



Zootaxa 2179: 1–72 (2009)
www.mapress.com/zootaxa/

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Monograph

ISSN 1175-5326 (print edition)

ZOOTAXA

ISSN 1175-5334 (online edition)

ZOOTAXA

2179

**Revision of *Toxomerus* Macquart, 1855 (Diptera: Syrphidae)
from Brazil with synonymic notes, identification key to
the species and description of three new species**

ZULEICA M. BORGES & MARCIA S. COURI

*Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro. Quinta da Boa Vista,
São Cristóvão, 20940-040. Rio de Janeiro-RJ, BRAZIL. E-mail: zmborges@mn.ufrj.br; mcouri@terra.com.br*



Magnolia Press
Auckland, New Zealand

Accepted by D. Bickel: 16 Jun. 2009; published: 6 Aug. 2009

Zuleica M. Borges & Marcia S. Couri

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(*Zootaxa* 2179)

72 pp.; 30 cm.

6 Aug. 2009

ISBN 78-1-86977-405-9 (paperback)

ISBN 978-1-86977-406-6 (Online edition)

FIRST PUBLISHED IN 2009 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

<http://www.mapress.com/zootaxa/>

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ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

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Abstract

Toxomerus Macquart (Diptera: Syrphidae) species from Brazil are revised, including the examination of most of the types. Thirty six species are confirmed. Twenty seven are synonymized: *T. dispar* (Fabricius, 1794) [= *T. vicinus* (Macquart, 1846), *T. tridentatus* (Rondani, 1868) *T. annulifer* (Bigot, 1884), *T. ruficaudatus* (Bigot 1884), & *T. triangulatus* (Hull, 1942)], *T. duplicatus* (Wiedemann, 1830) [= *T. vatius* (Walker, 1852), *T. gemini* (Hull, 1941), *T. arcturus* (Hull, 1943), *T. bipunctatus* (Hull, 1943)], *Syrphus basalis* Walker, 1837 [= *T. portius* (Walker, 1852), *T. rhea* (Hull, 1949), *T. harlequinus* (Hull, 1951)], *T. pictus* (Macquart, 1842) [= *T. jaguarinus* (Bigot, 1884), *T. maculatus* (Bigot, 1884), *T. pulchellus* (Macquart, 1846) [= *T. punctatus* Sack, 1921], *T. virgulatus* (Schiner, 1868) [= *T. confusus* (Schiner, 1868)], *T. laenas* (Walker, 1852) [= *T. barbulus* (Walker, 1852), *T. nitidiventris* (Curran, 1930), *T. vitreus* (Hull, 1941)], *T. norma* (Curran, 1930) [= *T. mulio* (Hull, 1941)], *T. productus* (Curran, 1930) [= *T. triradiatus* (Hull, 1942), *T. camilla* (Hull, 1951), *T. cyrillus* (Hull, 1951), *T. vanessa* (Hull, 1951)], *T. watsoni* (Curran, 1930) [= *T. lanei* (Hull, 1942)], *T. steatogaster* (Hull, 1941) [= *T. steatornis* (Hull, 1943)], *T. idalius* (Hull, 1951) [= *T. eurydice* (Hull, 1951)]. Two new combinations are presented: *Mesogramma apegiensis* Harbach, 1974 (= *Toxomerus apegiensis*) and *Syrphus basalis* Walker, 1837 (= *Toxomerus basalis*); six new records for Brazil are included: *T. difficilis* (Curran, 1930), *T. idalius* (Hull, 1951), *T. productus* (Curran, 1930), *T. purus* (Curran, 1930), *T. sylvaticus* (Hull, 1943) and *T. undecimpunctatus* (Enderlein, 1938). Three new species are described: *Toxomerus mosaicus*, *Toxomerus papaveroi* and *Toxomerus paraduplicatus*.

Key words: Syrphidae, *Toxomerus*, Brazil, taxonomy, new species, synonymies, key

Introduction

Toxomerus Macquart, 1855 belongs to Syrphinae (Syrphidae) and it is the only genus included in Tribe Toxomerini, with approximately 150 species described in the world. It occurs mainly in the Neotropical Region with 143 species (Thompson 1999), followed by the Nearctic Region with 16 species (9 endemic) (Poole & Gentili 1996) and with only one species introduced in the Australasian Region (Thompson & Vockeroth 1989).

Toxomerini was erected by Enderlein (1938) based on characters of calypteres and plumula and according to his definition included the genera: *Chasmia* Enderlein, 1938 (= *Allograpta* Osten Sacken, 1875); *Allograpta*; *Allograptina* Enderlein, 1938 (= *Rhysops* Williston, 1907); *Antiops* Enderlein, 1938; *Hybobathus* Enderlein, 1938 (= *Ocptamus* Macquart, 1834); *Mitrosphen* Enderlein, 1938; *Mesogramma* Loew, 1866; *Ocyptamus*; *Atrichosticha* Enderlein, 1938 (= *Melanostoma* Schiner, 1860) and *Toxomerus*.

Vockeroth (1969) rearranged the species of Toxomerini using mainly male genitalic characters. Since then the genera *Mesogramma*, *Mesograptus* Loew, 1872, *Mitrosphen* and *Antiops* are synonymies of *Toxomerus* and the other genera were reorganized in other tribes.

Most of the *Toxomerus* species were originally described as *Mesogramma* and *Mesograptus*.

The first comprehensive key to *Mesogramma* species was provided by Curran (1930), and included 42 species. Hull (1943b) published a key to 97 *Mesogramma* species with 84 illustrations of the abdominal colour patterns, many of them based on type-material.

The last list of the Neotropical *Toxomerus* species was published by Thompson *et al.* (1976) and included 143 species. Thompson (1981) studying the West Indian species of *Toxomerus* provided a key to species from that Region. Metz and Thompson (2001) revised the larger species of *Toxomerus*, with more than 9 mm.

Thompson *et al.* (1976), Thompson (1981), Harbach (1984) and Metz and Thompson (2001) recorded 43 species of *Toxomerus* from Brazil.

The aim of the present paper is to revise the Brazilian species of *Toxomerus*, including the exam of most of the type-material and the material deposited in collections. A key to the Brazilian species and genitalia descriptions are included.

Material and methods

The material examined comprehends 46 holotypes, nine allotypes, 105 paratypes, six cotypes, seven syntypes and 1911 specimens belonging to the institutions below (name of the curator between parentheses): AMNH—American Museum of Natural History, New York, USA (Dr. David Grimaldi); BMNH—The Natural History Museum, London, United Kingdom (Nigel Wyatt); CNC—Canadian National Collection, Ottawa, Canada (Dr. Jeffrey M. Cumming); DZUP—Entomological Collection Father Jesus S. Moure, Department of Zoology, Universidade Federal do Paraná, Paraná, Brazil (Dr. Luciane Marinoni); INPA—Instituto Nacional de Pesquisas da Amazônia, Amazonas, Brazil (Dr. José A. Rafael); MNRJ—Museu Nacional, Rio de Janeiro, Brazil (Dr. Márcia S. Couri); MZSP—Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (Dr. Carlos José E. Lamas); OXUM—Hope Entomological Collections, University Museum, Oxford, England (Dr. Adrian C. Pont); UNISC—Universidade de Santa Cruz do Sul, Rio Grande do Sul, Brazil (Dr. Andreas Kohler); USNM—United States National Museum, Washington, USA (Dr. F. Christian Thompson).

The morphological terms used are based on Thompson (1999) and Metz & Thompson (2001). Thorax, wings and legs illustrations are schematic.

Results

Based on the analysis of the material in the detailed study of the external morphology and genitalia, thirty six

species names are confirmed, twenty seven synonymized, two new combinations and six new records are presented and three new species are described.

The main characters used to recognize the species were the face length, the scutum and scutellum color, the microtrichia pattern on wing, the legs color, the abdomen color pattern and male and female genitalia morphology.

List of valid *Toxomerus* species occurring in Brazil and synonymies.

1. *Toxomerus apegiensis* (Harbach, 1974) **n. comb.**
Mesograpta apegiensis Harbach, 1974
2. *Toxomerus aquilinus* Sack, 1941
Mesograpta anchoratus Schiner, 1868
Mitrosphen interruptus Enderlein, 1938
3. *Toxomerus basalis* (Walker, 1837) **n. comb.**
Syrphus basalis Walker, 1837
Syrphus portius Walker, 1852 **syn. nov.**
Mesogramma rhea Hull, 1949 **syn. nov.**
Mesogramma harlequina Hull, 1951 **syn. nov.**
4. *Toxomerus croesus* (Hull, 1940)
Mesogramma croesa Hull, 1940
5. *Toxomerus difficilis* (Curran, 1930) (new record for Brazil)
Mesogramma difficilis Curran, 1930
6. *Toxomerus dispar* (Fabricius, 1794)
Syrphus dispar Fabricius, 1794
Syrphus basilaris Wiedemann, 1830
Syrphus vicinus Macquart, 1846 **syn. nov.**
Mesogramma soror Schiner, 1868
Syrphus tridentatus Rondani, 1868 **syn. nov.**
Mesograpta variabilis Wulp, 1883
Melanostoma annulifer Bigot, 1884 **syn. nov.**
Paragus ruficaudatus Bigot 1884 **syn. nov.**
Mesogramma bidentatus Giglio-Tos, 1893
Mesogramma imperialis Curran, 1926
Mesogramma flavocunea Hull, 1940
Mesogramma triangulata Hull, 1942 **syn. nov.**
Mesogramma neotrpica Hull, 1943
7. *Toxomerus duplicatus* (Wiedemann, 1830)
Syrphus duplicatus Wiedemann, 1830
Syrphus vatius Walker, 1852 **syn. nov.**
Syrphus ochrogaster Thomson, 1869
Mesogramma gemini Hull, 1941 **syn. nov.**
Mesogramma arcturus Hull, 1943 **syn. nov.**
Mesogramma bipunctata Hull, 1943 **syn. nov.**
8. *Toxomerus elisa* (Hull, 1951)
Mesogramma elisa Hull, 1951
9. *Toxomerus flaviplurus* (Hall, 1927)
Mesogramma flaviplurus Hall, 1927
10. *Toxomerus floralis* (Fabricius, 1798)
Syrphus floralis Fabricius, 1798
Syrphus quadrifasciatus Bigot, 1857

- Mesogramma subannulata* Loew, 1866
Mesogramma flamminea Hull, 1941
Mesogramma nasica Hull, 1941
11. *Toxomerus funestus* (Doesburg, 1966)
Mesograpta funesta Doesburg, 1966
 12. *Toxomerus idalius* (Hull, 1951) (new record for Brazil)
Mesogramma idalia Hull, 1951
Mesogramma eurydice Hull, 1951 **syn. nov.**
 13. *Toxomerus intermedius* (Hull, 1949)
Mesogramma intermedia Hull, 1949
 14. *Toxomerus lacrymosus* (Bigot, 1884)
Mesograpta lacrymosa Bigot, 1884
 15. *Toxomerus laenas* (Walker, 1852)
Syrphus laenas Walker, 1852
Syrphus barbulus Walker, 1852 **syn. nov.**
Mesogramma nitidiventris Curran, 1930 **syn. nov.**
Mesogramma vitrea Hull, 1941 **syn. nov.**
 16. *Toxomerus minutus* (Wiedemann, 1830)
Syrphus minutus Wiedemann, 1830
 17. *Toxomerus mosaicus* Borges **sp. nov.**
 18. *Toxomerus musicus* (Fabricius, 1805)
Scaeva musicus Fabricius, 1805
 19. *Toxomerus norna* (Curran, 1930)
Mesogramma norna Curran, 1930
Mesogramma mulio Hull, 1941 **syn. nov.**
 20. *Toxomerus papaveri* Borges **sp. nov.**
 21. *Toxomerus paraduplicatus* Borges **sp. nov.**
 22. *Toxomerus pictus* (Macquart, 1842)
Syrphus pictus Macquart, 1842
Mesogramma poecilogastra Loew, 1866
Mesograpta jaguarina Bigot, 1884 **syn. nov.**
Mesograpta maculata Bigot, 1884 **syn. nov.**
Mesogramma extrapolata Hull, 1943
 23. *Toxomerus politus* (Say, 1823)
Scaeva polita Say, 1823
Syrphus anchoratus Macquart, 1842
Syrphus cingulatus Macquart, 1850
Syrphus hectitus Jaenicke, 1867
 24. *Toxomerus polygraphicus* (Hull, 1940)
Mesogramma polygraphica Hull, 1940
 25. *Toxomerus procrastinatus* Metz, 2001
 26. *Toxomerus productus* (Curran, 1930) (new record for Brazil)
Mesogramma producta Curran, 1930
Mesogramma triradiatus Hull, 1942 **syn. nov.**
Mesogramma camilla Hull, 1951 **syn. nov.**
Mesogramma cyrilla Hull, 1951 **syn. nov.**
Mesogramma vanessa Hull, 1951 **syn. nov.**
 27. *Toxomerus pulchellus* (Macquart, 1846)
Syrphus pulchellus Macquart, 1846

- Mesograpta laciniosa* Loew, 1866
Toxomerus punctatus Sack, 1921 **syn. nov.**
Mesogramma lyrata Hull, 1940
28. *Toxomerus purus* (Curran, 1930) (new record for Brazil)
Mesogramma purus Curran, 1930
29. *Toxomerus sedmani* Harbach, 1984
30. *Toxomerus steatogaster* (Hull, 1941)
Mesogramma steatogaster Hull, 1941
Mesogramma steatornis Hull, 1943 **syn. nov.**
31. *Toxomerus sylvaticus* (Hull, 1943) (new record for Brazil)
Mesogramma sylvatica Hull, 1943
32. *Toxomerus teliger* (Fluke, 1953)
Mesograpta teligera Fluke, 1953
33. *Toxomerus tibicen* (Wiedemann, 1830)
Syrphus tibicen Wiedemann, 1830
Syrphus sinuatinervis Macquart, 1850
Toxomerus ornatus Sack, 1941
34. *Toxomerus undecimpunctatus* (Enderlein, 1938) (new record for Brazil)
Mitrosphen undecimpunctatus (Enderlein, 1938)
35. *Toxomerus virgulatus* (Macquart, 1850)
Syrphus virgulatus Macquart, 1850
Mesogramma confusa Schiner, 1868 **syn. nov.**
Mesograpta maculipes Bigot, 1884
Mesogramma alphabetica Hull, 1942
36. *Toxomerus watsoni* (Curran, 1930)
Mesogramma watsoni Curran, 1930
Mesogramma lanei Hull, 1942 **syn. nov.**

***Toxomerus* Macquart, 1855**

Toxomerus Macquart, 1855: 92, *notatus* Macquart (original designation) = *geminatus* Say; Thompson *et al.*, 1976: 47 (catalogue); Thompson, 1981: 65 (key); Metz & Thompson, 2001: 225 (revision and key).
Mesogramma Loew, 1866: 157, *parvula* Loew (original designation); Curran, 1930: 1 (key and new species); 1934: 399 (key and new species); Hull, 1943b: 1 (revision, key and illustrations).
Mesograpta Loew, 1872: 114 (nomen nov. *Mesogramma*); Osten Sacken, 1878: 125 (synonymy).
Mitrosphen Enderlein, 1938: 227, *Syrphus tibicen* Wiedemann (original designation); Hull, 1949b: 290 (synonymy).
Antiopts Enderlein, 1938: 228, *Mesograpta saphiridiceps* Bigot (original designation); Hull, 1949b: 290 (synonymy).

Diagnosis. Eye with distinct triangular emargination on posterior margin (Figs. 1–3); female fronto-orbital plate black on 1/3 superior and yellow on 2/3 inferior; face well developed; gena narrow, with white pollen and piles, short and thick, more abundant inferiorly; arista bare. Pleuron with discreet polinosity, more accentuated on katapisternum; postpronotum bare; proepisternum with few short pile on anterior surface; proepimeron with short pile with very few cilia on 1/3 medial; meron bare; anatergum bare; katatergum bare; posterior spiracle with short pile on margin. Metasternum bare; metaepisternum pilose; metaepimeron bare. Legs with procoxa

very short pilose on anterior surface; meso and meta coxae with apical piles on anterior surface; claws yellow on basal half and black on apical half. Wing pilose on margins, with subcostal cell brown; spurious vein with brown spot on medial 1/3. Male genitalia well sclerotized, very short to long postanal process arising from fused surstylar apodemes and projecting caudad between bases of surstyli.

Identification key for the *Toxomerus* species from Brazil

1. Large species, 9 mm or more in length..... 2
 - Smaller species, less than 9 mm in length 11
2. Supracoxal yellow macula absent (Fig. 5); alula as wide as cell c (Fig. 11) *T. croesus* (Hull)
 - Supracoxal yellow macula present (Fig. 8); alula wider than cell c (Fig. 15)..... 3
3. Posterior anepimeron, katepimeron and katatergum almost yellow; abdomen with isolated lateral brown puncta on 3rd – 5th terga (Metz & Thompson 2001: Fig. 7) *T. undecimpunctatus* (Enderlein)
 - Posterior anepimeron, katepimeron and katatergum brownish to black; abdomen not as above 4
4. Abdomen with 3rd and 4th terga yellow on basal 2/3, with a narrow black subbasal fascia connected to medial vitta to form a L-shaped macula not touching the lateral margin (Metz & Thompson 2001: Fig. 6) ; female genitalia with two spermatecae *T. politus* (Say)
 - Abdomen not as above; female genitalia with three spermatecae 5
5. Scutellum yellow; abdomen with 3rd and 4th terga entirely yellow on basal 2/3 which sometimes contain two small medial brown to black spots (Fig. 33); male genitalia with postanal process about 3/4 as long as surstylus (Metz & Thompson 2001: Fig. 28 a)..... *T. norma* (Curran)
 - Scutellum brownish to black with yellow margin; abdomen not as above; male genitalia with postanal process at least half as long as surstylus 6
6. Dorsomedial anepimeron yellow; abdomen with 3rd and 4th terga brown to black with many yellow spots (Fig. 31); surstylus dorsally with long hairs on apical 2/3 (Fig. 59)..... *T. mosaicus* sp. nov.
 - Dorsomedial anepimeron brownish to black; abdomen not as above; surstylus dorsally with short hairs 7
7. Abdomen with yellow maculae on 3rd and 4th terga narrow (Metz & Thompson 2001: Fig. 9); male genitalia with postanal process about 1/3 as long as surstylus (Metz & Thompson 2001: Fig. 29 a) *T. procrastinatus* Metz
 - Abdomen not as above; male genitalia with postanal process not distinct, about as wide as long 8
8. Abdomen with 3rd and 4th terga with apical black transverse area, neither curved anteriorly nor extending to base laterally (Metz & Thompson 2001: Fig. 4) *T. aquilinus* Sack
 - Abdomen with 3rd and 4th terga with apical black area curved anteriorly and extending almost or to base laterally ..9
9. Alula almost entirely bare *T. teliger* (Fluke)
 - Alula entirely microtrichose 10
10. Abdomen with yellow maculae on 3rd and 4th terga isolated from lateral margins (Metz & Thompson 2001: Fig. 2); male genitalia with surstylus almost as long as epandrium; phallic complex with superior lobe with long and thick setae (Metz & Thompson 2001: Fig. 32 a–c) *T. tibicen* (Wiedemann)
 - Abdomen with yellow maculae on 3rd and 4th terga broadly extending to lateral margin (Fig. 29); male genitalia with surstylus almost twice as long as epandrium; phallic complex with superior lobe with short and thin setae (Metz & Thompson 2001: Fig. 27 a–c) *T. intermedius* (Hull)
11. Scutum all dark [usually only postpronotum yellow] or with lateral yellow vitta interrupted, either between postpronotum and transverse suture (Fig. 6, 7)..... 12
 - Scutum with lateral yellow vitta continuous and extending from postpronotum to scutellum (Fig. 8) 15
12. Katepisternal yellow macula absent or greatly reduced (Fig. 7); wing completely microtrichose (Fig. 13); female abdomen much broader than head (Fig. 28) *T. flaviplurus* (Hall)
 - Katepisternal yellow macula well developed (Fig. 6); wing partially bare basally (Fig. 16); female abdomen not as above 13
13. Abdomen usually with two medial yellow macula on 2nd tergum; male abdomen with 5th tergum almost yellow or orange (Thompson 1981: Figs. 91 a–c) (Fig. 25); female abdomen with yellow triangular latero medial or oval medial macula (Fig. 26); male genitalia with postanal process about 2/3 as long as surstylus (Thompson 1981: Figs. 116) *T. dispar* (Fabricius)
 - Abdomen without two medial yellow macula on 2nd tergum; male abdomen with 5th tergum entirely black or almost black; female abdomen black or with yellow triangular lateral macula but never extending more than 1/4 abdomen; male genitalia with postanal process about 1/3 as long as surstylus or less 14
14. Head with face about 1/3 as long as compound eye (Fig. 1); scutellum black; abdomen all black (Fig. 30); male genitalia with long and slender aedeagus (Fig. 58) *T. laenas* (Walker)
 - Head with face about 1/2 as long as compound eye (Fig. 2); scutellum black with yellow or brownish margin; abdomen black with lateral yellow macula on 3rd, 4th and 5th terga (Fig. 22, 23); male genitalia with aedeagus not as above (Fig. 43) *T. basalis* (Walker)
15. Head with face about 1/3 as long as compound eye (Fig. 1) 16
 - Head with face about 1/2 as long as compound eye or more (Fig. 2) 26
16. Supracoxal yellow macula present 17

- Supracoxal yellow macula absent	19
17. Anterior anepimeron yellow; abdomen with 3 rd and 4 th terga yellow on basal 2/3, with narrow black subbasal fascia connected to medial vitta to form L-shaped macula not touching the lateral margin (Metz & Thompson 2001: Fig. 6); female genitalia with two spermatecae	<i>T. politus</i> (Say)
- Anterior anepimeron black to brownish; abdomen not as above; female genitalia with three spermatecae	18
18. Body length longer than 8 mm; dorsomedial anepimeron yellow; abdomen with 3 rd and 4 th terga brown to black with yellow spots distributed as in Fig. 31; surstylus dorsally with long hairs on apical 2/3 (Fig. 59)	<i>T. mosaicus</i> sp. nov.
- Body length never reaching 8 mm long, usually 6–7 mm; dorsomedial anepimeron brown to brownish; abdomen variable, but never as above (Thompson 1981: Fig. 92); surstylus dorsally with short hairs (Thompson 1981: Figs. 117)	<i>T. floralis</i> (Fabricius)
19. Alula bare.....	20
- Alula entirely microtrichose	21
20. Abdomen with yellow lateral macula contiguous with medial macula on 3 rd and 4 th terga or yellow lateral macula absent on 4 th and 5 th terga (Fig. 37); male genitalia with surstylus dorsolaterally concave; postanal process about 3/4 as long as surstylus (Harbach 1984: Fig. 10).....	<i>T. purus</i> (Curran)
- Abdomen with yellow lateral macula separated from medial macula on 3 rd and 4 th terga and lateral yellow macula always present on 4 th and 5 th terga (Hull 1943: Fig. 14); male genitalia with surstylus dorsolaterally straight; postanal process at least 2/4 as long as surstylus (Harbach 1984: Fig. 7)	<i>T. croesus</i> (Hull)
21. Male head with frontal triangle brown to black; wing with alula at least as wide as cell BM; abdomen with triangular basolateral yellow macula (Harbach 1974: Fig. 2).....	<i>T. apegiensis</i> (Harbach)
- Male head with frontal triangle yellow; wing with alula wider than cell BM; abdomen not as above	22
22. Abdomen with black to brown bean-shaped macula in yellow areas on 3 rd and 4 th terga; those macula oblique and isolated from surrounding black areas (Thompson 1981: Fig. 74); male genitalia with surstylus laterally very enlarged at apical half (Thompson 1981: Fig. 127 a)	<i>T. pulchellus</i> (Macquart)
- Abdomen not as above; male genitalia with surstylus not enlarged on apical half	23
23. Abdomen with square laterobasal macula on 3 rd and 4 th terga and broad submedial yellow macula apically rounded reaching at least 2/3 from apical margin (Thompson 1981: Fig. 78); male genitalia with postanal process rectangle-shaped (Thompson 1981: Fig. 121 c)	<i>T. pictus</i> (Macquart)
- Abdomen not as above; male genitalia with postanal process not rectangle-shaped	24
24. Wing extensively bare, costal cell never with microtrichia (Fig. 14); male genitalia with postanal process very short (Fig. 53); female genitalia with two spermatecae.....	<i>T. lacrymosus</i> (Bigot)
- Wing all microtrichose or extensively microtrichose, costal cell always with microtrichia at least on apical half (Fig. 17); male genitalia with postanal process prominent; female genitalia with three spermatecae	25
25. Abdomen with submedial yellow macula interrupted (Fig. 36); male genitalia with surstylus sinuous dorsoapically (Fig. 68); aedeagus as in Fig. 70	<i>T. polygraphicus</i> (Hull)
- Abdomen with submedial yellow macula joined with lateral yellow macula medio apically (Fig. 32); male genitalia with surstylus not sinuous dorsoapically (Thompson 1981: Fig. 122 a, c); aedeagus not as in Fig. 70.....	<i>T. musicus</i> (Fabricius)
26. Anterior and dorsomedial anepimeron brown to black (Fig. 4)	27
- Anterior anepimeron brownish to yellow and dorsomedial anepimeron yellow (Figs. 9, 10)	29
27. Metafemur almost all black (Fig. 19); abdomen black with lateral yellow macula on 3 rd , 4 th and 5 th terga (Fig. 22, 23)	<i>T. basalis</i> (Walker)
- Metafemur with apical black annulus (Fig. 20); abdomen not as above	28
28. Profemur yellow with dorsoapical brown macula; abdomen without yellow medial vitta (Fig. 40); male genitalia with postanal process at least 1/3 as long as surstylus (Fig. 74)	<i>T. virgulatus</i> (Macquart)
- Profemur yellow without dorsal brown macula; abdomen with yellow medial vitta (Harbach 1984: Fig. 3); male genitalia with postanal process about 2/3 as long as surstylus (Harbach 1984: Fig. 4).....	<i>T. sedmani</i> Harbach
29. Abdomen with 3 rd and 4 th terga entirely yellow on basal 2/3 or more which sometimes contain small gemini medial brown to black spots (Fig. 34, 35)	30
- Abdomen with 3 rd and 4 th terga not as above	38
30. Head with face about 2/3 as long as compound eye (Fig. 3); male genitalia: surstylus with pointed apex; postanal process 3/4 as long as surstylus; aedeagus enlarged, prominent dorsally and ventrally; superior lobe somewhat quadrangular with short dorsal extension, forked distad, with scattered hairs, longer along anteroventral margin, with small lobe medio-posteriorly with hairs (Figs. 50–52).....	<i>T. idalius</i> (Hull)
- Head with face about 1/2 as long as compound eye (Fig. 2); male genitalia with a different combination of characters as described above.....	31
31. Male head with frontal triangle brown to black; abdomen much broader than the head (Fig. 38); female 9 th tergum	

- with a dorsal prominence; male genitalia: surstylus with pointed apex; postanal process 1/2 as long as surstylus; aedeagus enlarged, slightly prominent dorsally; superior lobe somewhat rounded with very short dorsal extension, with hairs along anterior margin and medially (Figs. 71–73)..... *T. steatogaster* (Hull)
- Male head with frontal triangle yellow; abdomen not as above; female 9th tergum without a dorsal prominence or with a strong dorsal spur; male genitalia with a different combination of characteres as described above 32
 - 32. Body length with less than 6 mm 33
 - Body length with more than 6 mm 34
 - 33. Female 9th tergum with a strong dorsal spur (Thompson 1981: Fig. 112); male surstylus with posterior edge notched in dorsal view, with posteromedial corner extending beyond posterolateral corner (Thompson 1981: Fig. 105 a, b) ..
..... *T. difficilis* (Curran)
 - Female 9th tergum simple, without a spur; male posterior edge straight, with posterolateral corner extending beyond posteromedial one (Thompson 1981: Fig. 106 a, b) *T. watsoni* (Curran)
 - 34. Body length usually with 9 mm long or longer; male genitalia with superior lobe somewhat quadrangular with setae longer along ventral margin (Metz & Thompson 2001: Fig. 28 c)..... *T. norma* (Curran)
 - Body length usually with 8 or 7 mm long; male genitalia not as above..... 35
 - 35. Supracoxal yellow macula present; metafemur yellow with apical black annulus (Fig. 20); female genitalia with oval spermatecae..... 36
 - Supracoxal yellow macula usually absent; metafemur usually all yellow without apical black annulus (Fig. 21); female genitalia with rounded spermatecae..... 37
 - 36. Wing extensively bare, costal, R and BM cells usually without microtrichia (Fig. 16); male genitalia with postanal process about 1/3 as long as surstylus (Fig. 62); female genitalia as Figs. 122–124 *T. papaveri* **sp. nov.**
 - Wing not bare as above, costal, R and BM cells partially with microtrichia (Fig. 18); male genitalia with postanal process about 3/4 as long as surstylus (Gerdes 1975: Fig. 6); female genitalia as Figs. 140–142
..... *T. productus* (Curran)
 - 37. Mesonotum with postallar callus usually black pilose; wing all microtrichose; alula at least as wide as cell BM (Fig. 17); male genitalia with surstylus curved (Fig. 65); female genitalia as Figs. 125–127 *T. paraduplicatus* **sp. nov.**
 - Mesonotum with postallar callus usually yellow pilose; wing extensively microtrichose, but not in all extension; alula wider than cell BM (Fig. 12); male genitalia with surstylus straight (Thompson & Thompson 2006: Fig. 12 a); female genitalia as Figs. 92–94..... *T. duplicatus* (Wiedemann)
 - 38. Abdomen with yellow areas laterally on basal 1/3; tergites 3rd and 4th with a median long yellow spot on basal half (Fig. 27); male genitalia with postanal process about 1/2 as long as surstylus (Fig. 44)..... *T. elisa* (Hull)
 - Abdomen with yellow areas larger than described above (Fig. 39); male genitalia with postanal process about 3/4 as long as surstylus (Harbach 1984: Fig. 13) *T. sylvaticus* (Hull)

***Toxomerus apegiensis* (Harbach) n. comb.**

(Figs. 77–79)

Mesograpta apegiensis Harbach, 1974: 31 (descr.).

Diagnosis. Face 1/3 as long as eye width, yellow with brownish to black vitta; frontal triangle black. Proepimeron black; scutum black except broadly yellow laterally; scutellum black with yellow margins, yellow pilose with black piles on posterior margin; anepimeron black. Pro and mesofemora yellow, metafemur yellow with black annulus; pro and meso tibiae yellow, metatibia black to brownish on basal 2/3 and yellow on apical 1/3. Wing extensively microtrichose; alula broader than cell BM apically, microtrichose. Abdomen with triangular basolateral yellow macula on 3rd to 4th terga. Surstylus broader and somewhat triangular apically in dorsal view; postanal process almost 2/3 as long as surstylus; aedeagus enlarged, prominent dorsally; superior lobe somewhat rectangular with erect setae along anteroventral margin, with small lobe posteriorly with hairs.

Female genitalia: 9th tergum with no distinct black macula; epiproct round, cercus slender; hypoproct somewhat oval; 9th sternum as in Fig. 78; three oval spermatecae similar in size (Figs. 77–79).

