access to a sufficient amount of material. Detailed information is provided for most material examined, including number and sex of specimens; however, because of the long pe-

<sup>1</sup> Curator, Division of Invertebrate Zoology, American Museum of Natural History (schuh@amnh.org).

riod over which specimens were examined for this study, in some instances specimen numbers are indicated only as males or no specimen numbers are given. All measurements are in millimeters; see table 1 for measurements of all species.

### *Europiella* Reuter

Type species: *Agalliaetes stigmosus* Uhler.

*Europiella* Reuter 1909: 83 (n. gen., descr.);

Schuh et al., 1995: 379 (n. syn., disc.).

*Poliopterus* Wagner, 1949: 53 (n. subgen. of *Plagiognathus*, descr.). (syn. by Schuh et al., 1995: 379).

**DIAGNOSIS:** Recognized by the relatively small size, length 2.14–3.68; body form varying from elongate and nearly parallel-sided to ovoid. Coloration varying from almost completely pale or weakly greenish to almost entirely black, usually with a few dark markings on femora and at bases of tibial spines. Vestiture of dorsum with reclining simple setae and recumbent, weakly woolly, silvery setae; eyes weakly produced laterally, not closely conforming to anterior margin of pronotum. Some species showing strong sexual dimorphism with males elongate, nearly parallel-sided and females strongly ovoid with hemelytra strongly conforming to shape of body. Pale-colored species similar in appearance, including type of vestiture, to *Knightopiella*, new genus and *Megalopsallus* spp. Distinguished from both of those genera by the structure of the male genitalia, and from *Megalopsallus* by the much smaller pygophore in members of that group.

Male genitalia varying greatly in size, but pygophore always moderately large to large relative to total size of abdomen; right paramere truncate apically, with a more or less well-developed protrusion on either side (figs. 3–5), never lanceolate as in most Phylini; body of vesica with a distinctive curvature and form, and usually with a proximal portion of one strap terminating near midpoint of vesica (see fig. 1, *angulata*, fig. 2, *E. lattini*); vesica always with two apical processes, these sometimes elongate, flattened, and broadened basally (figs. 3–5), and in the form of blades very similar to that found in *Plagiognathus* spp., or much shorter and variously acuminate and/or strongly curving and

spinellike (figs. 3–5); secondary gonopore large and heavily sclerotized, placed to the side of the chitinous bands of the vesica rather than in the same plane (figs. 3–5), as in *Plagiognathus*, and distinctly proximad of attachment of spines.

Often breeding exclusively on *Artemisia* spp., occasionally on other Asteraceae, and rarely on Lamiaceae in Palearctic.

**REDESCRIPTION:** *Male:* Relatively small, elongate to ovoid, total length 2.14–3.68; body in transverse cross-section more or less cylindrical, not flattened. **COLORATION** (figs. 1, 2): Coloration varying from almost completely white or pale greenish to nearly all black. Mesoscutum often orange laterally. Femora usually with some contrasting dark spots; tibial spines usually black with black bases, sometimes pale but with bases always at least darkened if not distinctly black. **SURFACE AND VESTITURE** (figs. 1, 2, 7, 9–11): Dorsum smooth, dull, clothed with reclining simple setae and recumbent, weakly woolly, silvery setae. **STRUCTURE** (figs. 7, 9–11): Head transverse, frons weakly bulging, clypeus generally not visible from above; eyes relatively small, not sexually dimorphic; antennal segment 2 slender, tapering to slightly greater diameter distally, sexual dimorphism very weak; length of labium variable, from just reaching middle coxae to just surpassing posterior margin of hind coxae; claws elongate, gently curving, parempodia always setiform, pulvilli small. **GENITALIA** (figs. 3–5): Genital capsule and genitalia moderately large to large relative to size of abdomen; vesica formed of two chitinous bands, always with two apical process, these sometimes elongate and broadened basally, and in the form of blades, or much shorter and variously acuminate and/or strongly curving and in the form of spines; body of vesica with distinctive curvature and form, with a portion of one strap often terminating near midpoint of vesica (e.g., fig. 1, *E. angulata*, fig. 2, *E. lattini*) and most species with a distinctive, broad, membranous projection extending beyond gonopore straps just distad of gonopore (e.g., fig. 4, *E. pilosula*, fig. 5, *E. stigmosa*); secondary gonopore large and heavily sclerotized, placed laterad of the chitinous bands of the vesica rather than between them, slightly proximad

of attachment of spines; phallosome of relatively uniform structure, typical of Phylini (figs. 4, 5); left paramere boat-shaped, typical of Phylini (fig. 3); right paramere distinctive for the group, truncate apically, with a more or less well-developed protrusion on either side (figs. 3–5), never lanceolate.

*Female*: Elongate ovoid, usually of more robust appearance than male; total body length 2.14–3.32.

**DISTRIBUTION**: Like many other genera of Phylinae in North America, but with the notable exception of *Plagiognathus* Fieber, endemism and species diversity in *Europiella* are restricted almost entirely to the West. Only *Europiella decolor* Uhler and *E. artemisiae* (Becker) occur in eastern North America, both species also occurring in the Palearctic.

**HOST ASSOCIATIONS**: Unlike most members of the Phylini, *Europiella* spp. are usually found on their hosts when the plants are not in flower. This is true in North America for *Artemisia* and *Chrysothamnus*-associated species, which are collected during the late spring and early summer, whereas the plants flower in the late summer. *Europiella* spp. in the Nearctic, with the exception of *E. lattini*, n. sp., are restricted to members of the Asteraceae, primarily *Artemisia* spp., whereas in the Palearctic some species are also found feeding on the Lamiaceae.

**DISCUSSION**: Because sexual dimorphism is pronounced in some *Europiella* spp., the two sexes are not always recognizable as belonging to the same taxon. Accurate identifications of females will require association with males, in most cases. Indeed, as with many phylines, placing females to genus can be difficult. For this reason the following key is designed to be used for male specimens, although it will work for females of some species. Information on host associations is often helpful in placing species to genus. Because some aspects of coloration are quite variable within species, positive identification may require dissection of the male genitalia.

KEY TO MALES OF NORTH AMERICAN SPECIES OF *EUROPIELLA*

1. All antennal segments entirely pale; bases of tibial spines with at most a small, weak,

- dark area; coloration of dorsum entirely pale . . . . . 2
- Antennal segment I usually entirely black, much less commonly only black near extreme base or on one face; tibial spines with conspicuous black bases; coloration of dorsum variable . . . . . 3
- 2. Genitalia as in figure 4 (see discussion of color variation under species account) (British Columbia south to Arizona, east to Kansas) . . . . . *pilosula* (Uhler)
- Genitalia as in figure 5 (northern Arizona) . . . . . *signicornis* Knight
- 3. Dorsum entirely pale; femora pale, sometimes with a few darker blotches . . . . . 4
- Dorsum with at least some dark areas, sometimes dorsum almost entirely dark, occasionally dark areas appearing only as faint infuscations of portions of clavus, corium, or cuneus; coloration of femora variable . . . . . 5
- 4. Long, slender species, total length 3.30–3.61, ratio width pronotum/total length 1:3.65; cuneus elongate, as in figure 2; vesica as in figure 4; extreme southern California . . . . . *morrisoni*, new species
- Body form not so elongate and slender; cuneus more broadly triangular; vesica variable . . . . . 8
- 5. Large species, total length always at least 3.22; vesica as in figure 3; coloration of dorsum almost entirely dark in some populations (fig. 1); widely distributed in western North America . . . . . *consors* (Uhler)
- Smaller species, total length always less than 3.08 . . . . . 6
- 6. Specimens usually with dorsum entirely white, sometimes with some faint infuscation on pronotum and cuneus . . . . . 7
- Males always with some infuscation on dorsum, especially anterior pronotal lobe and areas between veins on hemelytra, giving a mottled appearance (females more frequently almost entirely pale) (fig. 2); vesica with anterior terminal blade very long and decurved (fig. 5); interior western North America . . . . . *stigmosa* Reuter
- 7. Genital capsule large and deep, in lateral view appearing more or less parallel-sided and very broad posteriorly; vesica as in figure 4 (British Columbia south to Mojave Desert, east to Colorado) . . . . .
- Genital capsule more slender, in lateral view tapering to a much less broad posterior margin (see fig. 11B for example conformation); vesica as in figure 3 (Oregon to Wyoming) . . . . . *carvalhoi* Schuh

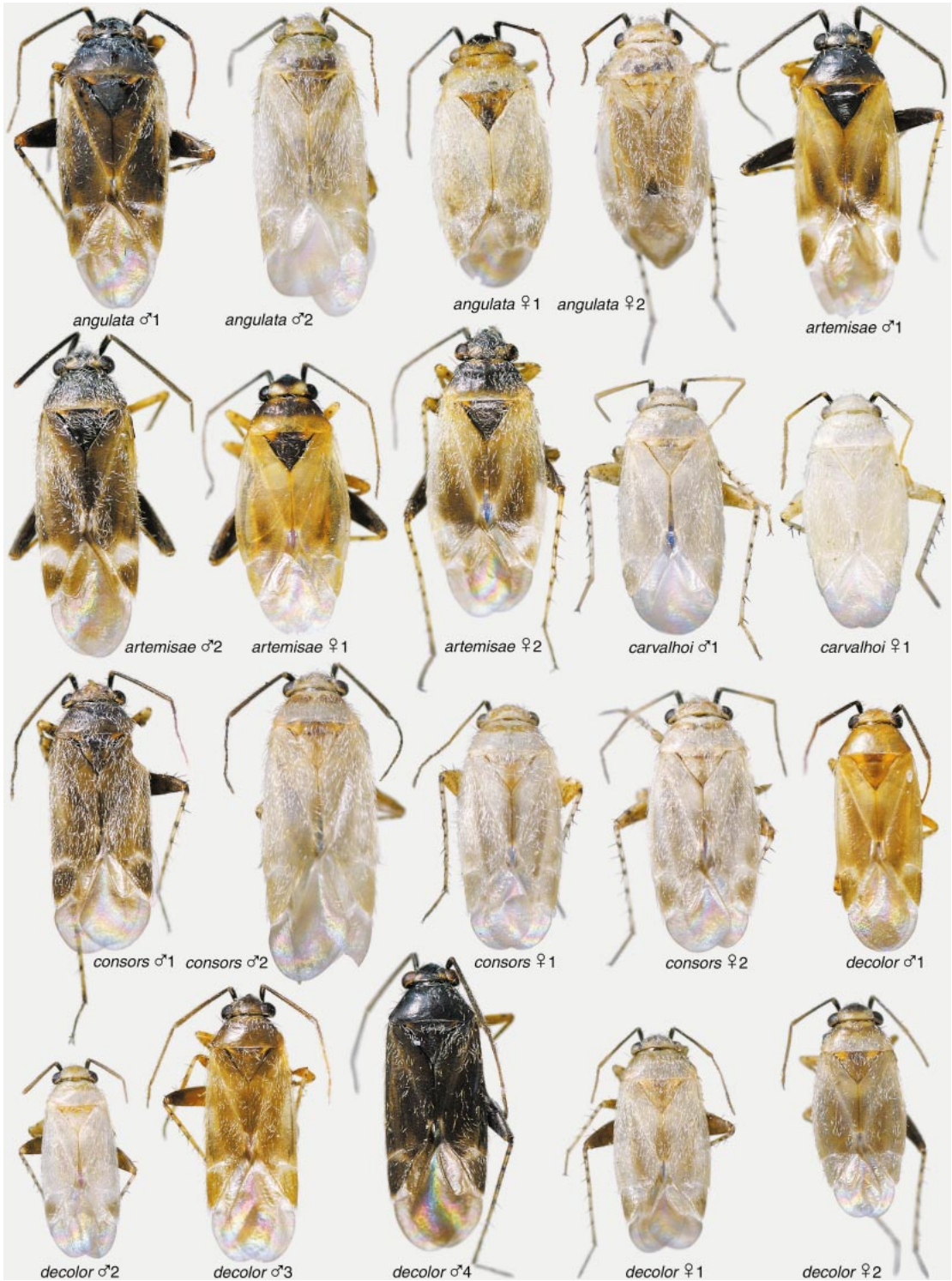


Fig. 1. Habitus views of *Europiella* spp.: *angulata*–*decolor*. See appendix 1 for localities.

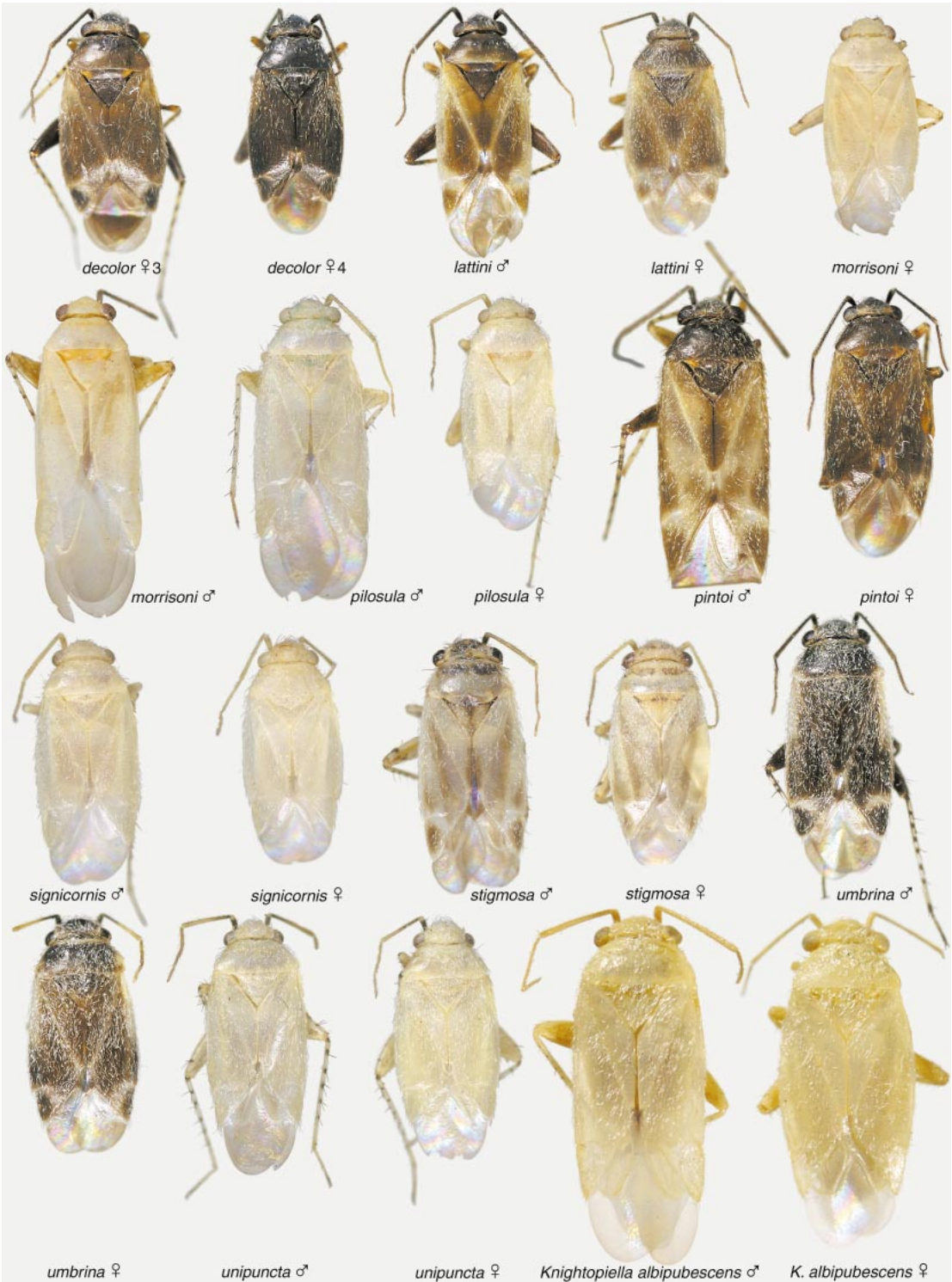


Fig. 2. Habitus views of *Europiella* spp.: *decolor*–*unipuncta*. Habitus of *Knightiopiella albipubescens*. See appendix 1 for localities.

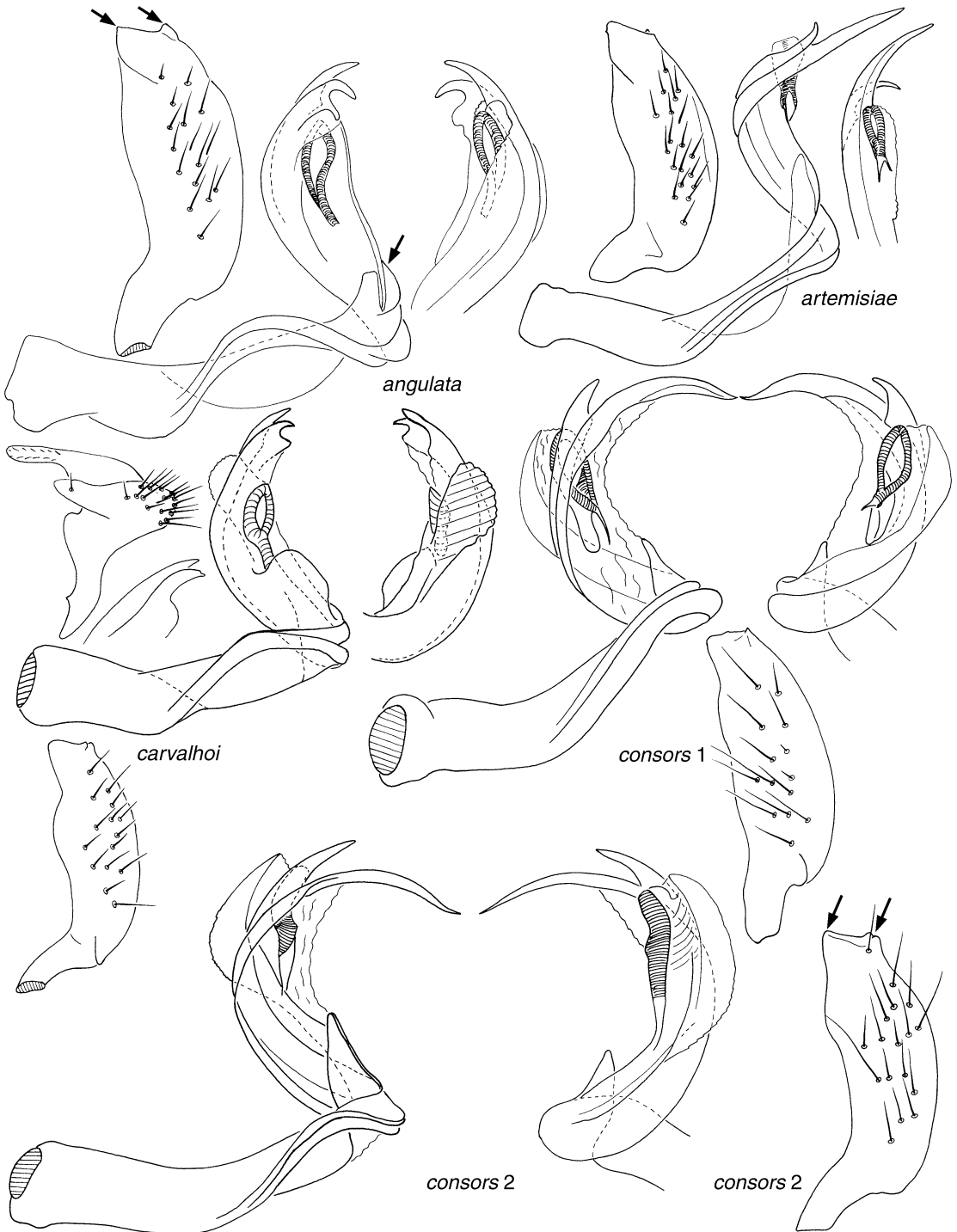


Fig. 3. Male genitalia of *Europiella* spp.: *angulata*–*consors*.

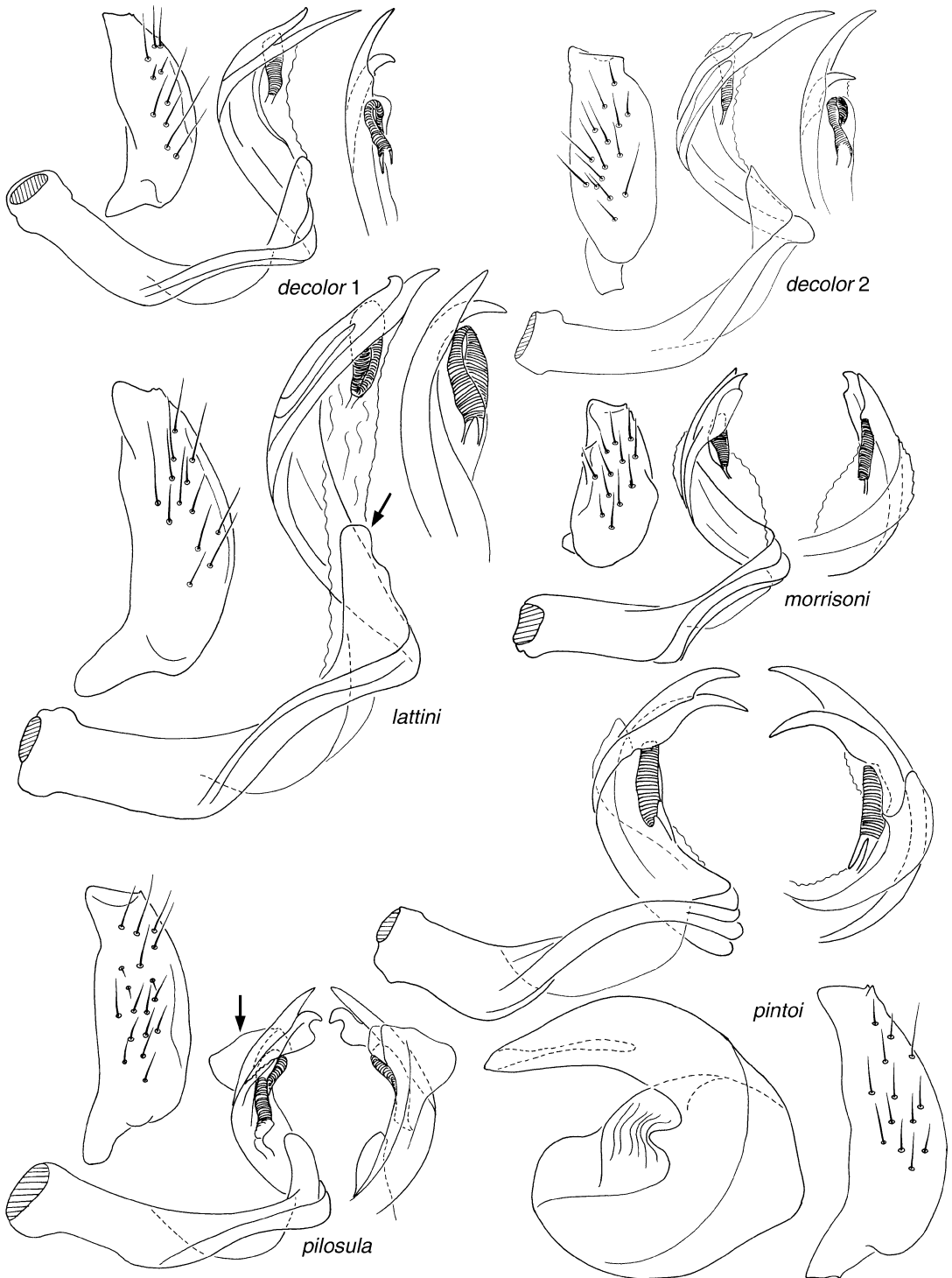


Fig. 4. Male genitalia of *Europiella* spp.: *decolor*–*pintoi*.



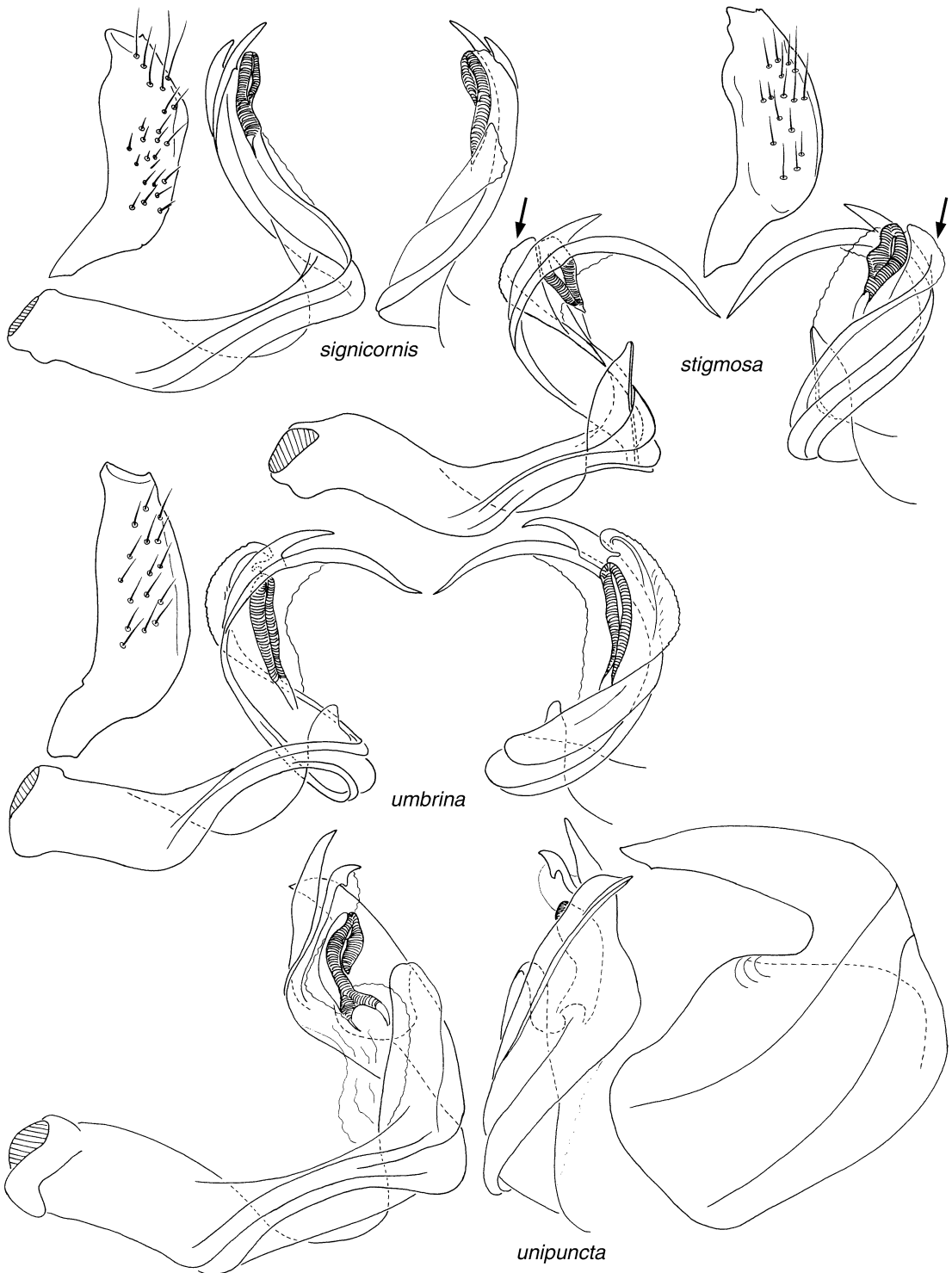


Fig. 5. Male genitalia of *Europiella* spp.: *signicornis*–*unipuncta*.

TABLE 1  
Measurements of *Europiella* Species

Species		Length				Width			
		Total Body	Cun-Clyp	Head	Pronotum	Head	Pronotum	InterOcDi	AntSeg2
<i>angulata</i>									
<b>M</b> ( <i>N</i> = 7)	<b>Mean</b>	<b>3.30</b>	<b>2.29</b>	<b>0.24</b>	<b>0.47</b>	<b>0.77</b>	<b>1.05</b>	<b>0.46</b>	<b>0.86</b>
	SD	0.20	0.08	0.06	0.02	0.02	0.06	0.02	0.05
	Range	0.48	0.21	0.15	0.08	0.04	0.18	0.05	0.14
	Min	3.04	2.18	0.18	0.43	0.75	0.96	0.45	0.79
	Max	3.53	2.39	0.33	0.51	0.79	1.14	0.50	0.93
<b>F</b> ( <i>N</i> = 7)	<b>Mean</b>	<b>3.10</b>	<b>2.20</b>	<b>0.23</b>	<b>0.45</b>	<b>0.79</b>	<b>1.05</b>	<b>0.50</b>	<b>0.73</b>
	SD	0.19	0.13	0.03	0.02	0.02	0.07	0.01	0.06
	Range	0.48	0.30	0.08	0.06	0.04	0.18	0.04	0.16
	Min	2.84	2.01	0.19	0.42	0.77	0.95	0.48	0.65
	Max	3.32	2.31	0.27	0.48	0.82	1.13	0.52	0.82
<i>artemisiae</i>									
<b>M</b> ( <i>N</i> = 5)	<b>Mean</b>	<b>3.47</b>	<b>2.39</b>	<b>0.25</b>	<b>0.48</b>	<b>0.71</b>	<b>0.99</b>	<b>0.39</b>	<b>1.15</b>
	SD	0.12	0.06	0.04	0.04	0.00	0.02	0.01	0.06
	Range	0.31	0.15	0.09	0.10	0.01	0.06	0.02	0.15
	Min	3.27	2.31	0.19	0.45	0.71	0.97	0.38	1.09
	Max	3.58	2.46	0.28	0.55	0.72	1.02	0.40	1.24
<b>F</b> ( <i>N</i> = 5)	<b>Mean</b>	<b>3.11</b>	<b>2.27</b>	<b>0.24</b>	<b>0.47</b>	<b>0.73</b>	<b>1.02</b>	<b>0.44</b>	<b>0.89</b>
	SD	0.10	0.11	0.03	0.03	0.02	0.07	0.01	0.05
	Range	0.28	0.24	0.08	0.07	0.04	0.16	0.02	0.14
	Min	2.94	2.15	0.19	0.42	0.71	0.94	0.42	0.81
	Max	3.22	2.39	0.27	0.49	0.75	1.10	0.44	0.95
<i>carvalhoi</i>									
<b>M</b> ( <i>N</i> = 5)	<b>Mean</b>	<b>2.83</b>	<b>2.00</b>	<b>0.23</b>	<b>0.39</b>	<b>0.70</b>	<b>0.92</b>	<b>0.44</b>	<b>0.66</b>
	SD	0.13	0.09	0.02	0.02	0.03	0.05	0.03	0.05
	Range	0.35	0.19	0.05	0.06	0.06	0.13	0.07	0.11
	Min	2.64	1.90	0.20	0.36	0.67	0.85	0.41	0.59
	Max	3.00	2.09	0.25	0.42	0.73	0.98	0.48	0.70
<b>F</b> ( <i>N</i> = 5)	<b>Mean</b>	<b>2.66</b>	<b>1.91</b>	<b>0.24</b>	<b>0.38</b>	<b>0.74</b>	<b>0.93</b>	<b>0.47</b>	<b>0.57</b>
	SD	0.13	0.08	0.04	0.02	0.01	0.03	0.02	0.18
	Range	0.35	0.19	0.11	0.05	0.03	0.09	0.05	0.41
	Min	2.51	1.84	0.20	0.35	0.72	0.89	0.45	0.26
	Max	2.86	2.04	0.31	0.40	0.74	0.98	0.50	0.67
<i>consors</i>									
<b>M</b> ( <i>N</i> = 7)	<b>Mean</b>	<b>3.53</b>	<b>2.39</b>	<b>0.22</b>	<b>0.45</b>	<b>0.83</b>	<b>1.06</b>	<b>0.48</b>	<b>0.94</b>
	SD	0.15	0.09	0.03	0.03	0.05	0.05	0.03	0.08
	Range	0.47	0.29	0.08	0.09	0.13	0.15	0.08	0.21
	Min	3.22	2.20	0.20	0.40	0.75	1.00	0.43	0.81
	Max	3.68	2.48	0.27	0.49	0.88	1.15	0.51	1.02
<b>F</b> ( <i>N</i> = 7)	<b>Mean</b>	<b>3.08</b>	<b>2.20</b>	<b>0.25</b>	<b>0.44</b>	<b>0.80</b>	<b>1.04</b>	<b>0.49</b>	<b>0.72</b>
	SD	0.15	0.09	0.03	0.02	0.01	0.04	0.02	0.04
	Range	0.47	0.25	0.08	0.07	0.04	0.10	0.04	0.12
	Min	2.79	2.01	0.21	0.41	0.78	0.98	0.47	0.64
	Max	3.26	2.25	0.29	0.48	0.81	1.09	0.51	0.76

TABLE 1  
(Continued)

Species		Length				Width			
		Total Body	Cun-Clyp	Head	Pronotum	Head	Pronotum	InterOcDi	AntSeg2
<i>decolor</i>									
M (N = 10)	Mean	<b>2.86</b>	<b>1.94</b>	<b>0.20</b>	<b>0.37</b>	<b>0.65</b>	<b>0.86</b>	<b>0.36</b>	<b>0.78<sup>a</sup></b>
	SD	0.39	0.22	0.02	0.04	0.05	0.08	0.03	0.16
	Range	1.37	0.73	0.06	0.14	0.16	0.26	0.09	0.46
	Min	2.14	1.52	0.18	0.30	0.55	0.69	0.32	0.51
	Max	3.50	2.25	0.24	0.44	0.71	0.96	0.42	0.98
F (N = 9)	Mean	<b>2.45</b>	<b>1.78</b>	<b>0.20</b>	<b>0.37</b>	<b>0.63</b>	<b>0.86</b>	<b>0.39</b>	<b>0.63</b>
	SD	0.20	0.15	0.02	0.03	0.03	0.06	0.03	0.09
	Range	0.65	0.47	0.09	0.09	0.10	0.20	0.08	0.28
	Min	2.45	1.69	0.19	0.33	0.59	0.81	0.35	0.53
	Max	2.72	1.95	0.26	0.41	0.67	0.95	0.42	0.77
<i>lattini</i>									
M (N = 5)	Mean	<b>2.90</b>	<b>2.02</b>	<b>0.21</b>	<b>0.37</b>	<b>0.67</b>	<b>0.93</b>	<b>0.37</b>	<b>0.77</b>
	SD	0.09	0.05	0.04	0.02	0.02	0.03	0.01	0.04
	Range	0.23	0.12	0.08	0.05	0.06	0.07	0.04	0.10
	Min	2.81	1.95	0.16	0.36	0.63	0.91	0.35	0.72
	Max	3.05	2.07	0.25	0.40	0.69	0.97	0.39	0.82
F (N = 5)	Mean	<b>2.60</b>	<b>1.86</b>	<b>0.21</b>	<b>0.37</b>	<b>0.65</b>	<b>0.90</b>	<b>0.39</b>	<b>0.65</b>
	SD	0.07	0.07	0.02	0.02	0.01	0.01	0.01	0.03
	Range	0.18	0.19	0.05	0.04	0.02	0.03	0.02	0.07
	Min	2.51	1.75	0.19	0.36	0.64	0.89	0.38	0.61
	Max	2.70	1.94	0.24	0.39	0.66	0.91	0.40	0.68
<i>morrisoni</i>									
M (N = 5)	Mean	<b>3.50</b>	<b>2.27</b>	<b>0.21</b>	<b>0.40</b>	<b>0.71</b>	<b>0.96</b>	<b>0.37</b>	<b>0.78</b>
	SD	0.13	0.07	0.03	0.02	0.02	0.01	0.02	0.02
	Range	0.32	0.15	0.07	0.06	0.04	0.03	0.06	0.06
	Min	3.30	2.18	0.17	0.38	0.69	0.94	0.34	0.74
	Max	3.61	2.33	0.24	0.44	0.72	0.97	0.40	0.80
F (N = 2)	Mean	<b>2.69</b>	<b>1.89</b>	<b>0.21</b>	<b>0.37</b>	<b>0.67</b>	<b>0.93</b>	<b>0.38</b>	<b>0.57</b>
	SD	0.28	0.16	0.06	0.03	0.02	0.00	0.04	0.07
	Range	0.40	0.22	0.09	0.04	0.03	0.00	0.05	0.10
	Min	2.50	1.78	0.17	0.35	0.65	0.93	0.35	0.52
	Max	2.89	2.00	0.25	0.39	0.69	0.93	0.41	0.62
<i>pilosula</i>									
M (N = 5)	Mean	<b>2.99</b>	<b>2.03</b>	<b>0.22</b>	<b>0.42</b>	<b>0.73</b>	<b>0.97</b>	<b>0.41</b>	<b>0.76</b>
	SD	0.35	0.20	0.02	0.05	0.06	0.08	0.05	0.09
	Range	0.87	0.54	0.06	0.12	0.16	0.19	0.12	0.20
	Min	2.63	1.81	0.20	0.37	0.66	0.88	0.37	0.65
	Max	3.50	2.35	0.26	0.49	0.81	1.07	0.49	0.84
F (N = 5)	Mean	<b>2.71</b>	<b>1.90</b>	<b>0.22</b>	<b>0.40</b>	<b>0.70</b>	<b>0.92</b>	<b>0.44</b>	<b>0.64</b>
	SD	0.26	0.20	0.03	0.04	0.05	0.08	0.02	0.06
	Range	0.63	0.49	0.08	0.10	0.14	0.20	0.06	0.18
	Min	2.42	1.65	0.18	0.36	0.63	0.82	0.41	0.54
	Max	3.04	2.14	0.26	0.46	0.77	1.02	0.47	0.71
<i>pintoii</i>									
M (N = 2)	Mean	<b>3.46</b>	<b>2.39</b>	<b>0.18</b>	<b>0.44</b>	<b>0.78</b>	<b>1.08</b>	<b>0.37</b>	
	SD	0.13	0.00	0.05	0.01	0.03	0.04	0.00	
	Range	0.19	0.00	0.07	0.02	0.04	0.06	0.00	
	Min	3.37	2.39	0.14	0.44	0.76	1.05	0.37	
	Max	3.55	2.39	0.21	0.45	0.80	1.11	0.37	

<sup>a</sup>(N = 9).

