

TAXONOMY AND NOMENCLATURE

**A review of the Neotropical species of the shore-fly genera
Orasiopa and *Pectinifer* (Diptera: Ephydriidae)**

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ABSTRACT. Species of two genera of the tribe Discocerini from the Neotropics are reviewed with an emphasis on the fauna from Brazil. The two species, *Orasiopa (Reymontopa) mera* (Cresson, 1939) and *Pectinifer aeneus* (Cresson, 1918), are described, illustrated and new occurrence data are provided. Phylogenetic relationships of these two genera into the tribe are discussed. To facilitate identification of these species, we have included diagnoses of the Discocerini and both genera and have also provided an annotated key to the New World genera in this tribe. We have also provided illustrations, photographs, and scanning electron micrographs of external structures and of structures of the male terminalia for included species.

KEY WORDS. Neotropical Region, shore flies, Discocerini, taxonomy.

Two shore-fly genera, *Orasiopa* Zetwornicki & Mathis, 2001, and *Pectinifer* Cresson, 1944, that occur in the Neotropics are reviewed in this paper. Although both genera had been reported previously from the Neotropical Region (WIRTH 1968, MATHIS & ZATWORNICKI 1995, MATHIS 1997), our knowledge was then limited to a few specimens from even fewer localities. Herein, we present a more comprehensive treatment of both genera, including much new distributional data and illustrations to facilitate identification of both species. This paper is part of a series of comprehensive treatments on the Neotropical fauna of Discocerini Cresson, 1925 (MATHIS & ZATWORNICKI 2012, 2013).

Both genera being reviewed here are represented by a single species in the Neotropics. Elsewhere, *Orasiopa* is represented by 15 species in the Old World tropics (ZATWORNICKI 2002), and *Pectinifer* is monotypic and occurs exclusively in the New World tropics. Until recently, specimens of these taxa were generally scarce in collections.

In the Neotropical Region, Discocerini is biologically diverse (MATHIS & ZATWORNICKI 1995). At the species level, however, that diversity is only now becoming reasonably well known. This observation is based on samplings of the fauna from various localities throughout the Region during the last 40 years and also on recent revisions of three included genera (*Facitrachophora* Mathis & Zetwornicki, 2013, *Hydrochasma*

Hendel, 1936, and *Polytrichophora* Cresson, 1924) in which several new species from the Neotropics were described (MATHIS & ZATWORNICKI 2012, 2013). When CRESSON (1946) published his synopsis of Discocerini from the Neotropical Region, 28 species were included in four genera, and some of these species were based on tentative identifications. Over twenty years later, WIRTH's (1968) catalog of shore flies from the Neotropical Region listed 30 species in four genera. Herein, in the recent revisions noted (MATHIS & ZATWORNICKI 2012, 2013), and in revisions we are preparing of the genera *Discocerina* Macquart, 1835 and *Lamproclasiopa* Hendel, 1933 we treat 38 species in seven genera from the fauna of Brazil alone. Our sampling from Brazil is mostly from the southern states, and we anticipate that additional species will be added. The same patchiness or total lack of sampling applies to the Neotropical fauna in general. Comprehensive collecting of the Neotropical fauna of shore flies still needs to be encouraged and supported.

The genesis for this review was the shore-fly survey from of this biologically diverse country, especially the southern states, and resulted in many specimens of Discocerini. We soon discovered that unreported species were represented in this fauna. The purpose of this paper is to review species of the genera *Orasiopa* and *Pectinifer*, documenting more comprehensively the included species and providing new distributional data.

MATERIAL AND METHODS

The terminology, with the exceptions noted in MATHIS (1986) and MATHIS & ZATWARNICKI (1990a, 1990b), follows McALPINE (1981). ZATWARNICKI (1996) suggested that the pre- and postsurstylus correspond with the pre- and postgonostylus and that the subepandrial sclerite is the same as the medandrium. We use the term basal flagellomere for the large antennomere beyond the pedicel. We prefer this term over “first flagellomere” as there may be more than one flagellomere involved, and basal does not imply a number or numbers. We likewise do not use “postpedicel” (STUCKENBERG 1999) for this antennomere because at least the multisegmented arista is beyond the pedicel in addition to the large antennomere, and postpedicel is thus ambiguous and lacking in precision.

Because specimens are small, usually less than 2.60 mm in length, study and illustration of the male terminalia and determination of species required use of a compound microscope.

Dissections of male terminalia were performed following CLAUSEN & COOK (1971) and GRIMALDI (1987). Abdomens were removed with microforceps and macerated in a sodium hydroxide solution. Cleared genitalia were then neutralized in dilute glacial acetic acid and transferred to glycerin for observation, description, and illustration. The dissected abdomen was placed in a plastic microvial filled with glycerin and attached to the pin supporting the remainder of the insect from which it was removed.

Photographs of specimens, especially heads, were taken with a Visionary Digital System. The images series obtained were combined by Zerene Stacker® and edited with Adobe Photoshop®.

The species descriptions are composite and not based solely on holotypes. Head and two venational ratios used in the descriptions were based on three specimens (largest, smallest, and one other) as follows: gena-to-eye ratio – genal height (immediately below maximum eye height)/eye height; costal vein ratio – the straight line distance between the apices of R_{2+3} and R_{4+5} /distance between the apices of R_1 and R_{2+3} ; M vein ratio – the straight line distance along vein M between crossveins dm-cu and r-m/distance apicad of dm-cu.

Distribution maps were made using ESRI ArcView® GIS 3.2. Geographical coordinates were obtained from specimen labels. If coordinates were unavailable, they were culled from gazetteers and maps.

Specimens examined are deposited in the following collections: National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM); Universidade Federal do Paraná, Coleção Entomológica Padre Jesus Santiago Moure, Departamento de Zoologia, Curitiba, Paraná, Brazil (DZUP); Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica (INBio); Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP). We also examined specimens, especially primary types from the Academy of Natural Sciences of Philadelphia, Pennsylvania (ANSP).

For perspective and to facilitate genus-group and species-group recognition, the tribe Discocerini is diagnosed and a key to included genera is provided.

TAXONOMY

Discocerini Cresson, 1925

Discocerini Cresson, 1925: 228 [as Discocerini]. Type genus: *Discocerina* Macquart, 1835. Cresson, 1942: 104 [correct spelling, as “new tribe” in his key]. Mathis & Zuyin, 1989: 435 [diagnosis]. Mathis & Zatzwarnicki, 1995: 163-186 [world catalog]. Zatzwarnicki & Mathis, 2001: 5-51 [tribal revision]. Zatzwarnicki et al., 2016: 1-34 [phylogenetic review of tribe].

Diagnosis. Discocerini as a tribe of Gymnomyzinae, is distinguished from others by the following combination of characters: **Head.** Frontal vitta (or ocellar triangle) mostly bare of setulae, not conspicuously setulose; ocellar setae well-developed, inserted anterolaterad of anterior ocellus; reclinate fronto-orbital seta inserted anteromediad of proclinate fronto-orbital (if 2 proclinate fronto-orbital setae, reclinate seta inserted anteromediad of larger, posterior, proclinate seta); pseudopostocellar setae well developed, proclinate, slightly divergent, usually at least half length of ocellar setae. Pedicel bearing a large seta anterodorsally; arista bearing 4-6 dorsal rays, inserted along length of arista; conical process of basal flagellomere in lateral view finger-like. Face generally shallowly arched, frequently more prominent at level of dorsal facial setae, not conspicuously pitted, rugose, tuberculate, or carinate. Gena generally short (secondarily high in some species), bearing setulae (including midportion) and 1 large seta, its posterior (postgenal) margin rounded, not sharp. Oral opening and clypeus narrow; mouthparts generally dark colored; proboscis with number of pseudotracheae quite variable; lacinia Y-shaped with narrow posteromedial arm, dorsal arm spatulate; 2 different kinds of cibarium: (1) primitive type with dispersed medial sensillae arranged sparsely in a horizontal line; (2) advanced type with medial sensillae arranged densely in a sinuous line. **Thorax.** Mesonotum generally microtomentose, frequently densely so, although variable; mesonotal setae weakly developed, only posteriormost pair of dorsocentral and acrostichal conspicuous; postsutural supra-alar seta usually evident although sometimes reduced or absent; prescutellar acrostichal setae inserted approximate and posterior of alignment of posteriormost dorsocentral setae; scutellar disc usually densely setulose; scutellum bearing 2 large, marginal setae: notopleural setae 2, inserted at same level near ventral margin, in some genera notopleuron bears setulae in addition to the two large notopleural setae (Fig. 12); anepisternum with 2 subequal setae inserted along posterior margin. Wing with vein R_{2+3} long, extended nearly to level of apex of vein R_{4+5} . Foreleg normally developed, not raptorial with greatly enlarged femur. **Abdomen.** Five tergites visible, usually not covered with microtomentum. Male terminalia: Epandrium as inverted U, encircling cerci, anterior margin rounded, in lateral view with setae mainly on dorsum and along anteroventral margin; cerci paired, hemispherical, setose; presurstylus lacking or fused indistinguishably with ventral margin of epandrium;

posterolateral arms of epandrium attached with ventral apex of gonites, middle of posterior margin a base for phallapodeme; phallapodeme situated under aedeagus, associated with hypandrium and with ventral part of base of aedeagus, ventral margin with lobate appendix providing attachment for genital muscles that move aedeagus; gonite paired, connecting sides of base of aedeagus and laterodorsal margin of epandrium, bearing 1 or some setulae; aedeagus tubular, tapered anteriorly; ejaculatory apodeme usually lacking, if present as a spatula.

