



## The genus *Oecetis* McLachlan in Bolivia and northwestern Argentina (Trichoptera: Leptoceridae), with new species and identification key for males of *Oecetis* species from Mexico, Central and South America

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### Abstract

Six new species of *Oecetis* are described from Bolivia: *O. carlibanezae*, *O. chipiriri*, *O. dominguezii*, *O. oberdorffi*, *O. pseudoamazonica* and *O. traini*. Eight previously described species are recorded from Bolivia and northwestern Argentina: *O. amazonica* (Banks 1924), *O. avara* (Banks 1895), *O. exisa* Ulmer 1907, *O. inconspicua* (Walker 1852), *O. knutsoni* Flint 1981, *O. paranensis* Flint 1982a, *O. punctipennis* (Ulmer 1905) and *O. rafaelli* Flint 1991b. This work contains an identification key for males of *Oecetis* species from Mexico, Central and South America.

**Key words:** new species, new records, caddisfly, South America, Systematic

### Introduction

The family Leptoceridae has a world-wide distribution. It is classified in 2 subfamilies, Leptocerinae Ulmer, 1903, and Triplectidinae Ulmer, 1906 (Morse 1981). In the Neotropics, there are 7 triplectidine genera *Triplectides* Kolenati 1859, *Grumichella* Müller 1879, *Atanatolica* Mosely 1936, *Hudsonema* Mosely 1936, *Notalina* Mosely 1936, *Amazonatolica* Holzenthal & Pes 2004 and *Osflintia* Calor & Holzenthal 2008 and 7 leptocerines genera *Achoropsyche* Holzenthal 1984, *Amphoropsyche* Holzenthal 1985, *Brachysetodes* Schmid 1955, *Nectopsyche* Müller 1879, *Neoathripsodes* Holzenthal 1989, *Oecetis* McLachlan 1877, and *Triaenodes* McLachlan 1865.

In northwestern Argentina and Bolivia, there are 5 recorded genera: *Achoropsyche*, *Atanatolica*, *Grumichella*, *Nectopsyche* and *Oecetis*.

*Oecetis* is a cosmopolitan genus with more than 200 described species, 28 of which are found in the Neotropical region and 16 of which are known from South America. Many undescribed species probably still occur in South America, where the Amazon basin is a major center of diversity (Flint *et al.* 1999).

Adults of *Oecetis*, have long antennae (2 to 3 times the body length) directed forward as for most of the Leptoceridae. The species are differentiated by the morphology of the male genitalia, but only the lateral view has been illustrated for most descriptions, with sometimes a ventral view of the inferior appendages. However, diagnostic characters from genitalia can be seen in dorsal and ventral views also. Other important diagnostic characters are in the venation and color pattern of wings, which are scarcely illustrated.

Larval descriptions have been provided for numerous *Oecetis* species (Ross 1944, Flint 1968, Marlier 1964, Roback 1966, Roldán Pérez 1998, Floyd 1995, Wiggins 1996). The larvae are predatory and build cases with a wide variety of materials such as sand grains, pieces of wood, or leaves.

The Trichoptera fauna of northwestern Argentina and Bolivia has been poorly studied. Only 4 species of *Oecetis* have been recorded from the area: *O. excisa* Ulmer 1907, *O. knutsoni* Flint 1981, *O. avara* (Banks 1895), and *O.*

*punctipennis* (Ulmer 1905). Many species of *Oecetis* were recorded from their type locality and a few other locations, and their distributional ranges remain mostly unknown. Material of *Oecetis* from Bolivia and northwestern Argentina was recently collected during several collection efforts and water quality monitoring studies in the region. This allowed for the discovery of 6 new species, which are described and illustrated herein. We have also obtained new locality records of previously described species from northwestern Argentina and new country records for Bolivia and 1 for Argentina. The collected material of *Oecetis* was compared with material of Neotropical *Oecetis* from the United States National Museum of Natural History, Washington, DC (NMNH). For all the species presented here, we provide lateral, dorsal, and ventral views of male genitalia, a detailed study of the phallic apparatus, and illustrations of fore- and hind wings. An identification key for males of *Oecetis* is provided for all previously described species from Mexico, Central and South America including the 6 new species described here.

## Material and methods

*Oecetis* adults were collected with light traps at the edge of rivers and lakes in Bolivia and northwestern Argentina. The light trap used consists of a white sheet supported in a metallic rectangular arch. The illumination system was a mercury-vapor light bulb. Light traps were operated for about 4 hours beginning at sunset. Collected material was cleared in a 10% solution of NaOH and then neutralized with phenol. The cleared abdomens of males of all collected species were mounted in euparal or in glycerin for observation and illustration. The material mounted in glycerin was preserved in microvials with glycerin and the microvials stored in 75% ethanol. The fore- and hind wings of all species were mounted in euparal (or dry) for illustration.

Voucher material has been deposited in the collections of Instituto Miguel Lillo (IML), Argentina and in the Bolivian Collection of Fauna of Universidad Mayor de San Andrés (CBF-UMSA). One paratype of each new species is deposited in CBF-UMSA. Holotypes and other examined material were deposited in IML.

Type material of Neotropical *Oecetis* was reviewed from the United States National Museum of Natural History (NMNH), Washington DC. The cleared abdomens of these types were mounted in glycerin, and compared with collected material.

## Systematics

### Wings and male genitalia

*Oecetis* adults have a body length of 6 to 12 mm. The general coloration is yellowish, but some species are darker, almost brown. The antennae are 2 to 3 times longer than the body, and the maxillary palpi are formed by 5 subequal segments.

Wing venation is characteristic of the genus (Fig. 1A). In the apical area of the forewings, the veins are straight and parallel. One of the diagnostic characteristics of the forewing is the positioning of vein M3+4. It seems to be absent; however, it arises from the *m-cu* crossvein or from *cu1* (Betten 1934). The shape, coloration and spot pattern of the wings constitute important characters to include in species descriptions. Several species have small, dark spots at the forks and apices of the veins on the forewing margin. When the genitalia are similar, these different coloration patterns help to confirm the identification. Terminology of male genitalia follows that of Wells (2004) (Figs 1B–F). Segment IX is annular, sometimes with a pair of dorsal knobs with variable shape and size even in individuals of the same species. In some species, the posterolateral edge of segment IX produces a slender process. The anterior margin of segment IX can have a well developed antecosta (Snodgrass 1935) and 1 or 2 dorsal acrotergites (Morse, 1975). Tergum X is composed of a single element or is divided in dorsal and ventral lobes (Fig. 3B); generally, it is weakly sclerotized. The preanal appendages are laterodorsal, are generally rounded and setose, and can be fused mesally. The inferior appendages offer the most important variations; they usually are long and setose and in some species, bear dorsal and apical processes

Two types of phallic apparatus are observed. One is slightly elongate and curved the other is more or less spherical and posteroventrally produced. Both types may contain in the retracted phallus a sinuous paramere spine and a usually less-distinct phallosclerite.

## Species descriptions

### *Oecetis amazonica* (Banks)

Fig. 1

*Oecetina amazonica* Banks 1924: 447 (male, original description); Fisher 1966: 109 (catalog); Flint 1967a: 22 (male lectotype); Flint 1972: 244–5 (distribution); Flint 1982b: 49 (male, distribution); Paprocki *et al.* 2004 (distribution).

This species belongs to a group of closely related species, which includes *O. inconspicua* (Walker 1852), *O. pseudoinconspicua* Bueno-Soria (1981), *O. excisa* Ulmer (1907), and *O. pseudoamazonica* **n. sp.** (Figs 12A–F). The phallic apparatus for this group is spherical with an acute, apical process. The genital structures of *O. amazonica* and *O. pseudoamazonica* **n. sp.** are very similar, and the differences are listed in the description of the new species. *Oecetis amazonica* can be distinguished from the other species by the presence of a well developed antecosta of segment IX not interrupted by the dorsal acrotergite of segment IX (which is positioned in this species distinctly behind the antecosta), the posteroventral margin of segment IX is rounded in ventral view, and the phallobase has its ventral process longer than in *O. pseudoamazonica* **n. sp.** The forewings of this species each have the crossveins *r-m* and *m-cu* almost in line, the coloration pattern is sharp and clear, and the length of each forewing is about 10 mm.

This species is recorded for the first time in Bolivia.

**Material examined. BOLIVIA: Béni:** Río Mocovi, 14°44'27"S, 64°54'24"W, (near Trinidad), 12.xi.2002, (CBF-UMSA) — 5 females; Lake Belen, near Trinidad, 14°27'29"S, 64°51'41"W, 26.v.2003, (CBF-UMSA) — 1 male; 03.iv.2003, (IML) — 2 males, 2 females; Río Ibare, Puerto Ballivian, near Trinidad, 14°47'41"S, 64°58'21"W, 17.xi.2002, (CBF-UMSA) — 2 males, 6 females; Lake Colorada, near Trinidad, 14°48'21"S, 64°58'41"W, 16.xi.2002, (CBF-UMSA) — 4 males, 3 females; Arroyo near Reyes, 14°15'44"S, 67°26'52"W, 11.iii.2003, (CBF-UMSA) — 2 males, 2 females; Lake Granja, Bella Vista, 13°15'50"S, 63°42'33"W, 06.v.2006, (IML) — 1 male. Lake California, near Bella Vista, 10.v.2006, (CBF-UMSA) — 1 male; **Pando:** Lake Bay, Río Manuripi basin, 03.viii.2007, (CBF-UMSA) — 4 males, 5 females.