TABLE 1  
(Continued)

Species		Length				Width			
		Total Body	Cun-Clyp	Head	Pronotum	Head	Pronotum	InterOcDi	AntSeg2
<i>pintoi</i> (continued)									
F (N = 5)	Mean	<b>2.89</b>	<b>2.07</b>	<b>0.19</b>	<b>0.42</b>	<b>0.71</b>	<b>1.01</b>	<b>0.40</b>	<b>0.78</b>
	SD	0.09	0.10	0.02	0.05	0.05	0.08	0.03	0.02
	Range	0.25	0.24	0.04	0.12	0.13	0.19	0.07	0.06
	Min	2.75	1.90	0.17	0.35	0.64	0.92	0.37	0.75
	Max	3.00	2.14	0.21	0.47	0.78	1.11	0.43	0.80
<i>signicornis</i>									
M (N = 5)	Mean	<b>2.83</b>	<b>1.93</b>	<b>0.20</b>	<b>0.40</b>	<b>0.72</b>	<b>0.95</b>	<b>0.44</b>	<b>0.64</b>
	SD	0.07	0.05	0.01	0.01	0.02	0.03	0.03	0.04
	Range	0.18	0.12	0.02	0.02	0.05	0.07	0.06	0.10
	Min	2.73	1.86	0.19	0.39	0.69	0.91	0.40	0.61
	Max	2.91	1.98	0.21	0.41	0.74	0.98	0.46	0.70
F (N = 1)	Mean	<b>2.56</b>	<b>1.90</b>	<b>0.22</b>	<b>0.38</b>	<b>0.70</b>	<b>0.95</b>	<b>0.43</b>	<b>0.57</b>
	SD	NA	NA	NA	NA	NA	NA	NA	NA
	Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Min	2.56	1.90	0.22	0.38	0.70	0.95	0.43	0.57
	Max	2.56	1.90	0.22	0.38	0.70	0.95	0.43	0.57
<i>stigmosa</i>									
M (N = 5)	Mean	<b>2.85</b>	<b>2.03</b>	<b>0.22</b>	<b>0.44</b>	<b>0.81</b>	<b>1.01</b>	<b>0.50</b>	<b>0.66</b>
	SD	0.12	0.07	0.02	0.02	0.03	0.07	0.01	0.06
	Range	0.28	0.19	0.05	0.05	0.07	0.16	0.03	0.15
	Min	2.78	1.92	0.21	0.41	0.78	0.96	0.49	0.59
	Max	3.06	2.11	0.26	0.46	0.85	1.12	0.51	0.74
F (N = 5)	Mean	<b>2.77</b>	<b>2.04</b>	<b>0.26</b>	<b>0.46</b>	<b>0.85</b>	<b>1.05</b>	<b>0.54</b>	<b>0.68</b>
	SD	0.11	0.08	0.02	0.02	0.01	0.03	0.04	0.04
	Range	0.26	0.18	0.04	0.04	0.04	0.07	0.10	0.11
	Min	2.65	1.94	0.24	0.45	0.84	1.02	0.48	0.64
	Max	2.91	2.12	0.28	0.49	0.88	1.09	0.58	0.75
<i>umbrina</i>									
M (N = 5)	Mean	<b>2.93</b>	<b>2.09</b>	<b>0.25</b>	<b>0.45</b>	<b>0.77</b>	<b>0.99</b>	<b>0.48</b>	<b>0.59</b>
	SD	0.03	0.03	0.02	0.01	0.02	0.03	0.02	0.03
	Range	0.07	0.09	0.06	0.03	0.06	0.08	0.04	0.08
	Min	2.89	2.04	0.22	0.43	0.74	0.96	0.46	0.57
	Max	2.96	2.14	0.27	0.46	0.81	1.04	0.50	0.64
F (N = 5)	Mean	<b>2.80</b>	<b>2.05</b>	<b>0.26</b>	<b>0.45</b>	<b>0.79</b>	<b>1.14</b>	<b>0.52</b>	<b>0.57</b>
	SD	0.06	0.06	0.01	0.03	0.02	0.20	0.01	0.04
	Range	0.17	0.15	0.04	0.08	0.05	0.47	0.03	0.09
	Min	2.73	2.01	0.24	0.41	0.77	1.02	0.51	0.52
	Max	2.89	2.16	0.28	0.49	0.82	1.50	0.53	0.61
<i>unipuncta</i>									
M (N = 5)	Mean	<b>2.90</b>	<b>2.02</b>	<b>0.24</b>	<b>0.39</b>	<b>0.72</b>	<b>0.93</b>	<b>0.45</b>	<b>0.63</b>
	SD	0.21	0.11	0.02	0.05	0.03	0.07	0.02	0.07
	Range	0.45	0.26	0.05	0.11	0.07	0.15	0.04	0.16
	Min	2.63	1.89	0.21	0.32	0.69	0.85	0.43	0.55
	Max	3.08	2.14	0.27	0.43	0.76	1.00	0.47	0.71
F (N = 5)	Mean	<b>2.66</b>	<b>1.92</b>	<b>0.24</b>	<b>0.39</b>	<b>0.72</b>	<b>0.92</b>	<b>0.46</b>	<b>0.60</b>
	SD	0.10	0.09	0.02	0.03	0.03	0.06	0.03	0.06
	Range	0.28	0.24	0.04	0.07	0.08	0.16	0.07	0.16
	Min	2.49	1.79	0.22	0.34	0.67	0.83	0.43	0.54
	Max	2.78	2.04	0.26	0.42	0.75	0.99	0.50	0.70

TABLE 1  
(Continued)

Species	Length				Width				
	Total Body	Cun-Clyp	Head	Pronotum	Head	Pronotum	InterOcDi	AntSeg2	
<i>Knightopiella albipubescens</i>									
M (N = 5)	<b>Mean</b>	<b>3.49</b>	<b>2.37</b>	<b>0.22</b>	<b>0.49</b>	<b>0.89</b>	<b>1.13</b>	<b>0.52</b>	<b>0.96</b>
	SD	0.09	0.10	0.02	0.03	0.02	0.05	0.02	0.04
	Range	0.26	0.23	0.05	0.10	0.04	0.12	0.06	0.10
	Min	3.38	2.20	0.19	0.43	0.87	1.05	0.50	0.92
	Max	3.64	2.43	0.24	0.53	0.91	1.17	0.55	1.02
F (N = 5)	<b>Mean</b>	<b>3.42</b>	<b>2.41</b>	<b>0.25</b>	<b>0.51</b>	<b>0.95</b>	<b>1.16</b>	<b>0.57</b>	<b>0.86</b>
	SD	0.08	0.08	0.04	0.03	0.04	0.07	0.03	0.05
	Range	0.21	0.22	0.11	0.08	0.11	0.18	0.05	0.11
	Min	3.31	2.27	0.22	0.48	0.90	1.04	0.55	0.80
	Max	3.51	2.49	0.33	0.56	1.00	1.22	0.60	0.91

- 8. Relatively large species, total length never less than 3.04 . . . . . 9
- Smaller species, total length never greater than 3.50, usually less than 3.05 . . . . 12
- 9. Length of antennal segment 2 more than one-third greater than width of head (Holarctic) . . . . . *artemisiae* (Becker)
- Length of antennal segment 2 no more than one-fourth greater than width of head . . . . . 10
- 10. Genitalia as in figure 4 (southern California) . . . . . *pintoi*, new species
- Genitalia not as in figure 4 for *pintoi* . . 11
- 11. Genitalia as in figure 3 (western North America) . . . . . *angulata* (Uhler)
- Genitalia as in figure 3 (western North America) . . . . . *consors* (Uhler)
- 12. Antennal segments 1 and 2 entirely black; narrow, elongate to very elongate species, width of pronotum never greater than 0.99, usually less than 0.95 . . . . . 13
- Antennal segment 1 sometimes only partially black, segment 2 always pale on at least distal two-thirds of segment; broader, more ovoid species, width of pronotum always greater than 0.94 . . . . . 14
- 13. Pygophore (and aedeagus) large, diameter of pygophore as measure from side at junction with pregenital abdominal segments about equal to width of head; coloration of dorsum appearing somewhat mottled; size variation limited, total length apex 2.81–3.05; genitalia as in figure 4 (coastal mountains of Pacific Northwest) . . . . . *lattini*, new species
- Pygophore (and aedeagus) smaller, diameter of pygophore as measured from side at junction with pregenital abdominal seg-

- ments distinctly less than width of head; coloration of dorsum varying from nearly uniform brown to completely pale/white; size variation great, total length 2.14–3.50; genitalia as in figure 3 (Holarctic, widely distributed in North America) . . . . . *decolor* (Uhler)
- 14. Dorsum weakly to moderately infusate, appearing mottled, brownish; genitalia as in figure 5 (interior western North America) . . . . . *stigmaosa* Reuter
- Dorsum strongly infusate, usually appearing blackish, with some contrasting white areas; genitalia as in figure 5 (Great Basin and California south to northern Baja California) . . . . . *umbrina* Reuter

*Europiella angulata* (Uhler)  
Figures 1, 3, 6, 7

*Maurodactylus angulatus* Uhler, 1895: 53 (n. sp., descr.).  
*Europiella angulata*: Knight, 1968: 41 (n. comb.); Schuh et al., 1995: 386 (n. syn.).  
*Europiella yampae* Knight, 1968: 43 (n. sp.; syn. by Schuh et al., 1995: 386).

DIAGNOSIS: Recognized by the relatively large size, elongate, nearly parallel-sided, broad body form (fig. 6), usually dark general coloration of dorsum, and the vesica with a short, sickle-shaped anterior apical spine and short, weakly curving, posterior spine (fig. 3), a condition shared with *E. carvalhoi*, *E. pilosula*, and *E. unipuncta*. Most similar in size, general appearance, and coloration to *E. consors*, and apparently not sep-

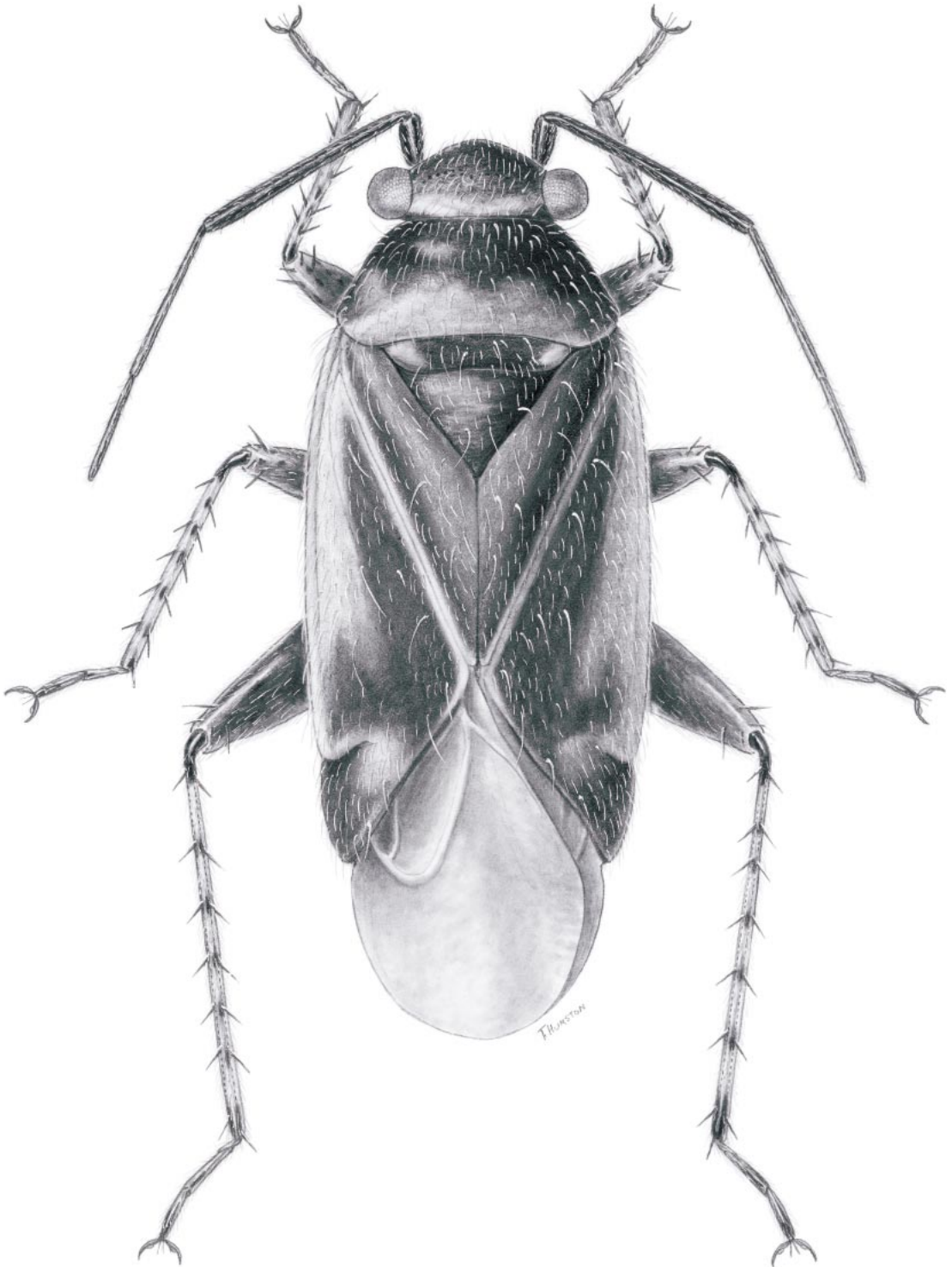


Fig. 6. *Europiella angulata* (Uhler). Male: USA: Colorado: Jefferson Co.: Red Rocks Park near Morrison, 5600 ft.

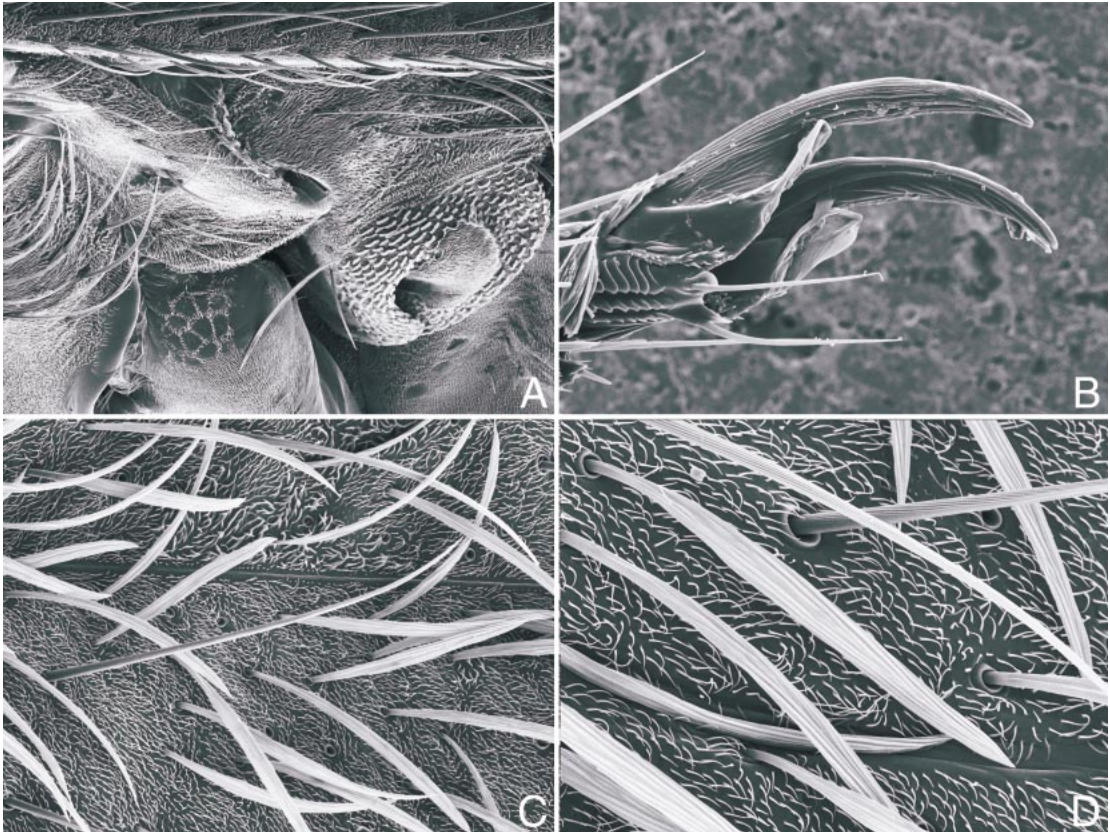


Fig. 7. Scanning electron micrographs of *Europiella angulata* ( $\delta$ ). **A.** Mesothoracic spiracle and metepisternal scent-efferent system, lateral view. **B.** Pretarsus, lateroventral view. **C.** Setae on hemelytra. **D.** Setae on hemelytra, detail of microstructure.

arable from it with certainty except by dissection of the male genitalia. Sexual dimorphism in this species is pronounced, the females being smaller than the males and conspicuously ovoid rather than parallel-sided (fig. 1).

**REDESCRIPTION:** *Male:* Relatively large, broad-bodied species, total length 3.04–3.53, width across pronotum 0.43–0.51. **COLORATION** (fig. 1): General coloration of dorsum usually largely dark, but sometimes extensively pale; antennal segments 1–4 black; labium with segments 1 and 2 mostly pale, segments 3 and 4 much darker; much of venter dark in dark specimens, largely pale in pale specimens; coxae, trochanters, and femora mostly dark in dark specimens, largely pale in pale specimens, femora when pale with dark spots or blotches; tibiae with pale background coloration, spines black with

black bases. **SURFACE AND VESTITURE** (fig. 7C, D): Surface and vestiture as in generic diagnosis. **STRUCTURE** (fig. 7): Elongate, nearly parallel-sided, corial margin weakly convex. **GENITALIA** (fig. 3): Pygophore moderately large relative to size of abdomen; anterior vesical spine short, sickle-shaped, posterior spine short, weakly curving, spines similar in structure to *E. carvalhoi*, *E. pilosula*, and *E. unipuncta*.

*Female:* Coloration usually light, seldom as dark as in males. Females much shorter than males, ovoid (fig. 1). Total length 2.84–3.32, width pronotum 0.42–0.48.

**HOSTS:** *Artemisia arbustorum*, *A. dracuncululus*, *A. tridentata*. Also recorded from *Chrysothamnus* sp., *Solidago* sp. (Asteraceae).

**DISTRIBUTION:** Widely distributed in the interior of western North America, from Brit-

ish Columbia to Saskatchewan in the north to Arizona and east to west Texas and the foothills of the Rocky Mountains in the south.

**DISCUSSION:** The distribution of *E. angulata* is overlapped almost completely by that of *E. consors*. The great external similarity of these species therefore makes their recognition on the basis of distribution impossible. Consequently, over much of the range of these two taxa dissection of the male genitalia would appear to be necessary to confirm that identifications are accurate.

**SPECIMENS EXAMINED:** Holotype of *angulata*: ♂, Type; Colo., 1691; P. R. Uhler Collection (USNM). Holotype of *Europiella yampae* Knight: ♂, Steamboat Springs, July 12, 1964, COLO., 6700', H. H. Knight (USNM). Additional specimens: CANADA: **Alberta:** Elkwater Park, July 25, 1952, L. A. Konotopetz, 3♂ (CNC). **British Columbia:** Mt. Kobau, 11 km NW of Osoyoos Summit, 1834 m, August 30, 1993, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (CNC). **Saskatchewan:** Willow Bunch, July 17, 1955, A. R. Brooks, 1♂, 7♀ (CNC). USA: **Arizona:** *Greenlee Co.:* Apache National Forest, September 20, 1998, J. C. Schaffner, 2♂ (TAMU). **Colorado:** *Archuleta Co.:* 14 mi NE of Pagosa Springs, August 16, 1969, H. M. Ohlendorf, 1♂ (TAMU). *Bent Co.:* 15 mi S of Lamar, May 3, 1982, J. T. Polhemus, 16♂ (JTP). Lamar, 3600 ft, June 4, 1919, 3♂ (AMNH). *Boulder Co.:* Nederland, Science Lodge, 9000 ft, July 29, 1961, J. R. Stainer, 6♂, 3♀ (CNC). Ward, Roosevelt National Forest, July 30, 1968, L. A. Kelton, *Solidago* sp. (Asteraceae), 40♂, 35♀ (CNC). *Clear Creek Co.:* West Chicago Creek, Arapaho National Forest, 9800 ft, July 28, 1968, L. A. Kelton, 2♂ (CNC). *Eagle Co.:* N of Minturn, Grouse Creek Trail, 7840 ft, June 24, 1987, D. A. Polhemus, 1♂ (JTP). *Gunnison Co.:* 5 mi NE of Almont, along Taylor River, August 31, 1980, D. A. and J. T. Polhemus, 2♂ (JTP). Gunnison, August 17, 1925, H. H. Knight, *Chrysothamnus* sp. (Asteraceae), 2♂ (USNM). *Hinsdale Co.:* 11 mi N of Lake City, August 6, 1997, J. C. Schaffner, 2♂ (TAMU). *Huerfano Co.:* Veta Pass, August 9, 1925, H. H. Knight, 1♂ (USNM). *Jackson Co.:* 1 mi E of Gould, August 13, 1969, J. C. Schaffner, 1♂ (TAMU). 4 mi N of Gould, August 5, 1975, J. C. Schaffner, 1♂ (TAMU). North Park, July 31, 1926, F. C. Hottes, 2♂ (USNM). *Jefferson Co.:* Red Rocks Park near Morrison, 5600 ft, July 15, 1983, Schuh and Polhemus, *Artemisia* sp. (Asteraceae), 17♂ (AMNH). *Larimer Co.:* Estes Park, 8800 ft, August 27, 1920, H. C. Severin, 3♂, 1♀ (USNM). Fall River Road, Rocky Mountain Na-

tional Park, 9500 ft, August 16, 1968, L. A. Kelton, 1♂ (CNC). Fort Collins, June 24, 1920, 1♂ (USNM). Glen Haven, August 3, 1947, Lawson, 1♂ (KU). *Moffat Co.:* Craig, July 14, 1949, R. H. Beamer, 1♂ (KU). *Montezuma Co.:* Dolores, August 3, 1900, E. D. Ball, 9♂ (USNM). Mancos, August 13, 1925, H. H. Knight, 3♂ (USNM). *Routt Co.:* Steamboat Springs, July 12, 1964, H. H. Knight, 15♂, 15♀ (USNM). *Saguache Co.:* 7 mi W of Cochatopa Pass, August 31, 1980, D. A. and J. T. Polhemus, 47♂ (JTP). Jct Cochetopa Pass Rd and Cochetopa Creek Rd, August 31, 1980, D. A. and J. T. Polhemus, 15♂ (JTP). **Idaho:** *Fremont Co.:* Henrys Lake, 7000 ft, July 12, 1936, R. E. Miller, 2♂ (USNM). **Montana:** *Deer Lodge Co.:* Silver Lake, 14 mi W of Anaconda on Rt 10A, 6400 ft, August 9, 1986, Schuh, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 130♂ (AMNH). *Madison Co.:* 15 mi SE of Virginia City, July 12, 1982, S. E. Cummings, 1♂, 1♀ (UNHAMP). **Nevada:** *Elko Co.:* Ruby Mts., Lomoille Canyon, 6200 ft, June 16, 1983, Schuh, Schwartz, *Artemisia dracuncululus* (Asteraceae), 14♂ (AMNH). **New Mexico:** *Bernalillo Co.:* Albuquerque, June 1, 1983, J. T. Polhemus, 1♂ (JTP). *Grant Co.:* 4 mi SE of Gila Cliff Dwellings Natl. Monument of Hiway 15, September 20, 1998, J. C. Schaffner, 2♂ (TAMU). *Lincoln Co.:* Ruidoso, June 26, 1940, Lipovsky, 1♂ (KU). *Otero Co.:* 4 mi E of Cloudcroft, June 22, 1979–September 26, 1979, J. C. Schaffner et al., 5♂ (TAMU). 7 mi N of Cloudcroft, August 13, 1982, J. C. Schaffner, 4♂ (TAMU). Cloudcroft, June 17, 1976, Oman, 19♂ (OSU). Cloudcroft, June 27, 1940, Beamer, Hardy, Lipovsky, 100♂ (KU). *Taos Co.:* Taos, August 20, 1927, R. H. Beamer, 6♂ (KU). **Oregon:** *Crook Co.:* 23 mi E of Prineville, Mark's Creek, July 29, 1976, J. D. Lattin, *Artemisia arbustorum* (Asteraceae), 6♂ (OSU). *Wallowa Co.:* Joseph, July 10, 1969, P. W. Oman, 1♂ (OSU). **Texas:** *El Paso Co.:* No specific locality, July 18, 1927, R. H. Beamer, 1♂ (KU). **Utah:** *Cache Co.:* Blacksmith Fork Canyon, June 28, 1971, G. F. Knowlton, 1♂ (OSU). Tony Grove Lake, August 17, 1974, G. F. Knowlton, 1♂ (UCD). *Sevier Co.:* Richfield, July 15, 1929, E. W. Davis, 1♂ (USNM). *Summit Co.:* Emory, August 16, 1929, R. H. Beamer, 1♂ (KU). Kimball Junction, August 31, 1967, L. A. Kelton, 1♂, 2♀ (CNC). *Wasatch Co.:* Soldier, August 13, 1906, 1♂ (USU). *Washington Co.:* La Verkin, V. M. Tanner, 1♂ (CAS). Red Cliff Recreation Area near Leeds, 3200 ft, October 16, 1982, D. A. Polhemus, 4♂ (JTP). Zion National Park, Watchman C.G., 3900 ft, October 17, 1982, D. A. Polhemus, 1♂ (JTP). **Wyoming:** *Park Co.:* Shoshone National Forest, August 14, 1927–August 15, 1927, H. H. Knight, 2♂ (UCB). Shoshone National For-



est, August 7, 1927, H. H. Knight, 2♂ (USNM). *Sweetwater Co.*: 10 mi E of Rock Springs, July 4, 1968, H. H. Knight, 1♂ (USNM).

*Europiella artemisiae* (Becker)

Figures 1, 3

*Capsus artemisiae* Becker, 1864: 487 (n. sp., descr.); Schuh et al., 1995:385 (n. syn., disc., figs.).

*Plagiognathus diversus* Van Duzee, 1917a: 283 (n. sp.). NEW SYNONYMY.

*Plagiognathus solani* Matsumura, 1917: 432 (n. sp.; syn. by Schuh et al., 1995: 386).

*Plagiognathus albipennis* var. *obscura* Sahlberg, 1920: 167 (n. var.; syn. by Schuh et al., 1995: 386).

*Plagiognathus (Poliopterus) gracilis* Wagner, 1956: 74 (n. sp.; syn. by Schuh et al., 1995: 386).

*Psallus artemisicola* Knight, 1964: 149 (n. sp.); Schuh et al., 1995: 384 (n. syn. with *Europiella decolor* [Uhler]). REVISED SYNONYMY.

DIAGNOSIS: Always with strongly infuscate hind femora and dark areas on the hemelytra (fig. 1). Similar in appearance to *E. decolor* and *E. lattini*, but distinguished by its usually larger size and antennal segment 2 in males always greater than width of pronotum; length of antennal segment 2 not diagnostic for females; male genitalia very similar in structure to those of *E. decolor* and *E. lattini*, but pygophore and vesica smaller than those in *E. lattini*, and anterior apical spine longer (compare figs. 3 and 4).

REDESCRIPTION: *Male*: Moderately large, elongate species, total length 3.27–3.58, width pronotum 0.97–1.02. COLORATION (fig. 1): Head, pronotum, and scutellum usually mostly dark; hemelytra usually dark with pale areas at base of corium and base of cuneus; some specimens lighter with posterior margin of pronotum and lateral angles of mesoscutum orange and hemelytra generally yellow-orange except for infuscate posterior half of endocorium and posterior portion of cuneus; all antennal segments black; labium generally pale, segment 4 black; venter of body generally infuscate to nearly black; all trochanters pale; forecoxae almost entirely pale; fore and middle femora only weakly darkened, usually with some orange, hind femora heavily infuscate; all tibiae with black spines with distinct black bases. SURFACE AND VESTITURE: Surface and ves-

titure as in generic diagnosis. STRUCTURE: Elongate, nearly parallel-sided, corial margin only weakly convex; antennal segment about one-third longer than width of head. GENITALIA (fig. 3): Pygophore moderately large relative to size of abdomen; posterior apical spine of vesica short, sharply curving, hook-shaped just surpassing gonopore, anterior spine conspicuously longer and weakly decurved, structure very similar to that of *E. decolor* (fig. 3), also similar to *E. lattini* (fig. 4), but anterior spine much longer and entire vesica smaller than in that species.

*Female*: Coloration similar to male. Body form much more strongly ovoid. Total length 2.94–3.22, width pronotum 0.94–1.10; antennal segment 2 relatively shorter than in males, less than or equal to width of pronotum.

HOSTS: Breeds on various species of *Artemisia*, including both herbaceous and woody taxa. Also recorded from *Chrysothamnus*, *Haplopappus*, and *Solidago* spp. (Asteraceae).

DISTRIBUTION: In the Nearctic ranging from Alaska in the north to Zacatecas, Mexico, in the south. In the Rocky Mountain system ranging south into New Mexico, and at higher latitudes as far east as Minnesota and Wisconsin. Although many localities are what would be called boreal, others—such as those from southern California and Mexico—are not.

DISCUSSION: The status of this holarctic species was discussed by Schuh et al. (1995), who were the first authors to recognize its occurrence in North America.

Van Duzee (1917a) described a species *Plagiognathus diversus* from Santa Cruz County, California. Examination of the holotype and dissection of a male paratype of *P. diversus* from the type locality, as well as examination of a number of other paratypes, indicate that this taxon is a junior synonym of *Europiella artemisiae*, **new synonymy**.

Schuh et al. (1995), without comment, synonymized *Psallus artemisicola* Knight, described from St. Paul, Minnesota, with *Europiella decolor*. I can only conclude that this decision was made in haste, because upon further examination of specimens used by Knight in the preparation of his original description, this nominal taxon is clearly the

same as *E. artemisiae*, not *E. decolor* (Uhler) **revised synonymy.**

**SPECIMENS EXAMINED:** Holotype of *Psallus artemisicola* Knight: ♂, St. Paul, Minn., Sept. 3, 1923, H. H. Knight, *Artemisia ludoviciana*; deposited in the USNM. Holotype of *Plagiognathus diversus* Van Duzee: ♂, Niles Canyon, Cal., W. M. Gifford, Alameda Co., 12-VI-17, Cal., Type *diversus*, Type No. 357; deposited in the CAS. Additional specimens: **CANADA: Alberta:** Head Smashed-in Buffalo Jump Interpretive Park, September 1, 1993, M. D. Schwartz, *Artemisia cana* (Asteraceae), 28♂ (CNC). **British Columbia:** 15.8 km N of S end of Muncho Lake Provincial Park, August 1, 1982, G.G.E. Scudder (UBC). 5 mi W of Toad River Lodge, August 24, 1980, R. J. Cannings (UBC). 9 mi E of Grand Forks, June 8, 1959, L. A. Kelton (CNC). 9 mi E of Grand Forks, June 8, 1959, L. A. Kelton, 2♂ (CNC). Blue River Bridge, km 705.6 Cassiar Highway, July 21, 1983, G.G.E. Scudder (UBC). Cassiar Hiway, km 705.6, Blue River Bridge, July 21, 1983, G.G.E. Scudder, 1♂ (UBC). Grand Forks, June 8, 1959, E. E. MacDougall (CNC). Hyland River, July 20, 1983, G.G.E. Scudder (UBC). Kamloops, July 1, 1959, L. A. Kelton (CNC). Kamloops, July 1, 1959, L. A. Kelton, 1♂ (CNC). Kootenay Pass, August 8, 1970, L. A. Kelton, *Artemisia longifolia* (Asteraceae) (CNC). Kootenay Pass, August 8, 1970, L. A. Kelton, *Artemisia longifolia* (Asteraceae), 8♂, 9♀ (CNC). Lillooet, June 1, 1921, J. McDunnough, 1♂ (USNM). Lillooet, June 1, 1926, J. McDunnough (CNC). Lillooet, May 29, 1926, J. McDunnough (CNC). Lillooet, May 30, 1926, J. McDunnough (CNC). Lillooet, May 31, 1926, J. McDunnough (CNC). Lillooet, Seton Lake, June 16, 1926, J. McDunnough (CNC). Lillooet, June 1, 1926, J. McDunnough, 12♂, 20♀ (CNC). Meyer Flat, June 29, 1959, L. A. Kelton (CNC). mi 392 Alaska Highway, Summit Lake, 4200 ft, July 19, 1959, R. E. Leech (CNC). mi 392 Alaska Highway, Summit Lake, July 21, 1959, R. E. Leech (CNC). Muncho LPP, 15 km N of S end of park, August 1, 1982, G.G.E. Scudder, 2♀ (CNC, UBC). Nicola, September 1, 1993, G.G.E. Scudder (UBC). Nicola, September 1, 1993, G.G.E. Scudder, 1♂, 9♀ (CNC). Oliver, July 19, 1970, L. A. Kelton (CNC). Oliver, July 19, 1970, L. A. Kelton, 1♂ (CNC). Oliver, Meyer Flats, June 29, 1959, L. A. Kelton, 20♂ (CNC). Oliver, Vaseaux Lake, May 29, 1959, E.E. MacDougall, L. A. Kelton, 1♂, 9♀ (CNC). Osoyoos, Richter Pass, July 28, 1959, L. A. Kelton, 2♂ (CNC). Osoyoos, Richter Pass, June 28, 1959, L. A. Kelton (CNC). Spillmacheen Rest Area, September 12, 1992, G.G.E. Scudder, 1♀ (UBC). Summit Lake, mile 392 on Alaska Hiway, July 19, 1959, R. E. Leech, 4♀ (CNC). Surprise Lake,

August 18, 1980, R. J. Cannings (UBC). Surprise Lake, August 18, 1980, R. J. Cannings, 3♂, 3♀ (CNC, UBC). Terrace, July 24, 1960, W.R. Richards, 3♂, 3♀ (CNC). Tetsa Br. no. 1, August 16, 1982, L. A. Kelton, *Artemisia tilesii* (Asteraceae), 10♂, 20♀ (CNC). Tetsa Bridge no. 1, August 16, 1982, L. A. Kelton, *Artemisia tilesii* (Asteraceae) (CNC). Trutch, 1260 m, August 25, 1980, R. J. Cannings (UBC). Trutch, 1260 m, August 25, 1980, R. J. Cannings, 3♀ (CNC, UBC). Yahk, July 22, 1959, L. A. Kelton, 1♂ (CNC). **Manitoba:** Glenlea near Red River, Agr. Res. Sta., August 19, 1993, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 41♂ (CNC). Herchmer, August 10, 1937, D. G. Denning, 1♀ (USNM). **Northwest Territories:** Aklavik, July 25, 1931, Bryant, 1♂ (CAS). Fort McPherson, MacKenzie River, July 18, 1957, R. Hurley, 9♂, 2♀ (CNC). Fort McPherson, MacKenzie River, July 20, 1957, R. Hurley, 1♂ (CNC). Fort McPherson, MacKenzie River, July 24, 1957, R. Hurley, 6♂, 1♀ (CNC). Fort McPherson, MacKenzie River, August 6, 1922, C.H. Crickmay, 1♀ (CNC). Inuvick, July 25, 1983, L.A. Kelton, *Artemisia* sp. (Asteraceae) 54♂, 74♀ (CNC). Norman Wells, August 2, 1949, W.R.M. Mason, 3♂ (CNC). Norman Wells, August 7, 1949, W.R.M. Mason, 1♂ (CNC). Reindeer Depot, MacKenzie Delta, August 5, 1948, W.J. Brown, 4♂, 5♀ (CNC). Reindeer Depot, MacKenzie Delta, August 15, 1948, J.R. Vockeroth, 3♂, 5♀ (CNC). Reindeer Depot, MacKenzie Delta, August 2, 1948, W.J. Brown, 1♂ (CNC). Reindeer Depot, MacKenzie Delta, August 18, 1948, J.R. Vockeroth, 1♂, 2♀ (CNC). Reindeer Depot, MacKenzie Delta, August 11, 1948, J.R. Vockeroth, 1♂, 2♀ (CNC). **Saskatchewan:** 10.8 km E of Maidstone on Hwy 16, August 22, 1993, M. D. Schwartz, *Artemisia biennis* (Asteraceae), 35♂ (CNC). Fort Walsh Natl. Hist. Park nr visitor center, September 3, 1993, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 26♂ (CNC). N. Battleford, August 22, 1993, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 24♂ (CNC). **Yukon Territory:** Arctic Circle, Dempster Highway, July 29, 1983, L.A. Kelton, 1♀ (CNC). Blackstone River, Dempster Hiway km 92, July 12, 1983, G.G.E. Scudder, 3♂, 3♀ (UBC). 14 mi E of Dawson, 1300 ft, July 29, 1962, R. E. Leech, 12♂, 16♀ (CNC). Dawson, July 17, 1949, W. W. Judd, 1♂ (CNC). Dawson, July 23, 1983, L.A. Kelton, *Artemisia frigida* (Asteraceae), 9♂, 12♀ (CNC). Mi 87 Dempster Highway, August 4–8, 1973, G. and D.M. Wood, 1♂ (CNC). Destruction Bay, July 26, 1982, L.A. Kelton, *Artemisia tilesii* (Asteraceae) 43♂, 27♀ (CNC). Engineer Creek, Dempster Highway, July 23, 1983, L.A. Kelton, *Rosa* sp. (Rosaceae), 1♂ (CNC). Gravel Lake, 58 mi E of Dawson, 2050

ft, August 11, 1962, P.J. Skisko, 18♂, 11♀ (CNC). Junction of Dempster and Klondike Highway, July 20, 1982, L.A. Kelton, 1♂ (CNC). Moose Creek, July 18, 1982, L.A. Kelton, 1♂ (CNC). Rancheria, August 11, 1982, L.A. Kelton, *Lathyrus* sp. (Fabaceae), 45♂, 65♀ (CNC). Takahane River, July 20, 1981, C. S. Guppy, 1♂ (UBC). Tatchun, August 11, 1983, L.A. Kelton, 1♀ (CNC). MEXICO: **Durango:** 20 mi E of El Salto, Navajos, 8000 ft, July 27, 1964–August 11, 1964, L. A. Kelton, 61♂ (CNC). **Puebla:** San Miguel Texmelucan, August 27, 1969, L. A. Kelton, 1♂ (CNC). **Zacatecas:** Guadalupe, July 6, 1969, L. A. Kelton, 1♂ (CNC). USA: **Alaska:** Big Delta, July 13, 1951, J.R. McGillis, 1♂ (CNC). Big Delta, July 26, 1951, W.R.M. Mason, J.R. McGillis, 1♂ (CNC). Chicken, July 22, 1982, L.A. Kelton, *Aster* sp. (Asteraceae), 47♂, 35♀ (CNC). Chitina, August 10, 1934, C. P. Alexander, *Artemisia* sp. (Asteraceae), 3♂ (USNM). Gardiner Creek Camp, Alaska Hiway, August 5, 1978, P. H. Arnaud, Jr., 1♂ (CAS). Gulkana River, Richardson Hwy, August 2, 1952, 3♂ (USNM). Isabel Pass, mi 206 Richardson Highway, 2900 ft, July 13, 1962, P. J. Skisko, 1♂, 1♀ (CNC). Kotzebue, June 26, 1951, R. I. Sailer, 1♂ (USNM). Lower Tonsina, July 15, 1953, W.C.F., 4♂ (USNM). Palmer, August 1, 1948, R. I. Sailer, 1♂ (USNM). 21 mi N of Paxson, July 16, 1987, S. G. Cannings, 1♀ (UBC). Steese Hwy MP 145.2, September 4, 1948, G. Jefferson, 1♂ (USNM). Teller, July 11, 1951, R. I. Sailer, 10♂, 10♀ (USNM). Umiat, July 16, 1959, R. Madge, 5♂, 8♀ (CNC). Umiat, July 17, 1959, J.E.H. Martin, 1♀ (CNC). Umiat, July 18, 1959, R. Madge, 9♂, 10♀ (CNC). Umiat, July 19, 1959, J.E.H. Martin, 1♀ (CNC). Umiat, July 23, 1959, J.E.H. Martin, 1♂, 5♀ (CNC). Unalakleet, July 6, 1961, R. Madge, 3♂, 2♀ (CNC). Unalakleet, July 8, 1961, R. Madge, 5♂, 2♀ (CNC). Unalakleet, July 10, 1961, R. Madge, 8♂, 4♀ (CNC). Unalakleet, July 13, 1961, R. Madge, 2♂, 2♀ (CNC). Unalakleet, July 15, 1961, R. Madge, 14♂, 7♀ (CNC). Unalakleet, August 5, 1961, B.S. Heming, 1♂, 5♀ (CNC). **Arizona:** *Apache Co.:* Apache National Forest on Hwy 78, 5.4 mi SW Arizona-New Mexico state line, September 20, 1998, J. C. Schaffner, 2♂, 2♀ (TAMU). *Coconino Co.:* 7 mi NW Flagstaff, August 13, 1975, J. C. Schaffner, 3♂ (TAMU). *Navajo Co.:* Show Low, Sitgreaves National Forest, August 10, 1967, L. A. Kelton, 3♂, 1♀ (CNC). **California:** *Alameda Co.:* Niles Canyon, June 13, 1917, W. M. Giffard, 5♂ (CAS, USNM). *Butte Co.:* Oroville, April 30, 1927, H. H. Knight, *Artemisia heterophylla* (Asteraceae), 2♂ (CAS). *Fresno Co.:* 2 km W of Kaiser Pass on USFS 80, 2600 m, July 25, 1999, M. D. Schwartz, *Artemisia* sp. (Asteraceae), 29♂, 12♀ (CNC). *Humboldt Co.:* Beatrice, July 10, 1949, B. P. Bliven, 1♂ (CAS). Blocksburg, October 10, 1937, B. P. Bliven, 4♂ (CAS). Dinsmores, June 25, 1939, B. P. Bliven, 1♂ (CAS). Larabee Valley, July 3, 1938, B. P. Bliven, 1♂ (CAS). Mad River Beach, June 20, 1969, W. G. Goodman, 3♂ (UCD). Miranda on Hwy 101, June 8, 1952, B. P. Bliven, 1♂ (CAS). Myers, August 21, 1938, B. P. Bliven, 1♂ (CAS). Redway, May 29, 1938, B. P. Bliven, 2♂ (CAS). *Inyo Co.:* Bishop, July 28, 1940, E. E. Kenaga, 1♂ (KU). *Kern Co.:* 5 mi N of Kernville, May 15, 1968, S. Earnshaw, 1♂ (UBC). *Lake Co.:* Laurel Dell, August 3, 1916, E. P. Van Duzee, 1♂ (CAS). *Los Angeles Co.:* Whittier, February 19, 1935, *Artemisia californica* (Asteraceae), 3♂ (USNM). *Mariposa Co.:* Yosemite, Nevada Falls, June 7, 1931–July 29, 1946, E. Essig and R. Usinger, 2♂ (UBC). *Mendocino Co.:* 4 mi W of Eel River Ranger Station, Mendocino National Forest, 1450 ft, June 9, 1972, J. Powell, *Artemisia douglasiana* (Asteraceae), 8♂ (UBC). Willits, July 3, 1948, W. F. Chamberlain, 11♂ (TAMU). *Modoc Co.:* Hackamore, July 12, 1947, R. Usinger, *Chrysothamnus* sp. (Asteraceae), 2♂ (UBC). *Orange Co.:* Cleveland National Forest, 1.5 mi E of San Juan Campground, 500 m, May 12, 1978, R. T. Schuh and J. D. Pinto, 11♂ (AMNH). Cleveland National Forest, El Cariso Campground on Hwy 74, 750 m, May 12, 1978, J.D. Pinto and R. T. Schuh, *Artemisia* sp. (Asteraceae), 13♂ (AMNH). Green River Camp, Lower Santa Ana Canyon, May 11, 1933, E. P. Van Duzee, 3♂ (CAS). Santa Ana, April 1, 1936, C. E. Norland, 1♂ (LACM). *Plumas Co.:* 4 mi W of Quincy, June 19, 1949, P.D. Hurd, 1♂ (UBC). *Riverside Co.:* Saboba Springs, June 2, 1917, E. P. Van Duzee, 15♂ (CAS). *Sacramento Co.:* Sacramento, April 3, 1920, E. P. Van Duzee, 1♂ (CAS). Sacramento, August 10, 1935–May 11, 1960, H. H. Keifer, R. F. Wilkey, *Artemisia douglasiana* (Asteraceae), 10♂ (CAFA). Sacramento, August 10, 1935, H. H. Keifer, *Artemisia* sp. (Asteraceae), 1♂ (CAS). *San Diego Co.:* San Diego, March 11, 1914–May 8, 1913, E. P. Van Duzee, 8♂ (CAS). *San Joaquin Co.:* No specific locality, May 30, 1917, W. M. Giffard, 2♂ (CAS). *Santa Barbara Co.:* 13 mi E of Lompoc, April 21, 1932, E. P. Van Duzee, 1♂ (CAS). Lompoc, April 21, 1922–August 6, 1938, R. H. Beamer, E. P. Van Duzee, 2♂ (KU, CAS). *Santa Clara Co.:* Felton, June 12, 1952, W. H. Lange, 1♂ (UCD). *Santa Cruz Co.:* No specific locality, June 7, 1917, W. M. Giffard, 6♂ (CAS). *Siskiyou Co.:* Hornbrook, June 14, 1959, L.A. Kelton, R. Madge, 1♂ (CNC). 2.5 mi N of Medicine Lake on Medicine Lake Rd, 750 m, July 10, 1985, G. M. Stonedahl and J. D. McIver, 3♂ (AMNH). Yreka, June 15, 1959, L. A. Kelton, *Solidago* sp. (Asteraceae), 1♂

