Zootaxa 3926 (4): 499–522
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3926.4.3
http://zoobank.org/urn:lsid:zoobank.org:pub:8C078FEF-60FC-41A1-A305-E0DBA2B8DAF5

A review of *Mimapsilopa* Cresson (Diptera: Ephydridae) from Brazil

WAYNE N. MATHIS[1], DANIEL N. R. COSTA[2] & LUCIANE MARINONI[2]

[1]*Department of Entomology, NHB 169, PO Box 37012, Smithsonian Institution, Washington, D. C. 20013-7012, United States. E-mail: mathisw@si.edu.*
[2]*Departamento de Zoologia, Universidade Federal do Paraná, Jardim das Américas, 81531-980 - Curitiba, Paraná, Brazil. E-mail: negosekidan@ufpr.br and lmarinoni@ufpr.br*

Abstract

Species of *Mimapsilopa* from Brazil are reviewed with an emphasis on the fauna from southern Brazil, where six new species were discovered and herein are diagnosed and described. To facilitate identification of species, we have included a diagnosis of the tribe Discomyzini and of *Mimapsilopa* and have also provided an annotated key to the New World genera of the tribe. We have also provided photos of representative specimens, illustrations of structures of the male terminalia and a distribution map for all included species.

Key words: Neotropical Region, shore flies, taxonomy

Introduction

The little-known shore-fly genus *Mimapsilopa* Cresson is known to occur only in the New World (Mathis and Zatwarnicki 1995), primarily in tropical zones. *Mimapsilopa* has been treated infrequently, even among shore-fly workers, and its relationship with other genera within the tribe Discomyzini remains largely unresolved (Mathis and Zatwarnicki 1998). Cresson (1941), for example, proposed *Mimapsilopa*, but five years later he (Cresson 1946) treated the included species in *Helaeomyia,* a second genus Cresson also described in the same 1941 paper but a page earlier. *Mimapsilopa* was considered a junior synonym of *Helaeomyia* (Cresson 1946, Wirth 1968) until Lizarralde de Grosso (1982) revised the species related to *Helaeomyia* and included recognition of *Mimapsilopa* as a separate genus. Lizarralde de Grosso's revision comprised six species, four being newly described. In our world catalog (Mathis and Zatwarnicki 1995), we followed Lizarralde de Grosso's precedent and recognized *Helaeomyia* and *Mimapsilopa* as separate genera. Our listing in the catalog was based on Zatwarnicki's research, especially on structures of the male terminalia that indicates the species placed in these two genera form monophyletic and separate lineages. Since publication of the world catalog, Mathis and Zatwarnicki (1998) added two species from the West Indies, resulting in a total of nine congeners in *Mimapsilopa* before this paper. The species of *Mimapsilopa* occurring in Brazil are the subject of this review, and all six of the included species are new and are described herein.

This review of *Mimapsilopa* was prompted by recent field work in southern Brazil that is part of an overall survey of the shore flies of this biologically diverse country. An objective of the field work in 2009–2010 was the shore-fly fauna from the state of Paraná and to a lesser degree from Santa Catarina and São Paulo and resulted in numerous specimens of Discomyzini, including *Mimapsilopa*. We soon discovered that *Mimapsilopa* is represented by six undescribed species from Brazil. The purpose of this paper is to describe these new species within the context of a faunistic review of *Mimapsilopa* from Brazil. All six species are described, including structures of the male terminalia, which are also illustrated.

Accepted by S. Gaimari: 11 Feb. 2015; published: 9 Mar. 2015

Material and methods

The descriptive terminology, with the exceptions noted in Mathis (1986) and Mathis & Zatwarnicki (1990a), follows that published in the *Manual of Nearctic Diptera* (McAlpine 1981). Because specimens of Discomyzini are generally moderately small, usually less than 4.0 mm in length, study and illustration of the male terminalia required use of a compound microscope. We have followed the terminology for most structures of the male terminalia that other workers in Ephydridae have used (see references in Mathis 1986, and Mathis & Zatwarnicki 1990a, 1990b), such as surstylus. Zatwarnicki (1996) suggested that the pre- and postsurstylus correspond with the pre- and postgonostylus and that the subepandrial plate is the same as the medandrium. The terminology for structures of the male terminalia is provided directly on Figs. 4–7.

Dissections of male and female genitalia and descriptions were performed using the method of Clausen & Cook (1971) and Grimaldi (1987). Microforceps were used to remove abdomens, which were macerated in a potassium hydroxide solution. Cleared genitalia were rinsed in a weak solution of acetic acid and then transferred to glycerin for observation and illustration. If necessary for proper orientation, the specimen was transferred from glycerin to glycerin jelly. The glycerin jelly was heated, and the specimen appropriately oriented. After cooling, the embedded specimen in glycerin jelly became immobilized. The 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. Illustrations of structures of the male terminalia were produced by first producing a pencil illustration through a camera lucida on a compound microscope, which was then rendered as a vector file in ©Adobe Illustrator. The resulting illustration, as a vector file, was then compared again with the structure for accuracy.

Photographs of wings and heads, especially faces, were taken with a Leica DFC 500 digital camera attached to a stereoscopic microscope (Leica MZ 16). The images were captured with the software Combine ZP from the Project Tax*on line*—Network of Biological Collections of Paraná State. The images series obtained were combined by Zerene Stacker and retouched with ©Adobe Photoshop. Distribution map were made using ESRI ArcView GIS 3.2.

The new species descriptions are composite and not based solely on holotypes. One head and two venational ratios used in the descriptions are based on three specimens (largest, smallest, and one other): Eye ratio: maximum width/maximum height; 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.

Specimens for this study are in the Natural History Museum, London (BMNH); Universidade Federal do Paraná (DZUP: Coleção Entomológica Padre Jesus Santiago Moure, Departamento de Zoologia, Curitiba, Paraná, Brazil); Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP); and the National Museum of Natural History, Smithsonian Institution, Washington, D. C. (USNM).

Taxonomy

Tribe Discomyzini Acloque (12 genera, 56 species)

Discomyzini Acloque 1897: 486. Type genus: *Discomyza* Meigen 1830.─Mathis and Zatwarnicki 1995: 21–30 [world catalog].

Diagnosis. The tribe Discomyzini is distinguished from other shore-fly tribes by the following combination of characters: Small to moderately small shore flies, body length 1.50–4.50 mm; body color and vestiture quite variable, from mostly black and shiny with sparse vestiture of microtomentum to yellowish red and densely invested with microtomentum. *Head:* Ocellar seta aligned behind anterior ocellus, sometimes only slightly so; pseudopostocellar seta small (elongate in *Clasiopella* Hendel); fronto-orbital setae reclinate and/or proclinate; reclinate fronto-orbital seta usually inserted behind larger, proclinate fronto-orbital seta. Pedicel bearing an elongate, conspicuous, dorsal, spine-like seta. Facial conformation variable, smooth to strongly and coarsely sculptured on at least lower 1/2; medial facial setae short, the longest at most as long as its distance from opposite seta; facial area and ventral facial margin without setae; facial setae inserted in more or less vertical series, parallel

with parafacial; subcranial cavity small to large. *Thorax:* Prescutellar acrostichal setae usually present, large (subequal to posterior dorsocentral seta), inserted widely apart (distance between setae subequal to that between either prescutellar and the posterior dorsocentral seta on the same side) and usually inserted anterior of intra-alar seta; presutural or sutural dorsocentral and postsutural setae absent (a synapomorphy for Discomyzinae). Base or stem of R_{4+5} bearing 2–4 setulae on dorsum (lacking secondarily in *Rhysophora* and *Guttipsilopa* Wirth). *Abdomen:* Male terminalia: Presurstylus well developed; postsurstylus (clasper) lobate, generally setose, sometimes with a postsurstylar process; subepandrial plate present; pregonite moderately well developed, usually bearing 2–3 long, apical setulae(a synapomorphy for Discomyzinae); postgonite often greatly reduced, lacking, or perhaps fused with pregonite(a synapomorphy for Discomyzinae); hypandrium round; aedeagus tubular, simple; phallapodeme generally hemispherical to rounded triangular in lateral view; ejaculatory apodeme lacking(a synapomorphy for Discomyzinae). Female terminalia: Ventral receptacle with a relatively large operculum and curved extended process. Larva: Anterior spiracle cauliflower shaped.

Discussion. We follow Zatwarnicki (1992) in recognizing two tribes (Discomyzini and Psilopini) within the subfamily Discomyzinae. Evidence for the monophyly of Discomyzini, however, is not overwhelming (base or stem of vein R_{4+5} bearing 2–4 setulae on dorsum) and more evidence and assessment are needed. For example, the synapomorphies noted in the tribal diagnosis mostly apply to both Discomyzini and Psilopini (the subfamily Discomyzinae). The tribe Discomyzini presently comprises 12 genera and 56 species (Mathis and Zatwarnicki 1995 and electronic updates).

Key to genera of Discomyzini from the New World

1. A postsutural supra-alar seta much reduced (no larger than surrounding setulae) or absent 2
- A postsutural supra-alar seta present, size subequal to presutural supra-alar seta 5
2. Pseudopostocellar setae well developed, length about 1/2 that of ocellar setae, orientation divergent at usually less than 90° . . . . . *Clasiopella* Hendel
- Pseudopostocellar setae weakly developed, length considerably less than 1/2 that of ocellar setae, orientation variable 3
3. Only the reclinate fronto-orbital seta well developed; face conspicuously and deeply, transversely rugose . . . . . *Discomyza* Meigen
- At least 1 proclinate fronto-orbital seta in addition to reclinate seta well developed; face usually at most with shallowly impressed, transverse striae 4
4. Eye appearing bare; 1 well-developed proclinate fronto-orbital seta (2nd seta greatly reduced), inserted anterior to reclinate seta; presutural supra-alar seta weakly developed, length less than anterior notopleural seta (except in *M. cressoni* Lizarralde de Grosso); legs bicolored . . . . . *Mimapsilopa* Cresson
- Eye conspicuously setulose; 2 well-developed proclinate fronto-orbital setae, anterior proclinate seta at about same level as large, reclinate seta, posterior proclinate seta inserted posterior of reclinate seta; presutural supra-alar seta well developed, length longer than anterior notopleural seta; legs unicolorous, blackish brown . . . . . *Helaeomyia* Cresson
5. Interfrontal seta present; fronto-orbital setae 4 (anterior 2 setae proclinate, 3rd lateroclinate, 4th lateroreclinate) . . . . . *Paratissa* Coquillett
- Interfrontal seta absent; fronto-orbital setae 2–3 6
6. Supra-alar seta well developed, length subequal to postalar seta; wing usually mostly hyaline, at most with anterior margin faintly infuscate . . . . . *Rhysophora* Cresson
- Supra-alar seta moderately well developed, length about half postalar seta; wing usually with at least anterior margin infumate, wing sometimes mostly brown and with white spots . . . . . *Guttipsilopa* Wirth

Genus *Mimapsilopa* Cresson

Mimapsilopa Cresson 1941: 36. Type species: *Clasiopella metatarsata* Cresson 1939, original designation.—Cresson 1946: 153 [synonymy with *Helaeomyia* Cresson].—Lizarralde de Grosso 1982: 121–128 [revision].—Lizarralde de Grosso *et al.* 2011: 4 [catalog, Argentina].—Mathis and Zatwarnicki 1995: 27–28 [world catalog]; 1998: 7–24 [review of West Indian species].

Diagnosis. *Mimapsilopa* is distinguished from other genera of Discomyzini by the following combination of characters: Small to medium-sized shore flies, body length 1.30–3.40 mm; generally black species, many surfaces subshiny to shiny. *Head:* Normally developed, not triangular or with bulging eyes; antenna inserted at dorsal 1/3 of head height; frons conspicuously wider than long, sparsely microtomentose to microgranulose, contrasted from

subshiny to shiny face, vertex distinctly to somewhat angulate, not broadly rounded; interfrontal setae absent; well-developed fronto-orbital setae 2 (2nd proclinate seta greatly reduced, inserted posterior of larger proclinate seta), proclinate seta usually smaller than reclinate seta, inserted anterior of reclinate seta; ocellar setae well developed, inserted behind level of anterior ocellus, orientation usually proclinate and slightly divergent; pseudopostocellar setae weakly developed, divergent and slightly proclinate; both medial and lateral vertical setae well developed, lateral seta shorter than medial seta. Antennal shape quite variable; arista pectinate, bearing 5–11 dorsal rays or hairs. Eye irregularly elliptical, higher than wide, interfacetal setulae sparse, appearing bare. Face swollen medially, mostly to entirely bare, shiny, smooth to microsculptured, lacking pits; well-developed facial setae 2, level of insertion variable, inclinate and usually slightly dorsoclinate; proboscis normally developed, not elongate; palpus black. *Thorax:* Generally black, mesonotum, including postpronotum and notopleuron sparsely microtomentose, thereafter ventrally, including most of pleural area, mostly bare of microtomentum, shiny black; scutellum more or less triangular, posterior angle bluntly rounded. Chaetotaxy as follows: prescutellar acrostichal setae well developed, inserted far anteriad, slightly anteriad of level of single, large, dorsocentral seta, distance between dorsocentral setae more than that between apical scutellar setae; presutural supra-alar seta variable, well developed or greatly reduced; postsutural supra-alar seta lacking; postalar seta 1; scutellar disc moderately setulose; basal scutellar seta over 1/2 length of apical seta; notopleuron lacking setulae but bearing anterior and posterior setae, these equidistant from notopleural suture; anepisternum with 2 large setae at posterior margin, ventral seta only slightly longer to nearly twice length of dorsal seta; katepisternum with 1 large setae. Halter with knob white to yellowish. Wing variable, hyaline or with pattern of infuscation; vein R_{2+3} extended normally to costal margin, well separated from costa, lacking a stump vein, moderately long, making section II about 1.5 length of section III; vein M very shallowly curved anteriorly on apical portion; R stem vein bearing 2–4 setulae dorsally; crossvein dm-cu straight. Tarsi, at least basitarsomere, white to yellow, contrasted sharply from dark colored tibiae and femora, in some species the dorsum of the basitarsomere is somewhat darkened; forefemur with dorsal surface uneven, slightly emarginate. *Abdomen:* Mostly shiny, blackish, microtomentum generally sparse; tergite 5 of male shinier than preceding tergites, almost devoid of microtomentum, anterior margin with broad, shallow emargination dorsomedially, bearing longer setae along posterior margin. Male terminalia mostly symmetrical; epandrium as an inverted U in posterior view, arms projected ventrad, posterior surface generally setulose, generally thickly formed; cercus in posterior view broadly lunate, especially ventrally, dorsal apex more narrowly pointed; presurstylus large at ventral margin of epandrium, medial surface with a small emargination dorsally, thereafter ventrally on apical 2/3 shallowly concave and bearing numerous, short setulae, external surface arched; postsurstylus elongate, bearing numerous setulae, symmetrical or asymmetrical at apex, apex sometimes bilobed, mediobasal surface of some species bearing an internal, medially directed, usually rod-like postsurstylar process; subepandrial plate broadly U-shaped, base longer than length of arms; aedeagus longer than wide, variously shaped, often quadrate basally in lateral view; phallapodeme in lateral view more or less triangular, angle at attachment with hypandrium thicker; hypandrium in lateral view angulate, usually becoming much wider toward anterior margin, concavity moderately deep, pocket-like.