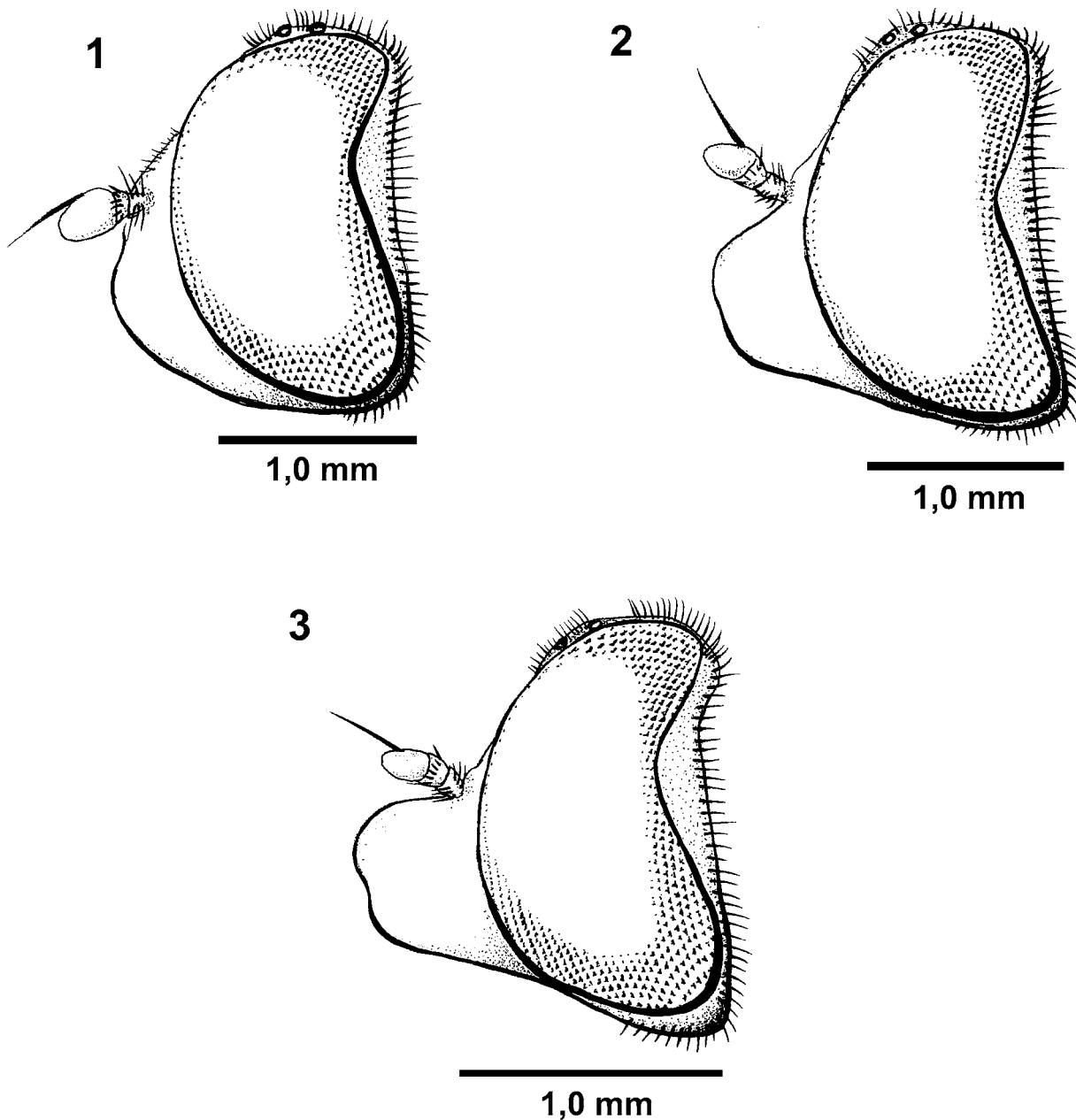
Length. Body 6.0–8.0 mm, wing 6.0–7.0 mm.

Type material examined. Holotype. BRAZIL. Pará: Belém, *Mesograpta apegiensis*, holotype male, 26/IV/1967, Y. Sedman (CNC). Allotype. BRAZIL. Pará: Belém, ♀, 26/IV/1967, Y. Sedman (CNC). Paratypes.

BRAZIL. Pará: Belém, 2f, 26/IV/1967, 28/IV/1967 & 2m, 05/V/1967, 01/VI/1967, Y. Sedman (USNM).

Other material examined. BRAZIL. Rondônia: Vilhena, 3 ♀, X/1986, O. Roppa, P. Magno & J. Becker (MNRJ). Mato Grosso: Sinop, ♂ & 3 ♀, III/1976, Alvarenga & Roppa (MNRJ).

Geographical record. Northern Brazil (Amazon rainforest).



FIGURES 1–3. Head, lateral view. 1, *Toxomerus mosaicus*. 2, *T. sylvaticus*. 3, *T. idalius*.

Toxomerus aquilinus Sack

(Figs. 80–82)

Mesogramma anchoratus Schiner, 1868: 348 (descr.); Osten Sacken, 1878: 125 (citation); Williston, 1886: 313 (cat.); Kertész, 1910: 149 (cat.); Curran, 1930: 3 (key); Hull, 1943b: 9, 35 (key and illustration); Fluke, 1956: 217 (cat.).

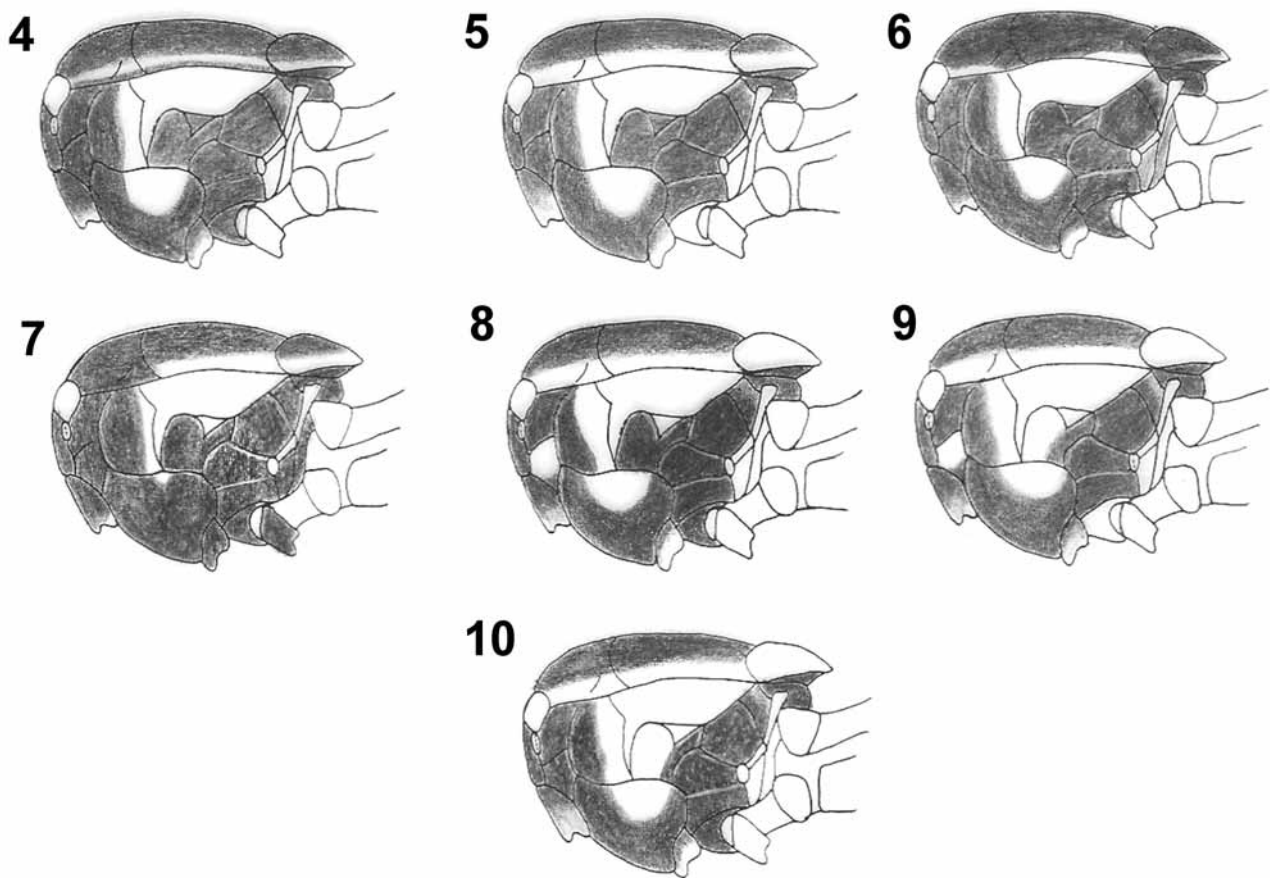
Mitrosphen interruptus Enderlein, 1938: 227 (descr.); Metz & Thompson, 2001: 231 (synonym).

Toxomerus aquilinus Sack, 1941: 100 (1951: 96) (descr.); Fluke, 1956: 157 (cat.); Thompson *et al.*, 1976: 48 (cat.); Metz & Thompson, 2001: 228, 231 (key and redescr.).

Diagnosis. Face 1/3 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum brown with yellow margins, black pilose; anepimeron black. Femora and tibiae yellow, except metatibia brownish. Wing extensively bare; alula broader than cell BM apically, microtrichose. Abdomen with 3rd and 4th terga with apical black transverse area, neither curved anteriorly nor extending to base laterally. Surstylus concave apically in lateral view; postanal process not distinct; aedeagus enlarged, prominent dorsally; superior lobe somewhat rounded with short dorsal extension, forked distad, with scattered hairs, longer along anteroventral margin, with small lobe posteriorly with hairs.

Female genitalia: 9th tergum with somewhat quadrangular black macula pointed anteriorly; epiproct slender; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 81; three rounded spermatecae similar in size (Figs. 80–82).

Length. Body 9.6–11.5 mm, wing 7.2–8.6 mm.

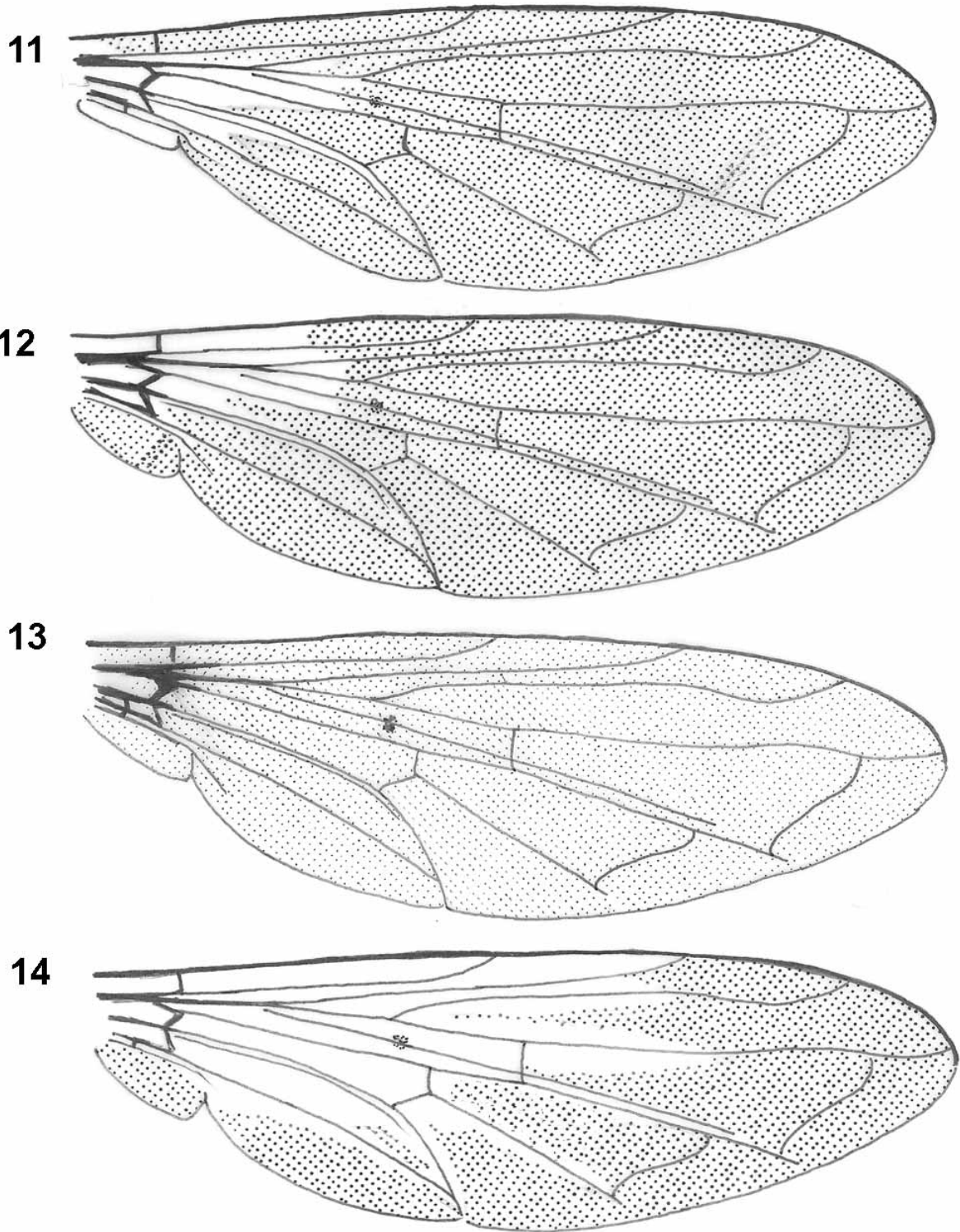


FIGURES 4–10. Thorax, lateral view. 4, *Toxomerus basalis*. 5, *T. croesus*. 6, *T. dispar*. 7, *T. flaviplurus*. 8, *T. mosaicus*. 9, *T. papaveroi*. 10, *T. paraduplicatus*.

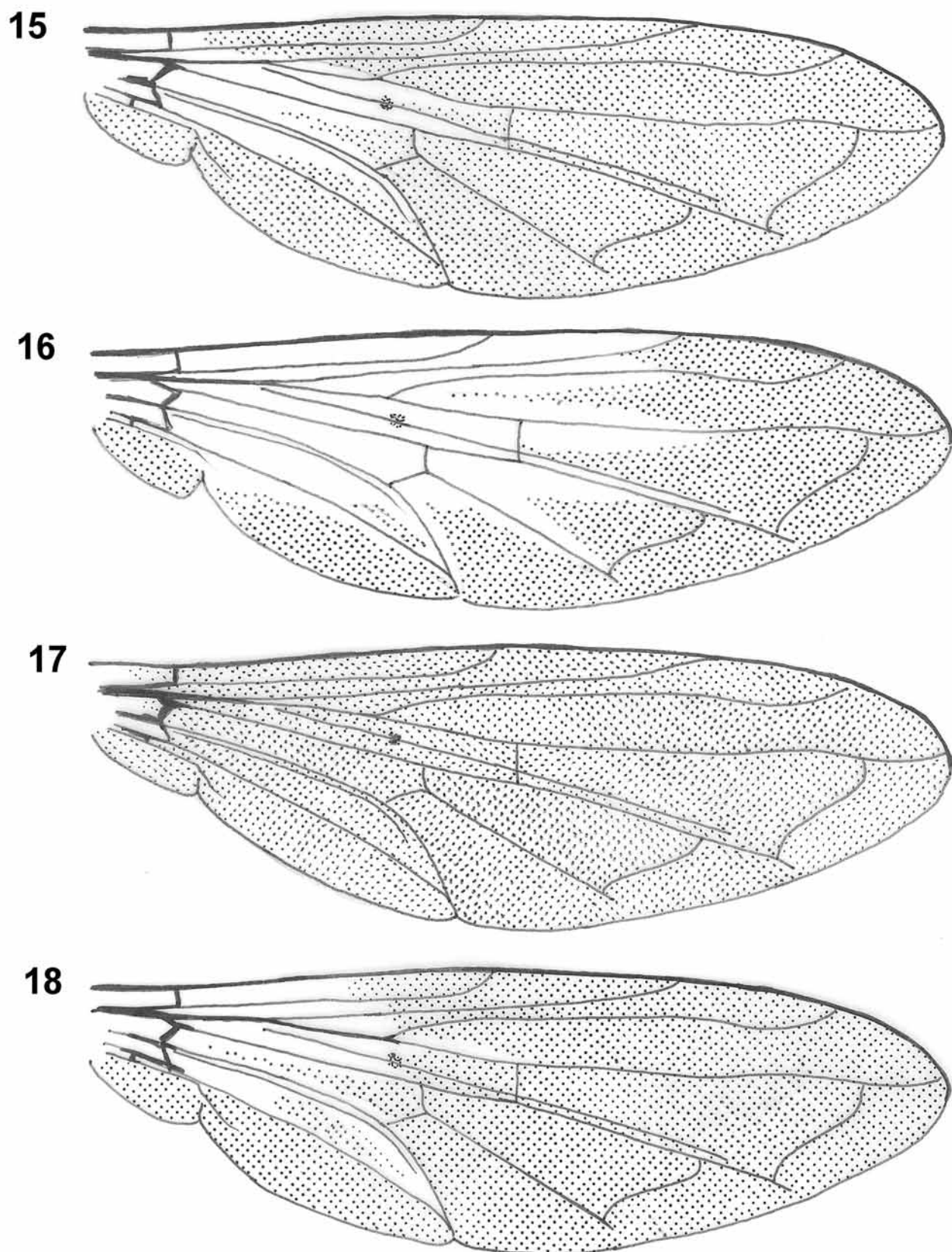
Material examined. VENEZUELA. **Puerto Ayacucho:** ♂ & ♀, 19/I/1989, P. J. Spangler, R. A. Faitoute & C. B. Barr (USNM). PERU. **Cuzco:** ♀, 3–6/XII/1979, J. B. Heppner (USNM). BRAZIL. **Amazonas:** Puruzinho, ♂, 14–17/XI – 3–6/XII/1975, Exp. Perm. Amaz. (USNM). **Rondônia:** Vila Velha, 2 ♂ & ♀, IX/1973, Alvarenga & Roppa (MNRJ); ♂ & 4 ♀, X/1986, P. Magno & J. Becker (MNRJ); Calama, 10 ♂ & 5 ♀, 19–21/XI/1975, Exp. Perm. Amaz. (USNM). **Goiás:** Corumbá, 4 ♂ & 15 ♀, XI/1946, M. P. Barreto (MZSP). **Mato Grosso:** Maracajú, 2 ♀, II/1937 (USNM); 3 ♀, VI/1937 (MZSP); S. Domingos, ♀, XI/1949, Werner (MZSP); Sinop, 20 ♂ & 22 ♀, III/1976, Alvarenga & Roppa (MNRJ); Vera, 13 ♂ & 7 ♀, X/1973, Alvarenga

& Roppa (MNRJ). **Minas Gerais:** Caldas, 5 ♂ & 2 ♀, 8/I/1967, O. Roppa & O. Leoncini (MNRJ); Belo Horizonte, ♀, 15/XII/1972, Grisi (MNRJ); Arceburgo, ♀, XII/1946, Barretto (MZSP). **São Paulo:** Barueri, ♀, 8/XI/1954, K. Lenko (MZSP); Santo Amaro, 2 ♂, II/1950, J. Lane (MNRJ). **Paraná:** Porto Cabral, ♂, 20–31/III/1944, Trav. Fo, Carrera & E. Dente (USNM).

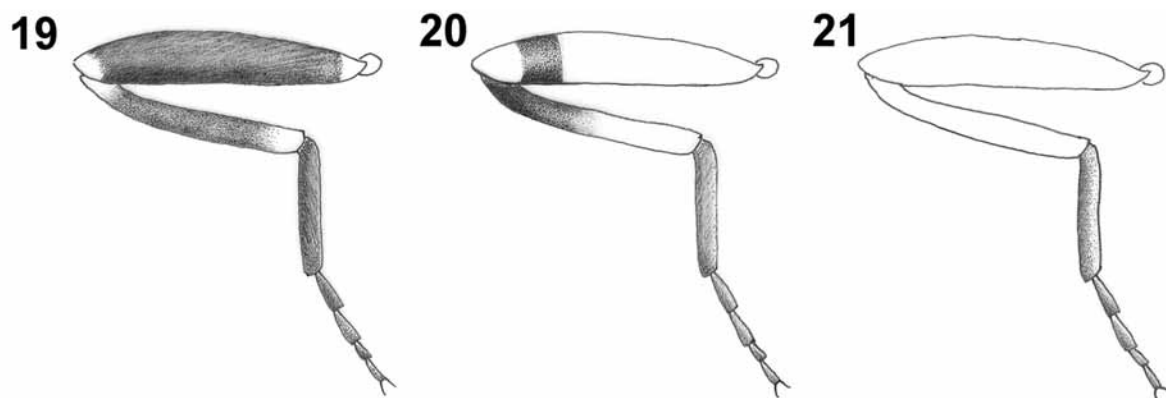
Geographical record. Widespread, from Mexico to southern Brazil.



FIGURES 11–14. Right wing, dorsal view. 11, *Toxomerus croesus*. 12, *T. duplicatus*. 13, *T. flaviplurus*. 14, *T. lacrymosus*.



FIGURES 15–18. Right wing, dorsal view. 15, *Toxomerus mosaicus*. 16, *T. papaveri*. 17, *T. paraduplicatus*. 18, *T. productus*.



FIGURES 19–21. Posterior leg, lateral view. 19, *Toxomerus basalis*. 20, *T. papaveroi*. 21, *T. paraduplicatus*.

***Toxomerus basalis* (Walker) n. comb.**

(Figs. 4, 19, 22, 23, 41, 42, 43, 83, 84, 85)

Syrphus basalis Walker, 1837: 345 (descr.); Kertész, 1910: 107 (cat.); Fluke, 1957: 155 (cat.); Thompson *et al.*, 1976: 39 (cat.).

Syrphus portius Walker, 1852: 239 (descr.); Kertész, 1910: 124 (cat.).

Syrphus basilaris Williston, 1886: 328 (cat.) [misspelling].

Mesogramma portia Hull, 1943b: 12, 17 (key & illus.).

Mesogramma rhea Hull, 1949c: 228 (descr.).

Mesogramma harlequina Hull, 1951b: 69 (descr.).

Mesograpta portius Fluke, 1956: 228 (cat.).

Mesograpta harlequina Fluke, 1956: 223 (cat.).

Mesograpta rhea Fluke, 1956: 229 (cat.).

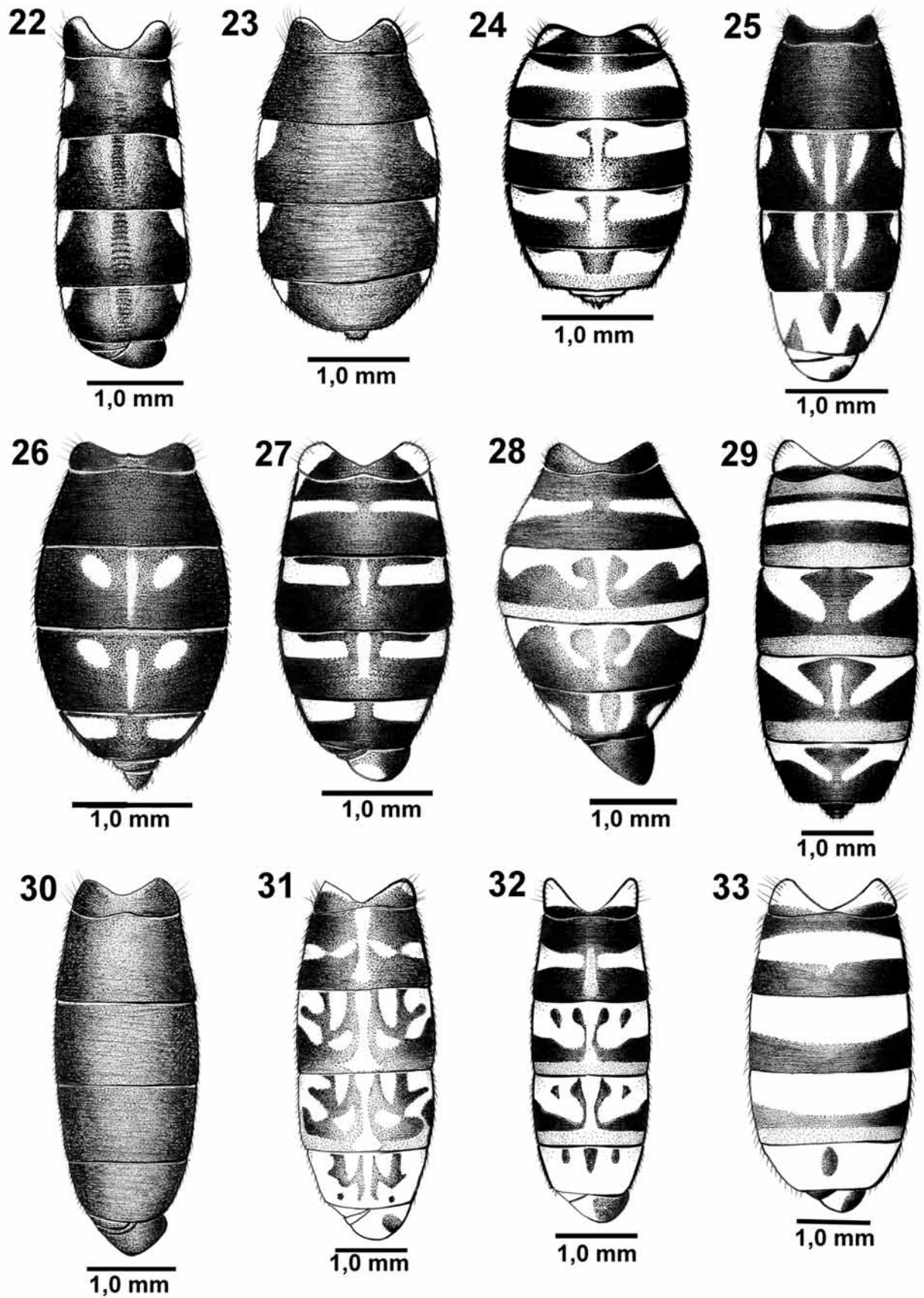
Toxomerus portius Thompson *et al.*, 1976: 54 (cat. & n. comb.); Thompson, 1981: 100 (note), **syn. nov.**

Toxomerus rhea Thompson *et al.*, 1976: 54 (cat. & n. comb.), **syn. nov.**

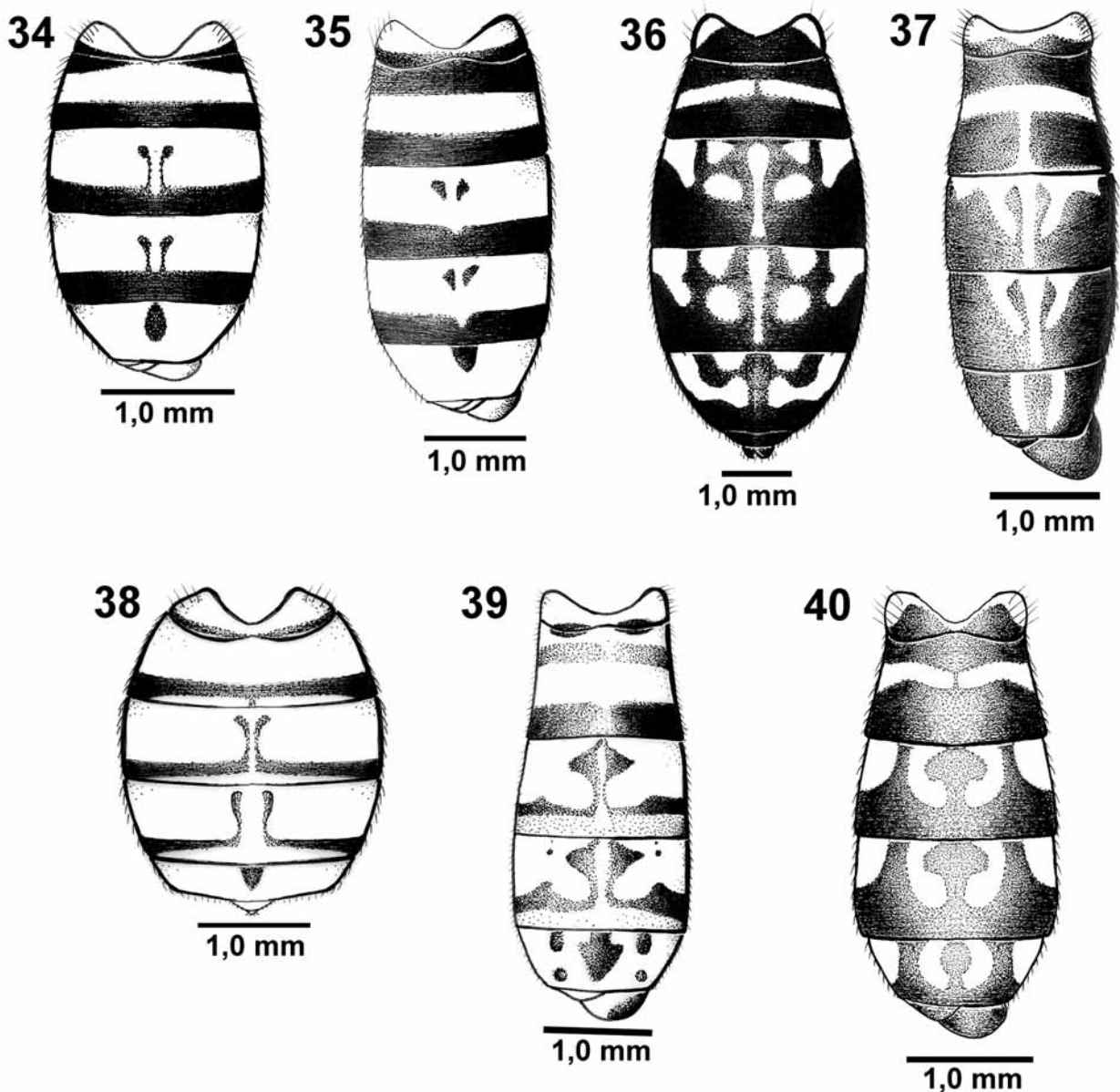
Toxomerus harlequinus Thompson *et al.*, 1976: 50 (cat. & n. comb.), **syn. nov.**

Male. Head: face 1/2 as long as eye width, yellow to brownish, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, black pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow to brownish; proepisternum black, white to bronze pollinose; proepimeron brown; scutum black except broadly yellow to brownish laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum black with yellow to brownish margins, yellow pilose with black piles on posterior margin or black pilose; anterior anepisternum black, short and sparsely yellow pilose; posterior anepisternum black on anterior half, yellow pilose dorsally, and yellow on posterior 1/2, yellow pilose; katepisternum black except on dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow to brownish; metasternum brown; halter yellow (Fig. 4). Legs: pro- and mesocoxae black on basal 2/3, yellow to brownish apically, yellow pilose; metacoxa yellow to brownish, yellow pilose; trochanters yellow, yellow pilose; femora black, yellow on basal and apical extremity, yellow and black pilose; pro- and mesotibiae all yellow or with black annulus on medial 1/3, yellow and black pilose; metatibia black, yellow on basal and apical extremities, black pilose; protarsus brown, yellow ventrally, brown pilose; meso- and metatarsi black, black pilose (Fig. 19). Wing: hyaline to brownish, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.



FIGURES 22–33. Abdomen, dorsal view. 22, *Toxomerus basalis*. 23, *T. basalis*. 24, *T. difficilis*. 25, *T. dispar*. 26, *T. dispar*. 27, *T. elisa*. 28, *T. flaviplurus*. 29, *T. intermedius*. 30, *T. laenas*. 31, *T. mosaicus*. 32, *T. musicus*. 33, *T. norma*.



FIGURES 34–40. Abdomen, dorsal view. 34, *Toxomerus papaveri*. 35, *T. paraduplicatus*. 36, *T.s polygraphicus*. 37, *T. purus*. 38, *T. steatogaster*. 39, *T. sylvaticus*. 40, *T. virgulatus*.

Abdomen: terga yellow and black pilose; 1st tergum black except narrowly yellow anteriorly; 2nd tergum all black or yellow only lateral 1/3; 3rd to 5th terga black with yellow macula latero-anteriorly (Figs. 22, 23). Male genitalia: surstylus with pointed apex, with scattered short setae; postanal process not so distinct; aedeagus all enlarged; superior lobe somewhat rectangular, forked dorsally, with erect setae in distad ventral margin and scattered hairs (Figs. 41–43).

Female. Similar to male except for the frons black, bronze pollinose, black pilose. Anterior anepisternum bare. Female genitalia: 9th tergum with extend transversal black macula medially; epiproct somewhat elliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 84; three elliptical spermatacae, one of them smaller (Figs. 83–85)

Length. Body 5.5–6.0 mm, wing 5.5–6.0 mm.

Discussion. The male holotype of *T. portius*, the female holotype of *Mesogramma harlequina* and three male and one female cotypes of *Mesogramma rhea* were examined dissected and compared with the holotype of *Syrphus basalis*.

Type material examined. Holotype. BRAZIL. *Syrphus basalis*, male (BMNH).