**Distribution.** Argentina, Brazil, Peru, Venezuela, **Bolivia (new record)**.

### *Oecetis avara* (Banks)

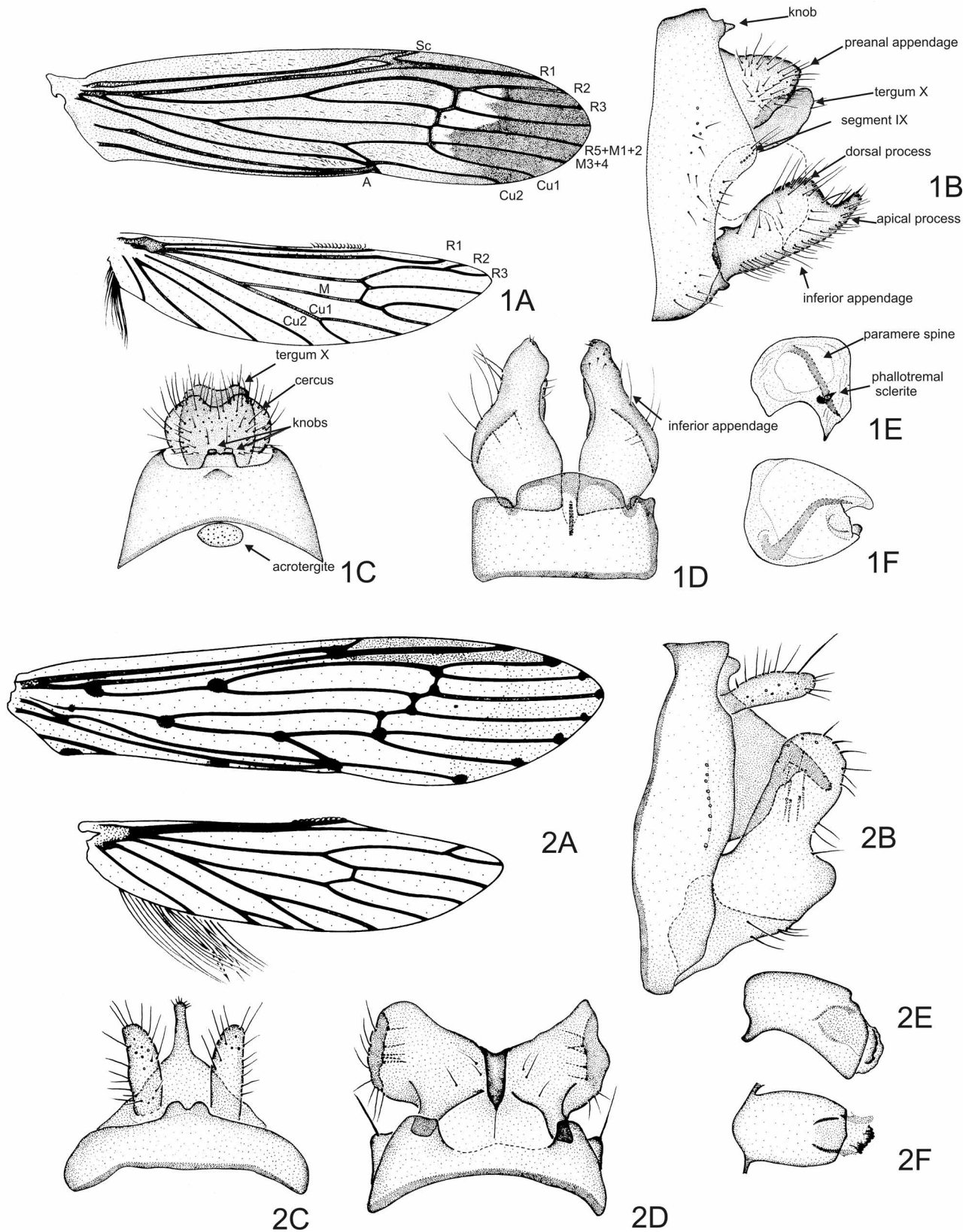
Fig. 2

*Setodes avara* Banks 1895: 316 (sex not stated, original description); Banks 1899: 214 (in *Oecetina*); Ulmer 1907: 129 (in *Oecetodes*); Sibley 1926:105; Ross 1944: 240 (male, female, distribution); Smith & Lehmkuhl 1980: 641 (male, female, larva, pupa, differentiation from *O. disjuncta*); Bueno & Flint 1980: 213 (distribution); Flint 1991a: 96 (distribution); Flint 1996: 423 (distribution); Botosaneanu & Alkins-Koo 1993: 35 (distribution).

*Oecetis avara* is a widespread species, with records from Bolivia to the northern United States and Canada. This species belongs to the *O. avara* Complex with *O. disjuncta* (Banks 1920) and *O. metlacensis* Bueno-Soria (1981). *Oecetis marquezii* and *O. elata* Denning & Sykora (1966) are also similar and could belong to the same group of species. *Oecetis avara* can be distinguished by the narrow segment IX, the small preanal appendages, the inferior appendages each having a big and broad dorsal process and small apical process. The specimen found in the study area has tergum X basally membranous and forewings bearing the typical spots in the membrane.

**Material examined. BOLIVIA: Cochabamba:** Small tributary of the Río Espiritu Santo, Chipiriri, near Villa Tunari, 16°50'45"S, 65°25'33"W, 25.ix.2003, (CBF-UMSA) — 1 male.

**Distribution.** Belize, Bolivia, Brazil, Canada, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Trinidad, U.S.A., Venezuela.



**FIGURE 1.** *Oecetis amazonica* (Banks). A—forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**FIGURE 2.** *Oecetis avara* (Banks). A—forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

***Oecetis carlibanezae*, new species**

Fig. 3

This species clearly belongs to a group of closely related species including *O. scoparia* Flint 1974, *O. peruviana* (Banks, 1924), and *O. traini* n. sp. (Fig. 14) that have tergum X divided into 2 structures: A dorsal lobe and a ventral paired lobe (Figs 3 A–F). *Oecetis carlibanezae* n. sp. is closest to *O. scoparia*, with which it shares the following characters:

The shape of the single dorsal lobe of tergum X, the presence of 2 ventral flaps of tergum X and the absence of a dorsal process on each inferior appendage.

**Specific diagnosis.** *Oecetis carlibanezae* can be diagnosed by its triangular ventral paired lobe of tergum X, each with a serrate ventral margin bearing one ventral tooth.

Adult. Length of each forewing 5–6 mm. Forewings each with R2+3 branched near apex of Sc (Fig. 3A).

Male genitalia. Segment IX annular with small, triangular dorsal knob. Preanal appendages each with rounded apex. Tergum X divided in 2 portions: Ventral portion triangular with ventral tooth in lateral view (Fig. 3B), divided into 2 lobes in dorsal view (Fig. 3C); dorsal portion digitate in lateral view (Fig. 3B), with single median dorsal lobe in dorsal view (Fig. 3C). Inferior appendages elongate, each narrowed at tip, 3 times as long as width of base; dorsal margin sinuous and apex truncate in lateral view (Fig. 3B); strongly curved to midline with ends nearly touching in ventral view (Fig. 3D). Phallic apparatus short, slightly curved and broadened at apex in lateral view (Fig. 3E); broadened at midlength and narrowed at tip in dorsal view (Fig. 3F).

**Holotype male. BOLIVIA: Béni:** Lake Belen, near Trinidad, 14°27'29"S, 64°51'41"W, 26.v.2003, (IML).

**Paratypes.** One male, same data as holotype, (CBF-UMSA).

**Etymology.** This species is dedicated to our friend and colleague, Carla Ibañez.

***Oecetis chipiriri*, new species**

Fig. 4

This species is most similar to *O. knutsoni* Flint (1981). The pattern of forewing spots is similar in the 2 species, but the total size of the wings is different. Segment IX is narrow in both species, but tergum X is more developed in the new species. The structure of the inferior appendages is similar in the 2 species but in the new species the dorsal process of each inferior appendage is rounded and bears spines arising from small projections of dorsal margin whereas in *O. knutsoni* the apical area of the dorsal process bears digitate projections.

**Specific diagnosis.** The new species is characterized firstly by the mesoventral lobe of the inferior appendage, which is rounded and bearing strong spines, and secondly by a well-developed segment X.

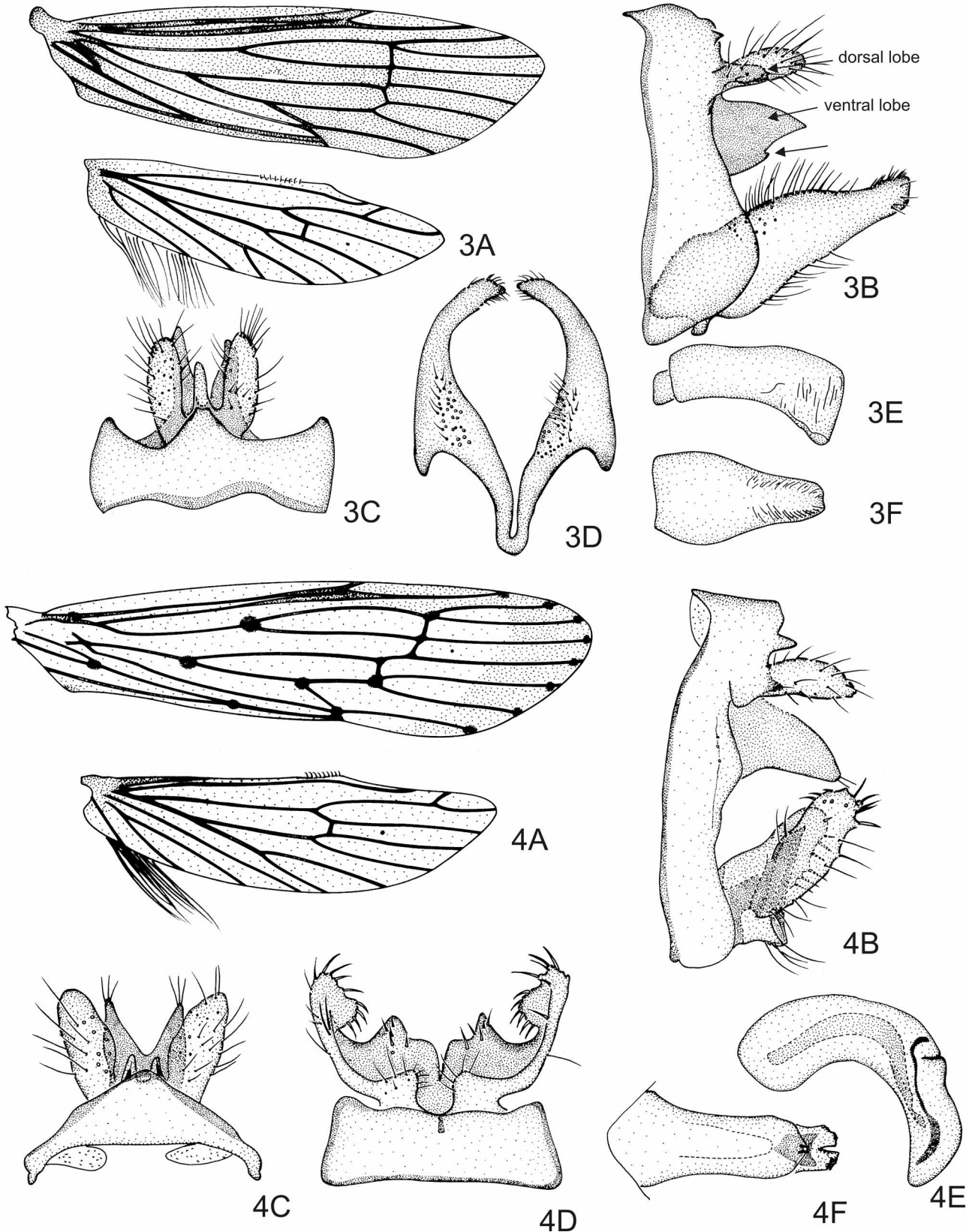
Adult. Length of each forewing: 7 mm. Forewing with R2+3 without petiole. Forewings with black spots in membrane at forks, junctions, and at apical ends of veins. Forewing broadest toward rounded apex (Fig. 4A).

