

**UC Office of the President**  
**UC Publications in Entomology**

**Title**

Species Revision and Generic Systematics of World Rileyinae (Hymenoptera: Eurytomidae)

**Permalink**

<https://escholarship.org/uc/item/6d0851rn>

**Author**

Gates, Michael William

**Publication Date**

2008-05-31

Peer reviewed

UNIVERSITY OF CALIFORNIA PUBLICATIONS

ENTOMOLOGY

VOLUME 127

**Species Revision and  
Generic Systematics of  
World Rileyinae  
(Hymenoptera: Eurytomidae)**

---

**Michael W. Gates**

Available online at <http://repositories.cdlib.org/ucpress/>

Species Revision and Generic  
Systematics of World Rileyinae  
(Hymenoptera: Eurytomidae)

Michael W. Gates



Species Revision and Generic  
Systematics of World Rileyinae  
(Hymenoptera: Eurytomidae)

Michael W. Gates

UNIVERSITY OF CALIFORNIA PRESS  
Berkeley • Los Angeles • London

University of California Press, one of the most distinguished university presses in the United States, enriches lives around the world by advancing scholarship in the humanities, social sciences, and natural sciences. Its activities are supported by the UC Press Foundation and by philanthropic contributions from individuals and institutions. For more information, visit [www.ucpress.edu](http://www.ucpress.edu).

University of California Publications in Entomology, Volume 127

Editorial Board: Rosemary Gillespie, Penny Gullan, Bradford A. Hawkins, John Heraty, Lynn S. Kimsey, Serguei V. Triapitsyn, Philip S. Ward, Kipling Will

University of California Press  
Berkeley and Los Angeles, California

University of California Press, Ltd.  
London, England

© 2008 by The Regents of the University of California  
Printed in the United States of America

Library of Congress Cataloging-in-Publication Data

Gates, Michael W. (Michael William), 1969–.

Species revision and generic systematics of world Rileyinae (Hymenoptera:Eurytomidae) / Michael W. Gates.

p.cm. — (University of California publications in entomology ; 127)

Includes bibliographical references and index.

ISBN 978-0-520-09850-3 (pbk. : alk. paper)

1. Eurytomidae--Classification. I. Title. II. Series.

QL568.E85G382008

595.79 22—dc22

2004047866

The paper used in this publication meets the minimum requirements of  
ansi/niso z39.48-1992 (r 1997) (*Permanence of Paper*).

## CONTENTS

<i>List of Figures</i> , vii	
<i>List of Tables</i> , ix	
<i>Acknowledgements</i> , x	
<i>Abstract</i> , xii	
INTRODUCTION	1
BIOLOGY	5
MATERIALS AND METHODS	7
Specimen Examination, 8	
Descriptive Format, 10	
Terminology, 11	
<i>Measurements and Abbreviations</i> , 12	
<i>Setation</i> , 13	
<i>Sculpture</i> , 13	
<i>Color</i> , 14	
<i>Head</i> , 14	
<i>Antenna</i> , 14	
<i>Mesosoma</i> , 15	
<i>Wings</i> , 15	
<i>Metasoma</i> , 16	
Sexual Dimorphism, 17	
Phylogenetic Relationships, 17	
Morphological Character Analysis, 18	
RESULTS	33
Phylogenetic Analysis, 33	
Relationships, 33	
Support-Family Level, 35	
Species-Level Phylogeny, 35	
Revision of Rileyinae, 36	
Key to Genera, 37	
<i>Austrophotismus</i> , 38	

<i>Dougiola</i> , 43	
<i>Neorileya</i> , 48	
<i>Platyrileya</i> , 73	
<i>Rileya</i> , 76	
Incertae Sedis, 227	
REFERENCES	230
APPENDICES	254
INDEX TO NAMES OF RILEYINAE	263
ILLUSTRATIONS	266
TABLES	318



## ILLUSTRATIONS

### Figures

- 1–3. Composite chalcidoid (head + antenna), 266  
4. Composite chalcidoid (mesosoma), 267  
5–6. Composite chalcidoid (mesosoma + wing), 268  
7–8. Composite chalcidoid (gaster + genitalia), 269  
9–14. Scanning electron micrographs (heads), 270  
15–20. Scanning electron micrographs (heads + antenna), 271  
21–26. Scanning electron micrographs (mesosomas), 272  
27–32. Scanning electron micrographs (mesosomas), 273  
33–40. Scanning electron micrographs (legs), 274  
41–46. Scanning electron micrographs (antenna + petioles), 275  
47–52. Scanning electron micrographs (gasters), 276  
53–58. Scanning electron micrographs (heads, mesosomas, gasters), 277  
59–64. Scanning electron micrographs (*Neorileya*: antenna + mesosomas), 278  
65–70. Scanning electron micrographs (*Neorileya*: heads, mesosomas, gaster), 279  
71–79. Line art: *Austrophotismus* spp., 280  
80–90. Line art: *Austrophotismus* spp., *Dougiola* spp., *Neorileya* spp., 281  
91–101. Line art: *Neorileya* spp., 282

- 102–108. Line art: *Neorileya*, *Platyrileya*, 283  
 109–118. Line art: *Neorileya* genitalia, 284  
 119–124. Line art: *Rileya* genitalia, 285  
 125–134. Line art: *Rileya abnormicornis* through *R. antioquia*, 286  
 135–143. Line art: *Rileya auranti* through *R. bumeliae*, 287  
 144–153. Line art: *Rileya bumeliae* through *R. bisulcata*, 288  
 154–159. Line art: *Rileya cearae* through *R. columbar*, 289  
 160–169. Line art: *Rileya cattleyae* through *R. couridae*, 290  
 170–180. Line art: *Rileya cylindripetiolata* through *R. gigas*, 291  
 181–192. Line art: *Rileya glabra* through *R. grisselli*, 292  
 193–201. Line art: *Rileya grisselli* through *R. hegei*, 293  
 202–214. Line art: *Rileya hegei* through *R. infuscata*, 294  
 215–223. Line art: *Rileya atopogaster* through *R. laeliae*, 295  
 224–233. Line art: *Rileya laeliae* through *R. mimica*, 296  
 234–241. Line art: *Rileya megastigma* through *R. petiolata*, 297  
 242–250. Line art: *Rileya minuta* through *R. oncidii*, 298  
 251–262. Line art: *Rileya pallidipes* through *R. paraplesius*, 299  
 263–271. Line art: *Rileya orbitalis* through *R. quadraticaulis*, 300  
 272–280. Line art: *Rileya robusta* through *R. spadix*, 301  
 281–286. Line art: *Rileya tricolor* through *R. warneri*, 302  
 287. Map: Australian Rileyinae, 303  
 288. Map: *Neorileya*, 304  
 289. Map: *Neorileya*, 305  
 290. Map: *Rileya* spp. (a–c), 306  
 291. Map: *Rileya* spp. (c–g), 307  
 292. Map: *Rileya* spp. (h–p), 308  
 293. Map: *Rileya* spp. (misc.), 309  
 294. Map: *Rileya cecidomyiae*, *insularis*, 310  
 295. Map: *Rileya piercei*, *longitergum*, *tricolor*, 311  
 296. Map: *Rileya orbitalis*, *pulchra*, *heterogaster*, 312  
 297. Map: *Rileya megastigma*, *bumeliae*, *mellea*, 313  
 298. Map: *Rileya hegei*, *Platyrileya cururipe*, 314  
 299. Map: *Rileya pallidipes*, 315

## Cladograms

1. Strict consensus, morphological data, Eurytomidae, 316
2. Strict consensus, morphological data, Eurytomidae, 316
3. Strict consensus, morphological data, Eurytomidae, 316
4. Strict consensus, morphological data, Rileyinae, 317
5. Strict consensus, morphological data, *Rileya* spp., 317

## **TABLES**

1. Subfamily concepts in Eurytomidae, 318
2. Biological and Distributional Synopsis of Genera of Eurytomidae, 319
3. Rileyinae Host Utilization and Distribution, 324
4. Rileyinae Confirmed and Suspected Hosts and Host Plants, 327
5. Number of Species Cecidomyiidae (Known/Suspect Hosts), 333

## ACKNOWLEDGMENTS

Without the assistance and encouragement of Dr. John Heraty, this study would not have been possible. His amenable demeanor, intense constructive criticism, and work ethic inspired me. Drs. John Pinto and Len Nunney were receptive and instrumental in the completion of this work. Further, Dr. Pinto permitted almost exclusive use of his supplementary laboratory for my “isolation chamber”, which reduced menial distractions considerably. My wife, Lynette, endured the hardships of being a “bug widow” during my forays into the field and demonstrated good-natured tolerance when assisting me on collecting trips. In addition, she entered a significant portion of the locality information into the BIOTA data set for the Rileyinae.

Several individuals at the University of California, Riverside (UCR) have made my work much easier and more enjoyable: Dave Hawks provided superior technical assistance, taxonomic expertise, and interesting discussions of a variety of topics from the arcane to the profane; Krassimir Bohzilov, Dr. Steven McElfresh, Andrew Sanders for plant identifications; Angie Arballo, Drs. Leo Schouest and Adam Trickett for computer troubleshooting; Roger Burks, Dr. Tomas Perring, Bryan Carey, Jung-Wook Kim, Jeremiah George, Marta Guillen, James Munro, and Dr. Christina Babcock. I am grateful to Dr. Eric Grissell, Dr. Marina Zerova, Dr. Walker Jones, Dr. Henry Hespeneide, Dr. Jorge Peña, Louis LaPierre, and Milton Mendonça for their assistance. Partial financial support was provided by the PEET program (NSF BSR-9978150), UCR Graduate Division for travel and dissertation research grants, and the UCR Entomology Graduate Student Association and the UCR Department of Entomology for travel grants. During

my month in Mexico, my two-week trip to Brownsville, Texas and various other trips throughout the Desert Southwest, I was assisted by or permitted to collect by the following people: Marco Lazcano (Director, Reserva Ecología El Eden), Rodolfo Rodríguez (Mexican student collaborator, Universidad de Monterrey), Alejandro Blanco, Claudia Sandoval, Eric Acosta (Assistants, Reserva Ecología El Eden), Dr. Ben Brown (Director, Animas Foundation), Arthur Fong (California State Parks), David Riskind (Texas State Parks), Doug Scoville (Mojave National Preserve), Karen Chapman (Director, Audubon Sabal Palm Sanctuary), Drs. Claudia Luke and Jim André (UCR Granite Mountains Reserve), Edward Riley (Texas A&M University), Laura Merrill (San Bernardino National Forest), Tim Alten (Chaffey College, Rancho Cucamonga, California), Nathan Schiff (USDA Forest Service, Stoneville, Mississippi). Special thanks to Carolina Godoy and the staff at INBio (Santo Domingo, Costa Rica) and Paul Hanson (University of Costa Rica, San Pedro) for their support of my research. Thanks also to John Noyes (The Natural History Museum) and Gary Gibson (Agriculture Canada) for their thorough review of the manuscript. Last but definitely not least, I wish to thank Dr. Michael Schauff (USDA-Systematic Entomology Laboratory, Washington, D.C.) for allowing me the time and the resources to complete this work.

## Abstract

Chalcidoidea includes 19 families of cosmopolitan parasitic hymenopterans ranging in size from 0.2 mm to 15 mm. Species of Chalcidoidea, with 21, 250 nominal species, parasitize (rarely prey on) many arthropods: twelve orders of Insecta, two orders of Arachnida, and one family of Nematoda. In Eurytomidae, ~87 genera and 1,400 species are recognized as valid. The subfamily Rileyinae is characterized by a reduced prepectus, foreshortened anterior gastral terga, and 2 to 3 anelli. Herein, Rileyinae *sensu stricto* contains six genera (*Rileyia*, *Platyrileyia*, *Neorileyia*, *Dougiola*, *Austrophotismus*, *Boucekiana*) and 69 species, 44 described as new, for which keys are provided.

A morphological data set was analyzed to determine generic relationships in Rileyinae and its placement within Eurytomidae. Forty-one morphological characters were scored across 52 taxa (23 genera of Eurytomidae, 10 species of Rileyinae, three outgroup taxa) and analyzed using maximum parsimony with PAUP\*. Eurytomidae and Rileyinae are recovered as monophyletic groups in all (Eurytomidae) or some (Rileyinae) of the parsimonious trees but the characters supporting the monophyly of Eurytomidae do so weakly because of homoplasy and/or symplesiomorphy, whereas Rileyinae has better synapomorphic support. Putative sister taxa (Leucospidae, Chalcididae) are monophyletic. An additional analysis of taxa of Rileyinae (28 species of *Rileyia* plus representatives of 4 other genera of Rileyinae; Heimbrinae as the outgroup) using the above character matrix with an additional 9 characters useful in interspecific differentiation supported *Rileyia* + *Platyrileyia* and *Neorileyia* as monophyletic within Rileyinae. Also included are tables detailing host utilization for Eurytomidae (genera) and Rileyinae (species) as well as confirmed or suspected plant hosts (by plant family) for Rileyinae.

## INTRODUCTION

Eurytomidae (Hymenoptera: Chalcidoidea) is a cosmopolitan family whose host utilization ranges from phytophagy to entomophagy. Currently, 90 genera and at least 1,400 nominal species from every zoogeographic region of the world are recognized as valid (Noyes 2001). These figures probably underestimate the true diversity of Eurytomidae, given that just over 21,250 species of Chalcidoidea have been described to date (Noyes 2001) and estimates of the potential number of species of Chalcidoidea range from 60,000 to 500,000 (Noyes 1978, 1990, 2000, pers. comm.; Gordh 1979).

Historically, eurytomids have been characterized by a quadrate pronotum in dorsal view, dense, coarse punctation on the head and mesosoma, and propodeum often depressed medially or longitudinally channeled. Unfortunately, these characters are neither possessed by all eurytomids nor absent from putative sister groups (Leucospidae, Chalcididae). Walker (1833) originally recognized four genera of Eurytomidae when he characterized the family: *Eurytoma*, *Decatoma*, *Isosoma*, and *Systole*. Ashmead (1904) designated twenty-three new genera and five tribes: Aximini, Eurytomini, Isosomini, Rileyini, and Decatomini, which were accepted by Schmiedeknecht (1909) and Bugbee (1936). The tribes were elevated to subfamily status (Ferrière 1950) and maintained by subsequent authors (Nicol'skaya 1952; Claridge 1961a). Burks (1971) proposed three additional subfamilies: Heimbrinae, Prodecatominae, and Philoleminae, although he did not provide any characters to distinguish these groups. Peck's (1963) catalog of Nearctic Chalcidoidea recognized five subfamilies, Peck et al. (1964) recognized two subfamilies, Burks (1979) accepted seven subfamilies, Riek (1970) and Stage and Snelling (1986) recognized three, and, most recently, Zerova (1988, 1995a) proposed seven and five subfamilies, respectively. Unlike most other works, the latter three provided some morphological justification for reported subfamilial classification. Only Rileyinae was considered distinct by all authors.

In recognizing the two subfamilies Rileyinae and Eurytominae (= Harmolitinae, Eudecatominae), Peck et al. (1964) reasoned that only these two taxa had characters explicit enough to merit subfamily rank. Stage and Snelling (1986) agreed with this assessment, although they recognized Heimbrinae based on results of a comparative morphological study. The subfamily character intergradation problems were thereby superficially solved but greater

uncertainty was created concerning monophyly of Eurytominae. Zerova (1988) criticized the classification of Stage and Snelling on the grounds that they cited a limited number of characters and referred to less than one-half the known generic fauna. Zerova (1988) felt that familial evolutionary trends such as the apomorphic reduction in body size, smoothing of punctation, and oligomerization of equally segmented structures were unduly ignored. Although various subfamilies of Eurytomidae have been recognized, roughly the same taxa are consistently merged or separated depending on the authors' perspective (Table 1).

Three new subfamilies were proposed by Burks (1971) (Philoleminae, Prodecatominae, and Heimbrinae). Stage and Snelling (1986) synonymized Philoleminae, Aximinae, Decatominae, Harmolitinae, Prodecatominae, and Eudecatominae with Eurytominae. For Philoleminae (sensu Burks 1971), Subba Rao (1978) provided the tribe Philolemini (with morphological characterization in the key to tribes) for the name proposed by Burks. Subba Rao (1978) proposed Heimbrini as well as Buresiini, Rileyini, and Eurytomini, which were placed in two subfamilies: Eurytominae (Philolemini, Eurytomini) and Rileyinae (Heimbrini, Buresiini, Rileyini). Based on available information, including the works of Burks (1971) and Subba Rao (1978), I consider these tribal designations neither definable by solid synapomorphy nor correctly assigned to subfamily (i.e., Heimbrini placed in Rileyinae) and agree with the assessment of Stage and Snelling (1986) in terms of subfamily synonymy. However, as Stage and Snelling (1986) synonymized Philoleminae (sensu Burks 1971) under Eurytominae, I hereby propose Philolemini (sensu Subba Rao 1978; first valid proposal of this name) as a synonym of Eurytominae (**New Synonymy**). The characters purported to differentiate this taxon (Subba Rao 1978), including a concave frons and preorbital carinae, are found throughout Eurytominae and thus useless in defining Philolemini.

The name Buresiini, originally proposed by Bouček (1970) as a monotypic tribe for *Buresium* within Rileyinae, is characterized by the presence of a single anellus versus 2 to 3 in the rest of Rileyinae. Subba Rao (1978) followed this definition but Zerova (1988) elevated the tribe to Buresiinae on the basis of differences in the antenna and wing venation from other members of Rileyinae. While I agree that this genus is distinct from other rileyines, the features presented by Zerova (1988) are not unique to *Buresium*. Thus, until such time as *Buresium* is firmly placed within Eurytomidae, I feel that the nomenclatural stability of the family is best served by synonymizing Buresiinae with Eurytominae (**New synonymy**).



The plesiomorphic "ground plan" for Eurytomidae is hypothesized to consist of the following: (1) elongate, cylindrical metasoma with a short petiole, (2) horizontal positioning of the ovipositor elements on the metasoma, (3) homonomous segmentation of the metasoma, and (4) relatively homonomous segmentation of the flagellum (Nikol'skaya 1960; Bugbee 1936). Further, coarse umbilicate sculpture (Bouček 1988b; Zerova 1988) and antenna with a relatively greater number of segments (13) (Bouček & Heydon 1997) have been hypothesized to be plesiomorphic. Morphological specialization is reflected by oligomerization of roughly equally segmented structures, reduction in the length of the mesosoma, and increase in sexual dimorphism (Bugbee 1936; Zerova 1988).

What I term Rileyinae *sensu stricto* is characterized by (1) 13-segmented antenna in both sexes (plesiomorphic); (2) sexual dimorphism in antennal shape (males with sensory ventral plaque on scape) (apomorphic); (3) gaster with terga 1, 1 and 2, or 1 to 3 reduced or fused and positioned anterodorsally (apomorphic); (4) highly reduced prepectus (apomorphic); and (5) 2 or 3 anelli (apomorphic). Thus, Rileyinae *s.s.* has a predominance of apomorphic features that highlight its distinctiveness.

As defined, Rileyinae *s.s.* contains 6 genera (*Rileya*, *Platyrileya*, *Neorileya*, *Dougiola*, *Austrophotismus*, *Boucekiana*) and 69 species. Included taxa are most speciose in the New World, with the primary diversity occurring in the tropical regions. The genera apparently are fairly depauperate in the Old World based on numerous published faunal lists and revisionary studies pertaining to Eurytomidae and Rileyinae (Crosby 1909; Masi 1917; Nikol'skaya 1952; Risbec (6 publications, 1951–1957); Bouček 1954, 1977; Erdős 1960; Mani et al. 1974; Szelényi 1974, 1975; Zerova 1976; Graham 1979; Mukerjee 1981; Narendran 1984, 1994; Farooqui & Subba Rao 1986; Mani 1989). *Platyrileya* is a very unusual taxon morphologically, having  $Gt_{1-3}$  foreshortened and a mesepimeral-metapleural junction similar to that of *Rileya* (albeit smaller and less distinctly produced); however, it has larger "anelli" than other Rileyinae except for *Dougiola*. It is difficult to differentiate the basal three flagellomeres of *Platyrileya* but they appear to lack MPS and are only slightly smaller than subsequent funiculars (Fig. 105). *Platyrileya* also possesses a large, triangular, anteroventrally deflected prepectus. I provisionally include it in Rileyinae, until additional material becomes available. *Dougiola* and *Boucekiana* are also slightly aberrant, with the latter having a closer affinity with Rileyinae by possessing three ringlike "anelli" that lack MPS, a slightly foreshortened  $Gt_1$ , and a small triangular prepectus. *Dougiola* has a reduced prepectus but possesses three larger, non-ringlike

“anelli” that lack MPS, and the  $Gt_1$  is not significantly reduced. *Boucekiana* is also slightly aberrant, having a closer affinity with Rileyinae based on possession of three ringlike “anelli” that lack MPS, a slightly foreshortened  $Gt_1$ , and a small triangular prepectus. *Dougiola* has a reduced prepectus but possesses three larger, non ringlike “anelli” that lack MPS and a  $Gt_1$  that is not significantly reduced. Because these genera do not share all diagnostic features of Rileyinae and are known from only very few specimens, I only provisionally include them in Rileyinae until additional information becomes available (see Descriptions and Incertae Sedis sections). Rileyinae *sensu lato* (“historical” Rileyinae) contains an additional three genera that lack the suite of synapomorphies of Rileyinae *s.s.*: *Macrorileya*, *Archirileya*, *Buresium*. These three taxa have a large triangular prepectus that is broadly beltlike ventrally, the gastral terga unmodified, and anelli not ringlike (*Macrorileya* possesses two elongate anelli and *Archirileya* has three quadrate anelli). The “anelli” of these taxa are almost the size of subsequent flagellomeres but lack MPS (for complete discussion, see Character Analysis below). *Macrorileya*, *Archirileya*, and *Buresium* appear better classified in the Eurytominae (**New placement**; appendix 7). Thus, Rileyinae as previously defined and maintained in the literature contains taxa belonging elsewhere. The aforementioned genera were apparently “dumped” into Rileyinae out of convenience and have been maintained in their current placement because of the lack of a comprehensive revision at the subfamily level. Understanding of subfamily classification has been (and remains) rudimentary, which continues to hamper accurate placement of taxa.

## BIOLOGY

Most eurytomids are primary or hyperparasitoids but there are several strictly phytophagous genera (see Table 2). Those that are primary parasites typically attack eggs, larvae, or pupae of Coleoptera, Orthoptera, Diptera, and Hymenoptera (Goulet & Huber 1993; DiGiulio 1997). The hyperparasitic eurytomids often attack primary ichneumonoid parasites. The phytophagous eurytomids are known from at least 10 plant families (Zerova 1978) and are miners, gallers, or seed eaters. Certain eurytomids are also known to switch to phytophagy before and/or after consuming an insect host (Phillips 1917, 1927).

Where host associations are known (Table 3), Rileyinae *s.s.* attack cecidomyiid gall formers exclusively, with the exception of *Neorileya*, which attacks exposed eggs of Heteroptera (Ferriera 1981, 1986; Jones 1983). The cecidomyiids themselves are cosmopolitan in distribution and occur on a variety of plant families (Table 4). Despite the relatively few confirmed host records (I consider a record confirmed if I have reared it myself, read a reliable published account of the host record, or seen exuviae or unemerged adults or gall remnants for a particular wasp series), Cecidomyiidae probably harbors many more unrecorded species because this family is quite speciose (Table 5). Considering the numerous known agricultural pests in the Cecidomyiidae (Barnes 1949) and the number of species of Eurytomidae reared from them (Mathur & Vermeer 1974; Orphanides 1976; Habib 1983; Tewari & Moorthy 1986; Jesudasan & David 1989; Mathur et al. 1991; Kobayashi et al. 1991; Sain & Kalode 1992), it is surprising that species of Rileyinae are recorded only infrequently as beneficial parasitoids in agroecosystems. Only *Neorileya* sp. (Ferriera 1981, 1986) and *Rileya cecidomyiae* Ashmead (Barnes 1949; Highland 1964) have been even remotely implicated as parasitoids having potential economic importance. However, several species of *Rileya* have been documented from noneconomic cecidomyiids in the United States (Plakidas 1982; Plakidas & Weis 1994; Waring & Price 1989; Hawkins & Goeden 1984). The remaining taxa in the less inclusive Rileyinae *s.l.* attack completely different hosts. *Macrorileya* and *Archirileya* utilize eggs of Orthoptera embedded in plant tissues (Smith 1930; Silvestri 1920; Zerova 1976; Bruner 1890; Udine & Pinckney 1940). *Buresium* species are commonly associated with grasses, and *Buresium naso*

Bouček has been reared from *Mordellistena* sp. (Coleoptera: Mordellidae) in stems of *Cannabis sativa* L. (Bouček 1983).

Obligately phytophagous genera are not known in Rileyinae *s.s.* and are found only in Eurytominae, which appears to indicate that phytophagy can be uniquely derived in the mainly entomophagous Eurytominae. All putative sister taxa (Leucospidae, Chalcididae) and outgroup taxa included in this study (Pteromalidae: Cleonyminae, Pteromalinae) are entomophagous, further supporting a unique derivation of phytophagy within Eurytomidae. Interestingly, both Rileyinae *s.s.* and Eurytominae contain taxa that can switch from entomophagy to phytophagy during their larval existence (*Rileya cecidomyiae* Ashmead [as *R. tegularis* Gahan] [Hawkins & Goeden 1984]; *Eurytoma pachyneuron* Girault [Phillips 1917]; *Eurytoma flavimana* Boheman [Claridge 1961a]; *Eurytoma parva* [Girault] [Phillips 1927]). This mixed feeding habit is apparently an important component in parasitoid success (Hawkins & Goeden 1984). With respect to the phytophagous habit, Bugbee (1936) felt that evidence for ancestral host utilization “favours a plant feeding origin,” whereas Nikol’skaya (1956) favored parasitic ancestry. Claridge (1961a) cited several examples that point to the possibility of multiple unique derivations of phytophagy within Eurytominae and discounted the arguments of Bugbee (1936) as subjective. Despite the arguments of Claridge (1961a), Malyshev (1968) regarded phytophagy as secondary (i.e., phytophagy redeveloped in the entomophagous Eurytomidae, which had originally radiated as phytophages) in Chalcidoidea and as a reversal in dietary evolution in several taxa. He equated retention of phytophagy as plesiomorphic and equivalent to certain morphological features (elongated body, greater number of antennal segments) occurring in certain phytophagous taxa. However, certain facultatively (*Eurytoma*) or obligately (*Bruchophagus*) phytophagous eurytomid taxa possess apomorphic features (more compact body, fewer antennal segments, gibbose habitus, etc.), whereas other obligately entomophagous forms (*Archirileya*, *Macrorileya*) possess plesiomorphic features (elongate body, more antennal segments, nongibbose habitus, etc.). Clearly, the derivation of phytophagy as unique and/or a reversal within Chalcidoidea poses interesting evolutionary questions that can best be addressed by utilizing taxa of Eurytomidae.

## MATERIALS AND METHODS

Specimens of Rileyinae were examined from more than twenty-five museums worldwide. Of these, several reported that no specimens were available or that specimens were present but unavailable due to lack of higher-level sorting for specimen retrieval or did not respond to inquiries. These three results occurred primarily at collections located in Central and South America and in eastern Europe. Many museums apparently possess drawers of unsorted Eurytomidae but shipping and examining this material is impractical and best done on-site.

Material was borrowed from the institutions listed below (the collection manager's or curator's name is given in parentheses). Museum codens are based on the list maintained on the Bishop Museum Web site (<http://bishop.hawaii.org/bishop/ento/codens-r-us.html>). Label data from all specimens were entered into the biodiversity information management program BIOTA (Colwell 1996). This information was used to generate the Materials Examined section for each species.

AEIC	American Entomological Institute, Gainesville, Florida, USA (D. Wahl).
ANIC	Australian National Insect Collection, Canberra, Australia (I. Naumann).
BMNH	The Natural History Museum, London, England (S. Lewis).
BPBM	Bernice P. Bishop Museum, Honolulu, Hawaii, USA (G. Nishida).
CNC	Canadian National Collection, Agriculture Canada, Ottawa, Ontario (J. Huber).
EAPZ	Escuela Agrícola Panamericana, Tegucigalpa, Honduras (R. Cave).
EPNC	Escuela Politécnica Nacional Collection, Quito, Ecuador.
HHC	Personal collection, Henry Hespenehede, Los Angeles, California, USA.
INPA	Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (C. Motta).
KJHC	Personal collection, Karl-Johan Hedqvist, Sweden.

MLPA	Universidad Nacional de La Plata, La Plata, Argentina (L. De Santis).
MWGC	Personal collection, Michael Gates, Alexandria, Virginia, USA.
MZCR	Universidad de Costa Rica, San Pedro, Costa Rica (P. Hanson).
MZSP	Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (R. Brandão).
NCSU	North Carolina State University Insect Collection, Raleigh, North Carolina, USA (B. Blinn).
NMW	Naturhistorisches Museum, Wien, Austria (S. Schödl).
TAMU	Texas A&M University, College Station, Texas, USA (E. Riley).
UCDC	University of California, Davis, California, USA (S. Heydon).
UCR	University of California, Riverside, California, USA (S. Triapitsyn).
USNM	United States National Museum, Smithsonian Institution, Washington, D.C., USA (E. Grissell).
ZIN	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.
ZMHB	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (F. Koch).
SIZ	Schmalhausen Institute Zoology, Kiev, Ukraine (M. Zerova).
ZSMC	Zoologische Staatssammlung des Bayerischen Staates, Munich, Germany.

**Note:** Specimens indicated as being deposited at EPNC are temporarily held at the USNM in trust until such time as the facility for housing them in Quito is completed.

### **Specimen Examination**

Most members of Eurytomidae are heavily sclerotized and do not collapse after dehydration. Thus, the majority of specimens were in good condition and external features readily observable. Materials received in alcohol were chemically dried via ethyl alcohol (EtOH) dehydration into hexamethyldisilazane (HMDS) (Heraty & Hawks 1998). This process is

beneficial both because HMDS reacts with water to form hexamethyldisiloxane and ammonia, which evaporate from the specimen without causing collapse, and because external debris is rinsed away during the procedure (Swearingen et al. 1997).

Slide mounts of genitalia, wings, and antennae were made from previously dried specimens. Specimens were rehydrated and floated off mounts in a 70% EtOH bath and subsequently placed into 10% potassium hydroxide (KOH) for a minimum of 4 hours on a warming plate or overnight at room temperature. Specimens were then processed through an EtOH dehydration series into clove oil (Platner et al. 1999) in preparation for slide mounting. Permanent mounts were prepared with Canada Balsam under 6 mm cover slips. Specimen remains were dehydrated via the HMDS method and remounted with the label stating that portions of the specimen were located on a slide with identical data.

Leica MZ8 and Nikon SMZ1500 stereomicroscopes with 10X (Nikon only), 15X (Leica only), and 25X oculars (both) and Nikon MKII and Chiu Technical Corp. Lumina 1 FO-150 fiber optic light sources were used for card- and point-mounted specimen observation. Mylar film was placed over the ends of the light source to reduce glare from the specimen. Slide mounts were examined with a Zeiss Axioscope 2 compound microscope. Scanning electron microscope (SEM) images were taken with a Phillips XL30-FEG. Specimens were cleaned of external debris with 50% stabilized H<sub>2</sub>O<sub>2</sub> after Bolte (1996) and affixed to 12.7 X 3.2 mm Leica/Cambridge aluminum SEM stubs with Scotch® 665 double-sided tape. Stub-mounted specimens were sputter coated using an Emscope ES500 with a gold-palladium mixture from at least three different angles to ensure complete coverage.

Illustrations were prepared using an AutoMontage image capture system (Microbiology International, Synchronoscopy). With this system, digital images were captured from a stereoscope (Zeiss Stemi SV6 with 1.6X main objective lens) or a compound microscope (Zeiss Axioscope 2) by using a JVC 3-CCD Color Video Camera (Model No. KY-F55B) affixed to the appropriate microscope phototube and connected to the AutoMontage computer system (Gateway E-4200, 450MHz; 19" high-resolution ViewSonic E790). This system captures multiple source images, each representing a discrete plane of focus, and combines these source images into a single completely focused montage image. Montage images were modified in Photoshop 4.0 if required and subsequently printed at high resolution on an Epson Stylus Photo750 printer. Some images not requiring unlimited depth of field were captured with a Nikon Coolpix 990 attached to the Nikon

SMZ1500. In either instance, illustrations could then be inked directly onto Mylar drafting film using the printed image as a template. The inked illustrations were then photocopied (Canon NP 6560) (illustrations scanned directly from Mylar originals were of unsatisfactory quality) and scanned (HP Scanjet 4100c) at 600 dpi for inclusion in final plates, which were produced by Adobe Illustrator 8.0. Maps were created in Adobe Illustrator 8.0 using line maps saved from ArcView 8.0 in vector format.

All measurements were made using an eyepiece reticle installed into 15X oculars on a Leica MZ8 at 50X magnification (10X and 11.25X with the Nikon SMZ1500). Absolute measurements (mm) are used for the body length in the descriptions, with a range given for all specimens of each sex for each species, where possible. Such measurements were calibrated using an eyepiece micrometer with 0.01 mm divisions. All other measurements are relative because intraspecific variation exists in most species. All measurements were taken such that the measured distance is perpendicular to the plane of view. Structures having any type of curvature were measured between in-focus end points of said structure. The major views for distances to be measured were frontal and dorsal head, lateral antenna, dorsal mesosoma, dorsal wing, and dorsal gaster.

### **Descriptive Format**

Where possible, all previously treated species have been redescribed based on type material because the original descriptions were insufficient for adequate diagnosis. I have endeavored to maximize the reader's ability to compare taxa by preparing rigorously comparable descriptions. Certain unique states are described only for the taxon possessing it and are inserted at an appropriate location. Descriptions of the opposite sex include only measurements and morphological differences beyond what are indicated in the primary description.

The descriptive format begins with the original citation and nomenclatural changes. The label data for type material are listed verbatim after a generic "COUNTRY: Province:" style prefix, with separation between labels indicated by a semicolon. Throughout the specimen information and descriptions, square brackets indicate author comments, and [?] denotes label information of questionable interpretation. Etymological information for new species is treated briefly and followed by a diagnosis. The Variation section at



the end of each description is useful because many taxa exhibit different color patterns or drastic size differences. Descriptions of new species are based on holotype specimens including, where possible, information gleaned from other specimens in the type series. Thus, when ranges of measurements, and so on, are incorporated into the body of the description, it is in reference to other type material. This was done to provide pertinent information concomitantly with the description with the Variation section serving to present more qualitative intraspecific differences for *all* included material (e.g., color, sculpture variation). Absolute and relative measurements presented in each description are based on 10 individuals of each sex across its distributional range, where possible. The Comments section discusses the type material (i.e., condition and any pertinent notes regarding slides, depository, etc.) and offers general notes regarding the preceding species. Lectotypes designated herein are intended to promote nomenclatural stability, establish a sole name-bearing type specimen for that nominal species, and ensure the validity of all such designations as per Article 74.7.3 (ICZN 1999).

Distribution maps (see the Illustration section) are provided for all taxa described in this monograph. However, certain taxa (and/or unknown localities within each species) are excluded from the maps or not mapped at all based on (1) incomplete label data, as in many of the species of *Rileyia* associated with Orchidaceae and Araceae intercepted at U.S. ports of entry; (2) localities not determined, which typically applies to localities that cannot be located (e.g., because of old name) and are excluded from the species distribution map; and (3) insufficient specimens examined from a widespread species (e.g., *Rileyia asiatica* Zerova).

## Terminology

Terms used herein are derived from several sources or are combinations of terms from those sources (Bouček 1988b; Gibson 1986, 1997). Combinations and/or modifications of terms found in these sources are explained in subsequent sections. Despite numerous prior attempts to describe terminology in Chalcidoidea (Schauff 1984; LaSalle 1987; Gibson 1985, 1986, 1997; Bouček 1988b; see Gibson et al. 1999 for a complete summary of pertinent morphological literature in Chalcidoidea), a lack of consensus remains as to which term is most applicable to a particular structure, and thus no standardized set of terms exists. For example, some terms used herein

indicate only relative structure rather than an implicit statement of homology (Gibson 1985). Further, a set of terms useful throughout Hymenoptera depends not only on correct homology assessment but also on general agreement to utilize a stable terminology system because numerous terms have often been proposed for a given structure (Gibson 1985). Gibson (1997) probably best approaches what could be considered a “standard” terminology system, in a general sense, for Chalcidoidea. However, he did not cover certain finer structures or discuss sculpture.

*Measurements and Abbreviations.* Abbreviations and terminology used in the text that require definition appear in bold in the following sections as they are discussed (refer to Figs. 1–8 and the terminology list preceding them). Head height is measured from the dorsum of the vertex to the ventral apex of the clypeus. Head width is taken at the maximum outer margin of the eyes. **Malar space** (Fig. 2: **m<sub>sp</sub>**) is the distance between the lower eye margin and lateral margin of the **oral fossa** (Fig. 1: **of**). Eye height is the maximum distance between the dorsal and ventral eye margins. The length and width of the **scape** (**sc<sub>p</sub>**), **first funicular segment** (**fu<sub>1</sub>**), and **clava** (**cl<sub>v</sub>**) (Fig. 3) are measured in lateral view. The **midlobe of mesoscutum** (Figs. 4, 7: **mlm**) is measured longitudinally and transversely between the **notauli** (Figs. 4, 7: **not**) medially. **Scutellum** (Figs. 4, 7: **sc<sub>t</sub>**) length is the maximum distance between the **transscutal articulation** (Figs. 4, 7: **tsa**) and the apex of the **frenum** (Figs. 4, 7: **fr<sub>e</sub>**), and its width is between the dorsal edges of the **axillula** (Figs. 4, 7: **axl**). All **gastral terga** (Fig. 5: **G<sub>t<sub>n</sub></sub>**) are measured from base to apex in dorsal view. Each gastral tergum is designated by numeric subscripts (e.g., G<sub>t<sub>1</sub></sub> is the first tergum distad of the petiole, G<sub>t<sub>6</sub></sub> has the only functional spiracles); G<sub>s<sub>1</sub></sub> is the only gastral sternite discussed. Wing length is the distance between the **humeral plate** (Fig. 8: **hpl**) apex and the wing tip; its width is the maximum distance between the anterior and posterior wing margins measured at the stigmal vein. The wing veins are measured as follows (see Fig. 8): **submarginal vein** (**smv**), between humeral plate and angulation toward the leading edge of the forewing that is the base of the **parastigma** (**pst**); **marginal vein** (**mv**), between base at wing margin and base of stigmal vein; **stigmal vein** (**stv**), between basal contact with marginal vein to base of **uncus** (**unc**); **stigma** (**stg**), from basal to apical edge (Fig. 8); **uncus**, from base to apex; **postmarginal vein** (**pmv**), from base of stigmal vein to terminus of postmarginal vein.

*Setation.* Setation is used in reference to short setae found on the forewing and body. Setae are referred to as decumbent (nearly parallel to body surface), subdecumbent (less than angle of 30°), semierect (between angles of 30–60°) or erect (nearly perpendicular to body surface) (Bouček 1988b), or cruciate (crossing at some point along their lengths).

*Sculpture.* No consensus has been reached regarding a standardized set of descriptors for sculpture in Hymenoptera (Eady 1968; Harris 1979), much less in Chalcidoidea (LaSalle 1987; Bouček 1988b; Gibson 1989). Even with SEM images of various sculpture types as presented in Harris (1979) and LaSalle (1987), no comprehensive work that exhaustively describes sculpture types exists, making it difficult to accurately define sculptural diversity (Bouček 1988b).

Terms used herein are as follows: **carinate** (Fig. 64; propodeum), one to many raised ridges; **foveate** (Fig. 32; edge femoral depression), regular, deep depressions with dividing septa; **glabrate** (Figs. 44, 54; Gt<sub>1</sub> and Gt<sub>3</sub>, respectively), mostly smooth, shining, almost without sculpture but minute sculpture and/or scattered fine setae are present; **glabrous** (Figs. 42, 48, 68; Gt<sub>1</sub>), smooth, bare, shining; **reticulate** (Fig. 11, scrobal depression; Fig. 25; prepectus and mesepisternum), regular network of raised septa can be fine (Fig. 23; mesoscutum) or coarse (Fig. 25, mesepisternum); **rugose** (Figs. 62, 63), irregular rough, raised sculpture (diminutive = **rugulose**); **striate** (Figs. 2, 70, 275), fine to robust longitudinal raised lines; **umbilicate** (Figs. 27, 31, 32; dorsal mesosoma), more or less deep depressions bearing a seta within it and either sparse (broadly separated; Fig. 24) or coarse (narrowly separated; Fig. 32), often with reticulate interstices.

Certain taxa present sculpture types that are more difficult to define. In these instances the descriptive types are hyphenated, with the dominant sculpture type occurring first. In other instances a mixed sculpture type can yield to a specific sculpture type from anterior to posterior. For example, some *Rileya* spp. have mesosomal sculpture that is transversely reticulate anteriorly and becomes finely umbilicate posteriorly (Figs. 21, 23). In most instances a particular sculpture type, hyphenated or not, is illustrated. Terms such as weak, robust, fine, and crude are used to refer to the degree of production of a structure or a particular sculpture type. For example, a “crudely” carinate scutellar apex has the carina blunt, without a well-defined sharp edge. Such terms are used only as a means of comparison. Finally, following each section (e.g., Head, Mesosoma) within a given description, a term identifying the dominant sculpture type for that region is provided. This

term is general in purpose, specific and hyphenated sculpture types appear in the body of the description as described above.

*Color.* Coloration is notoriously unreliable for specific diagnosis due to the effects of specimen age or preservation technique (Huber 1988) (e.g., specimens killed via cyanide gas can have an orange cast [Gordh 1978]). Specimens prepared with HMDS or critically point dried can appear quite different from air-dried specimens. Color change due to leaching in alcohol can be ameliorated by storage at low temperatures (Huber 1988). Further, there are documented cases of intraspecific coloration differences in latitudinal morphoclines in Chalcidoidea (Askew 1984), as well as at a locality or within a series collected at identical times (Gates pers. obs.), and seasonal coloration differences (Flanders 1931; Gradwell 1958; Murakami 1960; Askew 1961). Thus, I tried to characterize the variation observed in the known material, particularly in reference to patterns of maculation and infuscation of the body and wings, respectively.

*Head.* Terminology for structural characters of the head follows Bouček (1988b) and Gibson (1997). One notable difference is the **postorbital carina** (Fig. 2: **poc**) of Gibson (1997), which is continuous along the posterior margin of the malar sulcus to the lateral margin of the oral fossa (Fig. 22). Some taxa have the postorbital carina continuous with the preorbital carina (Fig. 2: **prc**), so that the eye appears “ringed” (e.g., *Rileyia orbitalis* Ashmead). In addition, a **genal carina** (Fig. 1: **gc**) can be present or absent, depending on the taxon. **Postgenal lamellae** (Fig. 1: **pgl**) were initially observed by Thomson (1878) and refined by Claridge (1958, 1961a) and considered a development of the hypostomal carina (Richards 1956). Delvare (1988) used it as the “lamina postgénal” in differentiating species of African Eurytomidae described by Risbec (1950–1957).

*Antenna.* The antenna of Rileyinae is generalized in form and structure and possesses the basic segmentation, starting basally: scape, pedicel, anelli, funicular segments, and clava (Fig. 3). The number of segments in each antennal subdivision is designated with a corresponding number (e.g., 11353 = 1 scape, 1 pedicel, 3 anelli, 5 funiculars, and 3 claval segments). The male **scape** (Fig. 3: **scp**) often has a slightly to distinctly developed **ventral plaque** (Fig. 3: **vpl**) on which can often be seen sensory pores. The first two or three flagellomeres are reduced and ringlike. The anelli (Fig. 3: **A1–A3**), operationally defined as ringlike flagellomeres that lack multiporous plate

sensilla (MPS) (Grissell 1995), are located between the pedicel (Fig. 3: **pdl**) and first funicular segment (Fig. 3: **fu<sub>1</sub>**). **Funicular segments** (Fig. 3: **fun**) are the flagellomeres between the anelli and the clava. The terminal three flagellomeres, termed the **clava** (Fig. 3: **clv**), are slightly to distinctly segmented and are included in the count of the antennal segments. Multiporous plate sensilla (Fig. 3: **mps**) are normally seen on funicular and claval flagellomeres.

*Mesosoma.* The mesosoma is the fused thorax + first metasomal segment (**propodeum**) (Fig. 4: **ppd**) found in Apocrita. Terms for the mesosoma follow Gibson (1997). The propodeum can have one or two costulae (primary and secondary), typically located medially or anteriorly (Figs. 4, 7: **co<sub>1</sub>**, **co<sub>2</sub>**). These costulae can be variously interconnected with one another or the **nucha** or extend to the **dorsellum** (Figs. 4, 7: **nuc**, **dor**) by the following: a complete or incomplete median carina (Fig. **mc**) or variously produced plicae (Figs. 4, 7: **plc**). Further, the costula(e) can be incomplete medially, either being intercepted by submedian carinae (Fig. 22) or united before turning anteriorly to intercept the dorsellum (Fig. 24). The propodeal spiracles (Figs. 4, 7: **spr**) are usually located within one spiracular length from the metanotum (Figs. 4, 7: **dor**) anteriorly and are obliquely oriented. They are typically subcircular (Fig. 57) or variously reniform (Figs. 4, 7, 22, 27, 64). The **mesepimeral-metapleural junction** (Figs. 29–42: **mmj**), a tongue-and-groove articulation between the aforementioned sclerites, is unique to *Rileyia* and *Platyryleya*. This junction is usually rigidly appressed (Fig. 28) in other taxa.

*Wings.* Wing nomenclature concerns wing venation and setation patterns (Fig. 8). The **submarginal vein (smv)** was measured from the **humeral plate (hpl)** to the initial curvature anteriorad (usually at the anterior end of the **basal setal line [bsl]**). The **parastigma (pst)** was measured from the apical end of the submarginal vein to its point of initial contact with the anterior wing margin, whereas the **marginal vein (mv)** was measured from this point to the base of the stigmal vein. The **stigmal vein (stv)** connects the marginal vein to the top of the **stigma (stg)** and the **uncus (unc)** extends from the apical edge of the stigma. The **postmarginal vein (pmv)** extends from the base of the stigmal vein to its termination point near the anteroapical edge of the wing. Features defined by setation (or lack thereof) include the **basal cell (bc)**, **cubital setal line (csl)**, **subcubital setal line (scl)**, and **speculum (spc)**.

*Metasoma*. Males of Rileyinae always have the petiole distinct in dorsal view, and usually longer than broad (Figs. 46, 49, 212, 283) to approximately quadrate (Figs. 125, 130, 163). The majority of females, with the exception of a few species of *Rileyia*, have a sessile gaster (Figs. 134, 285, 286). The gastral terga are numbered **Gt<sub>1</sub>–Gt<sub>8</sub>** (Fig. 5), and Gt<sub>1-3</sub> can be separate (Figs. 134, 164, 167) or partially to completely fused (Figs. 48, 51, 170, 208). The gastral sterna are similarly indicated, although sternite one (Fig. 5: **Gs<sub>1</sub>**) is typically the only sternite referred to because it is most frequently modified. Gt<sub>1</sub>–Gt<sub>3</sub> are modified as foreshortened terga often located anterodorsally on the gaster (Fig. 5). Occasionally, foreshortened gastral terga can be difficult to discern as separate terga except at certain angles and appear fused under diffuse lighting conditions (Figs. 48, 51, 170, 208). Difficulty observing the terga occurs most commonly when the “apparent” Gt<sub>1</sub> is actually a minute disc representing the fusion of Gt<sub>1-2</sub> or Gt<sub>1-3</sub> (Figs. 187, 210, 227, 244, 254, 271). Partial fusion between terga also occurs where separation is still detectable (Figs. 170, 208), or fusion can be so complete that former independence is only indicated in lateral view as a faint indentation (Figs. 227, 254). Further, Gt<sub>1</sub> can have interesting structural modifications, such as being anteriorly depressed dorsad of the petiole (Fig. 172) or being robustly carinate (Figs. 152, 176). Finally, Gt<sub>1+2</sub> can cover Gt<sub>3</sub> dorsally so that it is only visible in lateral view (Figs. 235, 281, 283), or Gt<sub>3</sub> can be completely hidden beneath Gt<sub>1</sub> (Fig. 51). Sexual dimorphism is commonly seen in which terga are foreshortened. For example, in *Rileyia cecidomyiae* the female has Gt<sub>1-3</sub> foreshortened, whereas the male has Gt<sub>1-2</sub> foreshortened and Gt<sub>3</sub> extending to approximately the middle of the gaster (Figs. 163, 164). The tergite following any foreshortened tergite(s) is usually the largest and appears to be the result of elongation and/or fusion of subsequent terga (Fig. 5). The next visible unmodified tergum is Gt<sub>5</sub>, which is distinctly emarginate in most males (Figs. 125, 143, 163) but not or only vaguely emarginate to expose the spiracle on Gt<sub>6</sub> in females (Fig. 5). The first gastral sternum (Gs<sub>1</sub>) can be variously modified as well, often in conjunction with modifications to either the petiole or Gt<sub>1</sub>. Most commonly, it is produced anteriorly as a variously produced “collar” abutting the nucha and partially surrounding the base of the petiole (Figs. 146, 166, 176) or as lateral carinate lobes (Fig. 227). The greatest modification is seen in *Rileyia atopogaster* (Figs. 215, 216).

Male genitalia exhibit a “typical” form within Chalcidoidea: sheathlike phallobase surrounding an elongated aedeagus (Fig. 6: **adg**). Posteriorly, the phallobase (Fig. 6: **phl**) has lateral lobes, the parameres (Fig. 6: **par**), which are usually elongate and have at least one robust apical seta

and often other variously positioned setae subapically. Also present are two median lobes, the volsellae (Fig. 6: **vls**), which possess an elongate digitus (Fig. 6: **dig**) having two or more socketed digital spines (Fig. 6: **dgs**) apically. The adeagus is tapered, rounded, or bulbous due to a slight constriction subapically at its apex (Figs. 71, 72, 109–118).

### Sexual Dimorphism

Males are easily distinguished from females by the following attributes: petiole distinct, visible in dorsal view (Figs. 46, 49) (although a few females of *Rileyia* are similarly structured), absence of externally visible ovipositor sheaths and ovipositor, usually with distinct ventral plaque on scape (Figs. 3, 67, 129), and the gaster typically dorsoventrally flattened (Figs. 199, 235, 245, 252).

### Phylogenetic Relationships

Phylogenetic hypotheses are virtually unknown for Eurytomidae, much less Rileyinae. With the exception of Zerova's (1988) intuitive dendrogram concerning subfamily evolution in Eurytomidae, no hypotheses of phylogeny (within a rigorous cladistic framework or otherwise) have focused specifically on this family. Those molecular and morphological phylogenetic analyses involving eurytomid taxa to a limited degree yield conflicting results. Wijesekara (1997) used two eurytomid taxa (*Eurytoma* and *Tetramesa*) as a monophyletic sister group in his morphologically based phylogenetic analysis of Chalcididae. Monophyly of Eurytomidae was based on two characters: distinct separation of the anterior condyles from the ventral region of the petiole (Fig. 44) and the presence of a hypostomal bridge unobscured by the genal bridge below the occipital foramen (Fig. 19) (see Morphological Character Analysis). However, his eurytomid taxon sampling was limited and his initial intention was not to test the monophyly of Eurytomidae. Of the characters used to support the monophyly of Eurytomidae, the genal bridge character state as defined by Wijesekara is not found in all eurytomids (e.g., *Macrorileya* and *Archirileya* have a state similar to that defined by Wijesekara for Cleonyminae) whereas the petiolar character is homoplasious

because a similar state occurs in both Haltichellinae (Chalcididae) and Heimbrinae (Eurytomidae). Further, not all eurytomids possess a petiole as defined by Wijesekara, particularly in respect to the ventral body of the petiole abutting the nucha. Molecular evidence presented by Campbell et al. (2000) indicates a polyphyletic Eurytomidae based on an analysis of an approximately 800 base pair region of the 28S-D2 rRNA transcript for all Chalcidoidea (five eurytomid taxa included).

The phylogenetic goals of the present research are twofold: to test the monophyly of Rileyinae and to address, at least in a preliminary fashion, the higher phylogeny of Eurytomidae with respect to monophyly of the family, including subfamilies and their relationship to the putative sister taxa Leucospidae and Chalcididae. Three sets of outgroup taxa from the Cleonyminae (*Agamerion cleptideum* Girault, *Epistenia coeruleata* Westwood), Pteromalinae (*Nasonia vitripennis* Walker, *Muscidifurax zaraptor* Kogan & Legner) (both Pteromalidae), Leucospidae, and Chalcididae were included in separate analyses to polarize morphological characters and to root trees obtained. Twelve taxa from Chalcididae and Leucospidae plus 12 taxa of Eurytominae and 11 of Rileyinae were included to assess placement of Rileyinae. Forty-one morphological characters were scored for 42 taxa total. Characters from published studies, to support the monophyly of Chalcididae (Wijesekara 1997) and Leucospidae (Bouček 1974; Wijesekara 1997), were included for taxa discussed here. The remaining characters were obtained from various sources and modified or were discovered during the course of this study. Identical taxa were excluded from the analysis (mainly species of *Rileya*). The following discussion focuses primarily on analyses using Cleonyminae as the outgroup because other outgroups previously mentioned did not appreciably alter ingroup topology in early analyses.

### Morphological Character Analysis

The morphological character matrix is presented in Appendix 2. External adult characters (discussed below) were coded as binary (0,1) or multistate (0, 1, 2, . . .) and reflected putative polarity (plesiomorphic = 0). Polarity was established in the analyses using the outgroup method. Some characters were ordered following initial unordered analyses indicating a polarity for that character (Mickevich 1982). The two numbers following individual character



descriptions are the retention indices for the full and combined data sets, respectively. An asterisk (\*) after a character name indicates that it was used only in the analysis of taxa of Rileyinae.

**1. Flagellomere 1:** 0, “normally” sized, at least as broad as long with multiporous plate sensilla (MPS) (Fig. 41); 1, transverse and ringlike,  $>2x$  as broad as long without MPS (Figs. 59, 67); 2, subtransverse to quadrate,  $<2x$  as broad as long without MPS (Fig. 20) (0.56, 0.44).

**2. Flagellomere 2:** 0, “normally” sized, at least as broad as long with multiporous plate sensilla (MPS) (Fig. 20); 1, transverse and ringlike,  $>2x$  as broad as long without MPS (Figs. 59, 67); 2, subtransverse to subquadrate,  $<2x$  as broad as long without MPS (Figs. 78, 84, 129) (0.77, 0.86).

**3. Flagellomere 3:** 0, “normally” sized, at least as broad as long with multiporous plate sensilla (MPS) (Fig. 20); 1, transverse and ringlike,  $>2x$  as broad as long without MPS (Figs. 3, 132, 141); 2, subtransverse to quadrate,  $<2x$  as broad as long without MPS (Figs. 78, 84, 105) (0.75, 1.00).

These first three characters represent the final permutation of several attempts to code in a meaningful fashion basal flagellomeres (= anelli) that are ringlike and lack MPS. The single distinct anellus of most Chalcidoidea is considered the groundplan condition (Schauff 1984; Gibson 1986). Initial coding of the anellus was difficult due in part to the plastic nature of this feature and borderline cases of anellar versus flagellar differentiation. Grissell (1995) operationally defined an anellus as "a greatly reduced (i.e., "ringlike") flagellomere without ridge-like, multiporous plate sensilla (MPS)." He indicated that many Torymidae have "flagellar" segments that are not ringlike yet lack sensilla, whereas others possess "anelli" that are ringlike and possess sensilla. This clearly causes problems in deciding when to designate an anellus (Grissell 1995; Schauff 1986). In earlier analyses, the anellus was defined as a ringlike flagellomere lacking MPS. Thus, certain taxa possessing only basal flagellomeres not ringlike or only lacking MPS were considered to lack anelli. Most eurytomid taxa have anelli fitting this operational definition. The majority of rileyines possess easily distinguishable anelli that are ringlike and lack MPS (*Rileya*, *Neorileya*, *Austrophotismus*); however, certain taxa in Eurytominae (*Macrorileya*, *Archirileya*) have “anelli” that are not ringlike and are almost the size of subsequent flagellomeres but lack MPS. For various reasons, this definition of an anellus and subsequent coding of this feature, particularly for borderline cases mentioned above, was unsatisfactory. The current coding attempts to homologize the first three segments of the flagellum as independent

characters by separating each based on relative size, shape, and possession of MPS rather than statements about the presence or absence of anelli per se. The presence of three anelli in Rileyinae is not unique within Chalcidoidea (also seen in Pteromalidae, Torymidae, Trichogrammatidae, and Eulophidae). Thus, this feature is only locally phylogenetically informative.

**4. Antennal segments:** 0, 13-segmented (Fig. 3); 1, 11-segmented (0.63, 0.83).

The larger number of funicular segments is presumed to be plesiomorphic (Bouček & Heydon 1997). All Rileyinae have thirteen flagellomeres, varying only in the number of anelli and subsequent funiculars (*Neorileya* and certain *Rileya* spp. 11263; *Rileya* spp., *Austrophotismus* 11353). Eurytominae and Chalcididae are variable in the number of antennal segments, ranging from 11 to 13 segments, though eurytomines typically have 11 and chalcidids usually possess 13 segments. Included outgroup taxa in Cleonyminae have the same number of antennal segments (*Epistenia* = 11; *Agamerion* = 11); this character is potentially homoplasious.

**5. Lower face structure:** 0, rugose or umbilicate (Fig. 14); 1, reticulate to finely punctate (Fig. 55, reticulate); 2, longitudinally to obliquely striate (Figs. 70, 173, 177); 3, rugose-reticulate (Fig. 11) (0.74, 0.76).

In general, coarse, umbilicate sculpture is hypothesized to be plesiomorphic (Bouček 1988b; Zerova 1988), whereas finer reticulation is apomorphic. In coding this character, states 0–3 are commonly seen across all included taxa. Specifically, states 0–3 are seen within Eurytomidae (0, *Conoaxima*; 1, *Rileya megastigma* (Ashmead); 2, *Rileya* spp., *Neorileya* spp.) as well as across taxa of Chalcididae, Cleonyminae, and Leucospidae.

**6. Supraclypeal area:** 0, flat, not horizontally raised (Fig. 10); 1, horizontally raised (Wijesekara 1997; Fig. 2) (1.00, 1.00).

The region between the clypeus and the torulus is raised as a horizontal ridge in the Chalcidini (Delvare 1992; Wijesekara 1997) and referred to as bulging or convex. Certain species of *Rileya* have the supraclypeal area slightly elevated above the remainder of the lower face but not produced as a horizontal ridge. Some Eurytominae (*Aximopsis*, *Conoaxima*, some *Eurytoma* spp.) and Rileyinae (*Neorileya*; Figs. 65, 66) have a distinct median carina between the clypeal region and interantennal prominence but this is not considered horizontally raised.

**7. Position of torulus:** 0, below lower eye margin (Figs. 11, 12); 1, at or above lower eye margin (Figs. 9, 10) (0.83, 0.89).

This character has been used in the past (Habu 1960; Wijesekara 1997; Delvare 1992), and the toruli below the lower eye margin is presumed

to be the plesiomorphic condition based on outgroup comparison. However, this character is homoplasious as members of the Haltichellinae (Chalcididae) possess state 1. Grissell (1995) attempted to use this character by subdividing it into five states based on ratios of the toruli from the vertex and clypeus but could not recognize discontinuities in the states.

**8. Orientation of torulus:** 0, lateral and ventral margins of toruli not produced and toruli facing forward or upward (Figs. 12, 14); 1, lateral and ventral margins of toruli produced forward (Figs. 9, 10) (0.67, 1.00).

The taxa with produced torular margins in this analysis are the Haltichellinae and Epitraninae.

**9. Clypeus:** 0, indistinct, clypeal area emarginate (Fig. 70); 1, entire, produced ventrally as a flap (Figs. 53, 55, 161); 2, bilobate, notch as deep as wide (Fig. 9); 3, bilobate, notch deeper than wide (Fig. 226); 4, slightly produced, pointed medially (Figs. 13, 177); 5, straight (Figs. 11, 14) (0.41, 0.63).

The relative production of the clypeus has been used to assess relationships from a phylogenetic perspective in Pteromalidae (Heydon 1989) and Torymidae (Grissell 1995) with some success. However, this character is homoplasious in this analysis, and it appears that it might be better utilized at a lower taxonomic level. State 0 is found in all *Neorileya*, some *Rileya*, and some taxa of Eurytominae (e.g., *Conoaxima*). State 1 is found primarily in Chalcididae and some *Rileya*, whereas states 2 and 3 are found in Rileyinae and Eurytominae. State 4 is autapomorphic for *Heimbra bicolor* and *H. opaca*, and state 5 is found primarily in Chalcididae.

**10. Eye:** 0, pubescent (Figs. 11, 74, 75); 1, glabrous (Figs. 9, 10, 12). State 0 refers to the presence of an even coverage of setae (either dense or sparse) on the eye surface (0.43, 0.40).

Eye pubescence is hypothesized to be the plesiomorphic condition because it is found in the outgroup Cleonyminae (*Agamerion*, *Epistenia*), plesiomorphic Eurytominae (*Macrorileya*, *Archirileya*, *Tetramesa*), Rileyinae (*Austrophotismus*, *Rileya oculiseta*, *R. glabra*), and Leucospidae but not in the outgroup Pteromalinae.

**11. Postgenal lamella:** 0, absent (Figs. 15–18); 1, present (Figs. 1, 19) (0.80, 0.75).

This character occurs as a flattened lobe, directed laterally or ventrolaterally, in the postgenal region of the head below the occipital foramen (Fig. 19). It appears to function in tongue-and-groove fashion with a corresponding groove on the prosternum. This character was initially observed by Thomson (1878) and defined by Claridge (1958) as a hypostomal

lamella, an apparent development of the hypostomal carina (Richards 1956). Claridge (1961a) later termed the same structure "postgenal lamella" when it became apparent that it probably was not an extension of the hypostomal carina. Delvare (1988) termed it the "lamina postgénal" in differentiating species of African Eurytomidae described by Risbec (1951, 1952, 1953, 1956a, 1956b, 1957). Delvare (1992) also referred to a hypostomal process located at the dorsolateral margin of the oral fossa in his study of the Chalcidini; however, it remains to be seen if there is any correspondence between these two structures. Bouček et al. (1981) felt that the postgenal carina identified by Claridge was actually the occipital carina. This character appears to occur primarily in Eurytominae, although not exclusively, because some Chalcididae (*Acanthochalcis nigricans* Cameron) also possess it. *Platyrileya* was coded as "?" because it is only known from the unique type and could not be disarticulated (similarly for characters 16, 17, 24, 35, 36, 38). Neither of the outgroup Cleonyminae have this feature, and I hypothesize it to be apomorphic.

**12. Postgenal spur:** 0, absent (Figs. 15, 17); 1, present (Figs. 1, 18) (0.67, 0.75).

This structure occurs as a spurlike protrusion on the lateroventral surface of the head that is continuous with the genal carina, if present (Fig. 18). To date, it has been observed only in some Rileyinae and Chalcididae (*Acanthochalcis nigricans* Cameron); thus, it is homoplasious. It is possible that this character occurs in other related taxa (Pteromalidae) that have not been surveyed extensively.

**13. Scrobal depression:** 0, two separate scrobes, deep, margined (Fig. 11); 1, scrobes fused into scrobal depression, deep, margined (Figs. 2, 89, 108); 2, scrobes fused into scrobal depression, shallow, unmargined (Figs. 9, 10, 12) (0.75, 0.77).

By outgroup comparison, the presence of a distinctly separated scrobal depression, where each scape is received into a discrete scrobe, at least basally, is hypothesized to be plesiomorphic. The fusion of separate scrobes into a single scrobal depression appears to have occurred within both the Eurytomidae and the Chalcididae at least once.

**14. Base of labrum:** 0, concealed by clypeus (Figs. 9–11, 13); 1, exposed (Figs. 12, 14) (1.00, 1.00).

Darling (1988) hypothesized that a broad labrum contiguous with the apical margin of the clypeus is the ground plan for Chalcidoidea. This character was used by Wijesekara (1997) as a synapomorphy supporting the monophyly of Chalcididae and is included here to aid in differentiating

Chalcididae. No other taxa in the analyses presented here possess an exposed labrum. This character is homoplasious within Chalcidoidea because it also occurs in *Aperilampus* (Perilampidae).

**15. Mandibular base:** 0, concealed by genal margin (Figs. 9, 10, 13); 1, exposed (Fig. 14) (1.00, 1.00).

This character was used by Wijesekara (1997) as a synapomorphy supporting the monophyly of Chalcididae and is included here for the same purpose. No other taxa in the analyses presented here possess an exposed mandibular base. Perilampids possess a similar character but are differentiated by a concave genal margin as opposed to chalcidids, which have a straight genal margin.

**16. Hypostomal/postgenal bridge:** 0, postgenal bridge absent, postgenae separated and not converging, hypostomal bridge completely exposed (Fig. 15); 1, postgenal bridge absent but postgenae converging, hypostomal bridge exposed medially (Fig. 17); 2, postgenal bridge present, with postgenae narrowly uniting below occipital foramen, hypostomal bridge slightly exposed (Fig. 16); 3, postgenal bridge present and complete, postgenae broadly uniting hypostomal bridge obscured (Fig. 19) (0.89, 0.81).

**17. Hypostomal carina:** 0, hypostomal carina distinct, complete, encircles occipital foramen (Fig. 15); 1, hypostomal carina distinct, incomplete, terminates laterad occipital foramen (Wijesekara 1997; Fig. 13); 2, hypostomal carina distinct, complete, does not approach occipital foramen, unites below occipital foramen (Fig. 16); 3, hypostomal carina distinct, incomplete, approaching one another below occipital foramen (Fig. 17); 4, hypostomal carina distinct, incomplete, present laterad ventral mouthparts (Fig. 18) (0.73, 0.82).

Wijesekara (1997) used characters 16 and 17 as a single character, which might needlessly eliminate phylogenetic signal. I chose to separate it into two characters because the hypostomal carina cannot necessarily be correlated with character state changes in genal bridge production/hypostomal bridge exposure. The genal bridge, when present, is formed by the fusion of the genae (postgenae) between the occipital foramen and the ventral mouthparts and typically obscures the hypostomal bridge (depending on the degree of development of the genal bridge) (Wijesekara 1997). The hypostomal carina proceeds dorsoventrally along the lateral margin of the oral fossa and either turns medially at the base of the ventral mouthparts or continues dorsally to approach or encircle the occipital foramen. Leucospids possess state 0 for both characters. Cleonyminae, Heimbrinae, most Rileyinae, and some eurytomines possess state 2 for character 16. In

character 17, state 1 is seen only in Chalcididae; state 2 is homoplasious across Chalcididae and Eurytomidae; state 3 is mainly seen in Eurytomidae; and state 4 is autapomorphic for *Acanthochalcis*. *Platyrileya* was coded as "?" because it is only known from the unique type and could not be disarticulated (similarly for characters 11, 24, 35, 36, 38). As a homoplasious character, genal bridge production cannot be regarded as a synapomorphy for Eurytomidae.

**18. Distance between toruli:** 0, greater than one torulus diameter (Fig. 11); 1, less than one torulus diameter (Figs. 9, 10, 12) (0.0, 0.60).

The cleonymine outgroup is symplesiomorphic for state 0 relative to all the other taxa in this study, except for *Rileya antennata* (not included in character matrix). This species has the most dramatically modified antenna in the genus and the toruli located greater than one torular diameter apart.

**19. Prepectus:** 0, large, exposed portion greater than twice the length of tegula (Fig. 25); 1, small, exposed portion less than or equal to twice the length of tegula (Figs. 27, 29, 31) (0.85, 0.88).

Chalcidoidea is the only apocritan possessing an externally visible prepectus, an independent sclerite between the posterolateral pronotum and anterodorsal margin of the mesepisternum (Goulet & Huber 1993; Gibson et al. 1999) (Fig. 7) (Rotoitidae have the prepectus hidden [Gibson & Huber 2000]), and some chalcids have it fused to the pronotum as in Eucharitidae [Heraty 1994]). The visible portion of the prepectus is typically as large as or larger than the tegula, and this condition has been hypothesized to be the plesiomorphic condition (Zerova 1988). In contrast, a highly reduced prepectus is considered apomorphic. However, numerous taxa possess a greatly reduced subtriangular to subcircular (Eurytomidae: Rileyinae, Heimbrinae) or striplike prepectus (Chalcididae, Leucospidae). I treated the prepectus as a binary character for purposes of this analysis, although Wijesekara subdivided my "small prepectus" into three states (Leucospidae = intermediate, elongate, ventromedially narrow; Chalcididae = small, not elongate, ventromedially narrow, or reduced to a thin sclerite and difficult to see) that pertained to Chalcididae + Leucospidae. Gibson et al. (1999) considered the state seen in Leucospidae an intermediate state between the plesiomorphic condition and the reduced states seen in Chalcididae; thus, the difference between the two is obscure.

**20. Scutellum:** 0, not distinctly carinate posteriorly (Fig. 175); 1, distinctly carinate posteriorly (Figs. 25, 27); 2, spiniform projection posteriorly (Fig. 31) (0.59, 0.46).

A scutellum lacking an apical production is variously rounded, with a vague blunt edge, or otherwise acarinate. A carinate scutellum can be blunt, where the carina is slightly thickened and/or lacking a sharp edge apically, or fine, in which a sharp apex is present. A produced scutellum has either a carina or a spiniform process apically. The spiniform process is found in *Heimbra bicolor* Subba Rao and *H. opaca* (Ashmead). It is not unique to Heimbrinae, however. It is also seen in *Conoaxima* (Eurytominae) in this analysis, although the different processes are possibly nonhomologous. This character is homoplasious across Eurytomidae and Chalcididae in this analysis. All Cleonyminae possess state 1.

**21. Mesosomal sculpture:** 0, coarse, umbilicate punctation (Figs. 27, 31); 1, fine, umbilicate punctation (Fig. 24); 2, reticulate (Fig. 25; prepectus and mesepisternum); 3, fine, transverse reticulation (Figs. 22, 26); 4, imbricate-reticulate (Fig. 40; imbricate).

Coarse umbilicate punctation has been hypothesized as the plesiomorphic condition within Chalcidoidea (Bouček 1988b). The majority of Eurytomidae, Chalcididae, and Leucospidae have state 0 or 1. In this analysis, only taxa of Rileyinae (most *Rileya*) possess state 3 (some species have state 2), whereas two plesiomorphic eurytomids (*Archirileya*, *Macrorileya*) are autapomorphic (state 4).

**22. Mesepimeral-metapleural junction (MMJ):** 0, absent (Figs. 28, 32); 1, present (Fig. 30) (1.00, 1.00).

This character occurs only in Rileyinae as a synapomorphy of *Rileya* + *Platyrileya*. The mesepimeron is grooved posteroventrally to receive the anteroventrally produced process of the metapleuron, which fit together in a tongue-and-groove manner (Fig. 30). Typically, striae radiate dorsally from this junction. Taxa lacking an MMJ usually have the mesepimeron and metapleuron appressed against one another without any type of intervening production or gap (Fig. 28).

**23. Mesopleural wing process:** 0, partly exposed (see Wijesekara 1997; Fig. 13); 1, covered by tegula (Fig. 32) (0.0, 0.5).

The mesopleural wing process is a dorsal production of the mesopleuron that functions as a support for the forewing. Usually, the process is at least partly exposed.

**24. Carina between metacoxae:** 0, absent; 1, single median carina present; 2, two submedian carinae present; 3, two carinae connecting the anterior edge of the metacoxal insertion with nucha, two transverse carinae connect longitudinal carinae (0.62, 0.57).

Most taxa in this study possessed state 0 or 1 but the Aximini (*Axima*, *Conoaxima*, *Aximopsis*) and *Bephratelloides* (all Eurytominae) have state 2. *Acanthochalcis* is autapomorphic for state 3. This character is homoplasious but might have potential as more taxa of Eurytominae are sampled.

**25. Metacoxa:** 0, not laminate, carinate, or grooved (Figs. 29, 238); 1, posterior, transverse, or oblique lamina present, groove absent (Fig. 38); 2, longitudinal carina present, groove absent; 3, grooved to receive femur (0.40, 0.50).

The majority of included taxa possess the plesiomorphic condition of a simple, unmodified metacoxa (state 0). A few taxa have state 1 across Chalcididae and Eurytomidae, whereas only the outgroup possesses state 2. *Aximopsis* and *Axima* are synapomorphic for state 3.

**26. Notauli:** 0, distinct and complete (Figs. 4, 25); 1, indicated as a faint groove and complete (Figs. 22, 23); 2, distinct partially, incomplete, present either anteriorly or posteriorly (Fig. 64); 3, absent (Wijesekara 1997; Fig. 19) (0.56, 0.67).

The presence of notauli appears to be a symplesiomorphy within Chalcidoidea (Schauff 1984; Gibson 1985, 1989; LaSalle 1987; Grissell 1995). The notaulus was coded as present when distinct grooves were visible. Faint grooves were typically only visible at certain angles and/or under indirect illumination or were indicated by a linear arrangement of dorsal sculpturing of the mesosoma.

**27. Metafemur:** 0, enlarged (greater than or equal to 3x as long as broad), dentate ventrally (Figs. 33, 37, 38); 1, not enlarged (less than or equal to 3x as long as broad) or dentate ventrally (1.00, 0.94).

A metafemur that is neither enlarged nor modified with ventral dentition is the hypothesized groundplan state within Chalcidoidea (Grissell 1995; Gibson et al. 1999). The enlarged metafemur appears to have originated multiple times within Chalcidoidea (Pteromalidae [Bouček 1988b], Chalcididae [Wijesekara 1997], Leucospidae, Agaonidae [Bouček 1988b], Eulophidae [Bouček 1988b] and Torymidae [Grissell 1995]). Within Eurytomidae, males of *Macrorileya oecanthi* (Ashmead) (Gates pers. obs.; Smith 1930) and *Archirileya inopinata* Silvestri (Bouček 1951; Erdős 1957; Zerova 1976) and females of *Masneroma angulifera* Bouček (Bouček 1983) have an enlarged, nondentate metafemur. Unlike Chalcididae, the enlarged femur in some eurytomids is flattened ventrally and does not have the corresponding curved tibia.



**28. Stigma:** 0, normally sized, less than twice length of stigmal vein basad stigma (Figs. 93–97, 180, 182, 232); 1, enlarged, greater than or equal to twice length of stigmal vein basad stigma (Figs. 156, 237, 241) (0.0, 1.00).

An enlarged stigma was hypothesized as apomorphic for Tanaostigmatidae (LaSalle 1987), and Grissell (1995) determined this for Torymidae based on outgroup comparison with Pteromalidae. The enlarged stigma is autapomorphic for *Rileyia megastigma* and *R. cearae* but a slightly enlarged stigma (still within range of state 0) can be found in several species of *Rileyia*. A similarly sized stigma is also known from certain species of *Nikanoria* (Eurytominae; Zerova 1988).

**29. Wing fold:** 0, capable of folding longitudinally; 1, incapable of folding longitudinally (1.00, 1.00).

This character is autapomorphic for the outgroup Leucospidae.

**30. Junction of parascutal and axillar carinae:** 0, converging above wing base and meeting on dorsal surface toward mesosomal midline (Figs. 25, 29); 1, meeting directly above wing base (Fig. 27) (1.00, 1.00).

Wijesekara (1997) considered this character apomorphic for Chalcididae. All nonchalcidid taxa in this analysis possess state 0.

**31. Metatibia:** 0, straight; 1, arcuate (Figs. 33, 37, 38) (1.00, 0.94).

The plesiomorphic condition for the metatibia is hypothesized as straight (Grissell 1995). State 1 is correlated with an enlarged metafemur and appears to have originated several times within Chalcidoidea in conjunction with the enlarged metafemur (see discussion of metafemur).

**32. Metacoxa:** 0, not enlarged (Figs. 7, 29); 1, enlarged with flat inner surface (Fig. 37); 2, enlarged with convex inner surface (Fig. 33) (0.92, 1.00).

Wijesekara (1997) hypothesized that an enlarged metacoxa with a flat inner surface is correlated with a sessile, transverse petiole and rigid propodeal/gastral junction, which is seen in Leucospidae and Cleonyminae. This is contrasted with the enlarged, mesally convex coxa seen in Chalcididae. However, the state seen in Chalcididae is also found in *Platyrileyia* and thus is globally homoplasious. An unenlarged metacoxa is typical of most Pteromalidae and Eurytomidae.

**33. Metatibial spurs:** 0, two (Fig. 40); 1, one (Figs. 36, 39) (0.25, 0.43).

The presence of two metatibial spurs is considered plesiomorphic within Hymenoptera (Bouček 1988a, 1988b; Bouček & Heydon 1997).

**34. Apex of metatibia:** 0, truncate at right angle (Fig. 40); 1, diagonally truncate, ventroposterior corner acute (Fig. 39); 2, diagonally truncate, ventroposterior corner elongated into spine (Figs. 35, 36); 3, diagonally

truncate, outer tibial spur incorporated into a spine (see Wijesekara 1997; Fig. 39) (0.86, 0.82).

Right angle truncation is common in Chalcidoidea, and diagonal truncation has been hypothesized as an apomorphy derived independently in Chalcididae and Leucospidae (Wijesekara 1997). Wijesekara (1997) indicates that two metatibial spurs with a diagonally truncated ventral apex as seen in *Epistenia* (Cleonyminae) is evidence for the derivation of state 3 without incorporating a spur. However, after examining additional taxa of Cleonyminae available to me but not included in the analysis, I cannot find state 1 in *Cleonymus* sp., *Epistenia coeruleata* Westwood, *Epistenia* sp., or *Agamerion cleptideum* Girault, which all have state 0; only *Amotura hyalinipennis* (Ashmead) and *Amotura caelata* Grissell have state 1, and *Dryadochalcis* sp. from Venezuela has state 2 with only a single weak spur present. All Eurytomidae assessed have state 0.

**35. Propodeal spiracle:** 0, elongate and transversely or obliquely oriented (Fig. 27); 1, elongate and longitudinally oriented along body axis (see Wijesekara 1997; Fig. 25); 2, subcircular (Fig. 57); (1.00, 1.00).

Only the Australian rileyine *Austrophotismus* and *Rileya orchideara* (and other related species) possess a circular propodeal spiracle. In Chalcididae (Delvare 1992; Wijesekara 1997), this character has been used to assess tribal and subfamily relationships, respectively. Delvare (1992) considered elongate, transversely or obliquely oriented spiracles the ground plan state. State 1 occurs only in the outgroup taxa *Conura* and *Melanosmicra* in this analysis.

**36. Propodeal sculpture:** 0, completely reticulate; 1, one or two distinct transverse costulae; 2, carinaceous, median channel present; 3, median, distinct complete carina present; 4, two submedian, distinct complete carinae present; 5, entirely carinaceous, median channel absent.

This character is difficult to code accurately into discrete states, and taxa sharing identical states in the coding might not reflect a valid homology statement implied in the data matrix. This character was excluded from the analysis pending reevaluation at a later time. It is likely more useful at a lower taxonomic level.

**37. Propodeal angle:** 0, propodeum roughly on same plane as scutellum, forming an angle of  $\sim 135^{\circ}$ – $180^{\circ}$  (Fig. 175); 1, propodeum angled relative to scutellum, forming an angle of  $\sim 90^{\circ}$ – $135^{\circ}$  (Figs. 27, 29, 31) (1.00, 0.77).

The slightly larger and/or more elongate taxa (chalcidids, leucospids, *Macrorileya*, *Archirileya*) possess a roughly coplanar scutellum and

propodeum. This can be due in part to a spatial constraint acting on taxa with the apomorphic state (Eurytominae, Rileyinae), which attack gall formers, seed feeders, and so on. (Bugbee 1936) versus the phytophagous stem-feeding (or entomophagous species attacking elongate eggs embedded in stems) species with the plesiomorphic state.

**38. Petiole structure:** 0, anterior condyle distinct and petiole ventrally membranous (Figs. 43, 45); 1, petiole completely sclerotized and anterior ventral margin extended into propodeum, anterior articulation not separate from body (see Wijesekara 1997; Fig. 44); 2, anterior condyle separate from petiole body, anterior ventral margin of petiole expanded outside propodeum (Fig. 44); 3, anterior condyle separated from petiole body by a lamella, petiole body variously elongated (Fig. 42); 4, anterior condyle united with extended anterior ventral surface of petiole body, lamella absent (see Wijesekara 1997; Fig. 59); 5, anterior condyle separate from petiole body, which is distinct dorsally and ventrally, posterior ventral margins not distinctly separated from sternum of metasoma (see Wijesekara 1997; Fig. 48); 6, anterior condyle separate from petiole body dorsally only, anterior ventral margin of petiole body abuts propodeal foramen (Fig. 46) (0.71, 0.86).

This character was used by Wijesekara (1997) in his analysis of Chalcididae and is based in part on work by Steffan (1957) and Delvare (1992). It was included initially to support the monophyly of Eurytomidae (state 6) but was subsequently found to be homoplasious as Heimbrinae possesses state 2.

**39. Relative length of gastral terga:** 0, roughly equal segmentation; 1, first longest; 2, second longest, first shortest; 3, third longest, first and second shortened; 4, fourth longest, first through third shortened; 5, fourth longest, first through third not shortened; 6, fifth longest, no terga reduced.

The anterior gastral terga are modified in Rileyinae into small, anterodorsal “flaps.” Roughly equal gastral segmentation has been hypothesized as the plesiomorphic condition (Bugbee 1936; Zerova 1988) and is coded here as 0. States 1–4 apply to Rileyinae, whose anterior gastral terga are modified and typically much reduced. States 5 and 6 are seen primarily in Eurytominae and some Chalcididae. However, this character was homoplasious and was excluded from current analyses as I am not confident about the homology implied by the present coding. State 2 is found in taxa that were initially coded into the matrix but ultimately excluded from the analysis.

**40. Gastral tergum 1:** 0, not foreshortened (Figs. 42, 43); 1, foreshortened (Figs. 47, 48, 50) (1.00, 1.00).

Only the Rileyinae have gastral tergum one distinctly foreshortened (Figs. 5, 46–60). I hypothesize this foreshortening to be apomorphic based on outgroup comparison and previous work (Bugbee 1936; Zerova 1988) indicating that shortening or reduction of body regions is apomorphic.

**41. Gt<sub>2</sub> versus Gt<sub>3</sub>:** 0, approximately equal in length (Fig. 46); 1, Gt<sub>3</sub> about twice the length of Gt<sub>2</sub> (Fig. 52); 2, Gt<sub>3</sub> greater than twice length of Gt<sub>2</sub>, Gt<sub>3</sub> not extending beyond basal half of gaster (Fig. 49); 3, Gt<sub>3</sub> much greater than twice length of Gt<sub>2</sub>, Gt<sub>3</sub> extending to midline of gaster (Figs. 194, 195); 4, Gt<sub>3</sub> much greater than 2x length of Gt<sub>2</sub>; Gt<sub>3</sub> extending beyond basal third of gaster (Fig. 99); 5, Gt<sub>3</sub> less than Gt<sub>2</sub>; 6, Gt<sub>3</sub> much less than Gt<sub>2</sub> (Fig. 51); 7, Gt<sub>1</sub> + Gt<sub>2</sub> (fused) much greater than Gt<sub>3</sub> (*Heimbra* spp.) (0.52, 0.67).

The initial purpose of this character was to provide differentiation within Rileyinae. However, it has proven to be homoplasious and of limited utility with respect to phylogenetic signal. State 4 is found in taxa that were initially coded into the matrix but ultimately excluded from the analysis.

[Note: Characters 42–50, denoted with an \*, were included only in the separate analysis of the modified data matrix focusing on inferring the relationships of taxa of Rileyinae.]

**42. Flagellomere shape\*:** 0, filiform (Figs. 132, 138); 1, moniliform (Figs. 126, 270) (1.00, 1.00).

This character is autapomorphic for *Rileyia protuberona* and *R. abnormicornis*, both of which share moniliform antennae in which the funicular segments are broadest medially and taper proximally and apically. All other taxa in this analysis possess filiform antennae in which each funicular segment is more or less subequal in width along its length, at most broadening slightly apically.

**43. Gt<sub>1-3</sub> fusion\*:** 0, the anterior three gastral terga distinguishable as separate terga (Figs. 135, 142, 151); 1, the anterior three gastral terga fused, only two terga visible (Figs. 208, 210, 263); 2, the anterior three gastral terga fused, only one tergum visible (Figs. 47, 146, 158, 166, 170, 254, 262, 271) (0.29, 0.38).

Those taxa with state 0 have the first three gastral terga visible as distinctly separated tergites (Figs. 135, 142, 151). Almost all Eurytominae (at least those in this analysis) and many Rileyinae possess state 0. In state 1, the first three gastral terga are fused such that only two apparent terga are visible. The line of separation between the fused Gt<sub>1+2</sub> can be represented only by an indentation representing former independence (Figs. 208, 210, 263) but the separation between Gt<sub>1+2</sub> and Gt<sub>3</sub> is usually distinct (Figs. 208, 210, 263). State 1 is shared among Heimbrinae, *Rileyia orbitalis*, and *R. heterogaster*, as

all technically have  $G_{1+2}$  fused. Coding the two included species of *Heimbra* as state 3, since this combined tergum forms a carapace, did not appreciably alter the outcome of this analysis in terms of the placement of Heimbrinae. In state 2, the first three gastral terga are fused such that only one apparent tergum is visible. The line of separation between the fused  $G_{1+2+3}$  can be represented only by an indentation representing former independence (Figs. 146, 166, 170, 271) or a line of setae (Figs. 47, 158, 254, 262) but the separation is indistinct or incomplete at best.

**44.  $G_{s1}$  production\*:** 0, not distinctly produced (Figs. 133, 140); 1, produced as slightly expanded lobes laterad of petiole (Fig. 227); 2, produced as a ventral collar surrounding petiole, buttressed by longitudinal carinae (Figs. 125, 176); 3, produced as the ventral portion of a robust petiole +  $G_{s1}$  integrated structure (Figs. 47, 170, 271); 4, produced as a recurved, ventral collar surrounding petiole (Figs. 107, 166, 286) (0.50, 0.50).

In state 0,  $G_{s1}$  is not produced as a lobe, lip, collar, or other structure and appears smoothly continuous between the petiole basally and the remaining venter of the gaster (Figs. 133, 140). States 1–4 are seen, in this analysis, throughout the various species of Rileyinae. However, the bulk of these character states might prove homoplasious globally as additional specific-level taxa are examined across Eurytominae (e.g., some *Eurytoma* spp. show similar production), Pteromalidae, and Chalcididae.

**45.  $G_{7+8}$  production\*:** 0, not distinctly elongate, <3x as long as broad (Figs. 133, 140, 164); 1, distinctly elongate, >3x as long as broad (Figs. 205, 227) (0.50, 0.0).

This character (state 1) is autapomorphic for *Rileyia heratyi* + *R. longitergum*.

**46. Presence of costula on propodeum\*:** 0, distinct, transverse costula(e) absent from propodeum (Fig. 57); 1, one or more distinct costula(e) present on propodeum (Figs. 21–24, 64) (0.33, 0.33).

Only four taxa of Rileyinae lack one or more costulae on the propodeum (*Dougiola koebelei*, *Platyrileyia cururipe*, *R. orchideara*, *R. glabra*), whereas the remaining taxa in the analysis possess costulae.

**47. Female gaster\*:** 0, not petiolate (Figs. 133, 135); 1, distinctly petiolate (Figs. 49, 134, 281, 285) (0.17, 0.38).

Most rileyines possess state 0 in which females do not have a distinctly petiolate gaster, specifically, one that is distinctly visible in dorsal view. Only a few species known to date have a petiolate gaster (e.g., *R. tricolor* [Fig. 281], *R. warneri* [Fig. 285], *R. bicolor* [Fig. 49]).

**48. Gs<sub>1</sub>/petiole production\*:** 0, not integrated as a single robust connection between the gaster and propodeum (Figs. 49, 133, 135); 1, integrated as a single robust connection between the gaster and propodeum (Figs. 47, 170, 271) (1.00, 0.0).

*Rileyia hansonii*, *R. quadraticaulis*, and *R. cylindripetiolata* all possess this distinct integration (state 1) between the petiole and Gs<sub>1</sub> such that they integrate to form a single functional unit. No other known taxa of Rileyinae display this state.

**49. Gt<sub>1</sub> carinate\*:** 0, lacking transverse carinate lip anteriorly on Gt<sub>1</sub> (Figs. 133, 135); 1, with transverse carinate lip anteriorly on Gt<sub>1</sub> (Figs. 152, 179) (0.50, 0.50).

Most taxa of Rileyinae display an "unproduced" (i.e., lacking a transverse carinate lip) anterior edge to Gt<sub>1</sub>, often rounded (Fig. 133), sculptured (Figs. 125, 151), or otherwise produced (Figs. 153, 216). For the sake of simplicity, these are coded as 0, and those taxa having the transverse carinate lip (*R. carinaegaster*, *R. gigas*, *R. clarki*) are coded as 1. This character will ultimately be reevaluated to attempt to tease apart the complex morphologies observed in other taxa not included in this analysis.

**50. Propodeum setation\*:** 0, lacking any setation medially; 1, with distinct setation medially (1.00, 0.0).

Only *Rileyia grisselli* possesses setation medially on the propodeum.

## RESULTS

### Phylogenetic Analysis

The morphological data set was analyzed by maximum parsimony using PAUP\* 4.0b3a (Swofford 2000). The heuristic search algorithm was used in all analyses, with random stepwise addition, holding one tree at each step, Tree-Bisection-Reconnection (TBR) branch swapping, 100 replicates, and all characters initially unweighted and unordered. Successive approximations character weighting (SAW; Farris 1969; Carpenter 1988) was used to select a subset of the most parsimonious trees and to test analytical stability. Characters were reweighted and reanalyzed by their rescaled consistency index using a base weight of 1000 until tree length stabilized. If the final tree length is identical to that of the original unweighted tree when all characters are reweighted to one, then SAW has selected at least one of the most parsimonious trees and analytical stability has been attained. This procedure was performed separately for any islands (Maddison 1991) of most parsimonious trees that were detected. Nodal support was estimated by bootstrapping (Felsenstein 1985, 1988) with 100 replicates (or with “fast” bootstrapping as in rileyine analysis, Cladogram 5) and Bremer support (Bremer 1988, 1994), calculated with TreeRot2.0 (Sorenson 1999).

All results and discussion presented in this section pertain to those analyses in which Cleonyminae was used as an outgroup, since these findings are representative of the topological diversity seen across all outcomes. As phylogenetic results obtained for Pteromalinae and Chalcididae outgroups differed only slightly in terms of topology from results of analyses utilizing Cleonyminae, the former results shall be referred to only in general terms.

### Relationships

Many characters were assessed over the course of these analyses for phylogenetic signal. Certain characters were either discarded or reevaluated and retained. Analysis of the complete morphological data for all taxa (Appendix 2), with *Agamerion cleptideum* Girault defined as the outgroup,

two characters excluded (36, 39), and all characters unordered, resulted in 76 most parsimonious trees (MPT) (length 188, ci 0.47, ri 0.76) distributed across 3 islands (island 1 = 35 trees; island 2 = 16 trees; island 3 = 25 trees). All characters were parsimony informative. A strict consensus tree (Cladogram 1) was calculated across all islands to assess clades that were supported in all trees. Cladograms 2 and 3 represent the two topologies observed in the strict consensus of the three islands (identical topologies for two islands) recovered for Eurytomidae only. All family-level clades were supported as monophyletic but Eurytomidae collapsed to a bush with Rileyinae and Heimbrinae retained as monophyletic. Three taxa previously classified as Rileyinae, *Macrorileya*, *Buresium* and *Archirileya*, are placed in the Eurytominae polytomy rather than with the other rileyines and were never placed with Rileyinae in any analytical permutation. The support for Eurytomidae consists primarily of homoplasious or plesiomorphic characters of little utility for defining Eurytomidae as monophyletic when taken in a global context across Chalcidoidea. Support for Rileyinae is more robust than that of Eurytomidae, with the exception of *Dougiola*, which is included in Rileyinae only in the strict consensus trees of islands 1 and 2. Topological differences between islands were assessed by calculating strict consensus trees for each island in order to deduce sources of topological conflict. Islands 1 and 2 are identical topologically (for relationships within Eurytomidae) and *Dougiola* is included in Rileyinae in both (Cladogram 2), whereas *Dougiola* is placed between Heimbrinae and all remaining Eurytomidae in the strict consensus of island 3 (Cladogram 2). Eurytominae is supported as either a basal grade (Cladogram 2) in which the more plesiomorphic taxa (clade spanned by *Macrorileya* and *Buresium*) group separately from the remaining Eurytominae or as a monophyletic clade apically within Eurytomidae (Cladograms 2, 3). Again, the plesiomorphic eurytomines group separately from the others. This divergence (not as clear in Cladograms 2, 3) within Eurytominae is due to lack of synapomorphic support for this subfamily. Those characters common to the bulk of Rileyinae (reduced prepectus, foreshortened gastral terga) are not seen in *Macrorileya*, *Archirileya*, and *Buresium* that have a large, triangular prepectus that is broadly beltlike ventrally and "normal" gastral terga that are not foreshortened. Although *Macrorileya* and *Archirileya* each possess two and three anelli, respectively (*Buresium* has one), these anelli are not ringlike (elongate in *Macrorileya* and quadrate in *Archirileya*). The "anelli" of these taxa are almost the size of subsequent flagellomeres but lack MPS (for



complete discussion, see Character Analysis above). Thus, the character information does not support the inclusion of these three genera in Rileyinae.

### Family-Level Support

In general, morphological results support family-level groupings, although the support for Eurytomidae is weak at best (Cladogram 1). Morphological data support Chalcididae (all traits at the internode are listed in the following discussion) (14: 0>1; 15: 0>1; 30: 0>1; 32: 1>2) and Leucospidae (26: 0/1>3; 29: 1>0) as monophyletic independently but Chalcididae + Leucospidae is supported by homoplasious features (chars. 13, 16, 37). Eurytomidae is monophyletic (Cladograms 1–3) but the support is weak. That is, all changes occurring at the eurytomid internode are homoplasious (9: 5>0/2/3/4/5; 10: 0/1>1; 13: 1>2; 24: 0/1>0; 38: 0>6/2; 41:1/2/3/4/5>1/2/3) or plesiomorphic (27: 0/1>1; 31: 0/1>1; 32: 1>0). Proposed synapomorphies of Eurytomidae have, to date, been discovered to be homoplasious and/or plesiomorphic on close examination. The question arises as to the validity of Eurytomidae as a family. However, before such assertions can be made, it is essential to explore, as thoroughly as possible with respect to taxon sampling, all available morphological features of taxa of Eurytomidae, including those not investigated intensively for the group (i.e., mouthparts, hind wing venation, larval morphology). This is the next logical step for studies of Eurytomidae.

### Species-Level Phylogeny

Characters 42–50 were coded additionally and included in the analysis of taxa of Rileyinae. See Morphological Character Analysis above for discussion of the character states. Characters 14, 15, 21, 23–25, 27, 29, 31, 32–38 were excluded from the analysis as they were either primarily included for use in the full morphological matrix to define Chalcididae and Leucospidae or found to be invariant in initial analyses of Rileyinae. The remaining characters were included. *Rileyia* is included in a clade containing *Neorileyia*, *Platyrileyia*, *Austrophotismus*, and *Dougiola* based on sharing 2 or 3 anelli, reduced prepectus (except *Platyrileyia*), and foreshortened  $Gt_{1,3}$  ( $Gt_1$  not as distinctly foreshortened in *Austrophotismus* and *Dougiola*). The remaining discussion

herein focuses on analytical results presented in Cladograms 4 and 5. In these analyses, the full morphological data set was truncated by removing outgroup and putative sister taxa in lieu of adding 22 species of *Rileyia* to the truncated data set with Heimbrinae as the outgroup. The unweighted analysis of the morphological data resulted in 31,511 MPT that reduced to 4,157 MPT after SAW. In strict consensus of the MPTs from the unweighted analysis (Cladogram 4), the bulk of taxa of *Rileyia* are placed in an apical polytomy. However, certain species are placed as monophyletic during unweighted and successive approximations analysis based on distinctive morphological features: (1) *Rileyia protuberona* + *R. abnormicornis* (moniliform antenna, Figs. 126, 270; Gs<sub>1</sub> produced as lateral carinate lobes buttressed longitudinally by carinae, cf. Fig. 125); (2) *R. longitergum* + *R. heratyi* (elongate Gt<sub>7+8</sub>, Figs. 205, 227); (3) *R. glabra* + *R. orchideara* (orchid association [not coded]; ventrally produced, truncate clypeus (Figs. 55, 161, 184), usually without costula on propodeum); (4) *R. cylindripetiolata* + *R. hansonii* + *R. quadraticaulis* (distinctive Gs<sub>1</sub>-petiole interaction, forms distinctive connection between gaster and propodeum; Gt<sub>1-3</sub> fused, minute [Figs. 47, 170, 271]). Cladogram 5 is a strict consensus of the 4,157 most parsimonious trees resulting from SAW and supports the following clades mentioned above, with the apical polytomy slightly better resolved. However, given the lack of support of these better-resolved clades, caution should be used in drawing definitive conclusions about the evolutionary patterns within *Rileyia*.

### Revision of Rileyinae

The most recent key to genera of Rileyinae treats only the Australian genera (Bouček 1988b). Previously, Zerova (1976) focused on the Palearctic fauna of Rileyinae, whereas others concentrated on the genus *Rileyia* (Gahan 1918; Subba Rao 1978). In the following revision, descriptions and keys are provided for six genera and 66 species found worldwide. Abbreviations and terminology are as discussed in Materials and Methods.

**Diagnosis.** The vast majority of species of Rileyinae can be recognized by the following combination of features: presence of 2 or 3 anelli (Figs. 3, 59); greatly reduced, subcircular to subtriangular prepectus (*Platyrileyia* possesses a large, anteroventrally deflected prepectus [Figs. 29, 60, 62]); distinctly

foreshortened basal gastral terga (not as obvious in *Austrophotismus* [Figs. 76, 77, 83], *Dougiola* [Figs. 87, 88] or some *Rileyia* [Fig. 151]) (Figs. 47–52). *Rileyia* + *Platyrileyia* is further differentiated by the possession of a distinct, interlocking MMJ (Figs. 29, 30).

### Key to Genera

- 1 Eye densely setose, setae of eye 0.2–0.3x their own lengths from nearest seta (eye of *A. fallax* less densely setose [seta 0.4–0.6x its length from nearest seta]) (Figs. 74, 75). Antenna densely setose (Figs. 73, 78). Propodeum reticulate with some rugosity posteromedially and a few fine setae submedially.....  
.....*Austrophotismus* Girault
- 1' Eye glabrous or some *Rileyia* spp. sparsely setose, setae 0.7–1.4x their own lengths from nearest seta (Figs. 48, 184). Antenna less densely setose (Figs. 59, 67). Propodeum carinate with distinct costulae and plicae (a few taxa lack costulae/plicae: *R. glabra*, *R. guatemalae*, *R. oncidii*, *R. orchideara*), with intervening foveae and interstices rugulose-reticulate to polished and asetose submedially (Figs. 64, 69).....2
- 2 (1') Mesepimeral-metapleural junction appressed, noninterlocking (Figs. 28, 32).....3
- 2' Mesepimeral-metapleural junction not appressed, with interlocking tongue-and-groove structure (Figs. 29, 30).....4
- 3 (2) Antenna with two transverse anelli and six funicular segments (Figs. 59, 67). Scrobal depression slightly narrowed dorsally, anterior ocellus above scrobal depression (Figs. 65, 66). Face striate ventrally and evenly setose (sparser, even setation in *N. lynetteae*), with two stouter, erect setae laterad clypeal area, convergent ventrally (Figs. 65, 66, 70).  $Gt_{1-2}$  foreshortened (Fig. 68). Color black (except females of *N. lynetteae* are brown and males are golden).....  
.....*Neorileyia* Ashmead
- 3' Antenna with three transverse to subquadrate anelli and five funicular segments (Fig. 84). Scrobal depression distinctly narrowed dorsally, then diverging to encompass anterior ocellus (Fig. 89). Face striate

ventrally only immediately surrounding oral fossa (Fig. 89), asetose laterad clypeal area.  $Gt_{1-2}$  not distinctly foreshortened (Figs. 87, 88). Color golden (darker maculation dorsally) or dark brown.....  
 .....*Dougiola* Bouček

- 4 (2') Anellus two or three distinct, quadrate to transverse; clava symmetrically tapered apically (Figs. 129, 132, 141). Prepectus reduced, less than 2x size of tegula (Figs. 7, 29), facing laterally. Scrobal depression without ventrally directed carinate dorsal margin (Figs. 9, 10, 161, 224).....*Rileyia* Ashmead
- 4' Anellus three indistinct, subtransverse; clava asymmetrically tapered apically (Fig. 105). Prepectus large, at least 2x size of tegula (cf. Fig. 37), facing anteroventrally. Scrobal depression with ventrally directed carinate dorsal margin (Fig. 108).....*Platyrileyia* Burks

### *Austrophotismus* Girault

(Figs. 71–83)

*Austrophotismus* Girault, 1938: 84. Type species: *Austrophotismus ater* Girault, by original designation.

*Matna* Bouček, 1988b: 92. Type species: *Matna fallax* Bouček, by original designation. **New synonymy.**

**Diagnosis.** *Austrophotismus* contains two species found only in Australia. It is differentiated by possessing densely setose eyes and antennae (Figs. 73–75, 78, 79) and having the petiole of the male with anteriorly projecting carinate flange dorsally (Figs. 76, 77); the male genitalia with 2–4 robust setae ventrally on parameres, digiti spatulate, each with three strong digital spines apicolaterally and adeagus cleft apicomediaally (Figs. 71, 72).

#### **Description.**

*Head.* Reticulate. Ovate to subtriangular in frontal view; anterior ocellus closer to posterior ocellus than posterior ocelli are to one another. Face striate ventrally becoming finely reticulate dorsally, striae radiating from clypeus reaching lower eye margin (approaches lower eye margin and scrobal depression in *A. fallax*) but not lower margin of scrobal depression; face evenly clothed in brownish setae. Malar space 0.1–0.6 eye height. Eye large,

moderately to densely setose (Figs. 74, 75), anteroventral facets  $\sim 2.0x$  larger than posterodorsal facets (much more pronounced in females), postorbital carina absent. Scrobal depression unmarginated to slightly marginated, deepest ventrally and becoming shallow dorsally; interantennal prominence narrowly triangular, pointed dorsally, and extending  $\sim 0.2x$  length of scape. Clypeus notched, bilobate (Figs. 74, 75). Antenna 13-segmented (11353); scape 2.6–4.0x as long as broad; anelli transverse, each increasing in width apically; F1 0.5–1.5x as long as broad, subsequent funicular segments broader than long to elongate; clava 1.3–3.0x as long as broad, teardrop shaped or elongate, clearly segmented or segments partially fused, densely setose (Figs. 73, 78, 79), entire clava or apical segment tapered apically.

*Mesosoma*. Transversely reticulate dorsally; notaulus complete but finely impressed; dorsum evenly setose; midlobe of mesoscutum 1.0–1.6x as long as broad. Scutellum 1.1–1.4x as long as broad, carinate apically; lateral panel of axilla asetose and reticulate. Mesepisternum reticulate ventrally and more finely rugulose-reticulate dorsally; mesepimeron glabrate, with 1–2 irregular depressions posteriorly. Propodeum reticulate-rugose with primary rugosity located medially, several fine elongate setae present submedially; posterolateral propodeum with fine setae; callus densely setose; with transverse row of foveae abutting dorsellum. Coxae finely reticulate with one or more rows of setae along length of anterolateral and dorsolateral surfaces. Wings hyaline, venation brown; forewing 1.7–2.2x as long as broad; parastigma broader than submarginal vein, with more or less distinct hyaline break; stigmal vein arises at  $45^\circ$  angle to marginal vein; stigma 0.3–1.0x as long as stigmal vein; uncus short to elongate, 0.6–1.0x as long as stigma; marginal vein 0.5–1.0x as long as postmarginal vein (Figs. 80–82), costal cell with submarginal fringe.

*Metasoma*. Petiolate in male, the petiole transverse in dorsal view with anteriorly projecting carinate flange (Figs. 76, 77); petiole not visible dorsally in female.  $Gt_{1-2}$  bare, remaining terga finely reticulate,  $Gt_1$  3.8–11x as long as  $Gt_2$  and 1.5–4.2x as long as  $Gt_3$ ,  $Gt_{1-3}$  2.1–2.8x as long as  $Gt_4$ ,  $Gt_{1-2}$  sparsely setose laterally, remaining terga mostly evenly setose (Figs. 76, 77),  $Gt_6$  and  $Gt_{7+8}$  facing more or less posteriorly, roughly elliptical in posterior view;  $Gt_{7+8}$  dorsally keeled, cerci with at least 4 erect setae, the longest cercal seta variously curved dorsally at apex; ovipositor valves setose. Male phallobase with 2–4 robust setae ventrally on parameres, digiti spatulate, each with three strong digital spines apicolaterally, aedeagus cleft apicomediaally (Figs. 71, 72).

**Distribution.** This genus is found throughout Australia (Fig. 287).

**Biology.** Unknown.

**Comments.** The merits of recognizing a monotypic *Matna* are negligible in light of the similarities shared with *Austrophotismus*. Both genera possess setose eyes, though the setation is denser in *A. daicles*. Although Bouček (1988b) keyed *Matna* separately from *Austrophotismus*, in part based on the relative size of the eyes, their ventral facets, and the density of setation ("almost bare"), this is likely due to sexual dimorphism, particularly since only male *M. fallax* are known. Males of both species share remarkably similar genitalia (Figs. 71, 72) but differ in that males of *M. fallax* have the antenna filiform (elongate flagellomeres) rather than clavate (transverse flagellomeres) (Figs. 73, 79) as in *A. daicles*, though both have densely setose flagellomeres. Finally, the structure of the gaster is very similar in the two species (Figs. 76, 77).

#### Key to species of *Austrophotismus*

- 1      Eye large, >0.5x head height, densely setose (Figs. 74, 75), anteroventral facets largest. *Male & female*: antenna stout, clavate, segments broader than long, (Figs. 73, 78).....*A. daicles* (Walker)
- 1'     Eyes moderately sized, ~0.5x head height, ventral facets of same size as others (Fig. 3). *Female*: Unknown. *Male*: antenna elongate, segments longer than broad (Fig. 79).....*A. fallax* (Bouček)

#### *Austrophotismus daicles* (Walker)

(Figs. 72, 73, 75, 77, 78, 80, 82, 83)

*Miscogaster daicles* Walker, 1839: 19–20. Lectotype ♀ (designated by Bouček 1988b: 92). Australia, New South Wales (BMNH, examined). This specimen was originally described as a male.

