CLASSIFICATION, NATURAL HISTORY, AND EVOLUTION OF THE EPIPHLOEINAE (COLEOPTERA: CLERIDAE). PART II. THE GENERA CHAETOPHLOEUS OPITZ AND PLOCAMOCERA SPINOLA

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CLASSIFICATION, NATURAL HISTORY, AND EVOLUTION OF THE EPIPHLOEINAE (COLEOPTERA: CLERIDAE). PART II. THE GENERA *CHAETOPHLOEUS* OPITZ AND *PLOCAMOCERA* SPINOLA

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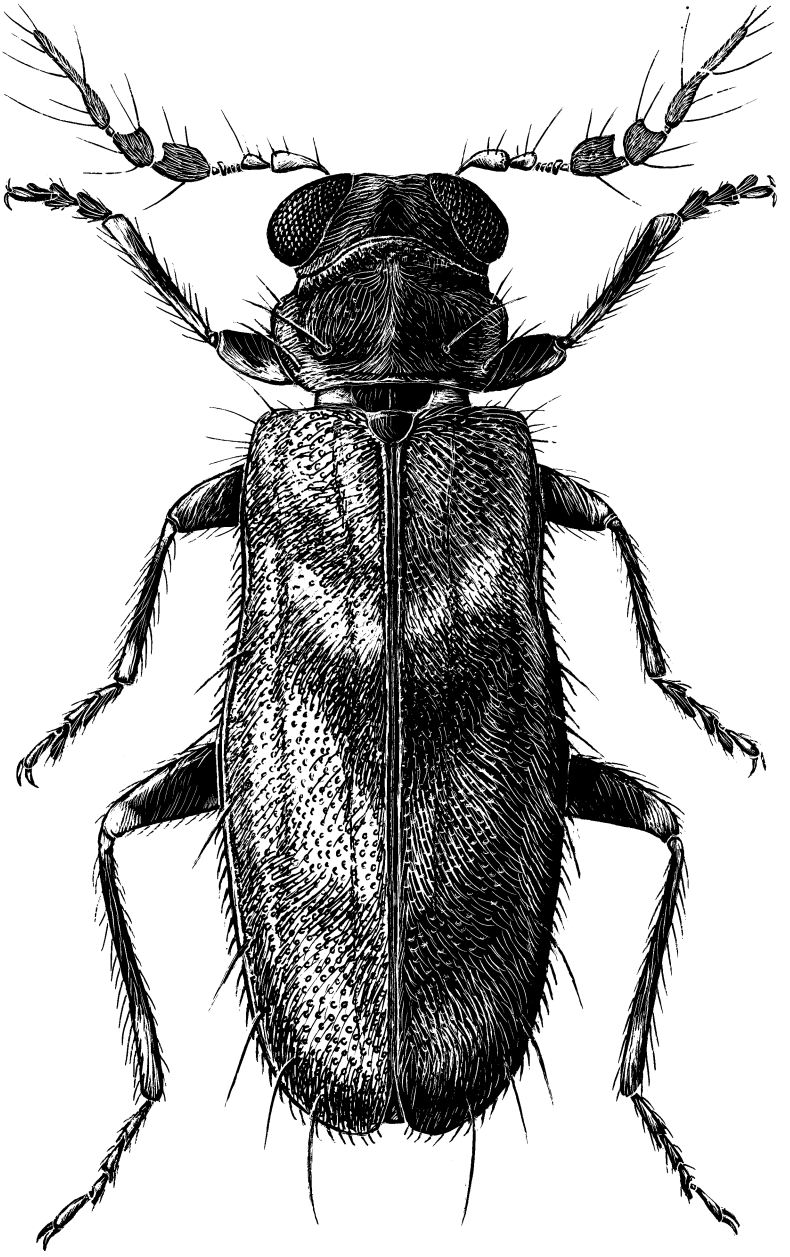


Habitus of *Plocamocera castanea*, n.sp.

CONTENTS

ABSTRACT

This study deals with the sister genera *Chaetophloeus*, new genus and *Plocamocera* Spinola of the checkered beetle subfamily Epiphloeinae. *Chaetophloeus* is monotypic and is described on the basis of *C. hispidus*, new species. *Plocamocera* is revised to include 35 species as follows: *P. castanea*, new species; *P. pupula*, new species; *P. jayhawkalis*, new species; *P. confrater* Kuwert; *P. procera*, new species; *P. aliguantula*, new species; *P. minima*, new species; *P. manausensis*, new species; *P. coactilis*, new species; *P. sericella* Spinola; *P. auratilis*, new species; *P. argentea*, new species; *P. lucis*, new species; *P. sesquipedalis*, new species; *P. salasis*, new species; *P. iota*, new species; *P. prolixa*, new species; *P. quadrula*, new species; *P. baria*, new species; *P. aura*, new species; *P. buenavista*, new species; *P. taruma*, new species; *P. aspera*, new species; *P. paris*, new species; *P. bispina*, new species; *P. onorei*, new species; *P. carnegei*, new species; *P. santa*, new species; *P. sericellopsis*, new species; *P. insula*, new species; *P. ambra*, new species; *P. similis*, new species; *P. bolivari*, new species; and *P. selva*, new species. A neotype is selected for *P. sericella* Spinola. Lectotypes are designated for *P. confrater* Kuwert and *P. byssinus* Erichson (junior synonym of *P. sericella* Spinola). Five new synonymies are recognized, they are *P. confrater* var *similis* Kuwert (junior synonym of *P. confrater* Kuwert), *P. confrater* var. *sericelloides* Kuwert (junior synonym of *P. confrater* Kuwert), *P. impressicollis* Pic (junior synonym of *P. confrater* Kuwert), *Epiphloeus byssinus* Erichson (junior synonym of *P. sericella* Spinola), and *P. latefasciata* Pic (junior synonym of *P. sericella* Spinola).

Plocamocerans are diurnal, but are considerably active at night, highly cryptic on bark, when disturbed conduct flylike escape behavior, and are predators of lignicolous insects. The morphology of integumentary sensilla on the antenna, pronotum, and elytra are described, and SEM photographs of them is provided. Described for the first time are four types of antennal sensilla (one type of sensilla trichodea, two types of sensilla chaetica, and one type of sensilla basiconica), four pronotal trichobothria, and three types of pronotal sensilla trichodea, and on the elytra of *Plocamocera confrater* Kuwert eight trichobothria and two types of sensilla trichodea. It is postulated that filamentous sensilla trichodea on the antenna serve to perceive volatile tree trunk chemicals and/or aggregate pheromones of prey bark beetles. The study includes a review of trichobothrial function and distribution among insects. Morphological analysis is extended to include structure of the internal reproductive organs of some plocamoceran species. Also included are a discourse on species-level discontinuities; discussion of the specimen-study methods; methods for phylogenetic analysis; a treatise of evolutionary relationships based on Hennigian principles implemented in a data base analysis involving Farris's Hennig 86 which produced a computer-based phylogeny involving genera, species groups, and species; a list of specimen repositories (with e-mail addresses); key to species groups and species; table of character-state analysis; four color photographs; 20 SEM photographs; a total of 219 illustrations; 12 distribution maps; and one diagram of phylogeny that depicts a hypothesis of inter-and intrageneric evolutionary relationships. The 35 plocamoceran species are categorized into six species groups whose combined distribution extends from southern Mexico to southern Brazil. The members of the *confrater* and *coactilis* species groups are superficially very similar; their aedeagal structure and shape of antennomeres must be examined in detail for credible identifications at the species level. The sister group relationship between *Chaetophloeus* and *Plocamocera* is supported by the following four synapomorphies, they are pedicel very large, aedeagus lanceolate, male accessory glands reduced to two pairs, and metabasitarsomere one longer than metabasitarsomere two. Profuse distribution of bristlelike setae (chaetosomes) on the dorsum, forebody, and elytral disc and presence of moderately elongated sensilla trichodea on the antenna are autapomorphies for *Chaetophloeus*, whereas filamentous sensilla trichoidea on the antenna, boldly transverse pronotum, very robust metacoxa, very robust metafemora, presence of trichobothria on the epipleural margin, and sex dimorphism of abdominal color are synapomorphic character states that establish the monophyly of *Plocamocera* and define its ancestral basic plan. It is postulated that South America was the ancestral environs of *Chaetophloeus* and *Plocamocera* and that there were three independent northward extensions of major plocamoceran lineages into Central America.

RESUMEN

En esta obra se trata los géneros *Chaetophloeus* y *Plocamocera* de la subfamilia Epiphloeinae, familia Cleridae. El género *Chaetophloeus* se describe a base de una especie, *C. hispidus*, especie nueva. El género *Plocamocera*, Cleridae se revisó, e incluye las 35 especies siguientes: *P. castanea*, especie nueva; *P. pupula*, especie nueva; *P. jayhawkalis*, especie nueva; *P. confrater* Kuwert; *P. procera*, especie nueva; *P. aliguantula*, especie nueva; *P. minima*, especie nueva; *P. manausensis*, especie nueva; *P. coactilis*, especie nueva; *P. sericella* Spinola; *P. auratilis*, especie nueva; *P. lucis*, especie nueva; *P. argentea*, especie nueva; *P. sesquipedalis*, especie nueva; *P. salasis*, especie nueva; *P. iota*, especie nueva; *P. prolixa*, especie nueva; *P. quadrula*, especie nueva; *P. baria*, especie nueva; *P. aura* Opitz, especie nueva; *P. buenavista*, especie nueva; *P. taruma* Opitz, especie nueva; *P. aspera*, especie nueva; *P. paris*, especie nueva; *P. bispina*, especie nueva; *P. onorei*, especie nueva; *P. carnegei*, especie nueva; *P. santa*, especie nueva; *P. sericellopsis*, especie nueva; *P. insula*, especie nueva; *P. ambra*, especie nueva; *P. similis*, especie nueva; *P. bolivari*, especie nueva, y *P. selva*, especie nueva. Un neotipo se designo para *P. sericella* Spinola. Se designaron lectotipos para *P. confrater* Kuwert y *P. byssinus* Erichson (sinónimo junior de *P. sericella* Spinola). Cinco nuevas sinonimias se encontraron: *P confrater* var. *similis* Kuwert (sinonimo junior de *P. confrater* Kuwert), *P. confrater* var. *sericelloides* Kuwert (sinónimo junior de *P. confrater* Kuwert), *P. impressicollis* Pic (sinónimo junior de *P. confrater* Kuwert), y *Epiphloeus byssinus* Erichson sinónimo junior de *P. sericella* Spinola). Se incluye también una lista de los lugares de deposito de los especimen con sus respectivas direcciones electrónicas, una discusión de las discontinuidades genéticas de las especies, datos sobre historia natural, claves y descripciones de los generos, grupos de especies, y de las especies, mapas de distribución, discurso sobre análisis de los caracteres y un diagrama que propone una hipótesis de evolución de las especies.

INTRODUCTION

In a very relevant way, this study began in the laboratory of Ayodyha P. Gupta, Emeritus Professor of Entomology, Rutgers University. His stern, but fair, tutelage as a graduate advisor inspired uncompromising scientific writing and critical thinking in functional morphology. During that time, I met William F. Barr, Gupta's graduate advisor and renowned cleridologist. The setting for a career in Systematic Entomology was complete.

When one commits to a taxon specialization there is an innate impulse to borrow, collect, and borrow some more, then, to investigate live specimens in the field—all meant to gain a thorough perspective of the ''gestalt'' variations of the organisms under study. Lee Herman, of the American Museum of Natural History, and the late Hank Dybas, of the Field Museum of Natural History, were very generous stewards of collections, and with their constant support and encouragement they fueled the fire in an incipient cleridologist. Among their collections I found a few seemingly uninteresting clerids that showed three unusual features. First, the antennae were somewhat plumose; second, the hind femora and hind coxae were particularly robust (fig. 18); and third, the pronotum showed a curious set of discal and paralateral ''hairs'' (long filiform setae set in a spheroid depression) (figs. 7, 9). The filiform hairs, subsequently identified as the trichs of trichobothria and signature autapomorphy (uniquely derived character state) of the Epiphloeinae, I presumed to be sensory organs, whereas I interpreted the stout development of the hind legs as a specialization involving some form of saltation.

Jumping, however, was not in the venue of behavior that I experienced during my early exposure to live clerids. These beetles scurry (*Perilypus*), play dead upon disturbance (*Pelonium*), or abruptly take flight (*Phyllobaenus*), never having a suggestion of jumping despite the moderately thickened femora of some species. Then, in 1981, a sojourn to the Amazonian rain forests of Brazil provided the opportunity to observe and collect a variety of clerids. In a forest clearing (much like the one depicted in fig. 4), aside the Rio Negro, I noted an inordinate quantity of small insects catapulting from a felled hardwood of *Manilkara* sp. At first, I presumed that these insects were flies, but to my astonishment they proved to be plocamocerans, and to my great

delight I realized that, indeed, ''jumping checkered beetles'' do exist.

This is the second of a series of publications intended to more clearly describe and make more accessible the known species of Epiphloeinae, to place the species into a credible arrangement of genera, and to provide hypotheses of evolutionary relationships at the species, genera, and suprageneric levels. The first contribution (Opitz, 1997), a synopsis of the epiphloeine genera, intended to familiarize collectors and curators with the generic entities of the subfamily. With subsequent contributions I hope to generate interest toward collection, fluid preservation, indentification, and field study of additional specimens of epiphloeines and to gradually build up an inventory of evidence toward more complete and heuristic classifications and hypotheses of epiphloeine evolution, as well as of other taxa within Cleridae akin to Epiphloeinae. With few exceptions, there is a great need for larval specimens in our studies of Cleridae systematics.

Inherent in my contributions is the strong desire to promote a most important edict of our profession, that is, it is imperative that systematists present the results of their efforts in such a way that they stimulate and serve the broader community of biologists. In my view, this is done by providing a detailed table of contents, thorough and efficient descriptions of species, user-friendly diagnostic keys, an abundance of relevant illustrations, and refutable syntheses of evolutionary relationships. In this context, the recent work of my colleague Roland Gerstmeier (1998) is an outstanding example. In that work Gerstmeier presents, in a most eloquent manner, the clerid fauna of the Western Palearctic. Ultimately, our goal is to establish logically sound, stable, and heuristic classifications. In my view, such classifications are of greatest value when they are based on substantive estimates of phylogeny. No one has expressed this view of classification more succinctly than did Charles Darwin (1859: 486) when he prophetically wrote, ''Our classifications will come to be, as far as they can be so made, genealogies. . . ''. Moreover, proposals of phylogenies /classifications, particularly at the suprageneric levels, which often involve cumbersome nomenclatural changes, should include ''gestalt'' level analyses and a comprehensive understanding of species-level systematics. The eminent G. H. Horn (1887: 7) implies this very point as he noted, ''Progress in Natural History necessarily starts from a basis of species, and until these are accurately described so that others can arrive at a knowledge of them no great advance is possible''.

Anatomically, chaetophloeans and plocamocerans are very distinctive among epiphloeines. However, at infrageneric levels, plocamocerans are notably homogeneous to an extent that very few variations of character states are suitable for hypotheses of evolution. The lengthy filamentous-like setae on the antenna (fig. 10), boldly transverse pronotum (fig. 7), sexual dimorphism in color of the abdominal venter, and presence of only one pair of male accessory glands are uniquely derived features within the subfamily and establish the hypothesized basic body plan of ancestral *Plocamocera*.

Literature Review

The name *Plocamocera* was formally established by Spinola (1844a). He aligned the genus with *Epiphloeus*, pointing out that *Plocamocera* specimens differed from epiphloeines by the plumose antenna. This unique feature of the genus was also discussed by Lacordaire (1857), Desmarest (1860), Gorham (1882), Schenkling (1903), Gahan (1910), and Opitz (1997). Gorham included the genus in his descriptive paper of 1877 and Kuwert (1893) listed *Plocamocera* in a key to '' Die Epiphloinen Gattungen ''. Corporaal (1950: 255) listed four species and two varieties of the genus in his *Coleopterorum Catalogus.*

Materials and Methods

This study is based on approximately 900 adult specimens, some of which I studied in the field during an expedition to the Amazon Basin in 1981. Specimens were observed during daylight and evening hours, collected, and then preserved in Pampel's fluid (Ekis, 1977: 6) for study of internal organs. Not all species descriptions contain information about internal visceral or internal reproductive structure. Inclusion of such information was based on availability of fluid-preserved specimens. A few specimens were completely disarticulated

to determine the range of anatomical differences among beetles of different species and to establish a foundation of structural variations for future assessments of evolutionary relationships at suprageneric levels.

Techniques of dissection, illustration, and procurement of meristic data were similar to those I described in my work on *Perilypus* (Ekis, 1977: 6). Also, the conventional integumental terminology used herein stems from that paper and from Nichols (1989). Names of antennal and elytral sensilla were adopted from Callahan (1975: 390). In the illustration of the alimentary canal, only two of four cryptonephridial malpighian tubules are drawn. The figures of the female and male internal reproductive organs show only one of two ovaries and one of two testes and accessory glands, respectively. I examined the primary type specimen of all nominal species, except that of *P. sericella*. Spinolas' type is presumed lost; a neotype of *P. sericella* Spinola has been selected during this project.

To some extent, color of the elytral surface and distribution of elytral setae are diagnostic of plocamoceran species. The elytral patterns, however, are sometimes obscured by intraspecific variations and by the varied physical condition of the elytral surface. Therefore, in my drawings of elytral color (see fig. 52), I have selected a specimen that best exemplifies the elytral surface pattern of a species. I have illustrated a left elytron to represent the color pattern of nearly all recognized species. However, the outline, or shape, of these elytra should not be taken to signify the accurate representation of elytral form of the species represented. Further, the abovementioned elytral outlines do not show the full complement of elytral trichobothria. For example, the non-SEM assessment of elytral trichobothria is depicted in figures (see fig. 53), whereas during SEM analysis it was discovered that more, minute trichobothria actually occur. Moreover, it was determined that the level of development of the elytral trichobothria ranges from highly developed (fig. 16) to moderately developed (fig. 17). Only those trichobothria that could be observed with certainty at 750× were illustrated by hand. A definitive assessment of the number of elytral trichobothria for each species will have to be determined with SEM magnifications, as was done for the elytral trichobothria of *P. confrater* Kuwert.

An important component of applied systematic work is to assure the unquestionable indentity of primary types. I have experienced considerable difficulty with type specimens established by some of our pioneer workers in Cleridae. To minimize future problems in this area, my descriptions include the exact sequence of labels associated with each primary type. Also, locality label information of each primary type specimen is duplicated in exact sequence in the descriptions, whereas such information affiliated with secondary types is placed in the following sequence . . . country: state or province: specific locality; dates of specimen collection, natural history data, collector, and repository. In the bibliography, I have appended my current name to my published former name. The name change resulted from an inquiry and discovery of the identity of my biological father, a casualty of WW II.

Assessment of Species-Level Discontinuities

Species status was postulated in accordance with the biological species concept as advocated by Mayr (1969). Conjectures about reproductive isolation are primarily based on indirect evidence of structure and to a lesser extent on the basis of spatial occurrence and presumed extant and/or historical geographical barriers. Differences in male genitalia, body size, shape of antennomeres and pygidia, and elytral pubescence patterns were very helpful in predictions of gene-flow discontinuites, as was, to a lesser extent, the predicted species limits of distribution due to refugial systems (Haffer, 1969; Brown, 1975; Ekis, 1977).

Among species of Cleridae, variations of male, and in some cases female, genitalia are very reliable criteria for supporting notions about reproductive isolation. However, there are several groups within the family in which such variations are minimal, as is the case in *Plocamocera*. Similarly, I found diversity of genital structure wanting in various other clerid groups, such as in the largely Neotropical *Enoclerus*, Paleotropical *Tenerus*, and Australian *Phlogistus* complexes. How-

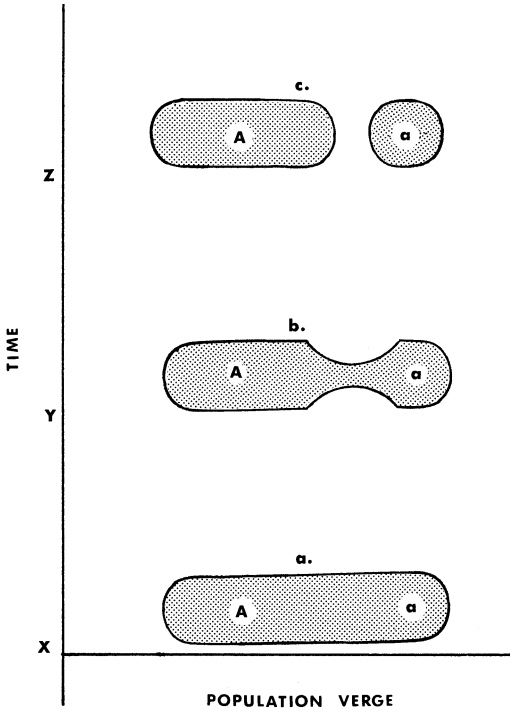


Fig. 1. Speciation event in population Aa involving times X to Z (see Phyllogenetic Methods).

ever, even in these complexes significant genital differences are observable at species group levels, although the differences are minimal. Frequently, such variations appear among assemblages of species whose specimens are strikingly similar externally. It would be a serious oversight not to consider such characteristics in studies of Cleridae systematics, irrespective of categorical level. The nominal species presented in this study represent my best estimate of what comprise the biological species within *Plocamocera*.

Phylogenetic Methods

The phylogenetic relationships proposed in this and subsequent revisions are based primarily on principles pioneered by Willi Hennig (1965, 1966). The dataset selected for predicting evolutionary relationships was analyzed with Farris's computer package, Hennig86 version 1.5 (Farris, 1988). The application of Hennig's principles involves two inherent assumptions. First, we assume that new species evolve when a population diverges genetically into two populations that are no longer mixing genes. This is not an unreasonable assumption, as the gene pool of both the ancestral population and that of the incipient species populations will change in time. Further, the first assumption incorporates the falsifiability factor into the relationship statement because inherent in the assumption is the notion that every species must have a sister species. Once the sister species relationship is proposed it is subject to falsification as new information becomes available. The importance of falsifiability in scientific work has been proposed by Popper (1968) and fully discussed and debated by many authors among which there are the works of Bock (1973), Kitts (1977), and Platnick and Gaffney (1977, 1978).

The second assumption in Hennigian systematics is that none of the species under study is the immediate ancestor of any of its congeners. This is also a reasonable assumption because once an ancestral gene pool (fig. 1a, population Aa) evolves nuances of genome, or reshuffles and isolates genotype by selection factors (or factors such as genetic drift), two or more genetically incompatible populations may evolve (fig. 1c, population Aa has dichotomized into population A and population a). The ancestral population (Aa), at times X and Y, is no longer genetically identical to population A of time Z in that a portion of the ancestral genome, with potentially unique alleles, has been lost to population Aa during genome Aa divergence, or ''polyvergence''. Therefore, population Aa of time X (the ancestral population) and that of time Y (the ancestral population in the process of, let us say, ''genetic drifting'') are at least potentially not genetically identical to populations A or a of time Z, even if new alleles have not been generated in the three-or-so million years of speciation time. . . an unlikely event. Thus, population Aa is essentially extinct in the purest sense because it has lost a portion of its ancestral genome, that is, the ancestral gene pool (represented by Aa) has lost its original allelic identity in the process, and as a result of the speciation events. Attemps to relate phylogenetically an assemblage of recently evolved taxa is the bane of species-level phylogeny and is perhaps the principle cause of the enigmatic ''phylogenetic bush''.

When we attempt to reconstruct phylogenies according to Hennig's methods, we implement the principle of synapomorphy. To establish synapomorphies we must first determine whether the various expressions of a character (the specific alleles of a gene) are derived (apomorphic) or primitive (plesiomorphic). All taxa that share a particular apomorphic expression of a character (i.e., a synapomorphy) are joined to form a monophyletic group, with potential difficulties associated with evolutionary reversals being dully noted. The methods for character-state analysis have been amply discussed by various authors, some of which are cited in my earlier work on *Perilypus* (Ekis, 1977). Therein, I formulated and discussed five criteria by which one can predict whether a particular character state is apomorphic or plesiomorphic. The most useful of these criteria has been the ''criterion of frequency of occurrence'' conceptually aligned with the cannons of ''out-group comparisons'' discussed by Ross (1974: 152), Erwin (1975: 3), and Watrous and Wheeler (1980: 9). My analyses involving assessments of apomorphy or plesiomorphy of character states has included information from all epiphloeine, enopliine, and korynetine species known to me.

Repositories of Specimens

The following abbreviations (letter codons) indicate the repositories of specimens from which material was obtained. Letter codons used to abbreviate the name and address of collections were taken from the comprehensive work of Arnett et al. (1993). Implementation of these codons on a worldwide basis would greatly facilitate communication among world systematists and promote consistency in our collection-related language.

I am indebted to collectors, curators, and collection managers for arranging loans of specimens. E-mail addresses of these colleagues are included to facilitate collection-oriented communications.

AMNH
: American Museum of Natural History, Department of Invertebrate Zoology, Central Park West at 79th Street, New York, New York 10024-5192 (Lee Herman; herman@amnh.org)

BMNH
: British Museum of Natural History, Department of Entomology, SW 5BD, London, England (Max Barclay; m.barclay@nhm.ac.uk. Martin Brendell; m.brendell@nhm.ac.uk)

CASC
: California Academy of Science. Department of Entomology, Golden Gate Park, San Francisco, California 94118, (Roberta Brett; rbrett@cas.calacademy.org. David H. Kavanaugh; dkavanaugh@calacademy.org)

CDAE
: California Department of Food and Agriculture, Plant Pest Diagnostic/Entomology Laboratory, Entomological Collection. 3294 Meadowview Road, Sacramento, California 95832-1448 (Chuck Bellamy; cbellamy@cdfa.ca.gov)

CHAH
: Henry A. Hespenheide Collection, University of California, Los Angeles Department of Biology. 621 Circle Drive South, Box 951606, Los Angeles, California 90095-1606 (henryh@biology.lifesci.ucla.edu)

CMNC
: Canadian Museum of Nature, Insect Collection. Post Office Box 3443, Station D, Ottawa, Ontario, Canada K1P 6P4 (Robert S. Anderson; randerson@mus-natur.ca; Francois Genier; fgenier@mus-nature.ca)

CMNH
: Carnegie Museum of Natural History, Invertebrate Zoology, 4400 Forbes Avenue, Pittsburgh, Pennsylvania 15213 (Robert L. Davidson; davidsonr@clpgh.org)

CNCI
: Eastern Cereal and Oilseed Research Centre, Biological Resources Program, Agriculture and Agri-Food Canada, K.W. Neatby Building. 960 Carling Avenue, Ottawa, Ontario, K1A 0C6, Canada (Donald E. Bright; brightd@em.agr.ca)

CSUC
: Colorado State University, Department of Bioagricultural Sciences and Pest Management. Fort Collins, Colorado 80523-1177 (Boris C. Condratieff; bkondrat@ceres.agsci.colostate.edu)

CUIC
: Cornell University, College of Agriculture and Life Sciences, Department of Entomology. Comstock Hall, Ithaca, New York 14853–0901. (Jim K. Liebherr; jk15@cornell.edu)

DEIC
: Deutsches Entomologisches Institute. 13 Eberswalde, Germany (Lothar Zerche; zerche@dei.eberswalde.de)

EMEC
: University of California, College of Agriculture, Division of Entomology and Parasitology. California Insect Survey, Berkeley 4, California 94720 (Cheryl Barr; cbarr@nature.berkeley.edu)

EMUS Utah State University, Department of Biology. Logan, Utah, 84322-5305 (Wilford J. Hanson; biomail@cc.usu.edu)

FMNH Field Museum of Natural History, Department of Entomology. Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605 (Alfred F. Newton; newton@fmnh.org)

FSCA Florida State Insect Collection of Arthropods, Division of Plant Industry, Florida Department of Agriculture, P.O. Box 147100, Gainsville, Florida 32614-7100 (Mike C. Thomas; thomasm@doacs.state.fl.us; Paul E. Skelley; dpilib@nervm.nerdec.ufl.edu)

IMLA Fundacion Miguel Lillo, Instituto de Zoologia, Miguel Lillo 251, Entomologia. 4000 San Miguel de Tucuman, Argentina (Arturo L. Teran)

INBC Instituto Nacional de Biodiversidad. Santo Domingo de Heredia, Apartado Postal 22–3100, Heredia, Costa Rica (Angel Solis; asolis@inbio.ac.cr)

INHS Illinois Natural History Survey, Center for Biodiversity, 607 East Peabody Drive, Champaign, Illinois 61820-6970 (Kathleen R. Zeiders; kmethven@staff.uiuc.edu)

INSB Institute Royal des Sciences Naturelles de Belgique, Department d'Entomologie. Rue Vautier, 29, B-1000, Bruxelles, Belgium (Didier Drugmand; drugmand@kbinirsnb.be)

IZAV Universidad Central de Venezuela, Facultad de Agronomia, Departamento e Instituto de Zoologia Agricola, Apartado Postal 4579, Maracay 2101-A, Venezuela (Luis J. Joly; ljoly@cantu.net)

JEWC Jim E. Wappes Collection. 171 Fall Creek, Bulverde, Texas 78163 (Jim E. Wappes; beetle@wireweb.net)

JNRC Jacques Rifkind Collection. 5105 Morella Avenue, Valley Village, California 91607 (Jacques Rifkind; clerid@aol.com)

JPHC Jeffrey P. Huether Collection. 443 Turk Road, Geneva, New York 14456 (jhmeloid@hotmail.com)

KSUC Kansas State University, Department of Entomology. West Walters Hall, Manhattan, Kansas 66506-4004 (Gregory Zolnerowich; gzolnero@oz.oznet.ksu.edu)

LACM Natural History Museum of Los Angeles County, Entomology Section. 900 Exposition Boulevard, Los Angeles, California 90007 (Brian P. Harris; bharris@nhm.org)

LSUC Louisiana State University, Louisiana State Arthropod Museum, Department of Entomology. 402 Life Sciences Building, Baton Rouge, Louisiana 70803-1710 (Victoria L. Moseley; vmosele@unix1.1sncc.lsu.edu)

MCNZ Fundacão Zoobotânica do Rio Grande do Sur, Museu de Ciências Naturais, Rua Dr. Salvador Franca, 1427 Caixa Postal 1188, 90001–970, Porto Alegre, RS, Brasil (M. H. M. Galileo)

MCZC Museum of Comparative Zoology, Harvard University, Entomology. Cambridge, Massachusetts, 02138 (Philip D. Perkins; perkins@oeb.harvard.edu)

MEMU Mississippi State University, Mississippi Entomological Museum. Post Office Box 9775, Mississippi State, Mississippi 39762 (Terry Schaefer; tschaefer @entomology.msstate.edu)

MIUP Museo de Invertebrados Graham B. Fairchild, Departamento de Zoologia, Universidad de Panama, Facultad de Ciencias Naturales, Exactas Y Tecnologia, Estafeta Universitaria, Panama (Roberto Cambra T.; quinterd@tivoli.si.edu)

MLPA Universidad Nacional de La Plata, Facultad de Ciencias Naturales Y Museo, Division Entomologia.1900 Paseo del Bosque, La Plata, Argentina (L. De Santis)

MMEC Moravian Museum, Department of Entomology, Presloval, 602 00 Brno, Czechslovakia (Jiri Kolibac; ento.kol@volny.cz)

MNHN Muséum Naturelle d'Histoire, Entomologie. 45 bis, Rue de Buffon, Paris (Ve), France (Jean J. Menier; menier@cimrs1.mnh.fr)

MRSN Museo Regionale Scienze Naturali, Via Giolitti, 36, Torino, 10123, Italy (O. Bortesi)

MSUC Michigan State University, Department of Entomology. 243 Natural Science, East Lansing, Michigan 48824-1115 (Wayne Whehling; wehling@pilot.msu.edu)

MZSP Museu de Zoologie da Universidade de São Paulo. Caixa Postal 7172, 04263, São Paulo, Brazil (Cleide Costa; cleideco@usp.br)

NINA Norwegian Institute for Nature Research, Division of Conservation Biology, Tungasletta 2, NO-7485, Trondheim, Norway (Frode Odegaard; frode.odegaard@ninatrd.ninianiku.no)

NYSM New York State Museum. 3140 Cultural Education Center, Albany, New York 12230 (Tim L. McCabe; timmccabe@aol.com)

OSEC Oklahoma State University, Division of Agricultural Sciences and Natural Resources, Department of Entomology and Plant Pathology. 127/110 Noble Research Center, Stillwater, Oklahoma 74078-3033 (Don C. Arnold; 405-;744-5531)

OSUC The Ohio State University, Museum of Biological Diversity, Insect Division, 1315 Kinnear Rd. Columbus, Ohio 43212 (Norman F. Johnson; johnson.2@osu.edu)

OSUO Oregon State University, Systematic Entomology Laboratory, Department of Entomology. Cordley 2046, Cornvallis, Oregon 97331 (A.V.Z. Brower; entoffice@bcc.orst.edu)

PMNH Yale University, Division of Entomology, Peabody Museum of Natural History. New Haven, Connecticut 06520-8118 (Raymond J. Pupedis; raymond.pupedis@yale.edu)

PURC Purdue University, Department of Entomology, Entomology Hall. West Lafayette, Indiana 47907 (Arwin Provonsha; arwin_'povonsha@entm.purdue.edu)

QCAZ Pontifica Universidad Catolica del Ecuador, Departamento de Biologia. Avenida 12 de Octubre, entre Patria y Beintilla, Apartado 17–01–2184, Quito, Ecuador (Giovanni Onore; onore@puceuio.puse.edu.ec)

RFMC Roy F. Morris II Collecton. 2635 Ewell Rd., Lakeland, Florida 33811(catchbugs@aol.com)

RHTC Robert H. Turnbow, Jr. Collection. Supervisory Entomologist, Directorate of Public Works, Building 1404, Fort Rucker, Alabama 36362–5000. (turnbowr@rucker.army.mil)

SEAN Museo Entomologico. S.E.A., A.P. 527, Leon, Nicaragua (Jean-Michel Maes; jmmaes@ibw.com.ni)

SEMC The University of Kansas, Snow Entomological Division, The Natural History Museum of the University of Kansas. Lawrence, Kansas 66045-2454 (Robert W. Brooks; ksem@kuhub.cc.ukans.edu)

TAMU Texas A & M University, College of Agriculture and Life Sciences, Department of Entomology, Minnie Belle Heep Building, College Station, Texas 77843-7029 (Edward G. Riley; egrchryso@tamu.edu)

TUMC Technische Universitat Munchen, Angewandte Zoologie. D-85350 Freising, Germany (Roland Gerstmeier; r.gerstmeier@lrz.tu-muenchen.de)

UASM Strickland Entomological Museum, Department of Entomology Collection, University of Alberta. Edmonton, Alberta, T6G 2 E 3, Canada (George E. Ball; g.ball@ualberta.ca)

UCAG University of Georgia, Museum of Natural History, Entomology Collections. Natural History Building. Athens, Georgia 30602-1882 (Cecil Smith; Clsmith@arches.uga.edu)

UCDC University of California-Davis, Department of Entomology, R. M. Bohart, Museum of Entomology. One Shields Avenue, Davis, California 95616-8584 (Steve L. Heydon; slheydon@ucdavis.edu)

UMMZ Museum of Zoology, Division of Insects, University of Michigan-Ann Arbor, Michigan 48109-1079 (Mark F. O'Brien; mfobrien@umich.edu)

UMRM Wilbur R. Enns Entomology Museum, Department of Entomology. 1–87 Agriculture Building, University of Missouri-Columbia, Missouri 65211 (Kristin B. Simpson; simpsonk@showme.missouri.edu)

UMSP University of Minnesota, Department of Entomology, College of Agriculture, Food, and Environmental Sciences. 219 Hodson Hall, 1980 Folwell Avenue, Saint Paul, Minnesota 55108-6125 (Philip J. Clausen; claus004@maroon.tc.um.edu)

USNM National Museum of Natural History, Smithsonian Institute, Department of Entomology,Washington, DC 20560 (Natalia J. Vandenberg; nvandenb@sel.barc.usda.gov)

WFBC William F. Barr Collection. 1415 Borah Avenue, Moscow, Idaho 83843 (William F. Barr; wfbarr@uidaho.edu)

WFBM University of Idaho, Division of Entomology, William F. Barr Museum, Moscow, Idaho, 83844 (Frank Merickel; fmerickel@uidaho.edu)

WOPC Weston Opitz Collection, Kansas Wesleyan University, Department of Biology, 100 East Claflin Avenue, Salina, Kansas 67401-6196 (opitz@kwu.edu)

WSUC Washington State University, Department of Entomology, P.O. Box 646382, Pullman, Washington 99164-6382 (Richard S. Zack; zack@mail,wsu.edu)

ZMAN Zoologisch Museum der Universiteite van Amsterdam, Entomologie. Plantage Middenlaan 64, Amsterdam, 1004, Netherlands (Johan P. Duffels)

ZMHB Museum fur Naturkunde on der Humbolt-Universitat zu Berlin, 1040 Berlin, Invalidenstrasse 43, Germany (Manfred Uhlig; manfred=uhlig@rz.hu-berlin.de)

NATURAL HISTORY

As part of a research effort of sustainable forestry, Mecke et al. (2001: 13) conducted a comprehensive inventory of the insect fauna associated with the Brazilian pine *Araucaria angustifolia* (Bert.) O. Kunze. These workers sampled, by various collecting methods, tree branches and boles of the aforementioned tree species and others coexisting with *Araucaria*. Among the materials they gathered were 115 specimens of *Chaetophloeus hispidus*, n. sp., obtained from November to February. One hundred-nine of these specimens were reared from branches and six were collected by beating. Part of the findings of these investigators was that *C. hispidus*, although apparently a general predator of a variety of lignicolous beetles, seems to prefer species such as *Corthylus rufopilosus*, and *Xylechinosomus minimus* (Scolytidae). The authors further suggest that these clerids are also significant predators of other *Xylechinosomus* species. By association, that is, by coemergence from the same tree branches, *C. hispidus* is thought also to feed on *Baudonisia villosiventris* (Buprestidae), *Strangalia dimidiata* (Cerambycidae), *Helipodus tuberculatus* (Curculionidae), and *Copidita* sp. (Oedemeridae).

Plocamocerans seem diurnal, with large populations congregating on felled tree trunks during mid-morning, late afternoon, and at night. A tropical rainforest with freshly cut tree trunks (figs. 2–5) is prime collecting habitat for epiphloeines and clerids in general. In Central America, specimens were collected during July and April, some on dry wood of *Inga* and *Guarea*.

I observed large populations of *P. manausensis*, new species, of the Amazon Basin, assembled on a recently felled tree leaning against its stump. The insects seemed to congregate on the underside, (i.e., shaded side) of the log, especially during the more sun-intensive hours (figs. 3–5). They were also easily captured at night on the surface of the aforementioned felled tree. Wilford J. Hanson collected a variety of plocamocerans in a Malaise trap draped over trunks of recently felled trees (fig. 2).

On the basis of mouthpart structure and stomodeal contents, I conclude that plocamoceran beetles are carnivorous and are consumers of lignicolous insects, such as larvae of wood borers. The extent to which these beetles blend into their bark surroundings is astonishing. Their elytral variegations blend in perfectly with the thin bark of tree genera such as *Manilkara* and represent an outstanding example of adaptive coloration. Unfortunately, such adaptations tend to homogenize the outward appearance among congeners, which makes species-level identifications particularly difficult. Also noteworthy is the manner by which these clerids escape capture. Their strategy most often involves an initial scurry movement, then catapult to full flight. Their jumping abilities coincide well with the extraordinary development of their metafemur and metacoxa. Hespenheide (1973) associated such locomotory behavior with fly mimicry.