Other material examined. BRAZIL. **Rio de Janeiro:** ♂, III/1952, A. G. da Silvas (MNRJ). **São Paulo:** Bocaina, ♀, V/1951, D. Albuquerque (MNRJ); ♂, III/1954, Dalcy and R. Barros (MNRJ); XI/1970, M. Alvarenga (MNRJ). **Santa Catarina:** Nova Teutônia, 4 ♂, 2 ♀, VI/1964, F.X/1964, VII/1965, V/1970, XI/1971, F. Plaumann (USNM); 5 ♂ & 2 ♀, IX/1964, F.X/1964, F.F.F. XI/1969, F. Plaumann (CNC).

Geographical record. Southeastern Brazil.

***Toxomerus croesus* (Hull)**

(Figs. 5, 11, 86, 87, 88)

Mesogramma croesus Hull, 1940a: 248 (descr.).

Mesograpta croesus Fluke, 1956: 221 (cat.).

Toxomerus croesus Thompson *et al.*, 1976: 49 (cat. & n.comb.).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena brown; frontal triangle yellow, white pilose; vertical triangle black, white pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, bronze pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow and black pilose; scutellum brown with yellow margins, yellow and black pilose; anterior anepisternum black, short and sparsely yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow; metasternum yellow; halter yellow (Fig. 5). Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 1/3; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia black, yellow on basal and apical extremities or black on basal 2/3 and yellow on apical 1/3, yellow and black pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus brown to black, yellow and black pilose. Wing: brownish, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula as broad as cell C, not microtrichose (Fig. 11).

Abdomen: terga yellow and black pilose; 1st tergum yellow except narrowly black posteriorly; 2nd tergum black with medial yellow fascia and brownish-orange fascia anteriorly and posteriorly; 3rd to 4th terga black with sub-lateral arcuate yellow vitta, medial yellow vitta extended posteriorly and latero-anteriorly yellow macula; 5th tergum yellow with three black macula. Male genitalia: surstylus little convex apically in lateral view, with scattered short setae; postanal process 1/2 as long as surstylus; aedeagus enlarged, slightly prominent dorsally; superior lobe somewhat trapezoid with short dorsal extension, forked distad, with scattered hairs, longer along anteroventral margin, with small lobe posteriorly with hairs.

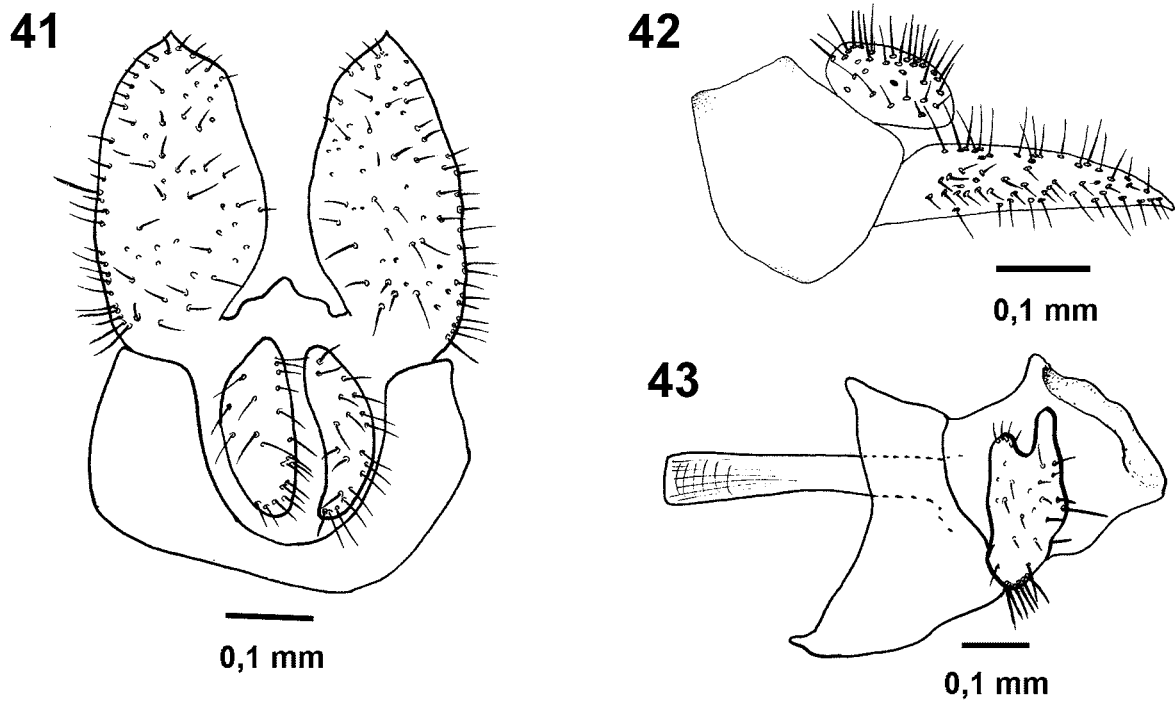
Female. Similar to male except for the frons black, white pollinose, black pilose. Anterior anepisternum bare. Female genitalia: 9th tergum with somewhat rectangular black macula concave anteriorly and convex posteriorly; epiproct as kidney form; cercus broad somewhat triangular; hypoproct as a triangular arch; 9th sternum as in Fig. 87; three biconvex spermatecae similar in size (Figs. 85–88).

Length. Body 9.0 mm, wing 8.0 mm.

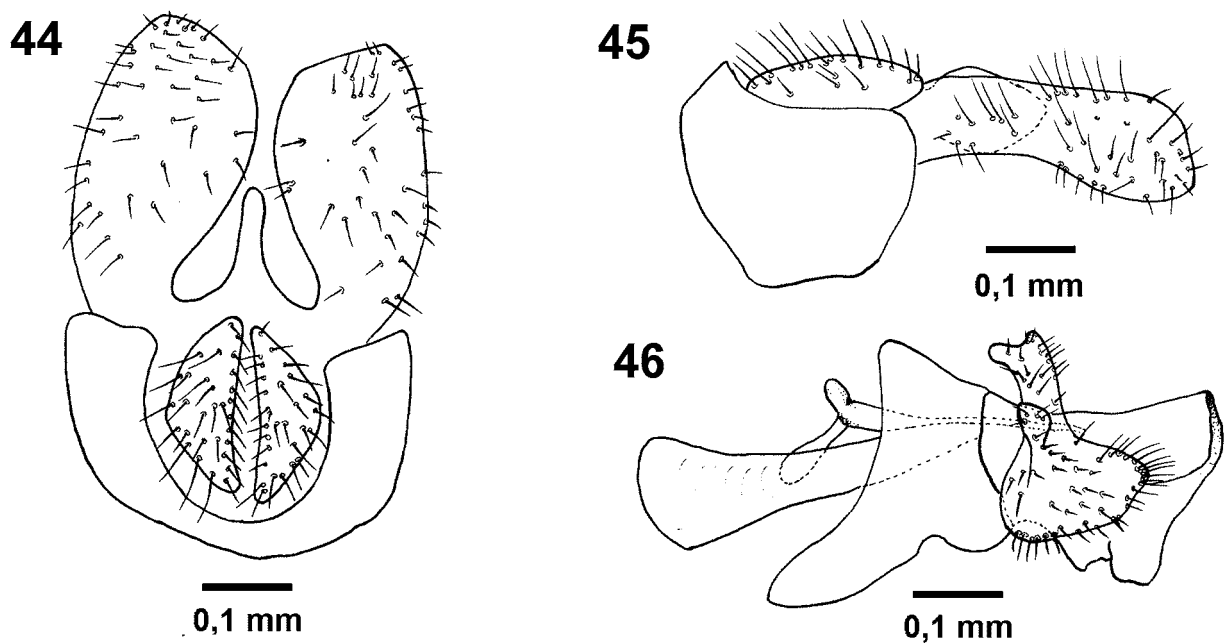
Type material examined. Holotype. BRAZIL. **São Paulo:** Osasco, *Mesogramma croesus*, male, 1–8/IV/1939, J. Lane (CNC).

Other material examined. BRAZIL. **Minas Gerais:** Varginha, 5 ♂ & 9 ♀, II/1972, M. Alvarenga (MNRJ). **Rio de Janeiro:** Jacarepaguá, ♂, XII/1969, M. Alvarenga (MNRJ); ♀, III/1970, M. Alvarenga (MNRJ); Alto da Boa Vista, ♀, 13/I/1951, Dalcy & S. Lopes (MNRJ). **São Paulo:** Tamoio, ♂, 3/II/1944, Barreto (CNC); **Santa Catarina:** Nova Teutônia, 2♀, IX/1964, XII/1964, F. Plaumann (USNM); ♂, XI/1964, F. Plaumann (CNC).

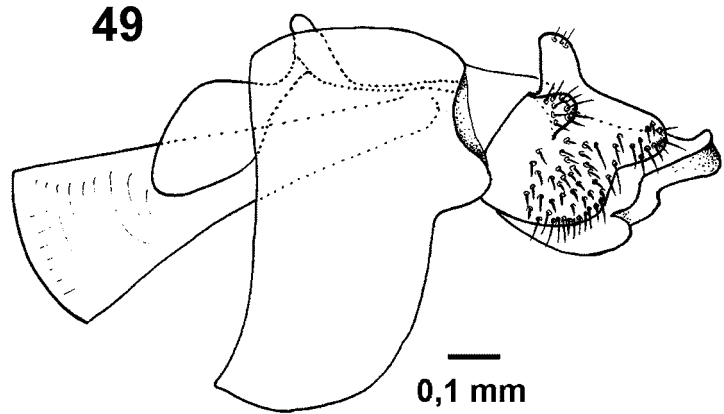
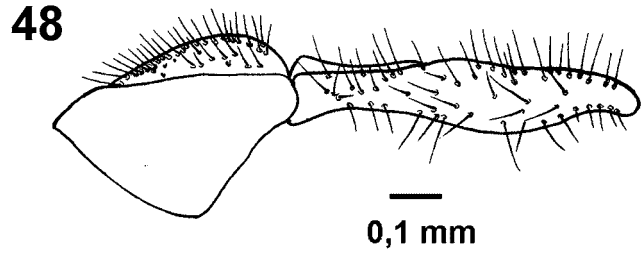
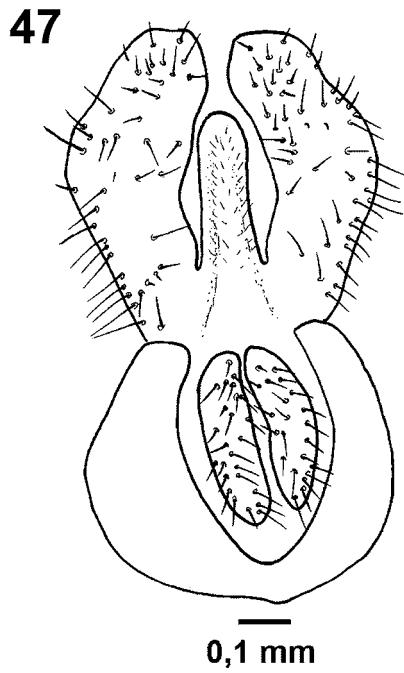
Geographical record. Southeastern to southern Brazil.



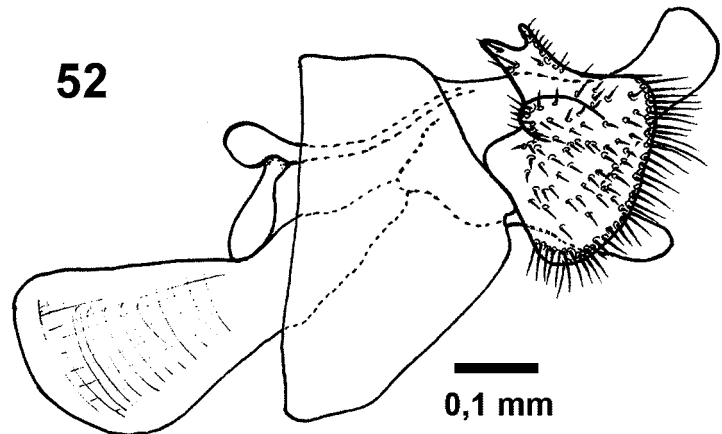
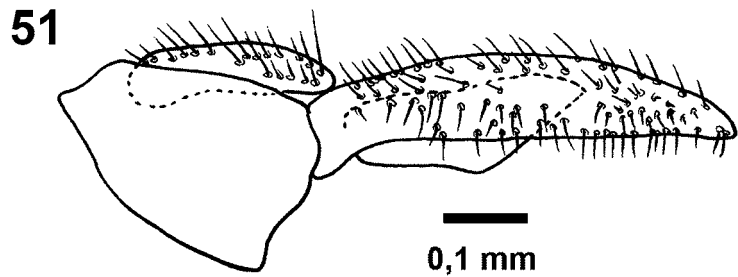
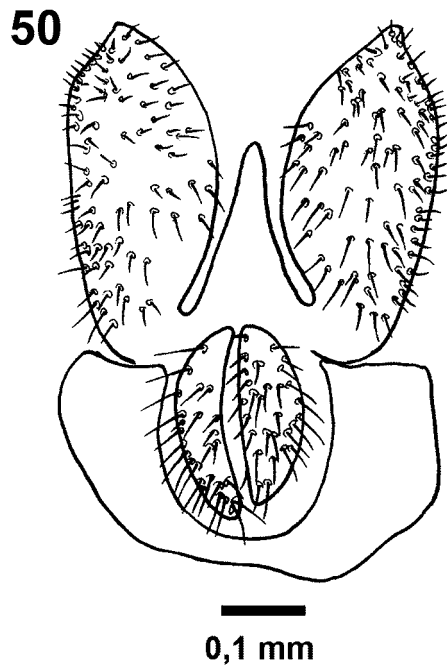
FIGURES 41–43. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus basalis*.



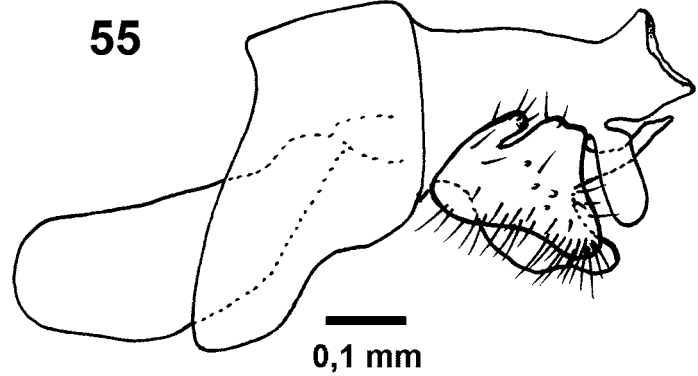
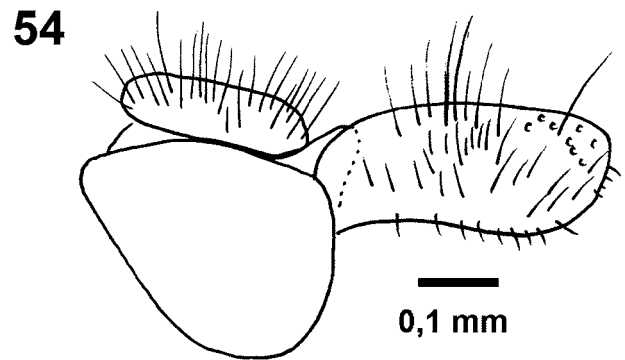
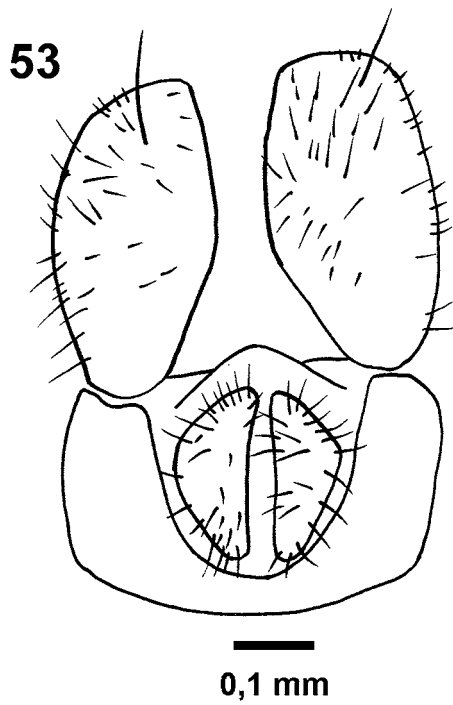
FIGURES 44–46. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus elisa*.



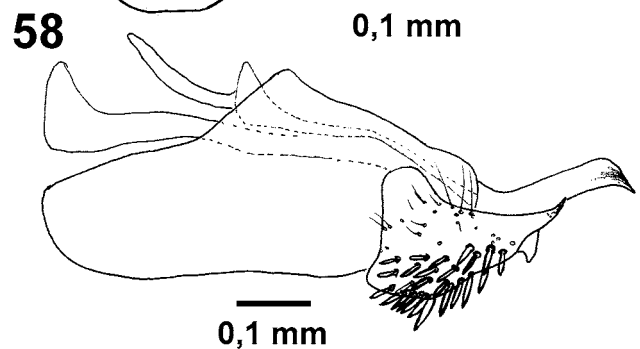
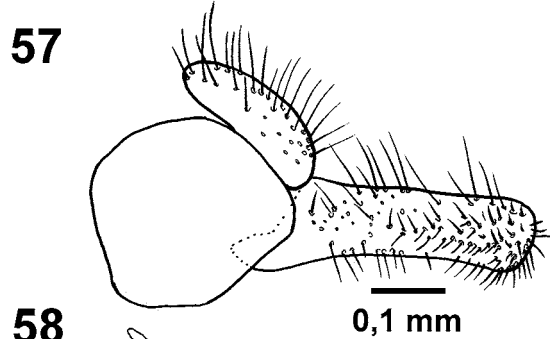
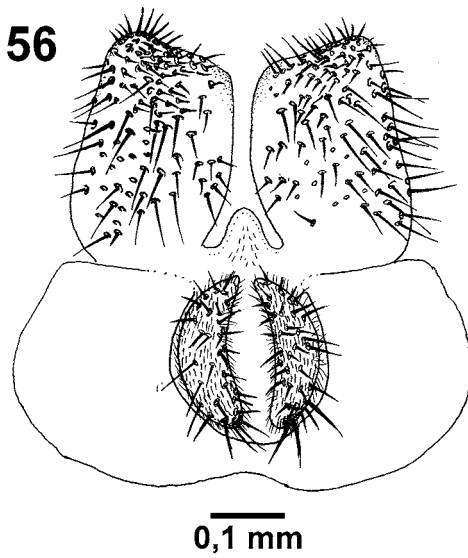
FIGURES 47–49. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus flaviplurus*.



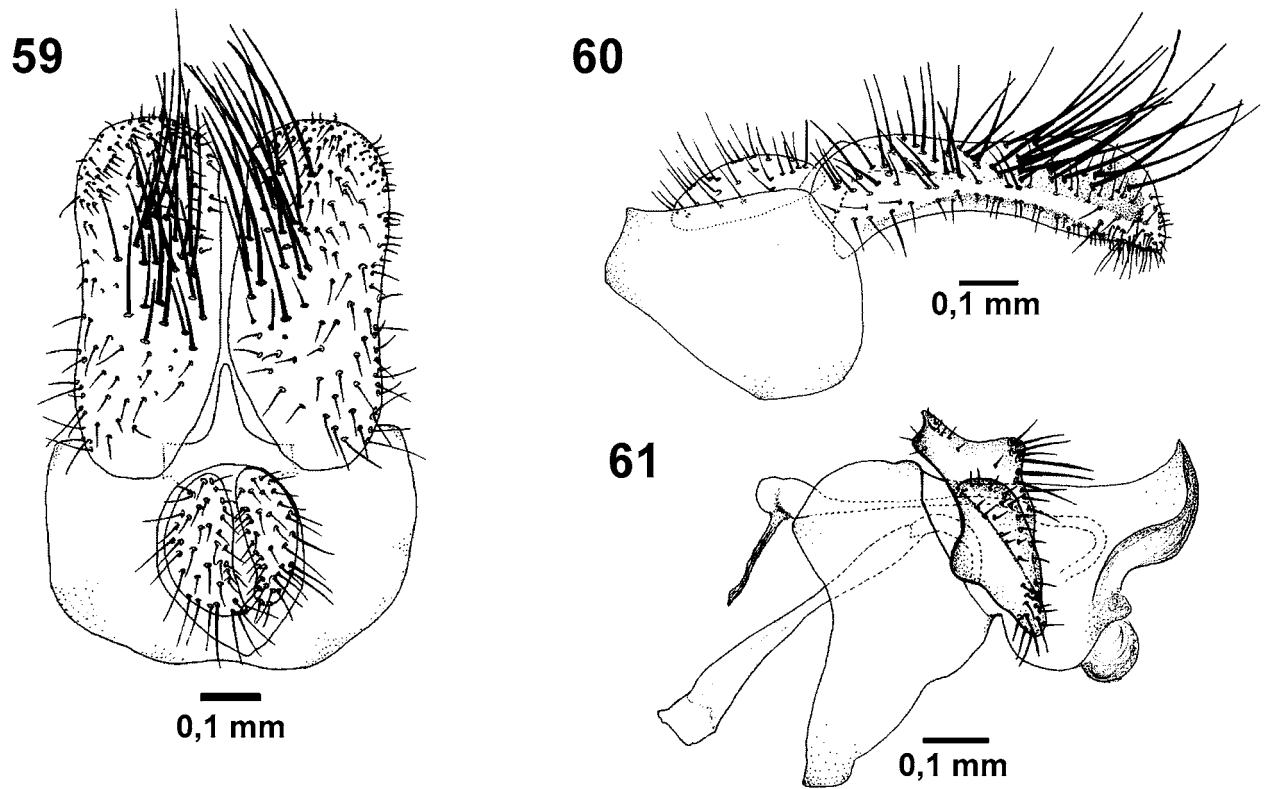
FIGURES 50–52. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus idalius*.



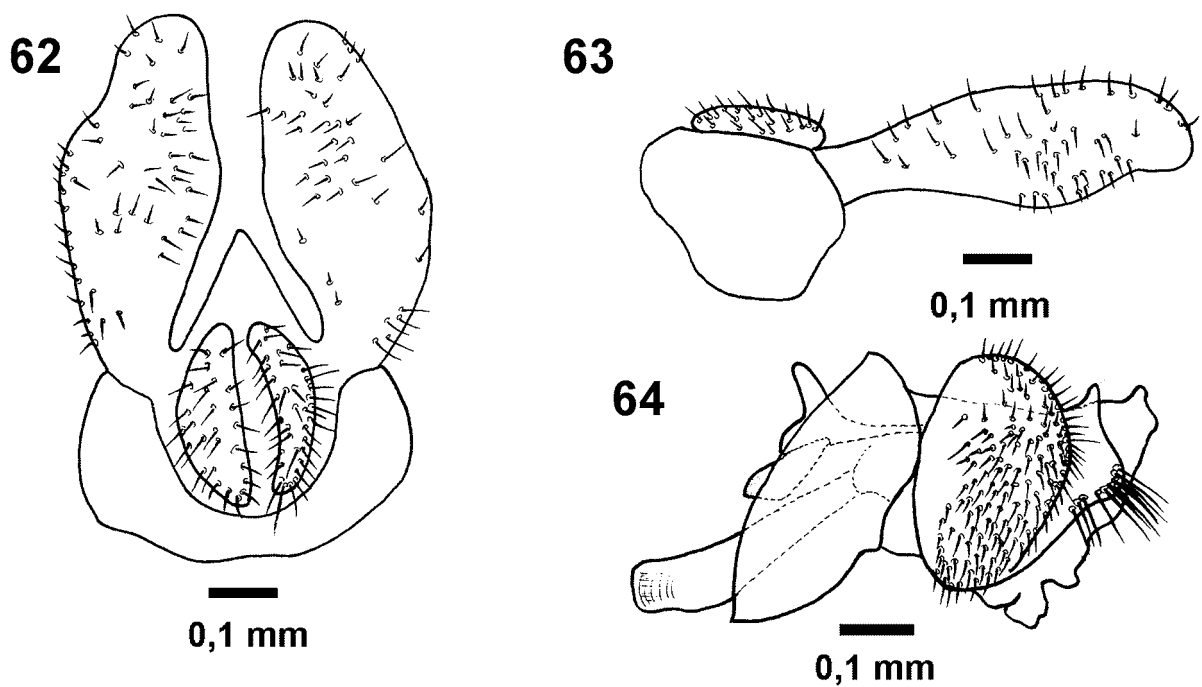
FIGURES 53–55. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus lacrymosus*.



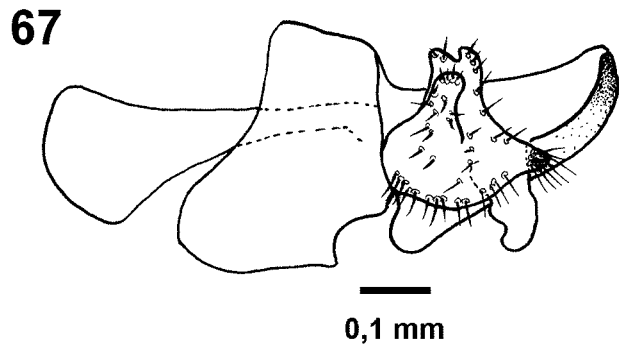
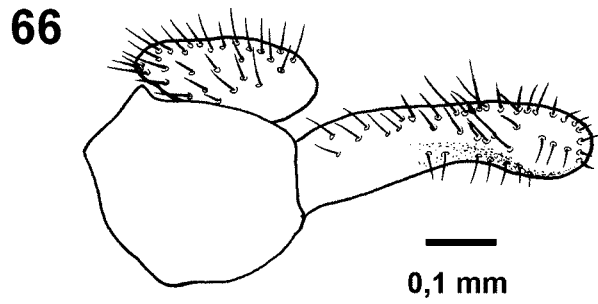
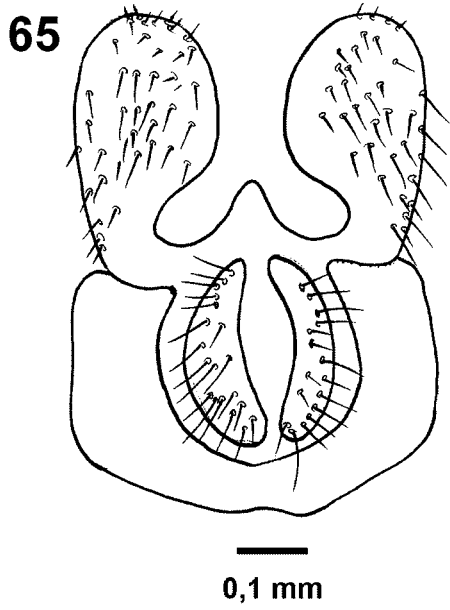
FIGURES 56–58. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus laenas*.



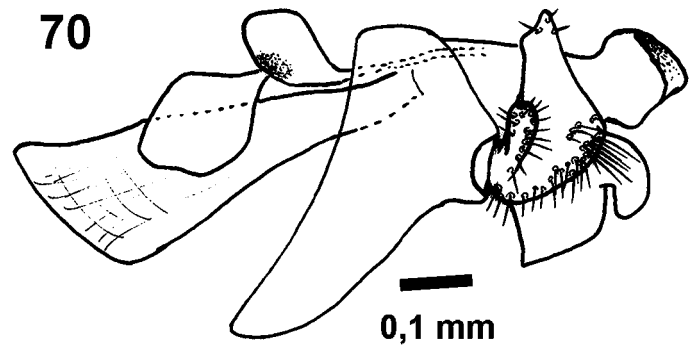
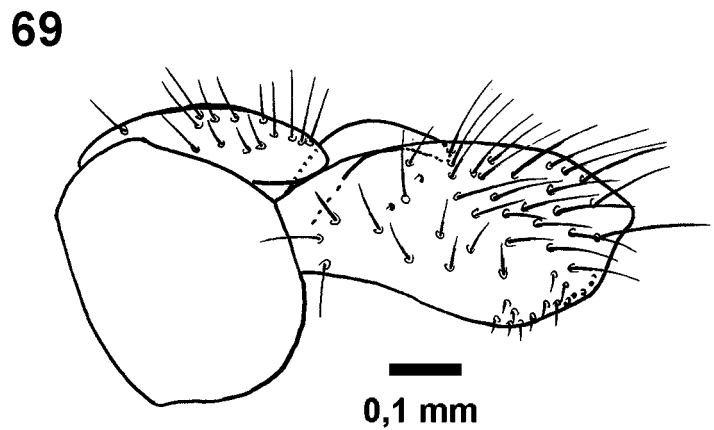
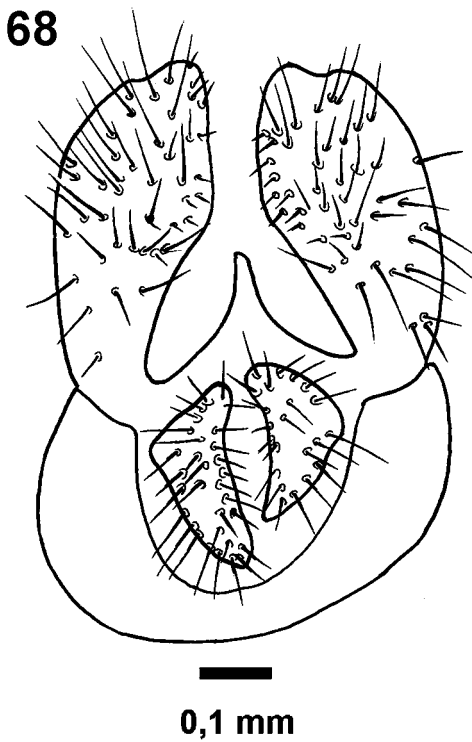
FIGURES 59–61. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus mosaicus*.



FIGURES 62–64. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus papaveroi*.

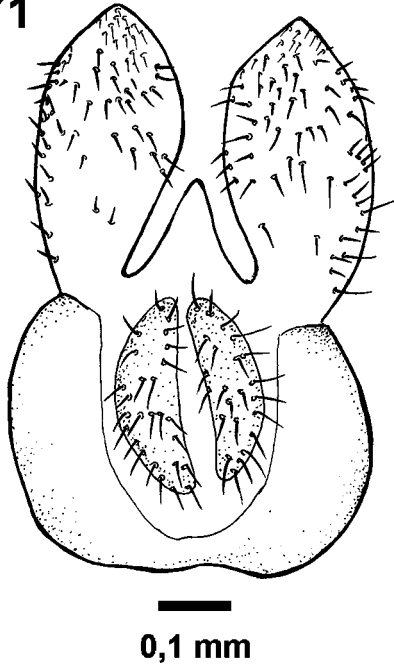


FIGURES 65–67. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus paraduplicatus*.

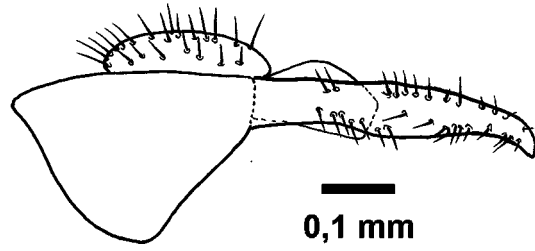


FIGURES 68–70. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus polygraphicus*.