(CNC). Yreka, June 15, 1959, L.A. Kelton, R. Madge, 11♂, 24♀ (CNC). *Sutter Co.*: Nicolaus, July 27, 1935, R. H. Beamer, 2♂ (KU). *Trinity Co.*: Coffee Creek, July 30, 1931, R. Usinger, 1♂ (UBC). *Tulare Co.*: Woodlake, April 24, 1932, E. P. Van Duzee, *Artemisia* sp. (Asteraceae), 2♂ (CAS). *Ventura Co.*: Santa Paula, June 28, 1955, W. E. Simonds, 1♂ (CAFA). **Colorado**: *Chaffee Co.*: 20 mi NE of Buena Vista, August 31, 1914, A. K. Fisher, 1♂ (USNM). *Elbert Co.*: 10 mi E of Kiowa, August 29, 1982, D. A. Polhemus, 7♂ (JTP). *Jefferson Co.*: Red Rocks Park near Morrison, 5600 ft, July 15, 1983, R. T. Schuh, D. A. Polhemus, 1♂ (AMNH). *La Plata Co.*: Durango, August 12, 1925, H. H. Knight, 5♂, 5♀ (USNM). *Lake Co.*: Leadville, 10,300 ft, August 3, 1919–August 5, 1919, 1♂, 3♀ (AMNH). *Larimer Co.*: Fort Collins, June 7, 1898, 4♂ (USNM). *Montezuma Co.*: Mesa Verde Natl. Park, 7000 ft, July 17, 1968, L. A. Kelton, 3♂, 1♀ (CNC). *Pitkin Co.*: Aspen, 8000 ft, July 24, 1919, 1♂ (AMNH). *Rio Blanco Co.*: 30 mi N of Rifle on Rt 13, 6800 ft, August 14, 1986, R. T. Schuh, *Artemisia ludoviciana* (Asteraceae), 103♂ (AMNH). *Routt Co.*: Steamboat Springs, July 12, 1964, H. H. Knight, *Artemisia* sp. (Asteraceae), 20♂, 20♀ (USNM). *Saguache Co.*: Alder Creek, July 14, 1993, W. F. Chamberlain, 4♂ (TAMU). *Washington Co.*: Lindon, June 21, 1937, C. L. Johnston, 6♂ (KU). *Yuma Co.*: Joes, June 27, 1937, C. L. Johnston, 1♂ (KU). **Idaho**: *Franklin Co.*: Cub River Canyon, August 12, 1973, G. F. Knowlton, 5♂ (USU). *Idaho Co.*: E of Lowell, Wilderness Access Campground (m.p. 123), 2200 ft, August 7, 1986, Schuh, Schwartz, Stonedahl, *Artemisia ludoviciana* (Asteraceae), 13♂ (AMNH). Lochsa River Valley, E of Wilderness Access Campground (mp 127), 2400, August 8, 1986–August 1, 1987, Schuh, Schwartz, Stonedahl, *Artemisia ludoviciana* (Asteraceae), 147♂ (AMNH). W of Lowell on Rt 12, 3 Devils Picnic Site, 1700 ft, August 7, 1986, Schuh, Schwartz, Stonedahl, *Artemisia ludoviciana* (Asteraceae), 13♂ (AMNH). *Oneida Co.*: Ireland Canyon, October 1, 1969, G. F. Knowlton, 2♂ (USU). *Unknown Co.*: Silver Cow Camp, July 23, 1991, W. J. Hanson, 2♂ (USU). **Iowa**: *Dickinson Co.*: Cayler Prairie, July 11, 1963, J. C. Schaffner, *Artemisia* sp. (Asteraceae), 3♂ (USNM). *Story Co.*: Ames, August 9, 1932, F. Andre, 1♂, 1♀ (USNM). Ames, May 27, 1929, H. H. Knight, 2♂, 1♀ (USNM). *Unknown Co.*: Cedar Falls, July 26, 1927, Harris and Johnston, 2♂ (USNM). **Minnesota**: *Chisago Co.*: North Branch, August 5, 1922, H. H. Knight, 40♂, 40♀ (USNM). *Hennepin Co.*: Fort Snelling, August 2, 1923, H. H. Knight, 10♂, 10♀ (USNM). *Ramsey Co.*: St. Paul, September 3, 1923, H. H. Knight, 10♂, 10♀ (INHS). **Montana**: *Bighorn Co.*: Custer Battlefield, August 4, 1927, H. H. Knight, 2♂, 2♀ (USNM). *Carbon Co.*: Rock Creek Vista Pt on Rt 212 NE of Beartooth Summit, 9100 ft, August 11, 1986, Schwartz, Stonedahl, *Artemisia michauxiana* (Asteraceae), 34♂ (AMNH). *Gallatin Co.*: Willow Creek, June 17, 1921, W. C. Cook, 3♂, 1♀ (USNM). **Nevada**: *Washoe Co.*: Verdi, June 18, 1964–July 9, 1967, C. N. Slobodchikoff, W. Gagne, 3♂ (CAS). **New Mexico**: *Grant Co.*: Silver City, 1800–1900 m, August 1, 1977, N. Krauss, 1♂ (AMNH). *Lincoln Co.*: Ruidoso, June 26, 1940, D. E. Hardy, 2♂ (KU). Sierra Blanca Mt., 8600 ft, August 18, 1970, J. R. and M. H. Sweet, 1♂ (TAMU). *Los Alamos Co.*: Los Alamos Mortandad Canyon, 2190 m, September 1, 1976–February 1, 1977, D. C. Lowrie, 40♂ (AMNH). Los Alamos, Mortandad Canyon, 2190 m, April 1, 1976–June 1, 1976, D. C. Lowrie, 10♂ (AMNH). *Otero Co.*: 2 mi NW of Mayhill, September 26, 1979, R. R. Murray and J. C. Schaffner, 5♂, 10♀ (TAMU). 4 mi E of Cloudcroft, August 18, 1979–September 26, 1979, J. C. Schaffner et al., 43♂ (TAMU). 7 mi N of Cloudcroft, August 13, 1982, J. C. Schaffner, 15♂, 15♀ (TAMU). 7 mi N of Cloudcroft, August 13, 1982, J. C. Schaffner, 90♂ (TAMU). Cloudcroft, June 27, 1940, Hardy, Beamer, Kuitert, 32♂ (KU). Near Cloudcroft, 30 km E of Alamogordo, September 1, 1998, M. D. Schwartz, 1♂, 1♀ (CNC). **North Dakota**: *Trail Co.*: No specific locality, August 19, 1923, A. A. Nichol, 5♂, 5♀ (USNM). **Oregon**: *Clatsop Co.*: Saddle Mountain, 2300–2700 ft, August 11, 1970, Lattin, Oman, 4♂ (OSU). *Crook Co.*: 23 mi E of Prineville, June 28, 1988, G. M. Stonedahl, *Artemisia arbuscula* (Asteraceae), 56♂ (AMNH, OSU). *Jackson Co.*: Medford, TouVelle Park, May 18, 1968, Oman, 1♂ (OSU). Mt. Ashland, 4.5 mi below ski lodge, 5500 ft, September 24, 1968, J. D. Lattin, *Artemisia douglasiana* (Asteraceae), 1♂ (OSU). *Klamath Co.*: near Pothole, July 25, 1958, Joe Schuh, *Haplopappus* sp. (Asteraceae), 1♂ (OSU). *Lake Co.*: 11 mi S of Summer Lake P.O., June 27, 1980, J. D. Lattin, *Artemisia ludoviciana* (Asteraceae), 13♂ (OSU). *Linn Co.*: Tombstone Prairie, 36 mi E of Sweet Home, 4200 ft, September 12, 1956–June 27, 1980, G. Eulenson, J. Lattin, P. Oman, J. Schuh, *Artemisia ludoviciana* (Asteraceae), 28♂ (OSU). *Marion Co.*: 12 mi N of Salem, September 7, 1956, J. D. Lattin, 1♂ (OSU). *Wallowa Co.*: Joseph, July 10, 1969–July 21, 1970, Paul Oman, 3♂ (OSU). **South Dakota**: *Jackson Co.*: Kadoka, August 23, 1927, H. H. Knight, 4♂ (USNM). **Utah**: *Emery Co.*: Woodside, July 14, 1954, G. F. Knowlton, 2♂ (KU). *Kane Co.*: Mount Carmel, June 16, 1948, G. F. Knowlton, 1♂ (USU). *Salt Lake Co.*: Albion Basin near Alta, 10,000 ft, August 18, 1984, D. A.

Polhemus, 6♂ (JTP). Wasatch Mts., Hidden Peak, August 13, 1987, D. A. Rider, 37♂ (DAR). Wasatch Mts., Little Cottonwood Canyon, Snowbird Ski Resort, August 19, 1986, M. D. Schwartz, *Artemisia ludoviciana* (Asteraceae), 40♂ (AMNH). *Sanpete Co.*: 13 mi E of Fairview on Rt 31, T14S R6E, 7500 ft, August 8, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). *Sevier Co.*: Fish Lake National Forest, N end of Johnson Valley Reservoir, 2725 m, July 16, 1980, R. T. Schuh, G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 1♂ (AMNH). *Summit Co.*: Coalville, July 13, 1965, H. H. Knight, 5♂, 5♀ (USNM). *Wasatch Co.*: Buckboard Creek at Rt 35, Uintah National Forest, 8000 ft, August 16, 1986, M. D. Schwartz and G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). **Washington:** *Pierce Co.*: DuPont, July 5, 1935, R. H. Beamer, 1♂ (KU). *Yakima Co.*: 36 mi S of Toppenish, June 26, 1969, Oman, 1♂ (OSU). **Wisconsin:** *Trumpealeau Co.*: near Osseo on Co. Rts G & K., 800 ft, September 13, 1986, M. D. Schwartz, *Artemisia ludoviciana* (Asteraceae), 45♂ (AMNH). **Wyoming:** *Crook Co.*: Sundance, July 20, 1927, H. H. Knight, 3♂, 1♀ (USNM). *Sweetwater Co.*: Green River Lake, 8500 ft, August 1, 1935, H. Ruckes, 1♂ (USNM). *Weston Co.*: Newcastle, August 19, 1927, H. H. Knight, 2♀ (USNM).

*Europiella carvalhoi* Schuh

Figures 1, 3

*Europiella carvalhoi* Schuh (in Schuh et al.), 1995: 387 (n. sp., descr.).

**DIAGNOSIS:** Recognized by the pale, nearly white coloration of the dorsum in most specimens, the elongate-oval body shape (fig. 1), antennal segment 1 black, segment 2 black on at least proximal one-half but sometimes of lighter coloration distally, and the detailed structure of the vesica spines, the anterior spine short and sickle-shaped, the posterior spine relatively short and weakly curving (fig. 3), a condition shared with *E. angulata*, *E. pilosula*, and *E. unipuncta*. Most similar in body form, coloration, and genitalic structure to *E. unipuncta*, but differing from that species by the smaller pygophore, smaller vesica, and differences in the details of the vesical structure. Separated from *E. pilosula* by the entirely pale antennae in most specimens of that species and from *E. angulata* by that species' larger size and generally darker coloration.

**REDESCRIPTION:** *Male:* Relatively small, elongate-ovoid species, total length 2.64–

3.00, width pronotum 0.85–0.98. **COLORATION** (fig. 1): Dorsum, including membrane pale, white to tan, tinged with green; neck castaneous; thoracic pleura and venter and pregenital abdominal segments weakly infuscate, pygophore somewhat darker; antennal segment 1 black, segment 2 black proximally, progressively lighter distally in most specimens, segments 3 and 4 weakly infuscate; femora pale to weakly infuscate with some dark spots, tibiae pale, narrowly black at femoral articulation, tibial spines black with black bases. **SURFACE AND VESTITURE:** Surface and vestiture as in generic description. **STRUCTURE:** Body elongate ovoid. **GENITALIA** (fig. 3): Pygophore moderately large relative to total size of abdomen; apical vesical spines short, of nearly equal length, anterior spine sickle-shaped.

*Female:* Coloration as in male; body form more strongly ovoid. Total length 2.51–2.86, width pronotum 0.89–0.98.

**HOSTS:** Collected almost exclusively on *Artemisia tridentata*. Also known from a single record on *Chrysothamnus nauseosus*.

**DISTRIBUTION:** Most frequently collected in the northern Great Basin and adjoining areas, ranging from Washington to Wyoming in the North, south into Nevada, Utah, and Colorado.

**DISCUSSION:** The apical spines of the vesica as illustrated by Schuh et al. (1995) were drawn in error. The correct form is shown in figure 3.

**SPECIMENS EXAMINED:** Holotype: ♂, USA: WYOMING: Big Horn Co.: 27 mi W Burgess Jct on Rt 14, 7700 ft., Aug 12, 1986, Schuh Schwartz and Stonedahl; *Artemisia tridentata* Nutt (Asteraceae); deposited in the American Museum of Natural History. Additional specimens: USA: **Colorado:** *Saguache Co.*: 23 mi E of Gunnison on Rt 50, 8100 ft, July 17, 1986, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 10♂, 4♀ (AMNH). **Idaho:** *Ada Co.*: near Kuna, June 21, 1982, T. J. Henry, *Artemisia* sp. (Asteraceae), 3♂, 8♀ (USNM). **Nevada:** *Elko Co.*: 30 mi W of Elko on Rt 80, June 18, 1982, T. J. Henry, *Artemisia* sp. (Asteraceae), 4♂, 5♀ (USNM). *Lander Co.*: 1.5 mi S of Rt 50 on Rt 376, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂, 1♀ (AMNH). Smith Creek Valley, 9.5 mi S of Rt 2, T15N R39E, June 30, 1983, Schuh, Schwartz, 2♂ (AMNH). *Nye Co.*: 3 mi SE of Manhattan Toiyabe National Forest, July

13, 1980, R. T. Schuh and G. M. Stonedahl, 1♂ (AMNH). *Washoe Co.*: 7 mi W of Vya toward Cedarville, 1800 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Artemisia tridentata* (Asteraceae), paratypes: 4♂, 4♀ (AMNH). **Oregon:** *Crook Co.*: 23 mi E of Prineville, June 28, 1988, G. M. Stonedahl, 97♂ (AMNH, USNM). *Jackson Co.*: 1 mi below Mt. Ashland summit, 6500 ft, September 24, 1968, J. D. Lattin, paratypes: 6♂, 7♀ (OSU). Ashland, 6500 ft, September 24, 1968, P. Oman and J. D. Lattin, paratypes: 8♂, 8♀ (OSU). *Umatilla Co.*: 2 mi W of Tollgate, 4600 ft, August 4, 1986, Schuh, Schwartz, and Stonedahl, *Artemisia tridentata* (Asteraceae), paratypes: 22♂, 50♀ (AMNH, USNM). *Wheeler Co.*: 2 mi W of Mitchell on Rt 26, June 22, 1979, M. D. Schwartz, G. M. Stonedahl, R. T. Schuh, *Artemisia tridentata* (Asteraceae), paratypes: 15♂, 20♀ (AMNH). Mitchell, June 22, 1979, R. T. Schuh, *Artemisia tridentata* (Asteraceae), paratypes: 1♂ (AMNH). **Utah:** *Cache Co.*: 0.4 mi off Rt 189 along Franklin Basin Road, 6750 ft, July 17, 2001, T. J. Henry and A. G. Wheeler, Jr., *Artemisia tridentata* (Asteraceae), 3♂ (USNM). Rt 189 (Logan Canyon Road) at milepost 389, 5775 ft, July 17, 2001, T. J. Henry and A. G. Wheeler, Jr., *Artemisia tridentata* (Asteraceae), 3♂, 4♀ (USNM). *Rich Co.*: Logan Canyon, Cache National Forest, 6200 ft, August 9, 1972, L. A. Kelton, 1♂ (CNC). **Washington:** *Benton Co.*: Hanford Reservation A.E.C., Rattlesnake Ridge, June 28, 1978–July 12, 1967, W. W. Cone, *Artemisia tridentata* (Asteraceae), 1♂, 2♀ (WSU). *Douglas Co.*: 7 mi S of Rock Island, Columbia River Orchards, May 28, 1987, R. J. Rathman, *Chrysothamnus nauseosus* (Asteraceae), 1♂ (WSU). **Wyoming:** *Big Horn Co.*: 27 mi W of Burgess Jct on Rt 14, 7700 ft, August 12, 1986, Schuh, Schwartz, and Stonedahl, *Artemisia tridentata* (Asteraceae), paratypes: 3♂, 3♀ (AMNH).

*Europiella consors* (Uhler)

Figures 1, 3, 8, 9

*Maurodactylus consors* Uhler, 1895: 53 (n. sp., descr.); Schuh et al., 1995: 387 (n. syn., disc.). *Europiella fuscicornis* Knight, 1969: 82 (n. sp.; syn. by Schuh et al., 1995: 387). *Europiella basicornis* Knight, 1970: 230 (n. sp.; syn. by Schuh et al., 1995: 387). *Europiella monticola* Knight, 1970: 230 (n. sp., descr.). NEW SYNONYMY. *Europiella yampae*: Kelton, 1980: 341 (misidentification). *Megalopsallus monticola* Schuh et al., 1995: 389 (n. comb.).

**DIAGNOSIS:** Recognized by the relatively large size, elongate, nearly parallel-sided,

broad body form, general coloration of dorsum being either dark or light (figs. 1, 8), and the vesica with a long, flat, decurved, anterior apical spine and shorter posterior spine (fig. 3), a condition shared with *E. umbrina* and *E. stigmosa*. Most similar in size, general appearance, and coloration to *E. angulata*, and apparently not separable from it with certainty except by dissection of male genitalia. Sexual dimorphism pronounced, females being much smaller than males and conspicuously ovoid, in contrast to the nearly monomorphic situation found in *E. stigmosa* and *E. umbrina*.

**REDESCRIPTION:** *Male:* Relatively large, broad-bodied species, total length 3.22–3.68, width pronotum 1.00–1.15. **COLORATION** (figs. 1, 8): General coloration of dorsum either largely dark or mostly pale; antennal segments 1–4 black; labium mostly black in dark specimens, pale basally in pale specimens; much of venter dark in dark specimens, largely pale in pale specimens; coxae, trochanters, and femora mostly dark in dark specimens, largely pale in pale specimens, femora when pale with dark spots or blotches; tibiae with pale background coloration with black spines with black bases. **SURFACE AND VESTITURE** (fig. 9C): Surface and vestiture as in generic diagnosis. **STRUCTURE** (fig. 9): Elongate nearly parallel-sided, corial margin only weakly convex. **GENITALIA** (fig. 3): Pygophore moderately large relative to size of abdomen; vesica with anterior spine long and decurved, posterior spine shorter and nearly erect, similar to condition found in *E. stigmosa* and *E. umbrina*.

*Female:* Coloration usually light, seldom as dark as in males. Females much shorter than males, ovoid. Total length 2.79–3.26, width pronotum 0.98–1.09.

**HOST:** Known from various *Artemisia* spp., although recorded primarily from *A. filifolia* and *A. tridentata*. Also known to breed on *Chrysothamnus* spp. Records from *Cowania* and *Crotalaria* are almost certainly not breeding records.

**DISTRIBUTION:** Ranging from British Columbia to Saskatchewan in the North, south through the western plains to Texas, and west to California.

**DISCUSSION:** Examination of topotypic

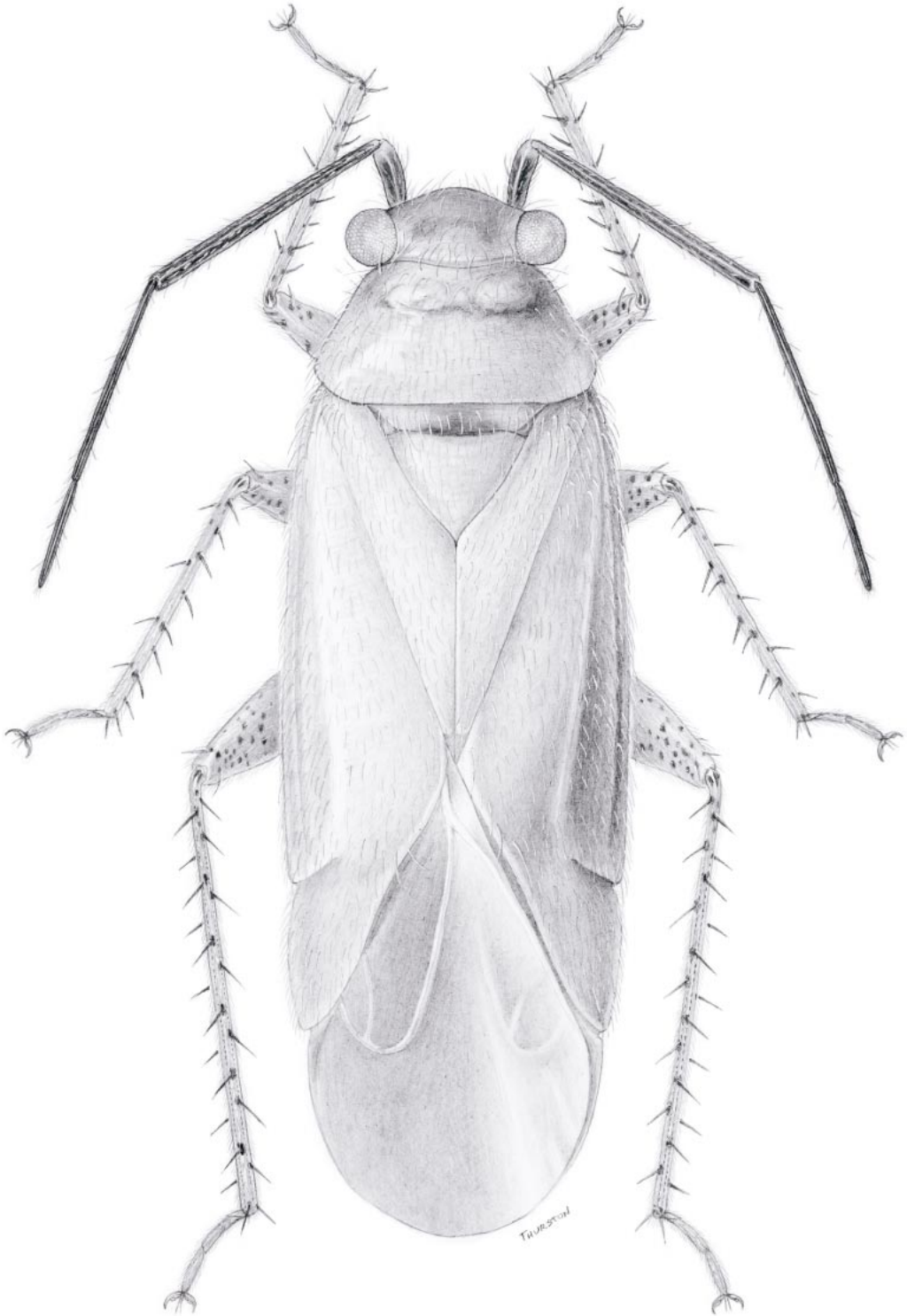


Fig. 8. *Euopiella consors* (Uhler). Male: USA: Utah: Sevier Co.: 11 mi W of Sevier on Rt 4, 2000 m.



Fig. 9. Scanning electron micrographs of *Europiella consors* (♂). **A.** Mesothoracic spiracle and metepisternal scent-efferent system, lateral view. **B.** Pretarsus, ventral view. **C.** Setae on hemelytra.

paratypes of *E. monticola* Knight suggests that this nominal species is the same as *E. consors*, and I am therefore treating the former as a junior synonym of the latter **new synonymy**. Both specimens examined were

general, and the male genitalia were therefore of no value; nonetheless, judging from the light coloration, which is much more common in *E. consors* than in *E. angulata*, the only other species with which *monticola* could be easily confused, the synonymy with *E. consors* would appear to be reasonably secure. This taxon was placed in *Megalopsalus* in error by Schuh et al. (1995).

**SPECIMENS EXAMINED:** Holotype: ♂, Colo., 1744; P. R. Uhler Collection (USNM). Holotypes of synonyms: *Europiella fuscicornis* Knight: ♂, Hudson, Colo., Aug. 25, 1925, H. H. Knight, *Artem. filifolia* (USNM). *Europiella basicornis* Knight: ♂, Coalville, UTAH, July 13, 1965, H. H. Knight (USNM). Additional specimens: CANADA: **Alberta:** Irvine, June 11, 1952, L. A. Konotopetz, 3♂ (CNC). **British Columbia:** Mt. Kobau, 11 km NW of Osoyoos Summit, 1834 m, August 30, 1993, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 38♂ (CNC). Osoyoos, Mount Kobau Road, August 18, 1996, J. Jarrett (UBC). Osoyoos, Mount Kobau Road, August 18, 1997, J. Jarrett (UBC). Osoyoos, Mount Kobau, 1865 m, August 27, 1988, G.G.E. Scudder (UBC). Osoyoos, Mount Kobau, 1885 m, August 26, 1986, G.G.E. Scudder, *Artemisia tridentata* (Asteraceae) (UBC). Osoyoos, Mount Kobau, 1885 m, August 27, 1986, G.G.E. Scudder, *Artemisia tridentata* (Asteraceae) (UBC). Osoyoos, Mount Kobau, May 22, 1996, J. Jarrett (UBC). Osoyoos, Mount Kobau, September 22, 1997, J. Jarrett (UBC). Osoyoos, Mt. Kobau, 1885 m, August 26, 1986–August 30, 1993, G.G.E. Scudder, *Artemisia tridentata* (Asteraceae), 45♂, 45♀ (UBC, AMNH). Osoyoos, Mt. Kobau, September 22, 1997–October 25, 1997, J. Jarrett, 3♂, 3♀ (UBC). **Manitoba:** Russell, July 17, 1954, Brooks and Wallis, 6♂, 8♀ (CNC). **Saskatchewan:** Elbow, June 20, 1960, A. R. Brooks, 1♀ (CNC). Willow Bunch, July 27, 1955, A. R. Brooks, 6♂, 5♀ (CNC). USA: **Arizona:** *Cochise Co.:* 1 mi E of Wilcox, October 20, 1979, J. D. Pinto, 5♂ (UCR). 4 mi E of Wilcox, May 10, 1987, J. G. Rosen, 1♂ (AMNH). *Coconino Co.:* Grand Canyon, 7000 ft, June 22, 1925, A. A. Nichol, 1♂ (CNC). Grand Canyon, 7000 ft, June 22, 1925, A. A. Nichol, 1♂ (USNM). Rt 64 just SE of Grand Canyon Natl. Park in Kaibab National Forest, June 26, 1980, K. and R. Schmidt, *Artemisia* sp. (Asteraceae), 20♂ (AMNH). *Navajo Co.:* Holbrook, June 25, 1980, J. D. Pinto, 1♂ (UCR). *Pinal Co.:* Superior, 2400 ft, April 16, 1928, A. A. Nichol, 2♂ (USNM). *Yavapai Co.:* near Congress, Aguila, May 20, 1960, B. P. Bliven, 1♂ (CAS). **California:** *Inyo Co.:* Mammoth Lakes, June 29, 1940, L. C. Kuitert, 1♂ (KU). *Kern Co.:* 11 mi NW of Tehachapi



on Rt 58, April 25, 1983, G. M. Stonedahl, *Chrysothamnus nauseosus* (Asteraceae), 21♂ (AMNH). *Los Angeles Co.*: 1 mi S of Gorman, June 13, 1964, A. G. Raske, 1♂ (UCB). *Mono Co.*: Mammoth Camp, 3♂ (LACM). *San Diego Co.*: Morena Dam, May 26, 1929, C. C. Sarl, 1♂ (SDNM). *Siskiyou Co.*: 5 mi N of Gazelle, June 15, 1959, Kelton and Madge, *Crotalaria* sp. (Fabaceae), 9♂, 18♀ (CNC). *Tulare Co.*: 21 mi W of Rt 395 toward Kennedy Meadows, 1875 m, July 1, 1980, R. T. Schuh, *Chrysothamnus parryi* (Asteraceae), 4♂ (AMNH). *Ventura Co.*: Ventura, January 23, 1919, E. O. Essig, *Artemisia californica* (Asteraceae), 1♂ (UCB). **Colorado**: *Archuleta Co.*: Piedra, San Juan National Forest, 6300 ft, July 22, 1968, L. A. Kelton (Asteraceae), 6♂, 8♀ (CNC). *Baca Co.*: 3 mi S of Walsh, May 23, 1947, M. T. James, 15♂, 5♀ (WSU). *Clear Creek Co.*: Berthoud Pass, July 12, 1949, J. R. White, 1♂ (KU). *Conejos Co.*: Elk Creek Recreation Area, August 22, 1969, J. C. Schaffner, 7♂ (TAMU). *Douglas Co.*: Roxborough Road near Chatfield Park, May 28, 1978, J. T. Polhemus, 1♂ (JTP). *Eagle Co.*: 1 mi N of Minturn, Grouse Creek, 7840 ft, August 2, 1986–August 11, 1987, T. J. Henry, J. T. and D. A. Polhemus, *Artemisia tridentata* (Asteraceae), 14♂, 8♀ (USNM, JTP). McCoy, August 22, 1968, L. A. Kelton, 10♂, 8♀ (CNC). N of Minturn, Grouse Creek Trail, 7840 ft, August 11, 1986, J. T. and D. A. Polhemus, *Artemisia tridentata* (Asteraceae), 4♂ (JTP). Sloss, August 17, 1929, L. D. Anderson, R. H. Beamer, 4♂ (KU). Wolcott, August 1, 1932–August 24, 1935, G. F. Knowlton, Vasco Tanner, 2♂ (USU, BYU). *Garfield Co.*: W Evacuation Creek, 11 mi SE state line on Rt 45, 6800 ft, July 9, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). *Grand Co.*: Granby, August 19, 1968, L. A. Kelton, 2♂ (CNC). Parshall, August 17, 1973, W. J. Hanson, G. F. Knowlton, 1♂ (USU). *Gunnison Co.*: 35 mi E of Gunnison on Rt 50, 8500 ft, July 17, 1986, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). 5 mi NE of Almont, along Taylor River, 8400 ft, August 13, 1987, J. T. and D. A. Polhemus, T. J. Henry, *Artemisia tridentata* (Asteraceae), 30♂, 15♀ (JTP, USNM). 5 mi NE of Almont, Taylor River Bridge, 8400 ft, August 13, 1987, T. J. Henry, *Artemisia tridentata* (Asteraceae), 25♂, 10♀ (USNM). Black Mesa, 10.7 mi W of Sapinero, August 19, 1966, T. C. Emmel, 1♂ (LACM). Gunnison, August 17, 1925, H. H. Knight, *Chrysothamnus* sp. (Asteraceae), 15♂, 15♀ (USNM). Gunnison, August 17, 1925, H. H. Knight, *Chrysothamnus* sp. (Asteraceae), 2♂ (CNC). Parlin, August 27, 1968, L. A. Kelton, 16♂, 5♀ (CNC). *Huerfano Co.*: Veta Pass, August 9, 1925, H. H. Knight, 3♂ (USNM). *Jackson Co.*: 1 mi E of Gould, August 13, 1969, J. C. Schaffner, 41♂ (TAMU). 7 mi NE of Rand, August 14, 1969, J. C. Schaffner, 60♂ (TAMU). Cowdrey, 8000 ft, August 15, 1968, L. A. Kelton (Asteraceae), 50♂, 25♀ (CNC). Gould, 9200 ft, August 12, 1968, L. A. Kelton, *Artemisia* sp. (Asteraceae), 5♂, 5♀ (CNC). Muddy Pass, Routt National Forest, 8600 ft, August 19, 1968, L. A. Kelton, 16♂, 2♀ (CNC). Northgate, August 20, 1931, R. H. Beamer, 1♂ (KU). Rabbit Ears Pass, 9680 ft, July 11, 1964, H. H. Knight, 2♂ (USNM). Rabbit Ears Pass, July 11, 1964, H. H. Knight, 1♂ (CNC); paratype of *Europiella monticola* Knight. Walden, August 20, 1931, R. H. Beamer, 2♂ (KU). *Jefferson Co.*: Golden, 6000 ft, August 6, 1919, 1♂ (AMNH). *Lake Co.*: Leadville, 10,300 ft, August 3, 1919, 8♂ (AMNH). *Larimer Co.*: 3 mi S of Estes Park, August 2, 1997–August 4, 1997, J. C. Schaffner, 1♂ (TAMU). Estes Park, 8800 ft, August 27, 1920, H. C. Severin, 5♂ (USNM). Estes Park, August 24, 1925, H. H. Knight, 1♂ (USNM); paratype of *Europiella fuscicornis* Knight; Hudson, August 25, 1925, H. H. Knight, 2♂ (USNM). Rocky Mountain National Park, August 5, 1947, R. H. and L. D. Beamer, 2♂ (KU). Rocky Mountain National Park, Grand Lake Entrance, August 18, 1968, L. A. Kelton, 1♂ (CNC). Rustic, Poudre Canyon, September 6, 1972, L. A. Kelton, 3♂, 1♀ (CNC). *Logan Co.*: Sterling, August 25, 1925, H. H. Knight, 2♂ (USNM). *Moffat Co.*: Craig, July 14, 1949, R. H. Beamer, 1♂ (KU). *Montezuma Co.*: Dolores, August 15, 1925, H. H. Knight, 5♂, 5♀ (USNM). *Montrose Co.*: Black Canyon, August 15, 1973, J. C. Schaffner, 1♂ (TAMU). *Park Co.*: Grant, Geneva Park, 9500 ft, July 22, 1916, L. O. Jackson, 1♂ (USNM). *Pitkin Co.*: Aspen, White River National Forest, August 24, 1968, L. A. Kelton, 25♂, 12♀ (CNC). *Pueblo Co.*: Avondale, May 10, 1981, J. T. Polhemus, 51♂ (JTP). *Rio Blanco Co.*: 30 mi N of Rifle on Rt 13, 6800 ft, August 14, 1986, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 11♂ (AMNH). *Routt Co.*: Steamboat Springs, July 15, 1964, H. H. Knight, 2♂ (USNM). Steamboat Springs, September 1, 1943, O. B., 1♂ (KU). *Saguache Co.*: 1 mi E of North Pass, August 19, 1969, J. C. Schaffner, 48♂ (TAMU). 23 mi E of Gunnison on Rt 50, 8100 ft, July 17, 1986, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 44♂ (AMNH). Valley View Springs, ca. 7 mi E Mineral Hot Springs, 8500 ft, August 14, 1965, H. B. Leech, 1♂ (CAS). *Summit Co.*: Dillon, August 29, 1972, L. A. Kelton, *Artemisia* sp. (Asteraceae), 5♂, 3♀ (CNC). *Sutter Co.*: Nicolaus, June 27, 1935, R. H. Beamer, 1♂ (KU). *Weld Co.*: 10 mi E of Roggen, July 16, 1983, D. A. Polhemus, 1♂ (JTP). 10 mi N of Hodson, June 11, 1979, D. A. Polhemus, 1♂ (JTP). 2 mi SE of Masters, June

- 4, 1979, D. A. Polhemus, 2♂ (JTP). 24 mi N of Stoneham along Hwy 71, June 5, 1979, D. A. Polhemus, 2♂ (JTP). 5 mi NW of Roggen, July 15, 1983, D. A. and J. T. Polhemus, 3♂ (JTP). 5 mi W of Roggen, 5200 ft, July 16, 1983, R. T. Schuh, D. A. and J. T. Polhemus, *Artemisia filifolia* (Asteraceae), 9♂ (AMNH). 7 mi E of Nunn, August 15, 1968, Oman, 1♂ (OSU). Riverside Reservoir, June 4, 1979, D. A. Polhemus, 2♂ (JTP). **Idaho:** *Franklin Co.:* Cub River Canyon, August 13, 1974, G. F. Knowlton, 1♂ (OSU). **Montana:** *Deer Lodge Co.:* Silver Lake, 14 mi W of Anaconda on Rt 10A, 6400 ft, August 9, 1986, Schuh, Schwartz, Stonedahl, *Artemisia ludoviciana* (Asteraceae), 66♂ (AMNH). *Fergus Co.:* 6 mi S of Grass Range, July 6, 1972, G. C. Gaumer, 2♂ (TAMU). *Gallatin Co.:* Targhee Pass on Rt 191, 7072 ft, August 10, 1986, Schuh, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 52♂ (AMNH). **Nevada:** *Carson City Co.:* Carson City, Summit Clear Creek Grade, July 10, 1934, E. P. Van Duzee, 1♂ (CAS). *Elko Co.:* Ruby Mts., Lomaille Canyon, 6200 ft, June 16, 1983, R. T. Schuh, M. D. Schwartz, *Artemisia dracunculus* (Asteraceae), 23♂ (AMNH). *Esmeralda Co.:* 2 mi W of Lida, 6500 ft, August 6, 1966, W. C. Gagne, 1♂ (UCB). 3 mi W of Lida, 6800 ft, July 7, 1966, C. W. O'Brien, 1♂ (UCB). *Lander Co.:* Austin Summit, July 21, 1968, J. Scott, 1♂ (UCB). *Washoe Co.:* Reno, June 27, 1927, E. P. Van Duzee, 1♂ (CAS). Reno, Sky Ranch, June 16, 1952, E. I. Schlinger, 1♂ (UCB). *White Pine Co.:* 2.3 mi N of Hwy 50 on Steptoe Creek Rd, 6800 ft, July 19, 1980, G. M. Stonedahl, *Chrysothamnus viscidiflorus* (Asteraceae), 18♂ (AMNH). Wheeler Peak Drive, Humboldt National Forest, 7000–10,000 ft, August 6, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). **New Mexico:** *Bernalillo Co.:* Albuquerque, June 1, 1983, J. T. Polhemus, 9♂ (JTP). Tijeras, along I-40, June 1, 1983, J. T. Polhemus, 6♂ (JTP). *Dona Ana Co.:* 4 mi W of Las Cruces, April 10, 1976, Oman, 3♂ (OSU). *Eddy Co.:* Site 1, May 23, 1979, Delorme and Carrola, 7♂ (TAMU). Site 11, April 24, 1979, Burke, Delorme, Schaffner, 161♂ (TAMU). Site 13, April 24, 1979, Burke, Delorme, Schaffner, 9♂ (TAMU). Site 7, September 23, 1979–June 2, 1979, Murray, Schaffner, Burke, Delorme, Carrola, Friedlander, *Artemisia filifolia* (Asteraceae), 27♂ (TAMU). *Hidalgo Co.:* Lordsburg, May 10, 1939, G. Willette, 1♂ (LACM). *Otero Co.:* Cloudcroft, June 27, 1940–June 17, 1976, Lipovsky, Wickham, Oman, 9♂ (KU, CAS, OSU). *Taos Co.:* Taos, August 20, 1927, P. A. Read, 1♂ (KU). **North Dakota:** *Ramsey Co.:* Roosevelt Natl. Mem. Park, N. Unit, June 30, 1973, L. A. Kelton, *Artemisia* sp. (Asteraceae), 3♂, 6♀ (CNC). **Oregon:** *Crook Co.:* Ochoco National Forest, July 29, 1967, P. Oman, 2♂ (OSU). SE of Prineville near Eagle Rock, July 2, 1968, P. Oman, 2♂ (OSU). *Deschutes Co.:* 0.5 mi S of Millican, June 29, 1978, Lattin, *Artemisia tridentata* (Asteraceae), 2♂ (OSU). 1 mi S of Millican, 4180 ft, June 21, 1979, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). 3 mi W of Millican, sand dunes, July 6, 1977, J. D. Lattin (Asteraceae), 11♂ (OSU). *Grant Co.:* 1 mi S of Silvies, Malheur National Forest, T18S, R32E, Sec. 7, 4580 ft, July 23, 1979, M. D. Schwartz, *Chrysothamnus nauseosus* (Asteraceae), 28♂ (AMNH). *Harney Co.:* Fish Lake, Steens Mts., 7200 ft, August 14, 1958–August 18, 1958, K.M. Fender, 28♂ (OSU). T36S, R35E, Sec. 8, dunes, June 27, 1979, Lightfoot and Cobb, 1♂ (OSU). *Klamath Co.:* 28 mi SE Jct 97 31, July 25, 1979, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Lake Co.:* 11 mi NW of Silver Lake on Hwy 31, 4500 ft, June 25, 1979, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 6♂ (AMNH). 5.5 mi W of Silver Lake, 4955 ft, July 13, 1978, Oman, 4♂ (OSU). *Wallowa Co.:* Joseph, July 10, 1969, P. Oman, 5♂ (OSU). **Texas:** *Ward Co.:* Monahans Sandhills St. Pk., April 12, 1971, R. R. Murray, 10♂ (TAMU). **Utah:** *Box Elder Co.:* Devil's Gate, July 28, 1969, T. L. Whitworth, 2♂ (USU). South Curlew Valley, June 18, 1969, G. F. Knowlton, 1♂ (USU). *Cache Co.:* 0.4 mi off Rt 189 around Franklin Basin Road, 6750 ft, July 18, 2001, T. J. Henry, *Artemisia tridentata* (Asteraceae), 13♂, 3♀ (USNM). Beaver Mountain, August 31, 1982, G. F. Knowlton, 1♂ (USU). Elk Valley, July 29, 1976, Hanson, 1♂ (USU). Franklin Basin, August 13, 1974, Hanson, Knowlton, 1♂ (USU). Tony Grove Lake, Campground, 8400 ft, August 17, 1976–September 7, 1981, M. D. Schwartz, G. F. Knowlton, *Artemisia tridentata* (Asteraceae), 40♂ (UCD, USU, AMNH). *Daggett Co.:* Red Springs Camp, Ashley National Forest, August 25, 1966, C. W. O'Brien, 1♂ (UCB). *Duchesne Co.:* 10 mi W of Duchesne, July 20, 1962, J. B. Karren, 1♂ (USU). *Emery Co.:* 2.5 mi W of Rt 24 on Goblin Valley Road, 5500 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 89♂ (AMNH). *Garfield Co.:* 8.7 mi S of Rt 95 on Rt 276, Maidenwater Spring, 5000 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 21♂ (AMNH). Bryce Canyon National Park, V. M. Tanner, 1♂ (USNM). Hatch, August 11, 1972, L. A. Kelton, 1♂, 4♀ (CNC). Jct Rts 95 and 276, 4900 ft, June 19, 1983–June 18, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 48♂ (AMNH). Widtsoe, V. M. Tanner, 1♂ (USNM). *Grand Co.:* 5 mi S of Moab on US 163, 4600 ft, May 27, 1978, D. A. and J. T. Polhemus, 1♂ (JTP). *Iron*