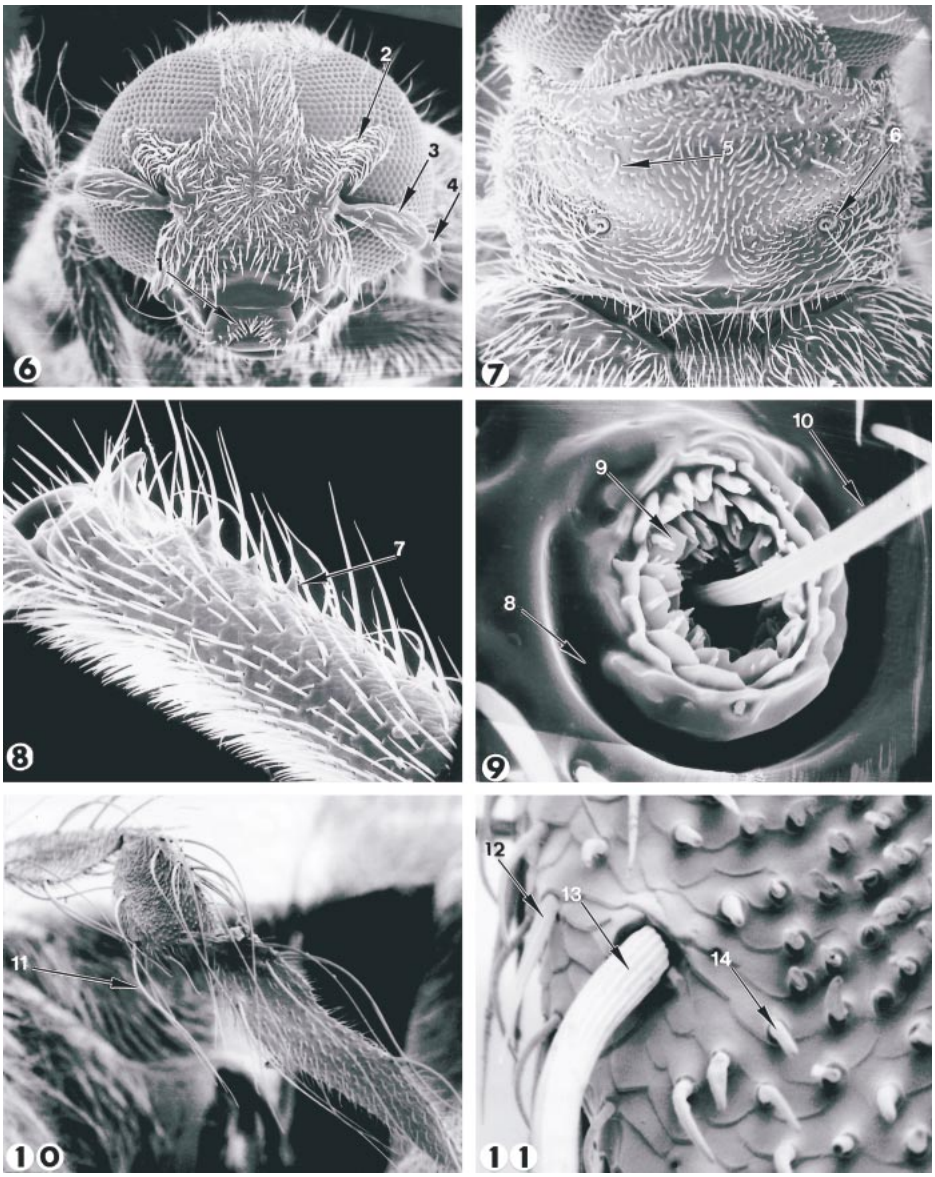
INTEGUMENTARY SENSORY ORGANS

Sensilla on the Antennae, Pronotum, and Elytra

Antennae: The plocamoceran antenna comprises 10 antennomeres (fig. 86); the scape is unusually long and curvate, the pedicel large and spheroid, and the flagellum is greatly expanded and highly setose distally. The initial four flagellar antennomeres are short and narrow, whereas the terminal three constitute a substantially expanded club that forms the organs most conspicuous portion. To date, four types of sensilla have been found on the plocamoceran antennae: one type of sensilla trichodea, two types of sensilla chaetica, and one type of sensilla basiconica.

The filamentous sensilla trichodea impart a subplumose appearance and form the most

Figs. 2–5. Brazilian tropical rain forest. **2.** Malaise trap in Rondonia, Wilbur J. Hanson's method of collecting Cleridae, November 1995. **3.** The author collecting specimens of Epiphloeinae, environs of Manaus, January 1981. **4, 5.** Excellent habitat for collecting Cleridae, environs of Manaus, January 1981.



Figs. 6–11. *Plocamocera coactilis*; **6.** Head (1, labrum, 2, ocular notch, 3, scape, 4, pedicel). **7.** Pronotum (5, trichosome, 6, discal trichbothrium). **8.** Distal portion of protibiae (7, spine). *P. confrater*. **A.** antenna, 90× (11, filamentous sensilla trichodea). **B.** Ninth antennomere. **9.** Pronotal discal trichobothrium (8, bothrium, 9, trabiculae, 10, trich). **10.** Antenna. **11.** Antennomere 1200× (12, sensilla chaetica I; 13, filamentous sensilla trichodea, 14, sensilla basonica).

striking feature of the plocamoceran antennae (fig. 10). Sensilla trichodea are most abundant on the club antennomeres (no. 13 in fig. 11) and take the form of long, longitudinally grooved, hairlike organs set on the antennomeres in well-formed sockets. Steinbrecht (1970: 124) suggested that the long sensilla trichodea of the male silk moth are instrumental in the detection of female sex pheromone. Shorter, but anatomically similar, sensilla trichodea have been studied in various other families of beetles in which these

sensory organs were interpreted as mechanoreceptors and chemoreceptors (Merivee et al. 1998: 312, and references therein).

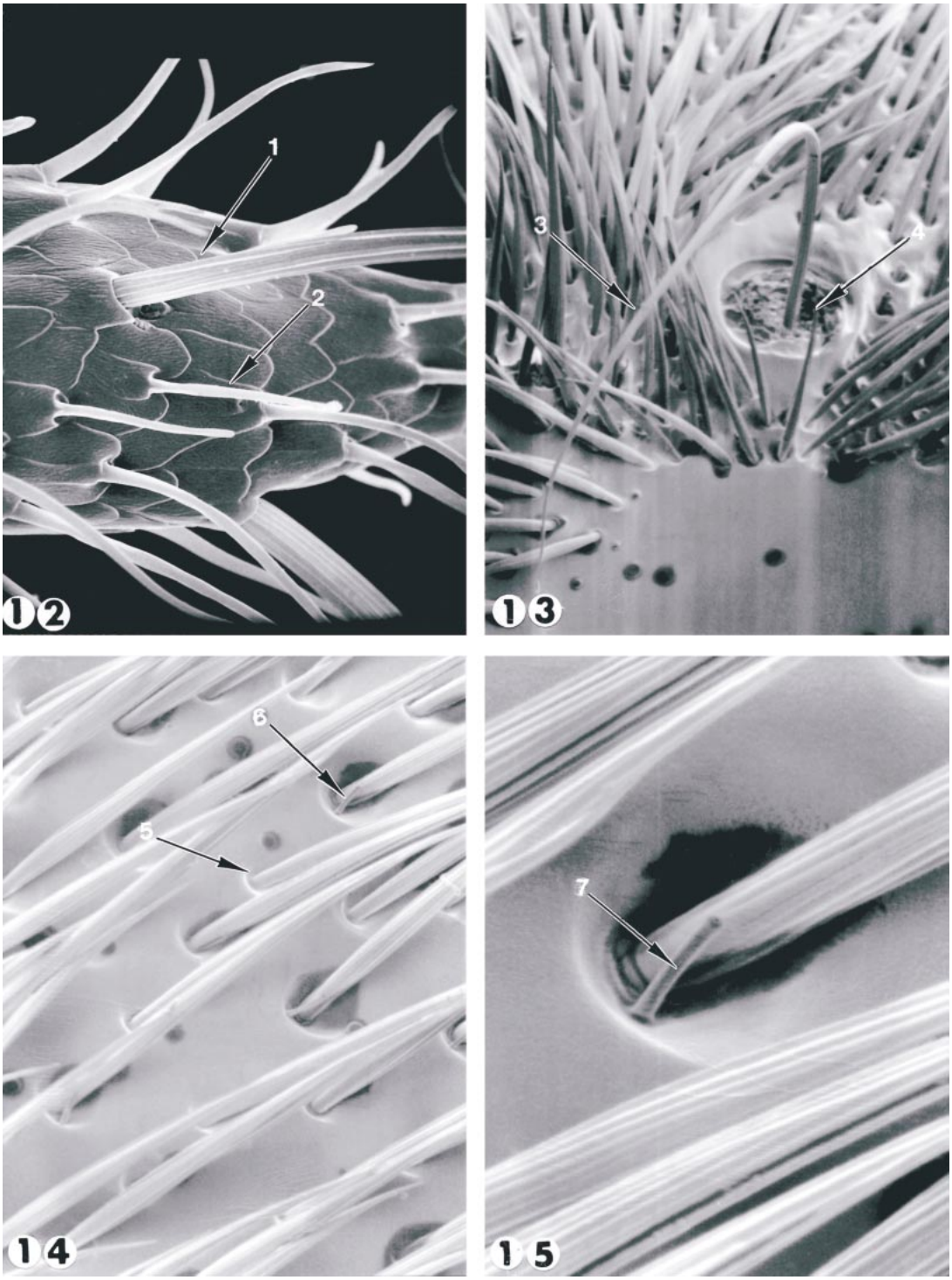
Elsewhere (see Natural History), I discussed my field observations involving specimens of *P. manausensis*, new species, on a recently felled tree infested with bark beetles within a tropical rainforest. On the basis of this predatory-prey association, and in conjunction with findings of antennal microsculpture and published biochemical information, I suggest that the filamentous sensilla trichodea of the plocamoceran antenna, which greatly increase the surface area of that organ, have an olfaction function and serve to detect volatile tree compounds and/or aggregate pheromones released by bark beetles. Borden and Wood (1966: 259) suggested that in the bark beetle *Ips confusus* (LeConte), sensilla trichodea are predominantly involved in afference of sex pheromones. Through this afferent mechanism, plocamoceran predators can readily enhance their ability to quickly find concentrations of prey species in an environment where wood decomposition is accelerated by tropical climatic factors and where availability of suitable prey species is temporally short. Kaissling (1971: 357) stressed the importance of antennal surface in relation to that organ's afferent properties. Furthermore, the plumose-like construction of the plocamoceran antenna is somewhat reminiscent of the antennal development of the *Bombyx* moth, in which it has been established that flagellar branches capture and absorb odor molecules of pheromones. Schneider (1969: 1034) suggested that highly plumose antennae, as those found in the silkworm moth *Bombix mori*, are effective molecular sieves.

Several North American studies have shown that checkered beetle predation on bark beetles involves sensitivities to tree compounds and/or barkbeetle pheromones. For example, Pitman and Vite (1971: 404) and Whittaker and Foemy (1971: 759) demonstrated that *Enoclerus lecontei* (Say) respond to conifer terpenes and aggregate hormones, respectively. Moreover, Harwood and Rudinsky (1966: 297) established that *Enoclerus sphegeus* (Fabricius) and *Thanasimus undatulus* (Say) were attracted to oleoresins collected from living trees of Douglas fir (*Pseudotsuga menziesii* (Mirb.)), ponderosa pine (*Pinus ponderosa*), and grand fir (*Abies grandis*). *Thanasimus dubius* (Fabricius) is known to respond to pheromones produced by bark beetles (*Ips* spp.) and to tree volatiles (Vite and Williamson, 1970: 238; Dixon and Payne, 1979: 180, 1980: 381, Billings and Cameron, 1984: 1545; Mizell et al., 1984: 180; Billings, 1986: 488).

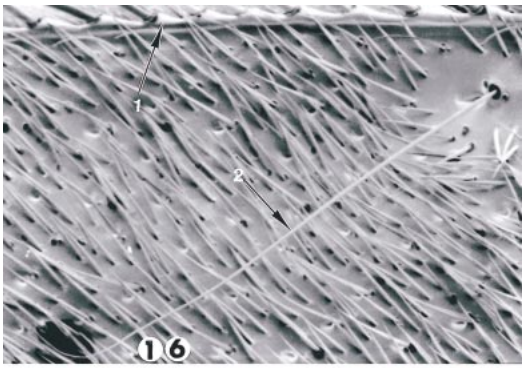
Type I sensilla chaetica (no. 12 in fig. 11) have been found on antennomere nine and type II sensilla chaetica (no. 2 in fig. 12) on antennomere ten. Type I emerge from a well-formed socket, varies in length, is suberect and fluted, and tapers to a fine point. In the leaf beetle *Psylliodes chrysocephala* Linnaeus these kinds of antennal sensory organs (identified as sensilla trichodea I) (Bartlet et al., 1999: 293) are known to be enervated by one sensory neuron attached to the base of the bristle shaft, an indication of mechanosensory function according to Zacharuk (1985: 26). Type II sensilla chaetica have heretofore been established to occur only on the terminal antennomere of the antennal club (fig. 12). They stem from a cuticular plate, vary in length and undulations, are externally smooth, and are relatively blunt at the apex. They most closely approximate the sensilla trichodea type II of *P. chrysocephala* L. (loc. cit.) and others reported in various species of weevils (Bartlet et al., 1999: 298). Mustaparta (1973: 570, 1975: 277) discussed similar antennal sensilla in the weevil *Hylobius abietis* and reported their electrophysiologically responsiveness to odors.

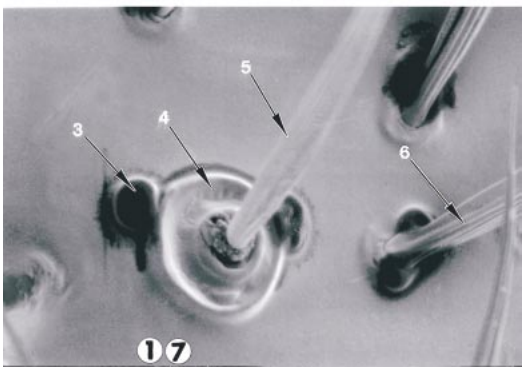
The plocamoceran sensilla basiconica (no. 14 in fig. 11) are short, externally smooth and thin-walled, straight or curved, peglike sensilla set in an elevated base. Elaterid, scolytid, curculionid, and coccinelid beetles are known to have similar antennal sensilla (Marivee et al., 1998: 312; Bartlet et al., 1999: 298) responsive to odors in electrophysiological experiments (Mustaparta, 1975: 283).

PRONOTUM: The most prominent exterosensillar elements on the plocamoceran pronotum are four trichobothria, with two being positioned paralaterally on the pronotal disc (no. 6 in fig. 7 and enlarged in fig. 9) and one each on the pronotal lower sides (fig. 13). The trichs of these sensory organs are

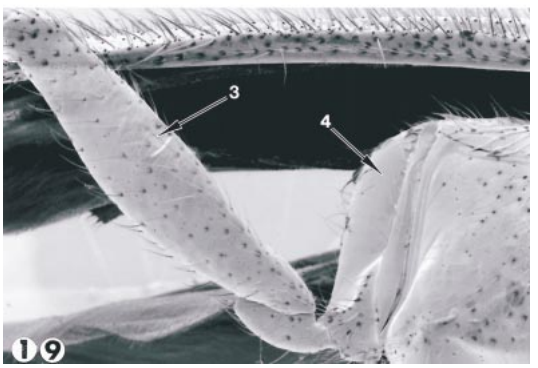


Figs. 12–15. **12.** *Plocamocera coactilis*; tenth antennomere (1, filamentous sensilla trichodea; 2, sensilla chaetica II). 13–15. *P. confrater*. **13.** pronotal lateral trichobothrium (3, trich; 4, bothrium). **14.** Pronotum (5, sensilla trichodea I; 6, basal peg of sensilla trichodea II). **15.** Pronotum (7, basal peg of sensilla trichodea II).





Figs. 16–17. *Plocamocera confrater*. **16.** Elytra (1, epipleural margin with chaetosomes; 2, trich of elytral trichobothrium. **17.** Elytra (3, elytral pit; 4, elytral trichobothrial bothrium; 5, elytral trichobothrial trich; 6, sensilla trichodea).

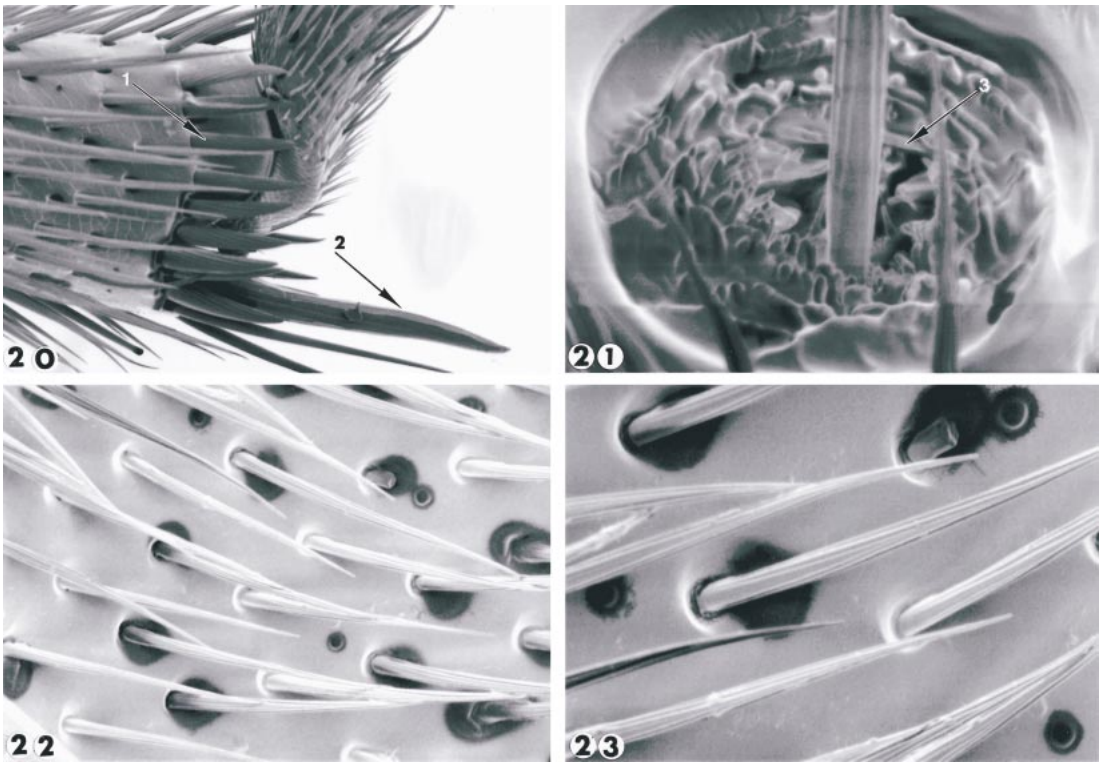


Figs. 18–19. **18.** *Plocamocera confrater*; hindbody, lateral view, 70× (1, metacoxa; 2, metafemora). **19.** *Ichnea marginella* (Klug); hindbody, lateral view, 70× (3, metafemora; 4, metacoxa).

extraordinarily long, fluted, and tapered to a very fine point. The core of the bothrium of the discal trichobothria is composed of an internal dome-shaped elevation adorned with papillose and serratelike trabeculae (fig. 21). A conspicuous difference between the discal (fig. 9) and lateral bothrium (no 4 in fig. 13 and no 3 in fig. 21) is the lack of trabecular development proximal to the base of the trich in the lateral trichobothria (fig. 9). Such a development, in these more dorsal organs, would permit the extremely long hair of these trichobothria a wider angle of deflection thereby rendering the more dorsal trichobothria a great sensitivity to airborne vibrations generated perhaps by the activities of oncoming predators (see below for a discussion of trichobothrial functions).

The remaining vestiture of the pronotal surface involves three types of sensilla trichodea (I, II, III). Pronotal sensilla trichodea types I (no. 5 in fig. 14 and no. 2 in fig. 24) and II (no. 6, fig. 14) are similar in shape; both are recumbent, short, fluted, linear, or slightly curved chaeta that narrow to a fine point. However, pronotal sensilla trichodea II differ as they arise from deeper punctiform depressions (see figs. 22 and 23). Further, some pronotal sensilla trichodea II are associated with a minute tubular peglike process (no. 7 in fig. 15).

Pronotal sensilla trichodea III (herein referred to as trichosomes; no. 5 in fig. 7) are very sparsely distributed on the pronotal disc, being most clearly evident along the anterior and posterior margins. Trichosomes are very robust, slightly curvate vertical bristles set in large punctiform depressions that are more abundantly found on the elytral disc and elytral epipleural (no. 1 in fig. 16) and sutural margins. An interesting additional feature of the pronotal surface is the presence of integumental pores (figs. 22, 23, and no.



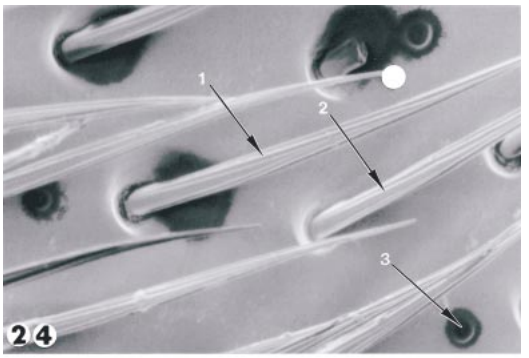
Figs. 20–23. *Plocamocera confrater*. **20.** Distal extremity of metatibia (1, croun of apical setae; 2, metatibial spur). **21.** Pronotal lateral trichobothrium (3, trabeculae). **22.** Pronotal setae. **23.** Pronotal detae.

3 in fig. 24) sparsely distributed among the discal sensilla.

ELYTRA: In *Plocamocera confrater* Kuwert, the side regions of the elytra, proximal to the epipleural margin, show eight trichobothria whose trichs become progressively shorter toward the elytral base. In these trichobothria (e.g., no. 2 in fig. 16) the trichs are also filiform and fluted, but unlike in the pronotal trichobothria, the elytral bothria are devoid of a crenulated interior dome (no. 4 in fig. 17). Moreover, the bothria are nested in an elevated collar and are flanked by two spheroid depressions with elevated borders (no. 3 in fig. 17). The more anterior elytral trichobothria have wider, shorter trichs (no. 5 in fig. 17) and have bothria that are set in a circular mote (e.g., no. 4 in fig. 17). Additional elytral sensilla involve trichosomes that are serially arranged along the epipleural and sutural margins. Discal sensilla trichodea (no. 6 in figure 17) are fluted, acuminate, most often decumbent, and are set in prominent sockets

TRICHOBOTHRIA

Schuh (1975: 2) provided a very useful review of the gross structure and distribution of trichobothria in Arthropoda, and Steyskal (1991: 95) clarified its proper orismology. Other contributions to our knowledge of this interesting cuticular sensory organ in insects have been made by Pumphrey (1940: 125), Ruckes (1961: 36), Roeder (963: 69), Schaefer (1975: 233), Markl and Tautz (1975: 84, 1977: 29, 1979: 455), Tautz and Markl (1978: 107), Fletcher (1978: 185), Tobias and Murphy (1979: 53), Schaefer (1975: 194, 1981: 595), Dambach et al., (1983: 417), Dambach and Heinzel (1985: 333), Magnuson and Baerwald (1987: 637), Hartman et al., (1987: 87), Hartman and Leander (1987: 77), Wygodzinsky and Lodhi (1989: 371), Zrzavy (1990: 323), and Gras and Horner



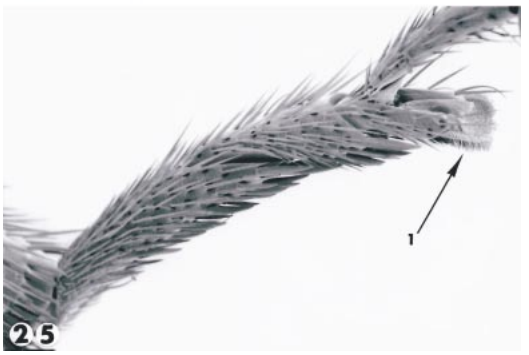


Fig. 24–25. *Plocamocera confrater*. **24.** Pronotal disc (1, pronotal sensilla trichodea II; 2, pronotal sensilla trichodea I; 3, pronotal pit). **25.** metatarsus (1, tarsomere pulvillus three).

(1992: 207), Oliva (1992: 39), Davidova-Vilimova and Stys (1993: 43), Comer and Dowd (1993: 90), and Ivanov (1994: 21).

Trichobothria are hairlike sensory organs found on the exoskeleton of many arthropods. In most cases their superficial components involve long, filiform cuticular setae (the ''trich'') that arise out of a cuticular cavity or pit (the ''bothrium''), or they may be elevated on a small dome. In the culicid larva of *Taxorhynchites rutilus* (Coquillett), the trichobothria are plumose and are thought to function to detect water vibrations (Magnuson and Baerwald, 1987: 637). There is substantial indication in the literature to suggest that trichobothria are multifunctional. They may serve as phonoreceptors (Pumphrey, 1940: 125, Frings and Frings, 1966: 580, Drasler, 1973: 182, Markl and Tautz, 1975: 82, Fletcher, 1978: 185), anemoreceptors (Hoffmann, 1967: 320, Smola, 1972: 383), tactile organs (Gorner and Andrews, 1969: 308), and sensory organs that detect airborne vibrations (Tautz and Merkle, 1978:107). From the standpoint of ethological considerations, trichobothria appear useful for detecting flying prey or detecting enemies (Roeder, 1963: 79, Tautz and Merkl, 1978: 707, Camhi, 1980: 147, Gras and Horner, 1992: 207, Stierle et al., 1994: 9, Comer, et al., 1994: 16, Barth et al., 1995: 409), general localization of prey (Gorner and Andrews, 1969: 315, Den Otter, 1974: 226, Friedel and Barth, 1977: 230, Barth and Holler, 1999: 189), and communicating in general (Lawson and Epling, 1966: 795). Trichobothria have been described in various shapes and sizes. Schuh (1975: 5) recognized four structural types of trichobothria and six types in accordance with their integumental distribution.

Heretofore, trichobothria have not been recorded in the Cleridae, although several workers have referred to the pronotal trichobothria as a ''pair of long sensory setae''(Crowson, 1964: 306), ''thorax with a pair of discal and a pair of internal sensory setae'' (Barr, 1950: 488), ''Halsschild mit je einem Paar disk aler und seitlicher Sinnesborsten.'' (Winkler, 1961: 30). Prothoracic trichobothria are variously developed within Epiphloeinae, reaching a high development in *Plocamocera*. In this genus the trichobothrial gross structures resembles those that Schuh (1975: 5) classified as structural type four in which the trich is deeply sunk into the integument. In plocamocerans the base of the pronotal trich shows a domelike scalloped structure at its core (fig. 9). It remains to be determined whether the variation of epiphloeine trichobothrial development and the distribution of other long integumental sensilla represent adaptation to a greater efficacy of afference. Schaefer (1975: 239) noted that the trich component of the trichobothrium was particularly long among ground-living heteropterans but was short among heteropterans that live on plants. Gorner and Andrews (1969: 301) discovered that, ''long trichobothria are more sensitive to airborne movements of low frequency (65 cycles/sec.) than shorter ones''.

The function of the pronotal trichobothria in clerids remains uncertain. However, their gross anatomical construction is very similar to the filiform setae described in the caterpillar of *Barathra brassicae* Linnaeus (Markl

and Tautz, 1975: 82) in which the trichs serve to detect vibrations generated by oncoming predatory wasps or parasitic flies. It is conceivable that the prothoracic trichobothria of plocamocerans, and perhaps those of other epiphloeines, serve to warn these clerid predators of other predatory species such as wasps or treetrunk-foraging lizards. Camhi (1980: 147) discovered that puffs of air made by a toad's lunge is perhaps the primary means through which the cockroach detects an attacking toad.

Plocamocerans display slightly different trichobothria on the epipleural margin of the elytra (no. 2 in fig. 16). Possibly these hair sensilla also serve as an antipredatory device. The development of elytral trichobothria, and apparently their numbers, may vary among the plocamoceran species. A complete survey of trichobothrial structure, and of the occurrence and distribution of extraordinary integumental sensilla, involving genera of Epiphloeinae is in progress. It is hoped that results from such a study will generate additional synapomorphies for a more thorough resolution of Epiphloeinae phylogenetics.

DIAGNOSIS OF *CHAETOPHLOEUS*, NEW GENUS

Specimens of this monotypic genus are most conveniently identified by the profuse presence of stout bristles (chaetosomes) on the dorsum of their forebody and elytra (figs. 26, 37). Other outstanding characteristics include the substantial length of the antennal scape, very globose pedicel, and lengthened antennal sensilla trichodea. These trichodea are slightly longer than the width of the antennomeres of the antennal club. The antennal sensilla trichodea of the antennal club are considerably longer in the members of *Plocamocera*, than they are in the members of this genus, the presumed sister taxon of *Chaetophloeus*.

DESCRIPTION OF *CHAETOPHLOEUS*

TYPE SPECIES: *Chaetophloeus hispidus* Opitz, new species.

DESCRIPTION: *Size*: Length 4.8; width 1.5 mm. *Form* **(**fig. 26): Elongate, elytra somewhat ovate and considerably tapered posteriorly, about two times longer than wide; pronotum (fig. 38) moderately transverse; epipleural margin feebly arcuate. *Integument*: dark-castaneous, intermixture of lighter and darker areas, particularly on elytra. *Vestiture*: Venter and legs copiously vested with setae that are short and decumbent or long and suberect; dorsum copiously vested with stout, bristlelike setae. *Head*: Cranium subrugosely punctated; eyes prominently bulging, finely faceted, deeply incised along frontal margin (fig. 27), incision half width of eyes when eye viewed from front; antenna (fig. 29) inserted at lower angle of eye incision, comprised of 10 antennomeres, loosely clubbed, vested with few lengthy setae, setae not longer than length of club articles; scape as long as combined length of funicular antennomeres, pedicel particularly large, subglobose, antennomeres four and six slightly expanded, antennomeres five and seven cylindric, club-antennomeres eight and nine subtrigonal, equal in length, tenth antennomere ovoid, only slightly longer than antennomeres eight and nine; labrum deeply incised (fig. 30); mandible not falciform, dentes poorly developed, anterior dens broadly accuminate (fig. 34), medial and posterior dens minute, mandibular penicillus absent; maxilla well developed (fig. 33), terminal palpomeres digitiform, laterolacinia present; labium well developed (fig. 39), terminal palpomere digitiform; gula trigonal (fig. 28). *Thorax*: Pronotum moderately transverse, anterior margin sinuous, prominently projecting medially, posterior margin broadly sinuous, subapical depression not very prominent, pronotal disc slightly depressed at sides where discal and paralateral trichobothria are prominent; disc with pair of paralateral swellings; epimeral prolongations only feebly extended mesad; procoxal cavities open; elytra distinctly tapered, surface subrugose, punctations small and shallow; epipleural margin feebly explanate; mesoscutellum quadrate-transverse (fig. 31); protibia with stout spines, protibial spur absent, protarsus with three pulvilli; mesotibia with one spur, mesotarsus with three pulvilli; metatibia with one spur, metatarsus with one pulvillus; tibial spurs not particularly elongated; metabasitarsus much longer than metatarsomere two; tarsal claws with small basal dens. *Abdomen*: Six visible sterna; pygidium broad-scutiform. *Male Genitalia*: Ae-

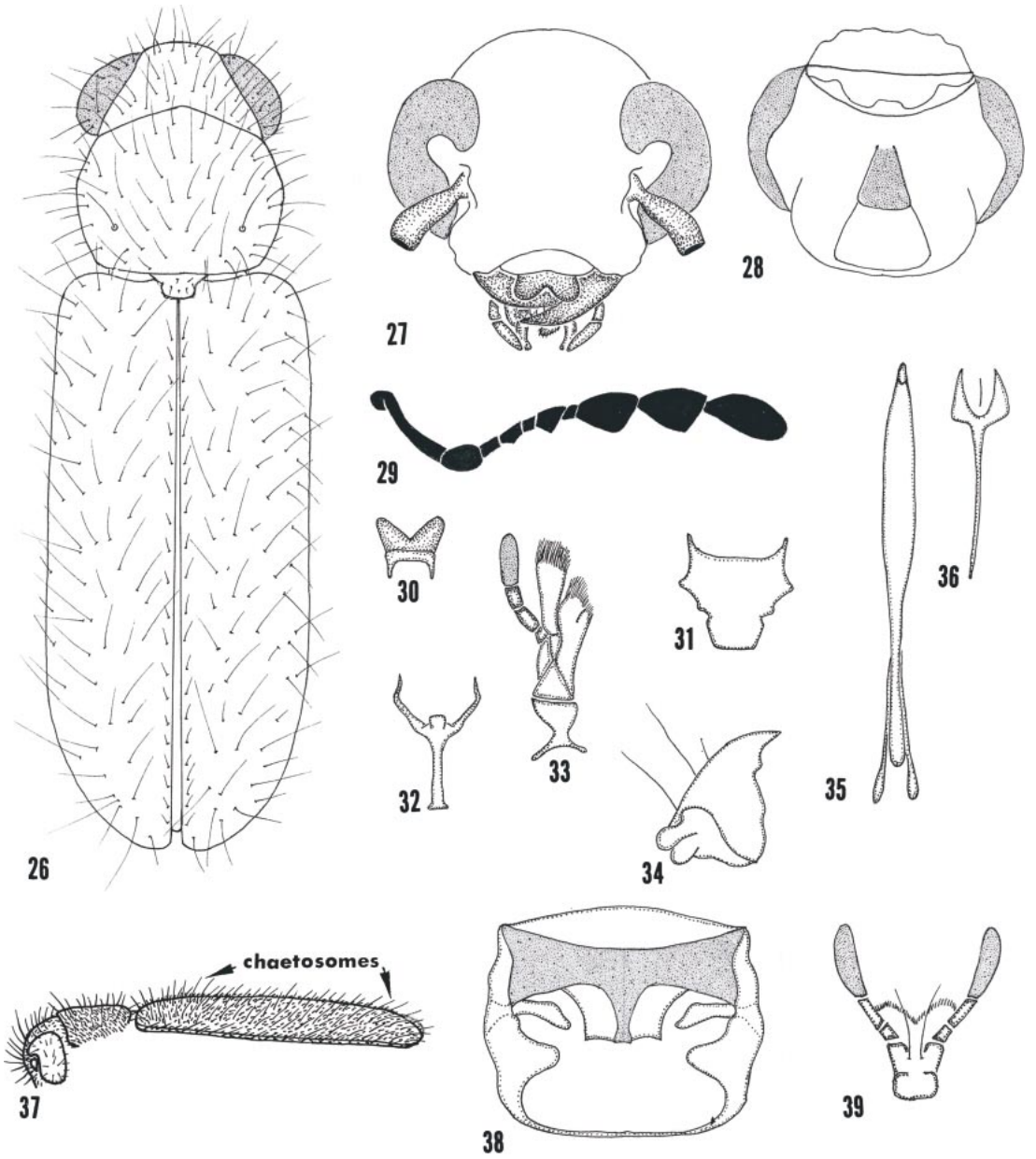


Fig. 26–39. *Chaetophloeus hispidus*. **26,** Habitus. **27,** head, frontal view. **28,** head, ventral view. **29,** antenna. **30,** labrum. **31,** mesonotum. **32,** metendosternite. **33,** maxilla. **34,** mandible. **35,** aedeagus. **36,** spicular fork. **37,** body outline, lateral view. **38,** pronotum, ventral view. **39,** labium.

deagus (fig. 35) lanceolate; interspicular plate of spicular fork slender (fig. 36), not bifid distally; parameres highly reduced.

DISTRIBUTION: These insects are known only from southern Brazil.

ETYMOLOGY: The generic name *Chaetophloeus* is a Greek compound name formed from *chaete* (long hair) and from *phloeus* (bark of trees). I refer to bristlelike hairs of these tree-dwelling beetles.

DESCRIPTION OF *CHAETOPHLOEUS* SPECIES

Chaetophloeus hispidus, new species

Figures 26, 28–31, 33–39, 126; map 12

HOLOTYPE: Male. Brazil: RS, S. Francisco de Paula, Pro-Mata, 22.XI.1999, Ex. Araucaria angustifolia, leg.: Roland Mecke (MCNZ). (Specimen card mounted, sex label affixed to paper card, white, machine printed; locality label, white, cursive, MCNZ repository label white, machine printed; number label (R 2488), white, machine printed; collection label with number (215.508), white, outlined, machine printed; holotype label red, machine printed.) The specimens identified as *Plocamocera* in Mecke et al. (2001: 113) involve members of this species.

PARATYPES: Fifty-nine specimens. Fifty-eight specimens from the same locality as the holotype (MCNZ, 3; WOPC, 3), 12-XI-1997 (WOPC, 1), 12-XII-1997 (MCNZ, 1), 9-I-1998 (WFBC, 1), 18-II-1998 (MCNZ, 1), 19-II-1998 (MCNZ, 1; WOPC, 1), 4-I-1999 (WOPC, 1), 25-I-1999 (MCNZ, 2), 10-XI-1999 (MCNZ, 1; WOPC, 1), 25-XI-1999 (MCNZ, 4; WOPC, 1), 6-XII-1999 (MCNZ, 1), 7-XII-1999 (MCNZ, 2; WOPC, 6), 14-XII-1999 (MCNZ, 2; WOPC, 1), 20-XII-1999 (MCNZ, 4; WOPC, 2), 4-I-2000 (MCNZ, 2), 6-I-2000 (MCNZ, 3), 25-I-2000 (MCNZ, 2), 27-I-2000, (MCNZ, 1), 31-I-2000 (MCNZ, 1), 8-II-2000 (MCNZ, 1), 11-II-2000 (MCNZ, 1), 21-II-2000 (MCNZ, 1), 24-II-2000 (MCNZ, 1); same locality, 29-VI-1999, Marcia Silva Barbosa (MCNZ, 1), 2-IX-1999, Marcia Silva Barbosa (MCNZ, 1), 28-X-1999, Marcia Silva Barbosa (WOPC, 1), 5-XI-1999, Marcia Silva Barbosa (WOPC, 2): Brazil: Nova Teutonia: II–1978, F. Plaumann (WOPC, 1).

DIAGNOSIS: Members of this monotypic genus can be conveniently distinguished from other epiphloeines by the profuse distribution of bristlelike setae on the head pronotum, and elytra. Further, from its sister genus *Plocamocera*, *Chaetophloeus* specimens are conveniently distinguished by the considerably shorter filamentous sensilla trichodea on the antenna. In *Plocamocera* the gula is crescentic, whereas in *Chaetophloeus* the gula has a more trigonal shape (compare figs. 28 and 126).

DESCRIPTION: Body length, width, form, and integumental color as in generic description. In addition, lower frons castaneous, upper frons and epicranium piceous; pronotum narrowly castaneous along anterior and lower lateral margins; elytron light-castaneous at humerus and sporadically vested with short silvery decumbent setae that are most prominent as three feebly formed setal pencils at elytral basal third, silvery setae also form oblique broad line at elytral apical half. Head, thorax, and abdomen as in generic description. In addition, frons distinctly concave, elytral disc depressed behind humerus, elytral punctations prominent throughout disc and not arranged in longitudinal rows, and fifth abdominal sternum narrowed distally in females, evenly arcuate in males; aedeagus as in figure 35.

VARIATION: The shape of the fifth visible abdominal sternum is sexually dimorphic. In females it is narrowed distally, whereas in males it is not narrowed distally.

NATURAL HISTORY: Mecke et al. (2001) studied the insect fauna associated with *Araucaria* trees. Among the insects that were found to frequent these trees were specimens of *C. hispidus*, n. sp., which readily emerged from *Araucaria angustifolia* (Bert) O. Kuntze. The available specimens were collected during January, February, June, October, September, November, and December.

DISTRIBUTION (map 12): These beetles are known only from southern Brazil.

ETYMOLOGY: The specific epithet, *hispidus*, is a Latin adjectival meaning ''bristly''. I refer to the bristlelike setae on the dorsum of these beetles.