Male genitalia. Segment IX annular and narrow, slightly broadly produced anteromesolaterally, with pair of mesodorsal knobs present in lateral view. Preanal appendages with subacute apices. Tergum X broad at base and narrowed at tip, with rounded extremity bearing setae in lateral view (Fig. 4B); divided into 2 structures: Dorsal paired short portion and ventral subtriangular portion with broad medial V-shaped excision in dorsal view (Fig. 4C). Inferior appendages short, each with quadrangular base and lateral lobe with rounded setose apex in lateral view (Fig. 4B); curved and concave with apical lobe broadened at tip and bearing strong setae, posterior margin with small setose process before midline in ventral view (Fig. 4D). Phallic apparatus short, curved, with phallostremal sclerite in dorsal fold near apical extremity in lateral view (Fig. 4E); apex crenellated with medial V-excision and with phallostremal sclerite subtriangular in dorsal view (Fig. 4F).

**Holotype male. BOLIVIA: Cochabamba:** Small tributary of the Río Espiritu Santo, Chipiriri, near Villa Tunari, 16°50'45"S, 65°25'33"W, 25.ix.2003, (IML).

**Paratypes.** same data as holotype, (CBF-UMSA) — 23 males, 27 females.

**Etymology.** The name of this species refers to the type locality.



**FIGURE 3.** *Oecetis carlibanezae*, new species. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**FIGURE 4.** *Oecetis chipiriri*, new species. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

***Oecetis dominguezi*, new species**

Fig. 5

This species is similar to *O. connata* Flint (1974), *O. punctipennis* (Ulmer 1905), and *O. iguazu* Flint (1983). It is more similar to *O. punctipennis*, but the preanal appendages are narrower than those of *O. punctipennis* and longer and straighter than those of *O. iguazu*. Tergum X is more decurved in lateral view than that of *O. punctipennis*, but the general aspect is similar. In *O. punctipennis*, the inferior appendages are upcurved and each is produced in a digitate process. The inferior appendages of the new species are slightly upcurved and uniformly narrowed toward the apex in lateral view. In ventral view, the differences in the shape of inferior appendages are also important. In the new species, the inferior appendages are curved to the midline whereas in *O. punctipennis* they are straight. The phallic apparatus of *O. dominguezi* n. sp. is shorter and the apex is gradually broader at the tip than that of *O. punctipennis*.

**Specific diagnosis.** *Oecetis dominguezi* can be distinguished from other species by the triangular and decurved shape of tergum X in lateral view, the inferior appendage curved to the midline in ventral view, and the broader apex of the phallic apparatus.

Adult. Length of each forewing: 6.5 mm. Forewings brown, each with large, rectangular pale spot midway along anterior margin and several small pale spots in other areas of wing. Forewing with R2+3 branched at end of Sc. Hind wings each with R2+3 branched beyond end of R1; M and Cu unbranched (Fig. 5A).

Male genitalia. Segment IX annular, anterodorsal margin slightly and broadly produced mesodorsally, posterodorsal margin slightly and acutely produced mesodorsally. Preanal appendages long, straight, digitate. Tergum X triangular and decurved in lateral view (Fig. 5B); with median, V-shaped excision in dorsal view (Fig. 5C). Inferior appendages elongate laterally, each 3 times as long as width of base and with rounded, narrow apex in lateral view (Fig. 5B); narrower and strongly curved to midline in ventral view (Fig. 5D). Phallic apparatus short, slightly curved and broadened at apex, apically truncate with grainy dorsal surface in lateral view (Fig. 5E); with ventral lobe divided into 3, divergent smaller lobes in dorsal view (Fig. 5F).

**Holotype male.** BOLIVIA: **Béni.** Lake Colorada, near Trinidad, 14°48'21"S, 64°58'41"W, 16.xi.2002, (IML).

**Paratypes.** BOLIVIA: **Béni:** Lake Granja Bella Vista, Río Blanco basin, 13°15'50"S, 63°42'33"W, 06.v.2006, (IML) — 2 males. Lake Curichal, near Bella Vista, 05.v.2006, (CBF-UMSA) — 1 male.

**Etymology.** This species is dedicated to Dr. Eduardo Domínguez, Fundación Miguel Lillo, Tucumán Argentina, as thanks for his continuing assistance.

***Oecetis excisa* Ulmer**

Fig. 6

*Oecetis excisa* Ulmer 1907: 15 (male, female, original description); Flint 1982b: 50 (male, distribution); Paprocki *et al.* 2004 (distribution).

*Oecetis mutila* Navás 1918: 22 (male); Schmid 1949: 382 (to synonymy)

*Oecetis castilleja* Navás 1920a: 134 (female); Schmid 1949: 382 (possible synonym of *O. excisa*); Flint 1972: 244 (to synonymy).

*Oecetis muhnia* Navás 1920b: 28 (male); Flint 1972: 244 (to synonymy).

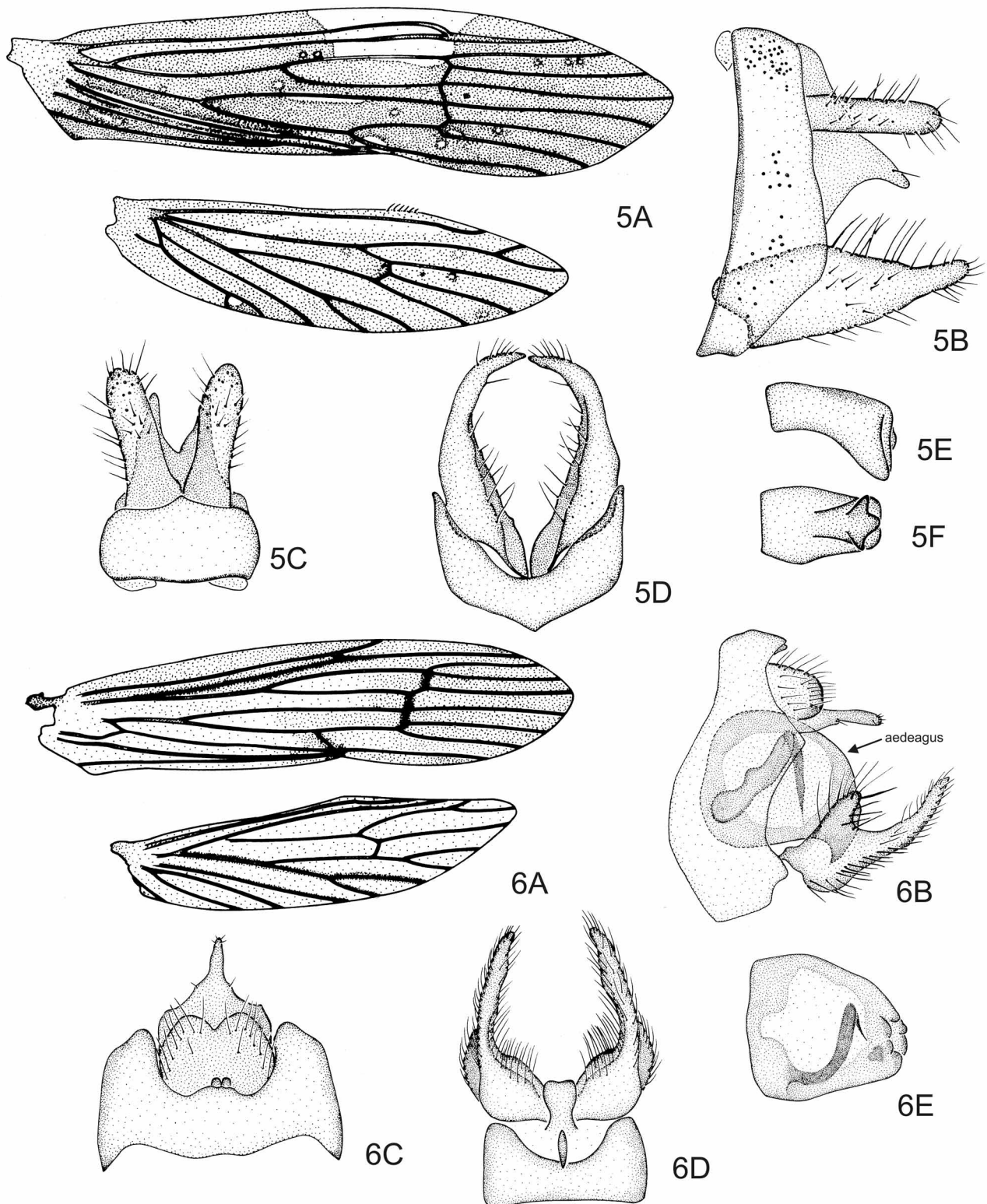
*Oecetis apicata* Navás 1931: 323 (female); Flint 1982b: 50 (to synonymy).