Co.: 1 mi N of Parowan, June 18, 1967, *Artemisia tridentata* (Asteraceae), 1♂ (USNM). 7 mi S of Beryl Junction, June 15, 1967, *Artemisia tridentata* (Asteraceae), 1♂ (USNM). *Juab Co.*: Nephi, June 22, 1966, Knowlton, 1♂ (USU). *Kane Co.*: Long Valley Jct, July 31, 1975, W. F. Chamberlain, 1♂ (TAMU). *Millard Co.*: 4 mi N of Beaver, July 16, 1967, H. R. Burke, 2♂ (TAMU). *Rich Co.*: Allen Canyon, August 27, 1975, G. F. Knowlton, 1♂ (USU). Logan Canyon Summit, 7800 ft, July 30, 1940–August 29, 1980, G. S. Stains, D. G. Hall, G. Knowlton, 15♂ (OSU, USU). *San Juan Co.*: 27 mi E of Blanding at MP 101 on Rt 95 near Mule Tower Ruins, 6500 ft, June 12, 1982, M. D. Schwartz, *Artemisia ludoviciana* (Asteraceae), 1♂ (AMNH). Brush Basin Rim Rd., Co. rd. no. 227 0.5 E mp 116, 5700 ft, June 12, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 17♂ (AMNH). Canyonlands Natl. Park, Grandview Point, 6400 ft, May 22, 1981, M. D. Schwartz, *Cowania mexicana* (Rosaceae), 1♂ (AMNH). Grand Flat near Collins Canyon, 5600 ft, June 1, 1982, D. A. and J. T. Polhemus, 5♂ (JTP). Near Halls Crossing, rim of Moki Canyon, 4000 ft, May 28, 1978, D. A. and J. T. Polhemus, 39♂ (JTP). *Sanpete Co.*: Ephraim Canyon, August 13, 1975, G. F. Knowlton, 1♂ (USU). 13 mi E of Fairview on Rt 31, T14S, R6E, 7500 ft, August 8, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 4♂ (AMNH, OSU). *Sevier Co.*: 11 mi W of Sevier on Rt 4, 2000 m, July 15, 1980, G. Stonedahl, *Artemisia tridentata* (Asteraceae), 50♂ (AMNH). 24.7 mi N Hwy 24 and Hwy 72, 7960 ft, July 17, 1980, G. Stonedahl, 6♂ (AMNH). Monroe, October 20, 1929, D. E. Fox, *Artemisia tridentata* (Asteraceae), 1♂ (USNM). Richfield, July 8, 1930, 1♂ (USU). Richfield, July 8, 1930, E. W. Davis, 10♂ (USNM). Salina, June 25, 1954, G. Nielsen, 1♂ (USU). Salt Gulch, 12 mi N Hwy 24 on Hwy 72, 8060 ft, July 17, 1980, G. Stonedahl, *Artemisia* sp. (Asteraceae), 11♂ (AMNH). *Summit Co.*: Kimball Junction, August 31, 1967, L. A. Kelton, 15♂, 10♀ (CNC). Weber Canyon Road, 4.5 mi E of Oakley, August 19, 1986, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). *Uintah Co.*: 20–22 mi N of Vernal, August 25, 1966, C. W. O'Brien, 2♂ (UCB). Kane Hollow on Red Cloud Loop, 8500 ft, September 7, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 5♂ (AMNH). *Unknown Co.*: Bone Draw, July 13, 1936, G. F. Knowlton, 1♂ (USNM). Current Creek, August 16, 1935, G. F. Knowlton, 1♂ (USU). *Utah Co.*: Spanish Fork Canyon, July 17, 1954, G. F. Knowlton, 1♂ (USNM). *Wasatch Co.*: Daniels Canyon summit, August 16, 1935, G. F. Knowlton, *Artemisia* sp. (Asteraceae), 3♂ (USU). Uintah National Forest, Wolf Creek Campground,

T4S, R10W, Sec. 7, 30 mi SE of Kamas on Rt 35, 9000 ft, August 15, 1986, M. D. Schwartz and G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 13♂ (AMNH). Uintah National Forest, Buckboard Creek at Rt 35, T4S R9E Sec 17, 8000 ft, August 16, 1986, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 19♂ (AMNH). *Washington Co.*: 2 mi NW of Toquerville on Rt 17, 3800 ft, April 25, 1981, M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 20♂ (AMNH). Hurricane, May 18, 1960, B. P. Bliven, 9♂ (CAS). La Verkin, V. M. Tanner, 1♂ (USNM). La Verkin, Vasco Tanner, 2♂ (CAS). Leeds, April 27, 1971, G. F. Knowlton, 1♂ (USU). Rt 15 at I-15 NE of St. George, 935 m, April 18, 1978, R. T. Schuh, *Chrysothamnus* sp. (Asteraceae), 165♂ (AMNH). Santa Clara, April 26, 1935, G. F. Knowlton, 2♂ (USU). Snow Canyon State Park, T41S R16W, 4000 ft, April 22, 1981–April 23, 1981, M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 41♂ (AMNH). St. George, June 30, 1965, H. H. Knight, 4♂, 5♀ (USNM). *Weber Co.*: 6 mi S of Monte Cristo, August 17, 1979, G. F. Knowlton (USU). **Wyoming:** *Albany Co.*: 5 mi W of Woods Landing, August 15, 1968, L. A. Kelton (Asteraceae), 10♂, 15♀ (CNC). Near Keystone, July 26, 1981, J. T. and D. A. Polhemus, 1♂ (JTP). *Big Horn Co.*: 21 mi W of Burgess Jct on Rt 14, 8500 ft, August 12, 1986–August 13, 1986, Schuh, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 54♂ (AMNH). 27 mi W of Burgess Jct on Rt 14, 7700 ft, August 12, 1986, Schwartz, Stonedahl, Schuh, *Artemisia tridentata* (Asteraceae), 86♂ (AMNH). *Carbon Co.*: 11 mi S of Red Lodge, Parkside Campground, 7250 ft, August 12, 1986, M. D. Schwartz and G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 4♂ (AMNH). Saratoga, June 29, 1931, H. H. Knight, 3♂ (USNM). *Fremont Co.*: Wind River Mts., 2.5 mi SW Shoshone NF boundary on Rt 131, August 14, 1986, M. D. Schwartz and G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 6♂ (AMNH). *Lincoln Co.*: Auburn, C. Lynn Hayward, 3♂ (BYU). *Park Co.*: Shoshone National Forest, August 7, 1927, H. H. Knight, 3♂ (USNM). Yellowstone National Park, August 8, 1927, H. H. Knight, 2♂ (USNM). *Sweetwater Co.*: Green River, August 3, 1937, Drake and Andre, 1♂ (USNM). *Teton Co.*: Moran, July 19, 1936, G. F. Knowlton, 1♂ (USU).

*Europiella decolor* (Uhler)  
Figures 1, 2, 4, 10

? *Phytocoris pallidulus* Dahlbom, 1851: 211 (n. sp.; syn. by Schuh et al., 1995: 384).  
*Agalliastes decolor* Uhler, 1893:380 (n. sp.,

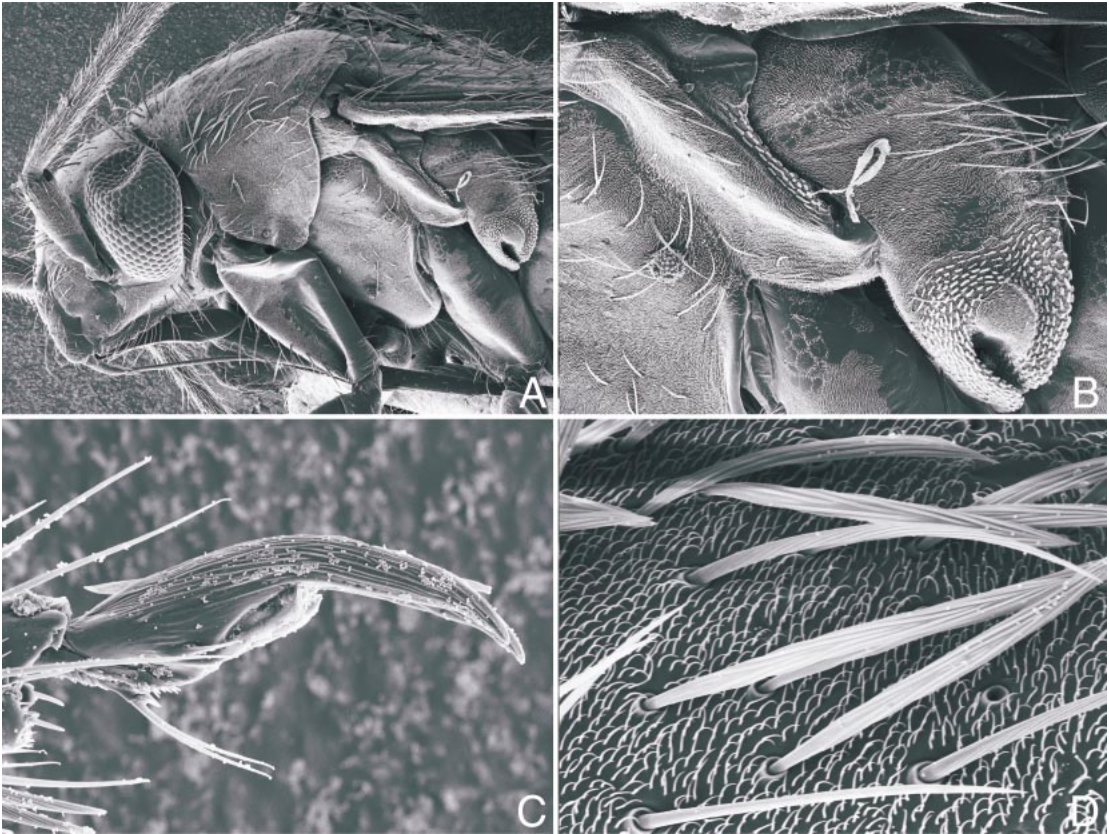


Fig. 10. Scanning electron micrographs of *Europiella decolor* ( $\delta$ ). **A.** Head and thorax, lateral view. **B.** Mesothoracic spiracle and metepisternal scent-efferent system, lateral view. **C.** Pretarsus, lateral view. **D.** Setae on hemelytra, detail of microstructure.

descr.); Schuh et al., 1995: 384 (n. syn., disc. figs.).

*Agalliaestes apiatus* Uhler, 1895: 53 (n. sp.; syn. by Schuh et al., 1995: 384).

*Agalliaestes signatus* Uhler, 1895: 55 (n. sp.; syn. by Schuh et al., 1995: 384).

*Chlamydatus bakeri* Bergroth, 1898: 35 (new name for *Agalliaestes signatus* Uhler).

*Plagiognathus albipennis* var. *extrema* Reuter, 1901: 187 (n. var.; syn. by Schuh et al., 1995: 384).

*Chlamydatus uhlerianus* Kirkaldy, 1909: 390 (unnecessary new name for *Agalliaestes signatus* Uhler).

*Europiella decolor*: Van Duzee, 1917b: 415 (n. comb., cat.); Schuh, 1995: 314 (cat.).

*Psallus waldeni* Knight, 1923 (n. sp.; syn. by Schuh et al., 1995: 384).

*Plagiognathus (Poliopterus) litoralis* Wagner, 1949: 53 (n. sp.; syn. by Schuh et al., 1995: 384).

*Plagiognathus (Poliopterus) litoralis* f. *abrotani*

Wagner, 1949: 53 (n. form; syn. by Schuh et al., 1995: 384).

*Plagiognathus apiatus*: Kelton, 1965: 1142 (n. comb.).

*Europiella nigricornis* Knight, 1968: 40 (n. sp.; syn. by Schuh et al., 1995: 384).

*Plagiognathus (Poliopterus) larae* Kerzhner, 1978: 46 (n. sp.; syn. by Schuh et al., 1995: 384).

*Europiella yampae*: Kelton, 1980: 341 (diag.) (misidentification).

**DIAGNOSIS:** Variable in size, coloration, and degree of sexual dimorphism (figs. 1, 2); often small, but some populations approaching or exceeding size of *E. artemisiae*; coloration of dorsum ranging from almost uniformly white to almost completely infuscate, specimens from much of western North America often pale, eastern North American specimens always infuscate; antennal seg-

ments 1 and 2, all femora, and entire venter moderately infuscate to black, even in specimens with pale dorsum; sexual dimorphism strong in many western North American populations, males elongate and parallel-sided, females ovoid, such dimorphism much less pronounced in eastern North American populations. Antennae and hind femora always heavily infuscate; apical vesical spines diagnostic. General appearance and structure of male genitalia (fig. 2) most similar to *E. artemisiae* and *E. lattini*, but differing from the former in having a relatively shorter antennal segment 2 in males and a shorter anterior apical vesical spine, and from the latter by having a much smaller pygophore and vesica.

**REDESCRIPTION:** *Male:* Size variable, often small, body form usually elongate, more rarely elongate ovoid, total length 2.14–3.50, width pronotum 0.69–0.96. **COLORATION** (figs. 1, 2): Extremely variable, dorsum ranging from almost entirely white to entirely infuscate, some specimens with dorsum generally dark except base of corium and base of cuneus pale; labium pale to nearly orange, except segment 4 black; all antennal segments black; venter of body generally infuscate to nearly black; all trochanters usually pale; fore and middle femora at most weakly infuscate, hind femora often nearly black; all tibiae of pale background coloration with black spines with black bases. **SURFACE AND VESTITURE** (fig. 10D): Surface and vestiture as in generic diagnosis. **STRUCTURE** (fig. 10): Most populations, especially in western North America elongate, narrow-bodied, nearly parallel-sided, corial margin only weakly convex; eastern North American populations often less conspicuously elongate; antennal segment 2 only slightly longer than the width of the head; pygophore relatively small in comparison to similar appearing *E. lattini*. **GENITALIA** (fig. 3): Pygophore moderately large relative to size of abdomen; posterior apical spine of vesica short, sharply curving, hook-shaped just surpassing gonopore, anterior spine conspicuously longer and weakly decurved, structure very similar to that of *E. artemisiae*, also similar to *E. lattini*, but anterior spine much longer and entire vesica smaller than in that species.

*Female:* Coloration as in male. Body form

much more strongly ovoid. Total length 2.45–2.72, width pronotum 0.81–0.95.

**HOSTS:** Breeds on a variety of herbaceous and woody *Artemisia* spp. Also recorded from other members of the Asteraceae, although probably not breeding. All records from non-Asteraceae are certainly sitting, rather than breeding, records.

**DISTRIBUTION:** Holarctic. In the Nearctic widely distributed in the West from Alaska to northern Mexico, except in wetter coastal regions. Ranging south to about 35 degrees north latitude in eastern North America.

**DISCUSSION:** This species appears to be truly Holarctic. Because of its great variability and the flawed diagnoses of some phyline genera, *E. decolor* was placed in several genera under different names (Schuh et al., 1995). Although the extremes of variation might tempt one to recognize more than one species, examination of several thousand specimens from North America—whose genitalia appear nearly invariable, and whose second antennal segment is always relatively short—has caused me to conclude that a single species is involved, no matter what the extent of variation in sexual dimorphism, size, and coloration. The alternative to recognizing a single species is to recognize many species, most with overlapping temporal, geographic, and host distributions. Studies at the molecular level might help to clarify the underlying nature of variation and thereby further test the single-species theory.

Uhler (1895) described *Agalliastes apiatus* from specimens collected at Fort Collins, Manitou, and Steamboat Springs, Colorado. He indicated that the taxon also occurred in Kansas. As noted by Schuh et al. (1995), the collections of the National Museum of Natural History, Washington, D.C., contain 10 specimens associated with the *A. apiatus* identification. One of these, the data for which are listed below under Specimens Examined, was labelled as a cotype by H. G. Barber. I have designated it as the lectotype. Schuh et al. (1995) treated *E. apiatus* as a junior synonym of *E. decolor*. They stated that the two taxa were “clearly congeneric”, which is true, but the statement should have read “clearly conspecific”.

Without elaboration Schuh et al. (1995) treated *Europiella nigricornis* Knight, 1968

as a junior synonym of *E. decolor*. This action was, in fact, based on comparison of the types of these nominal species and the examination of large numbers of dissected male genitalia of *E. decolor*.

SPECIMENS EXAMINED: Lectotype: ♀, Am. Fork, Ut., 22.6.91, P. R. Uhler Collection USNM). Types of synonyms: *Agalliaestes apiatus* Uhler: lectotype ♂, Colo., 1691, P. R. Uhler Collection (USNM). *Agalliaestes signatus* Uhler: Type not located. *Europiella nigricornis* Knight: holotype ♂, MERCURY, NEVADA, 6 M, VI-17-1965, H. Knight & J. Merino (USNM). Additional specimens: CANADA: **Alberta:** Aden, 25 mi E of Milk River, June 28, 1956, O. Peck, 1♂ (CNC). Calgary, June 18, 1959, Carr, 1♀ (CNC). Calgary, July 9, 1959, Carr, 1♂ (CNC). Calgary, August 9, 1959, Carr, 1♀ (CNC). 32 mi W of Calgary, July 18, 1970, Oman, 6♂ (OSU). Canmore, August 27, 1952, A.R. Brooks, 1♂ (CNC). Castor, August 7, 1957, A.R. and J.E. Brooks, 1♀ (CNC). Chim, September 7, 1929, J.H. Pepper, 1♂ (CNC). Coal Valley, August 31, 1970, L.A. Kelton, 8♂ (CNC). Coronation, July 28, 1973, L.A. Kelton, 3♀ (CNC). Coulters, June 15, 1952, L.A. Konotopetz, *Lupinus argenteus* (Fabaceae), 3♂ (CNC). 3.8 km S of Drumheller on Rt 56, July 14, 1990, M. D. Schwartz, 1♀ (CNC). Drumheller, June 18, 1957, A.R. Brooks, MacNay, 2♀ (CNC). Drumheller, August 11, 1957, A.R. and J.E. Brooks, 1♂, 5♀ (CNC). Eisenhower Junction, August 5, 1970, L.A. Kelton, 3♂ (CNC). Elkwater Park, June 13, 1952, L.A. Konotopetz, 1♂ (CNC). Elkwater Park, July 13, 1952, L.A. Konotopetz, 2♂ (CNC). Elkwater Park, July 26, 1952, L.A. Konotopetz, 1♂, 2♀ (CNC). Empress, June 7, 1957, A.R. Brooks, MacNay, 1♂, 3♀ (CNC). Empress, August 22, 1957, A.R. Brooks, MacNay, 2♀ (CNC). Fisher Creek A.F.S., July 26, 1973, L.A. Kelton, 1♂ (CNC). Geikie Road, Jasper National Park, August 29, 1932, R.H. Handford, 1♂, 1♀ (CNC). Glenwood, June 19, 1938, R.W. Salt, 1♀ (CNC). High Prairie, July 16, 17, 1961, A.R. Brooks, 1♂, 1♀ (CNC). Irvine, June 11, 1952, L.A. Konotopetz, *Artemisia cana* (Asteraceae), 14♂, 8♀ (CNC). Jasper, August 29, 1970, L.A. Kelton, *Artemisia longifolia* (Asteraceae), 1♂, 25♀ (CNC). Kananaskis Highway, July 20, 1974, L.A. Kelton, 1♀ (CNC). Kananaskis Highway, August 25, 1973, L.A. Kelton, 1♀ (CNC). Just W of Kananaskis, Eyrie Gap Picnic Area, July 24, 1994, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 15♂ (CNC). Lethbridge, June 4, 1939, R.W. Salt, *Medicago* sp. (Fabaceae), 1♀ (CNC). Lethbridge, June 16, 1939, R.W. Salt, *Medicago* sp. (Fabaceae), 2♂, 3♀ (CNC). Lethbridge, August 5, 1930, J. H. Pepper, 1♂ (CNC). Lethbridge, September 6,

1929, J. H. Pepper, 1♂, 1♀ (CNC). Lethbridge, September 23, 1929, J. H. Pepper, 4♂, 6♀ (CNC). Manyberries, June 4, 1952, L.A. Konotopetz, 2♂, 1♀ (CNC). Medicine Hat, June 14, 1930, J.H. Pepper, 1♂ (CNC). Medicine Hat, June 2, 1952, L.A. Konotopetz, A. R. Brooks, *Artemisia cana* (Asteraceae), 1♂, 5♀ (CNC). Nordegg, July 29, 1921, J.McDunnough, *E. bakeri* det. H. H. Knight, 4♂ (CNC). Nordegg, July 31, 1921, J.McDunnough, *E. bakeri* det. H. H. Knight, 3♀ (CNC). Nordegg, August 31, 1970, L.A. Kelton, 1♂ (CNC). Onefour, June 13, 1956, O. Peck, *Agropyron junceus* (Poaceae), 1♀ (CNC). Onefour, June 14, 1952, L.A. Konotopetz, 2♂, 7♀ (CNC). Peace River, June 18, 1961, A.R. Brooks, 2♀ (CNC). Red Deer, June 25, 1957, A.R. Brooks, MacNay, 6♀ (CNC). Robb, August 30, 1970, L.A. Kelton, 2♂, 1♀ (CNC). Scandia, July 26, 1956, O. Peck, E.E. Sterns, 4♀ (CNC). Steveville, August 21, 1957, A.R. and J.E. Brooks, 5♀ (CNC). Vermillion Provincial Park, August 22, 1993, M. D. Schwartz, *Artemisia biennis* (Asteraceae), 6♂ (CNC). Wainwright, July 27, 1957, A.R. and J.E. Brooks, 1♂, 2♀ (CNC). Walsh, May 28, 1952, A.R. Brooks, *Artemisia cana* (Asteraceae), 1♂, 2♀ (CNC). Waterton Lakes National Park, July 26, 1972, L.A. Kelton, 1♀ (CNC). **British Columbia:** 10 mi S of Merritt, July 19, 1970, Oman, 2♂ (OSU). 11 km N of Liard River, July 31, 1982, G.G.E. Scudder (UBC). 13 km E of Hudson Hope, June 14, 1982, R. D. Wilkie, S. G. Cannings (UBC). 13 mi E of Hudson Hope, June 14, 1982, R. D. Wilkie and S. G. Cannings, *Artemisia frigida* (Asteraceae), 9♂, 5♀ (UBC). 14 km E of Hudson Hope, July 26, 1986, B. A. Macdonald, S. G. Cannings (UBC). 149 Mile Lake, June 22, 1961, G.G.E. Scudder (UBC). 15 km E of Hudson Hope, June 22, 1985, Bidgemast, Cannings, and Macdonald, 4♂, 8♀ (UBC, CNC). 15 km E of Hudson Hope, June 22, 1985, Cannings, Macdonald, Bijdemast (UBC). 18 mi N of Lytton, June 12, 1963, G.G.E. Scudder (UBC). 2 km E of Twin Lakes, July 9, 1991, G.G.E. Scudder (UBC). 2 km E of Twin Lakes, July 9, 1991, G.G.E. Scudder, 4♂ (UBC). 2 km W of Greenwood, August 17, 1997, G.G.E. Scudder (UBC). 21 mi N of Kitwano, July 31, 1979, G.G.E. Scudder (UBC). 3 km E of Tahltan River, Telegraph Creek, June 22, 1985, E. Krebs, J. J. Robinson, *Artemisia frigida* Willd. (Asteraceae) (UBC). 30 km SW of Chetwynd, June 22, 1985, E. Bijdemast (UBC). 5 km S of Spences Bridge, July 26, 1983, G.G.E. Scudder (UBC). 5 mi W of Toad River Lodge, August 24, 1980, S. G. Cannings (UBC). 54 km N of Atlin, Atlin Lake, July 16, 1985, E. Krebs, J. J. Robinson (UBC). 7 mi E of Oliver, Indian Reservation, July 8, 1959, L. A. Kelton (Asteraceae) (CNC). 8 km

- N of Naramata, June 12, 1992, G.G.E. Scudder (UBC). 8 km N of Osoyoos, September 11, 1995, G.G.E. Scudder (UBC). Alaska Highway, km 1204, July 30, 1982, G.G.E. Scudder (UBC). Alaska Hwy mi 392, Summit Lake, 4200 ft, July 19, 1959, R. E. Leech, 1♂ (CNC). Alaska Hwy, km 1204, July 30, 1982, G.G.E. Scudder, 1♂ (UBC). Alkali Lake, August 13, 1988, G.G.E. Scudder (UBC). Alkali Lake, August 13, 1988, G.G.E. Scudder, 3♂ (UBC). Anahim Lake, July 18, 1978, G.G.E. Scudder (UBC). Ashcroft, Barnes Lake, August 31, 1993, G.G.E. Scudder (UBC). Atlin, 2200 m, August 17, 1955, H. J. Huckel, 2♂, 1♀ (CNC). Atlin, July 27, 1979, G.G.E. Scudder (UBC). Atlin, May 2, 1955, B. A. Gibbard (CNC). Beaumont Provincial Park, Fraser Lake, July 24, 1983, G.G.E. Scudder (UBC). Blue River Bridge, km 705.6 Cassiar Highway, July 21, 1983, G.G.E. Scudder (UBC). Blue River, Stewart-Cassiar Road, August 25, 1981, C.S. Guppy (UBC). Cariboo, Long Lake, August 13, 1988, G.G.E. Scudder, 5♀ (UBC). Cariboo, White Lake, August 13, 1988, G.G.E. Scudder (UBC). Cassiar Hiway, km 705.6, Blue River Bridge, July 21, 1983, G.G.E. Scudder, 3♀ (UBC). Chopaka, January 7, 1981, S. G. Cannings, 1♂ (UBC). Cormier Creek, July 29, 1979, G.G.E. Scudder (UBC). Dean River, July 16, 1978, G.G.E. Scudder (UBC). Douglas Lake, September 1, 1993, G.G.E. Scudder (UBC). Douglas Lake, September 1, 1993, G.G.E. Scudder, 30♀ (UBC). Elk River, Grasmere, July 10, 1981, R. J. Cannings, 1♂, 5♀ (UBC). Elko, July 8, 1970, L. A. Kelton (CNC). Elko, July 8, 1970, L. A. Kelton, 1♀ (CNC). Fairmont Hot Springs, Dutch Creek, July 1, 1982, B. A. Macdonald, 1♂, 4♀ (UBC). Fairmont Hot Springs, Dutch Creek, July 1, 1982, G.G.E. Scudder (UBC). Fernie, July 7, 1970, L. A. Kelton (CNC). Fernie, July 7, 1970, L. A. Kelton, 8♂, 3♀ (CNC). Fort Nelson, August 2, 1982, G.G.E. Scudder (UBC). Fourth of July Creek, July 28, 1979, G.G.E. Scudder (UBC). Grasmere, Elk River, July 10, 1981, S. G. Cannings (UBC). Hagensborg, July 17, 1978, G.G.E. Scudder (UBC). Haynes Ecology Reserve, sandy road, August 26, 1989, D. L. Sanford (UBC). Hedley, July 29, 1978, J. A. van Reenen, 3♂, 2♀ (UBC). Hedley, July 29, 1978, J. A. Van Reenen, *Artemisia* sp. (Asteraceae) (UBC). Hedley, June 4, 1961, G.G.E. Scudder (UBC). Hedley, Nickel Plate Mine, 5800 ft, July 31, 1934, A. N. Gartrell (CNC). Highway 7 at Yukon border, July 27, 1979, G.G.E. Scudder (UBC). Hope Mountains, 4500 ft, August 22, 1932, A. N. Gartrell (CNC). Hope Mountains, 4500 ft, August 26, 1932, A. N. Gartrell (CNC). Hope Mts., 4500 ft, August 26, 1932, A. N. Gartrell, 1♂, 1♀ (CNC). Jaffray, July 17, 1974, L. A. Kelton (CNC). Kaleden, July 2, 1975, L. A. Kelton (CNC). Kaleden, July 2, 1975, L. A. Kelton, 1♀ (CNC). Kamloops, June 11, 1972, N. L. H. Krauss (USNM). Kamloops, June 24, 1950, B. P. Beirne (Asteraceae) (CNC). Kamloops, June 24, 1950, B. P. Beirne, 1♂, 1♀ (CNC). Kamloops, Lac du Bois, August 6, 1954, W. Downes (UBC). Kamloops, Lac du Bois, August 7, 1956, W. Downes (UBC). Kamloops, Lac du Bois, August 8, 1954, W. Downes (UBC). km 1204 Alaska Highway, July 30, 1982, G.G.E. Scudder (UBC). Ladysmith, July 13, 1959, L. A. Kelton (CNC). Lillooet, Seton Lake, June 6, 1997, G.G.E. Scudder (UBC). Lillooet, Seton Lake, June 6, 1997, G.G.E. Scudder, 12♂, 8♀ (UBC). Lower Post, July 20, 1983, G.G.E. Scudder (UBC). Lytton, August 2, 1931, R. H. Beamer, 2♂ (KU). Manning Prov. Park, Blackwall, July 23, 1970, L. A. Kelton, 2♂ (CNC). Manning Provincial Park, August 27, 1961, G.G.E. Scudder (UBC). Manning Provincial Park, Blackwall, August 12, 1970, L. A. Kelton (CNC). Manning Provincial Park, July 29, 1962, G.G.E. Scudder (UBC). Merritt, August 29, 1962, G.G.E. Scudder (UBC). Merritt, September 21, 1962, G.G.E. Scudder (UBC). Midway, August 10, 1970, L. A. Kelton (CNC). Midway, August 10, 1970, L. A. Kelton, 5♂, 4♀ (CNC). Minnie Lake, June 13, 1963, G.G.E. Scudder (UBC). Minnie Lake, June 13, 1963, G.G.E. Scudder, 15♀ (UBC). Mount Robson Provincial Park, August 27, 1970, L. A. Kelton (CNC). Mt. Kobau, 11 km NW of Osoyoos Summit, 1834 m, August 30, 1993–August 26, 1986, M. D. Schwartz, G. E. Scudder, *Artemisia tridentata* (Asteraceae), 4♂ (AMNH,KU). Near Haynes Ecology Reserve, July 15, 1990, G.G.E. Scudder, *Artemisia tridentata* (Asteraceae) (UBC). Near Osoyoos, Anarchist Mountain, 2000 ft, June 13, 1957, N. H. Anderson (CNC). Near Osoyoos, Anarchist Mountain, July 13, 1970, L. A. Kelton (CNC). Near Osoyoos, Anarchist Mountain, June 7, 1959, R. Madge (CNC). Nicola Lake, July 26, 1970, L. A. Kelton, 2♀ (CNC). Nicola, September 1, 1993, G.G.E. Scudder (UBC). Nimpo Lake, July 18, 1978, G.G.E. Scudder (UBC). Nimpo Lake, July 18, 1978, G.G.E. Scudder, 5♂, 5♀ (UBC). Okanagan Valley, June 1, 1996, R. G. Footitt and D. R. Gillespie (Fabaceae) (CNC). Oliver, 7 mi E of Indian Reservation, July 8, 1959, L. A. Kelton, 5♂, 20♀ (CNC). Oliver, July 19, 1970, L. A. Kelton, *Artemisia* (Asteraceae) (CNC). Oliver, June 27, 1959, L. A. Kelton (CNC). Oliver, Madden Lake (CNC). Oliver, May 29, 1959, L. A. Kelton (CNC). Oliver, May 29, 1959, R. E. Leech, 8♂, 5♀ (CNC). Oliver, McIntyre Creek, July 4, 1959, L. A. Kelton, 3♀ (CNC). Oliver, Meyer Flats, June 29, 1959, L. A. Kelton, 7♂, 15♀ (CNC). Oliver, Spectacle Lake, June 10, 1959, L. A. Kelton (CNC). Oliver, Va-

- seaux Lake, May 29, 1959, E. E. MacDougall, 5♂, 5♀ (CNC). Osoyoos Lake, Haynes Ecology Reserve, June 30, 1981, S. G. Cannings (UBC). Osoyoos Lake, Haynes Ecology Reserve, October 4, 1992, G.G.E. Scudder (UBC). Osoyoos Lake, Northeast end, May 19, 1980, S. G. Cannings (UBC). Osoyoos, Anarchist Mt., July 13, 1970–June 30, 1981, L. A. Kelton, S. G. Cannings, 6♂ (CNC, UBC). Osoyoos, east bench, July 15, 1990, G.G.E. Scudder (UBC). Osoyoos, Mount Kobau, 1885 m, August 26, 1986, G.G.E. Scudder, *Artemisia tridentata* (Asteraceae) (UBC). Osoyoos, Richter Pass, June 28, 1959, L. A. Kelton, 2♂, 4♀ (CNC). Osoyoos, Richter Pass, June 6, 1959, R. E. Leech (CNC). Osoyoos, September 30, 1987, G.G.E. Scudder (UBC). Pavilion Lake, June 7, 1997, G.G.E. Scudder (UBC). Penticton, September 21, 1919, W. Downes (Asteraceae) (UBC). Penticton, west bench, June 23, 1983, G.G.E. Scudder (UBC). Penticton, west bench, June 29, 1981, S. G. Cannings (UBC). Pink Mountain, August 17, 1982, L. A. Kelton (CNC). Pink Mt., August 17, 1982, L. A. Kelton, 14♂, 15♀ (CNC). Prophet River, August 4, 1982, G.G.E. Scudder (UBC). Shaka Lake, Eastside Res., July 6, 1996, G.G.E. Scudder, 5♀ (UBC). Skaha Lake, Eastside Reservation, July 6, 1996, G.G.E. Scudder (UBC). Soda Creek, August 21, 1983, W. Downes (UBC). Soda Creek, July 22, 1947, G. J. Spencer (CNC). Soda Creek, July 8, 1949, R. Stace-Smith (CNC). Soda Creek, June 16, 1961, G.G.E. Scudder (UBC). Soda Creek, June 19, 1950–August 22, 1947, Spencer, Stace-Smith, 3♂, 2♀ (CNC). Soda Creek, June 19, 1950, G. J. Spencer (CNC). Spences Bridge, September 6, 1954, W. Downes (UBC). Spilimacheen Rest Area, September 12, 1992, G.G.E. Scudder, 12♂, 18♀ (CNC, UBC). Stewart, July 22, 1983, G.G.E. Scudder, 2♂ (UBC). Strawberry Creek, August 6, 1981, C. S. Guppy, 1♀ (UBC). Summerland, July 10, 1975, L. A. Kelton, 1♂ (CNC). Summerland, July 12, 1975, L. A. Kelton (CNC). Summerland, July 2, 1974, L. A. Kelton, *alfalfa* (Fabaceae) (CNC). Summerland, July 6, 1975, L. A. Kelton (CNC). Summerland, Trout Creek, June 5, 1959, Kelton, Madge, Leech (CNC). Summerland, Trout Creek, June 5, 1959, R. Madge and L. A. Kelton, *Artemisia tridentata* (Asteraceae), 8♂, 8♀ (CNC). Ta Ta Creek, June 8, 1961, G.G.E. Scudder, 5♂, 10♀ (UBC). Tahitan, August 10, 1986, S. G. Cannings, *Artemisia frigida* (Asteraceae), 1♂ (UBC). Terrace, August 14, 1960, W.R. Richards (CNC). Terrace, July 10, 1960, W.R. Richards (CNC). Terrace, July 24, 1960, W. R. Richards, 12♂, 15♀ (CNC). Terrace, July 6, 1960, W.R. Richards (CNC). Terrace, July 7, 1960, W.R. Richards (CNC). Tetsa Br. no. 1 (CNC). Upper Swan Lake, July 25, 1987, S. G. Cannings (UBC). Vasuex L., June 27, 1981, S. G. Cannings, 1♂ (UBC). Vernon, June 30, 1940, R. L. Usinger, 4♂ (UCB). W of Kleena Kleene, McClinchey Creek, July 16, 1978, G.G.E. Scudder (UBC). Wasa, August 7, 1970, L. A. Kelton, 3♀ (CNC). West Bench Penticton, June 23, 1983, S. G. Cannings, 5♂ (UBC). Williams Lake, August 20, 1960, W. R. Richards, 2♂, 5♀ (CNC). Williams Lake, June 15, 1970, G.G.E. Scudder (UBC). Winslow Experiment Station, August 13, 1925, G. J. Spencer (UBC). Yahk, July 22, 1959, L. A. Kelton, 1♀ (CNC). *Yale Co.*: 7 mi W of Bridesville, July 9, 1966, W. Gagne, J. Haddock, 1♂ (UCB). **Labrador**: Goose Bay, August 23, 1948, W.E. Beckel, 1♀ (CNC). **Manitoba**: Angusville, July 20, 1954, A.R. Brooks, L.A. Kelton, 1♀ (CNC). Aweme, July 5, 1930, N. Criddle, *Artemisia ludoviciana* (Asteraceae), 2♂, 2♀ (CNC). Aweme, August 18, 1922, N. Criddle, 3♂, 8♀ (CNC). Aweme, June 27, 1930, R.M. White, 1♀ (CNC). Aweme, June 22, 1953, A.R. Brooks, L.A. Kelton, 1♂, 1♀ (CNC). Aweme, August 17, 1922, N. Criddle, 1♀ (CNC). Aweme, June 9, 1921, R.M. White, 1♀ (CNC). Aweme, June 25, 1930, R.M. White, 2♀ (CNC). Aweme, August 2, 1931, R.R. Handford, 2♀ (CNC). Aweme, August 3, 1931, R.R. Handford, 1♀ (CNC). 1.0 km SE of Jct of Hwy 1 and 351, nr 351, W of Carberry, July 8, 1990, M.D. Schwartz, 2♀ (CNC). Carberry, June 14, 1953, A.R. Brooks, L.A. Kelton, 2♂, 5♀ (CNC). Carberry, June 15, 1953, A.R. Brooks, L.A. Kelton, *Artemisia* sp. (Asteraceae), 12♂, 10♀ (CNC). Carberry, June 16, 1953, A.R. Brooks, L.A. Kelton, 1♂ (CNC). Carberry, June 18, 1953, A.R. Brooks, L.A. Kelton, 3♂, 18♀ (CNC). Carberry, June 19, 1953, A.R. Brooks, L.A. Kelton, 1♀ (CNC). Carberry, July 30, 1953, A.R. Brooks, L.A. Kelton, 1♀ (CNC). Carberry, July 31, 1953, A.R. Brooks, L.A. Kelton, 1♂, 2♀ (CNC). Carberry, August 9, 1953, A.R. Brooks, L.A. Kelton, 1♀ (CNC). Carberry, August 10, 1953, A.R. Brooks, L.A. Kelton, 1♂, 3♀ (CNC). Goodlands, June 12, 1931, R.H. Handford, 1♀ (CNC). Melita, July 25, 1958, A.R. and J.E. Brooks, 1♀ (CNC). Millwood, July 19, 1954, A.R. Brooks, Wallis, 2♂, 1♀ (CNC). Morris, August 15, 1953, A.R. Brooks, 1♂, 5♀ (CNC). Ninnette, June 11, 1958, R.B. Madge, 1♀ (CNC). Ninnette, June 20, 1958, R.B. Madge, 1♀ (CNC). Oak Lake, July 9, 1953, A.R. Brooks, L.A. Kelton, 3♀ (CNC). Oak Lake, July 11, 1953, A.R. Brooks, L.A. Kelton, 5♂, 12♀ (CNC). Pilot Mound, July 31, 1958, A.R. and J.E. Brooks, 1♀ (CNC). Riding Mountain National Park, July 20, 1972, L.A. Kelton, 7♂, 6♀ (CNC). 10 mi W of Roblin, July 15, 1954, A.R. Brooks, L.A. Kelton, 1♂, 2♀ (CNC). Roblin, July 15, 1954, A.R. Brooks, L.A. Kelton, 1♂ (CNC). Russell, July 21, 1973, A.R. Brooks, L.A. Kelton,