DIAGNOSIS OF *PLOCAMOCERA* SPINOLA

The most outstanding characteristic of the members of this genus is the long filiform hairs on the antenna (fig. 86). As a group, the elytra of the members of *Plocamocera* tend to be variegated in color, ranging from stramineous to castaneous with many species characterized by a distinct flavotestaceous humeral macula that divides posteriorly. Moreover, I found the presence of setal aggregates on the elytra and number of conspicuous trichobothria on the epipleural mar-

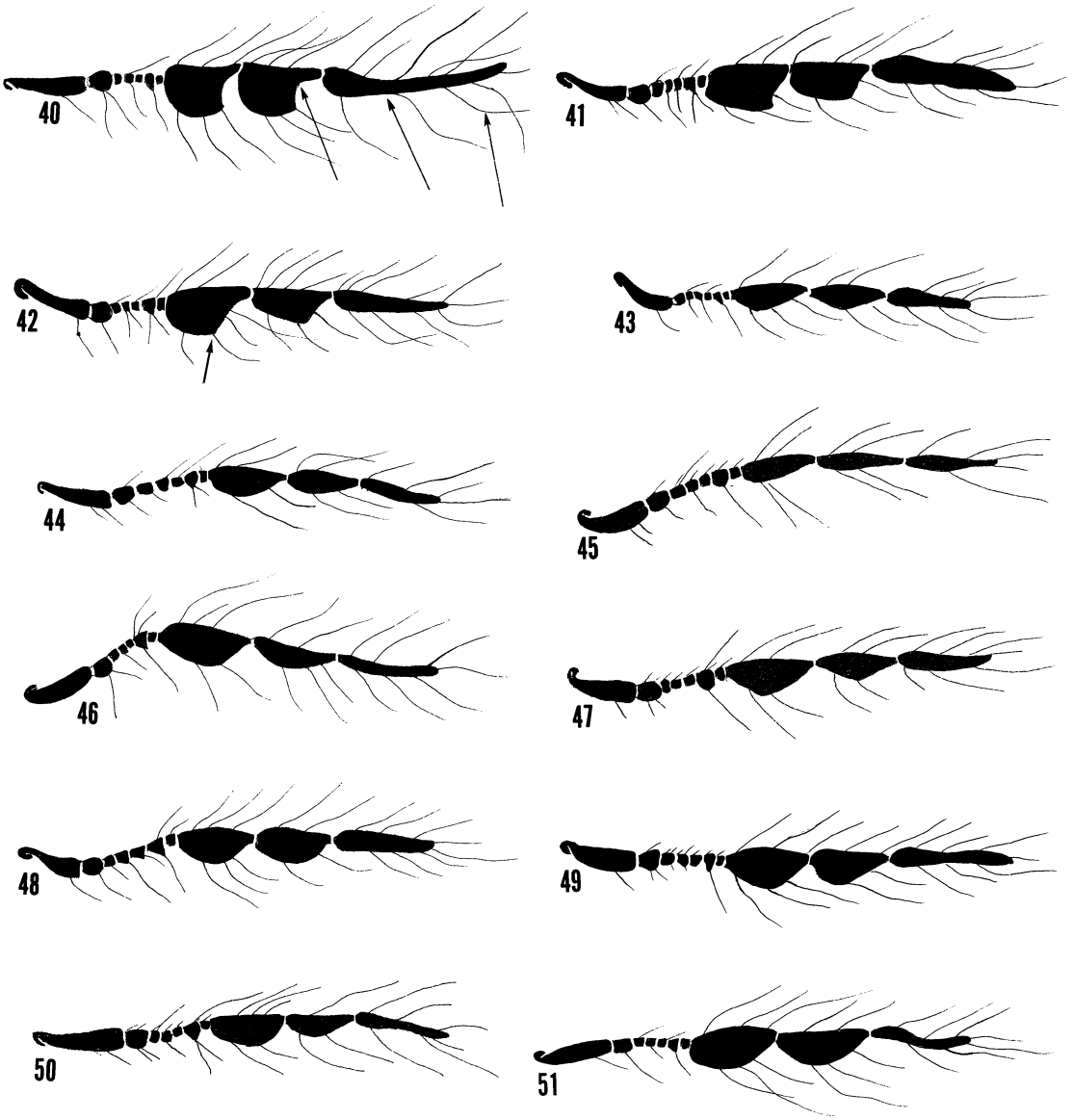
gin diagnostic for some species. Unfortunately, the elytra of many of the older specimens were severely depiliated, which rendered their identification difficult. When depiliated specimens do not show the elytral trichobothria (fig. 55), one can determine the presence of some of these sensory organs by the more conspicuous black indentations with which these filiform setae are associated. Males with depiliated elytra may be diagnosed on the basis of the configuration of the last three antennomeres, shape of the pygidium, and characteristics of the aedeagus. Severely depiliated females are particularly difficult to assign to species, but in most cases the shape of the antennomeres of the antennal club leads one to the correct identification. At present, I recognize 35 species of the genus *Plocamocera*.

In addition to the aforementioned characteristics, members of *Plocamocera* are readily identified by other characteristics such as: antennal scape very long, as long as combined length of funicular antennomeres; antennal pedicel very globose, much larger than antennomere three; pronotum boldly transverse (fig. 7), and with its anterior margin extensively projected at middle; pronotal trichobothria (fig. 9) well developed; elytra oblong-ovate, about three times longer than wide, epipleural margin arcuate when viewed from above, adorned with rows of stout chaetosomes, and vested with several trichobothria (fig. 53) that tend to diminish in length from posterior of elytron to anterior of elytron; elytra with or without maculae and with dense clusters of light and dark setae; metacoxa and metafemora particularly robust; metatarsal pulvillus present on third tarsomere; color of abdomen sex dimorphic, males piceous, females flavotestaceous in basal half piceous in remainder; spermathecal gland attached to subapex of spermathecal capsule; and males with one pair of accessory glands.

DESCRIPTION OF *PLOCAMOCERA*

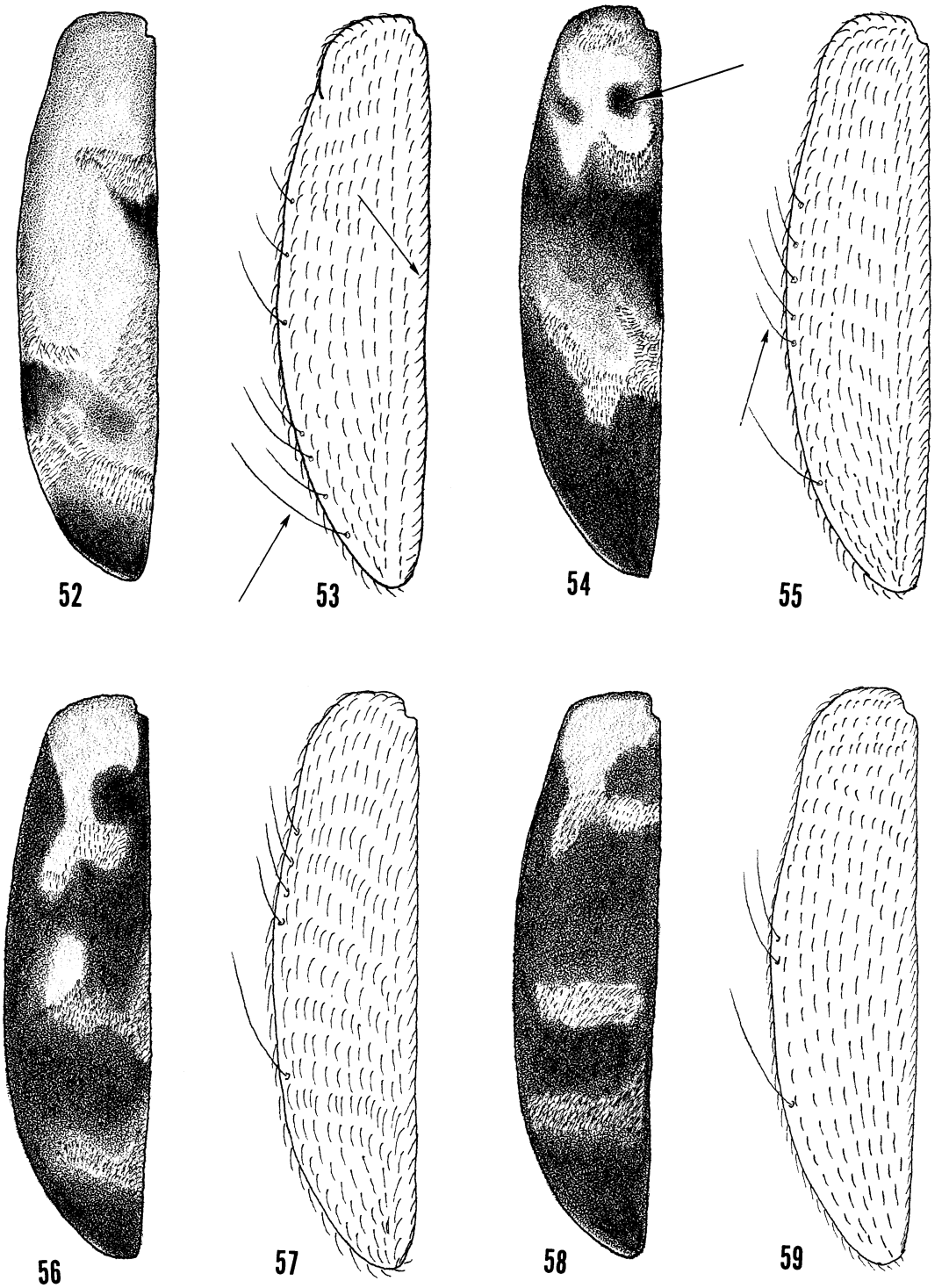
Plocamocera Spinola, 1844a: 17. Type-species *Plocamocera sericella* Spinola, 1844a: 19. By monotypy. Lacordaire, 1857: 468. Desmarest, 1860: 265. Gemminger and Harold, 1869: 1747. Guerin-Meneville, 1874: 274. Gorham, 1877: 249; 1882: 167. Kuwert, 1893: 492. Lohde, 1900: 88. Schenkling, 1903: 86, 88. Gahan, 1910: 73. Chapin, 1927: 5. Blackwelder, 1945: 388. Corporaal, 1942: 142; 1950: 255. Winkler, 1961: 59. Opitz, 1997: 55.

DESCRIPTION: *Size*: Length 4.0–8.0 mm; width 1.5–2.8 mm. *Form*: Elongate, elytra somewhat ovate, about three times longer than wide; pronotum (fig. 7) conspicuously transverse; epipleural margin feebly or strongly arcuate. *Integument*: Head, thorax, and abdomen concolorous or bicolorous, if bicolorous stramineous or castaneous, frons and vertex often infuscated; antenna bicolorous, scape flavotestaceous, remainder piceous; pronotum usually vested with pale setae at sides, disc usually infuscated; elytral surface usually variegated, rarely concolorous, when bicolorous stramineous or castaneous, or mixture of both. *Vestiture*: Integument copiously vested with decumbent and declinate setae; antenna (figs. 6, 40) with very long sensilla trichodea, discal and paralateral trichobothrial setae of pronotum (figs. 7, 9) particularly well developed, sides of pronotal disc matted with light setae whose apices extend toward middle; elytral disc abundantly vested with stout bristles, bristles are particularly notable along sutural and epipleural margins, disc also vested with pale or dark patches of setae, patches often transverse, sometimes oblique or angular in shape, epipleural margin minutely serrulate, adorned with row of chaetosomes and with three to eight trichobothria of various degree of development (fig. 55). *Head* (fig. 6): Cranium usually finely punctate, very rarely coarsely punctuated; frons plane; eyes prominently bulging, finely faceted, deeply incised along frontal margin, incision nearly bisects eye; antenna (fig. 6) inserted at lower angle of eye incision (ocular notch, fig. 136), comprised of 10 antennomeres, loosely clubbed, vested with filamentous setae (fig. 40), scape as long as combined length of funicular antennomeres, pedicel globose, funicular antennomeres subcylindric, except fourth antennomere sometimes, and sixth antennomere always, expanded laterally, basal club antennomere subovoid or subquadrate, about as long as combined length of funicular antennomeres, ninth antennomere abruptly narrowed distally (fig. 145) or gradually narrowed distally (fig. 148): labrum (fig. 125)



Figs. 40–51. Antennae. **40,** *Plocamocera castanea*. **41,** *P. pupula*. **42,** *P. confrater*. **43,** *P. aliguantula*. **44,** *P. minima*. **45.** *P. manausensis*. **46,** *P. coactilis*. **47,** *P. sericella*. **48,** *P. argentea*. 49, *P. auratilis*. **50,** *P. sesquipedalis*. **51,** *P. lucis*.

deeply incised; mandible (fig. 124) not falciform, dentes poorly developed, anterior dens broadly accuminate, medial and posterior dens minute, mandibular penicillus absent; maxilla (fig. 122) well developed, terminal palpomere digitiform, laterolacinia present; labium well developed, terminal palpomere digitiform; gula (fig. 126) crescentic. *Thorax*: Pronotum (figs. 7, 127) conspicuously transverse, anterior margin sinuous, prominently projecting medially, posterior margin broadly sinuous, subapical depression prominent, slightly depressed at sides where discal and paralateral trichobothria (figs. 7, 9) are prominent; disc with a pair of swellings that vary in expression; epimeral prolongations (fig. 127) only feebly extended mesad; procoxal cavity open (fig. 127); elytra moderately oval



Figs. 52–59. Elytra. **52, 53,** *Plocamocera castanea*. **54, 55,** *P. pupula*. **56, 57,** *P. confrater*, **58, 59,** *P. aliguantula*.

when viewed from above, punctations variable in size, not seriate, epipleural margin feebly or prominently explanate; mesoscutellum (fig. 129) quadrate-transverse; protibia (fig. 75) with one to five stout spines on anterior margin, protibial spur absent, protarsus with three pulvilli; mesotibia with one spur, mesotarsus with three pulvilli; metatibia (fig. 128) with one spur, metatarsus with one pulvillus (no.1 in fig. 25); tibial spurs (no. 2 in fig. 20) particularly robust, metafemur (fig. 109) and metacoxa (fig. 128) particularly robust; tibial apices crowned with short stout setae (no.1 in fig. 20); metabasitarsus slightly longer than metatarsomere two (fig. 108) or twice length of metatarsomere two (fig. 109), tarsal claw with large subquadrate denticle at base; appendiculate; metathoracic wing as in figure 130. *Abdomen*: Six visible sterna; pygidium broad-scutiform (fig. 95) or trigonal-scutiform (fig. 89), posterior margin plane (fig. 96), sinuous (fig. 87), or convex, usually with two discal and six marginal stout setae (fig. 95). *Male Genitalia*: Aedeagus usually long and slender, lanceolate (fig. 110), or sagittate (fig. 111); phallic struts usually extended beyond phallobasic apodeme (fig. 120), rarely not so extended (fig. 111); interspicular plate (fig. 134) of spicular fork slender, and bifid distally; parameres highly reduced. *Female Genitalia*: Ovipositor (fig. 131) long and slender, dorsal lamina (fig. 132) bilobed, ventral lamina (fig. 131) trilobed. *Alimentary Canal* (fig. 135): Ventricular papillae feebly developed; four cryptonephridial malpighian tubules. *Male Internal Reproductive Organs* (fig. 102): One pair of accessory glands; seminal vesicle particularly robust and elongate (fig. 102); testis comprised of 12 follicles. *Female Internal Reproductive Organs* (fig. 133): Spermatheca not visibly sclerotized; spermathecal gland attached to subapex of spermatheca; bursa copulatrix well developed.

DISTRIBUTION: These beetles are distributed from Mexico to Paraguay. They are most commonly known from the Amazon Basin.

SPECIES GROUPS OF *PLOCAMOCERA*

manausensis group

The members of this species group are foremost diminutive, most being about 3 mm in length; the cranium is usually black, the only exception being specimens of *P. salasis*, n. sp., in which the cranial margins are castaneous; and the first two antennomeres of the antennal club are usually ovoid (fig. 149), being particularly slender in *P. manausensis*, n. sp.; only in *P. salasis*, n. sp., does the eighth antennomere approach subquadrate. In aggregate, this group of species ranges from Guatemala to the Amazon Basin.

sesquipedalis group

The basal segment of the metatarsus is extraordinarily long in these beetles (fig. 109); the tripartite humeral macula is lacking; and the aedeagus (fig. 120) is particularly long. In the more northern specimens of *P. sesquipedalis*, n. sp., and in all specimens of *P. lucis*, n.sp., the relatively light color of the elytra accentuates the abundance and robustness of dark elytral bristles. The combined range of the four species of this group extends from Central Costa Rica, across Guyana, south through Ecuador and Peru, and to the forests of Matto Grosso, in Brazil.

castanea group

This group contains one species whose members have a stricking development of the antennal club (fig. 144); the elytral surface is somewhat undulated; and the sutural margin is bordered by particularly robust sensilla trichodea. The species ranges from the Napo rainforests of Ecuador to the more southern Brazilian lowlands of Goias.

confrater group

As a group, the members of these species show minimal interspecific variation of external structures. One must examine and correlate variations of the aedeagus with those of the antennal club to fully appreciate the taxonomic significance of subtle integumental differences. In *confrater* group specimens the eighth antennomere is subquadrate (fig. 145); the aedeagus is slender (fig. 173) or flared at the base (fig. 112); the female pygidium is trigonal-scutiform (fig. 91) or broad-scutiform (fig. 88); and the tripartite humeral macula (fig. 56) is well developed. This group of South American species has been recorded from Guyana, Ecuador, Peru, Bolivia, and Brazil.

coactilis group

In these plocamocerans the basal antennomere of the antennal club is most often narrow, rarely broad-oval (fig. 153); the pronotum is predominantly piceous; the tripartite humeral macula is well developed; and the female pygidium is broad-scutiform. The composite range of the species group extends from Ecuador to Brazil.

sericella group

The narrow-ovoid shape of antennomere eight, absence of the tripartite humeral macula, and presence of matted aggregates of white setae on the elytral disc characterize the members of this species group. Included in this species group is *P. sericella* Spinola, the most widely distributed species of *Plocamocera*; specimens are recorded from Mexico to Brazil.

DISCUSSION OF SPECIES KEY COUPLETS

Members of closely related species of this genus are very similar externally, yet subtle differences of the antenna and elytra usually corroborate the more obvious differences of the male genitalia. In general, it can be stated that the abovementioned subtle differences can best be ascertained with high magnification. I have used magnification in the 750–1000 range. When dealing with specimens of the *confrater* and *sericella* groups, the antenna of all available male specimens should be removed from the cranium and examined submerged in a fluid (such as water or glycerin) at a magnification of at least 750×. This level of magnification will provide clear resolution of the precise configurations of the antennomeres.

Interpretations of body size may occasionally become an obstacle when using this key. All known members of the *manausensis* group are uniformly diminutive, whereas specimens of other species groups are greater than 4 mm and, therefore, not diminutive as defined herein; all of these specimens will correctly filter through the first key couplet. However, small specimens of *P. sericella* Spinola approach the 4 mm body size of *P. manausensis*, n. sp., beetles. When confronting such specimens one must check the color of the cranium, which is black in *P. manausensis*, but predominantly castaneous in *P. sericella*. Also, one may precisely measure the body length of the beetles before one can proceed with confidence beyond the initial key couplet.

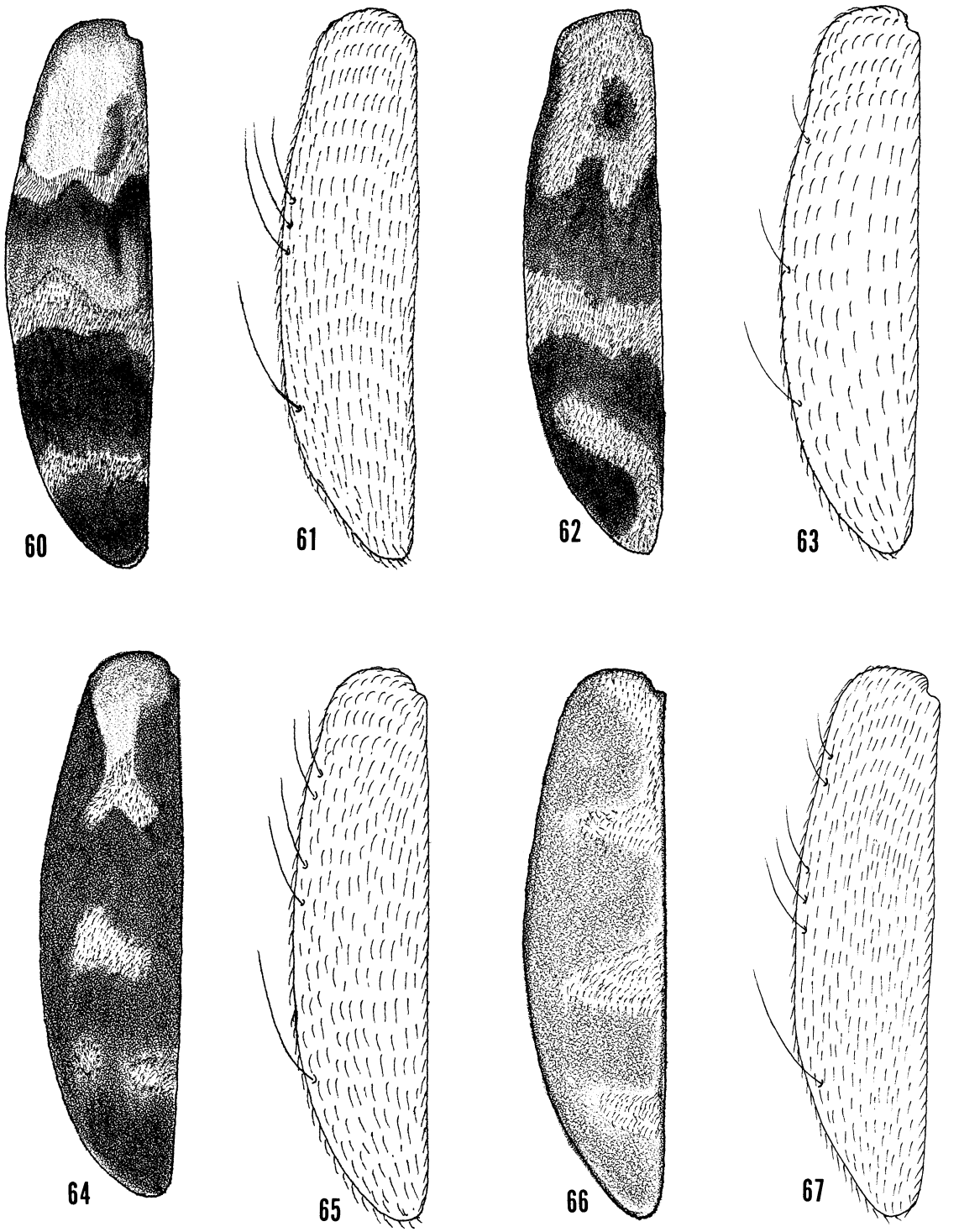
The next potential source of difficulty involves interpretation of ovality of the eighth antennomere, which is particularly relevant to couplet nine in which one has to distinguish between *P. sesquipedalis*, n. sp. and *P. similis* n. sp. The degree of ovality is more pronounced in *P. similis* n. sp., but one must observe this characteristic at a magnification approaching 1000×.

In couplet 10 one has to distinguish between a subquadrate and ovoid shape of the eighth antennomere. In most cases the two shapes are easily separated, but in *P. ambra*, n. sp., the eighth antennomere is slightly angular and possibly interpreted as subquadrate. However, in such specimens the elytra does not show a tripartite posthumeral macula, as is also the case in all other specimens of the *sericella* species group.

Lastly, the degree of ''narrowing'' of the distal extremity of antennomere eight is used, with some difficulty, to separate some specimens among the *coactilis* group (couplet 24 and 24′). The narrowing may be quite notable or deceptively short. A magnification of at least 90× must be used to recognize some of the more subtle differences among antennal characteristics.

KEY TO SPECIES GROUPS AND SPECIES OF *PLOCAMOCERA*

1. Diminutive, less than 4 mm; cranium usually black; elytra moderately setose, with well-defined flavotestaceous and piceous maculae (fig. 62) (*manausensis* group 2
1′. Not diminutive, 5–7 mm; if less than 5 mm elytra with dense patches of light and dark setae, rarely with flavotestaceous maculae 6
2(1). Cranium bicolorous, periphery castaneous, remainder black (Brazil: Amazonas) . . . . . *P. salasis*, n.sp.
2′. Cranium black 3
3(2′). Antennomeres 8 and 9 very slender, nearly digitiform (fig. 183) (Brasil: Amazonas) . . . . . *P. manausensis*, n. sp.



Figs. 60–67. Elytra. **60,** *Plocamocera minima*. **61,** *P. sericella*. **62, 63,** *P. manausensis*. **64, 65,** *P. coactilis*, **66, 67,** *P. auratilis*.

3′. Antennomeres 8 and 9 more ovate (fig. 185) 4

4(3′). Antennomere 10 robust, only slightly longer than antennomere 9 (fig. 149) (Brazil: Matto Grosso) . . . . *P. iota*, n. sp.

4′. Antennomere 10 slender, considerably longer than antennomere 9 (fig. 186) 5

5 (4′). Anterior margin of protibia with one spine (fig. 78); phallobasic apodeme short and obtuse (fig. 113) (Costa Rica: Limon) . . . . . *P. aliguantula*, n. sp.

5′. Anterior margin of protibia multispinous; phallobasic apodeme long and slender (fig. 114) (Panama) . . . . . *P. minima*, n. sp.

6 (1′). Metabasitarsus twice length of second metatarsomere (fig. 109) (*sesquipedalis* group) 7

6′. Metabasitarsus not twice length of second metatarsomere (fig. 108) 10

7 (6). Metatibial spur unusually long, about half as long as length of metabasitarsus (fig. 137), elytral disc predominantly stramineous (Brazil: Matto Grosso) . . . . . *P. lucis*, n.sp.

7′. Metatibial spur shorter than half length of metabasitarsus (fig. 138) 8

8 (7′). Elytral disc matted with yellow-gold setae at elytral basal third, postmedial third, and at preapical region (Costa Rica: Alajuela) . . . . . *P. prolixa*, n. sp.

8′. Elytral disc matted with light and brown setae 9

9 (8′). Distal half of ninth antennomere extensively narrowed (fig. 190); eighth antennomere narrow-ovate (fig. 196); phallic apex lobate (Guyana: Demerara: Bartica. Peru: Loreto. Brazil: Rondonia) . . . . . *P. sesquipedalis*, n. sp.

9′. Distal half of ninth antennomere not extensively narrowed (fig. 196); eighth antennomere broad-ovate, subrectangulate (fig. 158); phallic apex trigonal (Ecuador: Pichincha) . . . *P. similis*, n. sp.

10(6′). Basal antennomere of antennal club subquadrate (fig. 144), always with an outer angle (fig. 194); elytra subovoid, disc always with tripartite flavotestaceous macula (fig. 56), epipleural margin distinctly flared 11

10′. Basal antennomere of antennal club subovoid (fig. 163), rarely with an outer angle; elytra subrectangulate, disc with or without tripartite flavotestaceous macula, epipleural margin rarely flared, or only feeble arcuate 21

11(10). Tenth antennomere sickle-shaped (fig. 187) and considerably longer than combined length of antennomeres 8 and 9 (French Guiana: Cayenne; Ecuador: Napo; Bolivia: Cochabamba; Peru: Amazonas; Brazil: Goias) (*castanea* group); tegmen distinctly splayed at base (fig. 213) . . . . . *P. castanea*, n. sp.

11′. Tenth antennomere not sickle-shaped and not longer than combined length of antennomeres 8 and 9 (*confrater* group) 12

12(11′). Antennomere 9 not concave distally (figs. 146, 180, 188) 13

12′. Antennomere 9 shallowly (fig. 161) or deeply (fig. 147) concave distally 15

13(12). Epipleural margin of elytra notably arcuate (fig. 179) 14

13′. Epipleural margin of elytra notably linear (fig. 178) (Brazil) . . . . . *P. specula* (*Klug*)

14(13). Tripartite elytral post humeral flavotestaceous macula clearly defined (Brazil: Matto Grosso) . . *P. quadrula*, n. sp.

14′. Tripartite elytral post humeral flavotestaceous macula absent (Surinam: Saramacca) . . . . . *P. jayhawkalis*, n. sp.

15(12′). Antennomere 9 deeply concave distally (fig. 191) (Venezuela: Amazonas) . . . . . *P. baria*, n. sp.

15′. Antennomere 9 feebly concave distally (fig. 162) 16

16(15′). Antennomere 9 abruptly constricted distally (fig. 217) 17

16′. Antennomere 9 gradually narrowed distally 18

17(16). Antennomeres 8 and 9 very briefly narrowed distally (fig. 217): interstitial spaces of elytra minutely arenose (Bolivia: Santa Cruz) . . . . . *P. buenavista*, n. sp

17′. Antennomere 8 and 9 more extensively narrowed distally (fig. 218); interstitial spaces of elytra smooth and shiny (Bolivia: La Paz) . . . . *P. aura*, n. sp

18(16′). Antennomere 10 only slightly longer than antennomere 9 (fig. 193); aedeagus short, tegmen extensively broadened at base (fig. 215); anterodistal margin of antennomere 9 rounded 19

18′. Antennomere 10 nearly twice length of antennomere 9 (fig. 162); anterodistal margin of antennomere 9 with subacute outer angle (fig. 194) 20

19(18). Anterodistal angle of antennomere 8 subacute (fig. 42); aedeagus short,

broad, tegmen extensively broadened at base (fig. 112) (Guyana: Bartica; French Guiana; Cayenne. Ecuador: Napo. Peru: Madre de Dios. Bolivia: Beni. Brazil: Rondonia; Para; Matto Grosso; Jatai; Amazonas) . . . . . *P. confrater* Kuwert

19′. Anterodistal angle of antennomere 8 somewhat rounded (fig. 217) aedeagus elongate, slender, tegmen less extensively broadened at base than in previous species (fig. 214) (Colombia: Amazonas) . . . . . *P. procera*, n. sp.

20(18′). Antennomere 9 subrectangulate (fig. 194); antennal club particularly robust; elytral base with discal piceous spot that is not confluent with darkened region adjacent to elytral suture (Brazil: Matto Grosso) . . . . . *P. pupula*, n. sp.

20′. Antennomere 9 not subrectangulate (fig. 162); antennal club not robust; elytral base without discal piceous spot (Brazil: Amazonas) . . . *P. taruma*, n. sp.

21(10′). Tripartite elytral posthumeral flavotestaceous macula clearly defined (fig. 64) (*coactilis* group) 22

21′. Tripartite elytral posthumeral flavotestaceous macula absent, humeral region may be slightly lighter than rest of elytral disc; piceous spot may or may not be prominent near elytral basal margin; elytral disc usually densely vested with pale setae (*sericella* group) 28

22(21). Tenth antennomere particularly narrow, with margins distinctly sinuous (fig. 198), nearly twice length of ninth antennomere (fig. 163) (Brazil: Matto Grosso; Goias; Amazonas; Para) . . . . . *P. coactilis*, n. sp.

22′. Tenth antennomere not particularly narrow, margins not distinctly sinuous, only slightly longer than ninth antennomere (fig. 199) 23

23(22′). Antennomere 8 subglobose (fig. 200), anterodistal margin not abruptly narrowed 24

23′. Antennomere 8 subovate (fig. 154) anterodistal margin abruptly narrowed 25

24(23). Antennomere 9 gradually narrowed along anterodistal margin (fig. 199) (Brazil: mazonas) . . *P. aspera*, n. sp.

24′. Antennomere 9 abruptly narrowed along anterodistal margin (fig. 200) (Brazil: Santa Catarina) . . . . . *P. santa*, n. sp.

25(23′). Protibial anterior margin with two spines (Ecuador: Napo) . . . *P. onorei*, n. sp.

25′. Protibial anterior margin with more than two spines 26

26(25′). Antennomere 10 tapered to fine point (fig. 202) (Brazil: Matto Grosso) . . . . . *P. bispina* n. sp.

26′. Antennomere 10 not tapered to fine point, more lobate (fig. 203) 28

27(26′). Antennomere 8 subovoid (fig. 203) (Brazil: Guanabarra) . . . . . *P. carnegei*, n. sp.

27′. Antennomere 8 not subrectangulate (fig. 204) (Brazil: Distrito Federal) . . . . . *P. paris*, n. sp.

28(21′). Elytral, thoracic, and cranial vestiture predominantly white; integument uniformly light castaneous (Bolivia: Santa Cruz) . . . . . *P. argentea*, n. sp.

28′. Elytral, thoracic, and cranial vestiture admixture of light and dark setae; integument variegated 29

29(28′). Epipleural margin abruptly explanate at elytral basal fourth (fig. 74) 30

29′. Epipleural margin not explanate at elytral basal fourth 32

30(29). Eighth antennomere with distinct outer angle (fig. 155) (Costa Rica: Puntarenas; Alajuela) . . . . *P. ambra*, n. sp.

30′. Eighth antennomere without distinct outer angle (fig. 206) 31

31(30′). Epipleural margin piceous; metafemur predominantly piceous (Venezuela: Trujillo) . . . . . *P. bolivari*, n. sp.

31′. Epipleural margin predominantly light castaneous, sometimes with disconnected faint infuscations; metafemur predominantly or entirely flavotestaceous (Costa Rica: Alajuela. Panama: Panama) . . . . . *P. auratilis*, n. sp.

32(29′). Ninth antennomere abruptly narrowed distally (fig. 208) 33

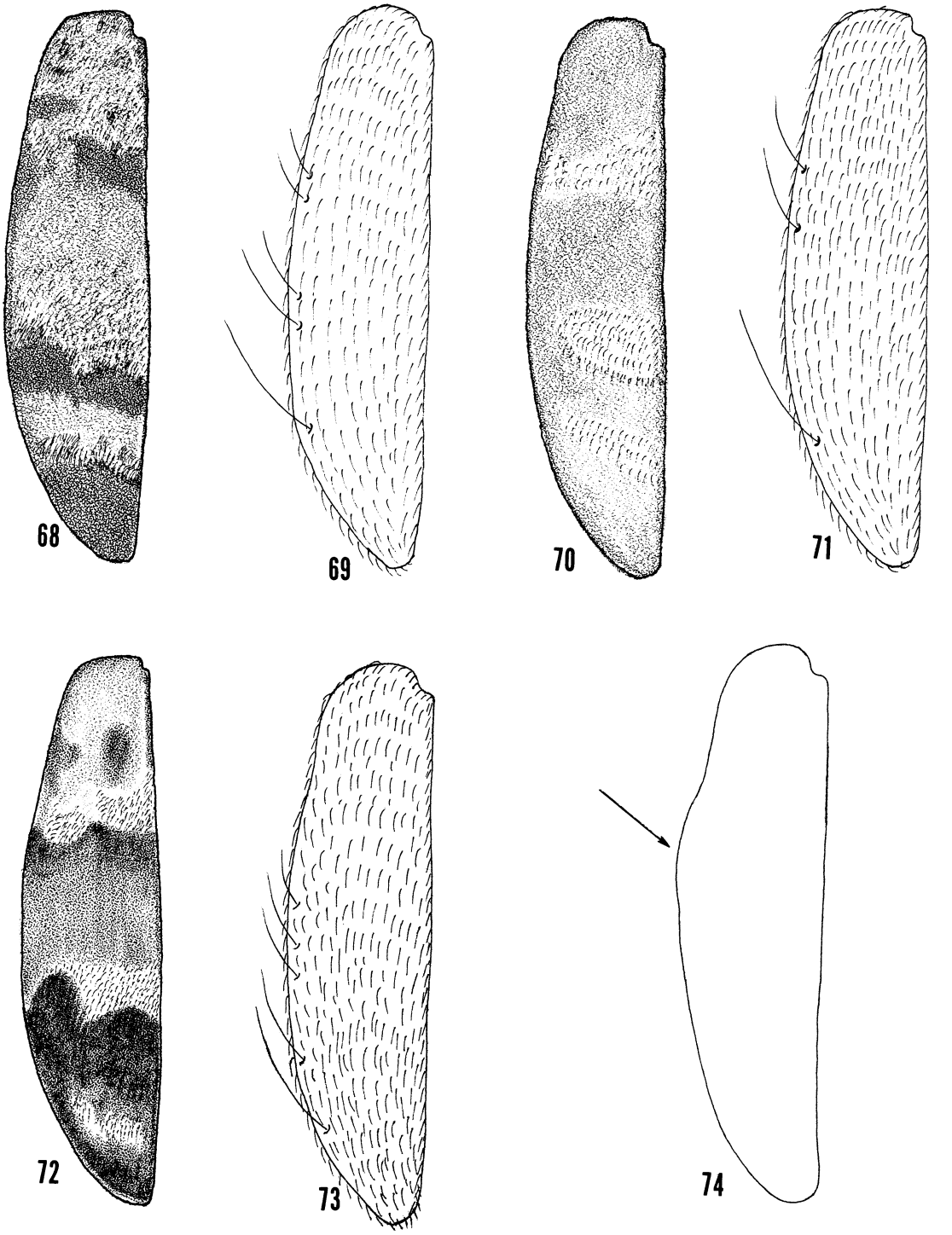
32′. Ninth antennomere more gradually narrowed distally (fig. 211) 34

33(32). Margin of tenth antennomere sinuous (fig. 167) (Trinidad) . . . . . *P. insula*, n.sp.

33′. Margin of tenth antennomere not sinuous (fig. 169) (Bolivia: Santa Cruz) . . . . . *P. selva*, n.sp.

34(32′). Light regions of elytra light castaneous; tegmen long, not explanate at base (fig. 117) (Mexico to Brazil) . . . . . *P. sericella* Spinola

34′. Light regions of elytra approaching roseate; tegmen short, explanate at base (fig. 174) (Brazil: Rondonia) . . . . . *P. sericellopsis*, n. sp.



Figs. 68–74. Elytra. **68, 69,** *Plocamocera argentea*. **70, 71,** *P. lucis*. **72, 73,** *P. sesquipedalis*. **74,** *P. auratilis*.

DESCRIPTION OF *PLOCAMOCERA* SPECIES

MANAUSENSIS GROUP

Plocamocera salasis, new species

Figures 139, 171, 186; map 6

HOLOTYPE: Male. Brazil: Amazonas: Manaus, 1 km W Taruma Falls, 19-I-1981, W. Opitz (MZSP). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed; natural history label, white, cursive; MZSP repository label, white, machine printed; holotype label, red, machine printed; plastic vial with pygidium and aedeagus.)

PARATYPES: Four specimens from the same locality as the holotype (CMNH, 1; WOPC, 3).

DIAGNOSIS: Within the *manausensis* group only members of this species have the cranium bicolorous. The periphery of the cranium is castaneous, the remainder piceous.

DESCRIPTION: *Size*: Length 3.4–3.8 mm; width 1.1–1.3 mm. *Integument*: Cranium bicolorous, peripheral areas castaneous, remainder piceous; pronotum bicolorous, disc piceous, peripheral areas castaneous; elytra variegated, flavous humeral macula bifurcated posteriorly, postmedial flavous macula fasciate, three irregular aggregates of white setae, piceous regions with dark setae; legs flavous. *Head*: Antenna as in figure 139. *Thorax*: Pronotal anterior margin moderately projected at middle; discal swellings prominent; elytral epipleural margin with three conspicuous trichobothria; protibial anterior margin with three spines. *Abdomen*: Male and female pygidium broad-scutiform, truncate (as in fig. 97); aedeagus (fig. 171) lanceolate.

VARIATION: The castaneous portions of the cranium may be reduced to narrow peripheral regions.

NATURAL HISTORY: The available specimens were collected from the Amazon Basin during December, on felled tree trunks of *Manilkara*, at an altitude of 100 m.

DISTRIBUTION (map 6): Known only from the type locality.

ETYMOLOGY: The trivial name *salasis* is derived from the Latin *salio* (leap). I refer the specific epithet to the peculiar jumping behavior of these beetles.

Plocamocera manausensis, new species

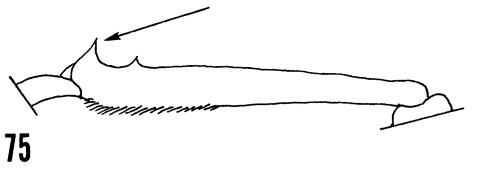
Figures 45, 62, 63, 80, 94, 107, 115, 140, 183; map 6

HOLOTYPE: Male. Brazil: Amazonas: Manaus, 1 km W Taruma Falls, 100 m, 19-I-1981, primary forest, on bark, day, G. Ekis (now W. Opitz) (MZSP). (Specimen point mounted, sex label affixed to paper point, white, cursive; support card, white; locality label, white, cursive; collector label, white, cursive; natural history label, white, cursive; holotype label, red, cursive; plastic vial with aedeagus.)

PARATYPES: One hundred seventy specimens from the same locality as the holotype (AMNH, 2; BMNH, 1; CASC, 1; CMNC, 1; CMNH, 1; CNCI, 1; CSUC, 1; CUIC, 1; DEIC, 1; EMEC, 1; EMUS, 1; FMNH, 1; FSCA, 1; IMLA, 1; INBC, 1; INHS, 1; INSB, 1; IZAV, 1; JEWC, 1; JNRC, 1; LACM, 1; MCZC, 1; MLPA, 1; MMEC, 1; MNHN, 1; MRSN, 1; MSUC, 1; MZSP, 1; OSEC, 1; OSUC, 1; OSUO, 1; PMNH, 1; PURC, 1; QCAZ, 1; RFMC, 1; RHTC, 1; SEAN, 1; SEMC, 1; TAMU, 1; TUMC, 1; UCDC, 1; UMMZ, 1; UMRM, 1; UMSP, 1; USNM, 1; WFBC, 1; WFBM, 1; WOPC, 117; WSUC, 1; ZMAN, 1; ZMHB, 1). Brazil: Rondonia: 62 km SW Ariquemes, nr. Fzda. Rancho Grande, 10-17-V-1995, K. Vulinec, blacklight trap (FSCA, 1).

DIAGNOSIS: The members of this species can be conveniently distinguished from the members of other *P. manausensis* species by the extraordinary slender condition of the antennal club (fig. 45).