*Austrophotismus ater* Girault, 1938: 84. Holotype ♀, by original designation. Australia: Qld (QMB, not examined). Synonymy with *daicles* by Bouček, 1988b: 92.

*Austrophotismus ater* (Walker), Bouček, 1988b: 92.

**Diagnosis.** Head and body dark brown to black and densely setose. Facial striae bolder than in *Austrophotismus fallax* and extending to lower eye margin and scrobal depression. Eye densely setose (Fig. 75), ventral facets largest. Flagellum stout, flagellomeres transverse, setose in both sexes (Figs. 73, 78).

**Description.** Female. Length 1.8–2.3 mm. Body dark brown to black; legs brown, except for tarsi, apex of femora, and base and apex of tibiae, which are golden.

*Head.* Subtriangular in frontal view, striae radiating from clypeus and reaching lower eye margin. Malar space 0.1–0.4x eye height. Eye densely setose (Fig. 75). Scrobal depression slightly margined, with fine intrascrobal carina. Scape 2.8–4.0x as long as broad, broadest basally, narrowing apically; A3 the longest and broadest anellus; F1 0.5–1.0x as long as broad, subsequent funiculars transverse, increasing in width apically. Clava 1.3–1.6x as long as broad, vaguely segmented, entire clava tapered to dull point and apical claval segment with sinuous separation from preceding claval segment (Figs. 73, 78).

*Mesosoma.* Midlobe of mesoscutum 1.0–1.5x as long as broad. Scutellum 1.1–1.3x as long as broad, finely carinate apically. Forewing 2.1–2.2x as long as broad, stigma 0.3–0.5x as long as stigmal vein, uncus short, <0.6x as long as stigma, marginal vein 0.5–1.0x as long as postmarginal vein (Figs. 80, 82).

*Metasoma.* Petiole glabrous. Gt<sub>1</sub> 8.7–11x as long as Gt<sub>2</sub> and 1.5–4.2x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 2.1–2.8x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with group of sublateral setae, Gt<sub>2</sub> with several sublateral setae; remaining terga with scattered setae dorsally and laterally (Fig. 83).

**Male.** Length 1.5 mm. Identical to female except as follows: petiole same as female, glabrate, projecting dorsally as an anteriorly directed flange abutting nucha (Fig. 77); Gt<sub>1</sub> 4.6–5.0x as long as Gt<sub>2</sub> and 2.0–2.8x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 2.2x as long as Gt<sub>4</sub>. Phallobase with 3 robust setae ventrally on paramere, apical seta largest (Fig. 72).

**Variation.** The female from Paddy's River has eyes that are the same size as male *A. fallax* with slightly less pronounced eye facet size differential. This specimen is accepted as a variant of *A. daicles* because no association can be made regarding female *A. fallax*. Primary differences seen are in coloration: some specimens are dark or lighter brown others have legs almost completely dark brown with minimal lightening at the apices of the femora or tibiae. The

male from Norseman has anelli that are larger, particularly the third (Fig. 78), than those of the Moruya male.

**Biology.** Unknown.

**Distribution.** Australia (Fig. 287).

**Material Examined.**

**Type Material:** AUSTRALIA: New South Wales: Sydney, Hym. 5-836 (Lectotype ♀ BMNH).

**Other Material:** AUSTRALIA: [?]: Paddy's River, E. F. Riek, 3.xi.1948 (1♀ ANIC); ACT: Canberra, 21.ix.1946, E. F. Riek (1♀ ANIC); Congo, 8km ESE Moruya, 19.iii.1983, M. S. Upton, malaise trap (1♂ ANIC); Black Mountain, 6.xi.1934, W. Rafferty (2♀ ANIC); Queensland: 1km E. Mt. Bilewilam, 26.01S 153.04E, 12.x.1984, I. Naumann & J. Cardale, ex ethanol (1♀ ANIC); Mt. Norman area, Via Wallangarra, 7-8.x.1972, S. R. Monteith (1♀ ANIC); Western Australia: 37km SSW Norseman, 32.30S 121.37E, 19.ix.1981, I. Naumann & J. Cardale, ex ethanol (1♂ ANIC).

***Austrophotismus fallax* (Bouček)**

(Figs. 71, 74, 76, 79, 81)

*Matna fallax* Bouček, 1988b: 92. Holotype ♂, Australia (WA) (ANIC, examined). **New combination.**

**Diagnosis.** Facial striae weak. Eye sparsely setose (Fig. 74) as compared to *A. daicles*, with ventral facets same size as dorsal facets. Flagellum elongate, flagellomeres slightly elongate, setose (Fig. 79). Propodeum rugulose-reticulate, with fine setae submedially in anterior. Petiole of male transverse in dorsal view, glabrate, projecting dorsally as an anteriorly directed flange abutting nucha (Fig. 76) but not as distinctly produced as in *A. daicles*.

**Description.** Male. Length 1.4–1.7 mm. Body dark brown to black, legs brown; tarsi, apex of femora, base and apex of tibiae lighter brown.

**Head.** Weak striae radiating from clypeus toward lower eye margin and lower margin of scrobal depression, not reaching either. Malar space 0.6x eye height. Eye sparsely but evenly setose. Scrobal depression unmarginated. Scape 2.6–3.0x as long as broad, narrowing slightly apically, A1 longest, A1–A3 each increasing in width apically, F1 1.5x as long as broad, subsequent



funiculars slightly elongate. Clava 2.4x as long as broad, clearly segmented, ultimate segment tapered to dull point (Fig. 79).

*Mesosoma*. Midlobe of mesoscutum 1.4–1.6x as long as broad, notaulus faint in posterior one-quarter. Scutellum 1.3–1.4x as long as broad, finely carinate apically. Forewing 2.1x as long as broad, stigma 0.5x as long as stigmal vein, uncus elongate, ~1.0x as long as stigma, marginal vein 0.7x as long as postmarginal vein (Fig. 81).

*Metasoma*. Petiole glabrate, with anteriorly directed flange (Fig. 76). Gt<sub>1</sub> 3.8–5.3x as long as Gt<sub>2</sub> and 2.6–2.7x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 2.2–2.3x as long as Gt<sub>4</sub>. Phallobase with 2 robust setae ventrally on paramere, apical seta largest (Fig. 71).

**Female.** Unknown.

**Biology.** Unknown.

**Distribution.** Australia (Fig. 287).

**Comments.** The type specimen is in good condition.

**Material Examined.**

**Type Material:** AUSTRALIA: Western Australia: 49km NE Wubin, 29.47S 117.00E, I. Naumann & J. Cardale, 27.ix.1981 (Holotype ♂ ANIC).

**Other Material:** AUSTRALIA: Western Australia: 5km WNW Perenjori, 29.25S 116.14E, 29–30.ix.1981, I. Naumann & J. Cardale (1♂ ANIC).

***Dougiola* Bouček**

(Figs. 84–89)

*Dougiola* Bouček, 1988b: 90–91. Type species: *Systole koebelei* Ashmead, by original designation.

**Diagnosis.** The primary characters used to recognize *Dougiola* are as follows: slightly protruding, dorsally pointed, laminate interantennal prominence extending for distance equal to one-quarter length of scape (Fig. 89); scrobal depression deep, narrowed dorsally, abruptly diverging subsequently as triangular depression encompassing anterior ocellus; anterior edge of metasternum produced ventrally as a rounded lamina, narrower than distance between lateral edges of metacoxal foramina; propodeum steep, convex,

slightly bulging laterally; prepectus reduced, subtriangular;  $Gt_1$  very slightly reduced with  $Gt_2$  having the shortest exposure dorsally; three anelli between pedicel and first funicular segment and funicular segments undifferentiated, all flagellomeres increasing in size toward distinct clava (Fig. 84).

**Description.** Only females are known for both species. Range in length 3.0–3.3 mm. Color brown or golden brown or in combination. Wing hyaline, forewing venation brown.

*Head.* Striate to reticulate. Anterior ocellus located in scrobal depression and closer to posterior ocellus than posterior ocelli are to one another. Face striate ventrally becoming rugulose or reticulate dorsally, striae radiating from clypeus and extending toward lower eye margin and scrobal depression. Eye 1.7–1.8x head height, glabrous. Malar space 0.7–0.8x eye height, postorbital carina absent. Scrobal depression slightly margined, deep, narrowed dorsally, and widening as triangular depression above scapes; interantennal projection slightly protruding, dorsally pointed, laminate, extending for distance equal to one-quarter length of scape. Anterior ocellus located within scrobal depression. Clypeus shallowly bilobate; supraclypeal area striate, not elevated. Antenna (11353); anelli each quadrate to slightly elongate, each (at least) increasing in width apically; subsequent funiculars subquadrate and subequal, increasing in length and width apically; clava 1.5–1.7x as long as broad, tapered apically (Fig. 84).

*Mesosoma.* Transversely rugulose to rugose; notauli complete, slightly impressed; dorsum evenly setose. Midlobe of mesoscutum 1.4–1.5x as long as broad. Scutellum 1.2–1.3x as long as broad, finely to distinctly carinate apically; lateral panel of axilla setose medially, rugulose-reticulate. Mesepisternum and mesepimeron rugulose-reticulate to reticulate. Prepectus small, subtriangular or subcircular, concave. Propodeum convex, carinaceous-rugose around periphery, reticulate submedially; lacking complete primary costulae, median carinae, or plicae; spiracle moderately sized, obliquely oriented, reniform, >1.0x its length from dorsellum; callus setose. Coxae imbricate to reticulate with one or more rows of setae longitudinally on anterolateral and dorsolateral surfaces; metacoxa usually with posteromesal row of large erect setae. Wings hyaline; venation brown; forewing 2.2–2.8x as long as broad; parastigma typically broader than submarginal vein and with hyaline break; stigmal vein arises at 30–45° angle to marginal vein; stigma 0.4x as long as stigmal vein; marginal vein 0.7–1.0x as long as postmarginal vein; costal cell with submarginal fringe.

*Metasoma*. Gaster sessile. Gt<sub>1</sub> not distinctly foreshortened, reticulate; remaining terga reticulate; Gt<sub>2</sub> shortest in dorsal view; Gt<sub>3-5</sub> roughly subequal or increasing in length; Gt<sub>6</sub> higher than broad to shorter than broad, facing posteriorly or dorsally; Gt<sub>7+8</sub> triangular in dorsal view; Gt<sub>1</sub> 1.9–2.7x as long as Gt<sub>2</sub> and 0.9–2.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.6x as long as Gt<sub>4</sub>; Gt<sub>1</sub> setose dorsolaterally to laterally, remaining terga evenly setose (Figs. 87, 88); Gt<sub>6</sub> spiracle is difficult to see (*D. koebelei*) or visible (*D. yanegai*); Gt<sub>7+8</sub> triangular in dorsal view.

**Phylogenetic Affinities.** In the full morphological analysis, *Dougiola* was either included basally within Rileyinae or within the polytomy of Eurytominae (Cladograms 1–3). It is provisionally included in Rileyinae based on sharing three anelli (although not ringlike, they lack MPS) and a reduced prepectus pending collection of further material that would indicate otherwise.

**Distribution.** *Dougiola* is known from New South Wales, Australia (Fig. 287).

**Biology.** Unknown. Bouček (1988b) indicated that *Dougiola koebelei* was possibly a seed feeder. *D. yanegai* is associated with *Casuarina luehmanni* R. T. Baker (Casuarinaceae).

#### Key to species of *Dougiola*

- 1 Gt<sub>6</sub> oriented nearly vertically (Fig. 87); stigma elongated and slightly tapered (Fig. 87).....*D. koebelei* (Ashmead)  
 1' Gt<sub>6</sub> oriented nearly horizontally (Fig. 88); stigma short and rounded (Fig. 86).....*D. yanegai* n. sp.

#### *Dougiola koebelei* (Ashmead)

(Figs. 84, 85, 87, 89)

*Systole koebelei* Ashmead, 1900: 335. Lectotype ♀, designated by Bouček, 1988b: 90–91. Australia (USNM examined).

*Dougiola koebelei* (Ashmead), Bouček, 1988b: 90–91.

**Diagnosis.** This species is separated from *Dougiola yanegai* by the following: color orange-brown with darker maculation (see below);

mesopleuron reticulate-rugulose; scutellum with sharp, slightly upturned carina; gaster short and almost circular in lateral view (Fig. 87), Gt<sub>6</sub> oriented nearly vertically; stigma elongated and slightly tapered (Fig. 85).

**Description.** Female. Length 3.3 mm. Color orange-brown, except for the following, which are black or dark brown: interantennal prominence apically, ocellar triangle, occipital region of head, prosternum, procoxa anterobasally, mesosternum, mesoscutum, axillae, scutellum excepting frenal area, mesocoxae, metacoxae, gaster dorsally; wing hyaline, venation brown.

*Head.* Rugulose to striate. Ovate in frontal view, numerous strong striae radiating from clypeus toward lower eye margin and scrobal depression. Clypeus shallowly bilobate; supraclypeal area not elevated above remainder of face, striate (Fig. 89). Malar space 0.7x eye height. Eye glabrous. Scape 4.8x as long as broad, broadest basally, anelli elongate to subquadrate, A1 narrowest and longer than broad, A2 and A3 each increasingly broader, A1 longest, A2–A3 subequal in length; F1 0.8x as long as broad, subsequent funiculars subequal in length (Fig. 84); clava 1.5x as long as broad, segmented, tapering apically.

*Mesosoma.* Transversely rugulose. Midlobe of mesoscutum 0.8x as long as broad, notaulus complete, slightly indicated. Scutellum 1.2x as long as broad, distinctly carinate apically. Mesepisternum and mesepimeron rugulose. Metasternum with anterior edge of metasternum produced ventrally as a rounded lamina, narrower than distance between lateral edges of metacoxal foramina. Propodeum rugulose, reticulate submedially, setose laterally; spiracle reniform, ~1.5x its length from dorsellum; callus densely setose. Forewing 2.2x as long as broad, stigma 0.4x as long as stigmal vein, stigma tapered (Fig. 85), uncus fine; marginal vein 0.7x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1</sub> not distinctly foreshortened, reticulate; remaining terga reticulate; Gt<sub>2</sub> shortest in dorsal view; Gt<sub>3-5</sub> roughly subequal; Gt<sub>1</sub> 7.0x as long as Gt<sub>2</sub> and 2.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 4.5x as long as Gt<sub>4</sub>; Gt<sub>1</sub> setose dorsolaterally to laterally, remaining terga evenly setose; Gt<sub>6</sub> higher than broad, facing posteriorly, spiracle difficult to see, at apical margin of Gt<sub>5</sub>; Gt<sub>7+8</sub> triangular in dorsal view (Fig. 87).

**Distribution.** Known only from Australia (Fig. 287).

**Biology.** Unknown. Possibly a seed feeder.

**Comments.** The right antenna, left antenna beyond the pedicel, right forewing, and portions of the right hind leg (tibia and tarsus) are slide mounted separately.

**Material Examined.**

**Type Material:** AUSTRALIA: [?]: Koebele, ♀ Type No4882 USNM [red label], Lectotype [circular label with purple border], *Systole koebelei* ♀ Type Ashm. [handwritten]; *Systole koebelei* ♀ Type Ashm. [slide mount, handwritten] (Lectotype ♀, USNM). **Other Material:** AUSTRALIA: New South Wales: Port Macquarie, 25.iii.36, D. F. Waterhouse (1♀ ANIC).

***Dougiola yanegai*, new species**

(Figs. 86, 88)

**Etymology.** Named in honor of Doug Yanega, a devoted entomophile.

**Diagnosis.** This species is separated from *Dougiola koebelei* by the following: color brown rather than golden, sculpture generally finely reticulate without indication of umbilicate sculpture, mesopleuron almost completely reticulate, scutellum finely carinate, stigma not elongate and tapered (Fig. 86), gaster elongate (Fig. 88).

**Description.** Female. Length 3.0 mm. Color golden brown, except for the antennae, legs, region laterad clypeus, and tegula, which are golden; wing hyaline, venation brown.

**Head.** Striate to elongate-reticulate. Ovate in frontal view, numerous strong striae radiating from clypeus toward lower eye margin and scrobal depression. Clypeus shallowly bilobate; supraclypeal area not elevated above remainder of face, striate. Malar space 0.8x eye height. Eye glabrous. Scape 6.0x as long as broad, broadest basally, anelli elongate to subquadrate, A1 narrowest and 2.0x as long as broad, A2 and A3 each increasingly broader, A1 longest, A2–A3 subequal in length; F1 0.8x as long as broad, subsequent funiculars subequal in length; clava 1.7x as long as broad, segmented, tapering apically.

**Mesosoma.** Finely transversely rugulose. Midlobe of mesoscutum 1.4x as long as broad, notaulus complete, slightly indicated. Scutellum 1.3x as long as broad, distinctly carinate apically. Mesepisternum reticulate, setose along anteroventral margin; mesepimeron reticulate-glabrate. Prepectus small, semicircular, concave. Propodeum rugose-reticulate, incomplete carinae

anteromedially and subanteromedially extending posteriad, setose laterally; spiracle ~1.5x its length from dorsellum; callus setose. Forewing at least 2.8x as long as broad [slightly folded, difficult to measure], stigma 0.4x as long as stigmal vein, stigma rounded (Fig. 86), uncus fine; marginal vein subequal to postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1</sub> not distinctly foreshortened, glabrous dorsally, reticulate laterally; remaining terga reticulate; Gt<sub>1</sub> setose dorsolaterally to laterally, remaining terga evenly setose laterally with sparser setation ventrally, setation absent dorsally except on Gt<sub>5</sub> and Gt<sub>6</sub>; Gt<sub>1</sub> 2.7x as long as Gt<sub>2</sub> and subequal to Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.6x as long as Gt<sub>4</sub>; Gt<sub>6</sub> facing dorsally; Gt<sub>7+8</sub> just visible in dorsal view and triangular.

**Distribution.** Known only from Australia (Fig. 287).

**Biology.** Unknown.

**Comments.** The holotype is missing its left clava, and its left hind leg is mounted separately on the same point but is otherwise intact.

**Material Examined.**

**Type Material:** AUSTRALIA: New South Wales: 13 mls. N.E. of Gilgandra, 7.xii.1958, K. L. Taylor; *Casuarina leuhmanni* [both handwritten]; *Dougiola* sp. n., det. Z. Bouček, 1986 (Holotype ♀, ANIC).

***Neorileya* Ashmead**

(Figs. 59–70, 90–104, 109–118)

*Neorileya* Ashmead 1904: 264–265, 382, 466. Type species: *Neorileya flavipes* Ashmead, by monotypy.

*Neorileya*; redescribed by Burks, 1971: 61–62.

**Diagnosis.** *Neorileya* contains six species found in the New World from the southwestern United States to Argentina and is differentiated as follows: color usually black [*N. lynetteae* brown or golden] with paler extremities; prepectus small, subcircular to subtriangular and glabrous (Figs. 61–65); Gt<sub>1-2</sub> foreshortened, glabrous to glabrate (Fig. 80); two anelli present (Figs. 59, 67); clypeus emarginate (Figs. 65, 66, 70); phallobase with apices of parameres and digiti elongate, each paramere with 1–4 subapical or apical setae and each

digitus with 2–4 digital spines, aedeagus narrowed or swollen apically (Figs. 109–118).

### **Description.**

*Head.* Circular to subtriangular in frontal view, anterior ocellus closer to posterior ocellus than posterior ocelli are to one another. Face striate ventrally becoming umbilicate dorsally, striae radiating from clypeus reaching lower eye margin and approaching lower margin of scrobal cavity; moderately to densely clothed with silvery setae (Figs. 65, 66, 70). Malar space 0.2–0.4x eye height. Eyes medium to large, glabrous; anteroventral facets equal or larger in size than posterodorsal facets. Scrobal depression margined or unmargined; interantennal prominence distinct and roughly rectangular to triangular, usually pointed dorsally and continuous with interantennal carina (Figs. 65, 66) (not in *N. lynetteae*). Anterior ocellus usually separated from scrobal depression by transverse carina (not in *N. lynetteae*). Clypeus emarginate (Figs. 65, 66, 70); strong median carina connects interantennal prominence with clypeal area; two suberect setae arising laterad clypeal area and extending ventrally toward each other (Figs. 65, 66). Antenna (11263); scape 2.8–5.0x as long as broad; ventral plaque usually developed in male, often with sensory pores visible (Figs. 59, 67, 90, 91); anelli transverse, each increasing in width and length apically; F1 0.7–1.2x as long as broad, subsequent funiculars subequal, subquadrate, setose. Clava 2.0–7.0x as long as broad, vaguely segmented, tapered apically.

*Mesosoma.* Finely to coarsely umbilicate dorsally, interstices usually reticulate; notaulus incomplete to complete but faint; dorsum evenly setose (Fig. 60); midlobe of mesoscutum 1.0–1.6x as long as broad. Scutellum 0.8–1.5x as long as broad, crudely carinate to acarinate apically; lateral panel of axilla asetose or with setae along posteroventral margin; reticulate, striate or glabrous. Mesepisternum variously sculptured: rugose, rugose-reticulate, glabrous-striate, striate or in combination; mesepimeron glabrous, with 1–2 irregular depressions posteriorly (Figs. 61–65). Prepectus small, subcircular to subtriangular. Propodeum carinate-rugose, interstices reticulate (Fig. 69; not *N. lynetteae* [Fig. 64]), glabrate to reticulate between carinae; usually two (one in *N. cornuta*) distinct costulae (primary = anterior and secondary = posterior) present, interconnected to each other, dorsellum and nucha by plicae, forming a row of 2–3 large foveae submedially; all plicae variously produced or complete; primary costula often incomplete medially, either appearing to turn anteriorly to intercept dorsellum submedially or being intercepted by submedian plicae, which connects secondary costula and

dorsellum; submedian plica often rendering primary costula incomplete medially; costulae and plicae continuing ventrally; secondary costula usually complete; posterolateral propodeum with moderate to dense fine setae; callus sparsely to densely setose. Coxae finely reticulate with one or more rows of setae along length of anterolateral and dorsolateral surface. Wing hyaline, rarely infusate posterior to stigma (*N. albipes*), venation light to dark brown; forewing 1.5–2.7x as long as broad; parastigma broader than submarginal vein, with more or less distinct hyaline break; stigmal vein arises at 45° angle to marginal vein, usually slightly curved; stigma 0.3–1.0x as long as stigmal vein; marginal vein 0.6–1.7x as long as postmarginal vein (Figs. 93–97); costal cell with submarginal fringe.

*Metasoma.* Petiolate in male, with petiole quadrate to slightly longer than broad in dorsal view, rugose to rugose-reticulate; petiole not visible in dorsal view in female. Gt<sub>1-2</sub> glabrous; Gt<sub>3</sub> becoming transversely reticulate or punctate, remaining terga reticulate and/or punctate; Gt<sub>1</sub> 2.5–12.0x as long as Gt<sub>2</sub> and 0.3–2.4x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.7–6.5x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with sublateral or subdorsal group or transverse row of setae (Figs. 98–101); Gt<sub>2</sub> sometimes with a few setae laterally, Gt<sub>3</sub> sparsely setose dorsally, denser laterally; remaining terga evenly setose dorsally and laterally; Gt<sub>6</sub> and Gt<sub>7+8</sub> typically face roughly posteriorly and are roughly rectangular to elliptical in posterior view; Gt<sub>7+8</sub> usually dorsally keeled, cerci with 5 erect setae. Male phallobase with 2–3 setae ventrally on parameres, the apical seta most robust and straight or recurved (Figs. 109–118); digiti elongate, broadest basally, each with 2–4 strong digital spines apicolaterally; adeagus narrowed (Figs. 112–117) or rounded (Figs. 109, 110, 118) apicomediaally.

**Distribution.** *Neorileya* are found primarily in the Neotropical region but one species extends as far north as central California (Figs. 288, 289).

**Biology.** Species of *Neorileya* are all apparently solitary endoparasitoids of eggs of Orthoptera (Tettigoniidae) and Hemiptera (Pentatomidae, Coreidae, Reduviidae). Further, hyperparasitism is possible in some instances (W. Jones pers. comm.). In preserved eggs vacated by *Neorileya* examined by the author, no evidence was found of remnant exuviae other than that of the *Neorileya* pupae.

#### **Key to species of *Neorileya***



- 1 Gaster distinctly flattened dorsoventrally, Gt<sub>1</sub> with two anterior prominences (Figs. 98, 100). Eye with anteroventral facets distinctly larger (~2x) than posterodorsal facets. Tegula yellowish or golden  
..... *N. meridionalis* Gahan
- 1' Gaster at most slightly dorsoventrally flattened, ovate or circular in cross section, Gt<sub>1</sub> lacking anterior prominences (Figs. 99, 101). Eye with anteroventral facets not or only slightly larger (<2x) (most *N. ashmeadi*) at the venter of the eye than facets near vertex (Fig. 8). Tegula yellowish or black.....2
- 2 (1') Gaster in dorsal view more or less truncate and terga beyond Gt<sub>4</sub> not or barely visible (Fig. 99). Mesepisternum striate with reticulation increasing posteriorly (Figs. 62, 63). Tegula black.....  
..... *N. ashmeadi* Crawford
- 2' Gaster in dorsal view not truncate and terga beyond Gt<sub>4</sub> visible (Figs. 68, 101). Mesepisternum striate, smooth, without reticulation (Fig. 61). Tegula yellow, brown, or black.....3
- 3 (2') Anterodorsal margin of pronotum produced as two triangular flanges (Fig. 102)..... *N. cornuta* n. sp.
- 3' Anterodorsal margin of pronotum not produced, evenly rounded.....4
- 4 (3') Forewing infusate medially, posterior to stigmal vein (Fig. 90). Gt<sub>1</sub> slightly flattened dorsoventrally, with faint, punctate dorsolateral depressions anteriorly. Tegula yellowish or golden.....  
..... *N. albipes* Girault
- 4' Forewing hyaline. Gt<sub>1</sub> not flattened dorsoventrally, rarely with faint, punctate dorsolateral depressions anteriorly. Tegula black or brown, sometimes partially golden and rarely completely golden.....5
- 5 (4') Delicately sculptured, females entirely dark brown, males golden. Propodeal carinae sharply defined, interstices not sculptured, intervening foveae glabrous with few rugae (Fig. 64). Mesepisternum with fine striae, separated from mesosternum by a carina (Fig. 61). Tegula brown in female and golden in male..... *N. lynetteae* n. sp.
- 5' Robustly sculptured, both sexes black with yellow or brown antennae and legs. Propodeal carinae rounded, not sharply defined, interstices reticulate, intervening foveae with numerous rugae. Mesepisternum with strong striae, not separated from mesosternum by a carina (Fig.

60). Tegula usually black but partially to completely golden in some specimens.....*N. flavipes* Ashmead

***Neorileya albipes* Girault**

(Fig. 90)

*Neorileya albipes* Girault, 1913: 57. Lectotype ♂, here designated. Paraguay (ZMB, examined).

**Diagnosis.** This species is intermediate in form between *N. flavipes* and *N. meridionalis* because the gaster is slightly flattened dorsoventrally but not to the extent of *N. meridionalis*. In *N. albipes*  $Gt_1$  possesses anteriorly two faint to distinct elliptical punctate depressions bearing fine setae (often abraded) similar to *N. meridionalis* and some *N. flavipes* (usually quite slightly produced in the latter species) but lacks the anterior prominences of *N. meridionalis*. At most,  $Gt_1$  has very faint indications of prominences but more often it is collarlike where it abuts with the petiole. The mesepisternum is striate with superimposed reticulation as in *N. ashmeadi*. However, *N. albipes* is unique because its forewing has an infuscate spot extending posteriad from the stigmal vein, which does not reach the posterior wing margin (Fig. 90).

**Description.** Male. Length 2.2–2.8 mm. Head and body black, legs, tegulae and scape golden yellow basally. Eye gray to pale pink. Scape apex and flagellum brown, anterior edge of gaster reddish brown or dark golden. Forewing hyaline with infuscation posterior to stigma.

**Head.** Striate to umbilicate. Ovate in frontal view with striae radiating from clypeus. Malar space 0.3–0.4x eye height. Scrobal depression slightly margined, interantennal prominence roughly triangular and merging with fine intrascrobal carina, extending for distance nearly entire length of scape. Anterior ocellus separated from scrobal depression by transverse carina. Scape 3.6–3.9x as long as broad, narrowing apically, broadest medially at ventral plaque which extends two-thirds length of scape; F1 0.7–0.8x as long as broad, subsequent funiculars subquadrate; clava 2.7–2.9x as long as broad.

**Mesosoma.** Umbilicate. Midlobe of mesoscutum 1.2–1.3x as long as broad, notaulus absent or very slightly indicated. Scutellum as long as broad, crudely carinate apically, lateral panel of axilla setose anteriorly, umbilicate to reticulate. Mesepisternum rugose-reticulate; mesepimeron rugose (cf. Fig. 62). Propodeum with primary costula incomplete medially, turning to intercept dorsellum submedially; secondary costula connected to dorsellum by

submedian plicae, which are continuous with primary costula anteriorly; several plicae interconnecting the primary and secondary costulae, and each costula with dorsellum and nucha, respectively (cf. Fig. 81); posterolateral propodeum moderately setose; callus moderately setose. Forewing 1.5–2.0x as long as broad; stigma 0.5x as long as stigmal vein; marginal vein 0.7x as long as postmarginal vein (Fig. 90). Wing incompletely setose basally.

*Metasoma*. Petiole 1.1–1.3x as long as broad, rugulose. Gt<sub>1-2</sub> glabrate; remaining terga finely reticulate; Gt<sub>1</sub> 1.7–4.0x as long as Gt<sub>2</sub> and 0.5–0.7x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 3.2–3.4x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with shallow, setose depressions anterodorsally and smoothly collarlike where it abuts the petiole; Gt<sub>3</sub> evenly setose laterally and in posterior one-quarter; Gt<sub>4</sub> evenly setose; remaining terga evenly setose, visible in dorsal view; Gt<sub>7+8</sub> roughly crescentic in posterior view.

**Female.** Length 2.0–3.2 mm. Identical to male, except as follows: Gt<sub>1-2</sub> glabrate; remaining terga finely reticulate; Gt<sub>1</sub> 5.7–7.0x as long as Gt<sub>2</sub> and 0.4–0.6x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 3.3–4.2x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with shallow, setose depressions anterodorsally and smoothly collarlike where it abuts petiole; Gt<sub>3</sub> evenly setose laterally and in posterior one-quarter; Gt<sub>4</sub> evenly setose; remaining terga evenly setose, visible in dorsal view; Gt<sub>7+8</sub> roughly crescentic in posterior view.

**Variation.** The main variation apparent within this species occurs as follows: antenna with scape black in apical third or more rarely completely golden, flagellum can be dark brown to black; anteroventral eye facets can be slightly enlarged (although typically not as pronounced or extensive as in *N. meridionalis*), and the eye color is usually a dull gray but can be pinkish; mesepisternum can be finely rugose with more extensive intervening reticulation or vice versa; propodeum varies primarily in the extent of the robustness or completeness of the costulae and plicae and the intervening sculpture; meso- and metasomal legs are usually concolorous but can tend to fade to white apically; the infuscation on the forewing ranges from a spot present at the apex of the stigmal vein to a larger spot encompassing more of the wing medially to a darker spot within an infuscate area in the anterobasal two-thirds of the wing; the stigma can be slightly enlarged apically.

**Biology.** The only host records come in the form of label data indicating being “bred from Heteroptera eggs” in the Panama Canal Zone. De Santis (1979) and Bruner et al. (1975) record Coreidae and Pentatomidae as hosts.

Although the label data on the specimen collected by Hespeneide at La Selva, Costa Rica (nr lep. egg mass), does not indicate it, his published account records a species of *Neorileya* (*meridionalis*?) as emerging from eggs of *Edessa* sp. (Pentatomidae) (Hespeneide 1985).

**Distribution.** Found in the Neotropical region (Fig. 289).

**Comments.** The lectotype has a cracked mesosoma, and both antennae are missing (except right scape and pedicel).

#### **Material Examined.**

**Type Material:** PARAGUAY: San Bernardino, K. Frieberg S. V. [blue label]; Type [red label]; ex coll. Girault; Zool. Mus. Berlin; alb [handwritten]; *Neorileya albipes* Type [handwritten] (Lectotype ♂ ZMB).

**Other Material:** BOLIVIA: Yungas: Puente Villa, 12–20.xii.1955, 1200m. L. Pena (1♀ CNC); 15km S. Caranavi, 26.i.1973, 920m, J. Helava (1♀ CNC). BRAZIL: Espírito Santo: Linhares, 1.x.1972, M. Alvarenga (1♀ CNC); Santa Catarina: Nova Teutonia, 27°11'S, 52°23'W, vii.1970, 300–500m, F. Plaumann (1♀ CNC). COSTA RICA: Heredia: Chilamate, 75m, 4.ii.1989, Hanson & Godoy (1♂1♀ BMNH); 3km S Puerto Viejo, La Selva Biol. Sta., 10°26'N, 84°01'W, 19.vii.1982–8.iv.1987, H. Hespeneide, nr lep. egg mass (1♂ USNM), at foliar nectaries *Byttneria aculeata* Jacquin (4♀ USNM), at foliar nectaries *Clibadium pittieri* (2♀ USNM) (9♂1♂ USNM); Limón: Parque Nacional Cahuita, 29.iv.1988, 0m, P. Hanson (1♀ BMNH); Puntarenas: Golfo Dulce, 24km W. Piedras Blancas, iii–v.1989 to vi.1991, 200m, P. Hanson (2♀ BMNH); Golfo Dulce, 10km W. Piedras Blancas, iii–v.1989, 100m, P. Hanson (1♀ BMNH); Golfo Dulce, 5km W. Piedras Blancas, vi–vii.1993, 100m, P. Hanson (3♀1♂ BMNH); Parque Nacional Corcovado, Est. Sirena, 8°28–31'N, 83°36'W, 24.iii.1981, H. Hespeneide (1♀ BMNH); San José: Ciudad Colón, ii.1990–v.1990, 800m, L. Fournier (5♀ BMNH); ECUADOR: Napo: Limoncocha, 15–28.vi.1976, 250m, S. & J. Peck (1♂ CNC); Yanayacu, 29–30.viii.1977, 300m (1♀ CNC) Pichincha: 47km S. Santo Domingo, Rio Palenque Station, 15–28.v.1975, S. & J. Peck (5♀ CNC); Zamora Chinchipe: Zamora, 27–31.iii.1965, 1500m, L. Pena (1♀ CNC). GUATEMALA: Petén: Tikal, ix.1959, N.L.H. Krauss (1♀ USNM). HONDURAS: Cortés: 4km S. Monteverde, Sta. Cruz de Yojoa, 23.x.1988, R. Cave (1♀ EAZP); Francisco Morazan: San Antonio de Oriente, El Zamorano, 27.i–8.ii.1990, R. Cave, malaise trap in coffee plantation (2♀ EAZP). PANAMA: Colón: iii–xii.1953, reared from Heteroptera eggs (3♀

USNM); 5mi. SW Gatun, 9°14'N, 79°58'W, 21.vii.1977, H. Hespenheide (2♀ UCRC); Chiva Chiva, x.1946, N.L.H. Krauss (1♀ USNM); Summit, xi.1946, N.L.H. Krauss (3♀ USNM). **PERU: Madre de Dios:** Laberinto, 1–2.i.1984, A. Finnemore (1♀ UCRC). **SURINAME: Brokopondo:** Brownsberg, 12–18.i.1985, A. Finnemore & T. Thomin (3♀ UCRC). **TRINIDAD & TOBAGO: St. George:** Port of Spain, x.1950, N. L. H. Krauss (1♀ USNM); **St. Patrick:** 10km NE Bonasse, 24.iii.1985, C.& J. Hevel (2♀ USNM); **Victoria:** San Fernando, Golconda Estate, 19.x.1910, H. Morrison (1♀ USNM); **VENEZUELA: Distrito Federal:** Caracas, x.1950, N.L.H. Krauss (4♀ USNM); **Zulia:** El Tucuco, 24.iv.1981, L. Masner, sweeping rain forest (2♀ UCRC).

***Neorileya ashmeadi* Crawford**

(Figs. 62, 92, 97, 99, 117–118)

*Neorileya ashmeadi* Crawford, 1913: 345–346. Lectotype ♀, here designated. Trinidad and Tobago (USNM, examined).

**Diagnosis.** This species resembles *N. flavipes* but differs in having a transverse row of setae on  $Gt_1$  anteriorly (variable, see below), rather than two subdorsal patches of setae. The mesepisternum is reticulate-rugose between the striae. Eyes have anteroventral facets slightly larger than dorsal facets (usually not as extensive or as large as in *N. meridionalis* and absent in *N. flavipes*). Tegula is black. See Discussion below.

**Description.** Female. Length 1.8–2.5 mm. Head, body, and tegula black, legs golden, except tips of femora, tibiae, and entire tarsi, which are whitish; forewing hyaline, venation light brown.

**Head.** Striate to umbilicate. Ovate in frontal view. Malar space 0.2x eye height. Scrobal depression slightly margined, interantennal prominence roughly triangular and merging with fine intrascrobal carina, which extends for distance ~one-third length of scape. Anterior ocellus separated from scrobal depression by transverse carina. Scape 3.2–3.6x as long as broad, narrowing apically, broadest basally; F1 0.8–1.0x as long as broad, subsequent funiculars roughly quadrate.

**Mesosoma.** Umbilicate. Midlobe of mesoscutum 1.2–1.3x as long as broad, notaulus absent or very slightly indicated. Scutellum 1.2–1.4x as long as broad, carinate apically, lateral panel of axilla asetose, reticulate. Mesepisternum rugose-reticulate; mesepimeron glabrate (Fig. 62).

Propodeum with primary costula incomplete medially, turning to intercept dorsellum submedially; secondary costula connected to dorsellum by submedian plicae, which are continuous with primary costula anteriorly; several plicae interconnecting the primary and secondary costulae, and each costula with dorsellum and nucha, respectively (cf. Fig. 81); posterolateral propodeum moderately setose; callus moderately setose. Forewing 2.3x as long as broad; stigma 0.5x as long as stigmal vein; marginal vein 1.2–1.7x as long as postmarginal vein (Fig. 97). Wing incompletely setose basally.

*Metasoma.* Gt<sub>1-2</sub> glabrate; remaining terga finely reticulate; Gt<sub>1</sub> 3.3–6.5x as long as Gt<sub>2</sub> and 0.4–0.5x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 2.4–5.3x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with transverse row of setae across dorsum anteriorly; Gt<sub>3</sub> evenly setose in posterior three quarters; Gt<sub>4</sub> evenly setose; remaining terga evenly setose and obscured in dorsal view by Gt<sub>4</sub> (Fig. 99), Gt<sub>7+8</sub> roughly elliptical in posterior view.

**Male.** Length 1.8–2.2 mm. Identical to female except as follows: scape with slightly expanded ventral plaque, extending almost entire length of scape (Fig. 90). Petiole distinct in dorsal view, 1.2–1.4x as long as broad, longitudinally rugulose, broadest basally where produced as a carinate flange abutting nucha. Gt<sub>1</sub> 1.8–3.0x as long as Gt<sub>2</sub> and 0.4x as long as Gt<sub>3</sub>; Gt<sub>1-2</sub> 0.5–0.6x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 1.8–3.3x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with transverse row of setae across dorsum anteriorly; Gt<sub>2</sub> glabrous or with a few setae laterally; Gt<sub>3</sub> evenly setose in posterior three quarters; Gt<sub>4</sub> evenly setose; remaining terga evenly setose Gt<sub>5</sub> visible in dorsal view, remaining terga usually obscured in dorsal view by Gt<sub>5</sub> (Fig. 99). Male genitalia were dissected from the few individuals available from southern United States and Honduras populations and are characterized as follows: parameres and digiti subequal in length; each paramere with 2 to 3 setae, the largest located apically and strongly recurved, the remaining 1 to 2 setae shorter, straight, located apically or subapically; digitus elongate, tapering apically, broadest basally, each with 3 robust digital spines (the left digitus with 4 digital spines in one south Texas population [Fig. 117]); adeagus “pinched” apically, elliptical (Figs. 117, 118).

**Variation.** Type series is essentially invariant. The main variation apparent within this species occurs as follows: antenna with scape black or dusky in apical half, flagellum can be dark brown to black; anteroventral eye facets can be slightly enlarged (although typically not as pronounced or extensive as in *N. meridionalis*); the tegula is usually black but can be golden. The

mesepisternum can be finely rugose with more extensive intervening reticulation or vice versa, whereas the propodeum varies primarily in the extent of the robustness or completeness of the costulae and plicae and the intervening sculpture. The meso- and metasomal legs can possess bands of dark brown or black coloration medially on the femur and less so on the tibia; this coloration can also be seen only on the metasomal legs. The male petiole ranges from smoothly rugose to reticulate-rugose, whereas the male phallobase with 2–3 setae on each paramere and 3–4 digital spines. The color differences listed above are often quite pronounced in California, Arizona, and Texas populations.

**Biology.** This species has been reared from eggs of the following hosts: *Acanthocephala thomasii* (Uhler), *Mozena arizonensis* Ruckes, *Leptoglossus zonataus* (Dallas), *Chelinidea vitiger* Uhler (all Coreidae; Jones 1983), *Spartocera lativentris* Stål (Becker & Prato 1982), *Leptoglossus gonagra* (F.) (Bruner et al. 1975), *Narnia femorata* (Stål) (Label data), *Leptoglossus* sp. (Hemiptera: Coreidae), *Brochynema chelonoides* Ruckes (W. Jones pers. comm.), *Euschistus inflatus* Van Duzee (Label data) (Hemiptera: Pentatomidae). The record from Riverside, California appears to be a coincidental adult recovered from a citrus sample infested with woolly whitefly. The trees from which the aforementioned specimen was collected are within 3 m of a large stand of *Opuntia* sp. infested with *Narnia pallidicornis* Stål (Hemiptera: Coreidae). My attempts to entice any resident *Neorileya* females to oviposit into ova of *Chlorochroa* spp. were unsuccessful. It appears to be a generalist, solitary endoparasitoid of ova of Hemiptera. One host record was found on the Web (<http://redpav-fpolar.info/ve/fargo/v11-14/v114m009.html>): ex ova of *Corecoris fuscus* on *Solanum melongena* v. *esculenta* (VENEZUELA: El Limón: Edo. Aragua, 450m, 2.xi.1956, J. R. Requena).

**Distribution.** This species is found throughout the Neotropical (including the Caribbean) region and extends into the southern United States (Arizona, California, Texas) (Fig. 288). DiGiulio (1997) records it also from southern Florida.

**Comments.** None of the type series possess a clava. *Neorileya ashmeadi* and *N. flavipes* can represent extremes of a single highly variable species as there is some degree of overlap in the characters used to separate *N. ashmeadi* from *N. flavipes* (see Diagnosis under each species). Specimens possessing

intermediate characters states exist, *N. flavipes* tending toward *N. ashmeadi* and vice versa. Many of the specimens identified as *N. flavipes* are up to 3.5 mm in length and those of *N. ashmeadi* are usually less than 2.5 mm in length. *N. flavipes* tend to possess a more robust flagellum in which flagellomeres are tightly appressed and have symmetrical, robust MPS (cf. Figs. 197, 251); a mesepisternum tending to be glabrous with robust longitudinal striae (cf. Fig. 60); Gt<sub>1</sub> with faint ovate, punctate depressions anterodorsally which contain fine setae; eye tending to be a bright to dull pink, rarely grayish, and the tegula black (although specimens with golden or partially golden tegulae are known). Specimens of *N. ashmeadi* tend to possess a more gracile flagellum in which flagellomeres have distinct separation and have asymmetrical, fine MPS (not in all specimens); a mesepisternum tending toward being rugulose-reticulate with fine longitudinal (often incomplete) striae (Fig. 62); Gt<sub>1</sub> with faint ovate, punctate depressions anterodorsally which contain fine setae that extend transversely across the dorsum; the eye tending to be grayish, rarely a dull pink, and the tegula black. For example, most *N. ashmeadi* specimens known from southeastern Arizona agree well with the type material of *N. ashmeadi* and are less than 2.0 mm in length. However, a small series of "giant size" (2+ mm) *N. ashmeadi* were reared from eggs of *Acanthocephala thomasii* (a large species) that tend toward *N. flavipes* in the antennal and mesepisternal structure.

Other species of Chalcidoidea are known to vary based on size and relative proportions. For example, *Torymus tubicola* females range in size from 1.5–5.5 mm with a concomitant change in the relative length and width of the funicular segments and the appearance or disappearance of a median carina on the propodeum (Grissell 1978). Oldroyd and Ribbands (1936) observed an almost twofold increase in wing setation with a doubling of both body and wing length. Similarly for Ichneumonoidea, Russo (1938) showed that five species of Braconidae were actually five variants of the same species that differed in number of flagellomeres, color, presence or absence of a median carina, host, and so on. When larger variants oviposited into small hosts and vice versa, any size and morph within the phenotypic range could be produced. Unfortunately, species of *Neorileya* have not been subjected to this type of controlled experimentation in which rearings of small specimens attacking large eggs and vice versa yield phenotypically different specimens in the subsequent generation (i.e., different phenotypes are the results of different host size or quality). Further, given that specimens of *Neorileya* are egg parasitoids and that the eggs of various Hemiptera attacked do not vary greatly in size (within an egg mass), it might be difficult to obtain proof of the



conspecific nature of *N. ashmeadi* and *N. flavipes* without conducting some type of experiment similar to that done by Russo, namely, observing if a larger female could be induced to oviposit in eggs of both large and small species in order to ascertain whether small and large morphs could be produced by a single female. Thus, current species-level taxonomy in *Neorileya* is retained, primarily with respect to *N. flavipes* and *N. ashmeadi*, until detailed reproductive experimentation can be performed. I have endeavored for completeness in the Variation and Comments sections for each species to maximize the apparency of the intergradation between species.

#### **Material Examined.**

**Type Material:** **TRINIDAD & TOBAGO: St. George:** Saint Clair, Aug. 1912, F. W. Urich (Lectotype ♀ USNM). Paralectotypes, 5♀1♂, same data as lectotype (USNM, examined).

**Other Material:** **COLOMBIA: Valle del Cauca:** Anchicaya, 24–27.vii.1970, J. Campbell (1♀ UCR); **Norte de Santander:** 10–30km S. Chinacota, 2000–3000m, 10.v.1974, J. Peck, (1♂ CNC); **Valle:** 10km S Cali, nr sugar cane field, 3.iv.1971, Eberhard & Garcia (1♂ UCR); Cali, 1000m (1♀ UCR). **COSTA RICA: Guanacaste:** F. Taboga, 6mi. S. & 6mi. W. Canas, 10°18'60"N, 85°9'0"W, ii.1967, H. Hespeneheide (1♀ BMNH); **Heredia:** 3km S Puerto Viejo, La Selva Biol. Sta., 10°25'60"N, 84°0'60"W, x.1992–vi.1993, P. Hanson (1♀ BMNH); **Puntarenas:** Pen. Osa, 5km N. Puerto Jimenez, 10m, i.1992–iv.1993, Hanson & Godoy (2♀ BMNH); Golfo Dulce, 10km W Piedras Blancas, 100m, iii–iv.1989, P. Hanson (1♀ BMNH); Golfo Dulce, 10km W Piedras Blancas, 10m, vi–viii.1989, P. Hanson (2♀ BMNH); Golfo Dulce, 3km SW Rincon, 10m, iii.1989–iv.1993, P. Hanson (3♀ BMNH). **CUBA:** San Cristobal, Cuban expt. Station, 23.xii.1943, J. Acune, ex egg of *Leptoglossus gonagra* (1♀ USNM). **DOMINICAN REPUBLIC: Baoruco:** Sierra de Bahoruco, Alcoa Rd, km 25, Montane dry forest, 18.i.1989, L. Masner (1♀ UCR); Loma Quiria Esperela, 20km NE San Francisco de Macoris, 300m, 18.iii.1991 (1♀ UCR). **GUATEMALA: Izabal:** Las Escobas, 13.ix.1986, M. Sharkey (1♂ UCR). **HONDURAS: Comayagua:** 3km S Comayagua, 23.vii.1989, R. Cave (1♀ EAPZ); **Distrito Central:** Tegucigalpa, 30.x.1965, N.L.H. Krauss (1♀ USNM); **Francisco Morazan:** Santa Lucia, Finca Loma Linda, 27.vi.1991, R. Cave (11♀ EAPZ); San Antonio de Oriente, El Zamorano, 27.i–22.ii.1990, R. Cave (28♀ EAPZ); San Antonio de Oriente, El Zamorano, 4.xi.1988, R. Cave (4♀ EAPZ); San Antonio de Oriente, El Zamorano, 2.iii–7.vi.1990, R. Cave (8♀ EAPZ); San Antonio de Oriente, El Zamorano, 8.x.1988, R. Cave (1♀ ZAM); **El Paraíso:** Los

Nigueros, 26.vi.1990, R. Cave (9♀ EAPZ). **MEXICO: Baja California Sur:** nr Candelaria, 4.v.1993, R. Garces & R. Wharton (1♀ TAMU); **Guerrero:** 2mi N Cacahuanilpa, 19.vii.1984, J. Woolley (1♂ UCR); **Nuevo Leon:** 5km W Bustamante, 13.vii.1983, A. Gonzalez (1♀ UCR); **Puebla:** 3km SW El Salado, 850m, 25.vii.1990, T. Eager & P. deSilva, *Ex Gliricidia sepium & Haematoxylon brasiletto* [These genera of Fabaceae probably do not represent the actual host but are erroneous uses of "Ex"] (2♀ USNM); **Quintana Roo:** 30 mi. E. Chetumal, Kohunlich Ruins, 110m, 15.vii.1983, R. Anderson (1♀ UCR); Cobá Ruins, 11.xii.1983, L. Masner (1♀ UCR); 32km N Felipe Carrillo Puerto, 17.viii.1983, M. Kaulbars (1♀ UCR); 3km S Puerto Morelas, Jardín Botánico, 14.xii.1993, L. Masner (4♀ UCR); Municipio de Lazaro Cardenas, Reserva Ecología El Edén, 21°12'60"N, 87°11'0"W, 12.viii.1998, R. Rodriguez, sweep trail in primary forest (2♀ UCR). **PERU: Madre de Dios:** Laberinto, 1–2.i.1984, A. Finnamore (2♀ UCR). **TRINIDAD & TOBAGO: [?]:** Scarborough, Botanical Garden, 7.xi.1918, H. Morrison (1♀ USNM); Goldsborough, 24.iii–12.v.1994, M. Sommeijer, Malaise trap in citrus orchard bordering primary forest (12♀ USNM); **St. George:** Tucker Valley, 1–19.i.1978, A. Sommelier (1♀ UCR); St. Augustine, Id Lat No. 19-13-9??, vi.1949, *Ex* eggs on cacao (1♀ USNM); Diego Martin, 27.iii.1941, D. Billes, on cacao leaf (3♀ USNM); Port of Spain, iv.1913, F. Urich, *Ex* eggs of pentatomid (3♀ USNM); **St. Patrick:** 10km NE Bonasse, 24.iii.1985, G. & J. Hevel (2♀ USNM); **Victoria:** San Fernando, Golconda Estate, 19.x.1918, H. Morrison (1♀ USNM). **UNITED STATES: Arizona: Cochise:** Chiricahua Mtns, Cave Creek Cyn, Sunny Flat, 31°52'60"N, 109°10'0"W, 1700m, 26.v.1985, H. Hespenheide, On *Quercus* sp. (1♀ CNC); Portal area, 31°54'5'0"N, 109°8'–10'0"W, 1660m, 23.vi.1984, H. Hespenheide, *Ex* Hemiptera eggs on *Gutierrezia* (2♀ UCR); Fort Bowie, 13.vi.1989, P. Schmidt, *Ex* eggs *Leptoglossus* sp. on *Sapindus saponarium* (2♀1♂ USNM); 1mi E. Portal, 1560m, G. Gibson, (10♀ UCR); Paradise Rd., 1mi. W Portal, 4.vi.1983, H. Hespenheide, mesquite (2♀ CNC); Paradise Rd., 1mi. W Portal, 31°54'60"N, 109°10'0"W, 1630m, 25.vi.1984, H. Hespenheide, *Ex* Hemiptera eggs on *Chrysothamnus* (3♀ UCR); Portal, 31°54'0"N, 109°10'0"W, 1583m, 23.vi.1984, H. Hespenheide (2♀ UCR); 3.5mi SE Willcox, 1381m, 6.viii.1996, M. Gates (1♀ UCR); 1.3mi E Paradise, 11.ix.1978, J. Woolley (1♀ TAMU); 1 mi. E Gleeson, 16.vii.1997, M. Gates (1♀ UCR); **Pima:** Brawley Wash, 850m, 3.viii.1982, G. Gibson (2♀3♂ UCR); Madera Canyon, Santa Rita Mtns, 1.ix.1989, W. Jones, *Ex Leptoglossus zonatus* eggs on *Prosopis* (3♀ USNM); Tucson, 8.ix–7.x.1989, W. Jones, *Ex Leptoglossus zonatus* eggs on *Opuntia* (10♀2♂ USNM); Tucson, 7.vii.1989, W. Jones, *Ex Euschistus*

*inflatus* eggs put on *Acacia greggii* (1♀ USNM); Tucson, 6.x.1988, W. Jones, *Ex Leptoglossus zonataus* eggs put on desert willow (4♀1♂ USNM); Tucson, ix.1988–x.1989, W. Jones, *Ex Leptoglossus zonataus* eggs on pomegranate (47♀3♂ USNM); Tucson, 3.viii.1983, R. Patana, *Ex Leptoglossus zonataus* eggs (5♀1♂ USNM); Tucson, 9–21.ix.1989, W. Jones, *Ex Narnia femorata* eggs on *Opuntia* (10♀2♂ USNM); **Santa Cruz:** Patagonia, 17.vi.1989, P. Schmidt, *Ex* eggs *Leptoglossus* sp. on *Sapindus saponarium*, Host Range: *Ex Acanthocephala thomasi* (9♀ USNM); 5 mi. S. Patagonia, P. Schmidt, *Ex* eggs *Leptoglossus* sp. on *Sapindus saponarium*, Host Range: *Ex Acanthocephala thomasi* (1♀ USNM); **California: Imperial:** Algodones Sand Dunes, 15 mi. NW Glamis, East edge of dunes, 25.ix.1998, M. Gates (1♀ UCR); **Riverside:** Riverside, UCR Biocontrol Grove, 21.x.1998, J. Barry, On *Citrus* sp. leaf (1♀ UCR); Puerto Rico: 10.viii.1936, H. Dozier (1♀ USNM); **San Mateo:** Pacifica, 15.xii.1985 [mounted with eggs of Hemiptera] (3♂ CNC); **Texas: Cameron:** Rancho Viejo (Anito), 11 mi. N. Brownsville, 1–6.viii.1995, D. Guner (1♀ USNM); Southmost Ranch, 7mi. SE Brownsville, 3–5.xii.1978, E. Grissell & A. Menke (1♀1♂ USNM); **Hidalgo:** Bentsen-Rio Grande Valley State Park, 30.xi–2.xii.1978, E. Grissell & A. Menke (1♀1♂ USNM); Bentsen-Rio Grande State Park, 15.xii.1983, J. Woolley & H. Browning (2♀ TAMU); Bentsen-Rio Grande State Park, 3.vii.1982, G. Gibson (6♀ UCR); Weslaco, 4.iv.1999, W. C. Warfield, *Ex Brochynema chelonoides* Ruckes ova on *Prosopis glandulosa* leaflet (6♀1♂ UCR); **Terrell:** ~5 mi. W. Sanderson, 18.vii.1997, M. Gates (1♂ UCR). **VENEZUELA: Zulia:** El Tucuco, Rain forest, 24.iv.1981, L. Masner (2♀ UCR). **SAINT VINCENT & THE GRENADINES:** Majorca, viii.1972 (1♀ UCR).

***Neorileya cornuta*, new species**

(Figs. 102–104)

**Etymology.** Participle from the Latin *cornu*, meaning “horned.”

**Diagnosis.** This species is most similar to *N. flavipes* but is readily distinguished by the carinate anterior pronotal margin, which is produced as two submedial triangular flanges (Fig. 102). Also, the antenna is completely dark brown to black and the stigmal vein is 0.5–0.8x the length of the postmarginal vein (Fig. 103), unlike other species of *Neorileya* which have the scape at least partially golden and the postmarginal vein often longer (Figs. 93–97).

**Description.** Female. Length 1.8–2.4 mm. Head, body, legs, tegula, and femur in basal four-fifths black; scape black, pedicel and flagellum dark brown; apex femora, tibiae. and tarsi golden to pale yellow. Wing hyaline, venation light brown.

*Head.* Striate to umbilicate. Circular in frontal view. Malar space 0.2x eye height. Eye large, glabrous. Scrobal depression margined; interantennal prominence roughly triangular, merging with very fine intrascrobal carina which extends length of scape. Anterior ocellus separated from scrobal depression by transverse carina (Fig. 66). Scape 2.8x as long as broad, broadest medially, narrowing apically. F1 0.7x as long as broad, subsequent funiculars subequal (Fig. 104). Clava 2.0x as long as broad, tapered apically.

*Mesosoma.* Umbilicate. Pronotum with carinate anterior pronotal margin, which is produced as two submedial triangular flanges (Fig. 102). Midlobe of mesoscutum 1.1x as long as broad, notaulus slightly indicated. Scutellum 1.5x as long as broad, acarinate apically, lateral panel of axilla setose posteroventrally, reticulate. Mesepisternum reticulate-striate; mesepimeron glabrous. Propodeum with primary costula complete medially, intercepted posteriorly by median carina; secondary costula absent; few plicae interconnecting primary costula dorsellum and nucha subdorsally (cf. Fig. 69); posterolateral propodeum sparsely setose; callus moderately setose. Forewing 2.0x as long as broad; stigma 0.4x as long as stigmal vein; marginal vein 1.5x as long as postmarginal vein; stigmal vein is 0.5–0.8x the length of the postmarginal vein (Fig. 103). Wing incompletely setose basally.

*Metasoma.* Gt<sub>1+2</sub> apparently fused; Gt<sub>1+2</sub> with two small, shallow, punctate depressions bearing setae anterolaterally (cf. Fig. 101); Gt<sub>3</sub> glabrate; remaining terga glabrate-reticulate; Gt<sub>4</sub> setose in medial half; remaining terga evenly setose dorsally and laterally; Gt<sub>6</sub> in posterior view with large, shallow punctation giving the impression of a irregular surface; Gt<sub>1+2</sub> 2.0–6.0x as long as Gt<sub>3</sub> and 0.2x as long as Gt<sub>4</sub>; Gt<sub>1-3</sub> 0.2–0.3x as long as Gt<sub>4</sub>; Gt<sub>7+8</sub> U-shaped in posterior view.

**Male.** Identical to female except as follows: scape 3.7–4.0x as long as broad, discernible ventral plaque absent, broadest basally. Petiole distinct in dorsal view, 0.9–1.2x as long as broad, longitudinally rugulose, broadest basally. Gt<sub>1+2</sub> 1.4–2.4x as long as Gt<sub>3</sub> and 0.3–0.5x as long as Gt<sub>4</sub>; Gt<sub>1-3</sub> 0.4–0.9x as long as Gt<sub>4</sub>; Gt<sub>7+8</sub> flattened U-shape in posterior view

**Variation.** Meso- and metatibiae in one female are black medially and golden at extreme base and apex. One male specimen lacks the pronotal

processes, although it does have the anterior margin completely carinate (usually at most only carinate laterally in other species of *Neorileya*).

**Distribution.** Known only from Ecuador (Fig. 288).

**Biology.** Unknown.

**Comments.** The holotype is card mounted and in excellent condition. The female paratype has the antenna and wings slide mounted separately and the body is disarticulated and card mounted. The male paratypes are both card mounted.

**Material Examined.**

**Type Material:** ECUADOR: Orellana: Reserva Etnica Waorani, Transect Ent.1 km S. Onkone Gare Camp, 0°39'25.7"S, 76°27'10"W, 8.x.1995, 220m, T. L. Erwin et al., #1259, t9..9, fog terre firme forest. (Holotype ♀, EPNC). Paratypes, 1♀2♂, same data as holotype (USNM).

***Neorileya flavipes* Ashmead**

(Figs. 59, 60, 66–68, 90, 91, 94, 96, 101, 112–116)

*Neorileya flavipes* Ashmead, 1904: 466–467. Lectotype ♀, here designated. Brazil (USNM, examined).

**Diagnosis.** Gaster ovate in cross section, arcuate apically in dorsal view (Fig. 101); Gt<sub>1</sub> with median area completely smooth, anteriorly with two faint to distinct elliptical punctate depressions bearing fine setae laterally. Scrobal depression margined, carina separating scapes present, transverse carina dorsally separating anterior ocellus. The final tergum visible in dorsal view with vague, shallow depressions giving the impression of an irregular surface. Mesepisternum glabrate, robustly striate.

**Description.** Female. Length 2.1–3.3 mm. Head, tegulae, and body black; legs and scape golden yellow. Flagellum brown. Eye usually bright pink. Wing hyaline.

*Head.* Striate to umbilicate. Subtriangular in frontal view. Malar space 0.2–0.4x eye height. Eye large, glabrous. Scrobal depression margined; interantennal prominence roughly triangular, merging with fine intrascrobal carina which extends ~one-third length of scape. Anterior ocellus separated

from scrobal depression by transverse carina (Fig. 66). Scape 3.2–3.7x as long as broad, parallel sided, narrowing apically. F1 1.0–1.2x as long as broad, subsequent funiculars subequal. Clava 1.8–2.5x as long as broad, tapered apically.

*Mesosoma.* Umbilicate. Midlobe of mesoscutum 1.0–1.5x as long as broad, notaulus absent or slightly indicated. Scutellum 1.1–1.3x as long as broad, crudely carinate apically, lateral panel of axilla asetose in anterior half, imbricate-reticulate, setose posteriorly. Mesepisternum striate, glabrous; mesepimeron glabrous (Fig. 60). Propodeum with primary costula incomplete medially, turning to intercept dorsellum submedially; secondary costula connected to dorsellum by submedian plicae, which are continuous with primary costula anteriorly; several plicae interconnecting the primary and secondary costulae, and each costula with dorsellum and nucha, respectively (cf. Fig. 69); posterolateral propodeum moderately setose; callus moderately setose. Forewing 2.2–2.4x as long as broad; stigma 0.3–0.5x as long as stigmal vein; marginal vein 0.7–1.0x as long as postmarginal vein (Fig. 94). Wing incompletely setose basally.

*Metasoma.* Gt<sub>1-2</sub> glabrous; Gt<sub>1</sub> with median area completely smooth, anteriorly with two shallow, elliptical punctate depressions bearing setae laterally (Fig. 101); Gt<sub>3</sub> glabrate; remaining terga glabrate-reticulate; Gt<sub>5</sub> in dorsal view with large, shallow punctation giving the impression of an irregular surface; Gt<sub>1</sub> 8.7–11.0x as long as Gt<sub>2</sub> and 0.2–0.7x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 2.1–2.7x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with group of sublateral setae; Gt<sub>2</sub> asetose; Gt<sub>3</sub> sparsely setose dorsally, denser laterally; remaining terga with evenly setose dorsally and laterally; Gt<sub>7+8</sub> elliptical in posterior view.

**Variation.** The main variation apparent within this species occurs as follows: antenna with scape black in apical half, flagellum can be dark brown to black; mesepisternum robustly striate with occasional (usually without) faint reticulation typically appearing ventrally; propodeum varies primarily in the extent of the robustness or completeness of the costulae and plicae; meso- and metasomal legs can possess bands of dark brown or black coloration medially on the femur and less so on the tibia, and this coloration can also be seen only on the metasomal legs. Gt<sub>1</sub> depressions can be quite faint, almost nonexistent. Eye color can range from pink to gray.

**Biology.** This species has been reared from eggs of Tettigoniidae, Coreidae, and Pentatomidae (see below and Table 3).

**Distribution.** This species occurs in the Neotropics from Argentina to Mexico (Fig. 289).

**Comments.** This species was described from 10 specimens from Chapada and Santarem, Brazil but no holotype was designated in the description. Further, only three of the eight specimens at the USNM appear to be *N. flavipes*. A female from the type series was found in the Naturhistorisches Museum, Wien, Austria but appears to be *N. meridionalis*.

Gahan identified one of the former syntypes from Santarem as *Neorileya meridionalis*. I concur with this assessment as the specimen agrees with the type series of *N. meridionalis*, albeit larger in size. Further, two additional female syntypes from Chapada appear to match *N. meridionalis* (as alluded to by Gahan [1948]) however, both specimens are damaged: the first female is missing both hind legs and the apical half of each antenna, the gaster and right wings are glued to the point; the second female is missing three legs, parts of two others, a flagellum, and gaster. The remaining former syntype from Santarem resembles *N. flavipes* with respect to the mesepisternal sculpture, all eye facets similarly sized, and gaster not greatly flattened but has  $Gt_1$  sculptured and produced as in *N. meridionalis*. It differs from both because the antennal insertion is located  $\sim 1.5$  torulus diameters from the anterior ocellus; thus the scrobal depression is quite abbreviated and the scapes extend greatly above the vertex. Given the absence of material matching this specimen and the variation that is apparent within the other species of *Neorileya*, I am reluctant to formally characterize this individual other than as a variant.

The male from the original type series is from Chapada, and all of the current female type series matching Ashmead's description are from Santarem. Santarem is located in the Amazon Basin, and Chapada is located much farther south of Santarem. This male has a flattened, petiolate gaster with  $Gt_1$  sculptured and produced similar to *N. meridionalis* and the mesepisternum is densely reticulate-rugose and the anterior eye facets are slightly enlarged. Thus, this male cannot be associated with female *N. flavipes* with certainty and more closely approximates how male *N. meridionalis* might appear (see Variation section under *N. meridionalis*).

#### **Material Examined.**

**Type Material:** BRAZIL: Santarem, H. H. Smith (Lectotype ♀ USNM). Paralectotypes, 2♀, same data as lectotype (USNM, examined).

**Other Material:** **ARGENTINA: Corrientes:** Loreto, A. Oglobin (1♀ MLPA). **BOLIVIA: Beni:** Rurrenabaque, 1921–1922, W. Mann (1♀ USNM). **BRAZIL: Amazonas:** 30km E Manaus, 14.vi.1975, D. Snyder, Eggs from leaf vein of cacao (5♀ USNM); **Pernambuco:** Dos Irmãos Mtns, 9.vii.1940, R. Corvalho (2♀ USNM). **COSTA RICA: Alajuela:** Atenas, 4.xii.1985, ex tettigoniid eggs on citrus (10♀ USNM); San Pedro de la Tigra, Cacao, 200m, ii.iv.1990, R. Cespedes (1♀ BMNH); **Cartago:** Los Esperales, 5km from Turrialba, 15.ii.1985, P. Stansly (1♀ TAMU); **Guanacaste:** Santa Rosa National Park, 200m, 16.iv.1989, P. Hanson (2♀ BMNH); Santa Rosa National Park, 200m, H-4C, 10.i, 21.ii.1987, P. Hanson (1♀ BMNH); Santa Rosa National Park, 200m, B.H. 11-0, ii.1987, I. Gauld (2♀ BMNH); Santa Rosa National Park (18♀ BMNH); Enrique Jimenez Nuñez exp. Sta., 20km SW Canas, 5–17.xi.1991, A. Menke, malaise trap (9♀ USNM); **Heredia:** Chilamate, 75m, 4.ii.1989–x.1990, Hanson & Godoy (12♀ BMNH); 3km S Puerto Viejo, La Selva Biol. Sta., 10°25'60"N, 84°0'60"W, x.1992–vi.1993, P. Hanson, (4♀ BMNH); **Limón:** Cuatro Esquinas Est., Tortuguero National Park, 0m, vi–viii.1989, Solano (1♀ BMNH); 4km NE Bribri, 50m, iv–ix.1990, P. Hanson (3♀ BMNH); Ciudad Colón, 800m, xii.1989–v.1990, L. Fournier (6♀ BMNH); **Puntarenas:** R. B. Carara, Station Quebrada Bonita, 50m, v–vi.1989, P. Hanson (1♀ BMNH); Pen. Osa, 5km N. Puerto Jimenez, 10m, i.1992–iv.1993, Hanson & Godoy (5♀ BMNH); Buenos Aires, 200m, viii.1991, P. Hanson (1♀ BMNH); 23km N Puerto Jimenez, La Palma, 10m, vi–viii.1993, P. Hanson (1♀ BMNH); 23km N Puerto Jimenez, La Palma, 10m, vi–viii.1992, P. Hanson (4♀ BMNH); Golfo Dulce, 10km W Piedras Blancas, 100m, iii–iv.1989, P. Hanson (8♀ BMNH); R. F. Golfo Dulce, 24km W Piedras Blancas, 200m, ii–xi.1989, P. Hanson (5♀ BMNH); R. F. Golfo Dulce, 24km W Piedras Blancas, 200m, xii.1991, P. Hanson (1♀ BMNH); Golfo Dulce, 3km SW Rincon, 10m, iii.1989–iv.1993, P. Hanson (2♀ BMNH); R. F. Golfo Dulce, 5km W Piedras Blancas, 100m, vi–ix.1993, P. Hanson (2♀ BMNH). **EL SALVADOR: [?]:** El Solva, 10.v.1965, eggs *Edessa reticulata* (1♀ USNM); **San Salvador:** San Salvador, 14.xii.1965, J. Quezada, *Ex Edessa reticulata* (6♀ UCR); San Salvador, 10.v.1965 (1♀ USNM). **MEXICO: [?]:** San Antonio, POE, 27.iv.1958, Bixby [Apparently intercepted at the San Antonio port of entry on a plant? shipment from Mexico] (1♀ USNM); **Chiapas:** 10km NW Chicoasen, 190m, 16.vii.1990, P. deSilva & T. Eager, *Ex Gliricidia sepium* [This genus of Fabaceae probably does not represent THE host, rather an erroneous use of “Ex”] (1♀ USNM); **Jalisco:** 17 mi N Guadalajara, 6.vii.1984, J. Woolley (2♀ TAMU); **Morelos:** Coatlán del Rio, 14.ix.1977, J. Gutierrez, ex Hemiptera eggs on citrus (5♀



USNM); **Oaxaca:** 6 mi W Tehuantepec, 15.vii.1987, R. Wharton (1♀ TAMU); **Veracruz:** 33km N Catemaco, Tuxtlas Res. Sta., 160m, 1.vii.1983, M. Kaulbars (1♀ UCR). **NICARAGUA: Rivas:** Ometepe, viii.1989, F. Reinholdt (2♀ CNC). **PANAMA: Colón [?]:** Panama Canal Zone, ix–xii.1953 (1♀ USNM); El Valle, xi.1946, N.L.H. Krauss (1♀ USNM); **Colón:** Barro Colorado I., 25.ii.1956, C. & M. Rettenmeyer (2♀1♂ CNC). **PERU: Madre de Dios:** Avispas, 1–15.x.1962, L. Pena (1♀ CNC). **VENEZUELA: Aragua:** San Esteban nr Puerto Cabello, 1940, P. Anduze (1♀ FSCA); **Portuguesa:** Araure experiment Sta., 23.x–28.xi.1978, C. Juarez, ex eggs of pentatomid (5♀ USNM).

***Neorileya lynetteae*, new species**

(Figs. 61, 64, 93, 109–110)

**Etymology.** Named in honor of my wife, Lynette, whose extraordinary patience with my entomological obsession knows almost no bounds.

**Diagnosis.** A distinctive species in the genus. Head and body dark brown (♀) or golden (♂). Coxae, legs and antennae are golden. Tarsi are pale yellow, except pretarsus, which is brown. *Neorileya lynetteae* have sharp costulae and plicae on the propodeum with the intervening areas glabrate (Fig. 64), unlike other species of *Neorileya* (Fig. 69). Further, the mesopleural area is glabrate-reticulate with a fine ventral carina (Fig. 61), whereas other *Neorileya* are more robustly sculptured and lack the carina (Figs. 60, 62, 63).

**Description.** Female. Length 1.4–1.5 mm. Body dark brown, coxae, legs, tegula, and antennae golden; tarsi are pale yellow, except pretarsus, which is brown. Wing hyaline, venation pale brown.

**Head.** Striate to finely umbilicate. Ovate in frontal view. Malar space 0.3–0.4x eye height. Eye large, glabrous. Scrobal depression unmarginated, shallow, interantennal prominence vague, roughly quadrate. Scape 3.3–3.5x as long as broad, parallel sided, narrowing slightly apically; F1 1.0x as long as broad, subsequent funiculars roughly quadrate. Clava 4.0–5.2x as long as broad, tapering apically

**Mesosoma.** Finely umbilicate. Midlobe of mesoscutum 1.0x as long as broad, notaulus slightly indicated. Scutellum 1.1–1.2x as long as broad, finely carinate apically, lateral panel of axilla asetose, glabrous. Mesepisternum distinctly striate in anterior half and finely reticulate-glabrous dorsally, mesepimeron smooth. Propodeum carinate-glabrate, with primary costula

incomplete medially, turning to intercept dorsellum submedially; secondary costula connected to dorsellum by submedian plicae, which are continuous with primary costula anteriorly; several plicae interconnecting the primary and secondary costulae, and each costula with dorsellum and nucha, respectively (Fig. 64). Forewing 2.2–2.3x as long as broad; stigma 0.6–0.7x as long as stigmal vein; marginal vein 1.1–1.3x as long as postmarginal vein (Fig. 93).

*Metasoma*. Finely umbilicate. Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrate; remaining terga reticulate; Gt<sub>1</sub> 5.0–12.0x as long as Gt<sub>2</sub> and 1.4–2.4x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.7–0.8x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with transverse row of setae (Fig. 64); Gt<sub>2</sub> asetose; Gt<sub>3</sub> with transverse row of setae along posterior third; remaining terga with evenly setose dorsally and laterally, although sparser anteriorly on Gt<sub>4</sub>; Gt<sub>7+8</sub> elliptical in posterior view.

**Male.** Length 1.3–1.5 mm. Identical to female except as follows: color completely golden, scape with ventral plaque medially; petiole distinct in dorsal view, 0.5–0.6x as long as broad, with sharp circular flange encircling petiole as abutment to nucha, longitudinally rugose. Gt<sub>2</sub> and Gt<sub>4</sub> 2.0x and 0.6x that of female, respectively. Clava 4.0–7.0x as long as broad. Males have genitalia characterized as follows: parameres and digiti apically with paramere ~2x as long as digitus; each paramere with 2 setae, the largest located apically and robust, the second smaller and apical to subapical; digiti elongate, tapering apically, broadest basally, each with 2 robust teeth; aedeagus narrowed apically (Figs. 109, 110).

**Biology.** Reared from ova of Reduviidae on ornamental trees and *Citrus sinensis* Osbeck.

**Distribution.** This species has been recovered only from Colombia and Honduras (Fig. 288).

**Comments.** All of the type specimens are point mounted and generally in good condition. However, two female and one male paratypes lack metasomas.

**Material Examined.**

**Type Material:** HONDURAS: Francisco Morazán: Fco Morazán, Hond. 32km E Teg., El Zamorano, Rec: Cave, 8/30/87-2; *Ex*: huevo de reduviido en

arbol ornamental (Holotype ♀, USNM). Paratypes, 14♀4♂, same data as holotype (7♀2♂ USNM; 7♀2♂ UCR).

**Other Material:** **COLOMBIA: Santafé de Bogotá, D.C.:** Santa Fe, viii.1975, R. Velez-Angel, *Ex* reduviid eggs (1♀ USNM). **HONDURAS: Francisco Morazán:** San Antonio de Oriente, San Juan del Rancho, 16.vi.1992, R. Cordero, *Citrus sinensis* frutificacion / *Ex*: huevo de Reduviidae (4♀ EAPZ); San Antonio de Oriente, El Zamorano, 2–22.ii.1990, R. Cave, *Ex*: Trampa Malaise en plantación de café bajo sombra (3♀ EAPZ); 110km E. Tegucigalpa, San Juan de Linaca, 30.viii.1989, R. Cave, *Ex* huevos de reduviido en arbol ornamental (1♀ EAPZ).

***Neorileya meridionalis* Gahan**

(Figs. 63, 65, 69–70, 95, 98, 100, 111)

*Neorileya meridionalis* Gahan, 1927: 7–9. Lectotype ♀, here designated. Costa Rica (USNM, examined).

**Diagnosis.** Anteroventral eye facets the largest. Gaster arcuate apically in dorsal view, dorsoventrally flattened in cross section, with two prominences anteriorly and two subdorsal teardrop shaped depressions on Gt<sub>1</sub>, Gs<sub>1</sub> with raised “collar” anteriorly encircling petiole (Figs. 98, 100). Mesepisternum glabrate, incompletely to completely striate (Fig. 62).

**Description.** Female. Length 2.0–3.2 mm. Body black; legs, tegula, scape, and pedicel pale yellow; wing hyaline, venation light brown.

*Head.* Striate to umbilicate. Subtriangular in frontal view. Malar space 0.3–0.4x eye height. Scrobal depression weakly margined, interantennal prominence roughly triangular and merging with fine intrascrobal carina, which extends ~one-third length of scape. Anterior ocellus separated from scrobal depression by transverse carina. Scape 3.3–5.0x as long as broad, narrowing apically, broadest basally; F1 0.7–1.2x as long as broad, subsequent funiculars roughly quadrate. Clava 2.8–4.2x as long as broad, tapering apically.

*Mesosoma.* Umbilicate. Midlobe of mesoscutum 0.8–1.2x as long as broad, notaulus faint. Scutellum 0.8–1.0x as long as broad, crudely carinate apically; lateral panel of axilla asetose, reticulate. Mesepisternum glabrate-striate; mesepimeron glabrate (Fig. 63). Propodeum with primary costula incomplete medially, turning to intercept dorsellum submedially; secondary costula

connected to dorsellum by submedian plicae, which are continuous with primary costula anteriorly; several plicae interconnecting the primary and secondary costulae, and each costula with dorsellum and nucha, respectively (similar to Fig. 69); secondary costula bifurcating sublaterally to intercept nucha and primary costula; posterolateral propodeum moderately setose; callus moderately setose. Forewing 2.3–2.7x as long as broad; stigma 0.3–0.5x as long as stigmal vein; marginal vein 0.6–1.5x as long as postmarginal vein (Fig. 30). Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous; Gt<sub>1</sub> with two faint, subparallel carinae extending one-third length of Gt<sub>1</sub>, each originating from anterior prominence; two punctate teardrop shaped depressions laterally containing sparse setation; remaining terga evenly setose dorsally and laterally; Gs<sub>1</sub> with ventral collar encircling petiole (Fig. 98); Gt<sub>2</sub> with several setae at lateral margin; Gt<sub>3</sub> glabrate, setose laterally; remaining terga finely reticulate and evenly setose; Gt<sub>1</sub> 2.5–3.8x as long as Gt<sub>2</sub> and 0.4–0.7x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 3.6–6.5x as long as Gt<sub>4</sub>; Gt<sub>7+8</sub> roughly elliptical in posterior view.

**Male.** There are no probable male-female associations based on rearing records. However, likely males found in series from different localities that possess the features seen in the type series (i.e., distinctly flattened gaster, sculpture or setation on Gt<sub>1</sub>, ventral collar on Gs<sub>1</sub>, enlarged anteroventral eye facets, similar mesepisternal sculpture) that can indicate conspecificity. Identical to female except as follows: scape with slightly expanded sensillar protuberance ventrally, extending almost entire length of scape. Petiole distinct in dorsal view, lightly reticulate to rugulose, broadest basally, dorsal surface with fine longitudinal striae. Gt<sub>1</sub> without anterior prominences. Genitalia were dissected from two localities (Taxa Co., Mexico; Trinidad, Oct. 1958, F. Bennett) with the following results: all males with paramere 1.0–2.0x as long as digitus; each paramere with 2 setae, the largest located apically and robust, the second smaller and apical to subapical; digitus elongate, tapering apically, broadest basally, each with 2 robust digital spines; aedeagus narrowed apically (Fig. 111).

**Variation.** Three former syntypes of *N. flavipes* are actually *N. meridionalis*. The main variation in this species is as follows: anteroventral eye facets always larger than dorsal facets but facet size can vary; anelli can vary slightly in length and width; mesepisternal sculpture can range from smooth with complete striae to slightly reticulate-punctate with incomplete striae; propodeal sculpture primarily in the extent of the robustness or completeness

of the costulae and plicae and the intervening sculpture; anterior prominences on  $Gt_1$  can vary slightly in size and degree of production. Male genitalia from the Mexico population has the digitus  $\sim 2x$  as long as the paramere apically and the teeth are greater than  $2x$  the digital spine basal diameter apart (very similar to *N. lynetteae*). The Trinidad population has a shorter digitus and digital spines less than the diameter of one tooth base apart but as digits are capable of extrusion this difference can be incidental. Finally, two interesting individuals from Costa Rica (Puntarenas, San Vito) agree with the type material except as follows:  $Gt_1$  narrower anteriorly, prominences smaller, much closer together; petiole visible in dorsal view, dorsal petiole body with two subdorsal protuberances;  $Gs_1$  with collar encircling petiole, one median and two submedian carinae extending posteriorly half the length of  $Gs_1$ ; all femora with subapical dark band, darkest on metafemur, lightest on profemur. I consider these variants of *N. meridionalis*.

**Biology.** Known only from the ova of *Chlorocoris atrispinus* Stål and other unidentified species of Pentatomidae.

**Distribution.** *Neorileya meridionalis* is known from Central and South America as well as the Caribbean Basin (Fig. 289).

**Comments.** In Gahan's original description, the type series was incorrectly listed as entirely male; the type series is female. Gahan labeled one specimen in the type series "type," but it was not specifically designated as such in the description.

**Material Examined.**

**Type Material:** COSTA RICA: Limón: Sixaola Valley, F. R. Swift, reared Dec. 18–24, *Ex Chlorocoris atrispinus* eggs (Lectotype ♀ USNM). Paralectotypes, 6♀, same data as lectotype (USNM, examined).

**Other Material:** ARGENTINA: Corrientes: Loreto, A. Oglobin (1♀ MLPA). BRAZIL: Amazonas: 26km NE Manaus, Reserva Ducke, 20m, Arm. Suspensa, 7.xii.1988, J. Rafael (2♀ INPA). COSTA RICA: Alajuela: San Pedro de la Tigra, Cacao, 200m, ii–iv.1990, R. Cespedes (1♀ BMNH); Heredia: 3km S Puerto Viejo, La Selva Biol. Sta., 10°25'60"N, 84°0'60"W, x.1992–vi.1993, P. Hanson (2♀ BMNH); 3km S Puerto Viejo, La Selva Biological Station, 10°25'60"N, 84°0'60"W, 18.vii.1995, H. Hespenheide (1♀ BMNH); 3km S Puerto Viejo, La Selva Biol. Sta., 10°25'60"N, 84°0'60"W, 17–23.v.1988, B. Brown, Secondary forest (1♀ BMNH); Limón: Ciudad

Colón, 800m, xii.1989–v.1990, L. Fournier (4♀ BMNH); 4km NE Bribri, 50m, iv–xi.1990, P. Hanson (2♀ BMNH); **Puntarenas:** San Vito, Las Tablas, 1600m, 10.iii.1989, P. Hanson (1♀ BMNH); Corcovado National Park, Sirena Station, 50m, iv–viii.1989, P. Hanson (3♀ BMNH); San Vito, Las Cruces Botanical Garden, 1200m, 5.viii.1988–xii.1988, P. Hanson (1♀ BMNH); San Vito, Biological Station Las Alturas, 1500m, xi.1991–iv.1992, Hanson & Godoy (2♀ BMNH); Golfo Dulce, 3km SW Rincon, 10m, iii.1989–iv.1993, P. Hanson (3♀ BMNH); Golfo Dulce, 10km W Piedras Blancas, 100m, iii–iv.1989, P. Hanson (1♀ BMNH); R. F. Golfo Dulce, 5km W Piedras Blancas, 100m, vi–vii.1992, P. Hanson (1♀1♂ BMNH); R. F. Golfo Dulce, 24km W Piedras Blancas, 200m, ii–xi.1989, P. Hanson (5♀2♂ BMNH); **San José:** San Antonio de Escazu, 1300m, ii.1989, W. Eberhard (2♀ BMNH). **ECUADOR:** **Napo:** Limoncocha, 250m, 15–28.vi.1976, S. & J. Peck (1♀ CNC). **EL SALVADOR:** **San Salvador:** Santa Tecla, 3.vi.1958, L. Bottimer (1♀1♂ USNM). **GUATEMALA:** Miami, 13.i.1949, Parker, orchid leaf [Intercepted at the Miami port of entry on an orchid shipment from Guatemala?] (3♀ USNM). **HONDURAS:** **El Paraiso:** Yuscaran, Agua Sucia, 22.viii.1992, R. Cordero, *Ex huevo de Pentatomidae on Musa sapientum* (4♂ EAPZ; 2♂ USNM); **Francisco Morazán:** San Antonio de Oriente, El Zamorano, 9–14.ii.1990, R. Cave (1♀ EAPZ). **MEXICO:** [?]: San Antonio, POE, 1.ix.1968, C. Parker [Apparently intercepted at the San Antonio port of entry on a plant? shipment from Mexico] (12♀ USNM); **Chiapas:** Palenque, 80m, 30.vii.1983, M. Kaulbars (1♀1♂ UCR); **Jalisco:** 5.2mi. N Autlan Mine Rd., 7.vii.1984, J. Woolley (1♀ TAMU); 4.2mi N Autlan Mine Rd., J. Woolley (2♀ TAMU); 6.7mi N Autlan Mine Rd., J. Woolley (1♀ TAMU); **Tamaulipas:** Gomez Fariás, La Florida, Pozo Azul, 2.iv.1987, R. Jones (1♀ TAMU); Gomez Fariás, 15.ix.1985, R. Jones (1♀ TAMU); Taxa Co., 15.xi.1984, C. Yoshimoto (5♀2♂ UCR); **Veracruz:** Fortín (Brownsville POE), 16.v.1957, Parker, *Philodendron* [Intercepted at the Brownsville port of entry on a *Philodendron* shipment from Mexico] (1♀ USNM); **PANAMA:** **Colón:** Gamboa, Pipeline Rd, vii.1967, W. Wirth (1♂ CNC); **Chiriquí:** 15km NW Hato del Volcan, 1200m, 24–31.v.1977, Peck & Howden (2♀ UCR). **PERU:** **Madre De Dios:** 30km SW Puerto Maldonado, Rio Tambopata Res., 12°50'0"S, 69°17'0"W, 290m, 10.iv–10.ix.1984, T. Erwin (2♀ USNM). **TRINIDAD & TOBAGO:** Oct. 1958, F. Bennett, pentatomid eggs (1♀ USNM).

***Platyrrhiza* Burks**

(Figs. 105–108)

*Platyrileya* Burks, 1971: 335. Type species: *Platyrileya cururipe* Burks, by original designation.

**Diagnosis.** The primary characters used to recognize *Platyrileya* are as follows: scrobal depression margined laterally and dorsally by carinate lip directed toward the antennae; supraclypeal area depressed to receive flagella and bounded laterally by row of dense setae (Fig. 108); occiput and pronotum on same plane; mesoscutum, propodeum, and gaster on same plane in lateral view; occiput with dense, anteriorly directed decumbent setae; mesosoma covered in dense, short, decumbent setae and sparser, longer subdecumbent setation; mesosoma dorsoventrally flattened, frons facing ventrally; propodeum completely rugose. Wing densely, completely setose; Gt<sub>1-3</sub> foreshortened, Gt<sub>1</sub> and Gs<sub>1</sub> produced anteriorly as slightly recurved carinate flange; Gt<sub>1-3</sub> densely setose subventrally; gaster densely setose ventrally and apically (Fig. 107).

**Description.** Only female known. Length 3.1 mm. Color brown, except for the following, which are golden: antenna, pronotum laterally and in posterior half, coxae, femora, and tibiae in basal and apical fourth, tarsi. Forewing hyaline, densely setose, forewing venation brown.

*Head.* Striate-umbilicate. Subtriangular in frontal view, anterior ocellus located above scrobal depression and closer to posterior ocellus than posterior ocelli are to one another. Face striate ventrally becoming reticulate-foveate dorsally, striae radiating from clypeus and extending toward lower eye margin and scrobal depression (Fig. 108). Eye glabrous, inner margin straight. Malar space 0.8x eye height, postorbital carina present, crenulate anteriorly. Scrobal depression distinctly margined dorsally and laterally, carinate edge oriented toward antennae, deep; lateral margin with lobate projection medially; interantennal prominence absent. Clypeus emarginate; supraclypeal area depressed for reception of antennae, with rows of setae laterally (Fig. 108). Antenna (11353) inserted below middle of frons, even with ventral margin compound eyes; scape broadest basally; anelli transverse to quadrate, each increasing in width apically; subsequent funiculars subquadrate and subequal; clava 1.5x as long as broad, asymmetrically tapered apically (Fig. 105).

*Mesosoma.* Reticulate to finely umbilicate, sculpture difficult to see due to dense pilosity; notauli complete, distinctly impressed anteriorly, fading posteriorly; dorsum densely covered in fine, decumbent pile, numerous longer, subdecumbent setae present. Pronotum carinate laterally, ecarinate medially, coplanar with vertex and lying at ~120° angle with dorsum of

mesoscutum. Midlobe of mesoscutum as long as broad, dorsally flattened, coplanar with scutellum and propodeum. Scutellum 0.6x as long as broad, finely carinate apically; lateral panel of axilla densely setose, reticulate, flattened. Mesepisternum striate-rugose and mesepimeron striate dorsally to glabrate ventrally. Prepectus large, triangular, anteriorly deflected. Propodeum distinctly, irregularly carinaceous-rugose, peripheral carina visible in dorsal view; lacking primary costula, faint median channel and carina indicated; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus densely setose. Coxae variously sculptured from glabrate to reticulate; metacoxa enlarged, ~0.8x as long as metafemur. Forewing hyaline, densely setose, venation brown; forewing 2.4x as long as broad; stigmal vein arises at ~45° angle to marginal vein; stigma ~0.4x as long as stigmal vein; marginal vein 2.1x as long as postmarginal vein; costal cell densely setose, with submarginal fringe (Fig. 106).

*Metasoma*. Gaster sessile. Gaster laterally flattened. Gt<sub>1-3</sub> foreshortened, Gt<sub>1</sub> glabrous anteriorly, reticulate posteriorly; remaining terga reticulate; Gt<sub>1</sub> and Gs<sub>1</sub> produced anteriorly as slightly recurved carinate, continuous flange; Gt<sub>1</sub> 7.0x as long as Gt<sub>2</sub> and 0.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.4x as long as Gt<sub>4</sub>; Gt<sub>1-8</sub> densely setose lateroventrally, Gt<sub>3</sub> also setose dorsolaterally, Gt<sub>1-2, 4</sub> asetose dorsally remaining terga densely setose; Gt<sub>5-6</sub> just visible in dorsal view, Gt<sub>5</sub> emarginate but Gt<sub>6</sub> spiracle only visible in posterior view, obscured by Gt<sub>5</sub>; Gt<sub>7+8</sub> triangular in dorsal view (Fig. 107).

**Phylogenetic Affinities.** In the full morphological analysis, *Platyrileya* was included within Rileyinae (Cladograms 1–3). It is provisionally included in Rileyinae based on sharing three anelli (although not reduced and ringlike, all apparently lack MPS), MMJ (with *Rileyia*) and Gt<sub>1-3</sub> foreshortened.

***Platyrileya cururipe* Burks**

(Figs. 105–108)

*Platyrileya cururipe* Burks, 1971: 7–9. Holotype ♀. Brazil (USNM, examined).

**Diagnosis.** This species (until others are discovered) is most easily diagnosed by those features useful in recognizing the genus: scrobal depression margined laterally and dorsally by carinate lip; supraclypeal area depressed and bounded laterally by row of dense setae (Fig. 108); occiput and pronotum on same plane; mesoscutum, propodeum, and gaster on same plane in lateral



view; occiput with dense, anteriorly directed decumbent setae; mesosoma dorsoventrally flattened, frons facing ventrally.

**Description.** Female. Length 3.1 mm. Color brown, except for the following, which are golden: antenna, pronotum laterally and in posterior half, coxae, femora, and tibiae in basal and apical fourth, tarsi. Forewing hyaline, densely setose, forewing venation brown.

*Head.* Striate-imbricate or umbilicate. Subtriangular in frontal view, anterior ocellus located above scrobal depression and closer to posterior ocellus than posterior ocelli are to one another. Face striate ventrally becoming imbricate-foveate dorsally, striae radiating from clypeus and extending toward lower eye margin and scrobal depression (Fig. 108). Eye glabrous, inner margin straight. Malar space 0.8x eye height, postorbital carina present, crenulate anteriorly. Scrobal depression distinctly margined dorsally and laterally, carinate edge oriented toward antennae, deep; interantennal prominence absent. Clypeus emarginate; supraclypeal area depressed for reception of antennae, with rows of setae laterally (Fig. 108). Antenna (11353); scape broadest basally; anelli transverse to quadrate, each increasing in width apically; subsequent funiculars subquadrate and subequal; clava 1.5x as long as broad, asymmetrically tapered apically (Fig. 105).

*Mesosoma.* Reticulate to finely umbilicate, sculpture difficult to see due to dense pilosity; notauli complete, distinctly impressed anteriorly, fading posteriorly; dorsum densely covered in fine, decumbent pilosity, numerous longer, subdecumbent setae present. Midlobe of mesoscutum 1.0x as long as broad. Scutellum 0.6x as long as broad, finely carinate apically; lateral panel of axilla densely setose, reticulate. Mesepisternum striate-rugose and mesepimeron striate dorsally to glabrate ventrally. Prepectus large, triangular, anteriorly deflected. Propodeum distinctly, irregularly carinaceous-rugose, peripheral carina visible in dorsal view; lacking primary costula, faint median channel and carina indicated; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus densely setose. Coxae finely reticulate (procoxa), glabrate (mesocoxa) or imbricate and densely setose (metacoxa); metacoxa enlarged, ~0.8x as long as metafemur. Forewing hyaline, densely setose, venation brown; forewing 2.4x as long as broad; parastigma typically broader than submarginal vein and without hyaline break; stigmal vein arises at ~45° angle to marginal vein; stigma 0.4x as long as stigmal vein; marginal vein 2.1x as long as postmarginal vein; costal cell densely setose, with submarginal fringe (Fig. 106).

*Metasoma*. Gt<sub>1-3</sub> foreshortened, Gt<sub>1</sub> glabrous anteriorly, reticulate posteriorly; remaining terga reticulate; Gt<sub>1</sub> and Gs<sub>1</sub> produced anteriorly as slightly recurved carinate, continuous flange; Gt<sub>1</sub> 7.0x as long as Gt<sub>2</sub> and 0.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.4x as long as Gt<sub>4</sub>; Gt<sub>1-8</sub> densely setose lateroventrally, Gt<sub>3</sub> also setose dorsolaterally, Gt<sub>1-2, 4</sub> asetose dorsally remaining terga densely setose; Gt<sub>5-6</sub> just visible in dorsal view, Gt<sub>5</sub> emarginate but Gt<sub>6</sub> spiracle only visible in posterior view, obscured by Gt<sub>5</sub> (Fig. 107).

**Distribution.** *Platyrileya cururipe* is known only from Brazil (Fig. 298).

**Biology.** Unknown.

**Comments.** The holotype is missing its right flagellum (slide mounted separately) but is otherwise intact. *Platyrileya* is included provisionally in Rileyinae based on individuals sharing a MMJ and reduced Gt<sub>1-3</sub> with other genera. However, this genus is very unusual and aberrant in form from other rileyines because it possesses a large, anteriorly deflected prepectus and anelli that are difficult to differentiate. A1 and A2 appear to be most ringlike, and A3 is larger, although all three appear to lack MPS (Fig. 105).

**Material Examined.**

**Type Material: BRAZIL: Bahia:** Cururipe, 19.ix.1930; Davis & Shannon; Type No. 61974 USNM [red label]; *Platyrileya cururipe* det Burks, Burks Type [handwritten, except “det Burks”]; Antennal pedicel and flagellum slide mounted separately, *Platyrileya cururipe* Burks, Antennal pedicel & flagellum; Cururipe, Baia, Brazil, Sept. 19, 1930; Davis & Shannon (Holotype ♀, USNM).

***Rileya* Ashmead**

(Figs. 9, 10, 21–24, 26, 29–30, 46–58, 119–286)

*Rileya* Ashmead, 1888a (June): 42, no species. Type species: *Rileya cecidomyiae* Ashmead, 1888b (July): by subsequent monotypy.

*Ashmeadia* Howard, 1889: 59. New name unnecessarily proposed for *Rileya*.  
Synonymy by Schmiedeknecht, 1909.

*Calorileya* Crawford 1910: 236. Type species: *Calorileya cearae* Crawford, by original designation. **New synonymy.**

*Xenopelte* Cameron, 1913: 126–127. Type species: *Xenopelte couridae* Cameron, by original designation. Synonymy by De Santis, 1979.

- Pararileya* Girault, 1915: 274. Type species: *Pararileya spadix* Girault, by original designation. Synonymy by Bouček, 1988b.
- Rileya*; Gahan, 1918: 136–149. Redescription, new species and key to species.
- Tragiicola* Brèthes, 1918: 82–84. Type species: *Tragiicola haumani* Brèthes (Gemignani, 1933: 487–488. As *Tragicola*). Synonymy by De Santis, 1967.
- Rileya*; Burks, 1971: 1–89. Redescription, key to genera of Eurytomidae.
- Releya*; lapsus (generic description) in Subba Rao, 1978: 293–319. Redescription, new species (described under *Rileya*) and key to species.
- Pseudrileya* Hedqvist 1980: 159–160. Type species: *Pseudrileya brasiliensis* Hedqvist, by original designation. **New synonymy.**
- Rileya*; Zerova, 1976: 79–89. Redescription, new species and key to genera of Rileyinae.
- Rileya*; Zerova, 1988: 649–674. Characterized Rileyinae, evolutionary trends.
- Rileya*; Doganlar, 1992: 275–279. Subgenera proposed for *Rileya*.
- Dillerileya* Doganlar, 1992: 276–279. Type species: *Rileya (Dillerileya) hanlari* Doganlar, by original designation. **New synonymy.**

**Comments.** *Rileya* was treated most comprehensively by Gahan (1918), who summarized the holdings of the USNM and redescribed several species as well as four new species. Subba Rao (1978) described five new species and incorporated them into Gahan's key. The synonymy of *Calorileya* is supported herein because recognizing it as a distinct genus would render *Rileya* paraphyletic based on the full morphological analysis (Cladograms 1–3). In addition, the characters formerly used to unify *Calorileya* (enlarged stigma and dense, complete wing pilosity) intergrade in species of *Rileya* (enlarged stigma: some *R. hegei*, *R. piercei*, etc.; complete pilosity: e.g., *Rileya petiolata* n. sp., *R. gracilis* n. sp.). Certain authors have maintained *Calorileya* as a distinct genus (Burks 1971; Subba Rao 1978). Doganlar's (1992) recognition of it as a synonym under *Rileya (Rileya)* was based on the assertion that “*Calorileya* Crawford 1910, which was synonymized by Gahan (1918),” is invalid. There is no record of Gahan synonymizing *Calorileya*, nor is there an indication that Bouček (1988b) follows Gahan's nonexistent synonymy, as asserted by Doganlar. *Pseudrileya* is here synonymized under *Rileya* as the features (see discussion under *R. haumani*) used by Hedqvist (1983) to define it are widespread within *Rileya*. Further, *P. brasiliensis* is a

junior synonym of *Rileyia haumani* Brèthes. The synonymy of the Doganlar subgenus *Dillerileya* under *Rileyia* is based on the fact that the proposed diagnostic synapomorphies are widely distributed within *Rileyia* and do not serve to differentiate the subgenera proposed.

**Diagnosis.** The primary characters used to recognize *Rileyia* are as follows: highly reduced prepectus, exposed portion subcircular or subtriangular (Fig. 29); Gt<sub>1-3</sub> reduced, sometimes partially to completely fused such that the apparent Gt<sub>1</sub> is actually comprised of more than one tergite (see Materials and Methods), or Gt<sub>1+2</sub> covers subsequent terga partially (subsequent tergum visible laterally only) or completely (subsequent tergum visible only after dissection), located anterodorsally; in subsequent tergum (usually Gt<sub>3</sub> or Gt<sub>4</sub> expanded or fused) the largest gastral (typically) tergum following the reduced anterior terga (Figs. 5, 47–64); two or three anelli between (anelli occasionally partially fused) the pedicel and first funicular giving the antenna a 11353 formula (Fig. 3) and the presence of a tongue-and-groove structure between the mesepimeron and metapleuron ventrally, the mesepimeral-metapleural junction (Figs. 29, 30, MMJ; seen in *Platyrileyia* also). Distinct sexual dimorphism is seen in this genus, with males typically exhibiting a distinctive swollen ventral plaque on the scape (Figs. 129, 141, 157). Under high magnification, pores are often evident, indicating a possible sensory function as in other Chalcidoidea. All males examined have a petiolate gaster where the petiole is typically rugulose, reticulate, or glabrate, at least as long as broad (usually longer than broad), and sometimes produced anteriorly as carinate flange which abuts the nucha (Figs. 46, 49, 143, 167, 187, 212). Females usually have a sessile petiole, except for six species with a distinctly petiolate gaster (*Rileyia rhytisma*, *R. cylindripetiolata*, *R. tricolor*, *R. warneri*, *R. violetae*). Further, many males have fewer anterior gastral terga reduced than in the conspecific female (e.g., *Rileyia cecidomyiae*; Figs. 163, 164). Propodeum almost always with primary costula, which can be complete, incomplete, angled, or straight (Figs. 21–24, 26).

**Description.** Both sexes are known for many species. Range in length 1.7–9.1 mm. Color black, brown, or golden with several golden species having darker maculation or vice versa. Wing hyaline, with infuscate spots or uniformly infuscate; forewing venation yellow to brown.

*Head.* Reticulate to umbilicate. Triangular, subtriangular, or ovate in frontal view (Figs. 9, 10), anterior ocellus closer to posterior ocellus than posterior ocelli are to one another. Face striate, reticulate, or umbilicate ventrally

becoming reticulate or umbilicate dorsally, if striate, then striae radiating from clypeus and extending toward lower eye margin, usually reaching lower eye margin and sometimes exceeding level of toruli (Figs. 144, 173, 177, 275); sparsely to moderately setose. Eye glabrous or setose, inner margin straight or slightly concave. Malar space 0.3–1.1x eye height, postorbital carina present or absent, if present can continue to vertex, sometimes continuous as preorbital carina. Scrobal depression margined or not, shallow to deep; interantennal projection lacking, minute, or continuous with variously produced intrascrobal lamina. Anterior ocellus located above scrobal depression. Clypeus emarginate (cf. Fig. 82), produced ventrally (Figs. 55, 207), straight (cf. Fig. 23), notched, or bilobate (Figs. 9, 10); supraclypeal area can be elevated slightly above and of differing sculpture (often more glabrate) than surrounding face (Fig. 10). Antenna 13-segmented (11353). Scape 2.0–6.3x as long as broad, with unapparent (Fig. 168) to distinct (Fig. 129) ventral plaque in males, occupying half to full length of scape; anelli transverse to quadrate, each subequal or increasing in length and width apically; F1 0.7–2.7x as long as broad, subsequent funiculars elongate to subquadrate and subequal, sometimes decreasing in length apically; clava 1.0–4.0x as long as broad, distinctly to indistinctly segmented, tapered apically.

*Mesosoma*. Finely transversely reticulate to coarsely umbilicate dorsally (Figs. 24, 26) interstices usually reticulate in umbilicate sculpture; notauli complete, rarely incomplete, very slightly to distinctly impressed; dorsum evenly setose. Midlobe of mesoscutum 0.8–1.5x as long as broad. Scutellum 0.7–1.7x as long as broad, finely or crudely carinate apically; lateral panel of axilla sparsely to completely setose, usually with at least one row of setae along scutoscutellar suture, reticulate or striate. Mesepisternum and mesepimeron striate, reticulate, rugose, glabrate, or some combination of the three. Prepectus small, subcircular to subtriangular. Propodeum usually with medially complete or incomplete primary costula (some *orchideara* species group taxa have the propodeum reticulate); incomplete primary costulae often turn anteriorly to meet dorsellum submedially and complete primary costulae either unite as a median carina to contact dorsellum medially or continue straight across the propodeum; complete to incomplete median carina sometimes present; complete or incomplete plicae connect costula to either dorsellum or nucha; intervening areas glabrate, reticulate, or rugose; spiracle <one-fifth to one-third length of propodeum, obliquely oriented and reniform to circular, 0.3–1.5x its length from dorsellum; callus sparsely to densely setose. Coxae usually reticulate to glabrate (some species are umbilicate: *R.*

*carinaegaster*) with one or more rows of setae longitudinally on anterolateral and dorsolateral surface; hind coxa usually with posteromesal row of large erect setae and variously sculptured (with several transverse carina or apical oblique lamina posteriorly). Wing hyaline, with infusate spots (*Rileyia infuscata*; Fig. 213) or almost completely infusate (*Rileyia auranti*); venation yellow to brown; forewing completely setose dorsally (Figs. 156, 240) to more or less bare basad parastigma (with only basal and cubital setal lines evident, speculum present) (Fig. 8), or sparsely setose (Fig. 232); 1.9–2.7x as long as broad; parastigma typically broader than submarginal vein and usually with hyaline break; stigmal vein arises at 30–80° angle to marginal vein; stigma 0.3–2.5x as long as stigmal vein, uncus elongate or short; marginal vein 0.6–4.3x as long as postmarginal vein; costal cell with submarginal fringe or bare.