- 1♀ (CNC). Russell, July 17, 1954, A.R. Brooks, Wallis, 2♂, 8♀ (CNC). Russell, July 31, 1973, L.A. Kelton, *Artemisia dentata* (Asteraceae), 6♀ (CNC). Saint Lazare, August 19, 1954, A.R. Brooks, L.A. Kelton, 2♂, 3♀ (CNC). 5 mi SW of Shilo, June 28, 1958, C.D.F. Miller, 5♀ (CNC). 8 km E of Roblin on Rt 5, August 21, 1993, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 20♂ (CNC). 8 km N of Spirit Sands, Spruce Wood Prov. Park (16 km S of Carberry), July 8, 1990, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 59♂ (CNC). Treesbank, July 7, 1928, R. H. Handford, 1♀ (CNC). Virden, July 8, 1953, A.R. Brooks, L.A. Kelton, 3♂, 6♀ (CNC). Virden, July 9, 1953, A.R. Brooks, L.A. Kelton, 1♂, 1♀ (CNC). Virden, July 10, 1953, A.R. Brooks, L.A. Kelton, 4♂, 9♀ (CNC). Virden, July 13, 1953, A.R. Brooks, L.A. Kelton, *Artemisia frigida* (Asteraceae), 13♀ (CNC). 4.5 mi E of Rt 201 on Rt 59, July 7, 1990, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 34♂ (CNC). **Northwest Territories:** Arctic River Road, July 18, 1980, R. J. Cannings, 2♂, 4♀ (UBC). Inuvik, July 19, 1980, R. J. Cannings, 2♀ (UBC). **Ontario:** Sandbanks Provincial Park, August 13, 1991, M.D. Schwartz, *Ambrosia trifida* L. var. *trifida* (Asteraceae), 13♀ (CNC). **Quebec:** Bradore Bay, August 2, 1930, W.J. Brown, 17♂, 22♀ (CNC). Bradore Bay, August 8, 1930, W.J. Brown, 5♂ (CNC). Choisy, nr Rigaud, August 25, 1956, Lindberg, 7♂, 16♀ (CNC). Great Whale River, July 22, 1949, J.R. Vockeroth, *Achillea millefolium* (Asteraceae), 1♂ (CNC). Great Whale River, July 28, 1949, J.R. Vockeroth, 1♀ (CNC). Great Whale River, July 31, 1949, J.R. Vockeroth, 1♂ (CNC). Great Whale River, August 24, 1949, J.R. Vockeroth, *Tanacetum huronense* (Asteraceae), 12♂, 31♀ (CNC). Laniel, July 20–21, 1963, W. Gagne, 1♀ (CNC). Laniel, July 24–25, 1963, W. Gagne, 1♀ (CNC). Rupert House, August 3, 1949, D.P. Gray, 1♀ (CNC). **Saskatchewan:** Assiniboia, June 20, 1955, A.R. Brooks, 11♀ (CNC). Attons Lake, Cut Knife, July 11, 1940, A.R. Brooks, 2♀ (CNC). Beaver Creek, September 8, 1950, L.A. Konotopetz, 2♂, 2♀ (CNC). Big River, July 5, 1959, A.R. and J.E. Brooks, 2♂, 3♀ (CNC). Buffalo Pound, June 29, 1955, A.R. Brooks, 2♀ (CNC). Canora, July 11, 1954, A.R. Brooks, Wallis, 2♂, 7♀ (CNC). Chaplin, June 21, 1954, A.R. Brooks, Wallis, 1♀ (CNC). Christopher Lake, July 11, 1959, A.R. and J.E. Brooks, 1♂ (CNC). Christopher Lake, July 13, 1959, A.R. and J.E. Brooks, 3♀ (CNC). Christopher Lake, July 15, 1959, A.R. and J.E. Brooks, 1♂, 1♀ (CNC). Cypress Hills, September 19, 1951, L.A. Konotopetz, 3♀ (CNC). Duck Lake, 16.3 km S of MacDowell Rd., July 12, 1990, M.D. Schwartz, 1♀ (CNC). Elbow, August 15, 1951, A.R. Brooks, 8♂, 3♀ (CNC). Elbow, June 20, 1954, A.R. Brooks, 1♀ (CNC). Elbow, June 23, 1954, A.R. Brooks, Wallis, 1♂ (CNC). Elbow, June 24, 1954, A.R. Brooks, Wallis, 2♀ (CNC). Elbow, June 17, 1960, A.R. Brooks, 2♂, 2♀ (CNC). Esterhazy, July 26, 1954, A.R. Brooks, Wallis, 3♀ (CNC). Esterhazy, August 14, 1954, A.R. Brooks, Wallis, 3♂, 7♀ (CNC). Estevan, June 15, 1955, A.R. Brooks, 1♀ (CNC). Gascoigne, August 23, 1957, A.R. and J.E. Brooks, 1♀ (CNC). Glidden, July 3, 1952, L.A. Konotopetz, 2♂ (CNC). Good Spirit Lake, July 10, 1954, A.R. Brooks, Wallis, 11♀ (CNC). Good Spirit Lake, August 23, 1954, A.R. Brooks, Wallis, 1♀ (CNC). Great Sand Hills, July 4, 1952, A.R. Brooks, 1♀ (CNC). Hudson Bay, July 9, 1954, A.R. Brooks, Wallis, 1♂, 6♀ (CNC). Kandahar, July 29, 1954, A.R. Brooks, Wallis, 14♀ (CNC). Kenosee, May 30, 1958, A.R. Brooks, 1♀ (CNC). Kenosee, June 7, 1958, A.R. Brooks, 2♀ (CNC). Lebret, July 5, 1951, L.A. Konotopetz, 4♂, 1♀ (CNC). Lisieux, June 21, 1955, A.R. Brooks, 1♀ (CNC). Lumsden, August 7, 1954, A.R. Brooks, Wallis, 5♂, 2♀ (CNC). Lumsden, July 12, 1958, A.R. and J. Brooks, Wallis, 1♀ (CNC). 10.8 km E of Maidstone on Hwy 16, August 22, 1993, M. D. Schwartz, *Artemisia cana* (Asteraceae), 2♂, 2♀ (CNC). McGee, July 3, 1952, L.A. Konotopetz, 1♀ (CNC). Minton, August 11, 1955, A.R. Brooks, 2♀ (CNC). Mossbank, June 23, 1955, A.R. Brooks, 5♀ (CNC). Pike Lake, September 1, 1949, A.R. Brooks, 4♂, 6♀ (CNC). Pike Lake, June 14, 1950, B.P. Beirne, 1♀ (CNC). Prince Albert, July 3, 1954, A.R. Brooks, Wallis, 3♀ (CNC). Prince Albert, July 4, 1954, A.R. Brooks, Wallis, 7♀ (CNC). Prince Albert, July 5, 1954, A.R. Brooks, Wallis, 1♂, 2♀ (CNC). Prince Albert, July 23, 1959, A. and J. Brooks, 4♀ (CNC). Rockglen, June 21, 1955, A.R. Brooks, 1♀ (CNC). Rockglen, August 2, 1955, A.R. Brooks, 1♀ (CNC). Rutland, July 23, 1940, A.R. Brooks, 6♀ (CNC). Rutland, August 2, 1940, A.R. Brooks, 4♀ (CNC). Saint Victor, June 25, 1955, A.R. Brooks, Wallis, 1♂, 2♀ (CNC). Saskatoon, June 13, 1950, A.R. Brooks, *Artemisia* sp. (Asteraceae), 1♀ (CNC). Saskatoon, June 20, 1949, L.A. Konotopetz, *Artemisia* sp. (Asteraceae), 1♀ (CNC). Saskatoon, June 29, 1923, K. M. King, 1♂ (CNC). Saskatoon, July 17, 1924, K. M. King, 1♀ (CNC). Saskatoon, July 21, 1950, A.R. Brooks, *Artemisia* sp. (Asteraceae), 9♀ (CNC). Saskatoon, July 22, 1950, A.R. Brooks, *Artemisia frigida* (Asteraceae), 1♀ (CNC). Saskatoon, August 10, 1950, A.R. Brooks, *Artemisia* sp. (Asteraceae), 1♀ (CNC). Saskatoon, August 11, 1949, A.R. Brooks, *Artemisia* sp. (Asteraceae), 2♀ (CNC). Saskatoon, August 15, 1950, A.R. Brooks, *Artemisia* sp. (Asteraceae), 1♂, 1♀ (CNC). Saskatoon, August 25,

- 1923, K. M. King, 1 ♀ (CNC). Saskatoon, August 27, 1923, K. M. King, 1 ♀ (CNC). Saskatoon, September 5, 1926, K. M. King, 1 ♀ (CNC). Saskatoon, September 6, 1923, K. M. King, 1 ♀ (CNC). Saskatoon, September 14, 1949, A.R. Brooks, L. A. Konotopetz, *Artemisia* sp. (Asteraceae), 1 ♂, 51 ♀ (CNC). Saskatoon, September 19, 1923, K. M. King, 2 ♀ (CNC). Saskatoon, September 27, 1923, K. M. King, 1 ♂ (CNC). Saskatoon, September 30, 1923, K. M. King, 3 ♂ (CNC). 45.8 km N of Stoughton on Rt 47, July 9, 1990, M. D. Schwartz, *Artemisia frigida* (Asteraceae), 30 ♂ (CNC). Swift Current, August 30, 1939, A.R. Brooks, 2 ♀ (CNC). Swift Current, September 1, 1939, A.R. Brooks, 1 ♂, 6 ♀ (CNC). Torch River, August 23, 1950, L.A. Konotopetz, 1 ♂ (CNC). 10.7 km S of Torch River Campground, on Rt 106, July 12, 1990, M.D. Schwartz, 1 ♂ (CNC). Torquay, August 14, 1955, A.R. Brooks, 1 ♂ (CNC). Tunstal, August 27, 1957, A.R. and J.E. Brooks, 1 ♂, 3 ♀ (CNC). Val Marie, June 12, 1955, A.R. Brooks, 2 ♀ (CNC). Val Marie, August 8, 1955, A.R. Brooks, 1 ♂, 3 ♀ (CNC). Val Marie, August 10, 1955, C. D. Miller, 1 ♂ (CNC). Willow Bunch, July 20, 1955, C. D. Miller, 1 ♂, 2 ♀ (CNC). Willow Bunch, July 27, 1955, A.R. Brooks, 1 ♂, 3 ♀ (CNC). Willow Bunch, July 29, 1955, A.R. Brooks, 1 ♂ (CNC). Willows, June 19, 1955, A.R. Brooks, 1 ♂, 5 ♀ (CNC). Wilczek Lake, July 19, 1982, G.G.E. Scudder, 2 ♂ (UBC). Wood Mountain, June 17, 1955, A.R. Brooks, 1 ♂ (CNC). **Yukon Territory:** Aishihik River, Alaska Hwy, August 13, 1983, J. J. Robinson, *Artemisia frigida* (Asteraceae), 2 ♂ (UBC). Burwash Landing, July 8, 1983, J. J. Robinson, 1 ♂ (UBC). Canyon, July 9, 1983, G.G.E. Scudder, 2 ♂ (UBC). Carcross, July 29, 1982, G.G.E. Scudder, *Artemisia frigida* (Asteraceae) (UBC). Carcross, August 9, 1983, L.A. Kelton, *Artemisia frigida* (Asteraceae), 49 ♀ (CNC). Carmacks, July 17, 1983, L.A. Kelton, *Artemisia* sp. (Asteraceae), 59 ♀ (CNC). Carmacks, July 28, 1982, G.G.E. Scudder, 2 ♂ (UBC). Dawson, July 23, 1983, L.A. Kelton, *Artemisia frigida* (Asteraceae), 1 ♀ (CNC). Dawson, July 11, 1983, G.G.E. Scudder, 2 ♂ (UBC). Dawson, July 21, 1982, L.A. Kelton, *Artemisia frigida* (Asteraceae), 11 ♂, 3 ♀ (CNC). Destruction Bay, July 26, 1982, L.A. Kelton, *Salix* sp. (Salicaceae), 1 ♀ (CNC). Engineer Creek, Dempster Highway, July 27, 1983, L.A. Kelton, 3 ♀ (CNC). Frog Lake, July 13, 1981, S. G. Cannings, 3 ♂ (UBC). Koidern (CNC). Gravel Lake, 58 mi E of Dawson, 2050 ft, August 11, 1962, P.J. Skisko, 3 ♂, 7 ♀ (CNC). Haines Junction, July 28, 1982, L.A. Kelton, 1 ♂, 1 ♀ (CNC). Junction of Dempster and Klondike Highway, July 20, 1982, L.A. Kelton, 2 ♂ (CNC). Koidern, July 24, 1982, L.A. Kelton, 6 ♂, 2 ♀ (CNC). 10 km E of McQuesten, July 13, 1980, C. Guppy, *Artemisia frigida* (Asteraceae), 3 ♂ (UBC). Moose Creek, July 19, 1982, G.G.E. Scudder, 3 ♂ (UBC). Moose Creek, July 18, 1982, L.A. Kelton, 31 ♂, 39 ♀ (CNC). Morley River, August 9, 1982, L.A. Kelton, 1 ♂, 3 ♀ (CNC). Old Crow, June 30, 1983, S. G. Cannings, 13 ♂ (UBC). Pelly Crossing, July 29, 1983, L.A. Kelton, *Artemisia* sp. (Asteraceae), 11 ♀ (CNC). Pelly Crossing, July 2, 1985, E. Bijdemast, 3 ♂ (UBC). Porcupine River, Pine Bluffs, July 11, 1982, C. Guppy, *Artemisia frigida* (Asteraceae), 11 ♂ (UBC). Rancheria, August 11, 1982, L.A. Kelton, *Lathyrus* sp. (Fabaceae), 1 ♂ (CNC). Silver City, July 27, 1982, L.A. Kelton, 1 ♂, 1 ♀ (CNC). Snag Junction, July 23, 1982, L.A. Kelton, 2 ♂, 5 ♀ (CNC). Stewart Crossing, July 27, 1982, G.G.E. Scudder, 9 ♂ (UBC). Tagish, August 3, 1982, L.A. Kelton, *Shepherdia canadensis* (Elaeagnaceae), 1 ♂, 3 ♀ (CNC). Takhini Hot Springs, 2400 ft, August 19, 1962, R.E. Leech, *Artemisia* sp. (Asteraceae), 4 ♀ (CNC). Tatchum, July 19, 1982, G.G.E. Scudder, 4 ♂ (UBC). Tatchun, August 11, 1983, L.A. Kelton, *Artemisia frigida* (Asteraceae), 2 ♂, 16 ♀ (CNC). Von Wilczek, July 18, 1982, L.A. Kelton, 9 ♂, 9 ♀ (CNC). Whitehorse, July 16, 1982, L.A. Kelton, *Artemisia frigida* (Asteraceae), 5 ♂ (CNC). Whitehorse, July 30, 1982, L.A. Kelton, *Artemisia frigida* (Asteraceae), 1 ♂, 5 ♀ (CNC). Whitehorse, August 6, 1949, L. C. Curtis, 1 ♂ (CNC). Whitehorse, August 19, 1959, R.B. Madge, 1 ♀ (CNC). **MEXICO: Baja California Norte:** 12 mi SE of Maneadero, April 19, 1965, Cavagnaro, Rose, Vesterby, 1 ♂ (CAS). 18.2 mi E of San Telmo, May 23, 1980, Brown and Faulkner, 1 ♂ (SDNM). 19 km E of El Rosario, March 28, 1980, J. Pinto, 1 ♂ (UCR). Tecate, 0.3 mi E of El Condor, April 15, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1 ♂ (AMNH). **Durango:** Durango, July 4, 1964, L.A. Kelton, 5 ♂, 2 ♀ (CNC). **USA: Alaska:** Anchorage, August 5, 1954, A. G. Hunt, 1 ♂ (KU). Anchorage, Fish Creek Flats, July 27, 1948, R. I. Sailer, 2 ♂ (USNM). Chicken, July 22, 1982, L.A. Kelton, *Betula glandulosa* (Betulaceae), 1 ♂, 3 ♀ (CNC). Copper Center, July 23, 1948, F. S. Blanton, *Aster* sp. (Asteraceae), 2 ♂, 4 ♀ (USNM). Dyea, July 6, 1980, R. J. Cannings, 2 ♂, 1 ♀ (UBC). Lawing, July 22, 1951, W.J. Brown, on tundra, 1 ♂ (CNC). Skagway, July 5, 1980, R. J. Cannings, 1 ♀ (UBC). Naknek, August 9, 1952, W.R.M. Mason, 1 ♂, 1 ♀ (CNC). Skagway, September 6, 1936, S. M. Williams, 1 ♂ (AMNH). **Arizona:** *Apache Co.:* Alpine, September 1, 1940, L. L. Stitt, 2 ♂, 2 ♀ (USNM). *Coconino Co.:* Flagstaff, 7000 ft, May 8, 1967, D. C. and K. A. Rentz, 6 ♂ (UCB). Flagstaff, August 5, 1933, R. H. Beamer, 3 ♂ (KU). Grand Canyon Natl. Park, July 15, 1947, R. H. Beamer, 3 ♂

- (KU). Grand Canyon, 7000 ft, June 22, 1925, A. A. Nichol, 8♂, 8♀ (USNM). Grand Canyon, June 29, 1930, R. L. Usinger, *Artemisia* sp. (Asteraceae), 10♂ (UCB). Grand Canyon, South Rim, June 29, 1930–June 16, 1949, R. L. Usinger, G. F. Knowlton, *Artemisia* sp. (Asteraceae), 22♂ (USU,UCB). Parks, Kaibab National Forest, August 16, 1967, L.A. Kelton, 1♂ (CNC). Oak Creek Canyon, July 9, 1941–July 9, 1942, Burt Hodgen, Beamer, 4♂ (KU). Rt 64 just SE of Grand Canyon Natl. Park in Kaibab National Forest, June 26, 1980, K. and R. Schmidt, *Artemisia* sp. (Asteraceae), 10♂ (AMNH). Sunset Crater Road, 1 mi E of Rt 89A, 7300 ft, June 16, 1983, R. T. Schuh, M. D. Schwartz, *Artemisia* sp. (Asteraceae), 72♂ (AMNH). Williams, June 24, 1925, A. A. Nichol, 3♂ (USNM). *Graham Co.*: Graham Mts., mp 120 on Rt 336, 4600 ft, April 25, 1982, M. D. Schwartz, *Artemisia dracunculus* (Asteraceae), 31♂ (AMNH). *Greenlee Co.*: Apache National Forest on Hwy 78, 5.4 mi SW Arizona–New Mexico state line, September 20, 1998, J. C. Schaffner, 93♂ (TAMU). *Navajo Co.*: Show Low, Sitgreaves National Forest, August 10, 1967, L.A. Kelton, 9♂, 9♀ (CNC). *Pima Co.*: Santa Catalina Mts., May 31, 1957, Butler and Werner, 1♂ (UAZ). Mt. Lemon, April 29, 1948, R. H. Beamer, 1♂ (KU). *Yavapai Co.*: Prescott, August 16, 1972, L.A. Kelton, 1♂ (CNC). **California**: *Alameda Co.*: East Oakland, February 22, 1936, P. Kinstry, 1♂ (KU). Niles Canyon, June 15, 1916–May 26, 1928, E. P. Van Duzee, R. L. Usinger, 5♂ (CAS,UCB). Niles Canyon, May 26, 1928, R. L. Usinger, 4♂ (UCB). Redwood Canyon, July 1, 1916, W. M. Giffard, 1♂ (CAS). *Contra Costa Co.*: Mt. Diablo, July 21, 1935, R. H. Beamer, 2♂ (KU). San Pablo, July 26, 1969, Gagne, 1♂ (UCB). *El Dorado Co.*: Lake Tahoe, August 11, 1940, L. J. Lipovsky, 1♂ (KU). Road to Fallen Leaf Lake, 6300 ft, August 28, 1981, K. A. Phillips, 6♂ (OSU). *Inyo Co.*: 4 mi NW of Independence, June 2, 1976, J. Pinto, 1♂ (UCR). 7 mi N of Parchers Camp, June 30, 1961, J. K. Drew, 1♂ (CAS). E side of California Rt 141, 4000 ft, May 31, 1981, J. T. Polhemus, 3♂ (JTP). Independence, June 14, 1929, R. L. Usinger, 3♂ (CAS). Mammoth Lake, July 29, 1940, D. E. Hardy, 7♂ (KU). *Lassen Co.*: Doyle State Wildlife Preserve, June 24, 1974, Oman, 1♂ (OSU). Litchfield, June 22, 1937, B. P. Bliven, 1♂ (CAS). Sage Hen, July 27, 1954–August 20, 1969, B. P. Bliven, W. Gagne, 4♂ (CAS,UCB). *Los Angeles Co.*: Malibu, February 27, 1966, 2♂ (LACM). 11.5 mi W of Malibu, April 15, 1965, F. Rindge, 1♂ (AMNH). 2 mi N of Escondido Beach, March 16, 1967, J. Powell, 5♂ (UCB). Claremont, Baker [no date], 2♂ (AMNH). Claremont, Baker [no date], 6♂ (HELSINKI). Latigo Canyon Road, 11.6 mi WNW of Malibu, April 15, 1965–June 19, 1975, M. W. Hetz, F. J. & M. Rindge, 2♂ (UAZ, AMNH). Los Angeles, Coquillett, 5♂, 5♀ (USNM). Palos Verdes, Sea Side, March 24, 1981, J. T. Polhemus, 9♂ (JTP). San Fernando, February 23, 1941, Dale Lindsay, 1♂ (KU). San Vicente, May 14, 1938, C. E. Norland, 2♂ (LACM). West Fork San Gabriel River, May 5, 1996, F. W. Furry, 1♂ (LACM). Westwood Hills, May 11, 1942–December 20, 1962, R. Beer, C. Ishida, 3♂ (LACM, KU). Whittier, March 24, 1916, L. L. Muchmore, 4♂ (LACM). *Marin Co.*: Muir Woods, June 6, 1950, W. J. Wall, 1♂ (UCD). Stinson Beach, August 15, 1938, R. H. Beamer, 1♂ (KU). *Mariposa Co.*: Yosemite National Park, August 4, 1940, R. H. Beamer, 1♂ (KU). *Modoc Co.*: 1 mi S of Lava Beds Natl. Mon. on Hill Rd, Modoc National Forest, July 17, 1985, G. M. Stonedahl, J. D. McIver, *Artemisia tridentata* (Asteraceae), 4♂ (AMNH). 2.5 mi S of Rt 139 towards Lookout, 1440 m, July 6, 1979, R. T. and Joe Schuh, *Artemisia* sp. (Asteraceae), 1♂ (AMNH). 24.7 mi NW of Canby, 1375 m, July 1, 1979, R. T. Schuh and B. M. Massie, 2♂ (AMNH). 4 mi E of Cedarville, 1440 m, July 2, 1979, R. T. Schuh and B. M. Massie, 1♂ (AMNH). *Mono Co.*: Coleville, June 10, 1966, W. Gagne, 1♂ (UCB). Crooked Creek Naval Res. Station, White Mts., 10,000 ft, August 4, 1966, L. and C. W. O'Brien, 11♂ (UCB). Mammoth Camp, W. D. Pierce, 2♂ (LACM). McKay Creek, Sonora Pass, August 18, 1960, E. Jessen, 1♂ (UCB). Mono Lake at Hwy 395, 2188 m, July 11, 1980, R. T. Schuh, G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 2♂ (AMNH). Mono Lake, January 1, 1939, W. D. Pierce, 2♂ (LACM). *Nevada Co.*: Hobart Mills, Prosser Creek, October 10, 1952, J. C. Hall, 1♂ (UCD). Sagehen Creek Station near Hobart Mills, August 20, 1969, W. Gagne, *Artemisia* sp. (Asteraceae), 4♂ (UCB). *Orange Co.*: Black Star (Canyon?), March 10, 1935, 1♂ (LACM). Green River Camp, Lower Santa Ana Canyon, May 9, 1933, E. P. Van Duzee, 4♂ (CAS). Newport Beach, April 24, 1971, Oman, 2♂ (OSU). *Placer Co.*: Truckee, Tahoe National Forest, August 29, 1967, L.A. Kelton, *Artemisia* sp. (Asteraceae), 22♂, 8♀ (CNC). *Plumas Co.*: near Chester, July 5, 1932, R. L. Usinger, 1♂ (UCB). *Riverside [?]* Co.: Peralta, May 7, 1948, R. A. Flock, *Artemisia vulgaris* (Asteraceae), 1♂ (UCR). *Riverside Co.*: 5.5 SE of Sage, March 14, 1979, J. Pinto, 1♂ (UCR). Hwy 74, Cleveland National Forest, El Cariso Station, 2500 ft, May 12, 1978, J. Pinto, *Artemisia* sp. (Asteraceae), 3♂ (UCR). Lower Tin Mine Canyon, July 14, 1963, M. Irwin, 3♂ (UCR). Menifee Valley, hills on W end, March 10, 1979, J. Pinto, 3♂ (UCR). Palm Springs, December 22, 1941, R. H. Beamer, 2♂

- (KU). Quail Valley, May 20, 1974–May 2, 1977, J. Pinto, 16♂ (UCR). Riverside, March 26, 1989, R. Wharton, 1♂ (TAMU). Riverside, March 29, 1971–March 26, 1989, E. J. Paddock, 1♂ (CAFA). Saboba Springs, July 4, 1917, E. P. Van Duzee, 5♂ (CAS). University of California at Riverside, June 14, 1982, T. J. Henry, *Artemisia californica* (Asteraceae), 3♂, 6♀ (USNM). *Sacramento Co.*: Sacramento, June 3, 1920–August 10, 1935, H. H. Keifer, 2♂ (CAFA). *San Bernardino Co.*: Cajon Pass Summit on I-15, July 2, 1949, Flock, 1♂ (UCR). Colton, May 26, 1917–May 28, 1917, E. P. Van Duzee, 4♂ (CAS). *San Diego Co.*: 8.2 mi E of Dulzura on Rt 94 at mp 36.50, April 15, 1982, M. D. Schwartz, 1♂ (AMNH). Alpine, July 9, 1929, R. H. Beamer, 4♂ (KU). Dictionary Hill, December 4, 1979, Faulkner, Brown, 1♂ (SDNM). Mission Dam, January 2, 1928–March 16, 1929, C. C. Searl, 23♂ (SDNM). Morena Dam, May 26, 1929, 1♂ (SDNM). Ramona, April 18, 1938, E. P. Van Duzee, 1♂ (CAS). San Diego, April 11, 1914–July 24, 1941, E. P. Van Duzee, R. H. Beamer, 16♂ (CAS, KU). San Diego, April 24, 1920, E. P. Van Duzee, 4♂ (CAS). Sentanac Canyon, May 4, 1968, J. DeVol, 1♂ (UCR). *San Joaquin Co.*: Stockton, August 21, 1919, E. P. Van Duzee, 1♂ (CAS). *San Luis Obispo Co.*: Baywood Park, May 17, 1980, J. Pinto, *Artemisia* sp. (Asteraceae), 10♂ (UCR). California Polytechnic State University Campus, Poly Canyon, 125 m, May 8, 1985, R. T. Schuh and B. M. Massie, *Artemisia californica* (Asteraceae), 16♂ (AMNH). Dune Lakes, May 20, 1972, J. D. Pinto, 1♂ (UCR). San Luis Obispo, April 24, 1919, E. P. Van Duzee, 6♂ (CAS). *Santa Barbara Co.*: 23 mi E of Santa Maria, June 20, 1952, R. E. and L. D. Beamer, 1♂ (KU). 6 mi SE of Lompoc, March 14, 1967, P. A. Opler, 3♂ (UCB). Jalama Beach, July 9, 1965, M. R. Gardiner, 2♂ (UCD). Santa Barbara, June 16, 1951, K. W. Tucker, 3♂ (UCD). Santa Cruz Island, Canyon Del Medio, March 2, 1971, R. O. Schuster, 1♂ (UCD). Santa Cruz Island, Puerto Canyon, March 21, 1977, A. J. Mayor, *Artemisia californica* (Asteraceae), 15♂ (UCR). Upper Oso Campground off Rt 154, 310 m, May 7, 1985, R. T. Schuh, *Artemisia californica* (Asteraceae), 9♂ (AMNH). *Santa Clara Co.*: Pacheco Pass on Rt 152, June 29, 1965, G. F. Knowlton, 1♂ (USU). *Shasta Co.*: Hat Creek, July 2, 1955, E. E. Lindquist, 1♂ (UCB). *Sierra Co.*: Sattley, July 7, 1970, R. M. Bohart, 1♂ (UCD). *Siskiyou Co.*: 1–2 mi N of Tule Lake Refuge Hdq, 1255 m, June 26, 1979, R. T. and Joe Schuh, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). 12.3 mi N of St. Hwy. 89 on Powder Hill Road, July 19, 1985, G. M. Stonedahl, J. D. McIver, *Chrysothamnus viscidiflorus* (Asteraceae), 34♂ (AMNH). 15 mi SE of Mt. Shasta, 3500 ft, July 10, 1972, J. D. Lattin, 2♂ (OSU). 2 mi N of Tule Lake Refuge Hdq, 4000 ft, June 26, 1979, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 6♂ (AMNH). 2.5 mi N of Medicine Lake on Medicine Lake Rd, July 18, 1985, G. M. Stonedahl and J. D. McIver, *Chrysothamnus* sp. (Asteraceae), 57♂ (AMNH). Bray, June 30, 1935, R. H. Beamer, 3♂ (KU). Yreka, June 15, 1959, L.A. Kellton, R. Madge, 1♂, 1♀ (CNC). *Sonoma Co.*: Guernwood Pk., May 30, 1928, R. L. Usinger, 1♂ (UCB). No specific locality, 1♂ (CAS). *Trinity Co.*: Coffee Creek, July 14, 1955, D. L. Dahisten, 4♂ (UCD). *Tulare Co.*: 2.6 mi W of county line near Chimney Peak RS, 2000 m, July 1, 1980, R. T. Schuh, 1♂ (AMNH). 21 mi W of Rt 395 toward Kennedy Meadows, 1875 m, July 1, 1980, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 5♂ (AMNH). Mineral King, July 29, 1935, Graham Heid, 1♂ (CAS). *Ventura Co.*: Casitas Reserve, N end, March 15, 1967, J. Powell, 8♂ (UCB). Oak View, December 30, 1964, P. M. Jump, 2♂ (LACM). Ventura, January 20, 1965, P. M. Jump, 5♂ (LACM). Ventura, January 23, 1919–January 20, 1965, P. M. Jump, E. O. Essig, 15♂ (LACM, UCB). Ventura, January 23, 1919, E. O. Essig, *Artemisia californica* (Asteraceae), 3♂ (UCB). **Colorado**: *Archuleta Co.*: Pagosa Springs, 7200 ft, August 24, 1972, L.A. Kelton, 1♂, 4♀ (CNC). *Boulder Co.*: 6 mi E of Nederland, August 8, 1973, J. C. Schaffner, 1♂ (TAMU). 6 mi W of Boulder, August 12, 1973, J. C. Schaffner, 5♂ (TAMU). 5 mi S of Nederland, 8000 ft, July 2, 1961, J.G. Chillcott, 1♀ (CNC). *Bourbon Co.*: No specific locality, 800 ft, January 1, 1915, R. H. Beamer, 1♂ (KU). *Clear Creek Co.*: Mount Evans, 13,000 ft, July 13, 1961, C.H. Mann, 1♀ (CNC). Mt. Goliath, 12,000 ft, August 7, 1987, D. A. and J. T. Polhemus, 2♂ (JTP). Mt. Goliath, 12,000 ft, June 21, 1988, J. T. Polhemus, 2♂ (JTP). West Chicago Creek, Arapaho National Forest, 9800 ft, July 28, 29, 1968, L.A. Kelton, 7 ♀ (CNC). *Conejos Co.*: Elk Creek Recreation Area, August 22, 1969, J. C. Schaffner, 1♂ (TAMU). *Denver Co.*: Denver, July 12, 1900–July 12, 1903, Van Duzee, 3♂ (CAS). *Dolores Co.*: 29 mi SW Norwood, July 7, 1980, J. T. and D. A. Polhemus, 2♂ (JTP). *Douglas Co.*: 3 mi E of Larkspur, July 3, 1979, D. A. Polhemus, 3♂ (JTP). Perry Park, July 13, 1977, D. A. and J. T. Polhemus, 2♂ (JTP). Roxborough Road near Chatfield Park, May 28, 1978, J. T. Polhemus, 7♂ (JTP). Waterton, Head of Hilene, June 9, 1978–August 7, 1981, J. T. Polhemus, 26♂ (JTP). Waterton, June 9, 1978–August 7, 1981, D. A. Polhemus, *Artemisia* sp. (Asteraceae), 38♂ (JTP). *Eagle Co.*: 9.2 mi S of Minturn, White River Natl. Forrest, 9080 ft, July 19, 1990, Zolnerowich, 4♂ (TAMU). Near Bond, Water Wheel Ranch, June

- 24, 1978, J. T. Polhemus, *Artemisia tridentata* (Asteraceae), 6♂ (JTP). *El Paso Co.*: Calhan, August 19, 1936, W. D. Field, 1♂ (KU). Garden of Gods, June 16, 1968, K. E. Slansky, 1♂ (UCD). *Elbert Co.*: 3 mi E of Kiowa, 6500 ft, July 16, 1983, R. T. Schuh, D. A. and J. T. Polhemus, 39♂ (AMNH). 5 mi E of Agate, August 9, 1987, J. T. and D. A. Polhemus, *Artemisia filifolia* (Asteraceae), 3♂ (JTP). *Garfield Co.*: W. Evacuation Creek, July 9, 1981, M. D. Schwartz, 1♂ (AMNH). *Gilpin Co.*: Aspen, White River National Forest, August 24, 1968, L.A. Kelton, *Artemisia* sp. (Asteraceae), 8♂, 6♀ (CNC). Pinecliffe, August 12, 1973, J. C. Schaffner, 1♂ (TAMU). Pinecliffe, July 19, 1949–August 12, 1973, J. R. White, J. C. Schaffner, 11♂ (KU, TAMU). Rollinsville, Roosevelt National Forest, September 2, 1972, L.A. Kelton, *Pinus flexilis* (Pinaceae) 1♂, 2♀ (CNC). *Gunnison Co.*: 5 mi NE of Almont, along Taylor River, 8400 ft, August 31, 1980, D. A. and J. T. Polhemus, *Artemisia filifolia* (Asteraceae), 14♂ (JTP). Taylor Park, July 25, 1982, J. T. Polhemus, 1♂ (JTP). *Jackson Co.*: Cowdrey, 8000 ft, August 15, 1968, L.A. Kelton, 1♀ (CNC). 4 mi N of Gould, August 5, 1975, J. C. Schaffner, 44♂ (TAMU). Gould, 9200 ft, August 13, 1968–August 13, 1969, Oman, Schaffner, 2♂ (OSU, TAMU). Muddy Pass, Routt National Forest, *Artemisia* sp. (Asteraceae) (CNC). Gould, 9200 ft, August 12–13, 1968, L.A. Kelton, *Artemisia* sp. (Asteraceae), 18♂, 24♀ (CNC). Grand Lake Entrance, Rocky Mountain National Park, August 18, 1968, L.A. Kelton, *Artemisia* sp. (Asteraceae), 6♂, 6♀ (CNC). Muddy Pass, Routt National Forest, 8600 ft, August 19, 1968, L.A. Kelton, *Artemisia* sp. (Asteraceae), 2♂, 4♀ (CNC). Muddy Pass, Routt National Forest, 8600 ft, August 21, 1968, L.A. Kelton, *Artemisia* sp. (Asteraceae), 2♂, 3♀ (CNC). *Jefferson Co.*: 10 mi NW of Golden, Guy Gulch, 7300 ft, August 10, 1987, J. T. and D. A. Polhemus, 1♂ (JTP). Red Rocks Park near Morrison, July 15, 1983–July 26, 1988, D. A. Polhemus, R. T. Schuh, 40♂ (AMNH, JTP). Red Rocks Park, July 26, 1988, D. A. Polhemus, *Artemisia ludoviciana* (Asteraceae), 12♂ (JTP). Upper Beaver Br. Gulch, August 12, 1981, D. A. Polhemus, 2♂ (JTP). *Lake Co.*: 10 mi N of Leadville, Tennessee Pass, 10,400 ft, July 24, 1988, R. Wharton, 2♂ (TAMU). La Plata Co.: La Plata, San Juan National Forest, 8500 ft, July 19–21, 1972, L.A. Kelton, 1♀ (CNC). *Larimer Co.*: 46 mi W of Fort Collins, Bennett Creek Picnic Grounds., Pingree Park Road, 7400 ft, July 14, 1986, R. T. Schuh, J. T. Polhemus, 54♂ (AMNH). 46 mi W of Fort Collins, Bennett Creek Picnic Grounds., Pingree Park Road, 7700 ft, July 14, 1986, R. T. Schuh, *Artemisia frigida* (Asteraceae), 30♂ (AMNH). 46 mi W of Fort Collins, Pingree Park Rd, 7700 ft, August 19, 1924–July 14, 1986, R. T. Schuh, J. T. Polhemus, Beamer, Lawson, 34♂ (AMNH, KU). Estes Park, August 24, 1925, H. H. Knight, 5♂, 5♀ (USNM). Estes Park, July 10, 1964, H. H. Knight, 10♂, 10♀ (USNM). Estes Park, July 18, 1916–August 27, 1920, H. C. Severin, 2♂ (KU, AMNH). Fort Collins, July 13, 1900, E. P. Van Duzee, 1♂ (CAS). Rocky Mountain National Park, Grand Lake Entrance, August 5, 1947, R. H. Beamer, 1♂ (KU). Rustic (CNC). Pingree Park, September 3, 1972, L.A. Kelton, 7♀ (CNC). Poudre Canyon, Rustic, September 6, 1972, L.A. Kelton, 2♂, 3♀ (CNC). *Las Animas Co.*: 1 mi E of Stonewall, Fire Dept., 7400 ft, August 18, 1986, R. T. Schuh, 104♂ (AMNH). *Logan Co.*: 15 mi N of Sterling, June 20, 1979, D. A. Polhemus, 8♂ (JTP). *Mesa Co.*: 20 mi E of Gateway, Upsweep Canyon, 6800 ft, August 15, 1987, J. T. and D. A. Polhemus, 3♂ (JTP). Colorado National Monument, Liberty Cap Trailhead, 6000 ft, June 10, 1982, M. D. Schwartz, 1♂ (AMNH). *Moffat Co.*: Gates of Lodore, June 28, 1979, D. A. Polhemus, 2♂ (JTP). *Montezuma Co.*: Mesa Verde Natl. Park, July 13, 1930–July 30, 0130, R. L. Usinger, 2♂ (UCB). Mesa Verde National Park, 7000 ft, July 17, 18, 1968, L.A. Kelton, 4♀ (CNC). *Ouray Co.*: Ouray, August 26, 1972, L.A. Kelton, 1♀ (CNC). *Routt Co.*: Steamboat Springs, 6900 ft, July 16, 1964, H. H. Knight, 5♂, 5♀ (USNM). Steamboat Springs, July 16, 1964, H. H. Knight, *Artemisia* sp. (Asteraceae), 10♂, 10♀ (USNM). Steamboat Springs, 6700 ft, July 15, 1964, H. H. Knight, det. as *Psallus artemisicola* Knight by Knight, 1♂ (CNC). *Saguache Co.*: 1 mi E of North Pass, August 19, 1969, J. C. Schaffner, 13♂ (TAMU). *Summit Co.*: Dillon, August 29, 1972, L.A. Kelton, *Artemisia* sp. (Asteraceae), 4♂, 6♀ (CNC). Dillon Reservoir near Dillon Dam, August 15, 1981, D. A. Polhemus, *Artemisia* sp. (Asteraceae), 1♂ (JTP). *Teller Co.*: Big Spring Ranch, July 30, 1966, T. C. Emmel, 1♂ (LACM). Woodland Park, 8000 ft, June 21, 1966, J. A. Slater, 2♂ (AMNH). *Weld Co.*: 7 mi NE of Nunn, August 15, 1968, Oman, 19♂ (OSU). **Connecticut**: New Haven, May 30, 1911, B. H. Walden, 1♀ (USNM). **Idaho**: *Ada Co.*: near Kuna, June 21, 1982, T. J. Henry, *Artemisia* sp. (Asteraceae), 4♂, 3♀ (USNM). *Bannock Co.*: McCammon, June 29, 1966, W. Gagne, J. Haddock, 2♂ (UCB). *Benewah Co.*: vicinity of Emida, St. Joe National Forest, T42N R53W, 3000 ft, August 5, 1986, Schwartz and Stonedahl, 1♂ (AMNH). *Blaine Co.*: 20 mi N of Shoshone, Big Wood River, July 1, 1966, W. Gagne, J. Haddock, 1♂ (UCB). 6 mi NW of Carey, Little Wood River, June 30, 1966, W. Gagne, J. Haddock, 2♂ (UCB). *Caribou Co.*: Blackfoot Reservoir, June 28, 1949,