DESCRIPTION: *Size*: Length 2.8–3.5 mm; width 1.0–1.2 mm. *Integument*: Cranium black; pronotum predominantly piceous, periphery castaneous; elytra variegated (fig. 62), flavous posthumeral macula bifurcated posteriorly, postmedial flavous macula fasciate, apex flavous, flavous portions of disc densely matted with yellow setae, piceous portions of disc vested with dark setae; legs flavous. *Head*: Antenna as in figure 45. *Thorax*: Pronotal anterior margin moderately projected at middle; discal swellings not very prominent; elytral epipleural margin with three conspicuous trichobothria (fig. 63); protibial anterior margin with five spines (fig. 80). *Abdomen*: Male pygidium broad-scuti-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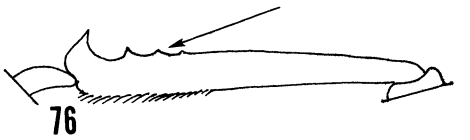
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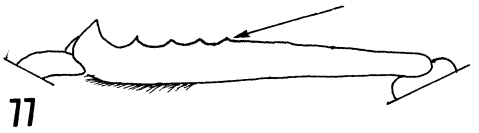
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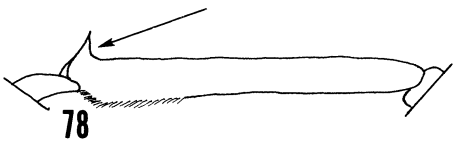
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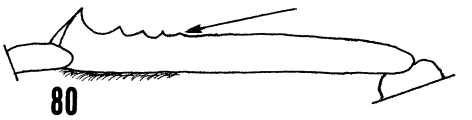
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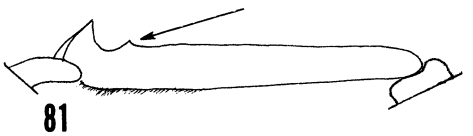
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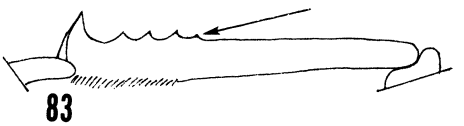
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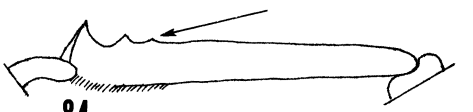
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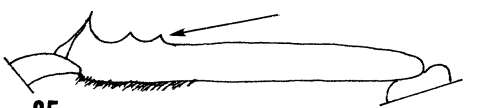
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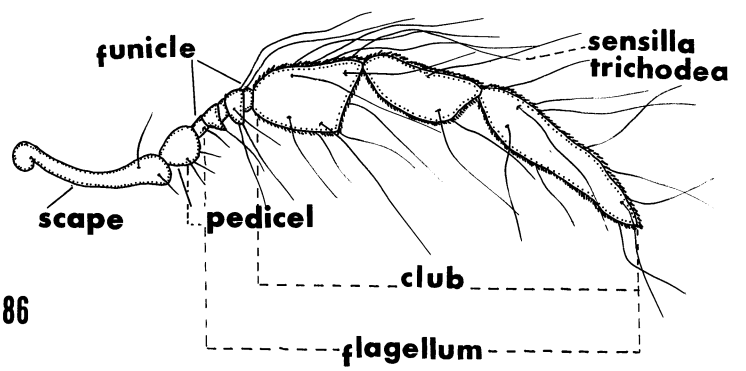

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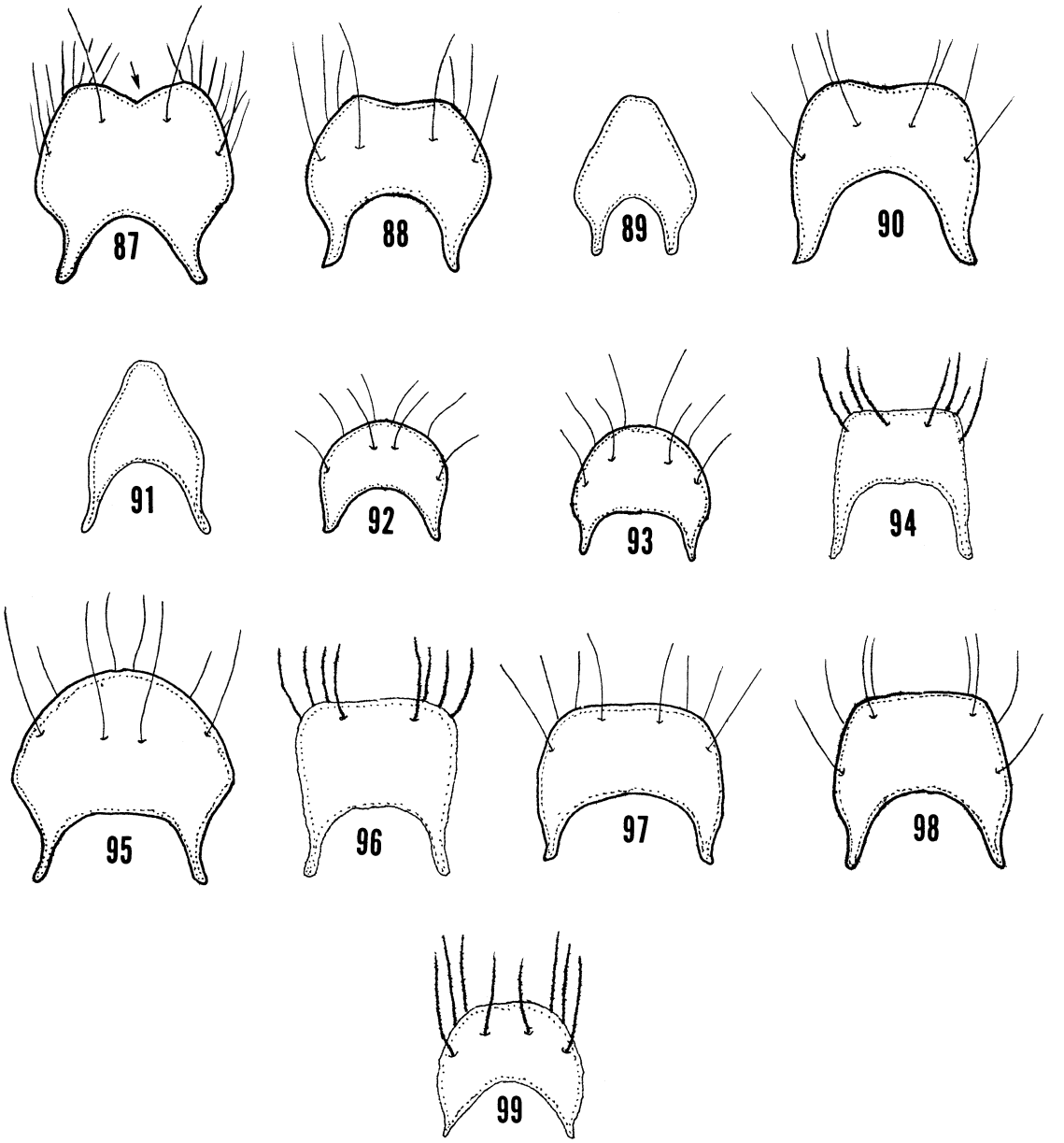
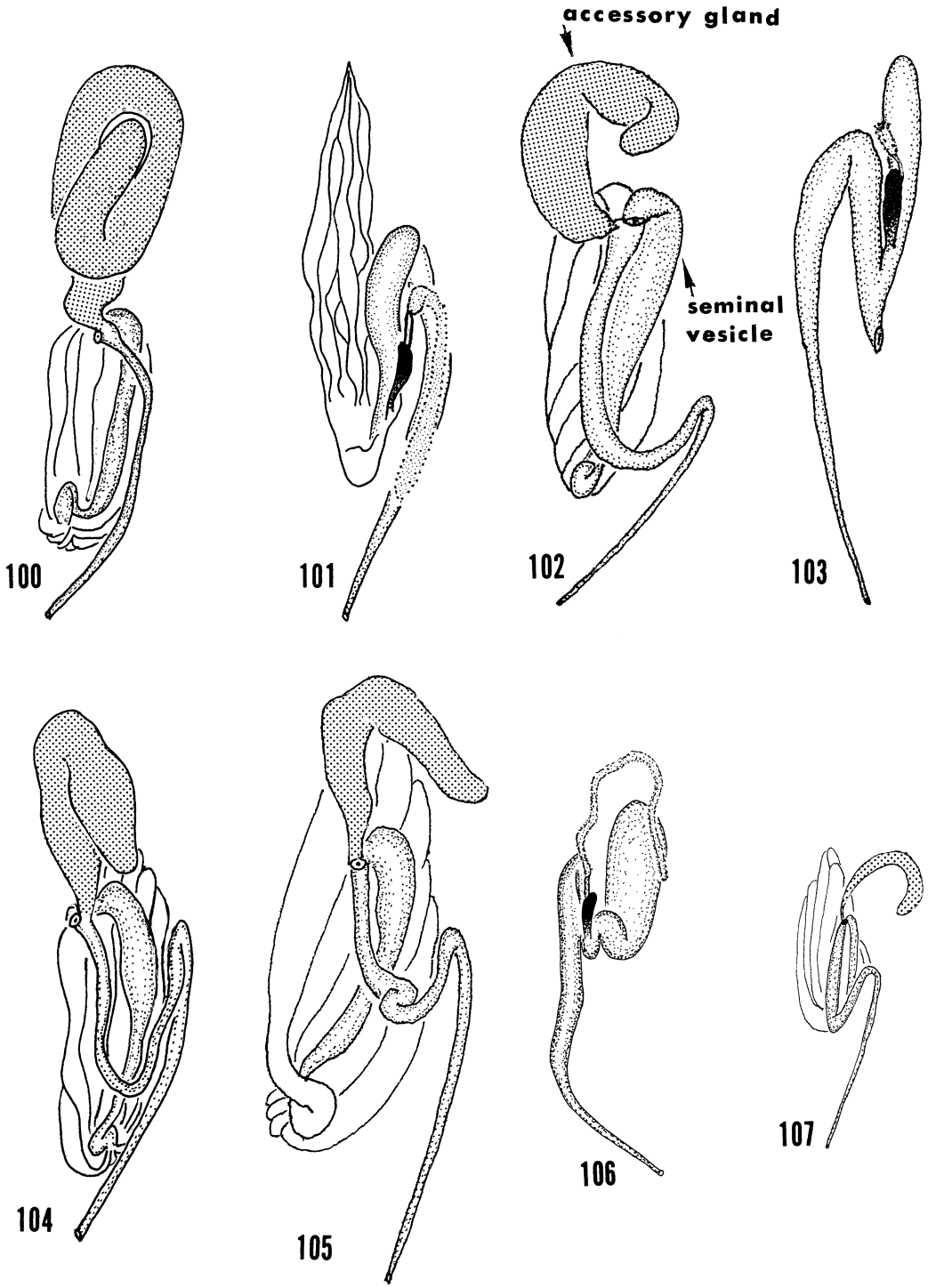


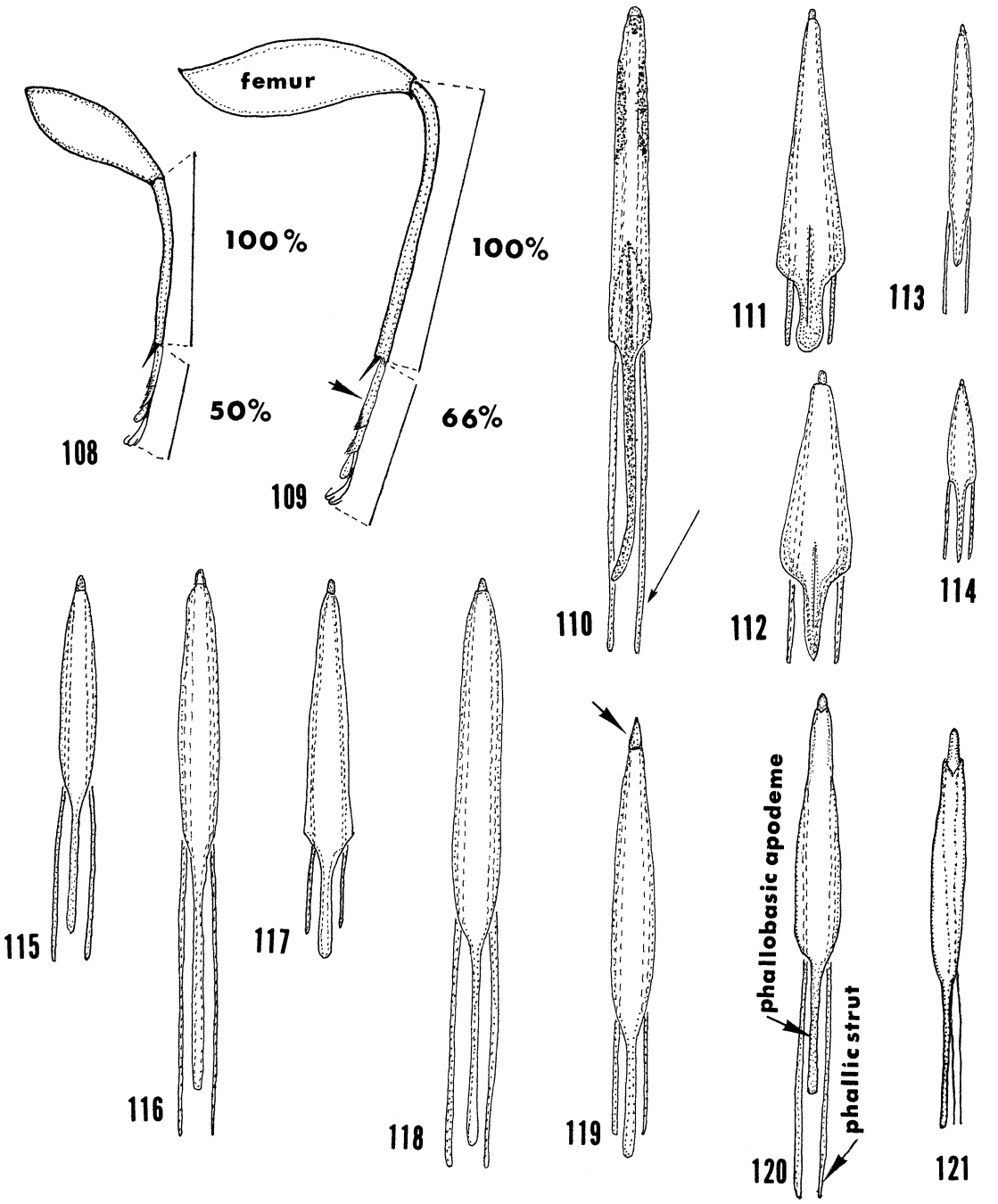
Figs. 87–99. Pygidia. **87.** *Plocamocera castanea*, male. **88, 89.** *P. pupula*, male (88), female (89). **90, 91.** *P. confrater*, male (90), female (91). **92.** *P. aliguantula*. **93.** *P. minima*. **94.** *P. manausensis*, male. **95.** *P. coactilis*, male. **96.** *P. sericella*, male. **97.** *P. argentea*, male. **98.** *P. lucis*, male. **99.** *P. sesquipedalis*, male.

←

Figs. 75–86. Protibiae. **75.** *Plocamocera castanea*. **76.** *P. pupula*. **77.** *P. confrater*. **78.** *P. aliguantula*. **79.** *P. minima*. **80.** *P. manausensis*. **81.** *P. auratilis*. **82.** *P. sericella*. **83.** *P. argentea*. **84.** *P. lucis*. **85.** *P. sesquipedalis*. **86.** Antenna. *P. pupula*.



Figs. 100–107. Internal reproductive organs. **100, 101.** *Plocamocera castanea*. 100 male, 101 female**. 102, 103.** *P. confrater*, male (102), female (103). **104.** *P. coactilis*, male. **105, 106.** *P. lucis*, male (105), female (106). **107.** *P. manausensis*, male.



Figs. 108–121. Metathoracic legs, **108.** *Plocamocera sericella*, **109.** *P. sesquipedalis*, 110–120. Aedeagi, **110.** *P. castanea*, **111.** *P. pupula*, **112.** *P. confrater*, **113.** *P. aliguantula*, **114.** *P. minima*, **115.** *P. manausensis*, **116.** *P. coactilis*, **117.** *P. sericella*, **118.** *P. argentea*, **119.** *P. lucis*, **120.** *P. sesquipedalis*. **121.** *P. selva*.

form, somewhat truncate (fig. 94), female pygidium broad-scutiform; aedeagus lanceolate (fig. 115); male internal reproductive organs as in figure 107.

VARIATION: Except for the slight tone variation of elytral color, the available specimens are quite homogenous.

NATURAL HISTORY: These beetles were collected from the environs of Manaus, Brazil, in January, on bark of *Manilkara,* during day and night.

DISTRIBUTION (map 6): Known only form the type locality.

ETYMOLOGY: The name *manausensis* constitutes a noun in apposition and refers to the type locality.

Plocamocera iota, new species

Figures 149, 185; map 6

HOLOTYPE: Female. Brazil: Matto Grosso: Rio Caraguata, 21°48′; 52°27′, XI-15–1953, 400 meters, Fritz Plaumann (FMNH). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine and hand printed; FMNH repository label, white, machine printed; holotype label, red, machine printed.)

PARATYPE: None.

DIAGNOSIS: The robustness of the antennal club antennomeres (fig. 149) distinguish the members of this species within the *manausensis* species group.

DESCRIPTION: *Size*: Length 3.5 mm; width 1.2 mm. *Integument*: Cranium black; pronotum predominantly piceous, borders castaneous; elytra variegated, disc somewhat roseate, with flavotestaceous fascia only faintly visible, three irregular patches of white setae, setae on piceous regions of elytral disc gold to dark brown; legs bicolorous, pro-mesofemora piceous at middle, flavotestaceous at extremities, metafemora flavotestaceous in basal half, piceous in remainder, tibiae increasingly infuscated from pro-to metatibiae; tarsus flavotestaceous. *Head*: Antennal club as in figure 149. *Thorax*: Pronotal anterior margin projected at middle, disc shallowly tumescent at middle, arch scabrous; epipleural margin with four conspicuous trichobothria. *Abdomen*: Female pygidium broad scutiform, somewhat truncated.

VARIATION: Not observed.

NATURAL HISTORY: The holotype, the only available specimen of this species, was collected from Central Brazil, during November, at 400 m.

DISTRIBUTION (map 6): Central Brazil.

ETYMOLOGY: The specific epithet, *iota,* is a Greek adjectival that describes ''anything very small''. I refer to the small body size of this beetle.

Plocamocera aliguantula, new species

Figures 43, 58, 59, 78, 92, 113; map 5

HOLOTYPE: Male. Costa Rica, F. Nevermann, 31-VI-24, Hamburgfarm, Reventazon, Ebene Limon, an trocken Holz, *Inga* (USNM). (Specimen point mounted, sex label and left antenna affixed to paper point, white, cursive; support card, white; two locality labels, green, machine and hand printed; natural history label, beige, machine and hand printed; USNM repository label, white, machine printed; holotype label, red, machine printed; plastic vial with aedeagus and abdomen.)

PARATYPES: Twenty-four specimens from the same locality as the holotype (BMNH 1; FMNH 2; USNM 16; WOPC, 5).

DIAGNOSIS: The single tibial spine on the protibia serves to identify members of this species. The males are also identified by the configuration of the phallobasic apodeme of the tegmen. Unlike in specimens of *P. manausensis* and *P. minima,* in which the phallobasic apodeme is slender and elongated, in *P. aliguantula* specimens the apodeme is short and obtuse (figs. 113–115).

DESCRIPTION: *Size***:** Length 3.0–3.7 mm; width 1.0–1.4 mm. *Integument*: Cranium piceous, pronotum flavotestaceous at sides, disc with large piceous macula; elytra (fig. 58) with flavotestaceous humeral and discal macula, and with three setal fascia; legs flavotestaceous. *Head*: Antenna as in figure 43. *Thorax*: Anterior margin of pronotum projected at middle, discal swellings very shallow; elytra with three conspicuous trichobothria on epipleural margin (fig. 59); anterior margin of protibia with one spine (fig. 78). *Abdomen*: Male pygidium (fig. 92) posterior margin evenly arcuate; aedeagus (fig.

113) with short and obtuse phallobasic apodeme.

VARIATION: The dark fascies of the dorsum is more pronounced in some specimens.

NATURAL HISTORY: Twenty-four specimens were collected on dry wood (an trockenem holtz, *Inga*) from species of *Inga* and *Guarea*, during July. One specimen was collected during April.

DISTRIBUTION (map 5): Known only from Central Costa Rica.

ETYMOLOGY: From *aliguantulus*, a Latin adjective meaning ''little''. I refer to the small size of these beetles.

Plocamocera minima, new species

Figures 44, 60, 79, 93, 114; map 5

HOLOTYPE: Male: Panama: Canal Zone: Barro Colorado Is., 8°10′ North 79°50′ West, 5-IV-1973, H.A. Hespenheide (AMNH). (Specimen point mounted, sex label affixed to paper point, white, cursive; support card, white; locality label, white, machine printed; collector label, white, machine printed; natural history label, white, cursive; holotype label, red, machine printed; plastic vial with aedeagus.)

PARATYPES: Fifteen specimens from the same locality as the holotype (AMNH, 1; BMNH, 1; CNCI, 1; FMNH, 1; MCZC, 1; MNHN, 1; OSUC; 1; WFBM, 1; WOPC, 7).

DIAGNOSIS: The most reliable characteristic that distinguishes the members of this species from members of the closely related *P. aliguantula* and *P. manausensis* is the shape of the tegmen of the male genitalia. In *P. minima* the aedeagus (fig. 114) is proportionally small and the phallobasic apodeme is about as long as the length of the phallobase.

DESCRIPTION: *Size*: Length 3.0–3.6 mm; width 1.0–1.2 mm. *Integument*: Cranium black; pronotum predominantly piceous, periphery castaneous; elytra variegated, flavous humeral macula well developed, post medial flavous macula transverse; flavous portions of disc densely matted with white setae, piceous portion vested with dark setae; legs flavous. *Head*: Antenna as in figure 44. *Thorax*: Pronotal anterior margin moderately projected anteriorly, discal swellings shallow; elytra without distinct trigonal post-humeral macula (fig. 60); elytral epipleural margin with four conspicuous trichobothria; protibial anterior margin with four spines. *Abdomen*: Male pygidium broad-scutiform, subtruncate, female pygidium broad-scutiform; aedeagus as in figure 114.

VARIATION: Except for tone variation involving elytral color the available specimens do not vary significantly.

NATURAL HISTORY: These beetles were collected from the type locality during April through July, form species of *Inga*.

DISTRIBUTION (map 5): *Plocamocera minima* specimens are known only from the type locality.

ETYMOLOGY: From the Latin adjective *minimus* (smallest). I refer to the small size of these beetles.

SESQUIPEDALIS GROUP

Plocamocera prolixa, new species

Figures 142, 170; map 7

HOLOTYPE: Male. Costa Rica: Alajuela, 20 km S. Upsula, 13–Dec.–1990, F. D. Parker (INBC). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed; INBC repository label; holotype label, red, machine printed; plastic vial with abdomen and aedeagus.)

PARATYPES: None.

DIAGNOSIS: The dense patches of golden setae on the elytral disc will distinguish these beetles from any other known specimens of the *latefasciatus* group.

DESCRIPTION: *Size*: Length 4.0 mm; width 1.3 mm. *Integument*: Predominantly castaneous, frons broadly infuscated; pronotum predominantly piceous, borders castaneous; elytra predominantly light castaneous, narrowly piceous along epipleural margin, across middle, and near apex, flavotestaceous regions matted with golden setae; legs flavotestaceous. *Head*: Antenna as in figure 142. *Thorax*: Pronotal anterior margin prominently projected anteriorly; elytral epipleural margin with three conspicuous trichobothria; protibial anterior margin with three spines; metabasitarsus twice length of metatarsomere two. *Abdomen*: Male pygidium broad-scutiform, truncate distally; aedeagus lanceolate (fig. 170).

VARIATION: One specimen examined.

NATURAL HISTORY: The holotype was collected from Costa Rica in December.

DISTRIBUTION (map 7): Central Costa Rica.

ETYMOLOGY: The trivial name *prolixa* stems from the Latin adjectival *prolixus* (stretched out). I refer to the extraordinary length of the metabasitarsus.

Plocamocera sesquipedalis, new species

Figures 50, 72, 73, 85, 99, 109, 120, 138, 190, 196; map 5

HOLOTYPE: Male. Guyana: Demerara: Ikuribisi, X-1948–III-1949, D. J. Atkinson (BMNH). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, beige, machine printed; natural history label, beige, machine printed, donation label, beige, machine printed; BMNH repository label, white, machine printed; holotype label, red, machine printed; plastic vial with aedeagus.)

PARATYPES: Thirty-four specimens; 22 from the same locality as the holotype (BMNH, 16; WOPC, 6). Guyana: Bartica: 15-V-1924 (AMNH, 1). Guyana (''British Guiana'') (CMNH, 1). Peru: Loreto, Estiron. Rio Ampiyacu. XI-13 to XII-9, 1961, B. Malkin leg (FMNH, 6; WOPC, 3). Peru: Tambopata: Madre de Dios, 15 km NE Puerto, Maldonado Reserva, Cuzco Amozonico, 12°33′, 69°03′, 200 m, 17-VII-1989, J. S. Ashe, R. A. Leschen, caught by handnet (EMEC, 1).

DIAGNOSIS: Within the *sesquipedalis* group, the members of this species closely resemble those of *P. similis*, Opitz, new species, from which males can be reliably distinguished by the shape of the apex of the phallus. The latter is digitiform in P. *sesquipedalis* beetles and trigonal in *P. similis* beetles. Females of these two species are virtually undistinguishable.

DESCRIPTION: *Size*: Length 3.7–4.5 mm; width 1.4–1.8 mm. *Integument*: Cranium predominantly castaneous, frons and vertex infuscated. Pronotum light cataneous; elytra variegated, flavotestaceous humeral macula not tripartite, spheroid posthumeral macula prominent (fig. 72), middle of disc faintly infuscated, elytral apical third piceous, disc with three patches of white setae; legs predominantly flavotestaceous, tibiae and femora variously infuscated. *Head*: Antenna as in figure 50. *Thorax:* Pronotal collar prominently defined, disc notably swollen; bristles on elytral disc, sutural margin, and epipleural margin particularly robust; elytral epipleural margin with five conspicuous trichobothria (fig. 73); metacoxa and metafemur (fig. 109) particularly robust; metabasitarsus twice length of metatarsal segment two (fig. 109). *Abdomen*: Male (fig. 99) and female pygidia broad-scutiform, female pygidium somewhat narrowed distally; aedeagus as in figure 120; ovipositor extraordinarily elongate.

VARIATION: The infuscation on the frons, vertex, legs, and elytral disc vary in intensity.

NATURAL HISTORY: The available specimens were collected during October, November, and December; the series from Ikuribisi on *Eschwellera sagotianum*. The two specimens from Rondonia, Brazil were collected at an altitude ranging from 160–350 m.

DISTRIBUTION (map 5): This South American species is known from Guyana, French Guiana, Ecuador, Peru, and Brazil.

ETYMOLOGY: The specific epithet stems from the Latin *sesquipes* (having a measure of one and a half) and the Latin suffix *-alis* (condition of). I refer to the extraordinary length of the metafemur.

Plocamocera lucis, new species

Figures 51, 70, 71, 84, 98, 105, 106, 119, 137; map 5

HOLOTYPE: Male. Brazil: Matto Grosso: Sinop, Coordenadas, X-74, 350 m, M. Alvarenga (MZSP). (Specimen point mounted, sex label and metathoracic leg and antenna affixed to paper point; sex label, white, machine printed, pygidium affixed to sex label; support card, white, cursive; locality label, white, cursive; MZSP repository label, white machine printed; holotype label, red, machine and hand printed; plastic vial with aedeagus and internal reproductive organs.)

PARATYPES: Six specimens; five from the same locality as the holotype (JNRC, 1; WFBC, 1; WOPC, 3). Brazil: Matto Grosso, 12°31′ 55°37′, X-1974, M. Alvarenga (MEMU, 1).

DIAGNOSIS: The members of this species are conveniently distinguished from all oth-

ers of the *sesquipedalis* group by the following combination of characteristics: elytral integument stramineous; elytral disc (fig. 70) with three faintly indicated white setal fasciae; pronotum broadly piceous; and mesoscutellum piceous.

DESCRIPTION: *Size*: Length 5.0–5.5 mm; width 1.5–2.0 mm. *Integument*: Cranium light castaneous, densely vested with golden-yellow setae; pronotum predominantly castaneous, disc broadly piceous; mesoscutellum piceous; elytra stramineous, disc with faintly visible flavous fascia (fig. 70), vested with two patches of white setae; legs flavotestaceous, femora and tibiae slightly infuscated. *Head*: Antenna as in figure 51, last article prominently sinuous. *Thorax*: Pronotal anterior margin moderately projected at middle, pronotal collar prominent, discal swellings prominent; stout elytral bristles particularly prominent; elytral epipleural margin with three conspicuous trichobothria (fig. 71); protibial anterior margin with three spines (fig. 84); metabasitarsus twice length of metatarsal segment two. *Abdomen*: Male pygidium broad-scutiform, truncated (fig. 98); female pygidium trigonal-scutiform; aedeagus as in figure 119, phallic apex conspicuously elongated. *Internal Reproductive Organs*: Male as in figure 105, female as in figure 106.

VARIATIONS: The extent of infuscation on the legs varies in intensity.

NATURAL HISTORY: Specimens were collected from the type locality in October, at 350 m. One of these beetles was taken in a Malaise trap.

DISTRIBUTION (map 5): Specimens are known only from the highlands of Matto Grosso, Brazil.

ETYMOLOGY: The Latin adjectival *lucis* (light) was chosen to accentuate the stramineous coloration of the integument.

***Plocamocera similis*,** new species

Figure 58, 59, 158, 177, 189; map 7

HOLOTYPE: Male. Ecuador: Pichincha: 18 km S Tinalandia, 28-IV-1978, L. & C. W. O'Brien & Marshall (QCAZ). (Specimen point mounted, antenna and sex label affixed to paper point, white, machine printed; support card, white; locality label, white; machine printed; QCAZ repository label, white, machine printed; holotype label, red machine printed; plastic vial with abdomen and aedeagus.)

PARATYPES: One specimen from the same locality as the holotype (WOPC, 1).

DIAGNOSIS: These beetles are very similar to those of *P. sesquipedalis*, new species. The males of these two species are most reliably distinguished by the shape of the apex of the phallus which is in *P. similis* n. sp. and lobate in *P. sesquipedalis*, n. sp. Females, and males, have the eighth antennomere subrectangulate rather than subovate as is the case in most of the *P. sesquipedalis* specimens. Females of *P. similis*, from the more southern latitudes, may be undistinguishable from females of *P. sesquipedalis*.

DESCRIPTION: *Size*: Length 4.1–4.5 mm; width 1.6–1.8 mm. *Integument*: Cranium castaneous, frons broadly piceous, scape flavotestaceous, remainder of antenna brunneus; pronotum light castaneous, disc infuscated; elytra variegated, anterior two-thirds predominantly brunneus, basal third with spheroid macula near sutural margin, middle transversely, irregularly infuscated, flavous humeral fascia indistinct, three irregular aggregates of white setae, middle aggregate broad, disc also with brown and piceous setae (fig. 58), elytral epipleural margin with three conspicuous trichobothria (fig. 59); legs bicolorous, predominantly flavotestaceous, prometafemora predominantly flavotestaceous, feebly infuscated on anterior surface, mesofemur entirely flavotestaceous, tibia and tarsus flavotestaceous. *Head*: Antenna as in figure 158. *Thorax*: Pronotal anterior margin projected at middle, disc shallowly tumescent, pronotal arch scabrous; elytral epipleural margin feebly serrulate and with eight conspicuous trichobothria; protibial anterior margin with three spines. *Abdomen*: Male and female pygidium broad -scutiform; aedeagus (fig. 177) lanceolate.

VARIATION: The paratype specimen does not vary appreciably from the holotype specimen except for the sexual dimorphic nature of abdominal color.

NATURAL HISTORY: The O'Brien expedition to Ecuador provided the two available specimens collected by beating, during May.

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: The trivial name *similis* (resembling) is a Latin adjectival that is herein used to accentuate the close similarity between these beetles and those of *P. sesquipedalis*.

CASTANEA GROUP

Plocamocera castanea, new species

Figures 40, 52, 53, 75, 87, 100, 101, 110, 144, 187, 213; map 1

HOLOTYPE: Male. Brazil: Goias: Jatai Goias, X-1972, F. M. Oliveira (MZSP). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white, cursive; holotype label, red, machine and hand printed; plastic vial with aedeagus.)

PARATYPES: Twenty-five specimens; two from the same locality as the holotype (WOPC, 2). Trinidad: Saint Andrew County: Guaico (Sangre Grande), W. I., 12-VII-1989, H. & A. Howden (CMNC, 1; WOPC, 1). French Guiana: Cayenne: Passoura, II-1907 (MNHN, 1; WOPC, 2); Gourdonville, IX-1906, E. Le Moult (MNHN, 1; WOPC, 1); Pariacabo, VII, E. Le Moult (BMNH, 1; MNHN, 1). Bolivia: Cochabamba: Bolivia tropica, Region Chapare, 15-VIII-1950, 400 m, R. Zischka leg (FMNH, 1). Ecuador: Napo: 2 km NE Ahuano, 6–15-IX-2000, F. T. Hovore, (JNRC, 1: WOPC, 1); 25 km NE Campo Cocha, 16-IV-1999, F. Hovore (JNRC, 2; WOPC, 1); 25 km E. of Alinahui, 450 m, I–II-1991, Puerto Napo, Selva, Edward S. Ross (CASC, 1); Yasuni Res. Sta., 19-30-IX-1998, 250 m, O°38′S, 6°36′W, W. J. Hanson (EMUS, 2; WOPC, 1). Peru: Amazonas (MNHN, 1) Brazil: Amazon, Bates (BMNH, 1); Santarem, Acc. No. 2966 (CMNH, 1); Amazones, Manes, Dr. Hahnel (MNHN, 1).

DIAGNOSIS: These beetles may be diagnosed on the basis of the antennal club articles (fig. 40), elytral shade and setal pattern (fig. 52), and shape of the male pygidium (fig. 87). Antennal articles eight and nine have the distal margin concave. The last article of the antennal club is as long as the combined length of articles eight and nine. The shades and setal patterns on the elytron are as in figure 52. The male pygidium is deeply incised at its posterior margin.

DESCRIPTION: *Size*: Length 7.0–8.0 mm; width 2.4–3.0 mm. *Integument*: Cranium castaneous, vertex infuscated; pronotum castaneous, disc with central piceous macula; elytral margins piceous, disc pale brunneus, with setal fascia as in figure 52; legs bicolorous, protibia predominantly piceous, mesotibia flavotestaceous, and metatibia flavotestaceous in basal half and piceous in distal half; abdomen flavous in females. *Head*: Antenna as in figure 40. *Thorax*: Pronotal anterior margin projected at middle, discal swellings prominent; elytral epipleural margin with seven conspicuous trichobothria (fig. 53), disc vested with three setal fascia; protibial anterior margin with two spines (fig. 75). *Abdomen*: Male pygidium broad-scutiform, somewhat truncate; aedeagus (fig. 110) with phallus considerably longer than tegmen and with outer margin of tegmen base considerably angular (fig. 213). *Internal Reproductive Organs*: Male as in figure 100, female as in figure 101.

VARIATIONS: The specimen from Bolivia has a third spine on the anterior margin of the protibia. Also, the cranial infuscation varies in intensity as does the general castaneous shade of the elytra.

NATURAL HISTORY: Specimens were collected from Bolivia during August at 400 m, from Ecuador during February (450 m) and April, and from Brazil in November. In Ecuador, at 250 m, Wilford J. Hanson collected three specimens with a Malaise trap draped over recently felled tree trunks (fig. 181).

DISTRIBUTION (map 1): This species is known from Bolivia and the Amazonian region of Ecuador, Peru, and Brazil.

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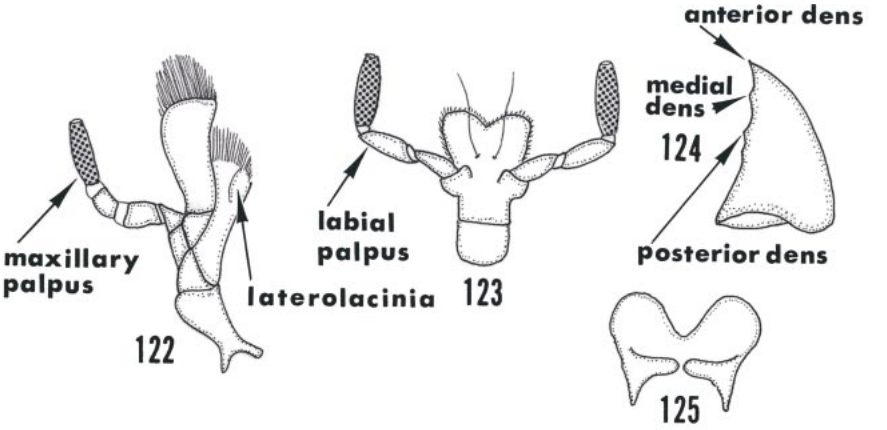
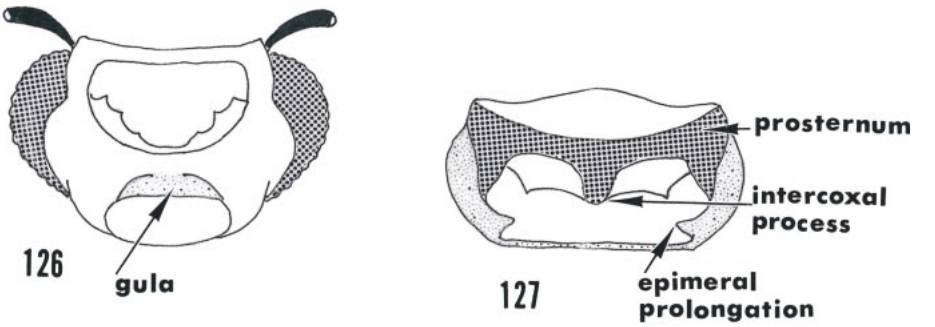
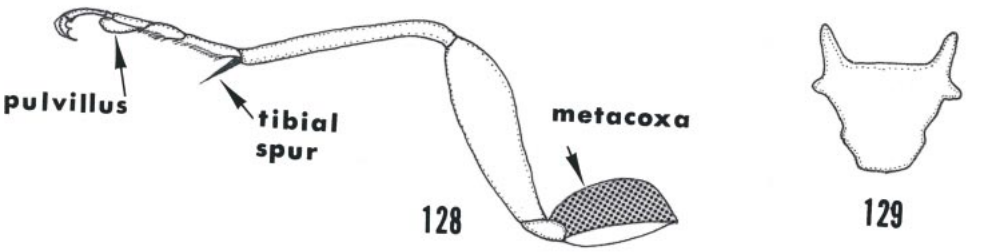
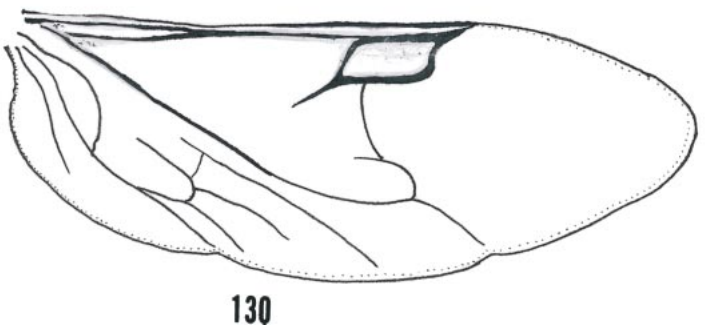
Figs. 122–130. *Plocamocera pupula*. **122.** Maxilla. **123.** Labium. **124.** Mandible. **125.** Labrum. **126.** Head (ventral view). **127.** Prothorax (ventral view). **128.** Metathoracic leg. **129.** Mesoscutellum. **130.** Metathoracic wing.









ETYMOLOGY: Latin, the adjectival *castanea* (chestnut). The trivial name refers to the color of the dorsal facies of these beetles.

CONFRATER GROUP

Plocamocera pupula, new species

Figures 41, 54, 55, 76, 86, 88, 89, 111, 122–132, 145, 194; map 5

HOLOTYPE: Male. Brazil: Matto Grosso: Sinop, X–1975, M. Alvarenga (MZSP). (Specimen point mounted, sex label affixed to paper point, white, hand printed, pygidium and eighth abdominal sternum glued to paper point; support card, white; locality label, white, cursive; plastic vial with aedeagus; holotype label, red, machine and hand printed.)

PARATYPES: Twelve specimens collected from the same locality as the holotype (AMNH, 1; BMNH, 1; CASC, 1; CNCI, 1; FMNH, 1; MCZC, 1; MNHN, 1; USNM, 1; WFBM, 1; WOPC, 3).

DIAGNOSIS: Within the *confrater* species group these beetles are readily identified by pronotal disc with piceous trigonal macula; elytra with piceous macula behind basal tumescence (fig. 54); antennal article eight and nine rectangulate (fig. 41); protibia with three spines (fig. 76); male pygidium broad-scutiform (fig. 88) feebly emarginate at posterior margin, female pygidium trigonal-scutiform (fig. 89); and aedeagus sagittate (fig. 111).