Remarks. Starting with CRESSON (1925), who first described Discocerinini, and including all researchers of the family until MATHIS & ZUYIN (1989), the diagnoses, descriptions, and catalogs of this tribe included some taxa that are not closely related phylogenetically, rendering the tribe polyphyletic. MATHIS & ZUYIN (1989) then recharacterized Discocerinini based on synapomorphies, under which MATHIS & ZATWARNICKI (1995) included eight genera and 143 species in their world catalog. ZATWARNICKI & MATHIS (2001) added two genera, *Galaterina* Zatzwarnicki & Mathis, 2001 and *Orasiopa*, and altered the status of some subgenera in their phylogenetic study of the tribe. More recently, MATHIS & ZATWARNICKI (2013) proposed *Facitrichophora* for four Neotropical species that were described in the same paper. As currently characterized (herein and in ZATWARNICKI et al. 2016), Discocerinini is one of the richest tribes within the family Ephydriidae with 213 species in 13 genera and two subgenera. Two genera are monotypic and have relatively localized distributions: *Galaterina* in the Solomon and Andaman Islands and *Pectinifer* limited to the Neotropics (herein). Other genera are more diverse and widespread. *Aquachasma* Zatzwarnicki (24 species), *Facitrichophora* (4 species), *Hydrochasma* (10 species), and *Polytrichophora* (nominotypical subgenus) (21 species) are found in the New World. The distributions of *Lamproclasiopa* (19 species) and *Orasiopa* (15 species) extend from the New World into the Australasian and Oriental Regions. *Diclasioipa* Hendel, 1917 (4 species), *Gymnoclasiopa* Hendel, 1939 (27 species), *Hecamedoides* Hendel, 1917 (26 species) and *Ditrichophora* Cresson, 1924 (35 species) have been recorded from all Regions except the Neotropics. Two genera, *Discocerina* (18 species) and *Skłodowskora* (10 species), are essentially cosmopolitan.

The two genera that we treat herein, *Orasiopa* and *Pectinifer*, are in different groups of genera within Discocerinini (ZATWARNICKI & MATHIS 2001, ZATWARNICKI et al. 2016), and the composition and phylogenetic relationships of these two groups are discussed under each genus.

Key to Genera and Subgenera of Discocerinini

1. Notopleuron with 2 large setae and bare of setulae2
- 1'. Notopleuron setulose in addition to 2 large setae.....6
2. Forefemur bearing distinct row of stout, short setae along apical half of posteroventral surface3
- 2'. Forefemur lacking row of short, stout setae along posteroventral surface.....4
3. Face metallic shiny bearing white microtomentose spots laterally; forefemur slightly enlarged*Pectinifer* Cresson
- 3'. Whole face shiny or completely covered with microtomentum; forefemur normally developed*Ditrichophora* Cresson
4. Postsutural supra-alar seta strong, distinct, longer than posterior notopleural seta. Face with dorsoclinate seta at lower lateral extremity.....*Diclasioipa* Hendel
- 4'. Postsutural supra-alar seta very short or absent, if distinguishable distinctly shorter than posterior notopleural seta. Face without dorsoclinate seta at lower lateral extremity.....5
5. Hindtibia with a preapical, ventral, spur-like seta; face rather prominent at level of dorsal facial setae, sometimes transversely carinate; facial series of setae inserted in some distance to parafacial, comprising 2-3 large setae; dorsal seta inserted slightly medially from other setae and arising from distinct, shiny papilla, with a small, slightly dorsoclinate seta laterad of dorsal seta*Hecamedoides* Hendel
- 5'. Hindtibia lacking a preapical, ventral spur-like seta; face rather flattened, antennal grooves not always sharply defined ventrally; facial series of setae inserted very close to parafacial, comprised of 2 large setae; dorsal seta not arising from a shiny papilla and lacking a smaller seta laterad of dorsal seta*Gymnoclasiopa* Hendel
6. Mesonotum bearing long and densely hairs*Galaterina* Zatzwarnicki & Mathis
- 6'. Mesonotum lacking long and densely hairs.....7
7. Face with 2 or more conspicuous rows of setae/setulae on each side, paralleling facial suture setal row medial, row(s) of setulae between setal row and parafacial8
- 7'. Face with a single row of setae laterally 10
8. Face with setae and setulae of rows inclinate or ventroinclinate *Facitrichophora* Mathis & Zatzwarnicki
- 8'. Face with secondary series of dorsolaterally inclined setae laterad to primary series Genus *Polytrichophora* Cresson
9. Parafacials becoming 3-4 times wider ventrally; gena high, at least 1/4 eye height.....Subgenus *Polytrichophora* Cresson
- 9'. Parafacials 2-3 times wider ventrally; gena low, less than 1/4 eye height Subgenus *Skłodowskora* Zatzwarnicki
10. Gena and lower part of parafacial broad; lateral margin of abdomen usually with gray to whitish microtomentose areas, these usually wedge-shaped..... 11
- 10'. Gena and parafacial rather narrow; abdomen lacking wedge-shaped, light-colored areas laterally 12
11. Head subglobose, oral opening comparatively large; dorsum of tergites darker dorsomedially than on lateral margins, but without contrasting areas..... *Hydrochasma* Hendel
- 11'. Head not subglobose, oral opening comparatively small; dorsum of tergites 2-4 extensively dark gray to black with

- sharply contrasted gray lateral margin or with wedge-shaped silvery-gray areas..... *Aquachasma* Zatwarnicki
12. Parafacial bearing setulae..... *Discocerina* Macquart
- 12'. Parafacial lacking setulae 13
13. Facial series of setae 2, these well separated, distance between subequal to length of basal flagellomere; parafacial very narrow at anteroventral margin of eye; postsutural supra-alar and prescutellar acrostichal setae greatly reduced or lacking *Lamproclasiopa* Hendel
- 13'. Facial series of setae 3-4, distance between setae conspicuously less than length of basal flagellomere; parafacial evenly wide throughout length; postsutural supra-alar and prescutellar acrostichal setae present 14 Genus *Orasiopa* Zatwarnicki & Mathis
14. Species slender; antenna largely yellow; arista bearing 5 dorsal rays; palpus yellow; knob of halter dark; thorax and abdomen gray microtomentose; legs mostly yellow (sometimes midfemur dark) Subgenus *Orasiopa* Zatwarnicki & Mathis
- 14'. Species compact; antenna dark brown or black; arista bearing usually 7-11 dorsal rays; palpus brownish or black; knob of halter white; coloration of thorax and abdomen dark brown or black; legs mostly dark brown to black..... Subgenus *Reymontopa* Zatwarnicki

Orasiopa Zatwarnicki & Mathis, 2001

Orasiopa Zatwarnicki & Mathis, 2001: 39. Type species: *Orasiopa millennica* Zatwarnicki & Mathis, 2001, original designation. Zatwarnicki, 2002: 297-317 [revision]. Zatwarnicki et al., 2016: 17-20 [recharacterization in phylogenetic review of tribe].

Diagnosis. *Orasiopa* is distinguished from other genera of Discocerini by the following combination of characters: Small to moderately small shore flies, body length 2.20-3.60 mm; generally densely microtomentose, dull species. **Head.** Frons lacking orbital setae. Face moderately prominent at level of dorsal facial seta; antennal grooves generally weakly defined ventrally; face bearing one series of setae and one series of fine setulae; facial setae 4, dorsal setae not arising from shiny papilla, lacking dorsoclinate seta at lower lateral extremity; parafacial narrow throughout length, lacking setulae; gena short (gena-to-eye ratio 0.06-0.22). Eye oval, moderately conspicuously microsetulose, bearing distinct interfacetal setulae. **Thorax.** Single presutural and postsutural supra-alar setae evident; acrostichal setae present; notopleuron bearing several setulae in addition to 2 larger, ventral setae. Wings brown infumate or transparent; costa bearing 5-6 long, dorsal setae between humeral and subcostal breaks. Forefemur normally developed, lacking row of short, stout setae along posteroventral surface; hindtibia lacking a preapical, ventral, spur-like seta. **Abdomen.** Tergites unicolorous, lacking pale colored areas laterally; tergite

4 of male longer than tergite 3. Male terminalia. Epandrium complete posteriorly, although sometimes attenuate in dorsal view, ellipsoidal in outline, generally more broad anteriorly, setulose mostly in anterior area; cerci not fused with epandrium, elongate, moderately covered with setae; gonites fused with hypandrium with one setula or without setulae, in dorsal view band-like, in lateral view not distinguishable from hypandrium; aedeagus symmetrical, moderately elongate, in dorsal view triangular or rectangular with broadly rounded anterior margin, or asymmetrically turned anterolaterally, posterior surface wrinkled or covered by small setulae dorsally; hypandrium in dorsal view U-shaped with broadly rounded base and slightly broadened lateral arms, in lateral view band-like; phallopodeme weakly developed, separate from aedeagus, in dorsal view flat or Y-shaped with triangular base, in lateral view band-like without ventral projection or irregularly trapezoidal; ejaculatory apodeme absent.