*Metasoma*. Petiole 0.9–3.2x as long as broad, rugose to glabrate, often broadest anteriorly if produced as a carinate flange abutting nucha. Apparent Gt<sub>1</sub>, Gt<sub>1-2</sub>, or Gt<sub>1-3</sub> foreshortened, glabrous or glabrate, often Gt<sub>1+2</sub> or Gt<sub>1+2+3</sub> are apparently fused (see discussion above); remaining terga reticulate; Gt<sub>4</sub> typically enlarged following the reduced anterior terga thus apparent Gt<sub>2</sub>, Gt<sub>3</sub>, or Gt<sub>4</sub> is the largest (actually Gt<sub>4</sub>), depending on the degree of fusion seen in Gt<sub>1-3</sub>; Gt<sub>1</sub> 1.5–20.0x as long as Gt<sub>2</sub> and 0.6–4.6x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.1–1.3.8x as long as Gt<sub>4</sub>, Gt<sub>1</sub> can be setose laterally or glabrous and variously sculptured (Figs. 125, 176, 216), Gt<sub>2</sub> and Gt<sub>3</sub> sometimes with complete or incomplete transverse row of setae apically, remaining terga usually evenly setose except Gt<sub>4</sub> and sometimes Gt<sub>5</sub> anteriorly; Gt<sub>6</sub> spiracle exposed laterally by slight emargination of Gt<sub>5</sub>, this emargination more distinct in males (Fig. 210), slight as in some females (Fig. 277), or absent; Gt<sub>6</sub> or its predecessor can obscure subsequent terga in dorsal view (usually Gt<sub>7+8</sub>); Gt<sub>7+8</sub> hemispherical or triangular in dorsal view; Gs<sub>1</sub> often produced anteriorly as a collar, lateral carinate lobes (Fig. 227), a carinate cylinder (Figs. 47, 170) or otherwise grossly modified (Figs. 215, 216), often interacting with various Gt<sub>1</sub> and/or petiolar production. Phallobase simple, parameres with 2–4 setae apicolaterally (Figs. 119–124), with medial process apically which can possess 0–4 setae (Figs. 119–124), volsellae absent, aedeagus tapered apically. Male genitalia vary intraspecifically and interspecifically.

**Distribution.** *Rileyia* is known from the Holarctic to the Australasian and Neotropical regions. It is most speciose in the Neotropics, primarily Central and South America, where the majority of the new species occur (Figs. 290–299). Interestingly, two species of *Rileyia* (*R. asiatica* and *R. spadix* [Fig.

287]) are known from the Palearctic and Australasian regions, respectively. It is interesting to note the paucity of species from the Australasian and Palearctic regions (Figs. 290–299). It is unknown if these disjunctions are the result of the activities of humans, limited collecting in these areas, or the small samples examined.

**Biology.** All species of *Rileyia*, whose biologies are known, attack cecidomyiid gall formers (Diptera: Cecidomyiidae). The most common genus attacked is *Asphondylia* (Cecidomyiidae: Asphondyliini) which is, like *Rileyia*, cosmopolitan in distribution with 260 described species (60 spp. in North America; 82 spp. in Neotropics) with at least 40 undescribed species known (Gagné 1989, 1994). Other genera attacked or potentially attacked are *Neolasioptera* (Alycaulini), *Schizomyia*, *Bruggmannia*, *Stephomyia* (Schizomyiina), *Prodiplosis*, *Contarinia* (Cecidomyiini), *Eugeniamyia* (poss. Lopesiini), *Ctenodactylomyia*[?] (Lestodiplosini), *Clinodiplosis* (Clinodiplosini), *Rhopalomyia* (Oligotrophini), *Olpodiplosis*, *Pilodiplosis* (other Cecidomyiidi) (specimen label data). The cecidomyiid hosts form galls on a wide variety of plant families, and at least 27 plant families support the cecidomyiid hosts of *Rileyia* spp. For a summary of confirmed and potential hosts, see Tables 3 and 4.

**Phylogenetic Affinities:** see Discussion above under Phylogenetic Analysis: Species-Level Phylogeny.

### Key to species of *Rileyia*

**Note:** Males and females of *Rileyia* differ primarily in the structure of the scape, petiole, and gaster (see Materials and Methods).

- 1 Two anelli present, ranging from minute and transverse (Figs. 126, 148) to larger and transverse (Figs. 138, 174, 193).....2
- 1' Three anelli present, ranging from small (typically larger than minute anelli above) and transverse (Figs. 3, 145, 178) to subquadrate (Figs. 129, 132) [Note: one specimen of *R. haumani* has A2 and A3 partially fused dorsally; Fig. 136].....8
- 2 (1) Funicular segments slightly (Figs. 148, 242) to distinctly moniliform (Fig. 126). Forewing sparsely setose dorsally, particularly in apical half (Fig. 232).  $Gs_1$  produced anterolaterally as distinct lobe

- buttressed by longitudinal carinae (Fig. 230). Usually smaller species less than 3.3 mm in length; dark brown to black in color.....3
- 2' Funicular segments filiform (Figs. 3, 228, 239). Forewing usually completely setose dorsally, particularly in apical half (Fig. 8).  $Gs_1$  not produced anterolaterally, smooth (Fig. 208). Usually larger species greater than 2.0 mm in length [never smaller than 1.5 mm except for some *R. pallidipes* and some males of *R. hegeli*]; deep golden [some with brown maculation dorsally] to black.....6
- 3(2) Vertex with transverse carina between posterior ocelli (Fig. 269). Pronotum with blunt to sharp protuberance apicomediaally (Fig. 269).....*R. protuberanota* n. sp.
- 3' Vertex without carina between posterior ocelli. Pronotum without protuberance apicomediaally.....4
- 4(3')  $Gt_1$  distinctly produced anteriorly as carinate lip with 5 longitudinal carinae extending posteriad from lip one-third to one-half length  $Gt_1$  (Fig. 152). Body sculpture coarsely umbilicate.....  
.....*R. carinaegaster* Subba Rao
- 4'  $Gt_1$  acarinate, glabrous to glabrate (Fig. 230). Body sculpture.....  
reticulate.....5
- 5(4') Antenna moniliform, funiculars distinctly pedicellate apically (Fig. 26).....*Rileyia abnormicornis* Ashmead
- 5' Antenna moniliform-filiform, funiculars obscurely pedicellate (Figs. 148, 242).....*R. minuta* n. sp.
- 6(2') *Both*: Propodeum with numerous fine setae medially.  $Gt_1$  rounded anteriorly, acarinate (Fig. 190); color black or dark brown, body sculpture transversely reticulate to slightly umbilicate *Female*: gaster >1.5x longer than mesosoma, evenly acuminate (Fig. 190).....  
.....*R. grisselli* n. sp.
- 6' *Female only known*: Propodeum asetose medially.  $Gt_1$  depressed anteriorly, with transverse carina contiguous with dorsal margin of depression (Fig. 172). Gaster <1.5x longer than mesosoma, unevenly acuminate (Fig. 172) to not distinctly acuminate (Fig. 135); color orange to dark brown, body sculpture umbilicate.....7



- 7(6') Gt<sub>1</sub> with >3 setae anterolaterally (Fig. 135). Forewing infusate except just posteriad marginal vein (Fig. 139). Color orange, body sculpture finely umbilicate.....*R. auranti* n. sp.
- 7' Gt<sub>1</sub> with three short setae anterolaterally (Fig. 172). Forewing hyaline. Color completely brown except for scape, coxae, and legs which are pale yellow, body sculpture coarsely umbilicate.....*R. gasterella* n. sp.
- 8 (1') Basal gastral terga (Gt<sub>1-3</sub>) distinctly separated, lacking evidence of partial or complete fusion (Figs. 49, 50, 54, 56).....9
- 8' Basal gastral terga (Gt<sub>1-3</sub>) indistinctly separated, partial or complete fusion evident (Figs. 47, 48, 51, 233, 262). [Usually the *apparent* Gt<sub>1</sub> or Gt<sub>1</sub>+Gt<sub>2</sub> represents a fusion of terga; slightly indicated at certain angles, under certain illumination by faint lines of separation or indentation or by transverse rows of setae indicative of the former edge of the tergum (see Figs. listed above and 153, 233, 262).....42
- 9(8) Clypeus produced ventrally as a truncate flap, often with a few setae apically (Figs. 55, 161, 195). Basal gastral terga not distinctly foreshortened (Figs. 151, 191, 195). Propodeum usually reticulate to rugulose, often lacking costulae (Fig. 57). Body sculpture typically finely reticulate to glabrate (Fig. 57).....11
- 9' Clypeus bilobate (Figs. 9, 226), trilobate, slightly to distinctly produced (Fig. 275) ventrally (Fig. 207), or more or less even apically (Fig. 144). Basal gastral terga foreshortened (Figs. 142, 146, 154, 164, 166, 198). Propodeum usually carinate or rugose, always with costulae (Figs. 21–24, 26). Body sculpture ranging from finely, transversely reticulate to coarsely umbilicate (Figs. 22, 23, 27).....15
- 10(9) *Both*: eyes setose (Figs. 53, 184). Gaster petiolate (Figs. 54, 68, 181, 191), with petiole distinct in dorsal view.....11
- 10' *Both*: eyes asetose (Figs. 9, 10). *Male*: gaster petiolate (Figs. 160, 194, 220). *Female*: gaster not distinctly petiolate (Figs. 151, 195, 221), at most with petiole only barely visible in dorsal view (Fig. 195).....12
- 11(10) Petiole with two cruciate setae laterally (Fig. 58), dorsal petiole body slightly elevated above remainder of petiole (Fig. 58), glabrate to rugulose.....*R. orchideara* n. sp.

- 11' Petiole aetose laterally, dorsal petiole body not elevated above remainder of petiole (Figs. 181, 185), rugulose.....*R. glabra* n. sp.
- 12(11') Intrascrobal carina present, fine, extending one-third to almost equal to the length of the scape (Figs. 161, 196, 224).....13
- 12' Intrascrobal carina absent (cf. Fig. 184).....*R. oncidii* n. sp.
- 13(12) Intrascrobal carina extending at most one-third length of scape (Fig. 196).....*R. guatemalae* n. sp.
- 13' Intrascrobal carina extending more than one-third length of scape (Fig. 161).....14
- 14(13')  $Gt_2$  distinct in dorsal view in both sexes (Figs. 151, 160). *Both*: Body sculpture reticulate, evenly covered with brownish setae. *Male*: petiole convex dorsally (Fig. 160).....*R. cattleyae* n. sp.
- 14'  $Gt_2$  distinct in dorsal view only in male (Fig. 221). Body sculpture glabrate, sparsely covered with pale setae. *Male*: petiole concave dorsally (Fig. 220).....*R. laeliae* n. sp.
- 15(9')  $Gt_{7+8} < 5.0x$  as long as broad (Figs. 208, 227, 281). Clypeus bilobate (Figs. 9, 226), trilobate, slightly produced ventrally (Fig. 275), or more or less even apically (Fig. 144).....16
- 15'  $Gt_{7+8} > 5.0x$  as long as broad (Fig. 205). Clypeus distinctly produced ventrally as a rounded lobe (Fig. 207), with a few setae apically.....*R. heraty* n. sp.
- 16(15) Antennal scape bowed medially in dorsal or frontal views. *Male*: scape flattened, greatly expanded at ventral plaque (Fig. 129).....*R. antennata* n. sp.
- 16' Antennal scape not bowed. *Male*: scape indistinctly (Figs. 168, 249) to moderately expanded (Figs. 157, 228) at ventral plaque.....17
- 17(16') Stigma distinctly enlarged,  $> 1.5x$  as long as stigmal vein basad stigma (Figs. 156, 237, 241), often darkened and sometimes with wing infuscate at periphery of stigma (cf. Fig. 202).....18
- 17' Stigma not distinctly enlarged,  $< 1.5x$  as long as stigmal vein basad stigma (Figs. 171, 180, 202, 268), typically not darkened and rarely with wing infuscate at periphery of stigma [except *R. hegeli*, which has a slightly enlarged, infuscate stigma].....20

- 18(17) *Female*: Gt<sub>2</sub> visible in dorsal view, not obscured by Gt<sub>1</sub> (Figs. 234, 36). *Male*: petiole >2.0x as long as broad (Figs. 154, 234, 236). *oth*: color primarily golden (brown maculation can be present dorsally) (Fig. 159).....19
- 18' *Female*: Gt<sub>2</sub> obscured by Gt<sub>1</sub> in dorsal view (Fig. 235). *Male*: petiole >2.0x as long as broad (Fig. 235). *Both*: color primarily brown above, some golden maculation present dorsally [golden maculation not as extensive as brown maculation in Fig. 159] [only male known].....  
.....*R. petiolata* n. sp.
- 19(18) Intrascrobal lamina present (Fig. 155). Mesosoma and metasoma with brown maculation dorsally (Fig. 159).....*R. cearae* (Crawford)
- 19' Intrascrobal lamina absent. Brown maculation limited or absent on mesosoma [if present, usually only present medially on scutellum and propodeum].....*R. megastigma* Ashmead
- 20(18') Gt<sub>1</sub> produced anteriorly as rugulose, transverse carina (Figs. 176, 179) or medially elevated and laterally concave (Figs. 215, 216), with group of setae anterolaterally (Figs. 176, 179, 215, 216). Gt<sub>1</sub> interacting ventrally with a distinctly produced Gs<sub>1</sub> (lateral carinate lobes buttressed by longitudinal carinae) (Figs. 176, 216).....21
- 20' Gt<sub>1</sub> not produced anteriorly, setose or asetose anterolaterally (Figs. 204, 234, 245). Gs<sub>1</sub> generally not produced as above, sometimes produced as lobes laterad petiole (Fig. 227) or as a collar encircling petiole ventrally (Fig. 288).....22
- 21(20) Gt<sub>1</sub> produced anteriorly as rugulose, transverse carina (Figs. 176, 179). Gs<sub>1</sub> anteriorly produced as lateral carinate lobes buttressed by longitudinal carinae (Fig. 176). Sculpture on dorsum of mesosoma serrate in lateral view (Fig. 175). Scutellum and propodeum on same plane in lateral view (Fig. 175).....*R. gigas* Subba Rao
- 21' Gt<sub>1</sub> produced anteriorly into medially carinate and laterally concave structure (Figs. 215, 216). Gs<sub>1</sub> laterally expanded as carinate lobes which are buttressed by short carinae posteriorly, uniting dorsally into a pointed anterodorsally directed prominence (Figs. 215, 216). Sculpture on dorsum of mesosoma not serrate in lateral view. Scutellum and propodeum on distinctly different planes in lateral

- view.....*R. atopogaster* n. sp.
- 22(20') Gt<sub>1</sub> with one or more setae anterodorsally (Figs. 134, 260, 285) [it is often necessary to look carefully for sockets of abraded setae on both sides of tergum].....23
- 22' Gt<sub>1</sub> asetose and usually glabrous (Figs. 212, 288).....28
- 23(22) Gt<sub>1</sub> with one seta anterodorsally (Figs. 257, 260). *Female*: gaster sessile (Fig. 260).....24
- 23' Gt<sub>1</sub> with at least two setae anterodorsally (Figs. 134, 285). *Female*: gaster petiolate (Figs. 281, 285–288).....27
- 24(23) Propodeum with primary costula elevated laterally as rounded protuberance. Gt<sub>1</sub> with (Figs. 277, 278) single fine seta present [if abraded, socket not easily visible]. Color primarily golden laterally and ventrally but with extensive dark brown maculation dorsally.....  
.....*R. spadix* (Girault)
- 24' Propodeum with primary costula not elevated laterally as rounded protuberance. Gt<sub>1</sub> (Figs. 140, 260) with single robust seta anterolaterally [if abraded, socket easily visible]. Color completely brown or orange.....25
- 25(24') Gt<sub>3</sub> with incomplete, transverse row of setae dorsally (Figs. 257, 260). Body sculpture reticulate. Color primarily brown except for light brown or golden antenna, tegula, legs.....*R. philodendrica* n. sp.
- 25' Gt<sub>3</sub> asetose (Fig. 140). Body sculpture umbilicate. Color completely orange.....*R. haumani* (Brèthes)
- 26(23') Gt<sub>2</sub> obscured in dorsal view by Gt<sub>1</sub> (Figs. 281, 283). Petiole glabrate to finely reticulate (Figs. 281, 283), with two nearly cruciate setae laterally; 1.1x (female, Fig. 281) to 3.0–3.2x as long as broad (male, Fig. 283). Coloration distinctive: head and gaster dorsally black, mesosoma orange, and legs, antennae, and gaster ventrally pale golden [males with concolorous gaster].....*R. tricolor* n. sp.
- 26' Gt<sub>2</sub> distinct in dorsal view, not obscured by Gt<sub>1</sub> (Figs. 134, 285). Other features not as above.....27
- 27(26') Female petiole with three clustered setae apicolaterally, 1.3x as long as broad (Fig. 285); *Male*: petiole with one seta apicolaterally, 4.0x as

- long as broad (Fig. 284). Color black or dark brown with supraclypeal area below toruli, lateral panel of pronotum, mesoscutum in posterior half, scutellum and axillae in anterior half, mesopleuron dorsally and portions of the gaster laterally red or brown and scape, pedicel, anelli (flagellum light brown), tegula, coxae, and legs golden.....*R. warneri* n. sp.
- 27' Female petiole with two separated setae apicolaterally, 1.4x as long as broad (Fig. 134). Color golden brown except for pale antenna and legs .....*R. antioquia* n. sp.
- 28(22') Gs<sub>1</sub> produced anteriorly as a slightly recurved lip (Fig. 286) or fine collar (cf. Fig. 49) encircling petiole ventrally. *Female*: gaster petiolate.....29
- 28' Gs<sub>1</sub> not produced anteriorly (Figs. 198, 199) or fine collar (Fig. 272) encircling petiole ventrally. *Female*: gaster sessile (Fig. 198).....30
- 29(28) Gs<sub>1</sub> produced anteriorly as a slightly recurved lip encircling petiole ventrally (Fig. 286). Gt<sub>4</sub> concolorous with rest of gaster [only female known].....*R. violetae* n. sp.
- 29' Gs<sub>1</sub> produced anteriorly as a fine collar (cf. Fig. 210) encircling petiole ventrally. Gt<sub>4</sub> with ovate brown maculation dorsally.....*R. rhytisma* n. sp.
- 30(28') Forewing infusate posteriad parastigma and stigmal vein (Fig. 213). Funiculars longer than broad (Fig. 214) [only male known].....*R. infuscata* n. sp.
- 30' Forewing hyaline. Funiculars subquadrate to just longer than broad (Figs. 197, 200, 228).....31
- 31(30') Basal terga occupying less than one-third length of gaster (Figs. 198, 199).....32
- 31' Basal terga more than one-third length of gaster (Figs. 229, 272).....33
- 32(31) Gt<sub>3</sub> with short, transverse row of 2–4 setae subdorsally (Figs. 198, 199, 204). Forewing with stigma swollen, circular to ovate (Figs. 201, 202). Color mainly golden, some specimens with brown maculation on body dorsally.....*R. hegeli* Girault
- 32' Gt<sub>3</sub> asetose (Figs. 251, 252). Forewing with stigma never enlarged.

- Color light to dark brown [some females with darker dorsal spot on gaster, Fig. 251].....*R. pallidipes* (Ashmead)
- 33(31') Color primarily golden to deep reddish orange [some specimens can be lightly to heavily maculated dorsally with brown coloration].....34
- 33' Color primarily dark brown [except *R. bicolor* with brown mesosoma and golden head and gaster] [some specimens can have paler regions laterally or along intersegmental sulci dorsally].....35
- 34(33) Basal gastral terga (Gt<sub>1-3</sub>), occupying about one-half length of gaster to just over one-half length of gaster (Figs. 229, 231). Gt<sub>3</sub> with long, dorsally incomplete transverse row of setae (Figs. 231, 229). Uncus distinct (cf. Fig. 191). Color completely golden.....*R. mellea* Girault
- 34' Basal gastral terga (Gt<sub>1-3</sub>), occupying about one-third length of gaster (Fig. 272). Gt<sub>3</sub> asetose (Fig. 272). Uncus indistinct (Fig. 274). Color mainly deep reddish orange except head excluding face, coxae, mesopleuron, metapleuron, scutellum, femora in basal three quarters brown, tibiae in basal one-half to three-quarters; antenna and remainder of legs pale yellow [only male known].....*R. robusta* n. sp.
- 35(33') Gt<sub>5</sub> barely visible in dorsal view, nearly completely covered by Gt<sub>4</sub> (Figs. 142, 143, 275) [more distinct in male].....36
- 35' Gt<sub>5</sub> clearly visible in dorsal view, not almost completely covered by Gt<sub>4</sub> (Figs. 163, 164).....37
- 36(35) Gt<sub>1</sub> with ovate, rugulose indentation anteriorly above petiole. Head and mesosoma coarsely umbilicate. Color dark brown.....*R. scabra* n. sp.
- 36' Gt<sub>1</sub> not produced (Figs. 142, 143). Head and mesosoma transversely reticulate. Color dark brown, with golden maculation.....*R. bumeliae* n. sp.
- 37(35') Eye variably setose (Fig. 266). Gt<sub>3</sub> with dorsally incomplete, transverse row of setae (Figs. 245, 246), never asetose.....*R. oculiseta* n. sp.
- 37' Eye glabrous (Figs. 9, 10). Gt<sub>3</sub> often with transverse row of setae (Fig. 49; cf. Figs. 54, 56, 163) or few setae laterally (Fig. 167) but

- usually asetose (Fig. 208).....38
- 38(37') *Male*: Gt<sub>3</sub> with two setae subdorsally (Fig. 167) and extending to approximately one-third length of gaster (Fig. 167) [only male known].....*R. couridae* (Cameron)
- 38' *Female*: Gt<sub>3</sub> asetose; *Male*: Gt<sub>3</sub> with numerous setae, usually with 1–2 transverse rows (Fig. 130) to more or less completely setose in apical one-half (Figs. 130, 163).....39
- 39(38') *Male*: scape with ventral plaque occupying entire length (Fig. 132). Gt<sub>3</sub> with numerous setae, usually with 1–2 transverse rows (Figs. 49, 130) to more or less completely setose in apical one-half (Figs. 130, 163).....40
- 39' *Male*: scape with ventral plaque occupying middle half (Fig. 162). Gt<sub>3</sub> with numerous setae, usually completely setose in apical three quarters (Fig. 163).....41
- 40(39) Scape and flagellum gracile (Fig. 132). Head and gaster brown, concolorous.....*R. asiatica* Zerova
- 40' Scape and flagellum broader (cf. Figs. 3, 162). Head and gaster golden, with gaster brown dorsally.....*R. bicolor* n. sp.
- 41(39') Pronotum acarinate to slightly carinate laterally. Frenal line incomplete, faint, usually not approaching dorsum of scutellum. Propodeum with primary costula ranging from slightly to distinctly angulated medially to approaching or contacting dorsellum (cf. Figs. 22, 23, 26).....*R. cecidomyiae* Ashmead
- 41' Pronotum usually distinctly carinate laterally. Frenal line more complete, usually more distinct and approaching dorsum of scutellum (Fig. 218). Propodeum with primary costula usually distinctly angulated medially to contact dorsellum (Fig. 22).....*R. insularis* (Ashmead)
- 42(8') Basal gastral terga with all indication of former independence obliterated, area completely glabrous, shining (Fig. 153), and with paired, deep, elongate teardrop-shaped sulci present anteromedially, with a single, erect seta laterad sulcus (Fig. 153).....*R. bisulcata* n. sp.
- 42' Basal gastral terga with at least some indication of former independence [look carefully for slightly indented lines of weakness,

- rows of setae, etc.] (Figs. 46–48, 166, 187, 225, 244) and without combination of paired sulci and single, erect seta.....43
- 43(42') Only first gastral tergum (fused  $Gt_{1-3}$ ) foreshortened [sometimes appearing to consist of  $>1$  tergite but separation typically incomplete], extending  $<$ one-third length of gaster (Figs. 146, 158, 170, 210, 233, 262).....44
- 43' Both first two gastral terga (fused  $Gt_{1+2}$ ,  $Gt_3$ ) foreshortened, extending  $\leq$ one-third length of gaster (Figs. 146, 170, 210).....56
- 44(43) Stigma  $<0.8x$  length of stigmal vein basad stigma (Figs. 171, 180, 264). Apparent gastral tergum 1 ( $Gt_1$ ) fused with  $Gt_{2+3}$  [indicated by faint lines of weakness or rows of setae] (Figs. 254, 262).....45
- 44' Stigma  $>0.8x$  the length of stigmal vein basad stigma (Fig. 268). Apparent gastral tergum 1 ( $Gt_1$ ) fused with  $Gt_2$  and  $Gt_{1+2}$  completely covering  $Gt_3$  [can occasionally see  $Gt_3$  without dissection in lateral view] (Figs. 48, 51).....*R. piercei* Crawford
- 45(44) Gaster with one foreshortened tergum (fused  $Gt_{1-3}$ ), extending  $<$ one-third the length of gaster (Figs. 146, 170, 227, 254).....46
- 45' Gaster with two foreshortened terga (fused  $Gt_{1+2}$ ) ( $Gt_3$ ), extending to or  $<$ one-third the length of gaster (Figs. 208, 210, 263).....52
- 46(45)  $Gs_1$  produced ventrad petiole as distinct collar encircling petiole ventrally, often buttressed by few to several longitudinal carinae (Figs. 233, 262).....47
- 46'  $Gs_1$  produced ventrad petiole as cylindrical or quadrate structure (Figs. 47, 170, 271) appressed to petiole, or as carinate lobes laterad petiole (Fig. 227).....48
- 47(46)  $Gs_1$  collar buttressed by faint longitudinal carinae; apical margin of apparent  $Gt_1$  ( $Gt_{1-3}$ ) distinctly separate from  $Gt_4$ , with short, transverse rows of setae subdorsally (Fig. 262).....*R. paraplesius* n. sp.
- 47'  $Gs_1$  collar buttressed by distinct longitudinal carinae; apical margin of apparent  $Gt_1$  ( $Gt_{1-3}$ ) fused with  $Gt_4$  [faint line indicated in holotype] with complete, transverse row of setae apically (Fig. 233).....  
.....*R. mimica* n. sp.



- 48(46') Gs<sub>1</sub> produced ventrad petiole as cylindrical or quadrate structure (Figs. 47, 170, 271) appressed to petiole.....49
- 48' Gs<sub>1</sub> produced as anteroventral prominences ventrad petiole (Fig. 254).....*R. panamae* n. sp.
- 49(48) Dorsal petiole body and Gs<sub>1</sub> united as variously produced, cylindrical attachment between propodeum and gaster (Figs. 47, 158, 170).....50
- 49' Dorsal petiole body and Gs<sub>1</sub> united as quadrate attachment between propodeum and gaster (Fig. 271).....*R. quadraticaulis* n. sp.
- 50(49) Petiole/Gs<sub>1</sub> attachment buttressed by robust longitudinal carinae (Figs. 47, 158), without line of independence indicated laterally.....51
- 50' Petiole/Gs<sub>1</sub> attachment acarinate, independence indicated by line of separation laterally (Fig. 170).....*R. cylindripetiolata* n. sp.
- 51(50) Scutellum lacking distinctly produced apical flange. Petiole/Gs<sub>1</sub> attachment ~0.6x as long as broad, anterior edge smooth (Fig. 47). Gt<sub>1-3</sub> not emarginate to receive median carina dorsally on petiole; lacking setae anterolaterally.....*R. hansonii* n. sp.
- 51' Scutellum with distinctly produced apical flange. Petiole/Gs<sub>1</sub> attachment ~0.4x as long as broad, anterior edge crenulate (Fig. 158). Gt<sub>1-3</sub> emarginate to receive median carina dorsally on the petiole; group of setae anterolaterally.....*R. columbar* n. sp.
- 52(45') Gs<sub>1</sub> produced ventrad petiole as distinct collar encircling petiole ventrally (Figs. 187, 244) [only males known].....53
- 52' Gs<sub>1</sub> produced laterad petiole as carinate lobe (Fig. 227).....54
- 53(52) Gs<sub>1</sub> collar glabrate. Petiole 1.6–1.7x as long as broad, two ventrally directed setae present laterally on anteroventral surface (Fig. 187). Basal gastral tergum 1 (Gt<sub>1-3</sub>) carinate.....*R. gracilis* n. sp.
- 53' Gs<sub>1</sub> collar glabrous. Petiole 1.9x as long as broad, asetose (Fig. 244). Basal gastral tergum 1 (Gt<sub>1-3</sub>) with two short submedian carinae dorsolaterally.....*R. obscura* n. sp.

- 54(52') Gt<sub>7+8</sub> <3.0x as long as broad.....55  
 54' Gt<sub>7+8</sub> 3.3–3.8x as long as broad (Fig. 227).....*R. longitergum* n. sp.
- 55(54) Gs<sub>1</sub> collar rugulose, contiguous with carinate basal tergum 1, which is produced anteriorly as rugulose carinate flange, two setae present subdorsally on Gt<sub>1</sub> (Fig. 166).....*R. clarki* n. sp.  
 55' Gs<sub>1</sub> collar glabrous with basal gastral tergum 1 not produced, asetose (Fig. 146).....*R. canalicoxa* Subba Rao
- 56(43') Fine or distinct postorbital carina present, ending at vertex or continuous with preorbital carina.....57  
 56' Postorbital carina absent.....*R. pulchra* (Ashmead)
- 57(56) Preorbital and postorbital carinae continuous, fine to distinct, forming a "ring" around eye. *Female*: Gs<sub>1</sub> produced anterolaterally as a faint to distinct lobe (cf. Fig. 227). *Male*: apex of metatibia pale.....  
 .....*R. orbitalis* Ashmead  
 57' Preorbital carina absent. *Female*: Gs<sub>1</sub> not produced anterolaterally as a faint to distinct lobe. *Male*: apex of metatibia brown.....  
 .....*R. heterogaster* Gahan

***Rileya abnormicornis* (Ashmead)**

(Figs. 125, 126)

*Ashmeadia abnormicornis* Ashmead, 1894 (in Riley et al. 1894): 145.  
 Lectotype ♂, here designated. St. Vincent and the Grenadines (USNM, examined).

*Rileya abnormicornis* (Ashmead), Schmiedeknecht, 1909: 148.

**Diagnosis.** This species is similar to *Rileya minuta*, *R. protuberanota*, and *R. carinaegaster* with respect to propodeal sculpture and forewing venation and setation, but is separated by the following: antenna distinctly moniliform with each funicular extruded apically into a pedicel at least as long as the corresponding funicular body and with only two anelli and four funiculars (Fig. 126); propodeum reticulate with fine primary costula contiguous with dorsellum in medial half and with fewer plicae, costula slightly elevated into blunt point sublaterally (not as robustly pointed as *R. carinaegaster*); fine reticulate sculpture; Gt<sub>1</sub> distinctly deflected toward petiole anteriorly and

glabrous;  $G_{S1}$  produced anteriorly as a carinate collar, buttressed laterally by longitudinal carinae (*R. carinaegaster* and *R. minuta* with similar production).

**Description.** Male. Length 1.0–1.2 mm. Color brown, except tibiae and tarsi golden. Wings hyaline, venation light brown.

*Head.* Subtriangular in frontal view, robust striae radiating from clypeus reaching lower eye margin and scrobal depression. Clypeus emarginate; supraclypeal area at same level as remainder of face, striate. Malar space 0.6x eye height, postorbital carina present, extending posteriad eye, ending before dorsal eye margin. Eye glabrous. Scrobal depression shallow, margined, intrascrobal carina absent. Scape 4.5x as long as broad, broadest basally; anelli transverse, minute, A1–A2 subequal in length and width; F1 2.0x as long as broad, each funicular moniliform, pedicellate apically, subsequent funiculars similar in form and length (Fig. 126); clava 2.3x as long as broad, indistinctly segmented, tapering apically.

*Mesosoma.* Reticulate. Midlobe of mesoscutum 2.3x as long as broad, notaulus complete, slightly indicated. Scutellum 0.7x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar suture, reticulate. Mesepisternum and mesepimeron reticulate. Propodeum reticulate with complete primary costula, angled anteriorly and contacting dorsellum in medial quarter; fine median carina present; plicae few and incomplete; spiracle obliquely oriented, ~0.5x its length from dorsellum; callus sparsely setose. [wing damaged]

*Metasoma.* Petiole visible in dorsal view, rugose, produced anteriorly as carinate flange abutting nucha, 0.8x as long as broad.  $G_{t1-2}$  glabrate, remaining terga reticulate;  $G_{t1-2}$  foreshortened;  $G_{t1}$  deflected anteriorly toward petiole;  $G_{S1}$  with robust carinate collar anteriorly, buttressed laterally by longitudinal carinae, abutting nucha;  $G_{t1}$  2.5x as long as  $G_{t2}$  and 1.0x as long as  $G_{t3}$ ,  $G_{t1-2}$  0.9x as long as  $G_{t3}$ ;  $G_{t1}$  with two setae anterolaterally,  $G_{t2}$  with transverse row of setae subdorsally,  $G_{t3}$  with group of setae sublaterally, remaining terga evenly setose;  $G_{t5}$  not emarginate to expose  $G_{t6}$  spiracle;  $G_{t7+8}$  hemispherical in posterior view (Fig. 125).

**Female.** Unknown.

**Distribution.** Known only from St. Vincent and Ecuador (Fig. 290).

**Biology.** Unknown.

**Comments.** The lectotype is point mounted on its left side after having been remounted from its right side. Pieces of the right midleg are embedded near the specimen. The pronotum is slightly askew on the right side relative to the remainder of the mesosoma.

**Material Examined.**

**Type Material:** SAINT VINCENT AND THE GRENADINES: St. Vincent, W.I. H. H. Smith, 216; Type No. 2420 [red label]; *Rileyia abnormicornis* ♂ Ashm Type, unique [handwritten] (Lectotype ♂ USNM).

**Other Material:** ECUADOR: Napo: Tiputini Biodiversity Station, 216m, 00°37'55"S 76°08'39"W, 5.ii.1999, Lot # 2085, Transect 9, T. Erwin et al. Canopy fogging bare leaves, some w/ bryophytic/lichenous coat (1♂ USNM); Reserva Etnica Waorani, Transect Ent., 1km S. Okone Gare Camp, 00°39'10"S 76°26'0"W, 220m, 10.x.1994, T. Erwin et al., canopy fogging, Lot# 935 (1♂ USNM) .

***Rileyia antennata*, new species**

(Figs. 127–129)

**Etymology.** Named for the highly unusual male antenna.

**Diagnosis.** Resembles *R. hegeli* but can be differentiated by the greatly expanded scape, the elongate pedicel and flagellomeres (Fig. 129), and the toruli more than two torular diameters apart in male. Males similar to stigmated males (Fig. 127) of *R. hegeli* but can be differentiated by the shorter petiole (Fig. 128) and distinctive antenna. The gastral terga are foreshortened, similar in size and Gt<sub>3</sub> setation to *R. hegeli*. Females are nearly identical to females of *R. hegeli* but have a more distinctly produced and infuscate stigma, and the toruli are at least one torular diameter apart, and the scapes are curved inward medially.

**Description.** Male. Length 1.6–2.5 mm. Color completely golden. Wings hyaline, except for infuscation around stigma, venation light brown.

*Head.* Finely reticulate. Ovate in frontal view, few striae radiating from clypeus toward lower eye margin. Clypeus notched, faintly bilobate; supraclypeal area slightly elevated above remainder of face, reticulate. Malar space 0.7–1.0x eye height, postorbital carina absent. Eye glabrous. Scrobal depression very vaguely indicated, unmarginated. Scape 2.3–4.1x as long as broad, broadest medially, modified as follows: laterally flattened with

distinctly lobate sensillar protuberance ventrally (Fig. 129), recurved in frontal view; anelli quadrate, each subequal in width and length; F1 1.3–2.0x as long as broad, subsequent funiculars longer than broad, subequal in length; clava 3.3–3.8x as long as broad, segmented, tapering apically.

*Mesosoma*. Finely, transversely reticulate. Midlobe of mesoscutum 1.0–1.1x as long as broad, notaulus complete, faint. Scutellum 1.3–1.4x as long as broad, carinate apically; lateral panel of axilla asetose, except for few fine setae along scutoscutellar sulcus, reticulate. Mesepisternum slightly striate; mesepimeron striate. Propodeum rugose, with complete primary costula oriented transversely; numerous plicae connecting costula with nucha and dorsellum; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.0–2.3x as long as broad, stigma 0.4–1.0x as long as stigmal vein, stigma slightly produced posteriorly (Fig. 127), uncus fine, marginal vein 1.2–1.5x as long as postmarginal vein. Wing completely setose in apical two-thirds.

*Metasoma*. Petiole visible in dorsal view, longitudinally rugulose with carinate lip anteriorly abutting nucha. Gaster dorsoventrally flattened. Gt<sub>1-3</sub> glabrous, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 1.7–2.0x as long as Gt<sub>2</sub> and 1.7–3.0x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.2x as long as Gt<sub>4</sub>; Gs<sub>1</sub> produced anteriorly as a fine collar encircling petiole ventrally; Gt<sub>3</sub> with transverse row of setae; remaining terga evenly setose, except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in posterior view.

**Female.** Length 2.0–2.4 mm. Identical to male except as follows: antenna not dramatically modified, scape broadest basally, 3.8–4.0x as long as broad, recurved in frontal view; flagellomeres not elongate: anelli transverse, each increasing in width and length, F1 1.3x as long as broad, subsequent funiculars subquadrate and subequal, clava not elongate, 2.6x as long as broad; toruli separated by at least 1.0x torular diameter; petiole not visible in dorsal view; gaster not flattened; Gt<sub>1</sub> 2.3–2.7x as long as Gt<sub>2</sub> and 1.0–1.1x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.4x as long as Gt<sub>4</sub>; Gs<sub>1</sub> slightly produced anteriorly as a fine collar encircling petiole ventrally; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** Slight variation exists in the completeness and extent of the costula and plicae on the propodeum, and there can be some maculation on male as follows: ocellar triangle, occiput, anterior pronotum, mesoscutum and scutellum, propodeum, gaster dorsally, mid and metatibiae apically. The male

paratype from Brazil is the most darkly maculated, with brown coloration around the ocelli and on the occiput, pronotal collar, mesoscutum, scutellum, propodeum, and gaster. Further, the stigma is surrounded by infuscation.

**Distribution.** Known from Central and South America (Fig. 290).

**Biology.** Unknown. However, two males and one female from Trinidad were reared from flower stems of *Stachytarpheta cayennensis* (Rich.) and *S. jamaicensis* (L.) (Verbenaceae). The only cecidomyiids recorded from these plants attack the seeds (see Table 4).

**Comments.** The holotype specimen is missing both left wings.

**Material Examined.**

**Type Material:** **TRINIDAD & TOBAGO: St. George:** Arena Reserve, 6.viii.1976; J. Noyes, Brit. Mus. 1976-462; Rainforest (Holotype ♂ BMNH). Paratypes, 4♀3♂, data as follows: same data as holotype (2♀ BMNH); Tumpuna Reserve, 9.viii.1976; J. Noyes, Brit. Mus. 1976-462; Caribbean Pine Plantation (2♀ BMNH). **ECUADOR: Napo:** 7km W on Rid Payamino, 2.ii.86, Finnamore, Thormin, Genier, Blader, Wojcick (1♂ USNM). **PERU: Madre de Dios:** Laberinto, 1-2.i.84, A. Finnamore (1♂ BMNH).

**Other Material:** **BRAZIL: Santa Catarina:** Nova Teutonia, 27°B.52-58°L.; 3.vi.1938, B.M. 1938-458 (1♂ BMNH). **HONDURAS: El Paraiso:** Danli, El Pataste, 14.xi.1988, R. Cave (1♂ EAPZ). **SURINAM: Brokopondo:** 12-18.i.1985, T. Thormin (1♀ CNC). **TRINIDAD & TOBAGO: St. George:** Simla Field Sta., Arima Valley, 5.viii.1977, P. Feinsinger, malaise trap (1♀ AEIC); **Victoria:** Santa Margarita, 13.x.1955, F. Bennett, *Ex* collection of flower stems of *S. jamaicensis* (1♂ USNM); Cotton Station, 1.xi.1955, F. Bennett, *Ex* collection of flower stems of *S. cayennensis* (1♀1♂ USNM).

***Rileyia antioquia*, new species**

(Fig. 134)

**Etymology.** Noun in apposition named for its collection locality.

**Diagnosis.** This species is distinct because the female has a petiolate gaster and cannot be easily confused with other, more vividly colored species of *Rileyia* with petiolate gastres (see Descriptions of *R. tricolor* and *R. warneri* [Figs. 281, 285]). Female with gaster petiolate, petiole 1.4x as long as broad,

with two anteriorly directed setae laterally, with distinct lamina ventrally connecting petiole and  $Gs_1$  (Fig. 134) and flagellomeres with robust, evenly spaced MPS (cf. Fig. 200).

**Description.** Female. Length 2.9–3.3 mm. Color golden brown, except for the antennae and legs which are slightly paler. Wing hyaline, pilosity complete, venation pale brown.

*Head.* Subtriangular in frontal view, striae radiating from clypeus absent, area reticulate. Clypeus slightly produced, entire; supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space 0.3x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 4.2x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent funiculars subequal in length; clava 2.4x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate-rugulose. Midlobe of mesoscutum 1.3x as long as broad, notaulus complete, indistinct. Scutellum 1.3x as long as broad, finely carinate apically; lateral panel of axilla setose medially and with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum finely striate-rugulose; mesepimeron glabrate-striate. Propodeum with complete primary costula medially, oriented transversely, bisected by median carina; distinct plica sublaterally spans length of propodeum but fades at either end, finer incomplete plicae present between costula, dorsellum, and nucha; spiracle obliquely oriented, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.7x as long as broad, stigma 0.5x as long as stigmal vein, uncus fine, marginal vein 1.5x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole distinctly visible in dorsal view, 1.4x as long as broad, longitudinally rugulose dorsally, with two anteriorly directed setae laterally and distinct lamina ventrally connecting petiole and  $Gs_1$  (Fig. 134). Gaster not laterally flattened.  $Gt_{1-3}$  glabrate, remaining terga reticulate;  $Gt_{1-3}$  foreshortened;  $Gt_1$  8.0x as long as  $Gt_2$  and 1.3x as long as  $Gt_3$ ,  $Gt_{1-3}$  0.6x as long as  $Gt_4$ ;  $Gt_1$  with two setae subdorsally at anterior edge,  $Gt_3$  with complete transverse row of setae apically,  $Gt_4$  evenly setose laterally in posterior half with single transverse row of setae dorsally,  $Gt_5$  setose apically, remaining terga evenly setose;  $Gt_5$  slightly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  triangular in dorsal view.

**Male.** Unknown.

**Distribution.** Known only from Colombia (Fig. 290).

**Biology.** Unknown.

**Comments.** The type is point mounted and in good condition.

**Material Examined.**

**Type Material:** COLOMBIA: Antioquia: 1800m, 7°5'N, 76°30'W, J. Helava; Montane rain forest, 18–22.iv.1973 (Holotype ♀, CNC). Paratype, 1♀, same data as holotype (CNC).

***Rileyia asiatica* Zerova**

(Figs. 130–133)

*Rileyia asiatica* Zerova, 1976: 86–89. Holotype, ♀. Turkmenistan (ZIN, not examined).

**Diagnosis.** Similar to *R. insularis* and *R. cecidomyiae* but distinguished by having a finer, more elongate antenna (Fig. 132), male ventral plaque extending almost entire length of scape medially (Fig. 132) (antenna broader in *R. cecidomyiae* [Fig. 162] and *R. insularis*). Frenal line extending up to dorsolateral edge of scutellum.

**Description.** Female. Length 3.7–4.4 mm. Color black, except for flagellum, femur in basal half, pretarsus and gaster, which are dark brown and scape, pedicel, and legs, which are golden. Wing hyaline, venation brown.

**Head.** Reticulate-striate. Triangular in frontal view, striae radiating from clypeus reaching lower eye margin. Clypeus notched, bilobate; supraclypeal area slightly elevated above remainder of face, smooth-reticulate. Malar space 0.8x eye height, postorbital carina present, extending posteriad eye, fading before reaching vertex. Eye glabrous. Scrobal depression shallow, margined, intrascrobal carina absent. Scape 5.2–5.3x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.6x as long as broad, subsequent funiculars subequal; clava 2.8x as long as broad, segmented, tapering apically.

**Mesosoma.** Finely transversely reticulate. Midlobe of mesoscutum 1.0x as long as broad; notaulus complete, slightly indicated. Scutellum 1.1x as long



as broad, crudely carinate apically; lateral panel of axilla with several setae in posterior half, reticulate. Mesepisternum reticulate; mesepimeron smooth-striate. Propodeum with incomplete primary costula that bends anteriorly to meet dorsellum submedially; median carina extends between dorsellum and nucha, several plicae submedially spanning all or some of the distance between costula and edges of propodeum laterally; spiracle obliquely oriented, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.5x as long as broad, stigma 0.6x as long as stigmal vein, marginal vein 1.2x as long as postmarginal vein (cf. Fig. 131).

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.4–2.5x as long as Gt<sub>2</sub> and 1.2–1.3x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.8x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view (Fig. 133).

**Male.** Length 3.2 mm. Identical to female except as follows: scape 4.3x as long as broad, with ventral plaque extending length of scape (Fig. 132); petiole 0.8x as long as broad, longitudinally rugose, broadest anteriorly where it is produced as a carinate flange abutting nucha (Fig. 130); Gt<sub>1-2</sub> glabrous, foreshortened, remaining terga reticulate; Gt<sub>1</sub> 2.2x as long as Gt<sub>2</sub> and 0.9x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.2x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>3</sub> in posterior half dorsally and Gt<sub>4</sub> in anterior fourth dorsally; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> not visible dorsally, hemispherical in posterior view (Fig. 130).

**Distribution.** Known from Turkmenistan [not mapped].

**Biology.** Reared from *Asphondylia* sp. galls on *Astragalus* (Fabaceae).

**Material Examined.**

**Type Material:** TURKMENISTAN: Balkan [?]: near Nochur, Kopetdag mountain, ~1800m, 18.v.1975, L. Diakonchuk, emerged from galls of *Asphondylia* sp. on *Astragalus* sp. on 20–28.v.1975 (Holotype ♀, ZIN; not examined). Paratypes, 25♀15♂ same data as holotype; 2♀9♂, same data as holotype except date, 18.v.1975 (43 ZIN, 5 SIZ, 3♀2♂ USNM) (USNM paratypes examined).

***Rileya atopogaster*, new species**

(Figs. 215–217)

**Etymology.** Named for the highly modified region at the anterior of the gaster. From the Greek *atopos* (strange) and *gaster* (stomach).

**Diagnosis.** This species has all of the wings amber and a distinctly produced anterior gaster. The anterior of the gaster ( $Gs_1$  and  $Gt_1$ ) produced into a heavily sclerotized abutment to the nucha as follows: laterally expanded as carinate lobes that are buttressed by short carinae posteriorly; the lateral lobes unite dorsally into a pointed anterodorsally directed prominence, petiole originates below this prominence; ventrally glabrous as the lateral lobes fade (Figs. 215, 216).

**Description.** Female. Length 3.8 mm. Color golden, except for the following, which are dark brown: anterior pronotum, anterior two-thirds of mesoscutum, gaster dorsally and gaster laterally at base and apex. Wing amber, venation brown.

*Head.* Umbilicate. Subtriangular in frontal view, few striae radiating from clypeus toward lower eye margin. Clypeus distinctly bilobate; supraclypeal area slightly elevated above remainder of face, umbilicate. Malar space 0.7x eye height, postorbital carina present, extending posteriad eye, fading before vertex. Eye glabrous. Scrobal depression deep, margined, intrascrobal carina absent. Scape 4.2x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 subequal in length; F1 0.9x as long as broad, subsequent funiculars subequal in length; clava 2.6x as long as broad, segmented, tapering apically.

*Mesosoma.* Umbilicate. Midlobe of mesoscutum 0.9x as long as broad, notaulus complete, faint posteriorly. Scutellum 1.4x as long as broad, carinate apically; lateral panel of axilla completely setose, except laterally, and with row of setae along scutoscutellar sulcus, umbilicate to striate. Mesepisternum striate; mesepimeron striate. Propodeum rugose with superimposed reticulation, complete primary costula angled anteromedially and connected to dorsellum by median carina; few strong plicae spanning some or all of distance between costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.3x as long as broad, stigma 0.3x as long as stigmal vein, uncus fine, marginal vein 1.2x as long as postmarginal vein (Fig. 217). Wing completely setose.

*Metasoma.* Petiole not visible in dorsal view. Gaster not flattened. Anterior of gaster ( $Gs_1$  and  $Gt_1$ ) produced into a heavily sclerotized abutment to the nucha

as follows: laterally expanded as carinate lobes which are buttressed by short carinae posteriorly; the lateral lobes unite dorsally into a pointed anterodorsally directed prominence, petiole originates below this prominence; ventrally glabrous as the lateral lobes fade (Figs. 215, 216); Gt<sub>1-3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.7x as long as Gt<sub>2</sub> and 1.8x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.4x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with group of setae laterally and with carinate lip anteriorly which is fused to lateral lobes of Gs<sub>1</sub> anterodorsally, Gt<sub>1</sub> also with two submedian carinae which extend half its length; a deeply recessed crescentic cavity is located between dorsal prominence and Gt<sub>1</sub>; Gt<sub>2-3</sub> aetose; remaining terga evenly setose, except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Unknown.

**Distribution.** Known only from Ecuador (Fig. 291).

**Biology.** Unknown.

**Comments.** The holotype has both right wings and the gaster mounted separately on the same card.

**Material Examined.**

**Type Material: ECUADOR: Zamora:** Jumboe Riv., 1–2.iv.1965, 1200m, L. Pena (Holotype ♀, CNC).

***Rileya auranti*, new species**

(Figs. 135, 136, 138)

**Etymology.** Named for its uniformly orange color; Latin noun *auranti* meaning "orange".

**Diagnosis.** This species resembles *R. haumani* in general coloration and size but is differentiated by the clypeus being pointed medially (bilobate in *R. haumani*), postorbital carina extending to near dorsal eye margin (absent from *R. haumani*), two anelli (three in all other orange species, including *R. haumani*) (Fig. 138, infusate wing (Fig. 139), Gt<sub>1</sub> with fine to robust transverse carina anteriorly (Fig. 135), which is effaced medially (not effaced in *R. haumani*).

**Description.** Female. Length 2.2–3.4 mm. Color completely orange except for Gt<sub>7+8</sub> and tips of ovipositor sheath, which are brown; wing pale amber, venation brown.

*Head.* Umbilicate to striate. Subtriangular in frontal view, numerous strong striae radiating from clypeus toward lower eye margin and scrobal depression. Clypeus with medial point ventrally, point connected to interantennal prominence by carina; supraclypeal area not elevated above remainder of face, striate. Malar space 0.3–0.4x eye height, postorbital carina present extending posteriad eye, fading before vertex. Eye glabrous. Scrobal depression deep, margined, intrascrobal lamina present, extending <0.2x length of scape. Scape 3.4–3.6x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 subequal in length; F1 1.7–2.0x as long as broad, subsequent funiculars subequal in length (Fig. 138); clava 2.0–2.3x as long as broad, segmented, tapering apically.

*Mesosoma.* Umbilicate dorsally. Midlobe of mesoscutum 0.8–1.1x as long as broad, notaulus incomplete, only slightly indicated anteriorly. Scutellum 1.1–1.2x as long as broad, crudely carinate apically; lateral panel of axilla evenly setose, umbilicate to glabrate. Mesepisternum slightly striate-reticulate; mesepimeron glabrate-striate. Propodeum carinate, complete primary costula oriented transversely, two submedian carinae connect costula to dorsellum; several complete or incomplete plicae connecting costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus moderately setose. Forewing infusate except posteriad marginal vein (Fig. 139), 2.3–2.5x as long as broad, stigma 0.4–0.5x as long as stigmal vein, stigma not produced posteriorly, uncus fine, marginal vein 1.1x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole not visible in dorsal view. Gaster not flattened. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate; remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 4.0–5.0x as long as Gt<sub>2</sub> and 1.4–1.5x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 1.0–1.2x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with transverse, medially effaced carina, Gs<sub>1</sub> produced anteriorly as a fine collar encircling petiole ventrally; Gt<sub>1</sub> with group of setae laterally, Gt<sub>2</sub> with transverse row of setae subdorsally, Gt<sub>3</sub> with transverse row of setae; remaining terga evenly setose, except Gt<sub>4</sub> in anterior fourth; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view (Fig. 135).

**Variation.** The wing infuscation of the paratype is only present posteriorly the stigma and parastigma, and this specimen has the least prominent production of the carina on Gt<sub>1</sub>.

**Male.** Unknown.

**Distribution.** Known from Brazil (Fig. 293).

**Biology.** Unknown.

**Comments.** The type is card mounted and in good condition.

**Material Examined.**

**Type Material:** BRAZIL: Agua Vermillas, vii.83, M. Alvarenga (Holotype ♀, CNC). Paratype, ♀, same data as holotype (1♀ USNM).

***Rileyia bicolor*, new species**

(Figs. 49–50)

**Etymology.** Named for the abrupt color differentiation seen between body regions.

**Diagnosis.** Several species of *Rileyia* (e.g., *R. insularis*, *R. cecidomyiae*, *R. asiatica*) share similar gastral structure (female: gaster sessile with Gt<sub>1-3</sub> foreshortened and distinctly separated; male: gaster petiolate, Gt<sub>1-2</sub> foreshortened, Gt<sub>3</sub> reaching middle of gaster). However, the coloration of *R. bicolor* is distinctive: mesosoma brown, head and gaster pale yellow, brown maculation dorsally on Gt<sub>3-4</sub> and on occiput (generally concolorous dark brown to black in *R. insularis*, *R. cecidomyiae*, *R. asiatica*). The male petiole is glabrate, lacking the rugose or carinate sculpture seen in similar species mentioned above, and the scape has the ventral plaque extending its entire length (seen also in *R. asiatica*).

**Description.** Male. Length 1.7–1.8 mm. Color pale yellow to golden except for the brown occipital region, mesosoma, and maculation dorsally on Gt<sub>3-4</sub>. Wing hyaline, venation light brown.

**Head.** Finely reticulate. Ovate in frontal view, several striae radiating from clypeus toward lower eye margin. Clypeus slightly bilobate; supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space

0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal lamina absent. Scape 3.0–3.2x as long as broad, broadest medially, with ventral plaque extending length of scape; anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 subequal in length; F1 1.0–1.1x as long as broad, subsequent funiculars subequal in length; clava 2.2–2.8x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate. Midlobe of mesoscutum 1.1x as long as broad, notaulus complete, faint. Scutellum 1.2–1.4x as long as broad, carinate apically; lateral panel of axilla asetose, except for few setae laterally along scutoscutellar sulcus, reticulate. Mesepisternum slightly reticulate; mesepimeron glabrous-striate. Propodeum rugulose-reticulate, primary costula angulated submedially to contact dorsellum, posteriorly incomplete median carina present; several plicae connecting costula with nucha and dorsellum; spiracle obliquely oriented, slightly reniform, <0.5x its length from dorsellum; callus sparsely setose. Forewing 2.3–2.4x as long as broad, stigma 0.4–0.6x as long as stigmal vein, stigma not produced posteriorly, uncus fine, marginal vein 1.2–1.4x as long as postmarginal vein. Wing completely setose in apical two-thirds.

*Metasoma.* Petiole visible in dorsal view, 1.1–1.6x as long as broad, glabrate, with carinate lip anteriorly abutting nucha (Fig. 49). Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate; remaining terga reticulate; Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 1.7–3.0x as long as Gt<sub>2</sub> and 0.8–1.3x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 2.1–2.5x as long as Gt<sub>4</sub>; Gs<sub>1</sub> produced anteriorly as a fine collar encircling petiole ventrally; Gt<sub>1-2</sub> asetose; Gt<sub>3</sub> with dorsally incomplete transverse row of setae; remaining terga evenly setose, except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in posterior view.

**Female.** Identical to male except as follows: scape broadest basally, lacking ventral plaque; petiole not visible in dorsal view; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.4–6.5x as long as Gt<sub>2</sub> and 2.0–2.1x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.7–0.8x as long as Gt<sub>4</sub> (Fig. 50); Gs<sub>1</sub> not produced; Gt<sub>4</sub> with elongate triangular spot dorsally; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view. Tips of ovipositor sheaths dark brown.

**Variation.** Slight variation exists in the completeness and extent of the costula and plicae on the propodeum. Maculation on male Gt<sub>4</sub> can be incomplete or sometimes with subdorsal golden fascia. A few specimens have the costula turning anteriorly to intercept dorsellum submedially.

**Distribution.** Known only from the Dominican Republic (Fig. 290).

**Biology.** Unknown.

**Comments.** The holotype is complete. One female paratype has been disarticulated and the pieces mounted separately on the same card. One male paratype has the gaster removed and mounted separately on the same card, and another is missing the left clava.

**Material Examined.**

**Type Material:** DOMINICAN REPUBLIC: **Baoruco:** Sierra de Bahoruco, Alcoa Rd., km 25, 18.i.89, L. Masner, Montane dry forest (Holotype  $\sigma$ , CNC). Paratypes, 2 $\text{Q}10\sigma$ , same data as holotype (1 $\text{Q}5\sigma$  CNC; 1 $\text{Q}5\sigma$  USNM); **Barahona:** 7km NW Paraiso, 200m, 27.xi.1991, L. Masner & S. Peck, rainforest remnant (2 $\sigma$  CNC).

***Rileya bisulcata*, new species**

(Fig. 153)

**Etymology.** Compound participle from Latin *sulco*, meaning "to furrow". Named for the distinctive grooves on the first gastral tergite.

**Diagnosis.** A very distinctive species that apparently has  $Gt_{1-4}$  fused and forming a carapace over more than three quarters of the gaster.  $Gt_{1-4}$  is glabrous in the anterior three quarters and produced anteriorly as three elongate "prongs" separated by two deep sulci (Fig. 153). The medial "prong" is received by a concave area on the dorsum of the petiole.

**Description.** Male. Length 1.6 mm. Color brown, darker dorsally fading to lighter brown on the mesosoma. Extremities pale yellow, including face laterad and ventrad scrobal depression. Wing hyaline, venation light brown.

**Head.** Finely reticulate to imbricate. Subtriangular in frontal view, lacking striae radiating from clypeus toward lower eye margin. Clypeus slightly produced, rounded apically; supraclypeal area slightly elevated above remainder of face, finely imbricate. Malar space 0.5x eye height, postorbital carina fine, fading before vertex. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal lamina absent. Scape 3.0x as long as broad, broadest medially, with ventral plaque extending length of scape; anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 subequal

in length; F1 1.1x as long as broad, subsequent funiculars subequal in length; clava 4.0x as long as broad, segmented, tapering apically.

*Mesosoma*. Finely, transversely reticulate-umbilicate becoming finely umbilicate. Midlobe of mesoscutum 1.5x as long as broad, notaulus complete, faint. Scutellum 1.4x as long as broad, carinate apically; lateral panel of axilla asetose, except for few setae laterally along scutoscutellar sulcus, finely imbricate. Mesepisternum striate; mesepimeron finely reticulate-striate. Propodeum rugulose, primary costula angulated submedially and connected to dorsellum by two submedian carinae, posteriorly incomplete median carina present; several plicae nearly connecting costula with nucha and dorsellum; spiracle circular, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.0x as long as broad, stigma 0.3x as long as stigmal vein, stigma not produced posteriorly, uncus fine, marginal vein 2.5x as long as postmarginal vein. Wing completely setose in apical two-thirds.

*Metasoma*. Petiole visible in dorsal view, roughly as long as broad, rugulose, with carinate lip anteriorly abutting nucha (Fig. 153) and two longitudinal carinae dorsolaterally. Gt<sub>1-4</sub> glabrous in anterior three-fourths, becoming reticulate posteriorly; Gt<sub>5</sub> reticulate; remaining terga reticulate; Gt<sub>1-4</sub> fused into carapace; Gt<sub>1-4</sub> 10.4x as long as Gt<sub>5</sub>; Gs<sub>1</sub> produced anteriorly as a robust collar encircling petiole, robustly carinate ventrally; Gt<sub>1-4</sub> with single, erect seta anterolaterally, with transverse row of setae dorsally at one quarter length and moderately setose in apical quarter; remaining terga sparsely setose; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> mask shaped in posterior view.

**Female.** Unknown.

**Distribution.** Known only from Ecuador (Fig. 290).

**Biology.** Unknown.

**Comments.** The holotype is card mounted and complete.

**Material Examined.**

**Type Material:** ECUADOR: Napo: Tiputini Biodiversity Station, 216m, 00°37'55"S 76°08'39"W, 6.ii.1999, Lot # 2066, Transect 7, T. Erwin et al. Canopy fogging bare leaves, some w/ bryophytic/lichenous coat. (Holotype ♂, EPNC).



***Rileya bumeliae*, new species**

(Figs. 141–144)

**Etymology.** Named for the genus of host plant from which the type material was reared.

**Diagnosis.** This species is similar to *R. cecidomyiae* and *R. insularis* in gross structure but is separated by its golden color described below (dark brown in *R. cecidomyiae* and *R. insularis*). Further, the facial striae are fewer and do not reach the lower eye margin. A faint postorbital carina is present posteriad eye only. The propodeum has the primary costula incomplete medially, turning anteriorly to intercept the dorsellum independently.  $Gt_4$  more completely covers  $Gt_5$  dorsally (Fig. 142) than in *R. cecidomyiae* and *R. insularis* (Figs. 164, 219). Finally, the mesopleuron lacks any distinctive striation or rugosity as seen in similar species.

**Description.** Female. Length 2.5 mm. Color brown except for the scape basally, pedicel apically, and flagellum, which are golden or pale yellow. The face, excluding scrobal depression, eye orbit, except just laterad of anterior ocellus (Fig. 144), pronotum with two spots dorsolaterally and anterolaterally, lateral lobe of mesoscutum laterally and medially along notaulus, axillula, mesopleuron dorsally, and metapleuron anterodorsally are all golden. The femur basally and apically, the tibia and the tarsus are pale yellow. Wing hyaline, venation brown.

**Head.** Reticulate-striate. Subovate in frontal view, few striae radiating from clypeus not reaching lower eye margin. Clypeus straight; supraclypeal area not elevated above remainder of face, finely reticulate. Malar space 0.6x eye height, postorbital carina fine, present only posteriad eye, fading before reaching vertex or malar space. Eye glabrous. Scrobal depression deep, margined, intrascrobal carina absent. Scape 5.0x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent funiculars subequal; clava 2.2x as long as broad, segmented, tapering apically.

**Mesosoma.** Finely transversely reticulate. Midlobe of mesoscutum 1.0x as long as broad, notaulus complete, slightly indicated. Scutellum 1.3x as long as broad, crudely carinate apically; lateral panel of axilla setose in posterior half, reticulate. Mesepisternum finely rugulose-striate; mesepimeron finely striate-rugulose. Propodeum reticulate rugose, with incomplete primary costula angulated anteriorly to intercept dorsellum submedially; fine median

carina extends between dorsellum and nucha, several plicae submedially connecting costula with dorsellum, fewer plicae between costula and nucha; spiracle, obliquely oriented, reniform,  $\sim 0.5x$  its length from dorsellum; callus sparsely setose. Forewing  $1.9x$  as long as broad, stigma  $0.5x$  as long as stigmal vein, marginal vein  $0.9x$  as long as postmarginal vein; forewing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub>  $2.6x$  as long as Gt<sub>2</sub> and  $1.1x$  as long as Gt<sub>3</sub>, Gt<sub>1-3</sub>  $1.0x$  as long as Gt<sub>4</sub> (Fig. 142); Gt<sub>3</sub> with one seta subdorsally on each side, remaining terga sparsely setose except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 2.2–2.3 mm. Identical to female except as follows: scape  $3.4$ – $3.6x$  as long as broad, with ventral plaque in apical half; petiole visible in dorsal view (Fig. 141),  $1.3x$  as long as broad, rugulose, broadest anteriorly where produced as a carinate flange abutting nucha; Gt<sub>1-2</sub> glabrous, foreshortened, remaining terga reticulate; Gt<sub>1</sub>  $2.2$ – $2.4x$  as long as Gt<sub>2</sub> and  $0.9x$  as long as Gt<sub>3</sub>, Gt<sub>1-2</sub>  $1.3x$  as long as Gt<sub>3</sub>; remaining terga sparsely but evenly setose except Gt<sub>3</sub> dorsally; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> not visible dorsally, hemispherical in posterior view (Fig. 143).

**Distribution.** Known only from Texas (Fig. 297).

**Biology.** Reared from galls of *Bruggmanniella bumeliae* (Felt) on *Bumelia lanuginosa* (Michx.) (Sapotaceae; now *Sideroxylon lanuginosum* [Mich.]). Gagné (1994) indicates that this cecidomyiid forms an irregular, polythalamous twig gall, with each cell occupied by a host larva, and occurs, minimally, west to southeastern Arizona (Gates pers. obs.).

**Comments.** The type material is point mounted and in excellent condition.

**Material Examined.**

**Type Material:** UNITED STATES: Texas: Uvalde: Uvalde (Duccini Rd.), 18-iv-1990, J. W. Stewart, ex *Asphondylia bumeliae* on *Bumelia lanuginosa*; *Riley* n. sp. E. Grissell, 1990, 90-6308 (Holotype ♀, USNM). Paratypes, 2♂, same data as holotype (USNM).

***Riley* canalicoxa** Subba Rao

(Figs. 145–147)

*Rileyia canalicoxa* Subba Rao, 1978: 316–318. Holotype ♀, Brazil (BMNH, examined).

**Diagnosis.** This species resembles *R. panamae* and *R. quadraticaulis* in general form and coloration but is separable as follows: apparent  $Gt_1$  small and nearly completely fused with subsequent terga actually representing the fusion of  $Gt_{1+2+3}$ , with grooves indicating former independence slightly visible at certain angles within apparent  $Gt_1$  (Fig. 146) (*R. panamae* has a few setae apically); metacoxa distinctly transversely carinate (acarinata in *R. panamae* and *R. quadraticaulis*); mesopleuron distinctly striate (only mesepimeron striate in *R. panamae*, mesepimeron finely reticulate-glabrate dorsally and striate ventrally in *R. quadraticaulis*); face reticulate; clypeus produced as flap ventrally (Fig. 147) (apically rounded with slight medial cleft in *R. panamae*, bilobate in *R. quadraticaulis*).

**Description.** Female. Length 2.0 mm. Color brown except for legs and antennae, which are golden. Wing hyaline, venation light brown.

*Head.* Reticulate. Triangular in frontal view, striae not radiating from clypeus. Clypeus produced, apical margin straight (Fig. 147); supraclypeal area slightly elevated and similarly reticulate to remainder of face. Malar space 0.6x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 3.5x as long as broad, broadest basally; anelli transverse, each increasing in width and length apically; F1 0.8x as long as broad, subsequent funiculars subequal; clava 2.2x as long as broad, segmented and tapering apically (Fig. 145).

*Mesosoma.* Transversely reticulate. Midlobe of mesoscutum 1.2x as long as broad, notaulus complete, slightly indicated. Scutellum 1.4x as long as broad, carinate apically; lateral panel of axilla sparsely setose, reticulate. Mesepisternum and mesepimeron continuously striate. Propodeum with complete primary costula, strongest plicae medially connecting it with dorsellum and nucha; irregular, weaker plica connect costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.5x its length from dorsellum; callus sparsely setose. Metacoxa with several transverse carinae partially encircling coxa posteriorly. Forewing 2.6x as long as broad, stigma 0.5x as long as stigmal vein, marginal vein 1.7x as long as postmarginal vein.

*Metasoma.* Petiole not visible in dorsal view.  $Gt_{1+2(+3?)}$  glabrous, remaining terga reticulate;  $Gs_1$  produced anteriorly as glabrous carinate collar encircling

petiole ventrally; apparent Gt<sub>1</sub> foreshortened, faint indication that Gt<sub>2</sub> and Gt<sub>3</sub> have fused with Gt<sub>1</sub>; Gt<sub>1+2(+3?)</sub> 0.1x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>4</sub> in anterior third; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 146); Gt<sub>7+8</sub> triangular in dorsal view (Fig. 146).

**Male.** Unknown.

**Distribution.** Known only from Brazil (Fig. 290).

**Biology.** Unknown.

**Comments.** The type specimen is point mounted and complete.

**Material Examined.**

**Type Material: BRAZIL: Santa Catarina:** Nova Teutonia, 27°11B 52°23L; 20.viii.1937, Fritz Plaumann, B. M. 1937-656; Holotype [circular label with red edge]; *Rileyia canalicoxa* sp. n., B. R. Subba Rao det. 1978; B.M. Type Hym. 5-2693 (Holotype ♀, BMNH). Paratypes, 29♀1♂, data as follows: same data as holotype (23♀ BMNH), same data as holotype but with different dates: 3.vii.1943 (3♀ BMNH); 3.vi.1938 (10♀ BMNH); 4.vi.1938 (10♀ BMNH); Curitiba, on *Baccharis*, 1963, F. D. Bennett (6♀1♂ BMNH).

***Rileyia carinaegaster* Subba Rao**

(Figs. 148, 149, 152)

*Rileyia carinaegaster* Subba Rao, 1978: 315. Holotype ♀, by original designation. Trinidad & Tobago (BMNH, examined).

*Rileyia trinidadensis* Subba Rao, 1978: **New synonymy.**

**Diagnosis.** This species is similar to *Rileyia minuta*, *R. protuberanota*, and *R. abnormicornis* with respect to propodeal sculpture, forewing venation and setation (Fig. 232), and moniliform antenna with minute anelli but is separated by the following: F1 longest flagellomere (neither as distinctly pedicellate as *R. abnormicornis* nor as moniliform as in *R. minuta* and *R. protuberanota*) (Fig. 148); propodeum reticulate with primary costula rendered incomplete medially by two divergent submedian carinae, costula elevated into blunt point sublaterally (Fig. 152) (costula of *R. abnormicornis* finer and approaches dorsellum more closely for a greater distance and plicae are fewer, not seen in the aforementioned similar species); coarse umbilicate

sculpture (sculpture reticulate in *R. minuta*, *R. abnormicornis*, and *R. protuberonota*);  $Gs_1$  distinctly produced anteriorly as a collar abutting nucha with robust longitudinal carinae buttressing anterior lip of collar (cf. Fig. 232) (*R. abnormicornis* and *R. minuta* with similar production);  $Gt_1$  distinctly produced anteriorly as carinate ridge with 5 distinct carinae extending posteriorly from ridge to half length of  $Gt_1$  (Fig. 152) (*R. abnormicornis*, *R. protuberonota* and *R. minuta* do not have a modified  $Gt_1$ ).

**Description.** Female. Length 1.7–2.8 mm. Color black except for the meso- and metacoxa, legs, and scape, which are golden. The pedicel and flagellum is brown. Wing hyaline, venation light brown.

*Head.* Umbilicate to striate. Subtriangular in frontal view, striae radiating from clypeus reaching lower eye margin. Clypeus emarginate; supraclypeal area at same level as remainder of face, glabrate, with carina extending between clypeus to toruli. Malar space 0.3–0.4x eye height, postorbital carina present, extending posteriad eye to vertex, continuing around anterior edge eye to intercept postorbital carina ventrally. Eye glabrous. Scrobal depression deep, margined, intrascrobal carina absent. Scape 3.8–4.3x as long as broad, broadest basally; both anelli minute, transverse, subequal in length and width; F1 1.5–2.7x as long as broad, subsequent funiculars decreasing slightly in length, moniliform; clava 1.7–2.4x as long as broad, indistinctly segmented and tapering apically (Fig. 148).

*Mesosoma.* Coarsely umbilicate, interstices reticulate. Midlobe of mesoscutum 1.1–1.4x as long as broad, notaulus complete, slightly indicated by differences in sculpture. Scutellum 1.1–1.3x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum and mesepimeron reticulate. Propodeum with incomplete primary costula, interrupted by two divergent submedian carinae (Fig. 152); spiracle obliquely oriented, reniform, <0.5x its length from dorsellum; callus sparsely setose. Forewing 2.1–2.5x as long as broad, sparsely setose, stigma 0.9–1.0x as long as stigmal vein, marginal vein 2.5–3.0x as long as postmarginal vein.

*Metasoma.* Petiole not visible in dorsal view.  $Gt_{1-3}$  reticulate in anterior half, glabrous posteriorly, remaining terga reticulate;  $Gt_{1-3}$  foreshortened;  $Gt_1$  produced anteriorly as robust carinate collar with five longitudinal carinae extending posteriorly half the length  $Gt_1$ ;  $Gs_1$  with robust carinate collar anterolaterally, abutting nucha, and continuous with  $Gt_1$  collar, with robust longitudinal carinae buttressing it (cf. Fig. 230);  $Gt_1$  1.8–3.7x as long as  $Gt_2$  and 1.5–2.8x as long as  $Gt_3$ ,  $Gt_{1-3}$  0.5–0.7x as long as  $Gt_4$ ; remaining terga

evenly setose; Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** The specimen from St. Augustine has antennae in which the funiculars are slightly more pedicellate than those of other specimens of *R. carinaegaster* and is also dark brown rather than black.

**Male.** Unknown.

**Distribution.** Known from Central and South America (Fig. 290).

**Biology.** Unknown.

**Comments.** In Subba Rao (1978), *Rileya carinaegaster* does not key out; rather *Rileya trinidadensis* keys out under the key character of *R. carinaegaster*. Because *R. carinaegaster* is the only species actually described and *R. trinidadensis* is only mentioned in the key, I assume that the name *trinidadensis* was proposed earlier, ultimately became *R. carinaegaster*, and was never edited out before publication. Thus, *R. trinidadensis* is a *lapsus* yet available name, herein synonymized.

**Material Examined.**

**Type Material: TRINIDAD & TOBAGO: St. Patrick:** Caura, 14.viii.1976; Coffee plantation and Rainforest; J. S. Noyes, Brit. Mus., 1976-462 [upside-down under locality label]; Holotype; *Rileya carinaegaster* sp. n. ♀ det. B. R. Subba Rao 1978; B. M. Type Hym. 5-2691 (Holotype ♀, BMNH). Paratypes, 6♀, data as follows: **TRINIDAD & TOBAGO: St. George:** Port Gourde, 8.viii.1976, J.S.Noyes (1♀ BMNH); Tumpuna Reserve, Caribbean Pine Plantation, 7.viii.1976, J.S.Noyes (1♀ BMNH); St. Augustine, xi.1976, F. D. Bennett (4♀ BMNH).

**Other Material: BRAZIL: Amazonas:** Manaus, Reserva Ducke, 2°55'S 59°58'W, 2.vii.1997, J. Heraty, H97-043, Sweep scrub (1♀ UCR); Reserva ZR2 off BR 174, ~50km N Manaus, 2°38'S 60°09'W, 28.vii.1997, J. Heraty, H97-045, Sweep roadside (1♀ MZSP). **PANAMA: Colón:** Barro Colorado Island, 24.viii.1978, R. B. & L. S. Kimsey (1♀ UCD). **TRINIDAD & TOBAGO: St. George:** St. Augustine, 19.vi.1976, J. S. Noyes, Brit. Mus., 1976-462, Wasteground (1♀ BMNH).

*Rileya cattleyae*, new species

(Figs. 150, 151, 160, 161)

**Etymology.** The specific name refers to the orchid genus, *Cattleya*, with which this species is associated.

**Diagnosis.** Similar to the other species in this complex which are suspected parasitoids of aerial root galls (Cecidomyiidae) on Orchidaceae. *Rileyia cattleyae* is most easily confused with *R. laeliae*, *R. orchideara*, *R. guatemalae*, and *R. oncidii* but is recognized as distinct because it possesses a deep scrobal depression with an intrascrobal lamina extending its entire length (Fig. 161) and the produced clypeus is concave ventrally (Fig. 161). The clypeus of *R. oncidii* is similarly produced but is not distinctly concave ventrally (Fig. 250), whereas the clypeus of *R. glabra* and *R. guatemalae* is slightly less produced and more or less truncate ventrally. Other similar species mentioned above have shallower scrobal depressions (Fig. 184) and the intrascrobal lamina absent or shorter (Figs. 184, 195). The propodeum of *R. cattleyae* has fine, irregular, longitudinal rugae and a complete primary costula present which is angulated anteriorly and unites as a median carina to intercept the dorsellum, whereas most of the other species in this complex have a completely reticulate propodeum (*R. guatemalae*) or variously produced median carinae and associated plicae (*R. laeliae*, *R. oncidii*, *R. orchideara* [Fig. 57]). The general sculpture on the head and mesosoma of *R. cattleyae* is a dense reticulation, bordering on punctation, whereas all of the related species in this complex have glabrate or imbricate sculpture (cf. Figs. 53, 55, 57). The eye is sparsely setose, a feature shared with *R. oncidii*, *R. orchideara* (Fig. 53), and *R. glabra* (setae slightly longer; Fig. 184). Gastral tergum 1 is slightly sculptured anteriorly with fine punctation or rugosity (Fig. 151). A similar state occurs in *R. oncidii*, although more pronounced (Fig. 247). The petiole in male *R. cattleyae* is cylindrical and reticulate-punctate (Fig. 160), a state not seen in males of related species.

**Description.** Female. Length 2.3–3.1 mm. Color dark brown except for the following which are light brown or golden: frons immediately laterad of scrobal depression, anterolateral portion pronotum, mesepisternum dorsally and ventrally, metapleuron dorsally and ventrally, portions of coxae, trochanter, basal three-fourths of femur, gaster laterally and ventrally (light brown); antenna and remainder of legs (golden). Wing hyaline, venation yellowish.

*Head.* Reticulate. Ovate in frontal view, striae radiating from clypeus absent. Clypeus produced ventrally, apex concave (Fig. 161); supraclypeal area at same level as remainder of face, reticulate-rugulose. Malar space 0.4–0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression deep, margined, intrascrobal carina present, extending almost to apex of scrobal depression (Fig. 161). Scape 4.2–4.6x as long as broad, broadest basally; anelli quadrate to transverse, A1 longer than broad, narrowest, A2 and A3 transverse, each increasing slightly in width, subequal in length; F1 0.8–1.0x as long as broad, subsequent subequal in length; clava 2.2–2.4x as long as broad, segmented, tapering apically.

*Mesosoma.* Reticulate. Midlobe of mesoscutum 1.1–1.2x as long as broad, notaulus complete, distinct. Scutellum 1.3–1.4x as long as broad, finely carinate apically; lateral panel of axilla setose, reticulate. Mesepisternum reticulate; mesepimeron glabrate, slightly striate. Propodeum rugose-reticulate with fine primary costula which unites medially and turns anteriorly to intercept dorsellum; numerous irregular rugae over remainder of propodeum; spiracle subcircular, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.4x as long as broad, stigma 0.4x as long as stigmal vein, uncus elongate (Fig. 150), marginal vein 1.1–1.3x as long as postmarginal vein. Wing with complete setation.

*Metasoma.* Petiole not visible in dorsal view. Gaster laterally flattened. Gt<sub>1-2</sub> glabrous, Gt<sub>1</sub> with crescentic, rugulose depression abutting petiole (Fig. 151), Gt<sub>3</sub> glabrate; remaining terga reticulate; Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 1.7–2.0x as long as Gt<sub>2</sub> and 1.5–2.7x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.8–2.0x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with one seta anterolaterally, Gt<sub>3</sub> with 2-3 dorsally incomplete, transverse rows of setae subdorsally; remaining terga evenly setose except Gt<sub>4</sub> anterolaterally and dorsomedially; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 151); Gt<sub>7-8</sub> not visible in dorsal view.

**Male.** Length 1.5–2.4 mm. Identical to female except as follows: petiole visible in dorsal view, 0.8x as long as broad, reticulate, convex dorsally (Fig. 160); Gt<sub>1</sub> 1.2x as long as Gt<sub>2</sub> and 1.1x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.4x as long as Gt<sub>4</sub>; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 160); Gs<sub>1</sub> convex, reticulate anteriorly, anterior margin slightly produced and collarlike; metacoxa slightly more globose than in female.

**Variation.** The type series is essentially invariant but some differences are seen in the extent and completeness of the costulae and rugae on the propodeum. Some specimens have the clypeus slightly less excavated



apically, whereas others have the intrascrobal lamina slightly less distinct dorsally.

**Distribution.** Known from Colombia and [?] Peru (Fig. 290).

**Biology.** *Cattleya* is a Neotropical orchid genus that is recorded as a host of *Neolasioptera* sp. (Gagné 1994), a genus of Cecidomyiidae attacking orchid roots. The gall is a characteristic swelling on the aerial roots of the plant. Additional material examined has preserved root galls in which heads of *R. cattleyae* are visible at emergence holes. They were apparently either dispatched before emergence could be completed or failed to emerge successfully.

**Comments.** The type series was intercepted in three separate orchid lots from Colombia at the Brownsville, Texas, port of entry. Three additional orchid lots from Peru, Ecuador, and Colombia were intercepted at the Miami, Florida port of entry. Where indicated, all material subsequently emerged from *Cattleya* sp. (Orchidaceae) root galls. The type material appears to have been dispatched and mounted immediately on emergence as many specimens have crumpled wings and cuticular remnants from the pupal stage on the antenna. Several paratypes are damaged: three specimens from Colombia, 1939 series missing gaster and legs; gaster, head, and all but one leg; both wings. Two specimens from Medellín are missing gaster and wings, respectively. One female specimen from the type locality is disarticulated with its head and gaster mounted separately on the same point.

**Material Examined.**

**Type Material:** **COLOMBIA: Antioquia:** Medellín, 10.ix.1941, Galls on roots of *Cattleya* sp. Brownsville, No. 48798; Lot No. 41-16063 [intercepted Brownsville POE] (Holotype ♀, USNM). Paratypes 26♀2♂, same data as holotype (4♀2♂ USNM); Colombia, 17.viii.39, In *Cattleya* root gall; Lot No. 39-12970 (6♀ CNC); Colombia, S.A.; Brownsville # 50837; Lattimore galls on *Cattleya* root; Lot No. 42-5586 (1♀ USNM); Colombia, 27.xi.39, *Cattleya* sp.; LotNo 39-19857 [4♀ on 3 points]" (4♀ USNM); Colombia, S. A., on orchid; at Wash. D. C., 15.iii.1934; B.P.Q. No. A24133 (2♀ USNM); Ecuador (Miami POE), 22.vii.1968, A. S. Mills, orchid root (2♀ USNM); Peru (Miami POE), 26.v.1961, W. T. Rowon, orchids (1♀ USNM); Palmira, Col. [Colombia?], 7.v.1972, A. Trochez, *Cattleya* (1♀ USNM).

***Rileya cearae* (Crawford), new combination**

(Figs. 154–157, 159)

*Calorileya cearae* Crawford, 1910: 236. Lectotype, ♀, here designated. Brazil (USNM, examined).

**Diagnosis.** Similar to other species possessing an enlarged stigma and a mostly golden coloration (*R. megastigma*, *R. petiolata*, some *R. hegei*) but differs because specimens of *R. cearae* possess dark brown maculation in the form of a longitudinal median stripe extending from the midlobe of the mesoscutum to Gt<sub>4</sub> (similar species above never have a distinct stripe but can have minimal, blotchlike maculation) the remaining terga with transverse brown band basally (Fig. 159). Scrobal depression margined with an intrascrobal lamina separating scapes present (Fig. 155). Stigma 1.1–1.7x as long as stigmal vein (Fig. 156), and the stigmal maculation extends posteriorly to the middle of the forewing (some *R. hegei* with slight maculation surrounding stigma but this never extends to middle of forewing).

**Description.** Female. Length 2.8–4.1 mm. Body golden, except for the following, which are dark brown: occiput dorsally, medial flange of pronotum, midlobe of mesoscutum medially, anterior two-thirds of scutellum medially, broad band on propodeum medially, Gt<sub>1,3</sub> dorsomedially, transverse bands across dorsum in anterior three-fourths of Gt<sub>2</sub>, all of Gt<sub>3</sub>, Gt<sub>4</sub> dorsomedially in anterior three-fourths, remaining terga with transverse bands in anterior one-half, visible beneath preceding tergum, and tips ovipositor sheath (Fig. 159). Wing hyaline; venation light brown, stigma dark brown.

**Head.** Umbilicate. Subtriangular in frontal view, striae radiating from clypeus toward lower eye margin and extending past lower margin of scrobal cavity, clypeus distinctly bilobate. Malar space 0.5–0.7x eye height. Scrobal depression deep, margined, narrowed dorsally, with distinct intrascrobal lamina, extending one-half to one-third length of scape (Fig. 155). Scape 3.3–4.4x as long as broad, narrowing slightly apically, anelli transverse, each increasing in length and width apically; F1 1.0–1.4x as long as broad, subsequent funiculars subquadrate and subequal; clava 2.0–2.4x as long as broad, segmented, tapering apically.

**Mesosoma.** Umbilicate. Dorsum evenly setose; mesoscutum 1.0–1.3x as long as broad, notaulus complete. Scutellum 0.9–1.1x as long as broad, finely carinate apically. Propodeum rugulose-reticulate, primary costula oriented transversely, intercepted by median longitudinal carina connecting it and the

dorsellum, complete or incomplete plicae connecting primary costula to nucha and dorsellum; callus and posteroventral propodeum sparsely setose. Spiracle obliquely oriented, reniform,  $\sim 1.0x$  its length from dorsellum. Forewing 2.2–2.7x as long as broad; stigma 1.1–1.7x as long as stigmal vein, postmarginal vein 1.0–1.3x as long as marginal vein, costal cell lacks marginal fringe.

*Metasoma*. Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, remaining terga finely reticulate, Gt<sub>1</sub> 3.1–12.0x as long as Gt<sub>2</sub> and 1.6–2.8x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.6–0.9x as long as Gt<sub>4</sub>, Gt<sub>1</sub> with 3–4 setae dorsolaterally near anterior margin, Gt<sub>3</sub> with two dorsally incomplete transverse rows of setae, remaining terga evenly setose, except dorsal surface Gt<sub>4</sub>, Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 3.4 mm. Identical to female except as follows: scape with ventral plaque in apical half (Fig. 164); stigma slightly larger than in female; petiole distinct in dorsal view, 1.4x as long as broad, with anteriorly directed flange encircling petiole and abutting nucha, longitudinally rugulose (Fig. 154).

**Variation.** Primary variation occurs in the brown maculation dorsally on the mesosoma and metasoma, size of the stigma, and presence of wing infuscation. The maculation varies in both its width and its length if it is present (e.g., stripe on scutellum can be entirely absent or extend one-half to three-fourths scutellum length). Wing infuscation can be a diffuse aura around the stigma or a discrete blotch extending posteriorly from the stigma to wing midline. The specimens from Costa Rica do not have the stigma as large and rounded.

**Distribution.** Known only from South America (Fig. 290).

**Biology.** Reared from galls of *Mayrellus mirabilis* Crawford (Crawford 1910). *Mayrellus mirabilis* (Pteromalidae: Ormocerinae) belongs to a subfamily whose members are associated with plant galls. Whether these ormocerines are phytophagous within the gall or parasitic on a cecidomyiid gall former has not been demonstrated (Bouček & Rasplus 1991; Heydon 1995), although certain taxa (*Hemadas*, *Trichilogaster*) are known gall formers (Bouček & Heydon 1997; Bouček 1988b).

**Comments.** The lectotype is point mounted and complete. The flagellum of one of the paratypes is slide mounted (with two labels: “Hym. Slide 12” and

“Ceara, Bra[j?], F. de la Rocha [different spelling from that on specimen labels], gall 17a & 18a”). Crawford based his original description on 12 specimens but only 11 have been located.

**Material Examined.**

**Type Material:** BRAZIL: Ceará: Ceará, FDdaRocha; TypeNo 13351 USNM [red label]; *Calorileya cearae* ♀ Type, Cwfd [handwritten]” (Lectotype ♀, USNM). Paralectotypes, 8♀2♂, same data as holotype (7♀2♂ USNM, 1♀ NMW; examined).

**Other Material:** ARGENTINA: Misiones: Loreto, A. A. Oglobin (1♂ MLPA). PARAGUAY: La Cordillera: San Bernardino, K. Fiebrig (5♀ USNM).

***Rileyia cecidomyiae* Ashmead**

(Figs. 52, 119–120, 162–165)

*Rileyia cecidomyiae* Ashmead, 1888a: 3. Lectotype of *R. cecidomyiae*, ♂, here designated. United States, Kansas (USNM, examined).

*Rileyia tegularis* Gahan, 1918: 147–148; synonymy by Burks, 1967: 271. Lectotype of *Rileyia tegularis*, ♀, here designated. United States, Arizona (USNM, examined).

**Diagnosis.** This species is difficult to diagnose because it is widespread in the New World and most features used to differentiate it from the closely related species, *R. insularis*, appear to intergrade slightly between these species. In general, the pronotum laterally is acarinate to only slightly carinate in *R. cecidomyiae*, whereas in *R. insularis* this feature is typically distinctly carinate. Specimens of *R. insularis* are typically slightly larger with a finer, more shagreened sculpture (Fig. 22), although some specimens of *R. cecidomyiae* are large and similarly sculptured. Finally, the primary costula in *R. insularis* is typically distinctly angulated anteriorly toward the dorsellum (Fig. 22), often contacting it as a single median carina, whereas *R. cecidomyiae* exhibits a range of angulation of the primary costula from that seen in *R. insularis* to being nearly completely transversely oriented (cf. Fig. 38), usually tending toward the latter.

**Description.** Male. Length 2.0–3.7 mm. Color dark brown to almost black, except for the following, which are brown to golden: legs, tegula, and antenna. Wing hyaline, venation brown.

*Head.* Reticulate-striate. Subtriangular in frontal view, striae radiating from clypeus reaching lower eye margin. Clypeus slightly bilobate; supraclypeal area slightly raised above remainder of face, finely reticulate. Malar space 0.7–0.8x eye height, postorbital carina present, extending posteriad eye, fading before reaching vertex. Eye glabrous. Scrobal depression shallow, margined, intrascrobal carina absent. Scape 3.3–3.4x as long as broad, broadest medially at ventral plaque (Fig. 162); anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1 shorter than A2 and A3, A2 and A3 subequal in length; F1 0.9–1.1x as long as broad, subsequent subequal in length; clava 2.2–2.5x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely transversely reticulate. Midlobe of mesoscutum 1.0–1.1x as long as broad, notaulus complete, slightly indicated. Scutellum 1.0–1.3x as long as broad, slightly carinate apically; lateral panel of axilla with row of setae along scutoscutellar suture, reticulate. Mesepisternum reticulate-rugulose; mesepimeron striate-reticulate. Propodeum carinate-rugose, complete primary costula slightly angulated anteriorly, approaching and usually contacting dorsellum; median carina connecting dorsellum and nucha, numerous plicae connecting costula with dorsellum and nucha, rugulose between; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.2–2.3x as long as broad, stigma 0.6–0.8x as long as stigmal vein, marginal vein 1.3–1.5x as long as postmarginal vein (cf. Fig. 165), wing incompletely setose basally.

*Metasoma.* Petiole visible in dorsal view, 0.7x as long as broad, rugulose with anteriorly directed flange abutting nucha, usually narrowest ventrally in lateral view (Fig. 163). Gt<sub>1-2</sub> glabrous, remaining terga reticulate; Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 2.5–3.0x as long as Gt<sub>2</sub> and 0.6–0.7x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.2–1.4x as long as Gt<sub>4</sub>; Gt<sub>1-2</sub> asetose, remaining terga evenly setose except Gt<sub>3</sub> in anterior half; Gt<sub>5</sub> emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> barely visible dorsally.

**Female.** Length 2.5–4.2 mm. Identical to male except as follows: scape lacking ventral plaque; propodeal costula not turning to intercept dorsellum, complete medially, distinct median carina lacking; petiole not visible dorsally, gaster sessile (Fig. 164); Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, all foreshortened, remaining terga reticulate; Gt<sub>1</sub> 1.8–1.9x as long as Gt<sub>2</sub> and 1.0–1.2x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.7–0.9x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>4</sub> in anterior third; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** Slight variation in coloration is seen within the type series and additional material examined, ranging from brown to black, with the extremities (antennae, tegulae, legs) usually lighter (light brown to yellowish) but some material from the southwestern United States is nearly completely reddish with darker maculation dorsally on the head, mesosoma, and gaster medially. The facial striae can be more distinctive in some specimens but generally reach or surpass the lower eye margin, and the clypeal notch can be slightly wider and deeper in some specimens. The notauli can be faint or distinct but are usually not deeply impressed. The mesopleural sculpture varies from almost completely reticulate to striate-reticulate. The primary costula on the propodeum can turn anteriorly to intercept the dorsellum separately or as a fused median carina, or be complete medially with a slight bend anteriorly (cf. Figs. 33–36). In either instance, a median carina can be distinct, indistinct, or absent, and the propodeal plicae can be variable in number and distinctiveness. The male petiole ranges from just longer than broad to just broader than long in dorsal view and is rugulose or rugose. The specimens from Wein have slightly longer anelli and more acuminate apex of the gaster.

**Distribution.** Nearctic, primarily in the western United States (Fig. 294).

**Biology.** There are numerous rearing records for this species, most of them derived from label data (See Table 3 and below). The original description of *R. regularis* (see above) indicates that the specimens were reared from stem galls on *Pluchea borealis* (Asteraceae) and galls on *Suaeda* sp. (Chenopodiaceae). However, Gagné (1989) does not list any stem-galling Cecidomyiidae on *Pluchea*. He does list a bud galler, *Asphondylia dondiae* Felt, as attacking *Suaeda*. One surprising record of note published by Goeden (1990) was of *Rileyia* sp. attacking *Eutreta diana* (O.S.) (Diptera: Tephritidae). However, the tephritid puparium mounted with them and recorded because the host lacked exit holes and contained a stunted, unemerged *E. diana*. Goeden has low confidence in the validity of this record (Goeden pers. comm.), and it is possible that an unapparent gall of a cecidomyiid was included inadvertently in the rearing because there are records of Cecidomyiidae forming galls on galls of Tephritidae (Headrick & Goeden 1997) and of Tephritidae ovipositing within galls of Cecidomyiidae, occasionally killing the gall former (Goeden unpublished data).

**Comments.** Ashmead indicated that in addition to the type material listed above, he used "two males and one female reared by me from cecidomyious larva in the seeds of a common *Crataegus*, the others taken in a beating net." Further, four specimens (3♀1♂) from the Naturhistorisches Museum, Wien, each bear the labels "3762x [handwritten]; Collect. G. Mayr [typed]" which appear to be in Ashmead's handwriting, and one female has an extra handwritten label "Ash. 27." In addition, each specimen bears a handwritten determination label, "*Rileyia cecidomyiae* det Ashmead Type." These specimens probably represent some of the original material collected by Ashmead but they are not given type status here because it is unclear as to the number of specimens used by Ashmead to characterize this species. The lectotype is point mounted and missing its left flagellum. The type material for *R. tegularis* was apparently reared from stem galls of *Pluchea borealis* (Tempe No. 2742) or galls on *Sueda* sp. (Tempe No. 2741).

I have not found any consistent diagnostic features within the *Rileyia tegularis* type series to separate it reliably from the variation seen within the *Rileyia cecidomyiae* type series. The only apparent difference provided in the key by Gahan was the color of the tegulae (black in *R. tegularis*, not black in *R. cecidomyiae*); however, this character is highly variable when viewed in the context of the other material examined.

As mentioned in the diagnosis above, specimens of this species can be difficult to separate from *R. insularis* and features used to differentiate them intergrade. Two scenarios are possible: (1) *Rileyia cecidomyiae* and *R. insularis* are synonyms and represent a wide-ranging and variable species, or (2) both *R. cecidomyiae* and *R. insularis* are two or more sibling species which are very similar morphologically but can otherwise be reproductively isolated. Further investigation of New World populations at the molecular level might prove useful in revealing nebulous patterns in this group.

#### **Material Examined.**

**Type Material:** *R. cecidomyiae*: **UNITED STATES: Kansas: Riley:** Sept., 710; TypeNo. 21834 U.S.N.M. [red]; *Ryleya* [sic] *cecidomyiae* Ashmead n. gen. TYPE [handwritten] (Lectotype ♂, USNM). Paralectotypes, 1♀3♂ 2? [damaged, probably ♂]. **FLORIDA: Duval:** Jacksonville, Type; Collection Ashmead; ParatypeNo 21834 U.S.N.M. [red]; *Rileyia cecidomyiae* Ashm. [handwritten, attached to ♀ paralectotype] (USNM, examined).

*Rileyia tegularis*: **UNITED STATES: Arizona: Maricopa:** Tempe, Mch 1918; VL Wildemuth, collector, Tempe No. 2742 [or 2741]; Type No. 21832 [red label]; *Rileyia tegularis* Gahan, ♀ Type [handwritten] (Lectotype ♀,

USNM. Paralectotypes, 28♀33♂, same data as lectotype, except for the specimens from NHM which have an additional label: "Hym. Inv. Nr., 31 L11-124" (27♀32♂ USNM, 1♀1♂ NHM; examined).

**Other Material:** **CANADA: Prince Edward Island:** Queens, Brackley Beach nr Stanhope, 17.viii.1988, C. Yoshimoto (2♂ CNC). **UNITED STATES: Arizona: Yavapai:** 7 mi. SW Potato Patch, Jerome, 30.viii.1969, G. Forister (4♀ UCD); **Yuma:** Picacho Pass, 10–12.x.1958, Timberlake, cecid. gall on *Larrea* (30♀ UCR); **Pima:** Tucson, E. Felt, *Ex Asphondylia auripila* (6♀1♂ USNM); **California: [?]:** Lily Pond, Alpine Lake, 30.v.1971, D. Munroe (1♀ CNC); Laurel Canyon, 4.vi.1912, P. Timberlake (3♀4♂ UCR); Lily Pond, Alpine Lake, 18.vii.1970, D. Munroe (1♀ CNC); **Imperial:** Palo Verde, 8.iv.1970, E. Grissell (2♂ UCD); Palo Verde, 9.iv.1969, E. Grissell (2♀ UCD); 3 mi. NW Glamis, 11.ii.1982, J. Huber (3♀ UCR); **Inyo:** Bennet [?] Wells, Death Valley, 19.iii.1947, A. McClay, *Ex* sage galls (2♀ UCD); 15 km S. Deep Springs, 24.v.1994, S. Heydon, on *Encelia* (4♀ UCD); Panamint Valley, Surprise Canyon, 27.iv.1981, J. Woolley (1♂ TAMU); Cottonwood Canyon, Death Valley Nat'l Mon., 31.iii.1984, E. Grissell, on *Encelia* (1♀ USNM); Warm Springs Canyon, Death Valley Nat'l Mon, 11.iv.1984, E. Grissell & R. Denno, on *Larrea* (1♀2♂ USNM); 2 mi. E. Lone Pine, 19.v.1970, E. Grissell (10♀ UCD); 10 mi. S. Big Pine, 26.x.1978, J. Miller (2♀ UCD); 2 mi. E. Lone Pine, 19.v.1970, R. Bohart (2♀ UCD); Lone Pine, 7.v.1961, D. Cavagnaro (1♀ UCD); 25 mi. E. Lone Pine, 27.vi.1980, Schoener & Toft (12♀ UCD); Alabama Hills, 12.v.1979, N. Smith (7♂ UCD); 22 mi. W. Panamint Springs, 7.v.1961, D. Cavagnaro (3♂ UCD); 12 mi. E. Keeler on Hwy 190, 27.viii.1980, Schoener & Toft (4♀ UCD); Surprise Canyon, Panamint Mtns., 27.iv.1981, G. Gordh (3♀ UCR); Panamint Valley, 2mi. W. Indian Ranch, 13.v.1980, J. Woolley, on *Larrea divaricata* (1♂ TAMU); **Kern:** Sand Canyon, 3 mi. W. Brown, 7.iv.1966, R. Schuster (2♂ ANIC); Red Rock Canyon, 23.x.1981, G. Gordh (1♀ UCR); **Los Angeles:** Claremont, 22.vi.1923, L. Ballou, *Ex* gall on *Ceanothus tomentosus* (13♀ USNM); **Riverside:** Colorado Mesa, Clinton Keith Rd., 29.iv.1982, J. Woolley (1♀ TAMU); 1000 Palms, 29.iii.1970, E. Grissell & R. Denno (4♀ UCD); Painted Canyon, N. of Salton Sea, 80m, 27.iii.1996, Gates, Heraty & Hawks (1♀ UCR); Mecca, 19.i.1966, H. Nakakihara, *Ex Atriplex* galls (17♀ UCR); 1000 Palms, 15.ix.1976, L. Lacey, *Ex Hymenoclea salsola* galls (12♀ UCR); Berdoo Canyon, 6.7 mi. from Dillon Rd., 26.iv.1979, J. Woolley (4♀2♂ TAMU); Corn Springs, Chuckwalla Mtns., 22.v.1980, G. Gordh (6♀ UCR); Whitewater wash, 7 mi. SE I-10 & Hwy 11 junction, 12.iii.1997, M. Gates (5♀ UCR); Whitewater Canyon, 3.5 mi. N. Hwy 10, 31.iii.1979, J.



Woolley (1♀ TAMU); Andreas Canyon, 26.iv.1979, J. Woolley (1♀ TAMU); Palm Desert, 3.iii.1979, B. Hawkins, *Ex* stem gall *Atriplex canescens* (38♀ UCR); Torres Martinez Indian Res., 2–17.iii.1980, B. Hawkins, *Ex Hymenoclea salsola* stem galls (15♀ UCR); Thermal, 13.iii.1933, W. McVitty, cecid. gall on *Atriplex* (22♀ UCR); 20 mi. W. Blythe, 13.x.1955, Timberlake, *Ex Asphondylia* on *Larrea* (15♀ UCR); Cathedral City, 5.iii.1978, G. Gordh (29♀ UCR); Bautista Canyon, 29.i.1978, G. Gordh, *Ex* gall on *Atriplex canescens* (4♀ UCR); **San Bernardino:** Baldwin Lake, 2300m, 27.vii.1996, M. Gates (1♀ UCR); 18 mi. N. Kramer Junction, 5.vi.1990, J. Woolley (9♀ TAMU); 23 mi. S. Trona, 13.v.1980, J. Woolley, on *Bebbia* sp. (1♂ UCR); 8 mi. E. Phelan, Baldy Mesa, 16–22.v.1981, J. Huber (4♀ TAMU); 27 mi. N. Baker, 11.v.1982, J. Woolley (39♀ TAMU); 5 mi. N. Kramer Junction, 5.vi.1980, J. Woolley (12♀ TAMU); 4 mi. E. Baldwin Lake, 2300m, 22.ix.1979, J. Woolley (4♀ TAMU); 10 mi. SE Baker, 12.iv.1969, E. Grissell, *Ex* cecid. gall on *Atriplex hymenelytra* (4♀ USNM); N. Lucerne Valley, 1–21.ix.1979, B. Hawkins, *Ex* stem gall on *Atriplex polycarpa* (3♀ UCR); Barstow, 1.iv.1979, B. Hawkins (3♀ UCR); Mill Creek, San Bernardino Mtns, 14.vi.1947, Timberlake, on *Malacothamnus* (20♀ UCR); Rainbow Basin, 22.iv.1983, A. Levin (4♀ UCR); 15 mi. W. Baker, 6.v.1977, R. Brooks, on *Chilopsis* (10♀ UCD); Cadiz Sand Dunes, 3.iv.1981, N. Smith (6♀ UCD); Baldwin Lake, 2000m, 31.viii.1978, J. LaSalle (4♀ UCR); 6 mi. NW Fawnskin, San Bernardino Mtns., 2000m, 16.v.1997, M. Gates (12♀ UCR); Kelso Dunes, 10.x.1977, N. Smith (2♀ UCD); Kelso, 7.v.1977, R. Bohart (2♀ UCD); 4 mi. S. Essex, 27.iii.1970, E. Grissell & R. Denno (5♀ UCD); Kelso Dunes, 25.iv.1978, N. Smith (1♀ UCD); 1.5 mi. E. Halloran Springs Rd, 20.iv.1997, M. Gates (2♂ UCR); 23 mi. S. Trona, 13.v.1980, J. Woolley (1♂ TAMU); Victorville, 28.x.1934, P. Timberlake, on *Chrysothamnus* (9♂ UCR); **San Diego:** Borrego Sink, 15.iv.1981, J. Woolley (1♂ TAMU); 10 mi. W. Ocotillo, 24.iv.1980, J. Woolley (1♂ TAMU); E. end Rodriguez Cyn, N. end Mason Valley, 22–23.iii.1997, M. Gates (1♂ UCR); Borrego Valley, 9–11.iv.1969, E. Grissell & R. Denno (40♀ UCD); Oriflamme Canyon, 22–23.iii.1997, M. Gates (2♀ UCR); **Solano:** Cold Canyon Rsrv, 11 km W. Winters, 25.iv.1993, S. Heydon, on *Eriodictyon* (9♀ UCD); **New Mexico: Sierra:** 8 mi. E. Kingston, E. Grissell & R. Denno, on *Chrysothamnus* (4♀ UCD); **Lincoln:** 10 mi. SE. Corona, 2.vi.1982, J. Pinto (2♀ UCR); **Otero:** White Sands National Monument, 25.vi.1940, R. Bugbee, seed pods *Poliomintha incana* (4♀2♂ USNM); **Utah: Murray:** 18.v.1914, P. Timberlake (1♀2♂ UCR).

***Rileya clarki*, new species**

(Fig. 166)

**Etymology.** Named in honor of my best friend, Dan Clark, whom I have known since fifth grade and whose company I truly enjoy.

**Diagnosis.** This species is unique and easily distinguished by the combination of a distinctly anteriorly produced  $Gs_1$  collar and carinate collar on  $Gt_1$  (Fig. 166). These two structures are continuous and form a complete collar around the petiole, which abuts the nucha (Fig. 166).

**Description.** Female. Length 2.7 mm. Color equal parts pale yellow: antenna (except pedicel, which is brown), face, gena, eye orbits, pronotum laterally and posteriorly, tegula, coxae, legs; dark brown: vertex, occiput, pronotum in anterior half medially, remainder of mesosoma and petiolar collar; and brown: gaster. Some areas are marked with gold as follows: lateral lobe of mesoscutum laterally and mesally along notaulus, axilla mesally along scutoscutellar suture, axillula dorsally, longitudinal line laterad of propodeal spiracle, line laterally on  $Gt_4$  and gaster apicolaterally. Wing hyaline, venation pale yellow.

*Head.* Finely reticulate to striate. Subtriangular in frontal view, numerous striae radiating from clypeus reaching lower eye margin and scrobal depression. Clypeus slightly emarginate; supraclypeal slightly elevated above remainder of face, glabrate. Malar space 0.6x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 3.6x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 each increasing in length; F1 1.0x as long as broad, subsequent funiculars subequal; clava 2.3x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely transversely reticulate. Midlobe of mesoscutum 0.9x as long as broad, notaulus complete, slightly indicated. Scutellum 1.2x as long as broad, crudely carinate apically; lateral panel of axilla with several setae posteriorly along scutoscutellar suture, reticulate-finely striate. Mesepisternum reticulate-striate, mesepimeron distinctly striate. Propodeum rugose-glabrate, with complete primary costula medially, angled anteriorly toward dorsellum, oriented transversely, several plicae submedially spanning all or some of the distance between costula with dorsellum and nucha, intervening areas rugose; nucha glabrate, setose laterally; spiracle obliquely oriented, ~1.0x its length from dorsellum; callus sparsely setose. Forewing

2.1x as long as broad, stigma 0.4x as long as stigmal vein, marginal vein 2.3x as long as postmarginal vein; incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view;  $Gs_1$  distinctly produced anteriorly as a carinate collar, longitudinal carina proceed laterally and buttress the collar;  $Gt_1$  produced anteriorly as a carinate collar with faint carinae extending posteriorly;  $Gt_1$  collar is continuous with  $Gs_1$  collar, both surrounding the petiole;  $Gt_{1+2(+3?)}$  glabrate, rugulose anteriorly, with faint indication of fusion, each with one seta dorsally near faint line indicating former tergite independence (other setae might have been abraded); remaining terga finely reticulate;  $Gt_{1+2(+3?)}$  foreshortened;  $Gt_{1+2(+3?)}$  0.2x as long as  $Gt_4$  and 5.0x as long as  $Gt_5$ ;  $Gt_4$  evenly setose in posterior three-fourths, remaining terga evenly setose;  $Gt_5$  slightly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  just visible dorsally, triangular in dorsal view.