DESCRIPTION: *Size*: Length 6.0–8.0 mm; width 2.3–3.0 mm. *Integument*: Cranium castaneous; pronotum castaneous, disc with large trigonal macula; elytra (fig. 54) with piceous punctiform macula behind basal tumescence, setal fascia sinuous in posterior two-thirds; legs bicolorous, predominantly flavotestaceous, pro–mesofemur infuscated anteriorly, metafemur infuscated anteriorly, tibia and tarsus predominantly piceous; abdomen flavous in females, brunneus in males. *Head*: Antenna as in figure 41. *Thorax*: Pronotal anterior margin projected at middle; elytral epipleural margin with six conspicuous trichobothria (fig. 55), disc vested with two setal fascia; protibial anterior margin with four spines (fig. 76). *Abdomen*: Male pygidium broad-scutiform, feebly incised (fig. 88), female pygidium trigonal-scutiform (fig. 89); aedeagus (fig. 111) sagittate.

VARIATIONS: In some specimens there is an indication of a fifth spine on the anterior margin of the protibia, and the cranium and vertex may be infuscated. The piceous markings on the elytra vary in intensity.

NATURAL HISTORY: The available specimens were collected from Central Brazil, in October.

DISTRIBUTION (map 5): This species is known only from central Brazil.

ETYMOLOGY: Latin, the noun *pupula* (pupil of the eye). I refer to the piceous macula behind the basal tumescence of the elytra.

Plocamocera quadrula, new species

Figures 146, 188, 179; map 7

HOLOTYPE: Male. Brazil: Matto Grosso: Sinop, X-1995, M. Alvarenga (AMNH). (Specimen point mounted, antenna and machine printed sex label affixed to paper point, white; locality label, white, hand printed; AMNH repository label, white machine printed; holotype label, red, machine printed; plastic vial with abdomen.)

PARATYPES: None.

DIAGNOSIS: Along with *P. pupula*, *P. quadrula* is the only other known species of the *confrater* group whose specimens do not have the distal narrowing of antennomere eight. Specimens of *P. quadrula* do not have the distal margin of antennomere eight feebly concave (fig. 146), which is the case in *P. pupula* specimens (fig. 145). Also, in *P. pupula* specimens the tenth antennomere is nearly twice as long as antennomere nine.

DESCRIPTION: *Size*: Length 5.7 mm; width 2.0 mm. *Integument*: Predominantly castaneous, frons feebly infuscated; pronotum predominantly castaneous, disc infuscated; elytra variegated, with flavotestaceous humeral macula oblique, with three irregular aggregates of white setae, golden setae abundant along sutural margin and in piceous regions of disc; legs flavotestaceous, metafemora faintly infuscated on inner distal surface. *Head*: Antennal club as in figure 146. *Thorax*: Anterior margin of pronotum boldly projected at middle; discal swellings prominent; elytral epipleural margin with five conspicuous trichobothria; protibial anterior margin with five spines, the second and third

contiguous. *Abdomen*: Male pygidium broad-scutiform; aedeagus lost.

VARIATION: One specimen studied.

NATURAL HISTORY: The holotype was collected in October.

DISTRIBUTION (map 7): Known only from the type locality.

ETYMOLOGY: The specific epithet *quadrula* is a Latin noun derived from *quadrus* (square). I refer to the rectangulate shape of the eighth antennal article.

Plocamocera jayhawkalis, new species

Figure 212; map 8

HOLOTYPE: Sex unknown. Suriname: Saramacca: west Suriname Road, 178 km WSW Zanderij Airport, 25 m, 4°59′6″N, 56°18′48″W; 13 JUN 1999, Z. H. Falin; SUR 1 F 99 070; Ex: splintered tree trunk (pyrethrum fogging)(SEMC). (Specimen point mounted, antenna affixed to paper point; support card, white; SEMC repository label, white, machine printed; locality label, white, machine printed; electronic repository label, white, plastic; holotype label, red, machine printed.)

PARATYPES: One specimen examined.

DIAGNOSIS: These beetles are most closely allied to the members of *P. pupula*, n. sp. from which they may be distinguished by the shape of the eighth antennomere. In *P. jayhawkalis*, n.sp., the outer angle of the anterodistal margin of the eighth antennomere is blunt (fig. 212). In *P. pupula*, n. sp., the outer angle of the anterodistal margin of the eighth antennomere is distinctly acute (fig. 195). Also, in *P. jayhawkalis*, n. sp., the ninth antennomere is abruptly constricted at its posterior limits, whereas in *P. pupula*, n. sp., the apical constriction is gradual.

DESCRIPTION: Size*:* Length 7.0 mm; width 3.0 mm. *Integument*: Predominantly castaneous; anterior disc of pro-mesotibiae infuscated, posterior disc metatibiae infuscated near femoral apex; elytra variegated, with two dark transverse bands near apex. *Head*: Antennal club as in figure 212. *Thorax*: Pronotal anterior margin broadly projected at middle; elytral epipleural margin with five conspicuous trichobothria; protibial anterior margin with five spines. *Abdomen*: The abdomen of the holotype specimen is missing.

VARIATION: Not studied.

NATURAL HISTORY: The holotype specimen was collected from Surinam, during June, at 25 m, by fogging, a splintered tree trunk with pyrethrum.

DISTRIBUTION (map 6): This species is known only from Surinam.

ETYMOLOGY: The specific epithet is a compound noun in apposition. It stems from the mascot name of Kansas University (''jayhawks'') and the Latin possessive suffix-*alis*. The author, a Kansas State ''wildcat'', wishes to extend his appreciation, and a tribute, to Kansas University for providing Kansas State University with many years of collegial athletic competition.

Plocamocera specula (Klug)

Figures 178, 180

Enoplium speculum Klug, 1842: 372. Lectotype male. Here designated. Brazil (ZMNB). (Specimen point mounted; support card, white, sex label affixed to support card; type label, orange, machine printed; ZMNB historical collection label; specimen number (58854) label, white, machine printed; identification/locality label, turquoise, cursive; ZMHB repository label; lectotype label, red, machine printed; identification label, white machine printed; plastic vial with abdomen and aedeagus.)

PARATYPES: None.

DIAGNOSIS: These beetles may be conveniently distinguished from superficially similar specimens of *P. quadrula* Opitz by the more slender form of the eighth antennomere (compare figs. 146, 180), and the more rectangular elytra (compare figs. 178, 179).

DESCRIPTION: *Size*: Length 6.8 mm; width 2.0 mm. *Integument*: Cranium piceous; pronotum dark castaneous; elytra variegated, with testaceous humeral macula, with three irregularly shaped aggregates of white setae; legs dark testaceous. *Head*: Antennomere eight as in figure 180. *Thorax*: Pronotal anterior margin moderately projected at middle; elytral epipleural trichobothria missing; protibiae missing. *Abdomen*: Male pygidium evenly arcuate in posterior margin; aedeagus broad lanceolate.

VARIATION: Not observed.

NATURAL HISTORY: No information available.

DISTRIBUTION: This holotype specimen was collected in Brazil.

Plocamocera baria, new species

Figures 147, 191; map 6

HOLOTYPE: Female. Venezuela: Amazonas: Rio Negro, Rio Baria, 0°55′N, 66°10′W, 140 m, 4–11–84, L. J. Joly, A. Chacon (IZAV). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed; coordinates label, white, machine printed; collectors label, white, machine printed; ownership label, green, machine printed; IZAV repository label, white, machine printed; holotype label, red, machine printed.)

PARATYPES: None.

DIAGNOSIS: The deeply concave distal margin of antennomeres 8 and 9 will distinguish the members of this species from those of the superficially similar specimens of *P. confrater* Kuwert.

DESCRIPTION: *Size*: Length 5.5 mm; width 2.0 mm. *Integument*: Cranium predominantly castaneous, frons infuscated; pronotum predominantly castaneous, anterior region of disc infuscated; elytra variegated, predominantly piceous, posthumeral flavotestaceous tripartite macula well developed, disc with short oblique flavotestaceous macula at middle, patches of pale setae extended to epipleural margin; legs bicolorous, pro–mesofemora piceous ventrally, flavotestaceous dorsally, metafemur flavotestaceous in basal half, piceous in distal half; tibia and tarsus piceous. *Head*: Antennal club as in figure 147. *Thorax*: Pronotal anterior margin moderately projected at middle; discal swelling prominent; elytral epipleural margin with five conspicuous trichobothria; protibial anterior margin with six spines. *Abdomen*: Female pygidium trigonal-scutiform.

VARIATION: Not observed.

NATURAL HISTORY: The available specimens were collected from southern Venezuela during February, at 140 m.

DISTRIBUTION (map 6): Southern Venezuela.

ETYMOLOGY: The trivial name constitutes a noun in apposition and refers to the type locality.

Plocamocera aura, new species

Figures 161, 218; map 7

HOLOTYPE: Female. Bolivia: La Paz: Tumupasa, XII, Mulford Biological Explorations, 1921–1922, W. M. Mann (USNM). (Specimens point mounted, antenna and sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed, expedition label, white, machine printed; USNM repository label, white, machine printed; holotype label, red, machine and hand printed.)

PARATYPES: None.

DIAGNOSIS: Specimens of this species may be distinguished from other members of the *confrater* group by the following combination of characteristics: interstitial spaces of elytral disc shiny, eighth antennomere only feebly narrowed distally, and tenth antennomere only slightly longer than antennomere nine.

DESCRIPTION: *Size*: Length 6.1 mm; width 2.1 mm. *Integument*: Cranium predominantly piceous, borders castaneous; pronotum predominantly piceous, borders castaneous; elytra variegated, flavotestaceous tripartite humeral macula well developed, mid-discal macula obscure, with three irregular patches of white setae, remainder of disc vested with admixture of piceous and golden setae, latter particularly abundant along sutural margin, legs bicolorous, pro- mesofemora predominantly piceous, metafemora flavotestaceous in proximal half, piceous in remainder, tibia and tarsus castaneous. *Head*: Antennal club as in figure 161. *Thorax*: Pronotal anterior margin prominently projected at middle, discal swelling shallow; elytral epipleural margin with five conspicuous trichobothria; protibial anterior margin with four spines. *Abdomen*: Female pygidium broad-scutiform.

VARIATION: One specimen examined.

NATURAL HISTORY: The only available specimen was collected from Bolivia, in December.

DISTRIBUTION (map 7): Known only from the type locality.

ETYMOLOGY: The trivial name *aura* (glow) is a Latin adjective. I relate the name to the bright reflection from the interstitial spaces of the elytra.

Plocamocera buenavista, new species

Figures 216, 217; map 11

HOLOTYPE: (FSCA). Bolivia: Santa Cruz, 3.7 km SSE Buenavista, Hotel Flora & fau-

na, 405 m, 5–15-XI-2001, 17°29.949′S, 63°33.152′W, M. C. Thomas & B. K. Dozier, tropical transition forest. (Specimen point mounted, sex label affixed to paper point, white, cursive; support card, white; locality label, white, machine printed; FSCA repository label, white, machine printed, holotype label, red, machine printed; plastic vial with abdomen and aedeagus.)

PARATYPES: Six specimens from the same locality as the holotype (FSCA, 2; WOPC, 4).

DIAGNOSIS: The members of this species may easily be confused with the superficially similar specimens of *P. aura* n. sp., also from Bolivia. However, the members of this species are distiguished from those of *P. aura*, n. sp. by the gritty property of the elytral interstitial spaces and by the subtle, but consistent, differences of antennomeres eight and nine (compare figs. 217–218). The anterodistal margin of the eighth antennomere is much less concave than it is in the holotype of *P. aura* n. sp. The distal, or apical, portion of antennomere nine is gradually less narrowed in *P. buenavista*, n. sp., than it is in specimens of *P. aura*, n. sp. (compare figs. 217–218).

DESCRIPTION: *Size:* Length 4.8–5.0 mm; width 8.0–2.2 mm. *Integument*: Cranium castaneous; pronotum castaneous, disc infuscated; remainder of thorax castaneous except promesofemora infuscated on anterior disc, metafemur black in distal half, tibiae variously infuscated; elytral color variegated, predominantly dark-cataneous, flavotestaceous trigonal posthumeral macula well developed. *Head*: Antenna as in figure 217. *Thorax*: Pronotal anterior margin notably projected at middle; elytral epipleural margin with five conspicuous trichobothria; protibial anterior margin with 3 spines. *Abdomen*: Male pygidium broad scutiform, female pygidium narrow scutiform; aedeagus (fig. 216) lanceolate, phallic struts particularly elongated.

VARIATION: The elytral disc is considerably more pale than it is in the other specimens. Otherwise, the available specimens are quite homogeneous.

NATURAL HISTORY: The available specimens were collected during November. In a tropical transition forest at 405 m.

DISTRIBUTION (map 8): This species is known only from the type locality.

ETYMOLOGY: The specific epithet is a noun in apposition. It is used as a tribute to the fine Bolivian people of Buena Vista.

Plocamocera taruma, new species

Figures 162, 173, 195; map 7

HOLOTYPE: Male. Brazil: Amazonas: Manaus, 1 km W. Taruma Falls, 19-I-1981, Weston Opitz (MZSP). (Specimen point mounted; antenna, pygidium, and machine printed sex label affixed to paper point; support card, white; locality label, white, machine printed; natural history label, white, hand printed; MZSP repository label, white, machine printed; holotype label, red, machine printed; plastic vial with aedeagus.)

PARATYPES: Four specimens, three from the same locality as the holotype (WOPC, 1). Brazil: Amazons: Paraque, 30 km E of Manaus, Amazon River, 34 km, 17-II-1981, Chen-wen Young (CMNH, 1).

DIAGNOSIS: This species belongs to the subgroup of *P. confrater* in which specimens have the pronotum predominantly castaneous and only faintly infuscated. Within this subgroup, *P. taruma* specimens most closely approximate those of *P. confrater*, from which they are distinguished by the proportionally longer 10th antennal article (compare figs. 152, 162).

DESCRIPTION: *Size*: Length 5.0–6.5 mm; width 2.1–3.0 mm. *Integument*: Cranium predominantly castaneous, frons and vertex narrowly piceous; pronotum predominantly dark-castaneous, disc faintly piceous; elytra variegated, with flavotestaceous humeral macula that divides posteriorly, postmedial fascia indistinct, more vertical than transverse; three irregular aggregates of white setae, golden setae prominent only along sutural margin; disc also with copious vestiture of dark setae primarily on piceous regions; legs bicolorous; pro-mesofemora infuscated on anterior fascies, remainder flavotestaceous, metafemur flavotestaceous in basal half, piceous in remainder, tibia, and tarsus brunneus. *Head*: Antennal club as in figure 162. *Thorax*: Pronotal anterior margin prominently projecting at middle, disc feebly tumescent in front of middle; pronotal arch fee-

bly scabrose; elytral epipleural margin with five conspicuous trichobothria; protibial anterior margin with four spines. *Abdomen*: Male pygidium broad-scutiform, female pygidium trigonal-scutiform; pygidia with two discal and six marginal stout setae; aedeagus elongated, not broadened at base of tegmen (fig. 173).

VARIATION: The intensity of the cranial and pronotal infuscation varies.

NATURAL HISTORY: The three specimens from Taruma Falls were collected in January on freshly felled trunks of *Manilkara*, a genus of hardwood prominent in riverside habitats of the Amazonian Basin.

DISTRIBUTION (map 7): Known only from the Amazonian environs near Manaus and Matto Grosso highlands of Brazil.

ETYMOLOGY: The specific epithet *taruma* constitutes a noun in apposition and refers to the type locality.

Plocamocera confrater Kuwert

Figures 6, 9–11, 13–18, 20–25, 42, 56, 57, 77, 90, 91, 102, 103, 112, 134, 152, 181, 193, 215; map 2

Plocamocera confrater Kuwert, 1893: 496. Lectotype female. Here designated. Peru, Amazon (MNHN). (Specimen card mounted, white, sex label affixed to paper point, white, support card, white; locality label, beige, outlined in black, cursive; collection label, beige, outlined in black; lectotype label, red, machine and hand printed.) Chapin, 1927: 5. Corporaal, 1950: 255.

Plocamocera confrater var. *similis* Kuwert. Type locality: Amazonas. NEW SYNONYMY. Type examined. This variety represents intraspecific color variation.

Plocamocera confrater var. *sericelloides* Kuwert. Type locality: Amazonas. NEW SYNONYMY. Type examined. This variety represents intraspecific color variation.

Plocamocera impressicollis Pic, 1942: 3. Holotype. Male. Examined. Brazil: Matto Grosso: Corumba (MNHN). (Specimen card mounted, sex label glued onto mount card; locality label, beige, machine printed; identification label mounted on beige support card, cursive; type label, beige, cursive; MNHN specimen number label (spec. 7), blue-green, bordered in black, machine and hand printed; MNHN repository label, white, machine printed; holotype label, red, machine printed; plastic vial with aedeagus). NEW SYNONYMY. *P. impressicolis* Pic falls within the variation range of this species. Corporaal, 1950: 255. Opitz, 1997: 70–71.

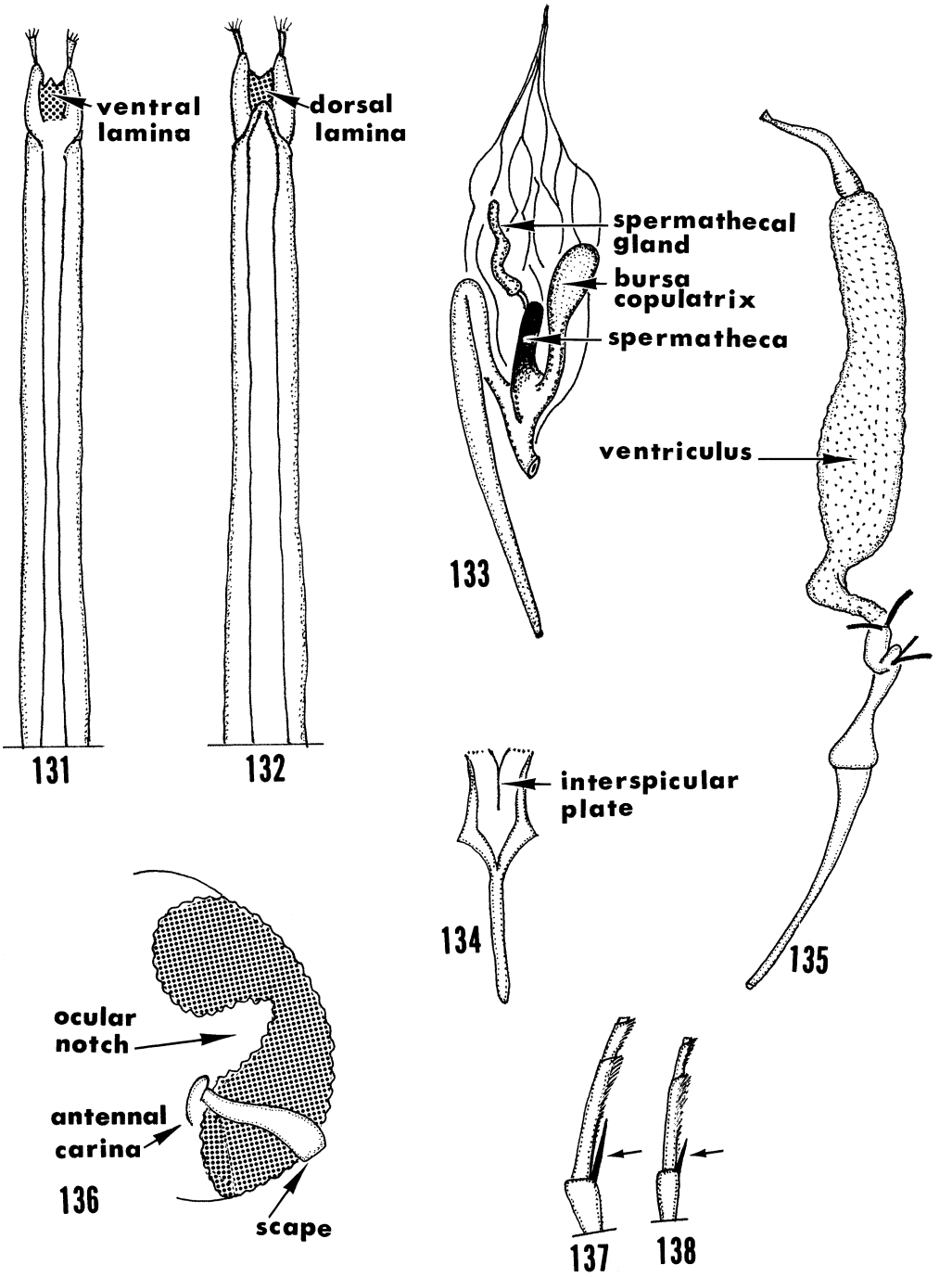
DIAGNOSIS: The following combination of characteristics distinguishes the members of this species from congeners: Eighth antennomere subquadrate (fig. 42), tenth antennomere only slightly longer than antennomere 9; male pygidium (fig. 90) feebly emarginate at distal margin, female pygidium (fig. 91) trigonal, and aedeagus (fig. 112) sagittate.

DESCRIPTION: *Size*: Length 4.0–6.5 mm; width 1.5–2.8 mm. *Integument*: Cranium castaneous, vertex and frons linearly infuscated; pronotum castaneous; elytra (fig. 56) with two surface macula and three setal fasciae; legs bicolorous, promesofemora predominantly flavotestaceous, feebly infuscated on anterior surface, metafemur flavotestaceous in basal half, piceous in distal half; tibiae and tarsi piceous; abdomen predominantly flavotestaceous in females, brunneus in males. *Head*: Antenna as in figure 42. *Thorax*: Pronotal anterior margin projected at middle, discal swellings shallow; epipleural margin with five conspicuous and three inconspicuous trichobothria (fig. 57); protibia anterior margin with five spines (fig. 77). *Abdomen*: Male pygidium broad-scutiform (fig. 90), female pygidium trigonal scutiform (fig. 91): aedeagus saggitate. *Internal Reproductive Organs*: Male as in figure 102, female as in figure 103.

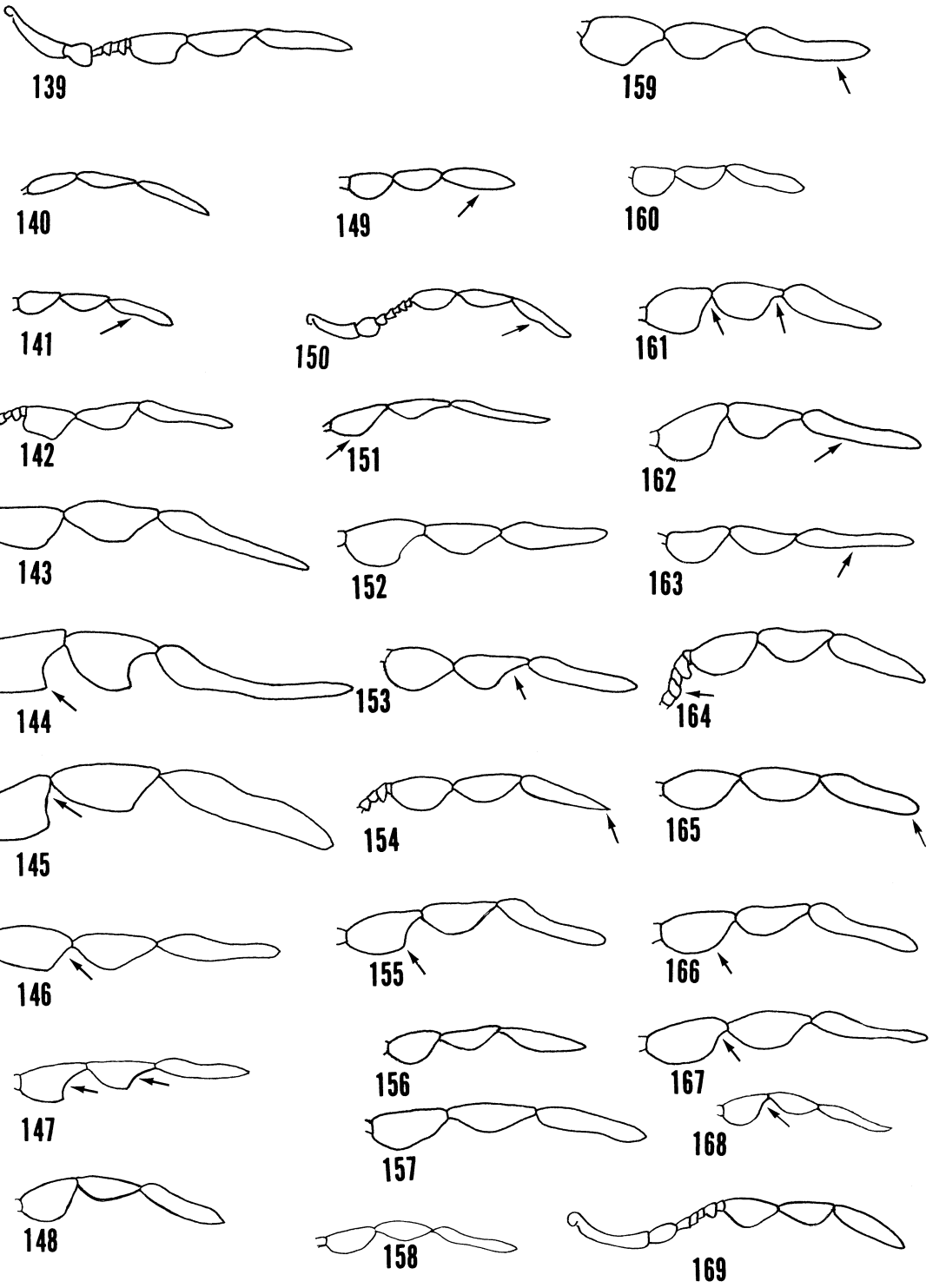
VARIATION: The pronotal disc is feebly infuscated in some specimens.

NATURAL HISTORY: Specimens of this species were collected from Guyana during March, Peru during April at about 160 m, Bolivia during December and August at 400 m, and throughout the year from Brazil.

DISTRIBUTION (map 2): I examined 60 specimens of this species. Colombia: Amazonas: PNN Amacayacu, Mocagua, 3°23′S, 70°6′W, 19-VII–31-VII-2000, Malaise, A. Parente (JNRC, 1). Guyana: Bartica: Kartabo, 14–22-V-1924: Kartabo, 6-III-1924. French Guiana: Kourou: Les Rouches de Kourou, 1906, Le Moult: Guyane: Rt. D 5, 4 km SE Tennegrande jct., 27-28-VIII-1995, E, Giesbert & J. Wappes. Ecuador: Napo: 21 km E. Atahualpa, Alinahui Lodge, 5-6-IV-1997, F. Hovore; Yasuni Research Station,



Figs. 131–138. Various organs. **131, 132.** *Plocamocera pupula*, ovipositor(131) (ventral view), ovipositor (132) (dorsal view). **133.** *P. sericella*, female internal reproductive organs. **134.** *P. confrater*, spicular fork. **135.** *P. sericella*, alimentary canal. **136.** *P. coactilis*, compound eye. **137.** *P. lucis*, metatibia. **138.** *P. sesquipedalis*, metatibia.



19–30-X-1998, 250 m, W. J. Hanson: 24 km E Atahualpa, 450 m, 6–8-IV-1997, E. Giesbert & F. Hovore. Peru: Madre de Dios: Rio Tambopata Reserve, 30 air km SW of Puerto Maldonado, 1–26–1982, 290 m, Edward S. Ross; Res. Manu. Est. Pakitza, 25-II–1-III-1992, R. Cambra. Bolivia: Cochabamba: 12 km E Villa Tumari, 10-11-X-1992, E. Giesbert. Brazil: Rondonia: 62 km SE Ariquemes, 8–20-XI-1994, 5-16-XI-1996, 23–31-X-1997, 1-14-XI-1997, B. Dozier; 62 km SW Ariquemes. Nr. Fza. Rancho Grande, 1–17-IX-1997, B. K. Dozier; same locality, 8-20-XI-1984, Black light trap, J. E. Eger: Para: June, July; same locality, 10-XI-1994, UV trap, C. O'Brien: Goias: Matto Grosso: Corumba: Sinop, X-1975, M. Alvarenga: Amazonas: Chapada: Para: Santarem, VI-1919, S. M. Klages. I examined 98 specimens deposited in AMNH, BMNH, CMNH, EMUS, FMNH, FSCA, IZAV, JNRC, MIUP, MNHN, USNM, WFBC, WOPC, and ZMAN.

Plocamocera procera, new species

Figures 182, 214; map 9

HOLOTYPE: (LACM). Colombia: Amazonas: PNN, Amacayacu, Matamata, 3°23′S, 70°6′W, 150 m, Malaise, 4/2/01–4/16/01, D. Chota, leg., M. 1609. (Specimen pin mounted; paper point with antenna; sex label affixed to white support card; locality label, white, outlined in black, machine printed; collection method, date of collection, collector label, white, outlined in black; LACM repository label, white, machine printed, holotype label, red, machine printed; plastic vial with abdomen and aedeagus.)

PARATYPES: None.

DIAGNOSIS: Distinguishable from specimens of the sister species, *P. confrater* Kuwert, by the shape of the 8th antennomere whose anterodistal margin is not angular (compare figs. 193, 182). Also, the aedeagus is more elongated in the members of this species.

DESCRIPTION: *Size:* Length 6.0 mm; width 2.4 mm. *Integument*: Cranium castaneous; frons and epicranium darker; pronotum castaneous, disc feebly infuscated in front of subapical depression; remainder of thorax castaneous except pro–mesofemora infuscated on anterior disc, metafemur black in distal half, tibiae variously infuscated; elytral color variegated, predominantly dark-cataneous, flavotestaceous trigonal posthumeral macula well developed. *Head*: Antennal club as in figure 182. *Thorax*: Pronotal anterior margin notably projected at middle; elytral trichobothria not discernible; protibial anterior margin with 4 spines. *Abdomen*: Male pygidium broad scutiform, aedeagus (fig. 214) lanceolate.

VARIATION: One specimen examined.

NATURAL HISTORY: The available specimen was collected during April with a Malaise trap at 150 m.

DISTRIBUTION (map 9): This species is known only from the type locality.

ETYMOLOGY: The specific epithet *procera* is a Latin adjectival and means slender. I refer to the extended length of the aedeagus when compared to the aedeagus of males of *P. confrater* Kuwert.

COACTILIS GROUP

Plocamocera coactilis, new species

Figures 6–8, 12, 46, 64, 65, 95, 104, 116, 136, 163, 198; map 3

HOLOTYPE: Male. Brazil: Matto Grosso: X-1973, M. Alvarenga (MZSP). (Specimen point amounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white machine and hand printed; holotype label, red, machine and hand printed.) Opitz, 1997: 70.

←

Figs. 139–169. Antenna or antennal club. **139.** *Plocamocera salasis*. **140.** *P. manausensis*. **141.** *P. iota*. **142.** *P. aliguantula*. **143.** *P. minima*. **144.** *P. prolixa*. **145.** *P. sesquipedalis*. **146.** *P. lucis*. **147.** *P. confrater*. **148.** *P. castanea*. **149.** *P. aspera*. **150.** *P. pupula*. **151.** *P. bispina*. **152.** *P. quadrula*. **153.** *P. amba*. **154.** *P. baria*. **155.** *P. sericella*. **156.** *P. bolivari*. **157.** *P. striga*. **158.** *P. santa*. **159.** *P. aura*. **160.** *P. taruma*. **161.** *P. coactilis*. **162.** *P. paris*. **163.** *P. onorei*. **164.** *P. auratilis*. **165.** *P. insula*. **166.** *P. sericellopsis*. **167.** *P. similis*. **168.** *P. carnegei*. **169.** *P. selva*.

PARATYPES: Forty-three specimens. Seventeen specimens from the same locality as the holotype (AMNH, 1; BMNH, 1; JNRC, 1; LACM, 1; OSUC, 1; USNM, 1; WFBM, 1; WOPC, 10). Bolivia: Cochabamba: Chapare: 5-X-1949, 400 m, R. Zischlka (FMNH, 1). Brazil: Matto Grosso: Sinop (CASC, 1; CNCI, 1; FMNH, 1; MCZC, 1; WOPC, 3): Goias (DEIC, 1; WOPC, 3): Rondonia (WOPC, 1): Amazonas: Manaus, 1 km W Taruma Falls, 19-1-1981, W. Opitz (WOPC, 1); 28-II-1981, C.W. Young (CMNH, 1): Amazonas (MNHN, 8; DEIC, 2; ZMHB, 1): Para: 70 km W. Monte Dourado, malaise at edge of natural forest, 27–29-XII-1980, R. Krell (UCAG, 1**).**

DIAGNOSIS: *P. coactilis* and *P. confrater* share the tripartite fascia behind the humerus of the elytral disc (compare figs. 64 and 56). In *P. coactilis* specimens, however, the eighth antennomere is rectangulate and not subquadrate (compare figs. 163 and 152) and the aedeagus is considerably more elongate (compare figs. 112 and 116).

DESCRIPTION: *Size*: Length 3.5–5.2 mm; width 1.2–2.0 mm. *Integument*: Cranium piceous, castaneous along ocular margins; pronotum castaneous, with broad discal macula; elytral coloration variegated as in figure 64; legs flavotestaceous, infuscated or not. *Head*: Antenna as in figure 46. *Thorax*: Pronotal anterior margin moderately projected at middle; anterior margin of protibia with four spines (fig. 8); elytral epipleural margin of elytra with five conspicuous trichobothria (fig. 65). *Abdomen*: Male pygidium broad-scutiform, very convex in posterior margin (fig. 95), female pygidium broad-scutiform; aedeagus conspicuously elongate (fig. 116). *Internal Reproductive Organs*: Male as in figure 104.

VARIATION: The legs vary in color, being entirely flavotestaceous in some specimens and infuscated in others.

NATURAL HISTORY: Brazilian specimens were collected from Villa Vera during October, from Goias during November, and from the environs of Manaus during January. I collected the Manaus specimen on a recently felled tree of *Manilkara*.

DISTRIBUTION (Map 3): Known from the Matto Grosso highlands and Amazon Basin of Brazil, and from northern Bolivia.

ETYMOLOGY: The Latin adjective *coactilis* (thick). I refer to the robust body of these beetles.

Plocamocera aspera, new species

Figures 153, 199; map 7

HOLOTYPE: Female. Brazil: Amazonas: Paraque, 30 km east of Manaus, Amazon River, 18-II-1981, 34 m Chen-wen Young (MZSP). (Specimen point mounted, antenna and sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed; MZSP repository label; holotype label, red machine printed.)

PARATYPES: None.

DIAGNOSIS: Within the *coactilis* group specimens of *P. aspera* most closely resemble those of *P. paris*. However, only in *P. aspera* specimens is the cranium distinctly rugose and antennomere eight more ovoid than angulate; also, antennomere nine is more narrowly prolonged distally (compare figs. 153, 164).

DESCRIPTION: *Size*: Length 6.0 mm; width 2.2 mm. *Integument*: Cranium piceous; pronotum predominantly piceous, castaneous along margins; elytra variegated, with flavotestaceous humeral macula that extends posteriorly, then divides, medialmost flavotestaceous macula prominent; three irregular patches of light setae that connect to abundance of light setae along sutural margin, setae dark in piceous regions; legs flavotestaceous, metafemora faintly infuscated, tarsus flavotestaceous. *Head*: Antennal club as in figure 153; cranium rugose. *Thorax*: Pronotal anterior margin prominently projected at middle, discal swelling shallow; epipleural margin with five conspicuous trichobothria. *Abdomen*: Female pygidium broad-scutiform.

VARIATION: Not observed.

NATURAL HISTORY: The holotype was collected during February, at 34 m.

DISTRIBUTION (map 7): Known only from the type locality.

ETYMOLOGY: The trivial name stems from the Latin adjective *aspera* (rough). I refer to the rugulose cranium.

Plocamocera paris, new species

Figures 164, 204; map 7

HOLOTYPE: Female. Brazil: Distrito Federal: Parque Nacional, III–II–1970, J. M. &

B. Z. Campbell (CNCI). (Specimen point mounted; sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed**;** CNCI repository label white, machine printed; holotype label, red, machine printed; plastic vial with pygidium and sixth visible sternum.)

PARATYPES: None.

DIAGNOSIS: The members of this species resemble members of *P. confrater*, from which they may be distinguished by the shape of the eighth antennomere (compare figs. 152, 164). Also, in *P. paris* specimens the humeral and postmedian maculae are more pronounced.

DESCRIPTION: *Size*: Length 5.3 mm; width 2.2 mm. *Integument*: Cranium piceous; pronotum piceous; elytra variegated, with flavous humeral macula that extends and divides posteriorly, mostmedial fascia angulate, transverse, three irregular aggregates of white and golden setae; legs bicolorous, pro–mesofemur predominantly flavotestaceous, boldly infuscated, metafemur flavotestaceous in basal half, piceous in remainder. *Head*: Antenna as in figure 164. *Thorax*: Pronotal anterior margin moderately projected at middle, discal swelling shallow, pronotal arch scabrous; elytral epipleural margin with four conspicuous trichobothria; protibial anterior margin with four spines. *Abdomen*: Female pygidium broad-scutiform.

VARIATION: Not observed.

NATURAL HISTORY: The holotype specimen was collected during March from the type locality, at 1000 m.

DISTRIBUTION (map 7): Known only from the type locality.

ETYMOLOGY: The trivial name *paris* is a Latin adjective that means ''equal''. I refer to the superficial similarity of this beetle to other members of the *P. confrater* group.

***Plocamocera bispina*,** new species

Figures 154, 202; map 7

HOLOTYPE: Female. Brazil: Matto Grosso: Rio Caraguata, 21°48′, 52°27′, XII-1953, 400 m alt., Fritz Plaumann (FMNH). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine and hand printed; FMNH repository label, white, machine printed.)

PARATYPES: None.

DIAGNOSIS: Within the *coactilis* species group, *P. bispina* specimens are readily identified by the following combination of characteristics: Cranium piceous, protibial anterior margin with two spines.

DESCRIPTION: *Size*: Length 6.0 mm; width 2.0 mm. *Integument*: Cranium piceous; pronotum castaneous; elytra variegated, with flavous humeral macula that divides posteriorly, postmedial fascia angular, transverse, extended to sutural margin; profemur predominantly flavotestaceous, mesofemur predominantly castaneous, metafemur flavotestaceous in basal half, piceous in remainder; tibiae progressively more infuscated from pro-to metatibia. *Head*: Antennal club as in figure 154. *Thorax*: Pronotal anterior margin moderately projected at middle; pronotal discal swelling shallow, pronotal arch feebly scabrous; elytral epipleural margin with five conspicuous trichobothria; protibial anterior margin with two spines. *Abdomen*: Female pygidium broad-scutiform.

VARIATION: Not observed.

NATURAL HISTORY: The available specimen was collected from the type locality during December.

DISTRIBUTION (map 7): Known only from the type locality.

ETYMOLOGY: The specific epithet is a compound name formulated from the Latin prefix *-by* (two) and the Latin noun *spina* (thorn). I refer to the two spines on the protibia.

***Plocamocera onorei*,** new species

Figure 165; map 7

HOLOTYPE: Female. Ecuador: Napo: Yasuni Research Station, 19–30 Oct. 1998, 250 m, W. J. Hanson (QCAZ). (Specimen point mounted, sex label affixed to paper point, white, machine printed; locality label, white, machine printed; QCAZ repository label, white, machine printed; holotype label, red, machine printed.)

PARATYPES: None.

DIAGNOSIS: Within the *coactilis* species group, these beetles may be conveniently identified by the combination of antenno-

mere eight ovate and protibial anterior margin with two spines.

DESCRIPTION: *Size*: Length 5.0 mm; width 2.0 mm. *Integument*: Cranium piceous; pronotum piceous, periphery castaneous; elytra variegated, flavotestaceous humeral macula reduced, very faintly connected to more posterior bifurcated macula, postmedial macula faintly developed proximal to epipleural margin, three irregular pale setal fascia, anterior setal fascia proximal to sutural margin, with admixture of golden-yellow, pale, and piceous setae; legs bicolorous, profemur predominantly flavotestaceous, very faintly infuscated on anterior surface, metafemur flavotestaceous, feebly infuscated near apex. *Head*: Antennal club as in figure 165. *Thorax*: Pronotal anterior margin only feebly projected at middle; discal swelling only faintly tumescent, pronotal arch finely punctated; elytral epipleural margin with four conspicuous trichobothria. *Abdomen*: Female pygidium broad-trigonal.

VARIATION: Not observed.

NATURAL HISTORY: The only available specimen was collected from the type-locality, during October, at 250 m.

DISTRIBUTION (map 7): Known only from the type locality.