Discussion. Following the precedent of Mathis and Zatwarnicki (1998), we recognize two species groups within *Mimapsilopa,* and herein, we treat the included species in both species groups in alphabetical order.

Key to species of *Mimapsilopa* from Brazil

1. Wing infuscate, at least along anterior margin or apically (Figs. 46–50) 2
- Wing hyaline (Fig. 51) 6
2. Wing with broad to narrow transverse bands, one subapical, other apical (Figs. 46, 47). 3
- Wing infuscate along anterior margin, becoming gradually hyaline toward posterior margin (Figs. 48–50); face variable but not conspicuously rugose 4
3. Mid- and hindtibiae yellow; foreleg black except for apical 2–3 yellowish tarsomeres. . . . . *M. rugosa* Mathis, Costa & Marinoni **n.sp.**
- All tibiae largely black; foreleg, including tarsomeres, black. . . . . *M. xingu* Mathis, Costa & Marinoni **n.sp.**
4. Face largely bare, somewhat polished and shiny (Figs. 16–18) . . . . . *M. onssa* Mathis, Costa & Marinoni **n.sp.**
Face microsculptured to granulose, often with shallow vertical striae (Figs 1–3) 5
5. Basal flagellomere mostly blackish, only slightly yellowish at base margin (Figs. 8–10) . . . . . *M. iguassu* Mathis, Costa & Marinoni **n.sp.**
- Basal flagellomere more extensively yellowish at base and along ventrobasal margin (Figs. 1–3). . . . . .

. . . . . .*M. acta* Mathis, Costa & Marinoni **n.sp.**

6. Small species, wing length 1.80 mm or smaller; forebasitarsomere whitish . . . . . .*M. oligocrada* Lizarralde de Grosso [not yet recorded from Brazil]

- Larger species, wing length 2.30 mm or larger; forebasitarsomere dark brown. . . . . *M. plaumanni* Mathis, Costa & Marinoni **n.sp.**

The *cressoni* Group

Diagnosis. Head: Face finely granulose and with some shallow, transverse rugosity or with conspicuous rugosity; dorsoapical seta of pedicel long, length greater than width of pedicel; basal flagellomere elongate, length about twice or more height. Thorax: Presutural supra-alar seta well developed, length subequal to notopleural setae; ventral anepisternal seta at posterior margin nearly twice length of dorsal seta; dorsal and posterior margins of anepisternum microtomentose, similar to notopleuron. Forecoxa sparsely microtomentose; forebasitarsomere variable, some species yellow, similar to mid- and hindtarsi, other species black, unicolorous with other tarsomeres. Abdomen: Male terminalia: Epandrium with high cercal cavity, making dorsal portion of epandrium narrow; and presurstylus lacking presurstylar basomedial process, with large, medial seta (sometimes 2) and medial surface rounded, not concave; postsurstylus lacking rod-like process; pre- and postgonites fused, elongate.

Mimapsilopa acta Mathis, Costa & Marinoni n.sp.

Figs. 1–7, 50, 52.

Diagnosis. This species is distinguished from congeners by the following combination of characters: Generally very dark brown, shiny; moderately small shore flies, body length 2.15–2.80 mm. *Head* (Figs. 1–3): Frons dark brown, microsculptured. Basal flagellomere blackish dorsoapically, yellowish basoventrally, gradually tapered to rounded apex; arista with 9–10 dorsal rays. Face mostly shiny bluish black to black, microsculptured with shallow, mostly vertical striae. Eye ratio: 0.62–63; gena-to-eye ratio: 0.12–0.13. *Thorax:* Mesonotum sparsely microtomentose with brown microtomentum on shiny black background, appearing subshiny; anepisternum mostly shiny, only extreme margins microtomentose. Wing (Fig. 50) mostly infuscate, anterior margin brown, becoming progressively lighter colored posteriorly, posterior margin largely hyaline; length 1.85–2.00 mm; costal ratio 0.61–0.68; M vein ratio 0.77–0.81. Knob of halter white, stem yellowish. Foreleg, including forebasitarsomere and femora, and tibiae of mid- and hindlegs dark brown to black; extreme apex of mid- and hindtibiae and mid- and hindtarsi yellow except for darkened apical tarsomere. *Abdomen:* Tergites sparsely microtomentose, mostly shiny; tergites 4, 5 about equal in length, both longer than tergite 3; tergite 5 bare, shiny. Male terminalia (Figs. 4–7): Epandrium in posterior view (Fig. 4) setulose with short, stout setulae, shape as an inverted, thick-walled U, widest at dorsolateral corners, slightly thinner at dorsal portion above cercal cavity, in lateral view (Fig. 5) more or less rectangular dorsally, then becoming wider subventrally with anterior, relatively narrow protrusion, ventral margin nearly straight but slanted; cercus in posterior view (Fig. 4) elongate, shallowly lunate but not sharply pointed at ventral and dorsal apices, in lateral view (Fig. 5) semi-hemispherical; presurstylus symmetrical, in posterior view (Fig. 4) with 2 short medial lobes, more medial lobe more robustly developed, bearing a stout, relatively long seta apically, other lobe short, apical seta shorter, large lateral lobe as wide as epandrial arm, slightly tapered ventrally, ventral margin rounded, in lateral view quadrate on basal half, thereafter apically thumb-like, broadly rounded apically; postsurstylus symmetrical, in lateral view (Fig. 7), elongate, moderately narrow, lateral margins sinuous, lacking a rod-like, extended process; subepandrial plate in ventral view moderately and widely W-shaped, lateral arms curved medially, acutely pointed; aedeagus in lateral view (Fig. 7) somewhat quadrate on basal half, apical portion narrower, thumb-like, apex rounded, in ventral view (Fig. 6) elongate, base wide, apical third abruptly narrowed, narrowly digitiform; phallapodeme in lateral view (Fig. 7) broadly lunate, extended keel wide but short, in ventral view (Fig. 6) elongate, slender, with basal crossbar Y-shaped and subapical short crossbars; pre- and postgonite fused, in lateral view (Fig. 7) a curved, rod-like process, bearing 2 setulae apically; hypandrium in ventral view (Fig. 6) broadly and robustly U-shaped, especially thickened anteriorly, anterior margin bluntly rounded, lateral margin with angulate extension, thereafter posteriorly narrowed, almost parallel sided, posterior margin truncate, in lateral view (Fig. 7) deeply pocket-like, anterior margin pointed, posterior margin extended as a tapered, narrow process toward phallapodeme.

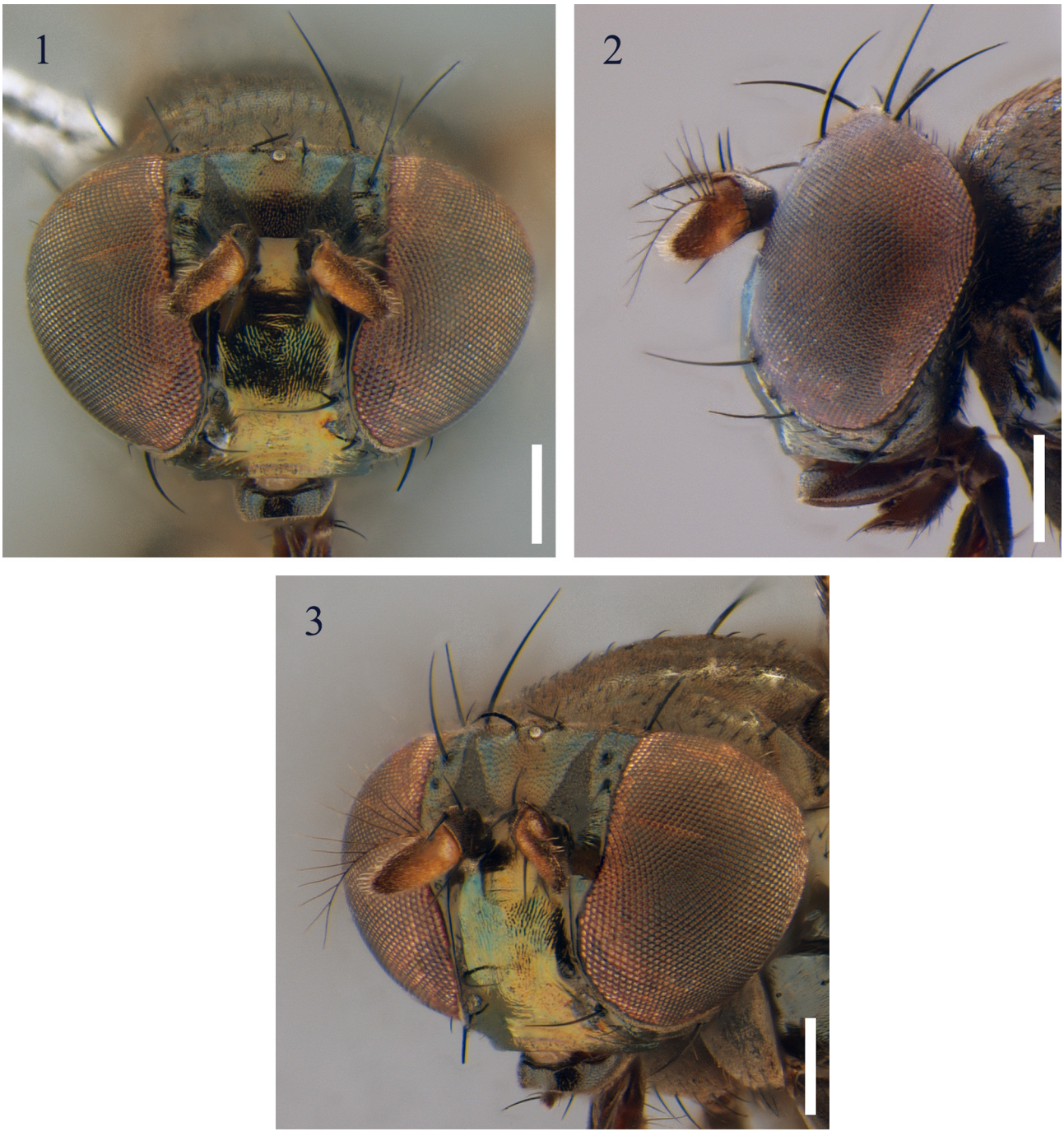
Type material. The holotype male is labeled **BRAZIL.** Paraná: Matinhos, Rio da Onça[,] 25°47.1'S, 48°31.6'W; 3 m), 27 Jan 2010[,] D. & W. N. Mathis/Holotype ♂ *Mimapsilopa acta* Mathis, Costa, &Marinoni DZUP [red]. The holotype is double mounted (minuten in a block of plastic elastomer), is in excellent condition, and is deposited in DZUP. Seven paratypes (7♂; DZUP, USNM) bear the same label data as the holotype.

Etymology. The species epithet, *acta,* is of Greek derivation, meaning seashore or coast, and refers to the coastal habitat of this species in southern Brazil.

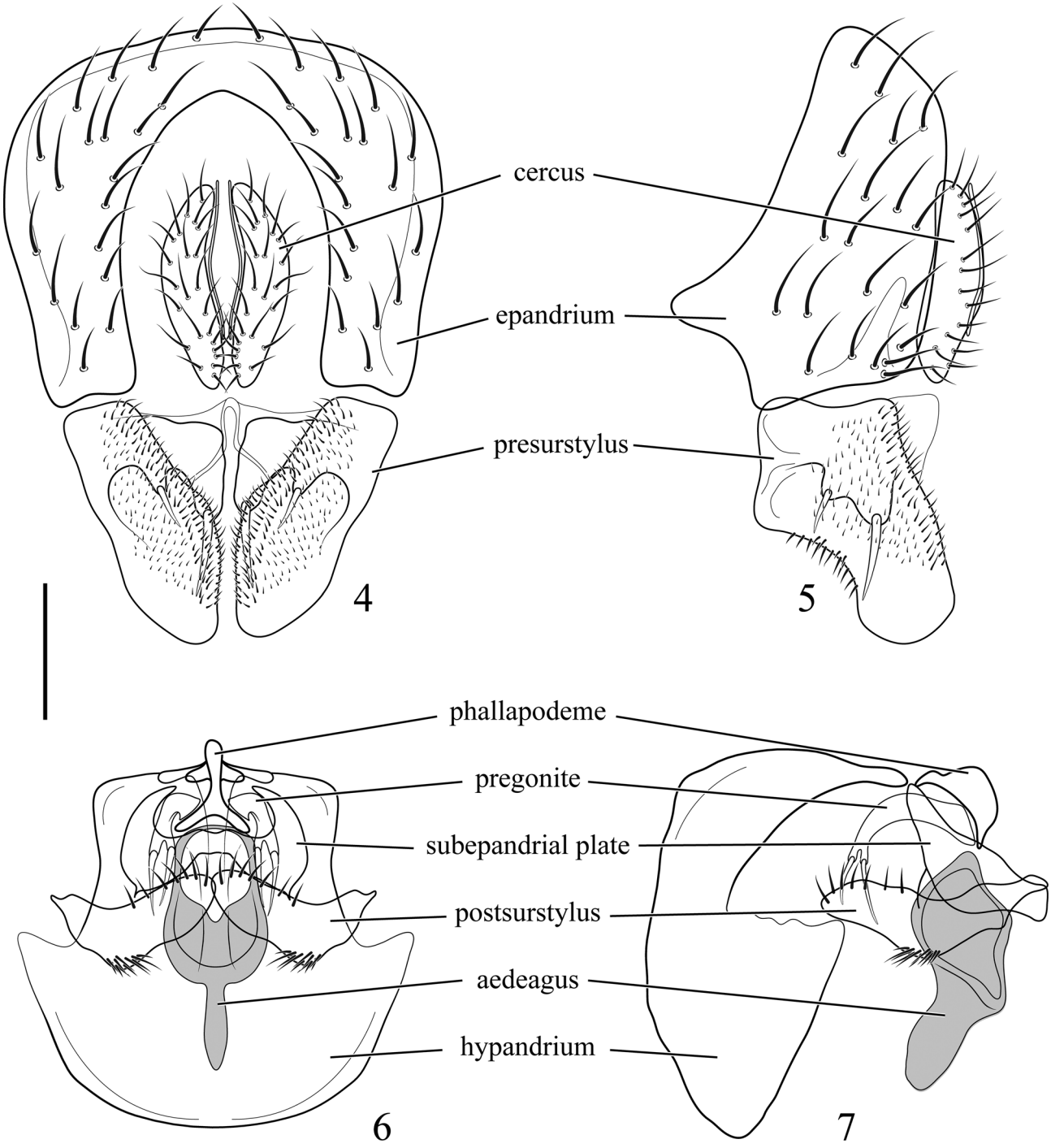
Type locality. BRAZIL. Paraná: Matinhos (Rio da Onça; 25°47.1'S, 48°31.6'W; 3 m).