**Male.** Unknown.

**Distribution.** Known only from Costa Rica (Fig. 291).

**Biology.** Unknown.

**Comments.** The type is card mounted and in excellent condition.

**Material Examined.**

**Type Material:** COSTA RICA: Puntarenas: Monte Verde, T-B, iii.2–4.1972; H M Powell, Colr (Holotype ♀, UCD).

***Rileya columbar*, new species**

(Fig. 158)

**Etymology.** The specific name is from a Latin noun meaning "collar".

**Diagnosis.** This species is similar to other *Rileyia* spp. having collarlike production of  $Gs_1$  (*R. cylindripetiolata*, *R. paraplesius*) and  $Gt_{1+2+3}$  fused and greatly reduced (cf. Figs. 146, 271) but it differs by having  $Gs_1$  (and portions of dorsal petiole body) completely encircling the petiole body and the apex of the nucha (Fig. 158). The interaction of the petiole with the propodeal foramen is completely obscured. This obscuring of the nucha is not seen in *R. cylindripetiolata* and *R. paraplesius*. *R. columbar* is further differentiated by possessing a distinct triangular flange projecting posteriorly from the frenum

and the forewing having a linear, heavily sclerotized region contiguous with the basal half of the marginal vein anteriorly, both of which are lacking in *R. cylindripetiolata* and *R. paraplesius*.

**Description.** Female. Length 2.7–2.9 mm. Color as follows: pale golden: antennae, supraorbital area anteriorly and dorsally, pronotum laterally and with two fascia subdorsally, mesoscutum medially and along notaulus, axilla laterally, scutellum laterally, tegula, mesopleuron dorsally, callus, legs and gaster ventrolaterally, anteriorly and posteriorly; brown: remaining portions of head, mesosoma, metasoma, and ovipositor sheaths apically. The paratype is completely golden with pale yellow legs and circumocular region and only a faint brown maculation dorsally on  $Gt_4$  and dark ovipositor sheaths. Wing hyaline, venation pale brown.

*Head.* Umbilicate. Subtriangular in frontal view, striae radiating from clypeus toward lower eye margin absent. Clypeus slightly produced, bilobate apically; supraclypeal slightly elevated above remainder of face, finely reticulate. Malar space 0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, margined laterally and dorsally, intrascrobal carina present only immediately between toruli. Scape 4.0–4.1x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 each increasing in length; F1 1.2x as long as broad, subsequent funiculars subequal in length; clava 2.2–2.5x as long as broad, segmented, tapering apically.

*Mesosoma.* Coarsely umbilicate. Midlobe of mesoscutum 1.4x as long as broad, notaulus complete, distinct. Scutellum 1.3–1.6x as long as broad, with distinct carinate flange apically; lateral panel of axilla asetose, finely striate, frenal line present as a complete carina. Mesepisternum striate; mesepimeron striate, reticulate dorsally. Propodeum carinate, complete primary costula connected to dorsellum by a median carina, slightly angulated anteriorly; several plicae spanning some or all of distance between costula and dorsellum or nucha; spiracle obliquely oriented, reniform, ~0.7x its length from dorsellum; callus sparsely setose. Forewing 2.3x as long as broad, stigma 0.4–0.5x as long as stigmal vein, uncus fine, marginal vein 2.0x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole visible in dorsal view, 0.4–0.6x as long as broad, produced in conjunction with  $Gs_1$  as a carinate collar surrounding nucha (Fig. 158); a median carina dorsally connects an anteromedial notch in the collar with a corresponding notch anteromedially on the basal gastral tergite, which receives the carina.  $Gt_{1+2+3+4}$  apparently fused, with two fine longitudinal

carinae arising from anterolateral corners, glabrous except in posterior fourth, remaining terga reticulate (Fig. 158); Gt<sub>1+2+3+4</sub> 8.8x as long as Gt<sub>5</sub>; Gt<sub>1+2+3+4</sub> with at least 2 setae anterolaterally near carinae, two transverse rows of setae subdorsally in anterior sixth; Gt<sub>5</sub> and Gt<sub>6</sub> setose only along apex, Gt<sub>7+8</sub> evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** The paratype is different from the holotype as follows: color more golden with distinct black spot at the anterodorsal margin of Gt<sub>4</sub>; scrobal depression not as distinctly carinate dorsally; scutellar flange not as extensively produced posteriorly; median carina of propodeum flanked laterally by two angled submedian carina which also extend to the primary costula; Gt<sub>1+2+3</sub> foreshortened and fused, with apex distinctly separated from Gt<sub>4</sub>; Gt<sub>1+2+3</sub> 0.4x as long as Gt<sub>4</sub> and 5.0x as long as Gt<sub>5</sub>.

**Male.** Unknown.

**Distribution.** Known from Ecuador (Fig. 291).

**Biology.** Unknown.

**Comments.** The types are card mounted and in excellent condition.

**Material Examined.**

**Type Material: ECUADOR: Napo:** Tiputini Biodiversity Station, 216m, 00°37'55"S 76°08'39"W, 7.ii.1999, Lot # 2040, Transect 5, T. Erwin et al. Canopy fogging bare leaves, some w/ bryophytic/lichenous coat (Holotype ♀, EPNC). Paratype, 1♀, same data except lot # 1940 (EPNC).

***Rileyia couridae* (Cameron)**

(Figs. 167–169)

*Xenopelte couridae* Cameron, 1913: 126–127. Lectotype, ♂, here designated. French Guiana (BMNH, examined).

*Rileyia couridae*; combination by De Santis, 1979: 72.

**Diagnosis.** This species is similar to males of *R. pallidipes* and *R. hegeli* in gross form but can be differentiated by the following: shorter, more rugulose petiole (smoother and less rugulose in *R. pallidipes* and *R. hegeli*), 0.8x as

long as broad (Fig. 167); Gt<sub>1</sub> and Gt<sub>3</sub> slightly longer and, although Gt<sub>3</sub> is setose as in *R. hegeli*, the setae are more widely separated and only two are present (Fig. 167). Further, *R. hegeli* is golden in color and *R. couridae* and *R. pallidipes* are brown.

**Description.** Male. Length 1.7 mm. Color brown, except for the following, which are pale yellow: apices of femora, tibia, tarsus excluding pretarsus. Wing hyaline; forewing venation light brown.

*Head.* Finely reticulate. Subtriangular in frontal view, faint striae radiating from clypeus toward lower eye margin. Clypeus slightly bilobate (Fig. 169). Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmargined, lacking intrascrobal carina. Scape 2.8x as long as broad, broadest medially at ventral plaque (Fig. 168); anelli transverse, A1 shortest and narrowest, A2 and A3 subequal; F1 1.5x as long as broad, subsequent funiculars subequal; clava 2.7x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely transversely reticulate. Midlobe of mesoscutum 1.0x as long as broad; notaulus complete, fine. Scutellum 1.2x as long as broad, finely carinate apically; lateral panel of axilla sparsely setose, reticulate. Mesepisternum and mesepimeron obscured, visible portions glabrate-reticulate. Propodeum rugose, with complete primary costula slightly angulated anteriorly, oriented transversely, connected to dorsellum by median carina, complete or incomplete plicae connect it to dorsellum and nucha; spiracle small, obliquely oriented, reniform, ~1.5x its length from dorsellum; callus sparsely setose.

*Metasoma.* Petiole visible in dorsal view, 0.8x as long as broad, rugose, broadest basally where it is produced as a carinate flange abutting nucha. Gt<sub>1-3</sub> glabrous, foreshortened, remaining terga reticulate; Gt<sub>1</sub> 3.0x as long as Gt<sub>2</sub> and 2.0x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.2x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with row of setae across dorsum, remaining terga evenly setose except Gt<sub>4</sub> anteriorly; Gt<sub>5</sub> emarginate to expose Gt<sub>6</sub> spiracle (Fig. 167), obscures all subsequent terga in dorsal view; Gt<sub>7+8</sub> hemispherical in posterior view.

**Female.** Unknown.

**Distribution.** Known from French Guiana (Fig. 290).

**Biology.** Unknown.

**Comments.** The lectotype is point mounted and is missing the left forewing and portions of the right forewing. The forewing could not be accurately measured due to missing portions and the remainder being crumpled.

**Material Examined.**

**Type Material:** FRENCH GUIANA: [?]: Type [circular label with red edge]; From galls on *Courida* leaves [handwritten]; P. Cameron Coll., B.M. 1914-110; 355 [handwritten]; *Xenopelte couridae* Cam. Type, Fr. Guiana [handwritten]; B.M. Type Hym. 5. 354a (Lectotype ♂, BMNH).

***Rileya cylindripetiolata*, new species**

(Figs. 170, 171)

**Etymology.** Compound adjective derived from the Latin *cylindrus* meaning "roll of a book" and *petiolus* meaning "stem" or "stalk".

**Diagnosis.** This species is unique and easily distinguished by the "petiole", which is actually the dorsal petiole body and  $Gs_1$ , which unite into a cylindrical attachment between the propodeum and gaster (Fig. 170). Further, the apparent  $Gt_1$  (there is faint indication that at least  $Gt_{1+2}$  and possibly  $Gt_3$  might have fused together) is the shortest tergum followed by the longer  $Gt_4$ , which occupies over half the gaster.

**Description.** Female. Length 2.3–2.4 mm. Color brown, except for the following, which are golden: line anterodorsally along eye margin, pronotum anterolaterally, lateral lobe mesoscutum anterolaterally and posteromesally along notaulus, axilla mesally along scutoscutellar suture, mesopleuron dorsally, metapleuron anteroventrally, line on callus laterad of spiracle, nucha apically, gaster in anterior and posterior quarters and ventrally; or pale yellow: antenna, coxa, and legs. Wing hyaline, venation brown.

**Head.** Reticulate. Subtriangular in frontal view, striae absent, area reticulate. Clypeus entire, slightly produced ventrally; supraclypeal not elevated above remainder of face, reticulate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 2.8–3.2x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 each increasing slightly in length; F1 1.0x as long as broad, subsequent funiculars subequal; clava 2.3–2.6x as long as broad, segmented, tapering apically.

*Mesosoma*. Finely reticulate. Midlobe of mesoscutum 1.0x as long as broad, notaulus complete, slightly indicated. Scutellum 1.2–1.4x as long as broad, slightly carinate apically; lateral panel of axilla with several setae posteriorly along scutoscutellar suture and mesally, reticulate. Mesepisternum and mesepimeron finely striate. Propodeum rugose-glabrate, with complete primary costula medially, oriented transversely, bisected by a fine median carina, few plicae sublaterally spanning all or some of the distance between costula and nucha; spiracle obliquely oriented, ~1.5x its length from dorsellum; callus sparsely setose. Forewing 3.3–3.8x as long as broad, stigma 0.3x as long as stigmal vein, marginal vein 1.7–1.8x as long as postmarginal vein (Fig. 171).

*Metasoma*. Petiole visible in dorsal view which is actually the dorsal petiole body and  $Gs_1$  uniting in a cylindrical attachment between the propodeum and gaster, sulcus laterally indicating former independence (Fig. 170).  $Gt_{1+2(+3?)}$  glabrous,  $Gt_4$  glabrate, remaining terga finely reticulate;  $Gt_{1+2(+3?)}$  foreshortened,  $Gt_{1+2(+3?)}$  0.2x as long as  $Gt_4$  and 1.6–1.8x as long as  $Gt_5$ ;  $Gt_4$  sparsely setose in posterior half, remaining terga evenly setose;  $Gt_5$  slightly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  barely visible dorsally, triangular in dorsal view.

**Male.** Unknown.

**Variation.** The type specimens vary primarily in the completeness and extent of the propodeal sculpture. Specifically, the median carina connecting the primary costula and dorsellum can be indistinct in some specimens.

**Distribution.** Known only from Panama and Costa Rica (Fig. 291).

**Biology.** Unknown.

**Comments.** The type series is card mounted and in excellent condition.

**Material Examined.**

**Type Material: PANAMA: Panama:** Cerro Campana, 8°40'N, 79°50'W, 7–14.v.73 (Holotype ♀, CNC); Paratypes, 2♀, same data as holotype (1♀ USNM; 1♀ CNC); **COSTA RICA: Guanacaste:** Estac. Pitilla, 9 km S. Santa Cecilia, 700m, iv/1989, I. Gauld (1♀ BMNH).

**Other Material: COSTA RICA: Guanacaste:** Estación Pitilla, 9km S. Santa Cecilia, iii.1995, 700m, P. Ríos, LN329950\_380450 (1♀ INBIO); Estación



Pitilla, 9km S. Santa Cecilia, 21.iii–7.iv.1993, 700m, P. Ríos (1♀ BMNH).

***Rileyia gastros*, new species**

(Figs. 172–174)

**Etymology.** The specific name is derived from the Greek *gaster*, meaning "stomach", and refers to the elongated gaster in this species.

**Diagnosis.** This species is most similar to *R. cecidomyiae* and *R. insularis* but can be differentiated as follows: Gt<sub>1</sub> almost completely covering Gt<sub>2</sub> in dorsal view, with transverse carinate lip anteriorly and 3 setae sublaterally in anterior third (these absent in *R. cecidomyiae* and *R. insularis*); Gt<sub>7+8</sub> elongate (Fig. 172). Further, only two anelli present, unlike *R. cecidomyiae* and *R. insularis*, which both possess three anelli. F1 is longer than any subsequent funicular in *R. gastros*, whereas F1 is subequal to subsequent funiculars in *R. cecidomyiae* and *R. insularis*. Finally, this species possesses a distinct intrascrobal lamina (Fig. 174).

**Description.** Female. Length 3.4–3.7 mm. Color completely brown, except for the scape, coxae, and legs, which are pale yellow. Wing hyaline, venation pale brown.

**Head.** Reticulate to striate. Subtriangular in frontal view, many strong striae radiating from clypeus toward lower eye margin (Fig. 173). Clypeus emarginate; supraclypeal not elevated above remainder of face, striate. Malar space 0.4x eye height, postorbital carina present, extending posteriad eye, fading near vertex. Eye glabrous. Scrobal depression deep, margined, sharp intrascrobal carina present, extending half length of scape. Scape 3.7–3.8x as long as broad, broadest basally; anelli transverse, A1 narrowest and difficult to discern, A2 increasing slightly in width, A1–A2 each increasing in length; F1 1.6x as long as broad, subsequent funiculars subequal in width, decreasing in length; clava 2.6–2.7x as long as broad, segmented, tapering apically.

**Mesosoma.** Reticulate-umbilicate anteriorly becoming umbilicate posteriorly. Midlobe of mesoscutum 1.0x as long as broad, notaulus complete. Scutellum 1.2x as long as broad, finely carinate apically; lateral panel of axilla evenly setose and with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate-rugulose; mesepimeron glabrate, slightly striate. Propodeum rugose-reticulate, complete primary costula slightly angulated anteriorly, bisected by complete median carina; numerous complete or incomplete plicae spanning some or all of distance between costula and

dorsellum or nucha; spiracle obliquely oriented, reniform, <0.5x its length from dorsellum; callus densely setose. Forewing 2.0–2.1x as long as broad, stigma 0.3–0.4x as long as stigmal vein, uncus fine, marginal vein 1.4–1.5x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma*. Petiole not visible in dorsal view. Gaster not flattened. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrous apically, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 7.7–8.0x as long as Gt<sub>2</sub> and 1.6x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 1.4x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with three setae laterally and with carinate lip bordering excavation which abuts petiole; Gt<sub>3</sub> with transverse row of setae subdorsally to laterally, remaining terga evenly setose; Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle (Fig. 172); Gt<sub>7+8</sub> narrowly triangular in dorsal view.

**Variation.** In the paratype, the mesepisternum is finely but distinctly striate.

**Male.** Unknown.

**Distribution.** Known from Peru (Fig. 291) but the specific locality cannot be located.

**Biology.** Unknown.

**Comments.** The holotype is missing the right hind wing. The right forewing, right antenna, and right midleg are mounted separately on the point. The paratype is missing parts of both flagella: beyond F2 on the right antenna and beyond F1 on the left antenna.

**Material Examined.**

**Type Material:** PERU: [?]: Yahuarmayo, 8.ii.10; CHT Townsend coll. (Holotype ♀, BMNH). Paratype, 1♀, same data as holotype (USNM).

***Rileya gigas* Subba Rao**

(Figs. 175–180)

*Rileya gigas* Subba Rao, 1978: 316. Holotype, ♀. Brazil, Nova Teutonia (BMNH, examined).

**Diagnosis.** A very distinctive species easily characterized by a distinct, sharp intrascrobal lamina which extends to the anterior ocellus (Fig. 177); each anellus is transverse and almost a third the length of F1 (Fig. 178); a small

pointed protrusion is present at the eye margin dorsally (most obvious in larger specimens); mesoscutum and scutellum with sculpture rasplike in lateral view (Fig. 175); the distinctly modified Gt<sub>1</sub>-Gs<sub>1</sub> complex (Fig. 176), and the scutellum on the same plane as the propodeum (Fig. 175).

**Description.** Length 3.3–4.5 mm. Color black, except for the following, which are either brown: coxae, pretarsus, and femur in basal three-fourths; or golden brown: antenna, apex of femur, tibia, tarsus and gaster ventrally; or red-brown: spot anteriorly on scutellum, fascia anterolaterally on pronotum, spot dorsally on mesepisternum and spots around periphery of metapleuron. Wing hyaline, venation light brown.

*Head.* Umbilicate to striate. Triangular in frontal view, striae radiating from clypeus reaching lower eye margin. Clypeus emarginate with blunt point medially (Fig. 177); supraclypeal area slightly elevated and glabrate between clypeus and toruli. Malar space 0.5x eye height, postorbital carina present, extending posteriad eye to half height of eye. Eye glabrous. Scrobal depression deep, margined, sharp intrascrobal carina extending to anterior ocellus (Fig. 177). Scape 5.0x as long as broad, parallel sided; anelli transverse, A1 just longest and narrowest, A2 and A3 subequal, just shorter than A1; F1 1.0–1.3x as long as broad, subsequent funiculars subequal, shorter than F1; clava 1.8–2.5x as long as broad, segmented and tapering apically (Fig. 178).

*Mesosoma.* Umbilicate with interstices reticulate, rasplike dorsally in lateral view (Fig. 175). Midlobe of mesoscutum 1.0–1.2x as long as broad, notaulus complete, slightly indicated. Scutellum 1.1–1.4x as long as broad, crudely carinate apically, plane of scutellum deflected ventrally and forming nearly a 180° angle with propodeum (Fig. 175); lateral panel of axilla sparsely setose anteriorly, umbilicate with interstices reticulate. Mesepisternum rugulose-reticulate, with areas of finer reticulation dorsally and ventrally; mesepimeron rugulose-reticulate. Propodeum coarsely rugose, complete primary costula angulated anteriorly and uniting as median carina to intercept dorsellum, strongest plicae medially connecting it with dorsellum; complete to incomplete, weaker plica connecting costula and nucha; spiracle obliquely oriented, reniform, ~1.5x its length from dorsellum; callus moderately setose. Forewing 2.0–2.2x as long as broad, stigma 0.3–0.4x as long as stigmal vein, marginal vein 2.1–2.5x as long as postmarginal vein, incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrate, glabrous along apical margin, remaining terga reticulate; Gt<sub>1</sub> produced anteriorly as carinate

collar anteriorly, abutting nucha, with group of several fine erect setae laterally (Figs. 176, 179); Gs<sub>1</sub> produced anteriorly as carinate collar abutting nucha, continuous with production of Gt<sub>1</sub> (Fig. 176); Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 4.0–4.5x as long as Gt<sub>2</sub> and 1.7–3.0x as long as Gt<sub>3</sub>, Gt<sub>1,3</sub> 0.3–0.4x as long as Gt<sub>4</sub>; remaining terga evenly setose, except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 176); Gt<sub>7+8</sub> hemispherical in dorsal view.

**Variation.** Most variation seen is in the extent and completeness of the propodeal sculpture. The paratype examined has the scutellum reddish brown in anterior half. The material from Ecuador is slightly more brownish with slightly less distinct rasplike sculpture on the mesosoma.

**Male.** None examined. Described by Subba Rao (1978) as “essentially similar to female.”

**Distribution.** Known from Brazil, Peru, and Ecuador (Fig. 291).

**Biology.** Unknown.

**Comments.** The holotype and single paratype examined are in good condition.

**Material Examined.**

**Type Material: BRAZIL: Santa Catarina:** Nova Teutonia, Holotype [circular label with red edge]; 20.viii.1933, 27°11B 52°23L, Fritz Plaumann; *Rileya gigas* sp. n., B. R. Subba Rao det. 1975; B.M. Type Hym. 5-2692 (Holotype ♀, BMNH). Paratypes, 5♀3♂, same data as holotype but different dates: 2, 11, 12, 19.v.1938; 3.iii.1937; 18.ii.1937, F. Plaumann (4♀2♂ BMNH); Paratype, 1♀, same data as holotype but different date and labelling: 23.xii.1937, 27°11B 52°23L, Fritz Plaumann; *Rileya gigas* sp. n., B. R. Subba Rao det. 1975; B. M 1938-312 (USNM, examined).

**Other Material: ECUADOR: Napo:** Limoncocha, on Rio Napo, 9.vi.1974 & 15.vii.1974, B. Drummond, Malaise trap (2♀ USNM). **PERU: Madre de Dios:** BIOLAT Biological Station, Rio Manu, Pakitza, 11° 56'47"S 71° 17'00"W, 23.ix.1991, 356m, T. Erwin, Lot #99, Canopy fogging (1♀ USNM).

***Rileya glabra*, new species**

(Figs. 181–186)

**Etymology.** Named for its general lack of sculpture on the body, from the Latin *glab* meaning "smooth".

**Diagnosis.** Similar to other species which are suspected parasitoids of aerial root galls (Cecidomyiidae) on Orchidaceae. This species is one of the more distinctive in this complex because the head and mesosoma are almost entirely clothed in erect setae (Fig. 184), the scrobal depression is shallow and lacks a median lamina (also lacking in *R. orchideara* [Fig. 53] and *R. oncidii*). The sculpture of the head and mesosoma is almost completely smooth and shining. Similar species can approach this condition but usually have some type of reticulate or imbricate (*R. orchideara*; Fig. 55) (or combination) sculpture. The petiole of the female is distinct and rugose (Fig. 181) and slightly "humped" dorsally. Similar species have the petiole barely visible (*R. guatemalae*; Fig. 195), visible but of a different form (*R. orchideara*; Fig. 54), or not visible in the female in dorsal view (*R. oncidii*; *R. laeliae*, Fig. 221; *R. cattleyae*, Fig. 151). The clypeus is produced as a short, truncate flap (Fig. 184) that is similar to the clypeus of *R. guatemalae* and *R. laeliae* but in all three species the clypeus is produced slightly less than in *R. orchideara* (Fig. 55), *R. oncidii* (Fig. 250), and *R. cattleyae* (Fig. 161). The terminal funicular segments and clava are whitish, whereas in all other species the antennae are concolorous.

**Description.** Female. Length 2.4 mm. Color dark brown, except for the antenna, legs and gaster ventrally (golden), and terminal segments of funicle and clava (whitish). Wing amber, pilosity mostly complete basally, venation pale brown.

*Head.* Glabrate. Ovate in frontal view, striae radiating from clypeus absent. Clypeus slightly produced ventrally with several apical setae (Fig. 184); supraclypeal slightly elevated above remainder of face, glabrate. Malar space 0.4x eye height, postorbital carina absent. Eye setose (Fig. 184). Scrobal depression shallow, unmargined, intrascrobal carina absent. Scape 4.0x as long as broad, broadest basally; anelli transverse, A1 subquadrate, the narrowest and longest, A2 and A3 each increasing slightly in width; F1 1.0x as long as broad, subsequent funiculars subequal in length; clava 2.1x as long as broad, segmented and tapering apically (Fig. 183).

*Mesosoma.* Glabrate. Midlobe of mesoscutum 1.1x as long as broad, notaulus complete, distinct. Scutellum 1.3x as long as broad, slightly carinate apically; lateral panel sparsely but evenly setose, glabrate. Mesepisternum slightly

reticulate; mesepimeron slightly striate. Propodeum rugulose, lacking complete primary costula medially, numerous irregular rugae present; nucha slightly elongate, setose laterally; spiracle obliquely oriented, ovate, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.4x as long as broad, stigma 0.3x as long as stigmal vein, which is slightly recurved (Fig. 182), unculus fine, marginal vein 1.4x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma*. Petiole distinctly visible in dorsal view, 1.1x as long as broad, longitudinally rugulose dorsally (Fig. 185); Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate with dorsally incomplete transverse row of setae, remaining terga glabrate; Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 3.1x as long as Gt<sub>2</sub> and 1.7x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.8x as long as Gt<sub>4</sub>; Gt<sub>4</sub> sparsely but evenly setose, except in anterior half, remaining terga evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 2.1–2.3 mm. Identical to female, except as follows: scape with inconspicuous ventral plaque just ventrad middle, 3.4–3.8x as long as broad (Fig. 186); terminal funicular and clava concolorous with remainder of flagellum; petiole visible in dorsal view, petiole 1.5x as long as broad (Fig. 181); Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 4.7–5.0x as long as Gt<sub>2</sub> and 1.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.9x as long as Gt<sub>4</sub>; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in dorsal view (Fig. 181).

**Distribution.** This species is known from Panama (Fig. 291).

**Biology.** Unknown.

**Comments.** The holotype and paratypes are in excellent condition, except that the wings of the holotype have been mounted separately on the same card.

**Material Examined.**

**Type Material: PANAMA: Panama:** Cerro Campana, 8°40'N 79°50'W, 7–14.v.73 (Holotype ♀, CNC). Paratypes, 3♂, same data as holotype (1♂ USNM; 2♂ CNC).

***Rileya gracilis*, new species**  
(Figs. 187–189)

**Etymology.** Named for its delicate legs and fragile appearance. A regular Latin adjective, third declension, meaning "slender."

**Diagnosis.** Similar to other species having males with distinctly petiolate gasters (*R. tricolor*, *R. antioquia*) but differentiated as follows: coloration distinctive (detailed below); petiole with single seta ventrally in anterior quarter (Fig. 187) (2 or 3 in *R. tricolor* and *R. antioquia*, respectively),  $Gt_1 + Gs_1$  combining to form a fine, continuous carinate collar encircling petiole (Fig. 187); apparent  $Gt_1$  foreshortened with faint indication that at least  $Gt_2$  and possibly  $Gt_3$  can be fused with  $Gt_1$  (not fused in *R. tricolor* and *R. antioquia*) flagellomeres with robust, evenly spaced MPS (cf. Fig. 200).

**Description.** Male. Length 2.3–2.6 mm. Color dark brown or black, except for the scape, gena and face to just anterior ocellus, coxae and legs (golden/yellow). Wing hyaline, pilosity incomplete basally, venation pale brown.

*Head.* Finely reticulate. Subtriangular in frontal view, few striae radiating from clypeus extending toward lower eye margin. Clypeus emarginate with three ventrally directed apical setae; supra-clypeal slightly elevated above remainder of face, glabrate. Malar space 0.7x eye height, postorbital carina present only along malar sulcus and at venter of eye. Eye glabrous. Scrobal depression shallow, unmargined, intrascrobal carina absent. Scape 2.8–3.0x as long as broad, broadest medially, ventral plaque present in basal half (Fig. 189); anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 each increasing in length; F1 1.2x as long as broad, subsequent funiculars subequal in length; clava 2.2–2.3x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate-imbricate. Midlobe of mesoscutum 1.3x as long as broad, notaulus complete, indistinct. Scutellum 1.6–1.7x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate becoming striate posteriorly; mesepimeron striate. Propodeum with complete primary costula medially, oriented transversely, angulated anteriorly and uniting as a median carina which intercepts dorsellum; numerous fine plicae submedially connecting costula, dorsellum and nucha; nucha slightly elongate, setose laterally; spiracle obliquely oriented, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.2–2.3x as long as broad, stigma 0.8–1.0x as long as stigmal vein, uncus fine, marginal vein 3.5–3.7x as long as postmarginal vein (Fig. 188). Wing incompletely setose.

*Metasoma*. Petiole distinctly visible in dorsal view, 1.6–1.7x as long as broad, longitudinally rugulose dorsally, two ventrally directed setae placed laterally on anteroventral surface (easily abraded), Gt<sub>1</sub> + Gs<sub>1</sub> produced anteriorly as a fine, carinate collar encircling petiole (Fig. 187); apparent Gt<sub>1</sub> foreshortened with faint indication that at least Gt<sub>2</sub> and possibly Gt<sub>3</sub> have fused with Gt<sub>1</sub> (Fig. 187). Gaster dorsoventrally flattened. Gt<sub>1+2(+3?)</sub> glabrate, remaining terga reticulate; Gt<sub>1+2(+3?)</sub> foreshortened; Gt<sub>1+2(+3?)</sub> 0.2x as long as Gt<sub>4</sub> and 1.5–1.6x as long as Gt<sub>5</sub>, Gt<sub>4</sub> sparsely but evenly setose, except in anterodorsal three quarters, Gt<sub>5</sub> setose apically, remaining terga evenly setose; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in dorsal view.

**Female.** Unknown.

**Distribution.** Known only from Costa Rica (Fig. 292).

**Biology.** Unknown but label data indicates that these specimens were taken on *Ficus* sp. (possibly *brenesii*[?] Standl.). Gagné (1994) lists two genera (*Ficiomyia* [1 sp.] and *Calmonia* [2 spp.]) and two unidentified cecidomyiids known to form leaf or fruit galls on *Ficus* spp. in the Neotropical region.

**Comments.** Both specimens are card mounted and in good condition.

**Material Examined.**

**Type Material:** COSTA RICA: San José: Zurquí de Moravia, 1600m, 4.viii.1991, col. Paul Hanson; *Ficus brenesii* [?; handwritten] (Holotype ♂, BMNH). Paratype 1♂, same data as holotype, except for plant label, “*Ficus*” [handwritten] (USNM).

***Rileyia grisselli*, new species**

(Figs. 190–193)

**Etymology.** Named in honor of my friend Eric Grissell (USDA, Systematic Entomology Laboratory, ret.) for his extensive assistance and cooperation in procuring type material and for his initial identification of this species.

**Diagnosis.** A very distinctive species characterized as follows: two anelli (Fig. 193), densely setose coxae and gaster; round nipple-like structure below



spiracle (Fig. 190); propodeum setose medially, callus densely setose; mesopleuron completely glabrate; gaster elongate, acuminate (Fig. 190).

**Description.** Female. Length 3.7–4.7 mm. Color black, except for the tegula, trochanter, base of femur, middle of midleg, apex of femur, tibia and tarsus (golden). Wing hyaline, venation brown.

*Head.* Reticulate to striate. Ovate in frontal view, many striae radiating from clypeus toward lower eye margin. Clypeus emarginate; supraclypeal area elevated above remainder of face, striate. Malar space 0.5x eye height, postorbital carina present, extending posteriad eye, fading before vertex. Eye glabrous. Scrobal depression deep, margined, intrascrobal carina absent. Scape 3.3–3.4x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 slightly broader and shorter (Fig. 193); F1 0.83x as long as broad, subsequent funiculars subequal in length; clava 1.9–2.1x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate-umbilicate. Midlobe of mesoscutum 1.2–1.3x as long as broad, notaulus complete. Scutellum 1.3–1.4x as long as broad, carinate apically; lateral panel of axilla completely setose, except laterally, and with 2 rows of setae along scutoscutellar sulcus, umbilicate to elongate-reticulate. Mesepisternum glabrate, foveate along posterior margin; mesepimeron glabrate. MMJ less distinct but discernible (similar to *Platyrileyia*). Propodeum rugose, with complete primary costula connected to dorsellum only by median carina; numerous plicae spanning some or all of distance of costula and nucha or dorsellum, setose medially; spiracle obliquely oriented, ~0.5x its length from dorsellum; callus densely setose. Forewing 2.2–2.4x as long as broad, stigma 0.3–0.5x as long as stigmal vein, uncus fine, marginal vein 0.7–0.9x as long as postmarginal vein (Fig. 191). Wing completely setose.

*Metasoma.* Petiole not visible in dorsal view. Gaster not flattened. Gt<sub>1</sub> glabrous, Gt<sub>2-3</sub> glabrate, completely glabrous apically, remaining terga reticulate; Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 2.9–3.3x as long as Gt<sub>2</sub> and 0.9–1.2x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 1.2–1.5x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with group of setae laterally and with rounded lip bordering anterior excavation which abuts petiole; Gt<sub>3</sub> with 2-3 dorsally complete, transverse rows of setae which extend laterally; remaining terga densely and evenly setose; Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>6</sub> with small, circular, nipple-like protuberance below spiracle (Fig. 196); Gt<sub>7-8</sub> triangular in dorsal view, keeled.

**Male.** Length 2.8–3.5 mm. Identical to female, except as follows: scape with ventral plaque apical of middle, 3.2–3.8x as long as broad; petiole visible in dorsal view, petiole about as long as broad, with median carina dorsally, glabrate; Gt<sub>1-2</sub> more or less foreshortened; Gt<sub>1</sub> 1.3–1.4x as long as Gt<sub>3</sub>; Gt<sub>2</sub> obscured in dorsal view by Gt<sub>1</sub> (Fig. 192); Gt<sub>1</sub> 0.4–0.7x as long as Gt<sub>4</sub>; Gt<sub>5</sub> weakly emarginate to expose Gt<sub>6</sub> spiracle, Gt<sub>6</sub> lacking small, circular, nipple-like protuberance below spiracle (Fig. 192); Gt<sub>7+8</sub> ovate in posterior view.

**Variation.** Slight variation exists in the completeness and extent of the costula and plicae on the propodeum.

**Distribution.** This species is known from extreme southern South America (Fig. 291).

**Biology.** The holotype was reared from galls on *Berberis* sp. (Berberidaceae). Gagné (1994) has recorded an unknown Oligotrophini that forms artichoke-like bud galls on *B. darwinii* Hook. and *B. empetrifolia* Lam. from the Río Negro in Argentina, which, coincidentally, is in the same province as the type locality.

**Comments.** The holotype specimen is missing the left midleg. The female paratype is complete, but the left flagellum is mounted separately on the same card, whereas the male paratypes are complete and point mounted.

**Material Examined.**

**Type Material:** ARGENTINA: Río Negro: Lgo. Moreno, 27.xi.1984, M. Lauria; *Ex* galls on *Berberis* sp.; *Rileyia* n. sp. “2-rings!” det. E. Grissell, 1985 (Holotype ♀, USNM). Paratypes, 1♀3♂, CHILE: Aisen: 15km S. Las Juntas, 30km NW Puyuhuapi, 30.xii.1984–29.i.1985, S&J Peck FIT, *Nothofagus* forest (1♂ CNC; 1♂ USNM); Arauco: Pichinahuel, Cord. Nahuelbuta, 23-31.xii.1958, 11-1400m, L. Peña (1♀ USNM); Colchagua: La Correana, Rio Tirguiriria, 16–20.ii.77 (1♀ CNC); El Chingue: Lianquihue, Lago Chapo, ii.91, L. Pena, MT (1♂ CNC).

***Rileyia guatemalae*, new species**

(Figs. 194–196)

**Etymology.** The specific name refers to Guatemala, the probable country of origin of this species.

**Diagnosis.** This species is most similar to *R. laeliae* but is distinguished by its completely reticulate propodeum and lack of costula (cf. Fig. 57), with only a few incomplete plicae originating from the anterior and posterior edges of the propodeum. An intrascrobal lamina is present but extends only for a distance equal to one-third the length of the scape (Fig. 196); *R. cattleyae* and *R. laeliae* also possess an intrascrobal lamina but they extend almost to the anterior ocellus in these taxa (Figs. 161, 224). The eyes are asetose, as in *R. laeliae* and *R. cattleyae* but *R. guatemalae* lacks anterior rugosity on Gt<sub>1</sub> and has only one anterolateral seta (Figs. 194, 195) (one in *R. cattleyae* also) and *R. laeliae* possesses three (Fig. 221).

**Description.** Female. Length 1.9–2.1 mm. Color dark brown, except for the following, which are golden: antenna, tegula, and legs. Wing hyaline, venation brown.

*Head.* Reticulate. Ovate in frontal view, striae radiating from clypeus absent. Clypeus produced, apex truncate (Fig. 196); supraclypeal area at same level as remainder of face, reticulate. Malar space 0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina present, not extending beyond basal third of scape (Fig. 196). Scape 3.5–4.0x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A2 and A3 subequal in length; F1 1.0x as long as broad, subsequent subequal in length; clava 1.8–2.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Reticulate. Midlobe of mesoscutum 1.1–1.8x as long as broad, notaulus complete, distinct. Scutellum 1.6–1.8x as long as broad, finely carinate apically; lateral panel of axilla with 2–3 setae along scutoscuteellar sulcus, reticulate. Mesepisternum reticulate; mesepimeron glabrate-striate. Propodeum reticulate, lacking primary costula, with a few fine incomplete plicae posteromedially and laterally; spiracle subcircular, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.2x as long as broad, stigma 0.4–0.5x as long as stigmal vein, uncus fine, marginal vein 1.2x as long as postmarginal vein. Wing incompletely setose in basal third.

*Metasoma.* Petiole not visible in dorsal view. Gaster laterally flattened. Gt<sub>1,2</sub> glabrous, remaining terga glabrate; Gt<sub>1,2</sub> foreshortened; Gt<sub>1</sub> 9.3–13.0x as long as Gt<sub>2</sub> and 2.3–2.6x as long as Gt<sub>3</sub>, Gt<sub>1,3</sub> 2.8–3.1x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with one seta sublaterally in anterior third, Gt<sub>3</sub> with dorsally incomplete, transverse row of setae; remaining terga evenly setose, except Gt<sub>4</sub> dorsally; Gt<sub>5</sub> covering Gt<sub>6</sub> spiracle (Fig. 195); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.9 mm. Identical to female, except as follows: scape with ventral plaque medially, petiole visible in dorsal view, 1.1x as long as broad, longitudinally rugulose, slightly concave dorsally (Fig. 194). Gt<sub>1</sub> covers Gt<sub>2</sub> dorsally; Gt<sub>1</sub> 2.0x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.7x as long as Gt<sub>4</sub>; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 194); Gs<sub>1</sub> produced anteriorly as a fine collar surrounding the petiole ventrally.

**Variation.** The type series is essentially invariant but some differences are seen in the extent and completeness of the plicae on the propodeum. The holotype is the only specimen that has A1 and A2 partially fused.

**Biology.** The type series was intercepted at the Washington, D.C. port of entry and was reared from root galls on orchids.

**Comments.** The type series was intercepted in an orchid lot, possibly from Guatemala, at the Washington, D.C. port of entry and subsequently emerged during its time there from orchid root galls. The type material appears to have been dispatched and mounted immediately on emergence as many specimens have crumpled wings and cuticular remnants from the pupal stage on the antenna.

**Material Examined.**

**Type Material: ?GUATEMALA:** In galls on roots of orchid; from C. America, Guatemala?; Inspection Wash. D.C., 4-11-1933, W. B. Wood; B. P. Q. # A21712; Hym. lot No. 9012 (Holotype ♀, USNM). Paratypes, 5♀1♂, same data as holotype (3♀1♂ USNM; 2♀ CNC)[3 paratypes missing heads].

***Rileya hansonii*, new species**

(Fig. 47)

**Etymology.** The specific name is in honor of Paul Hanson who collected the entire type series in Costa Rica and has provided hundreds of invaluable specimens used in this research.

**Diagnosis.** Gs<sub>1</sub> and the dorsal portion of the petiole is produced as a robust cylinder surrounding the anterior of the petiole, buttressed by evenly spaced longitudinal carinae; apparent Gt<sub>1</sub> only tergum foreshortened (fusion of Gt<sub>1-3</sub>) (Fig. 47). Similar to *R. columbar* in the produced petiole/Gs<sub>1</sub> attachment but

*R. columbar* has this structure relatively shorter, with a crenulate anterior edge (noncrenulate in *R. hansonii*), and Gt<sub>1-3</sub> emarginate to receive the median carina dorsally on the petiole (not emarginate in *R. hansonii*).

**Description.** Female. Length 2.0–2.9 mm. Color brown, except for the following, which are pale yellow: antenna, coxae, legs, gaster laterally and ventrally. Wing hyaline, venation pale yellow.

*Head.* Reticulate. Ovate in frontal view, striae radiating from clypeus absent. Clypeus produced, rounded apically; supraclypeal distinctly elevated above remainder of face, reticulate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 3.2–3.5x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent funiculars subequal in length; clava 3.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Transversely reticulate. Midlobe of mesoscutum 1.2–1.3x as long as broad, notaulus complete, distinct. Scutellum 1.2–1.3x as long as broad, finely carinate apically; lateral panel of axilla setose, reticulate. Mesepisternum distinctly rugulose-striate; mesepimeron glabrate-striate, longitudinally striate dorsally, more vertically striate ventrally. Propodeum rugose, with complete primary costula, oriented transversely, bisected by median carina which intercepts dorsellum and nucha; several plicae spanning some or all of distance between costula and dorsellum or nucha submedially; spiracle obliquely oriented, ovate, ~1.5x its length from dorsellum; callus sparsely setose. Forewing 2.4–2.5x as long as broad, stigma 0.3–0.5x as long as stigmal vein, unculus fine, marginal vein 2.1–2.3x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole visible in dorsal view, dorsal petiole body fused with similarly produced Gs<sub>1</sub> ventrally to form a robustly cylindrical connection between gaster and propodeum, structure with robust longitudinal carinae (Fig. 47). Gaster not flattened. Apparent Gt<sub>1</sub> glabrous (dissection reveals that at least Gt<sub>1</sub> and Gt<sub>2</sub> have probably fused), apparent Gt<sub>2</sub> (actually Gt<sub>4</sub>) glabrous anteriorly, reticulate posteriorly, remaining terga reticulate; Gt<sub>1+2(+3?)</sub> foreshortened; Gt<sub>1+2(+3?)</sub> 0.2x as long as Gt<sub>4</sub> and 1.5x as long as Gt<sub>5</sub>; Gt<sub>1</sub> with transverse row of setae apically (Fig. 47), Gt<sub>4</sub> evenly setose, except in anterior half; Gt<sub>5</sub> slight emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** The type series varies in body color, which can be brown to nearly black, and the extent of brown coloration on the gaster laterally and ventrally. The sculpture on the mesosoma can range from imbricate, finely umbilicate, to fine, transverse reticulation dorsally whereas the sculpture of the mesepisternum can be carinate to broadly reticulate. Finally, the extent and completeness of the plicae on the propodeum can differ.

**Male.** Unknown.

**Distribution.** Known only from Costa Rica (Fig. 293).

**Biology.** Unknown.

**Comments.** All type specimens are card mounted (except the point-mounted Iriquois paratype) and in excellent condition.

**Material Examined.**

**Type Material:** COSTA RICA: **Cartago:** Turrialba, viii.1994, 650m, M. Cerda & P. Hanson, Café YPT (Holotype ♀, BMNH). Paratypes, 4♀, data as follows: **COSTA RICA: Heredia:** 3km S. Puerto Viejo, OTS - La Selva, x.1992, 100m, P. Hanson (1♀ BMNH); **Limón:** 16km W. Guápiles, v-vi.1990, 400m, P. Hanson (1♀ USNM); Sur de Iriquois, 23.v.1987, 300m, P. Hanson (1♀ USNM); **Puntarenas:** Golfo Dulce, 24km W Piedras Blancas, vi-viii.1989, 200m, P. Hanson (1♀ BMNH).

**Other Material:** COSTA RICA: **Guanacaste:** Estación Pitilla, 9km S. Santa Cecilia, iv.1989, 700m, I. Gauld (1♀ BMNH).

***Rileyia haumani* (Brèthes)**

(Figs. 136–137, 140)

*Tragicola haumani* Brèthes, 1918: 83. Misidentified as Eucharitidae.

Lectotype of *R. haumani*, ♀, here designated. Argentina (MACN).

*Tragicola haumani*; incorrect subsequent spelling in redescription by Gemignani, 1933. Misidentified as Eucharitidae.

*Rileyia haumani*; combination by De Santis, 1967.

*Rileyia haumani*; redescription by Subba Rao, 1978.

*Pseudrileyia brasiliensis* Hedqvist, 1980: 159–160. Holotype of *Pseudrileyia brasiliensis*, ♀, by original designation. Brazil (KJHC). **New synonymy.**

**Diagnosis.** A robust, orange species that is most likely to be confused with *R. auranti*. *Rileyia haumani* differs in the wing not being infusate and the flagellum possessing three anelli (infusate and two anelli in *R. auranti*). See diagnosis of *R. auranti* for further details. The anterior ocellus is located within scrobal depression, and Gt<sub>5</sub> is almost completely covered by Gt<sub>4</sub> (Fig. 140).

**Description.** Female. Length 3.7 mm. Color completely reddish brown. Wing hyaline, venation pale brown.

*Head.* Umbilicate to striate. Subtriangular in frontal view, many strong striae radiating from clypeus toward lower eye margin. Clypeus slightly bilobate; supraclypeal area elevated above remainder of face, finely reticulate. Malar space 1.0x eye height, postorbital carina absent. Eye glabrous. Scrobal depression deep, margined, fine intrascrobal carina present, extending a third the length of scape, anterior ocellus located in scrobal depression. Scape 4.0x as long as broad, broadest medially; anelli quadrate to transverse, A1 narrowest and longest, quadrate, A2 and A3 each increasing slightly in width, subequal in length; F1 1.3x as long as broad, subsequent funiculars subequal in length; clava 3.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Umbilicate. Midlobe of mesoscutum 1.1x as long as broad, notaulus incomplete posteriorly, only vaguely indicated as slight furrow. Scutellum 1.4x as long as broad, carinate apically; lateral panel of axilla evenly setose and without row of setae along scutoscutellar sulcus, umbilicate. Mesepisternum reticulate dorsally to striate-rugulose ventrally; mesepimeron striate. Propodeum rugulose, with complete primary costula, angulated anteriorly and connected to dorsellum by median carina; numerous complete and incomplete plicae spanning some or all of distance between costula with dorsellum and nucha submedially, propodeum slightly elongate posteriorly; spiracle obliquely oriented, reniform, <1.0x its length from dorsellum; callus densely setose. Forewing 2.4x as long as broad, stigma 0.4x as long as stigmal vein, uncus fine, marginal vein 0.9x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 3.1x as long as Gt<sub>2</sub> and 1.5x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.4x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with at least one seta laterally and with rounded lip bordering anterior excavation which abuts petiole; remaining terga evenly setose, except Gt<sub>4</sub> in anterior third; Gt<sub>5</sub> just

visible dorsally, slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 140); Gt<sub>7+8</sub> barely visible in dorsal view, triangular.

**Male.** Length 3.6 mm. Identical to female, except as follows: slightly darker coloration present dorsally on head, pronotum anteriorly, mesoscutum and scutellum medially and Gt<sub>4</sub> dorsolaterally; scape with ventral plaque medially (Fig. 136), 2.8x as long as broad; petiole visible in dorsal view, 1.0x as long as broad, rugulose, with anterior carinate flange abutting nucha; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 3.0x as long as Gt<sub>2</sub> and 1.9x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.3x as long as Gt<sub>4</sub>.

**Variation.** All specimens differ mainly in propodeal sculpture (extent and distinctiveness of plicae, etc.). The holotype of *P. brasiliensis* has A2 and A3 fused dorsally.

**Distribution.** Known only from southern South America (Fig. 291).

**Biology.** Unknown.

**Comments.** No indication is given in the original publication of *T. haumani* as to the number of specimens used to generate the description of *R. haumani*. Presumably, more than one specimen was used in the description as Brèthes (1918) indicates, "le deux sexes ne presentent," and no single specimen was indicated as the type. Although the type material has not been examined, a single specimen in the USNM from Buenos Aires (see Material Examined below) apparently collected by Brèthes was available. This specimen might have been used by Brèthes in the original description. The holotype from the Hedqvist description of *R. brasiliensis* is almost identical to the USNM *R. haumani* specimen. The features used by Hedqvist (e.g., postorbital carina absent, pronotum acarinate laterally, Gt<sub>1-3</sub> foreshortened, propodeum elongate) to characterize *Pseudrileyia* as distinct from *Rileyia* are found in numerous species of *Rileyia*, in addition to *R. haumani*, thus supporting the synonymy.

**Material Examined.**

**Type Material:** *Rileyia haumani*: ARGENTINA: Buenos Aires: Buenos Aires, 25.xi.1917, L. Hauman, Ex Gallicula de volubilis (Lectotype ♀, MACN). *Pseudrileyia brasiliensis*: BRAZIL: Santa Catarina: Nova



Teutonia, xi.1938, Fr. Plaumann (Lectotype ♀, KJHC). Paratype, same data as holotype, lost (Hedqvist pers. comm.).

**Other Material: BRAZIL: Minas Gerais:** Pasa Quatro, xii.1972, E. M. Oliveira (1♂ CNC).

***Rileyia hegeli* Girault**

(Figs. 46, 123, 197–204)

*Rileyia hegeli* Girault, 1916: 340–341. Lectotype of *Rileyia hegeli*, ♀, here designated. United States, Florida (USNM, examined).

*Rileyia compressiventris* Gahan, 1918: 143–144. Lectotype of *Rileyia compressiventris*, ♀, here designated. United States, Texas (USNM, examined). **New synonymy.**

**Diagnosis.** Fine intrascrobal carina present and extending for a distance of half the length of scape;  $Gt_{1-3}$  occupying less than one-quarter length of gaster with  $Gt_1$  almost 1.5x as long as  $Gt_{2-3}$  (Figs. 198, 199, 204); stigma slightly enlarged posteriorly (Fig. 201). This species might be confused with *R. mellea* but does not have  $Gt_3$  reaching almost to midlength of the gaster. None of the *R. mellea* specimens examined have the stigma enlarged. Some *R. hegeli* specimens approach *R. megastigma* in general appearance and coloration but *R. megastigma* always has the wing completely setose and the stigma distinctly enlarged (Figs. 237, 241).

**Description.** Female. Length 1.6–3.5 mm. Color golden, except for the ovipositor sheaths (black), flagellum, occiput, mesoscutum and scutellum medially, gaster dorsomedially (dark brown). Wing hyaline, venation brown. **Head.** Reticulate. Subtriangular in frontal view, striae radiating from clypeus reaching lower eye margin. Clypeus slightly emarginate; supraclypeal area not distinctly elevated above remainder of face, finely reticulate. Malar space 0.5–0.8x eye height, postorbital carina absent. Eye glabrous. Scrobal depression deep, margined, intrascrobal carina present, extending one-half length of scape. Scape 4.0x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.0–1.2x as long as broad, subsequent funiculars subequal; clava 2.3–2.5x as long as broad, segmented and tapering apically (Fig. 197).

**Mesosoma.** Finely transversely reticulate. Midlobe of mesoscutum 0.9–1.1x as long as broad, notaulus complete, slightly indicated. Scutellum 1.3x as

long as broad, crudely carinate apically; lateral panel of axilla with several setae in posterior half, reticulate. Mesepisternum reticulate; mesepimeron glabrate-striate. Propodeum carinate-rugose, complete primary costula angulated slightly anteriorly, bisected by median carina, which connects dorsellum and nucha, several distinct plicae submedially connecting primary costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 1.9–2.2x as long as broad, stigma 0.4x as long as stigmal vein, marginal vein 1.3x as long as postmarginal vein.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrous, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.0x as long as Gt<sub>2</sub> and 1.0–1.2x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.3–0.5x as long as Gt<sub>4</sub>; remaining terga evenly setose, except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Figs. 198, 204); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.5–2.5 mm. Essentially identical to female, except as follows: scape with ventral plaque medially, 3.0–3.2x as long as broad, flagellomeres with robust, even MPS in most males (Fig. 200); petiole visible in dorsal view, 1.3–1.7x as long as broad, longitudinally rugulose (Fig. 199); Gt<sub>1</sub> 3.0–6.0x as long as Gt<sub>2</sub> and 1.2–1.3x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.2–0.3x as long as Gt<sub>4</sub>; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 199); Gt<sub>7+8</sub> hemispherical in posterior view.

**Variation.** Primary differences are seen in the extent and intensity of maculation in both sexes and in the distinctness of the production of propodeal sculpture. Specimens in the type series of *R. compressiventris* range in color from almost completely golden to having most of the dorsal surface of the mesosoma, occipital region, and gaster brown. Specimens from Mexico to Venezuela are typically more dorsally maculated in both sexes to the point of being almost completely brown dorsally. However, specimens from Quintana Roo and Brazil (Porto Alegre City) possess the lightly maculated and slightly stigmated form characteristic of the lectotype. Most of the Central and South American forms, in addition to possessing a slightly to moderately enlarged stigma, can possess infuscation immediately surrounding the stigma to extending posteriad a third of the wing width in one extreme variant. Most of the females of these variants do not have the gaster as laterally compressed as in those from the Brownsville, Texas, population but Gt<sub>1-3</sub> retain their slightly elliptical habitus and the characteristic Gt<sub>3</sub> setation in dorsal view. All specimens retain the Gt<sub>3</sub> setation and absence of postorbital

carina. All males have the distinctive MPS configuration on the flagellomeres (Fig. 200), with the, exception of some of the smaller males which possess MPS that are not as closely appressed. This might be a scaling issue due to their small size. Although the majority of males possess a longer than broad petiole (Fig. 199), some males (again, typically smaller specimens) have a shorter (quadrate to just longer than broad in dorsal view) petiole.

**Distribution.** Known from the southern United States into South America (Fig. 298).

**Biology.** This species has been reared from *Eugeniamyia dispar* (Cecidomyiidae: Lopeziini) from leaf galls on *Eugenia uniflora* L. (Myrtaceae) (Mendonça pers. comm. & examined mounted material). Gagné (1989) records *Stephomyia eugeniae* (Felt) and *Stephomyia* sp. as causing fuzzy and smooth, conical leaf galls, respectively, on *Eugenia axillaris* (Swartz) and *Eugenia scutoscutellaris*. Label data indicate specimen capture on *Coccoloba diversifolia* Jacq. (Polygonaceae), which has an unknown cecidomyiid deforming flowers. A series from Costa Rica was reared from leaf vein galls on *Piper* sp. (Piperaceae). This species has also been bred from "Mimosa tree" from the Brownsville, Texas area. This is apparently either *Leucaena pulverulenta* (Schlect.) or *Mimosa lindheimeri* Gray (synonym of *Mimosa biuncifera* Benth.), according to Gahan (1918). I have seen and reared different material from floret galls on *Leucaena pulverulenta* but cannot comment on *M. lindheimeri*. Only two other potential records are indicated on specimen label data: (1) "swept from plants of teosinte" (MX: Guerrero: 47 mi. W. Iguala), and (2) "Ex pupa in orchid seed pod" (Intercepted at Brownsville POE in Mexican shipment).

**Comments.** All paralectotypes of *R. compressiventris* listed are point mounted in radial fashion with up to 7 specimens mounted on a single pin. Some specimens are damaged as follows: 3 missing gaster on one radial mount, 1 missing gaster on another radial mount, and the [?] specimen is represented by only a wing and a leg. Materials examined from this species and other primarily golden to orange colored species (*R. heterogaster*, *R. pulchra*) from the Caribbean Basin and its environs exhibit substantial variation, particularly with respect to maculation dorsally on the body. Within *R. hegeli*, there are forms that are quite small, with very little maculation and inappreciably enlarged stigmas, to larger forms, which have distinct maculation and distinctly produced stigmas (Figs. 201, 202). The

basis for synonymizing these species names is one of shared features between the female lectotype of *R. hegeli* and type material of *R. compressiventris*: both have Gt<sub>1-3</sub> similarly reduced with similar setation on Gt<sub>3</sub> (Figs. 198, 199, 204) (although one seta appears to have been abraded from the *R. hegeli* lectotype) and similar production and setation of subsequent terga. The original basis for recognizing *R. compressiventris* as distinct was a laterally compressed gaster and the apical exposure of Gt<sub>3</sub> longer than that of Gt<sub>2</sub> (Gahan 1918). However, close inspection of the *R. hegeli* lectotype reveals that Gt<sub>3</sub> is slightly elongate and longer than Gt<sub>2</sub>. Further, this specimen has a slightly enlarged stigma and some faint dorsal maculation as in the *R. compressiventris* types. It is apparent that these two are synonymous and that the more extreme form of the Brownsville, Texas (*R. compressiventris* type locality), specimens are representative of the variation seen in this species. See Variation below for further discussion.

#### **Material Examined.**

**Type Material:** *Rileyia hegeli*: **UNITED STATES: Florida: Dade:** Bisc. Bay; TypeNo. 20324 USNM [red label]; *Rileyia hegeli* ♀ Type Ashm. [label folded, handwritten]; *Rileyia hegeli* ♀ Type Gir. [handwritten]; right antenna and wing are slide mounted, “*Rileyia hegeli* Gir. ♀ type [handwritten]” (Lectotype ♀, USNM).

*Rileyia compressiventris*: **UNITED STATES: Texas: Cameron:** Bred from *Mimosa*, Oct. 12, '12; Brownsville, Tex Exp. 1; Webster No. 6480; 17 [handwritten]; TypeNo 21831 USNM; *Rileyia compressiventris* ♀ Type Gahan [handwritten] (Lectotype ♀, USNM). Paralectotypes, 28♀16♂, same data as lectotype but with different dates, hand numbered labels, and red labels with “Paratype” rather than “Type”: 6.x.1912 and “22” (4 ♀1♂); 6.x.1912 and “45” (3♀3♂); 6.x.1912 and “45” (2♀1♂); 5.x.1912, “19” (1♀1[?]); 5.x.1912, “28” (1♀3♂); 7.x.1912 and “44” (2♀5♂); 9.x.1912 and “11” (10♀ [2 mounts of 5 each]); 11.x.1912 and “9” and “6480b” (1♀1♂); 5.x.1912 and “31” (1♂ [red label reads Allotype]); 3♀2♂ labeled “31” only; 1♀ labeled “17” only (all USNM, examined).

#### **Other Material:**

**BRAZIL: Minas Gerais:** ~10 km S. Vicoso, 16.viii.1997, 650m, J. Heraty, H97-95, dry scrub forest and grass sweep (1♂ MZSP); **Rio Grande do Sul:** Porto Alegre City, xi.1994–xii.1995, 30°01'S 51°13'W, *Ex Eugeniomyia dispar* on *Eugenia uniflora* (16♀6♂ USNM). **COSTA RICA: Cartago:** xi.1965, N.L.H. Krauss (1♂ USNM); **Guanacaste:** Arenales, W. side Volcán Cacao, 1988–1989, 900m (1♂ BMNH); Santa Rosa Park, 5.viii.1977, D. H.

Janzen, dry hill (1♀ AEIC); **Heredia:** Est. Biol. La Selva, 100m, 10°26'N 84°01'W, 24.x–3.xi.1994 San Vito, Jardín Bot. Las Cruces, xii.1988, 1200m, P. Hanson (2♀1♂ BMNH); **Puntarenas:** Golfo Dulce, 3 km SW. Rincón, vi–viii.1989, Hanson (1♂ BMNH); San Vito, Jardín Bot. Las Cruces, 5.vi.1988, 1200m, P. Hanson (1♀ BMNH); San Vito, Jardín Bot. Las Cruces, xii.1988, 1200m, P. Hanson (2♀ BMNH); **San José:** Zurquí de Moravia, 24[?].xii.1988, 1600m, P. Hanson; 9°45'N 84°23'W, 27.vi.1973, 800–825m, C. Tufares/J. Helava (1♀ UCR). **DOMINICA:** 1.7 mi. E. Pont Cassé, 4–11.iii.1965, 630m, Bredin-Archbold-Smithsonian Bio. Surv. Dominica (1♂ USNM); Fond Figues R., 9.iii.1965, 133m, H. E. Evans, Bredin-Archbold-Smithsonian Bio. Surv. Dominica (1♂ USNM); St. Peter: Morne Diablotin, 26.xi.1994, 700–900m, L. Masner, s.s. virgin forest (1♀ UCR). **GUATEMALA:** **Sacatepequez:** Antigua, x.1965, N. L. H. Krauss (1♀ USNM); **Trabal:** Las Escobas, 16.vii.1986, L. LeSage, sweep rainforest (1♀ UCR). **JAMAICA:** **St. Andrew:** Stony Hill, 25.iv.1941, Sta. 512, Chapin (1♀ USNM). **MEXICO:** **Guerrero:** 47 mi. W. Iguala on Arcelia Rd., 15.x.1967, W. H. Cross, 154, swept from plants of teosinte (1♀ USNM); 17 mi. E. Tixtla, 11.vii.1985, J. Woolley, G. Zolnerowich, 85/050 (1♀ TAMU); **Michoacan:** 49 mi. SE. Aquila, 13.vii.1984, J. B. Woolley, 84/031 (1♀ TAMU); 12 mi. NE. Uruapan, 12.iv.1980, Cuda & Schaffner (1♀ TAMU); 10 mi. S. Uruapan, 7.vii.1985, J. Woolley, G. Zolnerowich, 85/068 (1♀ TAMU); **Oaxaca:** 2 mi. N. Candelaria Loxicha, 17.vii.1985, J. Woolley, G. Zolnerowich, 85/037 (1♀ TAMU); **Quintana Roo:** Chichen Itza Ruins 17.xii.1993, L. Masner, secondary forest (1♂ UCR); Municipio de Lazaro Cardena, 25km NNE Leona Vicario, Reserva Ecología El Edén, 21°13'N 87°11'W, 14.vii.98, coll: M. Gates; Sweep secondary forest near greenhouse [one specimen reared from Cecidomyiidae[?] gall on *Gymnopodium floribundum*] (13♀ 2♂ UCR); **Tamaulipas:** Gomez Farias, 15.xi.1985, R. Jones (1♀ TAMU); **Veracruz:** 33 km NE Catemaco, Tuxtla Res. Sta., 1.vii.1983, 160m, M. Kaulbars (1♀ UCR). **UNITED STATES:** **Texas:** **Cameron:** Sabal Palm Sanctuary, 21.vii.97, M. W. Gates (1♀ UCR); Brownsville, 3.v.1943, from Mexico, #53905, Id. Lot No. 43-4978, ex pupa in orchid seed pod [intercepted at Brownsville POE?] (2♀ USNM). **VENEZUELA:** **Zulia:** Maracaibo, Caño Colorado, 27.iv.1979, R. W. Brooks, A. A. Grigarick, J. McLaughlin, R. O. Schuster (1♂ UCD).

***Rileya heratyi*, new species**

(Figs. 205–207)

**Etymology.** This species is named in honor of my Ph.D. advisor, John Heraty, for his patience.

**Diagnosis.** A unique species having a greatly elongate  $Gt_{7+8}$ , 6.4–9.3x as long as broad, and with  $Gt_1$  forming a strong ridge anterodorsally above the petiole so that the entire tergum appears roughly triangular in lateral view (Fig. 205);  $Gt_{1-3}$  slightly separated but can be discerned as distinct sclerites. Similar to *Rileyia longitergum* but this species lacks the  $Gt_1$  production and has  $Gt_{1-3}$  apparently fused (Fig. 227).

**Description.** Female. Length 2.5–3.2 mm. Color completely brown, except for the coxae and legs, which are pale yellow, and the gaster, which is golden laterally. Wing hyaline, venation pale brown.

*Head.* Reticulate. Ovate in frontal view, striae radiating from clypeus absent. Clypeus produced ventrally, convex (Fig. 207); supraclypeal area elevated above remainder of face, reticulate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmargined, intrascrobal carina absent. Scape 3.6–3.8x as long as broad, broadest basally; anelli transverse, A1 narrowest and difficult to discern, A2 and A3 each increasing slightly in width, A1–A3 each increasing in length; F1 1.0–1.3x as long as broad, subsequent funiculars subequal in length; clava 2.2–2.5x as long as broad, segmented and tapering apically (Fig. 206).

*Mesosoma.* Reticulate. Midlobe of mesoscutum 1.2–1.3x as long as broad, notaulus complete. Scutellum 1.3–1.4x as long as broad, finely carinate apically; lateral panel of axilla setose medially and with row of setae along scutoscutellar sulcus, finely reticulate. Mesepisternum broadly reticulate; mesepimeron glabrate dorsally, becoming striate ventrally. Propodeum rugose, with fine, complete primary costula, slightly angulated anteriorly; numerous fine plicae spanning some or all of distance between costula and dorsellum or nucha submedially; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus moderately setose. Forewing 2.2–2.3x as long as broad, stigma 0.4–0.6x as long as stigmal vein, uncus fine, marginal vein 1.9–3.5x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gaster not flattened.  $Gt_{1-3}$  glabrous, remaining terga reticulate;  $Gt_{1-3}$  foreshortened;  $Gt_1$  3.0–3.5x as long as  $Gt_2$  and 2.2–2.3x as long as  $Gt_3$ ;  $Gt_{1-3}$  0.2–0.3x as long as  $Gt_4$ ;  $Gt_1$  with raised anterior edge (Fig. 205);  $Gt_{1-3}$  asetose,  $Gt_4$  setose in posterior half, remaining terga evenly setose;  $Gt_5$  not emarginate to expose  $Gt_6$  spiracle (Fig.

205); Gt<sub>7+8</sub> extremely elongate in dorsal view, 6.4–9.3x as long as broad (Fig. 205).

**Male.** Unknown.

**Variation.** The paratype has the gaster completely light brown.

**Distribution.** Known only from Costa Rica (Fig. 292).

**Biology.** Unknown.

**Comments.** The holotype specimen is complete. The paratype has the left forewing mounted separately on the same point; the left hind wing is missing.

**Material Examined.**

**Type Material:** COSTA RICA: Heredia: La Selva, 3km S Pto. Viejo, 10°26'N 84°01'W; 16.iii.1980, H. A. Hespenehede; At foliar nectaries of *Byttneria aculeata* Jacq., Plant # T9:15-9:20 (Holotype ♀, USNM). Paratype, 1♀, same data as holotype (USNM).

***Rileyia heterogaster* Gahan**

(Figs. 10, 23, 208–211)

*Rileyia heterogaster* Gahan 1918: 141–142. Lectotype, ♀, here designated. United States, Texas (USNM, examined).

**Diagnosis.** Usually completely dark or light orange, male with dark brown coloration at apex of metatibia (*R. pulchra* and *R. orbitalis* with more distinctive coloration or maculation; see descriptions); Gt<sub>1-3</sub> foreshortened, glabrous, Gt<sub>1-2</sub> often slightly separated but typically more or less fused (Figs. 208, 210); with fine postorbital carina (*R. pulchra* lacks this feature) which does not extend around eye anteriorly (as in *R. orbitalis*); clypeus bilobate; Gs<sub>1</sub> lacking lateral lobes (slightly to distinctly produced in *R. orbitalis*) (Fig. 208; lobes similar to Fig. 227).

**Description.** Female. Length 2.0–3.4 mm. Color light to dark golden. Wing hyaline, venation brown.

*Head.* Reticulate. Triangular in frontal view, few fine striae radiating from clypeus toward lower eye margin. Clypeus bilobate. Malar space 0.6–0.7x

eye height, postorbital carina present, fading before reaching vertex. Eye glabrous. Scrobal depression shallow, unmarginated, lacking intrascrobal carina. Scape 3.3–3.5x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 subequal, each increasing slightly in width; F1 0.7–0.8x as long as broad, subsequent funiculars subequal; clava 1.2–1.5x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely reticulate. Midlobe of mesoscutum 0.8–1.0x as long as broad, notaulus complete, finely indicated. Scutellum 0.8–1.4x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus, finely reticulate. Mesepisternum reticulate; mesepimeron reticulate-glabrate. Propodeum rugose, with complete primary costula, slightly angulated anteriorly; distinct plicae connect costula to dorsellum and nucha; spiracle small, obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.3–2.5x as long as broad, stigma 0.5–0.6x as long as stigmal vein, uncus fine, marginal vein 0.8–2.3x as long as postmarginal vein (Fig. 211). Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrous, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened, Gt<sub>1-2</sub> nearly completely fused (Figs. 208, 209); Gt<sub>1</sub> 1.5–2.0x as long as Gt<sub>2</sub> and 1.2–1.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.3–0.4x as long as Gt<sub>4</sub>; remaining terga evenly setose, except Gt<sub>4</sub> in anterior two-thirds; Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle (Fig. 208); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.8–2.7 mm. Identical to female, except as follows: scape with ventral plaque medially (Fig. 209), 3.0–3.6x as long as broad; midleg with two brownish bands, medially and apically, apical band more distinct; hind leg with brownish band basally; petiole visible in dorsal view, 0.6–0.9x as long as broad, longitudinally rugose, broadest anteriorly where produced as a carinate flange abutting nucha (Fig. 210); Gt<sub>1-3</sub> glabrous, foreshortened, remaining terga reticulate; Gt<sub>1</sub> 1.5x as long as Gt<sub>2</sub> and 0.8–1.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.2–0.3x as long as Gt<sub>4</sub>; remaining terga evenly setose, except Gt<sub>4</sub> in anterior half dorsally; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 210); Gt<sub>7+8</sub> not visible dorsally; hemispherical in posterior view.

**Variation.** Primary variation occurs as follows: color can be light to dark golden; Gt<sub>1-2</sub> usually partially to completely fused, former independence indicated in dorsal or lateral views by faint indentation or line; one male



specimen from Mexico (8.3 mi. S. Autlan) is distinctly maculated dorsally, similar to *R. pulchra* but otherwise identical to other males of *R. heterogaster*.

**Distribution.** Known from the southern United States into South America (Fig. 296).

**Biology.** This species has also been bred from "Mimosa tree" from the Brownsville, Texas area. This is apparently either *Leucaena pulverulenta* (Schlect.) or *Mimosa lindheimeri* Gray (synonym of *Mimosa biuncifera* Benth.), according to Gahan (1918). I have seen and reared different material but not *R. heterogaster*, from floret galls on *Leucaena pulverulenta*, although I did sweep specimens from this tree species, and cannot comment on *M. lindheimeri* as a potential host. Several specimens were apparently reared from seed galls of Cecidomyiidae from *Pithecellobium guadalupense* (synonym of *P. keyensis*; Fabaceae), from which *Asphondylia* sp. is known to attack seed pods. A rearing record from flower galls of *A. websteri* on *Parkinsonia aculeata* is considered highly probable. A large series of this species was swept from *Rivina humilis* L. (Phytolaccaceae) in south Texas. This plant is attacked by a bud galler, *Schizomyia rivinae* Felt (Cecidomyiidae), which may serve as host for *R. heterogaster*.

**Comments.** The lectotype is point mounted with the gall from which it emerged, and both are intact. Two male and one female paralectotypes are missing their heads. All are point mounted with the galls from which they emerged. The male bred 4.x.1912 has labelled with a red "Allotype" label and a handwritten determination label that also indicates that this specimen is the allotype.

**Material Examined.**

**Type Material:** UNITED STATES: Texas: **Cameron:** Bred from *Asphondylia*, July 25, '12; Brownsville, Tex Exp. 3.; Webster No. 6467; #6467e [handwritten]; Type No. 21830 U.S.N.M. [red label]; *Rileyia heterogaster* ♀ Type Gahan (Lectotype ♀, USNM). Paralectotypes, 3♀4♂, same data as lectotype but with different dates, hand numbered labels, and red labels with "Paratype" rather than "Type": 4.x.1912 and "90", "97", "98" (1♀2♂); 6.x.1912, "74" (1♀); 8.x.1912 and "68" (1♂); 9.x.1912 and "2" (1♂); 10.x.1912, "82" (1♀) (USNM, examined).

**Other Material:** **BAHAMAS:** Eleuthera, Rainbow Bay, 1.vii.1987, D & R. Wiley, (2♀ AEIC). **MEXICO:** **Jalisco:** 8.3 mi. S. Autlan, hwy. 80, 8.vii.1984, J. Woolley (1♂ TAMU); **Michoacan:** 49 mi. SE Aquila, 13.vii.1984, J. Woolley, (2♀ TAMU); **Tamaulipas:** Canon de Navillo, 14.xi.1985, R. Jones, (1♀ TAMU). **TRINIDAD & TOBAGO:** **St. George:** Curepe, 6.i–12.ii.1978, F. Bennett, (3♀ CNC); **Victoria:** Cotton Station, 1.xi.1955, F. Bennett, (3♂ USNM); Santa Margarita Circular Rd., 15–20.v.1974, F. Bennett, (1♀ UCR). **UNITED STATES:** **Arizona:** **Pima:** Box Canyon, Santa Rita Mtns, 1700m, 3.viii.1996, M. Gates, (1♀ UCR); Tucson, 32°10'N, 111°05'W, xi.1986, W. Woods, Em. fresh flower galls of *Asphondylia websteri* on *Parkinsonia aculeata* (♀♂ USNM); **Florida:** **Monroe:** Grass Key, 22.iii.1977, E. Grissell, (3♀ AEIC); same data as preceding but *Ex* cecid gall in seed pod of *Pithecellobium guadalupense* (4♀ USNM); Key Largo, 26.ii.1956, H. Weems, (3♀ USNM); Key Largo, 26.xii.1954, H. Weems, (2♀ USNM); 5.v.1949, O. Link (1♀ ); **Texas:** **Cameron:** Sabal Palm Sanctuary, 11.vii.1983, M. Kaulbars (9♀1♂ UCR); same locality, 21.vii.1997, M. Gates (1♀ UCR); Bentsen Rio Grande SP, 30m, 3.vii.1982, G. Gibson (1♀ UCR); **Hidalgo:** Santa Ana NWR, 50m, 4.vii.1997, G. Gibson, (1♀ UCR). **VENEZUELA:** **Aragua:** San Esteban nr. Puerto Cabello, 1940, P. J. Anduze (1♀ AEIC).

***Rileyia infuscata*, new species**

(Figs. 212–214)

**Etymology.** The specific name refers to the two infuscate spots on each forewing. From the Latin participle of *infusco*, meaning "darkened".

**Diagnosis.** This species has elongate scape and funiculars (Fig. 214), with the antennae inserted above the middle of the face so that scape exceeds vertex and two infuscate spots on forewing: one each posteriad stigma and parastigma (Fig. 213); petiole 3.1x as long as broad (Fig. 212); nucha slightly elongate.

**Description.** Male. Length 3.0 mm. Color completely brown, except for the scape, coxae, and legs (pale yellow). Wing hyaline, except for infuscate spots posteriad the parastigma and stigma, venation pale brown.

**Head.** Reticulate. Subtriangular in frontal view, few fine striae radiating from clypeus toward lower eye margin. Clypeus distinctly bilobate; supraclypeal slightly elevated above remainder of face, finely reticulate. Malar space 0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal

depression shallow, unmarginated, intrascrobal carina absent. Scape 6.3x as long as broad, parallel sided, with slightly indicated swollen ventral plaque in apical half; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 2.4x as long as broad, subsequent funiculars decreasing in length (Fig. 214).

*Mesosoma*. Umbilicate. Midlobe of mesoscutum 1.3x as long as broad, notaulus complete, slightly indicated, particularly posteriorly. Scutellum 1.6x as long as broad, finely carinate apically; lateral panel of axilla evenly setose and with row of setae along scutoscuteellar sulcus, reticulate. Mesepisternum carinate, carina paralleling anterior edge, with carinae extending anteriorly and posteriorly from it; mesepimeron striate. Propodeum rugose-reticulate, with complete primary costula, transversely oriented, connected to dorsellum by median carina; numerous plicae connecting costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.4x as long as broad, two infusate spots on forewing: one each posteriad stigma and parastigma (Fig. 213); stigma 0.4x as long as stigmal vein, uncus fine, marginal vein 1.6x as long as postmarginal vein. Wing completely setose.

*Metasoma*. Petiole visible in dorsal view, 3.1x as long as broad, finely longitudinally rugulose-reticulate (Fig. 212). Gaster dorsoventrally flattened. Gt<sub>1-3</sub> glabrous, Gt<sub>4</sub> glabrous in anterior two-thirds, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 4.0x as long as Gt<sub>2</sub> and 3.2x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.7x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with dorsally incomplete, transverse row of setae (Fig. 212), Gt<sub>4</sub> setose in posterior third, remaining terga evenly setose; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in posterior view.

**Female.** Unknown.

**Distribution.** This species is known only from Costa Rica (Fig. 293).

**Biology.** Reared from a probable cecidomyiid root gall on *Dicranopygium wedelii* Harling (Cyclanthaceae).

**Comments.** The holotype is missing the clava of each antenna.

**Material Examined.**

**Type Material:** COSTA RICA: Limón: 16km W. Guápiles, 400m, i–iii.1990, col. Paul Hanson (Holotype ♂, BMNH).

**Other Material:** COSTA RICA: Limón: PN Braulio Carrillo, Quebrada Gonzalez, iii.2002, M. Gates, P. Hanson, C. Godoy, A. Azofeifa, Ex root gall of *Dicranopygium wedelli* (1♂ USNM).

***Rileyia insularis* (Ashmead)**

(Figs. 22, 29–30, 121–122, 218, 219)

*Ashmeadia insularis* Ashmead, 1894: 143–144 (in Riley et al. 1894).

Lectotype of *Rileyia insularis*, ♀, here designated. Saint Vincent & the Grenadines (USNM, examined).

*Rileyia insularis*; combination by Schmiedeknecht, 1909: 148.

*Rileyia similaris* Gahan, 1918: 149. Lectotype of *Rileyia similaris*, ♀, here designated. United States, Texas (USNM, examined). **New synonymy.**

*Rileyia opuntiae* Gahan, 1936: 482–483. Lectotype of *Rileyia opuntiae*, ♀, here designated. United States, Texas (USNM, examined). **New synonymy.**

*Rileyia americana* Girault, 1916: 339–340. Lectotype of *Rileyia americana*, ♀, here designated (USNM). **New synonymy.**

*Rileyia vardyi* Subba Rao, 1978: 315–316. Holotype of *Rileyia vardyi*, ♀. Peru (BMNH, examined). **New synonymy.**

**Diagnosis.** Pronotum carinate laterally, primary costula of propodeum usually always sharply angulated anteriorly where it contacts dorsellum (Fig. 22), sculpture finer than in *R. cecidomyiae*, almost shagreened (Fig. 22), frenal line often more distinct laterally and dorsally (Fig. 218). Further, specimens of *R. insularis* examined are generally larger in size and females usually have a more acuminate gaster than females of *R. cecidomyiae*.

**Description.** Female. Length 2.8–4.3 mm. Color medium to dark brown, except for the following, which are light brown to golden: antennae, legs, tegula; or golden: trochanter, base and apex of femur, tibia, tarsus, tegula, and antenna. Wing hyaline, venation light brown.

**Head.** Reticulate to striate. Subtriangular in frontal view, striae radiating from clypeus reaching lower eye margin. Clypeus indistinctly notched, slightly emarginate; supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space 0.7–0.8x eye height, postorbital carina present, extending posteriad eye to vertex, continuing around anterior edge eye as fainter carina to intercept postorbital carina ventrally. Eye glabrous.

Scrobal depression deep, margined, intrascrobal carina absent. Scape 2.0–3.0x as long as broad, broadest basally; anelli transverse, A1 narrowest and shortest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.0–1.4x as long as broad, subsequent funiculars decreasing slightly in length; clava 1.8–2.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Midlobe of mesoscutum 1.1–1.2x as long as broad, notaulus complete, slightly indicated. Scutellum 0.9–1.2x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate-rugulose; mesepimeron rugulose-reticulate. Propodeum with primary costula complete, distinctly angulated medially to contact dorsellum, several plicae submedially connecting costula with dorsellum and nucha; irregular, mostly incomplete plicae connect costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus moderately setose. Forewing 2.2–2.4x as long as broad, stigma 0.4–0.6x as long as stigmal vein, marginal vein 1.1–1.8x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.0–2.2x as long as Gt<sub>2</sub> and 1.0–1.3x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.5–0.9x as long as Gt<sub>4</sub>; remaining terga sparsely setose, except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 219); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.8–3.0 mm. Identical to female, except as follows: scape with ventral plaque medially, 2.1–2.3x as long as broad; petiole visible in dorsal view, 0.7x as long as broad, longitudinally rugulose (cf. Fig. 163); Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 3.0–3.2x as long as Gt<sub>2</sub> and 0.7–0.9x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.3–1.4x as long as Gt<sub>4</sub>.

**Variation.** The differences seen in specimens of this species are typically minor. The facial striae can extend past the lower eye margin and the preorbital carina can be distinct or faint. The clypeus is usually slightly emarginate but can also be minutely notched. The anelli sometimes vary slightly in length and width, whereas the mesopleuron can be slightly more rugulose or reticulate. The propodeal sculpture always has an angulated primary costula, which can either meet at a point medially on the dorsellum or unite as a median carina before contacting the scutellum (cf. Fig. 35).

**Distribution.** Known throughout the Nearctic region into South America (Fig. 294).

**Biology.** This species has been reared from *Asphondylia opuntiae* Felt galls on *Opuntia* sp., a cecidomyiid gall on *Helenium autumnale* L. and *Asphondylia* sp. galls on *Leucaena pulverulenta*. I attempted to rear this species from *L. pulverulenta* floret galls from Brownsville. Although unsuccessful, I can confirm that galls collected from this plant in the field are identical in shape to galls mounted with reared specimens. Gahan (1918) indicated that *Mimosa lindheimeri* (now *M. biuncifera*) might also be a potential host based on early rearing records indicating the gall host as "Mimosa tree" but I could not confirm this particular host. Additional rearing records from label data indicate the potential host association with *Asphondylia rudbeckiaeconspicua* Osten Sacken galls on *Rudbeckia* (Asteraceae). Various other records from label data (detailed below) include the following genera: *Apion* [!?](Apionidae); *Asphondylia* spp. (*clematidis*, *conspicua*, *conspicua*, *globulus*, *ilicicola*, *monacha*, *websteri*) and *Neolasioptera impatientifolia* (Cecidomyiidae).

**Comments.** The lectotype of *R. insularis* is point mounted and in good condition because only the right forewing is missing but the male paralectotype lacks the gaster, right wings, and antennae distad F4. Gahan (1918) did not examine the lectotype of *R. insularis*, and this species was placed into his key based on the original description and his assumption that it has Gt<sub>3</sub> the longest as it is assumed to be in the male (cannot be evaluated as gaster is lost). However, the female has Gt<sub>4</sub> as the longest tergum. Further, Gahan (1918) indicated that a male *R. insularis* (USNM Type No. 8080) from Chapada, Brazil, was mislabeled by Ashmead as *Rileyia orbitalis*. However, no male specimen is indicated in the original description of *R. orbitalis* by Ashmead, although the labels on this specimen match those of the female *R. orbitalis* lectotype. This male was definitely erroneously labeled because it possesses neither the color pattern nor the morphological characters seen in identified *R. orbitalis* males. The specimen matches the limited description for the male of *R. insularis* as well as identified male *R. insularis* specimens, but does not share the same locality information as the female *R. insularis* lectotype. I consider this specimen to be *R. insularis*. One *R. americana* paralectotype is missing its gaster, right forewing, right antenna, and left antenna distal to pedicel. The lectotype of *R. insularis* is nearly identical to the female type specimens of *Rileyia similis*, *R. vardyi*, *R. americana*, and *R. opuntiae*. All three share the following: pronotum distinctly angulate laterally, with fine transverse reticulate sculpture bordering on shagreened

(Fig 22), distinct facial striae extending to or just beyond lower eye margin, postorbital carina distinct along malar sulcus, posteriad eye and fading at or near vertex, posterior ocelli just closer to eye margin than either is to the other, primary costula distinctly angulated medially and meeting together on dorsellum at a discrete point (Fig. 22) or joining into a median carina just before contacting dorsellum (cf. Fig. 35); frenal line distinct laterally and usually extending dorsally on scutellum (Fig. 218); Gt<sub>1-3</sub> similarly foreshortened, with the main difference being that females of *R. similaris* have a slightly less acuminate gaster due to shortening of Gt<sub>5-8</sub> (or increased coverage of Gt<sub>5</sub> by Gt<sub>4</sub>), which I ascribe to intraspecific variability.

#### Material examined.

**Type Material:** *Rileyia insularis*: **SAINT VINCENT & THE GRENADINES**: Type; St. Vincent, W. I. H. H. Smith; W. Indies, 99-331; *Rileyia insularis*, Type, ♀ Ashm. [handwritten]; B.M. Type Hym. 5-363” (Lectotype ♀, BMNH). Paralectotype, ♂, same data as lectotype but with additional label, “AllotypeNo 2418 U.S.N.M. [red]” (USNM, examined).

*Rileyia vardyi*: **PERU: Cuzco**: Holotype [circular label with red edge]; Machu Picchu, museum 1,385m, 11-14.viii.1971, C. & M. Vardy, B.M. 1971-533; *Rileyia vardyi* sp. n., det. B. R. Subba Rao 1978 (Holotype ♀, BMNH). Paratypes, 9♀10♂, same data as holotype ([?]; 1♀1♂ USNM, examined).

*Rileyia americana*: [?]: 5140°, 9-7-91 [handwritten]; TypeNo. 20323 U.S.N.M.; *Rileyia americana* ♀ Gir. [handwritten]; *Rileyia americana* ♀ Type Gir. [printed] (Lectotype ♀, USNM). Paralectotypes, 2♀, same data as lectotype (USNM).

*Rileyia similaris*: **UNITED STATES: Texas: Cameron**: [mounted with gall] Bred from *Asphondylia* July 15, 42; Brownsville Tex Exp. 2; Webster No 6467 Type No 21833 U.S.N.M. *Rileyia similaris* Gahan ♀ Type (Lectotype ♀, USNM). Paralectotypes, 12♀ 10♂, same data as lectotype (USNM, examined).

*Rileyia opuntiae*: **UNITED STATES: Texas: Uvalde**: Par. of *Asphondylia opuntiae*; Uvalde Tex.; L. H. Hitchcock, coll. Apr.1928; 9 [all preceding handwritten]; TypeNo 51448 U.S.N.M.; *Rileyia opuntiae* Gahan ♀ Type (Lectotype ♀, USNM). Paralectotypes, 4♀, same data as lectotype (USNM, examined).

**Other Material:** **CANADA: Nova Scotia**: Victoria, Baddeck, Beinn Breagh, 27.viii-4.ix.1977, G. Fairchild (10♀ AEIC); **Ontario**: Finland, 26.vii.1960, S. Clark (1♂ CNC); Thwartay Island, St. Lawrence NP,

19.vii.1976, G. Thomson (1♂1♂ CNC); Bryanstown, 20.vi.1962, Kelton & Brumpton (1♂ CNC); Ancaster Prairie, 6.ix.1994, B. DeJonge (1♀ CNC). **COLOMBIA: Cundinamarca:** Cacheta, 1796m, xii.1939, F. Otoyoy, in fruit (14♀10♂ USNM). **COSTA RICA: Guanacaste:** Est. Exp. E. J. Nunez, 20km SW Canas, 5–17.xi.1991, A. Menke (1♀ USNM); **Puntarenas:** San Vito, Jardín Botánico, Las Cruces, 1200m, iii–xii.1988, P. Hanson (3♀ BMNH). **DOMINICA:** Portsmouth, 100m, vii.1976, N. Krauss (1♀ USNM). **ECUADOR:** Miami POE, 23.viii.1968, J. Buff (1♀ UCR). **EL SALVADOR: La Libertad:** La Libertad, x.1965, N. Krauss (2♀ USNM). **GUATEMALA: Chimaltenango:** Yepocapa, xii.1948, H. Dalmat (1♂ USNM); **Zacapa:** Zacapa, above San Lorenzo, 2200m, 8.viii.1987 (5♀ UCR); Zacapa, below San Lorenzo, 750m, xi.1986, M. Sharkey (2♀ UCR). **HONDURAS: Francisco Morazán:** Suyapa Morazan, 3.xi.1965, N. Krauss (1♀ USNM); El Rancho, Tegucigalpa, *Ex Apion godmani* larva [!], 4.ix.1989, R. Cordero (1♀ EAPZ); Zamorano, ix.1953, *Lantana* galls, N. Krauss (1♀ USNM). **MEXICO: Baja California Sur:** Las Barracas, 11.v.1985–26.vi.1989, P. DeBach (2♀2♂ UCR); **Chiapas:** Tuxtla Gutierrez, 21.viii.1984, G. Gordh (1♀ UCR); 20 mi. N. Bochil Yerba Buena, 1900m, 24.vi.1969, malaise trap (1♀ CNC); San Cristobal de las Casas, 2400m, 14.vi.1969, malaise trap (3♀ CNC); Zontehuitz, nr San Cristobal, 3150m, 27.vi.1969, W. Mason (3♀ CNC); **Coahuila:** 12.4 mi. S. Saltillo, 4.vii.1985, J. Woolley (1♀ TAMU); **Colima:** 7 mi. SSW Colima, 9.vii.1984, J. Woolley (1♀ TAMU); **Guerrero:** 4 mi. W. Chilpancingo, 15.vii.1984, J. Woolley (3♀2♂ TAMU); 6 mi. NE Tixtla de Guerrero, 16.vii.1984, J. Woolley (5♀ TAMU); 15 mi. SW Chichihualco, 15.vii.1984, J. Woolley (5♀ TAMU); **Jalisco:** 8.3 mi. S. Autlan on Hwy 80, 8.vii.1984, J. Woolley (1♀ TAMU); 11 mi. W. jct. hwy 54 (nr Atenquique), Rd to Parque Nacional de Volcan de Colima, 11–12.vii.1984, J. Woolley (3♀ TAMU); 6.7 mi N. Autlan Mine Rd., 7.vii.1984, J. Woolley (3♀ TAMU); **Mexico:** Ixtapan, La Sal, 1800m, 9.viii.1954, J. Chillcott (2♀ CNC); **Michoacan:** 10 mi. S. Uruapan, 7.vii.1985 (1♀ TAMU); 49 mi. SE Aquila, 13.vii.1984, J. Woolley (1♀ TAMU); Huetamo, Hwy 15, 7.iii.1972, Parker & Miller (3♀ USNM); **Morelos:** Lago de Zempoala, 23–25.ix.1991, A. Norrbom, stem gall on *Barkleyanthus salicifolius* (1♀ USNM); **Nayarit:** Campostella, 16.ix.57, R. & K. Dreisbach (1♀ USNM); 6mi. N. Cuernavaca, 2500m, 15.viii.1954, J. Chillcott (1♂ CNC); 12 mi. N. Cuernavaca, 1400, 14.viii.1954, J. Chillcott (1♀ CNC); **Nuevo Leon:** Puerto Genovero, 17.v.1980, J. Pinto (1♀ UCR); Chipinque (Monterrey), 2.xi.1982, J. Huber & A. Gonzalez (3♀ UCR); El Carmen, Hda. Bernabe Villareal, 10.vii.1983, A. Gonzalez (3♀ UCR); **Oaxaca:** Mitla Ruins, 13.vii.1984, G. Gordh (1♀ UCR);



8.3 mi. SE El Cameron, 24.vii.1974, Clark, Murray, Ashe (1♀ TAMU); **Puebla:** 4.4 mi SW Acatepec, 21.vii.1984, J. Woolley (1♂ TAMU); 4 mi. E. Azumbilla, 22.vii.1984, J. Woolley (1♀, TAMU); **Quintana Roo:** Chichen Itza Ruins, 17.xii.1993, L. Masner (3♀ UCR); SLP, 20 mi. N. Tamazunchale, 330m, 21.vii.1954, J. Chillcott (1♂ CNC); **Sinaloa:** 15 mi. W. El Palmito, 1600m, 8.viii.1964, W. Mason (1♀ CNC); **Tamaulipas:** Canyon de Navillo, 14.xi.1985, R. Jones (1♀ TAMU); Llera de canoles, 5 mi. N. Encinco, 200m, 8.iii.1986, Jones, Kovarik, Haack (1♀ TAMU); **Veracruz:** Fortín de las Flores, 30.x.1982, J. Huber & A. Gonzalez (1♀ UCR). **PANAMA:** **Chiriquí:** Boqueteo, x.1953, N. Krauss, leaf gall on *Lantana* (1♀ USNM); Boqueteo, x.1953, N. Krauss (2♀ USNM); **Coclé:** El Valle, xi.1946, N. Krauss (1♀ USNM). **SAINT VINCENT & THE GRENADINES:** St. David, Richmond Beach, 10.vii.1976, J. Noyes (2♀ BMNH). **TRINIDAD & TOBAGO:** [?]: Caron River, 12.x.1918, H. Morrison (1♀ USNM); i.1968, Bennett, in seed of Jusseae [?, probably *Jussiaea* (Onagraceae)] (1♀ USNM). **UNITED STATES:** **Alaska:** **Matanuska:** Glacier Park, 25.vii.1985, H. Anderson (1♀ UCR); **Arizona:** **Cochise:** Guadalupe Canyon, Peloncillo Mtns., 1420m, 12.vii.1982, G. Gibson (4♀ UCR); 7 mi. NE Douglas, 27.viii.1979, J. LaSalle (1♀ UCR); **Pima:** Box Canyon, 16 mi. SE Continental, *Ex Asphondylia websteri* galls on *Prosopis*, 29.viii.1991, E. Grissell & R. Denno (19♀22♂ USNM); **Florida:** **Alachua:** Gainesville, 31.xii.1974, J. Olesky, *Ex* gall on *Ambrosia artemisifolia* (3♀ AEIC); Gainesville, 10.xii.1974–18.ii.1975, M. Olesky, *Ex* gall on *Ambrosia artemisifolia* (8♀ AEIC); **Highlands:** Archbold Biol. Sta., 5.ii.1979–21.i.1980, Weems & Halkin (5♀ 1♂ AEIC); Lake Placid, 0.5mi S US27 & SR70 junct., W. Pierce, *Ex* cecid gall on *Palofaxia feayi* (4♀ AEIC); **Levy:** Cedar Key, on *Solidago microcephala*, *Asphondylia monacha*, 27.x.1973, E. Grissell (10♀1♂ USNM); **Monroe:** Fleming Key, 2.viii.1979–30.i.1980, H. Weems (3♀ AEIC); **Palm Beach:** Palm Beach, 15.iii.1947, W. Proctor (1♀ AEIC); **Idaho:** **Latah:** Moscow Mtn., 8.vi.1977, C. Hepner, on *Ceanothus sanguineus* (2♂ USNM); **Illinois:** **Cook:** Evanston, [data as follows]: *Ex Asphondylia globulus* (1♀ USNM); 140 (1♀ USNM); 141 (1♀ USNM); Evanston, 141 (4♀ USNM); same locality with *ex* gall of *Rhopalomyia anthophia* OS, 142 (1♀ USNM); Evanston, 142, (1♀ USNM); on *Helianthus* sp., 140, from coll. L.H. Weld (1♀ USNM); 140, from coll. L.H. Weld (1♀ USNM); on *Rudbeckia lacinata* L., 141, from coll. L. H. Weld (1♀ USNM); **Iowa:** **Dickinson:** Iowa Lakeside Lab, West Okobji, 23.viii.1979, B. Minor, stem gall *Helianthus grosserserratus* (4♀ USNM); **Kentucky:** **Boone:** Big Bone Lick SP, 22.vi.1982, R. Wharton (1♀ FLTSCA); **Maryland:** **Prince Georges:** College Park, H. Highland, holly

berries (2♀ USNM); **Washington:** Hanover, viii.1989, J. Plakidas, *Ex* summer galls *Asphondylia conspicus* (4♀1♂ USNM); **Michigan:** **Monroe:** 8.vi.1952, R. Dreisbach (2♀ USNM); **Missouri:** **St. Lewis:** Blackjack, 21.ix.1932, R. Swain, gall [?] on *Helianthus tuberosa* (1♀ USNM); same locality but reared stem gall artichoke (1♀ USNM); Baden Staj [?], 15.ix.1932, *Helianthus* (1♀ USNM); **Nevada:** **Nye:** Mercury, 19.v.1960 (2♂ USNM); **New Hampshire:** **Carroll:** Intervale, 8.viii.1969, H. Weems (1♀ AEIC); **New Jersey:** **Ocean:** Lakehurst, 5.viii.1939, H. Townes (1♀ AEIC); **New York:** **Otsego:** Oneonta, 17.viii.1935, H. Townes (3♀ AEIC); **North Carolina:** **Onslow:** Jacksonville, 19.vi.1957, H. Neunzig (5♂ NCSU); **Pamlico:** Vandermere, 17.ix.1943, in *Beyrrihia frutescens* (5♀ USNM); **Wake:** Raleigh, 27.vii.1940, S. Schell (2♀ NCSU); **Ohio:** **Summit:** 20.viii.1937, L. Lipovsky (7♀ USNM); Shaker Heights, 31.viii.1939, E. McDonald (1♀ USNM); **Pennsylvania:** **Blair:** Williamsburg, E. Holland, *Ex Asphondylia ilicicola* in holly berries (4♀ USNM); Williamsburg, 20.iv.1949, J. Brouwers, *Ex* holly berries (1♀ USNM); **Allegheny:** Pittsburgh, 17.ix.1986, from *Neolasioptera impatientifolia* (2♀ USNM); Pittsburgh, Highland, viii.1989, J. Plakidas, *Ex* summer galls *Asphondylia conspicus* (1♀3♂ USNM); **South Carolina:** **Richland:** Columbia, 6.ix.1951, G. Townes (1♀ UCR); **Charleston:** Charlestown, xii.1921, W. Thomas, *Ex* galls on saltbush (5♀ 1♂ USNM); **Oconee:** Walhalla, 15.viii.1957, J. Chillcott (1♀ CNC); **Rhode Island:** **Washington:** Westerly, 22.vii.1936, M. Chapman (2♀ AEIC); **Texas:** **Brazos:** Lick Creek Park, 22.vi.1987, J. Woolley (4♀ TAMU); College Station, 24.iii.1984, J. Woolley (9♀ TAMU); College Station, 12.iv.1986, R. Wharton (1♀ TAMU); College Station, 23.v.1986, L. Rodriguez, *Ex* cecidomyiid gall (1♀ TAMU); **Burnet:** 2 mi. E. Marble Falls, 11.vii.1972, E. Grissell, *Ex Asphondylia clematidis* on *Clematis drummondii* (21♀11♂ TAMU; 27♀11♂ USNM); 11 mi. S. Austin, 2.viii.1972, E. Grissell, on *Parthenium hysterophorus* (4♀ AEIC); 2 mi. E. Marble Falls, *Ex Asphondylia clematidis*, 11.viii.1972, E. Grissell (2♂ TAMU); **Cameron:** Brownsville, 10.v.1952, Lattimore, *Ex Borrichia* gall (1♀ USNM); Brownsville, 12.ii.1980, P. Kovarik (1♀ TAMU); Brownsville, 16.vii.1912, Webster [no. 6467, reared by E. Smyth], bred from *Asphondylia* (1♂ USNM); **Frio:** 4 mi. W. Pearsall, 7.vii.1972, E. Grissell, *Ex* cecid. bud gall on *Clematis drummondii* (20♀8♂ TAMU); **Grayson:** Rock Creek, 5 mi. NW Gordonville, 22.vii.1972, E. Grissell, *Ex* apical gall on *Ambrosia psilostachya* (1♀ TAMU); **Hale:** Cotton Center, 9.ix.1982, D. Dean (1♀ TAMU); **Hidalgo:** Bentsen Rio Grande SP, 20.iv.1985, J. Woolley (3♀ TAMU); **Presidio:** Big Bend Ranch SNA, duck pond 5 mi. W. Saucedo Ranch,

29°28'60"N, 104°0'60"W, 4–5.iv.1993, E. Grissell & R. Denno, on *Solanum* sp. (1♀ USNM); Big Bend Ranch SNA, 1.7 mi NE McGuirks Tanks, 29°28'60"N, 103°48'0"W, E. Grissell & R. Denno, on *Rhus virens* (1♀ USNM); **Starr:** Falcon Lake SP, J. Woolley (1♀ TAMU); **Travis:** Austin, Zilker Park, 8.x.1983, J. Woolley (1♀ TAMU); vic Cypress Creek, 30°25'58"N, 97°52'1"W, 13–14.vii.1994, Quinn, Riley, Wharton, on *Quercus virginiana* (2♀ TAMU); Heep Farm, 11 mi. S. Austin, 28.vi.1972, E. Grissell, on *Parthenium hysterophorus* (7♀ TAMU); **Wilbarger:** 21.vi.1972, C. Rogers, *Ex Asphondylia* sp. (2♀ TAMU); **Virginia:** Glencarlyn, *Ex Asphondylia conspicua* O.S., 22–30.viii.1929, J. Bridwell (72♀20♂ USNM); **Essex:** 1 mi. SE Dunnsville, 37°51'60"N, 76°48'0"W, 18–31.v.1996, D. Smith (2♀ USNM); **Washington, D.C.:** 18.v.1979, E. Grissell, emerg. 20–21.v.1979, *Ex Asphondylia ilicicola* on *I. opaca* (13♀20♂ USNM); **Wisconsin: Grant:** T6N, R6W, S17, 17–24.vi.1975, gypsy moth MT (1♀ AEIC).

#### ***Rileya laeliae*, new species**

(Figs. 220–224)

**Etymology.** The specific name refers to the orchid genus, *Laelia*, with which this species is associated.

**Diagnosis.** This species is most similar to *R. guatemalae* but is distinguished by the propodeum having a complete costula and the strong subdorsal plicae connecting the costula and nucha. This species is one of only two of similar *Rileya* spp. attacking aerial root galls possessing a complete or nearly complete intrascrobal lamina (Fig. 224) (see *R. cattleyae*, Fig. 161). The eyes are asetose, as in *R. guatemalae* and *R. cattleyae* (Figs. 161, 195), but *R. guatemalae* lacks anterior rugosity on Gt<sub>1</sub> seen in both *R. laeliae* and *R. oncidii* (Figs. 221, 247). *R. laeliae* possesses three anterolateral setae on Gt<sub>1</sub> (one in male) (Figs. 220, 221), whereas *R. guatemalae* and *R. cattleyae* have only one (Figs. 151, 194, 195) but the setae are often abraded (as in Fig. 160). The male petiole is distinct in it is distinctly depressed dorsally and saddlelike in lateral view (Fig. 220).

**Description.** Female. Length 1.8–2.3 mm. Color brown, except for the legs and antenna, which are golden brown. Wing hyaline, venation brown.

**Head.** Reticulate. Subtriangular in frontal view, striae radiating from clypeus absent. Clypeus produced ventrally, slightly concave apically (Fig. 224); supraclypeal area at same level as remainder of face, finely reticulate. Malar

space 0.3x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, sharp intrascrobal carina present, extending almost to apex of scrobal depression (Fig. 224). Scape 4.7–5.0x as long as broad, broadest basally; anelli transverse, A1 subquadrate, narrowest, A2 and A3 each increasing slightly in width, A2–A3 subequal in length; F1 0.8x as long as broad, subsequent funiculars subequal in length; clava 1.8–2.0x as long as broad, segmented and tapering apically (Fig. 222).

*Mesosoma.* Finely reticulate. Midlobe of mesoscutum 0.8–0.9x as long as broad, notaulus complete, distinct. Scutellum 1.5–1.6x as long as broad, finely carinate apically; lateral panel of axilla sparsely setose along posterior margin, finely reticulate. Mesepisternum slightly reticulate; mesepimeron glabrate-striate. Propodeum reticulate, with complete, fine costulae in anterior third, angulated slightly anteriorly; several irregular, fine rugae medially and submedially; spiracle subcircular, ~0.5x its length from dorsellum; callus moderately setose. Forewing 2.2–2.3x as long as broad, stigma 0.4–0.5x as long as stigmal vein, marginal vein 1.4x as long as postmarginal vein (Fig. 223). Wing with complete setation.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>1</sub> with several setae sublaterally, remaining terga glabrous-reticulate; Gt<sub>1-2</sub> foreshortened, Gt<sub>2</sub> not visible in dorsal view; Gt<sub>1</sub> 0–8.3x as long as Gt<sub>2</sub> and 4.2–5.0x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 3.0–3.8x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with dorsally incomplete, transverse row of setae, extending laterally; remaining terga sparsely but evenly setose; Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle (Fig. 221); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.7–2.0 mm. Identical to female, except as follows: scape with indistinct ventral plaque medially, 3.0–3.6x as long as broad; petiole visible in dorsal view, 0.5x as long as broad, longitudinally rugose, concave dorsally (Fig. 220); metacoxa larger, more globular than female; Gt<sub>1</sub> 10–20x as long as Gt<sub>2</sub> and 2.5–2.9x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 2.7–2.8x as long as Gt<sub>4</sub>; Gt<sub>2</sub> just visible in dorsal view; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 220); Gt<sub>7+8</sub> not visible in dorsal view.

**Variation.** The type series is essentially invariant but some differences are seen in the presence of additional, incomplete rugae submedially on the propodeum originating from either the nucha or the dorsellum. Some have a nearly complete median carina, whereas others have Gt<sub>2</sub> distinctly exposed in dorsal view.

**Biology.** *Laelia* is a Neotropical orchid genus that is recorded as a host of the cecidomyiid genus, *Neolasioptera* sp., which forms galls on the aerial roots (Gagné 1994).

**Comments.** The type series appears to have been intercepted at the Laredo, Texas, U.S. port of entry and subsequently emerged from *Laelia* sp. (Orchidaceae). The type material appears to have been dispatched and mounted immediately on emergence as many specimens have crumpled wings and cuticular remnants from the pupal stage on the antenna. Type specimen condition is generally good.

**Material Examined.**

**Type Material:** MEXICO: Guerrero: In *Laelia*, Chilpancingo, Gro Mex, Feb. 11-46; Laredo, Tex, 38383, 46-1657 (Holotype ♀, USNM). Paratypes, 16♀3♂, same data as holotype, or with data as follows: Chilpancingo, 24.vi.1946, Tex. 40001, 46-11419, with orchid plants (2♀); same locality, 29.iii.1947, Laredo 43290 [intercepted at port of entry?], Id. Lot No. 47-5894, on orchid plant (1♀) (USNM).

***Rileya longitergum*, new species**

(Figs. 225–227)

**Etymology.** Named for the elongated Gt<sub>7+8</sub>. Compound noun derived from Latin *longus* (long) and *tergum* (back).