ETYMOLOGY: The trivial name represents a noun in apposition and refers to Professor Giovanni Onore, an Ecuadorian Entomologist very devoted to the advancement of Ecuadorian insect systematics and to the growth of the insect collection at the Catholic Pontifical University of Quito, in Ecuador.

Plocamocera santa, new species

Figures 160, 200; map 6

HOLOTYPE: Female. Brazil: Santa Catarina: Nova Teutonia, 9-I-1957 (IZAN). (Specimen card mounted, antenna mounted on mount card; abdomen mounted on paper point; locality label, light green, machine and hand printed; IZAV repository label, white, machine printed; holotype label, red, machine printed.)

PARATYPES: One specimen from the same locality as the holotype (WOPC, 1).

DIAGNOSIS: The subovoid shape of the eighth antennomere distinguishes the members of this species from superficially similar specimens of *P. paris*, n. sp.

DESCRIPTION: *Size*: Length 4.0–4.8 mm; width 1.2–1.7 mm. *Integument*: Cranium black; pronotum predominantly piceous, dark castaneous near margins; elytra variegated, predominantly piceous, posthumeral flavotestaceous tripartite macula well developed, disc with short oblique flavotestaceous macula at middle; patches of white setae prominent on flavotestaceous macula and at preapex; legs bicolorous, pro-mesofemora piceous ventrally, flavotestaceous dorsally; metafemur flavotestaceous in basal half, piceous in distal half; tibia piceous in basal two-thirds, flavotestaceous in remainder; tarsus flavotestaceous. *Head*: Antennal club as in figure 160. *Thorax*: Pronotal anterior margin strongly projecting at middle; discal swelling prominent; protibial anterior margin with three spines; elytral epipleural margin with four conspicuous trichobothria. *Abdomen*: Female pygidium broad- scutiform.

VARIATION: The two available specimens do not vary appreciably.

NATURAL HISTORY: The type specimens were collected from southern Brazil during January.

DISTRIBUTION (map 6): Known only from southern Brazil.

ETYMOLOGY: The specific epithet represents a noun in apposition and refers to the type locality.

Plocamocera carnegei, new species

Figures 168, 203; map 6

HOLOTYPE: Female. Brazil: Guanabara: Rio de Janeiro, July (CMNH). (Specimen point mounted, sex label and antenna affixed to paper point, sex label white, machine printed; support card, white; locality label, beige, machine printed; month of capture label, beige, machine printed; holotype label, red, machine printed.)

PARATYPES: None.

DIAGNOSIS: Within the *coactilis* group the members of this species may be distinguished by the diminutive size of the elytral punctations and nearly subovoid shape of antennomere nine.

DESCRIPTION: *Size*: Length 4.5 mm; width 1.5 mm. *Integument*: Cranium predominantly

castaneous, frons infuscated; pronotum predominantly light castaneous, disc slightly infuscated; elytra predominantly dark castaneous, posthumeral tripartite flavotestaceous macula and short irregular middiscal macula well developed; patches of pale setae most prominent on middiscal macula and at preapex; legs bicolorous, anterior fascies of profemur dark castaneous, posterior fascies of profemur, mesofemur, and basal half of metafemur flavotestaceous, tibia and tarsus flavotestaceous. *Head*: Antennal club as in figure 168. *Thorax*: Pronotal anterior margin moderately projected at middle; discal swelling prominent; elytral epipleural margin with four conspicuous trichobothria; protibial anterior margin with five spines. *Abdomen*: Female pygidium trigonal-scutiform.

VARIATION: Not observed.

NATURAL HISTORY: The holotype was collected in June.

DISTRIBUTION (map 6): Known only from southeastern Brazil.

ETYMOLOGY: The specific epithet honors Andrew Carnegie, outstanding philanthropist and benefactor of Carnegie Museum of Natural History, where I was privileged to serve as Curator of Entomology from 1980 to 1983.

SERICELLA GROUP

Plocamocera argentea, new species

Figures 48, 68, 69, 83, 97, 118; map 5

HOLOTYPE: Male. Bolivia: Santa Cruz: Prov. del Sara, 450 m, Dec. 1909, J. Steinbach (CMNH). (Specimen pin mounted, locality label, beige, machine printed; Carnegie Museum accession label, beige, Acc. 4552, machine printed; repository label, white machine printed; sex of specimen indicated on holotype label; plastic vial with aedeagus.)

PARATYPES: Fifteen specimens from the same locality as the holotype (CMNH, 8; WOPC, 7).

DIAGNOSIS: Specimens from Bolivia belong to this species if their integument is brunneus and the elytra are vested with three silvery setal fascia. These characteristics distinguish the members of this species from congeners.

DESCRIPTION: *Size*: Length 5.0–6.0 mm; width 1.5–2.0 mm. *Integument*: Cranium, thorax, and abdomen castaneous; femur flavotestaceous; elytra (fig. 68) brunneus, with three silvery setal fascia that are bordered by piceous markings. *Head*: Antenna as in figure 48. *Thorax*: Pronotal anterior margin moderately projected at middle; elytra without trigonal post-humeral macula (fig. 68); elytral epipleural margin with five conspicuous trichobothria (fig. 69); anterior margin of protibia (fig. 83) with six spines. *Abdomen*: Male pygidium broad-scutiform (fig. 97), female pygidium broad-scutiform; aedeagus (fig. 118) conspicuously elongated.

VARIATION: The available specimens are quite homogeneous.

NATURAL HISTORY: Specimens were collected from the type locality during December, at 450 m.

DISTRIBUTION (map 5): Known only from the type locality.

ETYMOLOGY: From the Latin adjective *argenteus* (silvery). I refer to the silvery setal fasciae on the elytra.

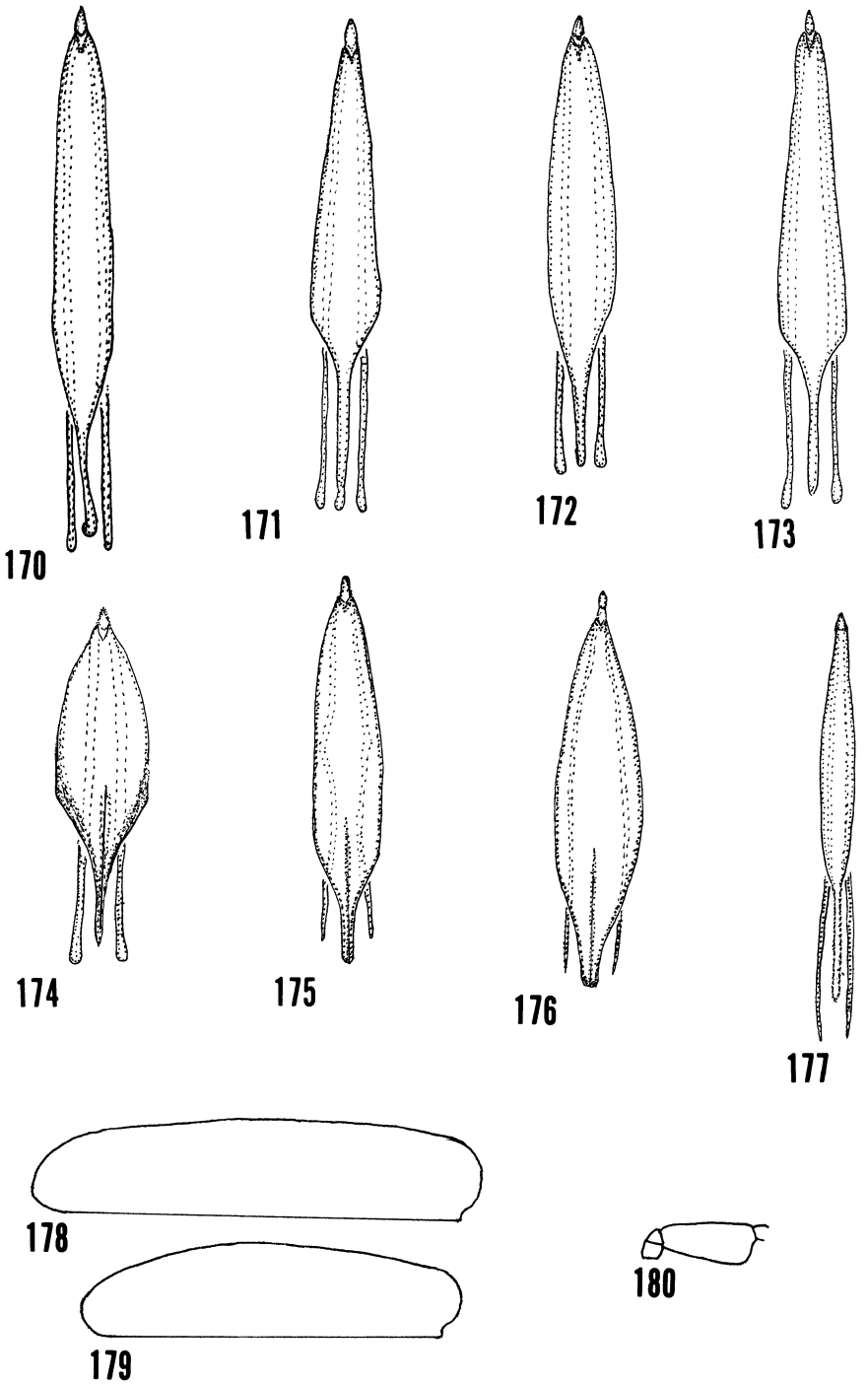
Plocamocera auratilis, new species

Figures 49, 66, 67, 74, 81, 166, 172; map 5

HOLOTYPE: Male. Panama: Panama: Pan American Hwy. 30 km E of Canita, 15–29 June 1992, Jean & Keve Ricardo (AMNH). (Specimens point mounted, antenna and sex label affixed to paper point, white machine printed; support card, white; locality label, white, machine printed; AMNH repository label, white, machine printed; holotype label, red, machine and hand printed.)

PARATYPES: Nine specimens, one from the same locality as the holotype (CASC, 1). Costa Rica: Alajuela: 20 km S Upala, 8-XI-1990, F. D. Parker (WOPC, 1): El Llano, Carti Rd., 27-VI–9-VII-1997, J. Huether (JPHC, 1). Panama: Canal Zone: Cabima, 22-IV-1911, August Busek (MCZC, 2; WOPC, 1)**:** Colon: N Shore Gatung Lake, 10–11-IV-1984, E. Giesbert (FSCA, 1); Panama: 10 km N El Llano, 427 m, 28-IV–3-VI-1984, E. Giesbert (FSCA, 1; WOPC, 1). Bolivia: Santa Cruz: 4–6 km S. Buena Vista, F. & F. Hotel, 2–12-II-2000, J. E. Wappes (JEWC, 1).

DIAGNOSIS: The specimens of this species are easily distinguishable by the gold-yellow



Figs. 170–180. Various organs. Aedeagi. **170.** *Plocamocera prolixa*. **171.** *P. salasis*, **172.** *P. auratilis*. **173.** *P. taruma*. **174.** *P. sericellopsis*. **175.** *P. bolivari*. **176.** *P. ambra*. **177.** *P. similis*. Elytra. **178.** *P. specula*. **179.** *P. quadrula*. Antennomere. **180.** *P. specula*.

coloration of the elytral setae which are unique within the *sericella* species group.

DESCRIPTION: *Size*: Length 4.5–5.0 mm; width 1.5–2.0 mm. *Integument*: Predominantly light- castaneous, pronotal disc infuscated; mesoscutellum piceous; elytral disc infuscated at sides along epipleural margin and at apex, profusely vested with gold-yellow setae which are particularly prominent along sutural margin, with four patches of silvery setae contiguous with sutural margin (fig. 66); legs predominantly flavotestaceous, distal half of femora and proximal half of tibiae infuscated, tarsus flavotestaceous. *Head*: Antenna as in figures 49, 166. *Thorax*: Pronotal anterior margin particularly projected at middle, discal swellings prominent; elytra notable expanded along epipleural margin at basal third (fig. 74), elytral epipleural margin with four conspicuous trichobothria (fig. 67); anterior margin of protibia (fig. 81) with two spines. *Abdomen*: Male pygidium broad-scutiform, truncate, female pygidium trigonal-scutiform; aedeagus as in figure 172.

VARIATION: The dark regions on the integument are more pronounced in the specimen from Costa Rica and in the one from El Llano, Panama.

NATURAL HISTORY: The available specimens were collected during November from Costa Rica, during May and June from Panama, and during February from Bolivia.

DISTRIBUTION (map 5): Known from Costa Rica and Panama.

ETYMOLOGY: From the Latin adjective *auratilis* (gold colored). I refer to the golden sheen characteristic of the elytral surface so apparent in these beetles.

Plocamocera sericella Spinola

Figures 47, 61, 82, 96, 108, 117, 133, 135, 156, 211; map 4

Plocamocera sericella Spinola, 1844b: 19. Neotype: Male. Here selected. Panama: Canal Zone: Madden Forest, mile 2.5, I–VII–1974, C. & L. O'Brien & Marshall (AMNH). The original type locality was ''Carthagene'' (Columbia). I did not find Spinola's type specimen in the Spinola Collection (Ekis, now Opitz, 1975: 63) nor in the collection of the MNHN. However, Spinola's description, and illustration (Spinola 1844b: 9, plate 38, fig. 4), provides a clear understanding about the identification of this species. (Neotype specimen point mounted, sex label affixed to paper point, white, point, hand printed; support card, white; locality label, white, machine printed; AMNH repository label, white, machine printed; neotype label, red, machine printed.) Desmarest, 1860: 265. Gorham, 1877: 249, 1882: 168, 1886: 341. Jacob, 1840: 216–217. Corporaal, 1950: 255. Opitz, 1997: 55, 71.

Epiphloeus byssinus Erichson, 1847: 86. Lectotype. Female. Here selected. Peru (MNHB). (Specimen point mounted; support card, white; locality *label*, blue-green, cursive; lectotype label, red, cursive; specimen label, white (58855); identification label, white, machine printed.) NEW SYNONYMY. There are no appreciable differences between the type of this junior synonym and the type specimen of the senior synonym. Corporaal, 1950: 253.

Plocamocera latefasciata Pic, 1942: 3. Holotype. Female. Examined. French Guiana: Cayenne: Nouveau Chantier, Collection Le Moult, Mars (MNHN). (Specimen card mounted; sex label affixed to mountcard, beige, outlined in black, machine printed; collection date label, beige, outlined in black, machine printed; identification label mounted on beige support card, beige, cursive; type label, beige, cursive; Museum Paris specimen number label, light blue, outlined in black, machine and hand printed; MNHN repository label, white, machine printed; holotype label, red, machine printed.) NEW SYNONYMY. There are no appreciable differences between the type specimen of this junior synonym and the type specimen of the senior synonym. Corporaal, 1950: 255.

DIAGNOSIS: The pronotal disc is piceous and the elytra do not have conspicuous macula, but they do have three irregularly shaped setal fascia that range from white to grey. The elytral humeral macula are more pronounced in South American specimens. These clerids are readily distinguishable from superficially similar specimens of *P. sericellopsis*, by the presence of four spines on the protibia. In *P. cericellopsis* the protibia show three spines.

DESCRIPTION: *Size*: Length 3.6–5.1 mm; width 1.2–2.0 mm. *Integument*: Cranium piceous; pronotum castaneous, disc with large piceous macula; elytra variegated, predominantly light castaneous, disc with two piceous macula; elytra variegated, predominantly light castaneous, disc with two piceous macula posterior to transverse bands of white se-

tae, gold-yellow setae prominently distributed along sutural margin, apex piceous, legs flavotestaceous. *Head*: Antenna as in figure 47. *Thorax*: Pronotum prominently and acutely projected at middle, discal swellings very prominent; elytral epipleural margin with four conspicuous trichobothria (fig. 61); protibia with four spines (fig. 82). *Abdomen*: Male (fig. 96) and female pygidia broad-scutiform, with two discal and six marginal stout setae; aedeagus as in figure 117. *Internal Reproductive Organs*: Organs of the male and female, and of the alimentary canal, are as described in Opitz (1997: 71).

VARIATION: The dark areas of the elytra become more pronounced in specimens from South America, especially those from French Guiana and Brazil. In some of these beetles the legs are infuscated and the elytra are marked with piceous maculae.

NATURAL HISTORY: These beetles were collected throughout the year from altitudes that range from 150 to 1300 m. Specimens were captured on dry branches of *Magnifer indica*, others were captured at night by light, on *Ficus*. Some specimens were taken in a Malaise trap braced over newly felled tree trunks.

DISTRIBUTION (map 4): This widely distributed species ranges from Mexico to Brazil. Mexico: Tamaulipas: Bocatoma, 7 km SSE Gomes Farias, 5–7-I-1981, E. G. Riley: Nayarit: 4 km NE San Blas, 5–7-X-1976, E. Giesbert: Veracruz: Los Tuxtlas, Biological Station, UNAM, 20-IV-1983, C. and L. O'Brien and G. Marshall: Oaxaca: 9.6 km W Tehuantepec, 6-VII-1971, taken at Light, Clark, Murray, Hart, Schaeffner: Chiapas: 12.8 km W Parque Nacional Montebello, 30-VII-1974, C. W. O' Brien: Campeche: Campedie, 4-VIII-1974, L. O'Brien. Quintana Roo, 19 km NW Carillo Puerto, 18-VI-1990, R. Turnbow. Belize: Belize: Kilometer 44.8 Northern road, 11-VIII-1997, C W & L. O'Brien & Marshall: Olancho: 17.6 km NE Catacamas, 366 m, 15-VI-1974, C. Howel & L. O'Brien, Carajal. Honduras: Comayagua: 6.4 km SW Comayagua, 488 m, 18-VII-1974, C. W. & L. O'Brien & Marshall. Costa Rica: Limon: Revantazon, Hamburg Farm, on moss on *Ficus* sp. 16-VII-1924, F. Nevermann: Near Sixoala, 3-IV-1981, B. K. Dozier: Puntarena: 4 km N Tarcoles, 21–28–1979, E. Giesbert: Parque Nacional Cocovado, Est. Sirena, 8°28–31′ N 83°36′W, 16-III-1981, H. A. Hespenheide: Alahuela: 20 km S Upala, 6-XII-1990, 25-XII-1990, 24-VI-24-VII-1991, F. D. Parker: Guanacaste: 3 km SE Rio Naranjo, 20-IX-1991, F. D. Parker; 20 km S Canas, 26–30-X-1990, F. D. Parker. Panama: Canal Zone: Fort Sherman, 9°20′ N 79°58′ W, 3-VIII-1974, 10 day old treefall, *Anacardium* sp., D. Engleman: Fort Kobbe, 28-IV-1985, H. Stockwell; Coco Solo Hospital, 9°21′ N 79°51′ W, 9-V-1973, H. Stockwell: Madden Forest, km 10, 9°05′ N 79°37′ W, 18-VII-1974: Margarita, 6 km SW, 18-VII-1974, H. Stockwell: Madden Forest, km 4, 30-VI-1974, C. & L. O'Brien & Marshall: Barro Colorado Island, 9°10′ N 79°50′ W, 23-VI-1971, H. Hespeheide: 27-VI-1924, N. Banks: Colon: Fort Sherman, 9°17′N 79°59′W, 13-IV-2002, on *Brisimun utile*, from dead branches in understory, F. Odegaard; Cerro Viejo Mine Road, 10 km SW Nombre de Dios, 27-XI-1992, A. R. Gillogly. Colombia: Cundinamarca: Puerto Salgar: Magdalena: Aracataca, Darlington. Venezuela: Bolivar: Las Nieves: 24-IV-1969, J. & B. Bechyne: El Dorado, Sta. Elena, km 150, 1–300 m, 26-III-1970, J. & B. Bechyne: Aragua: El Limon, 450 m, 8-VIII-1976, en ramas secas de *Mangifera indica*, J. Clavijo: Barinas: 40 km SE Socopo, 150 m, 25-I-1970, S. L. Wood, 31-7-1938. French Guiana: Nouvea Chantier: St. Laurent du Marron, 1909, E Le Moult. Ecuador: Napo: Yasuni Research Station, 19–30-X-1998, 250 m, W. J. Hanson: Pichincha: 18 km S Tinalandia, 28-IV-1998, L. & C. O'Brien & Marshall. Peru: Lareto: Estiron, Rio Ampiyacu, 13-XI–9-XII-1961, B. Malkin: San Martin: IV–X-1886, M. de. Mathan. Bolivia: Santa Cruz: 3.7 km SSE Buena Vista, Hotel Flora & Fauna, 450 m, 5–15-XI-2001, 17°29.949′S, 63°33.152 W, M. C. Thomas & K. Dozier, Tropical transition forest: Cochabamba: 1 km E Villa Tunari, 8-12-X-1992, E. Giesbert; 400 m, Zishka. Brazil: Rondonia: 62 km SE Arequemes, 17–24-III-1992, 8–20-IX-1994, 8–20-XI-1994, 22–31-X-1997, W. J. Hanson: Matto Grosso: Diamantino, Alto Rio Arinos, 13-XII-1981, E. Furtado: Amazonas: 1 km W. Taruma Falls, 19-I-1981, W. Opitz: Santarem: Goias: Station Isabel, Rio Araguata, Isla de Bananal, 27-X–4-XI-1960, B. Malkin. I examined 189 spec-

imens deposited in AMNH, BMNH, CASC, CHAH, CMNH, CNCI, CSUC, CMNC, CUIC, DEIC, EMEC, EMUS, FMNH, FSCA, IMLA, INBC, INHS, INSB, IZAV, JEWC, JNRC, JPHC, KSUC, LACM, LSUC, MCZC, MEMU, MMEC, MLPA, MNHN, MRSN, MSUC, MZSP, NINA, NYSM, OSEC, OSUC, OSUO, PMHN, PURC, QCAC, RFMC, RHTC, SEAN, SEMC, STRI, TAMU, TUMC, UCAG, UCDC, UMMZ, UMRM, UMSP, USNM, WFBC, WFBM, WOPC, WSUC, ZMAN, and ZMHB.

Plocamocera sericellopsis, new species

Figures 157, 174; map 7

HOLOTYPE: Male. Brazil: Rondonia: 62 km SE Ariquenes, 5–6 Nov. 1996, W. J. Hanson (MZSP). (Specimen point mounted, sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed; MZSP repository label, white, machine printed; holotype label, red, machine printed; plastic vial with aedeagus.)

PARATYPES: None.

DIAGNOSIS: Specimens of this species resemble very closely members of *P. sericella*. However, *P. sericellopsis* specimens differ by having only three spines on the protibia, the male pygidium is emarginate, and the aedeagus is shorter and more stout.

DESCRIPTION: *Size*: Length 5.0 mm; width 1.5 mm. *Integument*: Cranium predominantly piceous, castaneous near eyes; pronotum castaneous near margins, disc piceous; elytra variegated, anterior third and postmedial region pale, remainder piceous, light setae concentrated in anterior third; legs predominantly flavotestaceous, femora feebly infuscated. *Head*: Antennal club as in figure 157. *Thorax*: Pronotal anterior margin moderately projected at middle; disc swellings shallow, pronotal arch subscabrous; no conspicuous trichobothria on the elytral epipleural margin were found; protibial anterior margin with five spines; number of elytral trichobothria not discernible on holotype specimen. *Abdomen*: Male pygidium broad-scutiform, emarginate; aedeagus as in figure 174.

VARIATION: Not observed.

NATURAL HISTORY: The only available specimen was collected from the type locality, in November, with a Malaise trap perched over recently felled tree trunks.

DISTRIBUTION (map 7): Known only from the type locality.

ETYMOLOGY: The specific epithet stems from the Latin trivial name *sericella* and the Latin suffix *-opsis* (likeness). I refer to the superficial similarities between the members of this species and those of *P. sericella* Spinola.

Plocamocera bolivari, new species

Figures 148, 175, 206; map 6

HOLOTYPE: Male. Venezuela: Trujillo: La Guira.er. Betijoque, 9°19′ North, 70°24′ West, 4–9-XII-1996, 500 meters, Entrampa Malaise, J. Clavijo, J. L. Garcia, De Marmels, A. Chacon (IZAV). (Specimen point mounted, sex label affixed to paper point, white, machine printed; collectors label, white, machine printed; collecting technique label, white, machine printed; ownership label, green, machine printed; IZAV repository label, white, machine printed; holotype label, red, machine printed.)

PARATYPES: Five specimens from the same locality as the holotype (IZAV, 3; WOPC, 2).

DIAGNOSIS: This species is closely related to *P. auratilis*, n. sp. and *P. ambra*, n. sp. However, in *P. bolivari* specimens the body is shorter and more squat. Further, *P. bolivari* specimens differ from *P. auratilis* specimens by having the pygidium feebly emarginated, and the integument is generally more piceous. In *P. auratilis* beetles the pygidium is truncate and the integument is predominantly light castaneous. From *P. ambra* specimens, *P. bolivari* specimens differ by having a considerably narrower phallobasic apodeme.

DESCRIPTION: *Size*: Length 4.2–5.2 mm; width 1.5–2.2 mm. *Integument*: Cranium castaneous, frons piceous; pronotum castaneous near margins, disc piceous; elytra variegated, anterior third and posterior to middle broadly light castaneous, disc piceous in remainder; aggregates of light setae extended from epipleural to sutural margins; legs predominantly piceous, extremities of legs flavotestaceous. *Head*: Antennal club as in figure 148. *Thorax*: Pronotal anterior margin moderately projected at middle; discal swellings prominent; elytral epipleural margin with five con-

spicuous trichobothria; protibial anterior margin with three spines. *Abdomen*: Male pygidium broad-scutiform, feebly emarginate, female pygidium broad-scutiform; aedeagus as in figure 175.

VARIATION: The piceous regions of the elytra vary in intensity.

NATURAL HISTORY: The available specimens were collected from the eastern Andes of Venezuela, at 500 m. in a Malaise trap.

DISTRIBUTION (map 6): Known only from the type locality.

ETYMOLOGY: The specific epithet is a surname patronym and is used to honor General Simon Bolivar, a great liberator of the fine people of South America.

Plocamocera insula, new species

Figures 167, 208; map 7

HOLOTYPE: Female. Trinidad: St. George Co: Arima Ward, Simla (N.Y. Zool. Soc. Sta.), 11-VI-77, on dead twig, E. E. Grissell (FSCA). (Specimen point mounted, antenna and sex label affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed, collectors label, white, machine printed, natural history label, white, machine printed; FSCA repository label, white; holotype label, red, machine printed.)

PARATYPES: None.

DIAGNOSIS: Configuration of the antennomeres distinguishes specimens of this species from superficially similar specimens of *P. sericellopsis*; in *P. insula* beetles, antennomere eight is abruptly narrowed distally, whereas in *P. sericellopsis* specimens antennomere eight narrows gradually.

DESCRIPTION: *Size*: Length: 5.1 mm; width 2.0 mm. *Integument*: Cranium predominantly castaneous, frons and vertex narrowly piceous; pronotum castaneous; elytra variegated, humerus flavotestaceous, pale setae arranged into three irregular fascia; legs bicolorous, predominantly flavotestaceous, femora and tibiae infuscated. *Head*: Antennal club as in figure 167. *Thorax*: Pronotal anterior margin moderately projected at middle; pronotal disc with two prominent swellings; elytral epipleural margin with six conspicuous trichobothria; protibia anterior margin with three spines. *Abdomen*: Female pygidium broad scutiform.

VARIATION: Not observed.

NATURAL HISTORY: The available specimen was collected from the type locality during June, ''on dead twig''.

ETYMOLOGY: The trivial name *insula* is a Latin noun meaning ''island''. I refer to the type locality.

Plocamocera ambra, new species

Figures 155, 176; map 7

HOLOTYPE: Male. Costa Rica: Puntarenas: Est. Agujas. 300 m., 18–24 SET 1996, A. Azofeifa. 2_S_276750_526550 # 8486 (INBC). (Specimen point mounted; antenna and sex label affixed to paper point, white, machine printed; locality label, white, machine printed; electronic identification label, plastic, white, machine printed; INBC repository label, white, machine printed; holotype label, red, machine printed.)

PARATYPES: Three specimens; two from the type locality (INBC, 1; WOPC, 1). Costa Rica: Alajuela: 20 km S Upala, 8-XI-1990, D. D. Parker (EMUS, 1).

DIAGNOSIS: The outer angle on antennomere eight (fig. 155) will identify the members of this species within the *sericella* species group.

DESCRIPTION: *Size*: Length 5.0 mm; width 2.0 mm. *Integument*: Cranium dark castaneous, frons piceous; pronotum dark castaneous, disc piceous; elytra variegated, humerus flavotestaceous; pale setae arranged into three irregular fascia; legs bicolorous, femora and tibiae infuscated. *Head*: Antennal club as in figure 115. *Thorax*: Pronotal anterior margin moderately projected at middle; pronotal swellings feebly developed; elytral epipleural margin with six filamentous setae; protibial anterior margin with three spines. *Abdomen*: Aedeagus as in figure 176; male and female pygidia broad-scutiform.

VARIATION: The intensity of the infuscation on the frons varies.

NATURAL HISTORY: The specimen from Alajuela was collected in November; those from Puntarenas were collected at 300 m.

ETYMOLOGY: The specific epithet is a Latin noun that means amber. I refer to the amber-like luster emitted by the elytra.

Plocamocera selva, new species
Figures 121, 169; map 10

HOLOTYPE: Male. Bolivia: Santa Cruz: 5k ESE Warnes, Hotel Rio Selva, 20-X-200, blacklight trap, M. C. Thomas (FSCA). (Specimen point mounted, sex label and antenna affixed to paper point, white, machine printed; support card, white; locality label, white, machine printed; FSCA repository label, white, machine printed; holotype label, red, machine printed; plastic vial with abdomen and aedeagus.)

PARATYPES: None.

DIAGNOSIS: These beetles may be conveniently distinguished from superficially similar specimens of *P. insula*, n. sp. By the uniform curvate margins of the tenth antennomere.

DESCRIPTION: *Size*: Length 5.0 mm; width 2.0 mm. *Integument*: Cranium dark castaneous; pronotum castaneous at periphery, dark castaneous at disc; elytra variegated; legs flavotestaceous, femore infuscated distally. *Head*: Antenna as in figure 169. *Thorax*: Pronotal anterior margin prominently projected at middle, discal swelling very prominent; elytral epipleural margin with three conspicuous trichobothria; protibial anterior margin with three spines. *Abdomen*: Male pygidium broad-scutiform; aedeagus (fig. 121) lanceolate.

VARIATION: One specimen examined.

NATURAL HISTORY: The only available specimen was collected with blacklight.

DISTRIBUTION (map 10): This species is only known from the type locality.

ETYMOLOGY: The specific epithet constitutes a noun in apposition and refers to the type locality.

EVOLUTIONARY CONSIDERATIONS

The available evidence suggests that *Chaetophloeus* and *Plocamocera* are more closely related to each other than either one is to any other genus taxon within Epiphloeinae. Moreover, although the monophyly of *Plocamocera* is readily hypothesized on the basis of uniquely derived characteristics (apomorphies), I found it difficult to resolve all evolutionary pathways among its species groups and species. The task was impossible among members of the *confrater*, *coactilis*, and *sericella* groups in which only a few structural variations could be credibly evaluated as being apomorphic or plesiomorphic.

There are various other groups within Cleridae in which integumental variations are minimal. Indeed, finding structural diversity among taxa is no guarantee that such diversity will be useful towards credible, refutable hypotheses of evolution. I have found this a problem among a substantial variety of generic and suprageneric taxa within the family; for example, in such genera as *Enoclerus*, *Cymatodera*, *Priocera*, *Phlogistus*, and *Eleale*, and among the other genera of Epiphloeinae. Species of such groups may present observable differences, but in most cases few of such differences prove useful for predictions of relationships. Systematic progress within these difficult groups will have to await new information from nonintegumental characteristics, for example, information from internal anatomy, larval structure, or perhaps from nuances in nucleic acid research. Promising taxonomic results involving structural variations of the internal organs were published by Ekis and Gupta (1971), Crowson (1972), and Ekis (1978). Recently, Gerstmeier (2000) has pioneered some very exciting research in the Cleridae, setting the stage for innovative studies involving Cleridae DNA. It is hoped that such information will augment our present inventory of characteristics and contribute to the establishment of stable, heuristic classifications within Cleridae and Cleroidea.

CHARACTERS SELECTED FOR PHYLOGENETIC ANALYSIS

Twenty-six characters of *Chaetophloeus* and *Plocamocera* were used in the analysis, 25 from morphology and one from geographic distribution. Outgroups included representatives of the remaining 12 genera of Epiphloeinae and those of more distant outgroups such as genera of the Enopliinae–Korynetinae stock. Character states designated as ''0'' are considered plesiomorphic whereas those given a value of ''1'' (or ''2'' in the case of transformation series) are judged apomorphic.

Character 0—Body size: (0) not diminutive, 5 mm or longer; (1) diminutive, less than 4 mm

Character 1—Chaetosomes: (0) sparsely present on elytra and pronotum; (1) profusely present on dorsum of head, pronotum, and elytra
Character 2—Integumental color: (0) castaneous; (1) stramineous
Character 3—Cranium color: (0) predominantly castaneous; (1) predominantly black
Character 4—Sensilla trichodea of antenna: (0) short, much shorter than width of antennal club antennomeres; (1) medium length, about as long or slightly longer than width of antennal club antennomeres; (2) very long, much longer than width of antennal club antennomeres (fig. 10)
Character 5—Size of pedicel: (0) small; (1) large (fig. 86)
Character 6—Shape of antennomere eight: (0) suboval (fig. 156); (1) subquadrate (fig. 152)
Character 7—Shape of tenth antennomere: (0) linear (fig. 42); (1) cycle-shaped
Character 8—Shape of antennal club: (0) greatly expanded (fig. 144); (1) moderately expanded (fig. 153); (2) slender (fig. 140)
Character 9—Shape of pronotum: (0) subquadrate (fig. 38); (1) boldly transverse (habitus)
Character 10—Size of metacoxa: (0) normal (no. 4 in fig. 19); (1) very robust (no. 1 in fig. 18)
Character 11—Size of metafemur: (0) normal (no. 3 in fig. 19); (1) moderately robust (no. 2 in fig. 18); (2) very robust
Character 12—Number of protibial spines: (0) more than one; (1) one
Character 13—Lenght of metabasitarsomere: (0) about as long as metatarsomere two (1) slightly longer than metatarsomere two; (2) extensively longer than metatarsomere two
Character 14—Lenght of metatibial spur: (0) normal (fig. 108); (1) very long (no. 2 in fig. 20)
Character 15—Epipleural margin of elytra; (0) normal; (1) explanate
Character 16—Filamentous sensilla trichodea on elytral epipleural margin: (0) absent; (1) present (no 1 in fig. 16)
Character 17—Tripartite elytral humeral macula: (0) absent; (1) faintly discernible (fig. 72); (2) clearly discernible (fig. 56)
Character 18—Elytral color: (0) not subroseate; (1) subroseate
Character 19—Color of elytral setae: (0) not gold; (1) gold
Character 20—Color of abdomen: (0) not sexually dimorphic; (1) sexually dimorphic
Character 21—Pygidium: (0) not truncated; (1) truncated (fig. 96)
Character 22—Shape of aedeagus: (0) digitiform; (1) lanceolate (fig. 35); (2) sagittate (fig. 111)
Character 23—Lenght of phallic struts: (0) short, not much longer than phallobasic apodeme (fig. 111); (1) long, much longer than phallobasic apodeme (fig. 110)
Character 24—Male accessory glands: (0) two pair; (1) one pair
Character 25—Geographic distribution: (0) South America; (1) Central America–South America; (2) restricted to Central America

Phylogenetic Analysis of *Chaetophloeus* and *Plocamocera*

A character matrix was coded for the 13 taxa listed in table 1 (see p. 63) and encoded into Hennig86. The analysis yielded one phylogenetic tree (fig. 219) with a length index of 32, consistency index of 84, and retention index of 85.

Phylogenetic Interpretations

During the latter stages of this study I found among my fluid-preserved Cleridae one specimen of Epiphloeinae whose external features seem to bridge the evolutionary gap between *Plocamocera* and other Epiphloeinae genera such as *Epiphloeus* and *Madoniella*. It soon it became clear that this specimen represented a new genus and species most closely related to *Plocamocera*. Also, the serrulate condition of the epipleural margin present in all plocamocerans and in members of *Madoniella californica* (Van Dyke), *M. merkely* (Horn), and *M. nebulosa* (Chevrolat) suggest possible close kinships among the abovementioned genera. Stout elytral bristles (herein defined as chaetosomes), prominent among plocamoceran beetles and those of the monotypic genus *Chaetophloeus*, are also found, albeit in fewer numbers, in members of *Epiphloeus mucoreus* (Klug) and *E. duodecimmaculatus* (Klug). It remains to be determined whether some of the abovementioned similarities represent homoplasy or signify clues of suprageneric relationships. It is hoped that results from a survey involving structural variations of pronotal and elytral trichobothria, as well as elytral trichosomes within Epiphloeinae will contribute to a better understanding of sister-group relationships within this interesting subfamily.