Phylogenetic considerations. The former *Discocerina* group of genera (*Discocerina*, *Galaterina*, *Hydrochasma*, *Lamproclasiopa*, *Orasiopa*, and *Polytrichophora*) is the best supported clade within Discocerini and is characterized by two synapomorphies: (1) notopleuron bearing setulae; (2) gonites either elongated without an anterior projection or wholly reduced (ZATWARNICKI & MATHIS 2001). However, this clade was recently divided into two groups, the *Lamproclasiopa* and *Discocerina* groups (ZATWARNICKI et al. 2016), and *Orasiopa* is placed in the *Lamproclasiopa* group. ZATWARNICKI et al. (2016) confirmed the monophyly of *Lamproclasiopa* group by a single character: base of palpal setae papilla-like (character 13 in ZATWARNICKI et al. 2016). The monophyly of the *Orasiopa* + *Galaterina* clade is supported by mouthparts having a larger number of pseudotracheae (at least 8). According to ZATWARNICKI et al. (2016) the diagnostic characters for *Orasiopa* are: facial series of setae 3-4, 13-15 medial sensillae, gonites fused with hypandrium, and phallopodeme weakly developed. ZATWARNICKI et al. (2016) recently divided *Orasiopa* into two subgenera, with the nominotypical subgenus being distinguished by the following synapomorphies: proboscis with 8 pseudotracheae and knob of halter dark. The new subgenus they proposed, *Reymontopa*, is distinguished by three characters: (1) lacking epandrial setation on the dorsal section; (2) aedeagus and phallopodeme asymmetrical; and (3) mouthparts with 11 pseudotracheae.

Remarks. ZATWARNICKI & MATHIS (2001) described *Orasiopa* and shortly thereafter ZATWARNICKI (2002) revised the genus. *Orasiopa* is essentially an Old World genus that is widespread in the Australasian/Oceanian and Oriental Regions, as well as Japan and the Seychelles. *Orasiopa mera* (Cresson, 1939) is found in the New World, where it has apparently been widely introduced, perhaps through human transport, with some subsequent dispersal. This is the first record of *Orasiopa* from Brazil, Costa Rica, and the United States, as well as many island nations of the Caribbean (Barbados, Cuba, Grenada, Jamaica, Saint Vincent, and Trinidad and Tobago).

Subgenus *Reymontopa* Zatwarnicki, 2016

Reymontopa Zatwarnicki in Zatwarnicki et al., 2016: 19. Type species: *Discocerina mera* Cresson, 1939, by original designation.

Diagnosis. This subgenus is distinguished from the non-typical subgenus by the following combination of characters: Species generally compact; thorax and abdomen dark brown or black. **Head.** Antenna dark brown or black; arista bearing usually 7-11 dorsal rays; palpus brownish or black. Proboscis with 11 pseudotracheae. **Thorax.** Knob of halter white; legs mostly dark brown to black. **Abdomen.** Male terminalia asymmetrical; epandrium with setation over entire length.

Distribution. Afrotropical: Seychelles. Oriental: Brunei, China (Yunnan), Indonesia (Sumatra, Sulawesi, Irian Jaya), Japan (including Ryukyu Islands), Taiwan, Thailand, Malaysia, Singapore. Australasian/Oceanian: Australia, Bismarck Archipelago, Carolines, Eniwetok Atoll, Fiji, Gilbert Islands, Guam, Hawaii Islands, Marianas Islands, Marshall Islands, Pulau Biak, Papua New Guinea, Solomon Islands, Society Islands, Tahiti. Neotropical: Belize, Brazil (Paraná, São Paulo), Costa Rica (Puntarenas), Trinidad and Tobago, West Indies (Barbados, Cuba, Dominican Republic, Grand Cayman, Grenada, Jamaica, Puerto Rico, Saint Lucia, Saint Vincent).

Remarks. Of the 13 species included by ZATWARNICKI et al. (2016) in this subgenus, only *O. mera* (Cresson) occurs in the New World. The other congeners of both subgenera occur primarily in the Old World tropics. ZATWARNICKI et al. (2016) noted that this subgenus was named after a famous Polish novelist and Nobel laureate, Wladyslaw Reymont.

Orasiopa (Reymontopa) mera (Cresson, 1939)

Figs. 1-16

Discocerina mera Cresson, 1939: 6. [Taiwan. Takao (= Kao-hsiung); HT female, ANSP (6573)]. Zatwarnicki 1991: 303-305 [revision]. Cogan & Wirth, 1977: 326 [Oriental catalog]. Mathis, 1989: 642 [Australasian/Oceanian catalog]; 1997: 34-35 [review, Belize, figures, list Dominican Republic, Grand Cayman, Puerto Rico, St. Lucia]. Woodley & Hilburn, 1994: 29 [list, Bermuda]. Mathis & Zatwarnicki, 1995: 169 [world catalog]. *Discocerina peculiaris* Miyagi, 1977: 15 [Japan. Shikoku: Uwajima, Ehime-ken; HT male, HUS]. Zatwarnicki, 1991: 303 [synonymy].

Orasiopa mera. Zatwarnicki & Mathis, 2001: 40 [new combination]. Zatwarnicki, 2002: 310-311 [revision]. Mathis & Zatwarnicki, 2003: 630-631 [review, Aldabra, Seychelles]. Perez-Gelabert, 2008: 177 [list, Hispaniola].

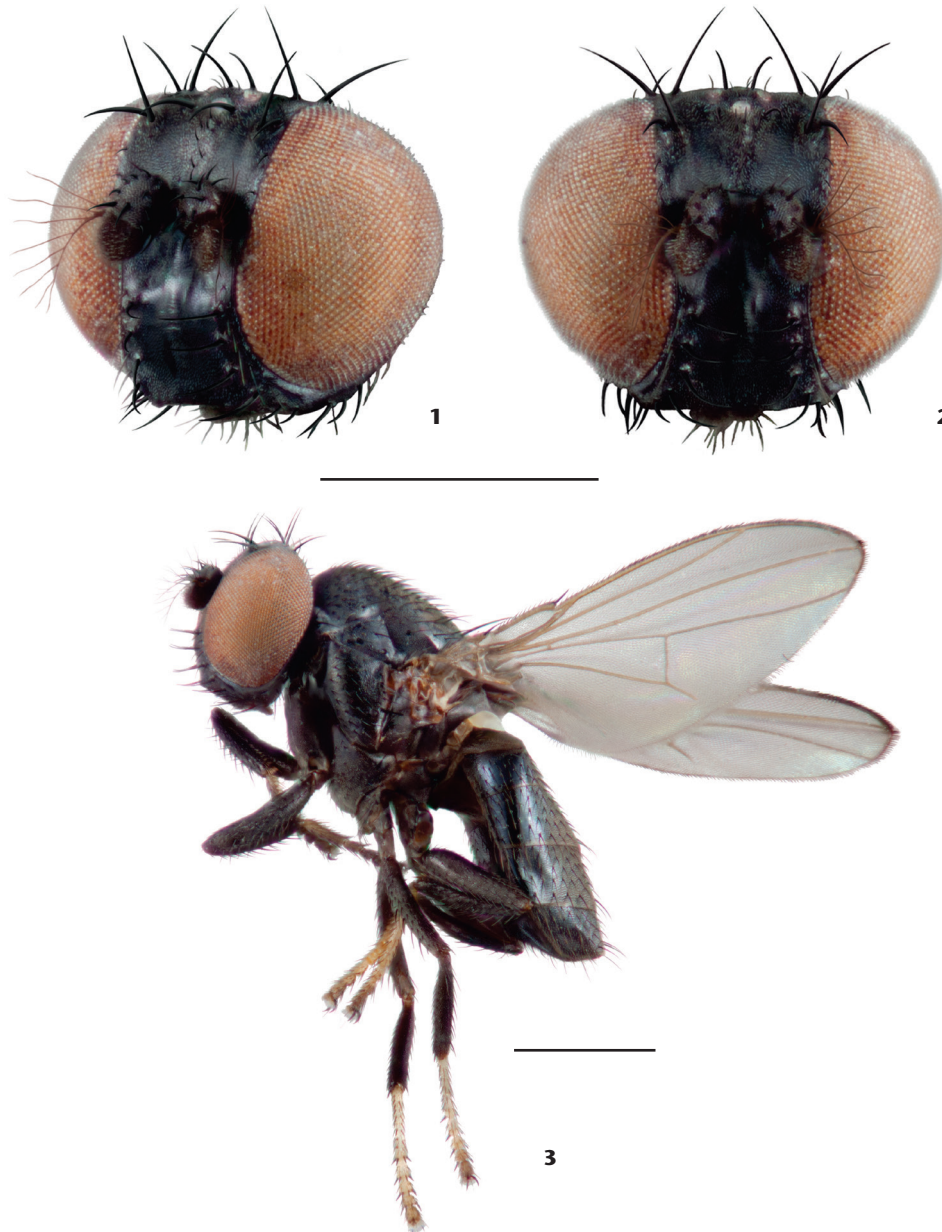
Orasiopa (Reymontopa) mera. Zatwarnicki et al., 2016: 19 [subgeneric combination].

Diagnosis. This species is distinguished from congeners by the following combination of characters: Small to moderately small shore flies (Fig. 3), body length 1.55-2.35 mm; specimens, except for tarsi, generally black. **Head** (Figs. 1-2, 4-9). Frons (Figs. 1, 6) black but with sparse investment of whitish microtomen-

tum, especially on anterior margin, lacking metallic blue or green stripes. Facial series of setae 3-4; face (Figs. 2, 8) entirely black, subshiny to shiny, sparsely invested with whitish microtomentum, lacking vertical stripes; parafacials narrow, lacking setulae, black, concolorous with face. Gena-to-eye ratio 0.12-0.13. **Thorax** (Figs. 10-12). Mesonotum sparsely microtomentose, subshiny; supra-alar seta present; and anterior notopleural seta inserted in anterior notopleural angle; anepisternum and anepimeron shiny, contrasted with dull, microtomentose notopleuron. Costal vein ratio 0.73-0.75; M vein ratio 0.56-0.64. Legs, including coxae, black except for yellowish tarsi. **Abdomen.** Male terminalia (Figs. 13-15). Epandrium symmetrical, in dorsal view oval in outline, 1.4X longer than wide, setulose mostly in anterior area (5-6 setae) and along its length; cercus distinctly elongate, in dorsal view 5.5X longer than wide; hypandrium-gonites complex without setula, in dorsal view pentagonal in outline, fused posteriorly; in lateral view hypandrium-gonites complex narrow and arcuate with attached C-shaped gonites; aedeagus symmetrical, in dorsal view triangular with broadly rounded posterior margin, with posterior section covered with short hairs, in lateral view aedeagus elongated with dorsal margin sinuous and ventral margin W-shaped forming two small rounded projections medially; phallopodeme not attached to hypandrium, in dorsal view irregular.