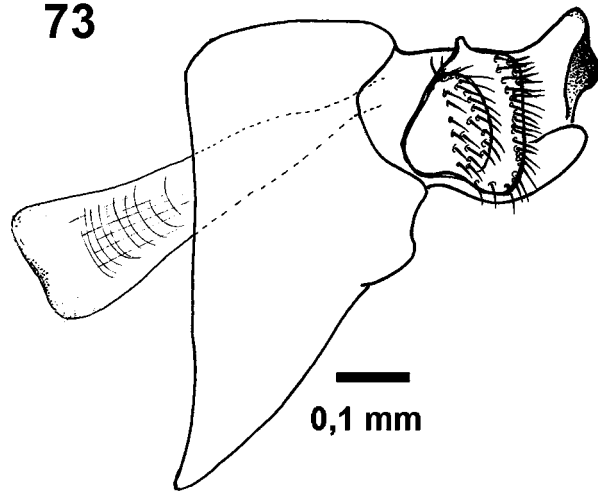
71



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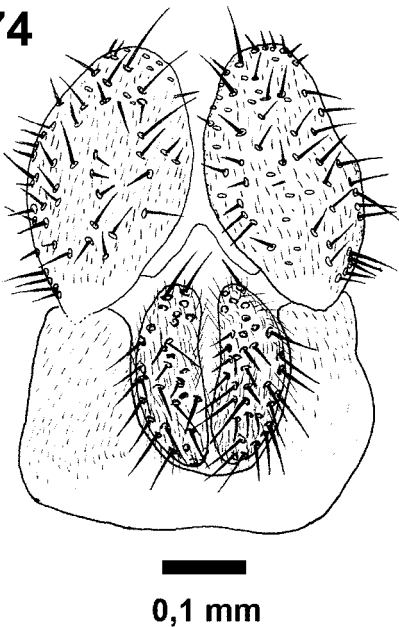


73

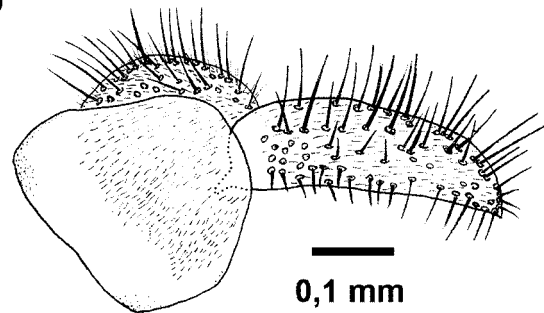


FIGURES 71–73. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus steatogaster*.

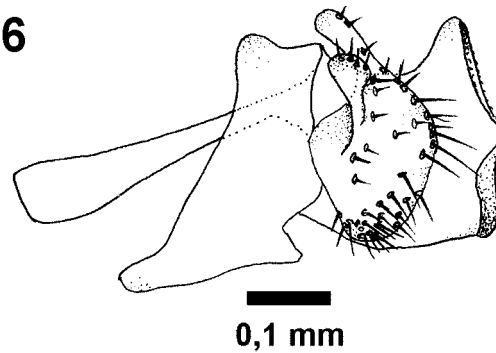
74



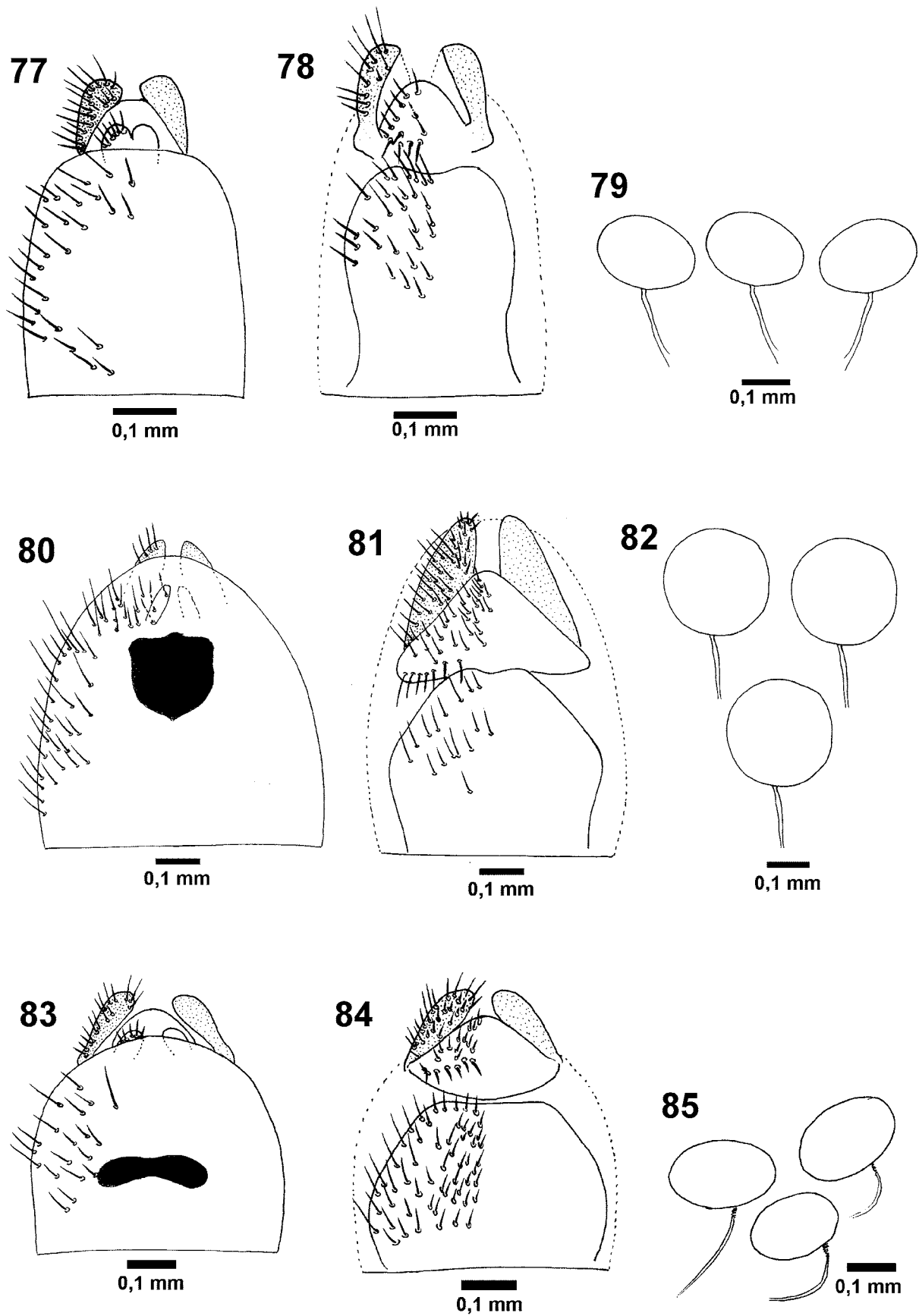
75



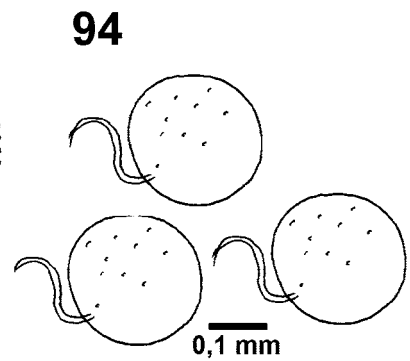
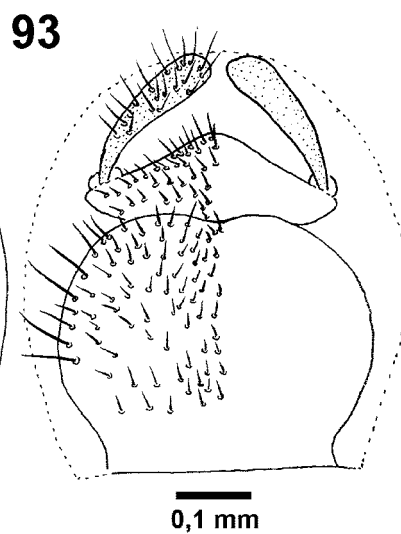
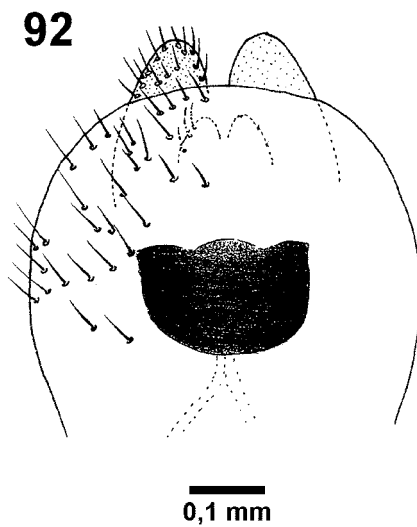
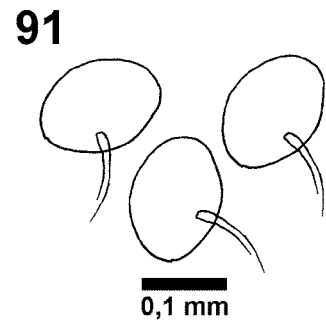
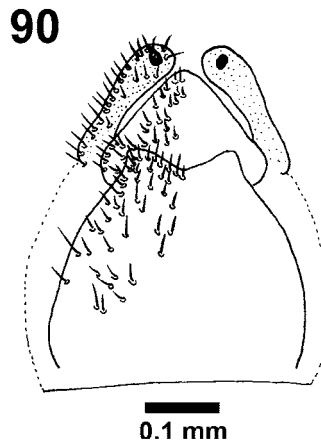
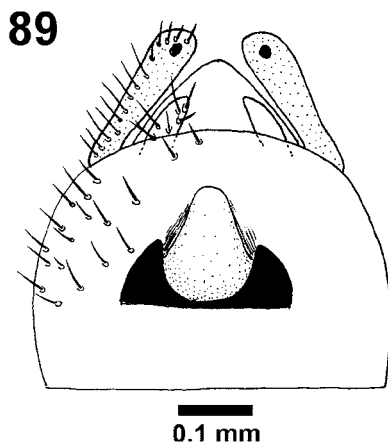
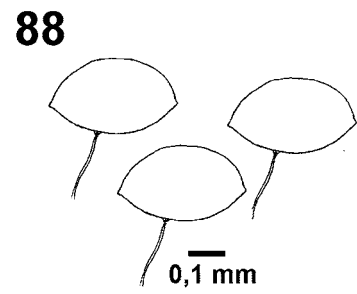
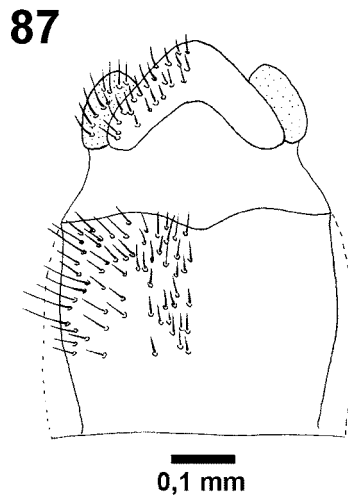
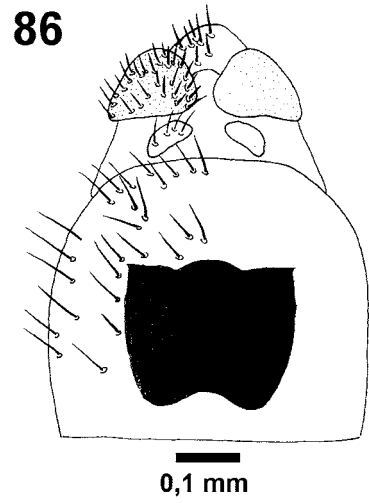
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FIGURES 74–76. Epandrium, cercus and surstylus, dorsal and lateral view; phallic complex, lateral view. *Toxomerus virgulatus*.



FIGURES 77–85. Female genitalia, dorsal and ventral view and spermathecae. 77–79, *Toxomerus apugiensis*. 80–82, *Toxomerus aquilinus*. 83–85, *Toxomerus basalis*.



FIGURES 86–94. Female genitalia, dorsal and ventral view and spermathecae. 86–88, *Toxomerus croesus*. 89–91, *Toxomerus difficilis*. 92–94 *Toxomerus duplicatus*.

***Toxomerus difficilis* (Curran)**

(Figs. 24, 89, 90, 91)

Mesogramma difficilis Curran, 1930: 6 (descr.); 1934: 399 (key); Hull, 1943b: 28 (illustration).

Mesograpta difficilis Fluke, 1956: 221 (cat.).

Toxomerus difficilis Thompson *et al.*, 1976: 49 (cat. & n. comb.); Thompson, 1981: 85 (key).

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow with a little brown macula next to lunule, black pilose; vertical triangle black, white and bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron yellow; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum brown with yellow margins, sometimes yellow, black pilose; anterior anepisternum black, short and sparsely yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior anepimeron yellow to brownish; dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum yellow posterodorsally; methatoracic pleuron yellow; metasternum yellow to brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 2/3; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose, mesotibia black pilose on basal 2/3; metatibia usually black on basal 2/3 and yellow on apical 1/3, black pilose; pro- and mesotarsi yellow to brownish, yellow pilose; metatarsus brown to black, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum usually black except yellow anteriorly and laterally; 2nd tergum yellow except narrowly black anteriorly or black with medial yellow fascia and medial yellow vitta; 3rd to 4th terga all yellow or black with yellow fascia on anterior 1/2 with two medial black macula; 5th tergum yellow except black macula medially and brownish fascia posteriorly (Fig. 24). Male genitalia: surstylus with a median pointed projection at apex, with scattered short setae; postanal process 2/3 as long as surstylus; aedeagus enlarged, with slender projection dorsally; superior lobe somewhat rectangular with setae on anterior margin, and hairs on posterior half.

Female. Similar to male except for the frons black, bronze pollinose, black pilose. Anterior anepisternum bare.

Female genitalia: 9th tergum with a semicircle black macula with a spur medially; epiproct slender; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 90; three oval spermatecae similar in size (Figs. 89–91).

Length. Body 6.0–6.5 mm, wing 5.5 mm.

Type material examined. Holotype. PUERTO RICO. Coamo Springs: *Mesogramma difficilis*, ♂, 5–7/VI/1915 (AMNH). Allotype. PUERTO RICO. Coamo Springs: *Mesogramma difficilis*, ♀, 17–19/VII/1914 (AMNH).

Other material examined. PUERTO RICO. Cidra: 2 ♂ & 4 ♀, 12/IV/1967; Esperanza: ♂ & 2 ♀, J. W. Boyes (CNC). BRAZIL. **Rio de Janeiro:** Friburgo, ♂, II/1932, M. L. (MNRJ). **São Paulo:** Mogi Guacu, Campininha, 11 ♂ & 4 ♀, 23–28/X/1970, J. W. Boyes (CNC); Ilha Seca, ♂, 19–26/II/1940 (CNC); S. P., ♀, 27/XII/1972, B. V. Peterson (CNC); Campos do Jordão, ♂, III/1945, Wygodzinsky (MNRJ). **Santa Catarina:** Nova Teutônia, ♂, ♀, I/1965, XI/1971, F. Plaumann (USNM); 6 ♂, ♀, 14/IV/1960, F. 29/III/1965, XI/1969, XII/1969, F. Plaumann (CNC); ♀, V/1970, F. Plaumann (MZSP).

Geographical record. West Indies, Central America to Southern Brazil.

***Toxomerus dispar* (Fabricius)**

(Figs. 6, 25, 26)

- Syrphus dispar* Fabricius, 1794: 309 (descr.); Wiedemann, 1830: 141 (redescr.); Williston, 1886: 312 (cat.); Kertész, 1910: 113 (cat.); Thompson *et al.*, 1976: 39 (cat.).
- Scaeva dispar* Fabricius, 1805: 253 (diag.).
- Syrphus basilaris* Wiedemann, 1830: 143 (descr.); Thompson, 1981: 86 (syn.).
- Syrphus vicinus* Macquart, 1846: 264 (descr.); Williston, 1886: 312 (cat.); Kertész, 1910: 132 (cat.); Fluke, 1957: 156 (cat.).
- Mesogramma basilaris* Schiner, 1868: 347; Curran, 1925: 307 (syn. & n.var.); Hull, 1941a: 432–434 (descry. & n. var.); 1943b: 25 (key, syn., n. var. and distr.).
- Mesogramma soror* Schiner, 1868: 350 (descr.); Williston, 1886: 312 (synonymy); Thompson *et al.*, 1976: 48 (cat.).
- Syrphus tridentatus* Rondani, 1868: 24 (descr.).
- Mesograpta basilaris* Wulp, 1883: 6 (ill.); Doesburg, 1970: 92, 98, 100; Telford, 1973: 222.
- Mesograpta variabilis* Wulp, 1883: 6 (descr. & ill.); Curran, 1925: 307 (syn.).
- Melanostoma annulifera* Bigot, 1884: 84 (descr.).
- Orthonevra annulifera* Bigot, 1884: 556 (descr.).
- Paragus ruficaudatus* Bigot, 1884: 541 (descr.).
- Mesogramma variabilis* Aldrich, 1905: 372 (cat.); Hull, 1943b: 9 (key).
- Toxomerus variabilis* Kertész, 1910: 150 (cat. & n. comb.).
- Toxomerus basilaris* Kertész, 1910: 144 (cat. & n. comb.); Boyes *et al.*, 1971: 120 (cariotype); Thompson *et al.*, 1976: 48 (cat.).
- Mesogramma imperialis* Curran, 1926: 103 (descr.); 1930: 4 (key); 1934: 400 (key); Hull, 1943b: 10 (key).
- Mesogramma basilare* Curran, 1930: 3 (key); 1934: 401 (key, & syn.).
- Mesogramma flavocunea* Hull 1940b: 433 (descr.); Hull 1943b: 37 (key); Thompson, *et al.* 1976: 48 (cat. & syn.).
- Mesogramma triangulata* Hull, 1942: 104 (descr.).
- Mesogramma neotropica* Hull, 1943b: 36 (descr.); Thompson *et al.*, 1976: 48 (cat. & syn.).
- Mesogramma basilaris* var. *bifidus* Hull, 1943b: 15, 26 (key & descry.); Thompson *et al.*, 1976: 48 (cat. & n. comb.).
- Mesograpta triangulata* Fluke, 1956: 231 (cat.).
- Toxomerus triangulatus* Thompson *et al.*, 1976: 55 (cat. & n. comb.), **syn. nov.**
- Toxomerus vicinus* Thompson *et al.*, 1976: 56 (cat. & n. comb.), **syn. nov.**
- Toxomerus tridentatus* Thompson *et al.*, 1976: 55 (cat. & n. comb.), **syn. nov.**
- Toxomerus annulifer* Thompson *et al.*, 1976: 48 (cat. & n. comb.), **syn. nov.**
- Toxomerus ruficaudatus* Thompson *et al.*, 1976: 54 (cat. & n. comb.), **syn. nov.**
- Toxomerus imperialis* Thompson *et al.*, 1976: 51 (cat. & n. comb.); Thompson, 1981: 86 (syn.).
- Toxomerus dispar* Thompson, 1981: 86 (syn.).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena brown; frontal triangle yellow, white pilose; vertical triangle black, white and bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black with sometimes postalar callus yellow, bronze pollinose except for two lateral and one medial bluish-white pollinose vitta, yellow pilose; scutellum usually black, sometimes black with brownish margins, yellow pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron brownish; metasternum brown; halter yellow (Fig. 6). Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow or black on basal 2/3, yellow apically, yellow pilose; trochanters yellow to black, yellow pilose; pro- and

mesofemora yellow or black on basal 1/2 and yellow on apical 1/2, yellow pilose, mesofemur black pilose on apical 1/3; metafemur yellow except for black annulus on apical 1/3 or black, yellow on basal and apical extremities, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia yellow except for two black annuli on basal 2/5 and apical 2/5 or black, yellow on basal and apical extremities, yellow and black pilose; tarsi brown, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow laterally or all black; 2nd tergum all black or yellow laterally with two medial triangles or rectangles; 3rd to 4th terga black with sub-lateral arcuate yellow vitta continuous from anterior and lateral margin or with sub-lateral yellow triangle continuous from anterior and lateral margin or with yellow semicircle on lateral 1/2 and with three medial yellow vitta as a trident or with medial yellow vitta and a rounded sub-medial yellow macula or all orange; 5th tergum black with sub-lateral yellow macula touching or not lateral margin or yellow with medial black vitta touching or not anterior margin and black sub-lateral maculae posteriorly, or all yellow (Figs. 25–26). Male genitalia: surstylus with pointed apex and concave apically in lateral view, with scattered short setae, longer ventro-apically; postanal process 3/4 as long as surstylus; aedeagus not so enlarged, with slender projection dorsally; superior lobe somewhat trapezoid with setae medio-ventrally and hairs on posterodorsal margin.

Female. Similar to male except for the frons black, white pollinose, black pilose. Anterior anepisternum bare.

Female genitalia: 9th tergum with not distinct black macula; cercus slender; hypoproct as an arch, oval posteriorly and triangular anteriorly; three rounded spermatecae similar in size.

Length. Body 6.0–6.7 mm, wing 4.5–5.0 mm.

Discussion. The specimens of *T. dispar* present a great thorax and abdomen color pattern variation, what can confuse the identification of this species. The type material of *T. dispar* was destroyed and a lectotype is at Museum Comparative of Zoology, Harvard University, though it was not examined. Most of the synonyms were made comparing the original description, abdomen and genitalia illustration and key from Thompson (1981), *T. dispar* identified material, the female holotype of *Mesogramma triangulata*, female holotype of *Orthonevra annulifera*, male holotype of *Paragus ruficaudatus* and female holotype of *Syrphus vicinus*. The synonym with *Toxomerus tridentatus* was based on the original description and especially on the color pattern of abdomen.

Material examined. MEXICO. **Morelos:** 2♂, 2♀, 1/ VIII/1944, 22/ VIII/1944, X/1944, N. L. H. Krauss (USNM). **Veracruz:** Orizaba, ♂, I/1945, N. L. H. Krauss (USNM); Cordoba, ♂, IX/1954, N. L. H. Krauss (USNM). GUATEMALA. Yepocapa: 2 ♂ & 2 ♀, 4/ VI/1947, H. T. Dalmat (USNM); Chimaltenango, ♂, 16/ II/1948, H. Dalmat? (USNM). Guirigia: 3 ♂, 8–10/ V/1949, D. G. Hall (USNM). Escuintlal: 2 ♂, VIII/1959, N. L. H. Krauss (USNM). HONDURAS. Tegucigalpa: 2 ♂ & 2 ♀, 8/ VIII/1985, Ronaldo Sequeira (USNM). EL SALVADOR. San Salvador: ♂, 6/VI/1958, O L Cartwright (USNM); ♂, 14/ VI/1958, L. J. Bottimer (USNM). Sta Tecla: ♂, X/1959, N. L. H. Krauss (USNM). San Andres: ♀, 7/V/1959, P. A. Berry (USNM). Santa Ana: 2 ♀, 19/VIII/1972, G. F. & S. Hevel (USNM). NICARAGUA. Santo Maria de Ostuma: ♂, XI/ 1959, N. L. H. Krauss (USNM). DOMINICAN REPUBLIC Sylvania: ♂, 25/I/1965, W. W. Wirth (USNM). Clarke Hall: ♂, 20/IV/1966, R. J. Gagne (USNM). PUERTO RICO. San German: 2 ♀, XII/23/1962, Paul & Phyllis Spangler (USNM). VENEZUELA. Caracas: 2 ♂ & 2 ♀, X/1950, N. L. H. Krauss (USNM). El Valle: 3 ♂ & ♀, 30/IX/1938, C. H. Ballou (USNM). COLOMBIA. Palmira: Valle, 2♂, 2♀, 31/V/1971, 2/VI/1971, 19/ VII /1971, 21/VII /1971, G. P. Waldbauer (USNM). BRAZIL. **Amazonas:** Tabatinga, ♂, IV/1950, J. C. M. Carvalho (MNRJ). **Pará:** Belém, 22♂, 4 ♀, 13/IV—26/IV/1967, Y. Sedman (USNM). **Pernambuco:** Olinda, ♀, X/1961, Krauss (USNM). **Goiás:** Campinas, ♂, XII/1936, Borgmeier & Lopes (MNRJ); Aragarças, ♂, 28/ I/1953, Moacir Alvarenga (MNRJ); Lago Feia, ♂ & 2 ♀, 25/IV/1972, L. Knutson (USNM); R. Preto, 2 ♂ & ♀, 21/X – 7/XI/1974, L. Knutson (USNM). **Brasília:** Distrito Federal, ♀, 15/X/1971, Luis Moojen (MNRJ); L. Paranoá, ♀, L. Knutson (USNM); National Park, ♂, L. Knutson (USNM). **Minas Gerais:** Diamantina, 5 ♂

& 5 ♀, 5/III/1962, N. Santos (MNRJ); ♂, 3–7/III/1956, Dalcy & Izolda (MNRJ); Viçosa, ♂, 13/X – 1/XI/1985, T. J. Henry & S. P. Fiuza F (USNM); Lagoa Santa, 3 ♂ & ♀, 18/I/1977, L. Knutson (USNM). **Espírito Santo:** Linhares, ♀, IX/1970, P. C. Elias (MZSP). **Rio de Janeiro:** ♀, 3/III/1952, Ayrton (MNRJ); Friburgo, ♂, II/1932, M. L. (MNRJ); ♂, II/1933, C. F. M. L. (MNRJ); ♀, II/1933, C. F. M. L. (MNRJ); Petrópolis, 2 ♂ & ♀, II/1956, D. Albuquerque (MNRJ); ♂, 24/I – 23/II/1959; ♀, 5/I/1970; Rio, ♂ & 2 ♀, X/1929, T. Borgmeier (MNRJ); Vassouras, 2 ♀, 22/VII/1955, Dalcy & Rego Barros (MNRJ); ♂, 11–17/XII/1955, D. O. Albuquerque (MNRJ); Estrada Rio-São Paulo km 47, 19 ♂, 5 ♀, 9/I/1945, 10/I/1945, 11/I/1945, 12/I/1945, 15/I/1945, 24/I/1945, B. Ramos (MNRJ); Recreio dos Bandeirantes, ♂, 28/X/1961, Krauss (USNM); Teresópolis, ♂, I/1935, P. Sandig (USNM). **São Paulo:** Ypiranga, ♂, ♀, 1/III/1936, 4/IV/1936, L. Moirety (MZSP); H. Florestal, ♀, III/1952, M. Carrera & M. d'Andretta (MZSP); Barueri, ♂, 7/II/1955, K. Lenko (MZSP); M. das Cruzes, ♂, M. Carrera (MZSP); Onda Verde, ♂, I/1946, F. Lane (MZSP); Guarujá, ♂, I/1942, M. Carrera (MZSP); Boracea, ♀, VI/1947, Rabello (MZSP); Juquiá, 2 ♂, IV/1941, J. Lane (MZSP); S. José dos Campos, ♂ & ♀, VII/1933, H.S. Lopes (MNRJ); S. Amaro, ♂, XII/1950, J. Lane (MNRJ); Pirassununga, 2 ♂, III/1954, N. Santos (MNRJ); Bocaína, 2 ♂ & ♀, III/1954, V/1951, Dalcy & Machado (MNRJ); Mauá, ♂, V/1961, N. L. H. Krauss (USNM); Piracicaba, 2 ♂ & 3 ♀, 11/I/1977, L. Knutson (USNM); Rio Claro, 2 ♂ & ♀, 14/I/1977, L. Knutson (USNM); Santos, 2 ♂ & 4 ♀, VI/1961, VIII/1961, X/1961, N. L. H. Krauss (USNM); São Vicente, ♂, VIII/1961, N. L. H. Krauss (USNM). **Paraná:** Curitiba, 3 ♂ & ♀, IV/1940, Claret (USNM). **Santa Catarina:** ♂, M. Leitão (MNRJ); Blumenau, ♂ & ♀, III/1935, F. Weber (MNRJ); ♂, III/1935, Weber (CNC). Nova Teutônia, 36 ♂ & 13 ♀, VI/1964, XI/1964, I/1965, II/1965, VII/1965, XI/1969, V/1970, XI/1971, I/1972, III/1973, IV/1973, F. Plaumann (USNM); 11 ♂, 8 ♀, II/1965, XII/1966, XI/1969, F. Plaumann (CNC); 4 ♀, V/1970, F. Plaumann (MZSP); Florianópolis, ♂, VI/1961, N. L. H. Krauss (USNM); Itajai, ♀, 15/VI/1961, N. L. H. Krauss (USNM). **Rio Grande do Sul:** Santa Cruz do Sul, 10 ♂, 6 ♀, 15/V/2002, 14/V/2002, 19/XII/2002, 18/IX/2003, M.N. Morales (UNISC); 2 ♂, 12/XI/2001, 21/XI/2001, C. Heitling (UNISC); ♀, 09/IV/2003, M.G. Hermes (UNISC); Derrubadas, ♀, 26/IV/2003, M.N. Morales (UNISC). **BOLIVIA.** Riberalta: ♂, I/1921–1922, Mulford (USNM).

Geographical record. Widespread, from United States to southern South America.

***Toxomerus duplicatus* (Wiedemann)**

(Figs. 12, 92, 93, 94)

Syphus duplicatus Wiedemann, 1830: 142 (descr.).

Syrphus vatius Walker, 1852: 240 (descr.); Kertész, 1910: 131 (cat.).

Mesogramma duplicata Schiner, 1868: 350 (n. comb.); Curran, 1926: 114; 1930: 4; 1934: 401 (key); Hull, 1943b: 6, 32 (key & ill.).

Syrphus ochrogaster Thomson, 1869: 494 (descr.); Williston, 1887 (syn.).

Mesograptia duplicata Williston, 1886: 313 (cat. & n. comb.); Lynch-Arribalzaga, 1892: 52 (key); Fluke, 1956: 221 (cat.); Etcheverry, 1963: 59 (distr.).

Toxomerus duplicatus Kertész, 1910: 145 (cat. & n. comb.); Thompson *et al.*, 1976: 50 (cat.).

Mesogramma gemini Hull, 1941c: 312 (descr.); 1943b: 32 (ill.).

Mesogramma bipunctata Hull, 1943b: 23 (descr.).

Mesogramma vatia Hull, 1943b: 10 (n.comb.).

Mesogramma arctura Hull, 1943b: 14, 18 (key & descry.).

Mesograptia bipunctata Fluke, 1956: 219 (cat.).

Mesograptia vatia Fluke, 1956: 232 (cat.).

Mesograptia arctura Fluke, 1956: 218 (cat.).

Toxomerus vatius Thompson *et al.*, 1976: 56 (cat. & n. comb.), **syn. nov.**

Toxomerus arcturus Thompson *et al.*, 1976: 48 (cat. & n. comb.), **syn. nov.**

Toxomerus bipunctata Thompson *et al.*, 1976: 48 (cat. & n. comb.), **syn. nov.**

Toxomerus gemini Thompson *et al.*, 1976: 50 (n. comb. & cat.), **syn. nov.**

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally;

gena black; frontal triangle yellow, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron usually black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow, black pilose; anterior anepisternum black, long and sparsely yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior and dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum yellow posterodorsally; methatoracic pleuron yellow; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow and black pilose; metafemur usually yellow, sometimes with black annulus on apical 1/3, black pilose; tibiae yellow; protibia yellow pilose; mesotibia yellow and black pilose; metatibia black pilose; pro- and mesotarsi yellow to brownish, protarsus yellow pilose, mesotarsus black pilose; metatarsus black, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula usually broader than cell BM apically, sometimes as broad as cell BM, microtrichose (Fig. 12).

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia; 3rd to 4th terga black with yellow fascia on anterior 1/2 with two medial black macula; 5th tergum black with yellow fascia on anterior 1/2 with black macula medially. Male genitalia: surstylus more concave laterally than medially, with scattered short setae; postanal process 1/3 as long as surstylus; aedeagus enlarged, prominent dorsally and ventrally; superior lobe somewhat rounded with long dorsal extension, forked distad, with scattered setae.

Female. Similar to male except for the frons black, bronze pollinose, black pilose.

Female genitalia: 9th tergum with somewhat semicircle black macula with two concavities posteriorly; epiproct somewhat elliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 93; three rounded spermatecae similar in size (Figs. 92–94).

Length. Body 6.5–8.0 mm, wing 6.0–6.5 mm.

Discussion. Many species of *Toxomerus* present the same abdomen color pattern as *Toxomerus duplicatus* and the morphology of the male and female genitalia (here described for the first time) helps their segregation. The type material of *T. duplicatus* is in Natural History Museum Vienna (NMW) and was not seen. Though the synonymies were based on the examination of the original description, *T. duplicatus* identified material, abdomen and genitalia illustration and key from Thompson & Thompson (2006), the male holotype, female allotype and female paratype of *Mesogramma arctura*, female holotype and female paratype of *Mesogramma bipunctata*, female holotype of *Mesogramma gemini* and male holotype of *Syrphus vicinus*.