Figure 219 illustrates the extent to which my current knowledge of *Chaetophloeus* and *Plocamocera* permits predictions of phylogeny at generic, species group, and species

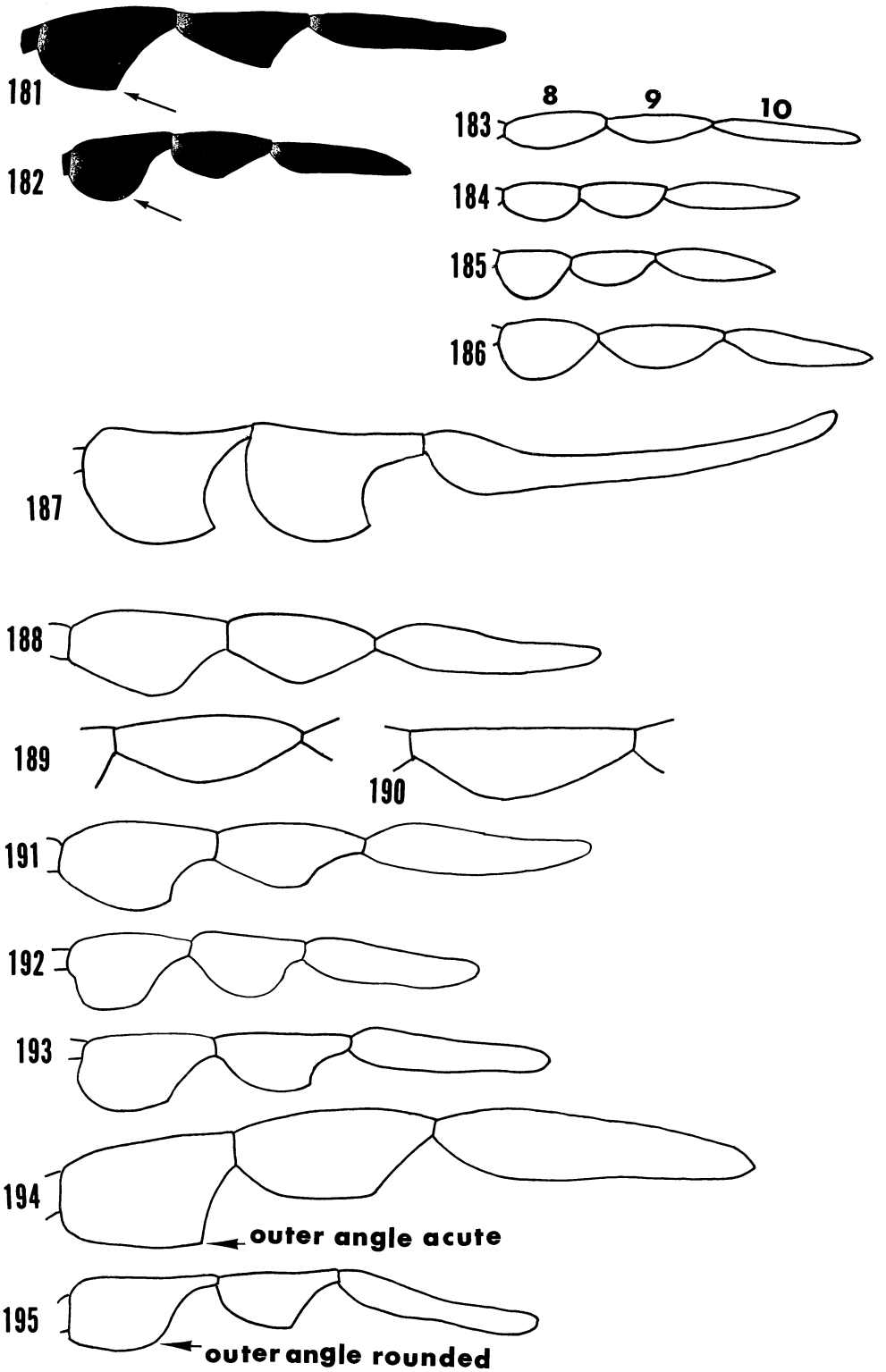
TABLE 1
Character Matrix of 25 Morphological Characters and One Geographic Charcter

	Characters																									
Taxa	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Chaetophloeus	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0
Castanea group	0	0	0	0	2	1	1	1	0	1	1	1	0	1	0	1	1	0	0	0	1	0	1	0	1	0
Confrater group	0	0	0	0	2	1	1	0	0	1	1	1	0	1	0	1	1	2	0	0	1	0	2	0	1	0
Coactilis group	0	0	0	0	2	1	1	0	0	1	1	1	0	1	0	1	1	2	0	0	1	0	1	0	1	0
lucis	0	0	1	0	2	1	0	0	1	1	1	1	0	2	1	0	1	0	0	0	1	0	1	0	1	0
sesquipedalis	0	0	0	0	2	1	0	0	1	1	1	1	0	2	1	0	1	0	0	0	1	0	1	1	–	0
prolixa	0	0	0	0	2	1	0	0	1	1	1	1	0	2	0	0	1	0	0	1	1	0	1	0	–	2
Sericella group	0	0	0	0	2	1	0	0	1	1	1	1	0	1	0	0	1	0	0	0	1	0	1	0	1	1
minima	1	0	0	1	2	1	0	0	2	1	1	1	0	1	0	0	1	1	0	0	1	0	1	0	–	2
aliguantula	1	0	0	1	2	1	0	0	2	1	1	1	1	1	0	0	1	1	0	0	1	0	1	1	–	2
salacis	1	0	0	1	2	1	0	0	2	1	1	1	0	1	0	0	1	1	0	0	1	0	1	0	–	0
manausensis	1	0	0	1	2	1	0	0	2	1	1	1	0	1	0	0	1	1	0	0	1	1	1	0	1	0
iota	1	0	0	1	2	1	0	0	2	1	1	1	0	1	0	0	1	1	1	0	1	0	–	0	–	0

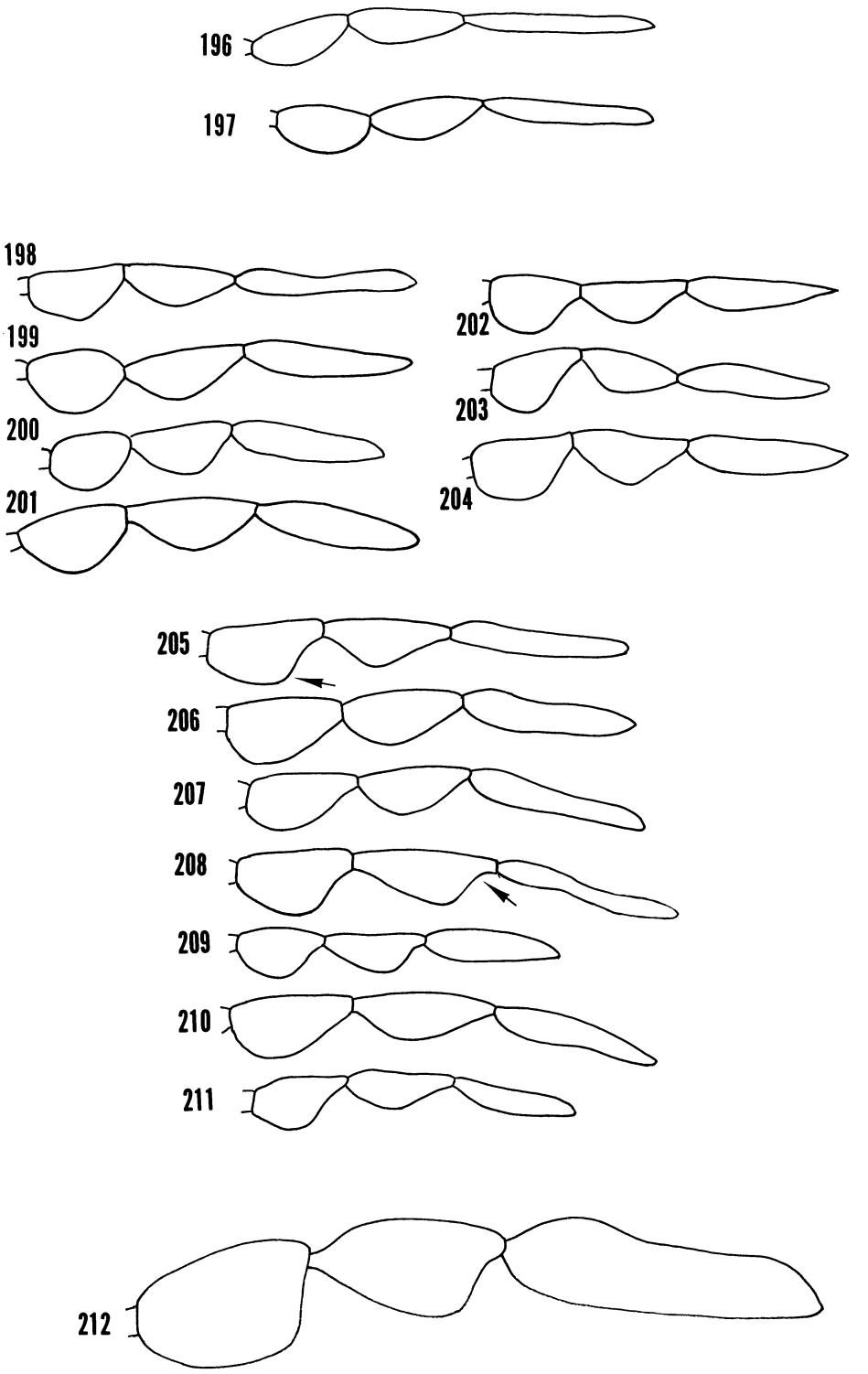
levels. Table 1 enumerates the data on which the phylogenetic diagram and narrative of relationships are based. The evidence for the discussion seems minimal, but it is offered as a beginning to build upon as more information becomes available.

The ancestral progenitor of the *Chaetophloeus-Plocamocera* stock (ancestral species A) (see fig. 219) evolved a very robust pedicel, the metabasitarsus became relatively lengthened, the aedeagus narrowed and lengthened, and the male internal reproductive organs were modified to the extent that only one pair of accessory glands remained. In time, this progenitor evolved the sister genera *Chaetophloeus* and *Plocamocera*. The indications are that this initial divergence took place in South America during the mid-Tertiary when the southern continent was disconnected from lower Central America (Malfait and Dinkelman, 1972), which functionally served as a small archipelago. Such an island setting would have been very conducive for speciation events. The monotypic *Chaetophloeus* and 80% of the extant plocamoceran species occur in South America, with most species being distributed within the Amazon Basin and central highlands of Brazil. The conjecture of a South American origin for these two genera assumes three independent northern dispersals involving taxa of three species groups. Five are known to occur in Central America, and only *P. sericella* extends from Brazil to southern Mexico. Such an extensive distribution of a species is not novel among clerid genera. Indeed, widespread distributions of clerid species may be more common than has been heretofore suspected, in view of the strong flying habits of these beetles. For example, the enopliine *Apolopha reichei* Spinola is known to occur from Argentina to Mexico (Opitz, 1998). Widespread distribution of a single species within a genus is not novel among the Cleridae.

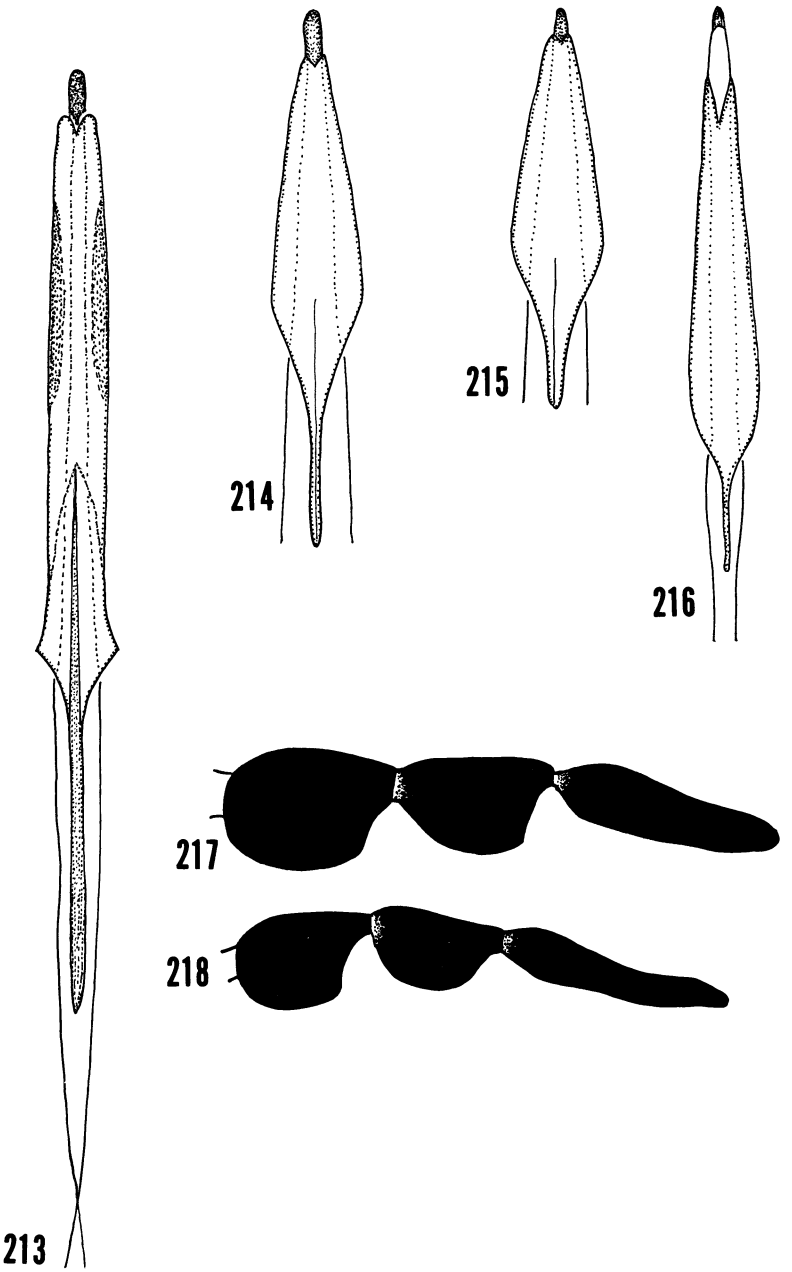
During the evolutionary progression from ancestral species A towards *Chaetophloeus*, chaetosomes became profusely distributed on the dorsal integument, and antennal sensilla trichodea were moderately lengthened. Antennal trichodea reached their maximal length in ancestral *Plocamocera* (i.e., ancestral species B), which was also characterized by an extensively transverse pronotum, very robust metacoxa and metafemur, an epipleural margin that evolved long trichobothria, and an abdominal venter that became sexually dimorphic in color. One of the early offshoots of the plocamoceran basic stock (ancestral species B) was the stem species of the *P. castanea–confrater–coactilis* group (ancestral species C), which eventually evolved into 14 known species, 13 of which stem from ancestral species D being characterized



Figs. 181–195. Antennal clubs. **181.** *Plocamocera confrater*. **182.** *P. procera*. **183.** *P. manausensis*. **184.** *P. alliguantula*. **185.** *P. iota*. **186.** *P. salasis*. **187.** *P. castanea*. **188.** *P. quadrula*. **189.** *P. similis*. **190.** *P. sesquipedalis*. **191.** *P. baria*. **192.** *P. aura*. **193.** *P. confrater*. **194.** *P. pupula*. **195.** *P. taruma*.



Figs. 196–212. Antennal clubs. **196.** *Plocamocera sesquipedalis*. **197.** *P. similis*. **198.** *P. coactilis*. **199.** *P. aspera*. **200.** *P. santa*. **201.** *P. onorei*. **202.** *P. bispina*. **203.** *P. carnegei*. **204.** *P. paris*. **205.** *P. ambra*. **206.** *P. bolivari*. **207.** *P. auratilis*. **208.** *P. insula*. **209.** *P. selva*. **210.** *P. cericellopsis*. **211.** *P. sericella*. **212.** *P. jayhawkalis*.



Figs. 213–218. Aedeagi and antenna. Aedeagi. **213.** *Plocamocera castanea*. **214.** *P. procera*. **215.** *P. confrater*. **216.** *P. buenavista*. Antenna. **217.** *P. buenavista*. **218.** *P. aura*.

by a clearly discernible tripartite humeral macula and an abundance of gold-colored setae. Ancestor D eventually diverged to produce the *P. confrater* (six species) and *P. coactilis* (seven species) species groups. During the evolutionary progression from progenitor E, there evolved a stem species (ancestral species F) that passed to its descendants (P. *lucis* and *P. sesquipedalis*) a substantially lengthened metatibial spur. During the evolutionary divergence of ancestral species E, there became established in its de-

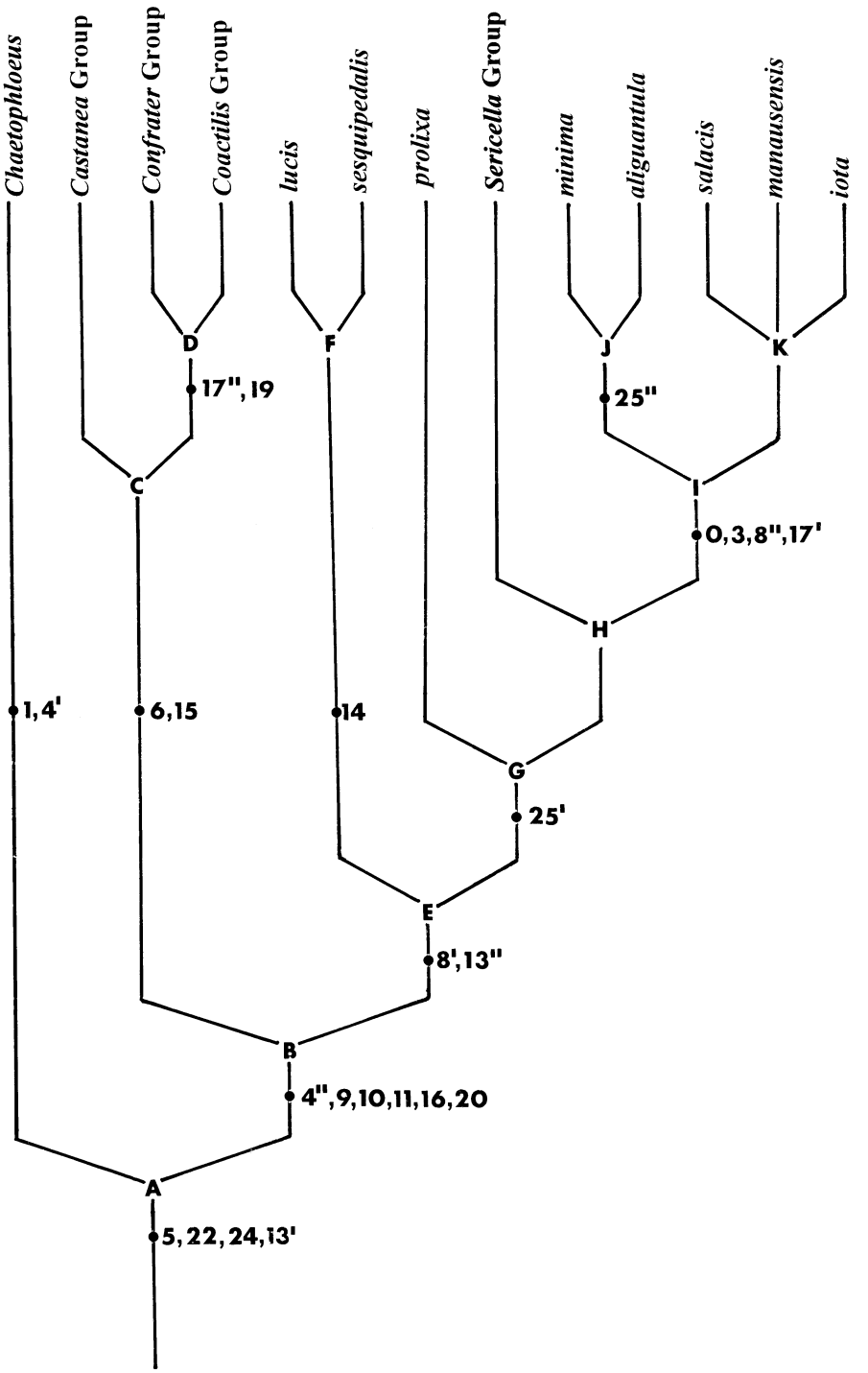


Fig. 219. Hypothesized phylogeny of *Chaetophloeus* and *Plocamocera* based on the Henig86 computer program. Letters at nodes represent ancestral species and numbers refer to apomorphic character states listed on page 92. High-set marks on numbers indicate a transformation series of a particular character, with the double marks representing the most derived condition.

scendants a trend towards a reduction of the width of the antennal club, and there was a continuance of the lengthening of the metabasitarsomere, which reached its highest degree of development in *P. lucis*, *P. sesquipedalis*, and *P. prolixa*. Subsequent evolution of ancestral species G led to *P. prolixa* and to the complementary stock that produced ancestral species H. The latter proceeded towards a secondary reduction of metabasitarsal length evident in *P. minima*, *P. aliguantula*, *P. manausensis*, and *P. iota*.

From the aspect of paleogeography, one may conclude that part of the evolutionary history of ancestral species G was a northward expansion from southern ancestral grounds during which populations of incipient species must have localized on the then-disjointed Central American archipelago. During this time, ancestral species H produced two major lineages, the *P. sericella* (seven species) group and its complementary stock (ancestral species I), in which there developed a considerable reduction of body length, the cranium became predominantly piceous, the antennal club reached its most slender form, and the tripartite elytral humeral macula became faintly visible. One stock from ancestral species I became an exclusively Central American progenitor (ancestral species J) that yielded *P. minima* and *P. aliguantula*. The complementary stock evolved ancestral species K, which remained in South America and evolved three species, *P. salasis*, *P. manausensis*, and *P. iota*, whose sister-group relationships cannot be postulated at present.

LOS GRUPOS DE ESPECIES DE *PLOCAMOCERA*

Grupo *manausensis*

Los miembros de este grupo de especies son diminutos, miden alrededor de 3 mm de largo; el cráneo es usualmente negro, con la única excepción de *P. salaris*, especie nueva, en la cual el craneo es parcialmente castaño; y los dos primeros artejos de la maza de las antenas son ovoides (fig. 149), siendo particularmente delgados en *P. manausensis*, especie nueva. Ademas, la distribución del grupo de la especie va desde Guatemala hasta la cuenca del Amazona en Brasil.

Grupo *sesquipedalis*

El segmento basal del metatarso es extraordinariamente largo en estas especies (fig. 109); la mancha apical tripartita falta; y el aedeagus (fig. 120) es particularmente largo. En dos de las especies (*P. sesquipedalis*, especie nueva, y *P. lucis*, especie nueva), el color pálido de los élitros acentua la abundancia de gruesas escamas oscuras. La combinación de las distribuciones de las tres especies se extiende desde el centro de Costa Rica hasta las selvas de Matto Grosso en Brasil.

Grupo *castanea*

Las especies de este grupo presentan antenas con maza muy desarrollada (fig. 144); la superficie de los élitros es un poco ondulada; y el margen sutural está cubierto con escamas particularmente robustas. La distribución del grupo va desde la selva pluvial de Napo en Eucador hasta las planicies del sur de Goias en Brasil.

Grupo *confrater*

Los miembros de este grupo presentan poca variación externa. Se deben examinar y correlacionar las variaciones del aedeago y de las antenas para poder apreciar totalmente lo util de las diferencias externas. En los especimen de *P. confrater* el octavo segmento antenal es subcuadrado (fig. 145); el aedeago es delgado (fig. 173) o acampanado en su base (fig. 112); el pigidio de la hembra es trígono-escutiforme (fig. 91) o escutiforme ancho (fig. 88) ; y la mancha humeral tripartita (fig. 56) está bien desarrollada. Este grupo de especies suramericanas ha sido reportado de Guayana, Ecuador, Perú, Bolivia, y Brasil.

Grupo *coactilis*

En estos *Plocamocera* el artejo basal de la maza de las antenas es más a menudo estrecho, raras veces ovalado ancho (fig. 153); el pronoto es principalmente café amarillento; la mancha humeral triparita es muy desarrollada; y el pigidio de la hembra es escutiforme ancho. El rango de distribución de las especies de este grupo va desde Ecuador hasta Brasil.

Grupo *sericella*

La forma ovalada estrecha del octavo artejo de las antenas; la ausencia de mancha humeral tripartita; y la presencia de agregados enmaranados de setas blancas sobre el disco elitral caracterizan los miembros de este grupo de especies. En este grupo encontramos *P. sericella* Spinola, la especie de *Plocamocera* de mas amplia distribución; se han reportado especimen desde Mexico hasta Brasil.

CLAVES DE LAS ESPECIES DE *PLOCAMOCERA*

Algunas de las especies más relacionadas en este género son muy similares externamente, las diferencias sutiles entre las antenas o entre los elitros generalmente corroboran diferencias más obvias en los genitales del macho. Cuando se trata de espécimen de los grupos *confrater* o *sericella*, se debe examinar los aedeagos de todos los machos disponibles y comparar con las ilustraciones. También se debe remover las antenas del cráneo y examinarlas sumergidas en agua o glicerina al mayor aumento posible, para obtener una resolución clara de la configuración de los artejos de las antenas.

La interpretación del tamaño del cuerpo puede ocasionalmente ser un obstáculo al usar esta clave. Todos los miembros del grupo *manausensis* son uniformemente diminutos, mientras que los espécimen de otros grupos de especies son superiores a cuatro milimetros y, por consiguiente, no diminutos como está definido en laclave; todos estos especímenes pasarán correctamente el primer paso de la clave. Sin embargo, pegueños especímenes de *P sericella* Spinola se acercan a los cuatro milimetros del grupo *manausensis*. Cuando se estudia estos especímenes, será necesario una medida exacta antes de poder pasar con toda seguridad el primer paso de la clave.

La siguiente dificultad potencial está en el paso ocho. En este caso, la forma de los artejos de las antenas puede presentar algunas dificultades de interpretación, especialmente con los espécimens de *P. aspera*, especie nueva. En estos coleópteros, el artejo ocho de la antena es algo ovalado, pero considerablemente más ancho que el de los miembros del grupo *sericella*. También, los especímenes que deberían salir de la clave como ocho prima no tienen el margen distal del artejo ocho cóncavo (el grado de concavidad varía con las especies, siendo sutilmente cóncavo en algunas y muy evidente en otros).

En el paso nueve, uno tiene que distinguir entre formas subcuadradas y ovoides del octavo artejo de la antena. En la mayoría de los casos es fácil separar las especies, pero en *P. amba*, especie nueva, el artejo ocho es levemente angular y posiblemente se podría interpretar como subcuadrado. Sin embargo, en especímenes de *P. ambra*, el élitro no presenta la mancha post–humeral tripartita, como en el caso de todos los especímenes del grupo *sericella*.

Por último, el grado de ‘‘estrechez’’ de la extremidad distal del artejo ocho de la antena es usado, con algunas dificultades, para separar los especímenes de algunas especies del grupo *confrater* (paso 22 y 22′). La ‘‘estrechez’’ puede ser muy notable o decepcionademente corta. Un aumento de por lo menos 90× debe ser usado para reconocer algunas de las mas utiles diferencias en las caracteristicas de las antenas.

1. Diminutos, menos de 4 mm; craneo usualmente negro; élitro moderadamente setoso, con una mancha bien definida café amarillenta (fig. 62) (grupo *manausensis*) 2
1′. Más grandes, 5–7 mm; cuando menos de 5 mm élitros, con parches densos de setas claras y oscuras, raras veces con manchas café marillentas 6
2(1). Cráneo bicolor, con orilla café (Brasil: Amazonas . . . *P. salasis*, especie nueva
2′. Cráneo negro 3
3(2). Artejos antenales ocho y nueve muy delgados, casi digitiformes (fig. 183) (Brasil: Amazonas . . . . . *P. manausensis*, especie nueva
3′. Artejos antenales ocho y nueve ovalados (fig. 149) 4
4(3′). Artejo antenal 10 robusto, tan sólo un poco más largo que el artejo nueve (fig. 103) (Brasil: Matto Grosso) . . . . . *P. iota*, especie nueva
4′. Artejo antenal 10 más delgado, mucho más largo que el artejo nueve (fig. 186) . . 5
5(4′). Margen anterior del protibia con una espina (fig. 78); apodema del falobase corta y obtusa (fig. 113) (Costa Rica: Limón) . . . . . *P. aliguantula*, especie nueva

5′. Margen anterior del protibia multiespinoso; apodema del falobase larga y delgada (fig. 114) (Panama: Zona del Canal) . . . . . *P. minima*, especie nueva

6(1). Metabasitarso el doble más largo que el segundo segmento metatarsal (fig. 109) (grupo *sesquipedalis*) 7

6′. Metabasitarso no el doble más larga que el segundo segmento metatarsal (fig. 108) 10

7(6). Espuela metatibal mucho más larga que la anchura de la margen distal del metatibia (fig. 137); élytro preeminente stramineous (Brasil: Matto Grosso) . . . . . *P. lucis*, especie nueva

7′. Espuela metatibial poquito más larga que la auchura de la margen distal del metatibia (fig. 138); élytro con regiones obscuras y alumbradas 8

8(7′). Élytro con muchas setas amarillo-oro (Costa Rica: Alajuela) . . . . . *P. prolixa*, especie nueva

8′. Élytro con setas obscuras alumbradas . . 9

9(8′). Mediodistal parte del artejo nueve estrecho, angosto (fig. 190); artejo antenal ocho angosto-ovado (fig. 196); apices del fálico lobado (Guyana: Demerara: Bartica. Perú: Loreto. Brasil: Rondonia) . . . . . *P. sesquipedalis*, especie nueva.

9′. Mediodistal parte del artejo nueve no muy estrecho, no tan angosto (fig. 196); artejo antenal ocho ancho-ovado, subrectangular (fig. 158); ápice del fálico triangular (Ecuador: Pinchincha) . . . . . *P. similis*, especie nueva

10(6′). Artejo basal de la maza antenal subcuadrado (fig. 144), siempre con un ángulo externo (fig. 144); élitros subovoides, disco siempre con mancha humeral tripartita (fig. 56), margen epipleural distintamente ensanchado 11

10′. Artejo basal de la maza antenal ovalada (fig. 163), raras veces con un ángulo externo; élitros subrectangulares, disco sin o con mancha humeral tripartita; margen epipleural no o muy poco ensanchado 21

11(10). Artejo antenal 10 falciforme (fig. 187) y considerablemente más largo que la suma de largo de los artejos ocho y nueve (Guiana Francia: Cayenne; Ecuador: Napo; Bolivia: Cochabamba; Perú: Amazonas; Brasil: Goias) (grupo *castanea*) . . . . . *P. castanea*, especie nueva

11′. Artejo antenal 10 no falciforme y no más largo que la suma del largo de los artejos ocho y nueve (grupo *confrater*) 2

12(11′). Margen distal del artejo noveno no cóncavo (figs. 146, 180, 188) 13

12′. Margen distal del artejo noveno poco concavo (fig. 161) o muy concavo (fig. 147) 15

13(12). Margen epipleural enarcado (fig.179) 14

13′. Margen epipleural lineal (fig. 178) (Brazil) . . . . . *specula*, especie nueva

14(13). Tripartita mancha humeral muy definitido (Brazil: Matto Grosso) . . . . . *P. quadrula* especie nueva

14′. Tripartita mancha humeral ausente (Surinam: Saramacca) . . . . . *P. jayhawkalis, especie nueva*

15(12′). Margen del artejo noveno muy cóncavo (fig. 191) (Venezuela: Amazonas) . . . . . *P. baria*, especie nueva

15′. Margen del artejo noveno poco concavo (fig. 122) 16

16(15′). Noveno artejo con una extensión distal muy estrecha (fig. 150) 17

16′. Noveno artejo con una corta extension distal 18

17(16). Octavo y noveno artejo poco estrechado distalmente (fig. 175); regiones intersticiales de los élitros arenosus (Bolivia: Santa Cruz) . . . . . *P. aura*, especie nueva

17′. Octavo y noveno artejo mas estrachado distalmente (fig. 218); regiones intersticiales de los élitros más brillantes (Bolivia: La Paz) . . . . . *P. aura*, especie nueva

18(16′). Decimo artejo antenal solamente un poco más largo que el noveno (fig. 215); tegmen corto; anterodistál margen del artejo nueve redondo . . . 19

18′. Décimo artejo antenal casi dos veces más largo que el noveno (fig. 162); anterodistál margen del artejo nueve angular (fig. 194) 20

19(18). Anterodistál angulo del artejo ocho poco angualar (fig. 42); tegmen corta, muy ancho a la base (fig. 112) (Guayan: Bartica. Giana Francais: Cayenne. Ecuador: Napo. Perú: Madre de Dios. Bolivia: Beni. Brasil: Rondonia; Para; Matto Grosso; Jatai, Amazonas) . . . . . *P. confrater*, especie nueva

19′. Anterodistal angulo del artejo ocho redondo (fig. 217); tegmen largo, delgado (fig. 214) (Coilombia: Amazonas) . . . . . *P. procera*, especie nueva

20(18′). Noveno artejo subrectangular (fig. 194); maza antenal robusta; la base del élitro

con un punto negro (Brasil: Matto Grosso) . . . *P. pupula*, especie nueva

20′. Noveno artejo mas cuadrado; maza antenal no robusta; la base del élitro sin punto negro (Brasil: Amazonas) . . . . . *P. taruma*, especie nueva

21(10′). Mancha humeral tripartita del élitro presente (fig. 64) (grupo *coactilis*) . . 22

21′. Mancha humeral tripartita del élitro ausente (grupo *sericella*) 28

22(21). Décimo artejo antenal dos veces mas largo que el noveno (fig. 163) (Brasil: Matto Grosso; Goias; Amazonas; Para) . . . . *P. coactilis*, especie nueva

22′. Decimo artejo antenal un poco mas largo que el noveno (fig. 199) 23

23(22′). Artejo antenal ocho globoso (fig. 200) 24

23′. Artejo antenal ocho ovado (fig. 154) 25

24(23). Noveno artejo antenal estrechado distantemente (fig. 199) (Brasil: Amazonas) . . . . . *P. aspera*, especie nueva

24′. Noveno artejo antenal no estrechado distantemente (fig. 200) (Brasil: Santa Catarina) . . . *P. santa*, especie nueva

25(23′). Margen anterior protibial con dos espinas (Ecuador: Napo) . . . . . *P. onorei*, especie nueva

22′. Margen anterior protibial con más de dos espinas 26

26(25′). Décimo artejo antenal acuminado (fig. 202) (Brasil: Matto Grosso) . . . . . *P. bispina*, especie nueva

26′. Décimo artejo antenal no acuminado, más lobado (fig. 203) 27

27(26′). Octavo artejo antenal angostado distantemente rapidamente (fig. 203) (Brasil: Guanabara) . . . . . *P. carnegei*, especie nueva

27′. Octavo artejo antenal angostado gradualmente (fig. 204) (Brasil: Distrito Federal) . . . *P. paris*, especie nueva

28(21′). Vestidura élitral, tóracica y craneal principalmente blanca; integumento uniformamente castaño pálido (Bolivia: Santa Cruz) . . . . . *P. argentea*, especie nueva

28′. Vestidura élitral, toracica y craneal mezclada de setas claras y oscuras; integumento variado 29

29(28′). Margen epipleural abruptamente explanado en el cuarto basal del élitro (fig. 74) 30

29′. Margen epipleural no explanado en el cuarto basal del élitro 32

30(29). Octavo artejo antenal con ángulo externo distinto (fig. 155) (Costa Rica: Puntarenas; Alahuela) . . . . . *P. ambra*, especie nueva

30′. Octavo artejo antenal sin ángulo externo (fig. 206) 31

31(30′). Margen epipleural obscuro; metafemora muy obscura (Venezuela: Trujillo) . . . . . *P. bolivari*, especie nueva.

31′. Margen epipleural castaño claro; metafémor más castaño clara que obscura (Costa Rica: Alajuela; Panama: Panama) . . . . . *P. auratilis*, especie nueva

32(29′). Noveno artejo antenal abruptamente más delgado distantemente (fig. 208) 33

32′. Noveno artejo antenal gradualmente más delgado distantemente (fig. 211) 34

33(32). Margen del decimo artejo sinuoso (fig. 167) (Tinidad) . . . . . *P. insula*, especies nueva

33′. Margen del decimo artejo no sinuoso (fig. 169) (Bolivia: Santa Cruz) . . *P. selva*, especie nueva

34(32′). Porciones claras del élitro castaño; tegmen largo, no esanchado en su base (fig. 117) (Mejico hasta Brasil) . . . . . *P. sericella* Spinola

34′. Porciones claras del élitro casi reseado; tegmen corto, ensanchado en su base (fig. 174) (Brasil: Rondonia) . . . . . *P. sericellopsis*, especie nueva

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REFERENCES

Arnett, Jr., R.H., G.A. Samuelson, and G.M. Nishida. 1993. The insects and spider collections of the world. Flora and fauna handbook no. 11., 2nd ed. Gainsville, FL: Sandhill Crane Press.

Barr, W.F. 1950. Contributions toward a knowledge of the insect fauna of lower California. (Coleoptera: Cleridae). Proceedings of the California Academy of Sciences 24(12): 483–519.

Barth, F.G., and A. Holler. 1999. Dynamics of arthropods filiform hairs. V. The response of spi-

der trichobothria to natural stimuli. Philosophical Transactions of the Royal Society of London B. Biological Sciences 354: 183–192.

Barth, F.G., J.A.C. Humphrey, U. Wastl, J. Halbritter, and W. Brittinger. 1995. Dynamics of arthropod filiform hairs. III. Flow patterns related to air movements detection in a spider (*Cupiennius salei* Keys). Philosophical Transactions of the Royal Society of London B Biological Sciences 347(1322): 359–469.

Bartlet, E.R. Romani, I.H. Williams, and N. Isidro. 1999. Functional anatomy of sensory structures on the antenna of *Psylloides chrysocephala* L. (Coleoptera: Chrysomelidae). International Journal of Insect Morphol and Embryology 28: 291–300.

Billings, R.F. 1986. Southern pine bark beetles and associated insects. Effects of rapidly-released host volatiles on response to aggregation pheromones. Zeitschrift fuer Angewandte Entomologie 99: 483–491.

Billings, R.F., and R.S. Cameron. 1984. Kairomonal responses of Coleoptera, *Monochamus titillator* (Cerambycidae), *Thanasimus dubius* (Cleridae), and *Temnochila viriscens (*Trogositidae), behavioral chemicals of southern pine bark beetles (Coleoptera: Scolytidae). Environmental Entomology 13: 1542–1548.

Blackwelder, R.E. 1954. Checklist of the coleopterous insects of Mexico, Central America, the West Indies, and South America, P. 3. United States National Museum Bulletin 185: 343–550.

Bock, W.J. 1973. Philosophical foundation of classical evolutionary classification. Systematic Zoology 22: 375–392.

Borden, J.H., and D.L. Wood. 1966. The antennal receptors and olfactory response to *Ips confusus* (Coleoptera: Scolytidae) to male sex attractants in the laboratory. Annales of the Entomological Society of America 59: 253–261.

Brown, K.S. 1975. Geographical patterns of evolution in neotropical Lepidoptera: systematics and derivation of known and new Heliconiini (Nymphalidae: Nymphaline). Journal of Entomology Series B. Taxonomy and Systematics 44(3): 201–242.

Calahan, P.S. 1975. Insect antenna with special reference to the mechanism of scent detection and the evolution of the sensilla. International Journal of Insect Morphology and Embryology 4(5): 381–430.

Camhi, J.M. 1980. The escape system of the cockroach. Scientific American 243: 144–156.

Chapin, E.A. 1927. The beetles of the family Cleridae collected on the Mulford Biological Exploration of the Amazon Basin 1921–1922. Proceedings of the United States National Museum 71(2): 1–10.

Comer, C.M., and J.P. Dowd. 1993. Multisensory processing for movement: antennal and cercal mediation of escape turning in the cockroach. *In* R. D. Beer, R. E. Ritzmann, and T. McKenna (editors), Biological neural networks in invertebrate neuroethology and robotics: 89–112. Boston: Academic Press.

Comer, C.M., E. Mara, K.A. Murphy, M. Getman, and M.C. Mungy. 1994. Multisensory control of escape in the cockroach *Periplaneta americana*. II. Patterns of touch-evolved behavior. Journal of Comparative Physiology A. Sensory Neural and Behavioral Physiology 174: 13–26.

Corporaal, J.B. 1942. Cleridae (Col.). Beitraege zur Fauna Perus 2(13): 135–147.

Corporaal, J.B. 1950. Cleridae. *In* W. D. Hincks (editor), Coleopterorum catalogus supplementa, Pars 23 (editio secunda): 373 pp. Gravenhage: W. Junk's.

Crowson, R.A. 1964. A review of the classification of Cleroidea (Coleoptera), with description of two new genera of Peltidae and of several new larval types. Transactions of the Royal Entomological Society of London 116(12): 275–327.

Crowson, R.A. 1972. On the systematic value of the alimentary canal in Cleridae. Systematic Zoology 21(3): 339–40.

Dambach, M., and H.-G. Heinzel. 1985. Niederfrequente Luftschwingungen als mogliche Kommunikationssignale bei einer Grille. Verhandlungen der Deutschen Zoologischen Gesellschaft 78: 333.

Dambach, M., H.-G. Rausche, and G. Wendler. 1983. Proprioceptive feedback influences the calling song of the field cricket. Naturwissenschaften 70: 417.

Darwin, C. 1859. On the origin of species by means of natural selection, or preservation of favoured races in the struggle for life. 2nd printing (1966). Cambridge: Harvard University Press.

Davidova-Vilimova, J., and P. Stys. 1993. Diversity and variation of trichobothrial patterns in adult Podopinae (Heteroptera: Pentatomidae). Acta Universitates Carolinae Biologica 73: 33–72.

Den Otter, C.J. 1973. Setiform sensilla and prey detection in the bird-spider *Sericopelma rubronitens* Ausserer (Araneae, Theraphosidae). Netherlands Journal of Zoology 24(3): 219–235.

Desmarest, E. 1860. Cleriens. *In* J.E. Chenu (editors), Encyclopedie de'histoire naturelle. Pt. 2: 226–279.Paris: Libraire de Firmin-Didot.