Distribution (Fig. 52). *Neotropical:* Brazil (Paraná).

Remarks. This species is similar and is apparently closely related to *M. cressoni* Lizarralde de Grosso and *M. bacoa* Mathis and Zatwarnicki, but it is distinguished from either of these two species by structures of the male terminalia, especially the presurstylus, which is tapered apically and does not have a lateral incision.



FIGURES 1–3. *Mimapsilopa acta* **n.sp.** (1) Head, anterior view; (2) Same, lateral view; (3) Same, oblique view. Scale bar = 0.2 mm.

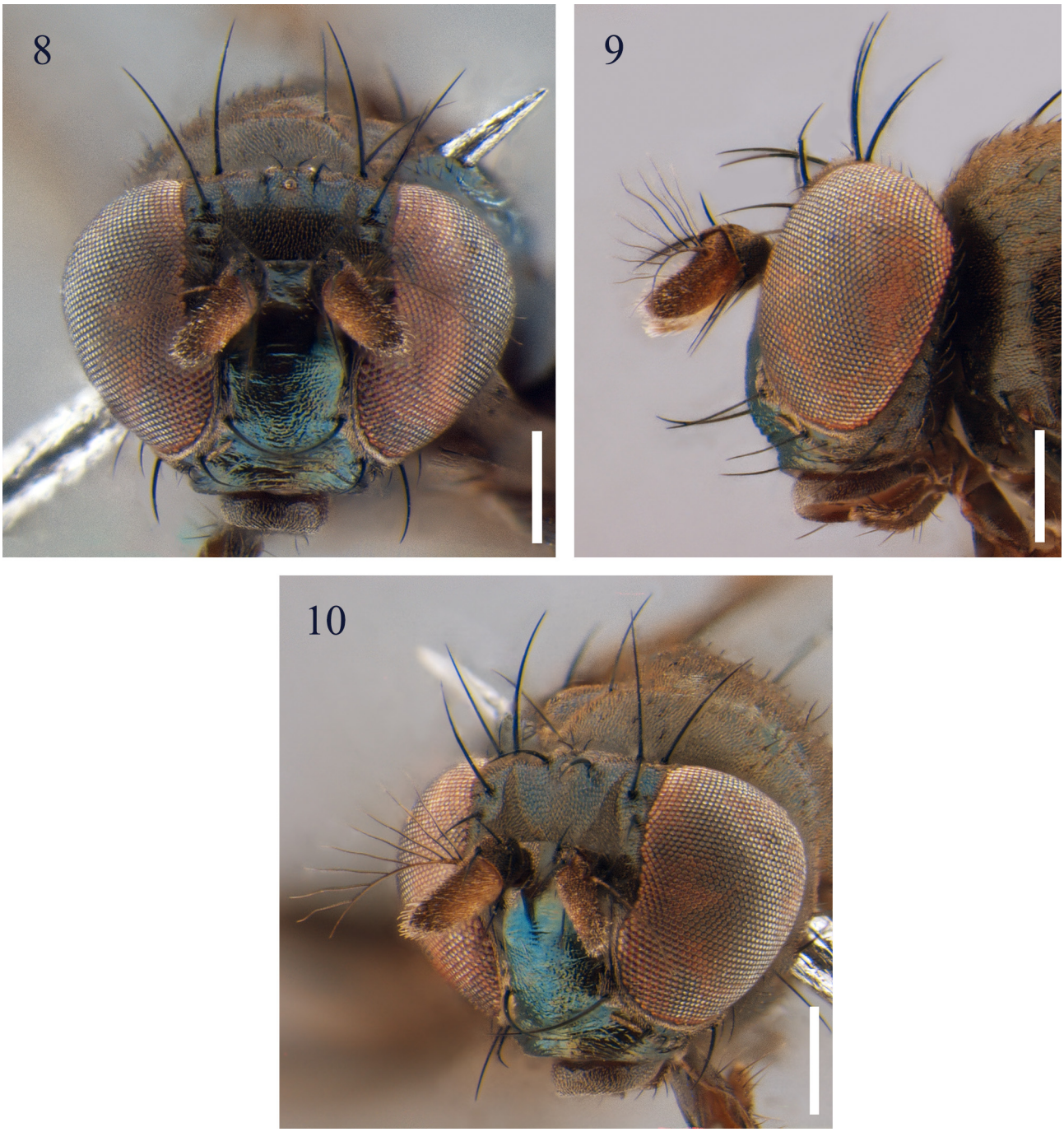


FIGURES 4–7. *Mimapsilopa acta* **n.sp.** (4). Epandrium, cerci, presurstylus, posterior view. (5). Same, lateral view. (6). Aedeagus, hypandrium, phallapodeme, postsurstylus, pregonite, subepandrial plate, ventral view. (7). Same, lateral view. Scale bar = 0.1 mm.

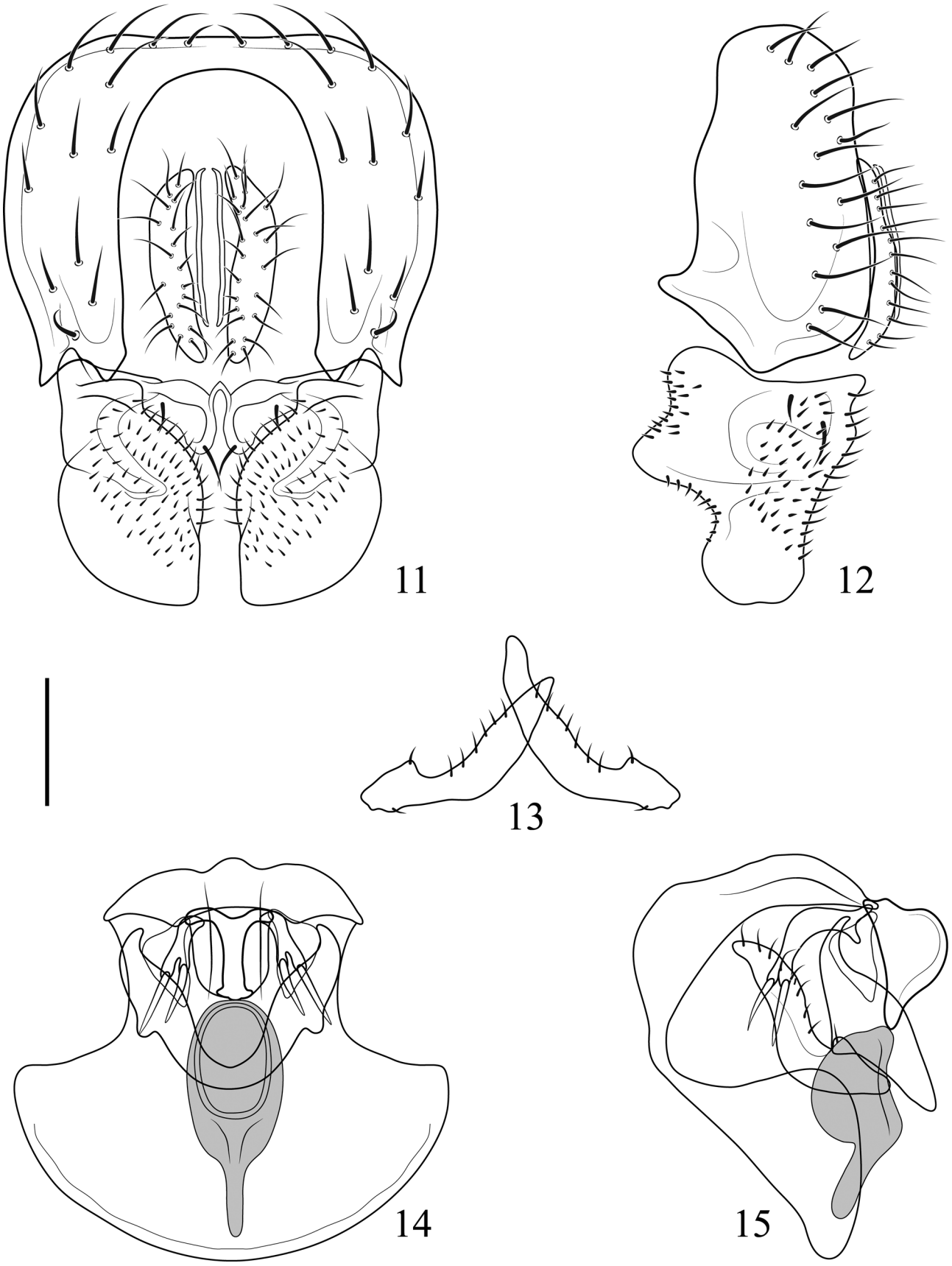
Mimapsilopa iguassu **Mathis, Costa & Marinoni n.sp.**
Figs. 8–15, 49, 52.

Diagnosis. This species is distinguished from congeners by the following combination of characters: Generally very dark brown, shiny; small to moderately small shore flies, body length 1.40–2.30 mm. *Head* (Figs. 8–10): Frons microtomentose brown on black background. Basal flagellomere mostly blackish, especially dorsoapically, only basoventromost portion yellowish, gradually tapered to rounded apex; arista with 7–10 dorsal rays. Face

mostly shiny bluish black to black, conspicuously microsculptured with shallow, mostly vertical and transverse striae. Eye ratio: 0.59–74; gena-to-eye ratio: 0.11–0.14. *Thorax:* Mesonotum sparsely microtomentose with brown microtomentum on shiny black background, appearing subshiny; anepisternum mostly shiny, only extreme margins microtomentose. Wing (Fig. 49) mostly infuscate, anterior margin brown, becoming progressively lighter colored posteriorly, posterior margin largely hyaline; length 1.50–2.20 mm; costal ratio 0.57–0.69; M vein ratio 0.73–0.91. Knob of halter white, stem yellowish. Foreleg, including forebasitarsomere and femora, and tibiae of mid- and hindlegs dark brown to black; extreme apex of mid- and hindtibiae and mid- and hindtarsi yellow except for darkened apical tarsomere. *Abdomen:* Tergites sparsely microtomentose, mostly shiny; tergites 4, 5 about equal in length, both longer than tergite 3; tergite 5 bare, shiny. Male terminalia (Figs. 11–15): Epandrium in posterior view (Fig. 11) setulose with short, moderately stout setulae, shape as an inverted, thick-walled U, widest at dorsolateral corners, conspicuously thinner at dorsal portion above cercal cavity, in lateral view (Fig. 12) height double width,



FIGURES 8–10. *Mimapsilopa iguassu* **n.sp.** (8) Head, anterior view; (9) Same, lateral view; (10) Same, oblique view. Scale bar = 0.2 mm.



FIGURES 11–15. *Mimapsilopa iguassu* **n.sp.** (11) Epandrium, cerci, presurstylus, posterior view. (12) Same, lateral view. (13) Postsurstyli and postsurstylar process. (14) Aedeagus, hypandrium, phallapodeme, pregonite, subepandrial plate, ventral view. (15) Same, postsurstylus, lateral view. Scale bar = 0.1 mm.

anterior margin sinuous and with sub-basal short projection, posterior margin nearly straight; cercus in posterior view (Fig. 11) elongate, shallowly lunate but not sharply pointed at ventral and dorsal apices, in lateral view (Fig. 12) semi-hemispherical; presurstylus symmetrical, robust, in posterior view (Fig. 11) with one short medial lobe bearing an apical, stout setulae, thereafter ventrally robustly developed, ventral margin rounded, slightly tapered in lateral view (Fig. 12) quadrate on basal half, thereafter apically with short, thumb-like, broadly rounded apical process; postsurstylus symmetrical, in lateral view (Fig. 15), elongate, moderately narrow, sinuous, bearing short, fringe-like setulae on posterior margin, in ventral view (Fig. 13) pointed medially, angulate subapically, apex truncate, lacking a rod-like, extended process; subepandrial plate in ventral view moderately and widely U-shaped, lateral arms recurved, tapered toward apex, in lateral view (Fig. 15) as a parallelogram; aedeagus in lateral view (Fig. 15) somewhat rectangular on basal half, apical portion narrower, digitiform, apex narrowly rounded, in ventral view (Fig. 14) elongate, base ovate, apical third abruptly narrowed, narrowly digitiform; phallapodeme in lateral view (Fig. 15) broadly helmut-like, extended keel wide and moderately high, in ventral view (Fig. 14) elongate, slender, T-shaped; pregonite fused, in lateral view (Fig. 15) a curved, rod-like process, bearing 2 setulae apically; hypandrium in ventral view (Fig. 14) broadly and robustly semi-circular, anterior margin broadly rounded, laterobasal margin with angulate extension, thereafter posteriorly narrowed, in lateral view (Fig. 15) deeply pocket-like but with deep emargination, basal portion curved, bar-like, anterior portion triangular.