Material examined. ARGENTINA. **Buenos Aires:** San Isidro, 8 ♂ & 2 ♀, 2/IX/1927, R. C. Shannon (USNM); Ao. Carnaval, 4 ♂ & 6 ♀, 26/XI/1979, 03/XII/1979, O. S. Flint Jr. (USNM); Rio Salado, 2 ♂, 2 ♀, 29/XI/1979, O. S. Flint Jr. (USNM); 3 ♂ & 2 ♀, 13–14/XII/1979, O. S. Flint Jr. (USNM). BRAZIL. **Minas Gerais:** Ouro Preto, ♂, VIII/1961, N. L. H. Krauss (USNM). **Rio de Janeiro:** Friburgo, ♂, II/1932, M. L. (MNRJ). Petrópolis, ♂, 24–27/X/1919 (USNM). Itatiaia, ♂, V/1945, Barreto (CNC). **São Paulo:** São Paulo ♂, 1964 (CNC); ♂, 27/XII/1972, B. V. Peterson (CNC). Bocaina, 3 ♂, V/1951, Dalcy & Machado (MNRJ); 4 ♂ & ♀, XI/1970, M. Alvarenga (MNRJ); Campos do Jordão, 4 ♂, III/1945, Wygodzinsky (MNRJ); Salesópolis, ♂, III/1969, N. Papavero (MZSP). **Paraná:** Curitiba, ♂, X/1939, A. G. Silva (CNC); ♂, III/1954, N. H. L. Krauss (USNM). **Santa Catarina:** Nova Teutônia, 17 ♂, 3 ♀, VI/1964, VII/1964, IX/1964, X/1964, XI/1964, XII/1964, I/1965, II/1965, VII/1965, X/1971, XI/1971, XII/1971, F. Plaumann (USNM); ♂, XI/1969, F. Plaumann (CNC); **Rio Grande do Sul:** Quinta, ♂ & ♀, 28/IX/1919, E. G. Holt (USNM); Pelotas, 7 ♂,

3♀, 20/X/1956, 25/X/1961, C. M. Biezanko (USNM); 2♂, 2 ♀, 18/IX/1963, 30/IX/1963, C. M. Biezanko (MZSP). URUGUAY. Brisa de la Plata: 3 ♂ & 2 ♀, 6/XII/1943, H. L. Parker (USNM).

Geographical record. Widespread, from Mexico to southern South America.

***Toxomerus elisa* (Hull)**

(Figs. 27, 44, 45, 46, 95, 96, 97)

Mesogramma elisa Hull, 1951a: 5 (descr.).

Mesograpta elisa Fluke, 1956: 222 (cat.).

Toxomerus elisa Thompson *et al.*, 1976: 50 (cat. &n. comb.).

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow with a little brown macula next to lunule, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum usually yellow, sometimes brown with yellow margins, black pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katapisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior and dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum yellow posterodorsally; methatoracic pleuron yellow; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, profemur yellow pilose, except black pilose on apical 1/3, mesofemur black pilose; metafemur usually yellow, sometimes with indistinct black annulus on apical 1/3, black pilose; tibiae yellow, protibia yellow and black pilose; meso- and metatibia black pilose; pro- and mesotarsi yellow, yellow and black pilose; metatarsus brown, black pilose. Wing: hyaline to brownish, all microtrichose; alula as broad as cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia interrupt medially and yellow latero-anteriorly; 3rd to 4th terga black with yellow fascia on anterior 1/3 not touching sub-lateral and medial base and interrupt in the middle for a yellow medial vitta; 5th tergum black with yellow fascia on anterior 1/2 interrupt medially (Fig. 27). Male genitalia: surstylus flattened apically, with scattered short setae; postanal process 1/2 as long as surstylus; aedeagus enlarged, prominent dorsally; superior lobe somewhat rounded ventrally with very long dorsal extension, forked distad, with scattered hairs, with small lobe medio-dorsal with hairs (Figs. 44–46).

Female. Similar to male except for the frons black, bronze pollinose and black pilose.

Female genitalia: 9th tergum with an extended “V” shape black macula; epiproct rounded; cercus broad; hypoproct somewhat triangular; 9th sternum as in Fig. 96; three biconvex spermatecae similar in size (Figs 95–97).

Length. Body 5.5–7.0 mm, wing 4.5–5.5 mm.

Type material examined. Holotype. BRAZIL. **São Paulo:** *Mesogramma elisa*, ♂, XI/1934, Hamilton (AMNH).

Other material examined. BRAZIL. **Minas Gerais:** Ouro Preto, ♀, VIII/1969, F. C. do Val (MZSP). **Rio de Janeiro:** Petropolis, ♀, XI/1929 (CNC); ♀, 24/I–23/II/1953, D. Albuquerque (MNRJ); ♂, 11/VI/1972, H. S. Lopes (MNRJ); Itatiaia, ♀, 26/IX/1954, D. Albuquerque & Barros (MNRJ). **São Paulo:** Bocaina, 5 ♂ & 7 ♀, V/1951, Darcy & Machado (MNRJ); ♂ & ♀, XI/1970, M. Alvarenga (MNRJ). **Paraná:** Curitiba, 11♂,

10♀, 17/XI/1975, 30/XI/1975, 26/XII/1975, 30/XII/1975, 6/I/1976, 8/I/1976, 11/I/1976, 3/II/1976, 4/II/1976, 9/II/1976, 10/II/1976, 12/II/1976, 14/II/1976, 19/II/1976, 26/II/1976, 2/III/1976, 4/III/1976, H. S. Telford (DZUP).

Geographical record. Southeastern Brazil.

***Toxomerus flaviplurus* (Hall)**

(Figs. 7, 13, 28, 47, 48, 49, 98, 99, 100)

Mesogramma flaviplura Hall, 1927: 239 (descr.); Curran, 1930: 1 (key); 1934: 398 (key).

Mesogramma flavipleura Hull, 1943b: 15, 28 (key & ill.).

Mesograptia flaviplura Fluke, 1956: 222 (cat.).

Toxomerus flaviplurus Thompson *et al.*, 1976: 50 (cat. & n. comb.).

Male. Head: face 1/3 as long as eye width, yellow with black medial vitta, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow to brownish; proepisternum black, white pollinose; proepimeron black; scutum black except yellow laterally after transverse suture, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum usually black, sometimes black with yellow margins, yellow pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black anterior 2/3, yellow pilose dorsally, and yellow posterior 1/3, yellow pilose; katepisternum black, sometimes with a little dorsal yellow macula, dull, yellow pilose; anepimeron black; plumula yellow to brownish, calypter yellow to brownish with brownish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black; methatoracic pleuron black; metasternum black; halter yellow (Fig. 7). Legs: coxae black, yellow or black pilose; trochanters brown, yellow pilose; femora black, yellow on basal and apical extremities, yellow and black pilose; pro- and mesotibiae yellow, yellow and black pilose; metatibia black, yellow on basal extremity, black and yellow pilose; tarsi brown, black pilose. Wing: brownish, all microtrichose; alula as broad as cell BM apically or as broad as cell C, microtrichose (Fig. 13).

Abdomen: terga yellow and black pilose; 1st tergum all black; 2nd tergum usually black with medial yellow fascia interrupt medially; 3rd to 4th terga black with yellow fascia on anterior 1/3 with sub-lateral triangular projection, sub-medial arcuate projection and medial yellow vitta extending from anterior to posterior brownish fascia; 5th tergum usually black with medial yellow vittae and lateral and posterior yellow maculae (Fig. 28). Male genitalia: surstylus very convex laterally and very concave medially, with scattered short setae; postanal process 3/4 as long as surstylus; aedeagus enlarged, prominent dorsally; superior lobe somewhat quadrangular with short dorsal extension, with hairs anteroventrally, with small lobe posterodorsally with hairs (Figs. 47–49).

Female. Similar to male except for the frons black, white pollinose, black pilose. Anterior anepisternum bare.

Female genitalia: 9th tergum with somewhat elliptical black macula concave posteriorly; epiproct as kidney form; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 99; three elliptical spermatecae, one of them smaller (Figs. 98–100).

Length. Body 7.0–8.0 mm, wing 6.0–7.0 mm.

Type material examined. Holotype. GUATEMALA. Los Amates: *Mesogramma flaviplura*, female, 16–20/I/1905, S. Hine (USNM).

Other material examined. BRAZIL. Amazonas: Manaus, 9 ♂, ♀, 12/V/1967, 13/V/1967, Y. Sedman (USNM); Pará: Belém, 20 ♂, ♀, 19/IV–03/IV/1967, Y. Sedman (USNM);

Geographical record. Central America to northern Brazil.

***Toxomerus floralis* (Fabricius)**

Syrphus floralis Fabricius, 1798: 563 (descr.); Wiedemann, 1830: 145 (redescr.); Kertész, 1910: 114 (cat.).

Scaeva floralis Fabricius, 1805: 253 (descr.).

Syrphus quadrifasciatus Bigot, 1857: 337 (descr.); Aldrich, 1905: 367 (cat.); Kertész, 1910: 125 (cat.); Fluke, 1957: 156 (cat.); Thompson, 1981: 90 (syn.).

Mesogramma subannulata Loew, 1866: 157 (descr.); Curran, 1930: 2 (key); 1934: 399 (key); Hull, 1943b: 8, 25, 35 (key, & ill.).

Mesogramma floralis Schiner, 1868: 347; Curran, 1925: 307 (syn.; 1930: 3 (key); 1934: 401 (syn.); Hull, 1943b: 9, 24, 40 (key & ill.).

Mesograptia subannulata Loew, 1872: 120; Osten Sacken, 1875: 49 (cat.); Miskimen & Bond, 1970: 66; Telford, 1973: 225.

Toxomerus subannulatus Kertész, 1910: 150 (cat. & n. comb.); Thompson *et al.*, 1976: 55 (cat.).

Mesogramma flamminea Hull, 1941c: 312 (descr.); 1943b: 6 (key & var.).

Mesograptia floralis Fluke, 1956: 223 (cat.).

Toxomerus floralis Thompson *et al.*, 1976: 50 (cat. & n. comb.).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, white and bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, white pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron yellow; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum black with yellow margins, yellow pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemora black pilose on apical extremity; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; tibiae yellow, yellow pilose; metatibia yellow and black pilose; pro- and mesotarsi yellow, yellow pilose; mesotarsus yellow pilose, except black pilose ventrally; metatarsus brown, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia extended latero-anteriorly; 3rd to 4th terga black with sub-medial quadrangular yellow macula continuous from lateral and anterior margin with medial yellow vitta; 5th tergum yellow with black macula medially or all yellow. Male genitalia: surstylus broad dorsally, with scattered short setae; postanal process little distinct; aedeagus slender dorsally; superior lobe somewhat trapezoid with setae medio-ventrally.

Female. Similar to male except for the frons black, white pollinose, black pilose. Anterior anepisternum bare.

Female genitalia: 9th tergum with not distinct black macula; cercus slender; hypoproct somewhat triangular; three rounded spermatecae similar in size.

Length. Body 6.0–7.0 mm, wing 5.0–6.0 mm.

Material examined. MEXICO. **Guadalupe:** Raizet Field, ♂ & 7 ♀, X/1950, N. H. L. Krauss (USNM);

Quintana Roo: Felipe Carrillo Puerto, 4 ♂, 11–13/X/1986, R. J. McGinley (USNM); **Chiapas:** Tuxtla Gutierrez, 2 ♀, P. J. Spangler (USNM). GUATEMALA. Tikal Ruins, 3 ♂ & ♀, G. F. & S. Hevel (USNM). EL SALVADOR. Santa Ana: 3 ♂, 19/VIII/1972, G. F. & S. Hevel (USNM). NICARAGUA. Santo Maria de Ostuma: ♂, XI/1959, N. H. L. Krauss (USNM). CUBA. La Palma: Pinar del Rio, ♀, XI, 1955, N. H. L. Krauss (USNM). JAMAICA. Worthy Park: 3 ♂ & ♀, 18–25/II/1970, R. E. Woodruff (USNM). VENEZUELA. **Merida:** Merida, ♂, 2/VI/1976, A. S. Menke & D. Vicent (USNM); **Zulia:** El Tucuco, ♀, 5–6/VI/1976, A. S. Menke & D. Vicent (USNM); **Aragua:** Puerto de Cata, ♂, 10–11/VI/1976, A. S. Menke & D. Vicent (USNM); **Lara:** Carora, 2 ♂ & 2 ♀, A. S. Menke & D. Vicent (USNM). BRAZIL. **Amazonas:** Manaus, ♀, X–XI/1969, Exp. Perm. Amaz. (MZSP); ♂, 27/XI – 8/XII/1985, T. J. Nentry (USNM). **Pará:** Belém, ♀, VII/1954, N. H. L. Krauss (USNM); 19 ♂, 15 ♀, 01–29/IV/1967, 7–26/V/1967, Y. Sedman (USNM); Altamira, ♂ & ♀, P. Spangler & O. Flint (USNM). **Pernambuco:** Caruaru, 4 ♂, VII/1974 (MZSP). **Goiás:** Lago Feia, 3 ♀, 25/IV/1972, L. Knutson (USNM); ♀, Planaltina, 25/IV/1972, L. Knutson (USNM). Aragarças, ♂, 28/I/1953, Moacir Alvarenga (MNRJ); **Brasília:** Distrito Federal, 2 ♂, 7/III/1952, A. G. Silva (MNRJ); **Mato Grosso:** Maracaju, ♂, V/1937, Serviço Febre Amarela (MNRJ); **Minas Gerais:** Lagoa Santa, ♂, 18/I/1977, L. Knutson (USNM); Paracatu, ♀, VII/1960, Exp. Formosa (MNRJ). **Espírito Santo:** Vitória, ♂ & ♀, VII/1961, N. L. H. Krauss (USNM); ♀, M. Leitão (MNRJ); Linhares, 12 ♂ & 3 ♀, IX/1970, P. C. Elias (MZSP); ♀, VII/1972, P. C. Elias (MNRJ); Baixo Guandu, ♀, IX/1970, P. C. Elias (MZSP). **Rio de Janeiro:** Floresta da Tijuca, ♂, III/1961, N. L. H. Krauss (USNM). Gávea, 2 ♂, 30/IV/1936, Lacerda (MNRJ); Deodoro, ♂, 15/V/1936, W. Zikán (MNRJ); São Paulo-Estrada Rio, km 47, 28 ♂, 9 ♀, 9/I/1945, 10/I/1945, 11/I/1945, 12/I/1945, 15/I/1945, 17/I/1945, , 24/I/1945, B. Ramos (MNRJ); ♂, 25/VI/1948, J. Miranda (MNRJ); Amaro, ♂, II/1949, J. Lane (MZSP); ♀, XII/1950, J. Lane (MNRJ); Bocaína, 2 ♂, III/1954, Darcy & R. Barros (MNRJ); **São Paulo:** ♀, 4/IV/1965, V. N. Alin (USNM); Rio Claro, ♀, 14/I/1977, L. Knutson (USNM); Mongagua, ♀, 24/VIII/1961, N. L. H. Krauss (USNM); Santos, ♂, VI/1961, N. L. H. Krauss (USNM); Salesópolis, 2 ♀, III/1969, N. Papavero (MZSP); **Paraná:** Curitiba, ♂, ♀, III/1954, , VII/1961, N. L. H. Krauss (USNM). PARAGUAY. Villarrica: ♂, XI/1937, F. Schade (USNM).

Geographical record. Widespread, from United States to southern South America.

***Toxomerus funestus* (Doesburg)**

Mesograpta funesta Doesburg, 1966: 65 (descr.).

Toxomerus funestus Thompson *et al.*, 1976: 50 (cat & n. comb.).

Diagnosis. Proepimeron black; scutum black; scutellum black with slightly reddish margins; anepimeron black. Femora brown, the apices broadly yellow; pro- and meso tibiae yellow; hind tibia brown, the base yellow. Wing extensively microtrichose; alula as broad as cell BM. Abdomen black, the 2nd, 3rd, 4th and 5th terga with three opaque, velvet-black spots.

Length. Body 5.0 mm.

Discussion. The type material is in Rijksmuseum van Natuurlijke Historie te Leiden, and it was not possible to examine any specimens. The characters presented here are based only on the original description of *Toxomerus funestus*,

Geographical record. Suriname and Northern Brasil (Amazon rainforest).

***Toxomerus idalius* (Hull)**

(Figs. 3, 50, 51, 52, 101, 102, 103)

Mesogramma idalia Hull, 1951a: 11 (descr.).

Mesogramma eurydice Hull, 1951a: 17 (descr.).

Mesograpta eurydice Fluke, 1956: 222 (cat.).

Mesogramma idalia Fluke, 1956: 223 (cat.).

Toxomerus idalius Gerdes, 1975: 13; Thompson *et al.*, 1976: 51 (cat. & n. comb.).

Toxomerus eurydice Gerdes, 1975: 13; Thompson *et al.*, 1976: 50 (cat. & n. comb.), **syn. nov.**

Male. Head: face 2/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally (Fig. 3); gena black; frontal triangle yellow, sometimes with a little brown macula next to lunule, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron yellow; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum usually yellow, sometimes brownish with yellow margins, black pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katapisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior and dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katapisternum, meron, katatergum, anatergum and postscutellum) black, anatergum yellow posterodorsally; methatoracic pleuron yellow; metasternum yellow; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 1/3; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia usually yellow, sometimes brownish on medial 1/3, black pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus brown, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia; 3rd to 4th terga black with yellow fascia on anterior 1/2 with two medial black macula; 5th tergum yellow with black macula medially. Male genitalia: surstylus with pointed apex, with scattered short setae; postanal process 3/4 as long as surstylus; aedeagus enlarged, prominent dorsally and ventrally; superior lobe somewhat quadrangular with short dorsal extension, forked distad, with scattered hairs, longer along anteroventral margin, with small lobe medio-posteriorly with hairs (Figs. 50–52).

Female. Similar to male except for the frons black, bronze pollinose, black pilose. Anterior anepisternum bare, sometimes with rare short piles.

Female genitalia: 9th tergum with somewhat triangular black macula; epiproct somewhat elliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 102; three rounded spermatecae similar in size. (Figs. 101–103).

Length. Body 7.0–8.0 mm, wing 5.5–6.5 mm.

Discussion. Gerdes (1975) indicated that the male genitalia of *Toxomerus idalius* and *Toxomerus eurydice* were identical and suggested that the names are synonyms. The examination of the male holotype of *Mesogramma eurydice* and male holotype and five male paratypes of *Mesogramma idalia* confirmed this synonymy.

Type material examined. Holotype. ECUADOR. **Puyo:** Oriente, *Mesogramma idalia*, male, 3–15/XII/1938, F. M. & H. Brown (AMNH). Paratypes. ECUADOR. San Francisco: *Mesogramma idalia*, 3 ♂, 1/X/1938, W. C. Macintyre (CNC). COLOMBIA. Cali: *Mesogramma idalia*, 2 ♂, 27/I/1935, Herbert F. Schwarz (CNC).

Other material examined. BRAZIL. **Pernambuco:** Caruaru, 3 ♂, IV/1972, VI/1972, M. Alvarenga (MNRJ). **Bahia:** Salvador, 2 ♂, 28/VIII/1951, D. Albuquerque (MNRJ). **Rio de Janeiro:** Friburgo, ♂, II/1932, M. L. (MNRJ). **São Paulo:** S. Bocaína, ♂, III/1954, Dalcy, R. Barros (MNRJ); São Paulo, ♂, 2/XII/1965, R. Inoue (CNC); Osasco, ♂, XII/1957, J. Lane (CNC); Campos do Jordão, ♂, III/1945, J. Lane (CNC); 2 ♂, III/1945, Wygodzinsky (CNC); Cajurá, 2 ♂, X/1954, M. P. Barreto (MZSP). **Santa Catarina:** Nova

Teutônia, 13♂, 2 ♀, VI/1970, XI/1971, F. Plaumann (USNM).

Geographical record. Tropical and subtropical South America.

***Toxomerus intermedius* (Hull)**

(Figs. 29, 104, 105, 106)

Mesogramma intermedia Hull, 1949a: 77 (descr.).

Mesograpta intermedia Fluke, 1956: 224 (cat.).

Toxomerus intermedius Thompson *et al.*, 1976: 51 (cat. & n.comb.); Metz & Thompson, 2001: 228, 236 (key & redescr.).

Diagnosis. Face 1/3 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum brown with yellow margins, black pilose; anepimeron black. Pro- and mesofemora yellow; metafemur brown except basal 1/3 yellow; pro- and mesotibiae yellow; metatibia brownish. Wing extensively bare; alula broader than cell BM apically, microtrichose. Abdomen with yellow maculae on 3rd and 4th terga broadly extending to lateral margin (Fig. 29). Surstylus with pointed apex; postanal process not distinct; aedeagus enlarged, proeminent dorsally; superior lobe somewhat rounded ventrally with short dorsal extension, with scattered hairs and long setae along anteroventral margin, with small lobe posteriorly with hairs. Female genitalia: 9th tergum with a semicircle black macula with a discreet concavity anteriorly; epiproct as kidney form; cercus slender; hypoproct rounded, triangular posteriorly; 9th sternum as in Fig. 105; three rounded spermatecae similar in size (Figs. 104–106).

Length. Body 9.6–10.4 mm, wing 8.4–9.7 mm.

Type material examined. Holotype. PERU. *Mesogramma intermedia*, female (CNC).

Other material examined. PERU. **Madre de Dios:** Manu, ♀, Wayne N. Mathis (USNM); Cuzco: Quiencemil, ♀, 13–31/VIII/1962, L. Pena (USNM). BRAZIL. **Rio de Janeiro:** Itatiaia, ♀, Barreto (USNM). **São Paulo:** Juquia, ♀, I/43, J. Lane (CNC).

Geographical record. Tropical South America.

***Toxomerus lacrymosus* (Bigot)**

(Figs. 14, 53, 54, 55, 107, 108, 109)

Mesograpta lacrymosa Bigot, 1884: 107 (descr.)

Mesogramma lacrymosa Aldrich, 1905: 371 (mssp. *lacrymosum* and catalogue).

Toxomerus lacrymosus Kertész, 1910: 147 (cat. & n. comb.); Thompson *et al.*, 1976: 51 (cat.).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, white pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow, yellow pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black on anterior 1/2, bare, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow, except metaepisternum black; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow

pilose; metatibia yellow except for black annulus on basal 1/3, yellow pilose; pro- and mesotarsi yellow to brownish, yellow pilose; metatarsus brown, black pilose. Wing: hyaline, extensively bare, as follow: mostly of cells C, SC, R, BM, CuP, basal 2/3 of cell R1, basal 1/3 of cell R2+3 and anterior basal 1/2 of cell R4+5; alula broader than cell BM apically, microtrichose (Fig. 14).

Abdomen: terga yellow and black pilose; 1st tergum black except yellow laterally; 2nd tergum black with medial yellow fascia sometimes extended medio-anteriorly and yellow latero-anteriorly; 3rd to 4th terga mostly yellow with sublateral black maculae, black medial vittae continuous posteriorly and laterally, and brownish posterior fascia; 5th tergum yellow with sub-lateral black vittae and medial black vitta variable, sometimes as a cross shape. Male genitalia: surstylus broader apically than basally, with scattered short setae, a little longer on dorsal surface; postanal process not distinct; aedeagus enlarged, prominent dorsally and with some projections ventrally; superior lobe somewhat trapezoid with scattered hairs, longer along ventral margin (Figs. 53–55).

Female. Similar to male except for the frons black, white pollinose, yellow pilose. Anepisternum with a few short piles.

Female genitalia: 9th tergum with not distinct black macula; epiproct somewhat elliptical; cercus slender; hypoproct somewhat rounded, pointed on posterior apex; 9th sternum as in Fig. 108; two somewhat elliptical spermathecae similar in size (Figs. 107–109).

Length. Body 6.8–7.2 mm, wing 5.5–5.8 mm.

Discussion. *Toxomerus lacrymosus* is very similar to *Toxomerus musicus* with a few morphological differences. The characters to distinguish them are the microtrichia distribution on wing, the genitalia morphology and numbers of spermathecae on the feamale.

Type material examined. Syntype. BRAZIL. *Mesograpta? lacrymosa*, ♂ & ♀, Ex. Coll. Bigot (OXUM).

Other material examined. BRAZIL. **Amazonas:** Manaus, ♀, 9/XII/1959, Elias and Roppa (MNRJ); Urucurituba, ♂, X/1969, Exp. Perm. Amaz. (MZSP); Parintins, 2 ♂, XI/1969, Exp. Perm. Amaz. (MZSP). **Pará:** Belém, ♂, 26/III/1970, J. M. & B. A. Campbell (CNC); Oriximiná, 2 ♂, IX/1969, Exp. Perm. Amaz. (MZSP); Trombetas, 2 ♂, X/1969, Exp. Perm. Amaz. (MZSP). **Pernambuco:** Caruaru, ♀, IV/1972, M. Alvarenga (MNRJ). **Goiás:** Rio das Almas, ♂, V/1938, F. Lane (MZSP); Jaraguá, ♀, VI/1942, F. Lane (MZSP). **Brasília:** D. F., 4 ♂, 3/III/1970, J. M. & B. A. Campbell (CNC). **Mato Grosso:** Poconé, ♀, I/1951, Valette (MZSP). **Minas Gerais:** Brumadinho, ♂, 20/III/1999, D. Pamplona (MNRJ); Serra do Cipó, 3 ♀, Aires (MNRJ); Lassance, ♂, 20–31/I/1939, Martins, Lopes and Mangabeira (CNC). **Rio de Janeiro:** Saquarema, ♂, 29/V/1999, Lamas C. J. E. (MNRJ); Estrada Rio-São Paulo, 3♂, 3♀, 8/I/1945, 15/I/1945, 17/I/1945, 24/I/1945, B. Ramos (MNRJ). **São Paulo:** Santo Amaro, 3 ♀, XI/1950, J. Lane (MZSP); **Santa Catarina:** Rio das Antas, ♂, I/1953, Camargo (MZSP). Nova Teutônia, 3 ♂, IV/1996, F. Plaumann (CNC).

Geographical record. Widespread Neotropical, from Mexico to southern Brazil.

Toxomerus laenas (Walker)

(Figs. 30, 56, 57, 58, 110, 111, 112)

Syrphus barbulus Walker, 1852: 238 (descr.); Kertész, 1910: 107 (cat.).

Syrphus laenas Walker, 1852: 241 (descr.); Kertész, 1910: 117 (cat.).

Mesogramma nitidiventrif Curran, 1930: 9 (descr.); 1934: 398 (key).

Mesogramma vitrea Hull, 1941b: 45 (descr.).

Mesogramma barbula Hull, 1943a: 10 (n. comb.).

Mesogramma laenas Hull, 1943a: 10 (n. comb.); 1943b: 16, 40 (key and ill.).

Mesograpta barbula Fluke, 1956: 218 (cat.).

Mesograpta laena Fluke, 1956: 224 (cat.).

Mesograpta nitidiventrif Fluke, 1956: 226 (cat.).

Mesograpta vitrea Fluke, 1956: 233 (cat.).

Toxomerus barbulus Thompson *et al.*, 1976: 48 (cat. & n.comb.), **syn. nov.**

Toxomerus laenus Thompson *et al.*, 1976: 51 (cat. & n. comb.).

Toxomerus nitidiventris Thompson *et al.*, 1976: 53 (cat. & n. comb.), **syn. nov.**

Toxomerus vitreus Thompson *et al.*, 1976: 56 (cat. & n. comb.), **syn. nov.**

Male. Head: face 1/3 as long as eye width, yellow, sometimes with black medial vitta, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum brownish to black; proepisternum black, white pollinose; proepimeron black; scutum black, bronze pollinose except for two lateral and one medial bluish-white pollinose vitta, white pilose; scutellum black, white pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black anterior 2/3, yellow pilose dorsally, and yellow posterior 1/3, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black; methatoracic pleuron black; metasternum black; halter yellow. Legs: coxae black, yellow pilose; trochanters yellow to brownish, yellowish pilose; femora black, yellow on basal and apical extremities, yellow and black pilose; tibiae brown, yellow and black pilose; protibia sometimes yellow with black annulus on medial 1/3; tarsi brown, brown pilose; mesotarsus black pilose ventrally. Wing: hyaline to brownish, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula as broad as cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum all black; 2nd tergum all black; 3rd to 5th terga all black or 3rd tergum black and 4th and 5th terga orange (Fig. 30). Male genitalia: surstylus almost as long as epandrium, with scattered short setae; postanal process little distinct; aedeagus slender dorsally; superior lobe somewhat triangular with setae medio-ventrally and scattered hairs (Figs. 56–58).

Female. Similar to male except for the frons black, white pollinose, yellow pilose. Anterior anepisternum bare.

Female genitalia: 9th tergum with not distinct black macula; cercus slender; hypoproct somewhat oval; 9th sternum as Fig. 111; three rounded spermatecae similar in size (Figs. 110–112).

Length. Body 6.0–7.0 mm, wing 5.0–5.5 mm.

Discussion. The synonymies were based on the examination of the male holotype of *Mesogramma nitidiventris*, male holotype of *Mesogramma vitrea*, male holotype of *Syrphus laenas* and female syntype of *Syrphus barbulus*. The postpronotum black is an external character that helps to identify this species. *Toxomerus barbulus* and *Toxomerus laenas* were described at the same paper (Walker 1852). *T. laenas* was chosen as senior synonym, based on the reason the description belongs a male specimen.

Type material examined. Holotype. BRAZIL. *Syrphus laenas*, male (BMNH).

Other material examined. PARAGUAY. Villarrica: 2 ♂, VIII/1937, F. Schade (USNM); ♀, IX/1937, F. Schade (USNM). BRAZIL. **Goiás:** Formosa, 2 ♀, 25/IV/1972, L. Knutson (USNM). **Brasília:** National Park, 2 ♀, 23/IV/1972, L. Knutson (USNM); Distrito Federal, ♂ & ♀, 24/IV/1972, L. Knutson (USNM); ♂ & ♀, 4–5/X/1974, L. Knutson (USNM). **Minas Gerais:** Viçosa, ♂, 13/X – 1/XI/1985, T. J. Henry & S. P. Fiuza F. (USNM); Lagoa Santa, 2 ♂, 18/I/1977, L. Knutson (USNM). **São Paulo:** Cantaneira, ♂, VII-45, J. Lane (MZSP); Boracea, ♀, VI-1947, Rabello (MZSP), ♀, IX-1947, J. Lane; Severínia, ♂, XII-1940, A. G. Silva; Salesópolis, 5 ♂ & 2 ♀, 14–19/X/1970, J. W. Boyes & J. H. Guimarães (CNC); Campininha, 3 ♂ & ♀, 23–28/X/1970, J. W. Boyes (CNC). Rio Claro, ♀, 14/I/1977, L. Knutson (USNM); Piracicaba, ♂, 11/I/1977, L. Knutson (USNM); Bocaina, 3 ♂, V/1951, III/1954, Dalcy & R. Barros (MNRJ); Cajurá, ♂, X/1954, M. P. Barreto (MZSP). **Paraná:** Curitiba, ♂ & ♀, J. W. Boyes (CNC). Foz do Iguaçu, ♀, 19/VII/1961, N. L. H. Krauss (USNM). **Santa Catarina:** Nova Teutônia, 4♂, 2 ♀, 23/III/1960, I/1970, F. Plaumann (CNC); ♂, V/1970, F. Plaumann (USNM); 13 ♂ & 3 ♀, V/1970, F. Plaumann (MZSP).

Geographical record. South America, southern Brazil and Paraguay.

***Toxomerus minutus* (Wiedemann)**

Syrphus minutus Wiedemann, 1830: 146 (descr.); Williston, 1886: 312 (cat.).

Mesogramma minuta Schiner, 1868: 347.

Mesograpta minuta Osten Sacken, 1875: 49 (cat.).

Toxomerus minutus Kertész, 1910: 148 (cat. & n. comb.); Thompson *et al.*, 1976: 52 (cat.); Thompson, 1981: 102.

Diagnosis. Scutum black except yellow laterally; scutellum yellow. Pro and mesofemora yellow, metafemur yellow with black annulus; tibiae yellow. Abdomen yellow with posterior borders of all terga brown. Length. Body 5.0 mm.

Discussion. The characters presented here are based on the original description because no specimens was examined. Although the diagnosis very brief, it suggests some color similarities with *T. duplicatus*. Some notes from Cuba and Puerto Rico refer to *T. watsoni* or *T. difficilis* (Thompson 1981).

Geographical record. Central America to South America.