*Oecetis excisa* is common and widespread in the Neotropical Region. This species was synonymized with *O. apicata* Navás (1931) by Flint (1982b). In this same work, he stated, "it may be shown that *O. excisa* is a synonym of *O. inconspicua* (Walker 1852)." We collected specimens of *O. excisa* and *O. inconspicua* and were able to distinguish the 2 species based on differences in the inferior appendages, tergum X, and wing venation. The genitalia of the 2 species are easily distinguished by the shape of the dorsal process of each inferior appendage (in lateral view), which is longer and thinner in *O. excisa* compared to *O. inconspicua* (Figs 6B, 7B). In dorsal view, tergum X of *O. excisa* is broad basally and abruptly narrowed distally (Fig. 6C), whereas tergum X of *O. inconspicua* is slightly narrowed and rounded distally (Fig. 7C). Finally, R2+3 is forked just before the terminus of R1 in the hind wings of *O. excisa*, but it is unforked in *O. inconspicua*.

**Material examined.** ARGENTINA: **Salta:** Parque Nacional Calilegua, A°Yuto, 23°38'40"S, 64°35'53"W, 7.xi.2006, C. Molineri *et al.* cols., (IML) — 1 male; **Córdoba:** Dique Los Molinos, Feb. 1955, A Willink, (NMNH)

— 1 male. **BRAZIL:** Corias St., Lago Feia, near Formosa, 25.iv.1972, (NMNH) — 1 male. **MEXICO:** Linares, Río Camacho, 21–22.vi.1965, (NMNH) — 1 male. **PARAGUAY:** Río Aquiblaban, Cerro Cora, 2.ii.1973, O. S. Flint col., (NMNH) — 1 male. **VENEZUELA:** Base Camp, 0°51'N, 66°10'W, (NMNH) — 1 male.

**Distribution.** Argentina, Bolivia, Brazil, Mexico, Paraguay, Venezuela.



**FIGURE 5.** *Oecetis dominguezi*, new species. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**FIGURE 6.** *Oecetis exisa* Ulmer. A— forewing and hind wing. Male genitalia: B—lateral, with detail of Phallic apparatus; C—dorsal; D—ventral; E—Phallic apparatus ventral.



***Oecetis inconspicua* (Walker)**

Fig. 7

*Leptocerus inconspicua* Walker 1852: 71 (male, original description); Ross 1938: 24–25 (synonyms); Betten & Mosely 1940 (male, redescription, lectotype, synonymy); Ross 1944: 242 (male, female, larva, pupa, synonymy, distribution); Hagen 1861: 275–276 (redescribed as *Molanna inconspicua*); Denning 1947: 656 (distribution); Wolcott 1950: 93 (distribution); Flint 1964: 64 (male, female); Fisher 1966: 149 (catalog); Flint 1967a: 23 (synonymy); Flint 1967b: 174 (distribution); Bueno-Soria & Flint 1980: 213 (distribution); Flint 1981: 32; Flint 1991a: 97 (distribution); 1996: 421 (distribution); Blahnik *et al.* 2004: 5 (distribution); Paprocki *et al.* 2004: 13 (distribution).

*Setodes flaveolata* Hagen 1861: 282 (male, female); Milne 1934: 19 (to synonymy); Ross 1938: 25.

*Setodes micans* Hagen 1861: 283 (male, female); Milne 1934: 19 (to synonymy).

*Setodes sagitta* Hagen 1861: 284 (female); Banks 1907: 46 (in *Oecetina*); Milne 1934: 19 (to synonymy); Betten 1934: 274.

*Oecetina parvula* Banks 1899:215 (female); Milne 1934: 19 (to synonymy).

*Leptocerus flaveolatus* Banks 1899: 214; Banks 1904: 213 (in *Oecetina*); Betten 1934: 269 (to *Oecetis*).

*Oecetina flavida* Banks 1899: 216; Ulmer 1907: 144; Milne 1934: 19 (to synonymy).

*Oecetina inornata* Banks 1907: 128; Milne 1934: 19 (to synonymy).

*Oecetina apicalis* Banks 1907: 129 (male); Milne 1934: 19 (to synonymy); Betten 1934: 274.

*Oecetina antillana* Banks 1938: 298 (male); Flint 1967a: 23 (lectotype, to synonymy).

This species has been recorded from North and Central America, the West Indies, and northern South America. Here, it is recorded for the first time from Bolivia. Floyd (1995) provided sufficient evidence to support that *O. inconspicua* is a complex of species. The adults are very similar and difficult to distinguish, but the larvae are morphologically distinct. The differences between this species and *O. excisa* have been discussed above.

**Material examined. BOLIVIA:** Lake Colorada, near Trinidad, 14°48'21"S, 64°58'41"W, 16.xi.2002, (IML) — 2 males, 5 females; Río Mocovi, near Trinidad, 14°44'27"S, 64°54'24"W, 12.xi.2002, (IML) — 8 males, 3 females; Lake Belen, near Trinidad, 14°27'29"S, 64°51'41"W, 13.xi.2002, (CBF-UMSA) — 2 males, 1 female; Río Itenez, Versalles, 12°39'42"S, 63°22'21"W, 04.v.2006, (IML) — 2 males, 23 females; Río Blanco, Bella Vista, 13°16'29"S, 63°42'32"W, 06.v.2006, (CBF-UMSA) — 1 male, 1 female; Lake California, near Bella Vista, 10.v.2006, (IML) — 1 male. **GUATEMALA:** Panajachei, 20.viii.1965, P. J. Spangler. Det. Joaquin Bueno Soria (NMNH) — 1 male

**Distribution.** Bahamas, **Bolivia (new record)**, Brazil, Canada, Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Puerto Rico, U.S.A., Venezuela.

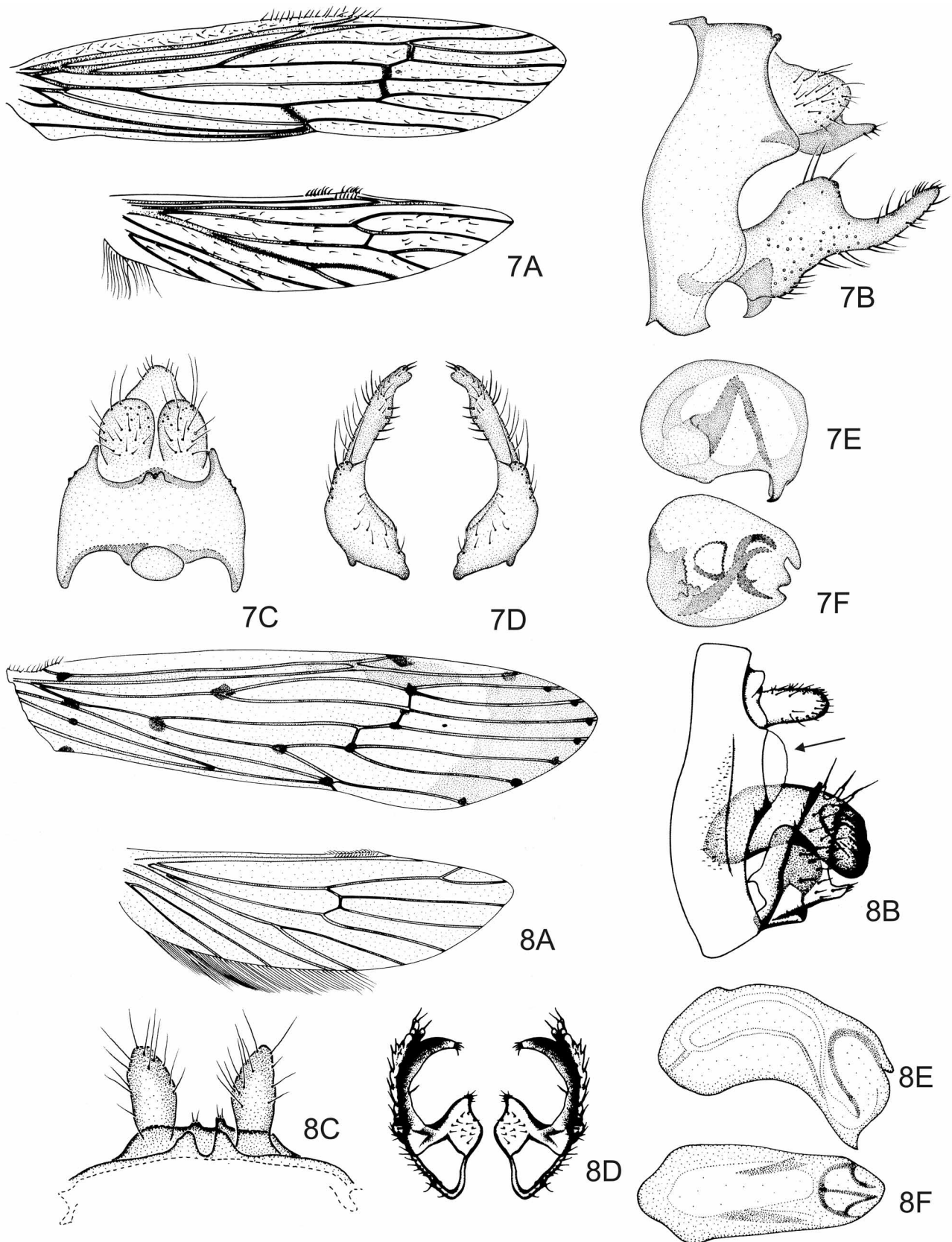
***Oecetis knutsoni* Flint**

Fig. 8

*Oecetis knutsoni* Flint 1981: 32 (male, original description); Malicky 1983: 264 (distribution); Flint 1991a: 97 (distribution); 1996: 422 (distribution); Botosaneanu 1994: 51 (distribution).