**Diagnosis.** Resembles *Rileya heratyi* with both possessing an elongated Gt<sub>7+8</sub>, though the Gt<sub>7+8</sub> of *R. heratyi* is 2.0–3.0x (Fig. 205) as long as that of *R. longitergum*. Also, Gt<sub>1</sub> of *R. longitergum* is not produced anteriorly and Gt<sub>2</sub> and Gt<sub>3</sub> are not apparent (Fig. 227) whereas in *R. heratyi* Gt<sub>1-3</sub> are distinct (Fig. 205); female with Gs<sub>1</sub> produced anteriorly into small lobes laterad of petiole (Fig. 227). Male gaster petiolate, with no indication of distinct foreshortened terga, and only a glabrous area anteriorly on the gaster indicates that Gt<sub>1-3</sub> have fused together and with Gt<sub>4</sub>.

**Description.** Female. Length 1.7–2.7 mm. Color brown, except for antenna, face, eye orbit, pronotum laterally and dorsolaterally, lateral lobe of mesoscutum laterally and medial spot along notaulus, axilla laterally and medial spot along scutoscutellar suture, mesopleuron dorsally, nucha apicodorsally, metapleuron dorsally just laterad spiracle, entire gaster except

brown spot occupying middle half dorsally and ovipositor sheaths (golden), coxae and legs (pale yellow). Forewing hyaline, venation light yellow.

*Head.* Reticulate. Subtriangular in frontal view, striae radiating from clypeus absent. Clypeus distinctly bilobate (Fig. 226); supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space 0.3–0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmargined, intrascrobal carina absent. Scape 3.8–4.3x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 each increasing in length; F1 0.8x as long as broad, subsequent funiculars subequal in length; clava 2.8–3.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate. Midlobe of mesoscutum 1.3x as long as broad, notaulus complete, distinct. Scutellum 1.4–1.5x as long as broad, carinate apically; lateral panel of axilla with row of setae along scutoscutellar suture, reticulate. Mesepisternum slightly reticulate, mesepimeron striate. Propodeum rugose, complete primary costula oriented transversely, turning anteriorly as median carina to intercept dorsellum; two distinct plicae laterad of median carina spanning distance between costula and dorsellum, remaining plicae posteriorly costula irregular or incomplete; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus sparsely setose. Forewing 2.4–2.5x as long as broad, stigma 0.3–0.4x as long as stigmal vein, uncus fine, marginal vein 2.5–2.7x as long as postmarginal vein. Forewing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gaster not flattened.  $Gt_{1+2(+3?)}$  glabrous; remaining terga reticulate;  $Gt_{1+2(+3?)}$  foreshortened;  $Gt_{1+2(+3?)}$  0.1–0.2x as long as  $Gt_4$  and 0.8x as long as  $Gt_5$ ;  $Gt_5$  distinctly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  3.3–3.8x as long as broad, triangular in dorsal view;  $Gs_1$  produced anterolaterally as carinate lobes abutting nucha (Fig. 227).

**Male.** Length 1.5–2.6 mm. Identical to female except as follows: color more generally brown dorsally and golden laterally and ventrally; scape with ventral plaque medially, 2.5–2.8x as long as broad; petiole visible in dorsal view, 1.1x as long as broad, rugulose, produced anteriorly as a carinate flange abutting nucha (Fig. 225);  $Gs_1$  collarlike rather than lobate laterally; gaster dorsoventrally flattened; no indication of foreshortened terga anteriorly, area only slightly more glabrate, which could indicate complete fusion of  $Gt_{1-3}$  with each other and with  $Gt_4$ ; apparent  $Gt_1$  ( $Gt_{1+2+3?}$ ; glabrous area) the shortest (Fig. 225), 0.11x as long as  $Gt_4$  and 0.8–1.0x as long as  $Gt_5$ ;  $Gt_{7+8}$  not visible in dorsal view.

**Variation.** The main differences are in coloration. For example, specimens from San Ramón have a more golden cast to the lighter-colored regions of the body, whereas La Selva specimens are more orange-brown. It is not known how all specimens were prepared. The brown dorsal spot on the gaster can vary slightly in size and intensity. Plicae anterior and posterior to the costula can be absent or reduced in some specimens. Some specimens have a better indication that at least  $Gt_1$  and  $Gt_2$  are fused into a single tergite; it is less clear if  $Gt_3$  has also been subsumed by  $Gt_1$  or  $Gt_4$  (given similar situations seen in other taxa, fusion with  $Gt_{1+2}$  seems more likely). Finally, the males from Empalme La Chonta include two smaller individuals: one identical to males from San Ramón and the other identical but half as large as the remaining males from La Chonta. Most males from La Chonta are identical structurally to the rest of the males in this species but tend to have more distinctive and restricted maculation on the mesosoma and gaster.

**Distribution.** Known only from Mexico and Costa Rica (Fig. 295).

**Biology.** This species has been reared from *Neea* sp. (Nyctaginaceae) leaf and fruit galls and *Piper* sp. (Piperaceae) leaf galls. Gagné (1994) indicates *Bruggmannia* spp. (Diptera: Cecidomyiidae) form galls on leaves and stems of *Neea*, whereas two unidentified cecidomyiids cause two different leaf gall phenotypes on leaves of *Piper*. These species of Cecidomyiidae can potentially serve as hosts for *R. longitergum*.

**Comments.** The holotype and paratypes are card mounted and in good condition.

**Material Examined.**

**Type Material:** COSTA RICA: **Alajuela:** Est. Biol. San Ramón, 900m, P. Hanson; *Neea* leaf gall [handwritten] (Holotype ♀, BMNH). Paratypes, 6♀ 3♂, same data as holotype (5♀2♂ BMNH; 1♀1♂ USNM).

**Other Material:** COSTA RICA: **Cartago:** 2km S. Empalme La Chonta, ii.1996, 2200m, *Piper* leaf gall (9♂ BMNH); **Heredia:** Chilamate, xii.1989-iii.1990, 75m, Hanson & Godoy (1♀ PHC); La Selva Biological Station, 3km S. Puerto Viejo, 11-16.v.1990 (5♀), 4.viii.1992 (4♀), 10°26'N, 84°01'W, H. A. Hespenheide, *Neea* fruit galls [host record for 1990 dates only] (USNM); **Puntarenas:** Golfo Dulce, 24km W. Piedras Blancas, xii.1989-xi.1992, 200m, Hanson (6♀1♂ BMNH); Monteverde, St. Luis Valley, 17.viii.1986,

1400m, L. Masner, semidisturbed area (1♀ UCR). **MEXICO: Quintana Roo:** Chichen Itza, 27.vii.1984, G. Gordh (3♂ UCR).

***Rileya megastigma* (Ashmead), comb. rev.**

(Figs. 9, 21, 234, 236–238, 240)

*Ashmeadia megastigma* Ashmead, 1894: 145 (in Riley et al. 1894).

Lectotype, ♀, here designated. Saint Vincent & the Grenadines (USNM, examined).

*Rileya megastigma* (Ashmead), Schmiedeknecht, 1909: 148.

*Rileya megalostigma*; Schulz, 1906. Incorrect subsequent spelling.

*Calorileya megastigma* (Ashmead), Subba Rao, 1978: 318.

**Diagnosis.** This species is similar in general appearance to several other species of *Rileya* (*R. mellea*, *R. hegeli*, and *R. cearae*) in terms of overall golden color but is differentiated by the enlarged stigma (2.0–2.5x as long as stigmal vein) and completely setose forewing (Figs. 237, 241); the other species have stigma normal sized and bare areas on the forewing. *Rileya cearae* has a similar wing but possesses distinctive dorsal maculation (Fig. 159) and intrascrobal lamina (Fig. 155), which *R. megastigma* lacks.

**Description.** Female. Length 1.8–3.1 mm. Body golden, tips ovipositor sheath dark brown. Wing hyaline; venation light brown, stigma dark brown.

**Head.** Finely reticulate. Subtriangular in frontal view. Clypeus bilobate, supraclypeal not elevated above remainder of face, glabrate. Malar space 0.6–0.7x eye height, postorbital carina absent. Eye glabrous. Scrobal depression unmarginated, shallow, intrascrobal carina lacking. Scape 3.0–4.0x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 1.1x as long as broad, subsequent funiculars subequal in length; clava 2.0–2.3x as long as broad, segmented, tapering apically.

**Mesosoma.** Finely transversely reticulate. Midlobe of mesoscutum 1.0–1.4x as long as broad; notaulus complete, faint in posterior half. Scutellum 1.0–1.2x as long as broad, crudely carinate apically, lateral panel of axilla with row of setae along scutoscutellar sulcus, finely reticulate. Mesepisternum rugulose-reticulate, mesepimeron rugulose-striate. Propodeum carinate, reticulate between carinae, with complete primary costula medially, oriented transversely, angulated anteriorly and uniting with a median carina which intercepts dorsellum; numerous complete or incomplete plicae submedially



connecting costula, dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 1.9–2.0x as long as broad; stigma 0.8–1.6x as long as stigmal vein, stigma distinctly enlarged, 2.0–2.5x as long as stigmal vein (Fig. 237), uncus fine, marginal vein 0.8–1.2x as long as postmarginal vein; costal cell with marginal fringe. Wing completely setose.

*Metasoma*. Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga finely reticulate; Gt<sub>1,3</sub> foreshortened, Gt<sub>1,2</sub> partially fused; Gt<sub>1</sub> 3.0–15.0x as long as Gt<sub>2</sub> and 1.4–3.0x as long as Gt<sub>3</sub>, Gt<sub>1,3</sub> 0.4–0.6x as long as Gt<sub>4</sub>, Gt<sub>1</sub> with group of 3-4 setae dorsolaterally on anterior margin (Fig. 234), Gt<sub>3</sub> with dorsally incomplete, transverse row of setae extending laterally; remaining terga evenly setose except dorsal surface of Gt<sub>4</sub>, Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle, Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.4–2.4 mm. Identical to female except as follows: scape with ventral plaque apical half, 2.0–2.3x as long as broad; Gt<sub>1</sub> 2.0–4.5x as long as Gt<sub>2</sub> and 0.9–1.6x as long as Gt<sub>3</sub>, stigma slightly smaller than in female (Figs. 237, 240), petiole distinct in dorsal view, 0.9–1.1x as long as broad, with carinate flange anteriorly abutting nucha, longitudinally rugulose (Fig. 236); metacoxa slightly globose (Fig. 238).

**Variation.** Primary variation occurs in the presence of brown maculation on the metanotum and extensiveness of lighter maculation dorsally in some males. The maculation varies in both its width and its length. Wing infuscation can be present as a diffuse aura surrounding the stigma. Some females have Gt<sub>1-2</sub> more distinct from one another.

**Distribution.** Known from Central and South America (Fig. 297).

**Biology.** Recorded from *Asphondylia* sp. and *Asphondylia boerhaviae* Möhn (Diptera: Cecidomyiidae) in bud galls on *Boerhavia diffusa* L. (Nyctaginaceae). Wolcott (1948) recorded this species from galls of seed pods of *Jussiaea angustifolia* (Onagraceae) caused by *Asphondylia rochae* Tavares. However, Gagné (1994) indicates that *A. vincenti* deforms the seed pod of *J. angustifolia*.

**Comments.** The lectotype is missing its left flagellum and right wings.

**Material examined.**

**Type Material. SAINT VINCENT & THE GRENADINES:** Leeward side, St. Vincent, W. I., H. H. Smith, 228; TypeNo. 2421 U. S. N. M. [red label]; *Rileyia megastigma* ♀ Type Ashm., unique [handwritten] (Lectotype ♀, USNM).

**Other Material: BELIZE: Corozal:** Ambergris Caye, 26.iii.1993, J. Denis & K. Bolte (2♀ UCR). **CUBA: Santiago:** Siboney, sea level, 11.xii.1995, L. Masner (1♀ CNC); **DOMINICA:** Springfield, xi.1967, N. L. H. Krauss (5♂1♂ USNM). **DOMINICAN REPUBLIC: Duarte:** Loma Quiria Esperela, 20km NE San Francisco de Macoris, 300, 18.iii.1991 (1♀ UCR); **San Domingo:** 8mi. up Macoris River, 16.vii.1917, Morrison (1♀ UCR). **ECUADOR: Pichincha:** Rio Palenque Res. Station, ii.1983, Sharkey & Masner (1♀ CNC). **EL SALVADOR: La Libertad:** La Libertad, 0–20', 14.viii.1975, N. L. H. Krauss (1♀ USNM); **San Salvador:** San Salvador, 0–20', 14.viii.1975, N. L. H. Krauss (1♀ USNM); **Santa Ana:** Santa Ana, 600–700', 16.viii.1975, N. L. H. Krauss (1♀ USNM); **GRENADA:** Mount Gay Est., H. H. Smith (2♀ UCR). **GUATEMALA: Izabal:** Las Escobas, 13.ix.1986, M. Sharkey (3♀ UCR); **Zacapa:** below San Loreto, 750m, ix.1986, M. Sharkey (3♀ UCR). **HONDURAS:** W. of Samana, 26.vii.1978, R. O. Schuster (1♀ UCR); **Cortés:** San Pedro Sula, viii.1975, N. L. H. Krauss (1♀ USNM); **Colón:** Cay Corker, viii.1953, N. L. H. Krauss (1♀ UCR). **JAMAICA: Clarendon:** Peidro River, 250, 17.vii.1974, S & J Peck (1♀ CNC); **St. Andrew:** Kingston, Richmond Cres., 6.v.1980, D. A. Goodhagen (1♀ UCR). **MEXICO: Colima:** Manzanillo, ix.1965, N. L. H. Krauss (1♀ USNM); **Guerrero:** 100 km S. Zihuatanejo, 6.viii.1984, G. Gordh (6♀ UCR); Acapulco, xii.1963, N. L. H. Krauss (1♀ USNM); **Michoacan:** 49 mi. SE Aquila, 13.vii.1984, J. Woolley (1♀ UCR); **Oaxaca:** 4.4 mi. N San Pedro Mixtepec, 16.vii.1985, Woolley & Zolnerowich (1♀ TAMU); **Quintana Roo:** Chichen Itza ruins, 17.vii.1993, L. Masner (1♂ UCR); vii.1955, N. L. H. Krauss (1♀ BISH); Kohunlich, 14–15.vii.1983, R. Anderson (3♂ UCR); **Sinaloa:** 13 mi. N. Mazatlán, 30.i.1964, R. van den Bosch (1♀ UCR); 11mi. N. La Concha, nr microondas sta. La Muralla, 25.x.1982, J. Huber (1♂ UCR); **Sonora:** 1 mi. E. Santa Ana, 30.x.1982, G. Gordh (1♀ UCR); **Tamaulipas:** 1.1 mi. W. Gomez Farias, 20.iii.1986, R. Jones (1♀ TAMU); Gomez Farias, 15.ix.1985, R. Jones (1♀ TAMU); **Veracruz:** 18.6 mi. S. Tampico, 13.viii.1972, E. E. Grissell (1♀ TAMU); 33 miles S. Nautla, 31.x.1982, J.T. Huber & A. Gonzalez (21♀5♂ UCR). **NICARAGUA: Managua:** Managua, Baker (1♀ USNM); Managua, xi.1959, N. L. Krauss (1♀ USNM). **PERU: Junín:** Río Perené, 27.iii.1910, C. H. Townsend (1♀ USNM). **SAINT LUCIA:** University of Waterloo, 29

vi.1973 (1♀ UCR). **VENEZUELA: Zulia:** Rosario, 4.vi.1976, A.S. Menke & D. Vincent (1♀ USNM).

***Rileyia mellea* (Ashmead)**

(Figs. 228–229, 231)

*Ashmeadia mellea* Ashmead, 1894: 321 (in Riley et al.1894). Lectotype, ♀, here designated. United States, Florida (USNM, examined).  
*Rileyia mellea* (Ashmead), Schmiedeknecht, 1909: 148.

**Diagnosis.** Similar to *R. hegeli* but differs in segmentation of the gastral terga described below (Figs. 231, 229). Distinguished by a fine intrascrobal carina extending for distance half length of scape (absent in *R. hegeli*); complete median carina present on propodeum, with primary costula diminishing slightly before reaching it, strong plicae submedially connecting costula to dorsellum and nucha; Gt<sub>1-3</sub> occupying almost one-half length of gaster (much less than one-half gaster in *R. hegeli*), with Gt<sub>1</sub> and Gt<sub>3</sub> subequal in length (Figs. 231, 229).

**Description.** Female. Length 2.9–3.1 mm. Color golden, except for the coxae and legs, which are pale yellow. Wing hyaline, venation brown.

**Head.** Finely reticulate. Subtriangular in frontal view, striae radiating from clypeus toward lower eye margin. Clypeus weakly bilobate; supraclypeal area not distinctly elevated above remainder of face, finely reticulate. Malar space 0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, finely margined, faint intrascrobal carina present, extending one-third length of scape. Scape 4.5–4.8x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent funiculars subequal; clava 2.2–2.4x as long as broad, segmented, tapering apically.

**Mesosoma.** Finely transversely reticulate. Midlobe of mesoscutum 0.9–1.0x as long as broad, notaulus complete, slightly indicated. Scutellum 1.1–1.2x as long as broad, crudely carinate apically; lateral panel of axilla with several setae in posterior half, reticulate. Mesepisternum glabrate-reticulate; mesepimeron striate. Propodeum rugose, with complete primary costula, angulated slightly anteriorly and diminishes in apparency prior to contacting complete median carina connecting dorsellum and nucha, several distinct plicae submedially spanning all or some of the distance between costula with

dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.0–2.2x as long as broad, stigma 0.4–0.5x as long as stigmal vein, marginal vein 1.0x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga finely reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 3.3–3.6x as long as Gt<sub>2</sub> and 1.5–1.6x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.1–1.9x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with dorsally incomplete, transverse row of seta subdorsally; remaining terga evenly setose except Gt<sub>4</sub> in anterior third; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 229); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.8–2.3 mm. Identical to female except as follows: scape with ventral plaque extending almost its entire length (Fig. 228), 3.4–3.6x as long as broad; petiole visible in dorsal view, 0.9–1.0x as long as broad, rugulose; gaster slightly dorsoventrally flattened with Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 6.6–9.0x as long as Gt<sub>2</sub> and 1.8–2.0x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.9–1.1x as long as Gt<sub>4</sub>; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 231); Gt<sub>7+8</sub> not visible in dorsal view.

**Distribution.** Known only from Florida (Fig. 297).

**Biology.** Label data indicate only two potential host records: a gall on skunk bush from Florida and a leaf gall on *Eugenia axillaris* (Myrtaceae).

**Comments.** The lectotype is point mounted and missing both flagella but otherwise complete. Four paralectotypes have both flagella missing, one paralectotype has a single flagellum missing, and the final one has both wings and antennae missing. Three male specimens deposited at the USNM have labeling identical to six of the female paralectotypes and are designated as paralectotypes even though only a single male was mentioned by Gahan (1918) and "several specimens" were the only mention of the type material in Ashmead's original description. Finally, a single female from the Naturhistorisches Museum, Wein, with an identical "Gall on skunk bush" handwritten label is described as a type (a similar situation was described for *Rileya cecidomyiae*) but is given no formal status here.

**Material Examined.**

**Type Material:** UNITED STATES: Florida: [?]: Gall on skunk bush, July '85, Indian Riv. [handwritten, folded]; Type No. 2173 [red label]; *Rileya*

*mellea* ♀ Type Ashm. [handwritten] (Lectotype ♀, USNM); Paralectotypes, 7♀3♂, same data as lectotype [only one label has the additional Indian Riv., Fla. information written on it] (USNM, examined).

**Other Material:** UNITED STATES: Florida: **Monroe:** Key Largo, 15.vi.1961, F. C. Craighead, lf. gall *Eugenia axillaris*; *Rileyia mellea* Ashmead ♂ det. Burks [both labels handwritten] (1♀1♂ USNM).

***Rileyia mimica*, new species**

(Fig. 233)

**Etymology.** Derived from the Latin *mimicus*, after my favorite X-Men character, the Mimic.

**Diagnosis.** Closely resembles *R. clarki* in the structure of the gaster but is separated because *R. mimica* lacks the distinctive color pattern of *R. clarki*, has the ventral collar formed by Gs<sub>1</sub> discontinuous laterally (Fig. 233), the mesepisternum reticulate rather than distinctly striate (as in *R. clarki*), the clypeus rounded ventrally (emarginate in *R. clarki*), and the lower face lacking striae (striate in *R. clarki*).

**Description.** Female. Length 2.1–2.4 mm. Color golden, except for the ovipositor sheaths (see Variation). Wing hyaline, venation light brown.

**Head.** Finely reticulate. Subtriangular in frontal view, lacking striae radiating from clypeus reaching lower eye margin and scrobal depression. Clypeus produced and rounded apically; supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space 0.5–0.6x eye height, postorbital carina present, extending posteriad eye, fading posteriad eye. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 4.0–5.7x as long as broad, broadest basally; anelli transverse, A1–A2 roughly subequal in length and width; F1 1.4x as long as broad, subsequent funiculars subequal in length; clava 3.2–3.5x as long as broad, distinctly segmented, tapering apically.

**Mesosoma.** Transversely striate-umbilicate becoming umbilicate posteriorly. Midlobe of mesoscutum 1.0x as long as broad, notaulus distinct. Scutellum 1.3–1.4x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus and medially, glabrate. Mesepisternum reticulate to slightly striate; mesepimeron glabrate with faint striae ventrally. Propodeum carinate, with complete primary costula that is connected with dorsellum and nucha by median carina; robust plicae

connecting primary costula and dorsellum subdorsally with finer plicae connecting costula to nucha subdorsally and laterally; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.3–2.4x as long as broad, completely setose, stigma 0.4x as long as stigmal vein, uncus fine, marginal vein 1.5x as long as postmarginal vein, wing completely setose in basal half.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrate, Gt<sub>4</sub> glabrate in anterior two-thirds, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened and apparently fused; Gt<sub>1-3</sub> 0.2x as long as Gt<sub>4</sub> and 2.0x as long as Gt<sub>5</sub>; Gt<sub>1-3</sub> produced anteriorly as a carinate lip with a few fine carinae extending from it posteriorly; Gs<sub>1</sub> produced as a robust carinate collar abutting nucha, with robust longitudinal carinae buttressing it and a distinct gap between ventral and lateral portions (Fig. 233); Gt<sub>1-3</sub> with transverse row of setae apically; Gt<sub>4</sub> sparsely setose in posterior third, remaining terga evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** The paratype has the gap laterally in Gs<sub>1</sub> fused anteriorly and the apex of Gt<sub>1-3</sub> essentially completely fused with Gt<sub>4</sub> (although the apical line of setae on former Gt<sub>3</sub> remains). Further, this specimen also has both the anteroventral and dorsolateral areas of Gt<sub>4</sub> and Gt<sub>7+8</sub> brown rather than golden.

**Male.** Unknown.

**Distribution.** Known only from Ecuador (Fig. 298).

**Biology.** Unknown.

**Comments.** The type series is card mounted, and the specimen deposited in the USNM permanently has its gaster mounted separately on the same card.

**Material Examined.**

**Type Material: ECUADOR: Napo:** Tiputini Biodiversity Station, 216m, 00°37'55"S 76°08'39"W, 8.ii.1999, Lot # 2024, Transect 3, T. Erwin et al. Canopy fogging bare leaves, some w/ bryophytic/lichenous growth (Holotype ♀, EPNC). Paratypes, 3♀, same data as holotype but 24.x.1998, Lot # 1940, Transect 7 (1♀ USNM); same data as holotype but 7.ii.1999, Lot # 2041, Transect 5 (1♀ USNM); Reserva Etnica Waorani, Transect Ent., 1km S. Okone Gare Camp, 00°39'10"S 76°26'0"W, 200m, 10.x.1994, T. Erwin et al., canopy fogging, Lot# 935 (1♀ USNM).

***Rileyia minuta*, new species**

(Figs. 230, 232, 242)

**Etymology.** Derived from the Latin *minutus*, meaning "small".**Diagnosis.** Related to *R. protuberona*, *R. abnormicornis*, and *R. carinaegaster* (see diagnostic discussion under *R. abnormicornis*) but is separated from closely related species as follows: vertex or pronotum not produced posteromedially as in *R. protuberona* (Fig. 269); Gt<sub>1</sub> not produced and carinate as in *R. carinaegaster* (Fig. 152); antenna not distinctly moniliform with pedicellate funiculars as in *R. abnormicornis* (Fig. 126).**Description.** Female. Length 1.5–2.7 mm. Color dark brown to black, except for the antennae, tegula and legs golden-brown. Wing hyaline, venation pale yellow.**Head.** Finely reticulate-striate. Ovate in frontal view, numerous striae radiating from clypeus reaching lower eye margin and scrobal depression. Clypeus emarginate; supraclypeal area not elevated above remainder of face, striate. Malar space 0.3x eye height, postorbital carina present, extending posteriad eye, fading near vertex. Eye glabrous. Scrobal depression shallow, margined, intrascrobal carina absent. Scape 4.3–5.3x as long as broad, broadest basally; anelli transverse, A1–A2 roughly subequal in length and width; F1 1.0–1.7x as long as broad, subsequent funiculars decreasing slightly in length, moniliform (Fig. 242); clava 2.4–2.8x as long as broad, indistinctly segmented, tapering apically.**Mesosoma.** Reticulate. Midlobe of mesoscutum 1.0–1.1x as long as broad, notaulus absent. Scutellum 1.4x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate; mesepimeron glabrate with faint striae and reticulation. Propodeum reticulate, with complete primary costula that is contiguous with dorsellum in medial half; median carina and a few plicae spanning some or all of distance between costula and nucha or dorsellum; spiracle obliquely oriented, reniform, <0.5x its length from dorsellum; callus sparsely setose. Forewing 2.1–2.4x as long as broad, sparsely setose, stigma 0.7–0.8x as long as stigmal vein, uncus short, marginal vein 2.6x as long as postmarginal vein, wing incompletely setose in basal half (Fig. 232).**Metasoma.** Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 3.8–4.3x as long as Gt<sub>2</sub> and 1.9–3.3x as

long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.5x as long as Gt<sub>4</sub>; Gs<sub>1</sub> with robust carinate collar anterolaterally, abutting nucha with robust longitudinal carinae buttressing it Gt<sub>1</sub> with 1–2 setae dorsolaterally in anterior third (cf. Fig. 230); Gt<sub>2</sub> with dorsally incomplete, transverse row of setae; Gt<sub>3</sub> with dorsally incomplete, transverse row of setae; remaining terga evenly setose (Fig. 230); Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 230); Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** The specimen from Rancho Grande possesses an antenna in which the flagellomeres are not distinctly moniliform. Also, the eye can be distinctly triangular ventrally (cf. Fig. 269), more circular ventrally, or intermediate. Otherwise, slight variation exists in the extent to which the primary costula is contiguous with the dorsellum and the relative production of any carinae/plicae on the propodeum.

**Male.** Unknown.

**Distribution.** Known from Mexico, the Caribbean, and South America (Fig. 291).

**Biology.** Unknown.

**Comments.** The holotype is card mounted, and the right midleg is mounted separately on the same card. The Linhares paratype has both left wings mounted separately on the same card.

**Material Examined.**

**Type Material:** **MEXICO: Quintana Roo:** Municipio de Lazaro Cardena, 25km NNE Leona Vicario, Reserva Ecología El Edén, 21°13'N 87°11'W, 23.vii.98, coll: M. Gates; Sweep secondary forest near greenhouse" (Holotype ♀, USNM). Paratypes, 7♀, **BRAZIL: Espírito Santo:** Linhares, ix.1972, M. Alarenha (1♀ UCD); **Rondonia:** Fazenda Rancho Grande, 62km S. Ariquemes, 2.xii.91, SLHeydon, on forest trail (1♀ UCD). **ECUADOR: Napo:** Reserva Etnica Waorani, Transect Ent., 1km S. Onkone Gare Camp, 00°39'10"S 76°26'00"W, 10.x.1994, 220m, T. Erwin *et al.*, Lot # 934, transect t3..5, canopy fogging (1♀ EPNC); Northern Production Facility, 00°39'25.7"S 76°27'10"W, 320m, T. Erwin *et al.*, Lot # 1059, transect NPF, canopy fogging terre firme forest (1♀ EPNC); Tiputini Biodiversity Station, 216m, 00°37'55"S 76°08'39"W, 6.ii.1999, Lot # 2068, Transect 7, T. Erwin *et al.* Canopy fogging bare leaves, some w/ bryophytic/lichenous growth (1♀



EPNC). **PERU: Loreto:** 1km SW Boca del Rio Samiria, Vigilante Post #1, 31.vii.1991, 04°40'29"S 74°18'54"W, T. Erwin fogging, 130m, Lot #74 (1♀ USNM). **TRINIDAD & TOBAGO: St. George:** Tumpuna Reserve, 9.viii.1976; J. S. Noyes, Brit. Mus. 1976-462, Caribbean pine plantation (1♀ BMNH).

***Rileya obscura*, new species**

(Figs. 243, 244)

**Etymology.** The specific name refers to the difficulty of differentiating Gt<sub>1+2+3</sub> from each other and from subsequent terga. Derived from the Latin adjective *obscurus* (indistinct).

**Diagnosis.** Apparent Gt<sub>1</sub> minute, very faint indication that Gt<sub>2,3</sub> have fused with Gt<sub>1</sub> and all are indistinctly separated from Gt<sub>4</sub>, two short submedian carinae dorsolaterally on Gt<sub>1+2+3</sub> (Fig. 244), carinate lip laterally and ventrally around petiole; petiole 1.9x as long as broad; nucha slightly elongate (Fig. 244).

**Description.** Male. Length 1.8 mm. Color completely golden-brown, except for the following, which are pale yellow: face below scrobal depression, coxae, and legs. Wing hyaline, venation pale brown.

**Head.** Reticulate. Ovate in frontal view, few fine striae radiating from clypeus toward lower eye margin. Clypeus bilobate; supraclypeal slightly elevated above remainder of face, finely reticulate. Malar space 0.6x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 2.2x as long as broad, broadest medially at ventral plaque; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 each increasing in length; F1 1.0x as long as broad, subsequent funiculars subequal in length; clava 3.0x as long as broad, segmented, tapering apically.

**Mesosoma.** Finely, transversely reticulate. Midlobe of mesoscutum 1.5x as long as broad, notaulus complete, distinct. Scutellum 1.4x as long as broad, finely carinate apically; lateral panel of axilla setose medially and with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum glabrate becoming rugulose dorsally, mesepimeron striate. Propodeum carinate, complete primary costula oriented transversely, slightly angulated anteriorly; numerous weak plicae spanning some or all of distance between costula and dorsellum or nucha; spiracle obliquely oriented, reniform, ~1.5x its length

from dorsellum; callus moderately setose. Forewing 2.2x as long as broad, stigma 0.6x as long as stigmal vein, uncus fine, marginal vein 2.3x as long as postmarginal vein (Fig. 243). Wing incompletely setose basally.

*Metasoma*. Petiole visible in dorsal view, 1.9x as long as broad, finely longitudinally rugulose with anteriorly directed, fine, carinate flange abutting nucha. Gaster dorsoventrally flattened. Gt<sub>1+2+3</sub> glabrous, remaining terga reticulate; Gt<sub>1+2+3</sub> foreshortened and minute, these terga apparently fused together; Gt<sub>1+2+3</sub> 0.5x as long as Gt<sub>4</sub> and 2.6x as long as Gt<sub>5</sub>; Gt<sub>1</sub> asetose; remaining terga sparsely but evenly setose; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 244); Gt<sub>7+8</sub> hemispherical in posterior view.

**Female.** Unknown.

**Distribution.** Known only from Venezuela (Fig. 292).

**Biology.** Unknown.

**Comments.** The holotype is missing its left hind leg and left middle leg beyond the femur. Both sets of wings and the left foreleg are mounted separately on the same card.

**Material Examined.**

**Type Material: VENEZUELA: Aragua:** Rancho Grande NP, 19.viii–3.ix.92, 200m, L. Masner, cloud forest (Holotype ♂, CNC).

***Rileyia oculiseta*, new species**

(Figs. 245, 246, 266, 267)

**Etymology.** Named for the fine, erect setae on the eye. A compound noun in apposition derived from the Latin *oculus* (eye) and *seta* (bristle).

**Diagnosis.** Similar to *R. gracilis* and males of *R. tricolor* but differentiated by its setose eye (Fig. 266); male petiole 1.5x as long as broad and rugulose (Fig. 241), which is shorter than petiole of males in aforementioned species (Figs. 187, 283); ventral plaque inconspicuous, placed basally (*e. g.* other species have the ventral plaque placed medially (cf. *R. gracilis*, Fig. 189) or along the entire length of the scape (*R. tricolor*); male forewing minutely stigmated, as opposed to similar aforementioned species which have the forewing hyaline.

**Description.** Male. Length 2.5–3.0 mm. Color brown, except for the following, which are golden: scape, coxae, legs, and gaster laterally and ventrally in female. Wing hyaline, complete setation basally, venation pale brown.

*Head.* Reticulate. Subtriangular in frontal view, fine striae radiating from clypeus extending toward lower eye margin. Clypeus slightly bilobate; supraclypeal slightly elevated above remainder of face, finely reticulate. Malar space 0.9–1.0x eye height, postorbital carina absent. Eye finely setose. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 5.0–5.1x as long as broad, broadest basally, ventral plaque inconspicuous basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 1.2–1.3x as long as broad, subsequent funiculars subequal in length; clava 4.0–4.2x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate. Midlobe of mesoscutum 2.1–2.3x as long as broad, notaulus complete, distinct. Scutellum 1.0–1.1x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate-glabrate and mesepimeron finely striate-glabrate. Propodeum rugose and finely reticulate, with complete primary costula medially, oriented transversely, turning antieriad and uniting as a median carina which intercepts dorsellum; numerous complete or incomplete plicae submedially connecting costula, dorsellum and nucha; nucha slightly elongate, setose laterally near base; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.1x as long as broad, stigma 0.6x as long as stigmal vein, stigma slightly enlarged, uncus fine, marginal vein 1.7–1.8x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole distinctly visible in dorsal view, petiole 1.5–1.6x as long as broad, longitudinally rugulose, Gs<sub>1</sub> forming a fine, carinate collar encircling petiole ventrally (Fig. 245); Gaster dorsoventrally flattened. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 4.0–4.4x as long as Gt<sub>2</sub> and 1.3–1.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.5–0.6x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with dorsally incomplete, transverse row of setae extending laterally; remaining terga evenly setose except Gt<sub>4</sub> in anterodorsal three-fourths; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in dorsal view.

**Female.** Length 2.9–3.8 mm. Identical to male, except as follows: scape lacking ventral plaque (Fig. 267); eye more densely setose (Fig. 266); petiole barely visible dorsally; gaster not dorsoventrally flattened;  $Gt_1$  4.5–4.6x as long as  $Gt_2$  and 1.6–1.7x as long as  $Gt_3$ ,  $Gt_{1+3}$  0.6–0.7x as long as  $Gt_4$ ;  $Gt_3$  with dorsally incomplete transverse row of setae;  $Gt_5$  slightly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  triangular in dorsal view (Fig. 246).

**Distribution.** Known only from Costa Rica and Colombia [?, not mapped] (Fig. 292).

**Biology.** Unknown.

**Comments.** The type material is card mounted in excellent condition, except for the holotype, which has its right forewing mounted separately on the same card. The paratype collected on i.1989 is point mounted.

**Material Examined.**

**Type Material:** COSTA RICA: San José: Zurquí de Moravia, 1600m, iii.1991, col. Paul Hanson (Holotype ♂, BMNH). Paratypes, 3♀, same data as holotype but different dates, xi.1995 (1♀ BMNH); viii.1995, i.1989 (2♀ MZCR).

**Other Material:** COLOMBIA: (NYPOE) [via New York Port of Entry?], 30vii.1965, orchids (1♂ USNM). COSTA RICA: Guanacaste: Monte Verde, 20–24.ii.1972, E. Powell (1♀ UCDC).

***Rileya oncidii*, new species**

(Figs. 247–250)

**Etymology.** The specific name refers to the genus of orchid, *Oncidium*, with which this species is associated.

**Diagnosis.** This species is similar to *R. cattleyae* in having rugulose sculpturing on the anterior edge of  $Gt_1$  (Figs. 151, 247) in females, though it is more distinct in *R. oncidii*. Although the strongly produced clypeus (Fig. 250) in *R. oncidii* is similar to that seen in *R. cattleyae* (Fig. 161), *R. oncidii* lacks the intrascrobal carina (Fig. 161) and dense, fine sculpture of the head and mesosoma seen in *R. cattleyae*. The propodeum of *R. oncidii* lacks a median carina (at most possesses incomplete carina) and costula, although

incomplete plicae are present laterally. The male petiole is slightly concave dorsally (Fig. 247), though not as distinct as in *R. laeliae* (Fig. 220).

**Description.** Female. Length 2.3–2.4 mm. Color brown, except for the following, which are golden: legs, tegula, antenna, and gaster ventrally. Wing hyaline, venation brown.

*Head.* Reticulate. Ovate in frontal view, striae radiating from clypeus absent. Clypeus produced, entire, apex emarginate (Fig. 250); supraclypeal area at same level as remainder of face, finely reticulate. Malar space 0.3x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 4.4–4.5x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent subequal in length; clava 4.0–4.1x as long as broad, segmented, tapering apically.

*Mesosoma.* Glabrate. Midlobe of mesoscutum 1.0x as long as broad, notaulus complete, distinct, divergent, forming an "X" in dorsal view with scutoscutellar carinae. Scutellum 1.6–1.7x as long as broad, finely carinate apically; lateral panel of axilla sparsely setose anteriorly, reticulate. Mesepisternum slightly reticulate; mesepimeron glabrate-striate. Propodeum reticulate with several irregular, fine rugae; spiracle circular, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.3–2.5x as long as broad, stigma 0.4x as long as stigmal vein, marginal vein 2.1–2.2x as long as postmarginal vein (cf. Fig. 248). Wing completely setose.

*Metasoma.* Petiole barely visible in dorsal view, transverse, rugose dorsally. Gaster laterally flattened. Gt<sub>1,2</sub> glabrous, Gt<sub>1</sub> with transverse anterior lip, with triangular patch of fine reticulation anteromedially that is contiguous with lip, Gt<sub>3</sub> reticulate, glabrous apically, remaining terga reticulate; Gt<sub>1,2</sub> foreshortened; Gt<sub>1</sub> 11.5–12.0x as long as Gt<sub>2</sub> and 4.6–4.8x as long as Gt<sub>3</sub>, Gt<sub>1,3</sub> 0.9–1.0x as long as Gt<sub>4</sub>; Gt<sub>2</sub> not visible in dorsal view, visible in lateral view, Gt<sub>3</sub> with transverse row of setae laterally; remaining terga evenly setose except Gt<sub>4+5</sub> in anterior half; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 2.3 mm. Identical to female, except as follows: scape with faint ventral plaque medially (Fig. 249), 5.0x as long as broad; A1 longest, A2 shortest; petiole visible in dorsal view, 0.7x as long as broad, longitudinally rugose (Fig. 247) and slightly concave dorsally. Gt<sub>2</sub> just visible dorsally; Gt<sub>5</sub>

distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 247), Gt<sub>7+8</sub> hemispherical in posterior view.

**Variation.** The type series is essentially invariant but some differences are seen in the presence of additional, incomplete rugae submedially on the propodeum originating from either the nucha or the dorsellum.

**Distribution.** Not mapped as specific localities unknown (see Material Examined).

**Biology.** *Oncidium oblongatum* (Orchidaceae) is found in the Neotropical region including Florida and the Caribbean. This genus is recorded as a host of the genus of Cecidomyiidae, *Neolasioptera* sp., forming galls on the aerial roots (Gagné 1994).

**Comments.** The type series might have been intercepted at an unidentified U.S. port of entry and subsequently emerged during its time there from *Oncidium oblongatum* Lindl. (Orchidaceae). One male and female specimen are each missing the right flagellum.

**Material Examined.**

**Type Material: GUATEMALA:** In *Oncidium oblongatum*; Guatemala IV-14-44, Lot No 44-16404; New genus nr *Rileyia*, det Gahan (Holotype ♀, USNM). Paratypes, 1♀1♂, same data as holotype (USNM).

***Rileyia orbitalis* Ashmead**

(Figs. 263–265)

*Rileyia orbitalis* Ashmead, 1904: 467. Lectotype, ♀, here designated. Brazil (USNM, examined).

**Diagnosis.** This species is similar in overall appearance to *R. heterogaster* and *R. pulchra* but can be differentiated as follows: complete (fine or robust) carina encircling eye (cf. Fig. 2) (present only posteriorly in *R. heterogaster*), Gs<sub>1</sub> produced anterolaterally as a faint to distinct lobe (cf. Fig. 227) (similar production in *R. pulchra* but absent in *R. heterogaster*), Gt<sub>1</sub> partially fused to Gt<sub>2</sub> (Fig. 263) (often seen in *R. pulchra* and *R. heterogaster* but not as common in *R. orbitalis*).

**Description.** Female. Length 2.2–4.1 mm. Color as follows: golden: face, antennae, genae, tegula, and legs, except for the apices of the femur and tibia and base of the tibia which are whitish; reddish brown: vertex, ocellar triangle, mesosoma laterally, pronotum laterally and posteriorly, along notaulus laterally, along scutoscutellar sulcus medially, scutellum apically and laterally; blackish-brown: occiput, pronotum anteriorly and in anteromesal half, mesoscutum and scutellum, propodeum dorsally, ovipositor sheaths apically. Wing hyaline, venation pale brown.

*Head.* Reticulate. Subtriangular in frontal view, few fine striae radiating from clypeus toward lower eye margin. Clypeus shallowly bilobate; supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space 0.4–0.7x eye height, postorbital carina present, continuing around eye as preorbital carina, fading before reaching postorbital carina again. Eye glabrous. Scrobal depression shallow, unmargined, intrascrobal carina fine, not extending beyond basal third of scape. Scape 3.8–3.9x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 0.8–1.0x as long as broad, subsequent funiculars subequal in length; clava 1.8–2.2x as long as broad, segmented and tapering apically (Fig. 265).

*Mesosoma.* Reticulate-umbilicate anteriorly becoming umbilicate posteriorly. Midlobe of mesoscutum 0.8–1.1x as long as broad, notaulus complete, distinct. Scutellum 1.1–1.3x as long as broad, finely carinate apically; lateral panel of axilla setose medially and with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate-rugose; mesepimeron striate-reticulate. Propodeum carinate, complete primary costula oriented transversely, angulated slightly anteriorly, connected to dorsellum by median carina; several plicae spanning some or all of distance between costula and dorsellum or nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum, reniform; callus moderately setose. Forewing 2.3–2.4x as long as broad, stigma 0.5–0.6x as long as stigmal vein, uncus fine, marginal vein 1.2–1.4x as long as postmarginal vein (Fig. 264). Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened, Gt<sub>1</sub> and Gt<sub>2</sub> partially fused; Gt<sub>1</sub> 1.0–1.3x as long as Gt<sub>2</sub> and 0.9–1.1x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.3–0.4x as long as Gt<sub>4</sub>; Gt<sub>1</sub> asetose laterally and smoothly rounded lip surrounding anteriorly excavation which abuts petiole, Gt<sub>1</sub> with carinate lip laterally which abuts nucha; Gt<sub>4</sub> evenly setose except in anterior half laterally and in anterior third

dorsally, remaining terga evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.9–2.3 mm. Identical to female, except as follows: scape with ventral plaque medially, 5.0x as long as broad; petiole visible in dorsal view, 0.6x as long as broad, longitudinally rugulose; Gt<sub>1-3</sub> apparently fused, faint indication that at least Gt<sub>1-2</sub> have fused; Gt<sub>1+2</sub> 1.3x as long as Gt<sub>3</sub> and Gt<sub>1-3</sub> 0.2x as long as Gt<sub>4</sub>; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle. [A male was reared from the same host, at the same locality but emerged three days later than a conspecific female; good but not indisputable evidence of association.]

**Variation.** Primary variation occurs in the extent and intensity of coloration. For example, the dorsal mesosoma can be dark brown or blackish brown and the legs can be almost entirely pale yellow. Brown coloration can extend to near the base of the scrobal depression from the vertex. The Brazilian material listed below matches the type material exactly, except that the ocular carina can be indistinct or absent anteriorly and there is apparent almost complete fusion of Gt<sub>1+2</sub> so that the gaster appears to have only Gt<sub>1-2</sub> reduced. I consider these variants within this species as slightly different degrees of gastral tergite fusion and ocular carina production can be seen.

**Distribution.** Known from Central and South America plus Florida (Fig. 296).

**Biology.** Unknown. However, a male and a female specimen from Trinidad were reared from flower stems of *Stachytarpheta cayannensis* (Verbenaceae) and another pair was reared from *Stachytarpheta* sp. flower stems separately. The only cecidomyiids recorded from these plants attack the seeds (see Table 4). Label data on another specimen indicates that it was reared “Ex cecid gall on *Randia aculeata*” (Rubiaceae) and three other specimens were taken on *Pithecellobium guadalupense* (Fabaceae) (see Table 4).

**Comments.** The lectotype is point mounted and intact. The label data indicate that Chapada (Brazil) is the type locality, not Santarem, Brazil, as indicated by Ashmead in the original description.

**Material Examined.**



**Type Material:** BRAZIL: April; Chapada; Type [handwritten]; H H Smith coll.; TypeNo. 8080 U.S.N.M. [red label]; *Rileya orbitalis* ♀ Type Ashm. [handwritten] (Lectotype ♀, USNM).

**Other Material:** BRAZIL: Rondonia: 62km S Ariquemes, Fazenda Rancho Grande, 27.xi.91, S. L. Heydon, goat pasture sweep (4♀ UCDC); same locality: 6.xii.91, between forest and cacao (1♀ UCDC); 5.xii.91 (5♀ UCDC), 2.xii.91, S. L. Heydon, overgrown bananas (1♀ UCDC). BRITISH GUYANA: Demerara-Mahaica: 4 mi. E. Georgetown, 30.ix.1918, H. Morrison, swept along seashore (1♀ USNM). COSTA RICA: Heredia: Est. Biol. La Selva, 18.x.1994, 100m, 10° 26'N, 84° 01'W (1♀ BMNH); Puntarenas: Pen. Osa, Puerto Jiménez, 10m, x–xi.1992, P. Hanson (1♀ BMNH). MEXICO: Quintana Roo: Municipio de Lazaro Cardena, 25km NNE Leona Vicario, Reserva Ecología El Edén, 21°13'N 87°11'W, 10.viii.98, R. Rodriguez, coll., Secondary growth near greenhouse, sweep (2♀ UCR). NICARAGUA: Carazo: San Marcos, Coll. Baker (1♀ USNM). TRINIDAD & TOBAGO: St. George: Curepe, Sta. Margarita Circular Rd, 15–25.v.1974, F. D. Bennett (1♀ UCR); Victoria: Cotton Station, 28.x–1.xi.1955, F. Bennett, *Ex* collection of flower stems of *S. cayennensis* (1♀ 1♂ USNM); 18.iii.1954, F. Bennett, *Stachytarpheta* fls stems (1♀ 1♂ USNM). UNITED STATES: Florida: [?]: Ex cecidomyid gall on *Randia aculeata*, 5.v.1949, O. D. Link, Fla. Acc. No.105179, Id. Lot No.49-8193 (1♂ USNM); Monroe: Grass Key, 22.iii.1977, E. E. Grissell, *Pithecellobium guadalupense* (2♀ AEIC).

***Rileya orchideaca*, new species**

(Figs. 53–58)

**Etymology.** The specific name is a Latin adjective and refers to the host plant family with which this species is associated.

**Diagnosis.** Eye setose (as in *R. glabra* but setae ~0.5x as long) (Fig. 53) and the median carina of propodeum complete to incomplete without costula (Fig. 57), reticulate with irregular rugae in *R. oncidii*, rugulose without costula medially in *R. glabra*. The petiole with two [easily abraded] cruciate setae laterally (Fig. 58), which are not seen in related species.

**Description.** Female. Length 2.1–2.5 mm. Color brown, except for the following, which are golden: legs, tegula, antenna, and gaster ventrally. Wing hyaline, venation brown.

*Head.* Reticulate. Ovate in frontal view, striae radiating from clypeus absent. Clypeus produced ventrally, truncate (Figs. 53, 55); supraclypeal area at same level as remainder of face, finely reticulate. Malar space 0.3–0.4x eye height, postorbital carina absent. Eye evenly covered with fine, erect setae (Fig. 53). Scrobal depression shallow, unmarginated, intrascrobal carina absent (Fig. 53). Scape 4.5–5.0x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1 longer than A2 and A3, A2–A3 subequal in length; F1 1.0x as long as broad, subsequent subequal in length; clava 2.2–2.4x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely transversely reticulate. Midlobe of mesoscutum 1.1–1.2x as long as broad, notaulus complete, distinct (Fig. 57). Scutellum 1.3x as long as broad, finely carinate apically; lateral panel of axilla sparsely setose anteriorly, reticulate. Mesepisternum slightly reticulate; mesepimeron glabrous slightly striate. Propodeum rugulose-reticulate with incomplete median carina (Fig. 57); spiracle subcircular, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.1x as long as broad, stigma 0.4x as long as stigmal vein, marginal vein 1.8x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole barely visible in dorsal view, rugose dorsally, with two (sometimes) cruciate setae laterally (Fig. 54). Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> reticulate, glabrous apically, remaining terga reticulate; Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 2.8–3.3x as long as Gt<sub>2</sub> and 1.3–1.4x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.7–1.8x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with transverse row of setae; remaining terga evenly setose except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> crescentic in dorsal view.

**Male.** Length 1.9–2.4 mm. Identical to female except as follows: petiole distinctly visible in dorsal view, 1.5–1.7x as long as broad, longitudinally rugose, slightly concave dorsally (Figs. 56–69). Gt<sub>1-2</sub> glabrous, remaining terga glabrate; Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 5.8–6.7x as long as Gt<sub>2</sub> and 1.7x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.4–1.5x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with dorsally incomplete, transverse row of setae; remaining terga evenly setose except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 56); Gt<sub>7+8</sub> hemispherical in dorsal view.

**Variation.** The type series is essentially invariant but some differences are seen in the extent of exposure of the petiole in females and the presence of

additional, incomplete rugae submedially on the propodeum originating from either the nucha or the dorsellum. The setae on  $Gt_1$  or the petiole are easily abraded, and sometimes only the setal socket is visible.

**Distribution.** Known from Costa Rica but is likely as widespread as its host [not mapped].

**Biology.** *Trichopilia suavis* is an orchid species found from Costa Rica to Colombia. Although this genus is not recorded as a host of the cecidomyiids that attack orchid roots (Gagné 1994), the documented wide host range of the genus of Cecidomyiidae, *Neolasioptera*, on four other orchid genera does not preclude it. The gall is a characteristic swelling on the aerial roots of the plant.

**Comments.** The type series was apparently intercepted at the Brownsville, Texas, port of entry and emerged from the roots of *Trichopilia suavis* (corrected spelling) (Orchidaceae).

**Material Examined.**

**Type Material:** COSTA RICA: San Jose: *Ex Trichopelia suaves* roots; San Jose, CR, VIII-3 46, Brownsv-61560, Lot 46-11902” (Holotype ♀, USNM). Paratypes, 21♀17♂, same data as holotype (16♀12♂ USNM; 5♀5♂ CNC).

***Rileyia pallidipes* (Ashmead)**

(Figs. 124, 251–253)

*Ashmeadia pallidipes* Ashmead, 1894: 144–145 (in Riley et al. 1894).  
Lectotype, ♂, here designated. Saint Vincent & the Grenadines (USNM, examined).

*Rileyia pallidipes* (Ashmead), Schmiedeknecht 1909: 148.

**Diagnosis.** Males of this species are similar superficially to males of *Rileyia compressiventris*, particularly in the structure of the antenna (Fig. 253) but are distinguished by their brown color (coxae, legs, scape, and pedicel are golden) (golden in *R. compressiventris*) and greatly foreshortened  $Gt_{1-3}$  (longer in *R. compressiventris*), which occupies less than a third the length of the gaster, with  $Gt_3$  asetose (Figs. 251–252); petiole glabrate; distinct propodeal plicae present only anteriorly primary costula; MV and PMV slightly thickened. Females resemble miniature *Rileyia cecidomyiae* or *R. insularis*, but aside

from usually being less than three-fourths the length of the smallest female of these aforementioned species, they are separated as follows: postorbital carina absent (usually distinct in *R. cecidomyiae* and *R. insularis*), facial striae very fine (robust in *R. cecidomyiae* and *R. insularis*), and  $Gt_{2-3}$  subequal in length in dorsal view (Figs. 251, 252).

**Description.** Male. Length 1.2–2.3 mm. Color brown, except for the following, which are golden: coxae, legs, scape, and pedicel. Wing hyaline, venation brown.

*Head.* Reticulate. Subovate in frontal view, fine striae radiating from clypeus reaching lower eye margin. Clypeus slightly emarginate; supraclypeal area not elevated above remainder of face, finely reticulate. Malar space 0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, margined, fine intrascrobal carina present, extending at least half the length of scape. Scape 2.8–3.0x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent funiculars subequal, MPS distinctive (Fig. 253); clava 2.6–3.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Reticulate. Midlobe of mesoscutum 1.3x as long as broad, notaulus complete, distinctly indicated. Scutellum 1.3x as long as broad, crudely carinate apically; lateral panel of axilla with several setae posteriorly along scutoscuteellar suture, reticulate. Mesepisternum reticulate-rugulose and mesepimeron striate. Propodeum with complete primary costula straight, oriented transversely, slightly angulated anteriorly, bisected by median carina which is present only anteriorly; several plicae submedially connecting costula with dorsellum; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.0x as long as broad, stigma 0.8x as long as stigmal vein, marginal vein slightly thickened, 1.1x as long as postmarginal vein, wing incompletely setose basally.

*Metasoma.* Petiole visible in dorsal view, 1.8–2.0x as long as broad, glabrate, broadest anteriorly where it is produced as a carinate flange abutting nucha (Fig. 252).  $Gs_1$  produced anteriorly as a fine collar encircling petiole ventrally.  $Gt_{1-3}$  glabrous, remaining terga finely reticulate;  $Gt_{1-3}$  foreshortened;  $Gt_1$  2.0–2.5x as long as  $Gt_2$  and 1.3–1.7x as long as  $Gt_3$ ,  $Gt_{1-3}$  0.3x as long as  $Gt_4$ ; remaining terga evenly setose except  $Gt_4$  in anterior third;  $Gt_4$  nearly completely covering  $Gt_5$  in dorsal view, distinctly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  barely visible dorsally, hemispherical in dorsal view.

**Female.** Length 1.7–2.5 mm. Similar to male in size and general form except as follows: MPS not evenly and symmetrically distributed in radial manner on each flagellomere (cf. Fig. 255); petiole not visible in dorsal view, Gs<sub>1</sub> not produced as a collar, Gt<sub>1-3</sub> foreshortened, glabrous (Fig. 252); Gt<sub>1</sub> 4.7–6.0x as long as Gt<sub>2</sub> and 3.5–4.0x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.4–1.5x as long as Gt<sub>4</sub>; remaining terga sparsely but evenly setose; Gt<sub>5</sub> easily visible in dorsal view, emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> visible dorsally, triangular in dorsal view.

**Variation.** One small series of four specimens from Carson Ridge (Marin Co., Calif.) appear to represent a variant within *R. pallidipes*. These specimens are larger in size and exhibit some resultant scaling increases: facial striae slightly more robust, Gt<sub>1-3</sub> slightly longer (particularly Gt<sub>3</sub>) in females. However, all features diagnostic of this species are present. Generally, coloration can range from dark brown, bordering on black, to light brown. In many series of this species, the females possess dark maculation dorsally on Gt<sub>4</sub> (Fig. 252), but others have a concolorous gaster. Mesopleural sculpture can range from reticulate to rugulose to glabrate-striate, sometimes within series from a particular locality.

**Distribution.** Known only from the southern United States into South America (Fig. 299).

**Biology.** Only one confirmed host record exists for this species. In a survey of insects associated with jojoba (*Simmondsia chinensis* L. [Simmondsiaceae]) (Pinto & Frommer 1980), a single male *R. pallidipes* was reared from *Asphondylia websteri* Felt, which deforms the fruit of jojoba. A similar rearing record from flower galls of *A. websteri* on *Parkinsonia aculeata* (Fabaceae) is considered likely to represent a host-parasitoid association. Rearing records are from Trinidad: (1) *Ex* black ball in seeds of *S. cayennensis* (Verbenaceae) and (2) *Ex* collection of flower stems of *S. cayennensis*. The only cecidomyiids recorded from these plants attack the seeds, thus making the first record more probable. Additional label data indicate a potential host (*Asphondylia ceanothi* Felt on *Ceanothus jepsonii* Greene) but this record is unconfirmed. Sweeping records indicate that this species was also recovered on *Sida acuta* (Malvaceae) and *Parthenium xanthocephalum* (Asteraceae) (see Table 4 for gall formers known from these plants).

**Comments.** The type is point mounted and complete.

**Material Examined.**

**Type Material:** SAINT VINCENT & THE GRENADINES: St. Vincent, W.I. H. H. Smith, 238; TypeNo. 2419 U.S.N.M. [red label]; *Rileyia pallidipes* Ashm. ♂ Type, unique [handwritten] (Lectotype ♂, USNM).

**Other Material:** BELIZE: Toledo: Blue Creek, 16°12'N, 89°3'W, 19.i.1982, A. Finnemore, sweep (1♀ CNC). BRAZIL: Goias: Jatai, i.1977, F. Olivera (2♀ CNC); Pernambuco: Caruaru, iv.1972, M. Alvarenga (1♀ CNC). COLOMBIA: Magdalena: 26 km E. Santa Marta, 14.ii.1979, R. Wilkerson (1♀ CNC); Norte de Santander: 30–40 km S. Cucuta, 13–14.v.1974, J. Peck (2♀ CNC). COSTA RICA: Alajuela: Inst. Tec. Santa Clara, 150m, 24.iii.1989, Hanson & Godoy (2♀ BMNH); San Pedro de la Tigua, iii-iv.1990, R. Cespedes (1♀ BMNH); Guanacaste: Cerro el Hacha, NW Volcan Orosi, 1988, 300m (1♀ BMNH); Heredia: Chilamate, 75m, 4.ii.1989, Hanson & Godoy (1♂3♂ BMNH); San José: 9°45'N 84°23'W, 800–825m, 27.vi.1973, C. Tufares/J. Helava (1♀ UCR); Ciudad Colon, 800m, xii.1989–i.1990, L. Fournier (2♀ BMNH); Zurquí de Moravia, 1600m, i.1992–viii.1995, P. Hanson (1♀ UCR). EL SALVADOR: La Libertad: Quetzaltepeque, 2.viii.1963, M. Irwin & D. Cavagnaro (1♀ 1♂ UCR); San Salvador: San Salvador, x.1965, N. Krauss (1♀ USNM). GUATEMALA: Izabal: Las Escobas, 13.xi.1986, M. Sharkey (13♀2♂ CNC). MEXICO: Baja California Sur: Las Barracas, 1.vi.1984–22.vi.1989, P. DeBach (69♀18♂ UCR); Chiapas: 1–6 km N. Tuxtla Gutierrez, 200m, 12.x.1974, S. Koch (1♀ NCSU); Guerrero: 6 mi. NE Tixtla de Guerrero, 16.vii.1984, J. Woolley (1♂ TAMU); 30 km N. Acapulco, 6.viii.1984, G. Gordh, (1♀ UCR); Nuevo Leon: 3 mi. W. Villa Santiago, 12.viii.1972, E. Grissell (16♀1♂ TAMU); 9 mi. S. Monterrey, 11.viii.1972, E. Grissell (2♀ TAMU); 5 km W. Bustamante, 13.vii.1983, A. Gonzalez (1♀ UCR); El Carmen, 10.vii.1983, E. Gonzalez (1♀ UCR); Santiago, El Cercado Hda. Las tres blanquitas, 9.vii.1983, A. Gonzalez (2♀ UCR); Allende, Lazarillos de Abajo, 9.vii.1983, A. Gonzalez (1♀1♂ UCR); Quintana Roo: Chichen Itza, 27.vii.1984, G. Gordh (1♀ UCR); Veracruz: 33 mi. S. Nautla, 31.x.1982, J.T. Huber & A. Gonzalez (11♀ UCR); 18.6 mi S. Tampico, 13.viii.1972, E. Grissell (9♀1♂ TAMU). NICARAGUA: Managua: Managua, xi.1959, N. Krauss (1♀ USNM). PANAMA: Chiriquí: Puerto Armuelles, 13–20.vii.1981, H. Weems (1♀ AEIC). TRINIDAD & TOBAGO: Goldsborough, 28.iv–5.v.1994, M. Sommeijer, Neglected citrus bordering on primary forest, MT (1♀ USNM); St. George: Curepe, sta. Margarita Circular Road, 28.v–8.vi.1974, F. Bennett

(1♂1♂ UCR); Santa Margarita, 19.viii.1955, F. Bennett (1♀ USNM); Arima Valley, 4th mile, 13.viii.1976, J. Noyes (17♀7♂ BMNH); Guanapo Valley, 29.vii.1976, J. Noyes (6♀5♂ BMNH); Lopinot, 10.viii.1976, J. Noyes (1♀4♂ BMNH); St. Augustine, 18.vi.1976, J. Noyes (4♀7♂ BMNH); Machapore Hill, 30.vi.1976, J. Noyes (1♀ BMNH); Maracas Valley, 23.vi.1976, J. Noyes (3♀ BMNH); Tumpuna Reserve, 9.viii.1976, J. Noyes (3♂ BMNH); Arima Valley, Silma Field Sta., 8–9.iii.1977, P. Feinsinger (1♀ BMNH); **Victoria:** Cotton Station, 28.x.1955, F. Bennett (2♀ USNM). **UNITED STATES: Arizona: Cochise:** Guadalupe Canyon, Peloncillo Mtns., 1420m, 12.vii.1982, G. Gibson (1♀ UCR); **Pima:** Tucson, 32°10'N, 111°05'W, xi.1986, W. Woods, Em. fresh flower galls of *Asphondylia websteri* on *Parkinsonia aculeata* (13♀11♂ USNM); **California: San Diego:** Coyote Canyon, 15.iv.1981, G. Gordh (13♀31♂ UCR); 10 mi. W. Ocotillo, 24.iv.1980, J. Woolley (2♀ TAMU); **Riverside:** 5.6 mi. S. Sage on R3, 33°30'60"N, 116°54'0"W, *Ex pupa* in seed heads jojoba, 3.xi.1977, J. Pinto (1♂ UCR); Deep Canyon, 8.x.1977, N. Smith (1♀ UCR); **Texas: Jim Wells:** La Copita Res. Sta., 8 mi. W. Ben Bolt, 20.v.1987, J. Woolley (1♂ TAMU); **Hidalgo:** Bentsen-Rio Grande SP, 20.iv.1985, J. Woolley (4♀1♂ TAMU); **Starr:** near Falcon Dam, 20.iv.1985, J. Woolley (2♀ TAMU); **Zapata:** Falcon Dam State Park, 3.vii.1997, G. Gibson (1♀1♂ UCR). **VENEZUELA: Zulia:** El Tucuco Perija, 24.vi.1979, Brooks, Grigarick, McLaughlin, Schuster (1♀ UCDC); El Tucuco, 26.iv.1981, H. Townes (1♀ USNM); Merida, 2 km NW La Azulita, 11.iv.1988, Finnamore & Roxfield (4♀ UCR); Los Angeles de Tucuco, 15–16.iv.1981, E. Grissell (6♀ USNM).

***Rileya panamae*, new species**

(Figs. 254–256)

**Etymology.** The specific name is in honor of Panama where the holotype was collected.

**Diagnosis.** This species is similar to *R. quadraticaulis* and *R. canalicoxa*. All three species have  $Gt_{1+2+3}$  fused and greatly reduced (Figs. 146, 271) but *R. panamae* lacks the distinct quadrate production of  $Gs_1$  (*R. quadraticaulis*; Fig. 271) and the lateral lobate production of *R. canalicoxa* (Fig. 146); *R. panamae* also has  $Gt_{1+2+3}$  minute with several setae apically (Fig. 254) (not seen in *R. quadraticaulis* or *R. canalicoxa*), and its  $Gs_1$  production consists of two small, anterolateral prominences just ventrad the propodeal foramen. The clypeus is

slightly produced and rounded apically as in *R. heratyi* but is slightly cleft medially (but *R. heratyi* has Gt<sub>7+8</sub> greatly elongated [Figs. 205, 207]).

**Description.** Female. Length 2.2–2.5 mm. Color as follows: pale golden: antennae, supraorbital area anteriorly and dorsally, pronotum laterally and with two fascia subdorsally, mesoscutum medially and along notaulus, axilla laterally, scutellum laterally, tegula, mesopleuron dorsally, callus, legs and gaster ventrolaterally, anteriorly and posteriorly; brown: remaining portions of head, mesosoma, metasoma, and ovipositor sheaths apically. The paratype is completely golden with pale yellow legs and circumocular region and only a faint brown maculation dorsally on Gt<sub>4</sub> and dark ovipositor sheaths. Wing hyaline, venation pale brown.

*Head.* Reticulate. Subtriangular in frontal view, few fine striae radiating from clypeus toward lower eye margin. Clypeus slightly produced, rounded apically but with slight medial cleft; supraclypeal not elevated above remainder of face, finely reticulate. Malar space 0.5x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 3.0–4.5x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 each increasing in length; F1 1.3–1.7x as long as broad, subsequent funiculars decreasing slightly in length; clava 1.2–3.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate. Midlobe of mesoscutum 1.2–1.4x as long as broad, notaulus complete, distinct. Scutellum 1.3x as long as broad, finely carinate apically; lateral panel of axilla setose medially and with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate; mesepimeron striate. Propodeum carinate, complete primary costula connected to dorsellum by two submedian carinae, slightly angulated anteriorly; several plicae spanning some or all of distance between costula and dorsellum or nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.3–2.5x as long as broad, stigma 0.5x as long as stigmal vein, uncus fine, marginal vein 1.8–2.2x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gaster not laterally flattened. Gt<sub>1+2+(3)</sub> apparently fused, glabrous, remaining terga reticulate; Gt<sub>1+2+(3)</sub> foreshortened and minute; Gt<sub>1+2+(3)</sub> 0.1x as long as Gt<sub>4</sub> and 0.7x as long as Gt<sub>5</sub>; Gt<sub>1+2+(3)</sub> with transverse row of setae dorsally; Gt<sub>4</sub> evenly setose except in anterior fourth, remaining terga evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.



**Variation.** Both specimens are nearly identical morphologically, with the main difference being in color detailed above. The paratype has only a single median carina connecting the costula to the anterior propodeum and two subdorsal carinae connecting them as well.

**Male.** Unknown.

**Distribution.** Known only from Panama and Ecuador (Fig. 291).

**Biology.** Unknown.

**Comments.** The types are card mounted and in excellent condition.

**Material Examined.**

**Type Material:** PANAMA: Panama: Cerro campana, 8°40'N 79°50'W, 7–14.v.73 (Holotype ♀, CNC). Paratype, ♀, ECUADOR: Napo: Tiputini Biodiversity Station, 216m, 00°37'55"S 76°08'39"W, 5.ii.1999, Lot # 2085, Transect 9, T. Erwin et al. Canopy fogging bare leaves, some w/ bryophytic/lichenous growth (1♀ EPNC).

***Rileyia paraplesius*, new species**

(Fig. 262)

**Etymology.** Latinized from the Greek *paraplesios*, meaning “somewhat like,” in reference to its resemblance to *R. carinaegaster*.

**Diagnosis.** A very distinctive species that resembles *R. warneri* in general coloration and *R. carinaegaster* in the structure of the propodeum and gaster. Gt<sub>1-3</sub> foreshortened and partly to nearly completely fused, with setae anterolaterally on Gt<sub>1</sub> and short subdorsal rows of setae on Gt<sub>3</sub> and sometimes Gt<sub>2</sub> (all easily abraded) (Fig. 262). Anteromedial prominences (sometimes faint) on Gt<sub>1</sub> extend posteriorly as carinae to a third or half the length of the tergite (cf. Fig. 152) (*R. warneri*, *R. abnormicornis*, *R. protuberonota* and *R. minuta* do not have Gt<sub>1</sub> modified as such). Gs<sub>1</sub> distinctly produced anteriorly as a collar abutting nucha with robust longitudinal carinae buttressing anterior lip of collar (Fig. 262) (*R. abnormicornis*, *R. carinaegaster*, and *R. minuta* with similar production).

**Description.** Male. Length 1.9–3.2 mm. Color black (see Variation below), except for areas of dark reddish brown dorsally on the mesoscutum, scutellum, dorsellum, tegula, mesopleuron dorsally, coxae, and gaster. The antennae and legs are a deep golden. Wing slightly amber, venation light brown.

*Head.* Coarsely umbilicate. Subtriangular in frontal view, lacking striae radiating from clypeus toward lower eye margin. Clypeus slightly produced, cleft apically; supraclypeal area not elevated above remainder of face, umbilicate. Malar space 0.4–0.6x eye height, postorbital carina robust, fading well before vertex. Eye glabrous. Scrobal depression shallow, margined, narrowing dorsally, intrascrobal lamina absent. Scape 3.4–3.8x as long as broad, broadest medially, with ventral plaque extending ~0.5x length of scape; anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 subequal increasing in length; F1 about as long as broad, subsequent funiculars subequal in length; clava 2.4–2.6x as long as broad, segmented, tapering apically.

*Mesosoma.* Coarsely umbilicate, interstices reticulate. Midlobe of mesoscutum 1.6–2.0x as long as broad, notaulus complete, distinct. Scutellum 1.9–2.5x as long as broad, carinate apically; lateral panel of axilla setose, with a few setae laterally along scutoscutellar sulcus, umbilicate. Mesepisternum striate; mesepimeron finely reticulate anteriorly, glabrate posteriorly. Propodeum reticulate-rugulose, primary costula angulated submedially and connected to dorsellum by a submedian carina; several robust, complete plicae connecting costula with nucha and dorsellum; spiracle reniform, obliquely oriented, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.0–2.4x as long as broad, stigma 0.3–0.4x as long as stigmal vein, stigma not produced posteriorly, uncus fine, marginal vein 1.0–1.3x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole visible in dorsal view, 0.8x as long as broad, alveolate-carinate, with carinate lip anteriorly abutting nucha (Fig. 262) two longitudinal carinae dorsolaterally and two erect setae laterally. Gt<sub>1-3</sub> glabrous; remaining terga reticulate; Gt<sub>1-3</sub> very closely appressed to fused; Gt<sub>1</sub> 3.5–5.0x as long as Gt<sub>2</sub> and 2.0–2.3x as long as Gt<sub>3</sub> [prior two measurements not included for specimens in which terga are fused]; Gs<sub>1-3</sub> 0.2–0.3x as long as Gt<sub>4</sub>; Gs<sub>1</sub> produced anteriorly as a robust collar encircling petiole, buttressed by robust longitudinal carinae; Gt<sub>1</sub> with 3 or more, erect setae [easily abraded] anterolaterally; Gt<sub>2</sub> with short, transverse row of setae sublaterally; Gt<sub>3</sub> with short, transverse row of setae sublaterally; Gt<sub>4</sub> setose in posterior half;

remaining terga completely setose; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in posterior view.

**Female.** Length 3.8 mm. Identical to male (most similar to first male treated under Variation) except as follows: scape lacking ventral plaque; mesepisternal carinae less robust with slightly more reticulate sculpture; dorsolateral margin of Gs<sub>1</sub> collar with dully pointed protuberance bearing two setae apically, with fewer carinae laterally and ventral margin of collar reticulate; Gt<sub>2,3</sub> setae apparently abraded.

**Variation.** The larger male from lot #929 is completely red-orange on the mesoscutum, scutellum, dorsellum, and mesopleuron, and Gt<sub>1,3</sub> are more completely fused with faint lines of separation evident. The smaller male from lot #929 is more completely medium brown and has Gt<sub>1,3</sub> more distinctly separated (as in the holotype) with the setae abraded. The final male from lot #2096 more closely resembles the latter specimen above in coloration but the basal gastral terga are fused.

**Male.** Unknown.

**Distribution.** Known only from Ecuador (Fig. 292).

**Biology.** Unknown.

**Comments.** The holotype is card mounted and complete. All paratypes are card mounted, except for a female with the gaster, hind legs, and left wings mounted separately on the same card and a male with the right forewing mounted separately on the same card.

**Material Examined.**

**Type Material: ECUADOR: Napo:** Reserva Etnica Waorani, Onkone Gare Camp, Transect Ent. 1 mi. S., 216.3m, 00°39'25.7"S 76°27'10.8"W, 10.ii.1995, Lot # 992, Transect 7...3, T. Erwin et al. Canopy fogging terre firme forest (Holotype ♂, EPNC). Paratypes, 1♀4♂. Data as follows: same data as holotype but Lot # 929, Transect 6...10 (2♂ EPNC); 2.vii.1995, Lot # 1063, Transect 7...3 (1♂ USNM); Tiputini Biodiversity Station, 216m, 00°37'55"S 76°08'39"W, 5.ii.1999, Lot # 2096, Transect 10, T. Erwin et al. Canopy fogging bare leaves, some w/ bryophytic/lichenous coat (1♂ EPNC).

***Rileya petiolata*, new species**

(Figs. 235, 239, 241)

**Etymology.** Named for the distinctive, elongate petiole in the holotype. Adjective derived from the Latin *petiolus*, meaning "stalk".

**Diagnosis.** This species is similar to other *Rileya* species (*R. megastigma* and *R. cearae*) having greatly enlarged stigmas and complete forewing setation but is separated by the following:  $Gt_2$  obscured by  $Gt_1$  in dorsal view; petiole 2.4x as long as broad (Fig. 235; cf. Fig. 236); color primarily brown with lighter maculation, and other species are primarily golden with darker maculation; color scheme is essentially reversed from other species.

**Description.** Male. Length 2.8 mm. Body dark brown dorsally, except for the following, which are golden: spot posteromesal to posterior ocellus, supraorbital margin of eye, elongate spot dorsolaterally on pronotum, lateral panel of pronotum, line along lateral margin of notaulus, axilla laterally above tegula, faint posteromesal spot on axilla, spot laterally on scutellum, golden ventrally, including coxa and legs. Wing hyaline; venation light brown, stigma dark brown.

**Head.** Reticulate. Subovate in frontal view, striae radiating from clypeus toward lower eye margin, extending past lower margin of scrobal depression. Clypeus shallowly bilobate; supraclypeal area slightly elevated above remainder of face, glabrate. Malar space 0.8x eye height, postorbital carina absent. Eye glabrous. Scrobal depression unmarginated, shallow, fine intrascrobal carina present, extending half length of scape. Scape 3.4x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 each increasing in length; F1 1.5x as long as broad, subsequent funiculars roughly quadrate, each slightly increasing in width apically; clava 2.3x as long as broad, segmented and tapering apically (Fig. 239).

**Mesosoma.** Finely reticulate. Midlobe of mesoscutum 1.1x as long as broad; notaulus complete in anterior half. Scutellum 1.2x as long as broad, crudely carinate apically; lateral panel of axilla setose, reticulate. Mesepisternum rugulose-reticulate; mesepimeron glabrate-striate. Propodeum carinate, complete primary costula oriented transversely, bisected by median carina connecting it to dorsellum and nucha, intersection of median carina and costula forms diamond-shaped enclosure; incomplete plicae connecting primary costula and nucha and dorsellum; callus moderately setose, nucha

sparsely setose laterally; spiracle obliquely oriented, reniform,  $\sim 0.5x$  its length from dorsellum. Forewing  $2.1x$  as long as broad; stigma  $2.8x$  as long as stigmal vein, postmarginal vein  $0.6x$  as long as marginal vein, costal cell with submarginal fringe. Wing completely setose (Fig. 241).

*Metasoma*. Petiole visible in dorsal view,  $2.4x$  as long as broad, reticulate-rugulose, with anteriorly directed flange abutting nucha (Fig. 235), terminating as two parallel longitudinal carina ventrally.  $Gt_1$  glabrous,  $Gt_3$  glabrate, remaining terga reticulate.  $Gt_2$  obscured in dorsal view by  $Gt_1$  (Fig. 235),  $Gt_1$   $1.6x$  as long as  $Gt_3$  and  $0.2x$  as long as  $Gt_4$ ,  $Gt_{1-3}$   $0.4x$  as long as  $Gt_4$ ,  $Gt_1$  with 2 setae dorsolaterally in anterior third,  $Gt_3$  with dorsally complete, transverse row of setae extending laterally, remaining terga evenly setose except dorsal surface  $Gt_4$ ,  $Gt_5$  distinctly emarginate to expose  $Gt_6$  spiracle,  $Gt_{7+8}$  semicircular in posterior view.

**Female.** Unknown.

**Distribution.** Known only from Costa Rica (Fig. 292).

**Biology.** Unknown.

**Comments.** The head, right forewing, and both antennae are mounted separately on the same card.

**Material Examined.**

**Type Material.** COSTA RICA: San José: Zurquí de Moravia, 1600m, v.1995, col. P. Hanson (Holotype  $\sigma$ , BMNH).

***Rileya philodendrica*, new species**  
(Figs. 257–261)

**Etymology.** The specific name is a Latinized adjective and refers to the genus of Araceae, *Philodendron*, with which this species is associated.

**Diagnosis.** This species is most similar to species of *Rileya* associated with orchids (*R. orchideaca*, *R. oncidii*, *R. guatemalae*, etc.) but is differentiated by the female gaster being more elongate with  $Gt_{1-3}$  more distinctly foreshortened (Fig. 260; cf. Figs. 54, 151, 195) and the clypeus being notched (Fig. 259) rather than produced as a flap (Figs. 161, 184, 195). This species is also unique within the aerial root galler complex because the stigma is slightly

enlarged (similar to most *R. orchideaca*) and minutely infusate immediately surrounding the stigma.

**Description.** Female. Length 1.7–2.6 mm. Color brown, except for the following, which are light brown or golden: antenna, tegula, legs. Wing hyaline, venation brownish.

*Head.* Ovate in frontal view, striae radiating from clypeus, almost reaching lower eye margin. Clypeus notched (Fig. 259); supraclypeal area slightly elevated above remainder of face, reticulate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression deep, margined, fine intrascrobal carina present, extending almost to apex of scrobal depression. Scape 3.4–3.6x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 increasing slightly in width, subequal, A2–A3 subequal in length (Fig. 261); F1 1.3x as long as broad, subsequent subequal in length; clava 2.4–2.6x as long as broad, segmented, tapering apically.

*Mesosoma.* Reticulate. Midlobe of mesoscutum 1.2x as long as broad, notaulus complete, distinct (cf. Fig. 69). Scutellum 1.4x as long as broad, finely carinate apically; lateral panel of axilla with row of setae along scutoscutellar carina, reticulate. Mesepisternum reticulate; mesepimeron glabrate, slightly striate. Propodeum carinate-reticulate, complete primary costula medially, intercepted by complete median carina; numerous irregular plicae connect costula to nucha; spiracle obliquely oriented, subcircular, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.4x as long as broad, stigma 0.8x as long as stigmal vein, uncus elongate nearly touching postmarginal vein, marginal vein 1.7x as long as postmarginal vein; uncus slightly elongate (Fig. 258). Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate anteriorly, glabrous posteriorly; remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 3.0–3.3x as long as Gt<sub>2</sub> and 1.5–1.6x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.6–0.7x as long as Gt<sub>4</sub>; Gt<sub>3</sub> with dorsally incomplete, transverse row of setae; remaining terga evenly setose except Gt<sub>4</sub> and Gt<sub>5</sub> anteriorly (Fig. 260); Gt<sub>5</sub> not emarginate to expose Gt<sub>6</sub> spiracle (Fig. 260); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** [Although no direct evidence supports this male as conspecific with females of *R. philodendrica*, I include it here on the basis of the characters of the clypeus and wing venation.] Length 1.7 mm. Identical to female, except as follows: scape with faint ventral plaque, 3.0x as long as broad; petiole visible in dorsal view, 1.5x as long as broad, longitudinally rugose, broadest

anteriorly where produced as a carinate flange abutting nucha (Fig. 257). Gt<sub>1</sub> 2.5x as long as Gt<sub>2</sub> and 2.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.5x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with 2-3 setae anterolaterally; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 257); Gt<sub>7+8</sub> hemispherical in posterior view.

**Variation.** The type series is essentially invariant.

**Distribution.** Known from Costa Rica; Mexican sites not mapped as specific localities unknown (Fig. 292; see Material Examined).

**Biology.** Label data indicate that some specimens were found on orchids, apparently at the Brownsville, Texas, port of entry. Others were reared from *Philodendron* sp. (Araceae) root galls, which are possibly caused by a member of the cecidomyiid tribe Oligotrophini (Rübsaamen 1908). Another specimen indicates emergence from an orchid stem.

**Comments.** Two type specimens were apparently intercepted in an orchid lot from Mexico at the Brownsville, Texas, port of entry, whereas the second two were reared from galls on *Philodendron* sp. The specimens associated with orchids emerged from or were found on the orchids. The type material is in excellent condition but the head of the holotype is mounted separately on the point.

**Material Examined.**

**Type Material: MEXICO: [?]:** Orchid plants, Mexico, BrTex. 75662, 4-13-54, 4095 (Holotype ♀, USNM). Paratypes, 2♀1♂, Mexico, BrTex, 19.iv.1954, Orchid plants (1♂ USNM); Fortín, Mex., (Laredo, P.O.E.), 14.iv.1953, *Philodendron* [handwritten] (2♀ USNM); [?]: Brownsville POE, 10.x.1959, Mabry, orchid stem (1♀ USNM).

**Other Material: COSTA RICA: Guanacaste:** Volcán Cacao, Cerro Pedegral, ii-iv.1989, 1000m, I. Gauld (1♀ BMNH).

***Rileya piercei* Crawford**

(Figs. 26, 48, 51, 268)

*Rileya piercei* Crawford, 1914: 29. Lectotype of *Rileya piercei*, ♂, here designated. United States, Arizona (USNM, examined).

*Rileyia hanlari* Doganlar, 1992: 278–279. Holotype of *Rileyia hanlari*, ♀. United States, California (ZSMC, examined). **New synonymy.**

**Diagnosis.** This species is distinctive because the apparent  $Gt_1$  is the only tergum that is foreshortened, but still rather large for a foreshortened tergum (Fig. 51). Dissection reveals that  $Gt_{1+2}$  have actually fused and  $Gt_3$  is a distinct tergite hidden completely beneath  $Gt_{1+2}$ . However, some specimens show an indication of  $Gt_3$  barely visible laterally (see Figs. 281, 283) or completely visible in dorsal view. The petiole is visible in dorsal view in the male and acutely triangular ventrally in lateral view (see Figs. 130, 163). The stigmata are enlarged in both sexes (Fig. 268).

**Description.** Male. Length 1.7–2.6 mm. Color dark brown, except for the following, which are either lighter brown: antennae, femur in basal two-thirds, gaster; or golden: apex of femur, base and apex of tibia, tarsus. Wing hyaline, venation brown.

*Head.* Reticulate. Subtriangular in frontal view, striae radiating from clypeus reaching lower eye margin. Clypeus straight; supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space 0.9–1.0x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, fine intrascrobal carina absent. Scape 4.7–4.8x as long as broad, broadest medially at ventral plaque; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 0.8x as long as broad, subsequent funiculars subequal; clava 1.8–2.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely transversely reticulate. Midlobe of mesoscutum 0.9–1.1x as long as broad, notaulus complete, slightly indicated. Scutellum 1.1–1.2x as long as broad, crudely carinate apically; lateral panel of axilla with several setae posteriorly along scutoscutellar suture, finely reticulate. Mesepisternum striate-rugulose and mesepimeron finely striate. Propodeum rugose, complete primary costula slightly angled anteriorly, oriented transversely, uniting medially as a median carina which contacts dorsellum (Fig. 26); numerous complete and incomplete plicae connecting costula and dorsellum; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus sparsely setose. Forewing 2.4–2.5x as long as broad, stigma 0.7–0.9x as long as stigmal vein (Fig. 268), marginal vein slightly thickened (Fig. 268), 0.8–1.0x as long as postmarginal vein; incompletely setose basally.

*Metasoma.* Petiole visible in dorsal view, 0.9–1.2x as long as broad, rugose to rugulose, broadest anteriorly where produced as a carinate flange abutting



nucha (Fig. 48).  $Gs_1$  produced anteriorly as a fine collar encircling petiole ventrally.  $Gt_{1+2}$  glabrous, with at least one seta anterodorsally [additional setal socket indicates abraded seta]; remaining terga finely reticulate;  $Gt_1$  foreshortened fused with  $Gt_2$  (Fig. 48)  $Gt_3$  located completely beneath  $Gt_{1+2}$ ;  $Gt_{1+2}$  0.5x as long as  $Gt_4$ ;  $Gt_{1+2}$  with 1-2 setae anterolaterally, glabrous becoming reticulate; remaining terga evenly setose except  $Gt_4$  in anterior third, reticulate;  $Gt_5$  completely covers  $Gt_6$  in dorsal view, distinctly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  barely visible dorsally, hemispherical in posterior in dorsal view.

**Female.** Length 2.0–3.5 mm. Identical to male, except as follows: scape lacking ventral plaque, gaster not petiolate,  $Gt_1$  foreshortened apparently fused with  $Gt_2$ ;  $Gt_3$  usually located completely beneath  $Gt_{1+2}$ ;  $Gt_{1+2}$  0.4x as long as  $Gt_4$ ;  $Gt_{1+2}$  with 2 setae anterolaterally, glabrous becoming reticulate; remaining terga evenly setose except  $Gt_4$  in anterior third, reticulate;  $Gt_5$  not covering  $Gt_6$  in dorsal view, slightly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  triangular in dorsal view.

**Variation.** Specimens of *R. piercei* can range in color from near black to pale brown. Lighter specimens typically are more concolorous with respect to mesosomal versus gastral coloration whereas darker specimens can possess a lighter gaster. Propodeal sculpture can vary in the degree of angulation of the primary costula and production of the plicae. A median carina connecting the costula to the dorsellum is typically present, though sometimes less distinct. The enlarged stigma can range in size from 0.8 to 1.5x as long as the stigmal vein and can be quite dark or lighter.

**Distribution.** Known from the southern United States and Central America (Fig. 295).

**Biology.** The type specimen was taken on *Thurberia thespesioides* Gray (Gahan, 1918), which has been synonymized under *Gossypium thurberi* Todaro (Malvaceae), though the specific identity is not indicated on labels on the lectotype. Gagné (1989) indicates that an unknown cecidomyiid folds leaves and midribs on *G. thurberi* in Arizona. Hawkins and Goeden (1984) reared *R. piercei* from *Asphondylia* spp. leaf and bud galls on saltbush (*Atriplex canescens* and *A. polycarpa*; Chenopodiaceae). Additional label data indicate the following, host and/or plant associations: on *Parthenium hysterophorus* L., from heads *Bidens pilosa* L., on *Chrysothamnus*, on *Encelia*

*farinosa* A. Gray (Asteraceae); on *Styrax officinalis* L. (Styracaceae), on *Larrea* sp. (Zygophyllaceae), *Ex Asphondylia websteri* on *Ceanothus jepsonii* (Rhamnaceae); *Ex* leaf gall *Lantana involucrata* L. (Verbenaceae); sweep *Chilopsis* (Bignoniaceae); on *Sphaeralcea angustifolia* (Cav.) (Malvaceae), and sweep cotton (see Table 4).

**Comments.** The lectotype of *R. piercei* is point mounted and intact. The holotype of *R. hanlari* is identical to female specimens of *R. piercei* because Gt<sub>1+2</sub> appears fused and completely covers Gt<sub>3</sub> (Fig. 51), and the stigma is enlarged (Fig. 268).

#### Material Examined.

**Type Material:** *Rileyia piercei*: **UNITED STATES: Arizona:** Fish Creek, VIII-19-13. Ariz.; On *Thurberia* [both labels handwritten]; WD Pierce collector; TypeNo. 16701 U.S.N.M. [red label]; *Rileyia piercei* Cwfd ♂ Type [handwritten] (Lectotype ♂, USNM).

*Rileyia hanlari*: **UNITED STATES: California:** Rancho Mirage, California, USA, 24–26.iv.1980, leg. Bachmaier, collected from *Larrea tridentata* (Lectotype ♀, ZSMC).

**Other Material:** **GUATEMALA: Zacapa:** Zacapa, Below San Loreto, 750m., xi.1986, M. Sharkey (3♀2♂ UCR). **MEXICO: Baja California Sur:** Las Barracas, 15.iv.1987, P. DeBach (8♀ UCR); Las Barracas, 15.iv.1984–15.iv.1987, P. DeBach (10♀ UCR); Las Barracas, 18.v.1983, P. DeBach (1♀ UCR); Hwy 1, 115km marker, S. El Rosario, 24–25.viii.1992, D. Russell (3♀ TAMU); 0.3 mi SE Catavina, 27.iii.1979, J. LaSalle, in arroyo, reared from gall of *Acacia greggii* (1♀ USNM); **Guerrero:** 15 m. SW. Chichihualco, 15.vii.1984, J.B. Woolley (1♀1♂ TAMU); 8 mi. W. Iguala, 18.vii.1984, J. Woolley (1♀ TAMU); **Jalisco:** 8.3 m. S. Autlan on Hwy. 80, 8.viii.1984, J.B. Woolley (4♀ TAMU); Guanajuato, 2 m. W. Dolores Hidalgo, 5.vii.1985, J. B. Woolley (1♀ TAMU); Guanajuato, 2 mi. W. Dolores Hidalgo, 5.vii.1985, Woolley & Zolnerowich (1♀ TAMU); 8.3 mi. S. Autlan on Hwy 80, 8.vii.1984, J. Woolley (4♀ TAMU); **Michoacan:** 3 mi N. Nueva Italia, 8.vii.1985, J.B. Woolley (2♀ TAMU); 3 mi. N. Nueva Italia, Woolley & Zolnerowich (1♀ TAMU); **Morelos:** 12 m. E. Cuernavaca, 1200m, 14.viii.1954, J.G. Chillcott (1♀ CNC); 12 mi. E. Cuernavaca, 1400m, J. Chillcott (1♀ CNC); Cuernavaca, v.1945, N. Krauss (4♀ USNM); Cuernavaca, v.1945, N. Krauss, *Ex* leaf gall on *Lantana involucrata* (1♀ USNM); **Nuevo Leon:** Puerto Genovero[?], 17.v.1984, G. Gordh (1♀ UCR); 20 km N. Salinas Victoria, Carr. 40m, 13.vii.1983, A. Gonzalez (1♀ UCR); 20

km. N. Salinas Victoria, 13.vii.1983, A. Gonzalez (1♀ UCR); **Veracruz:** 33 m. S. Nautla, 31.x.1982, J.T. Huber & A. Gonzalez (1♀ UCR); 1 m. S. Santa Ana, 30.x.1982, G. Gordh (2♀ UCR); Floria, Microondas Sta., 30.x.1982, G. Gordh (1♀1♂ UCR); 1 mi. S. Santa Ana, G. Gordh (5♀ UCR); Fortín de las Flores, nr microndas stat., 30.x.1982, J. Huber & A. Gonzalez (1♀ UCR). **UNITED STATES: Arizona: Cochise:** Chiricahua Mtns, Onion Saddle, 2500m, 7.viii.1996, M.W. Gates (1♀ UCR); Peloncillo Mountains, Guadalupe Canyon, 12.vii.1982, G. Gibson (4♀ UCR); Onion Saddle, Chiricahua Mtns., 2500m, 7.viii.1996, M. Gates (1♂ UCR); Portal, 1250–1600m, 30.ix.1958, H. Weems (1♀ USNM); **Maricopa:** Tempe, 18.v.1927, E. Russell, swept from alfalfa (1♀ USNM); **Pima:** 4 m. S. Robles Junction, 26.viii.1979, C.W. Melton (1♀ UCR); Tucson, 18.vi.1959, on cotton (1♀ USNM); **California: Imperial:** Glamis, 9.iv.1969, E. Grissell (2♀ UCD); Glamis, 27.iii.1967, J. Slansky (1♀ UCD); **Inyo:** Darwin Falls, 17.v.1970, E. Grissell (1♀ UCD); Darwin Falls, 13.v.1979, L. French (2♀ UCD); **Marin:** Carson Ridge, 17.vii.1968, E. Grissell (3♀ UCD); **Placer:** 3 mi. S. Auburn on Hwy 49, 11.v.1979, E. Sugden (1♀ UCD); **Riverside:** iii.1968, T.G.E. & J. Wheeler, *Ex Asphondylia* on *Larrea* (1♂ UCR); Painted Canyon N. of Salton Sea, 70m, 27.iii.1996, M.W. Gates (1♀ UCR); Box Canyon N. of Salton Sea, 80m, 27.iii.1996, J.M. Heraty (1♀ UCR); Deep Canyon, 8.x.1977, N.J. Smith (1♀ UCD); Bautista Canyon, 7.x.1978, J. LaSalle (1♀ UCR); Box Canyon N. of Salton Sea, 80m, 27.iii.1996, Gates, Heraty & Hawks (2♀ UCR); Andreas Canyon, 26.iv.1979, J. Woolley (1♀1♂ TAMU); Near Valle Vista, 13.xiii–21.x.1979, B. Hawkins (4♀1♂ UCR); Gavilan, 17.iv.1938, Timberlake (1♀ UCR); Thousand Palms, 11.iv.1976, E. E. Grissell (1♀ UCD); 1,000 Palms, 11.iv.1976, E. Grissell (1♀ UCD); Andreas Canyon, S. Palm Springs, 4.v.1932, Timberlake (1♀ UCR); Riverside, near Valle Vista, 13.vii–21.x.1979, B. Hawkins (4♀ UCR); near Thermal 86 & Ave. 60m, 12.viii.1979–3.ii.1980, B. Hawkins (8♀ UCR); near Thermal at Hwy 86 & Ave. 60m, 19.viii.1979–3.ii.1980, B. Hawkins (4♀5♂ UCR); Andreas Canyon, 26.iv.1979, J.B. Woolley (1♀ TAMU); **San Bernardino:** Highland, 13.i.1996, M.W. Gates (1♀ UCR); Baldy Mesa. 8 mi. E. Phelan, 16–22.v.1981, J. Huber (4♂ TAMU); 27 m. N. Baker, Salt Creek, Hwy. 127m, 11.v.1982, J.B. Woolley (4♀ TAMU); N. Lucerne Valley, 11–21.viii.1979, B. Hawkins (1♀3♂ UCR); 14.8 mi. E. Wrightwood, 5.viii.1981, G. Gordh (1♂ UCR); Summit Valley N. of Silverwood Lake, 1000m, 27.vii.1996, M.W. Gates (1♀ UCR); N. Lucerne Valley, 21.vii–18.viii.1979, B. Hawkins (4♀ UCR); **San Diego:** Borrego Valley, 11.iv.1969, E. Grissell (2♀ UCD); **Florida: Alachua:** Archbold, 14.xii.1945, J.G. Needham (1♀ AEIC); Archbold, 14.xii.1945, J.G.

Needham, From head *Bidens pilosa*, ID Lot No. 46-19736 (1♀ USNM); **Dade:** Hialeah, 1960, C. E. Stegmoier, *Ex* seed heads *Bidens pilosa* (1♀1♂ USNM); Monroe: Long Pine Key, xii.1958, *Ex Asphondylia* gall on *Borrchia* (1♀ USNM); **Sarasota:** Englewood, ii.1944, J.G. Needham (1♀ USNM); Englewood, i-ii.1944, J. Needham (3♀ USNM); **Nevada: Clark:** Willow Creek Campsite Charleston Mtns., 14.vii.1977, N.J. Smith (1♀ UCD); White Pine, 30mi. W. Ely, 9.vii.1971, E. E. Grissell (1♀ UCD); 30 mi. W. Ely, E. Grissell, *Stanleya* (1♂ UCD); **New Mexico: Hidalgo:** 10 m. E. Road Forks, 20.viii.1971, E. E. Grissell & R. Denno, *Larrea* (4♀ UCD); Karr Canyon, 28.vii.1977, L. Masner (1♂ CNC); **Sierra:** 8 mi. E. Kingston, 23.viii.1971, E. E. Grissell & R. Denno, *Chrysothamnus* (2♀ UCD); **Texas: Baylor:** 10-11.vii.1972, C. Rogers, *Ex Asphondylia* sp. (1♀1♂ TAMU); **Brewster:** Lost Mine Trail, Big Bend National Park, 1880-2280m, 15.vii.1982, G. Gibson (2♀ UCR); Trap Spring, Big Bend National Park, 29°9'60"N, 103°25'0"W, 9.ix.1993, E. Grissell & R. Denno (1♀ USNM); **Hidalgo:** Bentsen Rio Grande State Park, 15.xii.1983, Woolley & Browning (1♀ TAMU); Bentsen-Rio Grande State Park, 20.iv.1985, J. B. Woolley (2♀ TAMU); Bentsen-Rio Grande State Park, 20.iv.1985, J. Woolley (1♀1♂ TAMU); Brownsville, 18.i.1937, ER# 13613, airport [interception], on Gardenias from Mexico (1♀ USNM); **Jeff Davis:** La Copita Res. Sta, 7 mi. W. Ben Bolt, 20.v.1987, J. Woolley (3♀ TAMU); 13 m. W. Van Horn, 30°34'60"N, 104°10'0"W, 1.ix.1993, E. E. Grissell & R. Denno, dry wash (1♀ USNM); **Jim Wells:** 8 m. W. Ben Bolt La Copita Res. Sta., 20.v.1987, J.B. Woolley (3♀ TAMU); **Presidio:** 1.7 mi. NE McGuiirks Tank, Big Bend Rnch St. Nat. Area, 29°31'60"N, 103°48'0"W, 4.ix.1993, E. Grissell & R. Denno, on *Rhus virens* (2♀ USNM); 37 mi. E. Presidio, 8.ix.1971, R. Denno & E. Grissell, *Sphaeralcea angustifolia* (1♀ UCD); Big Bend National Park, Lost Mine Trail, 1890, 15.vii.1982, G. Gibson (2♀ UCR); Big Bend National Park Trap Spring, 29°9'60"N, 103°25'0"W, 9.ix.1993, E. E. Grissell & R. Denno, hillside and desert wash (1♀ USNM); Big Bend Ranch St. Natural Area 10 mi. NE Rt. 170, 29°31'60"N, 104°10'0"W, 2.ix.1992, E. E. Grissell & R. Denno, on *Chilopsis linearis* (1♀ USNM); 37 m. N.E. Presidio, 3.ix.1971, E. E. Grissell & R. Denno (1♀ UCD); **Starr:** Falcon Lake State Park, 20.iv.1985, J.B. Woolley (2♀ TAMU); **Travis:** Heep Farm, 11 mi. S. Austin, 2.viii.1972, E. Grissell, taken on *Parthenium hysterophorus* (2♀ TAMU); Heep Farm 7 mi. S. Austin, 2.viii.1978, E. E. Grissell (2♀ TAMU); **Williamson:** 2 mi. W. Round Rock, 10.vii.1972, E. Grissell, *Ex* cecid. Bud gall on *Rhus copallina lanceolata* (1♀ TAMU).

***Rileyia protuberona*, new species**

(Figs. 269–270)

**Etymology.** Derived from the Latin terms *pro* (before), *tuber* (swelling), and *nota* (mark), which refer to the distinctive protuberance on the pronotum.

**Diagnosis.** Similar to *R. minuta*, *R. carinaegaster* and *R. abnormicornis*, but easily differentiated by the presence of a sharp ridge on the vertex between the posterior ocelli and a spine on the posteromedial margin of the pronotum (Fig. 269), both of which are absent in other species.

**Description.** Female. Length 1.1–1.8 mm. Color black, except for the legs and antennae, which are golden-brown. Wing hyaline, venation pale yellow.

*Head.* Finely reticulate. Ovate in frontal view, numerous striae radiating from clypeus reaching lower eye margin and scrobal depression. Clypeus emarginate, with minute, medial point (see Fig. 82); supraclypeal area not elevated above remainder of face, striate. Malar space 0.6x eye height, postorbital carina present, extending posteriad eye, fading before vertex; vertex sharply, transversely carinate between posterior ocelli. Eye glabrous, distinctly triangular ventrally (Fig. 269). Scrobal depression shallow, margined, intrascrobal carina absent. Scape 4.3–5.0x as long as broad, broadest basally; anelli transverse, minute, A1–A2 roughly subequal in length and width; F1 1.3–1.5x as long as broad, subsequent funiculars decreasing slightly in length, moniliform; clava 2.5–2.7x as long as broad, indistinctly segmented and tapering apically (Fig. 270).

*Mesosoma.* Reticulate. Posteromedial margin pronotum with transverse, pointed protuberance (Fig. 269). Midlobe of mesoscutum 1.2x as long as broad, notaulus complete, faint. Scutellum 1.1–1.2x as long as broad, finely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum reticulate; mesepimeron reticulate anteriorly and glabrate posteriorly. Propodeum reticulate, complete primary costula contiguous with dorsellum in medial half; few plicae spanning some or all of distance between costula and nucha or dorsellum; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus sparsely setose. Forewing 2.1–2.2x as long as broad, bare basad parastigma, otherwise sparsely setose, stigma 0.8–1.0x as long as stigmal vein, uncus short, marginal vein 2.0x as long as postmarginal vein; forewing incompletely setose in basal half (see Fig. 232)

*Metasoma*. Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate; remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 3.0–3.3x as long as Gt<sub>2</sub> and 1.7–1.9x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.7–0.8x as long as Gt<sub>4</sub>; Gs<sub>1</sub> with robust carinate collar anterolaterally, abutting nucha, with robust longitudinal carinae buttressing it (see Fig. 230); Gt<sub>1</sub> with one seta dorsolaterally in anterior third; Gt<sub>2</sub> with at least two setae laterally; Gt<sub>3</sub> with dorsally incomplete row of setae extending laterally; remaining terga evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Unknown.

**Distribution.** Known only from Costa Rica and South America (Fig. 293).

**Biology.** Unknown.

**Comments.** The holotype is pin mounted and is missing the right flagellum, whereas the paratype is card mounted and intact.

**Material Examined.**

**Type Material:** COSTA RICA: Guanacaste: S. Rosa Park, Guan., C. Rica, 18.i.77, D. H. Janzen, Dry Hill (Holotype ♀, BMNH). Paratype, ♀, TRINIDAD & TOBAGO: St. George: St. Augustine, 20.vi.1976; J. S. Noyes, Brit. Mus. 1976-462, Wasteground; *Rileyia* midget sp. n. det. R. Subba Rao, 1978 (1♀ BMNH).

**Other Material:** COLOMBIA: Bolivar: Los Colorados Venado, 9°54'00"N 75° 07'00"W, 320m, 1–15.ix.2000, E. Deuluteut, 619m (1♀ USNM).

***Rileyia pulchra* (Ashmead)**

*Ashmeadia pulchra* Ashmead, 1894: 145–146 (in Riley et al.1894).  
Lectotype, ♀, here designated. Saint Vincent & the Grenadines.  
(BMNH, examined).

*Rileyia pulchra* (Ashmead), Schmiedeknecht, 1909: 148.

**Diagnosis.** This species is most similar to *R. orbitalis* and *R. heterogaster* but is separated as follows: distinctive coloration as below (similar to *R. orbitalis* but paler; see *R. orbitalis* description); postorbital carina absent (postorbital carina in *R. heterogaster* and complete ocular carina in *R. orbitalis*); clypeus bilobate (see Fig. 9) (clypeus notched in *R. heterogaster* [Fig. 10] and *R.*

*orbitalis*); Gt<sub>1-3</sub> foreshortened, glabrous, Gt<sub>1-2</sub> partially fused (seen in both species above; Figs. 208, 263); Gs<sub>1</sub> anteriorly produced laterally as small lobes (see Fig. 227) (not seen in *R. heterogaster* [Fig. 208] but seen in *R. orbitalis*).

**Description.** Female. Length 2.4–3.2 mm. Color golden, except for the following, which are brown: scrobal depression, continuing dorsolaterally to encompass the ocellar triangle and occipital region but not extending to eye margin; pronotum anteriorly, continuing posteriorly as four fascia on dorsum; mesoscutum except lateral lobes laterally; scutellum except axilla posteriorly and mesally and scutellum laterally and posteriorly; mesopleuron medially; mesocoxa; metapleuron medially; propodeum; gaster except for linear fascia laterally. Wing hyaline, venation light brown.

*Head.* Reticulate. Triangular in frontal view, striae radiating from clypeus toward lower eye margin. Clypeus bilobate (see Fig. 9). Malar space 0.7–0.8x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, lacking intrascrobal carina. Scape 4.0–4.3x as long as broad, broadest basally; anelli transverse, A1 shortest and narrowest, A2 and A3 subequal; F1 1.3x as long as broad, subsequent funiculars subequal; clava 2.3–2.4x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely reticulate. Midlobe of mesoscutum 0.8x as long as broad, notaulus incomplete, only slightly indicated anteriorly. Scutellum 0.8–1.7x as long as broad, finely carinate apically; lateral panel of axilla with very sparsely setose, reticulate. Mesepisternum reticulate; mesepimeron rugulose. Prepectus small, rounded. Propodeum rugose-carinate, complete primary costula, transversely oriented, angulated slightly anteriorly, complete and incomplete plicae connect it to dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.5x its length from dorsellum; callus sparsely setose. Forewing 2.4–2.5x as long as broad, stigma 0.8x as long as stigmal vein, marginal vein 3.4–4.3x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrous, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened, Gt<sub>1+2</sub> partially fused but separation visible (see Figs. 208, 263); Gt<sub>1</sub> 3.0x as long as Gt<sub>2</sub> and 1.5x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.5x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>4</sub> anteriorly; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 1.9–2.5 mm. Identical to female except as follows: scape with ventral plaque medially, 2.1–2.2x as long as broad; midleg with two brownish

bands, medially and apically; hind leg with brownish band basally; petiole visible in dorsal view, 0.9x as long as broad, longitudinally rugose, broadest anteriorly where produced as a carinate flange abutting nucha; Gt<sub>1-3</sub> glabrous, foreshortened, remaining terga reticulate; Gt<sub>1-3</sub> partially fused, separation between Gt<sub>2</sub> and Gt<sub>3</sub> more distinct; Gt<sub>1+2</sub> 1.2x as long as Gt<sub>3</sub> and 0.1x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>4</sub> in anterior half dorsally; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> not visible dorsally; hemispherical in dorsal view.

**Variation.** Primary variation occurs in extent and intensity of maculation as follows: scrobal depression lacking maculation, areas anteriad and laterad ocellar triangle can lack maculation, pronotum lacking or with reduced fascia, lateral lobe of mesoscutum and axilla with maculation reduced to spot anteriorly, mesoscutum midlobe and scutellum with longitudinal maculation medially, mesopleural area can be completely free of maculation; some specimens have faded maculation.