Type material (examined). The holotype female of *Discocerina mera* Cresson is labeled "Formosa Sauter/Takao 1907. 17 IV ["17 IV handwritten; 17 Apr 1907]/9123/TYPE No. 6573 Discocerina MERA E.T. Cresson, Jr, [red/"6573" and "Discocerina MERA" handwritten]." The holotype is double mounted (minuten pin in a thin, rectangular piece of fine foam), in excellent condition is deposited in the ANSP (6573). One female paratype bears the same locality label as the holotype but with the collection date of 22 Mar 1907.

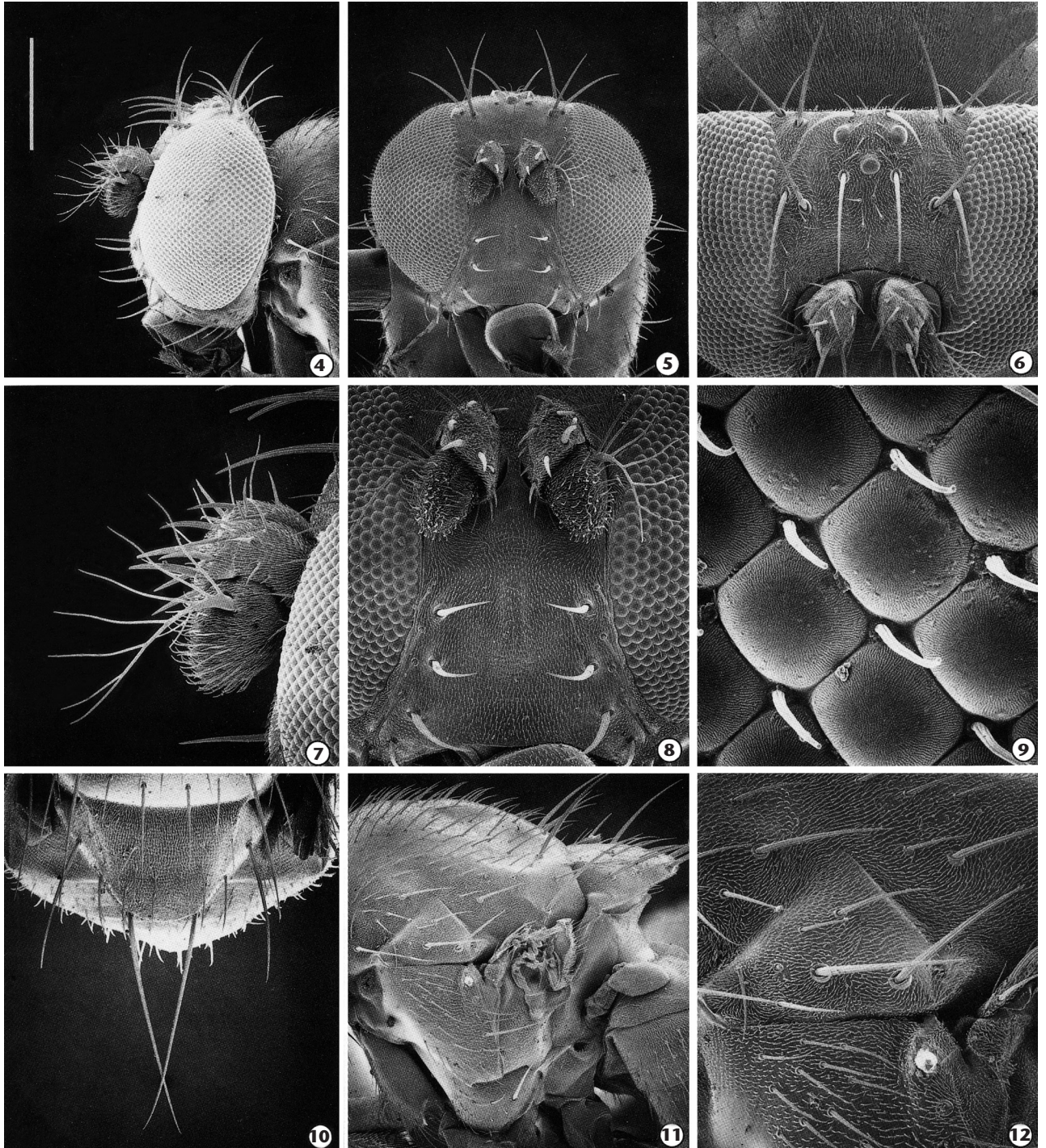
Material examined. UNITED STATES. *Florida*. Lee: Sanibel Island Causeway (26°28.2'N, 82°01.7'W), 17 Apr 1989, D. and W.N. Mathis leg. (3 males, 2 females; USNM). Monroe: Big Pine Key, Long Beach (24°38.1'N, 81°21.6'W), 11 Feb 2000, D. and W.N. Mathis leg. (1 male, 2 females; USNM); Key West (beach; 24°32.8'N, 81°47.7'W), 12 Jan 2007, D. and W.N. Mathis leg. (4 females; USNM); Layton (Long Key; 24°49.9'N, 80°48.3'W), 10 Feb 2000, D. and W.N. Mathis leg. (1 male, 1 female; USNM); Lower Matecumbe Key (24°51.4'N, 80°43.7'W), 10 Feb 2000, D. and W.N. Mathis leg. (1 male, 1 female; USNM); Marathon Key (24°41.6'N, 81°05'W), 11 Feb 2000, D. and W.N. Mathis leg. (1 female; USNM). *BERMUDA*. Devonshire: Devonshire Marsh (32°18'N, 64°45'W), 29 May 1991, W.N. Mathis, N. E. Woodley leg. (1 male, 2 females; USNM). *CUBA*. *Havana*: Havana (beach; 23°5.8'N, 82°27.7'W), 2-14 Dec 1994, W.N. Mathis leg. (3 males, 1 female; USNM). *Pinar del Rio*: Soroa (22°47.7'N, 83°W), 4-6 Dec 1994, W.N. Mathis leg. (1 male, 2 females; USNM). *Sancti Spiritus*: Playa Ancón (21°44.1'N, 79°59.9'W), 12 Dec 1994, W.N. Mathis leg. (5 males, 1 female; USNM). *GRAND CAYMAN*. George Town Harbour (19°18'N, 81°22.9'W), 28-29 Apr 1994, W.N.



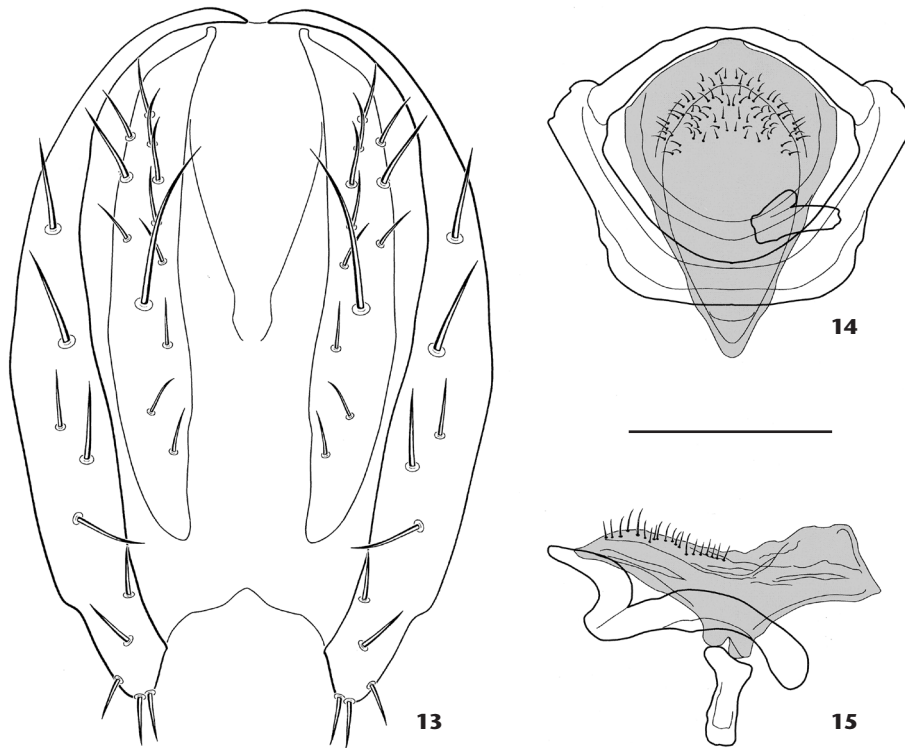
Figures 1-3. Photos of *Orasiopa (Reymontopa) mera*, male (Costa Rica. Puntaneras: Pochocal): (1) head, anterolateral oblique view; (2) same, anterior view; (3) habitus, lateral view. Scale bar: 0.5 mm.