Disney, R.H.L. 1993. Convergent evolution be-

tween *Echinophora* and Termitoxeniinae (Diptera: Phoridae). Systematic Entomology 20: 195–206.
Dixon, W.N., and T.L. Payne. 1979. Aggregation of *Thanasimus dubius* on tree under Mass-attack by the Southern pine beetle. Environmental Entomology 8: 178–181.
Dixon, W.N., and T.L. Payne. 1980. Attraction of entomophagous and associate insects of the southern pine beetle to beetle to beetle-and host tree-produced volatiles. Journal of the Georgia Entomological Society 15(4): 378–389.
Drasler, K. 1973. Functional properties of trichobothria in the bug *Pyrrhocoris apterus* (L.). Journal of Comparative Zoology 84: 175–184.
Ekis, G. [now W. Opitz]. 1975. Taxonomic and nomenclatural status of clerid taxa described by Massimiliano Spinola (1780–1857) (Coleoptera, Cleridae). Bollettino dell Museo di Zoologia dell' Universita di Torino. 1: 1–80.
Ekis, G. [now W. Opitz]. 1975. Classification, phylogeny, and zoogeography of the checkered beetle genus *Perilypus* (Coleoptera: Cleridae: Clerinae). Smithsonian Contributions to Zoology 227: 1–138.
Ekis, G. [now W. Opitz]. 1978. Comparative anatomy and systematic significance of the internal organs of checkered beetles. P. II. Reproductive systems of the New World genus *Enoclerus* Gahan (Coleoptera: Cleridae). Coleopterists Bulletin 34(4): 279–297.
Ekis, G. [now W. Opitz],and A.P. Gupta. 1971. Digestive system of Cleridae (Coleoptera). International Journal of Insect Morphology and Embryology 1(1): 51–86.
Erichson, W.F. 1847. Conspectus Insectorum Coleopterorum quae in republica Peruana observata sunt. XII. Fam. Clerii. Archiv fuer Naturgeschichte 13: 85–86.
Erwin, T.L. 1975. Studies of the subtribe Tachyna (Coleoptera: Carabidae: Bembidiinae), P. III: Systematics, phylogeny, and zoogeography of the genus *Tachyta* Kirby. Smithsonian Contributions to Zoology 208: 1–68.
Farris, J.S. 1988. Hennig86. Documentation.
Fletcher, N.H. 1978. Acoustical responses of hair receptors in insects. Journal of Comparative Physiology A. Sensory Neural Behavioral Physiology 127: 185–189.
Friedel, T., and F.G. Barth. 1977. Wind-sensitive interneurons in the spider CNS (*Cupiennis salei*): directional information processing of sensory inputs from trichobothria on the walking legs. Journal of Comparative Physiology A. Sensory Neural and Behavioral Physiology 180: 223–233.
Frings, H., and M. Frings. 1966. Reactions of orb-weaving spiders (Argiopidae) to airborne sounds. Ecology 43: 578–588.
Gahan, C.J. 1910. Notes on Cleridae and descriptions of new genera of this family of Coleoptera. Annals and Magazine of Natural History 5(8): 55–76.
Gemminger, M., and E. Harold. 1869. Catalogus Coleopterorum hucuque descriptorum synonymicus et systematicus, tome 6, familia XLIII, Cleridae: 1722–1759. Monaco: Sumptu E. H. Gummi.
Gerstmeier, R. 1998. Checkered beetles. Illustrated key to the Cleridae of the Western Palearctic. Weikersheim: Margraf Verlag. 241 pp.
Gerstmeier, R. 2000. Aktueller Stand der Buntkafer-Forshung (Coleoptera, Cleridae, Thanerocleridae). Entomologica Basiliensia. 22: 169–178.
Gorham, H.S. 1877. Description of new species of Cleridae. Transactions of the Royal Entomological Society of London 18(3): 245–263.
Gorham, H.S. 1882. Biologia Centrali-Americana, Insecta, Coleoptera, Cleridae, vol. 3, p. 2: 120–168: 1883; 169–193; 1886, Supp. pp. 332–346, pls. 7–10, 12, 13.
Gorner, P., and P. Andrews. 1969. Trichobothrien, ein Ferntastsinnesorgan bei Webespinnen (Araneen). Zeitschrift fuer Vergleichende Physiologie 64: 301–317.
Gras, H. and M. Horner. 1992. Wind-evoked escape running of the cricket *Gryllus bimaculatus*. I. Behavioural analysis. Journal of Experimental Biology 171: 189–214.
Guérin-Méneville, M.F.E. 1874. Catalogue des Clerides de la collection de M. A. Chevrolat. Revue et Magasin de Zoologie Pure et Appliquée, 3 ser. 2: 252–329.
Haffer, J. 1969. Speciation in Amazonian forest birds. Science 165: 131–137.
Hartman, H.B., and B.W. Leander. 1987. Enervation of cockroach cercal receptors as revealed by horseradish peroxide (Insecta, Blattodea). Zoomorphology 107(2): 77–80.
Hartman, H.B., L.P. Bennet, and B.A. Moulton. 1987. Anatomy of equilibrium receptors and cerci of the burrowing cockroach *Arenivaga* (Insecta, Blattoidea). Zoomorphology 107(2): 81–87.
Harwood, W.G., and J.A. Rudinsky. 1966. The flight and olfactory behavior of checkered beetles (Coleoptera: Cleridae) predatory on the Douglas-fir beetle. Oregon Agricultural Experiment Station Technical Bulletin 95.
Hennig, W. 1965. Phylogenetic systematics. Annual Revue of Entomology 10: 97–116. Hennig, W. 1966. Phylogenetic systematics. Urbana: University of Illinois Press, 263 pp.
Hespenheide, H.A. 1973. A novel mimicry com-

ples: Beetles and flies. Journal of Entomology 48(1): 49–56.
Hoffman, C. 1967. Bau und Function der Trichobothrien von *Euscorpius carpathicus* L. Zeitschrift fuer Vergleichende Physiology 54: 290–352.
Holler, A., W. Brittinger, T. Friedel, and F.G. Barth. 1993. Spider sensory systems: Trichobothria. The range of air movement detection. *In* N. Elsner, H. Breer (editors), Proceedings of 22nd Gottingen Neurobiology Conference, vol II. Gottingen Neurobiology Report 1994: 253.
Horn, G.H. 1887. A monograph of the Aphodiinae inhabiting the United States. Transactions of the Amererican Entomological Society (Philadelphia) 14: 1–110.
Ivanov, H. 1992. Electron microscopy of the pygidium of *Xenopsylla cheopis* Roths., 1903 (Siphonoptera). Entomological. Review (English Translaton of Entomologicheskoye Obozreniye) 73(3): 18–31.
Jacob, H. 1940. Cleriden. Entomologisches Berichten (Amsterdam) 10: 214–218.
Kaissling, K.-E. 1971. Insect olfaction. *In* L.M. Beidler (editor), Handbook of sensory physiology 4(1): 351–431.
Kitts, D.B. 1977. Karl Popper, verifiability, and systematic zoology. Systematic Zoology 26: 185–194.
Klug, J.C.F. 1842. Versuch einer systematischen Bestimmung und Auseinandersetzung der Gattungen und Arten der Clerii, einer Insectenfamilie aus der Ordung der Coleopteren. Abhandlungen Berlin Akademie der Berlin Wissenschaften, pp. 259–397.
Kuwert, A. 1893. Die Epiphloinen Gattungen der Cleriden und einige neue Arten derselben. Annales de la Societe Entomologique de Belgique 37: 492–497.
Lacordaire, J.T. 1857. Histoire naturelle des insectes. Genera des Coléoptéres ou expose methodique et critique des tous les genres proposes jusqu'ici dans cet ordre d'Insectes. Tome 4, famille XLI, Clerides: 415–496. Paris: Libraire Encyclopedique de Roret.
Lawson, F.A., and G.P. Epling. 1966. A new type of sensory hair in *Periplaneta Americana* (Insecta; Orthoptera: Blattidae). Journal of the Kansas Entomological Society 39: 783–796.
Lohde, R. 1900. Cleridarum catalogus. Stettiner Entomologische Zeitung. 61: 3–148.
Magnuson, L.J., and R.J. Baerwald. 1987. Water current trichobothria on the larvae of *Toxorhynchites rutilus* (Diptera: Culicidae). Annals of the Entomological Society of America 8(5): 637–641.
Malfait, B.T., and M.G. Dinkman. 1972. Circum-Caribbean tectonic and igneous activity and the evolution of the Caribbean Plate. Geological Society of America Bulletin 83: 251–272.
Markl, H., and J. Tautz. 1975. The sensitivity of hair receptors in caterpillars of *Barathra brassicae* L. (Lepidoptera, Noctuidae) to particle movement in a sound field. Journal of Comparative Physiology 99: 79–87.
Mayr, E. 1969. Principles of systematic zoology. New York: McGraw Hill, 328 pp.
Mencke, R., M.H.M. Galileo, and W. Engles. 2001. New records of insects associated with *Aracauria* trees: phytophagous Coleoptera and Hymenoptera and their natural enemies. Studies on Neotropical Fauna and Environment 36(2): 113–124.
Merivee, E., M. Rahi, J. Bresciani, H.P. Ravn, and A. Luik. 1998. Antennal sensilla of click beetle, *Limonius aeruginosus* (Olivier) (Coleoptera: Elateridae). International Journal of Insect Morphology and Embryology 27(4): 311–318.
Mizell III, R.F., J.L. Frazier, and T.E. Nebeker. 1984. Response to the clerid predator *Thanasimus dubius* (F) to bark beetle pheromones and tree volatiles in wind tunnel. Journal of Chemical Ecology 10(1): 177–187.
Mustaparta, H. 1973. Olfactory sensilla on the antenna of the Pine Weevil, *Hylobius abietis*. Zeitschrift fuer Zellforchung und Microskopisches Anatomie 144: 559–571.
Mustaparta, H. 1975. Responses of single olfactory cells in the pine weevil *Hylobius abietis* (Coleoptera: Curculioniodae). Journal of Comparative Physiology A. Sensory Neural and Behavioral Physiology 97: 271–290.
Nichols, S.W. 1987. The Torre-Bueno glossary of entomolgy. New York: Entomological Society, American Museum of Natural History, 840 pp.
Oliva, A. 1992. Cuticular microstructure in some genera of Hydrophilidae (Coleoptera) and their phylogenetic significance. Bulletin de l' Institute Royal des Sciences Naturelles de Belgique Entomologie 62: 33–56.
Opitz, W. (formerly G. Ekis). 1997. Classification, natural history, and evolution of the Epiphloeinae (Coleoptera: Cleridae). P. I. The genera of Epiphloeinae. Insecta Mundi 11(1): 51–96.
Pic, M. 1942. Opuscula martialis. 7: 3.
Pitman, G.B., and J.P. Vite. 1969. Predator-prey response to western pine beetle attractants. Journal of Economic Entomology 64: 402–404.
Platnick, N.I., and E.S. Gaffney. 1977. Systematics: A Popparian perspective. Systematic Zoology 26: 360–365.
Platnick, N.I., and E.S. Gaffney. 1978. Systematics: A Popperian perspective. Systematic Zoology 27: 137–141.
Popper, K. 1968. The logic of scientific discovery. 2nd English ed. New York: Harper and Row.

Pumphrey, R.J. 1940. Hearing in insect. Biological Reviews of the Cambridge Philosophical Society 15: 107–132.

Roeder, K. 1963. Nerve cells and insect behavior. Cambridge, MA: Harvard University Press, 188 pp.

Ross, H.H. 1974. Biological Systematics. Reading, MA: Addison-Wesley, 354 pp.

Ruckes, H. Sr. 1961. The diagnostic value of trichobothria in pentatomid taxonomy. Verhandlungen des XI Internationaler Kongress fuer Entomologie Verhandlungen, Wienna, 1960: 35–37.

Schaefer, C.W. 1975. Heteropteran trichobothria (Hemiptera: Heteroptera). International Journal of Insect Morphology and Embryology 4(3): 193–264.

Schaefer, C.W. 1981. Genital capsules, trichobothria, and host plants of the Podopinae (Pentatomidae). Annals of the Entomological Society of America 74(6): 590–601.

Schenkling, S. 1903. Coleoptera Malacodermata, fam. Cleridae, fasc. 13. *In* Genera Insectorum, fasc. 13: 1–124, pls. 1–5. Bruxelles: P. Wytsman.

Schneider, D. 1969. Insect olfaction: Deciphering system for chemical messages. Science 163: 1031–1037.

Schuh, R.T. 1975. The structure, distribution, and taxonomic importance of trichobothria in the Miridae (Hemiptera). American Museum Novitates 2585: 1–26.

Smola, U. 1969. Untersuchungen zur Topograpie, Mechanik und Stromungs der Sinneshaare dem Kopf der Wanderheuschrecke *Locusta migratoria*. Zeitschrift fuer Vergleichende Physiologie 67: 382–402.

Spinola, M. 1884a. Essai monographique sur les Clerites: insectes Coléoptéres, vol. 1, i–ix, 1–386. Genes.

Spinola, M. 1844b. Essai monographique sur les Clerites: insectes Coléoptéres. Vol. 2, 1–216, pls. 1–xlvii. Genes.

Steinbrecht, R.A. 1970. Zur Morphometrie der Antenne des Seidenspinners, *Bombyx mori* L.; Zahl und Verteilung der Reichsensillen (Insecta, Lepiudoptera). Zeitschrift fuer Morphologie de Tierre 68: 93–126.

Steyskal, G.C. 1991. On the meaning of the term ‘‘Trichobothrium. Entomological News 102(2): 95–96.

Stierle, J.E., M. Getman, and C.M. Comer. 1992. Multisensory control of escape in the cockroach *Periplaneta americana*. I. Mechanical properties of the receptor hairs. Journal of Comparative Physiology A. Sensory Neural and Behavioral Physiology 118: 13–31.

Stierle, J.E., M. Getman, and C.M. Comer. 1994. Multisensory control of escape in the cockroach *Periplaneta americana*. I. Initial evidence from patterns of wind- evoked behavior. Journal of Comparative Physiology A. Sensory Neural and Behavioral Physiology 174: 1–11.

Tautz, J. 1977. Reception of medium vibration by thoracal hairs of caterpillars of *Barathra bassicae* L. (Lepidoptera, Noctuidae). I. Mechanical properties of the receptor hairs. Journal of Comparative Physiology A. Sensory Neural and Behavioral Physiology 118: 13–31.

Tautz, J. 1975. Reception of particle oscillation in a medium-an unorthodox sensory capacity. Naturwissenschaften 66: 452–461.

Tautz, J., and H. Markl. 1978. Caterpillars detect flying wasps by hair sensitive to airborne vibrations. Behavioral Ecology and Sociobiology 4: 101–110.

Tobias, M., and R.K. Murphy. 1979. The response of cercal receptors and identified interneurons in the cricket (*Acheta domesticus*) to airstreams. Journal of Comparative Physiology A. Sensory Neural and Behavioral Physiology 129: 51–59.

Vite, J.P., and D.L. Williamson. 1970. *Thanasimus dubius*: Prey perception. Journal of Insect Physiology 16: 233–239.

Watrous, L.E., and Q.D. Wheeler. 1975. The outgroup comparison method of character analysis. Systematic Zoology 30: 1–11.

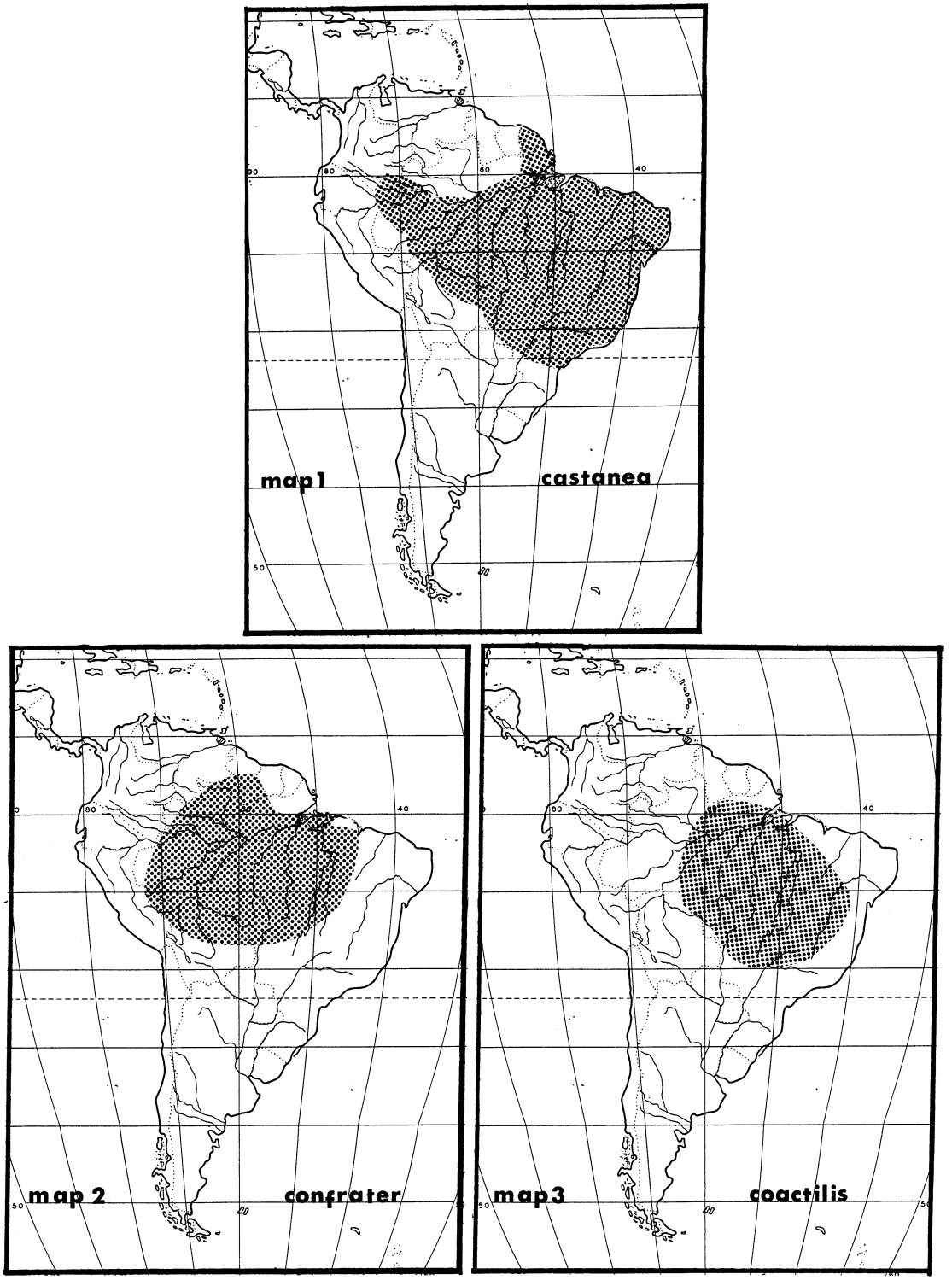
Whittaker, R.H., and P.P. Foemy. 1971. Allelochemics: chemical interactions between species. Science 171: 757–770.

Winkler, J.R. 1961. Die Buntkafer (Cleridae). Wittenburg, Lutherstadt: A. Ziemsen Verlag, 108 pp., 82 figs., 2 color pls.

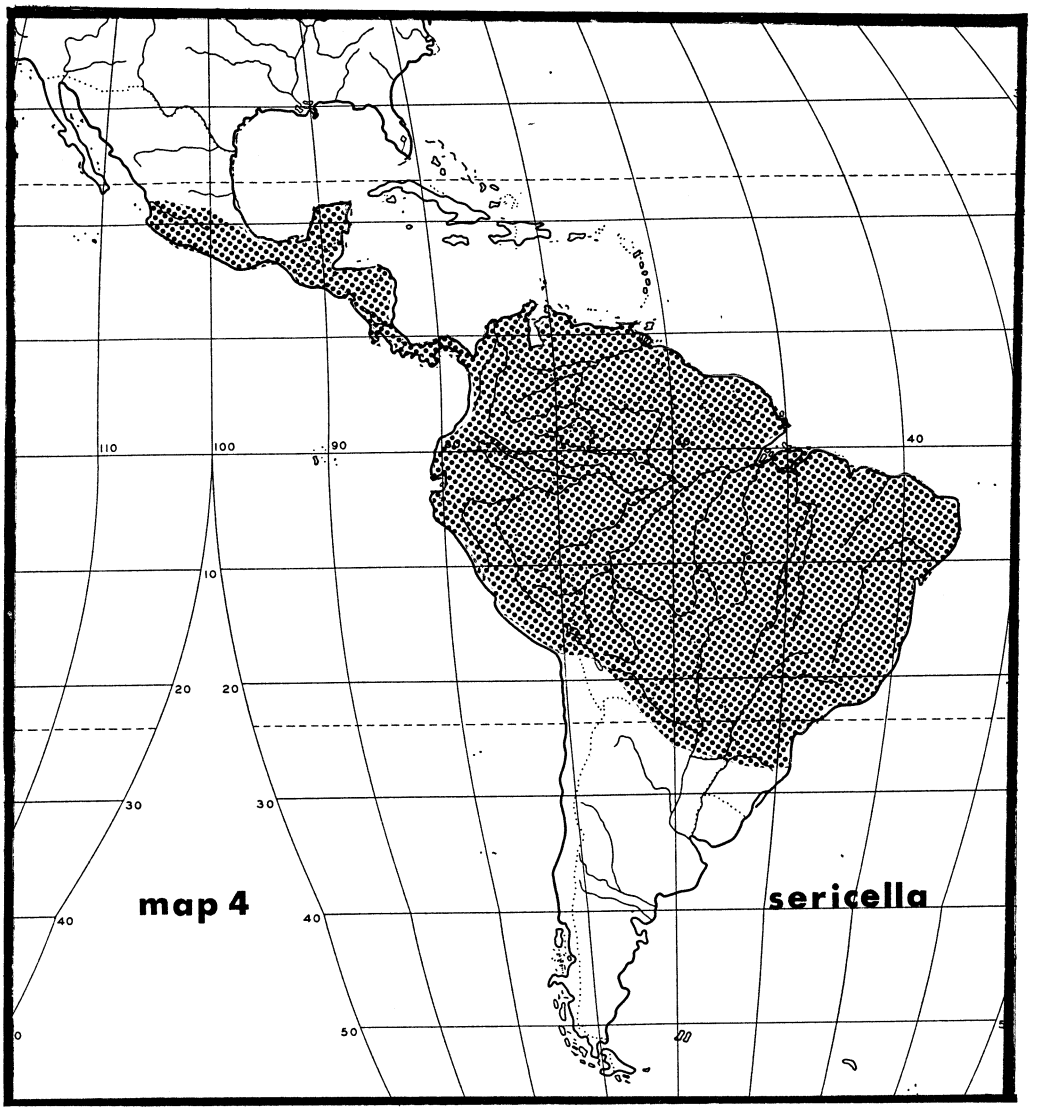
Wygodzinsky, P.W., and S. Lodhi. 1989. Atlas of antennal trichobothria in the Pachynomidae and Reduviidae (Heteroptera). Journal of the New York Entomological Society 97(4): 371–393.

Zacharuk, R.Y. 1983. Antenna and sensilla. *In* G.A. Kerkut and L.I. Gilbert (editors), Comparative insect physiology: biochemistry and pharmacology 6: 1–69.Oxford: Pergamon.

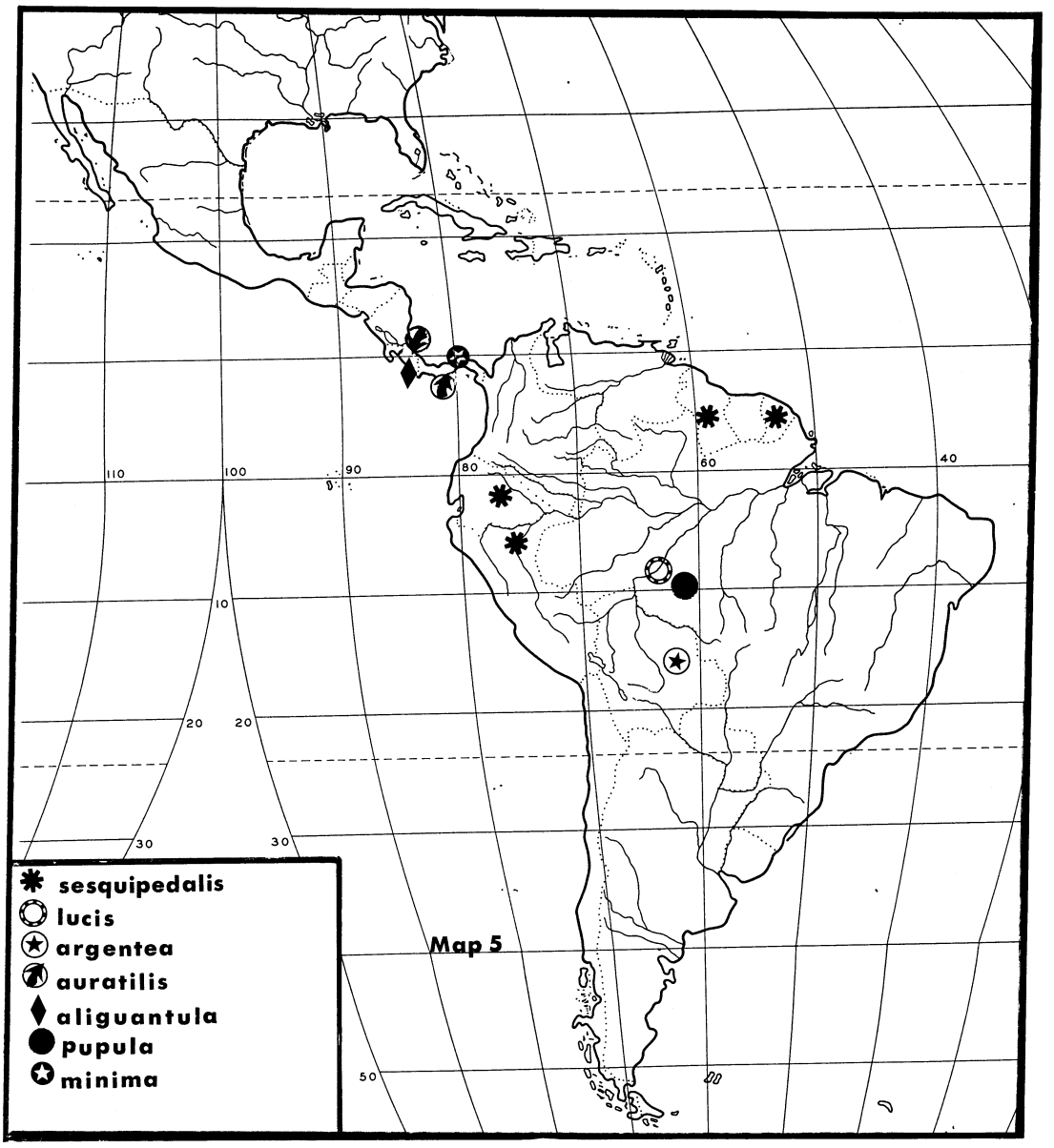
Zrzavy, J. 1990. Antennal trichobothria in Heteroptera: a phylogenetic approach. Acta Entomologica Bohemoslovaca 87(5): 321–325.



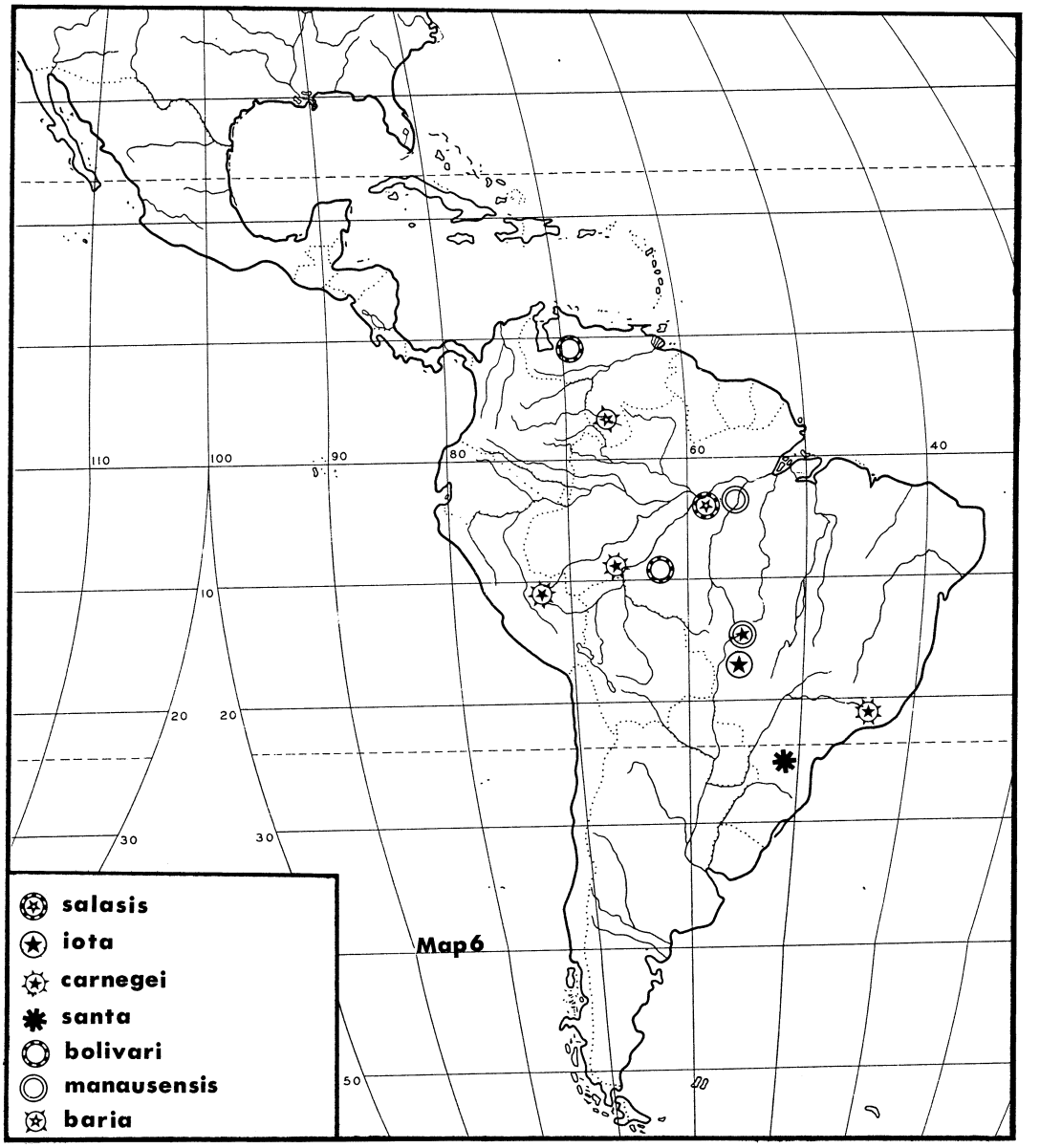
Maps 1–3. (1) Distribution of *Plocamocera castanea;* (2) Distribution of *Plocamocera confrater;* (3) Distribution of *P. coactilis.*



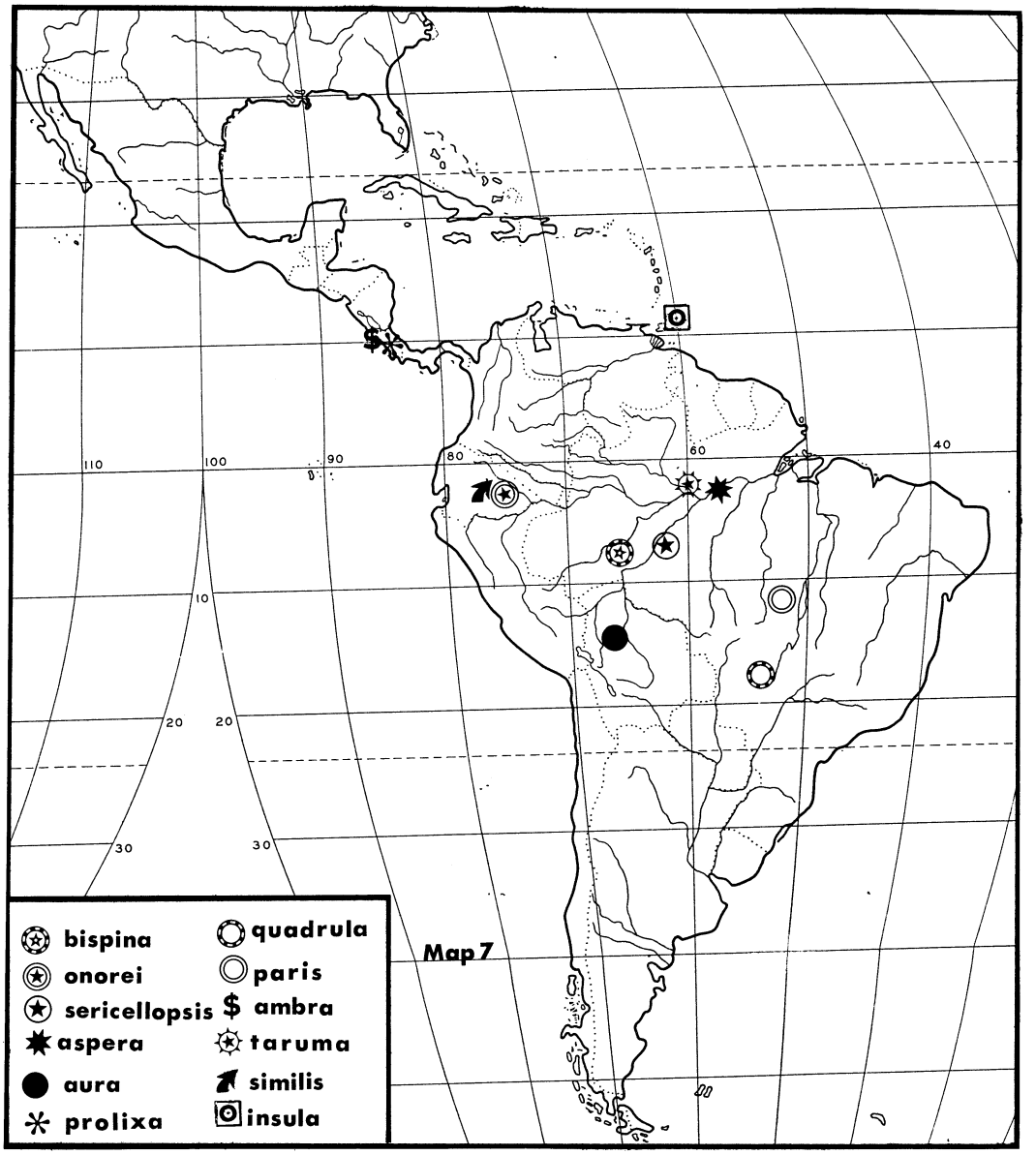
Map 4. Distribution of *Plocamocera sericella*.



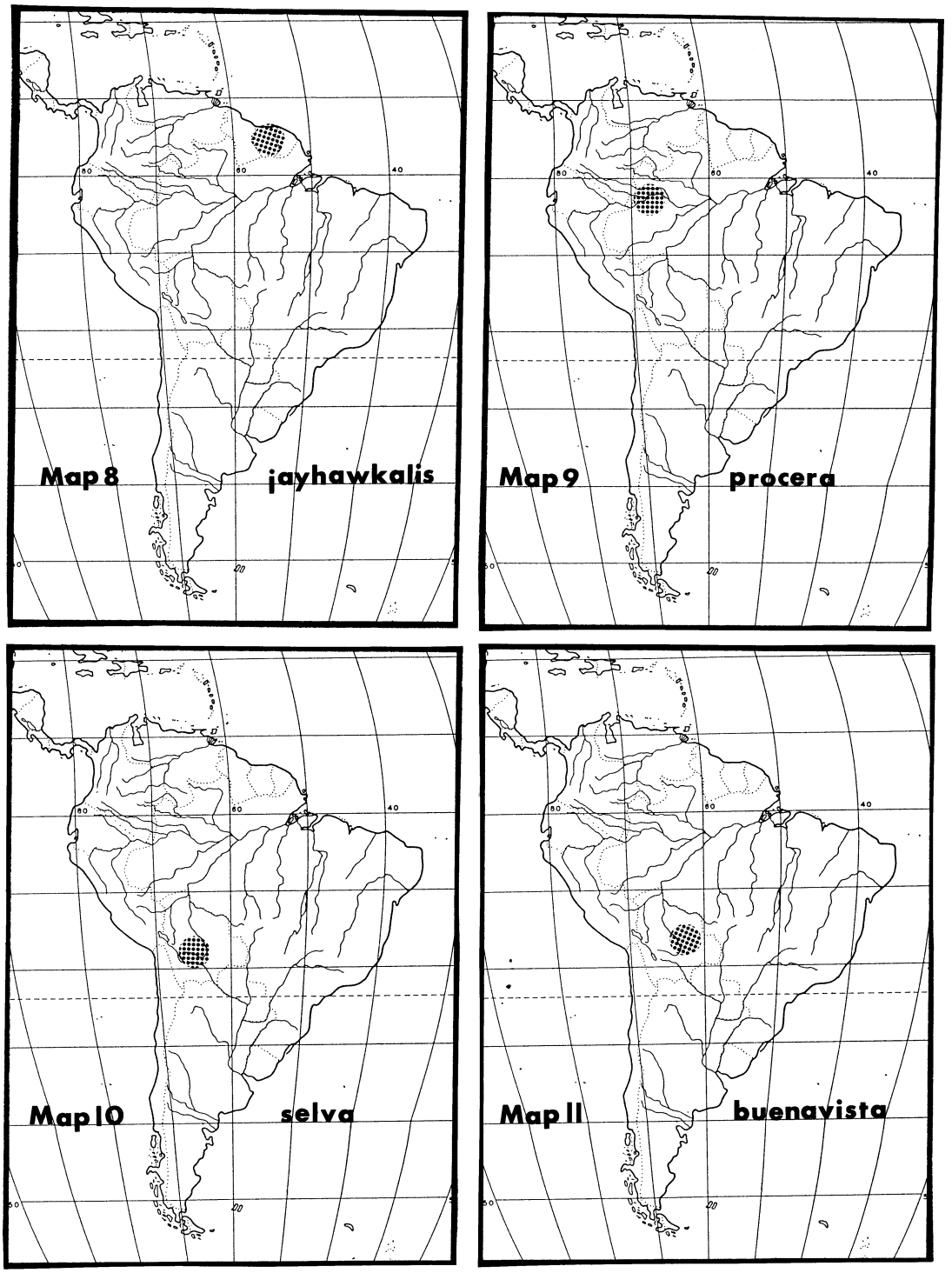
Map 5. Distribution of *Plocamocera sesquipedalis, P. lucis, P. argentea, P. auratilis, P. aliguantula, P. pupula, P. minima,* and *P. selva*.



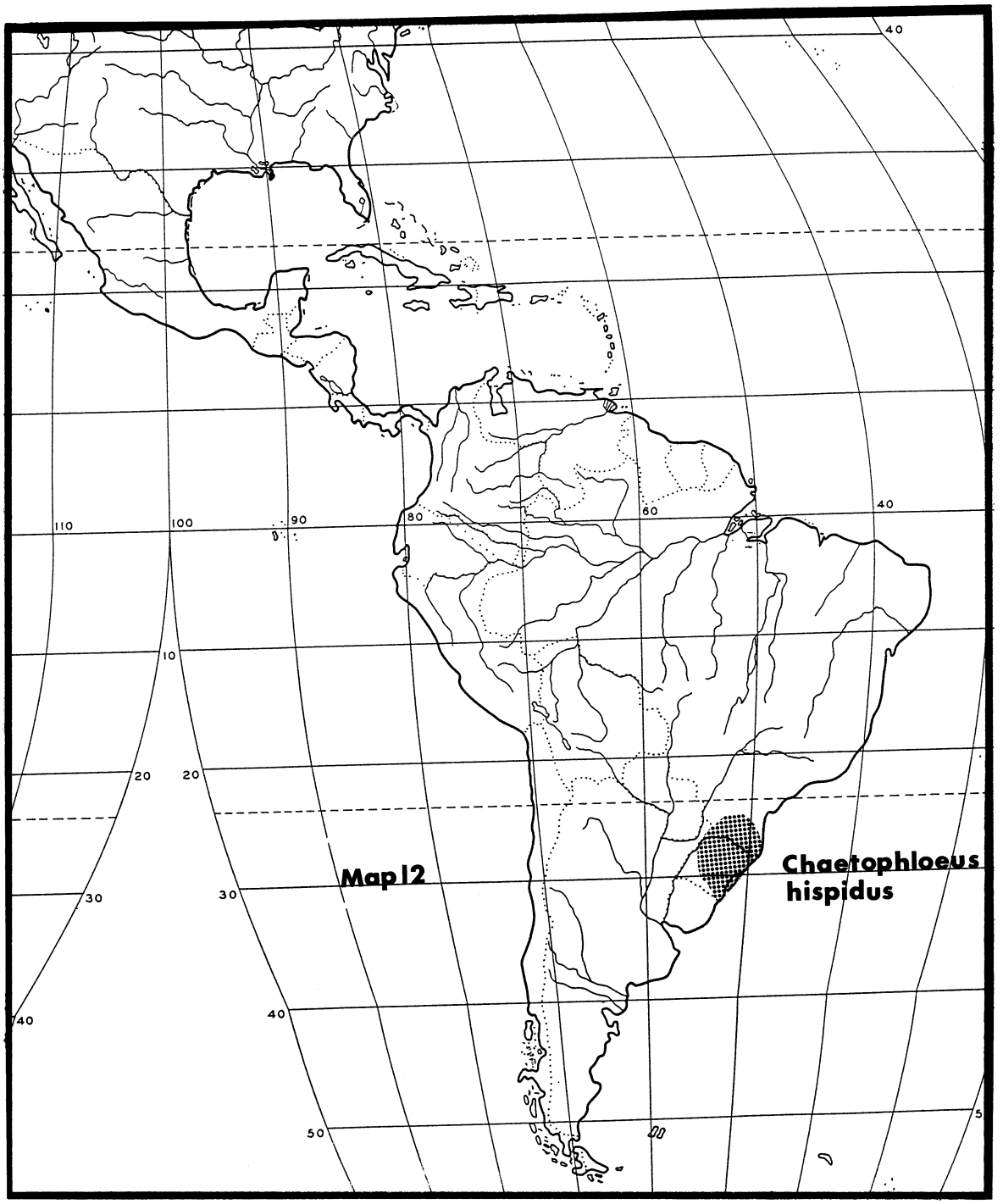
Map 6. Distribution of *Plocamocera salasis*, *P. iota*, *P. carnegei*, *P. santa*, *P. bolivari*, *P. manausensis*, *P. baria*.



Map 7. Distribution of *Plocamocera bispina, P. onorei, P. sericellopsis, P. aspera, P. aura, P. prolixa, P. quadrula, P. paris, P. ambra, P. taruma, P. similis,* and *P. insula*.



Maps 8–11. Distribution of *Plocamocera jayhawkalis, P. procera, P.selva, P. buenavista.*



Map 12. Distribution of *Chaetophloeus hispidus*.