***Toxomerus mosaicus* sp. nov**

(Figs. 1, 8, 15, 31, 59, 60, 61, 113, 114, 115)

Male. Head: face 1/3 as long as eye width, shiny yellow, sparsely white pollinose and pilose laterally (Fig. 1); gena brown; frontal triangle yellow, white pilose; vertical triangle narrow, elongate, black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, dull pollinose, yellow pilose; supracoxal yellow macula present; scutum black except broadly yellow laterally, bronze pollinose except for greyish pollinose medial vitta, yellow pilose; scutellum brown with yellow margins or all brownish, black pilose; anepisternum black except yellow posterior 1/2, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black, yellow dorsomedially; plumula yellow; calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black; methatoracic pleuron yellow; metasternum brown; halter yellow (Fig. 8). Legs: pro- and mesolegs yellow except coxae black; yellow pilose except as follow, profemur black pilose on 1/3 dorsoapical, mesofemur black pilose; metacoxa yellow, yellow pilose; metafemur yellow, black pilose; metatibia yellow, yellow and black pilose, metatarsus brown dorsally and yellow ventrally, black pilose dorsally and yellow pilose ventrally. Wing: hyaline, extensively microtrichose; bare only: on basal 1/3 of cell C, basal 1/6 of cell R1, basal 2/3 of cell R and basal 2/3 of cell BM; alula broad, broader than cell Bm apically, microtrichose (Fig. 15).

Abdomen: 1st tergum black except narrowly yellow basolaterally, yellow pilose; 2nd tergum black except yellow cross medially with not connected transversal strip, yellow pilose; 3rd to 5th tergum black with different shapes of yellow macula, black pilose; sterna yellow, yellow pilose (Fig. 31). Male genitalia: surstylus almost all with the same width, with long bristles on dorsal surface; postanal process 3/4 as long as surstylus; aedeagus enlarged, prominent dorsally and ventrally; superior lobe somewhat rectangular, forked dorsally, with erect bristles in distad anterior margin and scattered hairs (Figs. 59–61).

Female. Similar to male except for normal the frons black, bronze pollinose, black pilose; fronto-orbital plate. black on 1/3 superior and yellow on 2/3 inferior, bronze pollinose, black pilose. Anterior anepisternum bare. Female genitalia: 9th tergum with almost pentagonal black macula basomedially; epiproct reduced; cercus slender; hypoproct with ogive-like shape; 9th sternum with deep median scavation on anterior margin; two spermatecae rounded, with the same size (Figs. 113–115).

Length: body 8.3–9.5 mm. Wing 6.9–8.3 mm.

Discussion. *Toxomerus mosaicus* is a large species, morphologically similar to *T. undecimpunctatus*, both having similar male genitalia, but the new species differs from *T. undecimpunctatus* in having a longer

postanal process and different abdominal pattern, reminding a mosaic. Material of this species was found in various collections identified by Hull as *T. fragmentaria* Hull, but there is no paper about that.

Etymology: The term *mosaicus* comes from the Greek word mouseîn that means small pieces with many shapes to form some design. *T. mosaicus* has some small yellow macula on abdomen reminding the mosaic pieces.

Type material. Holotype. BRAZIL. **Santa Catarina:** Nova Teutônia, male, VI/1964, F. Plaumann (USNM). Paratypes. BRAZIL. **Santa Catarina:** Nova Teutônia, 2 ♂ & ♀, V/1970, F. Plaumann (USNM); ♀, IV/196_, F. Plaumann (CNC); 4 ♀, V/1970, F. Plaumann (MZSP); ♂, III/1971, F. Plaumann (MZSP); **Rio Grande do Sul:** Rio Pardo, ♂, 09/IV/2003, Marcel G. Hermes (MNRJ).

Geographical record. Southeastern Brazil.

Toxomerus musicus (Fabricius)

(Figs. 32, 116, 117, 118)

Scaeva musica Fabricius, 1805: 253 (descr.).

Syrphus musicus Wiedeman, 1830: 143 (redescr.); Williston, 1886: 312 (cat.).

Mesogramma musica Schiner, 1868: 347 (n. comb.); Curran, 1930: 4 (key); 1934: 401 (key); Hull, 1943b: 6, 30 (key & ill.).

Mesograpta musica Williston, 1888: 265 (note); Fluke, 1956: 223 (cat.).

Toxomerus musicus Kertész, 1910: 148 (cat. & n. comb.); Thompson *et al.*, 1976: 52 (cat.); Thompson, 1981: 70 (key).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, white pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow, yellow pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black on anterior 1/2, bare, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow, except metaepisternum brown; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 1/3; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; tibiae yellow, yellow pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus brown, black pilose. Wing: hyaline to brownish, usually all microtrichose; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally 2nd tergum black with medial yellow fascia and medial yellow vitta; 3rd to 4th terga mostly yellow with sublateral black maculae, black medial vittae continuous posteriorly and laterally, and brownish posterior fascia; 5th tergum yellow with sub-lateral black vittae and medial black vitta (Fig. 32). Male genitalia: surstylus all with the same width, with scattered long setae; postanal process almost 2/3 as long as surstylus; aedeagus enlarged, prominent dorsally and with some projections ventrally; superior lobe somewhat rectangular, forked dorsally, with erect setae in distad anteroventral margin and scattered hairs, with small lobe posteroventrally.

Female. Similar to male except for the frons black, white pollinose, black pilose. Anterior anepisternum bare.

Female genitalia: 9th tergum with two stick black macula; epiproct somewhat trapezoid; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 117; three elliptical spermatecae, one of them smaller

(Figs. 116–118).

Length. Body 7.0–7.5 mm, wing 5.6–6.0 mm.

Material examined. BRAZIL. **Amazonas:** B. Constantino, ♀, V/1950, J. C. M. Carvalho (MNRJ). **Mato Grosso:** Sinop, ♀, III/1976, Alvarenga and Roppa (MNRJ). **São Paulo:** Praia Grande, ♂, I/1945, M. Carrera (MZSP); Campos do Jordão, ♂, 31/I/1938, Trav. F. & N. Santos (MNRJ). **Santa Catarina:** Nova Teutônia, 14 ♂ & 5 ♀, V/1970, F. Plaumann (MZSP).

Geographical record: Widespread, from Mexico to southern South America.

Toxomerus norma (Curran)

(Figs. 33, 119, 120, 121)

Mesogramma norma Curran, 1930: 10 (descr.); 1934: 399 (key); Hull, 1943b: 13, 29 (key & ill.).

Mesogramma mulio Hull, 1941c: 311 (descr.); 1943b: 6, 29 (key & ill.).

Mesograpta norma Fluke, 1956: 227 (cat.).

Mesograpta mulio Fluke, 1956: 226 (cat.).

Toxomerus norma Thompson *et al.*, 1976: 53 (cat. & n. comb.).

Toxomerus mulio Thompson *et al.*, 1976: 52 (cat. & n. comb.); Metz & Thompson, 2001: 228, 238 (key & redescr.), **syn. nov.**

Diagnosis. Face 1/2 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum yellow, black pilose; anepimeron brown, yellow dorsomedially. Pro and mesofemora yellow, metafemur yellow with black annulus; pro and meso tibiae yellow, metatibia yellow to brownish. Wing extensively microtrichose; alula broader than cell BM apically, microtrichose. Abdomen with 3rd and 4th terga entirely yellow on basal 2/3 which sometimes contain two small medial brown to black spots (Fig. 33). Surstylus broader apicad; postanal process 3/4 as long as surstylus; aedeagus enlarged, prominent dorsally; superior lobe somewhat quadrangular with short posterodorsal extension, forked distad, with scattered hairs, and setae longer along ventral margin.

Female genitalia: 9th tergum somewhat a heart shape black macula; epiproct slender; cercus slender; hypoproct as an rounded arch; 9th sternum as in Fig. 120; three elliptical spermatecae similar in size (Figs. 119–121).

Length. Body 8.2–10.0 mm, wing 6.3–7.6 mm.

Discussion. The synonymies were based on the examination of the male holotypes of *Mesogramma mulio* and *Mesogramma norma*.

Type material examined. Holotype. PANAMA. Corozal: *Mesogramma norma*, male, 16/I/1929, C. H. Curran (AMNH).

Other material examined. MEXICO. Cordoba: ♂, 17/XII/1967, Fredk Knab (USNM); ECUADOR. **Napo:** Santa Cecilia, ♀, 17/V/1967, Ashley B. Gurney (USNM); VENEZUELA. **Aragua:** Ocumare de La Costa, ♀, 10–11/VI/1976, A. S. Menke & D. Vincent (USNM); 2 ♂, 12/VI/1976, A. S. Menke & D. Vincent (USNM); **Zulia:** Puerto de Cata 2 ♂, 10–11/VI/1976, A. S. Menke & D. Vincent (USNM); PARAGUAY. Villarrica: ♂, IX/1938, F. Shade (USNM); BRAZIL. **Pará:** Belém, ♀, 1/VI/1967, Y. Sedman (USNM); Araguaia, ♂, VII/1959, M. Alvarenga (DZUP). **Pernambuco:** Caruaru, ♀, VII/1974 (MZSP). **São Paulo:** Barueri, ♂, 23/III/1957, K. Lenko (USNM). **Paraná:** Curitiba, ♀, IV/1976, H. S. Telford (DZUP).

Geographical record. Widespread, from Mexico to southern South America.

Toxomerus papaveri sp. nov

(Figs. 9, 16, 20, 34, 62, 63, 64, 122, 123, 124)

Male.Head: face 1/2 as long as eye width, shiny yellow, sparsely white pollinose laterally, yellow pilose

laterally; gena brownish yellow; frontal triangle yellow, black and white pilose; vertical triangle narrow, elongate, black, brownish-black pollinose except shiny posterior to ocellar triangle, black pilose; occiput black, pale yellowish bronze pollinose, with thick white pile on ventral 1/2, with thin yellow pile dorsally, with a short row of black pile superiorly; antenna orange, black pilose; arista brown.

Thorax: postpronotum yellow, proepisternum black, dull pollinose, yellow pilose; supracoxal yellow macula present; scutum black except broadly yellow laterally, bronze pollinose except for greyish pollinose medial vitta, yellow pilose; scutellum yellow, dull, black pilose; anepisternum black except yellow posterior 1/2, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; katepimeron yellow on anterior 1/2, black posteriorly; plumula yellow; calypter yellow with yellow fringe except black fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black; metathoracic pleuron yellow; metasternum yellow; halter yellow (Fig. 9). Legs: pro- and mesolegs yellow except coxae black, yellow pilose; metacoxa yellow, yellow pilose; metafemur yellow except brown subapical annulus, yellow pilose except black pilose on ventroapical 3/4 and apical 1/4; metatibia yellow, black pilose on basal 1/2, yellow pilose apically; metatarsus brown, black pilose (Fig. 20). Wing: hyaline, extensively bare, microtrichose only: on apical 1/6 of cell R1, apical 2/3 of cell R2+3, apical 3/4 of cell R4+5, apical 1/2 of cells DM and Cu1, and on anal lobe; alula broad, as broad as cell BM apically, microtrichose (Fig. 16).

Abdomen: 1st tergum yellow except narrowly black apically, yellow pilose except narrowly black pilose on apicomedial margin; 2nd tergum yellow except brownish black on apical 1/3, yellow pilose except black pilose apically; 3rd tergum yellow except brownish black apical 1/3, with small basomedial black punctum, black pilose; 4th tergum yellow except brownish black apical 1/3, with small basomedial black punctum which is connected to apical dark area by dark submedial vitta, black pilose; 5th tergum yellow except with large basomedial black elongate triangular macula on basal 1/3, black pilose; sterna yellow, yellow pilose (Fig. 34). Male genitalia: surstylus broader on medial 1/3; postanal process 1/3 as long as surstylus; aedeagus all enlarged; superior lobe somewhat rounded with short anterior extension, with scattered hairs, longer on anterior margin (Figs. 62–64).

Female. Similar to male except for normal the frons black, bronze pollinose, black pilose; fronto-orbital plate. black on 1/3 superior and yellow on 2/3 inferior, bronze pollinose, black pilose. Anterior anepisternum bare. Female genitalia: 9th tergum with triangular black macula medially; epiproct reduced; cercus slender; hypoproct somewhat triangular; 9th sternum somewhat quadrangular; three spermatecae elliptical, with the same size (Figs. 122–124).

Length: body 6.5–7.5 mm. Wing 5.0–6.0 mm.

Discussion. *Toxomerus papaveroi* is very similar to *T. duplicatus* and *T. paraduplicatus*, but differs from them in having a supracoxal yellow macula present, more extensively bare wing and distinct male genitalia.

Etymology: This species is named after Nelson Papavero, in recognition of his contribution to our knowledge of the Neotropical Diptera fauna.

Type material. Holotype. BRAZIL. **Santa Catarina:** Nova Teutônia, male, XI/1969, F. Plaumann (CNC). Paratypes. ARGENTINA. **Catamarca:** El Pintado, S. La Vina, ♂, 27–29/IX/1968, L. Pena (CNC). PERU. **Loreto:** San Antonio, ♂ & 2♀, 11/VIII/1965, 12/VIII/1965, J. C. Hitchcock, Jr. (USNM).

Geographical record. Southeastern Brazil, Argentina and Peru.

***Toxomerus paraduplicatus* sp. nov.**

(Figs. 10, 17, 21, 35, 65, 66, 67, 125, 126, 127)

Male. Head: face 1/2 as long as eye width, shiny yellow, sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, yellow pilose; vertical triangle narrow, elongate, black, bronze pollinose, black pilose; occiput black, pale yellowish bronze pollinose, with thick white pile on ventral 1/2, with yellow pile

dorsally, with a short row of black pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, dull pollinose, yellow pilose; supracoxal yellow macula absent; scutum black except broadly yellow laterally, bronze pollinose except for greyish pollinose medial vitta, yellow pilose; scutellum yellow, black pilose; anepisternum black except yellow posterior 1/2, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron yellow on anterior 1/2 or more, black posteriorly; plumula yellow; calypter yellow with yellow fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black; methatoracic pleuron yellow; metasternum brown; halter yellow (Fig. 10). Legs: pro- and mesolegs yellow except coxae black; yellow pilose except as follow, profemur black pilose on 1/3 dorsoapical, mesofemur black pilose; metacoxa yellow, yellow pilose; metafemur yellow, black pilose; metatibia yellow, yellow and black pilose, metatarsus brown, black pilose (Fig. 21). Wing: hyaline, all microtrichose; alula narrow, as broad as cell BM basally, microtrichose (Fig. 17).

Abdomen: 1st tergum yellow except narrowly black apically, yellow pilose except narrowly black pilose on apicomedial margin; 2nd tergum yellow except brownish black on 1/3, yellow pilose, except black pilose apically; 3rd tergum yellow except brownish black apical 1/3, with small basomedial black punctum, black pilose; 4th tergum yellow except brownish black apical 1/3, with small basomedial black punctum which is sometimes connected to apical dark area by dark submedial vitta, black pilose; 5th tergum yellow except with large basomedial black elongate triangular macula on basal 1/3, black pilose; sterna yellow, yellow pilose (Fig. 35). Male genitalia: surstylus rounded apicad; postanal process 1/3 as long as surstylus; aedeagus not so enlarged, prominent dorsally with ventral projection; superior lobe somewhat trapezoid with short dorsal extension, forked distad, with scattered hairs, with small lobe dorsally with hairs. (Figs. 65–67).

Female. Similar to male except for normal the frons black, bronze pollinose, black pilose; fronto-orbital plate black on 1/3 superior and yellow on 2/3 inferior, bronze pollinose, black pilose. Female genitalia: 9th tergum with T-shape black macula medially; epiproct slender; cercus slender; hypoproct triangular; 9th sternum broad, somewhat quadrangular; three spermatecae rounded, with the same size (Figs. 125–127).

Length: body 7.0–7.5 mm. Wing 6.5–7.0 mm.

Discussion. *T. paraduplicatus* is similar to *T. duplicatus* differing mainly on the microtrichia pattern of wing and on genitalia morphology. In general *T. paraduplicatus* species are smaller than *T. duplicatus*.

Etymology: The name of this species, an adjective, is derived from *duplicatus*, because of the similarity between these species.

Type material. Holotype. BRAZIL. São Paulo: Salesópolis, ♂, 14–19/X/1970, J. W. Boyes & J. H. Guimarães (CNC). Paratypes: BRAZIL. São Paulo: Salesópolis, 2 ♂, 14/VIII/1947, E. Rabello & Trav. F. & J. Lane (CNC); 3 ♂ & 3 ♀, 14–19/X/1970, J. W. Boyes & J. H. Guimarães (CNC); Campos do Jordão, ♂, III/1945, Wygodzinsky (CNC); ♂, XII/1945, J. Lane (CNC); Cotia, ♂, IX/1945, J. Lane (CNC); Fazenda Pau D'Alho, ♂, 28–29/X/1972, R. V. Peterson (CNC); S. Bocaína, ♂ & ♀, V/1951, Dalcy & Machado (MNRJ).

Geographical record. Southeastern Brazil, São Paulo state.

***Toxomerus pictus* (Macquart)**

(Figs. 128–130)

Syrphus pictus Macquart, 1842: 159 (descr.); Williston, 1886: 312 (cat.).

Mesogramma poecilogastra Loew, 1866: 159 (descr.); Giglio-Tos, 1893: 52 (syn.).

Mesogramma picta Schiner, 1868: 347; Aldrich, 1905: 371 (cat.); Curran, 1930: 3 (key); 1934: 402 (key); Hull, 1943b: 14, 30 (key & ill.).

Mesograptia poecilogastra Loew, 1872: 120 (index); Osten Sacken, 1875: 49 (cat.); 1878: 125 (cat.).

Mesograptia jaguarinus Bigot, 1884: 112 (descr.); Fluke, 1957: 154 (cat.).

Mesograptia maculata Bigot, 1884: 111 (descr.).

Mesograptia? cuprina Bigot, 1884: 114 (descr.); Thompson *et al.*, 1976: 53 (cat. & syn.).

Mesogramma maculata Williston, 1891: 28 (cat.); Hull, 1943b: 13, 30 (key & ill.).

Toxomerus pictus Kertész, 1910: 148 (cat. & n. comb.); Boyes *et al.*, 1971: 121 (carotype); Thompson *et al.*, 1976: 53 (cat.); Thompson, 1981: 93 (key).
Toxomerus jaguarinus Kertész, 1910: 147 (cat. & n. comb.); Thompson *et al.*, 1976: 52 (cat.), **syn. nov.**
Toxomerus maculatus Kertész, 1910: 147 (cat. & n. comb.); Thompson *et al.*, 1976: 52 (cat.), **syn. nov.**
Mesogramma pictus var. *melleoguttata* Hull, 1941b: 45 (descr.).
Mesogramma extrapolata Hull, 1943b: 22, 30 (descry. & ill.)
Mesograptia extrapolata Fluke, 1956: 222 (cat.).
Mesograptia picta Fluke, 1956: 228 (cat.).
Toxomerus extrapolatus Thompson *et al.*, 1976: 52 (cat. & n. comb.); Thompson, 1981: 94 (syn.).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena brown; frontal triangle yellow, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum black to brownish with yellow margins, yellow pilose, rarely with black piles on posterior margins; anterior anepisternum black, bare; posterior anepisternum black on anterior 1/2, bare, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 1/3; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia yellow except for black annulus on basal 1/3 or black on basal 2/3 and yellow on apical 1/3, yellow and black pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus brown, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow laterally; 2nd tergum black with medial yellow fascia and yellow latero-anteriorly; 3rd to 4th terga black with a lateral yellow vittae on anterior 1/3, sub-lateral arcuate yellow vittae and medial yellow vitta extending to posterior margin; 5th tergum yellow with sub-lateral black vittae and medial black vitta T-shaped. Male genitalia: surstylus narrow all with the same width, with scattered short setae, some long on dorsal surface; postanal process 1/2 as long as surstylus; aedeagus enlarged, prominent dorsally and ventrally; superior lobe somewhat rectangular, slightly forked posterodorsally, with hairs anterodorsally and in distad anteroventral margin, with small lobe posteroventrally.

Female. Similar to male except for the frons black, white pollinose, black pilose.

Female genitalia: 9th tergum with a little somewhat rounded black macula concave posteriorly; epiproct somewhat elliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 129; three elliptical spermatecae similar in size (Figs. 128–130).

Length. Body 7.0 mm, wing 5.8–6.5 mm.

Discussion. The synonymies were based on the exam of the male holotype of *Mesograptia jaguarinus*, female syntype of *Mesograptia maculata* and male holotype of *Mesogramma picta* var. *melleoguttata*, determined by Hull as variation of *Mesogramma picta*.

Type material examined. Holotype. PANAMA. Canal Zone: Barro Colorado Island, *Mesogramma picta* var. *melleoguttata*, male, 25/VIII/1937, Hull (AMNH).

Other material examined. MEXICO. **Veracruz:** Salto de Eyplanta, ♀, 20/VIII/1989, A. L. Norrbom (USNM); Balzapote, ♂ & ♀, 17/IX/1987, A. L. Norrbom (USNM). GUATEMALA. San Antonio: ♂ & ♀, 6/VII/1965, P. J. Spangler (USNM). Escuintla: 2 ♀, 10/VIII/1965, P. J. Spangler (USNM). Matias de Galvez, ♀, 14–15/VIII/1965, P. J. Spangler (USNM). HONDURAS. Tegucigalpa: ♀, 30/X/1965, N. L. H. Krauss

(USNM). EL SALVADOR. Rosario Cuzcatlan: ♂ & ♀, 19/XI/1953, M. Salazar (USNM); 3♂ & 3♀, 20/VII/1955, 23/VII/1955, 24/VII/1955, M. S. V. (USNM). NICARAGUA. *Esteli*: ♀, 22/VIII/1972, G. F. & S. Hevel (USNM). COSTA RICA. **Heredia**: La Selva, ♀, 10–14/X/1973, P. A. Opler (USNM). CUBA. Havana: ♀, I–II/1945 (USNM); Santa Clara: San Juan, ♂, I–II/1927, C. T. & B. B. Brues (USNM). JAMAICA. Moneague: ♀, I/1923, W. S. Brooks (USNM). PANAMA. **Canal Zone**: Sumit, 2 ♀, VII/1953, Krauss (USNM). PUERTO RICO. Luquillo Forest: ♀, 17/XII/1962, Paul & Phyllis Spangler (USNM). VENEZUELA. San Esteban: ♀, XI/1939, Pablo Anduze (USNM). ECUADOR. 2 ♂ & ♀, 1962 (USNM). BRAZIL. **Pará**: Belém, 11♂, 4 ♀, 15/IV–3/VI/1967, Y. Sedman (USNM); Altamira, ♀, 8–16/X/1986, P. Spangler & O. Flint (USNM). **Pernambuco**: Caruaru, ♂, IV/1972 & 2 ♀, V/1972, M. Alvarenga and J. Lima (MNRJ); **Rondônia**: Vilhena, ♀, X/1986, P. Magno & J. Becker (MNRJ); **Goiás**: Campinas, ♂, 8/II/1934 (MNRJ). **Brasília**: D. F., ♀, 3/III/1970, J. M. & B. A. Campbell (CNC). **Minas Gerais**: Lagoa Santa, 2 ♀, 18/I/1977, L. Knutson (USNM). **Espírito Santo**: Linhares, ♂ & 6 ♀, V/1972 and VII/1972, P. C. Elias (MNRJ); **Rio de Janeiro**: Tijuca, ♂, II/1974, Seabra (MNRJ); Estrada Rio São Paulo km 47, ♂, 9/V/1945, B. Ramos (MNRJ); **São Paulo**: Barueri, 2 ♂ & ♀, 3.IV.1955 (MZSP); Boraceia, ♀, IV-1946 (MZSP); ♀, 6-11/III/1948 (MZSP); Juquiá, ♂, J. Lane (MZSP); M. das Cruzes, ♀, XI/1939, Carrera (MZSP); Horto Florestal, ♂, III/1952, M. Carrera and M. d'Andretta (MZSP); **Rio Grande do Sul**: Derrubadas, ♀, 26/IV/2003, Mirian N. Morales (UNISC).

Geographical record. Widespread, from Mexico to southern South America.

Toxomerus politus (Say)

(Figs. 131–133)

Scaeva polita Say, 1823: 88 (descr.).

Syrphus politus Say, 1823: 88 (descr.); Wiedemann, 1830: 132 (redescr.); Osten Sacken, 1878: 52 (cat.).

Syrphus achoratus Macquart, 1842: 97 (descr.); Kertész, 1910: 149 (cat. & syn.).

Syrphus cingulatus Macquart, 1850: 459 (descr.); Osten Sacken, 1878: 51 (cat.); Osten Sacken, 1875: 48 (cat. & syn.);

Metz & Thompson, 2001: 240 (lectotype des.).

Mesogramma polita Loew, 1866: 157; Schiner, 1868: 347; Curran, 1930: 2 (key); Hull, 1943b: 6 (key).

Syrphus hecticus Jaenicke, 1867: 398 (descr.); Osten Sacken, 1875: 48 (cat. & syn.).

Mesogramma anchorata Schiner, 1868: 348 (redescr.).

Mesograpta anchorata Osten Sacken, 1875: 48 (cat.); 1878: 125 (cat.).

Mesograpta polita Osten Sacken, 1875: 48 (cat.); 1878: 48 (cat.); Williston, 1887: 98 (redescr.); Miskimen & Bond, 1970: 66 (econ. import.).

Toxomerus politus Kertész, 1910: 149 (cat. & n. comb.); Cotton, 1918: 291; Wolcott, 1936: 349 (note); Thompson *et al.*, 1976: 53 (cat.); Thompson, 1981: 94 (key); Metz & Thompson, 2001: 228, 240 (key & redescr.).

Mesograpta politum Fluke, 1956: 228 (cat.).

Diagnosis. Face 1/3 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum yellow, black pilose; anepimeron anterior and dorsomedial yellow, anepimeron posterior black. Femora and tibiae yellow. Wing extensively microtrichose; alula broader than cell BM apically, microtrichose. Abdomen with 3rd and 4th terga yellow on basal 2/3, with narrow black subbasal fascia connected to medial vitta to form L-shaped macula not touching the lateral margin. Surstylus almost all with the same width; postanal process 1/3 as long as surstylus; aedeagus enlarged, prominent dorsally and ventrally; superior lobe somewhat rectangular, acuminate dorsally, with hairs in distad anteroventral margin and scattered hairs, with small lobe ventrally with hairs.

Female genitalia: 9th tergum with somewhat trapezoid black macula concave posteriorly; epiproct slender; cercus slender; hypoproct as a triangular arch; 9th sternum as in Fig. 132; two elliptical spermatecae similar in size (Figs. 131–133).

Length. Body 8.1–9.5 mm, wing 6.3–7.3 mm.

Material examined. MEXICO. Mexico City: ♂, 15/IX/1923, E. G. Smyth (USNM). **Guerrero**: Iguala, 2

♂, N. H. L. Krauss (USNM). **Sinaloa**: El Alamo, 2 ♂ & 2 ♀, 27/IX/1970, D. E. Breedlove (USNM). GUATEMALA. Amatitlan: 2 ♂ & ♀, 6/VIII/1965, P. J. Spangler (USNM). EL SALVADOR. San Andres: 3 ♂ & 8 ♀, 20–25/VII/1946, E. J. Hambleton (USNM). HONDURAS. Santa Rosa: Morazan, ♂ & 2 ♀, 24VIII/1990, R. Cave (USNM). COSTA RICA. Rio la Vieja: 5 ♂ & ♀, 2–3 VII/1967, Flint & Ortiz (USNM). CUBA. Baraguá: ♂ & ♀, 30/VIII/1929, L. C. Scaramuzza (USNM). JAMAICA. South Christiana: ♂, VII/1961, J. Maldonado (USNM). VENEZUELA. **Zulia**: El Tucuco, ♂, 5–6/ VI/1976. Ar. Portachuelo Pass: 2 ♂ & 4 ♀, 16/ VIII/1967, R. W. Poole (USNM). ECUADOR. **Napo**: Limoncocha, ♂ & 8♀, 6/VI/1977 9/VI/1977, P. J. Spangler & D. R. Givens (USNM). PERU. **Loreto**: San Antonio, ♀, 14/IX/1965, J. C. Hitchcock (USNM). BRAZIL. **Pará**: Belém, ♂, 2/IV/1967, Y. Sedman (USNM). **Goiás**: Anápolis, ♀, XII/1935 (MNRJ); **Brasília**: Distrito Federal, ♂ & 4 ♀, III/1952, A. G. Silva (MNRJ); **Minas Gerais**: Serra do Cipó, ♀, 6/XI/1939, Monte, Ribeiro, Lopes & Tupinambá (MNRJ); Lassance, ♀, 20–31/I/1936, Martins, Lopes & Mangabeira (MNRJ); **Espírito Santo**: Vitória, 2 ♂, M. Leitão (MNRJ); **Rio de Janeiro**: Floresta da Tijuca, ♀, III/1961, N. L. H. Krauss (USNM); Tijuca, ♀, III/1974, Seabra (MNRJ); Friburgo, 3 ♂ & 3 ♀, II/1932 & ♂ & 6 ♀, II/1933, M. Leitão (MNRJ); Teresópolis, ♀, I/1940, Trav. and Freitas (MNRJ); Petrópolis, 3 ♀, IV/1924 & ♀, II/1956, D. Albuquerque (MNRJ); Itatiaia, ♀, 9–10/III/1951, D. Albuquerque (MNRJ); **São Paulo**: Emas, ♀, XII/1936, N. Santos (MNRJ); Ubatuba, ♀, 31/III/1962, K. Lenko (MZSP); Ilha Seca, ♀, 18–26/II/1940 (MNRJ); Santo Amaro, ♀, III/1954, J. Lane (MNRJ); Caraguatuba, ♀, 22/V.I.VI/1962 (MZSP); A. Alvim, ♂, II/1945, J. Lamosa (MZSP); Ypiranga, ♂, 7/III/1936 & ♀, I/1934, Lange (MZSP); ♀, 22/II/1936, Morretes (MNRJ); Monte Alegre, 2 ♂, 25/III/1944, J. L. Lima (MZSP); Juquiá, ♀, J. Lane (MZSP); Onda Verde, ♀, I/1946, J. Lane (MZSP); Japurá, ♀, I/1945, W. F. Almeida (MZSP); Bocaína, ♀, III/1954, D. R. Barros (MNRJ); Campos do Jordão, ♀, 31/I/1936, N. Santos (MNRJ); **Santa Catarina**: Rio das Antas, ♀, I/1953, Camargo (MZSP); Nova Teutônia, 10 ♂ & 6 ♀, I/1965, F. Plaumann (USNM). **Rio Grande do Sul**: Santa Cruz do Sul, ♂ & ♀, 09/IV/2003, Marcel G. Hermes (UNISC); ♂, 27/VIII/2002, M. N. Morales (UNISC); Derrubadas, ♀, 26/IV/2003, M. N. Morales (UNISC).

Geographical record. Widespread in New World.

***Toxomerus polygraphicus* (Hull)**

(Figs. 36, 68, 69, 70, 134, 135, 136)

Mesogramma polygraphica Hull, 1940a: 249 (descr.); 1943b: 10, 30 (key & ill.).

Mesograptapolygraphica Fluke, 1956: 228 (cat.).

Toxomerus polygraphicus Thompson *et al.*, 1976: 54 (cat. & n. comb.).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, black pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, white pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow or brownish with yellow margins, yellow and black pilose; anterior anepisternum black, sparsely yellow pilose; posterior anepisternum black on anterior 1/2, bare, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron brownish to black; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia yellow, slightly brownish on basal 1/2, yellow pilose; pro- and

mesotarsi yellow to brownish, yellow pilose; metatarsus brown black, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia interrupt medially, sometimes with brownish-orange fascia anteriorly and posteriorly; 3rd to 4th terga black with a lateral trapezoid yellow vittae on anterior 1/3, two sub-lateral yellow maculae and medial yellow vitta extending to posterior margin; 5th tergum black with arcuate lateral yellow vittae and medial yellow maculae (Fig. 36). Male genitalia: surstylus slightly pointed at apex, with scattered short setae, some long on dorsal surface; postanal process 1/2 as long as surstylus; aedeagus prominent dorsally and with some projections ventrally; superior lobe somewhat rounded ventrally with short dorsal extension, slightly forked distad, with setae along ventral margin, with small lobe posteriorly with hairs (Figs. 68–70).