Type material. The holotype male is labeled **BRAZIL.** Paraná: Parque Iguaçu[,] 25°33.4'S, 49°13.6'W; 880 m), 22Jan 2010[,] D. & W. N. Mathis/Holotype ♂ *Mimapsilopa iguassu* Mathis, Costa, & Marinoni DZUP [red]. The holotype is double mounted (minuten in a block of plastic elastomer), is in excellent condition, and is deposited in DZUP. Twenty-three paratypes (12♂, 11♀; DZUP, USNM) bear the same locality data as the holotype but with dates from 22 Jan–14 Apr 2010.

Type locality. BRAZIL. Paraná: Parque Iguaçu (25°33.4'S, 49°13.6'W; 880 m).

Distribution (Fig. 52). *Neotropical:* Brazil (Paraná).

Etymology. The species epithet, *iguassu,* refers to the type locality, Parque Iguaçu, in the Municipality of Curitiba, Brazil, and is a noun in apposition.

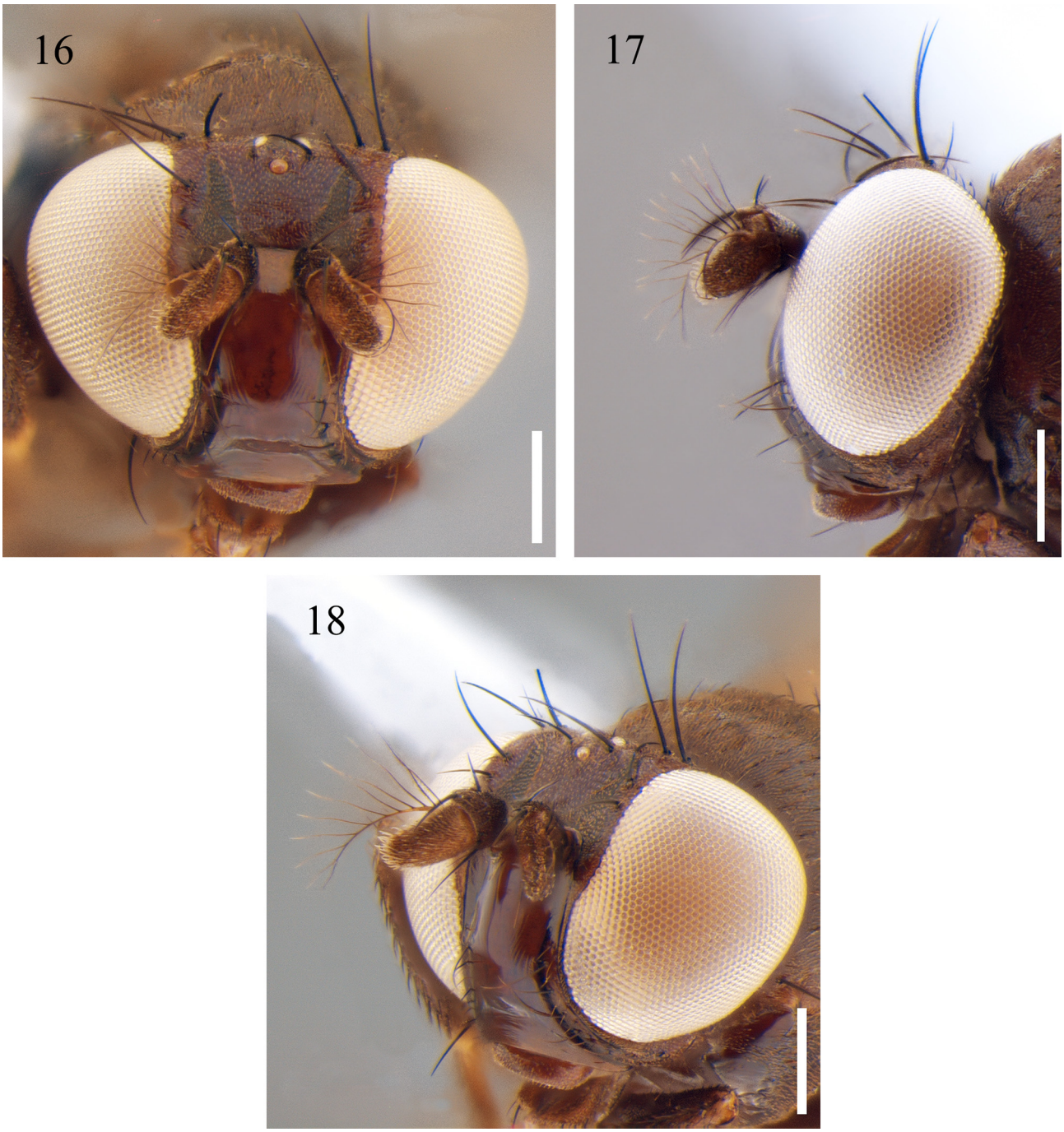
Remarks. Externally this species is similar to *M. acta* but can be distinguished from it and other congeners, especially those of the *cressoni* group, by the coloration and shape of the basal flagellomere, the pattern of infuscation of the wing, and by structures of the male terminalia.

Mimapsilopa onssa Mathis, Costa & Marinoni n.sp.

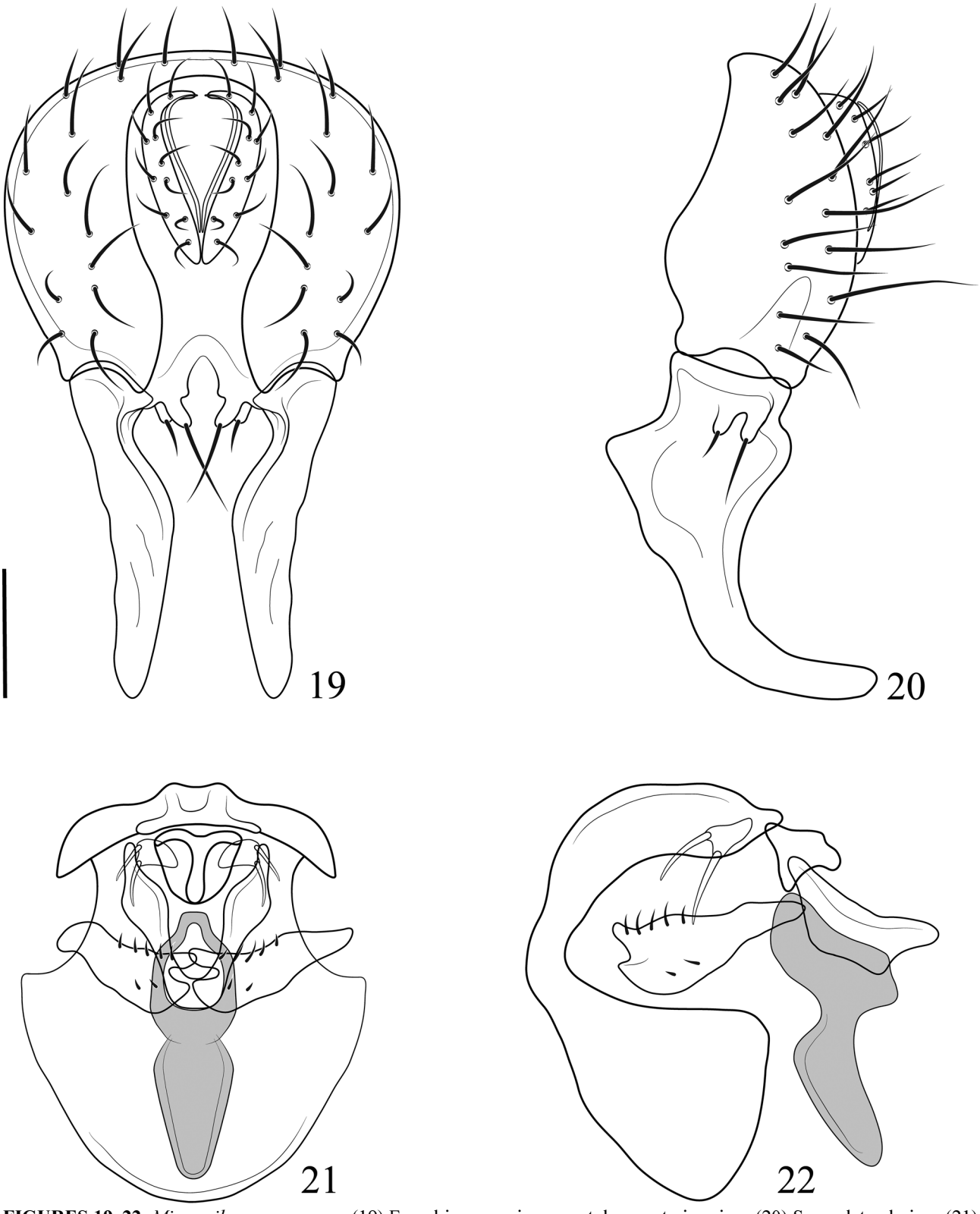
Figs. 16–22, 48, 52.

Diagnosis. This species is distinguished from congeners by the following combination of characters: Generally very dark brown, shiny. Moderately small to medium-sized shore flies, body length 2.00–3.50 mm. *Head* (Figs. 16–18): Frons black, very sparsely microtomentose, subshiny to shiny; 2 proclinate fronto-orbital setae, anterior seta 3–4X length of posterior seta, posterior seta immediately laterad of large, reclinate fronto-orbital seta. Basal flagellomere brownish black, some specimens with faint orange coloration basoventrally, length nearly twice height, apex rounded; arista with 9–11 dorsal rays. Face black, polished, shiny, with very shallow, faint, vertical striae. Maxillary palpus black. Eye ratio: 0.61–84; gena-to-eye ratio: 0.11–0.14. *Thorax:* Mesonotum microsculptured; anepisternum dark brown, shiny. Wing (Fig. 48) with anterior margin infuscate, becoming less so to hyaline posteriorly, darkened portion in cell r_1 with basal 1/4 noticeably paler than dark brown apical 3/4; wing length 1.80–2.50 mm; costal ratio 0.63–0.67; M vein ratio 0.61–0.67. Knob of halter white, stem yellowish. Femora and tibiae black (brownish black in specimens taken from alcohol); foretarsus brownish yellow ventrally; mid- and hindtarsi with basal 2–3 tarsomeres yellow to brownish yellow, apical 2 tarsomeres blackish brown. *Abdomen:* Tergites sparsely microtomentose; tergites 4, 5 about equal in length, both longer than tergite 3; tergite 5 bare, shiny. Male terminalia (Figs. 19–22): Epandrium in posterior view (Fig. 19) moderately setulose, shape as an inverted, thin to thick-walled U, narrowed dorsally between dorsal margin of cercal cavity and anterodorsal margin, lateral arms about equally wide, ventral margin shallowly emarginate; in lateral view (Fig. 20) with height about twice width, widest subventrally, dorsal 2/3 tapered, anterior margin with convexity on ventral half, posterior margin more or less evenly rounded; cercus in posterior view (Fig. 19) irregularly lunate, tapered toward apical angle, apical curved medially, in lateral view (Fig. 20) irregularly semicircular, curvature more abrupt dorsally; presurstylus symmetrical, in posterior view (Fig. 19) as a bilobed structure, with median lobe much shorter, rod-

like, bearing a long, stout seta apically that is oriented posteromedially, a much longer and wider lateral lobe, length equal to height of epandrium, lateral margin shallowly and irregularly sinuous, medial margin emarginate on basal third, thereafter ventrally straight, in lateral view with irregularly quadrate base, apical half shallowly curved, almost parallel sided, slightly tapered, apex rounded; postsurstylus in lateral view (Fig. 22) clavate, greatly expanded towards apex, apex with a small, thumb-like process and emargination, in ventral view (Fig. 21) as lateral, wing-like extensions; pregonite in lateral view (Fig. 22) short, rod-like, in ventral view (Fig. 21) robustly ovate, short; postgonite short, closely associated with lateral arms of subepandrial plate, not well developed; subepandrial plate in lateral view (Fig. 21) bar-like, elongate, both apices tapered, in ventral view (Fig. 22) V-shaped, acutely pointed apically; aedeagus in lateral view (Fig. 22) with wide base, thereafter abruptly narrowed, apical 2/3 somewhat clavate, rounded apex, in ventral view (Fig. 21) urn-like, with sub-basal emarginations, apical ovate, apex bluntly rounded; phallapodeme lateral view (Fig. 22) roughly and irregularly triangular, short and wide,



FIGURES 16–18. *Mimapsilopa onssa* **n.sp.** (16) Head, anterior view; (17) Same, lateral view; (18) Same, oblique view. Scale bar = 0.2 mm.



FIGURES 19–22. *Mimapsilopa onssa* **n.sp.** (19) Epandrium, cerci, presurstylus, posterior view. (20) Same, lateral view. (21) Aedeagus, hypandrium, phallapodeme, postsurstylus, pregonite, subepandrial plate, ventral view. (22) Same, lateral view. Scale bar = 0.1 mm.

apex (attached to base of aedeagus) more broadly rounded than angle that attaches with hypandrium, in ventral view T-shaped with crossbar as long as stem; hypandrium a deep pocket in lateral view (Fig. 22) with a deep U-shaped invagination medially, in ventral view (Fig. 21) with anterior margin widely arched, posterior margin narrowed, somewhat truncate posteriorly.

Type material. The holotype male is labeled MATHINHOS. Paraná. Brasil[.] Parque Rio da Onça (25°50'S, 48°30'O), 27/IV2007[,] E. R. Sepka col/Holotype ♂ *Mimapsilopa onssa* Mathis, Costa,&Marinoni DZUP [red]. The holotype is double mounted (glued to a paper triangle), is in excellent condition, and is deposited in DZUP. Five paratypes (3♂, 2♀; DZUP, USNM) bear the same label data as the holotype. Other paratypes (1♂, 2♀; DZUP, USNM) bear the same locality data as the holotype but with the date of 27 Jan 2010.