This species is the largest of the genus in this its occurrence area. The length of each forewing is more than 12 mm and bears the typical dark spots at the forks and at the apical ends of the veins. *Oecetis knutsoni* is commonly collected at light traps in northwestern Argentina in large numbers. In all specimens collected in northwestern Argentina and Bolivia, tergum X is composed of a paired small finger-like process between the preanal appendages and a rounded, membranous lobe above the phallic apparatus. This lobe is almost invisible. In figure 8B, it is illustrated for the first time.

**Material examined. ARGENTINA: Jujuy:** Parque Nacional Calilegua, A° Tres Cruces, 28.xii.1997, (IML) — 1 male; Sierra de Santa Bárbara (lado E), Río Entre El Fuerte y Palma Sola, 16–17.ix.1998, E. Domínguez. C. Molineri & Ubero cols., (IML) — 1 male; Río Zapla, 24°16'03"S, 65°07'10"W, 31.v.2000, F. Romero, C. Molineri, V. Manzo & C. Nieto cols., (IML) — 1 male; Ledesma, Río Zora, 23°44'54"S, 64°42'04"W, 8.xi.1006, 411 msnm, C. Molineri col., (IML) — 9 males; **Salta:** Dpto Sta Victoria, Río Huaico Grande, 1600 m, 11.xi.2004, P. Rueda Martín col., (IML) — 3 males; Lipeo, Río Los Naranjos, 22°25'47"S, 64°44'20"W, 1109 m, 13.xi.2004, P. Rueda Martín col., (IML) — 25 males; **BOLIVIA: Tarija:** Arce, 22°12'9.2"S, 64°37'36.6"W, Orosa, La Mamora, 1100m, 04.x.2004, Molineri & Manzo, (IML) — 6 males. La Paz: Río Takesi, Puente Villa, 16°24'14"S, 67°38'31"W, 22.ii.2002, (IML) — 3 males. Río Solacama, 16.v.2003, (IML) — 1 male; 19.ix.2003, (IML) — 2 males. Río Santa-Catalina, 02. xi. 2002, (IML) — 1 male. Río Unduavi, Puente Villa, 16°24'8"S, 67°38'31"W,



**FIGURE 7.** *Oecetis inconspicua* (Walker). A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—inferior appendage, ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**FIGURE 8.** *Oecetis knutsoni*, Flint. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—inferior appendage, ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

22.ii.2002, (IML) — 10 males. Tributary of Río Unduavi, 16°23'58"S, 67°38'3"W, 21.ii.2002, (CBF-UMSA) — 1 male. **COLOMBIA:** Quebrada La Mosca, 1 Km W Guarne, 7.ii.1983, O. S. Flint col., (NMNH) — 1 male.

**Distribution.** Argentina (new record), Bolivia, Colombia, Guadeloupe, Peru, Venezuela.

### *Oecetis oberdorffi* new species

Fig. 9

*Oecetis oberdorffi* **n. sp.** is closely related to *O. paranensis* Flint (1982a). Segment IX, tergum X, and the inferior appendages are similar in the 2 species, but there are small and consistent differences between them. Tergum X is triangular in the new species and gradually narrowed at the tip. Tergum X of *O. paranensis* is abruptly narrowed from midlength to the tip. In dorsal view, tergum X has a U-shaped excision in *O. oberdorffi* **n. sp.**, whereas this median excision is V-shaped in *O. paranensis*. The preanal appendages in the new species are longer and narrower than those of *O. paranensis*. In *O. paranensis*, the inferior appendages are generally square, whereas those of *O. oberdorffi* **n. sp.** are mitten-shaped in lateral view.

**Specific diagnosis.** Tergum X broad at the base and gradually narrowed at the tip in lateral view; tergum X with deep U-shaped excision; inferior appendage with dorsal process square and apex digitated and rounded at the tip in lateral view.

**Adult.** Length of each forewing: 5 mm. Forewing with R2+3 branched beyond the apex of Sc, below midpoint of stigma (defined by apex of R1). Hind wings with R2+3 unforked, Cu1 with fork (Fig. 9A).

**Male genitalia.** Segment IX annular, with 2 dorsal knobs (Figs 9B–C). Preanal appendages oval, elongate, with rounded apices (Figs 9B–C). Tergum X triangular and gradually narrowed at tip in lateral view (Fig. 9B); bilobed with deep U-shaped median excision in dorsal view (Fig. 9C). Inferior appendages broad, each with dorsal margin bearing dorsolateral square process, apical portion elongate and rounded, ventral margin curved, excision between processes U-shaped in lateral view (Fig. 9B); inferior appendages each broad at base and narrowed at tip, bearing median rounded process; apex slightly curved mesad at midlength in ventral view (Fig. 9D). Phallic apparatus short, curved and membranous at tip, with transverse ventral sulcus at the midlength in lateral view (Fig. 10E); slightly broad at base and tip and narrowed at midlength in dorsal view (Fig. 9F).

**Holotype male. BOLIVIA:** Bella Vista, Lake Granja, 13°15'50"S, 63°42'33"W, 06.v.2006, (IML).

**Paratypes.** 2 males, same as holotype, (CBF-UMSA), (IML).

**Etymology.** This species is dedicated to our friend and colleague, Thierry Oberdorff.

### *Oecetis paranensis* Flint

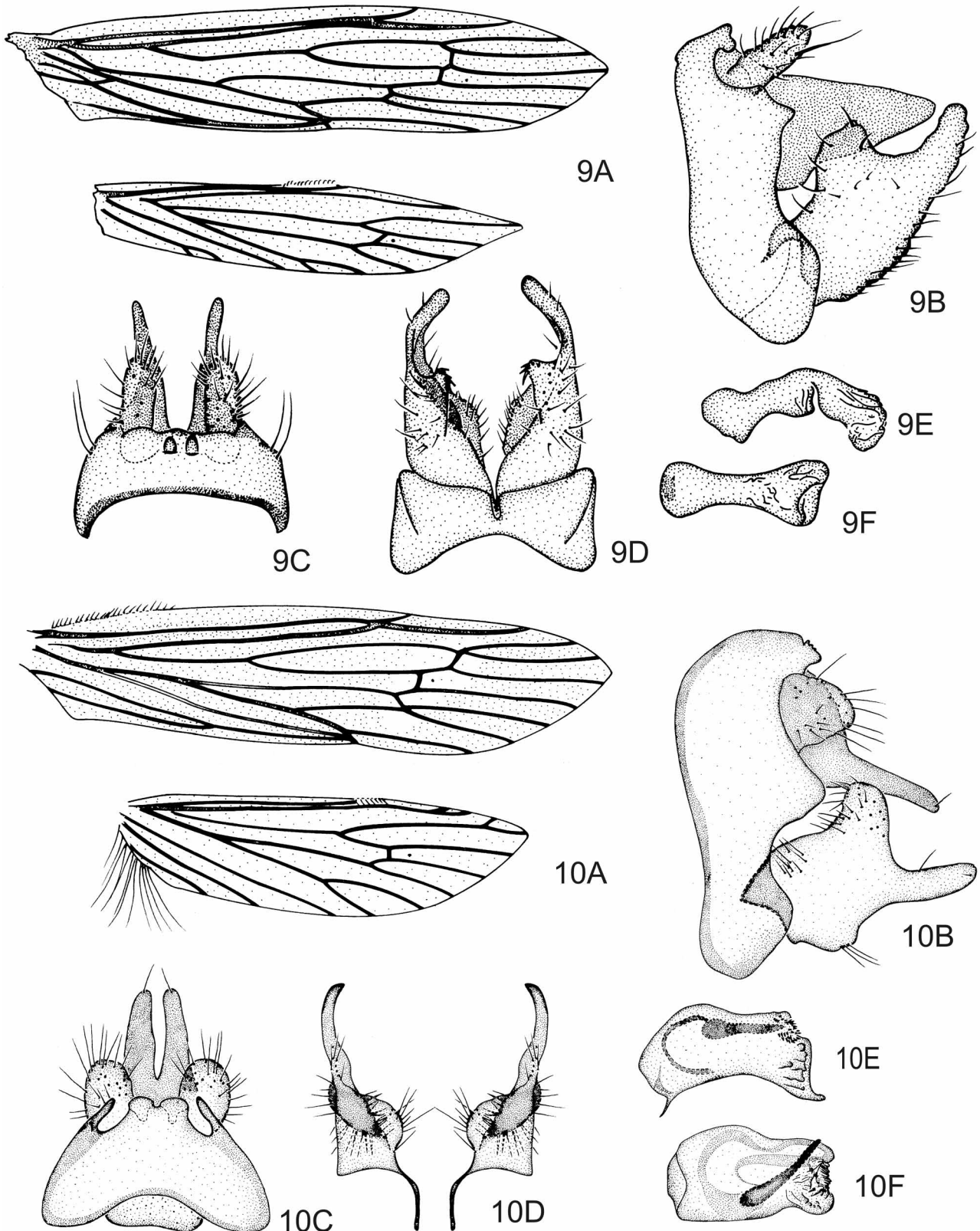
Fig. 10

*Oecetis paranensis* Flint 1982a: 46 (male, original description); 1982b: 52 (distribution); 1996: 421 (distribution); Paprocki *et al.* 2004 (distribution).

This species is known from northern Argentina, Brazil, and Paraguay. It is recorded from Bolivia for the first time. Diagnostic characteristics for this species are discussed above in the description of *O. oberdorffi* **n. sp.**

**Material examined. ARGENTINA: Entre Ríos:** Río Paraná Ibicuy, Pto. Ibicuy, 10.xii.1979, C. M. & O. S. Flint cols., (NMNH) — 1 male. **BOLIVIA: Béni:** Lake Belen, near Trinidad, 14°27'29"S, 64°51'41"W, 26.v.2003, (CBF-UMSA) — 1 male, 1 female; Río Blanco, Bella Vista, 13°16'29"S, 63°42'32"W, 06.v.2006, (CBF-UMSA) — 1 male; Lake San Gregorio, near Reyes, 12.v.2005, (CBF-UMSA) — 1 female; Río Itenez, Versalles, 12°39'42"S, 63°22'21"W, 04.v.2006, (IML) — 2 males; Lake California, near Bella Vista, 10.v.2006, (CBF-UMSA) — 15 males, 12 females; Lake Granja, near Bella Vista, Río Blanco basin, 13°15'50"S, 63°42'33"W, 06.v.2006, (CBF-UMSA) — 1 male; Lake Colorada, near Trinidad, 14°48'21"S, 64°58'41"W, 16.xi.2002, (CBF-UMSA) — 1 male; Río Ibare, Puerto Ballivian, near Trinidad, 14°47'41"S, 64°58'21"W, 17.xi.2002, (CBF-UMSA) — 1 male; Arroyo near Reyes, Río Beni basin, 14°15'44"S, 67°26'52"W, 11.iii.2003, (CBF-UMSA) — 1 male.