- G. Ruhr, 1♂ (AMNH). *Cassia Co.*: Black Pine Mountains, September 29, 1969, G. F. Knowlton, 1♂ (USU). Burley, July 11, 1932, D. E. Fox, 4♀ (USNM). *Latah Co.*: Moscow, June 14, 1936, T. A. Brindley, 1♂ (USNM). *Madison Co.*: Rexburg, June 22, 1935, C. F. Smith, 2♂ (USU). *Nez Perce Co.*: Lewiston, 550 ft, May 30, 1932, T. A. Brindley, 1♂ (USNM). Lewiston, May 30, 1932, T. A. Brindley, 2♂ (AMNH). Lewiston, 550 ft, May 30, 1932, T.A. Brindley, det. as *Chlamydatius bakeri* Bergroth by H.H. Knight, paratype of *Psallus artemisicola* Knight, 2♀ (CNC). *Oneida Co.*: 6 mi NW of Holbrook, June 13, 1969–June 30, 1969, G. F. Knowlton, 13♂ (USU). Black Pine Canyon, 7000 ft, June 4, 1974, G. E. Bohart, 1♂ (USU). Ireland Canyon, July 11, 1973, G. F. Knowlton, 1♂ (USU). Juniper, September 29, 1969, G. F. Knowlton, 1♂ (USU). Pocatello Valley, July 11, 1973, G. F. Knowlton, 1♂ (USU). Salyer Cow Camp, July 23, 1971, W. J. Hanson, 1♂ (USU). *Power Co.*: American Falls, August 5, 1972, L.A. Kelton, *Juniperus* sp. (Cupressaceae), 1♂, 2♀ (CNC). *Twin Falls Co.*: Hollister (plot 6 outside), June 13, 1931, D. E. Fox, 10♂, 10♀ (USNM). *Unknown Co.*: Giveout, July 7, 1920, 1♂ (AMNH). Tuttle, June 8, 1930, Harold Waters, 3♂, 3♀ (USNM). **Illinois**: *Ogle Co.*: Grand Detour, Castle Rock, July 12, 1934, Dozier and Mohr, 1♂ (INHS). Oregon, July 4, 1932, Dozier and Mohr, *Artemisia canadensis* (Asteraceae), 2♂, 2♀ (USNM). Oregon, July 4, 1932, Dozier and Mohr, *Artemisia* sp. (Asteraceae), 32♂ (INHS). *Winnebago Co.*: Rockton, July 5, 1932, Dozier and Mohr, 2♂ (INHS). **Kansas**: *Chautauqua Co.*: Castle Rock, July 8, 1937, C. L. Johnston, 1♂ (KU). Cedar Vale, June 23, 1943, R. H. Beamer, 3♂ (KU). *Harvey Co.*: Newton, August 3, 1945, R. H. Beamer, 4♂ (KU). *Kearny Co.*: Kearny, 2998 ft, July 19, 1921, 1♂ (KU). *McPherson Co.*: No specific locality, June 28, 1923, L. D. Anderson, 1♂ (KU). **Michigan**: *Marquette Co.*: Lake-wood, August 18, 1960, L.A. Kelton, Whitney, *Ambrosia* sp. (Asteraceae), 24♂, 20♀ (CNC). **Minnesota**: *Cook Co.*: Grand Marais, August 13, 1922, H. H. Knight, 15♂, 15♀ (USNM). Grand Marais, August 13, 1922, H.H. Knight, det. as *Plagiognathus albipennis* Fallen by H. H. Knight, 2♂ (CNC). *Chisago Co.*: North Branch, August 5, 1922, H.H. Knight, paratype of *Psallus artemisicola* Knight, 2♂, 2♀ (CNC). North Branch, August 5, 1922, H.H. Knight, det. as *Chlamydatius bakeri* Bergroth by H.H. Knight, paratype of *Psallus artemisicola* Knight, 3♂, 3♀ (CNC). *Clay Co.*: BB Ranch 4–5, T141N, R45W, sec. 8, August 4, 1995–September 14, 1995, Rider, Fauske, Locken, 5♂, 12♀ (DAR). Bluestem Site, T139N, R46W, sec. 15, July 13, 1995–August 22, 1995, Rider, Fauske, Locken, 6♀ (DAR). Clay County Land 2–3, T141N, R45W, August 15, 1995, D. Rider and C. Locken, 2♂ (DAR). *Hennepin Co.*: Fort Snelling, August 2, 1923, A. T. Hertig, 2♀ (USNM). *Polk Co.*: Agassiz Dunes, T147N, R44W, sec. 32, August 1, 1995, D. Marty and K. Urlacher, 1♂, 5♀ (DAR). **Montana**: *Carbon Co.*: Bear Creek between Red Lodge and Belfry, 5000 ft, August 12, 1986, Schuh, Schwartz, Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 6♂ (AMNH). Smith Mine, August 12, 1986, Schuh, Schwartz, Stonedahl, 3♂ (AMNH). *Deer Lodge Co.*: Silver Lake, 14 mi W of Anaconda on Rt 10A, August 9, 1986, Schuh, Schwartz, Stonedahl, 22♂ (AMNH). *Gallatin Co.*: Targhee Pass on Rt 191, 7072 ft, August 10, 1986, Schuh, Schwartz, Stonedahl, 6♂ (AMNH). 29 mi S of Bozeman Hot Springs on Rt 191, 5800 ft, August 10, 1986, Schuh, Schwartz, Stonedahl, 104♂ (AMNH). *Glacier Co.*: 10 mi W of Babb, Glacier National Park, August 8, 1969, P. Oman, 3♂ (OSU). **Nebraska**: *Brown Co.*: Long Pine, July 15, 1986, T. J. Henry and A. G. Wheeler, Jr., *Artemisia* sp. (Asteraceae), 10♂, 10♀ (USNM). *Cherry Co.*: Valentine, June 8, 1950–June 9, 1950, Slater, Hicks, Laffoon, 7♂ (AMNH). *Dodge Co.*: Fremont, August 28, 1925, H. H. Knight, 1♂ (USNM). **Nevada**: *Carson City Co.*: Carson City, June 25, 1929–May 30, 1947, R. L. Usinger, W. F. Chamberlain, 7♂ (CAS, TAMU). Carson City, June 25, 1929, E. P. Van Duzee, 5♂ (CAS). *Elko Co.*: 23.7 mi S of Hwy 229 on Hwy 93, 6400 ft, July 19, 1980, Stonedahl, *Chrysothamnus nauseosus* (Asteraceae), 1♂ (AMNH). 30 mi SE of I-80 on Hwy 229, July 19, 1980, Stonedahl, *Artemisia* sp. (Asteraceae), 2♂ (AMNH). 30 mi W of Elko on Rt 80, June 18, 1982, T. J. Henry, *Artemisia* sp. (Asteraceae), 3♂, 8♀ (USNM). Carlin, June 25, 1935, R. H. Beamer, 1♂ (KU). Ruby Mts., Lomoille Canyon, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia dracunculoides* (Asteraceae), 11♂ (AMNH). Utah state line on Utah Rt 30, June 25, 1983, R. T. Schuh, M. D. Schwartz, *Artemisia spinescens* (Asteraceae), 2♂ (AMNH). Wells, July 12, 1965, H. H. Knight, 3♂, 3♀ (USNM). *Esmeralda Co.*: 3 mi W of Lida, June 7, 1966, W. Gagne, 2♂ (UCB). *Eureka Co.*: 12 mi N of Rt 50 on Rt 278, 5800 ft, June 27, 1983, R. T. Schuh, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 6♂ (AMNH). 28 mi W of Eureka on Rt 50, 6000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). 8 mi W Eureka, July 11, 1993, G. M. Chamberlain, 1♂ (TAMU). *Lander Co.*: 9.5 mi S Rt 2, Smith Creek Valley, T15N, R39E, June 30, 1983, R. T. Schuh, M. D. Schwartz, 5♂ (AMNH). Austin, August 12, 1940, L. J. Lipovsky, 1♂ (KU). *Nye Co.*: 11 mi N of Belmont, 7200 ft, June 29, 1983, R. T. Schuh and

- M. D. Schwartz, *Artemisia nova* (Asteraceae), 18♂ (AMNH). 3.5 mi SE of Manhattan, Toiyabe National Forest, 2188 m, July 13, 1980, R. T. Schuh, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 17♂ (AMNH). Mercury, 18 M, June 11, 1965, H. H. Knight and J. Merino, *Artemisia tridentata* (Asteraceae), 1♂ (USNM). Mercury, 401M, June 18, 1965, H. H. Knight and J. Merino, 20♂, 20♀ (USNM). Mercury, 5 M, June 12, 1965, H.H. Knight, J. Merino, paratype of *Europiella nigricornis* Knight, 1♀ (CNC). Mercury, 18 M, June 11, 1965, H.H. Knight, J. Merino, *Artemisia tridentata* (Asteraceae), paratype of *Europiella nigricornis* Knight, 2♂ (CNC). Mercury, 19 M, June 23, 1965, H.H. Knight, J. Merino, *Artemisia tridentata* (Asteraceae), 1♂ (CNC). *Ormsby Co.*: No specific locality, July 1, 1900, Baker, 1♂ (CAS). *Reno Co.*: Reno, Sky Ranch, June 16, 1952, E. I. Schlinger, 3♂ (UCD). *Washoe Co.*: 13 mi SE of Reno, 5650 ft, Musgrave, 1♂ (OSU). 7 mi W of Vya on Rt 8A, 1813 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Artemisia tridentata* (Asteraceae), 22♂ (AMNH). Mt. Rose, July 9, 1970, Villegas, 1♂ (UCD). Patrick, June 16, 1964, P. Richerson, 1♂ (UCD). Reno, June 27, 1927, E. P. Van Duzee, 8♂ (CAS). Verdi, September 7, 1967, W. Gagne, 5♂ (UCB). *White Pine Co.*: 6 mi SW of Ely, June 23, 1966, W. Gagne and J. Haddock, 10♂ (UCB). Ely, July 3, 1960–June 23, 1966, Tucker, Gagne, Haddock, 10♂ (UCD, UCB). Lehman Caves Natl. Mon., June 24, 1966, W. Gagne, J. Haddock, *Artemisia* sp. (Asteraceae), 1♂ (UCB). **New Mexico**: *Cantron Co.*: 18 mi W Datil, August 15, 1982, J. C. Schaffner, 1♂ (TAMU). *Catron Co.*: 15.8 mi N of Silver City, 7160 ft, August 20, 1998, J. C. Schaffner, 1♂ (TAMU). 4 mi W of Mogollon, September 21, 1998, J. C. Schaffner, 22♂ (TAMU). *Cibola Co.*: 18 mi S El Malpais Natl. Conserv. Area, August 8, 1997, J. C. Schaffner, 2♂ (TAMU). *Colfax Co.*: 5 mi E of Eagles Nest, August 8, 1969, J. C. Schaffner, 7♂ (TAMU). *Grant Co.*: 3.4 mi W of Mule Creek, September 20, 1998, J. C. Schaffner, 2♂ (TAMU). Iron Creek CG, June 9, 1977–June 4, 1980, Knowlton, Hanson, 7♂ (USU). Pinos Altos, August 19, 1972, L.A. Kelton, 1♂, 4♀ (CNC). Roberts Lake, Gila National Forest, August 19, 1972, L.A. Kelton, 8♂, 7♀ (CNC). *Hidalgo Co.*: Skeleton Canyon, August 16, 1968, G. C. Batista, 1♂ (UCR). *Lea Co.*: Site 12, September 24, 1979, R. R. Murray, J. C. Schaffner, 1♂ (TAMU). *Lincoln Co.*: Ruidoso, June 26, 1940, Hardy, Lipovsky, Beamer, Kuitart, Kenegan, 30♂ (KU). Sierra Blanca Mt., 8600 ft, August 18, 1970, J. R. and M. H. Sweet, 5♂ (TAMU). *Otero Co.*: Mayhill, July 23, 1967, L.A. Kelton, 1♀ (CNC). 2 mi E of Mayhill, September 22, 1998, J. C. Schaffner, 10♂ (TAMU). Cloudcroft, June 17, 1976, P. Oman, 4♂ (OSU). Cloudcroft, June 27, 1940, R. H. Beamer, D. E. Hardy, Kenaga, Kuitert, 30♂ (KU). Mountain Park, June 27, 1940, L. J. Lipovsky, 3♂ (KU). Near Maryhill, Sacramento Mountains, September 1, 1998, M. D. Schwartz, 1♂, 1♀ (CNC). *Rio Arriba Co.*: 14 mi NW Chama, August 21, 1969, J. C. Schaffner, 9♂ (TAMU). *Sandoval Co.*: East Fork Jemez River, La Concha Campground, 8300 ft, August 14, 1972, R. E. Orth, 2♂ (UCR). Jemez Springs, August 23, 1972, L.A. Kelton, 7♂, 5♀ (CNC). *Socorro Co.*: No specific locality, August 18, 1927, Beamer, 1♂ (KU). *Taos Co.*: Taos, June 18, 1937, E. D. Ball, 1♂ (UAZ). *Torrance Co.*: Estancia, June 24, 1940, D. E. Hardy, 4♂ (KU). **New York**: *Rockland Co.*: South Nyack, Ross Avenue, June 11, 1988, M. D. Schwartz, 1♂ (AMNH). *Suffolk Co.*: Yaphank, May 29, 1982, A. G. Wheeler and T. J. Henry, *Artemisia campestris* (Asteraceae), 8♂, 20♀ (PDA, USNM). *Tompkins Co.*: Ithaca, Cornell Plantations, August 15, 1987, A. G. Wheeler, *Artemisia abrotanum* (Asteraceae), 6♂, 18♀ (PDA). **North Dakota**: *Ada Co.*: Leonard, July 26, 1937, R. H. Beamer, 2♂ (KU). *McKenzie Co.*: North Unit, Roosevelt National Memorial Park, June 30, 1973, L.A. Kelton, 2♂, 1♀ (CNC). *Ransom Co.*: 4 mi NW of McLeod, T134N, R53W, sec. 6, June 5, 1992, D. A. Rider, 1♀ (DAR). *Richland Co.*: 2.5 mi SE of McLeod, Cheyenne National Grassland, May 26, 1992, D. Rider, 1♂ (DAR). *Trail Co.*: Unknown locality, August 19, 1923, A.A. Nichol, paratype of *Psalis artemisicola* Knight, 1♂ (CNC). *Unknown Co.*: Beach, August 23, 1921, R. L. Webster, 1♀ (USNM). **Oklahoma**: *Payne Co.*: Stillwater, October 3, 1934, F. A. Fenton, 1♂ (USNM). **Oregon**: *Baker Co.*: 12 mi SW of Baker, June 20, 1968, Oman, 2♂ (OSU). *Crook Co.*: 23 mi E of Prineville, Mark's Creek, July 29, 1976, J. D. Lattin, *Artemisia arbuscula* (Asteraceae), 2♂ (OSU). 3–15 mi SE of Prineville, July 2, 1968–June 22, 1979, Oman, R. T. Schuh, M. D. Schwartz, 7♂ (OSU, AMNH). Just E of Prineville, June 22, 1979, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 8♂ (AMNH). Mitchell, July 22, 1979, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 7♂ (AMNH). *Deschutes Co.*: 1 mi S of Millican, 4180 ft, June 21, 1979, R. T. Schuh, 1♂ (AMNH). 1 mi S of Millican, 4380 ft, June 7, 1977–June 21, 1979, J. D. Lattin, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 6♂ (OSU, AMNH). 11 mi SE of Brothers, July 9, 1968, Lattin, Oman, 3♂ (OSU). 4 mi NE of Sisters, October 1, 1979, Lattin, 2♂ (OSU). *Harney Co.*: 3 mi S. Hdq of Squaw Butter Exp Sta., July 6, 1977, J. D. Lattin, 1♂ (OSU). Lily Lake, 13 mi E French Glen, July 10, 1968, Oman, 1♂ (OSU). T34S, R35E, sec. 10, off dunes, June 22, 1979, Lightfoot and Cobb, 1♂

- (OSU). *Jackson Co.*: 1 mi below summit of Mount Ashland, 6500 ft, September 24, 1968, J. D. Lattin, 2♂ (OSU). 9 mi SE Butte Falls, July 19, 1973, Ritcher and Carlson, 4♂ (OSU). Ashland, August 2, 1918, E. P. Van Duzee, 5♂ (CAS). *Jefferson Co.*: 2.5 mi N of Warm Springs, 1700 ft, June 6, 1972, J. D. Lattin, 4♂ (OSU). Allen Spring, Metolius River, July 27, 1960, K. M. Fender, 1♂ (OSU). *Klamath Co.*: 1 mi E of Dairy, October 10, 1957, J. Lattin, 1♂ (OSU). 10 mi SE of Chiloquin, July 4, 1982, G. M. Stonedahl, T. J. Henry, *Artemisia tridentata* (Asteraceae), 11♂ (AMNH). 28 mi SE of La Pine, June 25, 1979, R. T. Schuh, *Cercocarpus ledifolius* (Asteraceae), 1♂ (AMNH). 4 mi NW of Worden on road to Keno, July 17, 1985, G. M. Stonedahl and J. D. McIver, *Artemisia tridentata* (Asteraceae), 14♂ (AMNH). 5 mi N of Fort Klamath, 4400 ft, August 11, 1933, H. A. Scullen, 1♂ (USNM). 5–15 mi SE of Chiloquin, July 4, 1982, T. J. Henry and G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 1♂, 6♀ (USNM). Hayden Mt. Summit W of Keno, June 27, 1979, R. T. and Joe Schuh, 2♂ (AMNH). Lower Klamath Lake Hill, July 19, 1953, Joe Schuh, 3♂ (OSU). *Lake Co.*: 12 mi SE of Hampton, Glass Butte, July 12, 1968, Oman, 2♂ (OSU). E side Abert Lake, September 25, 1971, C. Musgrave, *Artemisia* sp. (Asteraceae), 1♂ (OSU). Hart Mountain, 6250 ft, September 2, 1977, J. Schuh, *Chrysothamnus* sp. (Asteraceae), 2♂ (AMNH). Lost Forest, July 9, 1968, Oman, 1♂ (OSU). *Umatilla Co.*: 2 mi W of Tollgate, August 4, 1986, Schuh, Schwartz, Stonedahl, *Holodiscus discolor* (Rosaceae), 1♂ (AMNH). *Wallowa Co.*: 30 mi N of Enterprise, July 30, 1968, Oman, 1♂ (OSU). Joseph, June 19, 1968–July 18, 1975, Paul Oman, WF Chamberlain, 5♂ (OSU, TAMU). *Wasco Co.*: 24 mi SW The Dalles, Knebal Springs, 3900 ft, July 8, 1978, Nancy Herman, 1♂ (AMNH). *Wheeler Co.*: 2 mi W of Mitchell on Hwy 26, June 22, 1979, G. Stonedahl, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). **South Dakota**: *Brookings Co.*: White, July 26, 1922, H. C. Severin, 1♂ (CAS). *Custer Co.*: Custer, Black Hills, August 26, 1935, M. W. Sanderson, 2♂ (KU). Black Hills, June 29, 1973, L.A. Kelton, 1♂ (CNC). Custer State Park, Black Hills National Forest, August 7, 1971, L.A. Kelton, 5♂, 15♀ (CNC). *Fall River Co.*: Hot Springs, August 27, 1922, H. C. Severin, 1♂ (CAS). *Harding Co.*: Buffalo, June 19, 1925, H. C. Severin, 1♀ (USNM). *Wallworth Co.*: Selby, September 25, 1925, H. C. Severin, 3♀ (USNM). **Texas**: *Jeff Davis Co.*: 39.7 km NW Ft. Davis, April 10, 1988, R. Anderson, 6♂ (TAMU). **Utah**: *Box Elder Co.*: Hansel Valley, June 20, 1969, H. J. Hanson, 2♂ (USU). Kelton, June 27, 1969–July 3, 1969, G. F. Knowlton, 6♂ (USU). Mantua, August 24, 1967, G. F. Knowlton, 4♂ (OSU). *Cache Co.*: 0.4 mi off Rt 189 along Franklin Basin Road, 6575 ft, July 18, 2001, T. J. Henry and A. G. Wheeler, Jr., *Artemisia tridentata* (Asteraceae), 1♂, 3♀ (USNM). Beaver Mountain, August 17, 1982, G. F. Knowlton, 1♂ (USU). Blacksmith Fork Canyon, June 28, 1971, Ritcher and Carlson, G. F. Knowlton, 2♂ (OSU). Elk Valley, July 29, 1976, W. J. Hanson, 1♂ (USU). Green Canyon, June 22, 1955–August 2, 1973, G. F. Knowlton, G. L. Nielson, 2♂ (USU). Logan Canyon, July 29, 1934–August 29, 1980, G. F. Knowlton, T. O. Thatcher, 5♂ (USU). Providence, August 3, 1934–June 2, 1953, J. Plant, C. Smith, 2♂ (USU). *Daggett Co.*: Red Springs Camp, Ashley National Forest, August 25, 1966, C. W. O'Brien, 4♂ (UCB). *Davis Co.*: Bountiful, July 2, 1935, G. F. Knowlton, 1♂ (USU). Farmington Canyon, July 3, 1935–June 6, 1979, G. E. Bohart, G. F. Knowlton, 6♂ (USU). *Duchesne Co.*: 23.7 mi S of Myton, Wells Draw, T10S, R15E, 6000 ft, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). *Garfield Co.*: 10 mi S of Antimony, July 18, 1969, 1♂ (BYU). 14.3 mi S Rt 95 on Rt 276, 5000 ft, June 18, 1983, R. T. Schuh, M. D. Schwartz, 2♂ (AMNH). Boulder Mt., June 13, 1969, D. W. Davis, G. F. Knowlton, 5♂ (USU). Mt. Ellen, 9900 ft, August 27, 1981, T. Griswold, 1♂ (USU). Hatch, August 11, 1972, L.A. Kelton, 8♀ (CNC). Panguitch, June 27, 1927–June 29, 1942, G. F. Knowlton, 3♂ (USU). *Grand Co.*: Colorado River Canyon near Fischer Towers, 4000 ft, May 27, 1978, D. A. and J. T. Polhemus, 4♂ (JTP). *Iron Co.*: Cedar City, June 29, 1965, H. H. Knight, 1♂, 1♀ (USNM). *Juab Co.*: 17 mi E of Leamington, July 27, 1962, C. W. O'Brien, 1♂ (UCB). Goshute Indian Reservation, July 27, 1953, P. D. Ashlock, 1♂ (BYU). *Millard Co.*: Scipio, June 29, 1965, H. H. Knight, 3♂ (USNM). *Rich Co.*: Garden City, July 7, 1969, G. F. Knowlton, 1♂ (USU). Logan Canyon, Bear Lake Summit, August 22, 1998, M. D. Schwartz, 1♀ (CNC). Monte Cristo, September 10, 1967, K. Capelle, 1♂ (USU). *Salt Lake City Co.*: Salt Lake City, July 13, 1976, Knowlton, Crowe, 1♂ (USU). *Salt Lake Co.*: Magna, June 16, 1954, G. F. Knowlton, 1♂ (AMNH). Mouth of Little Cottonwood Canyon on Rt 210, 5800 ft, June 28, 1981, M. D. Schwartz, *Artemisia ludoviciana* (Asteraceae), 10♂ (AMNH). *San Juan Co.*: 1 mi W of Clay Hills Crossing Road on Rt 263, T39S, R15E, 5100 ft, June 18, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 1♂ (AMNH). 27 mi E of Blanding at mp 101 on Rt 95 near Mule Tower Ruins, 6500 ft, June 12, 1982, M. D. Schwartz, *Artemisia ludoviciana* (Asteraceae), 1♂ (AMNH). 3 mi W of Clay Hills Crossing Road on Rt 263, T39S, R15E, 5000 ft,



- June 18, 1983, Schuh, Schwartz, *Artemisia filifolia* (Asteraceae), 5♂ (AMNH). Bridges National Monument, April 12, 1969, G. F. Knowlton, 1♂ (USU). Brush Basin Rim Rd., Co. rd. no. 227 0.5 E mp 116, 5700ft, June 12, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 28♂ (AMNH). Natural Bridges National Park, July 12, 1967, G. F. Knowlton, 3♂ (USU). White Canyon, Duckett Crossing, May 29, 1985, J. T. and D. A. Polhemus, *Artemisia tridentata* (Asteraceae), 6♂ (JTP). *Sanpete Co.*: 13 mi E of Fairview on Utah Rt 31, T14S, R6E, 7500 ft, August 8, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 13♂ (AMNH). *Sevier Co.*: 11 mi W of Sevier on I-70, 6400 ft, July 15, 1980, G. Stonedahl, *Chrysothamnus viscidiflorus* (Asteraceae), 3♂ (AMNH). 11 mi W of Sevier on Rt 4, 2000 m, July 15, 1980, R. T. Schuh, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 10♂ (AMNH). 32 mi N of Hwy 24 and Hwy 72, 7560 ft, July 17, 1980, G. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 9♂ (AMNH). Fish Lake National Forest, R2E, T25S, sec. 24, 25, 8720 ft, August 16, 1929, July 16, 1980, G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 1♂ (AMNH). Richfield, August 15, 1929, 1♂ (USNM). Salt Gulch, 12 mi N Hwy 24 on Hwy 72, 8060 ft, July 17, 1980, G. Stonedahl, *Artemisia* sp. (Asteraceae), 11♂ (AMNH). *Summit Co.*: 3 mi SE of Bear River, August 5, 1971–August 12, 1971, W. J. Hanson, 1♂ (USU). Coalville, July 13, 1965, H.H. Knight, det. as *Psallus artemisicola* Knight by Knight, 1♀ (CNC). 4.5 mi E of Oakley, Weber Canyon Road, August 19, 1986, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 6♂ (AMNH). Kimball Junction, August 31, 1967, L.A. Kelton, 2♂ (CNC). *Uintah Co.*: 22 mi N of Vernal, August 25, 1966, C. W. O'Brien, 4♂ (UCB). Bonanza, September 18, 1976–July 7, 1982, G. E. Bohart, 2♂ (BYU). Bonanza, White River Shale Project Trailers, T9S, R24E, sec. 23, 5000 ft, June 1, 1981–June 8, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 30♂ (AMNH). Kane Hollow on Red Cloud Loop, 8500 ft, September 7, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 41♂ (AMNH). *Unknown Co.*: Cedar Point, July 15, 1952, G. E. Bohart, G. F. Knowlton, 1♂ (USU). Knaab, August 6, 1954, G. F. Knowlton, D. W. Dayle, 1♂ (KU). *Utah Co.*: American Fork, June 28, 1965, H.H. Knight, det. as *Europiella decolor* by H. H. Knight, 2♂, 1♀ (CNC). American Fork, June 28, 1965, H. H. Knight, 10♂, 10♀ (USNM). Provo, June 4, 1965, A. M. Wesloch, 1♂ (BYU). *Wasatch Co.*: 30 mi SE of Kamas on Rt 34, Uintah National Forest, Wolf Creek Campground, T4S, R10W, sec. 7, 9000 ft, August 15, 1986, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 31♂ (AMNH). Daniels Canyon, August 8, 1964, G. F. Knowlton, 1♂ (UCU). *Washington Co.*: Leeda Canyon, July 28, 1965, W. J. Hanson, 1♂ (USU). St. George, June 30, 1965, H. H. Knight, 10♂, 10♀ (USNM). Zion National Park, August 1, 1929–June 18, 1935, C. C. Searl, G. F. Knowlton, 2♂ (SDNM). Zion National Park, Lava Point Campground, 7000 ft, May 24, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Wayne Co.*: Hanksville, Vasco Tanner, 2♂ (BYU). **Washington: Benton Co.**: Hanford Site ALE, T11N, R26E, sec. 34, 1200 ft, June 1, 1994, R. S. Zack, 2♂, 4♀ (WSU). *Kittitas Co.*: 5 mi S of Ellensburg, T17N, R18E, sec. 34, June 13, 1989, R. S. Zack, 1♂, 4♀ (WSU). *Okanogan Co.*: 0.5 mi S of Malott, June 2, 1966, W. Gagne and J. Haddock, 2♂ (UCB). Okanogan, July 6, 1966–June 22, 1983, W. Gagne, J. Haddock, S. G. Cannings, 8♂ (UBC, UCB). *Whitman Co.*: 4 mi NE of Steptoe, Steptoe Butte, June 11, 1989, R. S. Zack, 2♂ (WSU). Colfax, July 10, 1925, C. L. Fox, 1♂ (CAS). Fallon, June 8, 1949, C. O. Esselbaugh, 1♂ (AMNH). *Yakima Co.*: 11 mi SW of Ellensburg, T16N, R17E, sec. 3, Wenas Road, June 13, 1989, R. S. Zack, 2♂ (WSU). Naches, July 7, 1935, R. H. Beamer, 3♂ (KU). Yakima, September 6, 1932, A. R. Rolfs, 1♂, 1♀ (USNM). **Wyoming: Albany Co.**: 9 mi Laramie, 8600 ft, August 16, 1968, Oman, 5♂ (OSU). Near Keystone, July 26, 1981, J. T. and D. A. Polhemus, 1♂ (JTP). *Big Horn Co.*: 21 mi W of Burgess Jct on Rt 14, 8500 ft, August 13, 1986, Schuh, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). 27 mi W of Burgess Jct on Rt 14, 7700 ft, August 12, 1986, Schuh, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 55♂ (AMNH). *Carbon Co.*: 11 mi S of Red Lodge, Parkside Campground, 7250 ft, August 12, 1986, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 98♂ (AMNH). Saratoga, July 29, 1931, H. H. Knight, 2♂, 1♀ (USNM). *Fremont Co.*: Wind River Mts., 2.5 mi SW Shoshone NF boundary on Rt 131, August 14, 1986, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 47♂ (AMNH). *Lincoln Co.*: 4 mi N of W. Frontier, June 26, 1966, W. Gagne, J. Haddock, 1♂ (UCB). Kemmerer, July 13, 1983–August 24, 1983, Bohart, Meadows, 4♂ (BYU). *Natrona Co.*: 7 mi W of Waltman, August 12, 1962, J. G. and B. L. Rosen, 1♂ (AMNH). *Park Co.*: Yellowstone National Park, 5 mi S of Tower Falls, 7350 ft, September 17, 1980, J. D. Lattin, 4♂ (OSU). *Sheridan Co.*: Arvada, August 19, 1927, H. H. Knight, 1♂ (USNM). SW of Sheridan, August 16, 1979, J. T. Polhemus, 1♂ (JTP). *Sweetwater Co.*: 30 mi E of Rock Springs near Point of Rocks, July 4, 1968, H. H. Knight, 1♂, 1♀ (USNM). 10 mi E of Rock Springs, July 4, 1968, H.H. Knight, det.

as *Europiella decolor* by H. H. Knight, 1♀ (CNC).

***Europiella lattini*, new species**

Figures 2, 4

**DIAGNOSIS:** Recognized by its relatively small size, strongly infusate hind femora, dark areas on the hemelytra (fig. 2), and very large male genitalia (fig. 4), including pygophore and vesica, of the type found in *E. artemisiae* and *E. decolor*. Distinguished from *E. artemisiae* by its smaller size and shorter second antennal segment relative to the width of the head in males; easily distinguished from *E. artemisiae* and *E. decolor* by the smaller pygophore and vesica and the longer anterior vesical spine in those two species.

**DESCRIPTION:** *Male:* Relatively small species, total length 2.81–3.05, width pronotum 0.91–0.97. **COLORATION** (fig. 2): Head, pronotum, and scutellum generally mostly dark; hemelytra often dark with pale areas at base of corium, base of cuneus, and along costal margin; lateral angles of mesoscutum orange; all antennal segments black; labium generally pale, segment 4 strongly infusate; venter of body generally black; coxae black; trochanters pale; fore- and middle femora generally orange with a few dark spots, never strongly infusate, hind femora much more heavily infusate; tibiae pale with black spines with distinct black bases. **SURFACE AND VESTITURE:** Surface and vestiture as in generic diagnosis. **STRUCTURE:** Moderately elongate, nearly parallel-sided, corial margin only weakly convex. **GENITALIA** (fig. 4): Pygophore very large relative to total size of abdomen; vesica very large, posterior apical spine of vesica short, sharply curving, hook-shaped, just surpassing gonopore, anterior spine only slightly longer and weakly decurved; structure of vesica very similar to that of *E. artemisiae* and *E. decolor*, but anterior spine much shorter and entire vesica much larger than in those species.

*Female:* Coloration similar to that in male. Body form much more strongly ovoid than male. Total length 2.50–2.89, width pronotum 0.89–0.91.

**ETYMOLOGY:** Named in honor of John D. Lattin, who nurtured my interest in the Het-

eroptera and the North American Miridae while I was an undergraduate student at Oregon State University, and whose efforts in the field produced the first specimens of this species examined by me.

**HOSTS:** Recorded from *Achillea* sp. (Asteraceae), *Lupinus latifolius* (Fabaceae), and couch grass (Poaceae). These are certainly not all breeding records. Only further collecting will confirm the actual hosts for this species.

**DISTRIBUTION:** Primarily coastal mountains from Oregon to British Columbia.

**DISCUSSION:** The genital capsule is large relative to the size of the abdomen, and the aedeagus is also relatively large, which, upon careful examination, make this species easily distinguishable from the very similar appearing *E. decolor*.

**SPECIMENS EXAMINED:** Holotype: USA: **Oregon:** *Benton Co.:* Grass Mt., Summit Prairie, Lattin, VIII-14–1980, general sweeping; deposited in the American Museum of Natural History. Paratypes: **CANADA:** **British Columbia:** 10 mi S of Merritt, July 19, 1959, L. A. Kelton, 1♂, 4♀ (CNC). 24 km E of Cherryville, August 25, 1989, G.G.E. Scudder, 2♂ (UBC). 9 mi N of Clinton, July 26, 1988, G.G.E. Scudder, 2♂, 3♀ (UBC). 9.5 km N of Cawston, July 13, 1991, G.G.E. Scudder, 1♂ (UBC). Cariboo, Westwick Lake, August 1, 1959, G.G.E. Scudder, 1♂ (UBC). Cariboo, Westwick Lake, August 17, 1962, G.G.E. Scudder, 1♂ (UBC). Cariboo, Westwick Lake, June 23, 1961, G.G.E. Scudder, 2♂, 1♀ (UBC). Fairview, White Lake, July 4, 1995, J. Jarrett, 1♂, (UBC). Grand Forks, July 10, 1950, H. R. MacCarthy, 4♂, 1♀ (CNC). Gray Creek, July 22, 1959, L. A. Kelton, 1♂, 2♀ (CNC). Lillooet, Seton Lake, June 3, 1926, J. McDunnough, 1♂, (CNC). Manning Prov. Park, Allison Pass, August 12, 1970, L. A. Kelton, 3♂ (CNC). Oliver, 7 mi E of Indian Reservation, July 8, 1959, L. A. Kelton, 5♂, 3♀ (CNC). Oliver, Madden Lake, July 8, 1959, L. A. Kelton, 1♂, 1♀ (CNC). Oliver, McIntyre Creek, July 4, 1959, L. A. Kelton, 1♂ (CNC). Osoyoos, Anarchist Mt., July 13, 1970–July 20, 1959, L. A. Kelton, 3♂ (CNC). Salmon Arm, June 11, 1961, G.G.E. Scudder, 1♂ (UBC). Vancouver Island, Kelsey Bay, July 13, 1979, G.G.E. Scudder, 1♂ (UBC). Vancouver, July 28, 1922, W. Downes, 1♂ (UBC). Venables Valley entrance, July 26, 1983, G.G.E. Scudder, 1♂ (UBC). White Lake, Kearns Creek, June 29, 1996, G.G.E. Scudder, 2♂, 2♀ (UBC). USA: **Oregon:** *Benton Co.:* Grass Mt. Summit Prairie, August 14, 1980, Lattin, 4♀ (OSU). Mary's Peak below

campground, 3500 ft, August 17, 1970, *Achillea* sp. (Asteraceae), 6♂, 5♀ (AMNH, OSU). Mary's Peak, 14 mi W Corvallis, September 19, 1976, no collector, 2♂ (AMNH). Mary's Peak, 4000 ft, July 29, 1966–July 31, 1966, W. Gagne and J. Haddock, 10♂, 2♀ (UCB, AMNH). Mary's Peak, August 10, 1971, P. W. Oman, 1♂ (OSU). Mary's Peak, July 1, 1982, T. J. Henry and J. D. Lattin, 16♂, 6♀ (USNM, AMNH). Mary's Peak, meadow below campground, 3500 ft, August 23, 1988, A. Asquith and J. D. Lattin, *Lupinus latifolius* (Fabaceae), 15♂, 12♀ (AMNH, OSU, USNM). Hood River Co.: Mt. Hood, June 25, 1975, Hanson, Knowlton, 1♂ (USU). Jackson Co.: Siskiyou Summit, Old Road, 1260 m, July 22, 1999, M. D. Schwartz, 1♂ (CNC).

*Europiella morrisoni*, new species

Figures 2, 4

DIAGNOSIS: Recognized by the nearly entirely pale dorsum, the entirely black antennae, and the body in males being long, narrow, and parallel-sided (fig. 1). Sexual dimorphism pronounced, the females being ovoid, with the hemelytra more or less conforming to shape of the abdomen (fig. 1). Most similar in coloration and body form to *E. pilosula*, but differing in having a slightly more elongate body form and black antennae. Apical vesical spines in male short, subequal in length, most similar to those of *carvalhoi* and *pilosula*.

DESCRIPTION: *Male*: Long slender species, total length 3.30–3.61. COLORATION (fig. 2): Head, pronotum, scutellum (except basally sometimes orange), hemelytra, and labium pale. Venter of thorax and abdomen weakly infuscate. Legs generally pale, hind femur with a few black spots apically, all tibiae with strongly contrasting black spots at the bases of black spines. SURFACE AND VESTITURE: Surface and vestiture as in generic description. STRUCTURE: Hemelytra conspicuously elongate, parallel-sided, apex of abdomen reaching only to base of cuneus; cuneus elongate triangular. GENITALIA (fig. 4): Pygophore only moderately large relative to total size of abdomen; apical spines of vesica short, of approximately equal length, anterior spine weakly notched.

*Female*: Coloration as in male; body form ovoid, much shorter than in male. Total length 2.50–2.89, width pronotum 0.93.

ETYMOLOGY: Names for Harold Morrison,

who collected the only known specimens of this species.

HOSTS: *Artemisia* sp. (Asteraceae).

DISTRIBUTION: Imperial Valley of southern California.

DISCUSSION: This species is known only from the type locality and appears never to have been recollected.

SPECIMENS EXAMINED: Holotype: ♂, From Sagebrush beyond Jacumba, San Diego Co., Cal., swept 6:30 A.M., June 11, 1915, Harold Morrison; deposited in the National Museum of Natural History, Washington, D.C. Paratypes: USA: **California**: San Diego Co.: beyond Jacumba, swept 6:30 AM, June 11, 1915, Harold Morrison, *Artemisia* sp. (Asteraceae), 11♂, 3♀ (USNM, AMNH).

*Europiella pilosula* (Uhler)

Figures 2, 4

*Atomoscelis pilosulus* Uhler, 1893: 377 (n. sp., descr.); Schuh et al. 1995: 388 (n. syns., disc.). *Tuponia subnitida* Uhler, 1895: 45 (n. sp.; syn. by Schuh et al., 1995: 388).

*Microphylidea pallens* Knight, 1968: 29 (n. sp.; syn. by Schuh et al., 1995: 388).

*Europiella flavicornis* Knight, 1969: 82 (n. sp.; syn. by Schuh et al., 1995: 388).

*Europiella pallida* Knight, 1969: 83 (n. sp.; syn. by Stonedahl, 1990: 85).

*Europiella albata* Knight, 1969: 85 (n. sp.; syn. by Schuh et al., 1995: 388).

DIAGNOSIS: Recognized by the generally pale coloration of the body and the entirely pale antennae (fig. 2), a combination of attributes otherwise found together only in *E. signicornis*. Separated from *E. signicornis* by the more elongate body form in the males of *E. pilosula* and structure of the vesica, the anterior spine being sickle-shaped in *E. pilosula* (fig. 4) and nearly straight in *E. signicornis* (fig. 5). Body form and coloration also similar to *E. morrisoni*, but that species not so elongate and anterior vesical spine not sickle-shaped.

REDESCRIPTION: *Male*: Moderately elongate, total length 2.63–3.50, width pronotum 0.88–1.07. COLORATION (fig. 2): Dorsum, including membrane, usually pale, white, sometimes weakly to moderately infuscate; all antennal segments pale; labium pale on basal three-fourths, segment 4 black; legs entirely pale, femora with some black spots, tibial spines brown with at most tiny brown

bases; entire venter usually pale, sometimes largely dark in specimens with infuscate dorsum. **SURFACE AND VESTITURE:** Surface and vestiture as in generic diagnosis. **STRUCTURE:** Elongate, hemelytra ranging from nearly parallel-sided to weakly convex. **GENITALIA** (fig. 4): Pygophore only moderately large relative to total size of abdomen; vesica with short apical spines, anterior spine sickle-shaped, posterior spine narrow and weakly decurved.

**Female:** Coloration as in male; body form much more strongly ovoid. Total length 2.42–3.04, width pronotum 0.82–1.02.

**HOSTS:** *Artemisia* spp., recorded chiefly from *A. filifolia* and *A. tridentata*. Records from non-Asteraceae are certainly sitting records.

**DISTRIBUTION:** Interior regions of western North America from British Columbia to southern California, east onto the plains from South Dakota south to Texas.

**DISCUSSION:** The often pale, but somewhat variable, coloration of this rather widespread species would seem to have contributed to the rather large number of junior synonyms.