**Distribution.** Known only from Florida into South America (Fig. 296).

**Biology.** All records for this species are from label data that are unconfirmed. A small series from Gainesville, Florida, emerged from *Juncus effusus* (Juncaceae), the stems of which are attacked by species of *Procystiphora* (Cecidomyiidae).

**Comments.** The lectotype is point mounted and in excellent condition. One female paralectotype is missing the following: gaster, left hind leg, right foreleg, and left hind wing; a second female paralectotype has a hole anterodorsally on the gaster. A male paralectotype is missing both antennae beyond the pedicel and part of the left tarsus of the midleg.

**Material Examined.**

**Type Material:** Type [circular label with red edge]; St. Vincent, W. I., H. H. Smith 207; W. Indies. 99-331; *Rileyia pulchra* Type Ashm.[handwritten]; B.M. Type Hym. 5. 364 (Lectotype ♀, BMNH). Paralectotypes, 14♀ 4♂, same data as lectotype, but 1♀ has 238 and 1♂ lacks a number (3♀1♂ USNM, examined; 1♀ BMNH; 10♀3♂ unknown).

**Other Material:** **BRAZIL: Minas Gerais:** Agua Vermelhas, vii.1983, M. Alvarenga (1♀ UCR). **COSTA RICA: Puntarenas:** Las Cruces, 20.ii.1987, 1300m, primary forest frag. (1♀ UCD). **NETHERLANDS ANTILLES:**



**Curaçao:** Coral Specht, 3km E. Willemstad, 8–15.ii.1987, W. Steiner & J. Swearingen, MT in mesquite-acacia desert scrub near coast (1♂1♀ USNM). **DOMINICAN REPUBLIC:** [?]: Colonia, Cord. Central, 19.ii.1973, 1000m, J. Klapperich (2♀ CNC). **UNITED STATES: Florida: Alachua:** Gainesville, 3 mi. SW Bivens Arm, J. B. Heppner, *Juncus effusus* (1♀2♂ USNM); **Monroe:** Stock Island, 27.xii.1954, H. Weems (1♀ USNM). **ST. LUCIA: Castries:** Castries, x.1967, N. Krauss (1♀ USNM). **SAINT VINCENT & THE GRENADINES: Charlotte:** La Soufriere, E. slope, 9.vii.1976 (1♀ BMNH); Montreal, 8.vii.1976, J. Noyes, edge of rainforest (1♀ BMNH); **St. David:** Richmond, 10.vii.1976, J. Noyes, banana plantation & coastland (2♀1♂ BMNH); **St. George:** Belmont, 6.vii.1976, J. Noyes, wasteground (2♀4♂ BMNH). **VENEZUELA: Anzoategui:** 20km N. Andco, 1.viii.1986, B. Gill (1♀ UCR); **Aragua:** Puerto de Cata, 10–11.vi.1976, A. Menke & D. Vincent (1♀ USNM); **Lara:** 6km S. El Tucuyo, 29.xii.1985, R. Jones & P. Kovarik, *Acacia* savannah (5♀2♂ USNM); **Miranda:** 2.5km E. Carenero, 26.iii.1982, G. & J. Hevel (1♀ USNM); **Tachira:** 50 km SE San Cristobal, 19.v.1974, 1500m, J. Peck (1♀ CNC).

***Rileya quadraticaulis*, new species**

(Fig. 271)

**Etymology.** Named for the distinctive, quadrate production of  $Gs_1$  (Fig. 271). Compound noun derived from the Latin *quadratus* (four) and *caulis* (stem), referring to the four-sided petiole/  $Gs_1$  complex.

**Diagnosis.** This species is similar to *R. bumeliae* in general coloration but lacks facial striae and has a bilobate clypeus (cf. Fig. 9); nucha directed slightly ventrad; and is unique because  $Gs_1$  is distinctly produced anteriorly as a quadrate collar surrounding the petiole ventrally (Fig. 271); faint indication that  $Gt_{1+2}$  (and probably  $Gt_3$ ) have fused together and are greatly foreshortened (Fig. 271) but are more distinctly separated from large subsequent tergum ( $Gt_4$ ).

**Description.** Female. Length 2.1–2.6 mm. Color brown, except for the following, which are either golden: face, excluding scrobal depression and vertex, scape, eye orbit, except just laterad of anterior ocellus, pronotum with two spots dorsolaterally and anterolaterally, lateral lobe of mesoscutum laterally and medially along notaulus, axillula medially along scutoscutellar suture, mesopleuron dorsally, metapleuron anterodorsally, gaster laterally and

dorsally in posterior third; or pale yellow: coxae and legs. Wing hyaline, venation brown

*Head.* Subtriangular in frontal view, no striae radiating from clypeus. Clypeus distinctly bilobate (see Fig. 9); supraclypeal area slightly elevated above remainder of face, glabrate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmargined, intrascrobal carina absent. Scape 4.0–4.3x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 each increasing in length; F1 1.2–1.3x as long as broad, subsequent funiculars subequal in length; clava 2.8–3.2x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely, transversely reticulate. Midlobe of mesoscutum 1.2–1.3x as long as broad, notaulus complete, distinct. Scutellum 1.5x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus and setose medially, reticulate. Mesepisternum rugulose-striate and mesepimeron finely reticulate-glabrate dorsally and striate ventrally. Propodeum rugulose to rugose, with complete primary costula medially, oriented transversely, angulated anteriorly, uniting as a median carina which intercepts dorsellum; numerous fine, mostly incomplete plicae submedially connecting costula, dorsellum and nucha; nucha slightly elongate and directed slightly ventrad, setose laterally near base; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.3x as long as broad, stigma 0.4–0.5x as long as stigmal vein, uncus fine, marginal vein 2.9–3.2x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole not visible in dorsal view; Gs<sub>1</sub> forming a robust, quadrate carinate collar encircling petiole ventrally (Fig. 271); Gt<sub>1+2(+3?)</sub> glabrous, remaining terga reticulate; Gt<sub>1+2(+3?)</sub> foreshortened; Gt<sub>1+2(+3?)</sub> 0.1x as long as Gt<sub>4</sub> and 2.0–2.3x as long as Gt<sub>5</sub>; Gt<sub>4</sub> setose in posterior half, sparsely setose dorsally; Gt<sub>5</sub> setose apically; remaining terga evenly setose; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> triangular in dorsal view.

**Variation.** The type series is essentially invariant except for small differences in degree of production of the propodeal median carina and associated plicae.

**Male.** Unknown.

**Distribution.** Known only from Costa Rica (Fig. 292).

**Biology.** Unknown.

**Comments.** The type material is in excellent condition. One paratype has its left wings mounted separately on the same card.

**Material Examined.**

**Type Material:** COSTA RICA: San José: Zurquí de Moravia, 1600m, iii.1991, col. Paul Hanson” (Holotype ♀, BMNH). Paratypes, 2♀, Zurquí de Moravia, 1600m, [two dates: xii.1995 & v.1992], Hanson & Godoy (BMNH).

***Rileya rhytisma*, new species**

(Fig. 24)

**Etymology.** Named for the dark patch on the dorsum of the gaster and scutellum; a Greek noun.

**Diagnosis.** Resembles other primarily golden species of *Rileyia* (*R. hegei*, *R. megastigma*) but is distinctive because the female possesses a petiolate gaster (see Fig. 288) not seen in *R. hegei* or *R. megastigma*, and discrete maculation on Gt<sub>4</sub> medially, the scutellum, and the lateral lobe of the mesoscutum (maculation rarely seen in *R. hegei* and *R. megastigma* and never as discrete spot on Gt<sub>4</sub>).

**Description.** Male. Length 1.9 mm. Color golden, except for the face, coxa, and legs (pale yellow), portions of mesoscutum, lateral lobes and scutellum medially; petiole, Gt<sub>4</sub> with transverse spot dorsomedially (brown). Wing hyaline, venation light yellow.

**Head.** Reticulate. Ovate in frontal view, a few fine striae radiating from clypeus toward lower eye margin. Clypeus bilobate (see Fig. 9); supraclypeal area slightly elevated above remainder of face, finely reticulate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, fine intrascrobal carina present, extending a third the length of the scape. Scape 3.2x as long as broad, broadest medially at ventral plaque, anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 subequal in length; F1 1.2x as long as broad, subsequent funiculars subequal in length; clava 3.0x as long as broad, segmented, tapering apically.

**Mesosoma.** Transversely reticulate-umbilicate anteriorly becoming umbilicate posteriorly. Midlobe of mesoscutum 1.0x as long as broad, notaulus

complete, faint. Scutellum 0.8x as long as broad, carinate apically; lateral panel of axilla with asetose, except for row of setae laterally along scutoscutellar sulcus, reticulate. Mesepisternum slightly reticulate; mesepimeron glabrate-striate. Propodeum rugose-reticulate, complete primary costula oriented transversely, connected to dorsellum by median carina which does not extend beyond costula; several complete or incomplete plicae connecting costula and nucha and dorsellum; spiracle obliquely oriented, reniform, ~0.5x its length from dorsellum; callus sparsely setose. Forewing 2.4x as long as broad, stigma 0.6x as long as stigmal vein, uncus fine, marginal vein 1.5x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma.* Petiole visible in dorsal view, rugose, 1.9x as long as broad, glabrate with carinate lip anteriorly abutting nucha. Gaster dorsoventrally flattened. Gt<sub>1-3</sub> glabrous; remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 1.8x as long as Gt<sub>2</sub> and 1.2x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.5x as long as Gt<sub>4</sub>; Gs<sub>1</sub> with collar encircling petiole ventrally; Gt<sub>1-2</sub> asetose; Gt<sub>3</sub> with dorsally incomplete, transverse row of setae; remaining terga evenly setose, except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7</sub> hemispherical in posterior view.

**Female.** Length 1.9–2.2 mm. Identical to male except as follows: scape lacking ventral plaque; petiole shorter, 1.0x as long as broad; Gt<sub>1</sub> 2.7–4.0x as long as Gt<sub>2</sub> and 2.0–2.6x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.3–0.4x as long as Gt<sub>4</sub>; tips ovipositor sheaths dark brown.

**Variation.** The type series varies only slightly in extent and distinctiveness of the dorsal maculation. Some differences are also seen in extent of plicae and carinae on the propodeum.

**Distribution.** Known only from Mexico (Fig. 292).

**Biology.** Unknown. Adults were seen flying near, walking on, and antennating pilose, spherical leaf galls [formed by Cecidomyiidae?] on *Gymnopodium floribundum* Rolfe (Polygonaceae) at El Edén in Quintana Roo, Mexico. However, this species was not recovered from these galls during attempts to rear them.

**Comments.** The holotype specimen is intact. The female paratype from El Edén is disarticulated, and the head, both right wings, gaster, and a portion of

the left flagellum are mounted separately on the same card. The paratype from Felipe Carrillo is missing the right antenna and the left antenna beyond the pedicel.

**Material Examined.**

**Type Material:** MEXICO: Quintana Roo: Cobá Ruins, 11.xii.83, L. Masner, s. s. forest (Holotype ♂, USNM). Paratypes, 2♀, MEXICO: Quintana Roo: 32km N Felipe Carrillo P., 17.viii.83, 30m, M. Kaulbars, coll. (1♀ USNM); Municipio de Lazaro Cardena, 25km NNE Leona Vicario, Reserva Ecología El Edén, 21°13'N 87°11'W, 25.viii.98, coll: M. Gates, Sweep along trail in primary forest (1♀ USNM).

***Rileyia robusta*, new species**

(Figs. 272–274)

**Etymology.** Named for its large size and coarse sculpture, from the Latin *robustus* meaning "hard and strong".

**Diagnosis.** Resembles *R. haumani* in size, ground color, and sculpture but can be differentiated from that species by the distinctive coloration (see below) and an indistinct uncus (Fig. 274). The petiole is also squatter and more robustly sculptured (Fig. 272) and the ventral plaque is positioned more basally (Fig. 273) than in *R. haumani*.

**Description.** Male. Length 3.1 mm. Color reddish brown, except for the following, which are either brown: head excluding face, coxae, mesopleuron, metapleuron, scutellum, femur in basal three-fourths, tibia in basal one-half to three-fourths; or pale yellow: antenna and remainder of leg. Wing hyaline, venation yellow-brown.

**Head.** Umbilicate. Subtriangular in frontal view, several striae radiating from clypeus toward lower eye margin. Clypeus notched, bilobate; supraclypeal area slightly elevated above remainder of face, glabrate. Malar space 0.6x eye height, postorbital carina absent. Eye glabrous. Scrobal depression deep, margined, intrascrobal lamina present, extending <0.5x length of scape. Scape 2.3x as long as broad, broadest medially, ventral plaque unapparent, anelli transverse, A1 narrowest, A2 and A3 each slightly broader, A1–A3 subequal in length; F1 0.8x as long as broad, subsequent funiculars subequal in length; clava 2.3x as long as broad, segmented and tapering apically (Fig. 273).

*Mesosoma*. Umbilicate. Midlobe of mesoscutum 1.2x as long as broad, notaulus incomplete, only slightly indicated anteriorly. Scutellum 1.3x as long as broad, carinate apically; lateral panel of axilla with evenly setose, umbilicate. Mesepisternum striate, with several large foveae along anterior margin; mesepimeron striate. Propodeum distinctly rugose, complete primary costula oriented transversely, connected to dorsellum by median carina; numerous robust plicae spanning some or all of distance between costula and nucha and dorsellum; spiracle obliquely oriented, slightly reniform, <1.0x its length from dorsellum; callus moderately setose. Forewing 2.3x as long as broad, stigma 0.6x as long as stigmal vein, uncus abbreviated, marginal vein 0.6x as long as postmarginal vein. Wing incompletely setose basally.

*Metasoma*. Petiole visible in dorsal view, rugose, 0.8x as long as broad, with carinate flange anteriorly abutting nucha (Fig. 272). Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate; remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 3.3x as long as Gt<sub>2</sub> and 1.3x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.4x as long as Gt<sub>4</sub>; Gs<sub>1</sub> produced anteriorly as a fine collar encircling petiole ventrally; Gt<sub>1-3</sub> asetose; remaining terga evenly setose, except Gt<sub>4</sub> in anterior fourth; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in posterior view.

**Female.** Unknown.

**Distribution.** Known only from Mexico (Fig. 292).

**Biology.** Unknown.

**Comments.** The type specimen is card mounted and in excellent condition. The Nuevo León specimen appears very close to the holotype but no direct evidence links them as conspecific, and thus it is not incorporated above.

**Material Examined.**

**Type Material:** MEXICO: Quintana Roo: Municipio de Lázaro Cardena, 25km NNE Leona Vicario, Reserva El Edén, 21°13'N 87°11'W, 14.viii.98, coll: M. Gates; Secondary growth near greenhouse, sweep (Holotype ♂, USNM).

**Other Material:** MEXICO: Nuevo León: 20 km N. Salinas Victoria, Carr. 40, 13.vii.1983, A. Gonzalez (1♂ UCR).

***Rileya scabra*, new species**

(Fig. 276)

**Etymology.** Derived from the Latin *scaber*, meaning "rough".

**Diagnosis.** This species is similar to *Rileyia cecidomyiae* and *R. insularis* in gross structure but is separated as follows: coarse umbilicate sculpture on head and mesosoma with interstices reticulate; primary costula irregular, not as smoothly continuous as in other taxa, propodeum coarsely rugose; Gt<sub>1</sub> with ovate, rugulose indentation anteriorly above petiole; gaster slightly shorter and broader; Gt<sub>4</sub> almost completely covering Gt<sub>5</sub> in dorsal view (Fig. 276).

**Description.** Female. Length 2.3–2.7 mm. Color dark brown, except for the following, which are light brown: antenna, apical fourth of femur, tibia, and tarsus. Wing hyaline, venation brown.

*Head.* Umbilicate. Subtriangular in frontal view, few coarse striae radiating from clypeus toward lower eye margin. Clypeus bilobate; supraclypeal area elevated above remainder of face, glabrate. Malar space 0.5–0.6x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, faint intrascrobal carina present, extending one-third length of scape. Scape 3.2–3.4x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.3x as long as broad, subsequent funiculars subequal; clava 3.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Coarsely umbilicate, interstices reticulate. Midlobe of mesoscutum 1.1–1.2x as long as broad, notaulus complete, indistinctly indicated as differences in sculpture. Scutellum 1.2–1.3x as long as broad, crudely carinate apically; lateral panel of axilla with several setae posteriorly along scutoscutellar suture, reticulate. Mesepisternum and mesepimeron rugose-reticulate. Propodeum rugose-carinate, with irregular, complete primary costula angled slightly toward dorsellum, oriented transversely, numerous irregular plicae submedially spanning all or some of the distance between costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus sparsely setose. Forewing 2.1–2.2x as long as broad, stigma 0.4x as long as stigmal vein, marginal vein 0.5–0.6x as long as postmarginal vein.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-3</sub> glabrous, remaining terga finely reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.5–2.8x as long as Gt<sub>2</sub> and 1.2–1.4x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.3–0.4x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with ovate, rugulose indentation anteriorly above petiole; remaining terga beyond Gt<sub>3</sub> evenly setose except Gt<sub>4</sub> in anterior half; Gt<sub>4</sub> completely covering Gt<sub>5</sub>; Gt<sub>6</sub> spiracle,

visible at apex of Gt<sub>4</sub> (Fig. 276); Gt<sub>7+8</sub> barely visible dorsally, hemispherical in posterior view.

**Male.** Unknown.

**Distribution.** Known only from Texas (Fig. 293).

**Biology.** Unknown.

**Comments.** The type material is card mounted. The holotype is missing its left antenna but is otherwise in excellent condition.

**Material Examined.**

**Type Material:** UNITED STATES: Texas: Cameron: Sabal Palm Sanctuary, 11.viii.83, M. Kaulbars (Holotype ♀, CNC). Paratype, 1♀, same data as holotype (CNC).

***Rileyia spadix* (Girault)**  
(Figs. 275, 277–280)

*Pararileyia spadix* Girault, 1915: 274. Holotype, ♀, by original designation. Australia, Queensland (BMNH).

*Rileyia spadix*; combination by Bouček, 1988b: 93.

**Diagnosis.** This species is similar in overall form to *R. insularis* and *R. cecidomyiae*, particularly in the sexual dimorphism seen in the gastral terga and the form of the male petiole (Fig. 278; cf. Fig. 163). However, *R. spadix* is separated based on the following: distinctive coloration detailed below; primary costula produced laterally as an elevated protuberance; female Gt<sub>3</sub> with a few easily abraded, scattered seta in transverse row dorsolaterally [these must be searched for at different angles under oblique illumination].

**Description.** Female. Length 4.1–4.4 mm. Color primarily golden laterally and ventrally but with extensive dark brown color dorsally. Dark brown occurs as follows: gena, occiput, vertex between dorsal eye margin scrobal depression and occiput, scrobal depression (Fig. 275), pronotum in anterior two-thirds; dorsum of mesosoma except for lateral lobe of mesoscutum along notaulus and laterally, axilla medially along scutoscutellar suture; axillula, scutellum apically; Gt<sub>3</sub> dorsally at each end, these bands connected medially



(Figs. 277, 278); Gt<sub>5</sub> along apical edge, tips ovipositor sheaths. Wing hyaline, venation light brown.

*Head.* Striate to slightly umbilicate. Subtriangular in frontal view, striae radiating from clypeus reaching lower eye margin and lower margin of scrobal depression. Clypeus indistinctly notched (Fig. 275); supraclypeal area slightly elevated above remainder of face, glabrate. Malar space 0.8–0.9x eye height, postorbital carina present, extending posteriad eye to vertex, terminating as a faint carina. Eye glabrous. Scrobal depression deep, margined, fine intrascrobal carina present (Fig. 275). Scape 4.5–5.0x as long as broad, broadest basally; anelli transverse, A1 narrowest and shortest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent funiculars decreasing slightly in length; clava 1.9–2.0x as long as broad, segmented, tapering apically.

*Mesosoma.* Transversely reticulate. Midlobe of mesoscutum 1.0x as long as broad, notaulus complete, distinctly indicated. Scutellum 1.0x as long as broad, crudely carinate apically; lateral panel of axilla with row of setae along scutoscutellar sulcus and medially, reticulate. Mesepisternum and mesepimeron rugulose-striate. Propodeum with primary costula incomplete, turning 90° submedially to contact dorsellum, produced as an elevated protuberance sublaterally; median carina extending between dorsellum and nucha, indistinctly connected to costula, several plicae submedially connecting costula with dorsellum and nucha; irregular; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.0x as long as broad, stigma 0.7x as long as stigmal vein, stigma slightly produced posteriorly, marginal vein 1.1–1.2x as long as postmarginal vein (Fig. 279); incompletely setose basally.

*Metasoma.* Petiole not visible in dorsal view. Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.5–2.6x as long as Gt<sub>2</sub> and 0.9x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.8x as long as Gt<sub>4</sub> (Fig. 277); remaining terga sparsely but evenly setose except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> emarginate to expose Gt<sub>6</sub> spiracle (Fig. 277); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 3.5–5.1 mm. Identical to female except as follows: scape with ventral plaque medially, 3.1x as long as broad (Fig. 280); petiole visible in dorsal view, 1.0 x as long as broad, rugulose, produced anteriorly as a carinate flange abutting nucha, angulate ventrally in lateral view (Fig. 278); Gt<sub>1-2</sub> foreshortened; Gt<sub>1</sub> 3.1–3.3x as long as Gt<sub>2</sub> and 1.0x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 1.3x as long as Gt<sub>4</sub>; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 278); Gt<sub>7+8</sub> hemispherical in posterior view.

**Variation.** Differences in specimens of this species are typically minimal. Darker coloration dorsally varies in extensiveness: dorsum of mesosoma can be almost completely golden, with only faint maculation medially; Gt<sub>1-2</sub> can be slightly maculated anteriorly, Gt<sub>4</sub> bands of maculation can be much longer and connected by broader band medially, gena and vertex can be united along lower eye margin. Stigma can be indistinctly produced posteriorly; primary costula of propodeum can not turn so abruptly anteriorly, can be angulated and unite into a median carina which contacts dorsellum (in this case, dorsolateral protuberance not as pronounced).

**Distribution.** Australia (Fig. 287). One of only two species described outside the New World.

**Biology.** This species has been reared from galls of Cecidomyiidae on *Santalum lanceolatum* R. Brown (Santalaceae).

**Comments.** Although the type was not examined, numerous specimens identified by Bouček directly or indicated in his revision (1988b) were used to characterize this species.

**Material Examined.**

**Type Material:** AUSTRALIA: Queensland: Gordonvale; Cecidomyiid galls on wild grape vine (Holotype ♀, BMNH).

**Other Material:** AUSTRALIA: Queensland: 15 [mi.?] W. Bowen, 24.ix.1950, E. F. Riek (4♀8♂ ANIC); 10km ESE Angas Downs HS, 4.v.1978, 25.05S 132.21E, J. C. Cardale (1♀ ANIC); South Australia: 5km SE Akaroola Village, 25.x.1993, 30.21S 139.22E, E. Nielsen & E. Edwards, Ex galls on *Santalum lanceolatum*, emerg. 1–15.xi.1993 (6♀5♂ ANIC).

***Rileya tricolor*, new species**

(Figs. 281–283)

**Etymology.** Named for the habitus color scheme of this species.

**Diagnosis.** This is one of the most distinctively colored species of *Rileya*. The head and gaster dorsally are black, the mesosoma is orange, and the legs, antennae, and gaster ventrally are pale golden. The wing has a small infusate spot adjoining the stigma and one posteriad stigma in some specimens. The

female gaster is petiolate, petiole 1.1x as long as broad, with two slightly cruciate setae laterally [easily abraded] and glabrate-rugulose. Gt<sub>1</sub> is glabrate with a group of at least 2-3 fine setae subdorsally near the anterior edge, and completely covering Gt<sub>2</sub> dorsally (see variation) (Figs. 281, 283). Gt<sub>3</sub> possesses a dorsally incomplete transverse row of seta sublaterally (Figs. 281, 283).

**Description.** Female. Length 2.8–5.7 mm. Color orange, except for the following, which are either black: head and gaster dorsally (Fig. 281); or pale golden: antenna, coxae, legs and gaster ventrally. Wing pale brown, venation brown.

*Head.* Reticulate. Triangular in frontal view, faint striae radiating from clypeus almost reaching lower eye margin. Clypeus bilobate; supraclypeal area distinctly elevated above remainder of face, imbricate-reticulate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, fine intrascrobal carina present, extending a third the length of the scape. Scape 3.3–5.0x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1 just longest, A2–A3 subequal in length; F1 0.8x as long as broad, subsequent funiculars subequal; clava 2.1–2.8x as long as broad, segmented, tapering apically.

*Mesosoma.* Finely transversely reticulate-finely umbilicate. Midlobe of mesoscutum 1.0–1.2x as long as broad, notaulus complete, slightly indicated. Scutellum 0.8–1.1x as long as broad, crudely carinate apically; lateral panel of axilla with completely setose, reticulate-umbilicate. Mesepisternum distinctly striate-rugose; mesepimeron striate-reticulate. Propodeum carinate, distinct complete primary costula, oriented transversely and angulated anteriorly, uniting as a median carina to contact dorsellum; several plicae submedially connecting costula with dorsellum and nucha; spiracle obliquely oriented, reniform, ~0.3x its length from dorsellum; callus densely setose. Forewing 2.7x as long as broad, stigma 0.4–0.7x as long as stigmal vein, marginal vein 2.1–2.6x as long as postmarginal vein (Fig. 282). Wing completely setose.

*Metasoma.* Petiole visible in dorsal view, 1.1x as long as broad, with two setae laterally, glabrate-rugulose (Fig. 281). Gt<sub>1-3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened, Gt<sub>1</sub> obscuring Gt<sub>2</sub> dorsally (Fig. 281); Gt<sub>1</sub> 1.9–2.3x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.4x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>4</sub> in anterior half; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> slightly elongate, triangular in dorsal view.

**Male.** Length 5.4–6.0 mm. Identical to female except as follows: scape with ventral plaque extending entire length of scape, 3.9x as long as broad; petiole distinct in dorsal view, 3.0–3.2x as long as broad, longitudinally reticulate, broadest anteriorly where produced as a carinate flange abutting nucha (Fig. 283); Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> glabrate, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened, Gt<sub>1</sub> obscuring Gt<sub>2</sub> dorsally; Gt<sub>1</sub> 2.2–2.7x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.2–0.3x as long as Gt<sub>4</sub>; remaining terga evenly setose except Gt<sub>4</sub> in anterior fourth; Gt<sub>5</sub> distinctly emarginate to expose Gt<sub>6</sub> spiracle; Gt<sub>7+8</sub> hemispherical in dorsal view.

**Variation.** Most specimens are variable with respect to the extent of the black coloration dorsally. Some have the pronotum and/or propodeum partially or completely maculated. The holotype has the most elongate gaster of the type series, primarily due to an increase in the length of Gt<sub>6</sub> and Gt<sub>7+8</sub>. A few specimens have the lateral setae on the petiole abraded, thus apparently aetose, although the setal bases are present. One large, variant specimen (CR: Estac. Biol. San Ramón), included as *R. tricolor*, has the petiole not distinctly visible dorsally, two infuscate spots on the forewing (adjacent to stigma posteriorly and posteriad stigma), and very robust sculpture on the propodeum. It is possible that this larger specimen represents a separate species but it is included in *R. tricolor* at this time until large, reared series might be examined. The USNM specimen from Central de Anchicaya has a dark brown head and mainly golden brown mesosoma with some lighter maculae along the notauli, subdorsally on the pronotum, on the axillae medially, and laterally on the scutellum.

**Distribution.** Known from Central and South America (Fig. 295).

**Biology.** Unknown.

**Comments.** The type specimens are both card and point mounted and in good condition.

**Material Examined.**

**Type Material:** COSTA RICA: San José: P.N. Braulio Carrillo, 9.5 km E. tunnel, 1000m, x–xii.1989, P. Hanson” (Holotype ♀, BMNH). Paratypes, 4♀1♂, COSTA RICA: Guanacaste: Sotobosque, W. side Volcán Cacao, 1100m, ii.1989, I. Gauld (1♀ BMNH); Heredia: 3 km S. Puerto Viejo, OTS-La Selva, [xi.1992 & iii–iv.1993], P. Hanson (2♀ BMNH); Braulio Carrillo NP, 400–

500m, 11.iv.85, L. Masner, Ridge rd in rain forest (1♀ BMNH); **San José:** P.N. Braulio Carrillo, 8 km E. tunel, 1000m, 15.v.1988, Col. Hanson (1♂ BMNH).

**Other Material:** **COLOMBIA: Valle:** Central de Anchicaya, 30 km E. Buenaventura, 10.vi.1975, 560m, R. C. Wilkerson, tropical very wet forest (1♀ AEIC); Central de Anchicaya, 14–16.vii.1975, R. C. Wilkerson, malaise trap (1♀ USNM). **COSTA RICA: Alajuela:** Estac. Biol. San Ramón, viii–ix.1995, 900m, P. Hanson (1♀ BMNH); **Guanacaste:** Estac. Pitilla, 9 km S. Santa Cecilia, ix.1988 [P. Hanson] & iv, ix.1989, 700m, I. Gauld (3♂ BMNH). **VENEZUELA: Zulia:** El Tucuco, 45 km SW Machiques, 5–6.vi.1976, A. S. Menke & D. Vincent (1♀ USNM).

***Rileya violetae*, new species**

(Fig. 286)

**Etymology.** Named in honor of my maternal grandmother, Violet Kyro, one of the kindest people I have known.

**Diagnosis.** This species is easily distinguished both in being one of the few in which females possess a petiolate gaster and in having the petiole abutted ventrally by a slightly recurved carinate collar produced from  $Gs_1$  anteriorly (Fig. 286).

**Description.** Female. Length 2.1 mm. Color golden, except for the following, which are either brown: head and mesosoma dorsally, gaster in middle half along its length; or pale yellow: antenna, face, coxae, and legs. Wing hyaline, venation brown.

**Head.** Reticulate. Subtriangular in frontal view, striae absent. Clypeus distinctly bilobate; supraclypeal not elevated above remainder of face, reticulate. Malar space 0.4x eye height, postorbital carina absent. Eye glabrous. Scrobal depression shallow, unmarginated, intrascrobal carina absent. Scape 3.8x as long as broad, broadest medially; anelli transverse, A1 narrowest, A2 and A3 each increasing in width, A1–A3 subequal in length; F1 1.3x as long as broad, subsequent funiculars subequal; clava 2.6x as long as broad, segmented, tapering apically.

**Mesosoma.** Reticulate. Midlobe of mesoscutum 1.1x as long as broad, notaulus complete, very slightly indicated. Scutellum 1.3x as long as broad, crudely carinate apically; lateral panel of axilla with several setae posteriorly along scutoscutellar suture, reticulate-finely striate. Mesepisternum rugulose-

striate, mesepimeron finely striate. Propodeum with complete primary costula medially, oriented transversely, bisected by a median carina, few plicae submedially spanning all or some of the distance between costula with dorsellum and nucha; spiracle obliquely oriented,  $\sim 1.0x$  its length from dorsellum; callus sparsely setose. Forewing 2.4x as long as broad, stigma 0.4x as long as stigmal vein, marginal vein 1.1x as long as postmarginal vein; forewing completely setose.

*Metasoma.* Petiole visible in dorsal view, glabrate, produced anteriorly as a carinate flange abutting nucha;  $Gs_1$  produced anteriorly as a slightly recurved carinate collar (Fig. 286);  $Gt_{1-3}$  glabrous, remaining terga finely reticulate;  $Gt_{1-3}$  foreshortened,  $Gt_3$  indistinctly separated from  $Gt_4$ ;  $Gt_1$  2.5x as long as  $Gt_2$  and 1.5x as long as  $Gt_3$ ,  $Gt_{1-3}$  0.2x as long as  $Gt_4$ ;  $Gt_4$  evenly setose in posterior half, remaining terga evenly setose;  $Gt_5$  slightly emarginate to expose  $Gt_6$  spiracle;  $Gt_{7+8}$  barely visible dorsally, triangular in dorsal view.

**Male.** Unknown.

**Distribution.** Known only from Costa Rica (Fig. 293).

**Biology.** Unknown.

**Comments.** The type material is point mounted and in excellent condition.

**Material Examined.**

**Type Material:** COSTA RICA: San José: P.N. Braulio Carrillo, 8km NE Tunel, 1100m, 15/v/88, Col. Hanson (Holotype ♀, USNM).

***Rileyia warneri*, new species**

(Figs. 284, 285)

**Etymology.** The specific name is in honor of my son, Warner, whose birth has enriched my life.

**Diagnosis.** A distinctively colored species as described below. Characterized by the following: female gaster petiolate, rugulose with three easily abraded, anteriorly directed setae apicolaterally, carinate laterally and ventrally, anterior lip abuts nucha;  $Gt_1$  with 3 lateral setae and anterior carinate lip abutting petiole (Fig. 285).

**Description.** Female. Length 2.1–3.3 mm. Color black or dark brown, except for the following, which are either red or brown: supraclypeal area below toruli, lateral panel pronotum, mesoscutum in posterior half, scutellum and axillae in anterior half, mesopleuron dorsally and portions of the gaster laterally; or golden: scape, pedicel, anelli (flagellum light brown), tegula, coxae, and legs. Wing hyaline, venation pale brown.

*Head.* Umbilicate-reticulate. Subtriangular in frontal view, striae radiating from clypeus absent. Clypeus slightly produced ventrally, slightly rounded; supraclypeal area elevated above remainder of face, reticulate. Malar space 0.4–0.5x eye height, postorbital carina present, fading before reaching vertex. Eye glabrous. Scrobal depression shallow, unmargined, intrascrobal carina absent. Scape 3.8–4.2x as long as broad, broadest basally; anelli transverse, A1 narrowest, A2 and A3 each increasing slightly in width, A1–A3 subequal in length; F1 1.0x as long as broad, subsequent funiculars subequal in length; clava 2.1–2.3x as long as broad, segmented, tapering apically.

*Mesosoma.* Umbilicate. Midlobe of mesoscutum 1.0–1.2x as long as broad, notaulus complete, distinct. Scutellum 1.1–1.4x as long as broad, finely carinate apically; lateral panel of axilla with setose medially and with row of setae along scutoscutellar sulcus, reticulate. Mesepisternum distinctly striate; mesepimeron glabrate, three elongate foveae ventrally above MMJ. Propodeum rugose-reticulate, complete primary costula transversely oriented, connected to dorsellum by median carina; several plicae connecting costula with dorsellum or nucha; spiracle obliquely oriented, reniform, ~1.0x its length from dorsellum; callus moderately setose. Forewing 2.2–2.4x as long as broad, stigma 0.4x as long as stigmal vein, uncus fine, marginal vein 1.5–1.7x as long as postmarginal vein. Wing completely setose.

*Metasoma.* Petiole distinctly visible in dorsal view, 1.1–1.3x as long as broad, cylindrical, longitudinally rugulose dorsally, carinate laterally and ventrally; three anteriorly directed setae basolaterally. Gaster not laterally flattened. Gt<sub>1-3</sub> glabrous, Gt<sub>4</sub> glabrate anteriorly, reticulate posteriorly, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 2.8–3.4x as long as Gt<sub>2</sub> and 1.5–1.7x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.6–0.7x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with three setae laterally and carinate lip abutting petiole (Fig. 285), Gt<sub>3</sub> with dorsally complete, transverse row of setae, Gt<sub>4</sub> and Gt<sub>5</sub> evenly setose except in anterior half, remaining terga evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle (Fig. 285); Gt<sub>7+8</sub> triangular in dorsal view.

**Male.** Length 2.5 mm. Identical to female, except as follows: scape with ventral plaque extending two-thirds length of scape apicomediaally, 4.0x as

long as broad; petiole distinct in dorsal view, 1.9x as long as broad, finely striate with faint superimposed, elongate reticulation, one setae located laterally in posterior one-third (Fig. 284); Gt<sub>1-2</sub> glabrous, Gt<sub>3</sub> finely reticulate, becoming glabrate apically; Gt<sub>4</sub> glabrate anteriorly, becoming reticulate posteriorly, remaining terga reticulate; Gt<sub>1-3</sub> foreshortened; Gt<sub>1</sub> 10.0x as long as Gt<sub>2</sub> and 1.3x as long as Gt<sub>3</sub>; Gt<sub>1-3</sub> 0.5x as long as Gt<sub>4</sub>; Gt<sub>1</sub> with two setae anterolaterally, Gt<sub>2</sub> aetose, Gt<sub>3</sub> with complete, transverse row of setae present (Fig. 284). **Note:** Although this specimen has not been definitively proven to be conspecific with the female specimens, I include it here based on its resemblance to and co-collection with the series from Venezuela.

**Variation.** The orange coloration on the mesosoma can extend from the lateral panel of the pronotum to the metapleuron laterally and from the anterior edge of the mesoscutum to the anterior edge of the pronotum dorsally. Alternatively, the entire mesosoma can be dark brown with only hints of orange color. The wing color is usually hyaline although 1-2 specimens have a very faint amber coloration. The carinae on the propodeum and mesopleuron can be slightly more or less robust and or complete in some specimens.

**Distribution.** Known only from South America (Fig. 292).

**Biology.** Unknown.

**Comments.** The holotype and Ecuador paratypes are card mounted, whereas the Venezuela material is point mounted. All are in excellent condition.

**Material Examined.**

**Type Material: BRAZIL: Rondonia:** ~60km SE Ariquemias, Fazenda Rancho Grande, 187m, 10°17'S 62°52'W, 7.viii.97, J. Heraty, H97-68, Sweep along forest trails (Holotype ♀, MZSP). Paratypes, 10♀2♂, **ECUADOR: Napo:** Reserva Etnica Waorani, Transect Ent. 1 mi. S. Onkone Gare Camp, 220m, 00°39'10"S 76°26'00"W, 9.x.94, T. L. Erwin et al., fogging terre firme forest (1♀ USNM). **VENEZUELA: Barinas:** Barinas, i.43, P. Anduze (9♀1♂ USNM).

**Incertae Sedis**

***Boucekiana tetracampoide* De Santis, 1975: 182–183.**



**Comments.** The holotype was examined early in this study but was unavailable for reexamination. It was apparently returned to the collection by De Santis before his death but now cannot be located. This genus cannot be placed in Rileyinae until the material is found. However, notes taken from the initial examination indicate that this taxon shares the reduced prepectus and 11353 antennal formula with *Rileya* [clava appears two-segmented in De Santis's illustration], though  $Gt_1$  is not distinctly reduced. The male tarsal formula is unusual in being 4-3-3, whereas all other Rileyinae have 5-5-5.

**Type Material.** ARGENTINA: Buenos Aires: Argentina, Buenos Aires, La Plata, [?]xi.1952, Balcedo, col. (Holotype ♀, MLPA). Allotype, ♂, same data as holotype (MLPA). Paratypes, 6♀12♂: 6♀9♂, same data as holotype but with assorted dates: 24.xi.1952, xi.1952, 11 & 18.xi.1953, xi & 10.xi.1954 [no indication as to which dates are associated with which particular specimens]; 3♂, Argentina, Cordoba, La Cumbre, i.1952, Torres & De Santis, col. (MLPA).

***Neorileya cyanea* Schrottky, 1913: 705. *Nomen dubium.***

**Comments.** The original description is insufficient to identify of this species. The type material may have been destroyed during Paraguayan civil war in 1922 (De Santis 1996).

**Type Material.** PARAGUAY: Alto Paraná: Puerto Bertoni, 30.xii.09–1.i.10 (Syntype ♀, [?]). Syntype (1♂ [?]), same data as type [?].

***Rileya albicornis* Kieffer & Jörgensen, 1910: 367. *Nomen dubium.***

***Rileya gallicola* Kieffer & Jörgensen, 1910: 437. *Nomen dubium.***

**Comments.** Others attempted to locate material of Kieffer and Jörgensen (LaSalle 1987; Gagné 1994) but were unsuccessful. Gagné (1994) reports that Kieffer had few funds to maintain a collection. After his sudden death, any materials in his possession may have been discarded. Kieffer's colleague, Peter Jörgensen, who lived in Mendoza, sent gall insects and their associates to Kieffer (ultimately published in 1910). Unfortunately, his collections and any material sent to Kieffer after Jörgensen's murder were never found.

**Type Material:** Specific locality unknown. Described from females from the neighborhood of Mendoza, province of Mendoza, Argentina.

***Rileyia collaris* (Howard), 1897: 136. *Nomen dubium.***

*Ashmeadia collaris* Howard, 1897: 136–137. Lectotype, ♂, here designated. Saint Vincent & the Grenadines. (BMNH, examined).

*Rileyia collaris*; combination by Schmiedeknecht 1909: 148.

**Description.** Male. Gaster length 1.5 mm. Color golden-brown, except for the legs, which are pale yellow, excluding pretarsus.

*Metasoma.* Petiole 0.8x as long as broad, longitudinally rugose, broadest basally where it is produced as a carinate flange abutting nucha. Gt<sub>1-2</sub> glabrous, foreshortened, remaining terga reticulate; Gt<sub>1</sub> 1.2x as long as Gt<sub>1-2</sub> and 2.0x as long as Gt<sub>3</sub>, Gt<sub>1-3</sub> 0.3x as long as Gt<sub>3+4</sub>; Gt<sub>4</sub> setose in posterior third, remaining terga evenly setose; Gt<sub>5</sub> slightly emarginate to expose Gt<sub>6</sub> spiracle and obscures Gt<sub>6</sub> in dorsal view; Gt<sub>7+8</sub> visible in dorsal view, hemispherical in posterior view.

**Comments.** What is left of the lectotype is in poor condition. This consists of the gaster (badly fractured along the left side), portions of three legs, and the tips of the antennae. In addition, the lectotype is male rather than female as indicated in the original description. The remains of the lectotype are described below. Howard (1897) indicated that this species was very similar to *Rileyia pulchra* except for some variation in coloration. Material examined of *R. pulchra* from the Caribbean basin can exhibit dramatic variation in extent and intensity of darker maculation on the body and could conceivably subsume the color variant given by Howard, and the remnant gaster of *R. collaris* is quite similar to males of *R. pulchra*. It is possible that these taxa are synonyms but more specimens from the *R. collaris* type locality must be examined first.

**Type Material: SAINT VINCENT & THE GRENADINES:** Type [circular label with red edge]; Balthazar (Windward side), Grenada, W.I., H. H. Smith; W. Indies, 99-331; *Ashmeadia collaris* How. Type [handwritten]; B. M. Type, Hym. 5-365 (BMNH).

***Rileyia desantisi* Subba Rao, 1978: 314–315. *Nomen dubium***

*Rileya desantisi* Subba Rao, 1978: 314-315. Holotype, ♀. Argentina.  
(MLPA).

**Comments.** I examined the type of this species early in my studies and returned it to La Plata soon thereafter. However, Dr. Luis De Santis, former curator of Hymenoptera, has died and this specimen cannot currently be located.

**Type Material:** ARGENTINA: Misiones: Est. Exp. Loreto, 27.iv.1923, A. A. Oglobin (MLPA).

***Rileya nigra* (Gomes), new combination, *Nomen dubium*.**

*Calorileya nigra* Gomes, 1943: 244–246. Holotype, ♀. Brazil (depository unknown).

**Comments.** Gomes indicates that the type material (♀ holotype, ♂ allotype, and 3 paratypes) was deposited at Instituto Oswaldo Cruz, Rio de Janeiro. However, this material cannot be located there. It is possible that this species is conspecific with one of the new species of *Rileya* described herein that is associated with orchid root galls, given the similarity of the illustrated antenna and wing venation of *R. nigra* to one or more of those species (*R. orchideara*, *R. laeliae*, etc.). Without examination of the type material of *R. nigra*, it is impossible to place it definitively.

**Type Material:** BRAZIL: Rio de Janeiro, *Ex* galls on orchids, xi.1935, Milanez, coll.; Juiz de Fora, Fazenda da Floresta (M. Gerais), 17.viii.1938, Penido, coll. [?].

## REFERENCES

- Adlerz, W. 1972.** *Prodecatoma cooki* (Hymenoptera: Eurytomidae) a seed chalcid on Florida grapes. *Journal of Economic Entomology* 65:1530.
- Adlerz, W. & J. Mortensen. 1973.** Seed chalcid damage, distribution and control on central Florida bunch grapes. *Proceedings of the Florida State Horticultural Society* 86: 335–338.
- Ashmead, W. 1888a.** Descriptions of some unknown parasitic Hymenoptera in the collection of the Kansas State Agricultural College, received from Prof. E. A. Popenoe. *Bulletin of Kansas Agricultural Experiment Station, Manhattan No. 3* (appendix): i–viii.
- Ashmead, W. 1888b.** A revised generic table of the Eurytominae, with descriptions of new species. Pt I. *Entomologica Americana* 4: 41–43.
- Ashmead, W. 1900.** Order Hymenoptera, pp. 510–613. *In* Smith, *Catalogue of Insects of New Jersey, Annual Report of the New Jersey State Board of Agriculture 27*(Supplement). State Board of Agriculture, New Jersey.
- Ashmead, W. 1904.** Classification of the chalcid flies of the superfamily Chalcidoidea, with descriptions of new species in the Carnegie Museum, collected in South America by Herbert H. Smith. *Memoirs of the Carnegie Museum* 1(4): i–xi, 225–551, 39 pls.
- Askew, R. 1961.** The biology of the British species of the genus *Olynx* Förster (Hymenoptera: Eulophidae), with a note on seasonal colour forms in the Chalcidoidea. *Proceedings of the Royal Entomological Society of London (A)* 36: 103–112.
- Askew, R. 1984.** Variation in *Cirrospilus vittatus* Walker (Hym., Eulophidae) and the description of a new species from Britain. *Entomologist's Monthly Magazine* 120: 63–67.

- Barnes, H. 1949.** Gall midges of economic importance. Vol. 6, Gall Midges of Miscellaneous Crops. Crosby Lockwood & Son Ltd., London, England; 229 pp.
- Becker, M. & M. Prato. 1982.** Natality and natural mortality of *Spartocera lativentris* Stål, 1870 (Heteroptera: Coreidae) in the egg stage. *Anais da Sociedade Entomologia do Brasil* 11: 261–268.
- Bolte, K. 1996.** Techniques for obtaining scanning electron micrographs of minute arthropods. *Proceedings of the Entomological Society of Ontario* 127: 67–87.
- Bouček, Z. 1951.** Results of the zoological scientific expedition of the National Museum of Praha to Turkey. 7. Hymenoptera I. *Acta Entomologica Musei Nationalis Pragae* 27: 47–57.
- Bouček, Z. 1954.** Chalcidologické poznámky I, Pteromalidae, Torymidae, Eurytomidae, Chalcididae (Hymenoptera). *Acta Entomologica Musei Nationalis Pragae* 29: 49–80, 12 Figs.
- Bouček, Z. 1970.** On some new or otherwise interesting Torymidae, Ormyridae, Eurytomidae and Pteromalidae (Hym.) mainly from the Mediterranean subregion. *Bollettino del Laboratorio di Entomologia Agraria 'Filippo Silvestri', Portici* 27: 27–54.
- Bouček, Z. 1974.** A revision of the Leucospidae (Hymenoptera: Chalcidoidea) of the world. *Bulletin of the British Museum of Natural History, Entomology Supplement* 23: 1–241.
- Bouček, Z. 1977.** A faunistic review of the Yugoslavian Chalcidoidea (Parasitic Hymenoptera). *Acta Entomologica Jugoslavica* 13 (Supplement): 1–145.
- Bouček, Z. 1983.** On *Buresium*, *Masneroma* (n.gen.) and some other Eurytomidae (Hymenoptera). *Entomologica Scandinavica* 14: 186–194.
- Bouček, Z. 1988a.** An overview of the higher classification of the Chalcidoidea (Parasitic Hymenoptera), pp. 11–23. *In* Gupta, V. (Ed.),

Advances in parasitic Hymenoptera Research, Proceeding of the 2<sup>nd</sup> Conference on the Taxonomy and Biology of Parasitic Hymenoptera. E. J. Brill, Leiden. 546 pp.

- Bouček, Z. 1988b.** Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species. CAB International, Wallingford, Oxon, U.K., Cambrian News Ltd; Aberystwyth, Wales. 832 pp.
- Bouček, Z. & J.-Y. Rasplus. 1991.** Illustrated key to West-Palaeartic genera of Pteromalidae. (Hymenoptera: Chalcidoidea). Institut National de la Recherche Agronomique, Paris: 140 pp.
- Bouček, Z. & S. Heydon. 1997.** Pteromalidae. In Gibson, G., Huber, J. & J. Woolley (Eds.), Annotated keys to the genera of Nearctic Chalcidoidea (Hymenoptera). pp. 541–692. NRC Research Press, Ottawa, Ontario, Canada: xi + 794 pp.
- Bouček, Z., Watsham, A. & J. Wiebes. 1981.** The fig wasp fauna of the receptacles of *Ficus thonningii* (Hymenoptera, Chalcidoidea). Tijdschrift voor Entomologie 124: 149–233.
- Bremer, K. 1988.** The limits of amino acid sequence data in angiosperm phylogenetic reconstruction. Evolution 42: 795–803.
- Bremer, K. 1994.** Branch support and tree stability. Cladistics 10: 295–304.
- Brèthes, J. 1913.** Himenópteros de la América meridional. Anales del Museo Nacional de Historia Natural de Buenos Aires 24: 35–160.
- Brèthes, J. 1918.** Description d'un chalcidien gallicole de la République Argentina. Bulletin de la Société Entomologique de France 1918: 82–84.
- Brues, C. 1909.** Notes and descriptions of North American parasitic Hymenoptera. Bulletin of the Wisconsin Natural History Society (n.s.) 6: 154–163.

- Brues, C. 1922.** *Conoaxima*, a new genus of the hymenopterous family Eurytomidae, with a description of its larva and pupa. *Psyche* 29: 154–157.
- Bruner, L. 1890.** Insects injurious to young trees on tree claims. University of Nebraska, Bulletin of the Agricultural Experiment Station 14.
- Bruner, S., Scaramuzza, L. & A. Otero. 1975.** Catalogo de los insectos que atacan a las plantas economicas de Cuba. 2<sup>nd</sup> Ed. Academia de Ciencias de Cuba, Instituto Zoologia, Havana. 399 pp.
- Bugbee, R. 1936.** Phylogeny of some eurytomid genera. *Entomologica Americana* 26: 169–223.
- Bugbee, R. 1966.** A revision of the genus *Eurytomocharis* Ashmead in North America (Hymenoptera: Eurytomidae). *American Midland Naturalist* 75: 367–382.
- Bugbee, R. 1967.** Revision of chalcid wasps of the genus *Eurytoma* in America north of Mexico. *Proceedings of the United States National Museum* 118: 432–552.
- Burks, B. 1967.** Superfamily Chalcidoidea. In Krombein, K.V. (Ed.), *Hymenoptera of America north of Mexico. Synoptic Catalogue. 1<sup>st</sup> supplement.* Agriculture Monographs. U.S. Department of Agriculture 2: 213–282.
- Burks, B. 1971.** A synopsis of the genera of the family Eurytomidae (Hym., Chalcidoidea). *Transactions of the American Entomological Society* 97: 1–89.
- Burks, B. 1979.** Family Eurytomidae. In Krombein, K.V., Hurd, P., Smith, D. & Burks, B. (Ed.), *Hymenoptera of America north of Mexico. Synoptic catalogue. 2<sup>nd</sup> supplement.* Agriculture Monographs. U.S. Department of Agriculture 1: 835–860.
- Campbell, B., Heraty, J., Rasplus, J., Chan, K., Steffen-Campbell, J. & C. Babcock. 2000.** Molecular systematics of the Chalcidoidea using 28S-D2 rDNA. pp. 59–71. In Austin, A. & M. Dowton (Eds.),

Hymenoptera: Systematics, Biodiversity and Biocontrol. CSIRO Publishing, Australia.

- Cameron, P. 1884.** Fam. Chalcididae. [continued] *Biologia Centrali-Americana. Insecta. Hymenoptera (Families Tenthredinidae-Chrysididae)*. 1: 97–120.
- Cameron, P. 1908.** Descriptions of two new genera and species of Chalcididae from Borneo. *Deutsche Entomologische Zeitschrift*, Berlin 1908: 559–561.
- Cameron, P. 1911.** Descriptions of new genera and species of Chalcididae collected by Mr. John Hewitt, B.A. in Borneo. *Societas Entomologica* 26: 22–23.
- Cameron, P. 1913.** The Hymenoptera of the Georgetown Museum. Part V. *Timehri, Guyana* 3: 105–137.
- Carpenter, J. M. 1988.** Choosing among equally parsimonious cladograms. *Cladistics* 4: 291–296.
- Claridge, M. 1958.** *Tetramesa* Walker 1848, a valid name for *Isosoma* Walker 1832 in place of *Harmolita* Motschulsky 1863 with a short discussion on some eurytomid genera (Hym., Eurytomidae). *Entomologist's Monthly Magazine* 94: 81–85.
- Claridge, M. 1961a.** An advance towards a natural classification of eurytomid genera (Hym., Chalcidoidea) with particular reference to British forms. *Transactions of the Society for British Entomology* 14: 167–185.
- Claridge, M. 1961b.** Biological observations on some eurytomid (Hymenoptera: Chalcidoidea) parasites associated with Compositae, and some taxonomic implications. *Proceedings of the Royal Entomological Society of London (A)* 36: 153–158.
- Colwell, R. K. 1996.** *Biota: The biodiversity database manager*. Sinauer Associates, Sunderland, Mass.



- Crawford, J. 1910.** New South American parasitic Hymenoptera. Proceedings of the United States National Museum 39: 235–239.
- Crawford, J. 1913.** Descriptions of new Hymenoptera, No 8. Proceedings of the United States National Museum 46: 343–352.
- Crawford, J. 1914.** Two new parasitic Hymenoptera from Arizona. Proceedings of the Entomological Society of Washington 16: 29.
- Crosby, C. 1909.** Chalcid-flies reared from galls from Zumbo East Africa. Brotéria, Lisboa (Zoologia) 8: 77–90.
- Darling, C. 1988.** Comparative morphology of the labrum in Hymenoptera: the digitate labrum of Perilampidae and Eucharitidae (Chalcidoidea). Canadian Journal of Zoology 66: 2811–2835.
- De Santis, L. 1967.** Catálogo de los Himenópteros Argentinos de la Serie Parasítica, incluyendo Bethyloidea. Comisión de Investigación Científica, La Plata. 337 pp.
- De Santis, L. 1975.** Two new Eurytomidae of Argentina (Hymenoptera: Chalcidoidea). (in Spanish) Boletín de la Academia Nacional de Ciencias en Córdoba 51: 179–183.
- De Santis, L. 1979.** Catálogo de los himenópteros calcidoideos de América al sur de los estados unidos. Publicación Especial Comisión de Investigaciones Científicas Provincia de Buenos Aires. 488 pp.
- De Santis, L. 1983.** Catálogo de los Himenopteros Calcidoideos de America al sur de los Estados Unidos, primer suplemento. Revista Peruana de Entomología 24: 1–38.
- De Santis, L. 1989.** Catálogo de los Himenopteros Calcidoideos (Hymenoptera) al sur de los Estados Unidos, segundo suplemento. Catalogue of the Chalcidoidea (Hymenoptera) of America south of the United States, second supplement. Acta Entomologica Chilena 15: 9–90.

- De Santis, L. 1996.** La Coleccion Entomologica de Carlos Schrottky. Revista de la Sociedad Entomologica Argentina. 55: 49-50.
- Delvare, G. 1988.** Revision des *Eurytoma* (Hym.: Eurytomidae) d'Afrique occidentale decrits par Risbec. Annales de la Société Entomologique de France 24: 117-149.
- Delvare, G. 1992.** A reclassification of the Chalcidini with a check list of the New World species. Memoirs of the American Entomological Institute 53: 119-441.
- DiGiulio, J. 1997.** Eurytomidae, pp. 477-497. In Gibson, G., Huber, J. & J. Woolley (Eds.), Annotated keys to the genera of Nearctic Chalcidoidea (Hymenoptera). NRC Research Press, Ottawa, Ontario, Canada. xi + 794 pp.
- Doganlar, M. 1992.** Systematic studies on *Rileya* Ashmead, 1888, with description of a new species from California, USA (Hymenoptera, Eurytomidae). Spixiana, München 15: 275-279.
- Eady, R. 1968.** Some illustrations of microsculpture in the Hymenoptera. Proceedings Royal Entomological Society 43: 66-72.
- Erdős, J. 1957.** Miscellanea chalcidologica hungarica. Annales Historico-Naturales Musei Nationalis Hungarici (n.s.) 8: 347-374.
- Erdős, J. 1960.** Magyar Allat. XII., 3. füz. Fémfűrkészek II. Torymidae, Eurytomidae, Agaonidae, Cleonymidae, Eupelmidae. Fauna Hungariae 52: 1-230.
- Erdős, J. 1964.** Chalcidoidea nova en gallia er Numidia inventa (Hym.). Bulletin de la Société de France 69: 89-101.
- Farooqi, S. & B. Subba Rao. 1986.** Family Eurytomidae. In Subba Rao, B. & M. Hayat (Eds.). The Chalcidoidea (Insecta: Hymenoptera) of India and the adjacent countries. Oriental Insects 20: 247-258.
- Farris, J. 1969.** A successive approximation method to character weighting. Systematic Zoology 18: 374-385.

- Felsenstein, J. 1985.** Confidence limits on phylogenies: An approach using the bootstrap. *Evolution* 39: 783–791.
- Felsenstein, J. 1988.** Phylogenies from molecular sequences: Inference and reliability. *Annual Review of Genetics* 22: 521–565.
- Ferriera, B. 1981.** Ocorrência de parasitas em ovos e adultos de percevejos da soja. *In* 7<sup>th</sup> Congress Brasilia Entomologia, 12–17 July 1981. Fortaleza, Ceara (abstract).
- Ferriera, B. 1986.** Ocorrência natural do complexo de parasitóides de percevejos da soja ne Paran . *Annales Societe Entomologia Brasil* 15: 189–199.
- Ferri re, C. 1950.** Notes sur les *Eurytoma* (Hym., Chalcidoidea). I. Les types de Thomson et de Mayr. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 23: 377–410.
- Flanders, S. 1931.** The temperature relationships of *Trichogramma minutum* as a basis for racial segregation. *Hilgardia* 5: 395–406.
- Gagn , R. 1989.** The plant-feeding gall midges of North America. Cornell University Press, Ithaca, N.Y. 356 pp.
- Gagn , R. 1994.** The gall midges of the Neotropical region. Cornell University Press, Ithaca, N.Y. 352 pp.
- Gahan, A. 1918.** A synopsis of the species belonging to the chalcidoid genus *Rileya* Ashmead. *Proceedings of the Entomological Society of Washington* 20: 136–150.
- Gahan, A. 1927.** Miscellaneous descriptions of new parasitic Hymenoptera with some synonymical notes. *Proceedings of the United States National Museum* 71: 1–39.
- Gahan, A. 1936.** Four new species of Chalcidoidea parasitic on cactus insects. *Proceedings of the United States National Museum* 83: 481–486.

- Gahan, A. 1948.** The Herbert H. Smith collection of South American Chalcidoidea described by W. H. Ashmead. *Journal of the Washington Academy of Sciences* 38: 243–245.
- Gemignani, E. 1933.** The family Eucharidae (Hymenoptera: Chalcidoidea) in the republic of Argentina. *Anales del Museo Nacional de Historia Natural de Buenos Aires* 37: 477–493
- Gibson, G. 1985.** Some pro- and mesothoracic structures important for phylogenetic analysis of Hymenoptera, with a review of some terms used for structures. *Canadian Entomologist* 117: 1395–1443.
- Gibson, G. 1986.** Evidence for monophyly and relationships of Chalcidoidea, Mymaridae and Mymarommatidae (Hymenoptera: Terebrantes). *Canadian Entomologist* 118: 205–240.
- Gibson, G. 1989.** Phylogeny and classification of Eupelmidae, with a revision of the world genera of Calosotinae and Metapelmatinae (Hymenoptera: Chalcidoidea). *Memoirs of the Entomological Society of Canada* 149: 1–121.
- Gibson, G. 1993.** Superfamilies Mymarommatoidea and Chalcidoidea, pp. 570–655. *In* Goulet, H. & J. Huber (Eds.), *Hymenoptera of the World: An identification guide to families*. Canada Communication Group, Ottawa, Ontario. vii + 668 pp.
- Gibson, G. 1997.** Morphology and Terminology, pp. 16–44. *In* Gibson, G., Huber, J. & J. Woolley (Eds.), *Annotated keys to the genera of Nearctic Chalcidoidea (Hymenoptera)*. NRC Research Press, Ottawa, Ontario, Canada. xi + 794 pp.
- Gibson, G., Heraty, J. & J. Woolley. 1999.** Phylogenetics and classification of Chalcidoidea and Mymarommatoidea —A review of current concepts (Hymenoptera, Apocrita). *Zoologica Scripta* 28: 87–124.
- Girault, A. 1913.** More new genera and species of chalcidoid Hymenoptera. Hymenoptera from Paraguay. *Archiv für Naturgeschichte (A)* 79: 51–

69.

- Girault, A. 1914.** Some new Australian genera and species of chalcidoid Hymenoptera of the families Chalcididae, Callimomidae, Eurytomidae, Pteromalidae and Microgasteridae [*sic*]. *Societas Entomologica, Frankfurt* 29: 51–52.
- Girault, A. 1915.** Australian Hymenoptera Chalcidoidea, XI. The family Eurytomidae with descriptions of new genera and species. *Memoirs of the Queensland Museum* 4: 238–274.
- Girault, A. 1916.** Descriptions and observations on some Chalcidoid Hymenoptera. II. *Canadian Entomologist* 48: 337–344.
- Girault, A. 1938.** Some new Australasian insects which are parasites (Hym. Chalcidoidea). *Revista de Entomologia, Rio de Janeiro* 8: 80–89.
- Goeden, R. 1990.** Life history of *Eutreta diana* (Osten Sacken) on *Artemisia tridentata* Nuttall in Southern California (Diptera: Tephritidae). *Pan-Pacific Entomologist* 66: 24–32.
- Gomes, J. 1943.** Um novo Euritomidea de galhas em Orquidea (Hymenoptera, Chalcidoidea). *Boletim da Sociedade Brasileira de Agronomia* 6: 244–246.
- Gordh, G. 1978.** Taxonomic notes on *Zagrammosoma*, a key to the Nearctic species and description of a new species from California (Hymenoptera: Eulophidae). *Proceedings of the Entomological Society of Washington* 80: 344–359.
- Gordh, G. 1979.** Superfamily Chalcidoidea. In Krombein, K.V. & B. Burks (Eds.), *Hymenoptera of America north of Mexico. Synoptic catalogue. 2<sup>nd</sup> supplement. Agriculture Monographs. U.S. Department of Agriculture. 2: 743–748.*
- Goulet, H. & J. Huber. 1993.** *Hymenoptera of the world: An identification guide to families. Research Branch Agriculture Canada Publication 1894/E. 668 pp.*

- Gradwell, G. 1958.** *Eulophus nigribasis* Gradwell (Hym., Chalcidoidea) the overwintering form of *E. larvarum* (L.) Entomologist's Monthly Magazine 94: 234–235.
- Graham, M. W. R. de V. 1979.** The Chalcidoidea (Hymenoptera) of Madeira: A preliminary list. Entomologist's Gazette 30: 271–287.
- Grissell, E. E. 1976.** A revision of western Nearctic species of *Torymus* Dalman (Hymenoptera: Torymidae). University of California Publications in Entomology 79. 120 pp. + 6 plates.
- Grissell, E. E. 1995.** Toryminae (Hymenoptera: Chalcidoidea: Torymidae): A redefinition, generic classification, and annotated world catalog of species. Memoirs on Entomology, International 2: 1–470.
- Grissell, E. & M. Schauff. 1990.** A synopsis of the seed-feeding genus *Bephratelloides* (Chalcidoidea: Eurytomidae). Proceedings of the Entomological Society of Washington 92: 177–187.
- Grissell, E. & M. Foster. 1996.** A new *Bephratelloides* (Hymenoptera: Eurytomidae) from seeds of *Cymbopetalum* (Annonaceae) in Mexico. Proceedings of the Entomological Society of Washington 98: 256–263.
- Grissell, E. & M. Schauff. 1997.** Chalcidoidea, pp. 45–116. In Gibson, G., Huber, J. & J. Woolley (Eds.), Annotated keys to the genera of Nearctic Chalcidoidea (Hymenoptera). NRC Research Press, Ottawa, Ontario, Canada. xi + 794 pp.
- Habib, R. 1983.** The bionomics of *Psectrosema* spp. (Diptera: Cecidomyiidae) reared from galls on *Tamarix* spp. in Pakistan. Bulletin of Entomological Research 73: 457–463.
- Habu, A. 1960.** A revision of the Chalcididae (Hymenoptera) of Japan, with descriptions of sixteen new species. Bulletin of the National Institute of Agricultural Sciences, Series C, No. 11: 131–363.

- Harris, R. 1979.** A glossary of surface sculpturing. Occasional Papers Entomology California Department of Food and Agriculture 28: 1–31.
- Hawkins, B. & R. Goeden. 1984.** Organization of a parasitoid community associated with a complex of galls on *Atriplex* spp. in southern California. Ecological Entomology 9: 271–292.
- Headrick, D. & R. Goeden. 1997.** Gall midge forms galls on fruit fly galls (Diptera: Cecidomyiidae, Tephritidae). Proceedings Entomological Society Washington 99: 487–489.
- Hedqvist, K. 1980.** *Pseudrileya brasiliensis* n.gen., n.sp. from Brazil (Hymenoptera, Chalcidoidea: Eurytomidae). Entomologica Scandinavica 11: 159–160.
- Heraty, J. 1994.** Classification and evolution of the Oraseminae in the Old World, with revisions of two closely related genera of Eucharitinae (Hymenoptera: Eucharitidae). Life Sciences Contributions, Royal Ontario Museum 157: 1–174.
- Heraty, J. & D. Hawks. 1998.** Hexamethyldisilazane – a chemical alternative for drying insects. Entomological News 109: 369–374.
- Heraty, J., Woolley, J. & D. Darling. 1997.** Phylogenetic implications of the mesofurca in Chalcidodia (Hymenoptera), with emphasis on Aphelinidae. Systematic Entomology. 22: 45–65.
- Herting, B. 1973.** Coleoptera to Strepsiptera. A catalog of parasites and predators of terrestrial arthropods. Section A. Host or Prey/Enemy. 3. 185 pp. Commonwealth Agricultural Bureaux, Institute of Biological Control.
- Herting, B. 1977.** Hymenoptera. A catalogue of parasites and predators of terrestrial arthropods. Section A. Host or Prey/Enemy. Commonwealth Agricultural Bureaux, Institute of Biological Control. 4. iii + 206 pp.

- Herting, B. 1978.** Neuroptera, Diptera, Siphonaptera. A catalogue of parasites and predators of terrestrial arthropods. Section A. Host or Prey/Enemy. Commonwealth Agricultural Bureaux, Institute of Biological Control. 5. 156 pp.
- Hespenheide, H. 1985.** Insect visitors to extrafloral nectaries of *Byttneria aculeata* (Sterculiaceae): relative importance and roles. *Ecological Entomology* 10: 191–204.
- Heydon, S. 1989.** Relationships among Holarctic genera in the *Cyrtogaster*-group with a review of the species of North America north of Mexico (Hymenoptera: Pteromalidae). *Journal of the New York Entomological Society* 97: 192–217.
- Heydon, S. 1995.** The North American species of *Systasis* Walker (Hymenoptera: Pteromalidae). *Proceedings of the Entomological Society of Washington* 97: 569–581.
- Highland, H. 1964.** Life history of *Asphondylia ilicicola* (Diptera: Cecidomyiidae), a pest of American holly. *Journal of Economic Entomology* 57: 81–83.
- Howard, L. 1885.** Descriptions of North American Chalcididae from the collections of the U.S. Department of Agriculture and of Dr. C.V. Riley, with biological notes. (First paper). Together with a list of the described North American species of the family. *Bulletin of the United States Department of Agriculture, Bureau of Entomology* No. 5: 1–47.
- Howard, L. 1889.** Again *Rileya*. *Canadian Entomologist* 21: 59.
- Howard, L. 1897.** On the Chalcididae of the Island of Grenada. *Journal of the Linnaean Society (Zoology)* 26: 129–178.
- Huber, J. 1988.** The species groups of *Gonatocerus* Nees in North America with a revision of the *sulphuripes* and *ater* groups (Hymenoptera: Mymaridae). *Memoirs of the Entomological Society of Canada* 141: 1–109.



- Illiger, J. 1807.** Fauna Etrusca sistens Insecta quae in provinciis Florentina et Pisana praesertim collegit Petrus Rossius. Mantissae priore parte adjecta, iterum edita et annotatis perpetuis actua. 2. 6+511 pp.
- International Code of Zoological Nomenclature. 4<sup>th</sup> Ed. 1999.** International Commission on Zoological Nomenclature. 306 pp.
- Jesudasan, R. & B. David. 1989.** Record of parasitoids of *Asphondylia riveae* Mani (Cecidomyiidae: Diptera). Journal of the Bombay Natural History Society 85: 645.
- Jones, W. 1983.** New host and habitat associations for some Arizona Pentatomoidea and Coreidae. Southwestern Entomologist (Supplement) 16: 1–29.
- Kalina, V. 1969.** *Pseudosystole*, a new genus of the family Eurytomidae (Hym., Chalcidoidea). Acta Entomologica Bohemoslovaca 66: 181–183.
- Kalina, V. 1970.** *Pseudotetramesa*, neue Gattung der Familie Eurytomidae (Hym., Chalcidoidea). Studia Entomologica Forestalia 1: 121–125.
- Kieffer, J. & P. Jörgensen. 1910.** Gallen und Gallentiere aus Argentinien. Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten, Jena (II) 27: 362–444.
- Kobayashi, M., Kudagamage, C. & L. Nugaliyadde. 1991.** Hymenopterous parasitoids of the rice gall midge, *Orseola oryzae* Wood Mason, in the early maha season in Sri Lanka. Japan Agricultural Research Quarterly 25: 65–68.
- LaSalle, J. 1987.** New World Tanaostigmatidae. Contributions of the American Entomological Institute 23. 181pp.
- Liao, D. 1979.** A preliminary survey of the phytophagous species of Eurytomidae known from China with descriptions of a new genus and five new species. Scientia Silvae Sinicae 4: 256–264.

- Maddison, D. 1991.** The discovery and importance of multiple islands of most-parsimonious trees. *Systematic Zoology* 40: 315–328.
- Malyshev, S. 1968.** Genesis of the Hymenoptera and phases of their evolution. (Translation from Russian.) Methuen, London. 319 pp.
- Mani, M. 1989.** The fauna of India and adjacent countries, Chalcidoidea (Hymenoptera. Part I). Agaonidae, Torymidae, Leucospidae, Chalcididae, Eurytomidae, Perilampidae, Eucharitidae, Cleonymidae, Miscogasteridae, Pteromalidae, Eupelmidae and Encyrtidae. Zoological Survey of India, Calcutta. xlv + 1067 pp.
- Mani, M., Dubey, O., Kaul, B. & G. Saraswat. 1974.** Descriptions of some new and new records of some known Chalcidoidea (Hymenoptera) from India. *Memoirs of the School of Entomology, St. John's College, Agra No. 3*: 1–108.
- Masi, L. 1917.** Chalcididae of the Seychelles islands. (With an appendix by J. Kieffer.) *Novitates Zoologicae* 24: 121–330.
- Masi, L. 1943.** Nuove specie di imenotteri calcididi. Diagnosti precentive. *Misione biologia Sagan-Omo diretta dal Prof. E. Zavattari. Bollettino della Società Entomologica Italiana* 75: 65–68.
- Mathur, K., Das, P. & S. Sasmal. 1991.** Interaction of parasitoids with gall midges attacking rice (*Oryza sativa*) and grasses. *Indian Journal of Agricultural Science* 61(7): 526–530.
- Mathur, Y. & J. Vermeer. 1974.** Parasitic complex of *Acherontia styx* Westwood and *Asphondylia sesami* Felt in Rajasthan. *Indian Journal of Agricultural Science* 43(12): 1075–1077.
- Mickevich, M. 1982.** Transformation series analysis. *Systematic Zoology* 31: 461–478.
- Mukerjee, M. 1981.** On a collection of Eurytomidae (Chalcidoidea: Hymenoptera) from India. *Records of the Zoological Survey of India, Miscellaneous Publications and Occasional Papers No. 25*: 1–87.

- Murakami, Y. 1960.** Seasonal dimorphism in the Encyrtidae (Hymenoptera, Chalcidoidea). *Acta Hymenopterologica* 1: 199–204.
- Narendran, T. 1984.** A study of the Oriental genera of the family Eurytomidae (Hymenoptera: Chalcidoidea). *Entomon* 9: 1–10.
- Narendran, T. 1994.** Torymidae and Eurytomidae of Indian subcontinent (Hymenoptera: Chalcidoidea). Zoological Monograph, Department of Zoology, University of Calicut, Kerala, India. 500 pp.
- Narendran, T. & R. Padmasenan. 1989.** A new genus and species of Eurytomidae (Hymenoptera: Chalcidoidea) with redescription of a new species. *Akitsu* 108: 1–6.
- Narendran, T. & R. Padmasenan. 1991.** On Oriental species of *Mesoeurytoma* (Eurytomidae), with notes on two synonyms in Chalcididae (Hymenoptera). *Entomon* 16: 23–29.
- Narendran, T. & S. Sheela. 1994.** A new genus and a new species of Eurytomidae (Hymenoptera: Chalcidoidea) from Taiwan. *Journal of Ecobiology* 6: 141–144.
- Narendran, T. & B. Das. 2001.** A new genus and species of Eurytomidae (Hymenoptera: Chalcidoidea) from West Bengal, India. *Oriental Insects* 35: 293–297.
- Nikol'skaya, M. 1952.** Chalcids of the fauna of the USSR (Chalcidoidea). (in Russian) *Opredeliteli po Faune SSSR, Izdavaemie Zoologicheskim Institutom Akademii Nauk SSR* 44. 575 pp. Akademiya Nauk SSSR, Moscow and Leningrad.
- Nikol'skaya, M. 1955.** New chalcid genera and species of the families Eurytomidae and Callimomidae in Soviet Central Asia (Hymenoptera, Chalcidoidea). *Trudy Zoologicheskogo Instituta. Akademiya Nauk SSSR, Leningrad.* 21: 335–341.
- Nikol'skaya, M. 1956.** Seed-eating chalcids of the USSR and the importance of the phytophagous habit in the evolution of the group

(Hymenoptera, Chalcidoidea). Entomologicheskoe Obozrenie 35: 570–581.

- Nikol'skaya, M. 1960.** Chalcids of the families Chalcididae and Leucospidae. Fauna SSR 7(5). 220 pp.
- Noyes, J. 1978.** On the numbers and species of Chalcidoidea (Hymenoptera) in the world. Entomologist's Gazette 29: 163–164.
- Noyes, J. 1990.** A word on chalcidoid classification. Chalcid Forum (newsletter) 13: 6–7.
- Noyes, J. 2000.** Encyrtidae of Costa Rica. Memoirs of the American Entomological Institute 62: 1–355.
- Noyes, J. 2001.** Interactive Catalogue of world Chalcidoidea. 2<sup>nd</sup> ed. CD-ROM. Taxapad and The Natural History Museum.
- Oldroyd, H. & C. Ribbands. 1936.** On the validity of trichiation as a systematic character in *Trichogramma*. Proceedings of the Royal Entomological Society of London (B) 5: 148–152.
- Orphanides, G. 1976.** Damage assessment and natural control of the carob midge complex, *Asphondylia* spp. (Dipt., Cecidomyiidae) in Cyprus. Bollettino del Laboratorio di Entomologia Agraria 'Filippo Silvestri', Portici 33: 80–98.
- Peck, O. 1963.** A catalogue of the Nearctic Chalcidoidea (Insecta; Hymenoptera). Canadian Entomologist (Supplement) 30: 1–1092.
- Peck, O., Bouček, Z. & A. Hoffer. 1964.** Keys to the Chalcidoidea of Czechoslovakia (Insecta: Hymenoptera). Memoirs of the Entomological Society of Canada 34: 1–121.
- Perez, G. 1987.** Life cycle and fertility table of *Chryseida bennetti* Burks, an ectoparasitoid of *Acanthoscelides obtectus* Say (Coleoptera: Bruchidae). Folia Entomológica Mexicana 72: 76–88.

- Perioto, N. 1997.** Emergência de *Bephratelloides* (Hymenoptera: Eurytomidae) de sementes de *Xylopia aromatica* (Annonaceae) coletadas em fezes de *Dacnis cayna* (Aves: Coerebidae). Arq. Instituto Biológico 64(2): 135–137.
- Phillips, W. 1917.** Report on *Isosoma* investigations. Journal of Economic Entomology 10: 139–146 + 1 plate.
- Phillips, W. 1927.** *Eurytoma parva* (Girault) Phillips and its biology as a parasite of the wheat jointworm, *Harmolita tritici* (Fitch). Journal of Agricultural Research 34: 743–758.
- Pinto, J. & S. Frommer. 1980.** A survey of the arthropods on jojoba (*Simmondsia chinensis*). Environmental Entomology 9(1):137–143.
- Plakidas, J. 1982.** Notes on gall inhabitants of *Asphondylia helianthiglobulus* Osten Sacken (Diptera: Cecidomyiidae) in western Pennsylvania. Journal of the New York Entomological Society 90: 2–4.
- Plakidas, J. & A. Weis. 1994.** Depth associations and utilisation patterns in the parasitoid guild of *Asphondylia rudbeckiaeconspicua* (Diptera: Cecidomyiidae). Environmental Entomology 23(1): 115–121.
- Platner, G., Velten, R., Planoutene, M. & J. Pinto. 1999.** Slide-mounting techniques for *Trichogramma* (Trichogrammatidae) and other minute parasitic Hymenoptera. Entomological News 110: 56–64.
- Richards, O. 1956.** Hymenoptera: Introduction and key to families. Handbook for the identification of British Insects 6. 94 pp.
- Riek, E. 1970.** Hymenoptera, pp. 867–959. In The insects of Australia: A textbook for students and research workers. Melbourne University Press, Carlton, Victoria, Australia. xii + 1029 pp.
- Riley, C., Ashmead, W. & L. Howard. 1894.** Report upon the parasitic Hymenoptera of the island of St. Vincent. Journal of the Linnaean Society (Zoology) 25: 56–254.

- Risbec, J. 1951.** 1. Les Chalcidoïdes de l'Afrique occidentale française. Mémoires de l'Institut Français d'Afrique Noire, Ifan-Dakar 13: 1–409.
- Risbec, J. 1952.** Contribution à l'étude des chalcidoïdes de Madagascar. Mémoires de l'Institut Scientifique de Madagascar (E) 2: 1–449.
- Risbec, J. 1953.** Chalcidoïdes et proctotrupeïdes de l'Afrique occidentale française (2e supplément). Bulletin de l'Institut Français d'Afrique Noire 15: 549–609.
- Risbec, J. 1956a.** Hyménoptères parasites du Cameroun. (2e Contribution) Bulletin de l'Institut Français d'Afrique Noire (A) 18: 97–164.
- Risbec, J. 1956b.** Les parasites des insectes borers du riz au Cameroun. Agronomia Tropical 11: 234–247.
- Risbec, J. 1957.** Chalcidoïdes et proctotrupeïdes de l'Afrique occidentale française. Bulletin de l'Institut Français d'Afrique Noire (A) 19: 228–267.
- Rübsaamen, E. 1908.** Beiträge zur Kenntnis aussereuropäischer Zooecidien. III. Beitrag [cont.]: Gallen aus Brasilien und Peru. Marcellia 7: 15–79.
- Russo, C. 1938.** Contributa alla conoscenza dei Coleotteri Scolitidi Fleotribo: *Phloeotribus scarabaeoides* (Bern.). Bollettino Laboratorio Entomologia Agraria de Portici 2. 420 pp.
- Sain, M. & M. Kalode. 1992.** Seasonal dynamics of gall midge (*Orseolia oryzae* Wood-Mason) and its parasites in rice at Rajendranagar, Hyderabad, India. Indian Journal of Plant Protection 20(2): 223–225.
- Schauff, M. 1984.** The Holarctic genera of Mymaridae (Hymenoptera: Chalcidoidea). Memoirs of the Entomological Society of Washington 12: 1–67.

- Schauff, M. 1986.** An anellus by any other name, or putting more fun in your funicles. *Chalcid Forum* 7: 10–11.
- Schmiedeknecht, O. 1909.** Hymenoptera fam. Chalcididae. *Genera Insectorum* 97: 1–550. Wytzman, P. Brussels.
- Schrottky, C. 1913.** Neue südamerikanische Hymenopteren. *Deutsche Entomologische Zeitschrift*, Berlin 1913: 702–708.
- Schulz, W. 1906.** *Spolia Hymenopterologica*. Paderborn. i + 355 pp.
- Silvestri, F. 1920.** Contribuzione all conoscenza del parassiti della ova del grilletto canterino (*Oecanthus pellucens* Scop.). *Bollettino del Laboratorio di Zoologia Generale e Agraria della R. Scuola Superiore d'Agricoltura*, Portici 14: 219–250.
- Smith, L. 1930.** *Macrorileya oecanthi* Ashm. a hymenopterous egg parasite of tree-crickets. *University of California Publications in Entomology* 5: 165–172.
- Soenarjo, E. & P. Hummelen. 1976.** Observations on the occurrence of the rice gall midge, *Pachydiplosis oryzae*, and its parasites in Java, Indonesia. *Rice Entomology Newsletter* 4: 32.
- Sorenson, M. 1999.** *TreeRot*, version 2. Boston University, Boston, Mass.
- Spinola, M. 1840.** Description de trois Hyménoptères nouveaux, recueillis par M. Leprieur, à Cayenne. *Magasin de Zoologie, Seconde Serie, Classe IX, Insectes* 10: 1–20, plates 41–43.
- Stage, G. & R. Snelling. 1986.** The subfamilies of Eurytomidae and systematics of the subfamily Heimbrinae (Hymenoptera: Chalcidoidea). *Contributions in Science* 375: 1–17.
- Steffan, J. 1957.** Morphologie du petiole abdominal des Chalcididae (Hymenoptera). *Bulletin du Museum National D'Histoire Naturelle*, Paris 39: 315–322.

- Suárez, E. & R. Calvo. 1990.** Emergence of *Prodecatoma* sp. (Eurytomidae) and *Torymus* sp. (Torymidae) wasps from the gall of the fruit of *Psidium guineense* Swartz (Myrtaceae). *Brenesia* 32: 117–118.
- Subba Rao, B. 1974.** Redescription of *Plutarchia* Girault and *Axanthosoma* with the description of a new species of *Plutarchia* from Nigeria (Eurytomidae: Hymenoptera). *Journal of Entomology (B)* 42: 199–206.
- Subba Rao, B. 1978.** New genera and species of Eurytomidae (Hymenoptera: Eurytomidae). *Proceedings of the Indian Academy of Sciences (B)* 87: 293–319.
- Subba Rao, B. 1986.** *Mangoma spinidorsum*, gen. et sp. n. (Hymenoptera: Eurytomidae) associated with mango leaf galls. *Bulletin of Entomological Research* 76: 389–392.
- Sun, P., Shi, J. & Z. Xu. 1994.** Research on the biological properties of *Diomorus aiolomorphi* and its control. *Journal of Zhejiang Forestry Science and Technology* 14: 5–8.
- Swearingen, M., Headrick, D. & T. Bellows. 1997.** Comparison of fixation and drying procedures for scanning electron microscopy among insect body types. *Proceedings of the Entomological Society of Washington* 99: 513–522.
- Swofford, D. 2000.** PAUP\*. Version 4.0b3a. Sinauer, Sunderland, Mass.
- Szelényi, G. 1974.** Mongolian eurytomids (Hymenoptera: Chalcidoidea). *Acta Zoologica Academiae Scientiarum Hungaricae* 20: 433–441.
- Szelényi, G. 1975.** Description of eurytomid wasps from Hungary and Yugoslavia (Hymenoptera, Eurytomidae). *Annales Historico-Naturales Musei Nationalis Hungarici* 67: 257–264.
- Tewari, G. & P. Moorthy. 1986.** *Eurytoma* sp., a new parasite on *Asphondylia* sp. infesting egg plant. *Entomon* 11: 111–113.



- Thomson, C. 1878.** Hymenoptera Scandinavicae v. pteromasos (*Swederus*) continuatio Lund 307 pp. + 1plate.
- Thompson, W. 1955.** A catalogue of the parasites and predators of insect pests. Section 2. Host parasite catalogue, Part 3. Hosts of the Hymenoptera (Calliceratid to Evaniid), pp. 191–332. Commonwealth Agricultural Bureaux, Commonwealth Institute of Biological Control, Ottawa, Ontario, Canada.
- Udine, E. & J. Pinckney. 1940.** Some egg parasites of *Oecanthus quadripunctatus* Beut. and a species of *Orchelimum*. Proceedings of the Pennsylvania Academy of Science 14: 81–84.
- Walker, F. 1832.** (September 30), Monographia Chalcidum. Entomological Magazine 1: 12–29
- Walker, F. 1833a.** (January 31), Monographia Chalcidum. Entomological Magazine 1: 115–142,
- Walker, F. 1833b.** (July 31), Monographia Chalcidum. Entomological Magazine 1:3 67–384.
- Walker, F. 1833c.** (October 31), Monographia Chalcidum. Entomological Magazine 1: 455–466.
- Walker, F. 1839.** Monographia Chalcidum. 2. London, England: 100 pp.
- Walker, F. 1848.** List of the specimens of Hymenopterous insects in the collection of the British Museum, part 2. iv + 237 pp.
- Walker, F. 1862.** Notes on Chalcidites, and characters of undescribed species. Transactions of the Entomological Society of London 1: 345–397.
- Walker, F. 1871.** Part 1, Eurytomidae. Notes on Chalcidiae 1–18.
- Wang, H., Xu, T., Lin, C. & R. Liu. 1996a.** Studies on the biological characteristics of two chalcid-flies infesting bamboo. Forest Research 9: 52–57.

- Wang, H., Xu, T., Lin, C. & R. Liu. 1996b.** Studies on the interspecific relationships between two chalcid-flies on bamboo. *Forest Research* 9: 284–289.
- Waring, G & P. Price. 1989.** Parasitoid pressure and the radiation of a gall-forming group (Cecidomyiidae: *Asphondylia* spp.) on creosote bush (*Larrea tridentata*). *Oecologia* 79: 293–299.
- Wijesekara, G. 1997.** Phylogeny of Chalcididae (Insecta: Hymenoptera) and its congruence with contemporary hierarchical classification. *Contributions of the American Entomological Institute* 29: 1–61.
- Wolcott, G. N. 1948.** Insects of Puerto Rico, Hymenoptera. *Journal of Agriculture of the University of Puerto Rico* 32(4): 749–975.
- Yang, Z. 1996.** Parasitic wasps on bark beetles in China (Hymenoptera). Science Press, Beijing. iv + 363 pp.
- Zerova, M. 1971.** New species of chalcids of the genus *Nikanoria* Nik. (Hymenoptera, Eurytomidae) from Central Asia and Mongolia. *Entomologicheskoe Obozrenie* 50: 147–159.
- Zerova, M. 1974.** Novyi rod i vid semeyvsta Eurytomidae (Chalcidoidea) iz zapadnago Kazakhstana. *Zoologicheskii Zhurnal* 53: 1577–1579.
- Zerova, M. 1976.** Hymenoptera 7. Part 6. Family Eurytomidae; subfamilies Rileyinae and Harmolitinae. (in Russian). *Fauna SSSR, Akademia Nauk. SSSR, Zoological Institute* 110: 1–230.
- Zerova, M. 1978.** Hymenoptera Parasitica. Chalcidoidea - Eurytomidae. (in Russian) *Fauna Ukraini* 11: 1–465. Institute of Zoology, Ukrainian RSR.
- Zerova, M. 1980.** A new species of the genus *Chryseida* Spinola (Hymenoptera, Eurytomidae) from Central America. *Entomologicheskoe Obozrenie* 50: 147–159.

- Zerova, M. 1988.** The main trends of evolution and the system of chalcids of the family Eurytomidae (Hymenoptera, Chalcidoidea). (In Russian with English summary) *Entomologicheskoe Obozrenie* 67: 649–674.
- Zerova, M. 1995a.** The parasitic Hymenoptera - subfamilies Eurytominae and Eudecatominae (Chalcidoidea, Eurytomidae) of the Palaearctics (in Russian) Naukova Dumka Publishers, Kiev: 457 pp.
- Zerova, M. 1995b.** 42. Family Eurytomidae. (In Russian) Key to the insects of Russian far east in 6 volumes, 4: 257–286. Lera, P. A. Dal'nauka, Vladivostok.
- Zerova, M. & V. Fursov. 1991.** The Palaearctic species of *Eurytoma* (Hymenoptera: Eurytomidae) developing in stone fruits (Rosaceae: Prunoideae). (In English) *Bulletin of Entomological Research* 81: 209–219.
- Zerova, M. & G. Lindeman. 1983.** A review of Palaearctic species of the family Eurytomidae (Hymenoptera, Chalcidoidea) associated with xylophagous insects. (in Russian) *Trudy Vsesoyuznogo Entomologicheskogo Obshchestva* 65: 135–154.
- Zerova, M. & L. Seregina. 1994.** The Seed-eating Chalcidoidea of Palaearctics Institute of Zoology, National Academy of Sciences, Ukraine. 237 pp.

## Appendix 1. Alphabetical listing of terms used in the text and in illustrations

Abbreviation: figure	Term/Structure
a1-3: 3	anellus
adg: 6	aedeagus
ao: 2	anterior ocellus
ax: 4, 7	axilla
axl: 4, 7	axillula
bc: 8	basal cell
bsl: 8	basal setal line
cal: 4	callus
cc: 8	costal cell
cer: 5	cercus
clv: 3	clava
cly: 2	clypeus
co <sub>1-2</sub> : 4, 7	costula (1°, 2°)
csl: 8	cubital setal line
cx <sub>1-3</sub> : 7	coxa (pro, meso, meta)
dgs: 6	digital spine
dig: 6	digitus
dor: 4, 7	dorsellum
flg: 3	flagellum
fmd: 7	femoral depression
fre: 4, 7	frenum
frl: 4, 7	frenal line
ful: 3	funicle segment
fun: 3	funicle
gen: 1	gena
gc: 1	genal carina
Gs <sub>n</sub> : 5	gastral sternum
Gt <sub>n</sub> : 5	gastral tergum

**Appendix 1 (cont.)**

<b>Abbreviation: figure</b>	<b>Term/Structure</b>
hpl: 1	humeral plate
hsb: 1	hypostomal bridge
hsc: 1	hypostomal carina
iap: 2	interantennal prominence
isl: 2	intrascrobal lamina
lbr: 2	labrum
llm: 4, 7	lateral lobe of mesoscutum
lo: 1, 2	lateral ocellus
lpa: 4, 7	lateral panel of axilla
man: 2	mandible
mc: 4	median carina
mep: 7	mesepimeron
mes: 7	mesepisternum
mlm: 4	midlobe of mesoscutum
mmj: 7	mesepimeral-metapleural junction
msl: 2	malar sulcus
msc: 4	mesoscutum
msh: 2	malar space
mv: 8	marginal vein
no <sub>1</sub> : 4, 7	pronotum
not: 4	notaulus
nuc: 4	nucha
pl <sub>2</sub> : 7	mesopleuron
pl <sub>3</sub> : 7	metapleuron
oc: 1	occiput
ocf: 1	occipital foramen
osh: 5	ovipositor sheath
ost: 5	ovipositor stylet
ovp: 5	ovipositor

**Appendix 1 (cont.)****Abbreviation: figure****Term/Structure**

par: 6	paramere
pdl: 3	pedicel
pgb: 1	postgenal bridge
phl: 6	phallobase
plc: 4, 7	plica
pmv: 8	postmarginal vein
poc: 2	postorbital carina
ppd: 4	propodeum
prc: 2	preorbital carina
pre: 7	prepectus
psg: 1	postgena
pst: 8	parastigma
ptl: 5	petiole
rad: 3	radicle
sca: 2	supraclypeal area
scd: 2	scrobal depression
scl: 8	subcubital line
scp: 3	scape
sct: 4, 7	scutellum
smv: 8	submarginal vein
spc: 8	speculum
spr: 5, 7	spiracle
sss: 4, 7	scutoscutellar suture
stg: 8	stigma
stv: 8	stigmatal vein
tgl: 4, 7	tegula
tor: 2	torulus
unc: 8	uncus
vls: 6	volsella

**Appendix 1 (cont.)**

**Abbreviation: figure**

**Term/Structure**

vpl: 3  
vrt: 1

ventral plaque  
vertex







### Appendix 3. New Synonymies

#### Tribe

Philolemini Subba Rao 1978 now = Eurytominae (sensu Peck et al. 1964)

#### Genera

*Calorileya* Crawford, 1910 now = *Rileyia* Ashmead, 1888

*Matna* Bouček, 1988 now = *Austrophotismus* Girault, 1938

*Pseudrileyia* Hedqvist, 1978 now = *Rileyia* Ashmead, 1888

#### Subgenera

*Dillerileyia* Doganlar, 1992 now = *Rileyia* Ashmead, 1888

#### Species

*americana* Girault, 1916, *Rileyia* now = *Rileyia insularis* (Ashmead), 1894

*brasiliensis* Hedqvist, 1978, *Pseudrileyia* now = *Rileyia haumani* (Brèthes), 1918

*compressiventris* Gahan, 1918, *Rileyia* now = *Rileyia hegeli* Girault, 1916

*hanlari* Doganlar, 1992, *Rileyia* now = *Rileyia piercei* Crawford, 1914

*opuntiae* Gahan, 1936, *Rileyia* now = *Rileyia insularis* (Ashmead), 1894

*similaris* Gahan, 1918, *Rileyia* now = *Rileyia insularis* (Ashmead), 1894

*vardyi* Subba Rao, 1978, *Rileyia* now = *Rileyia insularis* (Ashmead), 1894

### Appendix 4. New Combinations

*Austrophotismus fallax* (Bouček), 1988 (from *Matna*)

*Rileyia cearae* (Crawford), 1910 (from *Calorileya*)

*Rileyia megastigma* (Ashmead), 1894 (from *Calorileya*)

*Rileyia nigra* (Gomes), 1942 (from *Calorileya*)

### Appendix 5. Lectotypes Designated

*Neorileyia albipes* Girault, 1913

*Neorileyia flavipes* Ashmead, 1904

*Rileyia abnormicornis* (Ashmead), 1894

*Rileyia cecidomyiae* Ashmead, 1888

*Neorileyia ashmeadi* Crawford, 1913

*Neorileyia meridionalis* Gahan, 1927

*Rileyia cearae* (Crawford), 1910

*Rileyia tegularis* Gahan, 1918

<i>Rileyia couridae</i> (Cameron), 1913	<i>Rileyia haumani</i> (Brèthes), 1918
<i>Rileyia hegei</i> Girault, 1916	<i>Rileyia compressiventris</i> Gahan, 1918
<i>Rileyia heterogaster</i> Gahan, 1918	<i>Rileyia insularis</i> (Ashmead), 1894
<i>Rileyia similaris</i> Gahan, 1918	<i>Rileyia opuntiae</i> Gahan, 1936
<i>Rileyia americana</i> Girault, 1916	<i>Rileyia vardyi</i> Subba Rao, 1978
<i>Rileyia megastigma</i> (Ashmead), 1894	<i>Rileyia mellea</i> (Ashmead), 1894
<i>Rileyia orbitalis</i> Ashmead, 1904	<i>Rileyia pallidipes</i> (Ashmead), 1894
<i>Rileyia piercei</i> Crawford, 1914	<i>Rileyia pulchra</i> (Ashmead), 1894
<i>Rileyia collaris</i> (Howard), 1897	

## Appendix 6. New Species Described

<i>yanegai</i> , <i>Dougiola</i>	<i>laeliae</i> , <i>Rileyia</i>
<i>cornuta</i> , <i>Neorileyia</i>	<i>longitergum</i> , <i>Rileyia</i>
<i>lynetteae</i> , <i>Neorileyia</i>	<i>mimica</i> , <i>Rileyia</i>
<i>antennata</i> , <i>Rileyia</i>	<i>minuta</i> , <i>Rileyia</i>
<i>antioquia</i> , <i>Rileyia</i>	<i>obscura</i> , <i>Rileyia</i>
<i>auranti</i> , <i>Rileyia</i>	<i>oculiseta</i> , <i>Rileyia</i>
<i>atopogaster</i> , <i>Rileyia</i>	<i>oncidii</i> , <i>Rileyia</i>
<i>bicolor</i> , <i>Rileyia</i>	<i>orchideara</i> , <i>Rileyia</i>
<i>bisulcata</i> , <i>Rileyia</i>	<i>panamae</i> , <i>Rileyia</i>
<i>bumeliae</i> , <i>Rileyia</i>	<i>paraplesius</i> , <i>Rileyia</i>
<i>cattleyae</i> , <i>Rileyia</i>	<i>petiolata</i> , <i>Rileyia</i>
<i>clarki</i> , <i>Rileyia</i>	<i>philodendrica</i> , <i>Rileyia</i>
<i>columbar</i> , <i>Rileyia</i>	<i>protuberona</i> , <i>Rileyia</i>
<i>cylindripetiolata</i> , <i>Rileyia</i>	<i>quadraticaulis</i> , <i>Rileyia</i>
<i>gastros</i> , <i>Rileyia</i>	<i>rhytisma</i> , <i>Rileyia</i>
<i>glabra</i> , <i>Rileyia</i>	<i>robusta</i> , <i>Rileyia</i>
<i>gracilis</i> , <i>Rileyia</i>	<i>scabra</i> , <i>Rileyia</i>
<i>grisselli</i> , <i>Rileyia</i>	<i>tricolor</i> , <i>Rileyia</i>
<i>guatemalae</i> , <i>Rileyia</i>	<i>violetae</i> , <i>Rileyia</i>
<i>hansonii</i> , <i>Rileyia</i>	<i>warneri</i> , <i>Rileyia</i>
<i>heraty</i> , <i>Rileyia</i>	
<i>infuscata</i> , <i>Rileyia</i>	

**Appendix 7. New Placement**

*Archirileya* Silvestri 1920 (transferred to Eurytominae)

*Buresium* Bouček 1970 (transferred to Eurytominae)

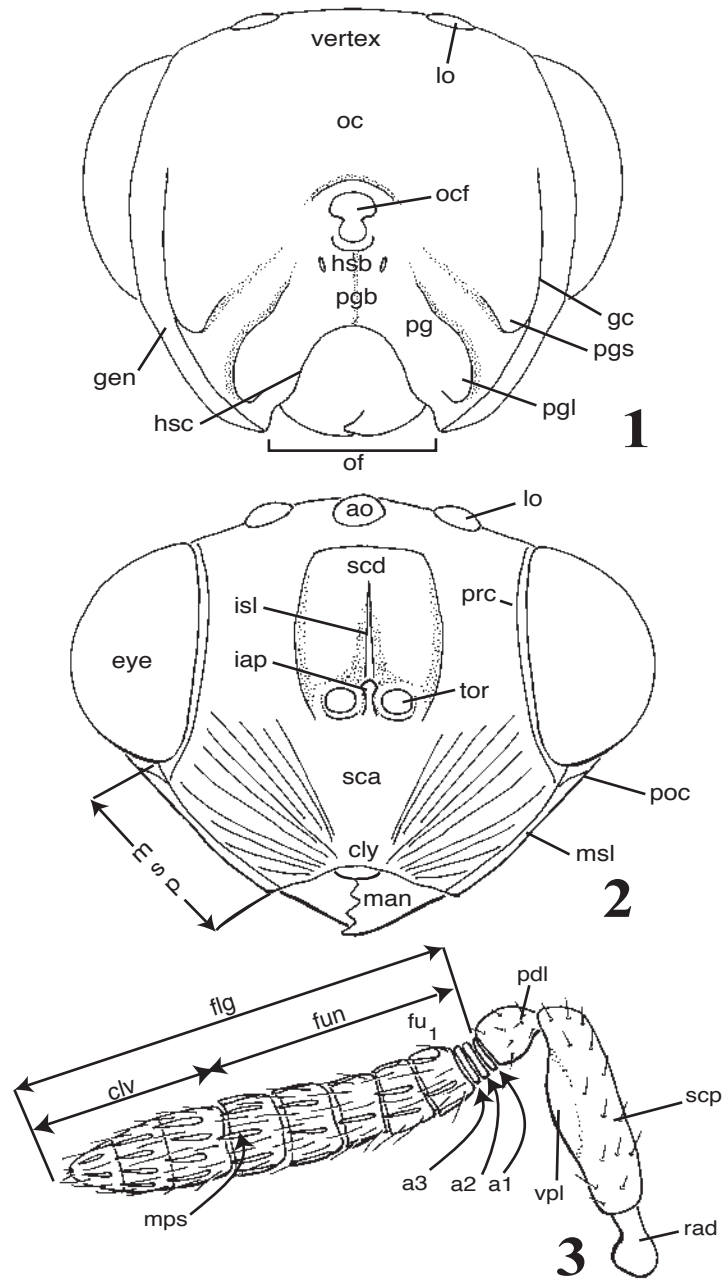
*Macrorileya* Ashmead 1904 (transferred to Eurytominae)

## INDEX

<i>abnormicornis</i> Ashmead, <i>Rileyia</i> .....	30, 36, 82, <b>92</b> , 109, 177, 196, 207
<i>albicornis</i> Kieffer & Jörgensen, <i>Rileyia</i> .....	<b>227</b>
<i>albipes</i> Girault, <i>Neorileyia</i> .....	50-52
<i>antennata</i> n. sp., <i>Rileyia</i> .....	24, 84, <b>94</b>
<i>antioquia</i> n. sp., <i>Rileyia</i> .....	87, <b>96</b> , 135
<i>ashmeadi</i> Crawford, <i>Neorileyia</i> .....	51-52, <b>55</b> , 57-59
<i>asiatica</i> Zerova, <i>Rileyia</i> .....	11, 81, 89, <b>98</b> , 101-102
<i>atopogaster</i> n. sp., <i>Rileyia</i> .....	16, 86, <b>156</b>
<i>auranti</i> n. sp., <i>Rileyia</i> .....	80, 83, <b>99</b> , 143
<i>Austrophotismus</i> Girault.....	3, 19, 20-21, 28, 35, 37-38, <b>40-43</b>
<i>bicolor</i> n. sp., <i>Rileyia</i> .....	31, 88-89, <b>101</b>
<i>bisulcata</i> n. sp., <i>Rileyia</i> .....	99, <b>103</b>
<i>bumeliae</i> n. sp., <i>Rileyia</i> .....	88, <b>105</b> , 211
<i>canalicoxa</i> Subba Rao, <i>Rileyia</i> .....	92, <b>107</b> , 194
<i>carinaegaster</i> Subba Rao, <i>Rileyia</i> .....	32, 80, 82, 92-93, <b>108</b> , 110, 177, 195-196
<i>cattleyae</i> n. sp., <i>Rileyia</i> .....	84, <b>111</b> , 133-134, 139, 165-166, 183-184
<i>cearae</i> n. sp., <i>Rileyia</i> .....	27, 76, 85, <b>114</b> , 170, 198
<i>cecidomyiae</i> Ashmead, <i>Rileyia</i> .....	5-6, 16, 76, 78, 89, 98, 101, 105 <b>116-121</b> , 129, 158, 175, 190, 217-218
<i>clarki</i> n. sp., <i>Rileyia</i> .....	32, 92, <b>122</b> , 175
<i>collaris</i> (Howard), <i>Rileyia</i> .....	<b>228</b>
<i>columbar</i> n. sp., <i>Rileyia</i> .....	91, <b>124</b> , 141
<i>cornuta</i> n. sp., <i>Neorileyia</i> .....	49, 51, <b>61</b>
<i>couridae</i> (Cameron), <i>Rileyia</i> .....	77, 89, <b>126</b>
<i>cururipe</i> Burks, <i>Platyrileyia</i> .....	31, 73, <b>74</b>
<i>cyanea</i> Schrottky, <i>Neorileyia</i> .....	<b>227</b>
<i>cylindripetiolata</i> n. sp., <i>Rileyia</i> .....	32, 36, 78, 91, 124, <b>127</b>
<i>daicles</i> (Walker), <i>Austrophotismus</i> .....	<b>40-42</b>
<i>desantisi</i> Subba Rao, <i>Rileyia</i> .....	<b>229</b>
<i>Dougiola</i> Bouček.....	3, 4, 31, 34-35, 37-38, <b>43</b> , 45, 47
<i>fallax</i> (Bouček), <i>Austrophotismus</i> .....	37-38, 40-41, <b>42</b>
<i>flavipes</i> Ashmead, <i>Neorileyia</i> .....	48, 52, 55, 57-59, 61, <b>63-67</b> , 70
<i>gallicola</i> Kieffer & Jörgensen, <i>Rileyia</i> .....	<b>227</b>
<i>gastros</i> n. sp., <i>Rileyia</i> .....	83, <b>129</b>