Female. Similar to male except for the frons black, bronze pollinose, yellow pilose. Anterior anepisternum with rare short piles.

Female genitalia: 9th tergum with two stick black macula; epiproct somewhat semielliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 135; three oval spermatecae similar in size (Figs. 134–136).

Length. Body 7.5–8.5 mm, wing 6.5–7.5 mm.

Type material examined. Holotype. BRAZIL. **São Paulo:** Batea, *Mesogramma polygraphica*, female, IX–37, J. Lane (CNC).

Other material examined. BRAZIL. **Paraná:** Curitiba, ♂, 12/II/1976, H. S. Telford (UFPR); ♂, IV/1976, H. S. Telford (UFPR); **Santa Catarina:** Nova Teutônia, ♂, 5 ♀, 6/VII/1936, 15/III/1937, 30/III/1960, 1/IV/1960, I/1970, F. Plaumann (CNC); 9 ♂ & 6 ♀, V/1970, XI/1970, F. Plaumann (MZSP).

Geographical record. Peru to southern Brazil.

Toxomerus procrastinatus Metz

(Figs. 137–139)

Toxomerus procrastinatus Metz & Thompson, 2001: 228, 242 (key & descr.).

Diagnosis. Face 1/3 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum brown with yellow margins or all brownish, black pilose; anepimeron brownish. Pro and mesofemora yellow, metafemur yellow on basal 1/3 and brown on apical 2/3; pro and meso tibiae yellow, metatibia brownish. Wing extensively microtrichose; alula broader than cell BM apically, microtrichose. Abdomen with yellow maculae on 3rd and 4th terga narrow. Surstylus a little concave apically, in lateral view; postanal process 1/3 as long as surstylus; aedeagus enlarged, slightly prominent dorsally; superior lobe somewhat rounded with dorsal extension, with scattered hairs, longer along anteroventral and ventral margin, with small lobe medio-dorsal with hairs.

Female genitalia: 9th tergum with a somewhat “U” shape black macula; epiproct elliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 138; three oval spermatecae similar in size (Figs. 137–139).

Length. Body 9.6–11.5 mm, wing 8.2–9.6 mm.

Type material examined. Paratypes. PARAGUAY. Ybycui: Ybycui National Park, ♂, 12–24/IV/1980, P. J. Spangler *et al.* (USNM). BRAZIL. **Rio de Janeiro:** Nova Friburgo, ♂, 1–31/I/1965, Gred & Guimarães (USNM); Itatiaia, ♀, IV/1945, Barreto (USNM); ♂, I/1948, C. d’Andretta (USNM). **São Paulo:** Cantareira, ♂, XI/1946, Barreto (USNM); ♂, XI/1946, M. Carrera (USNM); Santo Amaro, 3 ♂, X/1962, J. Lane (USNM); Coqueiros, ♀, 10/I/1954, E. Rabello (USNM); Rio Claro, ♂, I/1977, N. Papavero (USNM); H.

Florestal, ♂, XII/1951, L. Trav. (USNM); Osasco, ♂, V/1956, F. Lane (USNM); Guapiara, ♀, 6/III/1958, K Lenko (USNM); Campos do Jordão, 3♂, ♀, 18/XI/1957, 20/XI/1957, 23/XI/1957, 26/XI/1957; K. Lenko (USNM), 5 ♂, 6 ♀, 23/IX/1962, 21/X/1962, L. Silva & E. Dente (USNM); Bocaina, ♀, 4/XI/1965, F. M. Oliveira (USNM); **Santa Catarina**: Nova Teutônia, 43 ♂, 9 ♀, VI/1964, IX/1964, X/1964, , XII/1964, , I/1970, V/1970, XI/1971, V/1972, F. Plaumann (USNM); ARGENTINA. **Misiones**: San Antonio, ♂, XII/1973, M. Fritz (USNM).

Other material examined. BRAZIL. **Espírito Santo**: Santa Tereza, ♂, II/1972, H. Ebert (MNRJ). **Rio de Janeiro**: Itatiaia, ♂, Travassos & Dalcy (MNRJ). **São Paulo**: Bocaina, 2 ♂ & 2 ♀, XI/1969, Alvarenga & Seabra (MNRJ); ♀, F. M. Oliverira (MNRJ).

Geographical record. Southeastern Brazil to Paraguay and Argentina.

***Toxomerus productus* (Curran)**

(Figs. 18, 140, 141, 142)

Mesogramma producta Curran, 1930: 5 (descry. & key); 1934: 24 (key); Hull, 1943b: 14, 32 (key and ill.).

Mesogramma triradiata Hull, 1942: 48 (descr.); 1943b: 7, 33 (key and ill.).

Mesogramma camilla Hull, 1951a: 20 (descr.).

Mesogramma cyrilla Hull, 1951a: 9 (key).

Mesogramma vanessa Hull, 1951a: 15 (descr.).

Mesograpta camilla Fluke, 1956: 220 (cat.).

Mesograpta cyrilla Fluke, 1956: 221 (cat.).

Mesograpta producta Fluke, 1956: 229 (cat.); Etcheverry, 1963: 61 (distribution).

Mesograpta triradiata Fluke, 1956: 231 (cat.).

Mesograpta vanessa Fluke, 1956: 232 (cat.).

Toxomerus productus Gerdes, 1975: 16 (ill.); Thompson *et al.*, 1976: 53 (cat. & n. comb.).

Toxomerus triradiatus Thompson *et al.*, 1976: 53 (cat. & n. comb.), **syn. nov.**

Toxomerus cyrillus Gerdes, 1975: 16 (ill.); Thompson *et al.*, 1976: 53 (cat. & n. comb.), **syn. nov.**

Toxomerus camilla Thompson *et al.*, 1976: 49 (cat. & n. comb.), **syn. nov.**

Toxomerus vanessa Thompson *et al.*, 1976: 56 (cat. & n. comb.), **syn. nov.**

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, white and bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron usually yellow; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow, black pilose; anterior anepisternum black, sparsely yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior and dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum yellow posterodorsally; methatoracic pleuron yellow; metasternum yellow to brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose, mesotibia yellow and black pilose; metatibia yellow, brown on medial 1/3, black pilose; pro- and mesotarsi yellow, protarsus yellow pilose, mesotarsus black pilose; metatarsus brown to black, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose (Fig. 18).

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd

tergum black with medial yellow fascia; 3rd to 4th terga black with yellow fascia on anterior 1/2 with two medial black macula; 5th tergum yellow with black macula medially. Male genitalia: surstylus broader and somewhat triangular apically, with scattered short setae; postanal process almost 3/4 as long as surstylus; aedeagus slender dorsally with some projections ventrally; superior lobe somewhat rectangular with short dorsal extension, forked distad, with long hairs along anteroventral margin and strong setae ventrally, with small prominence medio-posteriorly with hairs.

Female. Similar to male except for the frons black, bronze pollinose, black pilose. Anterior anepisternum bare. Female genitalia: 9th tergum with somewhat triangular black macula; epiproct slender; cercus slender; hypoproct somewhat triangular, little convex anteriorly; 9th sternum as in Fig. 141; three oval spermatecae similar in size (Figs. 140–142).

Length. Body 6.5–8.0 mm, wing 5.5–6.5 mm.

Discussion. Gerdes (1975) indicated that the male genitalia of *Toxomerus productus* and *Toxomerus cyrillus* were identical and suggested that the names were synonyms. Based on this work the male holotype, female allotype and male paratype of *Mesogramma cyrilla* and male holotype of *Mesogramma productus* were compared and the synonymies were confirmed. The same comparison has done with the male holotype and female allotype of *Mesogramma Camilla*.

Type material examined. Holotype. ECUADOR. *Mesogramma productus*, male (AMNH).

Other material examined. ECUADOR. Macas, Rio Upano, ♂, ♀, 24/I/1939, 24/I/1939, F. M. & H. Brown (CNC). BRAZIL. **Minas Gerais:** Alpinópolis, ♂, II/1961, Claudionor Elias (DZUP); **Paraná:** Curitiba, ♂, 8/III/1976, H. S. Telford (DZUP). **Santa Catarina:** Nova Teutônia, ♀, 26/VI/1937, (AMNH); ♀, 20/VII/1937, F. Plaumann (CNC).

Geographical record. South America.

Toxomerus pulchellus (Macquart)

(Figs. 143–145)

Syrphus pulchellus Macquart, 1846: 266 (descr.); Osten Sacken, 1878: 52 (cat.).

Mesogramma pulchella Loew, 1866: 157; Schiner, 1868: 347; Aldrich, 1905: 372 (cat.); Curran, 1934: 399 (key); Hull, 1943b: 9, 34 (key & ill.).

Mesogramma laciniosa Loew, 1866: 159 (descr.); Williston, 1896: 350 (note); Aldrich, 1905: 371 (cat.); Curran, 1925: 307; 1930: 3 (key); 1934: 401 (key); Hull, 1943b: 6, 34 (key & ill.).

Mesograpta laciniosa Loew, 1872: 120; Roeder, 1885: 343; Osten Sacken, 1875: 48 (cat.); 1878: 48 (cat.); Fluke, 1956: 224 (cat.).

Mesograpta pulchella Osten Sacken, 1875: 49 (cat.); 1878: 125 (cat.); Wulp, 1883: 4 (ill.); Fluke, 1956: 229 (cat.).

Toxomerus pulchellus Kertész, 1910: 149 (cat. & n. comb.); Thompson *et al.*, 1976: 54 (cat.).

Toxomerus lacinosus Kertész, 1910: 147 (cat. & n. comb.); Wolcott, 1923: 219; Thompson *et al.*, 1976: 51 (cat.); Thompson, 1981: 95 (syn.).

Toxomerus punctatus Sack, 1921: 128 (descr.); Fluke, 1956: 233 (cat.); Thompson *et al.*, 1976: 54 (cat.), **syn. nov.**

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, white to black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for two lateral and one medial bluish-white pollinose vitta, yellow pilose; scutellum yellow, yellow pilose on anterior 2/3 and black pilose on posterior 1/3; anterior anepisternum black, short and sparsely yellow pilose; posterior anepisternum black on anterior 1/2, bare, posterior 1/2 yellow, yellow pilose; katapisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal

lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum sometimes brownish posterodorsally; methatoracic pleuron yellow to brownish; metasternum brown; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 1/3; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia yellow, brownish on basal 1/3, yellow and black pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus brown, yellow and black pilose. Wing: hyaline, extensively bare, as follow: mostly of cells C, SC, R, BM, CuP, basal 2/3 of cell R1, basal 1/3 of cell R2+3 and anterior basal 1/2 of cell R4+5; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia; 3rd to 4th terga mostly yellow with sublateral black maculae, black medial vittae continuous posteriorly and laterally, and brownish posterior fascia; 5th tergum yellow with sublateral black maculae and medial black vitta as a “V” shape. Male genitalia: surstylus slender dorsally and very broad laterally, with scattered short setae; postanal process little distinct; aedeagus not so enlarged, prominent dorsally; superior lobe somewhat rectangular, with hairs anterodorsally, with small lobe ventrally with hairs.

Female. Similar to male except for the frons black, white pollinose, black pilose. Anterior anepisternum with rare piles superiorly. Female genitalia: 9th tergum with somewhat cylindrical black macula broader posteriorly; epiproct slender; cercus very broad; hypoproct somewhat triangular; 9th sternum as in Fig. 144; two elliptical spermatecae similar in size (Figs. 143–145).

Length. Body 7.0–7.2 mm, wing 5.2–5.8 mm.

Discussion. *T. pulchellus* presents a characteristic color pattern of abdomen and the synonymy with *Toxomerus punctatus* was based comparing the female syntype of *Syrphus pulchellus* with the original description of that.

Type material examined. Syntype. MEXICO. San Domingo: *Syrphus pulchellus*, ♀, Ex. Coll. Bigot (OXUM).

Other material examined. MEXICO. **Quintana Roo:** Felipe Carrillo Puerto, 4 ♂, 5 ♀, 11–13/10/1986, R. J. McGinley (USNM). HONDURAS. Zamorano: ♀, 11/X, W. P. Cockerell (USNM). EL SALVADOR. San Salvador: 2 ♂, ♀, 12/V/1958, O. L. Cartwright (USNM). CUBA. Aguada: ♂, ♀, II/15/1970 (USNM). JAMAICA. Worth Park: Parrish St. Catherine, 2 ♂, 4 ♀, 9–19/XI/1968, R. E. Woodruff (USNM). PANAMA. Gamboa: C. Z. Pipeline Rd, 12 ♂ & 12 ♀, VII/1967, W. W. Wirth (USNM). VENEZUELA. **Zulia:** El Tucuco, ♂, 5–6/VI/1976, A. S. Menke & D. Vicent (USNM); **Aragua:** Ocumare de la Costa, ♂, A. S. Menke & D. Vicent (USNM); Puerto de Cata, ♀, A. S. Menke & D. Vicent (USNM). ECUADOR. Portoviejo: ♂ & ♀, 14/IV/1964, P. Alcivar (USNM). BRAZIL. **Amazonas:** Mirapinima, ♂ & ♀, 8/IV/1972, E. G. I & E. A. Munroe (CNC). Manaus, 4♀, 12/V/1967, 13/V/1967, Y. Sedman (USNM). **Pará:** Belém, 13♂, 14♀, 4/V–23/VI/1967, Y. Sedman (USNM). **Rio de Janeiro:** Tijuca, 2 ♂, II/1974, Seabra (MNRJ); Mangaratiba, ♂, X/1961, M Alvarenga (DZUP). Estrada Rio-São Paulo, ♂, ♀, 15/I/1945, 22/I/1945, B. Ramos (MNRJ). **São Paulo:** Guarujá, 2 ♂ & ♀, III/1939, Ramalho (MZSP and MNRJ).

Geographical record. Widespread, from Mexico to southern South America.

Toxomerus purus (Curran)

(Fig. 37)

Mesogramma purus Curran, 1930: 10 (descr.); 1934: 400 (key); Hull, 1943b: 6, 38 (key and illustration).

Mesograpta purus Fluke, 1956: 229 (cat.).

Toxomerus purus Thompson *et al.*, 1976: 54 (cat. & n. comb.); Harbach, 1984: 842 (male gen.).

Male. Head: face 1/3 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally;

gena brown; frontal triangle yellow, white pilose; vertical triangle black, white and bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for two lateral and one medial bluish-white pollinose vitta, yellow pilose; scutellum brown with yellow margins, usually black pilose, sometimes yellow and black pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katapisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with brown fringe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow; metasternum brown; halter yellow. Legs: pro- and mesocoxae brown on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; profemur yellow, yellow pilose; mesofemur yellow with brown macula apical posterodorsally, yellow pilose; metafemur yellow except for black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia brown, yellow on basal and apical extremities, black pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus dorsally brown, ventrally yellow, black pilose. Wing: hyaline to brownish, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula as broad as cell C, not microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia interrupt medially or with medial yellow fascia extended medio-posteriorly; 3rd to 4th terga black with sub-lateral arcuate yellow vitta continuous from anterior and lateral margin, sometimes not ending on lateral margin and with medial vitta extending from anterior to posterior margin; 5th tergum black with medial yellow vittae or yellow with sub-lateral black vittae and medial black vitta (Fig. 37). Male genitalia: surstylus very convex laterally and concave medially, with scattered short setae; postanal process almost 3/4 as long as surstylus; aedeagus enlarged, prominent dorsally; superior lobe somewhat quadrangular with a slightly dorsal extension, with hairs anteroventrally, with small lobe medially with hairs.

Female. Unknown.

Length. Body 7.0–8.0 mm, wing 6.5–7.0 mm.

Type material examined. Holotype. PANAMA. Corozal: *Mesogramma purus*, male, 19/I/1929, C. H. Curran (AMNH).

Other material examined. BRAZIL. **Rio de Janeiro:** Friburgo, 3 ♂, II/1932, M. L. (MNRJ). **Santa Catarina:** Nova Teutônia, ♂, 21/XII/1969, (CNC); 8 ♂, V/1970, X/1970, XI/1970, XI/1971, F. Plaumann (USNM).

Geographical record. Panama and southern Brazil.

Toxomerus sedmani Harbach

(Figs. 146–148)

Toxomerus sedmani Harbach, 1984: 840 (descr.).

Diagnosis. Face 1/2 as long as eye width, yellow; frontal triangle yellow. Proepimeron black; scutum black except broadly yellow laterally; scutellum brown with yellow margins, yellow pilose with black piles on posterior margin; anepimeron black. Pro and mesofemora yellow, metafemur yellow with black annulus; tibiae yellow, except metatibia brown with base and apex yellow. Wing extensively microtrichose; alula as broad as cell C, microtrichose. Abdomen with yellow medial vitta. Surstylus very convex laterally and very concave medially; postanal process 1/2 as long as surstylus; aedeagus all enlarged, slightly prominent dorsally; superior lobe somewhat quadrangular with a very short dorsal extension, with hairs anteroventrally,

with very small lobe medio-posteriorly with hairs.

Female genitalia: 9th tergum with a semicircle black macula; epiproct slender; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 147; three biconvex spermatecae similar in size (Figs. 146–148).

Length. Body 6.0 mm, wing 5.0 mm.

Type material examined. Holotype. BRAZIL. **Pará:** Belém, *Toxomerus sedmani*, male, 26/IV/1967, Y. Sedman (CNC).

Other material examined. BRAZIL. **Pará:** Belém, ♀, 20–21/XI/1963, Oliveira and Wygodzinsky (MNRJ).

Geographical record. Northern Brazil (Amazon rainforest).

***Toxomerus steatogaster* (Hull)**

(Figs. 38, 71, 72, 73, 149, 150, 151)

Mesogramma steatogaster Hull, 1941a: 62 (descr.).

Mesogramma steatornis Hull, 1943b: 20 (descr.).

Mesograpta steatogaster Fluke, 1956: 230 (cat.).

Mesograpta steatornis Fluke, 1956: 230 (cat.).

Toxomerus steatogaster Thompson *et al.*, 1976: 55 (cat. & n. comb.).

Toxomerus steatornis Thompson *et al.*, 1976: 53 (cat. & n. comb.), **syn. nov.**

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena brown to black; frontal triangle shiny brown, black pilose; vertical triangle black, white pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, sometimes with brown basoflagellomere, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, bronze pollinose; proepimeron yellow; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow, black pilose; anterior anepisternum black, sparsely yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior and dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum yellow posterodorsally; methatoracic pleuron yellow; metasternum yellow; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose posteriorly; metafemur yellow except for black annulus on apical 1/3, yellow pilose on basal 2/3 and black pilose on apical 1/3; tibiae yellow, pro- and mesotibiae yellow pilose; metatibia black pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus yellow, fourth and fifth tarsomeres brown, black pilose. Wing: hyaline, extensively bare, as follow: mostly of cells C, SC, R, BM, CuP, basal 2/3 of cell R1, basal 1/3 of cell R2+3 and anterior basal 1/2 of cell R4+5; alula broader than cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum yellow except narrowly black posteriorly; 2nd tergum yellow except narrowly black fascia posteriorly; 3rd to 4th terga yellow except narrowly black fascia posteriorly, sometimes interrupted medially and extended in two medial black macula; 5th tergum yellow with black macula medially (Fig. 38). Male genitalia: surstylus with pointed apex, with scattered short setae; postanal process 1/2 as long as surstylus; aedeagus enlarged, slightly prominent dorsally; superior lobe somewhat rounded with very short dorsal extension, with hairs along anterior margin and medially (Figs. 71–73).

Female. Similar to male except for the frons black, bronze pollinose, black pilose.

Female genitalia: 9th tergum with a spur medially; epiproct somewhat semielliptical; cercus slender;

hypoproct somewhat oval; 9th sternum as in Fig. 150; three elliptical spermatecae similar in size (Figs. 149–151).

Length. Body 7.5 mm, wing 5.5–6.0 mm.

Discussion. The synonymies were based on the examination of the female holotype and two females cotypes of *Mesogramma steatogaster* and male holotype and female allotype of *Mesogramma steatornis*.

Type material examined. Holotype. BRAZIL **Amazonas:** Rio Branco, *Mesogramma steatogaster*, male, 28/VIII/24 (CNC). Cotype. BRAZIL. **Goiás:** Rio das Allmas, ♀, V/1938, F. Lane (MZSP). **São Paulo:** Tamoyo, ♀, III/1944, Barreto (MZSP).

Other material examined. ECUADOR. **Sucua:** Rio Upano, ♂, 30/I/1939 (AMNH). BRAZIL. **Amazonas:** R. Itaborai, 2♀, V/1950, J. C. M. Carvalho (MNRJ); Marabitanas, ♀, VII/1949, J. C. M. Carvalho (MNRJ); Urupes, ♀, VI/1949, J. C. M. Carvalho (MNRJ); Cauaburi, 3 ♀, 9/XII/1962, J. Bechyné (MZSP). **Goiás:** Corumbá, 2♂, ♀, II/1946, XI/1946, M. P. Barreto (MZSP). **São Paulo:** Mogi Guacu, 3 ♂ & ♀, 23–28/X/1970, J. W. Boyes (CNC); Avanhandava, ♂, II/1946, M. P. Barreto (MZSP). **Paraná:** Porto Cabral, ♀, 1–25/IV/1944, Carrera & E. Dante (CNC).

Geographical record. Ecuador and Brazil.

Toxomerus sylvaticus (Hull)

(Figs. 2, 39, 152, 153, 154)

Mesogramma sylvatica Hull, 1943a: 34 (descr.); 1943b: 14, 40 (key & ill.).

Mesograptia sylvatica Fluke, 1956: 231 (cat.).

Toxomerus sylvaticus Thompson *et al.*, 1976: 55 (cat. & n. comb.); Harbach, 1984: 844 (ill.).

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally (Fig. 2); gena black; frontal triangle yellow, black pilose; vertical triangle black, bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, bronze pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow, black pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black anterior 1/3, bare, and yellow posterior 2/3, yellow pilose; katepisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior and dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe sometimes with brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow; metasternum yellow; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 1/2; metafemur yellow except for blackish annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia yellow except for black annulus on basal 1/3, yellow and black pilose; pro- and mesotarsi yellow, yellow pilose; metatarsus dorsally brown, ventrally brownish, black pilose. Wing: brownish, all microtrichose; alula as broad as cell C, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum yellow except narrowly black posteriorly; 2nd tergum black with anterior and medial yellow fascia; 3rd to 4th terga yellow with sub-lateral black point, sometimes absent on 3rd tergum, and with sinuous black medial vittae continuous posteriorly and laterally, and brownish posterior fascia; 5th tergum yellow with sub-lateral black vittae, sometimes interrupted and medial black vitta arrow-like (Fig. 39). Male genitalia: surstylus broader apically and concave ventrally in lateral view, with scattered short setae; postanal process 2/3 as long as surstylus; aedeagus enlarged, prominent dorsally and ventrally; superior lobe somewhat trapezoid with short dorsal extension, forked distad, with scattered hairs,

with small lobe dorsally with hairs.

Female. Similar to male except for the frons black, bronze pollinose, black pilose. Anterior anepisternum with a few short piles. Female genitalia: 9th tergum with a semicircle black macula little concave posteriorly; epiproct slender; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 153; three biconvex spermatecae similar in size (Figs. 152–154).

Length. Body 7.0–8.0 mm, wing 7.0–8.0 mm.

Type material examined. Allotype. ECUADOR. Sucua: Rio Upano, *Mesograpta sylvatica*, female, 31/1/1939, F. M. & H. Brown (AMNH).

Other material examined. COLOMBIA. Piedra Ancha: ♀, 5/IV/1966, E. Velastegui (USNM). ECUADOR. Banos: ♂, 5/VII/1938, W. C. Macintyre (USNM); 3♂, 2♀, 28/VII/1963, 20/VIII/1963, , 21/VIII/1963, ♂, 23/II/1965, 29/XII/1966, Velastegui (USNM). Obitahua: Cerro, 2♂, f, 3/IV/1967, 4/IV/1967, Velastegui (USNM); Oriente, ♂, 19/VIII/1966, Velastegui (USNM). BRAZIL. **Rio de Janeiro**: Petrópolis, ♂, 15/I/1973, H. S. Lopes (MNRJ); Teresopolis, ♀, 21/I/1940, Freitas & Lopes (CNC). **São Paulo**: Rio Claro, ♂, 14/I/1977, L. Knutson (USNM). S. Jose dos Campos, ♀, VII/1933, H. S. Lopes (CNC). Cantareira, ♀, VIII/1945, J. Lane (CNC); ♂, X/1945, Barreto (CNC); ♀, X/1945, M. Carrera (MZSP); Fazenda Pau D'Alho, 2♂ & ♀, 28–29/X/1972, B. V. Peterson (CNC); Barueri, ♂, 03/IV/1955, K. Lenko (MZSP); ♂, 04/X/1955, K. Lenko (MZSP).

Geographical record. Tropical South America.

***Toxomerus teliger* (Fluke)**

(Figs. 155–157)

Mesograpta teligera Fluke, 1953: 125 (descr.); Wirth *et al.*, 1965: 571 (cat.).

Toxomerus teliger Metz & Thompson, 2001: 228, 246 (key & redescr.).

Diagnosis. Face 1/3 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum brown with yellow margins, black pilose; anepimeron black. Pro and mesofemora yellow, metafemur yellow on basal 1/2 and brown on apical 1/2; pro and meso tibiae yellow, metatibia brownish. Wing extensively bare; alula broader than cell BM apically, not microtrichose. Abdomen 3th tergum black with sub-lateral arcuate yellow vitta continuous to basal border and shiny apical fascia. Surstylus very broad; postanal process little distinct; aedeagus slender; superior lobe somewhat trapezoid with curved anterior extension, with setae apically, scattered hairs and erect setae along anteroventral margin. Female genitalia: 9th tergum with a semicircle black macula with two concavities anteriorly; epiproct slender; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 156; three rounded spermatecae similar in size (Figs. 155–157).

Length. Body 9.5–11.8 mm, wing 7.1–8.0 mm.

Type material examined. Paratype. UNITED STATES. **Arizona**: Baboquivari, *Mesograpta teligera*, ♂, VII 19–50, H. O. Wright (USNM).

Other material examined. VENEZUELA. **Bolivar**: N. Rio Yuruani, ♂ & ♀, 29/VI-10/VII/1987, Gran Sabana (FMNH). BRAZIL. **Rondônia**: Porto Velho, ♂, 2♀, XI-1954, , XI-1954, F. Pereira, W. Dante, & M. Alvarenga (MZSP); Vilhena, 12♂ & 12♀, X/1986, P. Magno & J. Becker (MZSP). **Mato Grosso**: Pouso Grande, 2♂ & ♀, X/1949, X/1949, W. Bokermann (MZSP); Sinop, 10♂ & 6♀, III/1976, Alvarenga & Roppa (MZSP); Vera, 12♂ & 9♀, X/1973, Alvarenga & Roppa (MZSP). **Goiás**: Lagoa Formosa, ♀, 26–28/X/1964, Exp. Depto. Zool (MZSP). **Rio de Janeiro**: Jacarepaguá, ♂, XII/1969, M. Alvarenga (MNRJ). **São Paulo**: Santo Amaro, ♂, X/1962, J. Lane (MZSP).

Geographical record. Widespread from the southern United States to southeastern Brazil.

***Toxomerus tibicen* (Wiedemann)**

(Figs. 158–160)

Syrphus tibicen Wiedemann, 1830: 127 (descr.); Williston, 1886: 312 (cat.).

Syrphus sinuatinervis Macquart, 1850: 455 (descr.); Williston, 1886: 311 (cat.); Kertész, 1910: 128 (cat.); Fluke, 1957: 156 (cat. & syn.).

Mesogramma tibicen Schiner, 1868: 347; Curran, 1930: 2 (key); 1934: 398 (key).

Toxomerus tibicen Kertész, 1910: 150 (cat. & n. comb.); Thompson *et al.*, 1976: 55 (cat.); Metz & Thompson, 2001: 228, 248 (key & redescr.).

Toxomerus ornatus Sack, 1941: 103 (1951: 99) (descr.); Metz & Thompson, 2001: 248 (syn.).

Mesograpta tibicen Fluke, 1956: 231 (cat.).

Toxomerus sinuatinervis Thompson *et al.*, 1976: 55 (cat.); Metz & Thompson, 2001: 248 (syn.).

Diagnosis. Face 1/3 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum brown with yellow margins, black pilose; anepimeron black. Pro and mesofemora yellow, metafemur yellow on basal 1/2 and brown on apical 1/2; pro and meso tibiae yellow, metatibia brownish. Wing extensively bare; alula broader than cell BM apically, microtrichose. Abdomen with yellow maculae on 3rd and 4th terga isolated from lateral margins. Surstylus pointed latero-apically; postanal process little distinct; aedeagus not so enlarged, prominent dorsally; superior lobe somewhat rectangular, with hairs along anterior margin, with small lobe medially with hairs.

Female genitalia: 9th tergum with somewhat oval black macula pointed posteriorly; epiproct slender; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 159; three rounded spermatecae, one of them smaller (Figs. 158–160).

Length. Body 9.5–12.0 mm, wing 7.0–9.6 mm.

Material examined. BRAZIL. **Minas Gerais:** Caldas, 5 ♂, 8/I/1967, J. Becker, O. Roppa and O. Leoncini (MNRJ); **Rio de Janeiro:** Teresópolis, ♀, XII/1939, Freitas (MNRJ); ♂, 20/VIII/1944, Travassos (MNRJ); Petrópolis, 3 ♂, II/1956, D. Albuquerque (MNRJ); Grajaú, ♀, 27/IV/1941, Lopes & Oliveira (MNRJ); Corcovado, ♂, IV/1934, Trav. & Lopes (MNRJ); Itatiaia, ♂ & 2 ♀, I/1948, C. d'Andretta (MZSP); ♂ & 2 ♀, 8/I/1950, Travassos & Daley (MNRJ); 2 ♀, 6/I/1954, W. Zican (MNRJ); **São Paulo:** Bocaina, 2 ♂ & 5 ♀, IX/1969, Alvarenga and Seabra (MNRJ); Eug. Lefevre, 2 ♂ & 5 ♀, 1/XI/1937, Lopes (MNRJ); Cotia, ♀, 27/XII/1940, A. G. Silva (MZSP); M. das Cruzes, ♀, XI/1939, M. Carrera (MZSP); Osasco, ♂, XI/1940, J. Lane (MZSP); H. Florestal, ♀, XII/1951, E. Rabello (MZSP); Embú, ♂, 15/II/1946, F. Lane (MZSP); Campos do Jordão, M, 3 ♀, 23/I/1936, XII/1945, XII/1955, J. Lane (MZSP, MNRJ); Barueri, ♀, 8/XI/1954, K. Lenko (MZSP); S. Roque, ♂, XII/1946, J. Lane (MNRJ); **Paraná:** Curitiba, 7 ♂ & 5 ♀, IV/1940, Claret (USNM); P. Grossa, 3 ♂ & 2 ♀, 20/X/1986 (DZUP); S. José Pinhais, ♀, 3/XI/1986 (DZUP); Deodoro, ♂, XII/1944, Natschbach (MZSP); Rio Negro, ♂, 7/V/1929 (MNRJ); **Santa Catarina:** Nova Teutônia, ♂, 13/VI/1938, F. Plaumann (MNRJ); 27 ♂, 25 ♀, VI/1964, X/1964, VII/1965, X/1971, F. Plaumann (USNM). Rio das Antas, ♀, I/1953, Camargo (MZSP). **Rio Grande do Sul:** Derrubadas, ♀, 26/04/2003, M. N. Morales (UNISC); São Borja, 2 ♂ & 2 ♀, IX/1952, Agnelo C. Filho (MNRJ). PARAGUAY. Mboneno: 7 ♂ & 25 ♀, IX/1940, F. Schade (USNM). ARGENTINA. Misiones Dos de Mayo: 15 ♂ & 19 ♀, XII/1973, M. F. (USNM).

Geographical record. South America.

***Toxomerus undecimpunctatus* (Enderlein)**

(Figs. 161–163)

Mitrosphen undecimpunctata Enderlein, 1938: 228 (descr.).

Mesograpta undecimpunctata Fluke, 1956: 232 (cat.)

Toxomerus undecimpunctatus Thompson *et al.*, 1976: 55 (cat. & n. comb.); Metz & Thompson, 2001: 228, 249 (key & redescr.).