Mathis leg. (1 female; USNM). DOMINICAN REPUBLIC. *Monte Cristi*: Monte Cristi (beach; 19°51.5'N, 71°39.5'W), 18 May 1995, W.N. Mathis leg. (5 males, 5 females; USNM). *San Cristobal*: Rio Haina (18°25.9'N, 70°00.4'W), 27 May 1998, D. and W.N. Mathis leg. (2 males; USNM). BELIZE. *Belize District*: Turneffe Islands, Pelican Cay (17°24'N, 87°48'W), 30 Mar 1993, W.N. Mathis leg. (1 male; USNM). *Lighthouse Reef*: Half Moon Cay (17°12'N, 87°31'W), 1 Apr 1993, W.N. Mathis leg. (2 males, 2 females; USNM). *Stann*

Creek District: Bread and Butter Cay (16°45'N, 88°09'W), 25 Mar 1988, W.N. Mathis leg. (7 males, 6 females; USNM); Carrie Bow Cay (16°48.2'N, 88°04.9'W), 18-22 Mar 1988, W.N. Mathis leg. (1 female; USNM); Coco Plum Cay (16°52.8'N, 88°07.2'W), 23 Mar 1988, W.N. Mathis leg. (2 males, 2 females; USNM); Elbow Cay (16°39.7'N, 88°09.9'W), 25 Jul 1989, W.N. Mathis leg. (2 males; USNM); Man O' War Cay (16°53'N, 88°06.4'W; also known as Bird Cay), 23 Mar-15 Nov 1985, 1987, 1988, W.N. and D. Mathis



Figures 4-12. Scanning electron micrographs of *Orasiopa (Reymontopa) mera*, male (Belize, Stann Creek District: Tobacco Range; scale bar in parentheses): (4) head, lateral view (250 μm); (5) same, anterior view (250 μm); (6) frons, anterodorsal view (150 μm); (7) antenna, lateral view (100 μm); (8) face, anterior view (120 μm); (9) eye with interfacetal setulae, lateral view (10 μm); (10) scutellum, dorsal view (176 μm); (11) pleuron, lateral view (250 μm); (12) notopleuron, lateral view (100 μm).



Figures 13-15. *Orasiopa (Reymontopa) mera*, male: (13) epandrium and cerci, posterior view; (14) aedeagus, phallapodeme, gonites, and hypandrium, ventral view; (15) same, lateral view. Scale bar: 0.1 mm.

leg. (18 males, 10 females; USNM); Round Cay (near Coco Plum Cay; 16°52.8'N, 88°07.2'W), 23 Mar 1988, W.N. Mathis leg. (10 males, 11 females; USNM); Saddle Cay (16°40'N, 88°10'W), Jul 1989, W.N. Mathis, H.B. Williams leg. (2 females; USNM); South Water Cay (16°48.8'N, 88°04.9'W), 1 Jun 1985, W.N. Mathis leg. (1 male; USNM); Stewart Cay (16°47.5'N, 88°09.4'W), 24 Mar 1988, W.N. Mathis leg. (1 male, 1 female; USNM); Tobacco Range (16°53'N, 88°05.1'W), 29 Jul 1989, W.N. Mathis, H.B. Williams leg. (12 males, 16 females; USNM); Twin Cays (Aanderaa Flats, mud flat near Lair Channel, north of Lair Channel, south end of East Island, south end of West Island, West Bay, West Pond; 16°49.4'N, 88°06.3'W), 17 Jan-16 Nov 1985, 1987, 1988, 1989, D. and W.N. Mathis, C. Feller, H.B. Williams leg. (62 males, 36 females; USNM); Wee Wee Cay (16°45.9'N, 88°08.6'W), 24 Jan-21 Jul 1987, 1989, W.N. Mathis, C. Feller leg. (4 males, 1 female; USNM). Glover's Reef (Middle Cay; 16°44.4'N, 87°48.7'W), 28 Jul 1989, W.N. Mathis, H.B. Williams leg. (11 males, 8 females; USNM). JAMAICA. *Clarendon*: Jackson Bay (17°44.7'N, 77°12.6'W), 13 May 1996, D. and W.N. Mathis, H. Williams leg. (1 male; USNM). *Saint Elizabeth*: Black River (18°01.4'N, 77°51.1'W), 11 May 1996, D. and W.N. Mathis, H. Williams leg. (3 males; USNM). PUERTO RICO. Punta Jacinto (near Guanica; 17°57'N, 66°52.6'W), 20 Sep 1995, D. and W.N. Mathis leg. (2 males, 4 fe-

males; USNM). SAINT LUCIA. Soufrière (beach; 13°51'N, 16°54'W), 11-12 Jun 1991, D. and W.N. Mathis leg. (1 female; USNM). SAINT VINCENT. *Charlotte*: Owia Salt Pond (13°22.5'N, 61°08.5'W), 6 Sep 1997, W.N. Mathis leg. (1 female; USNM). BARBADOS. Christ Church: Graeme Hall Swamp (13°04.2'N, 59°34.7'W), 12 Sep 1996, W.N. Mathis leg. (1 male; USNM); Rockley Beach (13°04.3'N, 59°35.2'W), 1 Sep 1997, W.N. Mathis leg. (1 male, 2 females; USNM). GRENADA. *Saint George*: Airport (Point Salines; 12°05'N, 61°46.9'W), 11-12 Sep 1997, W.N. Mathis leg. (10 males, 3 females; USNM). COSTA RICA. *Guanacaste*: Nosara, R. Privada Nosara (9°58'7.35"N, 85°40'32.8"W; 0-5 m.), 15 Jun 2001, D. Briceño leg. (1 male, 1 female; INBio); Parque Nacional Marino Las Baulas, Playa Grande (10°19'32.44"N, 85°49'50.64"W; 0-100 m.), 19-25 Aug 2003, W. Porras leg. (1 female; INBio); Playa de Cuajiniquil (10°56.1'N, 85°42.2'W; beach), 16 Jun 2003, D. and W.N. Mathis leg. (1 male, 1 female; USNM). *Puntarenas*: Dominical (6 km S; 9°13.1'N, 83°49.8'W; waterfall), 12 Jun 2003, D. and W.N. Mathis leg. (3 males, 3 females; USNM); Pochotal (09°31.4'N, 84°28.4'W; 0-2 m), 12-13 Jun 2003, D. and W.N. Mathis leg. (5 males, 5 females; USNM); Puntarenas (9°58.5'N, 84°50.9'W), 18 Jun 2003, D. and W.N. Mathis leg. (2 males, 1 female; USNM); R. V. S. Golfito, Golfito, Llano Bonito (8°38.4'N, 83°11'W; mangal), 28 Apr 2004, W. Porras leg. (1 male; INBio).

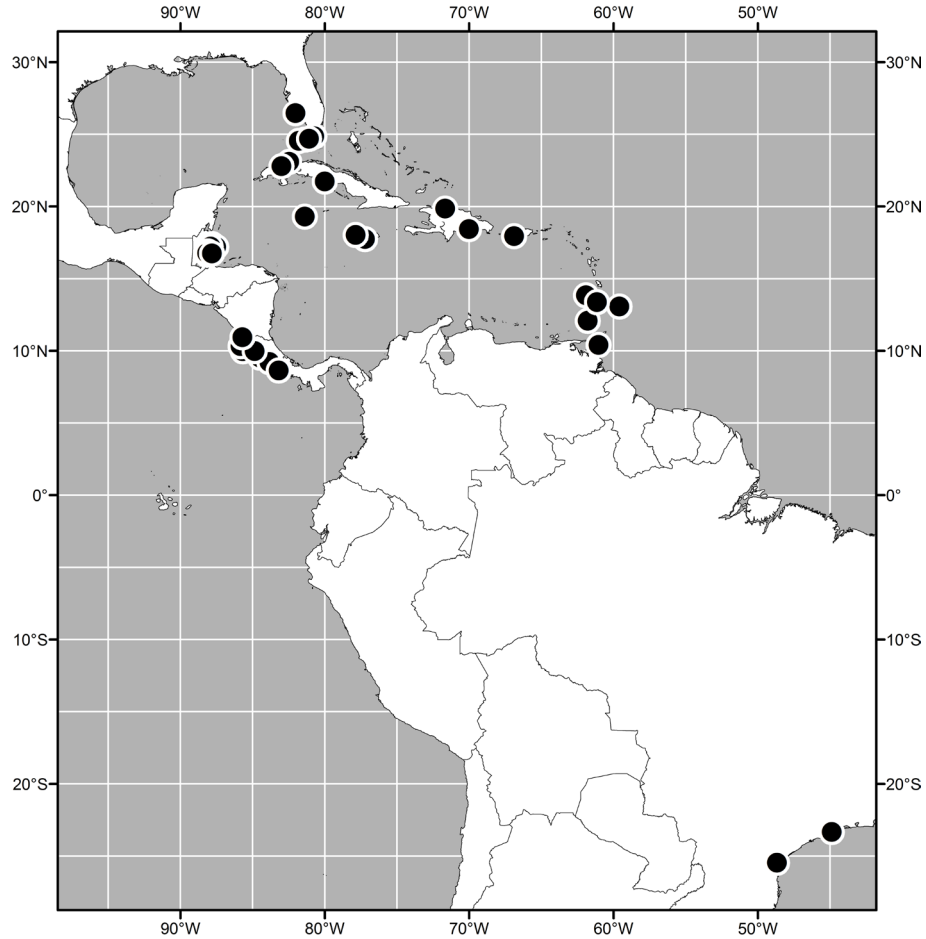


Figure 16. Distribution map for *Orasiopa (Reymontopa) mera*.