<i>gigas</i> Subba Rao, <i>Rileyia</i> .....	32, 85, <b>131</b>
<i>glabra</i> n. sp., <i>Rileyia</i> .....	21, 31, 36-37, 84, 111, <b>133</b> , 187-188
<i>gracilis</i> n. sp., <i>Rileyia</i> .....	77, 91, <b>135</b> , 181
<i>grisselli</i> n. sp., <i>Rileyia</i> .....	32, 82, <b>137</b>
<i>guatemalae</i> n. sp., <i>Rileyia</i> .....	37, 84, 111, 133, <b>139</b> , 165-166, 200
<i>hansoni</i> n. sp., <i>Rileyia</i> .....	32, 36, 91, <b>141</b>
<i>haumani</i> (Brèthes), <i>Rileyia</i> .....	77-78, 81, 86, 100 <b>143</b> , 215
<i>hegeli</i> Girault, <i>Rileyia</i> .....	77, 82, 85, 88, 94, 114, 126, <b>145</b> , 148, 170, 173, 213
<i>heratyi</i> n. sp., <i>Rileyia</i> .....	42, 47, 105, <b>185</b> , 204, 235
<i>heterogaster</i> Gahan, <i>Rileyia</i> .....	92, 148, <b>152</b> , 187, 209
<i>infuscata</i> n. sp., <i>Rileyia</i> .....	80, 87, <b>155</b>
<i>insularis</i> (Ashmead), <i>Rileyia</i> .....	89, 98, 101, 105, 116-117, 119, 129, <b>158</b> , 190, 17-218
<i>koebelei</i> (Ashmead), <i>Dougiola</i> .....	31, 43, <b>45</b>
<i>laeliae</i> n. sp., <i>Rileyia</i> .....	84, 111, 133, 139, <b>165</b> , 183, 229
<i>longitergum</i> n. sp., <i>Rileyia</i> .....	31, 36, 92, 150, <b>167</b>
<i>lynetteae</i> n. sp., <i>Neorileyia</i> .....	37, 48-49, 51, <b>67</b> , 71
<i>Matna</i> Bouček.....	38, 40, 42
<i>megastigma</i> , <i>Rileyia</i> .....	20, 27, 85, 114, 145, <b>170</b> , 198, 213
<i>mellea</i> Girault, <i>Rileyia</i> .....	88, 145, 170, <b>173</b>
<i>meridionalis</i> Gahan, <i>Neorileyia</i> .....	51-54, 55, 56, 65, <b>69</b>
<i>mimica</i> n. sp., <i>Rileyia</i> .....	91, <b>175</b>
<i>minuta</i> n. sp., <i>Rileyia</i> .....	82, 92-93, 109, <b>177</b> , 196, 207
<i>Neorileyia</i> Ashmead.....	3, 5, 19, 20-21, 35, 37, <b>48</b> , 52-70
<i>nigra</i> (Gomes), <i>Rileyia</i> .....	<b>229</b>
<i>obscura</i> n. sp., <i>Rileyia</i> .....	91, <b>179</b>
<i>oculiseta</i> n. sp., <i>Rileyia</i> .....	21, 88, <b>180</b>
<i>oncidii</i> n. sp., <i>Rileyia</i> .....	37, 84, 111-112, 133-134, 166, <b>182</b> , 187, 200
<i>orbitalis</i> Ashmead, <i>Rileyia</i> .....	14, 30, 92, 152, 160-161, <b>184</b> , 209
<i>orchideara</i> n. sp., <i>Rileyia</i> .....	28, 31, 36-37, 79, 84, 111, 133, 139, <b>187</b> , 200, 229
<i>pallidipes</i> Ashmead, <i>Rileyia</i> .....	82, 88, 126, <b>189</b>
<i>panamae</i> n. sp., <i>Rileyia</i> .....	91, 107, <b>193</b>
<i>paraplesius</i> n. sp., <i>Rileyia</i> .....	90, 124, <b>195</b>
<i>petiolata</i> n. sp., <i>Rileyia</i> .....	77, 85, 114, <b>198</b>

<i>philodendrica</i> n. sp., <i>Rileyia</i> .....	86, <b>199</b>
<i>piercei</i> Crawford, <i>Rileyia</i> .....	77, 90, <b>202</b>
<i>Platyrileyia</i> Burks.....	3, 5, 15, 22, 24-25, 27, 31, 35-38, <b>73</b> , 74, 75, 78
<i>protuberonota</i> n. sp., <i>Rileyia</i> .....	30, 36, 82, 92, 109, 177, 196, <b>207</b>
<i>pulchra</i> (Ashmead), <i>Rileyia</i> .....	92, 148, 152-153, 185, <b>208</b> , 228
<i>quadraticaulis</i> n. sp., <i>Rileyia</i> .....	32, 36, 91, 107, 194, <b>211</b>
<i>rhytisma</i> n. sp., <i>Rileyia</i> .....	78, 87, <b>213</b>
<i>Rileyia</i> Ashmead.....	3, 5-6, 11, 13, 14-17, 20-22, 24, 25, 27, 28, 30-32, 35-38, 74, <b>76-81</b> , 92-227 (species descriptions)
<i>robusta</i> n. sp., <i>Rileyia</i> .....	88, <b>215</b>
<i>scabra</i> n. sp., <i>Rileyia</i> .....	88, <b>217</b>
<i>spadix</i> (Girault), <i>Rileyia</i> .....	77, 81, 86, <b>218</b>
<i>tricolor</i> n. sp., <i>Rileyia</i> .....	31, 78, 86, 98, 135, 181, <b>224</b>
<i>violetae</i> n. sp., <i>Rileyia</i> .....	78, 87, <b>223</b>
<i>warneri</i> n. sp., <i>Rileyia</i> .....	31, 78, 87, 96, 195-196, <b>224</b>
<i>yanegai</i> n. sp., <i>Dougiola</i> .....	45, <b>47</b>



Figures 1-3. Composite chalcidoid: 1, posterior head; 2, anterior head; 3, antenna



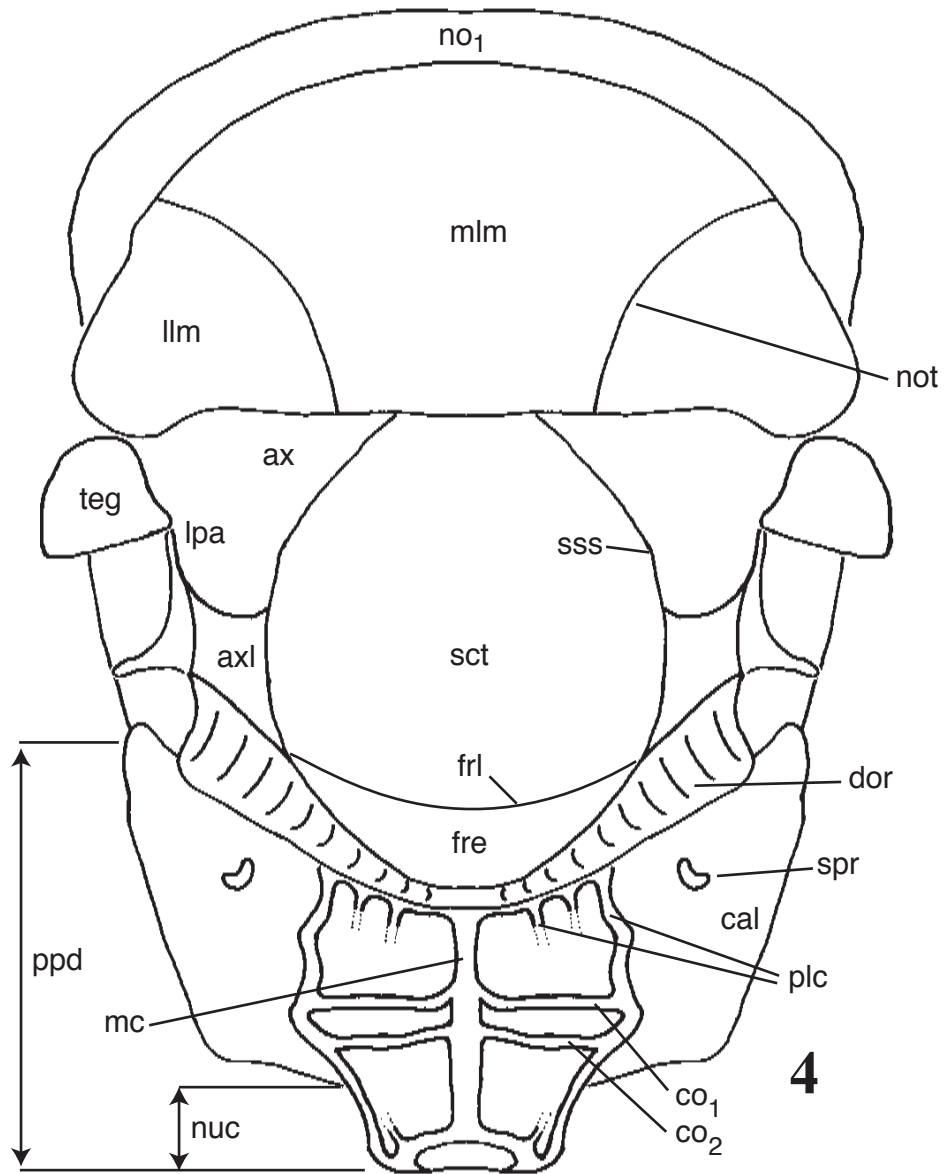
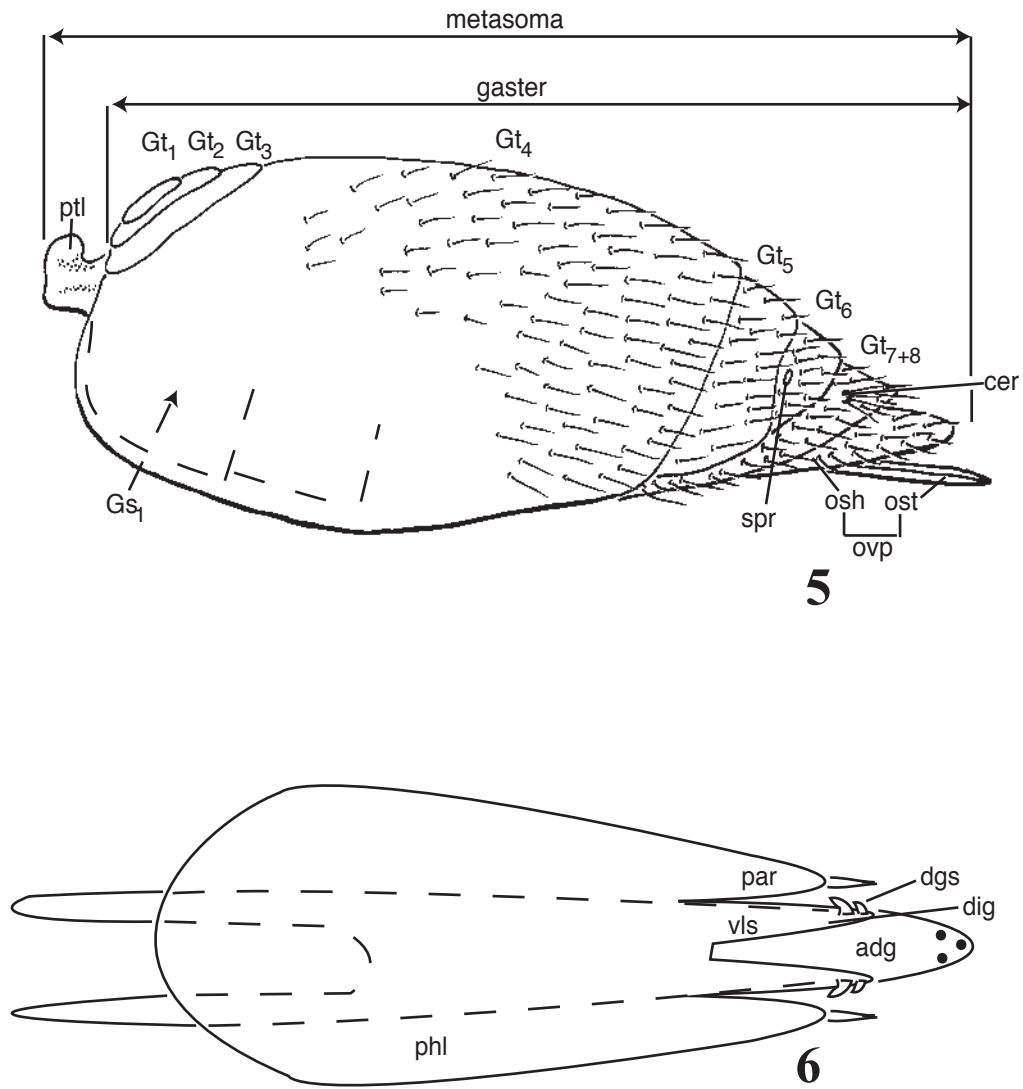
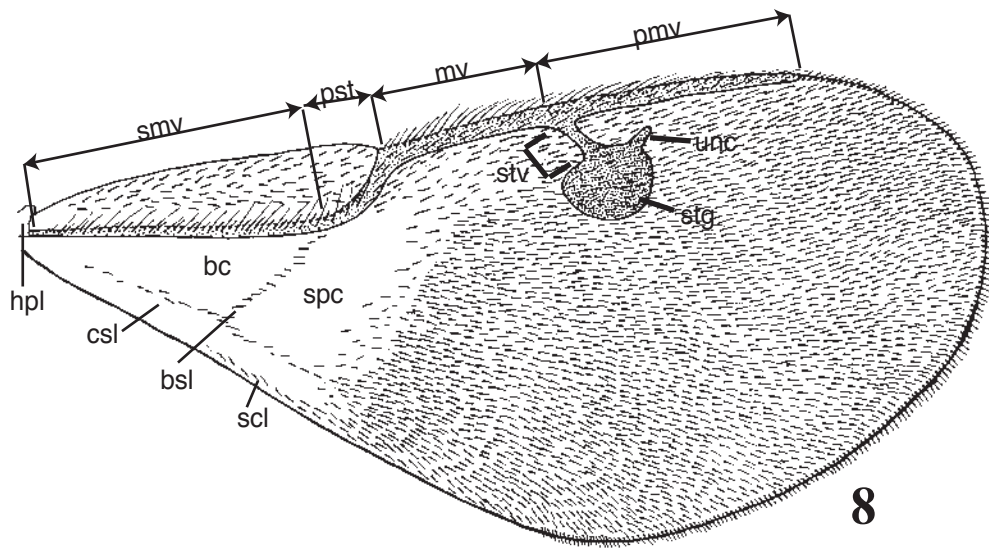
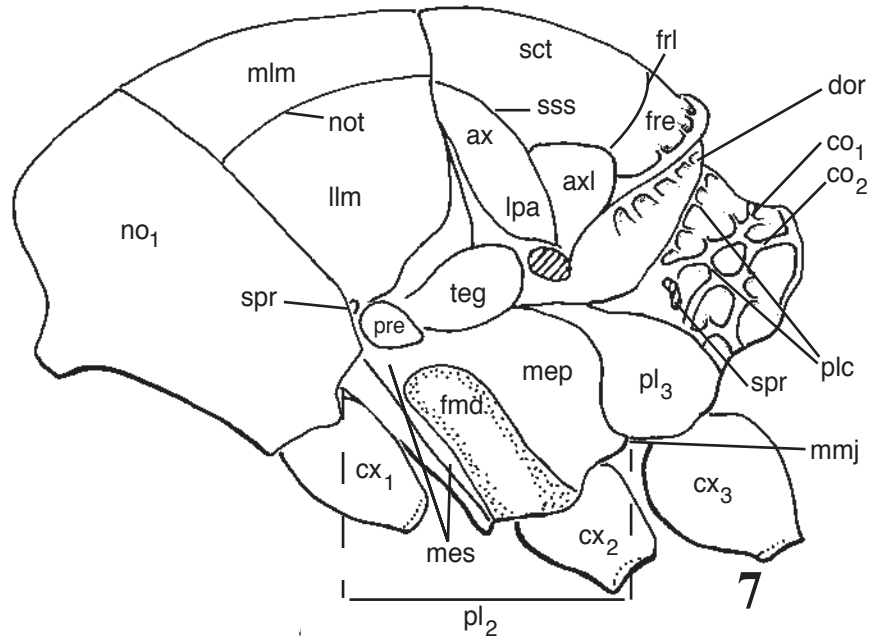


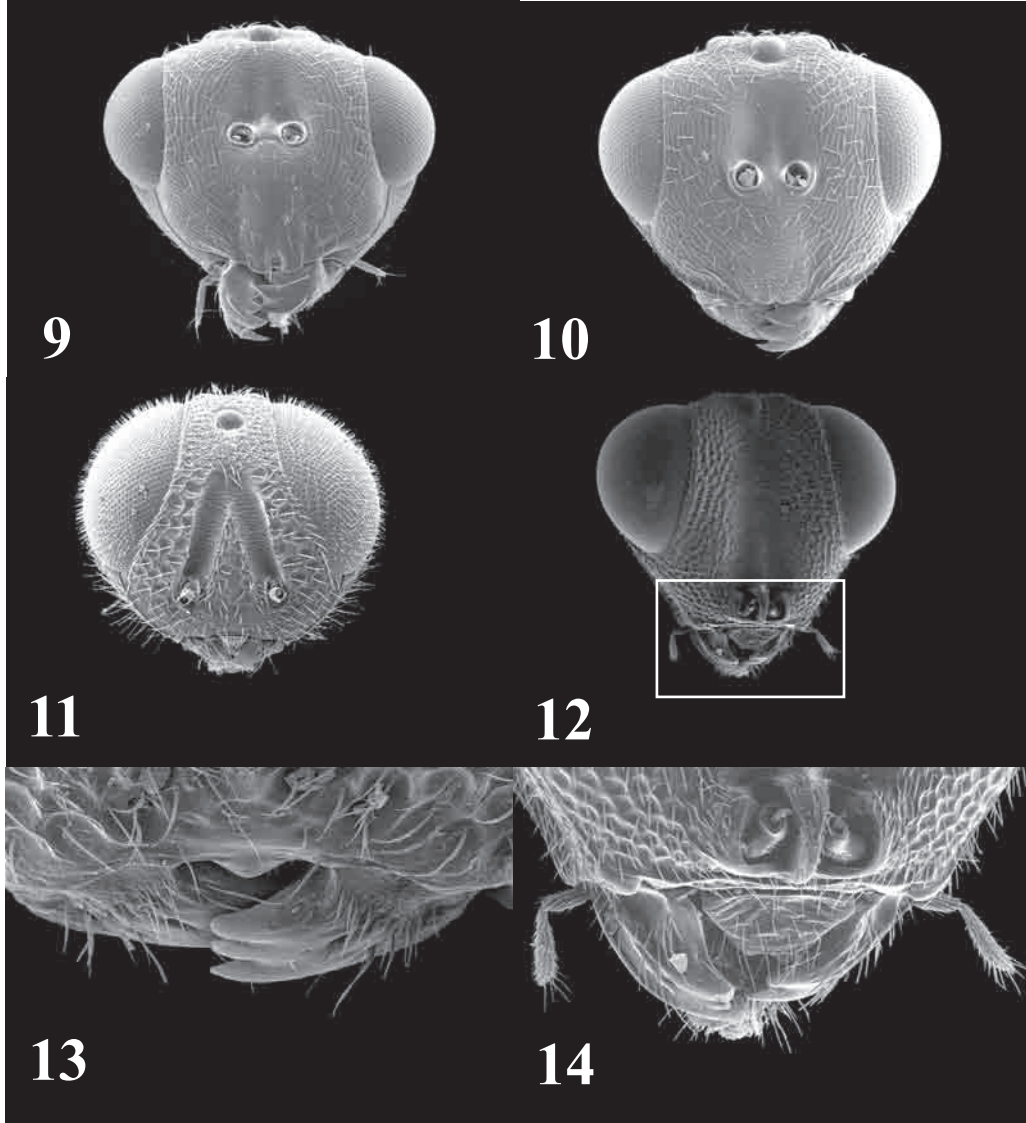
Figure 4. Composite chalcidoid mesosoma (dorsal).



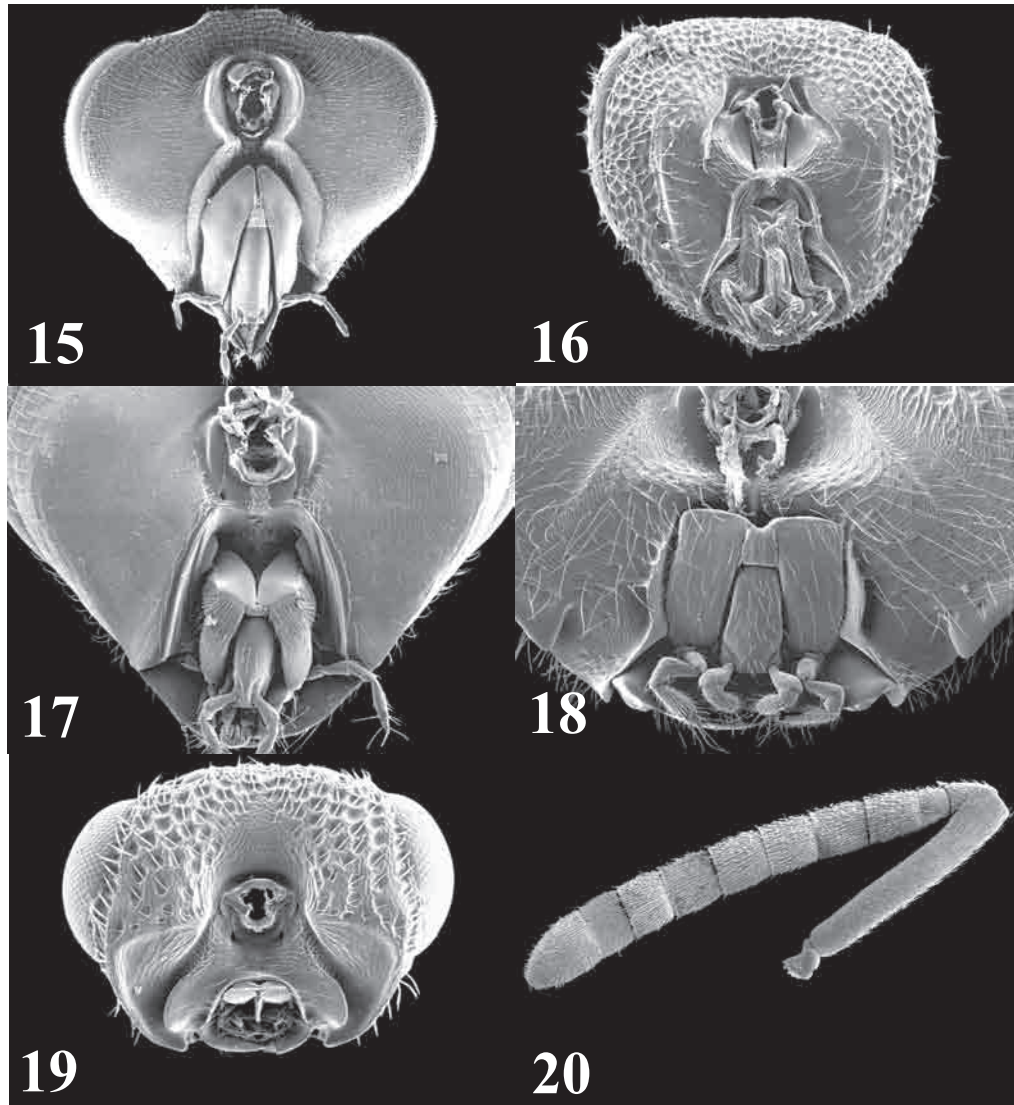
Figures 5–6. Composite chalcidoid: 5, lateral gaster; 6, male genitalia.



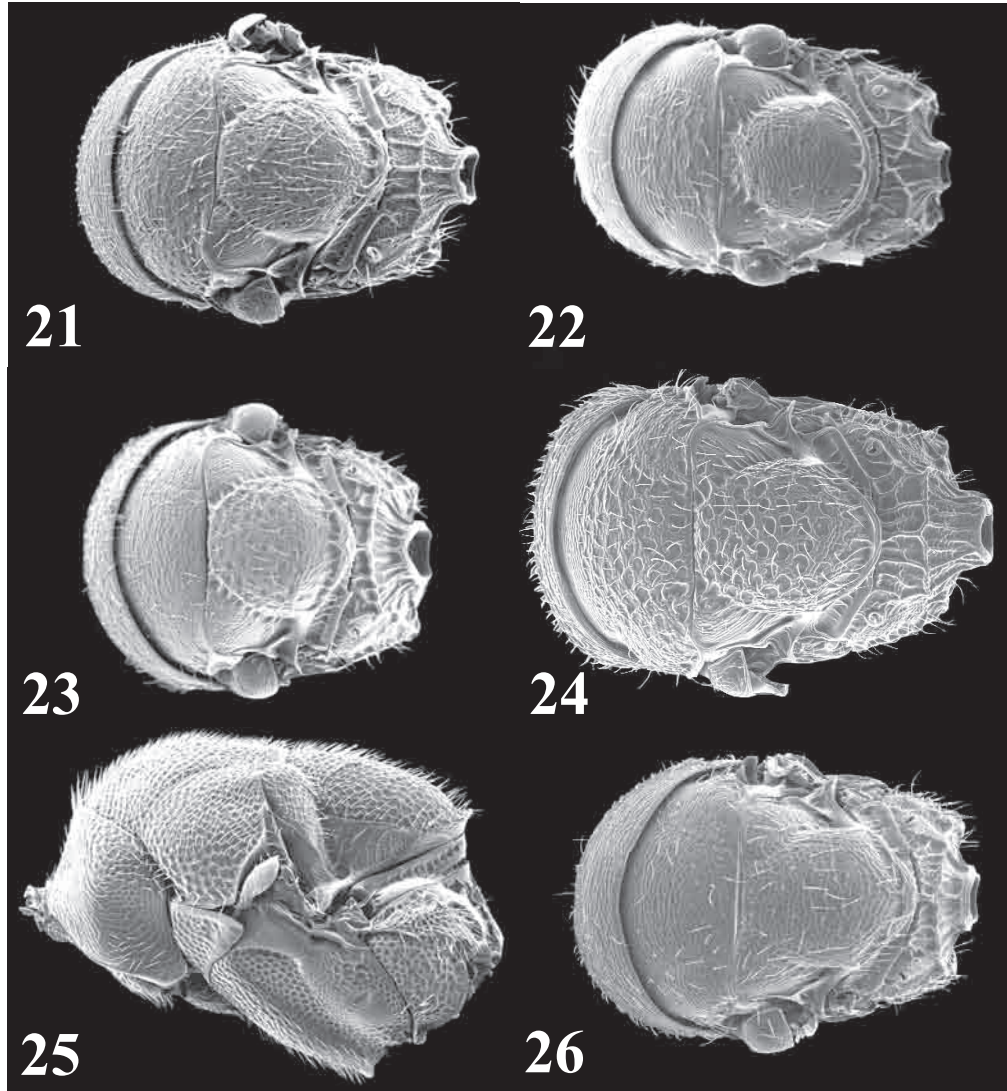
Figures 7–8. Composite chalcidoid: 7, lateral mesosoma; 8, forewing.



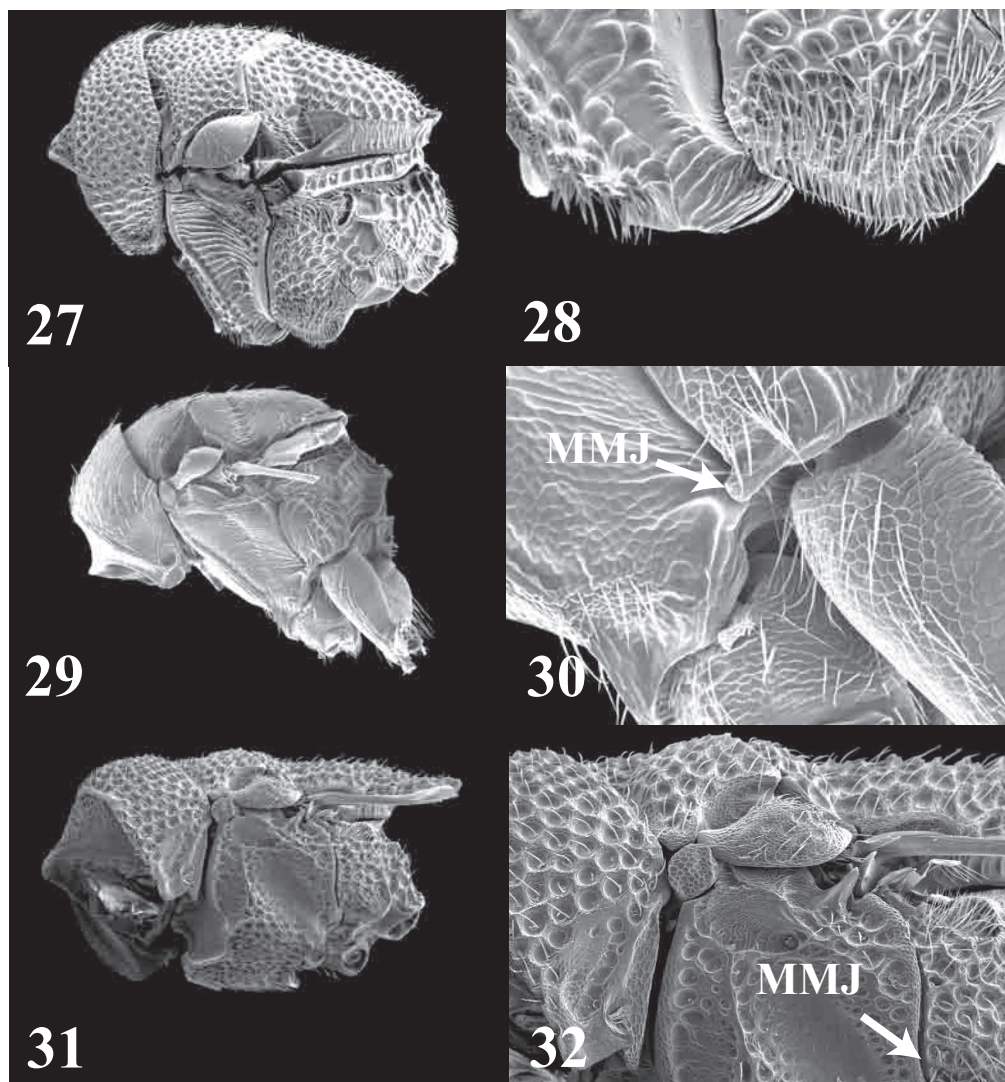
Figures 9-14. *Rileyya megastigma*, male: 9, face. *R. heterogaster*, female: 10, face. *Amotura hyalinipennis*, male: 11, face. *Hockeria* sp., female: 12, face; 14, clypeus. *Heimbra bicolor*, female: 13, clypeus. **Note:** in all SEM plates, structures delimited by a white box are enlarged in the image immediately beneath the image with the box.



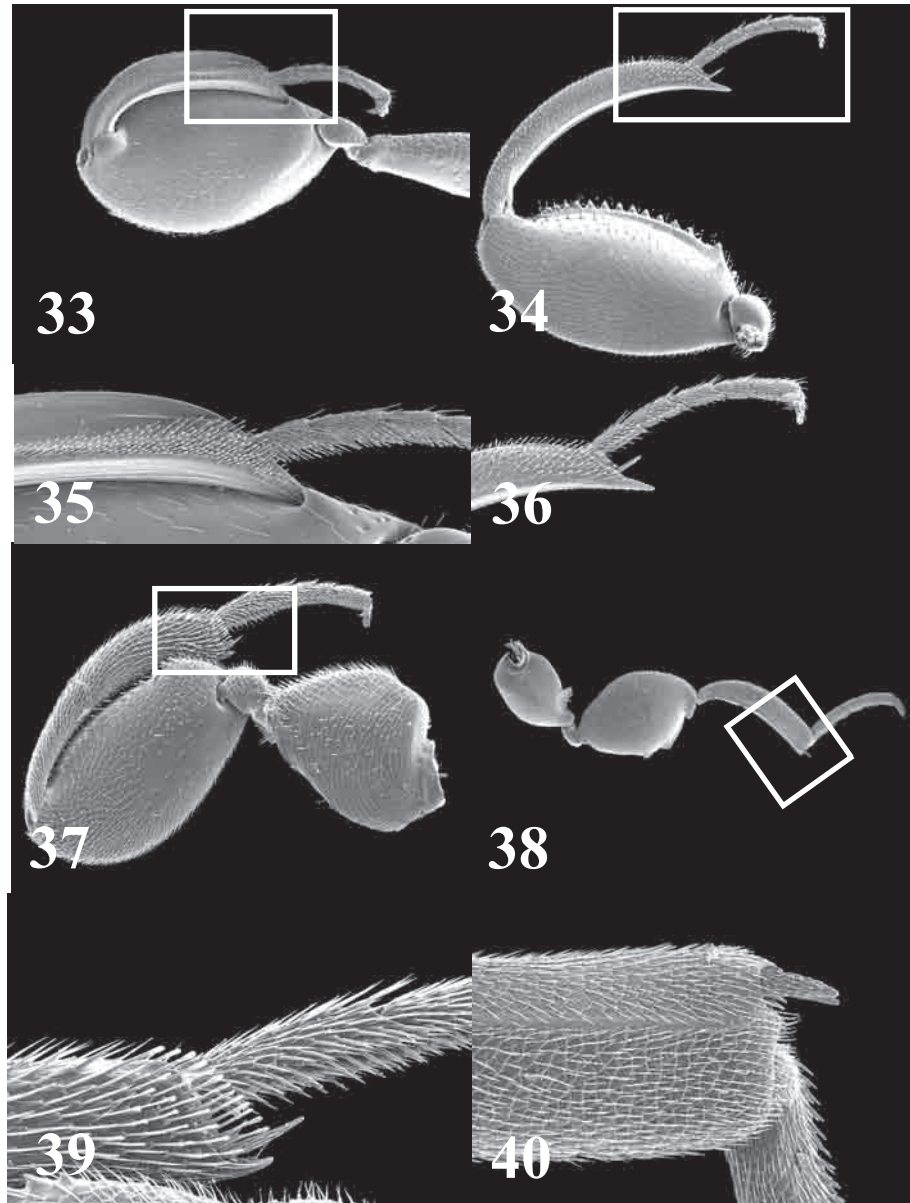
Figures 15-20. *Leucospis birkmani*, female: 15, posterior head. *Epistenia* sp., female: 16, posterior head. *Conura* sp., male: 17, posterior head; 20, antenna. *Acanthochalcis nigricans*, female: 18, posterior head. *Aximopsis* sp., female: 19, posterior head.



Figures 21-26. *Rileyia megastigma*, female: 21, dorsal mesosoma. *R. insularis*, female: 22, dorsal mesosoma. *R. heterogaster*, female: 23, dorsal mesosoma. *R. rhytisma*, female: 24, dorsal mesosoma. *Amotura caelata*, male: 25, lateral mesosoma. *R. piercei*, male: 26, dorsal mesosoma.

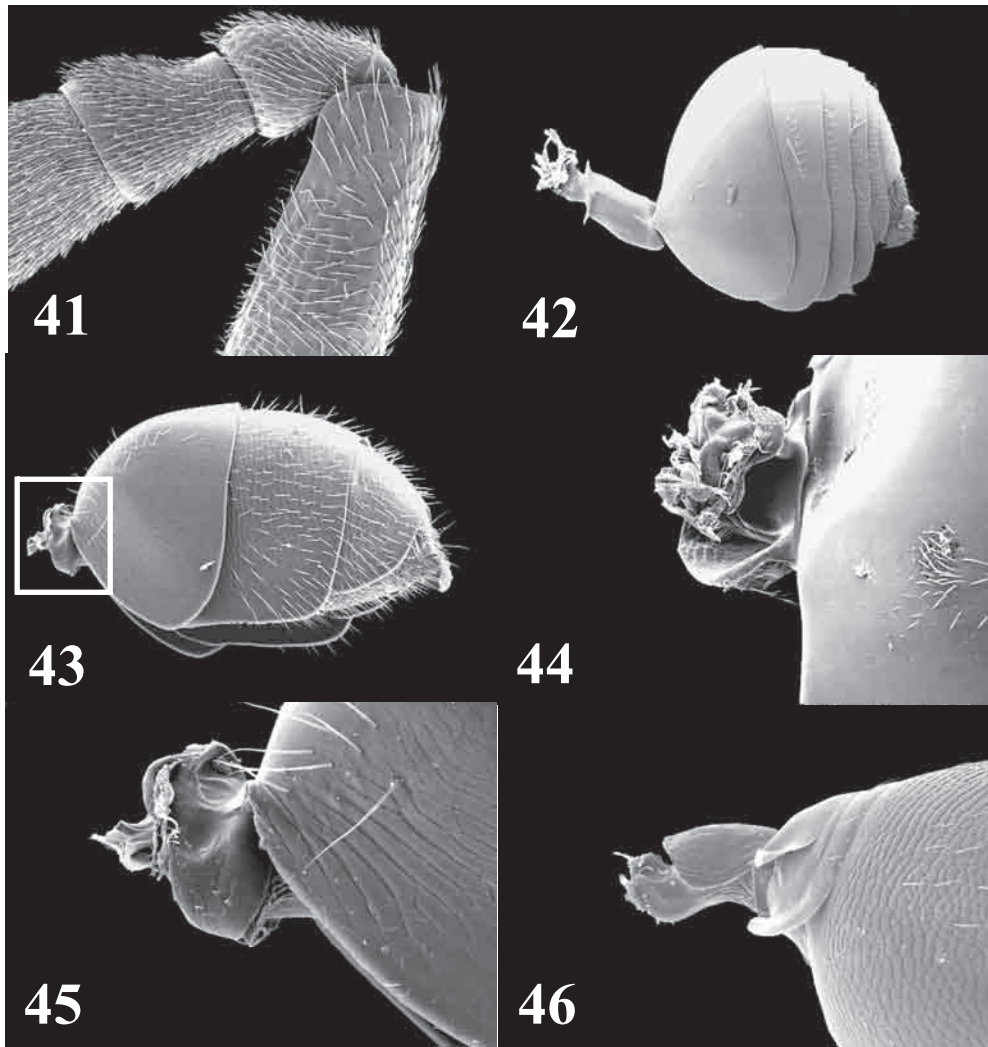


Figures 27-32. *Hockeria* sp., female: 27, lateral mesosoma; 28, mesepimeral-metapleural junction. *Rileyya insularis*, female: 29, lateral mesosoma; 30, mesepimeral-metapleural junction. *Heimbra bicolor*, female: 31, lateral mesosoma; 32, lateral mesosoma, close-up.

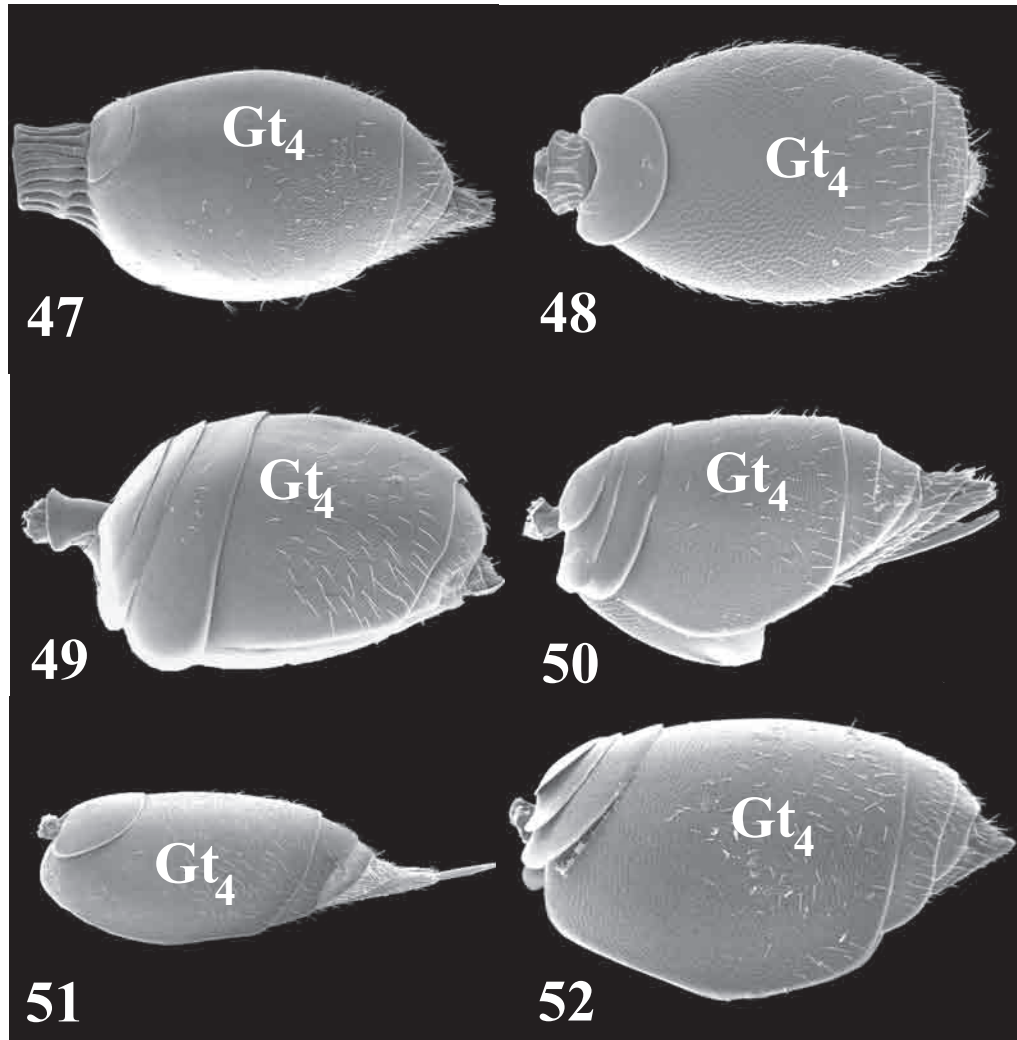


Figures 33-40. *Acanthochalcis nigricans*, male: 33, hind leg; 35, apex hind tibia. *Conura* sp., male: 34, hind tibia; 36, apex hind tibia. *Amotura hyalinipennis*, male: 37, hind leg; 39, apex hind tibia. *Hockeria* sp., female: 38, hind leg. 40, apex hind tibia.

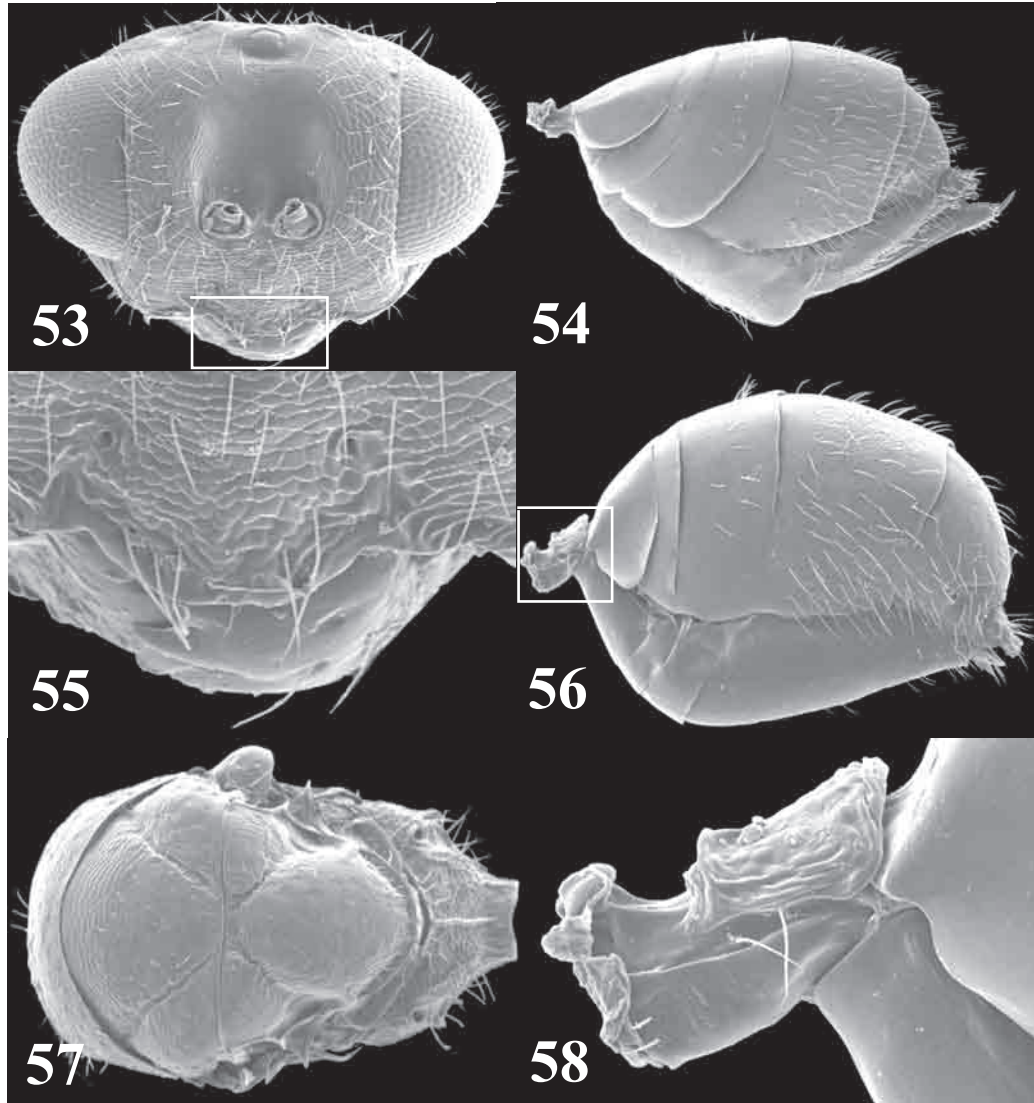




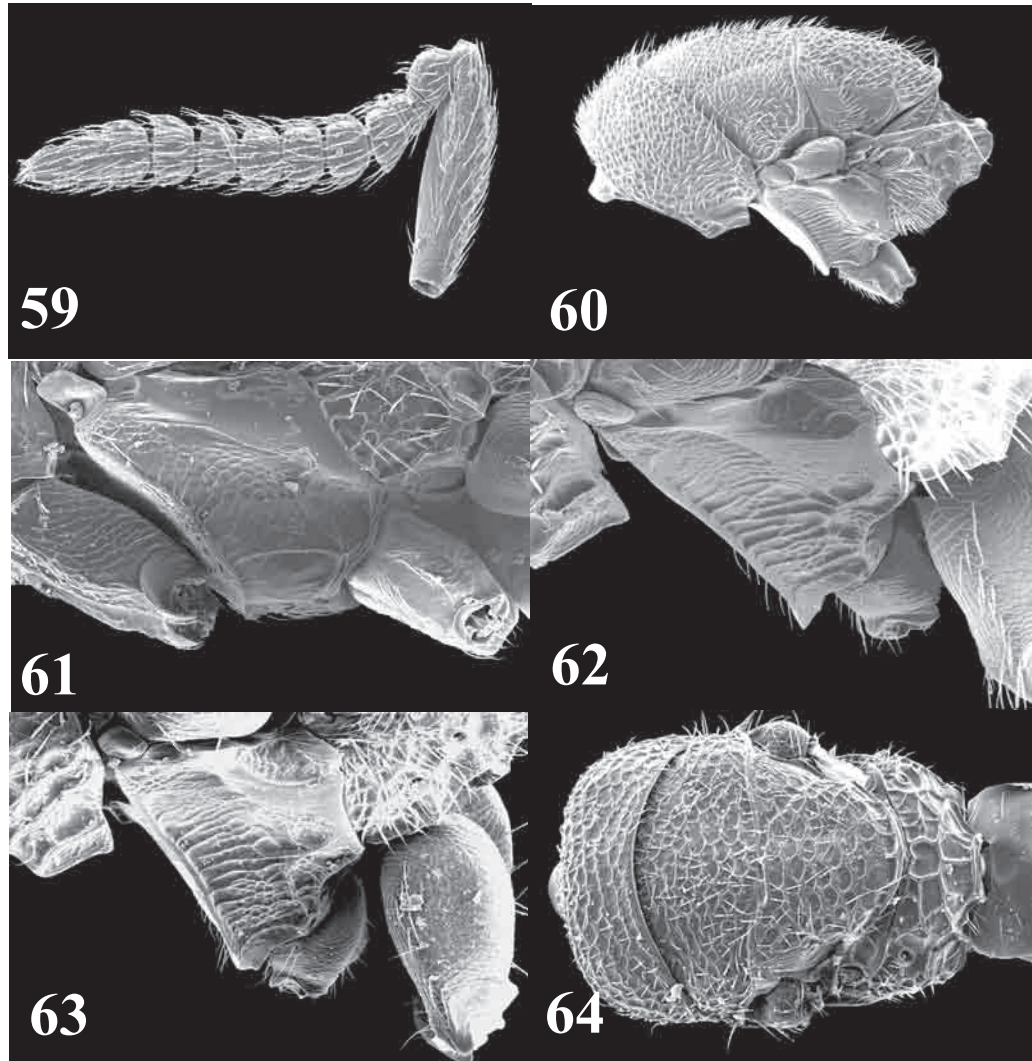
Figures 41-46. *Leucospis birkmani*, female: 41, apical scape. *Conura* sp. male: 42, petiole. *Amotura caelata*, male: 43, lateral gaster; 45, petiole. *Hockeria* sp., female: 44, petiole. *Rileyia hegeli*, male: 46, petiole. Note: Structures delimited by a white box are enlarged in the image immediately beneath the image with the box.



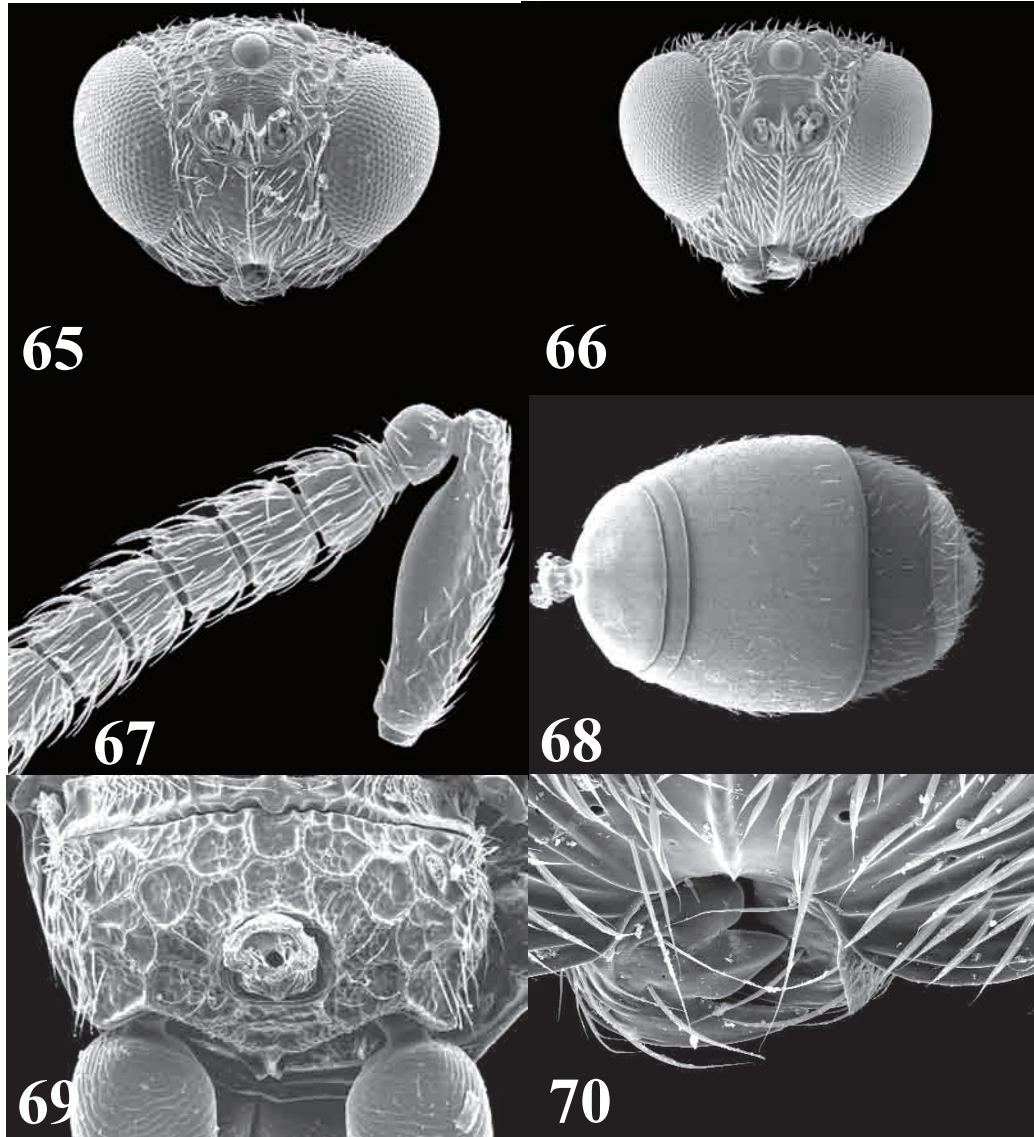
Figures 47-52. *Rileyia hansonii*, female: 47, lateral gaster. *R. piercei*, male: 48, dorsal gaster. *R. bicolor*, male: 49, lateral gaster; female: 50, lateral gaster. *R. piercei*, female: 51, lateral gaster. *R. cecidomyiae*, female: 52, lateral gaster.



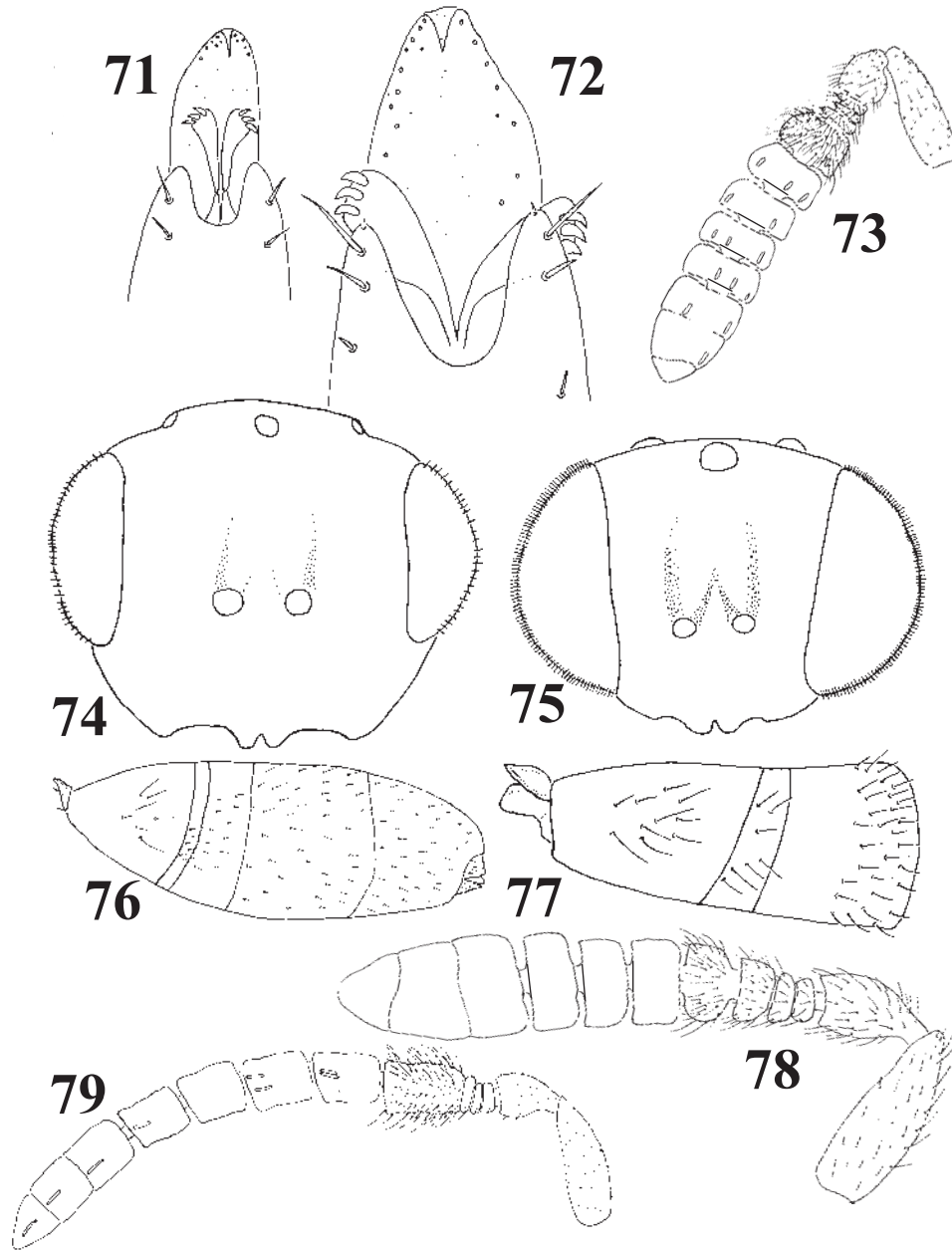
Figures 53-58. *Rileyya orchideara*, n. sp., female: 53, face; 54, lateral gaster; 55, clypeus; 57, dorsal mesosoma; male: 56, lateral gaster; 58, lateral petiole.



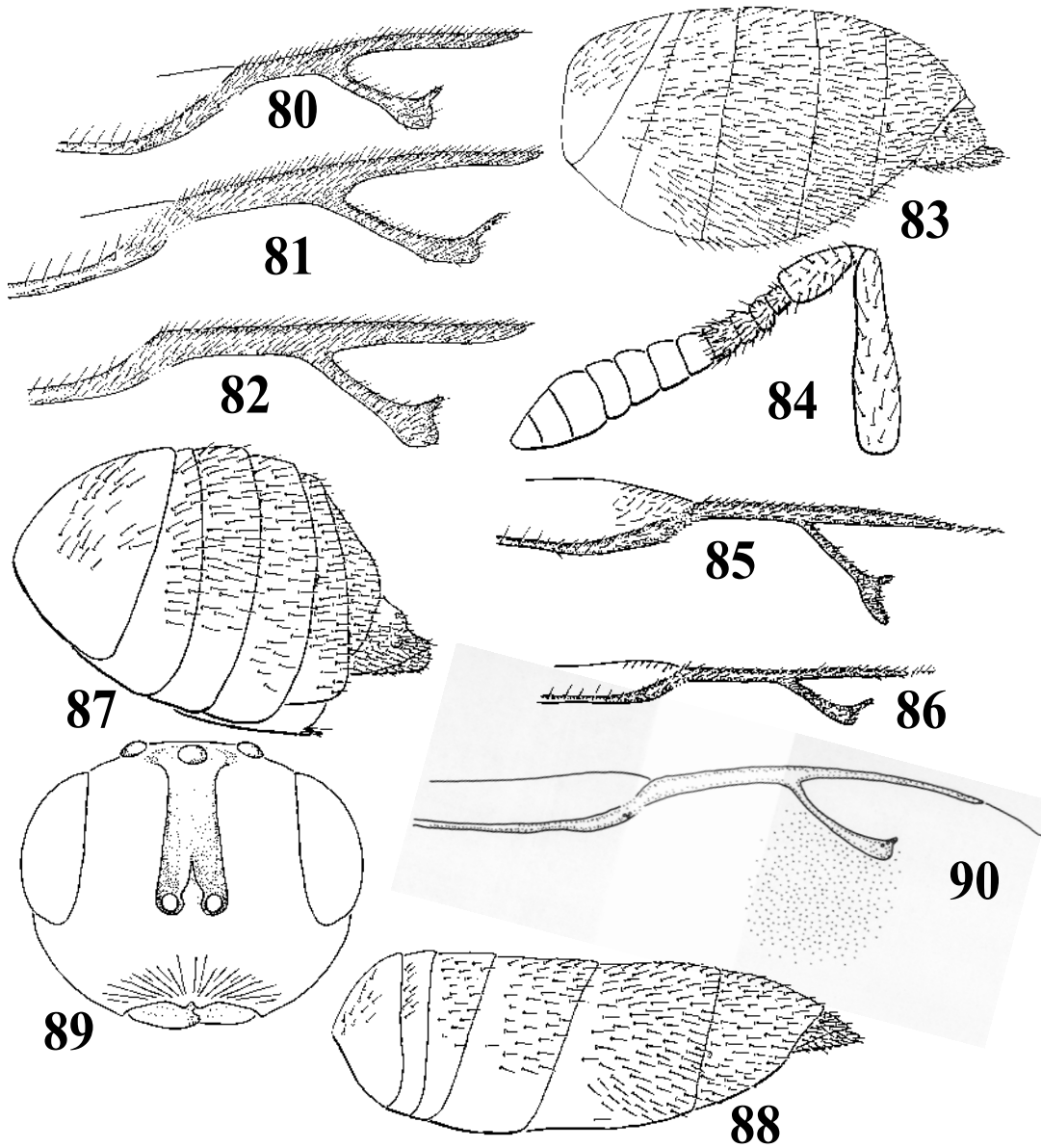
Figures 59-64. *Neorileyia flavipes*, female: 59, antenna; 60, lateral mesosoma. *N. lynnetae*, n. sp., female: 61, lateral mesosoma; 64, dorsal mesosoma and first gastral tergum. *N. ashmeadi*, female: 62, lateral mesosoma. *N. meridionalis*, female: 63, lateral mesosoma.



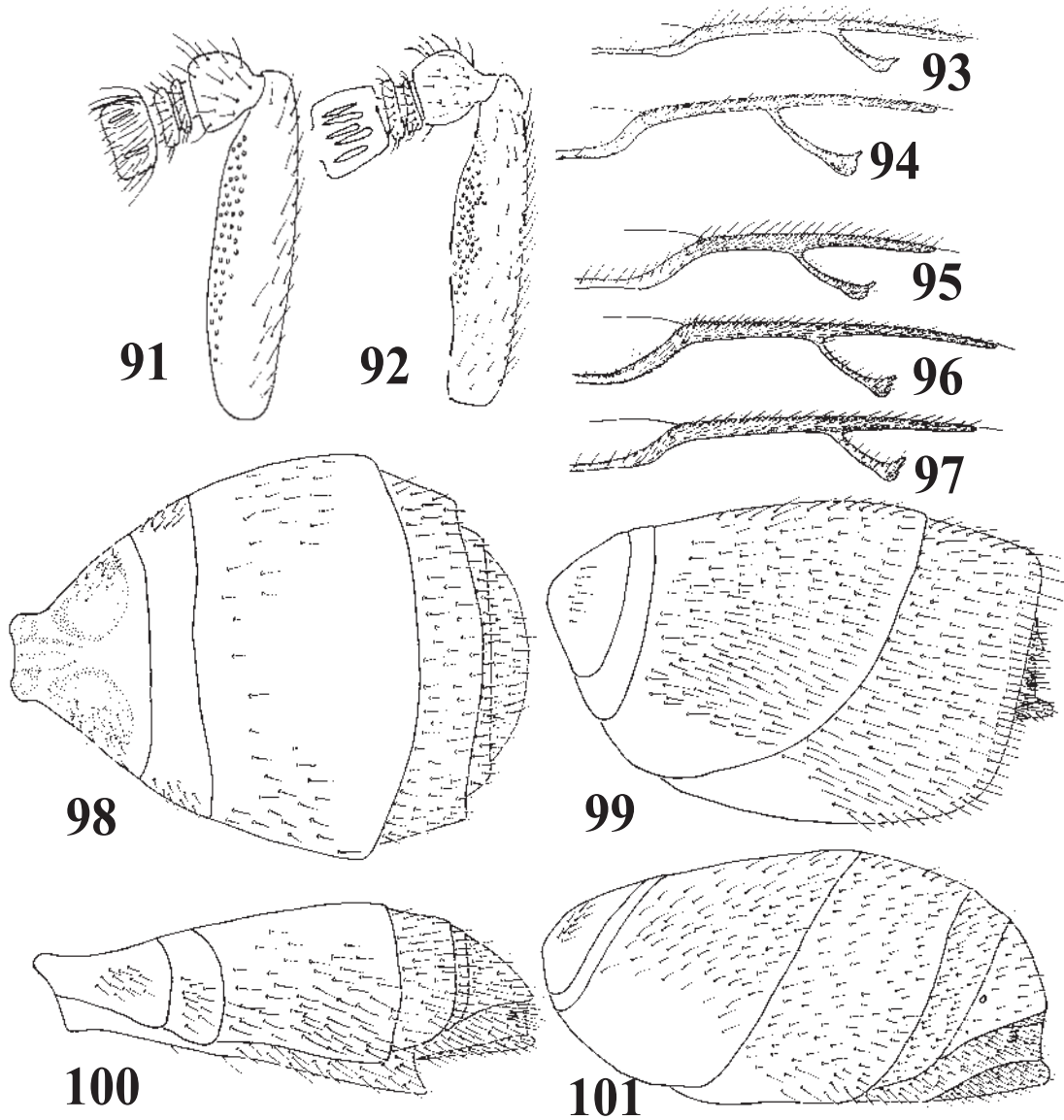
Figures 65-70. *Neorileya meridionalis*, female: 65, face; 69, posterior propodeum; 70, clypeus. *N. flavipes*, female: 66, face; 68, dorsal gaster; male: 67, antenna.



Figures 71-79. *Austrophotismus fallax*, male: 71, genitalia; 74, face; 76, lateral gaster; 79, antenna. *A. daicles*, male: 72, genitalia; 73, antenna; female: 75, face; 77, anterior lateral gaster; 78, antenna.

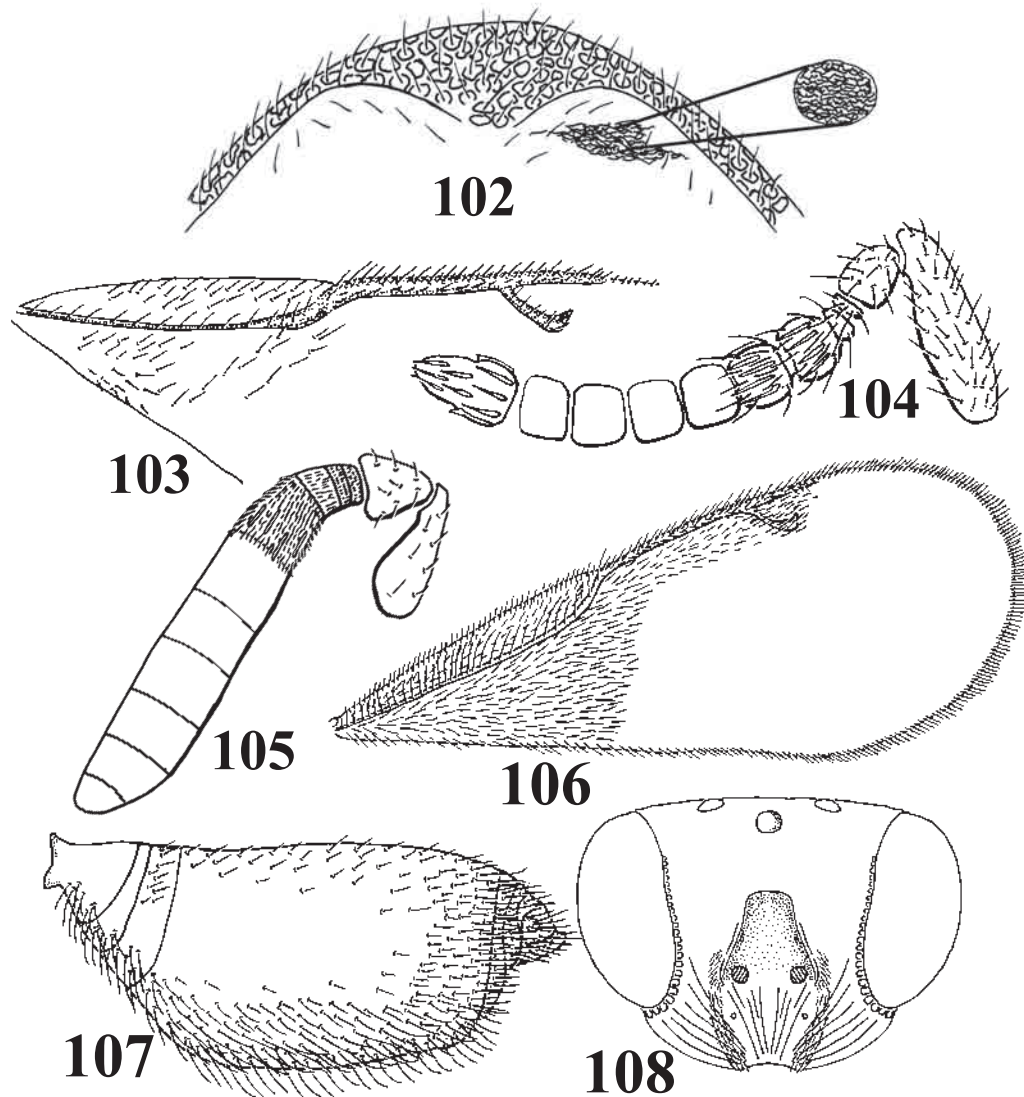


Figures 80-90. *Austrophotismus daicles*, male: 80, fore wing venation; female: 82, fore wing venation; 83, female lateral gaster. *A. fallax*, male: 81, fore wing venation. *Dougiola koebelei*, female: 84, antenna; 85, fore wing venation; 87, lateral gaster; 89, face. *Dougiola yanegai*, female: 86, fore wing venation; 88, lateral gaster. *Neorileya albipes*, female: 90, fore wing venation.

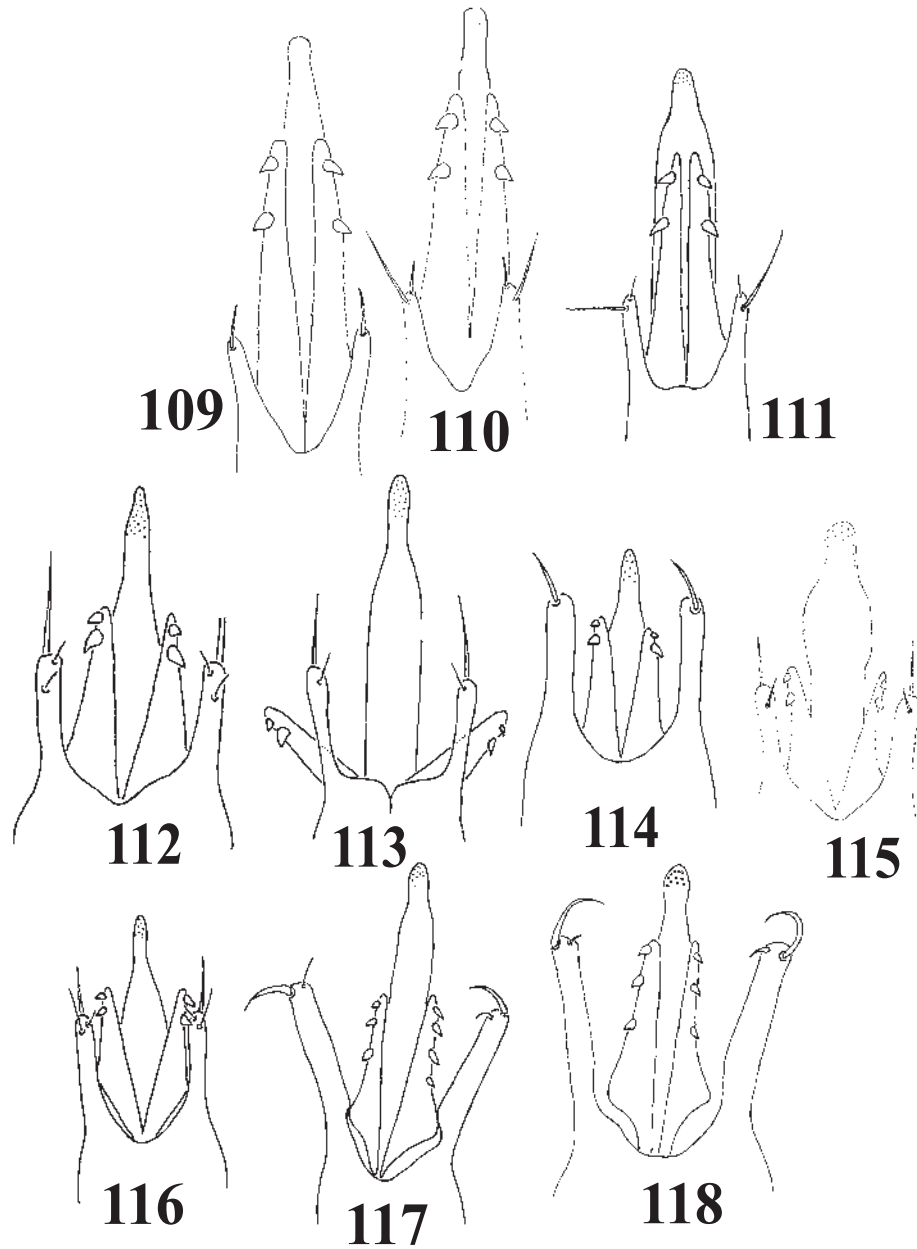


Figures 91-101. *Neorileya flavipes*, male: 91, scape; 94, fore wing venation; female: 96, fore wing venation; 101, lateral gaster. *Neorileya meridionalis*, female: 95, fore wing venation; 98, 100, dorsal and lateral gaster. *Neorileya ashmeadi*, male: 92, scape; female: 97, fore wing venation; 99, lateral gaster. *Neorileya lynetteae*, male: 93, fore wing venation.

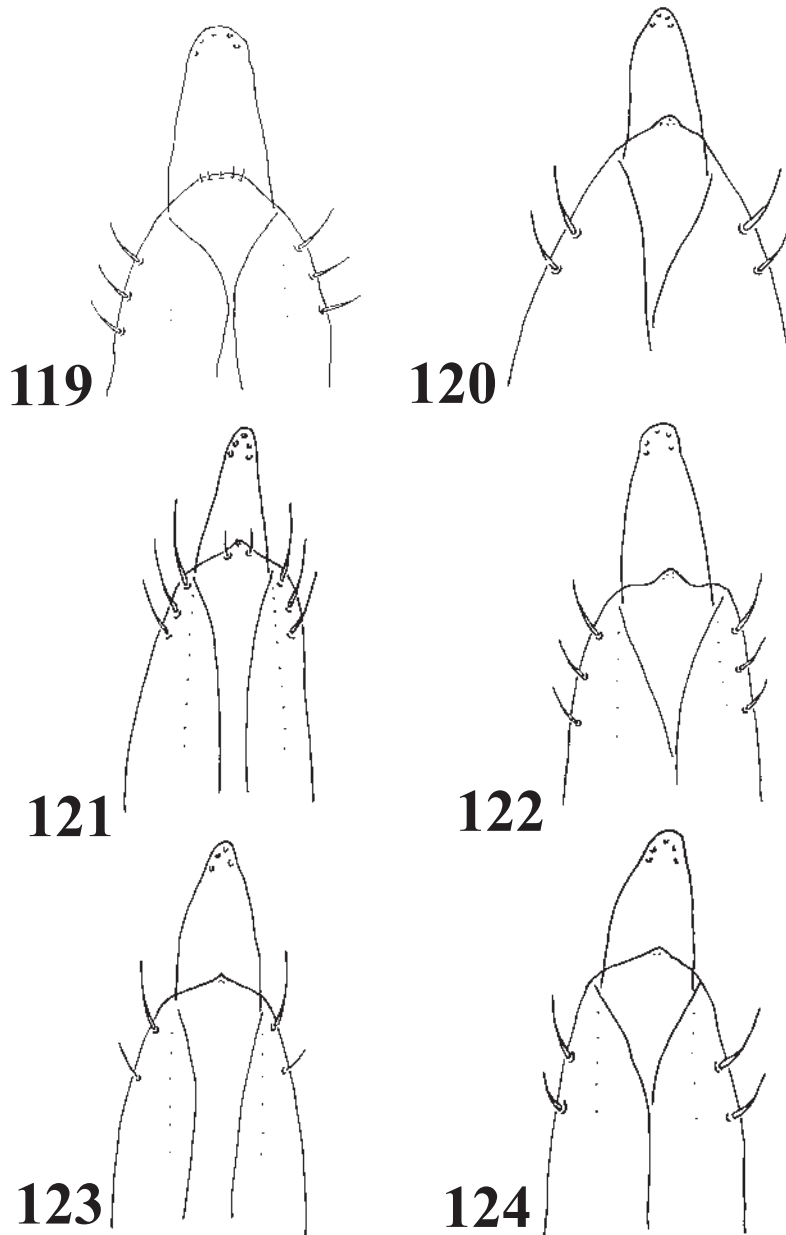




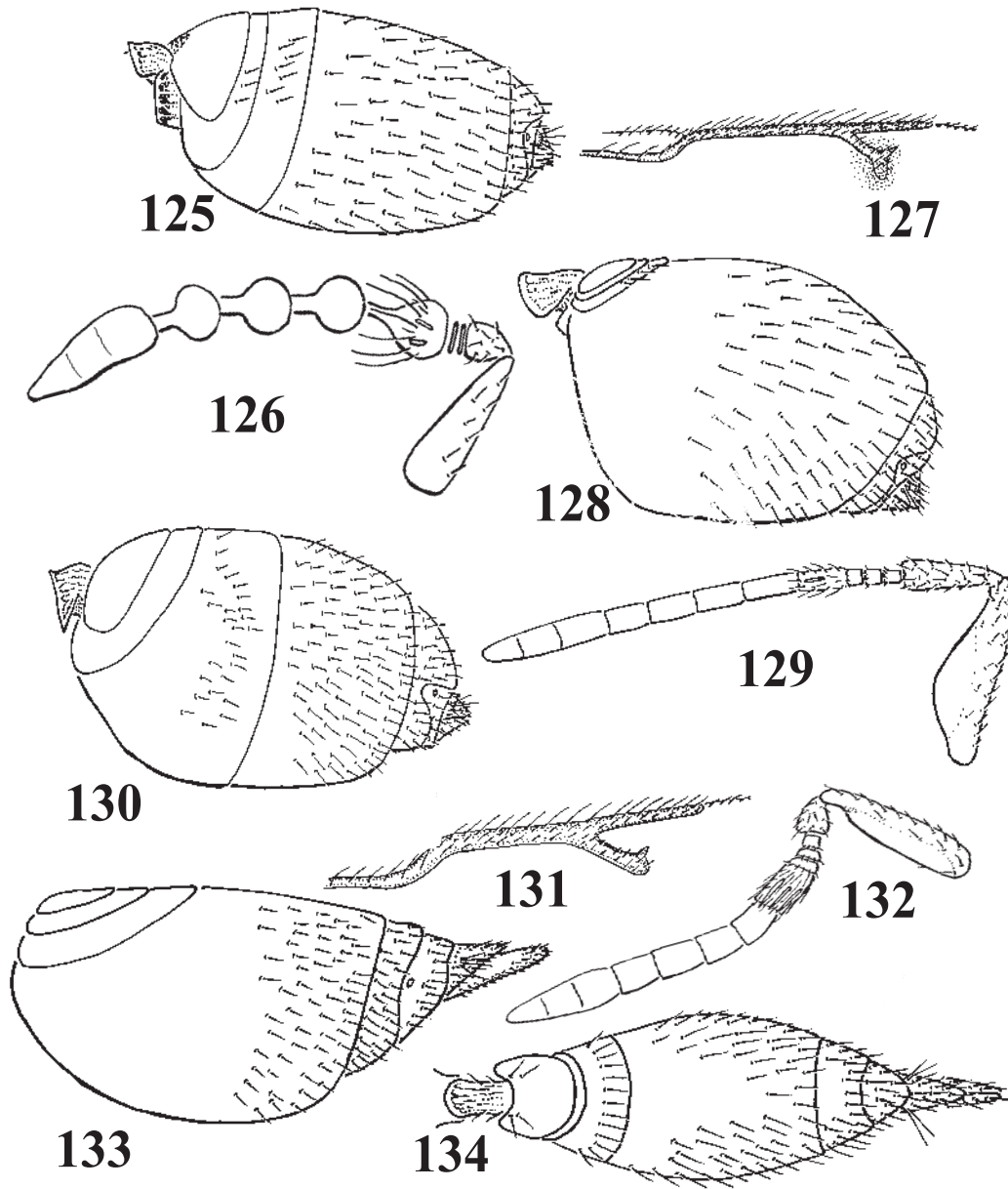
Figures 102-108. *Neorileyia cornuta*, female: 102, anterior view pronotum; 103, fore wing venation; 104, antenna. *Platyrileyia cururipe*, female: 105, antenna; 106, fore wing; 107, lateral gaster; 108, face.



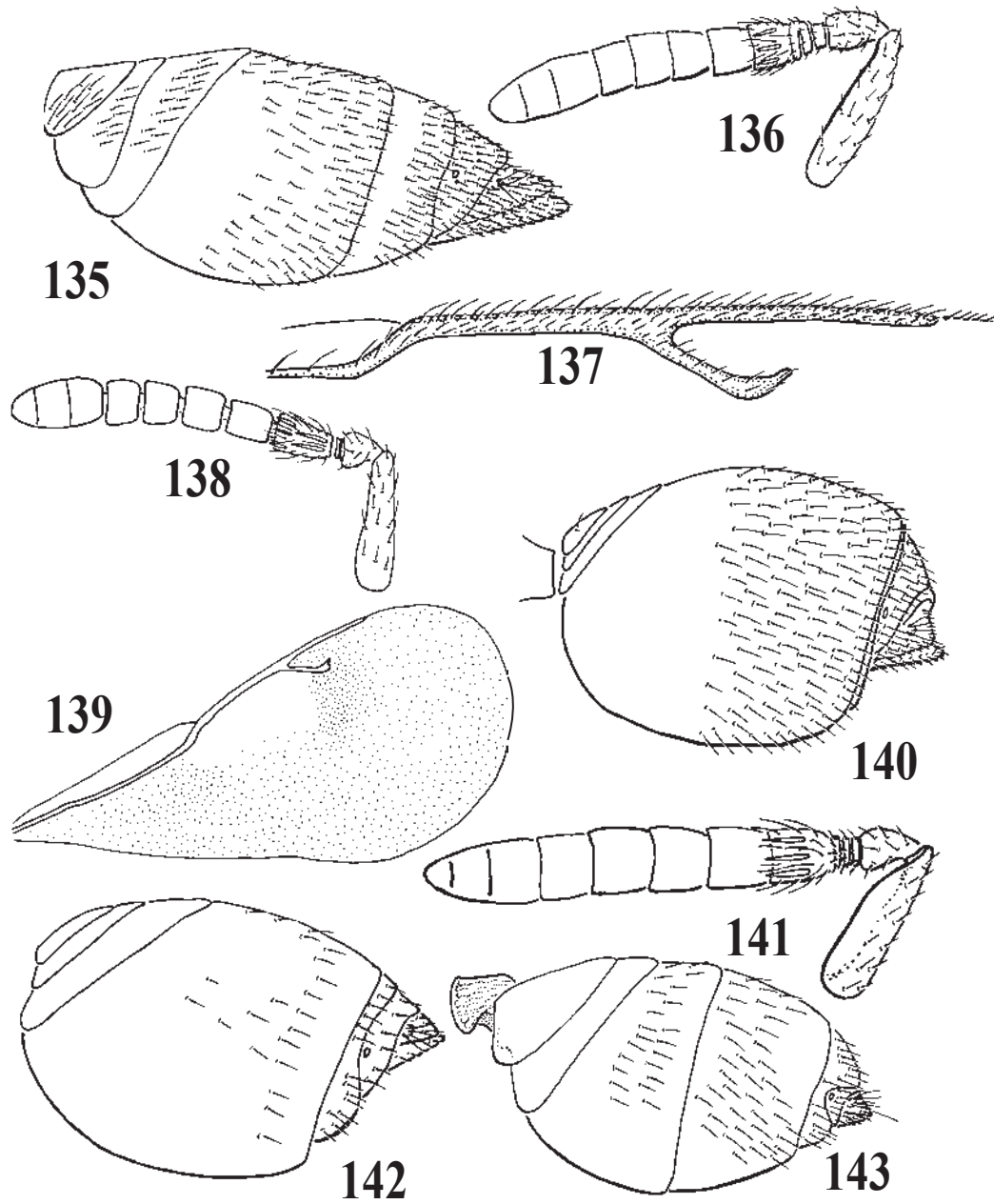
Figures 109-118. Male genitalia: *Neorileya lynetteae*: 109-110.  
*Neorileya meridionalis*: 111. *Neorileya flavipes*: 112-116.  
*Neorileya ashmeadi*: 117-118.



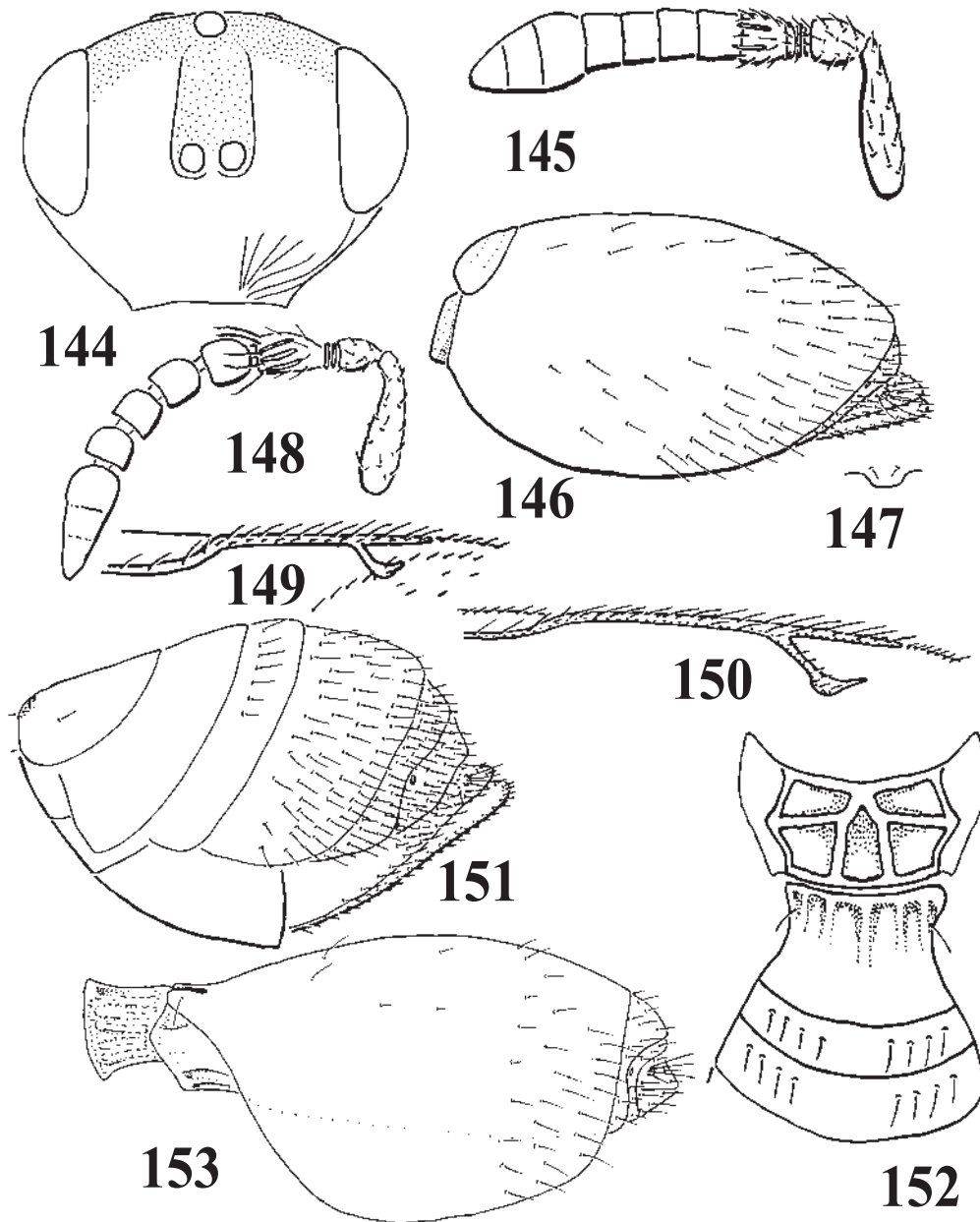
Figures 119-1124. Male genitalia: *Rileya cecidomyiae*: 119-120. *R. insularis*: 121-122. *R. hegei*: 123. *R. pallidipes*: 124.



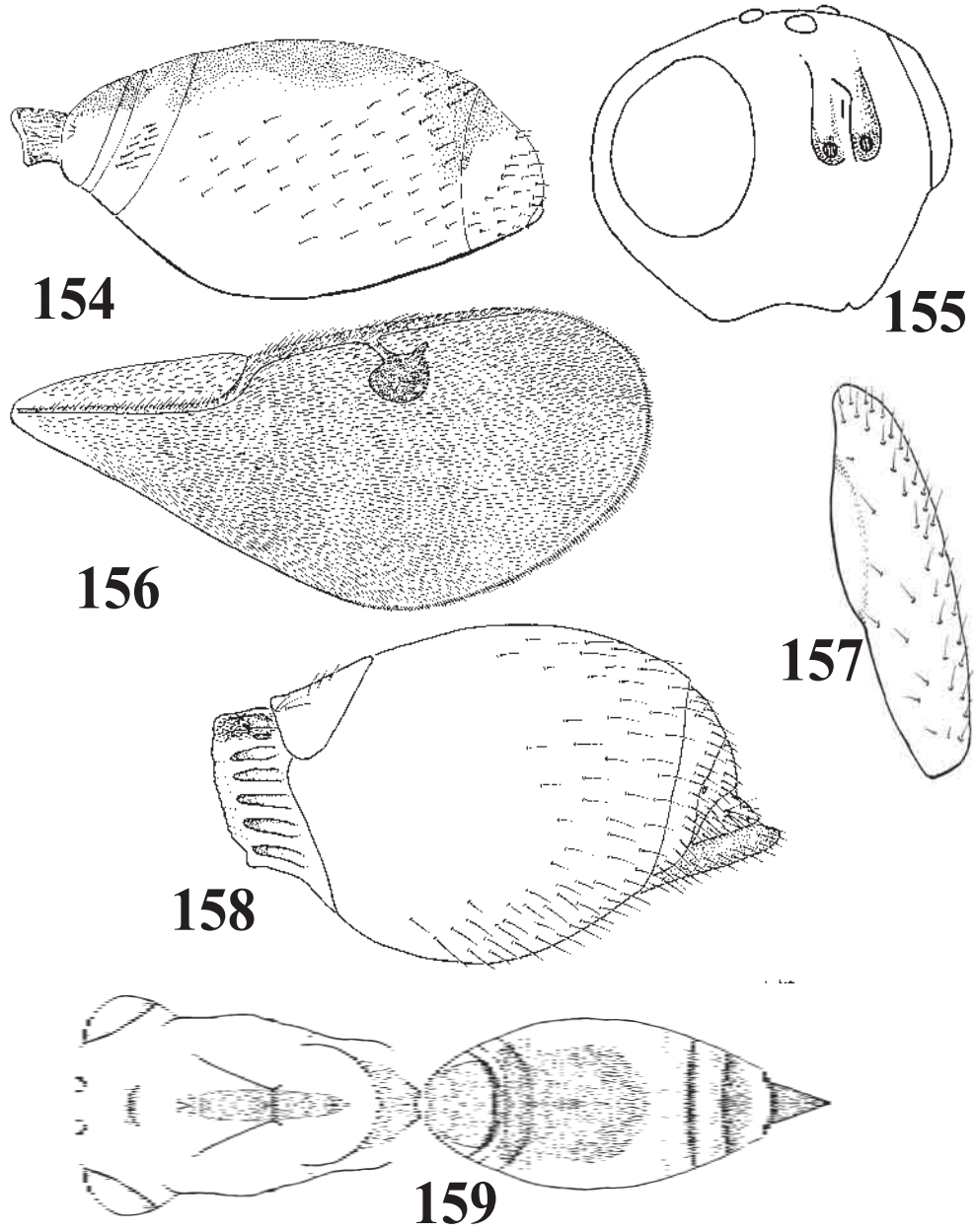
Figures 125-134. *Rileyia abnormicornis*, male: 125, lateral gaster; 126, antenna. *R. antennata*, male: 127, fore wing venation; 128, lateral gaster; 129, antenna. *R. asiatica*, male: 130, lateral gaster; 131, fore wing venation; female: 132, antenna; 133, lateral gaster. *R. antioquia*, female: 134, dorsal gaster.



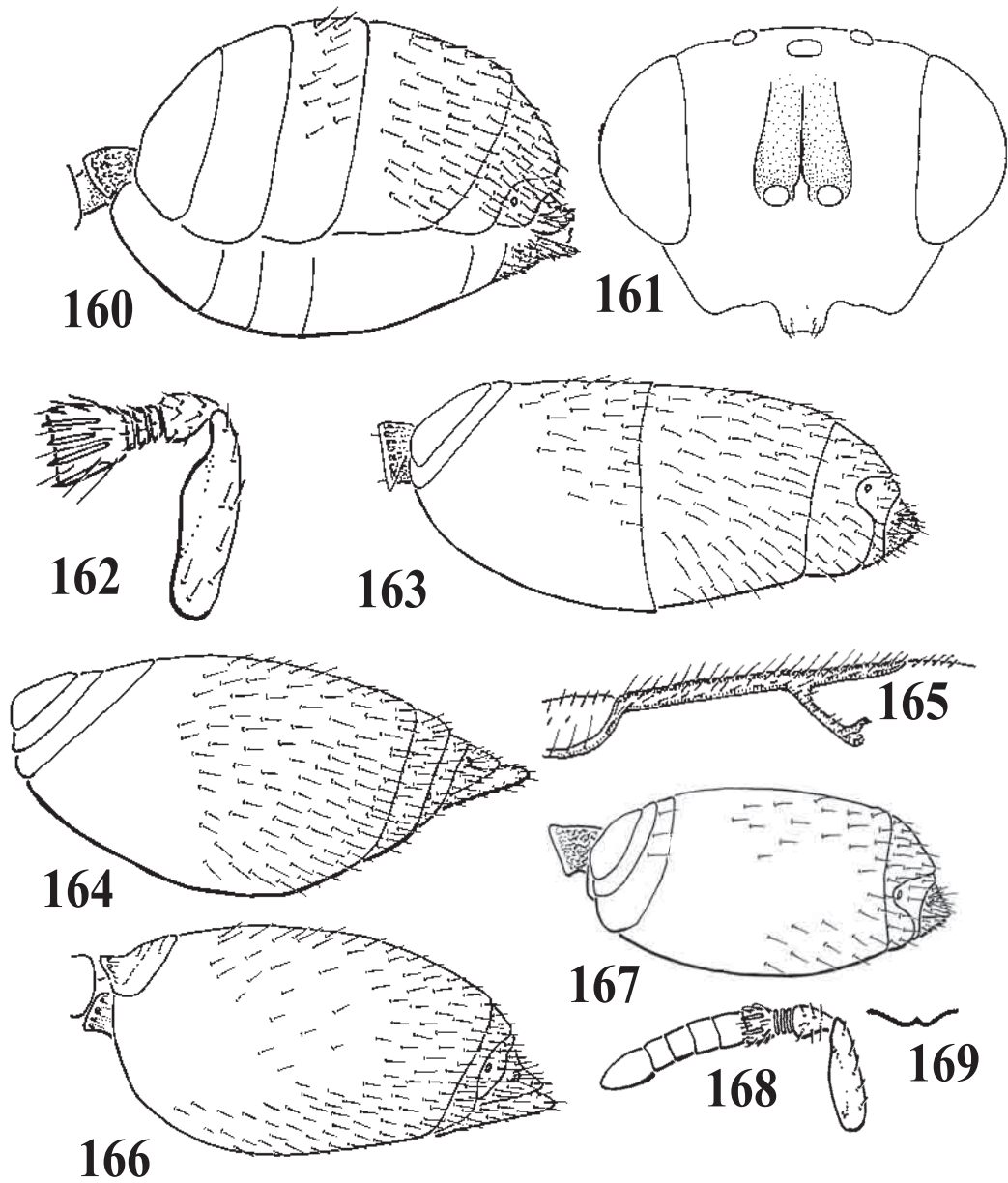
Figures 135-143. *Rileyia auranti*, female: 135, lateral gaster; 138, antenna; 139, fore wing. *R. haumani*, female: 136, antenna; 137, fore wing venation; 140, lateral gaster. *R. bumeliae*, male: 141, antenna; 142, lateral gaster; female: 143, lateral gaster.



Figures 144-153. *Rileya bumeliae*, female: 144, face. *R. canalicoxa*, female: 145, antenna; 146, lateral gaster; 147, clypeus. *R. carinaegaster*, female: 148, antenna; 152, propodeum and anterior gaster; 149, fore wing venation. *R. cattleyae*, female: 150, fore wing venation; 151, lateral gaster. *R. bisulcata*, male: 153, lateral gaster.

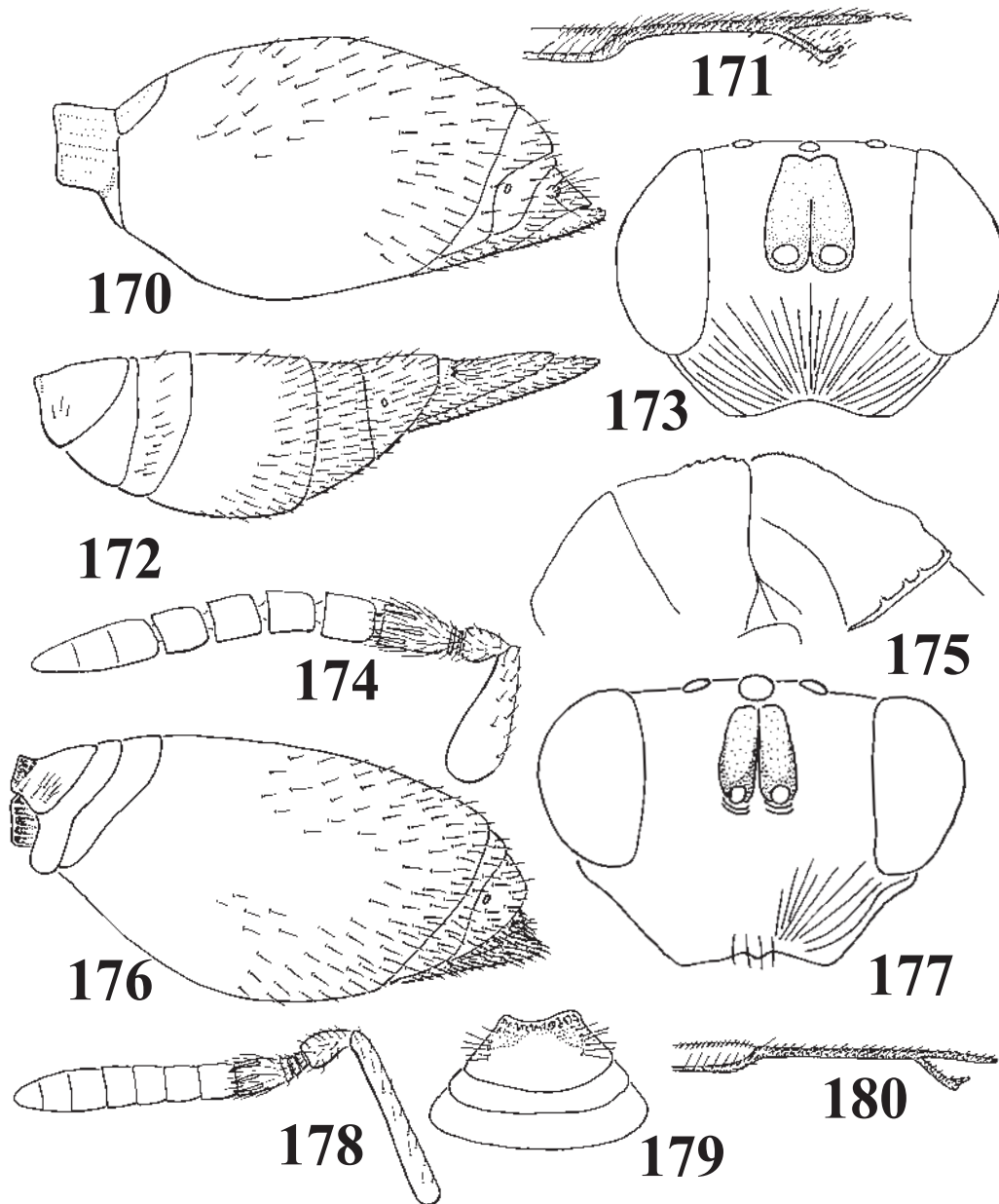


Figures 154-159. *Rileyya cearae*, male: 154, lateral gaster; 157, scape; female: 155, lateral face; 156, fore wing; 159, dorsal habitus. *R. columbar*, female: 158, lateral gaster.

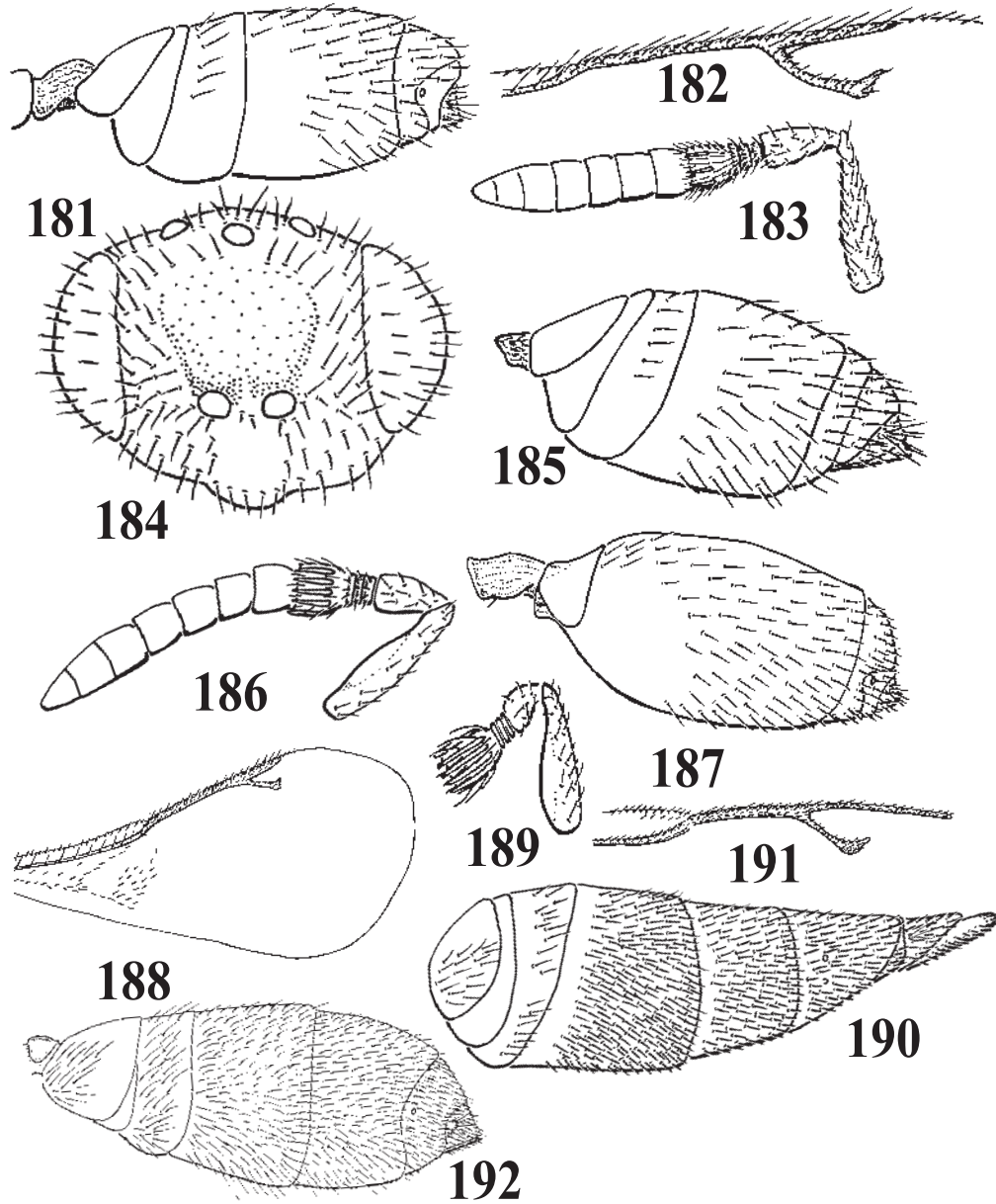


Figures 160-169. *Rileya cattleyae*, male: 160, lateral gaster; 161, face; *R. cecidomyiae*, male: 162, antenna; 163, lateral gaster; female: 164, lateral gaster; 165, fore wing venation. *R. clarki*, female: 166, lateral gaster. *R. couridae*, male: 167, lateral gaster; 168, antenna; 169, clypeus.