**Distribution.** Argentina, **Bolivia (new record)**, Brazil, Paraguay, Peru.



**FIGURE 9.** *Oecetis oberdorfii*, new species. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**FIGURE 10.** *Oecetis paranensis*, Flint. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—inferior appendage, ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

*Oecetis pseudoamazonica*, new species

Fig. 11

*Oecetis pseudoamazonica* n. sp. is closely related to *O. amazonica* (Banks 1924). The male genitalia of the 2 species are almost identical, and there are only small differences in some genital characters and wing venation. There are differences in the anterior margins of segment IX, which are reinforced by a conspicuous antecosta in both species. In *O. amazonica* this antecosta is continuous and it is not interrupted by its acrotergite (Fig. 1C), whereas, in the new species, this antecosta is discontinuous at the acrotergite. In the genitalia, the posteroventral margin of segment IX is rounded in *O. amazonica* in ventral view (Fig. 1D), but clearly produced into a median process which is rounded at the tip in the new species (Fig. 11D). The phallic apparatus shows a subtle difference in the length of the ventral process, which is longer in *O. amazonica*. In *O. amazonica*, the crossveins *r-m* and *m-cu* are almost in line, but, in the new species, they are clearly staggered. The difference in size is important, the length of a forewing of *O. amazonica* is 10 mm (n = 16) while it is 6.1 mm (n = 5) in *O. pseudoamazonica* n. sp. The coloration pattern of wings is sharper and darker in *O. amazonica*, paler in the new species. The apex of each forewing in *O. amazonica* is obtuse, whereas it is acute in *O. pseudoamazonica* n. sp. Fork I in of *O. amazonica* is petiolate, but sessile in *O. pseudoamazonica* n. sp.

**Specific diagnosis.** *Oecetis pseudoamazonica* n. sp. can be distinguished from other species by the fact that in each forewing, R2+3 is branched and without a petiole, the apex of each forewing is acute, the acrotergite of segment IX is not separated from the rest of dorsum IX by antecosta, the posteroventral margin of segment IX has a median process that is rounded at the apex, and the forewings are relatively short.

Adult. Length of each forewings: 6.1 mm. Forewings each with R2+3 branched at midpoint of stigma and without petiole. Hind wings each with R2+3 and M branched near margin of wing; Cu1 branched more deeply (Fig. 11A).

Male genitalia. Segment IX annular with 2 dorsal knobs; anterolateral margins almost straight, posterior margin slightly angulate (Fig. 11B). Posterior margin of segment IX reinforced with well developed antecosta, except with antecosta poorly developed, bent, and partially bordering acrotergite in dorsal view (Fig. 11C). Posteroventral margin of segment IX produced into median rounded process in ventral view (Fig. 11D). Preanal appendages rounded with broad bases in lateral view (Fig. 11B); fused almost completely on midline with U-shaped median excision in dorsal view (Fig. 11C). Tergum X membranous, digitate and slightly upcurved in lateral view (Fig. 11B); broad at base and slightly narrowed at tip in dorsal view (Fig. 11C). Inferior appendages broad, each with ventral margin curved with apex thin and rounded in lateral view (Fig. 11B); base broad with curved external margin gradually narrowing distally, abruptly narrowed at tip in ventral view (Fig. 11D). Phallic apparatus rounded, with sinuous paramere spine, C-shaped phallosomal sclerite, and acute ventral process in lateral view (Figs. 11E–F).

**Holotype male.** BOLIVIA: Río Mocovi, near Trinidad, 14°44'27"S, 64°54'24"W, 12.11.2001, (IML).

**Paratypes.** 2 males, same as holotype, (IML). Río Itenez, Versalles, 12°39'42"S, 63°22'21"W, 04.v.2006, (CBF-UMSA) — 1 male; Lake San Gregorio, near Reyes, (IML) — 1 male; Lake Granja, Bella Vista, 13°15'50"S, 63°42'33"W, 06.v.2006, (IML) — 1 male.

**Etymology.** This species is named *O. pseudoamazonica* because of its close relationship and appearance with *O. amazonica*.

*Oecetis punctipennis* (Ulmer)

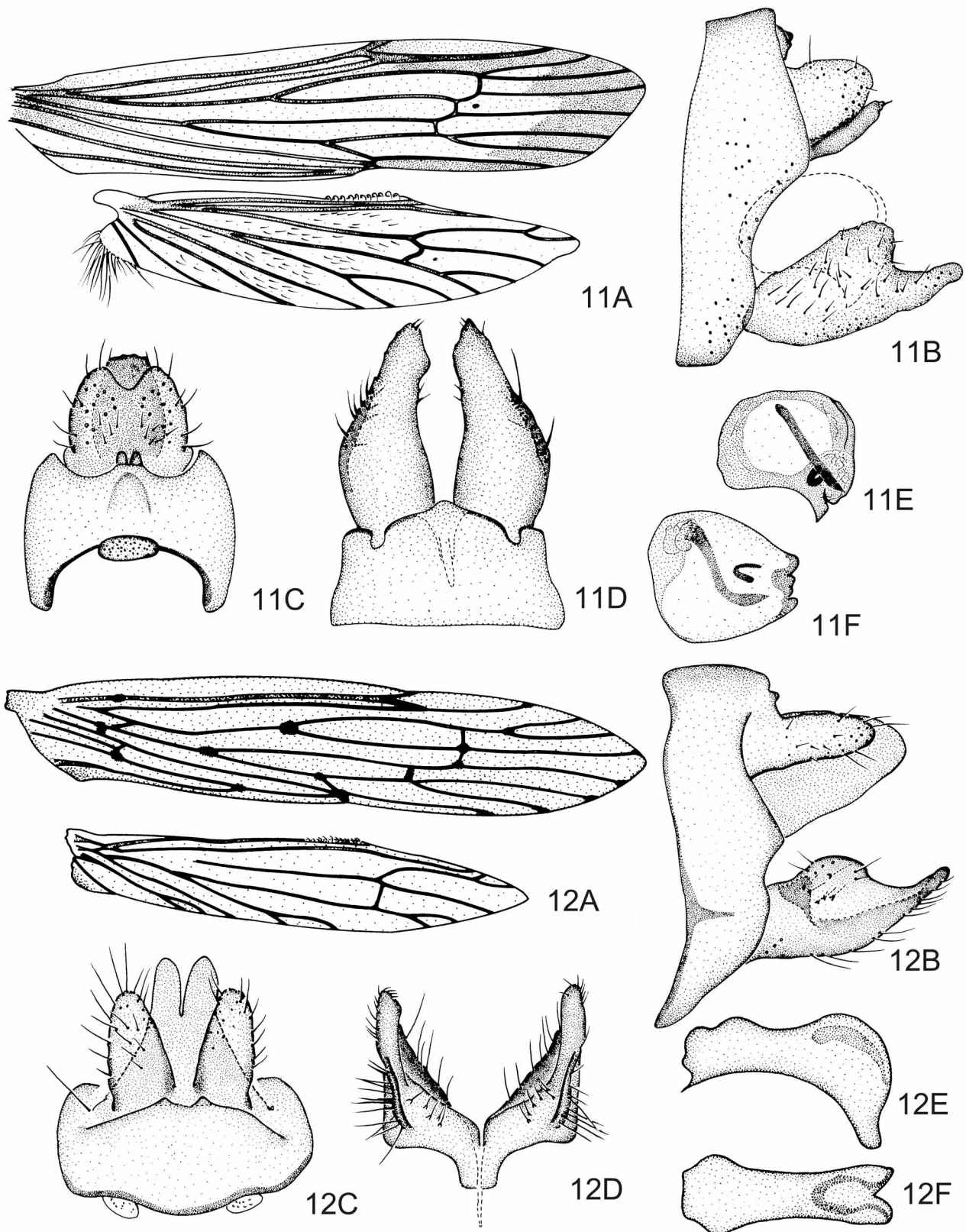
Fig. 12

*Pseudosetodes punctipennis* Ulmer 1905: 77 (female, original description); Flint 1966: 10 (female, lectotype, male); Flint 1982b: 53 (distribution); Flint 1996: 421 (distribution); Maes & Flint 1988: 6 (distribution); Holzenthal 1988: 74 (distribution); Aguila 1992: 544 (distribution); Paprocki *et al.* 2004 (distribution).

*Oecetina parishi* Banks 1915: 631 (male); Flint 1966: 10 (to synonymy).

*Oecetis bridarollina* Navás 1933 (male); Flint 1972 (to synonymy).

This species is widely distributed in Central and South America. According to Flint (1983), *O. punctipennis*, *O. connata* Flint (1974) and *O. iguazu* Flint (1983) form a complex of closely related species.



**FIGURE 11.** *Oecetis pseudoamazonica*, new species. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**FIGURE 12.** *Oecetis punctipennis* (Ulmer). A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**Material examined. BOLIVIA:** Lake Colorada, near Trinidad, 14°48'21"S, 64°58'41"W, 16.xi.2002, (IML) — 1 male, 6 females; Lake Belen, near Trinidad, 14°27'29"S, 64°51'41"W, 26.v.2003, (CBF-UMSA) — 1 male; 13.xi.2002 — 1 male; Río Ibare, Puerto Ballivian, near Trinidad, 14°47'41"S, 64°58'21"W, 17.xi.2002, (CBF-UMSA) — 1 female; Lake Bay, Río Manuripi basin, 03.viii.2007, (CBF-UMSA) — 2 males, 1 female, Lake Granja, near Bella Vista, 13°15'50"S, 63°42'33"W, 06.v.2006, (IML) — 1 male.