Type locality. BRAZIL. Paraná: Matinhos (Rio da Onça; 25°47.1'S, 48°31.6'W; 3 m).

Etymology. The species epithet, *onssa,* refers to the type locality, Rio da Onça in the municipality of Matinhos, Brazil. The name is a noun in apposition. The Portuguese cognate onça also refers to the Jaguar (*Panthera onca* L.).

Distribution (Fig. 52). *Neotropical:* Brazil (Paraná).

Remarks. Although *M. onssa* is similar to *M. acta* and *M. iguassu*, the latter two species also of the *cressoni* group, it is distinguished from the latter two species by the largely bare, and somewhat polished and shiny face in addition to the shape of the presurstylus, which is unmistakable, especially the elongated, narrow, and somewhat pointed and paired prolongations. These are usually visible in pinned specimens, facilitating recognition. In other congeners, the presurstylus is usually bluntly to narrowly rounded.

The *metatarsata* Group

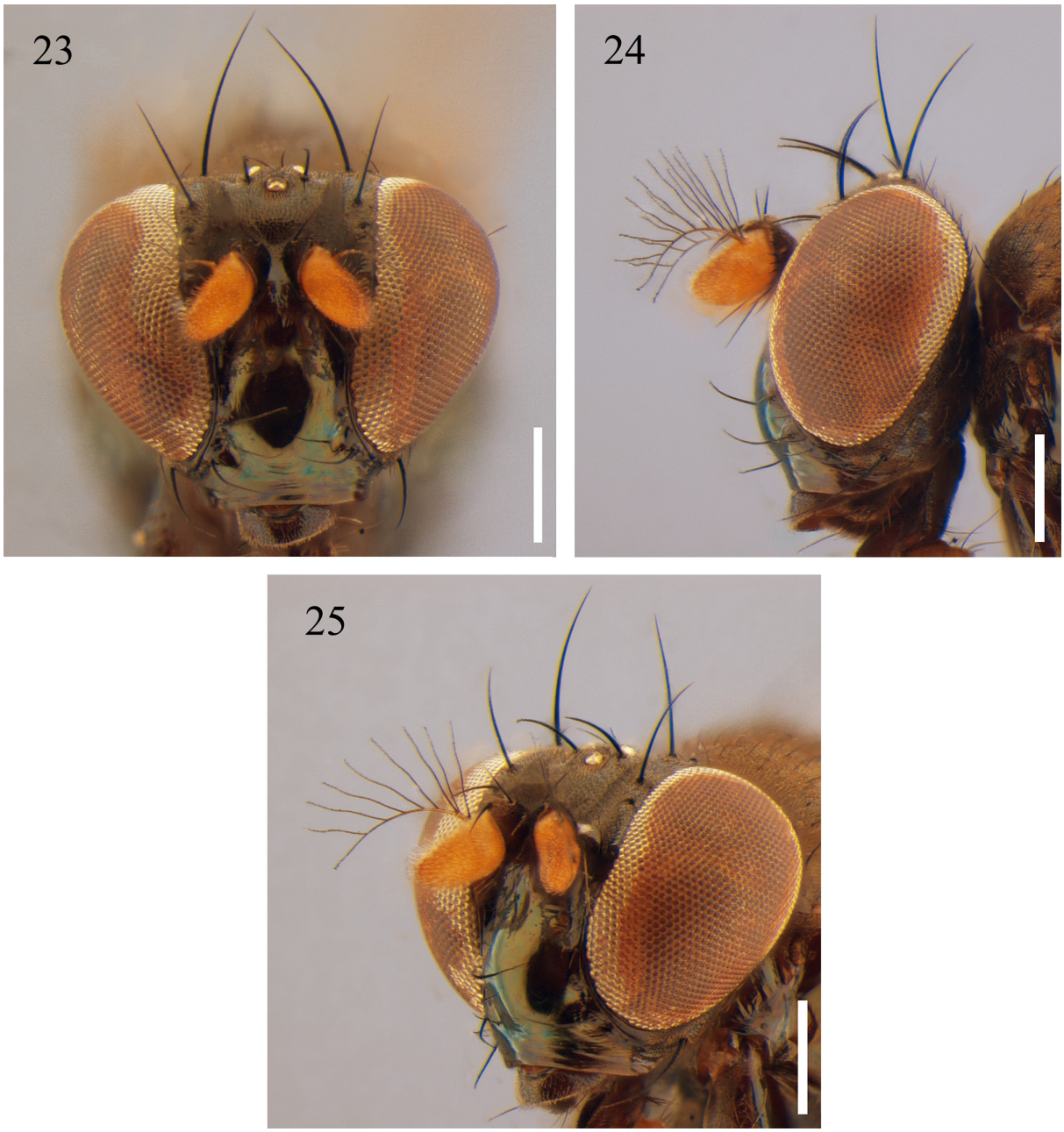
Diagnosis. Head: Face smooth, polished, some species with fine, shallow, transverse striae or conspicuously rugose; dorsoapical seta of pedicel long, length greater than width of pedicel; length of basal flagellomere equal to height or only slightly more. Thorax: Presutural supra-alar seta well developed, length subequal to notopleural setae; ventral anepisternal seta at posterior margin nearly twice length of dorsal seta; dorsal and posterior margins of anepisternum microtomentose, similar to notopleuron. Forecoxa sparsely microtomentose; forebasitarsomere black, contrasted with yellow mid- and hindtarsi except for darkened apical tarsomere. Abdomen: Male terminalia: Epandrium in posterior view thick-walled, especially dorsal portion above cercal cavity; presurstylus with basomedial, extended presurstylar process, often connected with process from opposite side to form an inverted V-shaped structure, primary presurstylar lobe with medial seta and medial surface rounded, not concave, often bearing numerous short setulae; postsurstylus with rod-like basolateral process; pregonite and postgonite separate.

Mimapsilopa plaumanni Mathis, Costa & Marinoni n.sp.

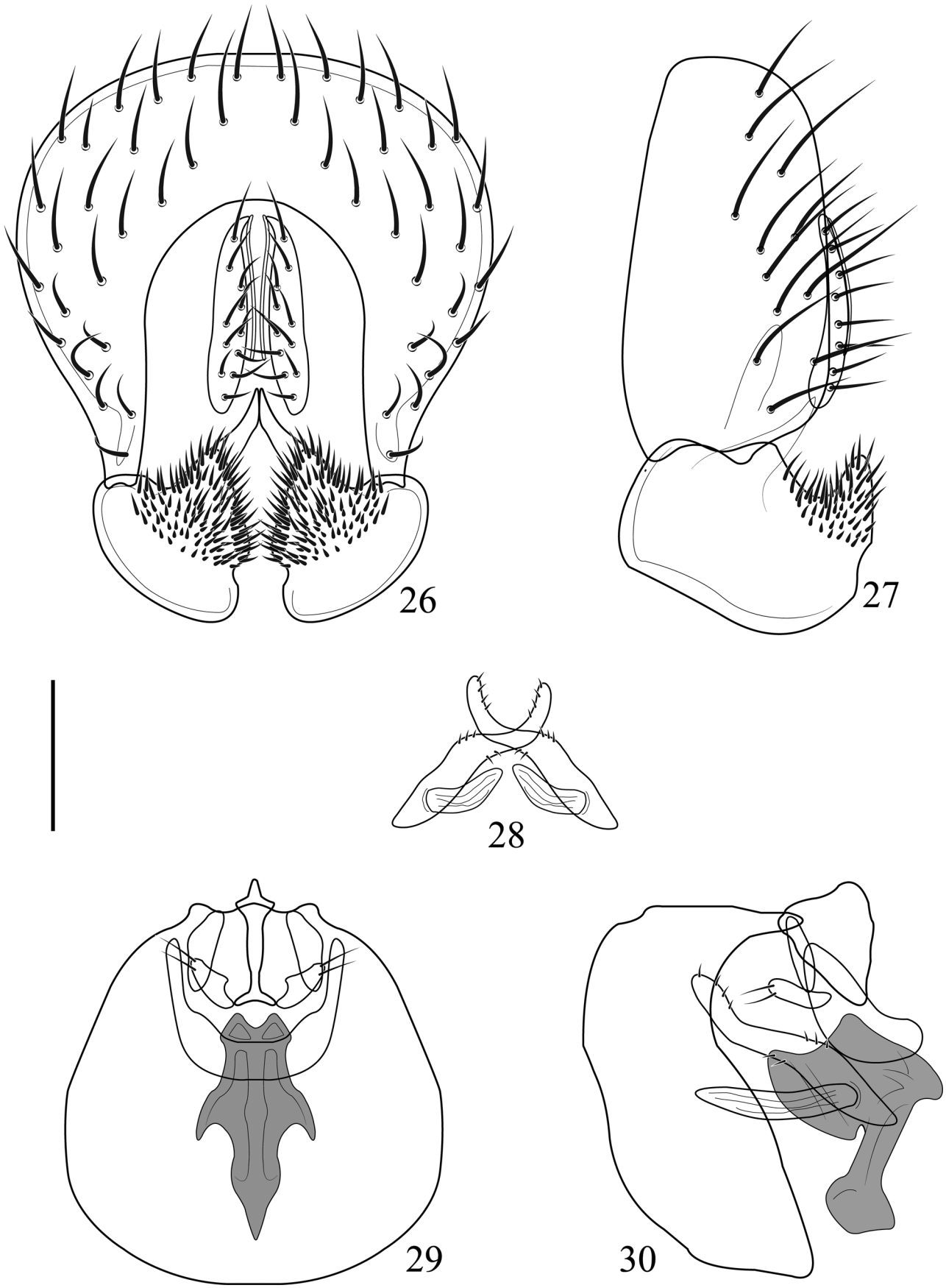
Figs. 23–30, 51, 52.

Diagnosis. This species is distinguished from congeners by the following combination of characters: Generally very dark brown to black, shiny, small shore flies, body length 2.30–2.80 mm. *Head* (Figs. 23–25): Frons dark brown, sparsely microtomentose. Basal flagellomere mostly yellow, some specimens with darkened dorsal margin, only very slightly tapered, apex moderately broadly rounded; arista with 8–9 dorsal rays. Face dark brown to black, shiny, shallowly swollen, ventral half microsculptured with fine transverse striae. Eye ratio: 0.62–65; gena-to-eye ratio: 0.17–0.20. *Thorax:* Scutum, including notopleuron, dark brown microtomentose, more densely so than frons but still subshiny; scutellum and notopleuron microtomentose; anepisternum, anepimeron, and katepisternum dark brown to black, shiny. Wing (Fig. 51) faintly brown to golden, mostly hyaline, lacking maculation pattern; length 2.60 mm; costal ratio 0.80–84; M vein ratio 0.60–65. Knob of halter white, stem yellowish. Foreleg including forebasitarsomere and femora and tibiae of mid- and hindlegs dark brown; extreme apex of mid- and hindtibiae and mid- and hindtarsi yellow except for darkened apical tarsomere. *Abdomen:* Tergites sparsely microtomentose; Tergites 4, 5 about equal in length, both longer than tergite 3; tergite 5 bare, shiny. Male terminalia (Figs. 26–30): Epandrium in posterior view (Fig. 26) setulose with short, stout setulae, shape as an inverted, thick-walled U, especially dorsal portion above cercal cavity, becoming gradually narrower toward ventral apices of arms, in lateral view (Fig. 27) more or less rectangular with height about twice width, dorsal margin bluntly rounded, slightly sloping ventrad posteriorly, widest subventrally; cercus in posterior view (Fig. 26) elongate, more or less oval, pointed dorsomedially, rounded ventrally, in lateral view (Fig. 27) lunate; presurstylus symmetrical, in posterior view (Fig. 26) rounded ventrolaterally, pointed dorsomedially, point oriented dorsally, this portion more densely

setulose, especially medial and dorsal margins, in lateral view (Fig. 27) irregularly rectangular, dorsal margin with 2 pointed extensions, between pointed extensions deeply emarginate, ventral margin irregularly convex; postsurstylus symmetrical, in lateral view (Fig. 30), elongate, moderately narrow lateral margins sinuous, each postsurstylus bearing a rod-like process extended subapically, process pointed apically; subepandrial plate in ventral view moderately broadly U-shaped, basal portion nearly flat; aedeagus in lateral view (Fig. 30) somewhat quadrate on basal half, apical portion as a narrow, clavate process, in ventral view (Fig. 29) elongate, moderately narrow, basally emarginate medially, with pointed, ventrally directed extensions laterally, thereafter ventrally tapered to acute point, lateral margins of apical portion sinuous; phallapodeme in lateral view (Fig. 30) triangular, in ventral view (Fig. 29) elongate, slender, with basal and subapical short crossbars; pregonite in lateral view (Fig. 30) small, rod-like, bearing 2 setulae apically; hypandrium in ventral view (Fig. 29) robustly U-shaped, especially anteriorly thickened, arms extended posteriorly, deeply emarginate posteromedially; in lateral view (Fig. 30) deeply pocket-like, more or less rectangular, posterior margin shallowly concave on basal portion, base oriented posterior, narrowly pointed.



FIGURES 23–25. *Mimapsilopa plaumanni* **n.sp.** (23) Head, anterior view; (24) Same, lateral view; (25) Same, oblique view. Scale bar = 0.2 mm.



FIGURES 26–30. *Mimapsilopa plaumanni* **n.sp.** (Brazil. Santa Catarina: Nova Teutônia). (26) Epandrium, cerci, presurstylus, posterior view. (27) Same, lateral view. (28) Postsurstyli and postsurstylar process. (29) Aedeagus, hypandrium, phallapodeme, pregonite, subepandrial plate, ventral view. (30) Same, postsurstylus, lateral view. Scale bar = 0.1 mm.