TRINIDAD AND TOBAGO. TRINIDAD. *Saint Andrew*: Lower Manzanilla (12 km S; 10°24'N, 61°02'W), bridge over Nariva River, 20-27 Jun 1993, W.N. Mathis leg. (3 males, 2 females; USNM). BRAZIL. *Paraná*: Antonina (25°28.4'S, 48°40.9'W; beach/mangal), 4 Feb 2010, D. and W.N. Mathis leg. (1 female; DZUP). *São Paulo*: Ubatuba, Praia do Estaleiro (23°20.5'S, 44°53'W; beach), 30 Mar 2010, D. and W.N. Mathis leg. (2 males; USNM).

Type locality. TAIWAN. *Pingtung*: Takao (= Kao-hsiung; 22°38'N, 120°20'W).

Distribution. Afrotropical: Aldabra, Seychelles. Australasian/Oceanian: Australia (New South Wales, Queensland), Caroline Islands, Eniwetok Atoll, Fiji, Gilbert Islands, Guam, Hawaiian Islands, Marianas Islands, Marshall Islands, Papua New Guinea (Papua New Guinea, Bismarck Archipelago), Solomon Islands, Society Islands, Tahiti. Nearctic: Bermuda, United States (Florida). Neotropical (Fig. 16): Belize, Brazil (Paraná, São Paulo), Costa Rica (Puntarenas), Trinidad and Tobago, West Indies (Barbados, Cuba, Dominican Republic, Grand Cayman, Grenada, Jamaica, Puerto Rico, Saint Lucia, Saint Vincent). Oriental: Malaya, Ryukyu

Islands, Taiwan (type locality of *D. mera*), Thailand, Vietnam. Palearctic: Japan (Shikoku, type locality of *D. peculiaris*).

Natural history. Nearly all specimens collected in the New World are from the littoral physiographic province, often in maritime habitats where saline conditions prevail.

Remarks. This species is distinguished from its Old World congeners by the following combination of characters: body generally black except tarsi; vertical series of facial setae three or more; face entirely black, lacking vertical stripes, sparsely invested with whitish microtomentum; parafacials narrow, lacking setulae, black, concolorous with face; frons black but with sparse investment of whitish microtomentum, especially on anterior margin, lacking metallic blue or green stripes; legs, including coxae, black except for yellowish tarsi; mesonotum sparsely microtomentose, subshiny; postsutural supra-alar seta present; and anterior notopleural seta inserted in anterior notopleural angle.

This species was originally described from specimens collected in the Orient (Taiwan and Japan), and it has been recorded from the Caribbean (MATHIS 1997), which was then

considered to be a rather remarkable range extension for any shore-fly species. This is the first report of this species from Brazil and Costa Rica, as well as many other islands of the Caribbean. We suspect that its occurrence in the New World is the result of an introduction, perhaps multiple introductions, with some subsequent dispersal.

Pectinifer Cresson, 1944

Pectinifer Cresson, 1944: 4. Type species: *Discocerina aenea* Cresson, 1918, original designation. Wirth, 1968: 9 [Neotropical catalog]. Mathis & Zatwarnicki, 1995: 183 [world catalog]. Zatwarnicki & Mathis, 2001: 44 [figs.], 48, 50 [generic diagnosis]. Zatwarnicki et al., 2016: 19-21 [recharacterization in phylogenetic review of tribe].

Diagnosis. *Pectinifer* is distinguished from other genera of Discocerini by the following combination of characters: moderately small shore flies, body length 2.40 mm; generally sparsely microtomentose, subshiny species. **Head.** Frons bearing orbital seta. Face rather prominent at level of dorsal facial seta; antennal grooves generally distinctly defined ventrally; face lacking secondary series of setae; facial setae 4-5, dorsal setae not arising from shiny papilla, lacking an dorsoclinete seta at lower lateral extremity; parafacial narrow throughout length, lacking setulae; gena generally low. Eye generally oval, moderately conspicuously microsetulose, bearing interfacetal setulae not discernible by light stereomicroscope. Proboscis with 10 pseudotracheae; cibarium with 6 medial sensillae arranged in a transverse row and 9 moderate posterior sensillae. **Thorax.** Presutural supra-alar seta well developed; postsutural supra-alar setae reduced or lacking; acrostichal setae present; notopleuron bare of setulae. Wings hyaline; costa bearing 4-5 long, dorsal setae between humeral and subcostal breaks. Forefemur slightly enlarged, bearing distinct row of stout, short setae along apical half of posteroventral surface; hindtibia lacking a preapical, ventral, spur-like seta. **Abdomen.** Tergites usually unicolorous, lacking pale colored areas laterally; tergite 4 of male longer than tergite 3. Male terminalia: Epandrium complete posteriorly, in dorsal view U-shaped with long arms, in outline 1.5 times as long as wide, in lateral view folded down anterolaterally; cerci separate from epandrium, elongate, in lateral view tapered apically, 5 times as long as wide; gonite separate from hypandrium, elongate with subapical setulae, in dorsal view slightly arcuately deflected inward, in lateral view broadened centrally, irregularly tapered to apices; aedeagus in dorsal view rectangular with rounded anterior margin and basal 1/4 margin roundly incised, in lateral view irregularly trapezoidal with anterodorsal appendix of 3/4 length of aedeagus; hypandrium in dorsal view U-shaped with posterolateral arms with length 3/4 of the base, in lateral view slightly depressed centrally; phallapodeme separate from aedeagus, in dorsal view as wide as 1/3 of aedeagus, in front of hypandrium broadened triangularly, ventral section as wide as 1/3 of dorsal, apically slightly broadened, obtuse, in lateral view irregularly triangular, surrounding aedeagus posteroventrally,

anterior margin sinuous forming protrusion ventrally; ejaculatory apodeme absent. Ventral receptacle with regular operculum, stalk -shaped with small basal bands.

Phylogenetic considerations. *Pectinifer* is currently placed in the *Diclasiopa* group of genera, also including *Diclasiopa*, *Ditrichophora*, and *Hecamedoides* (ZATWARNICKI & MATHIS 2001, ZATWARNICKI et al. 2016). The *Diclasiopa* group is characterized by an elongated gonite that is tapered apically and bears at most two dorsal and typically one subapical and ventral setula. *Pectinifer* forms a separate clade within the *Diclasiopa* group and is characterized by the following three autapomorphies: (1) Face metallic shiny bearing white microtomentose spots laterally; (2) forefemur slightly enlarged and bearing a distinctive row of stout, short setae along the apical half of the posteroventral surface; (3) 10 pseudotracheae (convergence with *Galaterina*). ZATWARNICKI et al. (2016) proposed the latter character based on their comparative study of mouthparts within Discocerini.

Distribution. See "Distribution" of the only included species below.

Remarks. This genus is currently monotypic and is only known from the New World tropics (MATHIS & ZATWARNICKI 1995, ZATWARNICKI & MATHIS 2001, ZATWARNICKI et al. 2016).

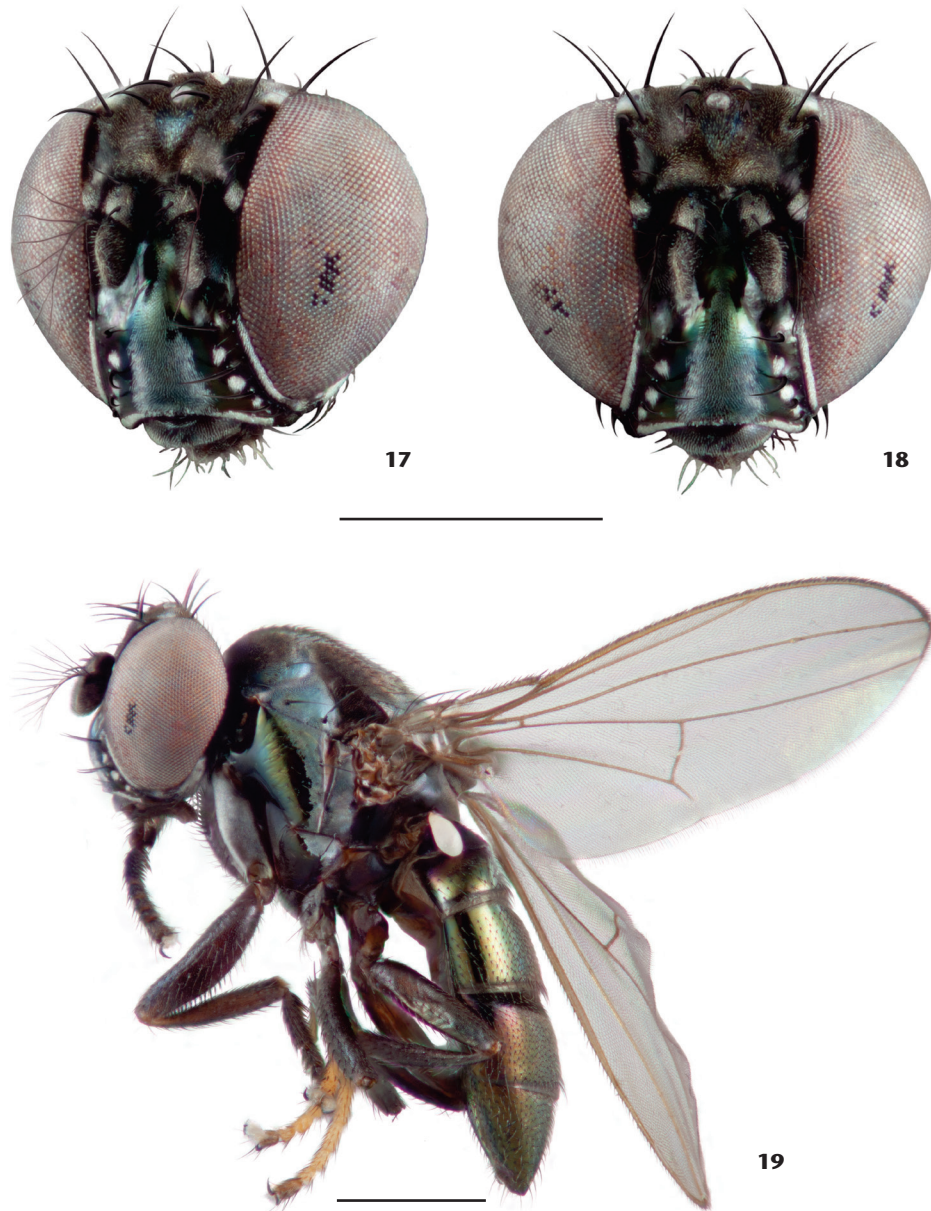
Pectinifer aeneus (Cresson, 1918)

Figs. 17-24

Discocerina aenea Cresson, 1918: 59 [Costa Rica. Cartago, Irazú; HT female, ANSP (6137)].