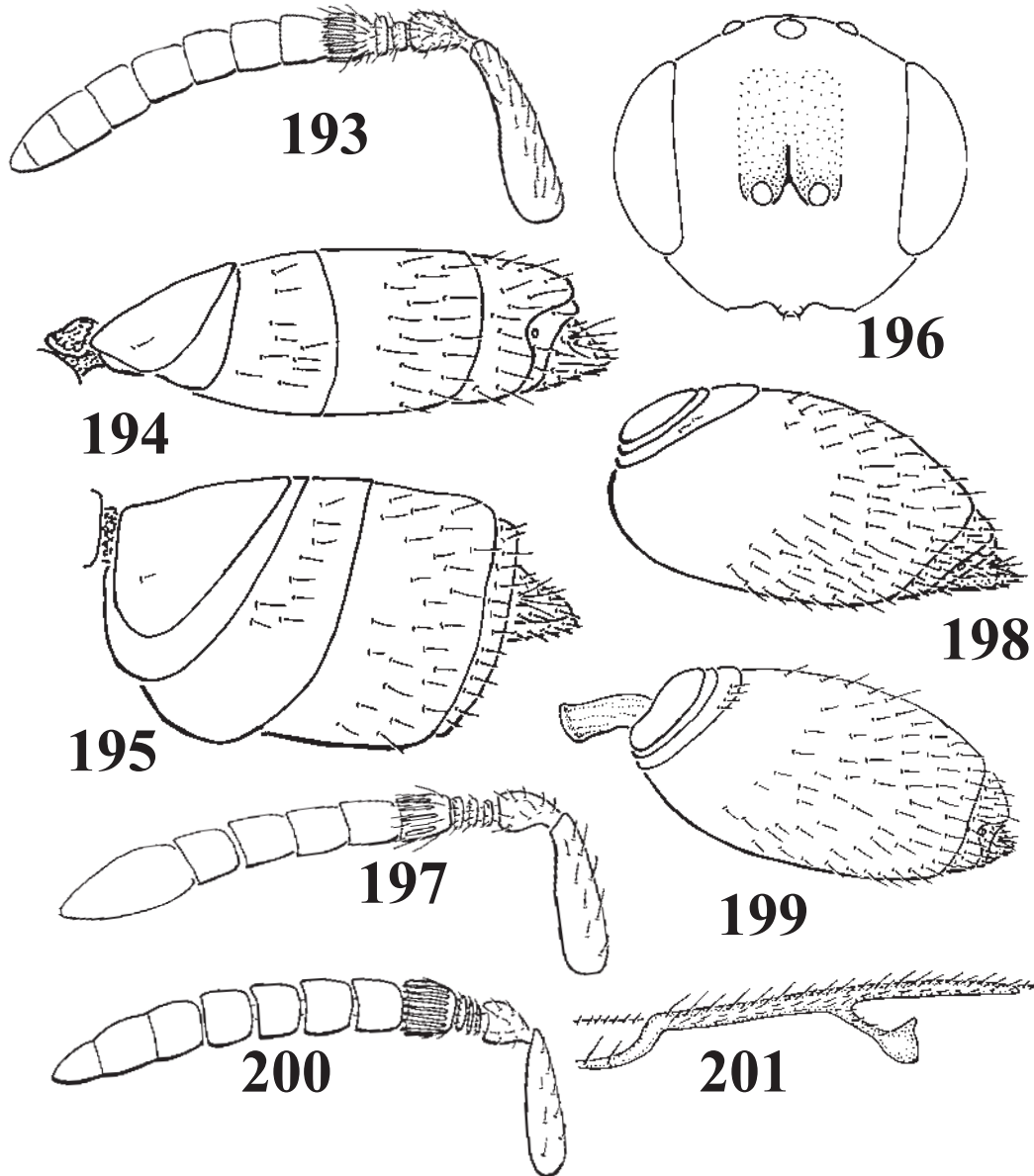




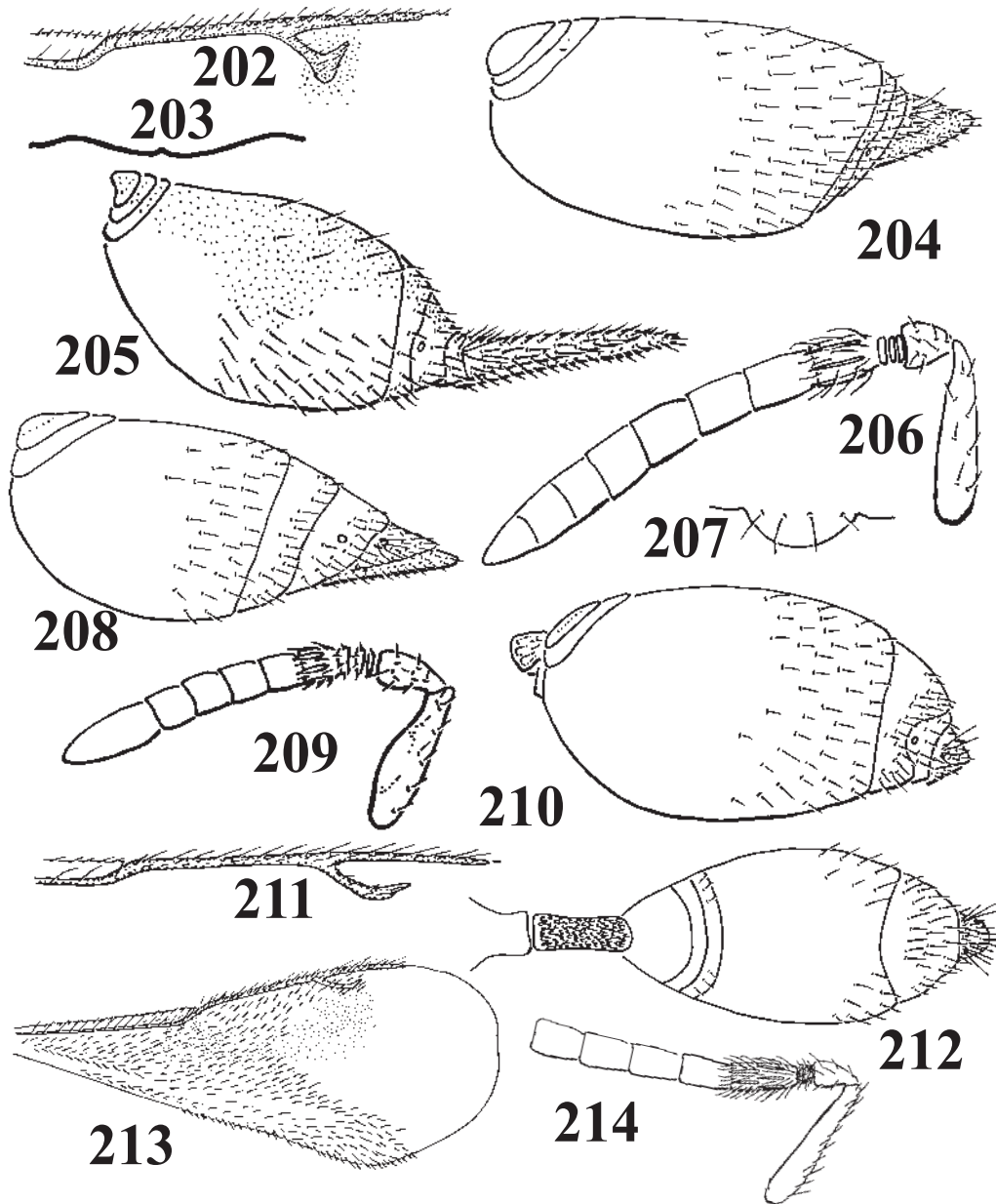
Figures 170-180. *Rileyella cylindripetiolata*, female: 170, lateral gaster; 171, fore wing venation. *R. gastros*, female: 172, lateral gaster; 173, face; 174, antenna. *R. gigas*, female: 175, lateral mesosoma; 176, lateral gaster; 177, face; 178, antenna; 179, anterodorsal gaster; 180, fore wing venation.



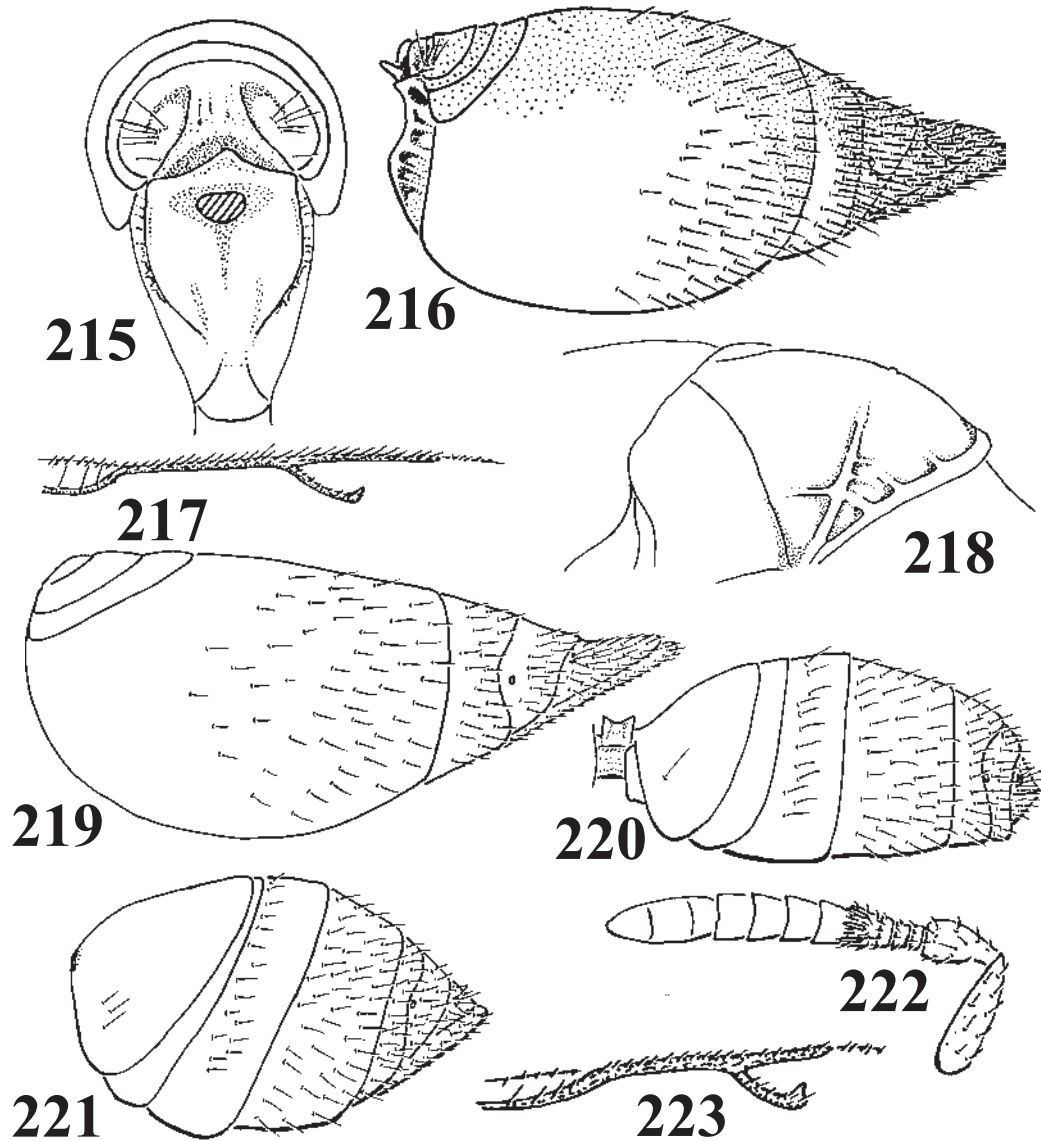
Figures 181-192. *Rileya glabra*, male: 181, lateral gaster; 182, fore wing venation; 186, antenna; female: 183, antenna; 184, face; 185, lateral gaster. *R. gracilis*, male: 187, lateral gaster; 188, fore wing; 189, scape. *R. grisselli*, female: 190, lateral gaster; 191, fore wing venation; male: 192, lateral gaster.



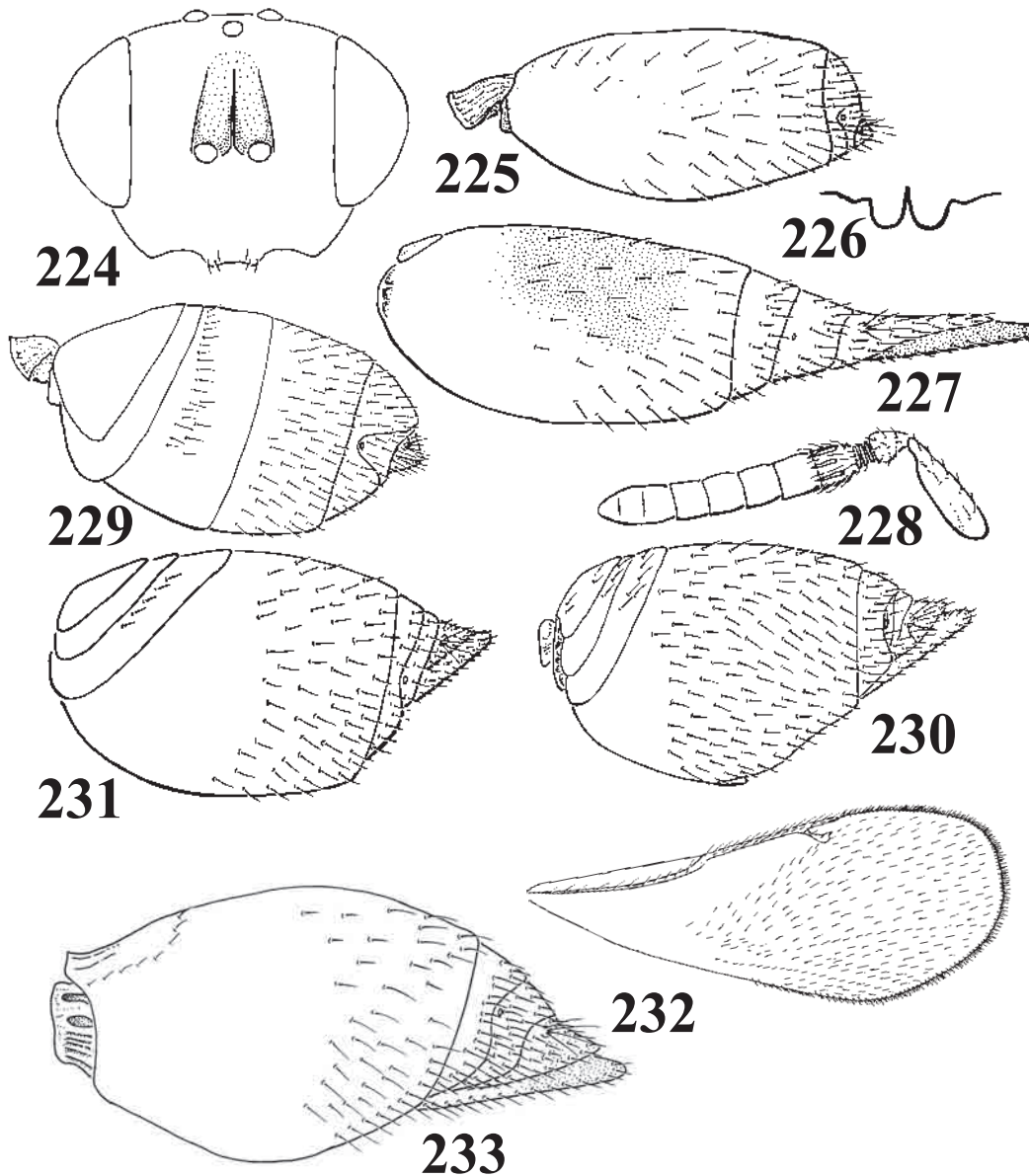
Figures 193-201. *Rileyya grisselli*, female: 193, antenna. *R. guatemalae*, male: 194, lateral gaster; female: 195, lateral gaster; 196, face. *R. hegeli*, female: 197, antenna; 198, lateral gaster; male: 199, lateral gaster; 200, antenna; 201, fore wing venation.



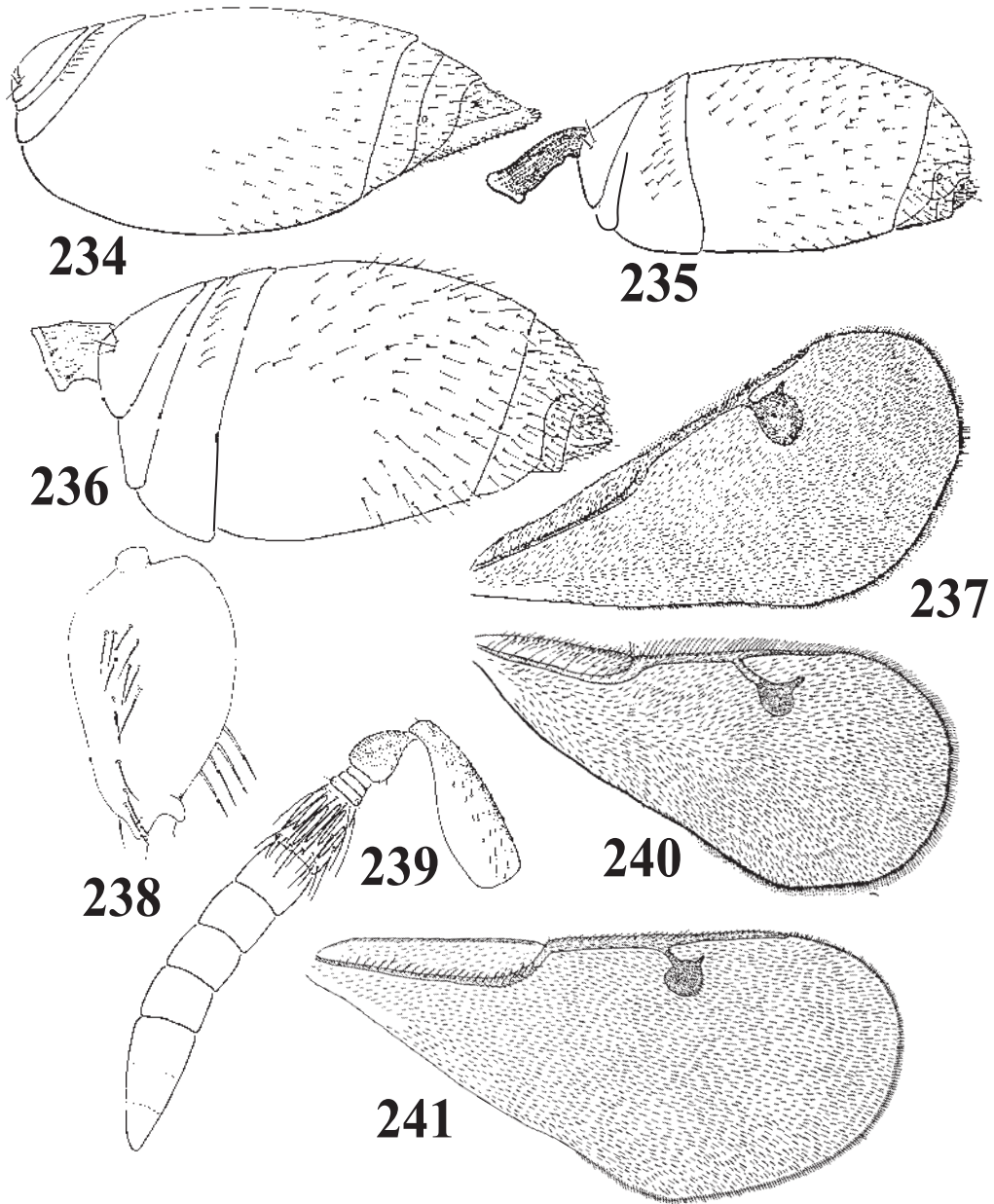
Figures 202-214. *Rileyia hegeli*, female: 202, fore wing venation; 203, clypeus; 204, lateral gaster. *R. heratyi*, female: 205, lateral gaster; 206, antenna; 207, clypeus. *R. heterogaster*, female: 208, lateral gaster; 211, fore wing venation; male: 209, antenna; 210, lateral gaster. *R. infuscata*, male: 212, dorsal gaster; 213, fore wing; 214, antenna.



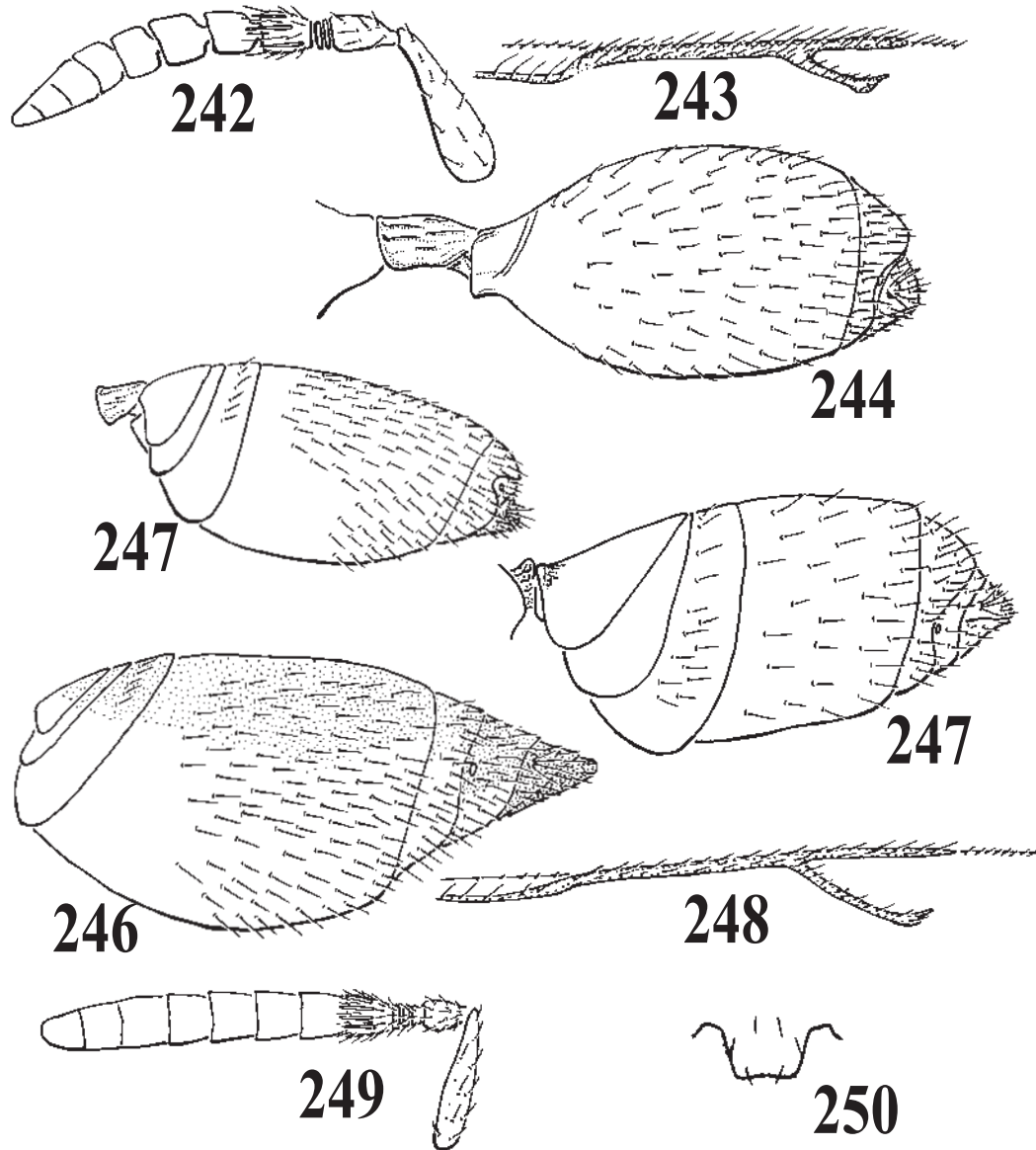
Figures 215-223. *Rileyia atopogaster*, female: 215, anterior gaster; 216, lateral gaster; 217, fore wing venation. *R. insularis*, female: 218, lateral scutellum; 219, lateral gaster. *R. laeliae*, male: 220, lateral gaster; female: 221, lateral gaster; 222, antenna; 223, fore wing venation.



Figures 224-233. *Rileyia laeliae*, female: 224, face. *R. longitergum*, male: 225, lateral gaster; 226, clypeus; female: 227, lateral gaster. *R. mellea*, male: 228, antenna; 231, lateral gaster; female: 229, lateral gaster. *R. minuta*, female: 230, lateral gaster; 232, fore wing venation. *R. mimica*, female: 233, lateral gaster.

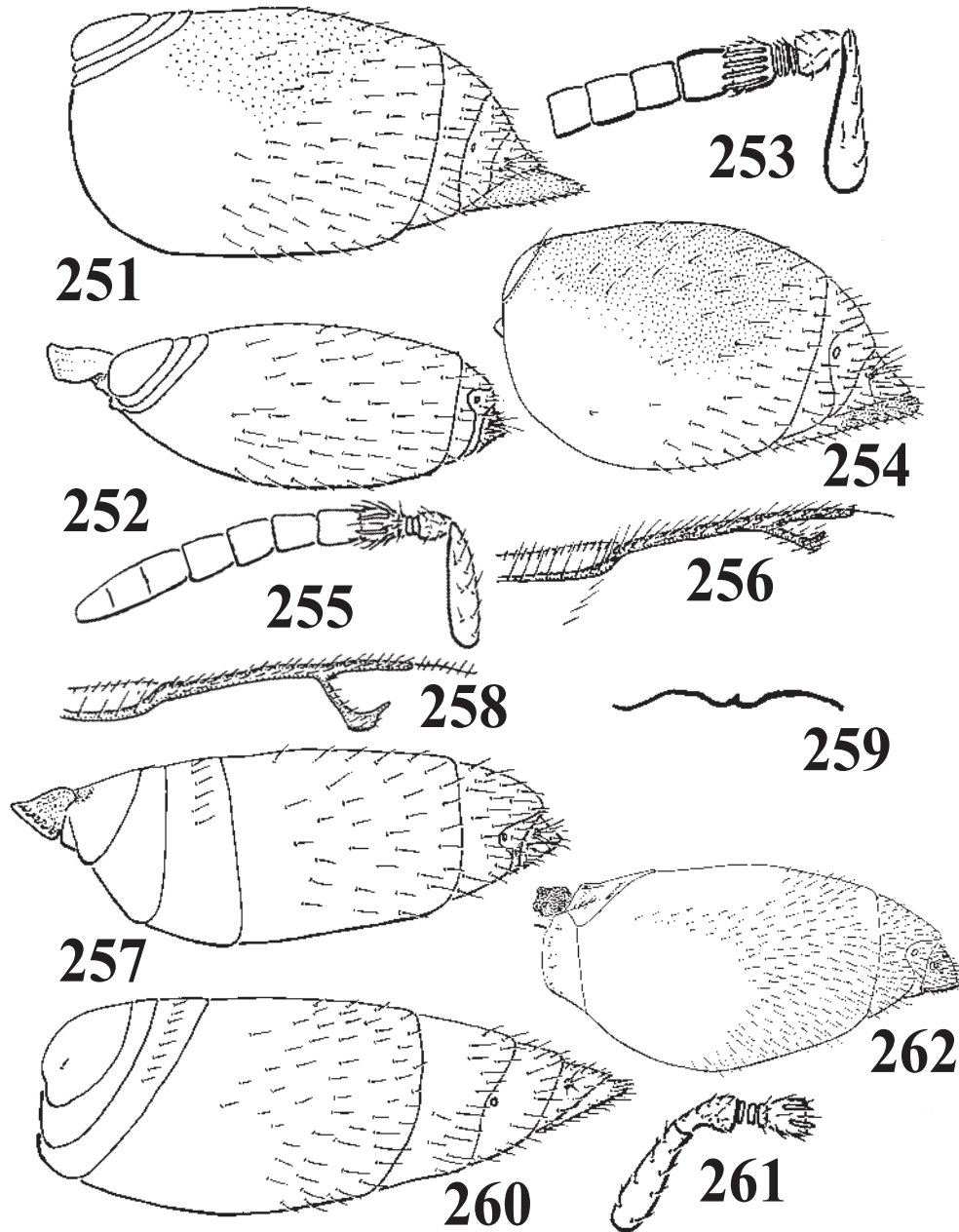


Figures 234-241. *Rileyia megastigma*, female: 234, lateral gaster; 237, fore wing; male: 236, lateral gaster; 238, metacoxa; 240, fore wing. *R. petiolata*, male: 235, lateral gaster; 239, antenna; 241, fore wing.

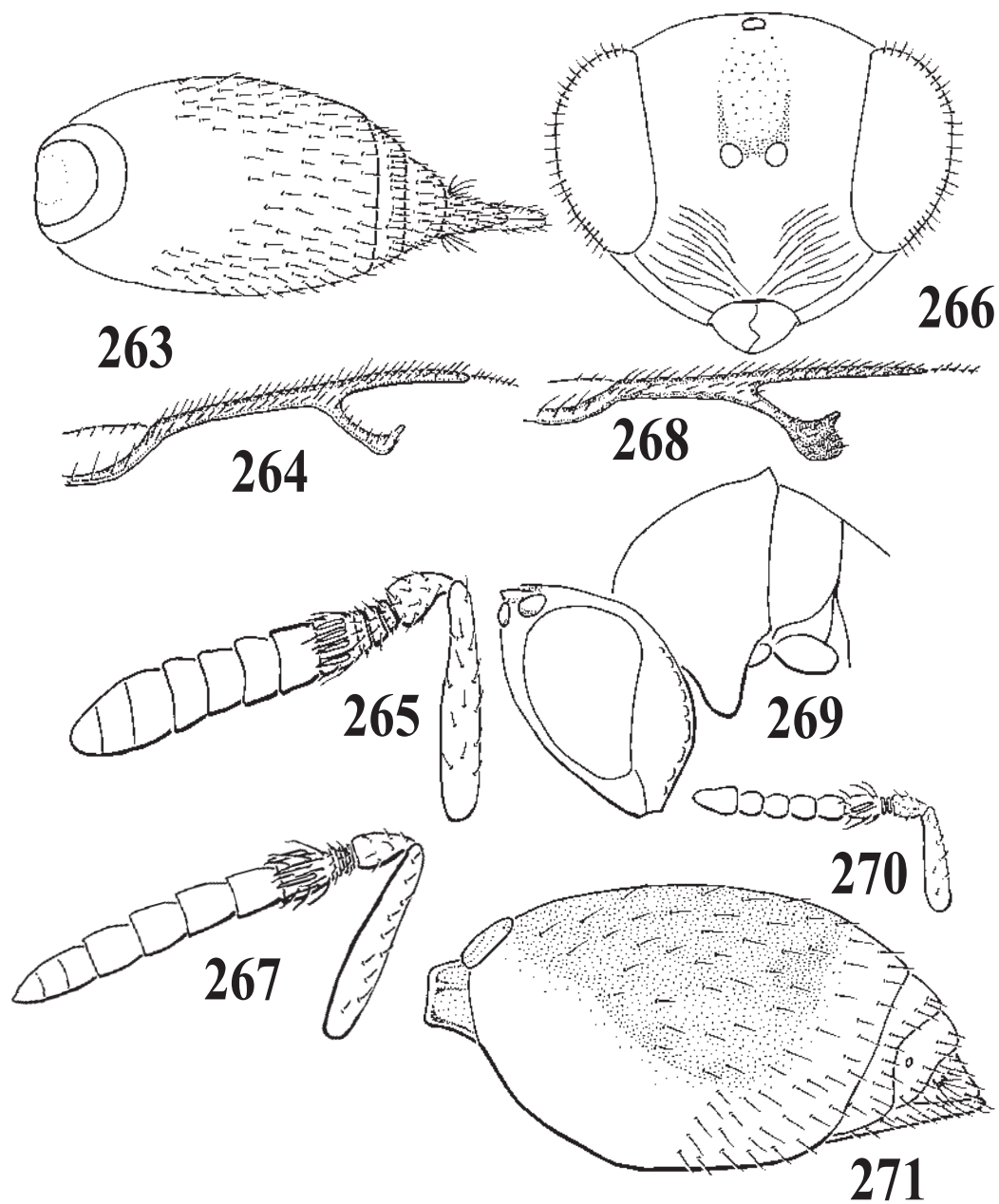


Figures 242-249. *Rileyia minuta*, female: 242, antenna. *R. obscura*, male: 243, fore wing venation; 244, lateral gaster. *R. oculiseta*, male: 245, lateral gaster; female: 246, lateral gaster. *R. oncidii*, male: 247, lateral gaster; 248, fore wing venation; 249, antenna; 250, clypeus.

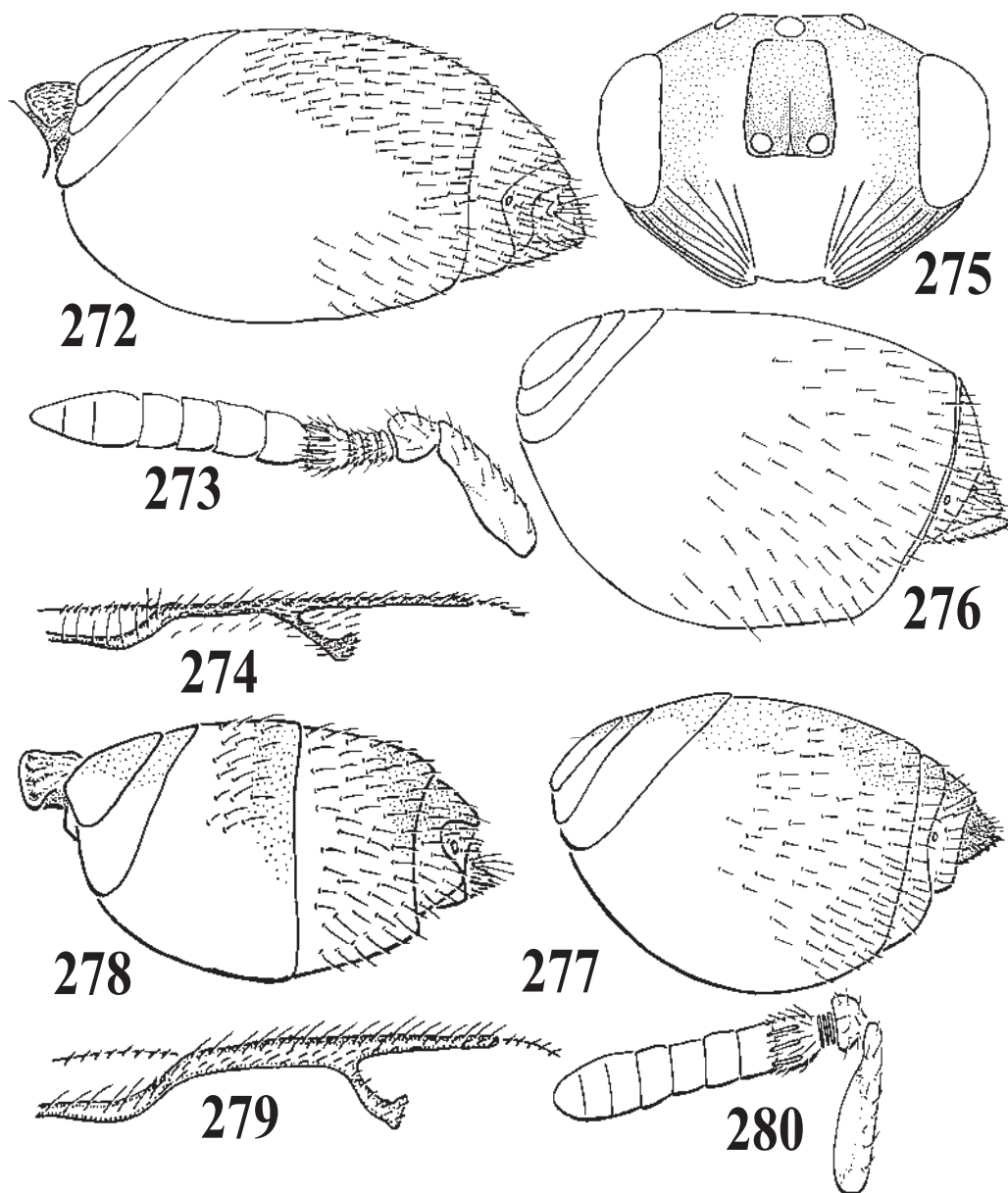




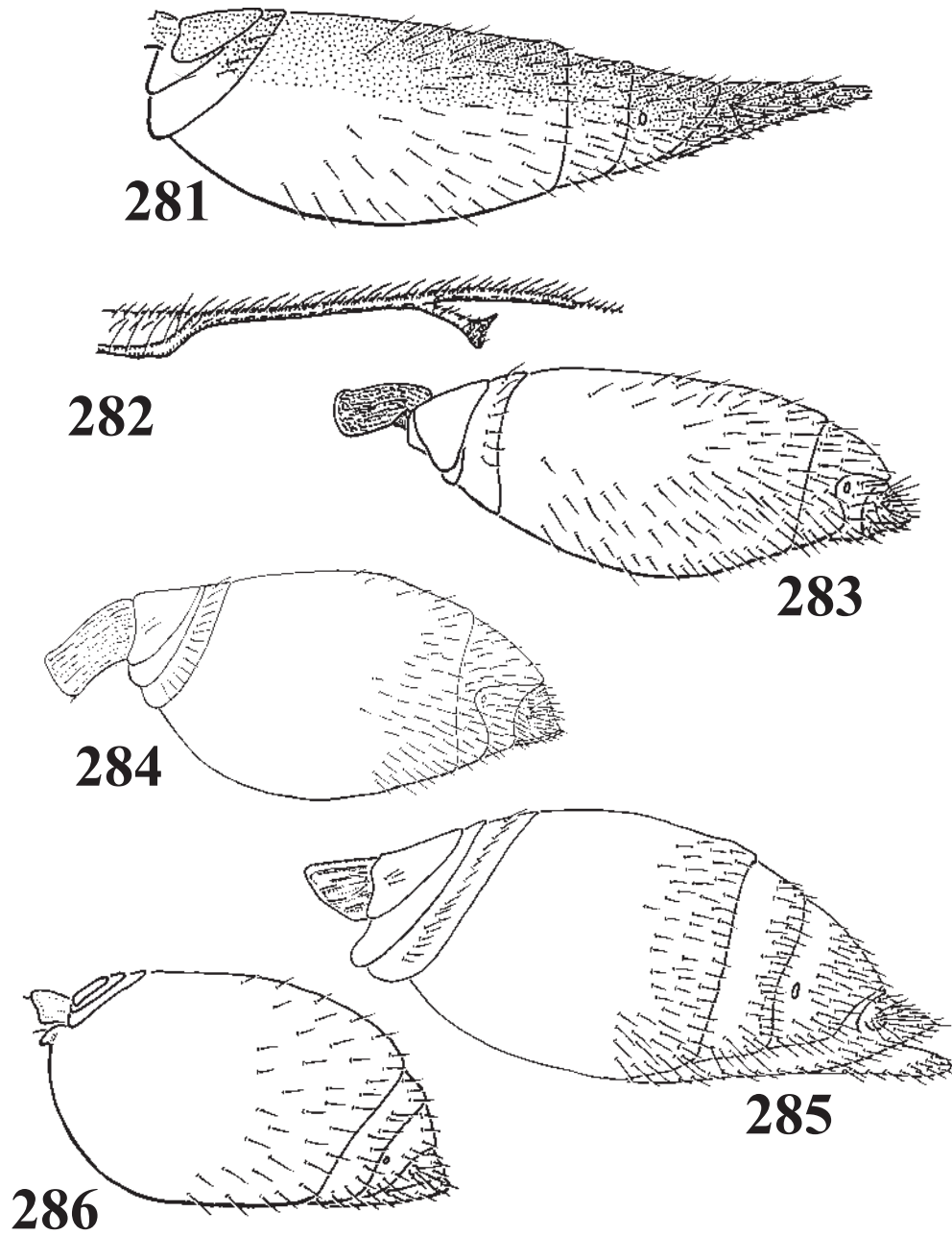
Figures 251-262. *Rileyia pallidipes*, female: 251, lateral gaster; male: 252, lateral gaster; 253, antenna. *R. panamae*, female: 254, lateral gaster; 255, antenna; 256, fore wing venation. *R. philodendrica*, male: 257, lateral gaster; 258, fore wing venation; 259, clypeus; 260, lateral gaster; 261, scape. *R. paraplesius*, male: 262, lateral gaster.



Figures 263-271. *Rileyia orbitalis*, female: 263, dorsal gaster; 264, fore wing venation; 265, antenna. *R. oculiseta*, female: 266, face; 267, antenna. *R. piercei*, female: 268, fore wing venation. *R. protuberonota*, female: 269, lateral head and mesosoma; 270, antenna. *R. quadraticaulis*: 271, lateral gaster.



Figures 272-280. *Rileyia robusta*, male: 272, lateral gaster; 273, antenna; 274, fore wing venation. *R. scabra*, female: 276, lateral gaster. *R. spadix*, female: 275, face; 277, lateral gaster; 279, fore wing venation; male: 278, lateral gaster; 280, antenna.



Figures 281-286. *Rileyia tricolor*, female: 281, lateral gaster, 282, fore wing venation; male: 283, lateral gaster. *R. warneri*, male: 284, lateral gaster; female: 285, lateral gaster. *R. violetae*, female: 286, lateral gaster.

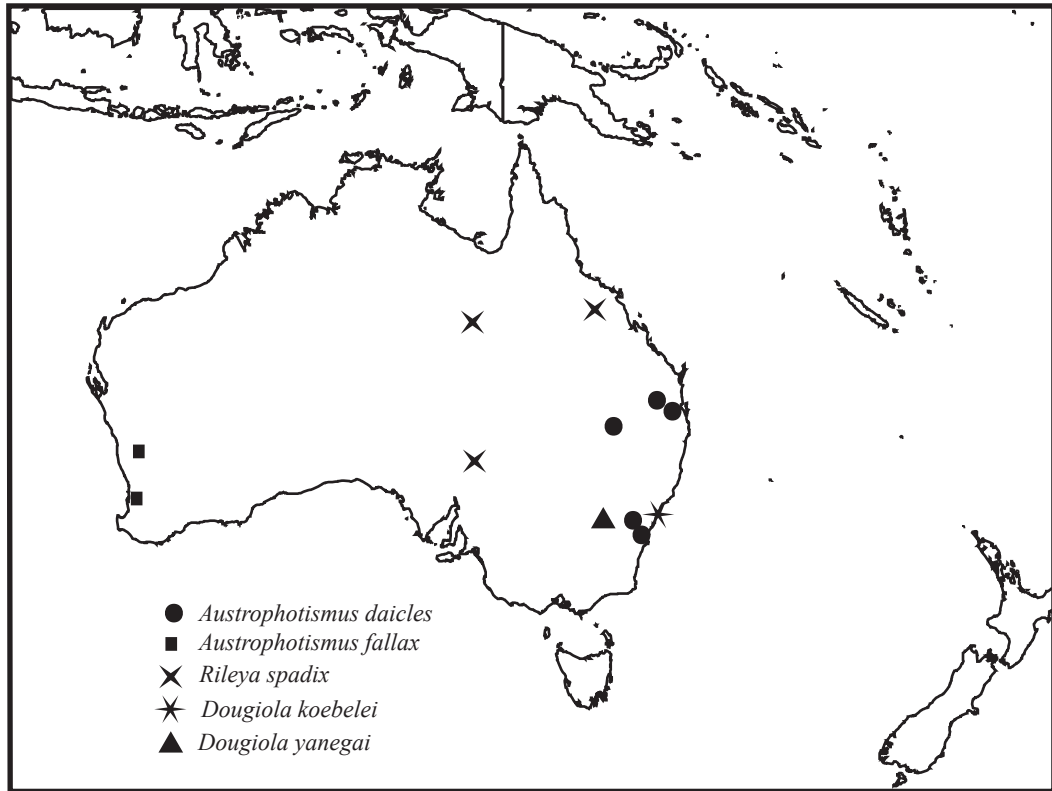


Figure 287. Distribution of *Austrophotismus daicles*, *A. fallax*, *Rileyia spadix*, *Dougiola koebelei*, and *D. yanegai*.

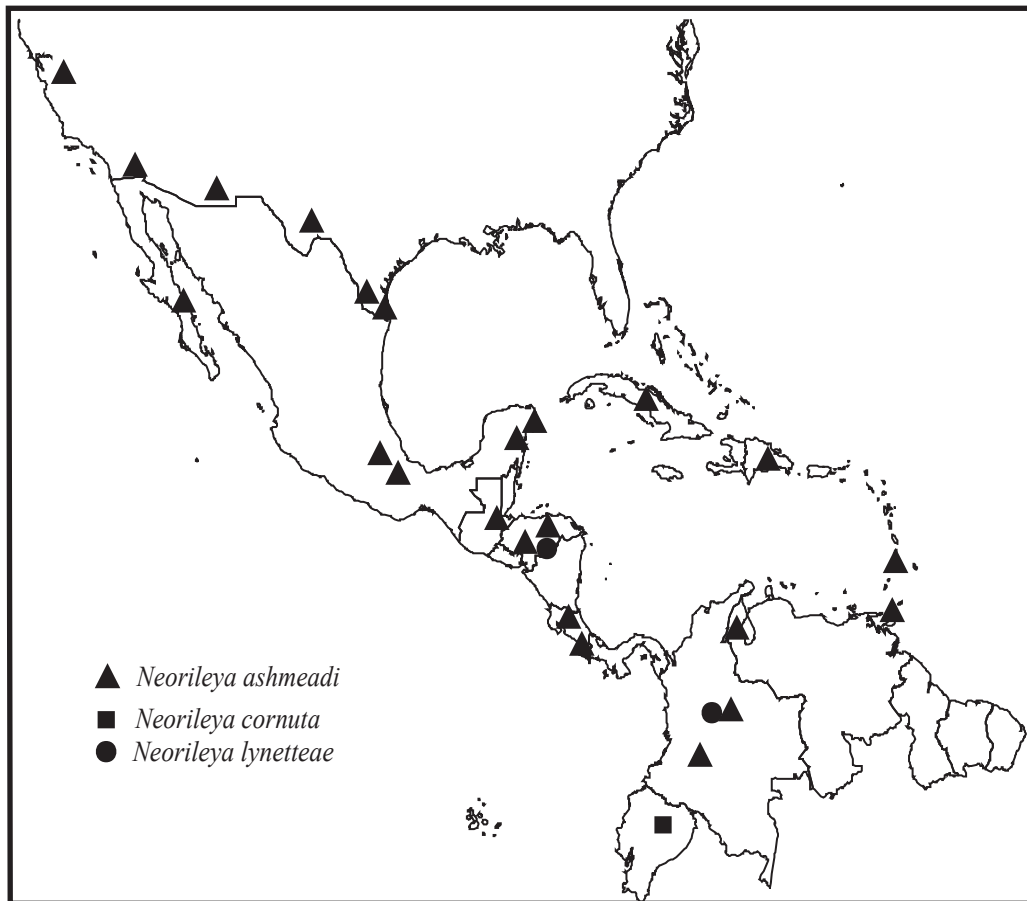


Figure 288. Distribution of *Neorileya ashmeadi*, *N. cornuta*, and *N. lynetteae*.

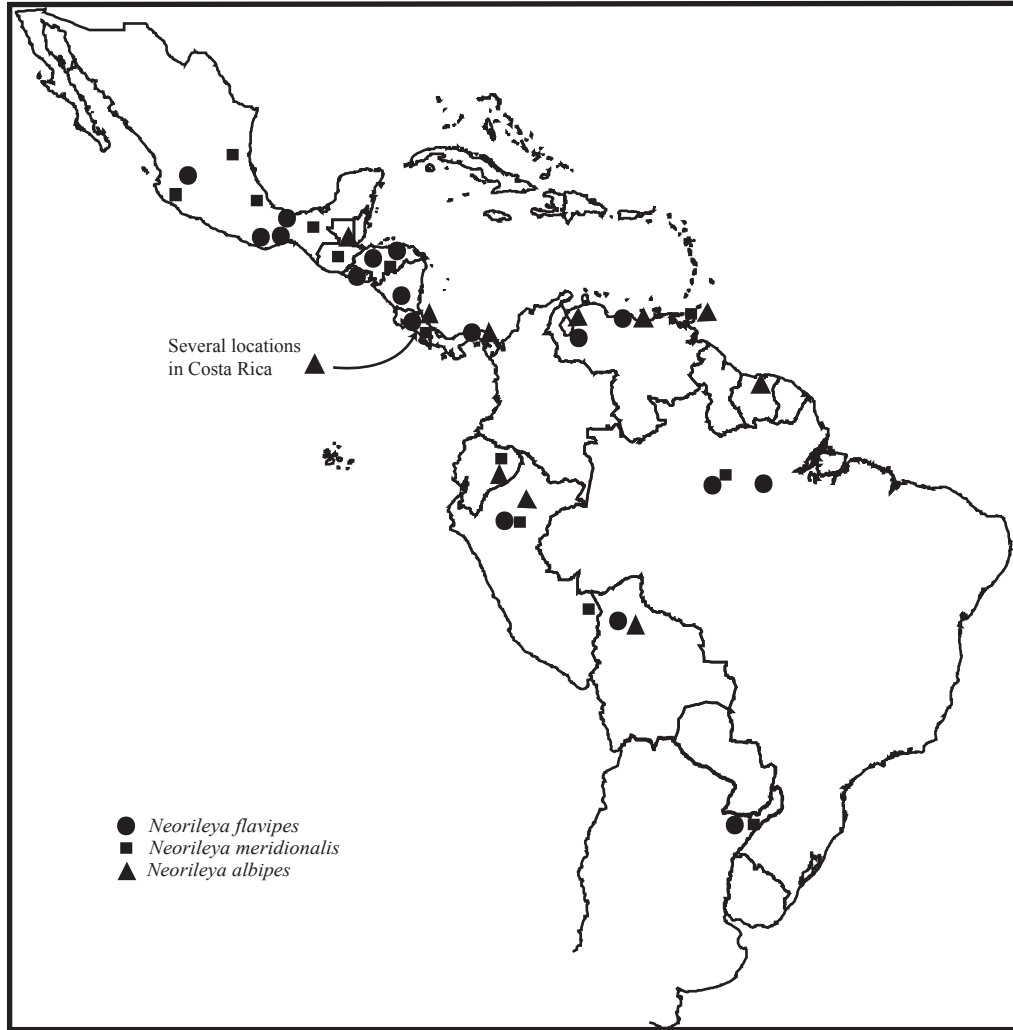


Figure 289. Distribution of *Neorileyia flavipes*, *N. meridionalis* and *N. albipes*.

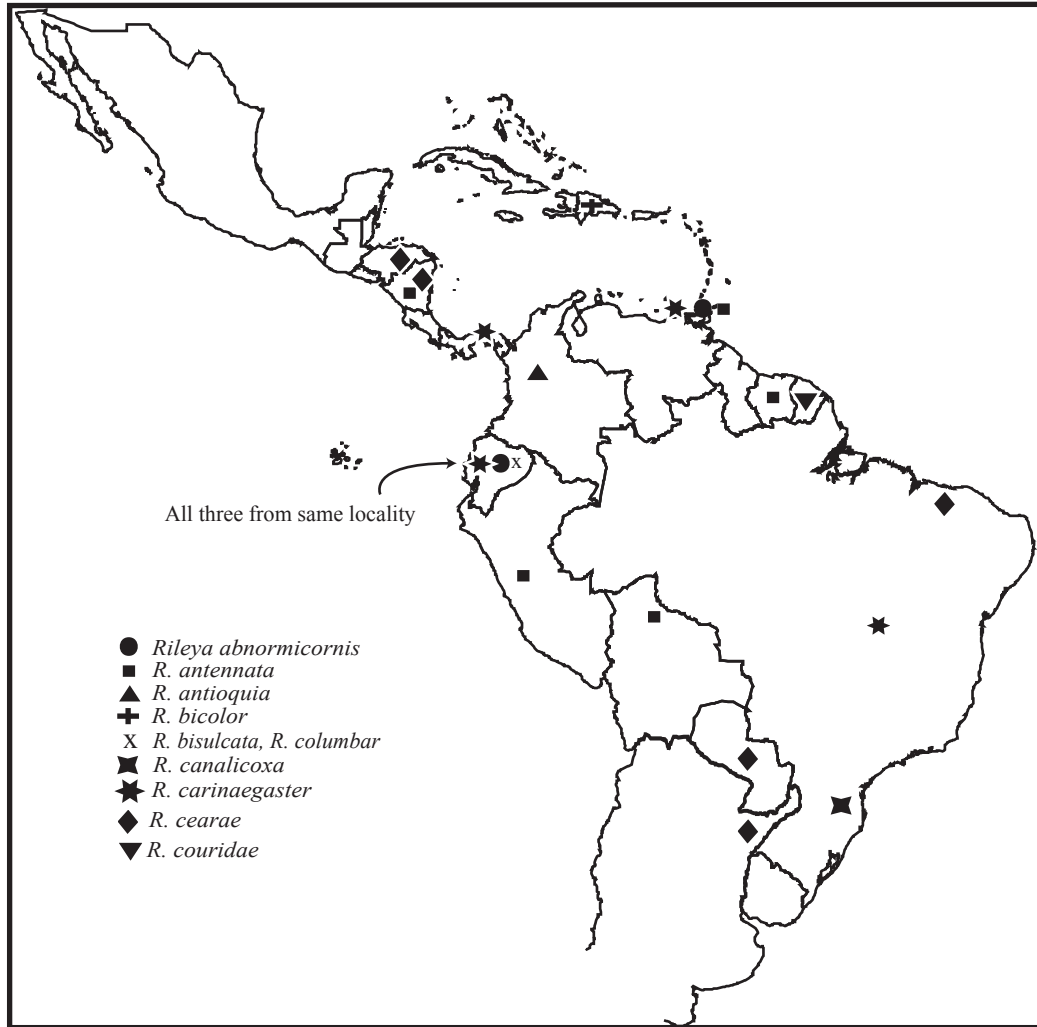
Figure 290. Distribution of *Rileyia* spp.





Figure 291. Distribution of *Rileyia* spp.





Figure 293. Distribution of *Rileyia* spp.

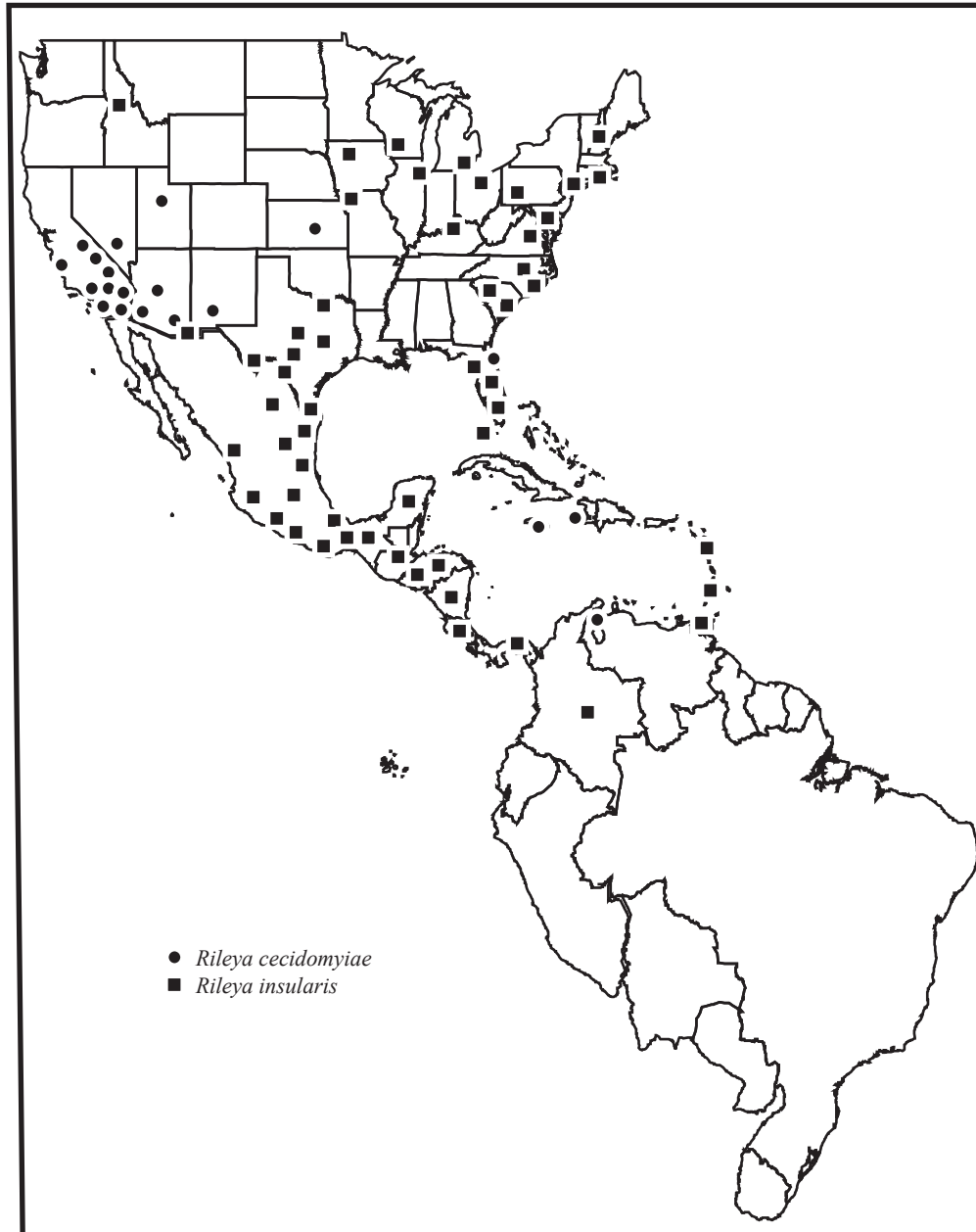


Figure 294. Distribution of *Rileyia cecidomyiae* and *R. insularis*.

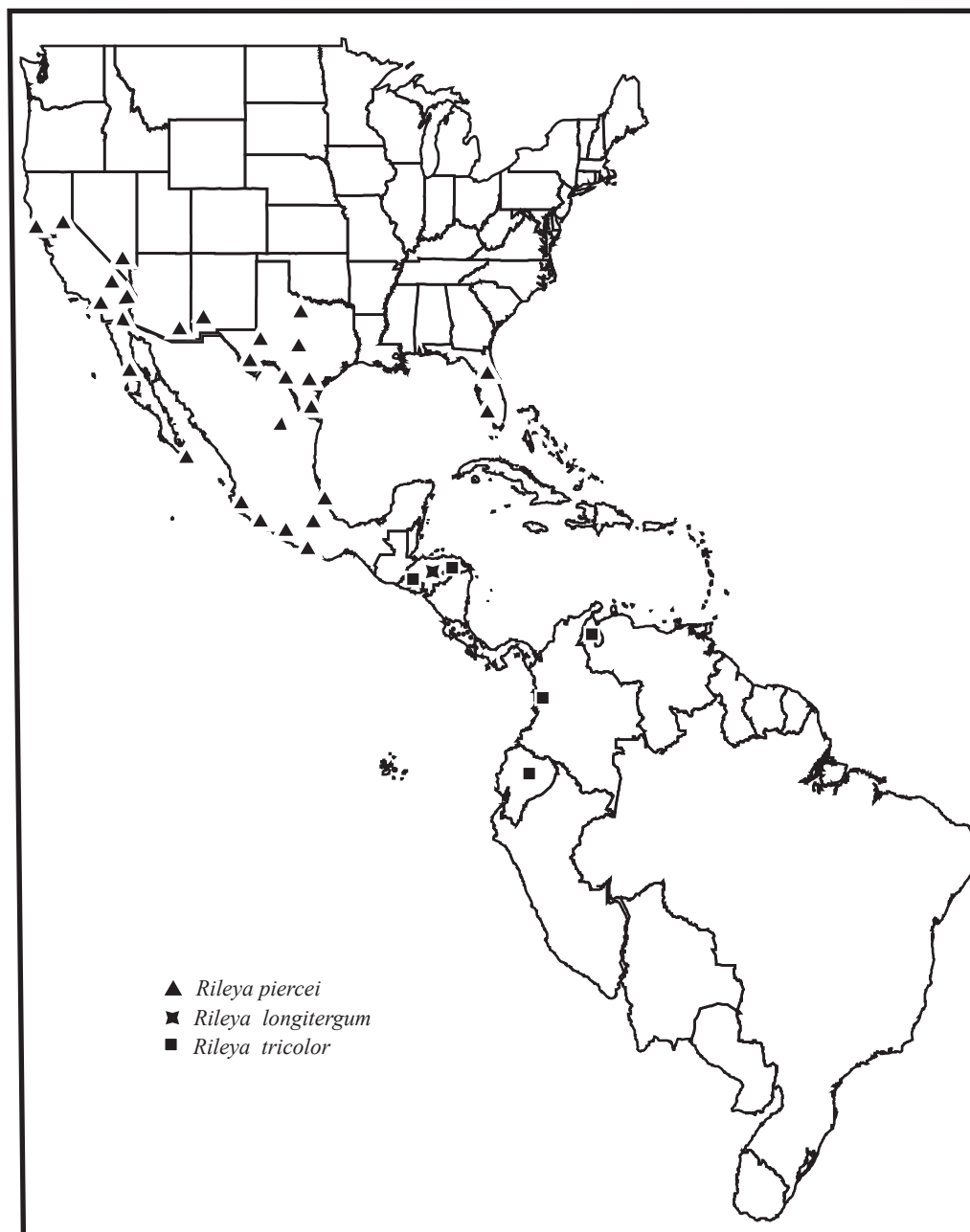


Figure 295. Distribution of *Rileyya* species.

Figure 296. Distribution of *Rileyia* spp.

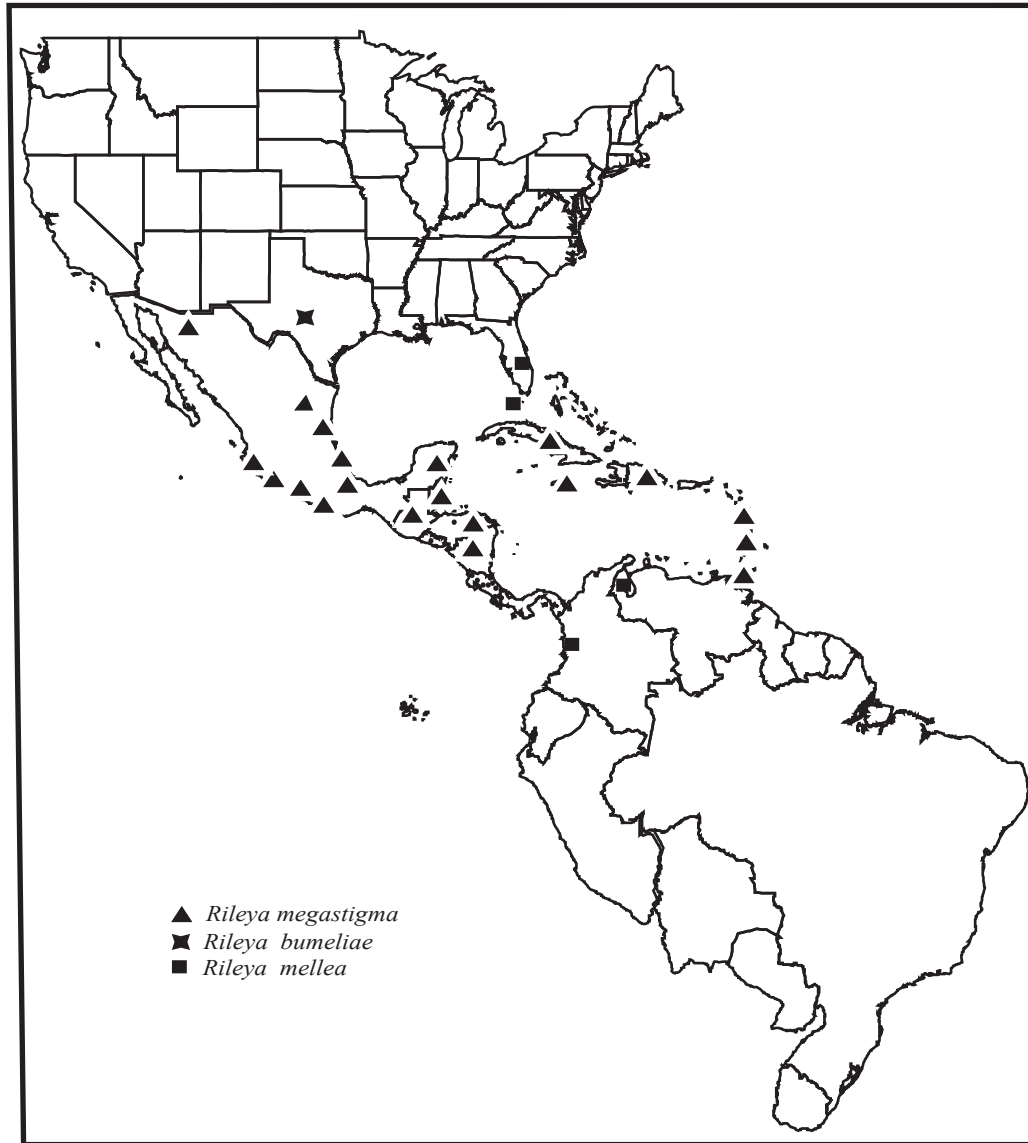


Figure 297. Distribution of *Rileyia* species.



Figure 298. Distribution of *Rileyia hegei*, *R. mimica* and *Platyrileyia cururipe*.



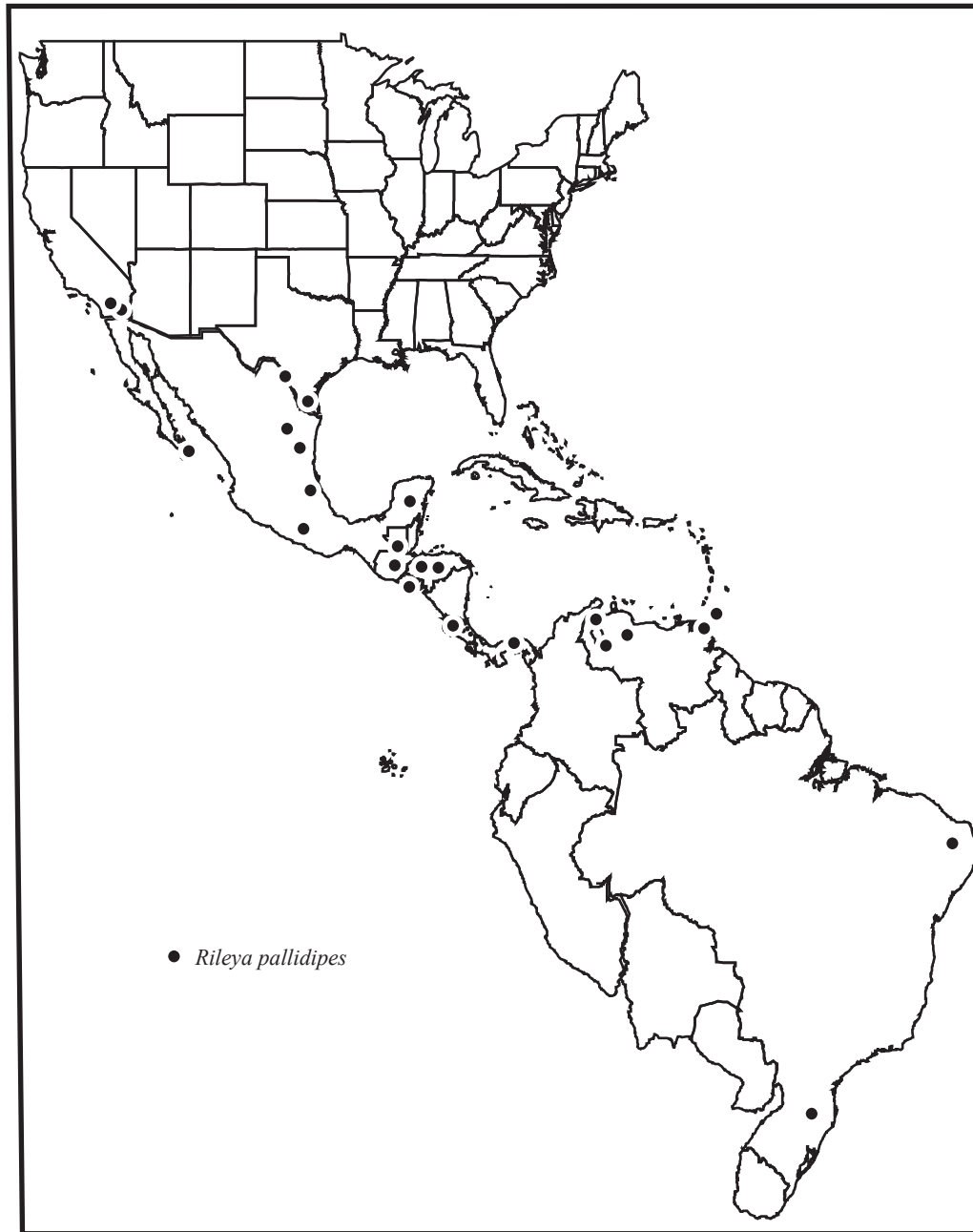
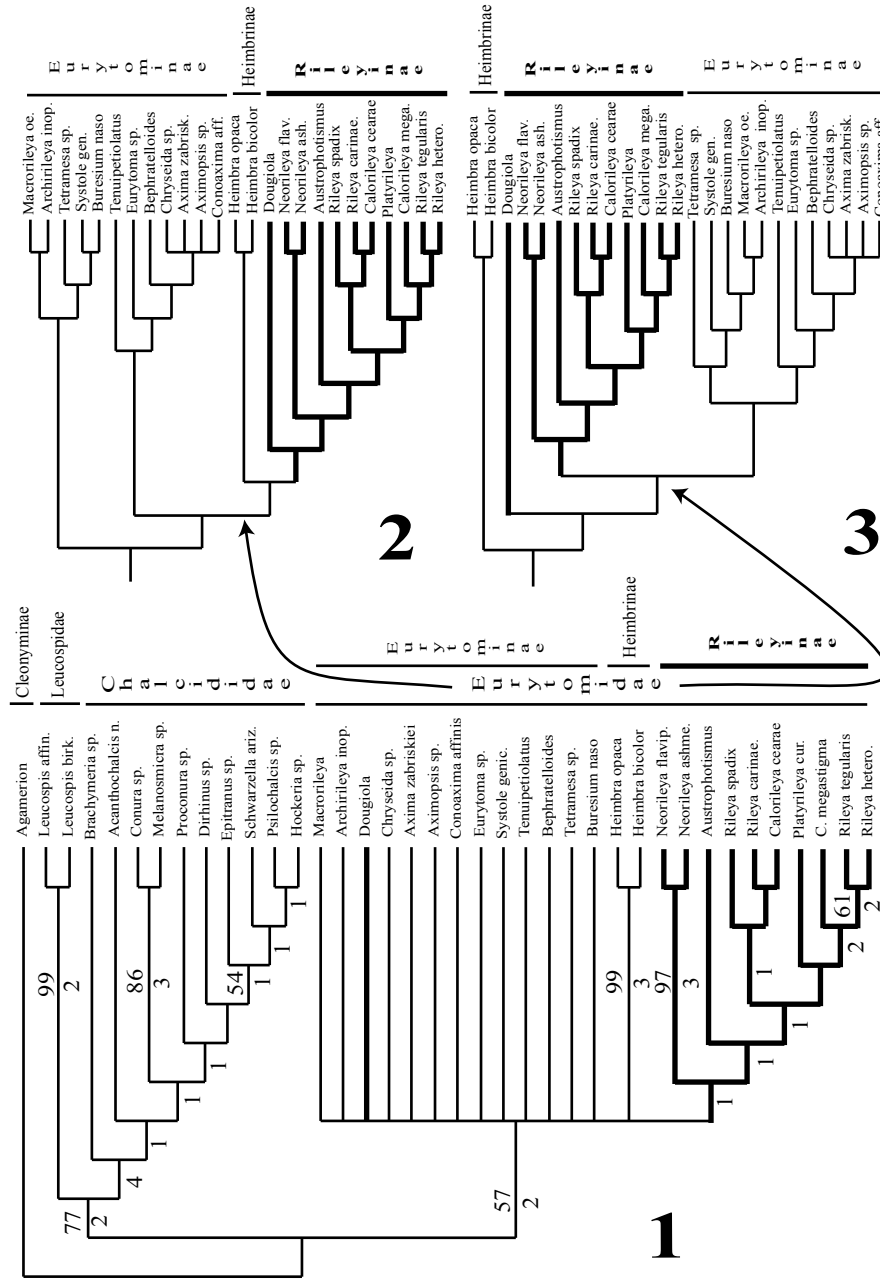
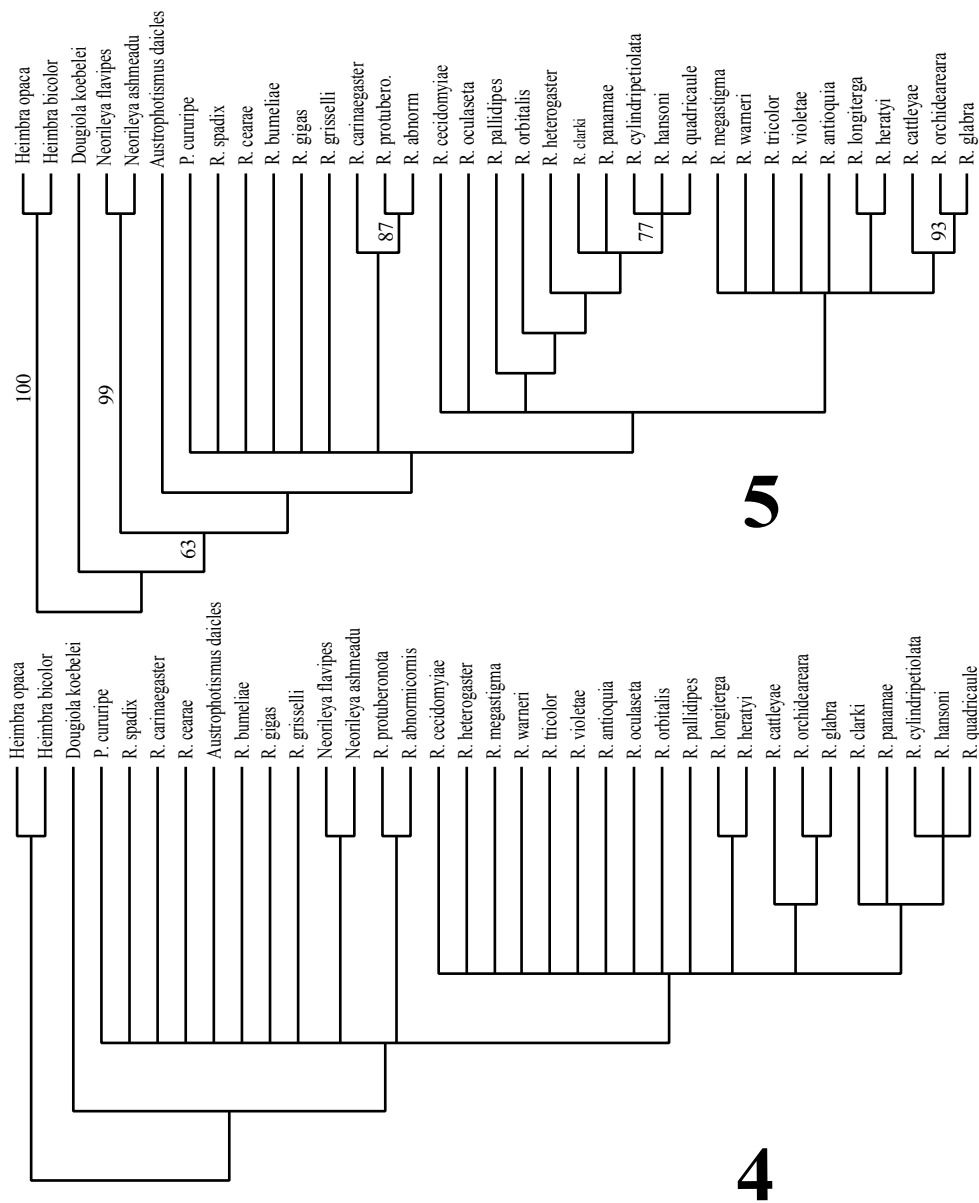


Figure 299. Distribution of *Rileyya pallidipes*.



Cladograms 1-3: 1, Strict consensus of 76 MPTs across 3 islands of morphological dataset. Length 188, ci 0.47, ri 0.76. 2, Eurytomidae topology on islands one and two from independent strict consensus trees. 3, Eurytomidae topology on island three from strict consensus tree. Thick lines indicate Rileyinae s.l. taxa. Bootstrap values >50 and Bremer values above/below branches.



Cladograms 4-5. 4, Strict consensus of 31,511 MPT from unweighted analysis of morphological matrix for Rileyinae. Length 92, ci 0.60, ri 0.73. 5, strict consensus of 4,157 trees stable to SAW for the same dataset. Length 92, ci 0.60, ri 0.73, bootstrap values above branches.

**Table 1. Eurytomid subfamily concepts**

<b>Author</b>	<b>Higher Taxa Recognized</b>
Walker 1833	<u>4 Genera:</u> <i>Decatoma</i> , <i>Eurytoma</i> , <i>Isosoma</i> , <i>Systole</i> .
Ashmead 1904	<u>5 Tribes:</u> Aximini, Eurytomini, Isosomini, Rileyini, Decatomini.
Schmiede- necht 1909	<u>5 Tribes:</u> Aximini, Eurytomini, Isosomini, Rileyini, Decatomini.
Bugbee 1936	<u>5 Tribes:</u> Aximini, Eurytomini, Isosomini, Rileyini, Decatomini.
Ferrière 1950	Proposed subfamily status for Rileyinae, Harmolitinae, Decatominae, Eurytominae.
Claridge 1961a	Maintained five subfamilies above.
Peck 1963	Aximinae, Eurytominae, Harmolitinae, Rileyinae, Eudecatominae.
Peck et al. 1964	Eurytominae, Rileyinae.
Riek 1970	Eurytominae, Rileyinae, Heimbrinae.
Burks 1971	Aximinae, Eurytominae, Harmolitinae, Rileyinae, Eudecatominae, Heimbrinae, Prodecatominae, Philoleminae.
Subba Rao 1978	Eurytominae, Rileyinae.
Krombein et al. 1979	Aximinae, Eurytominae, Harmolitinae, Rileyinae, Eudecatominae, Prodecatominae.
Stage & Snelling 1986	Eurytominae, Rileyinae, Heimbrinae.
Zerova 1988	Aximinae, Eurytominae, Harmolitinae, Rileyinae, Eudecatominae, Heimbrinae, Buresiinae.
Mani 1989	Aximinae, Eurytominae, Tetramesinae, Rileyinae, Sycophilinae.
Zerova 1995	Eurytominae, Harmolitinae, Rileyinae, Eudecatominae, Buresiinae.

Table 2. Biology and distribution of Eurytominae &amp; Heimbrinae

Taxon	#	Area	Biology	Host	Source
<b>EURYTOMINAE</b>					
<i>Acantheurytoma</i> Cameron 1911	4	IM <sup>a</sup>	Sphecid larva in <i>Ricinus</i> sp. petiole	Sphecidae	Farooqi & Subba Rao 1986
<i>Agriotoma</i> Burks 1971	1	IM			
<i>Aiolomorphus</i> Walker 1871	1	ORI	Galls on <i>Phyllostachys</i> sp.	Poaceae	Sun et al. 1994 Wang et al. 1996ab
<i>Aplatoides</i> Yoshimoto & Gibson 1979	1	NEO			
<i>Aranedra</i> Burks 1971	2	NEO	<i>Philodendron</i> sp., <i>Dieffenbachia</i> sp.	Araceae	Burks 1971
<i>Archirileya</i> Silvestri 1920	1	PAL	<i>Oecanthus</i> <i>pellucens</i> , <i>Tettigia</i> sp., <i>Plebeia</i> sp., <i>Cicada</i> eggs	Tettigoniidae, Gryllidae	Thompson 1955; Silvestri 1920
<i>Austrodecatoma</i> Girault 1925	3	AUS	Gall fruit of <i>Atalantia</i> sp.	Rutaceae	Bouček 1988b
<i>Ausystole</i> Bouček 1988	1	AUS	<i>Eutaxia</i> <i>microphylla</i> seeds	Fabaceae	Bouček 1988b
<i>Axanthosoma</i> Girault 1913	3	AUS, ETH	Cicada eggs ( <i>Melampsalta</i> sp. , <i>Amphipsalta</i> <i>cingulata</i> )	Cicadidae	Bouček 1988b Subba Rao 1974
<i>Axanthosomella</i> Narendran 2001	1	IM	Mango gall midge or grasses?	Cecidomyiidae Poaceae?	Narendran & Kumar Das 2001
<i>Axima</i> Walker 1862	6	NEO, NEA	Solitary bees, <i>Ceratina</i> sp.	Anthophoridae	Peck 1963; Herting 1977
<i>Aximogastroma</i> Narendran 1994	1	IM			Narendran 1994
<i>Aximogastra</i> Ashmead 1904	2	NEO	Orchids	Orchidaceae	Burks 1971
<i>Aximopsis</i> Ashmead 1904	3	NEO, ORI	<i>Pachyschelus</i> sp., <i>Tumidiscapus</i> sp., <i>Brachys</i> sp.	Buprestidae, Curculionidae?	Label data; Herting 1977
<i>Banyoma</i> Burks 1971	2	IM			Burks 1971 Narendran 1994
<i>Bephrata</i> Cameron 1884	3	IM			

Table 2 (cont.) Biology and distribution of Eurytominae &amp; Heimbrinae

Taxon	#	Area	Biology	Host Family	Source
<i>Bephratelloides</i> Girault 1913	7	NEO	Seeds of <i>Annona</i> , <i>Duguetia</i> , <i>Cymbopetalum</i> , <i>Xylopia aromatica</i>	Annonaceae	Grissell & Schauff 1990 Grissell & Foster 1996 Perioto 1997 Label data
<i>Bephratoides</i> Brues 1908	5	NEO, IM	<i>Agrilus otiosus</i>	Buprestidae	Peck 1963
<i>Bruchodape</i> Burks 1971	1	NEO	Xylophagous Coleoptera [?]		Burks 1971 Label data
<i>Bruchophagus</i> Ashmead 1888	120	COS	Seed feeder, gallers	Fabaceae	Burks 1979
<i>Buresium</i> Bouček 1970	4	PAL, ETH	Grass associates; <i>Mordellistena</i> sp.	Mordellidae	Bouček 1983
<i>Burksoma</i> Subba Rao 1978	1	NEO	<i>Acacia verrek</i> seeds	Fabaceae	Bouček 1988b
<i>Cathilaria</i> Burks 1971	1	NEA	Grass associates. Galls on <i>Hilaria</i> , <i>Opuntia</i>	Cecid.?	Peck 1963 Burks 1971
<i>Chryseida</i> Spinola 1840	10	NEO, NEA	Bruchid larvae	Bruchidae	Herting 1973 Peck 1963 Perez 1987 Zerova 1980
<i>Conoaxima</i> Brues 1922	3	NEO	<i>Azteca</i> spp.	Formicidae	Brues 1922
<i>Dougiola</i> Bouček 1988	2	AUS	Assoc. with seeds of <i>Casuarina</i> <i>leuhmanni</i>	Casuarinaceae	Bouček 1988b
<i>Endobia</i> Erdős 1964	2	PAL	<i>Dinoderus</i> sp.	Bostrichidae	Farooqi & Subba Rao 1986
<i>Eudoxinna</i> Walker 1862	1	NEO			Burks 1971
<i>Eurytoma</i> Illiger 1807	700	COS	Phytophagous/Para sitic	Numerous	Peck 1963 Bugbee 1967 Burks 1979
<i>Eurytomaria</i> Masi 1943	1	ETH			Masi 1943
<i>Eurytomidia</i> Masi 1917	1	ETH			Masi 1917
<i>Eurytomocharis</i> Ashmead 1888	18	HOL, IM	Associated with grasses	Poaceae	Bugbee 1966 Mukerjee 1981

**Table 2 (cont.) Biology and distribution of Eurytominae & Heimbrinae**

<b>Taxon</b>	<b>#</b>	<b>Area</b>	<b>Biology</b>	<b>Host Family</b>	<b>Source</b>
<i>Exeurytoma</i> Burks 1971	1	PAL	<i>Caragana</i> sp. seeds	Fabaceae	Burks 1971 Zerova 1995
<i>Ficomila</i> Bouček 1981	2	ETH	In <i>Ficus</i> spp.	Moraceae	Bouček et al. 1981
<i>Foutsia</i> Burks 1971	1	NEO	<i>Philodendron</i> sp. root galls	Cecid. [?]	Burks 1971
<i>Fronsoma</i> Narendran 1994	4	IM			Narendran 1994
<i>Gibsonoma</i> Narendran 1994	1	IM			Narendran 1994
<i>Giraultoma</i> Bouček 1988	2	AUS	Assoc. with grasses		Bouček 1988b
<i>Heimbrella</i> Subba Rao 1978	1	NEO			Subba Rao 1978
<i>Hexeurytoma</i> Dodd 1917	3	AUS	Wood-associated Coleoptera	Anthribidae [?]	Bouček 1988b Darling, pers. comm.
<i>Homodecatoma</i> Liao 1979	1	ORI	Seed feeder	Fabaceae	Liao 1979
<i>Houstonia</i> Bouček 1988	1	AUS	Seed eater ?		Bouček 1988b
<i>Isosomodes</i> Ashmead 1888	3	NEA NEO	<i>Bucrates</i> sp., <i>Tettigonia</i> sp.	Tettigoniidae	Herting 1973
<i>Isosomorpha</i> Ashmead 1888	1	HOL	<i>Muhlenbergia</i> sp., <i>Phalaris</i> sp.	Poaceae	Peck 1963
<i>Macrorileyia</i> Ashmead 1894	2	NEA AFR	<i>Oecanthus</i> spp.	Gryllidae	Smith 1930 Herting 1973 Peck 1963
<i>Mangoma</i> Subba Rao 1986	1	IM	<i>Procontarinia</i> <i>matteiana</i>	Cecid.	Subba Rao 1986
<i>Masneroma</i> Bouček 1983	1	NEA	Xylophagous larvae[?]	Coleoptera [?]	Bouček 1983
<i>Mesoerytoma</i> Cameron 1911	7	IM			Cameron 1911
<i>Neobephrata</i> Narendran & Padmas. 1991	1	IM			Narendran & Padmas 1991
<i>Neoeurytomaria</i> Narendran 1994	1	IM			Narendran 1994
<i>Nikanoria</i> Nikol'skaya 1955	25	PAL	Seeds and galls	Ephedraceae, Zygophyllaceae, Chenopodiaceae, Asteraceae, Cecidomyiidae	Zerova 1971, 1978

**Table 2 (cont.) Biology and distribution of Eurytominae & Heimbrinae**

<b>Taxon</b>	<b>#</b>	<b>Area</b>	<b>Biology</b>	<b>Host Family</b>	<b>Source</b>
<i>Paradecatomia</i> Masi 1943	1	ETH			Masi 1943
<i>Philippinoma</i> Narendran 1994	2	IM			Narendran 1994
<i>Philolema</i> Cameron 1908	5	IM	<i>Lema, Xyleborus,</i> <i>Apion, Campoletis</i>	Chrysomelidae Curculionoidea Ichneumonidae	Narendran 1999; Herting 1973
<i>Phleudecatoma</i> Yang 1996	2	IM	<i>Phloeosinus</i> <i>sinensis</i>	Scolytidae	Yang 1996
<i>Phylloxeroxenus</i> Ashm. 1888	5	NEA AUS	<i>Phylloxera</i> sp. galls [Cecidomyiidae within?]	Cecidomyiidae [?]	Burks 1971
<i>Plutarchia</i> Girault 1925	13	ETH IM AUS	Pupae of Diptera & Lepidoptera	Agromyzidae Gelechiidae	Bouček 1988b; Subba Rao 1974
<i>Prodecatoma</i> Ashmead 1904	42	NEO ETH, NEA IM	Seeds, plant galls	Myrtaceae, Vitaceae, Cynipidae, others	Suárez & Calvo 1990 Adlerz 1972 Adlerz & Mortensen 1973
<i>Prodecatomoidea</i> Risbec 1952	1	AFR			Risbec 1952
<i>Proseurytoma</i> Kieffer & Jørgensen 1910	1	NEO	Assoc. with <i>Geoffroea</i> sp.	Fabaceae	DeSantis 1967
<i>Pseudosystole</i> Kalina 1969	3	PAL NEO	Assoc. with <i>Festuca</i> sp.	Poaceae	Szelenyi 1975
<i>Pseudotetramesa</i> Kalina 1970	1	PAL			Kalina 1970
<i>Ramanuja</i> Narendran 1989	1	IM			Narendran 1989
<i>Ramdasoma</i> Narendran 1994	3	IM			Narendran 1994
<i>Risbecoma</i> Subba Rao 1978	5	ETH IM	Seed feeder	Fabaceae	Bouček 1988b; Narendran 1994
<i>Stigmeurytoma</i> Bouček 1988b	2	AUS	Assoc. with galls on eucalypts	Myrtaceae[?]	Bouček 1988b



**Table 2 (cont.) Biology and distribution of Eurytominae & Heimbrinae**

<b>Taxon</b>	<b>#</b>	<b>Area</b>	<b>Biology</b>	<b>Host Family</b>	<b>Source</b>
<i>Striateurytoma</i> Burks 1971	1	NEO IM	Seeds of <i>Annona muricata</i>	Annonaceae	DeSantis 1979
<i>Subbaella</i> Narendran 1994	1	IM			Narendran 1994
<i>Syceurytoma</i> Bouček 1981	1	ETH	On <i>Sycophila</i> sp. in <i>Ficus</i> sp.	Eurytomidae	Bouček et al. 1981
<i>Tenuipetiolus</i> Bugbee 1951	4	NEA	On gall formers	Cecidomyiidae Cynipidae	Burks 1979
<i>Tetramesa</i> Walker 1848	~205	HOL ETH	Grass feeder	Poaceae	Burks 1979
<i>Tetramesella</i> Zerova 1974	1	PAL			Zerova 1974
<i>Townesoma</i> Narendran 1994	1	IM			Narendran 1994
<i>Xanthosomodes</i> Brèthes 1913	1	NEO			Brèthes 1913
<i>Zerovella</i> Narendran & Sheela 1994	1	IM			Narendran & Sheela 1994
<b>HEIMBRINAE</b>					
<i>Heimbra</i> Cameron 1909	6	NEO NEA	Stem-boring beetles	Buprestidae & Curculionidae	Label data
<i>Symbra</i> Stage & Snelling 1986	1	NEO			Stage & Snelling '86

<sup>a</sup> IM = Indo-Malayan; PAL = Palaearctic; NEA = Nearctic; NEO = Neotropical; COS = Cosmopolitan; HOL = Holarctic; ETH = Ethiopian; AUS = Australian; ORI = Oriental; AFR = African

**Table 3. Rileyinae host utilization and distribution <sup>a</sup>**

<b>Taxon</b>	<b>Area</b>	<b>Biology</b>	<b>Host</b>	<b>Source</b>
<i>Dougiola</i> Bouček 1988b				
<i>koebelei</i> (Ashmead)	AUS	Possibly phytophagous	? <sup>b</sup>	Bouček 1988b
<i>yanegai</i> n. sp.	AUS	Associated with <i>Casuarina</i> <i>leuhmanni</i>	Casuarinaceae	Bouček 1988b Label data
<i>Neorileya</i> Ashmead 1904				
<i>albipes</i> Girault 1913	NEO	Hemiptera ova	Coreidae, Pentatomidae	De Santis 1979; Bruner et al. 1975
<i>ashmeadi</i> Crawford 1913	NEO	Hemiptera ova	Coreidae, Pentatomidae	De Santis 1979, 1989 Becker & Prato 1982; Jones 1983 Label data
<i>flavipes</i> Ashmead 1904	NEO	Hemiptera, Orthoptera ova	Tettigoniidae, Pentatomidae, Coreidae	Label data
<i>lynetteae</i> n. sp.	NEO	Reduviidae ova	Reduviidae	Label data
<i>meridionalis</i> Gahan 1927	NEO	Hemiptera, Orthoptera ova	Pentatomidae, Orthoptera	De Santis 1979, 1989 Label data
<i>Rileyia</i> Ashmead 1888				
<i>antennata</i> n. sp.	NEO	Flower stems <i>Stachytarpheta</i> <i>cayennensis</i> and <i>S. jamaicensis</i>	Cecid. <sup>?</sup>	Label data
<i>asiatica</i> Zerova 1976	PAL	<i>Asphondylia</i> sp. on <i>Astragalus</i>	Cecid.	Zerova 1976
<i>bumeliae</i> n. sp.	NEA	<i>Asphondylia</i> <i>bumeliae</i> on <i>Sideroxylon</i> <i>lanuginosum</i>	Cecid.	Label data
<i>canalicoxa</i> Subba Rao 1978	NEO	Assoc. with <i>Baccharis</i>	?	DeSantis 1983
<i>cattleyae</i> n. sp.	NEO	<i>Cattleya</i> spp. root galls	Cecid.: <i>Neolasioptera</i> ?	Label data
<i>cearae</i> (Crawford) 1910	NEO	<i>Mayrellus</i> <i>mirabilis</i> galls	Pteromalidae: Ormocerinae?	Crawford 1910

Table 3 (cont.) Rileyinae host utilization and distribution

Taxon	Area	Biology	Host	Source
<i>cecidomyiae</i> Ashmead 1888	NEA NEO	See Mat. Examined	Cecid.	Peck 1963 Gahan 1918 Thompson 1955 Hawkins & Goeden 1984
<i>couridae</i> (Cameron) 1913	NEO	Leaf galls on <i>Courida</i> sp.	Cecid.?	Cameron 1913
<i>gracilis</i> n. sp.	NEO	On <i>Ficus</i> <i>brenesii</i> [sp?]	Cecid.?	Label data
<i>grisselli</i> n. sp.	NEO	galls on <i>Berberis</i> sp.	Cecid.: Oligotrophini?	Label data
<i>guatemalae</i> n. sp.	NEO	galls on orchid roots	Cecid.	Label data
<i>hegeli</i> Girault 1916	NEO	<i>Eugeniomyia</i> <i>dispar</i> , <i>Stephomyia</i> sp.[?], <i>Asphondylia</i> sp.	Cecid.	Gahan 1918 Mendonça, pers. omm. Label data
<i>heterogaster</i> Gahan 1918	NEA NEO	<i>Leucaena</i> <i>pulverulenta</i> floret galls. <i>Schizomyia</i> <i>rivinae</i> Felt [?], <i>Asphondylia</i> <i>websteri</i> Felt	Cecid.	Gahan 1918 Label data
<i>haumani</i> (Brèthes) 1918	NEO	Gall on <i>Tragia</i> <i>volubilis</i>	Cecid.?	Brèthes 1918
<i>insularis</i> (Ashmead) 1894	NEA NEO	<i>Asphondylia</i> spp.	Cecid.	De Santis 1979 Gahan 1918 Plakidas 1982; Plakidas & Weis 1994; Peck 1963
<i>laeliae</i> n. sp.	NEO	<i>Laelia</i> root galls	<i>Neolasioptera?</i>	Label data
<i>longitergum</i> n. sp.	NEO	Galls on <i>Neea</i> sp. and <i>Piper</i> sp.	Cecid.?	Label data; Hanson, pers. comm.

**Table 3 (cont.) Rileyinae host utilization and distribution**

<b>Taxon</b>	<b>Area</b>	<b>Biology</b>	<b>Host</b>	<b>Source</b>
<i>megastigma</i> (Ashmead) 1894	NEO	<i>Asphondylia</i> <i>rochae</i> , <i>A.</i> <i>boerhaaviae</i>	Cecid.: Asphondyliina	De Santis 1979 Herting 1978 Wolcott 1949
<i>mellea</i> Ashmead 1894	NEO	“Gall on skunk bush” - <i>Cornus</i> <i>foemina</i> ?	Cecid.?:	Peck 1963
<i>oncidii</i> n. sp.	NEO	<i>Oncidium</i> <i>oblongatum</i> root galls	Cecid.: <i>Neolasioptera</i> ?	Label data
<i>orbitalis</i> Ashm. 1904	NEO	<i>Stachytarpheta</i> stem galls, gall on <i>Randia</i> <i>aculeata</i>	Cecid.?	Label data
<i>orchideara</i> n. sp.	NEO	<i>Trichopilia</i> <i>suavis</i> root galls	Cecid.: <i>Neolasioptera</i> ?	Label data
<i>pallidipes</i> (Ashmead) 1894	NEO	<i>Asphondylia</i> <i>websteri</i> Felt in fruit of <i>Simmondsia</i> <i>chinensis</i> & <i>Parkinsonia</i> <i>aculeata</i> ; <i>Asphondylia</i> spp.[?]	Cecid.	Pinto & Frommer 1980; label data
<i>philodendrica</i> n. sp.	NEO	<i>Philodendron</i> sp. root galls	Cecid.: Oligotrophini?	Label data
<i>piercei</i> Crawford 1914	NEO	<i>Asphondylia</i> <i>atriplicis</i>	Cecid.: Asphondyliina	Hawkins & Goeden 1984
<i>pulchra</i> (Ashm.) 1894	NEO	<i>Procystiphora</i> sp. [?]	Cecid.?	Label data
<i>rhytisma</i> n. sp.	NEO	Gall on <i>Gymnopodium</i> <i>floribundum</i>	Cecid.?	Pers. obs.
<i>spadix</i> (Girault) 1915	AUS	Galls on grapes, <i>Santalum</i> <i>lanceolatum</i>	Cecid.	Bouček 1988b

<sup>a</sup> Taxa for which host information is unknown have been omitted from this table.

<sup>b</sup> “?” indicates that the information is unknown or that the taxon preceding it is a potential host as recorded in other sources (primarily Gagné 1989, 1994).

Table 4. Confirmed and suspected hosts and host plants for Rileyinae

Plant Family	Plant Host	Gall-Former Host Potential Host	Gall Type	Source <sup>c</sup>
Anacardiaceae	<i>Rhus copallina</i> <i>lanceolata</i> Gray	<i>Asphondylia</i> <i>integrifoliae</i> Felt: galls <i>Rhus</i> spp. Same as above	Cecid. bud gall	Label
Araceae	On <i>Rhus virens</i> <i>Philodendron</i> sp.	Oligotrophini?	?	Label
Aquifoliaceae	<i>Ilex opaca</i> AIT.	<i>Asphondylia</i> <i>ilicicola</i> Foote	Aborted berry	Highland 1964
Asteraceae	<i>Ambrosia</i> <i>artemisifolia</i> L. <i>A. artemisifolia</i> L.	<i>Neolasioptera</i> <i>ambrosiae</i> Felt <i>Schizomyia</i> sp.	Tapered stem swelling	Label
	<i>A. artemisifolia</i> L.	<i>Rhopalomyia</i> <i>ambrosiae</i> Gagné	Globular leaf swelling	Label
	<i>A. artemisifolia</i> L.	<i>Asphondylia</i> <i>ambrosiae</i> Gagné	Green, leafy bud gall	Label
	<i>Ambrosia</i> <i>psilostachya</i> DC.	<i>Contarinia</i> <i>parthenicola</i> (Cock.)	White, fuzzy, ovoid bud/flower gall, white fungus internally	Label
	<i>Artemisia</i> <i>tridentata</i> Nutt. <sup>a</sup>	32 <i>Rhopalomyia</i> spp.	As above, no white fungus internally	Label
	<i>Baccharis</i> <i>sarothroides</i> A. Gray	<i>Neolasioptera</i> <i>lathamii</i> Gagné	Numerous	Label
	<i>Barkleyanthus</i> <i>salicifolius</i> (Kunth.)	?	Soft stem swellings	Label
	<i>Bidens pilosa</i> L.	<i>Asphondylia bidens</i> Johannsen	Leafy stem gall	Label
	<i>Borrchia</i> <i>frutescens</i> (L.)	<i>Asphondylia</i> <i>borrichiae</i> Rossi & Strong	Modified, aborted floret	Label
	<i>Cynara</i> sp.	?	Swollen pair leaves jointed at base	Rossi et al. 1992
	<i>Chrysothamnus</i> sp.	5 genera	Stem galler	Label
	<i>Encelia</i> sp.	<i>Asphondylia</i> <i>enceliae</i> Felt	Many	Label
			Leafy bud gall	Label

Table 4 cont. Confirmed and suspected hosts and host plants for Rileyinae

Plant Family	Plant Host	Gall-Former Host Potential Host	Gall Type	Source
Asteraceae	<i>Encelia</i> sp.	<i>Rhopalomyia enceliae</i> Felt	Conical lateral bud gall	Label
	On <i>Gutierrezia</i> sp.	2 genera, 4 spp. of Cecidomyiidae	Flower, stem, leaf galls	Label
	<i>Helianthus grosseserratus</i> Marteus <sup>b</sup>	<i>Asphondylia helianthiglobula</i> O.S.	Globular stem gall	Label
	<i>Helianthus tuberosus</i> L.	<i>Asphondylia helianthiglobula</i>	Globular stem gall	Label
	<i>H. tuberosus</i> L.	<i>Olpodiplosis helianthi</i> (Brodie)	Tubular gall, all plant parts	Label
	<i>H. tuberosus</i> L.	<i>Pilodiplosis helianthibulla</i> (Walsh)	Convex leaf gall	Label
	<i>Helenium autumnale</i> L.	<i>Asphondylia autumnalis</i> Beut. or sp.	Leafy bud gall & modified aborted flower, resp.	Peck 1963
	<i>Palofaxia feayi</i> Gray	<i>Asphondylia</i> sp.		Label
	<i>Parthenium hysterophorus</i> L.	<i>Asphondylia</i> sp.	Swollen male floret	Label
	<i>Parthenium xanthocephalum</i>	<i>Contarinia parthenicola</i> (Cock.)	White woolly galls on bud, leaf or inflorescence	Label
	<i>Pluchea</i> sp.	<i>Asphondylia</i> sp.	Seed heads	Label
	<i>Rudbeckia laciniata</i> L.	<i>Asphondylia rudbeckiaconspicua</i> O.S.	Globular bud & apical meristem gall	Plakidas 1982; Plakidas & Weis 1988
	<i>Solidago</i> spp.	At least 6 cecid. genera	Various	Label
Balsaminaceae	<i>Impatiens capensis</i> Meerb., <i>I. pallida</i> Nutt.	<i>Neolasioptera impatientifolia</i> (Felt)	Midrib or petiole gall	Label
Berberidaceae	<i>Berberis</i> sp.	Oligotrophini?	Bud gall	Label

**Table 4 cont. Confirmed and suspected hosts and host plants for *Rileyinae***

Plant Family	Plant Host	Gall-Former Host Potential Host	Gall Type	Source
Bignoniaceae	<i>Chilopsis linearis</i> (Cav.)	<i>Contarinia</i> sp.	Flower gall	Label
Brassicaceae	<i>Stanleya</i> sp.	<i>Dasineura stanleyae</i> (Cock)	Flower gall	Label
Cactaceae	<i>Opuntia</i> spp.	<i>Asphondylia betheli</i> (Cock.)	Fruit gall	Label + lit.
	<i>Opuntia</i> spp.	<i>Contarinia opuntiae</i> (Felt)	Necrotic tissue near base of spine	Label + lit.
		<i>Neolasioptera</i> sp. & "Mayetiola" spp.	Slight swelling	Label + lit.
Capparaceae	On <i>Cleomella oblusa</i> ( <i>obtusifolia</i> Torr. & Frem.?)			Label
Chenopodiaceae	<i>Atriplex canescens</i> (Pursh.), <i>A. polycarpa</i> (Torrey)	Three genera and ten species of Cecidomyiidae	Numerous	Hawkins & Goeden 1984
Chenopodiaceae	<i>Atriplex hymenelytra</i> (Torr.)	Gall of Cecidomyiidae	?	Label
	<i>Hymenoclea salsola</i> Gray	Unknown	"Galls"	Label
Cupressaceae	<i>Juniperus</i> sp.	Three genera of Cecidomyiidae	Needle, fruit, stem galls	Label
Fabaceae	<i>Acacia constricta</i> Benth.		Leaflet gall?	Label
	<i>Acacia greggii</i> A. Gray	<i>Contarinia</i> sp.	Swollen, joined leaflets	Label
	<i>Inga edulis</i> Mart.	Unknown cecidomyiid	Fruit gall	Label
	<i>Leucaena pulverulenta</i> (Schlect.)	Unknown cecidomyiid	Floret gall	Gahan 1918

Table 4 cont. Confirmed and suspected hosts and host plants for Rileyinae

Plant Family	Plant Host	Gall-Former Host Potential Host	Gall Type	Source
Fabaceae	<i>Phaseolus vulgaris</i> L.	<i>Asphondylia websteri</i> Felt or <i>Prodiplosis longifolia</i> Gagné	Bud and pod, respectively	Label
	<i>Prosopis glandulosa</i> Torrey	<i>Asphondylia prosopidis</i> (Cock.) and sp.	Flower galls	Label
	<i>Prosopis</i> sp.	<i>Asphondylia websteri</i> Felt	Leaflet galls?	Label
	<i>Pithecellobium guadalupense</i> (Pers.)	<i>Asphondylia</i> sp.	Seed pods	Label
Fagaceae	On <i>Quercus virginiana</i> P. Mill.	Six cecidomyiid genera	Various	Label
Juncaceae	<i>Juncus effusus</i> L.	<i>Procytiphora</i> spp.	Stems	Label
Lamiaceae	<i>Poliomintha incana</i> (Torrey)			Label
Malvaceae	<i>Sida acuta</i> Burm. f.	<i>Asphondylia sidae</i>	Bud gall	Label
	<i>Sida rhombifolia</i> L.	<i>Neolasioptera sidae</i>	Stem gall	Label
	<i>Sphaeralcea angustifolia</i> Cav.	<i>Contarinia</i> sp. known on other <i>Sphaeralcea</i> species	Larva in bud	Label
Moraceae	<i>Ficus brenesii</i> [?]	<i>Ficiomyia</i> sp., <i>Calmonia</i> sp.	Leaf/fruit galls	Label
Myrsinaceae	<i>Parathesis chrysophila</i>	<i>Chrysophalla</i> sp.?? Lundell	Leaf gall	Label
Myrtaceae	<i>Eugenia axillaris</i> (Sw.) Willd.	<i>Stephomyia eugeniae</i> (Felt) & sp.	Fuzzy & smooth conical leaf galls, respectively	Label
	<i>Eugenia uniflora</i> L.	<i>Eugeniamyia dispar</i> Maia, Mend. & Rom.	Leaf gall	Mendonça, unpub. data



**Table 4 cont. Confirmed and suspected hosts and host plants for Rileyinae**

Plant Family	Plant Host	Gall-Former Host Potential Host	Gall Type	Source
Nyctaginaceae	<i>Boerhavia coccinea</i> Miller, <i>diffusa</i> L. or <i>erecta</i> L.	<i>Asphondylia boerhaaviae</i>	Flower/fruit gall	Label
	<i>Neea</i> sp.	<i>Bruggmannia</i> spp. (8)	Spheroid, hairy stem/leaf galls	Label
Orchidaceae	At least four genera	<i>Clinodiplosis cattleyae</i> , <i>Neolasioptera</i> sp.	Swollen aerial root (Unemerged wasps)	Label
Phytolaccaceae	<i>Rivina humilis</i> L.	<i>Schizomyia rivinae</i> Felt	Bud gall	Label
	<i>Gymnopodium floribundum</i> Rolfe		Spheroid, fuzzy leaf galls	Reared
Portulacaceae	On <i>Portulaca belgica</i>	<i>Asphondylia</i> or <i>Neolasioptera</i> ?	Stem or flower galls on <i>Portulaca oleracea</i> L.	Label
Ranunculaceae	<i>Clematis drummondi</i> Torr. & Gray	<i>Asphondylia clematidis</i> Felt	Flower/bud gall (Wasps with host material)	Label.
Rhamnaceae	<i>Ceanothus jepsonii</i> Greene	<i>Asphondylia ceanothi</i> Felt	Bud gall	Label
	<i>Ceanothus</i> sp.	<i>Asphondylia</i> sp.	Leafy node gall	Label
	<i>Ceanothus tomentosus</i> Parry	?	Gall?	Label
Rosaceae	<i>Heteromeles arbutifolia</i> (Lindley)	<i>Asphondylia photiniae</i> Pritchard	Aborted berries	Label
	<i>Adenostoma</i> sp.	<i>Asphondylia adenostoma</i> Felt is on <i>A. fasciculatum</i> Hook & Arn.	In seeds	Label

Table 4 cont. Confirmed and suspected hosts and host plants for Rileyinae

Plant Family	Plant Host	Gall-Former Host Potential Host	Gall Type	Source
Rubiaceae	<i>Randia aculeata</i> L.	Unknown cecidomyiid	Gall?	Label
Sapotaceae	<i>Bumelia lanuginosa</i> (Michx.)	<i>Asphondylia bumeliae</i> Felt	Twig gall	Label
Simmond- siaceae	<i>Simmondsia chinensis</i> (Link)	<i>Asphondylia websteri</i> Felt	Deformed fruit (Wasps with host material)	Pinto & Frommer 1980
Styracaceae	On <i>Styrax officinalis</i> L.	Two genera known from <i>Styrax</i> sp.	? Leaf and stem galls known	Label
Zygophyll- aceae	<i>Larrea tridentata</i> (DC)	<i>Asphondylia auripila</i> + 15 <i>Asphondylia</i> spp.	Various leaf and stem galls	Waring & Price 1989

<sup>a</sup> See Jones et al. (1983) for cecidomyiids on *A. tridentata*.

<sup>b</sup> For *Helianthus* spp. attacked by 8+ species of Cecidomyiidae in the Nearctic, see Gagné (1989).

<sup>c</sup> Label data are assumed to be unconfirmed records.