**Paratype: VENEZUELA:** T. F. A., Agua Blanca. 0°49'N, 66°08'W, Cerro de la Neblina, 160 m, 10–21.iii.1984, O.S. Flint & J. Louton cols., (NMNH) — 1 male.

**Distribution.** Argentina, Bolivia, Brazil, Costa Rica, Ecuador, Guyana, Nicaragua, Panama, Peru, Surinam, Venezuela.

### *Oecetis rafaeli*, Flint

Fig. 13

*Oecetis rafaeli* Flint, 1991b: 74 (male, original description).

*Oecetis rafaeli* Flint was described from Brazil. This species bears long posterolateral processes in the segment IX. There are small differences in the dorsal view between the original description of the species and the collected material from Bolivia. In the original description of *O. rafaeli*, the lateral processes of segment IX are straighter than in the collected material. Comparing a paratype with the collected material, these differences are not visible. For this reason, *O. rafaeli*, is recorded for the first time for Bolivia.

**Material examined. BOLIVIA:** Lake Colorada, near Trinidad, 14°48'21"S, 64°58'41"W, 16.xi.2002, (IML) — 2 males.

**Paratype: BRASIL:** Am Am, 010, km 246, W Itacoatiara, 12–15.vii.1979, J. Arias *et al.* cols., (NMNH) — 1 male.

**Distribution.** Bolivia, Brazil.

### *Oecetis traini*, new species

Fig. 14

This species is closely related to *O. scoparia* Flint (1974) and *O. peruviana* (Banks 1924). These 3 species have tergum X divided into a single dorsal lobe and paired ventral lobes. The phallic apparatus of *O. scoparia* and *O. traini* n. sp. is similar.

**Specific diagnosis.** *Oecetis traini* is characterized by the dorsal, setose, rod-like process and ventral, membranous, forked portion of tergum X. The inferior appendages are large, each with a subapical process visible in ventral and lateral views.

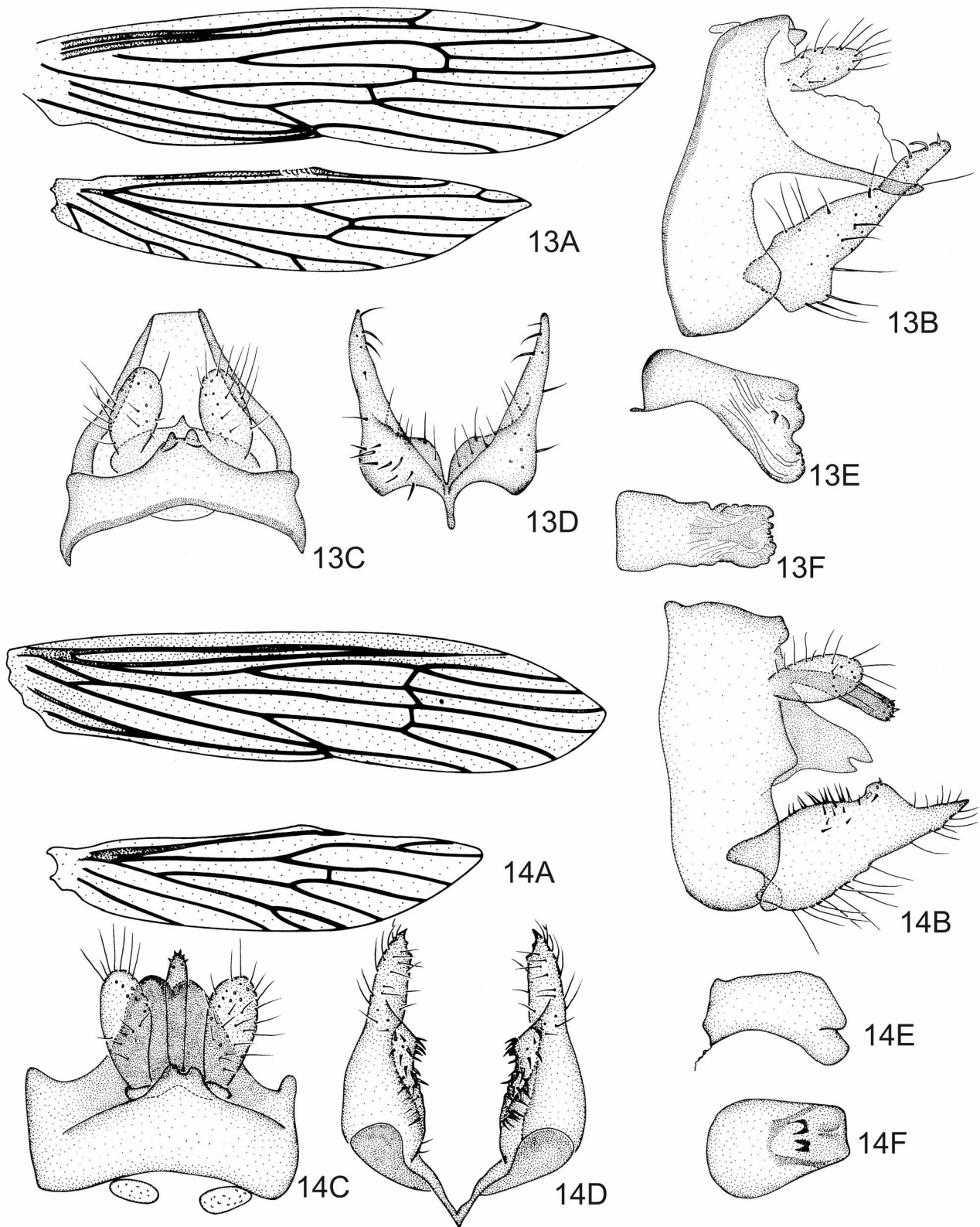
**Adult.** Length of each forewing: 7.5 mm. Forewings each with R2+3 branched at midpoint of stigma. Hind wings each with R2+3 and Cu1 branched near edge of wing; M branched more deeply (Fig. 14A).

**Male genitalia.** Segment IX annular and broad, with 2 posterodorsal knobs (Figs. 14B–C). Preanal appendages oval with rounded apices (Figs. 14 B–C). Tergum X with dorsal and ventral portions: Dorsal, digitate portion bearing setae at apex in lateral and dorsal views (Figs 14B–C); ventral portion subtriangular and with ventral digitate indentation at apex in lateral view, (Fig. 14B), with shallow median excision in dorsal view (Fig. 14C). Inferior appendages elongated, 3 times as long as width of base; dorsal preapical lobe rounded and with posterior, acute projection in lateral view (Fig. 14B); straight and slightly concave mesally, with median setose process in ventral view (Fig. 14D). Phallic apparatus short, curved and slightly broadened at tip (Fig. 14E); broad, almost hexagonal, narrowed at posterior extremity and bearing 2 internal square sclerites in dorsal view (Fig. 14F), possible dark ends of U-shaped phallosomal sclerite.

**Holotype male. BOLIVIA:** Lake Bay, Río Manuripi basin, 03.viii.2007, (IML).

**Paratypes. BOLIVIA:** Lake California, near Bella Vista, 10.v.2006, (CBF-UMSA) — 4 males, Lake Granja, near Bella Vista, 13°15'50"S, 63°42'33"W, 06.v.2006, (IML) — 3 males.

**Etymology.** This species is dedicated to Russell E. Train who, with support of the World Wildlife Fund (WWF), made possible some invertebrate sampling in the Bolivian Amazon.



**FIGURE 13.** *Oecetis rafaeli* Flint. A— forewing and hind wing. Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.

**FIGURE 14.** *Oecetis traini*, new species. A— forewing and hind wing . Male genitalia: B—lateral; C—dorsal; D—ventral; E—Phallic apparatus, lateral; F—Phallic apparatus ventral.



## Key to the males of *Oecetis* species from Mexico, Central and South America

It is recommended that the user of this identification key refer to the original descriptions of species to corroborate species determinations. Because some species of *Oecetis* show variations, identifications may be difficult using only an identification key. For example, in the *O. avara* Group, differences among *O. avara*, *O. metlacensis*, *O. marquesi*, *O. elata* and *O. inconspicua* are subtle. Furthermore, the structure of membranous tergum X can be difficult to recognize. All characters in this identification key are visible in the lateral view of the male genitalia, except for *O. amazonica* and *O. pseudoamazonica* **n.sp.**, in which case characters of wings are used. *Oecetis haitises* Flint & Sykora (2004), from Hispaniola (Dominican Republic), is known only from the female holotype.