Pectinifer aeneus. Cresson, 1944: 4 [new combination]; 1946: 149 [review]. Wirth, 1968: 9 [Neotropical catalog]. Mathis & Zatwarnicki, 1995: 183 [world catalog]. Zatwarnicki & Mathis, 2001: 44 [figs.], 48, 50 [generic diagnosis]. Perez-Gelabert, 2008: 177 [list, Hispaniola].

Diagnosis. This genus and its monotypic species are distinguished from related taxa by the following combination of characters: Small to moderately small shore flies (Fig. 19), body length 1.65-2.65 mm. **Head** (Figs. 17-18): Face bearing two rows of 3-4 spots of silvery white microtomentum between the slightly produced midventrally and the parafacial; gena-to-eye ratio 0.08-0.12. **Thorax.** Notopleuron lacking setulae (only 2 large setae present); prescutellar acrostichal seta lacking. Costal vein ratio 0.71-0.73; M vein ratio 0.58-0.60. Foreleg entirely dark brown, mid and hind tarsi yellow; forefemur slightly enlarged, bearing a distinctive row of short, stout setae along apical half of posteroventral surface. **Abdomen:** Male terminalia (Figs. 20-23): epandrium complete posteriorly, in dorsal view U-shaped with long arms, in outline 1.5 times as long as wide, in lateral view folded down anterolaterally; cerci separate from epandrium, elongate, in lateral view tapered apically, 5 times as long as wide; gonite separate from hypandrium, elongate with subapical setulae, in dorsal view slightly arcuately deflected inward, in lateral view broadened centrally, irregularly tapered to apices; aedeagus in dorsal view rectangular with rounded anterior margin and basal 1/4 margin roundly incised, in lateral view irregularly trapezoidal with

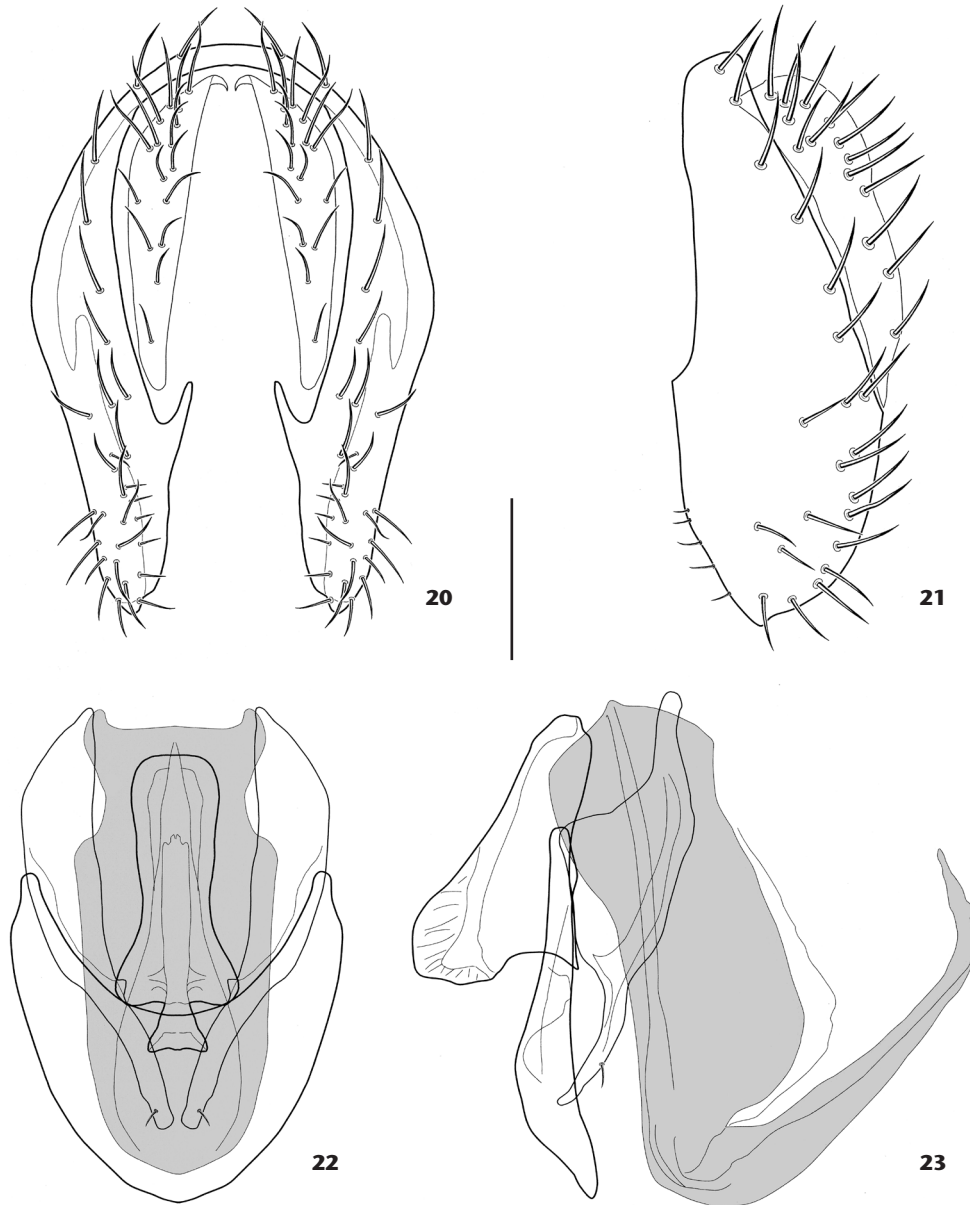


Figures 17-19. Photos of *Pectinifer aeneus*, male (Brazil. Paran: Antonina): (17) head, anterolateral oblique view; (18) same, anterior view; (19) habitus, lateral view. Scale bar = 0.5 mm.

anterodorsal appendix of 3/4 length of aedeagus; hypandrium in dorsal view U-shaped with posterolateral arms with length 3/4 of the base, in lateral view slightly depressed centrally; phallapodeme separate from aedeagus, in dorsal view as wide as 1/3 of aedeagus, in front of hypandrium broadened triangularly, ventral section as wide as 1/3 of dorsal, apically slightly broadened, obtuse, in lateral view irregularly triangular, surrounding aedeagus posteroventrally, anterior margin sinuous forming protrusion ventrally; ejaculatory apodeme absent.

Type material (examined). The holotype female of *Discocerina aenea* Cresson is labeled "So. slope of Irazu over mud/near Cartago 15XII'09 C[osta]R[ica] PPCalvert/Type Discocerina AENEAE.T.Cresson,Jr. 6137 [red; "Discocerina AENEAE" and "6137" handwritten]." The holotype is double mounted (minuten pin in a thin, rectangular card), is in good condition [left wing and left foreleg missing], and is deposited in the ANSP (6137).

Material examined. MEXICO. *Chiapas*: Finca Prusia (33 km S Jaltenango; 1549'N, 9242'W), 10-12 May 1985, W.N. Mathis



Figures 20-23. *Pectinifer aeneus*, male: (20) epandrium and cerci, posterior view; (21) same, lateral view; (22) aedeagus, phallapodeme, gonites, and hypandrium, ventral view; (23) same, lateral view. Scale bar: 0.1 mm.

leg. (1 female; USNM); Unión Juárez (15°03.9'N, 92°04.0'W), 23 Apr 1983, W.N. Mathis leg. (1 male; USNM). DOMINICAN REPUBLIC. *Barahona*: San Rafael (18°01.9'N, 71°08.4'W), 22 Mar 1999, W.N. Mathis leg. (1 male, 1 female; USNM). *La Vega*: Constanza (ca. 16 km SE; 18°50.6'N, 70°40.7'W; 1580 m), 15 May 1998, D. and W.N. Mathis leg. (1 male; USNM); La Ciénega de Manabao (19°03.9'N, 70°51.8'W; 1050 m), 28 Mar 1999, W.N. Mathis leg. (1 male; USNM). *Monseñor Nouel*: Jima (near; 19°01.2'N, 70°28.8'W; 670 m), 10 May 1995, W.N. Mathis leg. (1 male, 5 females; USNM).