Type material. The holotype male is labeled "Brasilien Nova Teutonia[,] 27°11' B, 52°23'L[,] Fritz Plaumann 300–500 m[,] VI 1970 [the label has a black submargin]/ Holotype ♂ *Mimapsilopa plaumanni* Mathis, Costa, & Marinoni MZUSP [red]). The holotype is double mounted (minuten in card board base), is in good condition (abdomen removed and dissected, some setae of the head missing) and is deposited in MZUSP. Two paratypes (1♂, 2♀; MZUSP) bear the same label data as the holotype.

Type locality. Brazil. Santa Catarina: Nova Teutônia (27°11'S, 52°23'W; 3–500 m).

Distribution (Fig. 52). *Neotropical:* Argentina (Tucumán), Brazil (Santa Catarina).

Etymology. The species epithet, *plaumanni,* is a Latin genitive patronym to honor Fritz Plaumann (deceased), collector extraordinaire, whose carefully prepared specimens have contributed significantly to the study of Brazil's insect biodiversity.

Remarks. This species is closely related to *M. schildi* (Cresson), also of the *metatarsata* group, as evidenced by the similarly shaped structures of the male terminalia. Both species have the dorsal portion of the epandrium very thickly developed and the medial margin of the presurstylus is minutely and densely setulose. The cercus of *M. plaumanni* is elongated, however, unlike the stout, short cercus of *M. schildi,* and the shapes of the presurstyli are also diagnostic, in both lateral and posterior views (see Figs. 26 and 27).

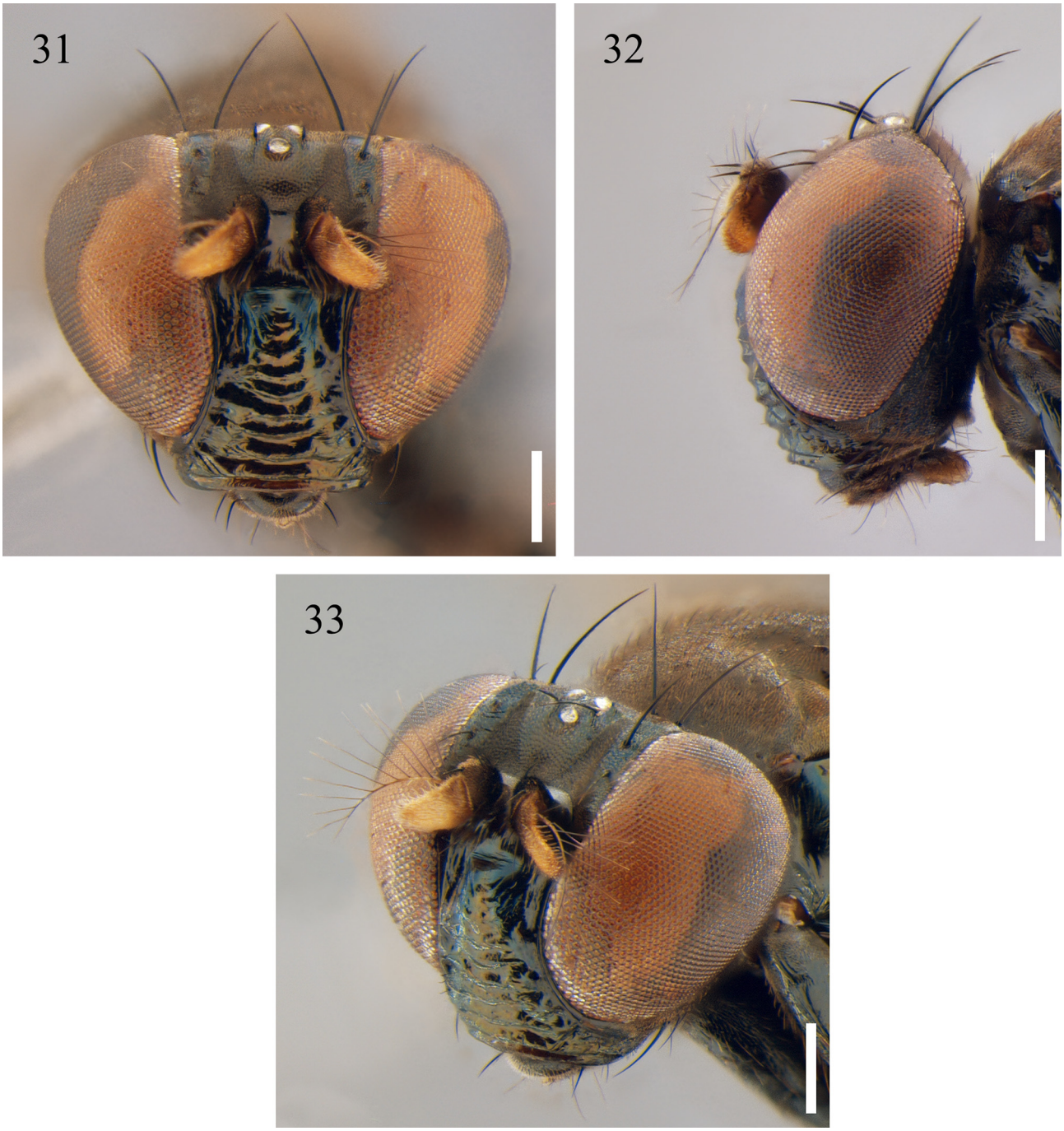
Mimapsilopa rugosa Mathis, Costa & Marinoni n. sp.

Figs. 31–38, 47, 52.

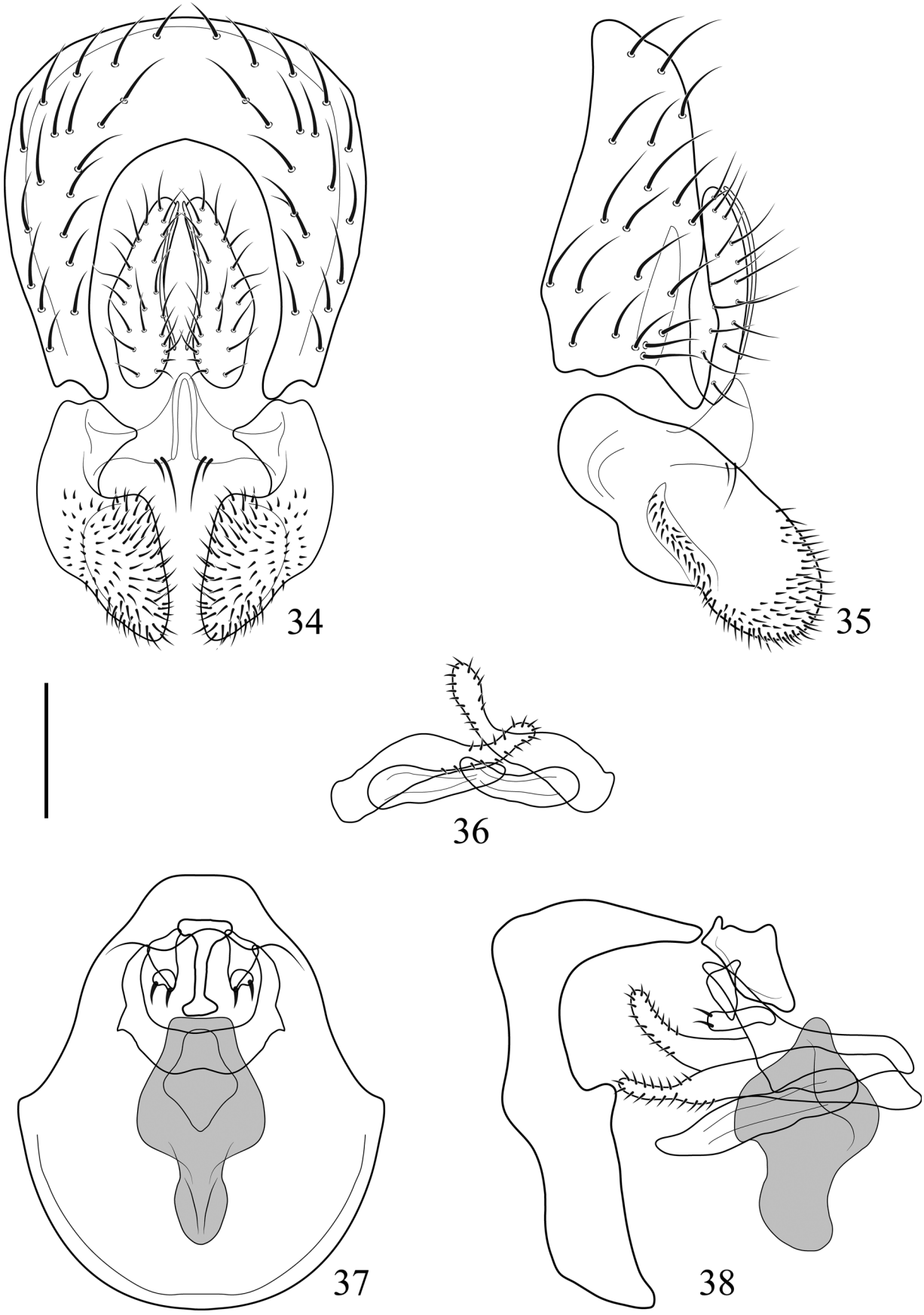
Diagnosis. This species is distinguished from congeners by the following combination of characters: Mostly shiny black; small to medium-sized shore flies, body length 1.65–3.90 mm. *Head* (Figs. 31–33): Frons black, moderately microtomentose, subshiny to partially dull; 1 proclinate fronto-orbital seta, about length of reclinate seta, inserted anterior of reclinate. Basal flagellomere mostly yellowish, ventrobasally darkened, length only slightly greater than height, apex broadly rounded; arista with 10–11 dorsal rays. Face black, shiny, conspicuously transversely rugose, rugosity moderately deep. Clypeus exposed, black; maxillary palpus black. Eye ratio: 0.64–64; gena-to-eye ratio: 0.14–0.16. *Thorax:* Mesonotum microsculptured; anepisternum black, shiny. Wing (Fig. 47) with distinct and conspicuous pattern; costal cell hyaline; cell r1 tannish brown; apical 1/3 of wing brown except for broad, completely hyaline, transverse band extended posteriorly from apex of vein R_{2+3}; immediately basad of hyaline band with slightly darker, transverse, brown band; wing length 1.60–2.95 mm; costal ratio 0.88–0.92; M vein ratio 0.58–0.72. Knob of halter whitish yellow, stem yellow. Foreleg entirely black except for apical 3 tarsomeres, tarsomere 3 darkened basally; mid- and hindfemora mostly black, apex yellowish; mid- and hindtibiae and tarsi yellowish brown to yellowish, apical tarsomere brownish black. *Abdomen:* Tergites sparsely microtomentose to mostly bare, shiny; tergites 1–2 subequal in length; length of tergite 3 subequal to combined length of tergites 1 and 2; tergite 4 slightly longer than 3; length of tergite 5 slightly more than half that of tergite 4; tergite 5 of male trapezoidal, bare, shiny. Male terminalia (Figs. 34–38): Epandrium in posterior view (Fig. 34) setulose with short, moderately stout setulae, shape as an inverted, thick-walled U, especially dorsal portion above cercal cavity, becoming gradually narrower toward ventral apices of arms, in lateral view (Fig. 35) more or less rectangular with height about twice width, dorsal margin sloped ventrad posteriorly, widest subventrally; cercus in posterior view (Fig. 34) elongate, more or less narrowly oval, both apices rounded, in lateral view (Fig. 35) semi-hemispherical; presurstylus symmetrical, in posterior view (Fig. 34) with lateral margin curved, more or less evenly, medial margin with sub-basal, moderately wide invagination, thereafter ventrally tapered, base with 2 well-developed setulae from basal arm, in lateral view (Fig. 35) lobate, fringed with short, closely set setulae, apex rounded; postsurstylus symmetrical, in lateral view (Fig. 38) elongate, tapered irregularly to apex, apical fourth narrowed, digitiform, bearing elongate, well sclerotized, rod-like process extended subapically, process pointed apically; subepandrial plate in ventral view broadly U-shaped, basal portion nearly flat, each arm tapered to point, in lateral view (Fig. 38) robustly L-shaped; aedeagus in lateral view (Fig. 38) somewhat quadrate on basal half, apical portion as thumb-like extension, in ventral view (Fig. 37) base wide, apical portion abruptly narrowed, narrowly rounded apically; phallapodeme in lateral view (Fig. 38) triangular, in ventral view (Fig. 37) elongate, slender, I-shaped, apical crossbar longer than basal bar; pregonite in lateral view (Fig. 38) small, rod-like, bearing 2 setulae apically; postgonite in lateral view narrow, elongate, curved on apical portion, apical portion digitiform; lateral postsurstylar process enlarged, elongate, nearly parallel sided, apex with right angle at one corner, rounded at other;

hypandrium in lateral view (Fig. 38) moderately deeply pocket-like, more or less elongate, rectangular, posterior margin shallowly concave on basal portion, base oriented posterior, narrowly pointed.

Type material. The holotype male is labeled PERU. Madre de Dios: Manu, Rio Manu, 250 m[,] Pakitza, 12°7'S, 70°58'W [11°56.6'S, 71°16.9'W], 9–23 Sep 1988[,] Wayne N. Mathis/USNM ENT 00118303 [plastic bar code label]/Holotype ♂ *Mimapsilopa rugosa* Mathis, Costa,&Marinoni USNM [red]. The holotype is double mounted (minuten in a block of plastic of plastic), is in excellent condition, and is deposited in USNM. Thirty-nine paratypes (22♂, 17♀; DZUP, USNM) bear the same label data as the holotype. Other paratypes are as follows: PERU. **Loreto:** Iquitos (12 km W; 03°48.4'S, 73°20.5'W), 16 Feb 1984, W. N. Mathis (1♂; USNM). **Madre de Dios:** Río Manu, Pakitza (5 km E; Aguajal; 11°58.2'S, 71°17'W; 250 m), 19 Sep 1988, W. N. Mathis (1♀; USNM); Río Manu, Erika (near Salvación; 12°50.7'S, 71°23.3'W; 550 m), 5–6 Sep 1988, A. Freidberg (6♂, 10♀; USNM).