1	Phallic apparatus spherical, not curved; paramere spine long, sinuous (Figs 1E–F) . . . . .	2
1'	Phallic apparatus cylindrical and generally curved (Figs 2E–F); paramere spine present or absent, but if present not long, sinuous (Figs 2E–F) . . . . .	6
2(1)	Tergum X slightly broader at base and narrower at tip in dorsal view (Figs 6C, 7C); inferior appendages each broad at base with elongate apical process longer than width of appendage in lateral view (Figs 6B, 7B) and usually with dorsal process slender and nearly parallel with apical process (Fig. 6B) . . . . .	3
2'	Tergum X with same width from base to tip (Figs 1C, 11C); inferior appendages each broad at base with apical process shorter than width of appendage and with dorsal process shorter than wide and in nearly 90° angle with apical process (Figs 1B, 11B) . . . . .	5
3(2)	Length of each inferior appendage more than 3 times maximum width (Bueno-Soria 1981, fig. 2) . . . . .	<i>O. pseudoinconspicua</i> Bueno-Soria.
3'	Length of each inferior appendage no more than 2.5 two times maximum width (Figs 6B, 7B) . . . . .	4
4(3')	Dorsal process of each inferior appendage slender, about as narrow as apical process in lateral view, projecting apicad (Fig. 6B) . . . . .	<i>O. excisa</i> Ulmer.
4'	Dorsal process of each inferior appendage broader than apical process, not projecting (Fig. 7B) . . . . .	<i>O. inconspicua</i> (Walker).
5(2')	Each forewing with apical margin rounded, fork I petiolate, coloration pattern sharp, apically much darker than base (Fig. 1A); acrotergite of segment IX clearly separated by well developed and straight antecosta from rest of segment IX (Fig. 1C) . . . . .	<i>O. amazonica</i> (Banks).
5'	Each forewing with apical margin acute, fork I sessile, coloration pattern with less contrast, apically darker than base but not contrasting as strongly (Fig. 11A); acrotergite of segment IX forming anterior indentation in dorsum of segment IX behind weakly developed and curved antecosta (Fig. 11C) . . . . .	<i>O. pseudoamazonica</i> , new species.
6 (1')	Segment IX with lateral processes elongated (Fig. 13B; Flint 1981, figs 148–149) . . . . .	7
6'	Segment IX lateral processes not elongated (Figs 2B; Flint 1974, fig 273) . . . . .	10
7(6)	Segment IX with lateral processes as long as half of tergum X (Denning 1951, fig. 1A) . . . . .	<i>O. arizonica</i> Denning.
7'	Segment IX with lateral processes almost as long as tergum X, if not, longer than half as long as tergum X (Fig. 13B) . . . . .	8
8 (7')	Segment IX with lateral processes long, branched, arising more nearly dorsally from segment IX (Denning & Sykora 1966, fig. 10) . . . . .	<i>O. falcia</i> Denning.
8'	Segment IX with lateral process unbranched, arising laterally from segment IX (Fig. 13B) . . . . .	9
9 (8')	Segment IX with lateral processes decurved at tip; tergum X with dorsal part long and slender, ventral part with broad base and narrow apex; inferior appendages narrow at base and slightly broader at tip (Flint 1981, fig. 148) . . . . .	<i>O. prolongata</i> Flint.
9'	Lateral processes of segment IX straight; tergum X with dorsal part short and ventral part broad and membranous; inferior appendages broad at base and narrowed at tip (Fig. 13B) . . . . .	<i>O. rafaeli</i> Flint.
10(6')	Inferior appendages each with dorsal preapical lobe rounded or digitate (Figs 2B, 4B, 8B) . . . . .	11
10'	Inferior appendages each with shallow dorsal preapical lobe or without dorsal preapical lobe (Figs 3B, 5B) . . . . .	25
11(10)	Inferior appendages each with dorsal lobe bearing digitate projections in dorsal margin or with dorsal margin irregular with strong spines (Figs 4B, 8B) . . . . .	12
11'	Inferior appendages each with dorsal lobe without digitate projections in dorsal margin, dorsal margin smooth (Figs 2B) . . . . .	15
12(11)	Inferior appendages each with dorsal lobe curved, hook-shaped (Bueno-Soria 1981, figs 8–9) . . . . .	<i>O. silviae</i> Bueno-Soria.
12'	Inferior appendages each with dorsal lobe straight or rounded (Figs 4B, 8B) . . . . .	13
13(12)	Inferior appendages each with apical process apparently absent in lateral view, reduced to a small setose process before midline in ventral view (Fig. 4B) . . . . .	<i>O. chipiriri</i> , new species.
13'	Inferior appendages each with apical process digitate in lateral view (Fig. 8B) . . . . .	14
14(13')	Inferior appendages each with dorsal process broadened, apically bearing digitate small subequal lobes; apical process curved (Chen 1992, fig. 7.32A) . . . . .	<i>O. punctata</i> (Navás).
14'	Inferior appendages each with dorsal process regularly broad from base to apex, apically bearing digitate small and broader lobes; apical process straight (Fig. 8B) . . . . .	<i>O. knutsoni</i> Flint.
15(11')	Inferior appendages each with dorsal lobe high (Fig. 2B) . . . . .	16
15'	Inferior appendages each with dorsal lobe short (Figs 9B, 10B, 14B) . . . . .	22
16(15)	Tergum X with dorsal process digitate or absent, shorter than inferior appendages (Fig. 2B) . . . . .	17
16'	Tergum X with dorsal process slender, longer than or as long as inferior appendages (Flint 1974, fig. 271) . . . . .	21
17(16)	Tergum X with dorsal process (Fig. 2B) . . . . .	18
17'	Tergum X with dorsal process absent (Denning & Sykora 1966, figs 9, 9A) . . . . .	20
18 (17)	Tergum X with ventral lobe inconspicuous, rounded at apex in lateral view (Bueno-Soria 1981, fig. 5) . . . . .	

18'	Ventral lobe of tergum X subtriangular in lateral view (Figs 2B, Smith & Lehmkuhl 1980, figs 1, 3) . . . . .	<i>O. metlacensis</i> Bueno-Soria.	19
19(18')	Inferior appendages each with apical process digitate (Figs 2B; Smith & Lehmkuhl 1980, fig. 3). . . . .	<i>O. avara</i> (Banks).	
19'	Inferior appendages each with apical process absent (Smith & Lehmkuhl 1980, fig. 1) . . . . .	<i>O. disjuncta</i> (Banks).	
20(17')	Inferior appendages each with apical process inconspicuous (Denning & Sykora 1966, figs 9, 9A) . . . . .	<i>O. elata</i> Denning & Sykora.	
20'	Inferior appendages each with apical process slender, digitate (Bueno-Soria 1981, fig. 7) . . . . .	<i>O. marquesi</i> Bueno-Soria.	
21(16')	Inferior appendages each with dorsal process slender, apically blunt, curved; apical process arising ventrally and pointed caudad; basal area normal not inflated (Flint 1974, fig. 271) . . . . .	<i>O. bilobosa</i> Flint.	
21'	Inferior appendages each with dorsal process shallow and rounded; apical process apparently absent; basal area broad and inflated (Flint 1974, fig. 272) . . . . .	<i>O. inflata</i> Flint.	
22(15')	Phallic apparatus elongated twice the length of inferior appendages (Flint 1974, fig. 273) . . . . .	<i>O. doesburgi</i> Flint.	
22'	Phallic apparatus short as long or shorter than inferior appendages (Fig. 14B) . . . . .		23
23(22')	Tergum X with dorsal digitate lobe and ventral subtriangular lobe with ventroapical indentation (Fig. 14B) . . . . .	<i>O. traini</i> , new species.	
23'	Tergum X with dorsal lobe absent, ventral lobe variable but without ventroapical indentation (Fig. 9B, 10B) . . . . .		24
24(23')	Tergum X triangular in lateral view; inferior appendages each with apical process curved; margin between apical process and dorsal preapical process rounded (Fig. 9B) . . . . .	<i>O. oberdorffi</i> , new species.	
24'	Tergum X suddenly narrowed from midlength to tip; inferior appendages each with apical process straight; margin between apical process and dorsal preapical process angulated (Fig. 10B) . . . . .	<i>O. paranensis</i> Flint.	
25(10')	Tergum X divided into a dorsal unique lobe and paired ventral lobes (Fig. 3B) . . . . .		26
25'	Tergum X constituted only by paired lobe (Figs 5B, 12B) . . . . .		31
26(25)	Tergum X with ventral paired lobes subtriangular (Fig. 3B) . . . . .		27
26'	Tergum X with ventral paired lobes rounded or digitate (Flint, 1974, fig. 269) . . . . .		30
27(26)	Inferior appendages subtriangular, broad at base and narrowed at tip, twice as long as wide (Botosaneanu 1977, fig. 108) . . . . .	<i>O. maspeluda</i> Botosaneanu.	
27'	Inferior appendages elongated, slightly broad at base and narrowed at tip 3 or more times as long as wide (Fig. 3B) . . . . .		28
28(27')	Tergum X with dorsal process half as long as ventral paired lobe; inferior appendages each with truncated apex (Fig. 3B) . . . . .	<i>O. carlibanezae</i> , new species.	
28'	Tergum X with dorsal lobe as long as ventral paired lobe; inferior appendages with acute or rounded apex (Flint 1967a, figs 108, 109) . . . . .		29
29(28')	Dorsal lobe of tergum X slightly broader at apex; inferior appendages each with apical process slightly downcurved, narrowed at tip with acute apex (Flint 1967a, figs 108, 109) . . . . .	<i>O. peruviana</i> (Banks).	
29'	Dorsal lobe of tergum X digitate; inferior appendages with apical process directed dorsally, not narrowed at tip with rounded apex (Denning 1947, fig. 1A) . . . . .	<i>O. pratti</i> Denning.	
30(26')	Ventral lobe(s) of tergum X rounded; inferior appendages narrowed at tip with rounded apex (Flint, 1974, fig. 269). . . . .	<i>O. scoparia</i> Flint.	
30'	Ventral lobe of tergum X slender; inferior appendages narrowed at the tip with acute apex (Ross 1944, fig. 822A) . . . . .	<i>O. cinerascens</i> (Hagen).	
31(25')	Tergum X fused with preanal appendages (Flint 1974, fig. 267) . . . . .	<i>O. connata</i> Flint.	
31'	Tergum X not fused with preanal appendages (Figs 5B, 12B) . . . . .		32
32(31')	Inferior appendages each with same with from base to tip (Flint 1983, fig. 250) . . . . .	<i>O. iguazu</i> Flint.	
32'	Inferior appendages each broad at base and narrowed from midlength to tip (Figs 5B, 12B) . . . . .		33
33(32')	Tergum X broad at base and narrowed at tip, with digitate apical areal en lateral view (Fig. 5B) . . . . .	<i>O. dominguezi</i> , new species.	
33'	Tergum X broad from base to tip with rounded apex (Fig. 12B) . . . . .	<i>O. punctipennis</i> (Ulmer).	

## Acknowledgements

We wish to thank Dr. E. Domínguez for giving valuable comments and corrections. Special considerations are for Dr. O. S. Flint Jr. for his, generosity and kindness and because without his help the visit to the National Museum of Natural History, Washington DC would be impossible. This manuscript was prepared with an internal fellowship from CONICET (National Council of Scientific Research, Argentina) and financially supported by: "Agencia Nacional de Promoción Científica y Tecnológica" PICT 01-528 and "Consejo de Investigaciones de la Universidad Nacional de Tucumán" CIUNT 26G309.

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