Pedernales: Las Abejas (37 km N Cabo Rojo; 18°10'N, 71°37'W; 1440 m), 13-16 Jul 1987, R. Davidson, J. Rawlins leg. (1 male; CMP). JAMAICA. *Saint Andrew*: Hardwar Gap (18°04.2'N, 76°44'W), 17 May 1996, D. and W. Mathis, H. Williams leg. (1 male, 1 female; USNM); Silver Hill Gap (18°05.1'N, 76°41.2'W; 980 m), 26 Apr 2000, W.N. Mathis leg. (1 male; USNM). PUERTO RICO. *Adjuntas* (near; 18°09.7'N, 66°46.6'W), 22 Sep 1995, D. and W.N. Mathis leg. (1 male, 2 females; USNM). *Maricao*, Los Viveros (18°10.5'N, 66°59.2'W), 21 Sep 1995, D. and W.N. Mathis leg. (2 females;

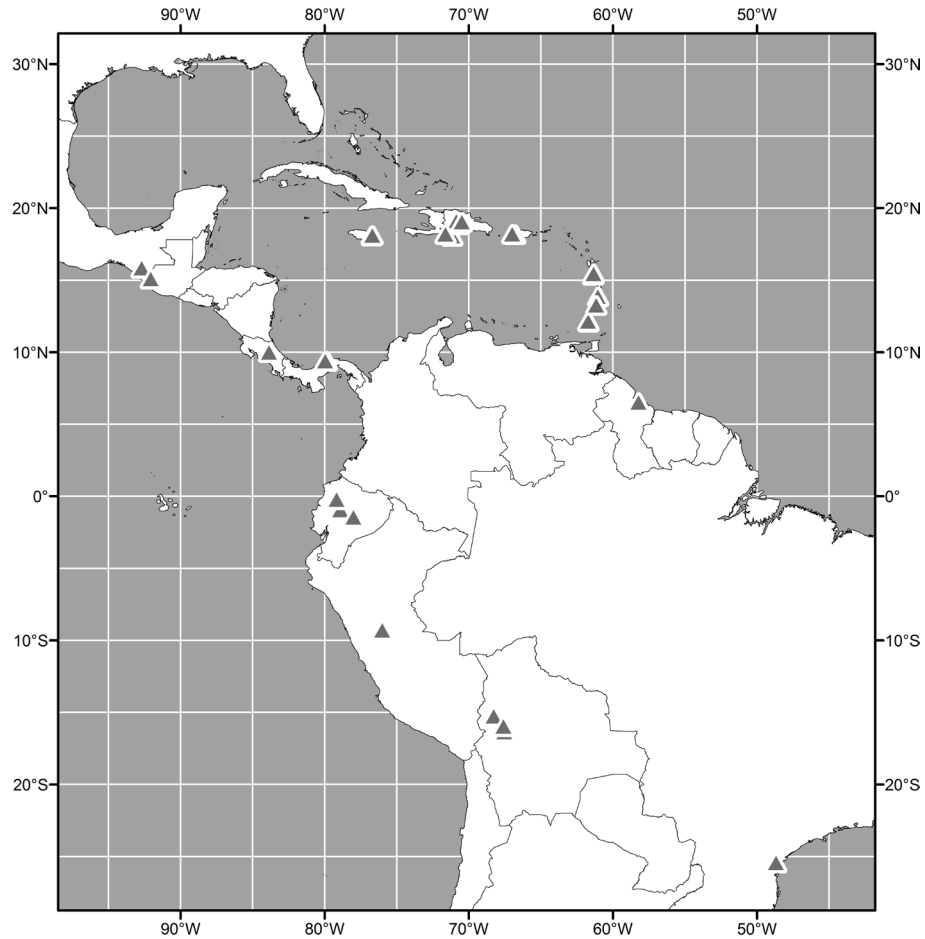


Figure. 24. Distribution map for *Pectinifer aeneus*.

USNM). SAINT LUCIA. Fond St. Jacques (13°50'N, 61°02'W), 13-14 Jun 1991, D. and W.N. Mathis leg. (14 males, 9 females; USNM). SAINT VINCENT. *Charlotte*: South Rivers (13°14.6'N, 61°09.3'W), 8 Sep 1997, W.N. Mathis leg. (1 female; USNM). GRENADA. *Saint George*: Vendôme (1 km E; 12°04.8'N, 61°42.2'W), 17 Sep 1996, W.N. Mathis leg. (1 male, 1 female; USNM). *Saint John*: Concord Falls (12°07.1'N, 61°43'W), 12-14 Sep 1996, 1997, W.N. Mathis leg. (3 males, 4 females; USNM). COSTA RICA. *Cartago*: Irazú (09°58.4'N, 83°51.1'W), 15 Dec 2009, P. P. Calvert leg. (1 female; ANSP; holotype). DOMINICA. Antrim Valley (15°20.7'N, 61°22.2'W; 305 m), 17 Mar 1956, J. F. G. Clarke leg. (4 females; USNM). G'leau Gommier near Belles (15°25.4'N, 61°20.4'W), 17 Mar 1956, J. F. G. Clarke leg. (2 males; USNM). PANAMA. *Colón*: Cativa (09°21.6'N, 79°50.4'W), 27 Aug 1956, F. S. Blanton leg. (1 female; USNM); Mojingas Swamp, Fort Sherman (09°21.8'N, 79°57.2'W), Jan 1953, F. S. Blanton leg. (1 female; USNM). GUYANA. Conservation of Ecological Interactions and Biotic Associations (CEIBA; ca. 40 km S Georgetown; 6°29.9'N, 58°13.1'W), 28 Aug 1997, W.N. Mathis leg. (2 males; USNM). BRAZIL. *Paraná*: Antonina (25°28'S, 48°41.3'W; 13 m), 3 Feb 2010,

D. and W.N. Mathis leg. (1 male; DZUP); Antonina (25°28.4'S, 48°40.9'W; beach/mangal), 4 Feb 2010, D. and W.N. Mathis leg. (1 male; USNM). ECUADOR. *Cotopaxi*: Quevedo (66 km E; 00°57.7'S, 78°54.1'W), 15 Jan 1978, W.N. Mathis leg. (1 female; USNM). *Pastaza*: Puyo (01°29'S, 78°0.1'W; black light), 30 Jan 1976, D. R. Givens, P. J. Spangler leg. (10 males, 16 females; USNM). *Santo Domingo de los Tsáchilas*: Santo Domingo, (00°15.2 S, 79°10.3 W; 600 m), Jun 1965, L. E. Peña, leg. (1 male, 1ex; MZUSP). PERU. *Huánuco*: Tingo Maria (1 km S; 09°19.6'S, 75°59.8'W), 6 Feb 1984, W.N. Mathis leg. (1 male; USNM). BOLIVIA. *La Paz*: Apa Apa (8 km S Chulumani; 16°22'S, 67°30.4'W; 1960 m), 9-10 Mar 2001, W.N. Mathis leg. (1 male, 2 females; USNM); Chulumani (2 km S; 16°23.5'S, 67°31.8'W; 1750 m), 9-10 Mar 2001, W.N. Mathis leg. (1 female; USNM); Guanay (22km SE; 15°17.8'S, 68°15.6'W, 540 m), 17 Mar 2001, W.N. Mathis leg. (3 males; USNM); San Pedro (3 km NE; 16°S, 67°35.3'W; 780 m), 12 Mar 2001, W.N. Mathis leg. (1 male; USNM).

Type locality. COSTA RICA. *Cartago*: south slope of Volcan Irazú (09°58.2'N, 83°51.1'W).

Distribution (Fig. 24). Neotropical: Bolivia (La Paz), Brazil (Paraná), Costa Rica (Cartago), Ecuador (Cotopaxi, Pastaza), Guyana, Mexico (Chiapas), Panamá (Colón), Peru (Huánuco), West Indies (Dominica, Dominican Republic, Grenada, Jamaica, Puerto Rico, Saint Lucia, Saint Vincent).

Natural history. Although widespread in the Neotropics, specimens are seldom abundant at a locality. The site on the West Indian island of Saint Lucia where we collected nearly 25 specimens was where a cart load of cabbage had been overturned on a mountainous road a few days earlier and the cabbage leaves were beginning to decompose. We simply swept our nets immediately over the pile of depositing vegetation to collect the series. About a week later, we returned to the site, hoping to collect more specimens but without any success. By this time the rotting pile of cabbage had been reduced to an amorphous mass.

Remarks. Being the only included species in *Pectinifer*, the generic diagnosis serves to distinguish this species from others in the tribe.

ACKNOWLEDGMENTS

We gratefully acknowledge the assistance and cooperation of many organizations and individuals who contributed to the field work and production of this paper. Photographs of the specimens, especially the faces, were expertly taken with a Visionary Digital System. For reviewing a draft of this paper we thank Tadeusz Zatwarnicki, who also allowed us to use illustrations of the male terminalia that he prepared. We thank the curators and collections managers who loaned collections or facilitated work in their museums: Jon K. Gelhaus and Jason D. Weintraub (ANSP) and Carlos José Einicker Lamas (MZUSP). This study was supported by grants from Conselho Nacional de Desenvolvimento Científico e Tecnológico – Brazil (CNPq process number 234167/2014-9) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brazil, including a recent field work in Brazil (December 2009–June 2010) that resulted in the vast majority of specimens from Brazil that were studied in this paper was supported by a grant from CNPq (Visiting Researcher/Process number 401609/2009-0), which we gratefully acknowledge and thank. We thank Dianne Mathis for helping with all aspects of the production of this paper, especially the field work in Brazil. We also thank A. Bernardo Carvalho and his lab (Elisa, Monica, Susana) for hosting us while conducting field work along the coast of São Paulo.

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Submitted: 17 October 2015

Received in revised form: 24 March 2016

Accepted: 18 April 2016

Editorial responsibility: Ângelo Parise Pinto

Author Contributions: WNM conceived the paper; WNM DNRC collected and identified specimens; DNRC prepared all figures; WNM DNRC LM analyzed the data and wrote the paper.

Competing Interests: The authors have declared that no competing interests exist.