FIGURES 31–33. *Mimapsilopa rugosa* **n.sp.** (31) Head, anterior view; (32) Same, lateral view; (33) Same, oblique view. Scale bar = 0.2 mm.



FIGURES 34–38. *Mimapsilopa rugosa* **n.sp.** (34). Epandrium, cerci, presurstylus, posterior view. (35). Same, lateral view. (36) Postsurstyli and postsurstylar process. (37). Aedeagus, hypandrium, phallapodeme, pregonite, subepandrial plate, ventral view. (38). Same, postsurstylus, lateral view. Scale bar = 0.1 mm.

Type locality. Peru. Madre de Dios: Río Manu, Pakitza (11°56.6'S, 71°16.9'W; 250 m).

Other specimens examined.—GUYANA. Conservation of Ecological Interactions and Biotic Associations (CEIBA; ca 40 km S Georgetown; 06°29.9'N, 58°13.1'W), 13 Apr–29 Aug 1994, 1997, W. N. Mathis (18♂, 16♀; USNM).

BRAZIL. **Amazonas:** Reserva Ducke (02°55.8'S, 59°58.5'W; 40 m), 5 May 2010, D. & W. N. Mathis (1♂; USNM). **Bahia:** "Cururipe (= Cururupe; 14°51'S, 39°03'W), 13 Oct 1920, R. C. Shannon (1♂; USNM). **Pará:** Fazenda Taperinha, Santarém (02°31.9'S, 54°17.7'W), Nov 1970, Expedição Permanente da Amazônia (1♂; MZUSP).

Distribution (Fig. 52). *Neotropical:* Brazil (Amazonas, Bahia, Pará), Guyana, Peru (Loreto, Madre de Dios).

Etymology. The species epithet, *rugosa,* is of Latin derivation and means wrinkled, referring to the transversely wrinkled face of this species.

Remarks. This is the most widespread species of *Mimapsilopa* and as would be expected for such a widespread species, there is some variation, which we interpret to be intraspecific. Although similar to other species with subapical and apical transverse bands, such as *M. xingu,* this species is easily distinguished from congeners, including *M. xingu,* by the wing pattern, facial rugosity, and yellowish, apical tarsomeres of the foreleg.

***Mimapsilopa xingu* Mathis, Costa & Marinoni n. sp.**
Figs. 39–46, 52.

Diagnosis. This species is distinguished from congeners by the following combination of characters: Mostly shiny black; medium-sized shore flies, body length 3.45–3.70 mm. *Head* (Figs. 39–41): Frons black, moderately densely microtomentose, subshiny to dull; 1 proclinate fronto-orbital seta, about 2/3 length of reclinate seta, inserted anterior of reclinate. Basal flagellomere yellowish, height subequal to length, apex broadly rounded; arista with 9–10 dorsal rays. Face black, polished, shiny, swollen on dorsal 2/3, ventral 1/3 with transverse striae. Clypeus exposed, black; maxillary palpus black. Eye ratio: 0.58–66; gena-to-eye ratio: 0.19–0.21. *Thorax:* Mesonotum microsculptured; anepisternum black, shiny. Wing (Fig. 46) mostly hyaline but with distinct and conspicuous pattern; subcostal, costal, and cell r1 uniformly infuscate, light brown; crossvein dm-cu with slightly brown halo; apical 1.3 with 2 curved, transverse bands, subapical band extended from apex of vein R_{2+3} and extended into cell dm; apical band connected with subapical band near anterior margin in cell r_{2+3} transverse, moderately wide, brownish band at level of crossvein dm-cu, apical almost 1/3 of wing also infuscate, otherwise mostly hyaline; wing length 2.55–265 mm; costal ratio 0.86–0.90; M vein ratio 0.65–0.68. Knob of halter white, stem brownish black. Foreleg entirely black; mid- and hindfemora mostly black, apex yellowish; mid- and hindtibiae black; mid- and hindtarsi yellowish brown to yellowish, apical tarsomere brownish black. *Abdomen:* Tergites sparsely microtomentose to mostly bare, shiny; tergites 1–2 subequal in length; length of tergite 3 subequal to combined length of 1 and 2; tergite 4 slightly longer than 3; tergite 5 at most 1/3 length of tergite 4. Male terminalia (Figs. 42–45): Epandrium in posterior view (Fig. 42) moderately thin dorsally above cercal cavity, lateral arms robustly developed, in lateral view (Fig. 43); presurstylus bilobed, dorsal lobe much larger than ventral lobe, tapered to point, ventral lobe digitiform; pregonite short, bearing numerous short setulae on apical half; postgonite short, somewhat bar-like, closely associated with lateral arms of subepandrial plate; postsurstylus with base in lateral view (Fig. 45) quadrate, with elongate, digitiform, anterior process and an angulate, process that is narrowed basally and rectangular apically with apical margin bearing 4–5 short setulae, with a great enlarged, well-sclerotized, darkened basolateral process, often process exposed, T-shaped with crossbar at apex of T and tapered to acute point at each end; subepandrial plate in lateral view (Fig. 45) elongate, lateral arm curved and pointed apically, in ventral view (Fig. 44) U-shaped; aedeagus narrowed basally and apically, middle portion somewhat quadrate, basal process narrow, acutely pointed, apical process digitiform, apex rounded; phallapodeme in lateral view (Fig. 45) with large keel, more or less rectangular, in ventral view (Fig. 44) I-like with just slight expansions at apices; hypandrium in lateral view (Fig. 45) broadly and shallowly U-shaped, with base robustly developed, anterior margin wide, bluntly rounded, posterior margin tapered to acute point, in ventral view (Fig. 44) shield-like, tapered from wide anterior margin to narrow, partially emarginate posterior margin.

Type material. The holotype male is labeled BRAZIL. Pará: RioXingu Camp (03°39'S, 52°22'W) ca 60 km S. Altamira[,] 8–16 Oct 1986[,] P. Spangler & O. Flint/Igarape Jabuti malaise trap day collection/Holotype ♂

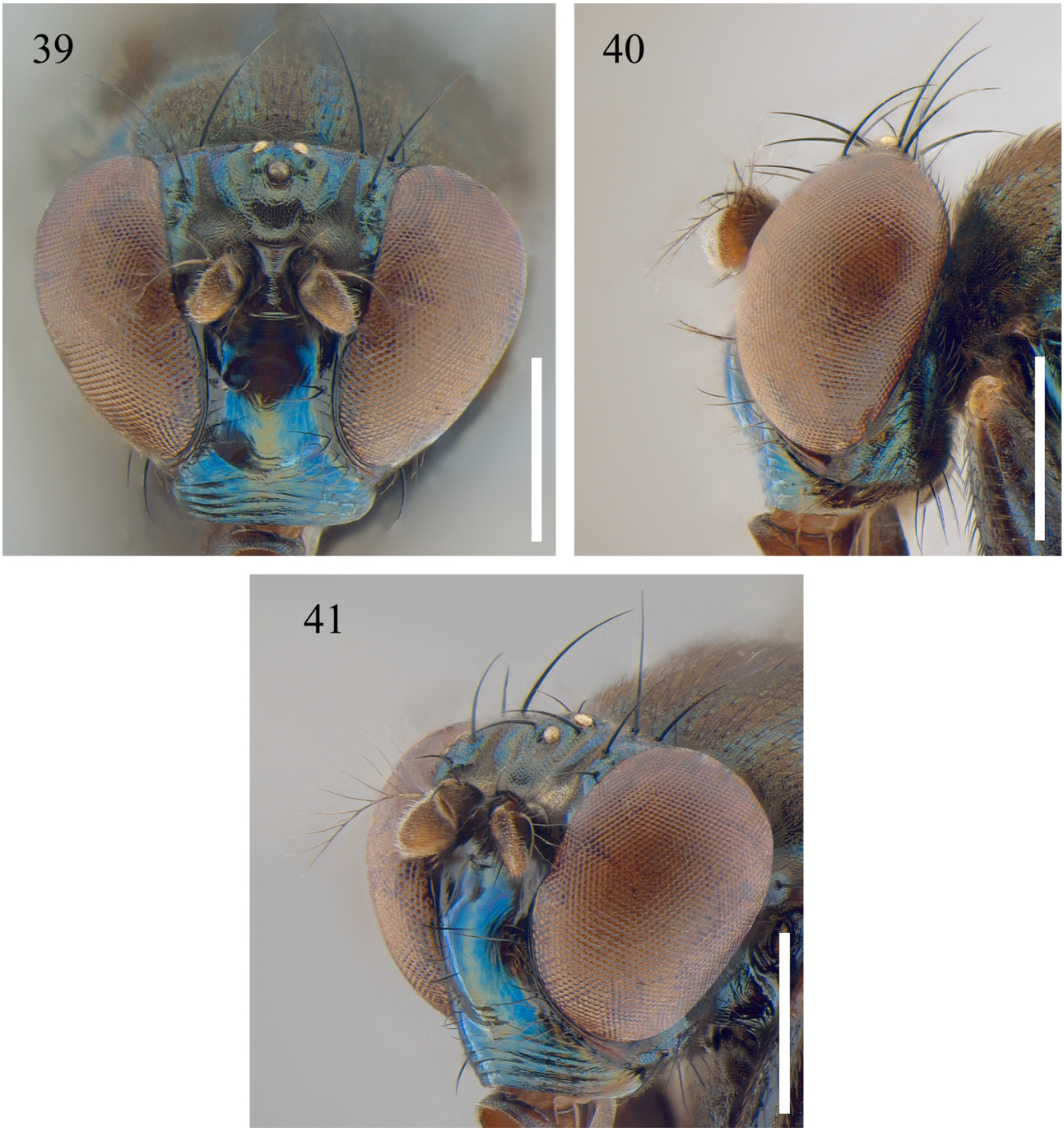
Mimapsilopa xingu Mathis, Costa,& Marinoni DZUP [red]. The holotype is double mounted (minuten in a block of plastic elastomere), is in very good condition (some lepidopteran scales), and is deposited in DZUP. One male paratype (abdomen removed and dissected; USNM) bears the same label data as the holotype.

Type locality. Brazil. Pará: Altamira (ca 60 km S; 03°39'S, 52°22'W; Rio Xingu Camp, Igarapé Jabuti).

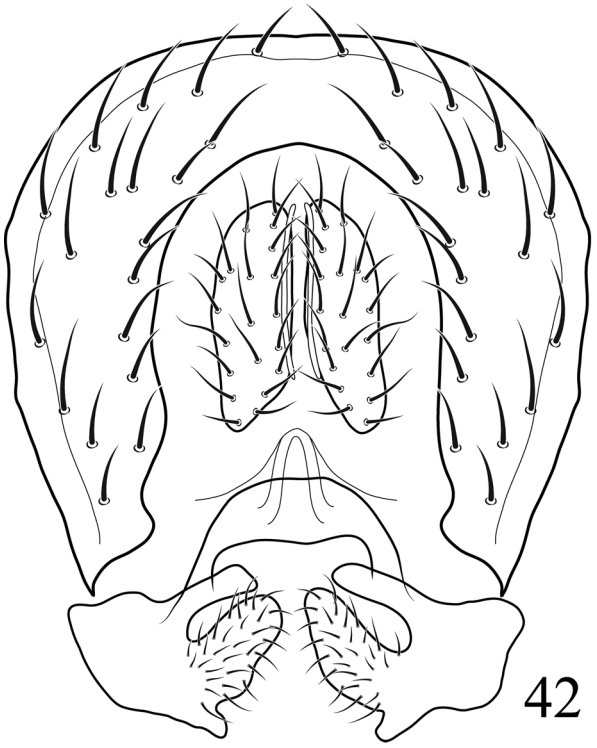
Distribution (Fig. 52). *Neotropical:* Brazil (Pará).

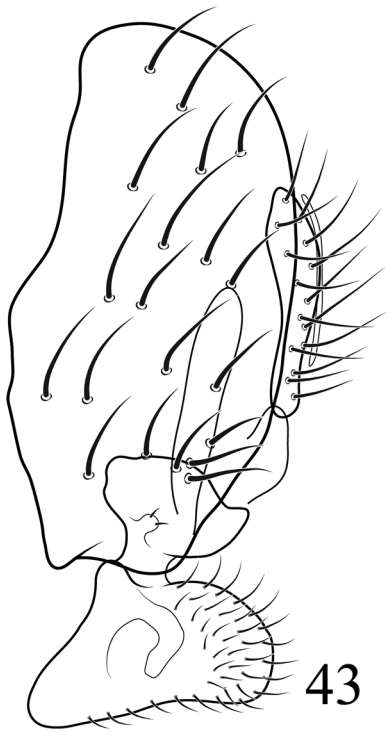
Etymology. The species epithet, *xingu,* has reference to the Rio Xingu in the state of Pará, Brazil, where the holotype was collected. The epithet is a noun in apposition.

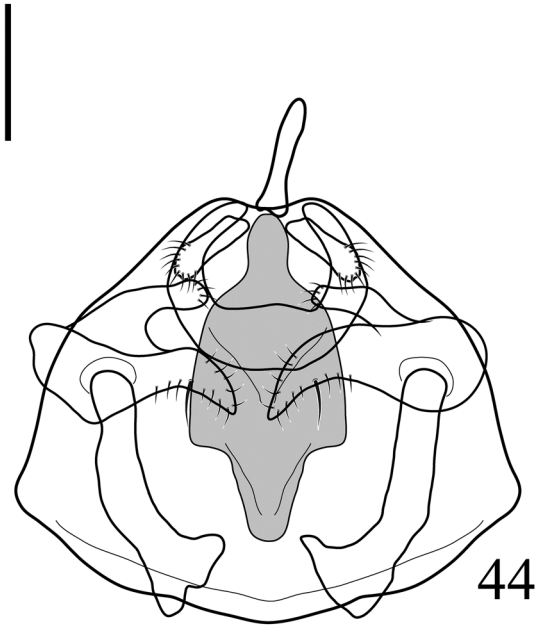
Remarks. This species is easily distinguished from congeners by its large, robust size and the coloration of mid- and hindtibiae, which is mostly black (only the apex is yellowish).