**SPECIMENS EXAMINED:** Lectotype: ♂, Am. Fork, Ut., 22–6.91 (USNM). Holotypes of synonyms: *Europiella albata* Knight: ♀, Jackson Co., Oklahoma, 11/4, 1939, collected by E. Hixson (USNM). *Europiella flavicornis* Knight: ♂, Sterling, Colo., Aug. 26, 1925, H. H. Knight (USNM). *Europiella pallida* Knight: ♂, St. George, UTAH, June 30, 1965, Harry H. Knight (USNM). *Microphylidea pallens* Knight: ♂, MERCURY, NEVADA, 19M VI-23–1965, H. Knight & J. Merino (USNM). Additional specimens: CANADA: **British Columbia:** 8 km N of Naramata, June 12, 1992, G.G.E. Scudder (UBC). 8 km N of Naramata, June 12, 1992, G.G.E. Scudder, 1♂ (CNC). 8.2 km from Osoyoos, Mount Kobau Road, 1150 m, August 3, 1997, G.G.E. Scudder (UBC). Chopaka, June 30, 1981, G.G.E. Scudder (UBC). Chopaka, June 30, 1981, S. G. Cannings, 1♂ (CNC). Kamloops, June 25, 1950, B. P. Beirne (Asteraceae) (CNC). Kamloops, June 25, 1950, B. P. Beirne, 1♂ (CNC). Nicola Lake, July 26, 1970, L. A. Kelton, 1♂ (CNC). Nicola Lake, July 26, 1970, L. A. Kelton, *alfalfa* (Fabaceae) (CNC). Osoyoos Lake, Haynes Ecol. Res., June 30, 1981, S. G. Cannings, 3♀ (CNC). Osoyoos Lake, Haynes Ecol. Res., June 30, 1981, S. G. Cannings, (UBC). Osoyoos Lake, northeast end, June 30, 1981, S. G. Cannings (UBC). Osoyoos, Mt. Kobau Road, km 8.2, 1150 m, August

3, 1997, G.G.E. Scudder, 1♀ (CNC). Penticton, west bench, June 23, 1983, S. G. Cannings (UBC). Princeton, July 25, 1970, L. A. Kelton, 1♂, 1♀ (CNC). West Bench, Penticton, June 23, 1983, S. G. Cannings, 1♂ (CNC). USA: **Arizona:** *Apache Co.:* St. Johns, August 14, 1967, L. A. Kelton, *Artemisia* sp. (Asteraceae), 10♂, 13♀ (CNC). *Cochise Co.:* 1 mi E of Wilcox, October 20, 1979, J. D. Pinto, 1♂ (UCR). *Coconino Co.:* Grand Canyon, June 29, 1930, R. L. Usinger, 1♂ (UCB). *Coshise Co.:* 31 mi E of E Douglas, August 24, 1974, J. D. Pinto, 1♂ (UCR). *Pinal Co.:* Superior, 2400 ft, April 16, 1928, A. A. Nichol, 2♂ (USNM). **California:** *Fresno Co.:* Selma, June 4, 1929, R. L. Usinger, 1♂ (CAS). *Inyo Co.:* Big Pine, June 17, 1929, R. L. Usinger, 2♂ (CAS). Independence, June 13, 1929–June 14, 1929, E. P. Van Duzee, 6♂ (CAS). Lone Pine, June 9, 1929, E. P. Van Duzee, 6♂ (CAS). Olancho, June 8, 1929, E. P. Van Duzee, 9♂ (CAS). *Lassen Co.:* 57 mi SE of Susanville, July 11, 1972, Oman, 1♀ (OSU). Sage Hen, July 26, 1954, B. P. Bliven, 1♂ (CAS). *Los Angeles Co.:* Mint Canyon, May 26, 1937, E. P. Van Duzee, 2♂ (CAS). **Colorado:** *Bent Co.:* John Martin Dam near Hasty, August 29, 1982, D. A. and J. T. Polhemus, 12♂ (JTP). *Costilla Co.:* Fort Garland, August 10, 1925, H. H. Knight, 2♂, 3♀ (USNM). *Elbert Co.:* 5 mi E of Agate, August 9, 1987, J. T. and D. A. Polhemus, *Artemisia filifolia* (Asteraceae), 22♂ (JTP). *Garfield Co.:* W. Evacuation Creek, 11 mi SE of Colorado state line on Rt 45, 6800 ft, July 9, 1981, M. D. Schwartz, 6♂ (AMNH). *Larimer Co.:* Hudson, August 25, 1925, H. H. Knight, *Artemisia filifolia* (Asteraceae), 1♂ (CNC). Hudson, August 25, 1925, H. H. Knight, *Artemisia filifolia* (Asteraceae), 1♂ (USNM). *Logan Co.:* Sterling, August 26, 1925, C. J. Drake, 1♂ (USNM). *Moffat Co.:* Craig, August 3, 1947, R. H. Beamer, 1♂ (KU). *Rio Blanco Co.:* 30 mi N of Rifle on Rt 13, 6800 ft, August 14, 1986, R. T. Schuh, 15♂ (AMNH). *Weld Co.:* 5 mi W of Roggen, 5200 ft, July 16, 1983–August 10, 1987, R. T. Schuh, D. A. and J. T. Polhemus, T. J. Henry, 71♂ (AMNH, USNM). Fort Lupton, June 10, 1910, 1♂ (USNM). NE of Hudson, September 1, 1978–August 9, 1987, D. A. and J. T. Polhemus, 24♂ (JTP). **Idaho:** *Oneida Co.:* Ireland Canyon, November 7, 1973, G. F. Knowlton, 1♂ (USU). *Power Co.:* American Falls, August 5, 1972, L. A. Kelton, *Juniperus* sp. (Cupressaceae), 3♂, 2♀ (CNC). *Twin Falls Co.:* Hollister, June 26, 1931, D. E. Fox, *Artemisia tridentata* (Asteraceae), 2♂ (USNM). **Kansas:** *Meade Co.:* No specific locality, September 13, 1944, R. H. Beamer, 1♂ (KU). **Nevada:** *Carson City Co.:* Carson City, June 26, 2029, R. L. Usinger, 1♂ (CAS). *Clark Co.:* Charleston Peak, 6000 ft, July

19, 1982, J. T. Polhemus, 1♂ (JTP). *Esmeralda Co.*: 13 mi W of Lida on Rt 3, 1938 m, July 12, 1980–July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 19♂ (AMNH). *Eureka Co.*: 12 mi N of Rt 50 on Rt 278, 5800 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Lyon Co.*: North Boundary of Toiyabe National Forest on Rt 22, 1780 m, July 11, 1980, R. T. Schuh and G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 14♂ (AMNH). *Nye Co.*: Mercury, August 13, 1965, J. Merino, *Artemisia tridentata* (Asteraceae), 2♂, 2♀ (USNM). *Washoe Co.*: 7 mi W of Vya toward Cedarville, 1800 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). Nixon, June 20, 1927, E. P. Van Duzee, 1♂ (CAS). Reno, June 27, 1927, E. P. Van Duzee, 1♂ (CAS). **New Mexico**: *Dona Ana Co.*: 9 mi W of Santa Teresa, May 8, 1999, J. C. Schaffner, *Artemisia* sp. (Asteraceae), 28♂, 14♀ (TAMU). *Eddy Co.*: Site 11, April 24, 1979, Burke, Delorme, and Schaffner, 6♂ (TAMU). Site 4, May 23, 1979–May 25, 1979, Delorme and Corolla, 9♂, 3♀ (TAMU). Site 7, April 24, 1979–September 14, 1979, Schaffner et al., 60♂ (TAMU). Site 8, June 2, 1979–July 24, 1979, Schaffner et al., 14♂, 5♀ (TAMU). *Hidalgo Co.*: Lordsburg, August 23, 1941, 2♂ (USNM). *Lincoln Co.*: 5.6 mi NW of Carrizozo, May 15, 1999, J. C. Schaffner, 3♂ (TAMU). *Socorro Co.*: 1–2 mi W of Magdalena, August 14, 1982, J. C. Schaffner, *Artemisia filifolia* (Asteraceae), 3♂, 2♀ (TAMU). **Oklahoma**: *Jackson Co.*: No specific locality, April 11, 1939, E. Hixson, 4♂, 4♀ (USNM). *Tillman Co.*: No specific locality, March 1, 1941, 5♂, 5♀ (USNM). **Oregon**: *Umatilla Co.*: Hermiston, June 13, 1973, Oman and Musgrave, 1♀ (OSU). **South Dakota**: *Fall River Co.*: Oelrichs, June 28, 1973, L. A. Kelton, 1♂ (CNC). **Texas**: *Dallam Co.*: Dalhart, May 26, 1964, L. A. Kelton, *Artemisia* sp. (Asteraceae), 12♂, 8♀ (CNC). **Utah**: *Beaver Co.*: 4 mi N of Beaver, July 18, 1967, H. R. Burke, 1♂ (TAMU). *Box Elder Co.*: 17 mi SW of Snowville, August 27, 1973–August 27, 1975, 2♂ (BYU). 6 mi W of Snowville, June 27, 1969–July 8, 1969, G. F. Knowlton, 4♂ (USU). Mantua, Devil's Gate, July 25, 1969, T. L. Whitworth, 1♂ (USU). S Curlew Valley, June 18, 1969, G. F. Knowlton, 1♂ (USU). *Cache Co.*: Sardine Canyon, August 3, 1935, C. F. Smith, 2♂ (USU). *Emery Co.*: 2.5 mi W of Rt 24 on Goblin Valley Rd, 5500 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 3♂ (AMNH). *Garfield Co.*: Jct Rts 95 & 276, 4900 ft, June 18, 1983, R. T. Schuh and M. D. Schwartz, 4♂ (AMNH). *Grand Co.*: Colorado River Canyon near Fischer Towers, 4000 ft, May 27, 1978, D.

A. and J. T. Polhemus, 9♂ (JTP). *Iron Co.*: Cedar City, June 29, 1965, H. H. Knight, 1♂ (USNM). *Rich Co.*: Logan Canyon, Bear Lake Summit, August 22, 1998, M. D. Schwartz, 8♂, 7♀ (CNC). *San Juan Co.*: Brush Basin Rim Rd., Co. rd. no. 227 0.5 E mp 116, 5700 ft, June 12, 1982, M. D. Schwartz, 3♂ (AMNH). Rim of Moki Canyon near Halls Crossing, 4000 ft, May 28, 1978, D. A. and J. T. Polhemus, 36♂ (JTP). *Sevier Co.*: 11 mi W of Sevier on Rt 4, 2000 m, July 15, 1980, R. T. Schuh and G. M. Stonedahl, *Chrysothamnus* sp. (Asteraceae), 10♂ (AMNH). Richfield, August 24, 1935, G. F. Knowlton, 1♂ (USU). *Summit Co.*: Weber Canyon Road, 4.5 mi E of Oakley, August 19, 1986, G. M. Stonedahl, 3♂ (AMNH). *Unknown Co.*: Knab Creek, May 23, 1956, G. F. Knowlton, 1♂ (USNM). *Utah Co.*: American Fork, June 22, 1891, 1♀ (USNM). *Washington Co.*: 2 mi NW of Toquerville on Rt 17, 3800 ft, May 25, 1981, M. D. Schwartz, 15♂ (AMNH). Hurricane, May 18, 1960, B. P. Bliven, 1♂ (CAS). St. George, 2800 ft, June 30, 1965, H. H. Knight, 1♂, 1♀ (CNC). St. George, June 30, 1965, H. H. Knight, 5♂, 5♀ (USNM). *Washinton Co.*: Leeds Canyon, June 14, 1978, Hanson, Knowlton, 1♂ (USU). Snow Canyon State Park, T41S, R16W, May 22, 1981–May 23, 1981, M. D. Schwartz, 18♂ (AMNH). **Wyoming**: *Carbon Co.*: Saratoga, July 29, 1931, H. H. Knight, 1♂ (CNC).

### *Europiella pintoi*, new species

Figures 2, 4

**DIAGNOSIS:** Similar in size and general appearance to *E. artemisiae* and to darker specimens of *E. angulata* and *E. consors*; distinguished from *E. artemisiae* by the shorter second antennal segment in the males, and from all three species by the more shaggy appearance of the vestiture of the dorsum. Also possibly confused with large, dark-colored specimens of *E. decolor*, but *E. decolor* always small and pale in areas where the distributions of the two species overlapping. Male genitalia distinctive, with apical spines flattened and of moderate and nearly equal length (fig. 4). Sexual dimorphism weak in comparison to most other *Europiella* spp., males slightly more elongate than females and with corial margin not so strongly convex.

**DESCRIPTION:** *Male:* Moderate-sized, relatively broad-bodied species, total length 3.37–3.55, width pronotum 1.05–1.11. **COLORATION** (fig. 2): Dorsum appearing mottled, head, pronotum, and scutellum gener-

ally dark, dull, base of corium, much of clavus, and base of cuneus pale. Antennae generally dark, although not black. Venter moderately infuscate. Femora pale to dirty colored with some darker spots, tibiae pale with distinct, although small, dark spots at bases of spines. SURFACE AND VESTITURE: Surface as in generic description; vestiture of dorsum noticeably shaggy, with numerous elongate, suberect common setae intermixed with weakly woolly, silvery setae. STRUCTURE: Elongate, corial margin weakly convex. GENITALIA (fig. 4): Pygophore moderately large relative to total size of abdomen; apical vesical spines moderately elongate, of nearly equal length, relatively broad.

*Female*: Coloration similar to male; body form stouter, somewhat more strongly ovoid. Total length 2.75–3.00, width pronotum 0.92–1.11.

ETYMOLOGY: Named for John D. Pinto, in recognition of his many contributions to our knowledge of the Miridae of the American Southwest through extensive fieldwork and host documentation.

HOST: *Artemisia californica*, “California sage brush” (Asteraceae).

DISTRIBUTION: Known only from a limited area of southern California.

DISCUSSION: This species has been taken at only four localities in southern California, and along with *E. morrisoni*, is the least well known of all Nearctic *Europiella* spp. This, after extensive springtime collecting on appropriate hosts, by John Pinto, myself, and others.

SPECIMENS EXAMINED: Holotype: ♂, CAL. Riverside Co., Menifee Vly (hills on W end), 33°33'N 117°13'W, 1800' el., IV-10-1979, John D. Pinto, *Artemisia californica* (Asteraceae); deposited in the American Museum of Natural History. Paratypes: USA: **California**: *Riverside Co.*: 2 mi N of Perris, E. I. Schlinger, 1 ♀ (UCD). Quail Valley, Coastal Sage Scrub Community, March 10, 1974, J. D. Pinto, 1 ♀ (UCR). *San Bernardino Co.*: 4 mi E of Mentone, 750 m, May 11, 1978, J. D. Pinto, 5 ♀ (UCR, AMNH). *San Diego Co.*: Mission Dam, March 16, 1929, C. C. Searl (Asteraceae), 2♂, 4♀ (SDNM, AMNH).

*Europiella signicornis* Knight  
Figures 2, 5

*Europiella signicornis* Knight, 1969: 84 (n. sp., descr., host).

DIAGNOSIS: Recognized by the generally pale body coloration and entirely pale antennae (fig. 2), a combination of attributes otherwise found together only in *E. pilosula*. Sexual dimorphism weak. Separated from *E. pilosula* by the more ovoid body form in the males in the present species and structure of the vesica, with two, short, acuminate spines of unequal length (fig. 5).

REDESCRIPTION: *Male*: Relatively small ovoid species, total length 2.73–2.91, width pronotum. 0.91–0.98. COLORATION (fig. 2): Dorsum, including membrane, white; all antennal segments pale; labium pale on basal three-fourths, segment 4 black; all legs pale, femora with some black spots, tibial spines black with tiny black bases; entire venter pale. SURFACE AND VESTITURE: Surface and vestiture as in generic description. STRUCTURE: Body form elongate ovoid. GENITALIA (fig. 5): Pygophore only moderately large relative to total size of abdomen; vesica with short, acuminate, apical spines, the anterior spine longer than the posterior, the posterior spine barely surpassing distal margin of gonopore.

*Female*: Body form and coloration similar to male. Total length 2.56, width pronotum 0.95.

HOST: Breeds on *Artemisia* sp. (Asteraceae).

DISTRIBUTION: Known only from the south rim of the Grand Canyon.

DISCUSSION: Based on available collections, *E. signicornis* has one of the most restricted distributions of any known *Europiella* sp. There seems to be little question about its status as distinctive, however, as the male genitalia are unlike those found in any other North American *Europiella* sp.

SPECIMENS EXAMINED: Holotype: ♀, *Europiella signicornis* Knight: ♀, Grand Canyon, Alt. 7000, Ariz., July 22, 1925, A. A. Nichol (USNM). Additional specimens: USA: **Arizona**: *Coconino Co.*: Grand Canyon, 7000 ft, June 22, 1925, A. A. Nichol, 4♂, 1♀ (USNM). Grand Canyon, south Rim, June 27, 1930, R. L. Usinger, *Artemisia* sp. (Asteraceae), 1♂ (UCB). Rt 64 just SE of Grand Canyon Natl. Park in Kaibab National Forest, June 26, 1980, K. and R. Schmidt, *Artemisia* sp. (Asteraceae), 19♂ (AMNH).

*Europiella stigmosa* Uhler  
Figures 2, 5, 11

*Agalliaestes stigmus* Uhler, 1893: 379 (n. sp., descr.).

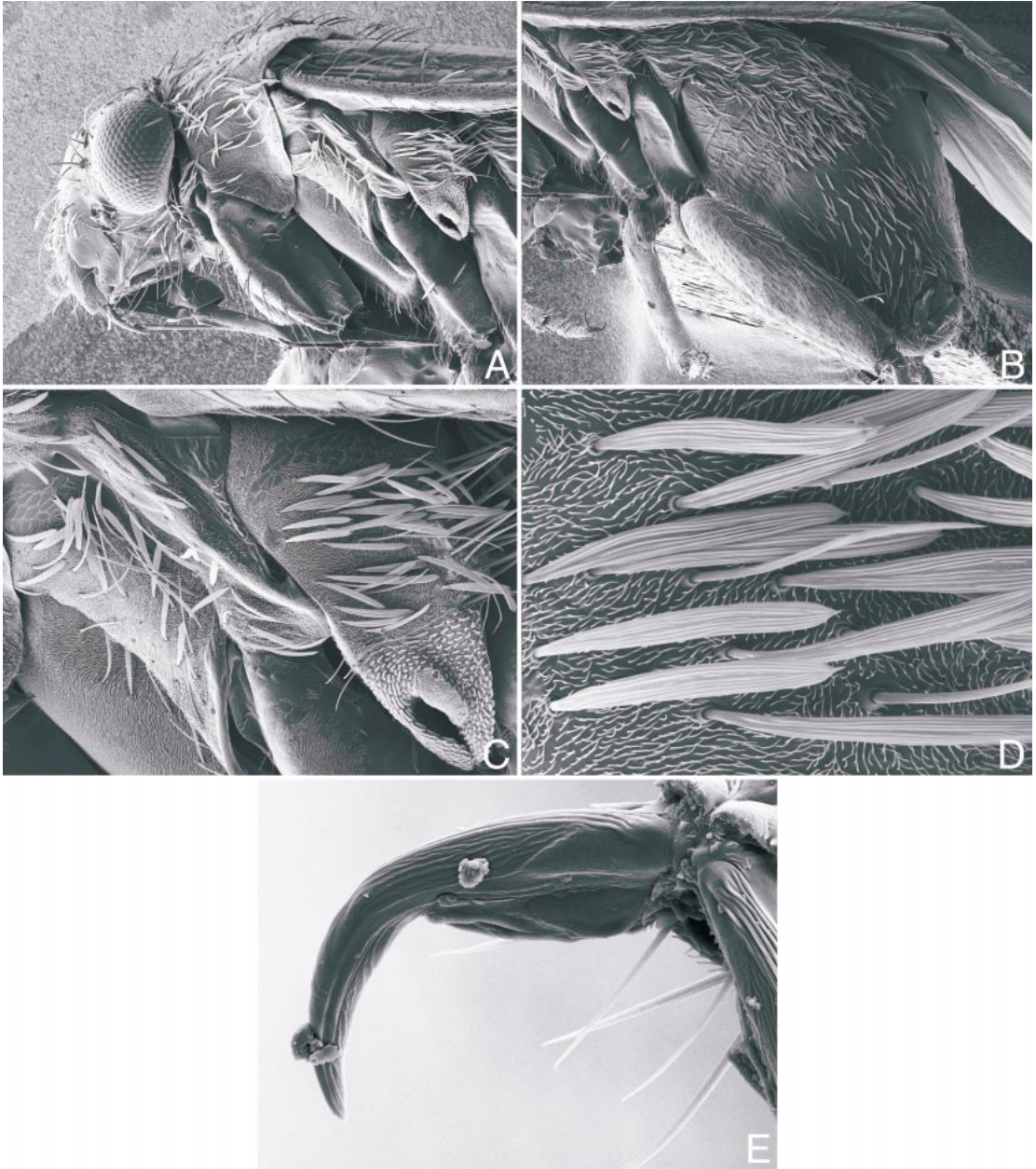


Fig. 11. Scanning electron micrographs of *Europiella stigmosa* (♂) **A.** Head and thorax, lateral view. **B.** Lateral view of thorax and abdomen. **C.** Mesothoracic spiracle and metepisternal scent-efferent system, lateral view. **D.** Setae on hemelytra, detail of microstructure. **E.** Pretarsus, frontal view.

**DIAGNOSIS:** Recognized by the relatively small size, elongate oval body shape, mottled coloration of the dorsum (fig. 2), generally pale femora with a relatively large number of dark spots, and the vesica with a long,

flattened, decurved, anterior apical spine and shorter, flattened posterior spine (fig. 5), a condition shared with *E. umbrina* and *E. consors*. Distinguished from *E. umbrina* by its lighter coloration and from *E. consors* by

its much smaller size and more ovate body form in the males; distinguished from both species by the pale antennae in *E. stigmosa*. Sexual dimorphism in *E. stigmosa* (and *E. umbrina*) is weak, the body form in the females being nearly the same as that in the males.

**REDESCRIPTION:** *Male:* Small, relatively broad-bodied species, total length 2.78–3.06, width pronotum 0.96–1.12. **COLORATION** (fig. 2): General coloration somewhat mottled, dorsum generally pale with brown-to-black blotches; antennal segment 1 black, sometimes black only basally, segment 2 at most darkened at extreme base, segments 3 and 4 varying from pale to very dark; labium pale basally, segments 3 and 4 black; much of venter dark; coxae partially pale; trochanters pale; femora pale or weakly darkened and ornamented with numerous dark spots or blotches; tibiae with pale background coloration with black spines with black bases. **SURFACE AND VESTITURE** (fig. 11D): Surface and vestiture as in generic diagnosis. **STRUCTURE** (fig. 11): Elongate ovoid, corial margin moderately convex. **GENITALIA** (fig. 5): Pygophore moderately large relative to total size of abdomen; vesica similar in structure of apical spines to *E. umbrina* and *E. consors*, anterior spine long and decurved, posterior spine shorter and nearly erect.

*Female:* Coloration often paler than in males, with dorsum sometimes almost entire pale. Body form very similar to male. Total length 2.65–2.91, width pronotum 1.02–1.09.

**HOSTS:** Known to breed on *Artemisia californica*, *A. ludoviciana*, and *A. tridentata* (Asteraceae). The record from *Lupinus* is certainly a sitting record.

**DISTRIBUTION:** Widely distributed in western North America, except for wetter coastal areas, ranging from British Columbia south to northern Baja California and east to Nebraska and Oklahoma.

**DISCUSSION:** Schuh et al. (1995) documented the identity of *E. stigmosa*.

**SPECIMENS EXAMINED:** MEXICO: **Baja California Norte:** 3.5 km W of Parque Sierra San Pedro Martir, 1875 m, April 25, 1985, R. T. Schuh and B. M. Massie, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). Tecate, 3.4 mi S of El Condor, May 15, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 5♂ (AMNH). USA: **Arizona:** Co-

*conino Co.:* Grand Canyon, south Rim, July 29, 1980, R. L. Usinger, *Artemisia* sp. (Asteraceae), 1♂ (UCB). Near Grand Canyon, 8000 ft, June 16, 1935, 4♂ (USNM). Rt 64 just SE of Grand Canyon Natl. Park in Kaibab National Forest, June 26, 1980, K. and R. Schmidt, *Artemisia* sp. (Asteraceae), 1♂ (AMNH). *Pinal Co.:* Casa Grande Natl. Monument, March 22, 1932, 1♂ (USNM). **California:** *Alpine Co.:* Ebbetts Pass, Pacific Crest N.S. Tr., Toiyabe N.F., Rt 4, 8000 ft, July 5, 1994, M. D. Schwartz, *Artemisia* sp. (Asteraceae), 1♂ (CNC). Ebbetts Pass, Pacific Crest N.S. Tr., Toiyabe N.F., Rt 4, May 7, 1994, M. D. Schwartz, 1♂ (AMNH). *Inyo Co.:* Big Pine, June 17, 1929, E. P. Van Duzee, 1♂ (CAS). Lone Pine, May 21, 1937, 1♂ (UCB). Silver Canyon, White Mts., May 10, 1926, 1♂ (CAS). *Lassen Co.:* Doyle State Wildlife Preserve, June 20, 1974, Oman, 3♂ (OSU). *Los Angeles Co.:* Claremont, C. F. Baker, 1♂ (HELSINKI). *Modoc Co.:* 2.5 mi S of Rt 139 towards Lookout, 1440 m, July 6, 1979, R. T. and Joe Schuh, *Lupinus* sp. (Fabaceae), 3♂ (AMNH). 24.7 mi NW of Canby, 1375 m, July 1, 1979, R. T. Schuh and B. M. Massie, 5♂ (AMNH). Ca. 4 mi E of Cedarville, 1440 m, July 2, 1979, R. T. Schuh and B. M. Massie, 1♂ (AMNH). *Mono Co.:* 10 mi N of Bridgeport, Schwauger Creek, 8500 ft, August 24, 1972, J. D. Iattin, 1♂ (OSU). Mammoth Camp, W. D. Pierce, 3♂ (LACM). Mono Lake, N edge at Rt 395, 2188 m, July 11, 1980, R. T. Schuh and G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). Mono Lake, Tioga Lodge, June 22, 1929, R. L. Usinger, 1♂ (USNM). Tioga Lodge, Mono Lake, June 22, 1929, R. L. Usinger, 12♂ (CAS, CNC). Tom's Place, September 6, 1966, 1♂ (UCB). *Orange Co.:* Anaheim, March 2, 1971, E. R. Paddock, 3♂ (CAFA). Cleveland National Forest, El Cariso Campground on Hwy 74, 750 m, May 12, 1978, J. D. Pinto, *Artemisia* sp. (Asteraceae), 17♂ (AMNH). *Riverside Co.:* 4 mi E of Elsinore, Red Rock Canyon, April 17, 1965, D. Veirs, 2♂ (UCB). Herkey Creek, San Jacinto Mts., June 4, 1940, 2♂ (CAS, UCB). Hwy 74, Cleveland National Forest E of El Cariso Station, 2500 ft, May 12, 1978, J.D. Pinto and R. T. Schuh, *Artemisia* sp. (Asteraceae), 20♂ (AMNH, UCR). Quail Valley, March 2, 1974–April 18, 1975, C. Linn, 1♂ (UCR). Riverside, March 11, 1947, M. M. Johnson, 1♂ (UCR). Riverside, March 29, 1971, E. R. Paddock, *Artemisia californica* (Asteraceae), 19♂ (CAFA). *San Diego Co.:* 8.2 mi E of Dulzura on Rt 94 at mp 36.50, May 15, 1982, M. D. Schwartz, *Artemisia californica* (Asteraceae), 2♂ (AMNH). beyond Jacumba, June 11, 1915, H. Morrison, *Artemisia* sp. (Asteraceae), 1♂ (USNM). Ramona, April 18, 1938, E. P. Van Duzee, 1♂ (CAS). San Diego, April 8, 1974, C.



Linn, 1♂ (UCR). *Santa Barbara Co.*: Upper Oso Campground off Rt 154, 310 m, May 7, 1985, R. T. Schuh and B. M. Massie, *Artemisia californica* (Asteraceae), 11♂ (AMNH). *Siskiyou Co.*: Bray, June 30, 1935, R. H. Beamer, 7♂ (KU). Lava Beds Natl. Mon. Near Headquarters, 1560 m, June 26, 1979, R. T. and Joe Schuh, 2♂ (AMNH). *Tulare Co.*: 21 mi W of Rt 395 toward Kennedy Meadows, 1875 m, July 1, 1980, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). **Colorado**: *Costilla Co.*: Fort Garland, August 10, 1925, H. H. Knight, 1♂ (USNM). *Jackson Co.*: Walden, August 20, 1931, R. Beamer, 1♂ (KU). *Montezuma Co.*: Dolores, August 15, 1925, C. J. Drake, 1♂ (USNM). **Idaho**: *Ada Co.*: near Kuna, June 22, 1982, T. J. Henry, 5♂, 4♀ (USNM). *Boise Co.*: 13 mi SW of Idaho City, June 27, 1975, Knowlton, Hanson, 1♂ (USU). **Nebraska**: *Dodge Co.*: Fremont, August 28, 1925, H. H. Knight, 1♂ (USNM). **Nevada**: *Carson City Co.*: Carson City, 6000 ft, July 11, 1965, H. H. Knight, 1♂ (USNM). Carson City, June 25, 1929–July 10, 1934, R. L. Usinger, E. P. Van Duzee, 2♂ (CAS). *Elko Co.*: 30 mi SE of I-80 on Hwy 229, 6260 ft, July 19, 1980, G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 1♂ (AMNH). 30 mi W of Elko on Rt 80, June 18, 1982, T. J. Henry, *Artemisia* sp. (Asteraceae), 8♂, 7♀ (USNM). *Esmeralda Co.*: 13 mi W of Lida on Rt 3, 1938 m, July 12, 1980, R. T. Schuh, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). *Eureka Co.*: 12 mi N of Rt 50 on Rt 278, 5800 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 9♂ (AMNH). 25 mi W of Eureka on Rt 50, 6000 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia* sp. (Asteraceae), 2♂ (AMNH). *Lander Co.*: 1.5 mi S of Rt 50 on Rt 376, 6000 ft, June 28, 1983, Schuh, Schwartz, *Artemisia tridentata* (Asteraceae), 8♂ (AMNH). *Lyon Co.*: N. boundary Toiyabe N.F. on Rt 22, July 11, 1980, R. T. Schuh, 1♂ (AMNH). *Mineral Co.*: 27 mi SW of Hawthorne on Rt 359 (1 mi NE of Anchorite Summit), 7400 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 9♂ (AMNH). *Nye Co.*: Atomic Test Site, 2 mi W of Tippapah Hwy on Mine Mt. Road, 4400 ft, June 7, 1983, Schuh, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). Mercury, 401 M, June 22, 1965, H. H. Knight and J. Merino, 4♂ (CNC). Mercury, June 23, 1965, H. H. Knight and J. Merino, 15♂, 15♀ (USNM). *Ormsby Co.*: No specific locality, July 1, 1900, Baker, 5♂ (CAS, HEL-SINKI). No specific locality, July 1, 1900, C. F. Baker, 1♂ (USNM). No specific locality, July 1, 1900, C. F. Baker, 4♂ (AMNH, UCB). *Washoe Co.*: 7 mi W of Vya toward Cedarville, 1800 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Artemisia* sp. (Asteraceae), 16♂ (AMNH). Reno, June 27, 1927, E. P. Van Duzee, 2♂ (CAS). **Oklahoma**: *Tillman Co.*: No specific locality, March 1, 1941, 2♂ (USNM). **Oregon**: *Crook Co.*: Ochoco National Forest, July 29, 1967, Paul Oman, 1♂ (OSU). *Deschutes Co.*: 12 mi SE of Bend, July 19, 1957, G. Kraft, *Artemisia tridentata* (Asteraceae), 3♂ (OSU). 8 mi SE of Brothers, July 9, 1968, Oman, 2♂ (OSU). Bend, July 2, 1935, R. H. Beamer, 1♂ (KU). *Grant Co.*: Seneca, July 24, 1935, Joe Schuh, 4♂ (AMNH). *Klamath Co.*: 10 mi SE of Chiloquin, July 4, 1982, G. M. Stonedahl and T. J. Henry, *Artemisia tridentata* (Asteraceae), 13♂ (AMNH). 13 mi W of Keno on Rt 66, 4600 ft, June 27, 1979, M. D. Schwartz, 1♂ (AMNH). 5–15 mi SE of Chiloquin, July 4, 1982, T. J. Henry and G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 4♂, 8♀ (USNM). 6 mi SE of Keno, 4100 ft, June 27, 1979, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 7♂ (AMNH). 8 mi SE of Dairy, Lost River, August 4, 1966, Gagne, Haddock, 1♂ (UCB). Between Worden and Keno, 1280 m, June 27, 1979, R. T. and Joe Schuh, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). Klamath Falls, July 5, 1953, J. Schuh, 1♂ (OSU). Lower Klamath Lake Hill, July 19, 1953, Joe Schuh, 2♂ (OSU). *Lake Co.*: 11 mi NW of Silver Lake on Hwy 31, 4500 ft, June 25, 1979, G. Stonedahl, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). **Utah**: *Cache Co.*: Logan Canyon, August 28, 1939, Harmston, 1♂ (USU). Logan Canyon, July 30, 1940, D. G. Hall, 2♂ (USNM). *Iron Co.*: 7 mi S of Beryl Junction, June 15, 1967, *Artemisia tridentata* (Asteraceae), 1♂ (USNM). *Kane Co.*: Kanab Creek, May 23, 1956, G. F. Knowlton, 6♂ (USNM). *Millard Co.*: Scipio, June 19, 1965, H. H. Knight, 20♂, 20♀ (USNM). *Salt Lake City Co.*: Salt Lake City, June 16, 1898, 2♂ (USNM). *Salt Lake Co.*: Mouth of Little Cottonwood Canyon on Rt 210, 5800 ft, June 28, 1981, M. D. Schwartz, *Artemisia ludoviciana* (Asteraceae), 1♂ (AMNH). *San Juan Co.*: 19 mi N of Mexican Hat on Rt 261, 6500 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). 27 mi E of Blanding at mp 101 on Rt 95 near Mule Tower Ruins, 6500 ft, June 12, 1982, M. D. Schwartz, *Artemisia ludoviciana* (Asteraceae), 2♂ (AMNH). 3 mi W of Clay Hills Crossing, 5600 ft, June 18, 1983, R. T. Schuh and M. D. Schwartz, 33♂ (AMNH). Abajo Mts., 0.2 mi SE Devils Canyon Cmpgd, 6900 ft, June 12, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). Buffdale, June 13, 1935, Knowlton, 1♂ (USU). White Canyon, Duckett Crossing, May 29, 1985, J. T. and D. A. Polhemus, *Artemisia tridentata* (Asteraceae), 6♂ (JTP). *Sanpete Co.*: Ephraim Canyon, June 13,

1904, E. Anthon, 1♂ (USU). *Sevier Co.*: 11 mi W of Sevier on Rt 4, 2000 m, July 15, 1980, R. T. Schuh and G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). Salt Gulch, 12 mi N Hwy 24 on Hwy 72, 8060 ft, July 17, 1980, G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 2♂ (AMNH). *Uintah Co.*: 22 mi N of Vernal, August 25, 1966, C. O'Brian, 2♂ (UCB). Bonanza, White River Shale Project, 5000 ft, June 1, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Utah Co.*: American Fork, June 22, 1891, P. R. Uhler Collection, 1♀ (USNM). American Fork, June 28, 1965, H. H. Knight, 10♂, 10♀ (USNM). *Wasatch Co.*: Strawberry, September 10, 1933, E. Anthon, 1♂ (USU). *Washington Co.*: Santa Clara, April 26, 1935, Knowlton, Smith, 2♂ (USU). **Wyoming**: *Lincoln Co.*: Kemmerer, July 23, 1981, G. Bohart, 1♂ (BYU).

### *Europiella umbrina* Reuter

Figures 2, 5

*Europiella umbrina* Reuter, 1909: 85 (n. sp., descr.); Schuh et al. 1995: 389 (n. syn., disc.).  
*Europiella similis* Knight, 1969: 81 (n. sp.; syn. by Schuh et al., 1995: 389).

**DIAGNOSIS:** Recognized by the moderate size, elongate oval body shape, and heavily black coloration of the dorsum except usually for base of cuneus (fig. 2); vesica with a long, decurved, anterior apical spine and shorter posterior spine, a condition shared with *E. stigmosa* and *E. consors*. Distinguished from *E. stigmosa* by its much more extensive black coloration, including the antennae, and from *E. consors* by its much smaller size and more ovate body form in the males. Sexual dimorphism in *E. umbrina* (and *E. stigmosa*) is weak, the body form in the females being nearly the same as that in the males.

**REDESCRIPTION:** *Male:* Moderate-sized, broad-bodied species, total length 2.89–2.96, width pronotum 0.96–1.04. **COLORATION** (fig. 2): General coloration of dorsum black with some white markings, most often at base of cuneus and sometimes at base of corium; antennal segment 1 black, segment 2 entirely black or black on basal one-third with remainder pale, coloration of segments 3 and 4 variable, usually pale; labium mostly black; most of venter black; trochanters pale; femora often heavily darkened but with some pale areas ornamented with dark spots or blotches; tibiae with pale background color-

ation with black spines with black bases. **SURFACE AND VESTITURE:** Surface and vestiture as in generic diagnosis. **STRUCTURE:** Elongate ovoid, corial margin moderately convex. **GENITALIA** (fig. 5): Pygophore moderately large relative to total size of abdomen; vesica similar in structure of apical spines to *E. stigmosa* and *E. consors*, anterior spine long and decurved, posterior spine shorter and weakly decurved.

*Female:* Coloration and structure very similar to that in males. Total length 2.73–2.89, width pronotum 1.02–1.06.

**HOSTS:** Recorded from *Artemisia* spp., including *A. californica*, *A. filifolia*, *A. nova*, and *A. tridentata* (Asteraceae).

**DISTRIBUTION:** Widely distributed in western North America, primarily in the interior.

**DISCUSSION:** Knight (1968: 43) listed *E. umbrina* as a synonym of *E. stigmosa*, a taxonomic decision reflected in the catalog of Henry and Wheeler (1988). Schuh et al. (1995) treated *E. umbrina* as a valid species on the basis of its distinctive male genitalic structure.

**SPECIMENS EXAMINED:** Holotype: ♂, Claremont, Cal., Baker; deposited in the Helsinki Museum. Holotype of *Europiella similis* Knight: ♂, MERCURY, NEVADA, 19 M, VI-23-1965, H. Knight & J. Merino; deposited in the USNM. Additional specimens: **MEXICO: Baja California Norte:** 4 mi S of El Condor, May 28, 1981, Brown and Faulkner, 1♂ (SDNH). Tecate, 3.4 mi S of El Condor, 4000 ft, May 15, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). **USA: Arizona: Coconino Co.:** Rt 64 just SE of Grand Canyon Natl. Park in Kaibab National Forest, June 25, 1980, K. and R. Schmidt, *Artemisia* sp. (Asteraceae), 29♂ (AMNH). Williams, 7000 ft, June 24, 1925, A. A. Nichol, 1♂ (USNM). **California: Mono Co.:** Benton Hot Springs, June 8, 1966, W. Gagne, 1♂ (UCB). Tom's Place, May 9, 1966, 1♂ (UCB). *Monterey Co.:* Gonzales, February 14, 1977, Oliver, *Artemisia* sp. (Asteraceae), 2♂ (CAFA). Pacific Grove, beach, May 29, 1915, H. Morrison, 1♂ (CNC). *Orange Co.:* 10 mi N of San Juan Capistrano, April 26, 1969, Joe Schuh, 1♂ (AMNH). *Riverside Co.:* 2 mi NE of Moreno, April 15, 1965, J. Doyen, 2♂ (UCB). 4 mi E of Elsinore, Red Rock Canyon, April 13, 1965, C. A. Toschi, 1♂ (UCB). Hemet Reservoir, San Jacinto Mts., May 22, 1940, C. D. Michener, *Artemisia tridentata* (Asteraceae), 1♂ (UCB). Quail Valley, April 18, 1975, J. D. Pinto, 4♂ (UCR). Riverside, March 24, 1971, E. L. Pad-

dock, *Artemisia californica* (Asteraceae), 1♂ (CAFA). *San Bernardino Co.*: 0.5 mi NE of Devore, 3200 ft, June 29, 1971, P. Oman, 1♂ (OSU). Redlands, May 6, 1948, R. A. Flock, *Artemisia californica* (Asteraceae), 1♂ (UCR). *San Diego Co.*: beyond Jacumba, June 11, 1915, H. Morrison (Asteraceae), 1♂ (CNC). Ramona, April 18, 1938, E. P. Van Duzee, 1♂ (CAS). *San Joaquin Co.*: Lone Tree Canyon, April 21, 1971, L. S. Hawkins, 1♂ (CAFA). *Santa Barbara Co.*: Upper Oso Campground off Rt 154, 310 m, May 7, 1985, R. T. Schuh and B. M. Massie, *Artemisia californica* (Asteraceae), 22♂ (AMNH). *Tulare Co.*: 2.6 mi W of county line near Chimney Peak RS, 2000 m, July 1, 1980, R. T. Schuh, 1♂ (AMNH). *Ventura Co.*: N end of Casitas Reservoir, March 15, 1967, J. Powell, 1♂ (UCB). Westlake Village, May 16, 1969, E. L. Paddock, 1♂ (CAFA). **Colorado**: *Eagle Co.*: Water Wheel Ranch near Bond, June 24, 1978, J. T. Polhemus, *Artemisia* sp. (Asteraceae), 8♂ (JTP). **Nevada**: *Elko Co.*: 30 mi W of Elko on Rt 80, June 18, 1982, T. J. Henry, *Artemisia* sp. (Asteraceae), 1♂, 4♀ (USNM). *Eureka Co.*: 12 mi N of Rt 50 on Rt 278, 5800 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 28♂ (AMNH). *Lander Co.*: Smith Creek Valley, 9.5 mi S of Rt 2, T15N, R39E, 6300 ft, June 30, 1983, R. T. Schuh and M. D. Schwartz, 9♂ (AMNH). *Nye Co.*: 11 mi N of Belmont, T10N, R46E sec. 26, 7200 ft, June 29, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia nova* (Asteraceae), 45♂ (AMNH). Mercury, 17 M, June 11, 1965, H. H. Knight and J. Merino, 1♀ (CNC). Mercury, 19 M, June 23, 1965, H. H. Knight and J. Merino, *Artemisia tridentata* (Asteraceae), 4♂ (USNM, CNC). Mercury, 19 M, June 23, 1965, H. H. Knight and J. Merino, *Artemisia tridentata* (Asteraceae), 1♂, 1♀ (CNC). *Washoe Co.*: 7 mi W of Vya toward Cedarville, 1813 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Artemisia tridentata* (Asteraceae), 5♂ (AMNH). **Oregon**: *Deschutes Co.*: 1 mi S of Millican, 4380 ft, June 21, 1979, R. T. Schuh, *Artemisia tridentata* (Asteraceae), 4♂ (AMNH). 3 mi W of Millican, sand dunes, July 6, 1977, J. D. Lattin, (Asteraceae), 3♂ (OSU). **Utah**: *Duchesne Co.*: 23.7 mi S of Myton, Well's Draw, T10S, R15E, 6000 ft, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). *Emery Co.*: 2.5 mi W of Rt 24 on Goblin Valley Road (near pictographs), 5600 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia filifolia* (Asteraceae), 1♂ (AMNH). *Juab Co.*: Fernow Valley, June 24, 1940, R. W. Fautin, 1♂ (USNM). *San Juan Co.*: 19 mi N of Mexican Hat on Rt 261, T41S, R18E, 6500 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 9♂ (AMNH). Brush Ba-

sin Rim Rd., Co. rd. no. 227 0.5 E mp 116, 5700 ft, June 12, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 10♂ (AMNH). *Sevier Co.*: 2.4 mi S of Rt 4 on Kanosh Rd., 2181 m, July 16, 1980, R. T. Schuh and G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). 32 mi N of Hwy 24 and Hwy 72, 7560 ft, July 17, 1980, G. M. Stonedahl, *Artemisia* sp. (Asteraceae), 1♂ (OSU). *Tooele Co.*: 4 mi E of Camel Back Mt., May 24, 1954, P. D. Ashlock, *Artemisia tridentata* (Asteraceae), 1♂ (USNM). *Toole Co.*: Rush Valley, 0.5 mi W of Faust RR Station, June 3, 1987, B. Haws and C. R. Nelson, 3♂ (BYU). *Uintah Co.*: Bonanza, White River Shale Project Trailers, T9S, R24E, sec. 23, 5000 ft, June 1, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 20♂ (AMNH). *Washington Co.*: 12 mi S of Central, June 16, 1967, Daine and Camenzind, 1♂ (USNM).