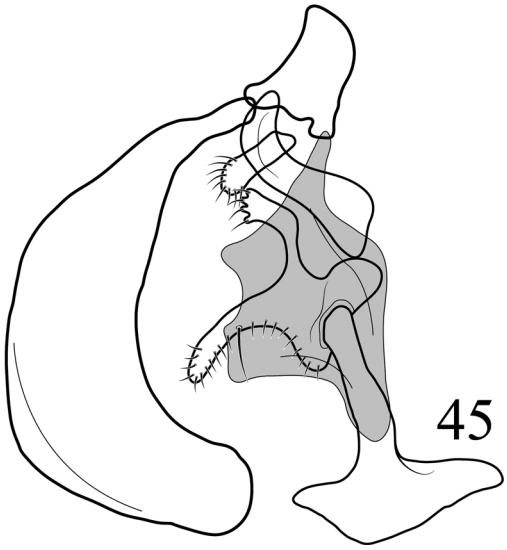


FIGURES 39–41. *Mimapsilopa xingu* **n.sp.** (39) Head, anterior view; (40) Same, lateral view; (41) Same, oblique view. Scale bar = 0.5 mm.



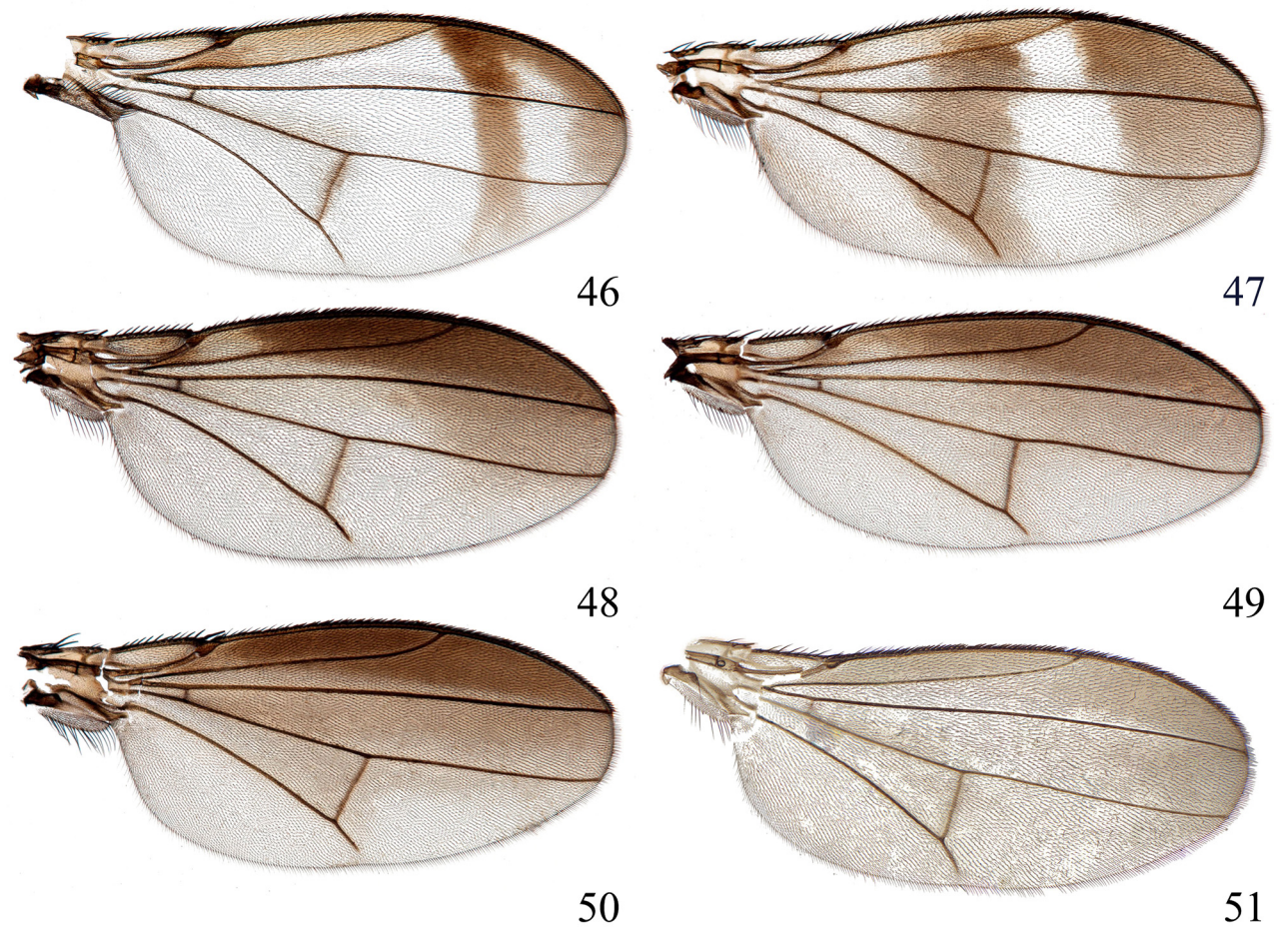






FIGURES 42–45. *Mimapsilopa xingu* **n.sp.** (42). Epandrium, cerci, presurstylus, posterior view. (43). Same, lateral view. (44). Aedeagus, hypandrium, phallapodeme, postsurstylus, pregonite, subepandrial plate, ventral view. (45). Same, lateral view. Scale bar = 0.1 mm.

Structures of the male terminalia of this species are unusual with extra processes and degrees of sclerotization. The postsurstylar basolateral process, for example, is uniquely developed in this species, being well sclerotized, darkened, elongated, T-shaped, and exposed as a process laterad of the presurstylus. Although other species of the *metatarsata* group, such as *M. rugosa,* have a postsurstylar process, it is usually short and largely unexposed, whereas in this species it is prominent, dark colored, and T-shaped with the crossbar at the ventral apex. Likewise, the basal portion of the postsurstylus has an angulate process and bears apical, short setulae in addition to the "normal extension, which apically, is digitiform.



FIGURES 46–51. Wings: (46) *Mimapsilopa xingu* **n.sp.** ; (47) *Mimapsilopa rugosa* **n.sp.** ; (48) *Mimapsilopa onssa* **n.sp.** ; (49). *Mimapsilopa iguassu* **n.sp.** ; (50). *Mimapsilopa acta* **n.sp.** ; (51). *Mimapsilopa plaumanni* **n.sp.**

Acknowledgments

We gratefully acknowledge the assistance and cooperation of many organizations and individuals who contributed to the field work and production of this paper. Keli Cristiane Correia Morais expertly produced photographs of heads. We also thank Tadeusz Zatwarnicki for reviewing an earlier draft of this paper.

Recent field work in Brazil (December 2009–June 2010) that resulted in the vast majority of specimens 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.

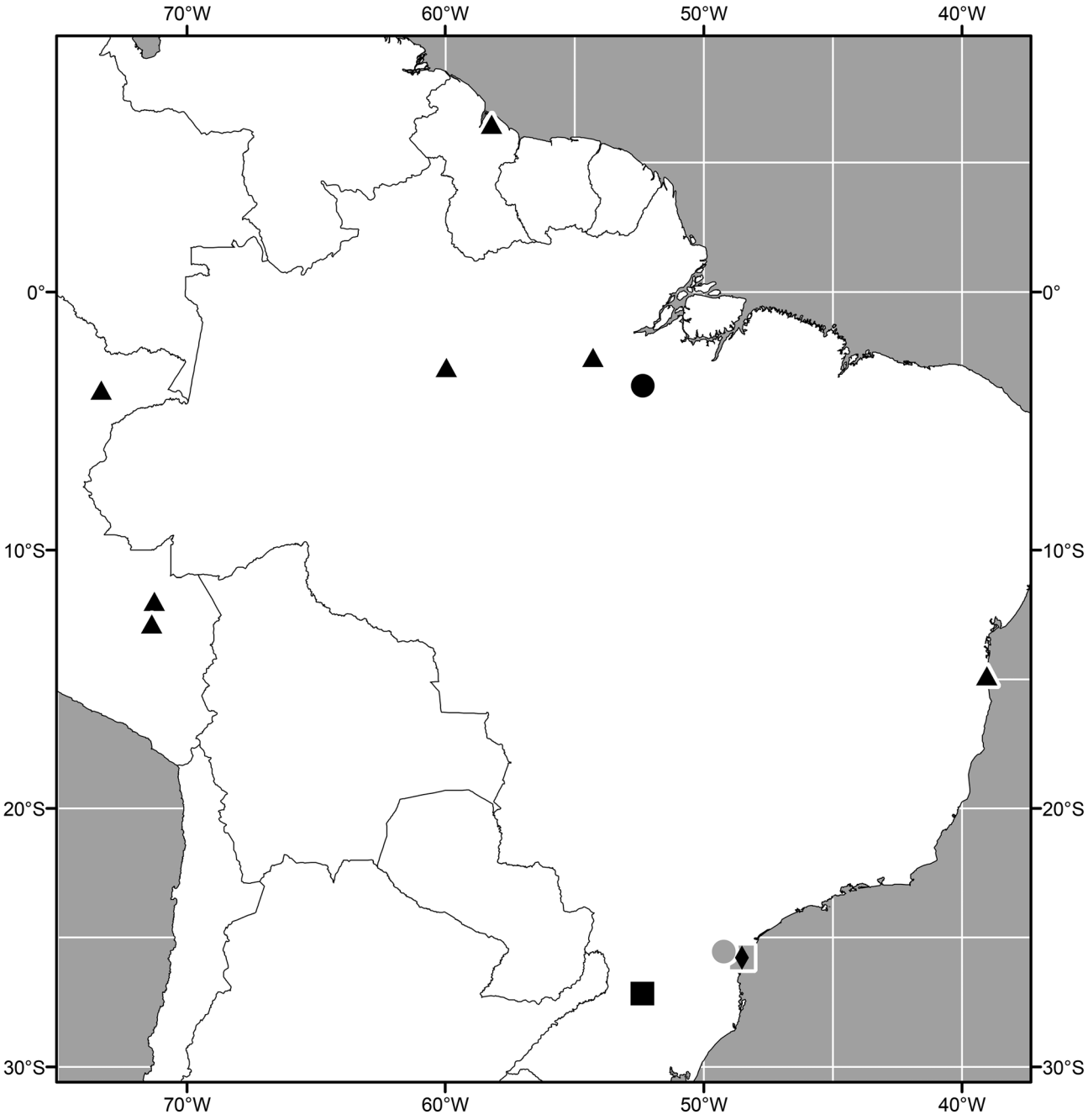


FIGURE 52. Distribution map of *Mimapsilopa. Mimapsilopa acta* **n.sp.** (■); *M. iguassu* **n.sp.** (●); *M. onssa* **n.sp.** (♦); *M. plaumanni* **n.sp.** (■); *M. rugosa* **n.sp.** (▲); *M. xingu* **n.sp.** (●).

References

Acloque, A. (1897) *Faune de France.* 516 pp. Baillière et Fils, Paris.

Clausen, P.J. & Cook, E.F. (1971) A revision of the Nearctic species of the tribe Parydrini (Diptera: Ephydridae). *Memoirs of the American Entomological Society,* 27, 1–150.

Cresson, E.T. Jr. (1941) New genera and species of North American Ephydridae (Diptera). *Entomological News,* 52 (2), 35–38.

Cresson, E.T. Jr. (1946) A systematic annotated arrangement of the genera and species of the Neotropical Ephydridae (Diptera) I. The subfamily Psilopinae. *Transactions of the American Entomological Society,* 71, 129–163.

Grimaldi, D.A. (1987) Phylogenetics and taxonomy of *Zygothrica*. *Bulletin of the American Museum of Natural History*, 186, 103–268.

Lizarralde de Grosso, M.S. (1982) Redescripcion del género *Helaeomyia* Cresson y reivindicacion de *Mimapsilopa* Cresson

(Diptera, Ephydridae). *Physis (Buenos Aires)*, 40 (99), 121–128.
Lizarralde de Grosso, M.S., Gramajo, M.C. & Corisi, C. (2011) Catálogo de Ephydridae de la República Argentina. *Miscelánea*, 127, 3–28. Fundación Miguel Lillo, Tucumán, Argentina.
Mathis, W.N. (1986) Studies of Psilopinae (Diptera: Ephydridae), I: A revision of the shore fly genus *Placopsidella* Kertész. *Smithsonian Contributions to Zoology*, 430, 30+iv pp.
Mathis, W.N. & Zatwarnicki, T. (1990a) A revision of the Western Palearctic species of *Athyroglossa* (Diptera: Ephydridae). *Transactions of the American Entomological Society*, 116 (1), 103–133.
Mathis, W.N. & Zatwarnicki, T. (1990b) Taxonomic notes on Ephydridae (Diptera). *Proceedings of the Biological Society of Washington*, 103 (4), 891–906.
Mathis, W.N. & Zatwarnicki, T. (1995) *A world catalog of the shore flies* (*Diptera: Ephydridae*). Memoirs on Entomology, International 4, vi+423 pp.
Mathis, W.N. & Zatwarnicki, T. (1998). A review of the West Indian species of *Mimapsilopa* Cresson (Diptera: Ephydridae). *Proceedings of the Entomological Society of Washington*, 100, 7–24.
McAlpine, J.F. (1981) Morphology and terminology-adults. *In:* McAlpine J.F. *et al.* (Eds.), *Manual of Nearctic Diptera.* Vol. 1: 9–63, Research Branch Agriculture Canada, Monograph no. 27, vi+674 pp.
Meigen, J. W. (1830) *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten.* 6. Schulz-Wundermann, Hamm. 401+xi pp.
Wirth, W.W. (1968) 77. Family Ephydridae. *In:* Papavero, N. (Ed.), *A Catalogue of the Diptera of the Americas South of the United States.* Departamento de Zoologia, Secretaria da Agricultura. São Paulo, pp. 1–43.
Zatwarnicki, T. (1992) A new classification of Ephydridae based on phylogenetic reconstruction (Diptera: Cyclorrhapha). *Genus* 3 (2), 65–119.
Zatwarnicki, T. (1996) A new reconstruction of the origin of eremoneuran hypopygium and its implications for classification (Insecta: Diptera). *Genus,* 7 (1), 103–175.