### *Europiella unipuncta* Knight

Figures 2, 5

*Europiella unipuncta* Knight, 1968: 44 (n. sp., descr., host).

**DIAGNOSIS:** Recognized by the nearly white coloration of the dorsum, the oval body shape, antennal segment 1 black, segment 2 black on at least proximal one-half (fig. 2), the very large pygophore and vesica, and the detailed structure of the vesical spines, the anterior spine short and sickle-shaped, the posterior spine relatively short and weakly curving (fig. 5), a condition shared with *E. angulata*, *E. carvalhoi*, and *E. pilosula*. *Europiella unipuncta* is most similar in general form and coloration to *E. pilosula*, *E. signicornis*, and *E. carvalhoi*, but can be distinguished from the first two by the entirely pale antennae in those species and from the last by the larger pygophore and genitalia in the present species.

**REDESCRIPTION:** *Male:* Moderate-sized, elongate-ovoid species, total length 2.63–3.08, width pronotum 0.85–1.00. **COLORATION** (fig. 2): Dorsum, including membrane pale, white, sometimes partially tinged with green; antennal segment 1 black, segment 2 black at least on proximal half, sometimes entirely black, segments 3 and 4 usually weakly infusate; labium pale on basal three-fourths, segment 4 black; legs pale, femora with some black spots, tibial spines black with black bases; entire venter pale. **SURFACE AND VESTITURE:** Surface and

vestiture as in generic diagnosis. STRUCTURE: Elongate ovoid, corial margin moderately convex. Pygophore very large, occupying well more than half of abdomen. GENITALIA (fig. 5): Pygophore very large relative to total size of abdomen; vesica large, robust, with short apical spines, anterior spine sickle-shaped, posterior spine narrow and weakly decurved.

*Female*: Coloration as in male. Body form more broadly ovoid. Total length 2.49–2.78, width pronotum 0.83–0.99.

HOSTS: Recorded from *Artemisia* spp., including *A. frigida*, *A. ludoviciana*, and most commonly from *A. tridentata* (Asteraceae).

DISTRIBUTION: Distributed in more northerly portions of western North America, ranging from British Columbia to Alberta in the north, south to Colorado, Utah, and Nevada.

SPECIMENS EXAMINED: Holotype: ♂, MERCURY, NEVADA, 12M(W) Aug. 13, 1965, Joe Merino, on *Artemisia tridentata* (USNM). Additional specimens: CANADA: **Alberta**: Elkwater Park, August 13, 1952, L. A. Konotopetz, 8♀ (CNC). **British Columbia**: Chopaka, July 1, 1981, S. G. Cannings, *Artemisia tridentata* (Asteraceae), 2♂ (UBC). USA: **California**: *Lassen Co.*: Doyle State Wildlife Preserve, June 20, 1974, P. Oman, 1♂ (OSU). Madeline, August 24, 1954, B. P. Bliven, 1♂ (CAS). Sage Hen, July 27, 1954, B. P. Bliven, 1♂ (CAS). *Modoc Co.*: 1 mi S of Lava Beds Natl. Mon. on Hill Rd, Modoc National Forest, July 17, 1985, G. M. Stonedahl and J. D. McIver, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). 2.5 mi S of Rt 139 toward Lookout, 1440 m, July 6, 1979, R. T. and Joe Schuh, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). 24.7 mi NW of Canby, 1375 m, July 1, 1979, R. T. Schuh and B. M. Massie, 5♂ (AMNH). *Mono Co.*: Mono Lake, N edge at Rt 395, 2188 m, July 11, 1980, R. T. Schuh, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). *Nevada Co.*: Sagehen Creek Station near Hobart Mills, August 20, 1969, W. Gagne, *Artemisia* sp. (Asteraceae), 13♂ (UCB). Truckee, Tahoe National Forest, August 29, 1967, L. A. Kelton, *Artemisia* sp. (Asteraceae), 4♂, 4♀ (CNC). *San Bernardino Co.*: Big Bear Lake, July 26, 1932, R. H. Beamer, 1♂ (KU). *Siskiyou Co.*: Lava Beds Natl. Mon. Near Headquarters, 1560 m, June 26, 1979, R. T. and Joe Schuh, *Artemisia tridentata* (Asteraceae), 15♂ (AMNH). **Colorado**: *Eagle Co.*: Sloss, August 17, 1929, L. D. Anderson, R. H. Beamer, 2♂ (KU). *Garfield Co.*: W. Evacuation Creek, 11 mi SE Colorado St line on Rt 45, 6800 ft, July 9,

1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Las Animas Co.*: 1 mi E of Stonewall, Fire Dept., 7400 ft, August 18, 1986, R. T. Schuh, *Artemisia frigida* (Asteraceae), 1♂ (AMNH). **Idaho**: *Bonneville Co.*: Pine Creek Pass, August 6, 1972, L. A. Kelton, 2♂ (CNC). *Oneida Co.*: 5 mi NW of Holbrook, July 6, 1972, W. J. Hansen, 1♂ (USU). Holbrook, June 27, 1969, G. F. Knowlton, 1♂ (USU). **Montana**: *Deer Lodge Co.*: Silver Lake, 14 mi W of Anaconda on Rt 10A, 6400 ft, August 9, 1986, Schuh, Schwartz, Stonedahl, *Artemisia ludoviciana* (Asteraceae), 6♂ (AMNH). *Gallatin Co.*: 29 mi S of Bozeman Hot Springs on Rt 191, 5800 ft, August 10, 1986, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 10♂ (AMNH). *Madison Co.*: 15 mi SE of Virginia City, July 12, 1982, S. E. Cummings, 1♂ (UNHAMP). **Nevada**: *Elko Co.*: 30 mi SE of I-80 on Hwy 229, 6260 ft, July 19, 1980, G. M. Stonedahl, *Purshia tridentata* (Rosaceae), 2♂ (AMNH). Ruby Mts., Lomoille Canyon, 6200 ft, June 16, 1983, R. T. Schuh, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Eureka Co.*: 12 mi N of Rt 50 on Rt 278, 5800 ft, June 27, 1983, R. T. Schuh, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). *Lander Co.*: 1.5 mi S of Rt 50 on Rt 376, T18E, R45E, 6000 ft, June 28, 1983, Schuh and Schwartz, *Artemisia tridentata* (Asteraceae), 29♂ (AMNH). Smith Creek Valley, 9.5 mi S of Rt 2, T15N, R39E, 6300 ft, June 30, 1983, R. T. Schuh, M. D. Schwartz, 4♂ (AMNH). *Nye Co.*: 3.5 mi SE of Manhattan, Toiyabe National Forest, 2188 m, July 13, 1980, R. T. Schuh, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 2♂ (AMNH). Mercury, August 13, 1965, J. Merino, *Artemisia tridentata* (Asteraceae), 1♂, 2♀ (USNM). *Washoe Co.*: 7 mi W of Vya, toward Cedarville, 1800 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *White Pine Co.*: Wheeler Peak Road, Humboldt National Forest, 7000–10,000 ft, August 6, 1982, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). **Oregon**: *Crook Co.*: Mitchell, June 22, 1979, G. Stonedahl, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Deschutes Co.*: 0.5 mi S of Millican, June 29, 1978, Lattin, *Artemisia tridentata* (Asteraceae), 1♂ (OSU). 12 mi SE of Bend, July 19, 1957, Gerald F. Kraft, *Artemisia tridentata* (Asteraceae), 6♂ (OSU). 3 mi W of Millican, sand dunes, July 6, 1977, Lattin (Asteraceae), 2♂ (OSU). 8 mi SE of Brothers, September 7, 1968, Oman, 1♂ (OSU). *Grant Co.*: 20 mi E of Seneca, August 14, 1971, Oman, 1♂ (OSU). Malheur National Forest, Funny Bug Basin, T17S, R32E, sec. 19, July 23, 1979, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 7♂ (AMNH). *Harney Co.*: 10 mi E of

Frenchglen, July 18, 1961, D. R. Smith (Asteraceae), 1♂ (OSU). 3 mi S of Hdq. Squaw Butte Exp. Sta., July 6, 1977, J. D. Lattin, (Asteraceae), 1♂ (OSU). *Klamath Co.*: 10 mi SE of Chiloquin, July 4, 1982, G. M. Stonedahl and T.J. Henry, *Artemisia tridentata* (Asteraceae), 3♂ (AMNH). 4 mi NW of Worden on road to Keno, July 17, 1985, G. M. Stonedahl and J. D. McIver, *Artemisia tridentata* (Asteraceae), 13♂ (AMNH). 5–6 mi SE of Keno, 4100 ft, June 27, 1979, M. D. Schwartz, G. M. Stonedahl, *Artemisia tridentata* (Asteraceae), 5♂ (AMNH). Between Worden and Keno, 1280 m, June 27, 1979, R. T. and Joe Schuh, *Artemisia tridentata* (Asteraceae), 9♂ (AMNH). *Wallace Co.*: 8 mi E of Joseph, July 10, 1969, Oman, 1♂ (OSU). *Wallowa Co.*: 2 mi E of Joseph, July 10, 1969, P. W. Oman, 1♂ (OSU). **Utah:** *Rich Co.*: Logan Canyon, Cache National Forest, 6200 ft, August 9, 1972, L. A. Kelton, 1♀ (CNC). *Sevier Co.*: Fish Lake, August 16, 1929, R. H. Beamer, 2♂ (KU). *Uintah Co.*: Bonanza, White River Shale Project, 5000 ft, June 1, 1981–June 8, 1981, M. D. Schwartz, *Artemisia tridentata* (Asteraceae), 9♂ (AMNH). *Utah Co.*: American Fork, June 22, 1891, 1♂, 3♀ (USNM). *Wasatch Co.*: 30 mi SE of Kamas on Rt 35, Wolf Creek Campground, Uintah National Forest, T4S, R10W, sec. 7, 9000 ft, August 15, 1986, Schwartz and Stonedahl, *Artemisia tridentata* (Asteraceae), 1♀ (AMNH). Uintah National Forest, Buckboard Creek at Rt 35, T4S, R9E, sec. 17, 8000 ft, August 15, 1986, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 1♂ (AMNH). *Washington Co.*: St. George, 2800 ft, June 30, 1965, H. H. Knight, 1♂, 1♀ (CNC). St. George, June 20, 1965, H. H. Knight, 3♀ (USNM). **Wyoming:** *Albany Co.*: near Keystone, July 26, 1981, J. T. and D. A. Polhemus, 4♂ (JTP). *Carbon Co.*: Parkside Campground, 11 mi S of Red Lodge, 7250 ft, August 12, 1986, Schwartz and Stonedahl, *Artemisia frigida* (Asteraceae), 8♂ (AMNH). *Fremont Co.*: Wind River Mts., 2.5 mi SW Shoshone NF boundary on Rt 131, August 14, 1986, Schwartz, Stonedahl, *Artemisia tridentata* (Asteraceae), 7♂ (AMNH). *Park Co.*: Shoshone National Forest, August 14, 1927, H. H. Knight, 1♀ (USNM). *Teton Co.*: Grand Teton National Park, August 18, 1931, R. H. Beamer, 1♂ (KU).

### *Knightopiella*, new genus

Type species: *Europiella albibubescens* Knight.

**DIAGNOSIS:** Recognized by the relatively large size, length 3.38–3.64; body very elongate-oval and relatively broad. Coloration weakly greenish, including appendages, with a few diffuse dark markings on femora and

weakly dark bases of tibial spines. Vestiture of dorsum with pale reclining simple setae and recumbent, woolly, silvery, shining setae (figs. 2, 13A–D); head weakly produced and not overlapping anterior margin of pronotum. Sexually dimorphic, females much more strongly ovoid than males and with hemelytra more strongly conforming to shape of body. Most easily confused with pale-colored species on *Europiella* and *Megalopsallus* on the basis of coloration, form of vestiture, and structure of head. Head and vertex both greater in width than in any *Europiella* species. Separated from *Europiella* spp. by its larger size and the form of the male genitalia, *Europiella* spp. always with two apical spines (figs. 2–5), *Knightopiella* with a spinose, cauliflowerlike, membranous apex (fig. 12); separated from *Megalopsallus* spp. also by its larger size and by the much smaller pygophore and more delicate vesica in that group terminating in a single attenuation (see Schuh, 2000).

**DESCRIPTION:** *Male:* Relatively large, very elongate-oval, relatively broad total length 3.38–3.64, width pronotum 1.05–1.17; dorsal surface of body weakly convex. **COLORATION** (fig. 2): Coloration pale greenish, including all appendages and ventral body surface; femora with some diffuse, weakly contrasting dark spots; tibial spines dark with weakly dark bases. Mesoscutum often dark mesially; phallosome heavily sclerotized and intensely dark. **SURFACE AND VESTITURE** (fig. 13A–D): Dorsum smooth, dull, clothed with pale, reclining, simple setae and recumbent, woolly, silvery, shining setae. **STRUCTURE** (fig. 13): Head transverse, frons bulging, clypeus barely visible from above; eyes bulging, nearly spherical as viewed from above, occupying slightly more than half of height of head in lateral view (fig. 13A), showing only weak sexual dimorphism; antennal segment 2 slender, tapering to slightly greater diameter distally, sexual dimorphism very weak; labium reaching to apex of middle coxae; claws nearly straight over most of length, strongly curving near apex, parempodia setiform, pulvilli relatively large, occupying most of length of claw, basal two-thirds of pulvillus adnate to claw (fig. 13 E, F); abdomen flattened, broad, lateral margins of pregenital segments

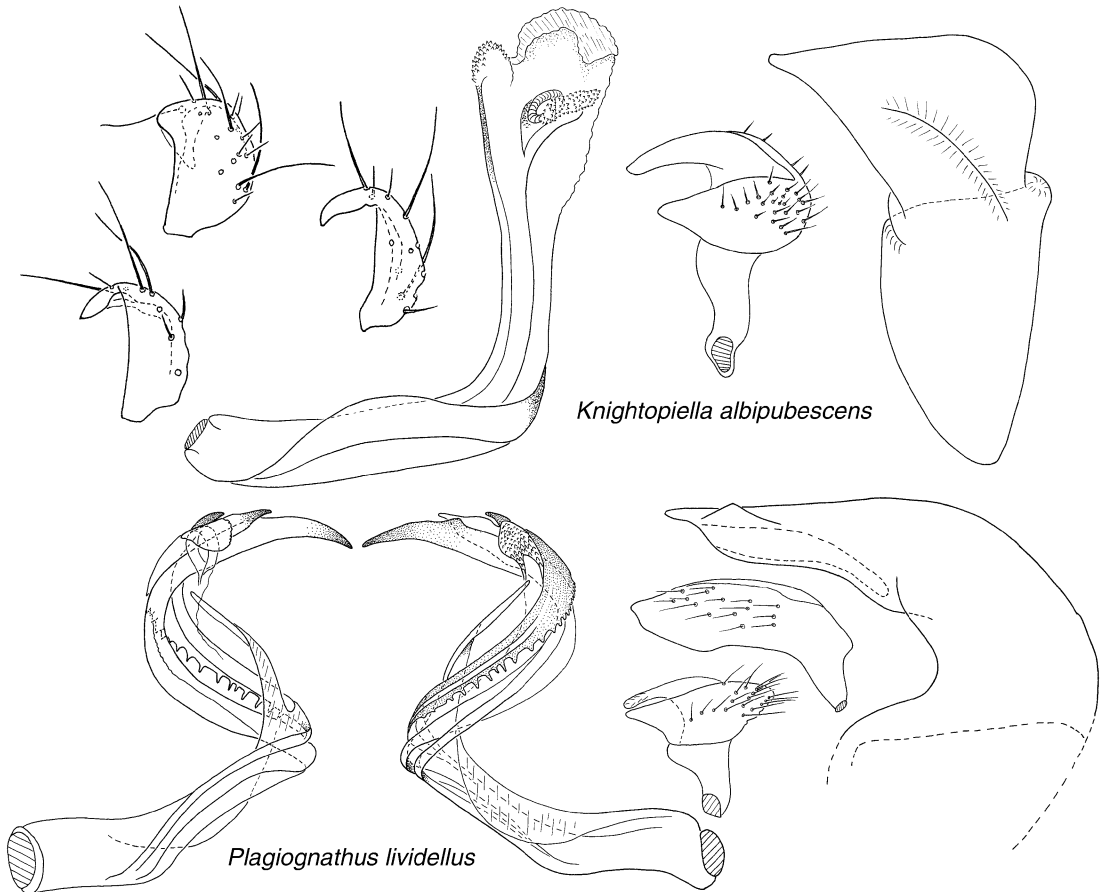


Fig. 12. Male genitalia of *Knightopiella albipubescens* and *Plagiognathus lividellus*.

strongly convexly rounded. **GENITALIA** (fig. 12): Pygophore and genitalia moderately large; vesica formed of two chitinous bands with weakly sclerotized apical ornamentation; secondary gonopore located near apex of vesica, relatively small and only moderately sclerotized; phallosome heavily sclerotized, strongly “hump-backed” on dorsal margin (fig. 13H); left paramere boat-shaped, typical of Phylini; right paramere decurved apically, unlike all species placed in *Europiella* under the diagnosis adopted in the present paper.

**Female:** Elongate ovoid, of more robust appearance than male; total body length 3.31–3.51. Coloration and vestiture as in male.

**ETYMOLOGY:** A combination of Knight and *Europiella*, in recognition of H. H. Knight,

the author of the type species, and its genus of original placement.

**DISCUSSION:** Knight (1968: 46) indicated that his new species *Europiella albipubescens* could be “Distinguished from allied species by having only white pubescent hairs and silvery, sericeous pubescence.” Not only is the exact meaning of this statement unclear to me, but it is made in the absence of a clear characterization of the diagnostic characters for *Europiella*. Comparison of the vestiture of *Knightopiella albipubescens* (figs. 2, 13C) with that of *E. stigmosa* and other *Europiella* spp. (figs. 1, 2, 7, 9–11) indicates that the type of vestiture is rather similar in *Europiella* and *Knightopiella* and does not form a strong basis for unequivocally recognizing *K. albipubescens*. The male genitalia, on the other hand, are absolutely distinctive for the

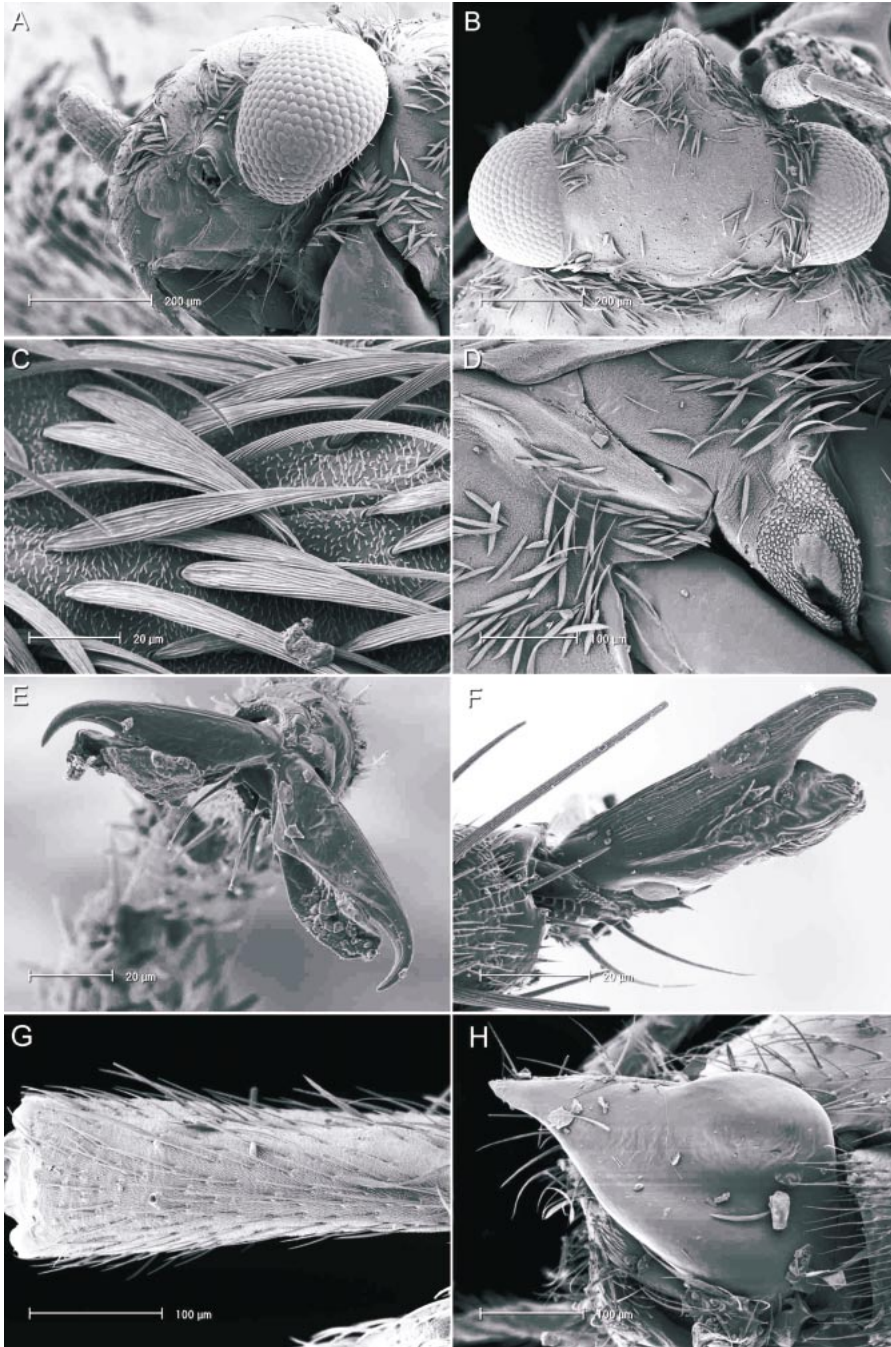


Fig. 13. Scanning electron micrographs of *Knightopiella albipubescens* (♂). **A.** Head, lateral view. **B.** Head, dorsal view. **C.** Setae on hemelytra, detail view. **D.** Mesothoracic spiracle and metepisternal scent-efferent system, lateral view. **E.** Pretarsus, frontal view. **F.** Pretarsus, lateral view. **G.** Hind femura, distal half, dorsal view. **H.** Phallosome, in situ, dorsal view.

taxa and do not ally *K. albipubescens* closely with either *Europiella* or *Megalopsallus*, for both of which Knight included many species under his concept of *Europiella*.

*Knightsiella albipubescens* (Knight),  
new combination  
Figures 2, 12, 13

*Europiella albipubescens* Knight, 1968: 46 (n. sp., host).

*Megalopsallus albipubescens*: Schuh et al., 1995: 389 (n. comb.).

DIAGNOSIS: As for genus.

REDESCRIPTION: As for genus.

Female: As for genus.

HOSTS: *Tetradymia glabrata*, *T. spinosa*, *Chrysothamnus nauseosus* (Asteraceae).

DISTRIBUTION: Widely distributed in the Great Basin. Also known from the Mojave Desert near Rosamond, California.

DISCUSSION: See generic discussion.

SPECIMENS EXAMINED: USA: **California:** *Kern Co.*: 4 mi N of Rosamond, April 23, 1971, Oman, 10♂, 5♀ (OSU). *Mono Co.*: 8 mi W of Nevada state line on Rt 359, 6700 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, *Tetradymia* sp. (Asteraceae), 15♂, 4♀ (AMNH). **Nevada:** *Elko Co.*: Utah state line on Utah Rt 30, 4760 ft, July 25, 1983, R. T. Schuh and M. D. Schwartz, *Tetradymia* sp. (Asteraceae), 12♂, 20♀ (AMNH). *Nye Co.*: Atomic Test Site, 6.8 mi SE of Mercury Hiway on Orange Blossom Rd (A11), 4000 ft, June 8, 1983, Schuh, Schwartz, Stonedahl, *Tetradymia* sp. (Asteraceae), 10♂, 21♀ (AMNH). Atomic Test Site, Mercury Hwy at Angle Rd. (A3), 3800 ft, June 8, 1983, Schuh, Schwartz, Stonedahl, *Tetradymia* sp. (Asteraceae), 16♂, 23♀ (AMNH). Atomic Test Site, Tweezer Rd at Orange Blossom Rd. (A6), 4750 ft, June 8, 1983, Schuh, Schwartz, Stonedahl, *Tetradymia* sp. (Asteraceae), 6♂, 18♀ (AMNH). Mercury, 16 M, June 11, 1965, H. Knight and J. Merino, *Tetradymia spinosa* (Asteraceae), 16♂, 12♀ (USNM). Mercury, 17 M, June 12, 1965, H. Knight and J. Merino, *Chrysothamnus viscidiflorus* (Asteraceae), 16♂, 15♀ (USNM). Mercury, 401 M, June 11, 1965, H. Knight and J. Merino, *Chrysothamnus nauseosus* (Asteraceae), 19♂, 16♀ (USNM, CNC).

*Plagiognathus lividellus* Kerzhner,  
revised combination  
Figure 12

*Plagiognathus lividellus* Kerzhner, 1979: 51 (n. sp.); Kerzhner, 1988: 854, 855 (key, figs., host).

*Europiella lividella* Schuh, Lindskog, and Kerzhner, 1995: 391 (n. comb.).

DISCUSSION: Schuh et al. (1995) transferred *Plagiognathus lividellus* Kerzhner to *Europiella* on the assumption that it possessed the diagnostic characteristics of that genus. I now judge this action to be in error, because the right paramere does not possess the diagnostic features found in all other species of *Europiella* (compare figs. 2–5 and 12). Although some features of the vesica such as the sawtooth edge of the vesica strap (fig. 12) are not typical of what is found in any species placed in *Plagiognathus* by Schuh (2001), this appears to be the most satisfactory generic placement for the moment.

#### ACKNOWLEDGMENTS

Extensive field assistance was provided by Michael Schwartz and Gary Stonedahl on several collecting expeditions in western North America. John Pinto and his family provided valuable field support and hospitality in southern California. John, Irma, and Dan Polhemus provided hospitality and field support in Colorado. Erica Chiao and Hadee Morgan assisted in recording locality data. Steve Thurston prepared the digital habitus illustrations using a Microptics-USA photomicrographic system equipped with an Infinity Photo-Optical K-2 lense system; he also rendered the habitus illustrations of *E. angulata* and *E. consors* and did the digitization and assembly for the male genitalic illustrations. Michael Schwartz checked the identifications and recorded data for many specimens in the Canadian National Collection of Insects, did many genitalic dissections, and prepared the scanning micrographs of *Knightsiella albipubescens*. Christiane Weirauch assisted with genitalic illustrations. T. J. Henry, J. C. Schaffner, M. D. Schwartz, and C. Weirauch commented on the manuscript. Measurements were taken and tables prepared by Christine Johnson. To all of these individuals, and also to my wife, Brenda Massie, for her assistance and companionship in the field over several seasons, I offer my sincere thanks for their contributions to this project.

Fieldwork for this study was supported by NSF grants DEB-8113481 and BSR-



8516635. This project was partially supported by, and represents a contribution to, the NSF Planetary Biodiversity Inventory grant DEB-0316495 to Randall Schuh and Gerasimos Cassis.

The herbarium staff at the New York Botanical Garden identified the hosts for material collected by my co-workers and me. These authoritative determinations add greatly to confidence in our knowledge concerning host relationships within *Europiella*. Particular thanks go to Jackie Kallunki and Eileen Schofield for their prompt and professional service.

Many individuals and institutions provided material for this study, during the course of which I examined approximately 10,000 specimens. Without their assistance, the diversity of the group would be much less well understood. Institutions, names of curators or other responsible individuals, and institutional abbreviations are presented in the following list:

AMNH	American Museum of Natural History, New York	TAMU	Texas A&M University, College Station, Joseph C. Schaffner and Edward C. Riley
BYU	Monte L. Bean Life Sciences Museum, Brigham Young University, Provo, Utah, Charles Riley Nelson	UAZ	University of Arizona, Tucson, the late Floyd Werner
CAFA	California Department of Food and Agriculture, Sacramento, Alan Hardy	UBC	Spencer Entomological Museum, University of British Columbia, Vancouver, Geoffrey G. E. Scudder
CAS	California Academy of Sciences, San Francisco, Paul Arnaud, Jr., Norman Penny, Keve Ribardo	UCB	University of California, Berkeley, John Chemsak
CNC	Canadian National Collection of Insects, Agriculture Canada, Ottawa, Leonard Kelton and Michael Schwartz	UCD	University of California, Davis, the late Robert Schuster
DAR	David A. Rider Collection	UCR	University of California, Riverside, John D. Pinto and Saul Frommer
HELSINKI	Univeristy Zoological Museum, Helsinki, Larry Hulden	UNHP	University of New Hampshire, Durham, Donald Chandler
INHS	Illinois Natural History Survey, Urbana, Kathryn C. McGiffen	USNM	United States National Museum of Natural History, Washington, D.C., Thomas J. Henry and the late Richard C. Froeschner
JTP	John T. Polhemus Collection, Englewood, Colorado	USU	Utah State University, Logan, Wilford Hanson
KU	University of Kansas, Snow Entomological Museum, Lawrence, Alex Slater	WSU	Washington State University, Pullman, Richard Zack
LACM	Natural History Museum of Los Angeles County, Julian P. Donahue		
OSU	Oregon State University, Corvallis, John D. Lattin		
PDA	Pennsylvania Department of Agriculture, Harrisburg, Karl Valley		
SDNM	San Diego Museum of Natural History, David K. Faulkner		

#### REFERENCES

- Becker, A. 1864. Naturhistorische Mitteilungen. Bulletin de la Societe des Nataturistes de Moscou 37: 477–493.
- Bergroth, E. 1898. Ueber einige amerikanische Capsiden. Wiener Entomologische Zeitung 17: 33–35.
- Dahlbom, A.G. 1851. Anteckningar ofver Insekter, som blifvit observerade pa Gottland och i en del af Calmare Lan, under sommaren 1850. Svenska Vetenskaps Akademiens Handlingar 1850: 155–229.
- Henry, T.J., and A.G. Wheeler, Jr. 1988. Family Miridae Hahn 1833 (= Capsidae Burmeister 1835). The plant bugs, pp. 251–507. In T.J. Henry and R.C. Froeschner (editors), Catalog of the Heteroptera, or true bugs, of Canada and the continental United States. Leiden: E.J. Brill. xix + 958 pp.
- Kelton, L.A. 1965. *Chlamydatus* Curtis in North America (Hemiptera: Miridae). Canadian Entomologist 97: 1132–1144.
- Kelton, L.A. 1980. The plant bugs of the prairie provinces of Canada. Heteroptera: Miridae. Part 8. In: The insects and arachnids of Canada. Agriculture Canada Research Branch Publication 1703: 408 pp.
- Kerzhner, I.M. 1978. Heteroptera of Sakhalien and Kurile Islands. Trudy Biologo Pochvenno-go Instituta Dal'nevostochnoe Otdelenie Akademiyi Nauk SSSR, Vladivostok, new ser., 50: 31–57. [In Russian]

- Kerzhner, I.M. 1979. New Heteroptera from the Far East of the USSR. Trudy Zoologicheskogo Instituta Akademii Nauk SSSR 81: 14–65. [In Russian]
- Kerzhner, I.M. 1988. Infraorder Cimicomorpha. 21. Family Miridae (Capsidae). In P.A. Ler (editor), Keys to the identification of insects of the Soviet Far East. Vol. 2. Homoptera and Heteroptera. pp. 778–857. Leningrad, Nauka. [In Russian]
- Kirkaldy, G.W. 1909. Hemiptera: new and old. No.1–2. Canadian Entomologist 41: 30–32, 388–392.
- Knight, H.H. 1923. Guide to the insects of Connecticut. Part IV. The Hemiptera or sucking insects of Connecticut-family Miridae (Capsidae). State of Connecticut Geological and Natural History Survey Bulletin 34: 422–658.
- Knight, H.H. 1964. *Phymatopsallus* new genus, and new species of Phylinae from North America (Hemiptera, Miridae). Iowa State University Journal of Science 39: 127–152.
- Knight, H.H. 1968. Taxonomic review: Miridae of the Nevada test site and the western United States. Brigham Young University Science Bulletin, Biological Series 9: 1–282.
- Knight, H.H. 1969. New species of *Pronotocrepis* Kngt., *Europiella* Reut., and *Hesperocapsus* Kngt., from the western United States (Miridae, Hemiptera). Iowa State University Journal of Science 44: 79–91.
- Knight, H.H. 1970. *Tannerocoris* new genus, and new species of Miridae (Hemiptera) from the western United States. Great Basin Naturalist 30: 227–231.
- Matsumura, S. 1917. Oyo konchu-gaku [Applied entomology]., Tokyo: Keiseisha. [In Japanese]
- Reuter, O.M. 1901. Capsidae rossicae. Ofversigt av Finska Vetenskaps Societetens Forhandlingar B 43: 161–194.
- Reuter, O.M. 1909. Bemerkungen ueber nearktische Capsiden nebst Beschreibung neuer Arten. Acta Societatis Scientiarum Fennicae 36: 1–86 pp.
- Sahlberg, J. 1920. Enumeratio Hemipterorum Heteropterorum Faunae Fennicae. Ed. 2. Bidrag till Kannedom af Finlands natur och folk 79: 1–227 pp.
- Schuh, R.T. 1995. Plant bugs of the world (Insecta: Heteroptera: Miridae). Systematic catalog, distributions, host list, and bibliography. New York: New York Entomological Society. 1329 pp.
- Schuh, R.T. 2000. Revision of the North American plant bug genus *Megalopsallus* Knight, with the description of eight new species from the West (Heteroptera: Miridae: Phylinae). American Museum Novitates 3305: 1–69.
- Schuh, R.T. 2001. Revision of New World *Plagiognathus* Fieber, with comments on the Palearctic fauna and the description of a new genus (Heteroptera: Miridae: Phylinae). Bulletin of the American Museum of Natural History 266: 1–267.
- Schuh, R.T., P. Lindskog, and I.M. Kerzhner. 1995. *Europiella* Reuter (Heteroptera: Miridae): recognition as a Holarctic group, and description of new species, *Europiella carvalhoi*, from North America. Proceedings of the Entomological Society of Washington 97: 379–395.
- Stichel, W. 1934. Illustrierte Bestimmungstabellen der Deutschen Wanzen. Fascicle 10. 275–306. Berlin-Hermsdorf: W. Stichel.
- Stonedahl, G.M. 1990. Revision and cladistic analysis of the Holarctic genus *Atractotomus* Fieber (Heteroptera: Miridae: Phylinae). Bulletin of the American Museum of Natural History 198: 1–88.
- Uhler, P.R. 1893. Summary of the collection of Hemiptera secured by Mr. E.A. Schwarz in Utah. Proceedings of the Entomological Society of Washington 2: 366–385.
- Uhler, P.R. 1895. [Descriptions of new genera and species]. In G.P. Gillette and C.F. Baker, A preliminary list of Hemiptera of Colorado. 53–55. Bulletin of the Colorado Agricultural Experiment Station 31.
- Van Duzee, E.P. 1917a. Report upon a collection of Hemiptera made by Walter M. Giffard in 1916 and 1917, chiefly in California. Proceedings of the California Academy of Sciences (4) 7: 249–318.
- Van Duzee, E.P. 1917b. Catalogue of the Hemiptera of America north of Mexico (excepting the Aphididae, Coccidae, and Aleurodidae). University of California Publications, Technical Bulletin in Entomology 2: XIV + 902 pp.
- Wagner, E. 1949. *Plagiognathus (Poliopterus) litoralis* n. sp. (Hem. Het. Miridae). Verhandlungen des Vereins fur Naturwissenschaftliche Heimatsforschung zu Hamburg 30: 53–58.
- Wagner, E. 1956. *Plagiognathus (Poliopterus) gracilis* nov. spec. (Heteropt. Miridae). Deutsche Entomologische Zeitschrift, N.F. 3: 74–75.

## APPENDIX 1

## LOCALITY DATA FOR SPECIMEN HABITUS FIGURES

**Fig. 1.** *E. angulata*—♂ 1 and ♀ 1: USA: Colorado: Jefferson Co.: Red Rocks Park near Morrison, 5600 ft.; ♂ 2: USA: Utah: Wasatch Co.: Uinta National Forest, Buckboard Creek at Rt 35, 8000 ft.; ♀ 2: USA: Montana: Deer Lodge Co.: 14 mi W of Anaconda on Rt 10A, 6400 ft. *E. artemisiae*—♂ 1 and ♀ 1: USA: Idaho Co.: Lochsa River Valley, E of Wilderness Access Campground (milepost 127), 2400 ft.; ♂ 2: USA: Oregon: Linn Co.: Tombstone Prairie; ♀ 2: USA: Utah: Salt Lake Co. Wasatch Mts., Little Cottonwood Canyon, Snowbird Ski Resort, 10,500 ft. *E. carvalhoi*—♂ and ♀: USA: Wyoming: Big Horn Co.: 27 mi W of Burgess Jct on Rt 14, 7700 ft. *E. consors*—♂ 1 and ♀ 2: USA: Wyoming: Big Horn Co.: 27 mi W of Burgess Jct on Rt 14, 7700 ft.; ♀ 1: USA: Utah: Garfield Co.: 8.5 mi S of Rt 95 on Rt 276, Maidenwater Springs, 5000 ft.; ♂ 2: USA: Wyoming: Carbon Co.: Parkside Campground, 11 mi S of Red Lodge, 7250 ft. *E. decolor*—♂ 1: USA: Illinois: Ogle; Oregon; ♂ 2: USA: Klamath Co.: 4 mi NW of Worden on road to Keno; ♂ 3: USA: California: Siskiyou Co.: 2.5 mi N of Medicine Lake Road; ♂ 4: USA: New Mexico: Otero Co.: 7 mi N of Cloudcroft; ♀ 1: USA: California: Riverside Co.: Wilson Valley

Road, 1 mi N of Hemet; ♀ 2: USA: Colorado: Larimer Co.: Bennett Creek Picnic Ground, Pingree Park Road, 40 mi W of Fort Collins

**Fig. 2.** *E. decolor*—♀ 3: USA: Colorado: Logan Co.: 15 mi N of Sterling; ♀ 4: USA: New Mexico: Otero Co.: 7 mi N of Cloudcroft. *E. latitini*—♂ (holotype): USA: Oregon: Benton Co.: Grass Mt., Summit Prairie; ♀: Oregon: Benton Co.: Mary's Peak, 3500 ft. *E. morrisoni*—♂ (holotype) and ♀: USA: California: San Diego Co.: beyond Jacumba. *E. pilosula*—♂: USA: Colorado: Rio Blanco Co.: 30 mi N of Rifle on Rt 13, 6800 ft.; ♀: USA: Utah: Washington Co.: Snow Canyon State Park, 4000 ft. *E. pintoii*—♂: USA: California: Riverside Co.: Menifee Valley, hills on W end, 1800 ft.; ♀: USA: California: San Bernardino Co.: 4 mi E of Mentone, 2400 ft. *E. signicornis*—♂ and ♀: USA: Arizona: Coconino Co.: Rt 64 just SE of Grand Canyon National Park in Kaibab National Forest. *E. stigmosa*—♂: USA: Oregon: Klamath Co.: 10 mi SE of Chiloquin; ♀: USA: California: Tulare Co.: 21 mi W of Rt 395 towards Kennedy Meadows, 1875 m. *E. umbriana*—♂: USA: Nevada: Lander Co.: Smith Creek Valley, 9.5 mi S of Rt 2, 6300 ft.; ♀: USA: Nevada: Eureka Co.: 12 mi N of Rt 50 on Rt 178, 5800 ft. *E. unipuncta*—♂ and ♀: 1.5 mi S of Rt 50 on Rt 376, 6000 ft.

Recent issues of the *Novitates* may be purchased from the Museum. Lists of back issues of the *Novitates* and *Bulletin* published during the last five years are available at World Wide Web site <http://library.amnh.org>. Or address mail orders to: American Museum of Natural History Library, Central Park West at 79th St., New York, NY 10024. TEL: (212) 769-5545. FAX: (212) 769-5009. E-MAIL: [scipubs@amnh.org](mailto:scipubs@amnh.org)

© This paper meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).