Diagnosis. Face 1/3 as long as eye width, yellow; frontal triangle yellow. Proepimeron yellow; scutum black except broadly yellow laterally; scutellum yellow to brownish with yellow margins, yellow and black pilose; anepimeron yellow; katapimeron yellow anterodorsally; katatergum yellow anteriorly. Femora and tibiae yellow. Wing extensively microtrichose; alula broader than cell BM apically, microtrichose. Abdomen with isolated lateral brown puncta on 3rd – 5th terga. Surstylus almost all with the same width, a little narrower basally, with long setae on dorsal surface; postanal process little distinct; aedeagus enlarged, prominent dorsally; superior lobe somewhat rectangular, acuminate dorsally, with hairs in distad anteroventral margin, with small lobe ventrally with some hairs. Female genitalia: 9th tergum with somewhat oval black macula straight posteriorly; epiproct somewhat rounded; cercus slender; hypoproct as a rounded arch; 9th sternum as in Fig. 162; two oval spermatecae similar in size (Figs. 161–163).

Length. Body 10.4–10.6 mm, wing 7.6–8.0 mm.

Material examined. BRAZIL. **Santa Catarina:** Nova Teutônia, 2 ♂, XI/1969, F. Plaumann (CNC). PARAGUAY. Areguá: ♀, 31/X/1980, D. D. Lowrie (USNM). ARGENTINA. **Entre Rios:** Pronunciamiento ♀, XII/1966, F. Walz (USNM).

Geographical record. Southeastern Brazil, northeastern Argentina and Paraguay.

Toxomerus virgulatus (Macquart)

(Figs. 40, 74, 75, 76, 164, 165, 166)

Syrphus virgulatus Macquart, 1850: 456 (descr.); Williston, 1886: 312 (cat.); Kertész, 1910: 149 (cat.); Fluke, 1957: 156 (cat.).

Mesogramma confusa Schiner, 1868: 349 (descr.); Curran, 1930: 3 (key); 1934: 400 (key); Hull, 1943b: 14 (key).

Mesograptia maculipes Bigot, 1884: 113 (descr.); Kertész, 1910: 145 (cat. & syn.).

Toxomerus confusus Kertész, 1910: 145 (cat. & n. comb.); Thompson *et al.*, 1976: 48 (cat.); Thompson, 1981: 101 (key),

syn. nov.

Mesogramma alphabetica Hull, 1942: 105 (descr.); Hull, 1943b: 14, 36 (key & ill.).

Mesogramma virgulatus Hull, 1943b: 11 (key).

Mesogramma alphabetica var. *flavopocula* Hull, 1948: 9.

Mesograptia confusa Fluke, 1956: 220 (cat.).

Mesograptia alphabetica Fluke, 1956: 217 (cat.).

Toxomerus virgulatus Thompson *et al.*, 1976: 56 (cat. & n. comb.).

Toxomerus alphabeticus Thompson *et al.*, 1976: 47 (cat. & n. comb.).

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena brown; frontal triangle yellow, white pilose; vertical triangle black, white and bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron black; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum brown with yellow margins, yellow pilose with black piles on posterior margin; anterior anepisternum black, short and sparsely yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katapisternum black except dorsal 1/3 yellow, dull, yellow pilose; anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katapimeron, meron, katatergum, anatergum and postscutellum) black, anatergum brownish posterodorsally; methatoracic pleuron yellow; metasternum yellow; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow with brown macula on apical 1/3 dorsally, yellow pilose, mesofemur black pilose on apical 1/3; metafemur yellow except for black annulus on apical 1/2, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia brown, yellow and black pilose; pro- and mesotarsi yellow, yellow pilose, mesotarsus black pilose; metatarsus brown, black pilose.

Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula as broad as cell BM apically, microtrichose.

Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia interrupt medially; 3rd to 5th terga black with lateral yellow macula on anterior 1/3 and arcuate medial yellow vittae (Fig. 40). Male genitalia: surstylus broader medially in dorsal view and almost as long as epandrium, with scattered setae; postanal process little distinct; aedeagus all enlarged; superior lobe somewhat quadrangular with dorsal extension, with scattered hairs, with small lobe dorsally with hairs (Figs. 74–76).

Female. Similar to male except for the frons black, white pollinose, black pilose. Anterior anepisternum bare.

Female genitalia: 9th tergum with a little rounded arch black macula; epiproct somewhat elliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 165; three oval spermatecae similar in size (Figs. 164–166).

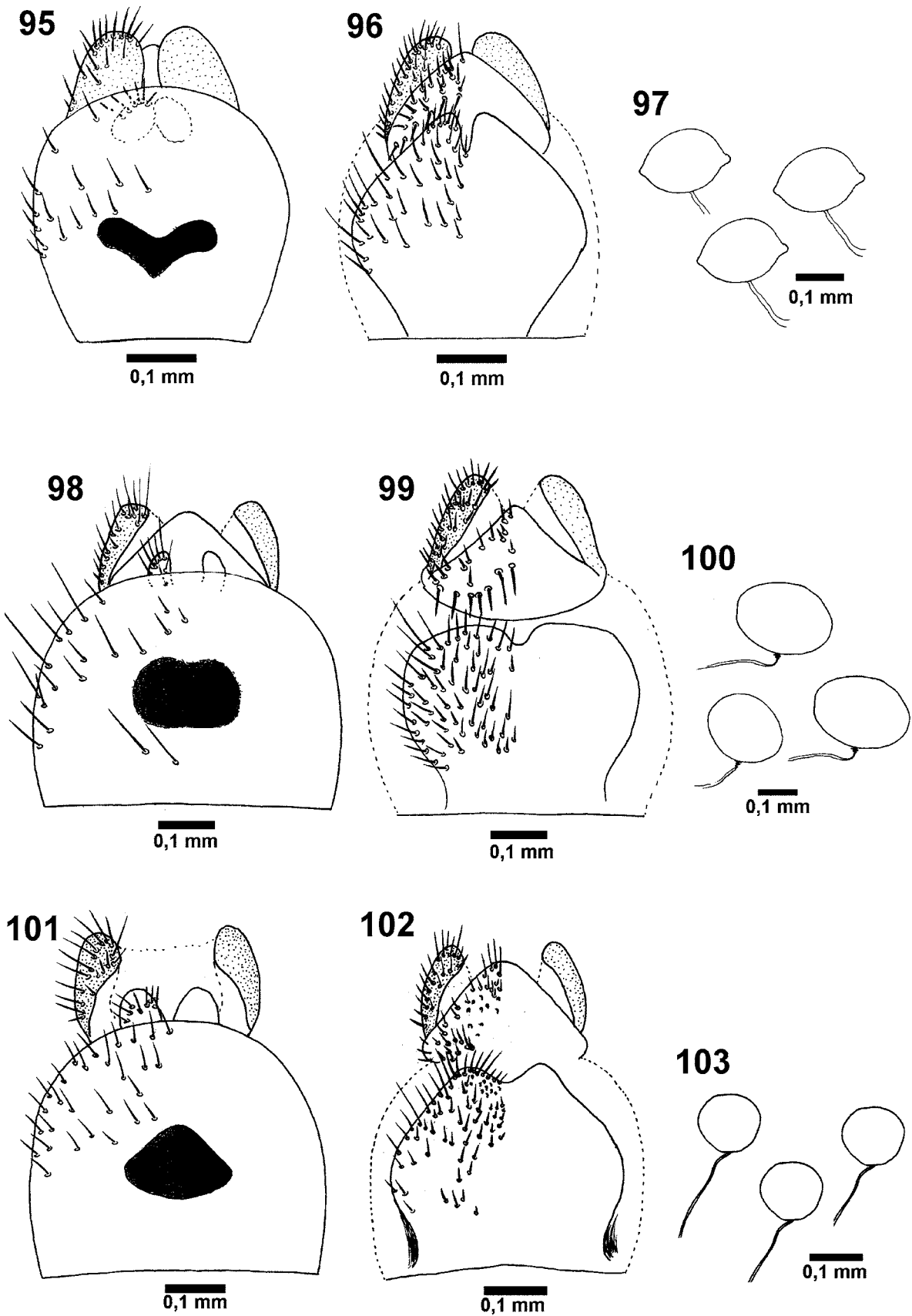
Length. Body 6.0–6.6 mm, wing 4.3–5.2 mm.

Discussion. The synonymies were based on the exam of the male holotype of *Syrphus virgulatus* and female allotype of *Mesogramma confusa*.

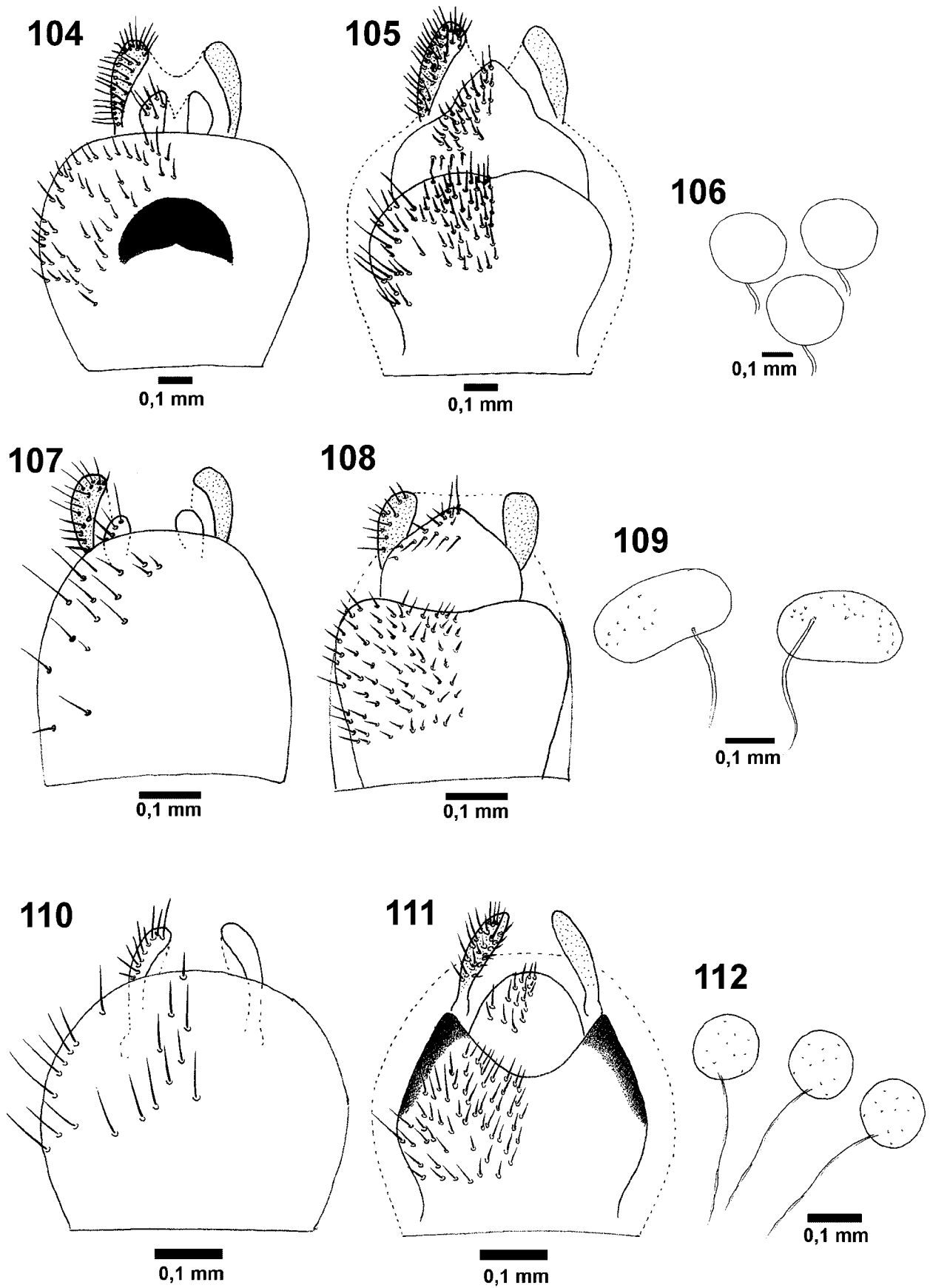
Type material examined. Holotype. *Syrphus virgulatus*, male (OXUM).

Other material examined. MEXICO. **Veracruz:** Balzapote, ♀, 17/ IX/1987, A. L. Norrbom (USNM). GUATEMALA. Yepocapa: 2 ♂ & ♀, VI/1948, H. T. Dalmat (USNM). NICARAGUA. Granada: ♀, Baker (USNM). COSTA RICA. Pedregoso: ♂, 1961, D. L. Rounds (USNM). PANAMA. Chirrigui Volcan: ♂, X/ 1959, N. L. H. Krauss (USNM). VENEZUELA. San Esteban: ♂, XI/1939, Pablo Anduze (USNM). COLOMBIA. El Colegio: ♂, 23/ V/1946, E. A. Chapin (USNM). BRAZIL. **Pará:** Belém, 22♂, 9♀ 12–30/IV/ 1967, Y. Sedman (USNM); 23♂, 11♀, 1/V–2/VI/1967, Y. Sedman (USNM); **Pernambuco:** Caruaru, ♂, V/ 1972, J. Lima (MNRJ); **Brasília:** Distrito Federal, 3 ♂, 7–9/III/1952, A. G. da Silva (MNRJ); **Mato Grosso:** Maracajú, ♂, ♀, V/1937, VI/1937 (USNM). **Bahia:** ♂, V/1929, Rock Found (USNM). Salobra, ♂, VII/1939, Exp. C. Z. B. (MZSP); **Minas Gerais:** Pedra Azul, 2 ♀, XI/1970, F. M. Oliveira (MNRJ); Varginha, ♀, II/ 1972, M. Alvarenga (MNRJ); **Rio de Janeiro:** Tijuca, 2 ♂ & ♀, II/1972, Seabra (MNRJ); São Cristóvão, ♂, 6/VII/1978, A. Almeida (MNRJ); Tinguá, ♂ (MNRJ); Itatiaia, ♀, 26/IX/1954, Lago Azul, Albuquerque and Barros (MNRJ); Muriqui, 7 ♂ & 4 ♀, VII/1969, M. Alvarenga (MNRJ); **São Paulo:** São José dos Campo, ♀, VII/1933, H. S. Lopes (MNRJ); Guarujá, ♂, 25–30/I/1941, M. Carrera (MZSP); Juquiá, ♂, XII/1938, J. Lane (MZSP); ♂ IV/1941 J. Lane (MZSP); Cantareira, ♂, XI/1951, M. Carrera & M. A. V. d`Andretta (MZSP); Barueri, ♂ & ♀, VIII/1955, K. Lenko (MZSP); Bocaina, ♂ & 2 ♀, XI/1969, Alvarenga & Seabra (MNRJ); Tamoyo, ♀, II/1944, Barreto (MNRJ); São Vicente, ♀, VIII/1961, N. L. H. Krauss (USNM); Rio Claro, ♂, 14/ I/1977, L. Knutson (USNM); Guarujá, 2 ♂, I/1942, M. Carrera (USNM). **Paraná:** Antonina, ♂, 24/XI/1986, Reserva Sapitanduva, Lev. Ent. PROFAUPAR (DZUP); Colombo, ♀, 12/I/1987, EMBRAPA Br 476 km 20, Lev. Ent. PROFAUPAR (DZUP); Guarapuava, ♂ 15/IX/1986 & ♀ 20/X/1986, Est. Águas Santa Clara, Lev. Ent. PROFAUPAR (DZUP); Iguazu, ♂, 6/X/1927, R. C. Shannon (USNM). **Santa Catarina:** Bom Retiro, ♀, I/1929 (MNRJ). Nova Teutônia, 26♂, 10♀, 5/IV/1960, VI/1964, IX/1964, X/1964, XII/1964, II/1965, II/ 1965, VII/1965, X/1965; V/1970, X/1971, IX/1971, III/1973, IV/1973, F. Plaumann (USNM); 16 ♂ & 3 ♀, XI/1969, I/1970, II/1970, F. Plaumann (CNC).. Chapecó ♂, VII/1960, F. Plaumann (CNC). **Rio Grande do Sul:** Santa Cruz do Sul, 2 ♂, 21/XI/2001 & ♀, 19/IX/2003, Cinturão Verde (UNISC); Derrubadas, ♂, 26/IV/ 2003, Pq. das Fontes (UNISC). PARAGUAY. Villarrica: 6♂, 4 ♀, V/1937, VII/1937, XII/1937, VIII/1938, F. Schade (USNM).

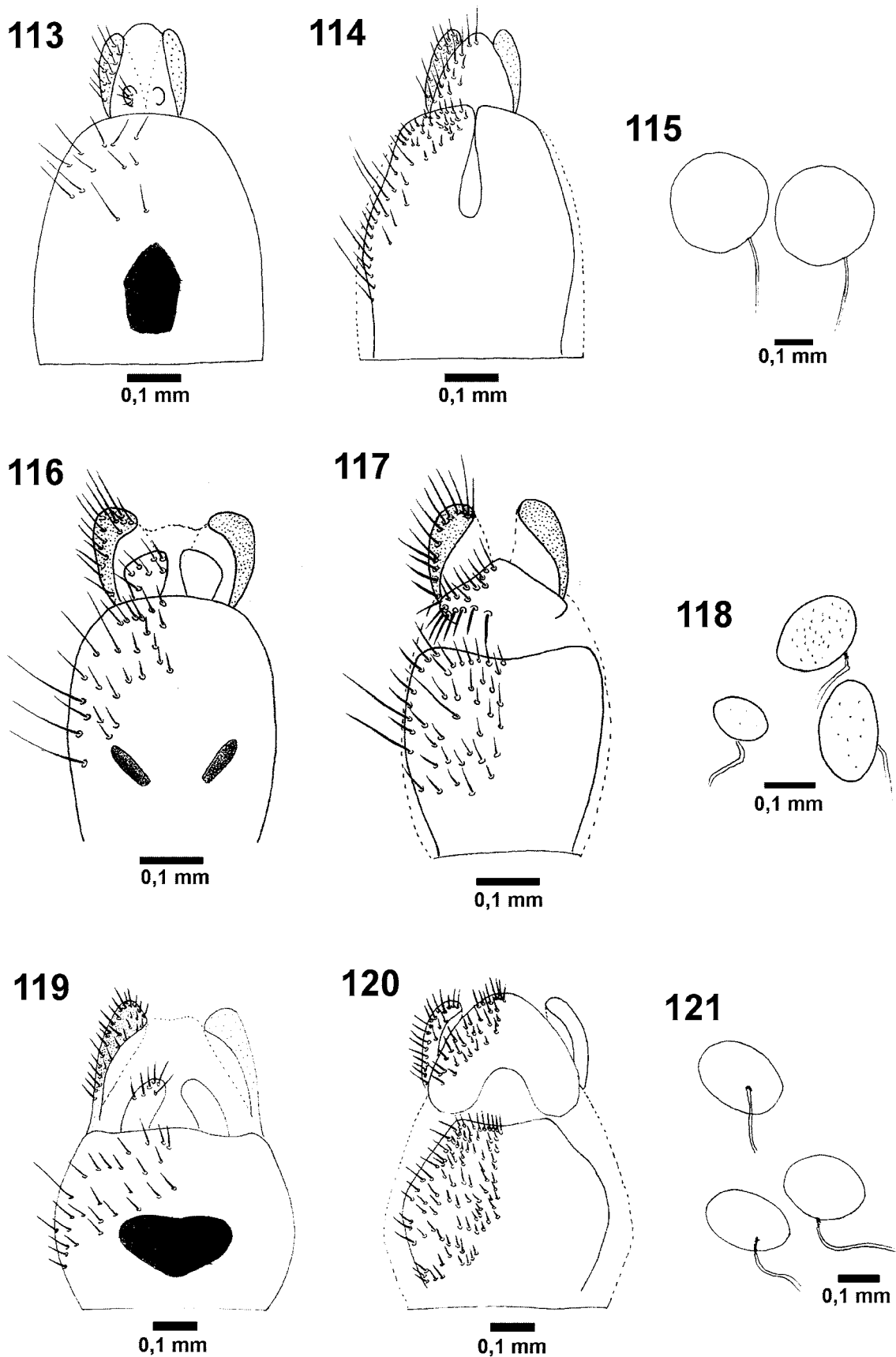
Geographical record. Widespread, from Mexico to southern Brazil



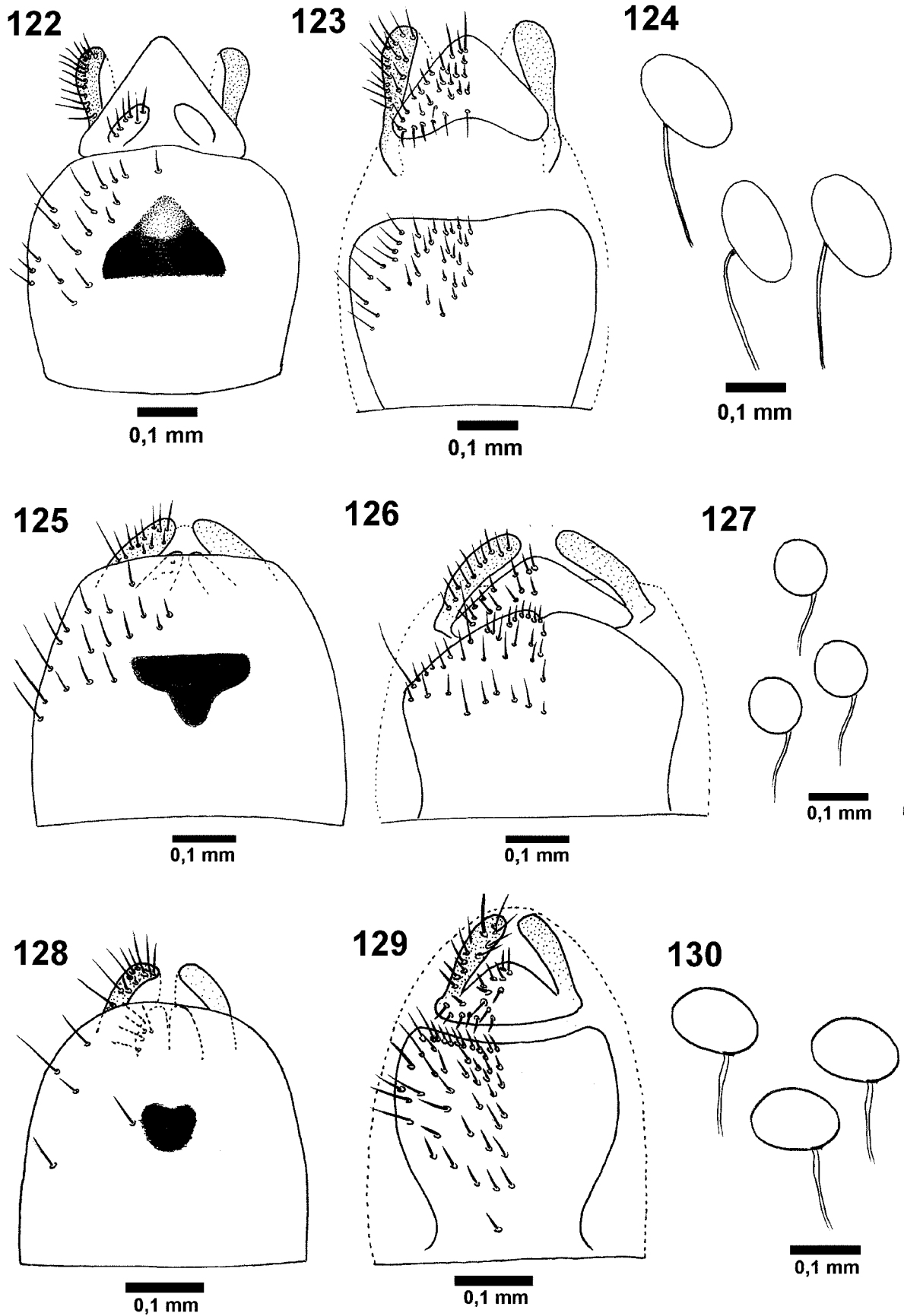
FIGURES 95–103. Female genitalia, dorsal and ventral view and spermatecae. 95–97, *Toxomerus elisa*. 98–100, *Toxomerus flaviplurus*. 101–103, *Toxomerus idalius*.



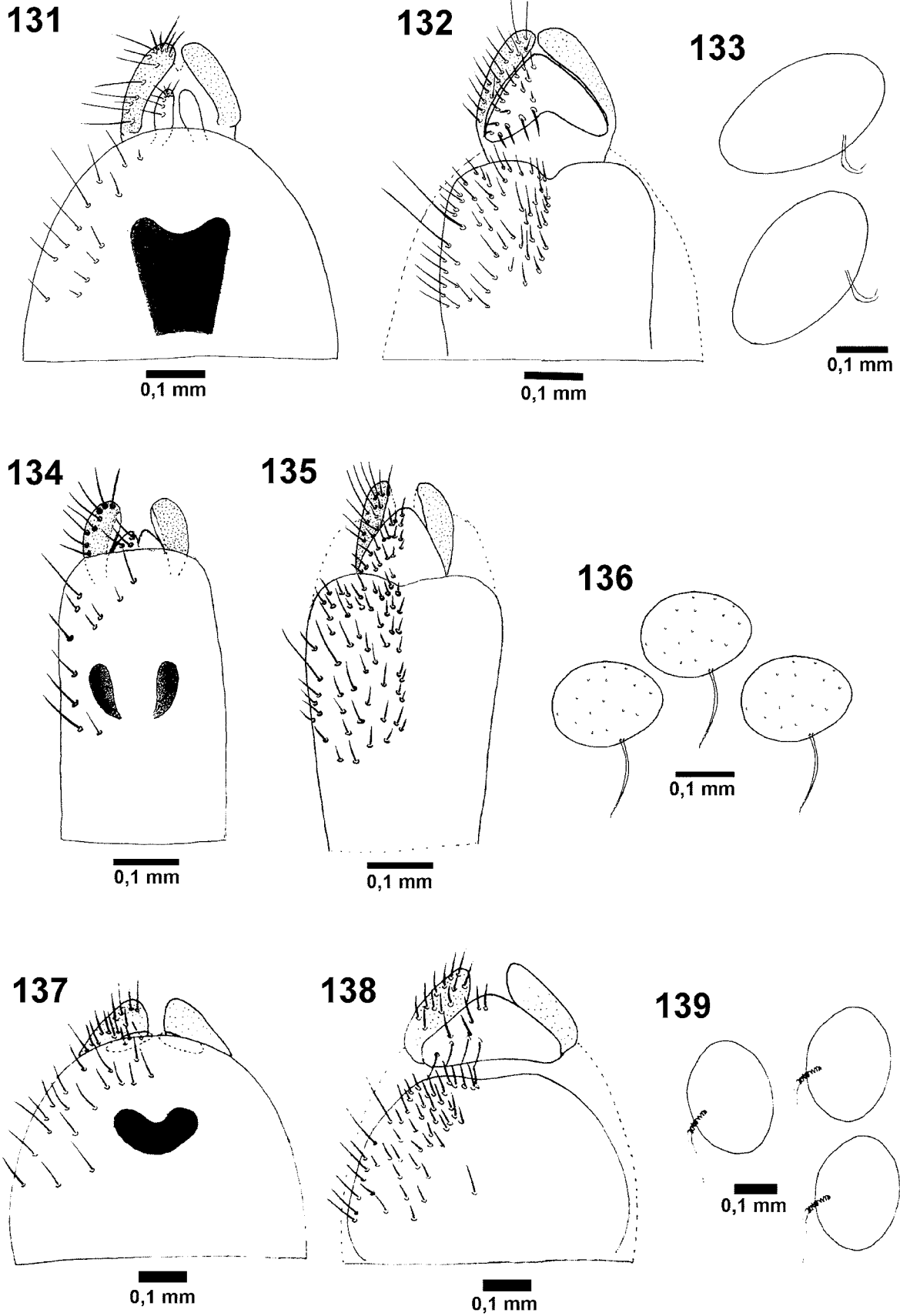
FIGURES 104–112. Female genitalia, dorsal and ventral view and spermatecae. 104–106, *Toxomerus intermedius*. 107–109, *Toxomerus lacrymosus*. 110–112, *Toxomerus laenas*.



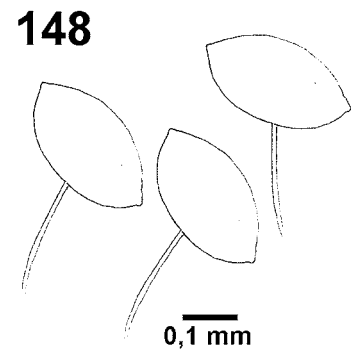
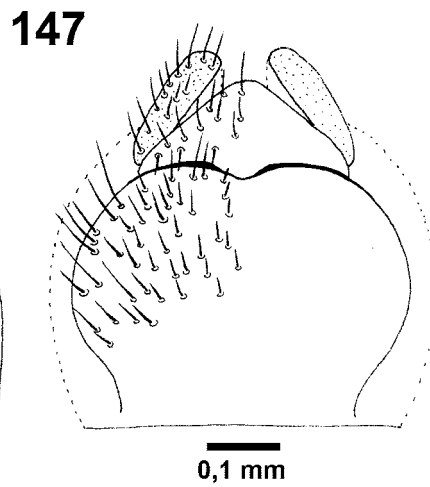
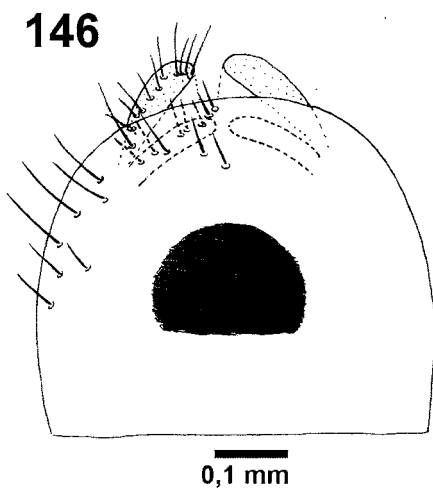
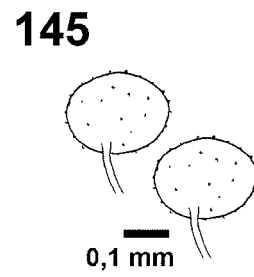
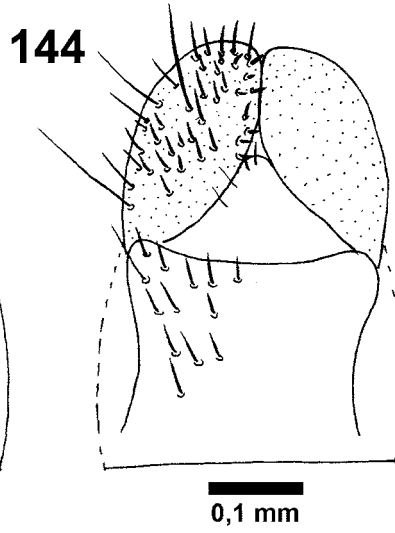
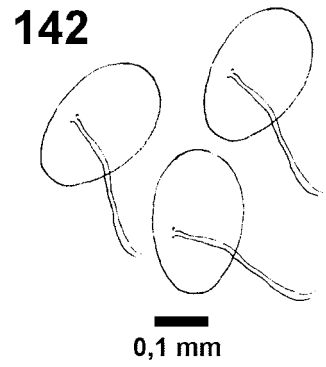
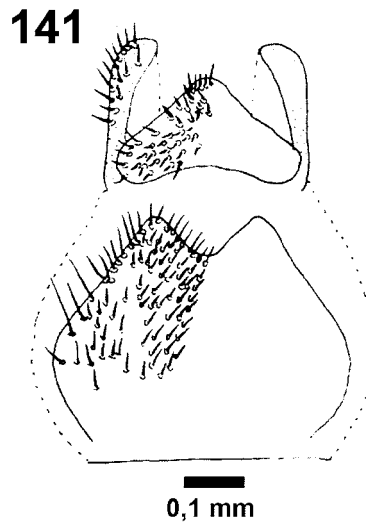
FIGURES 113–121. Female genitalia, dorsal and ventral view and spermatecae. 113–115, *Toxomerus mosaicus*. 116–118, *Toxomerus musicus*. 119–121, *Toxomerus norma*.



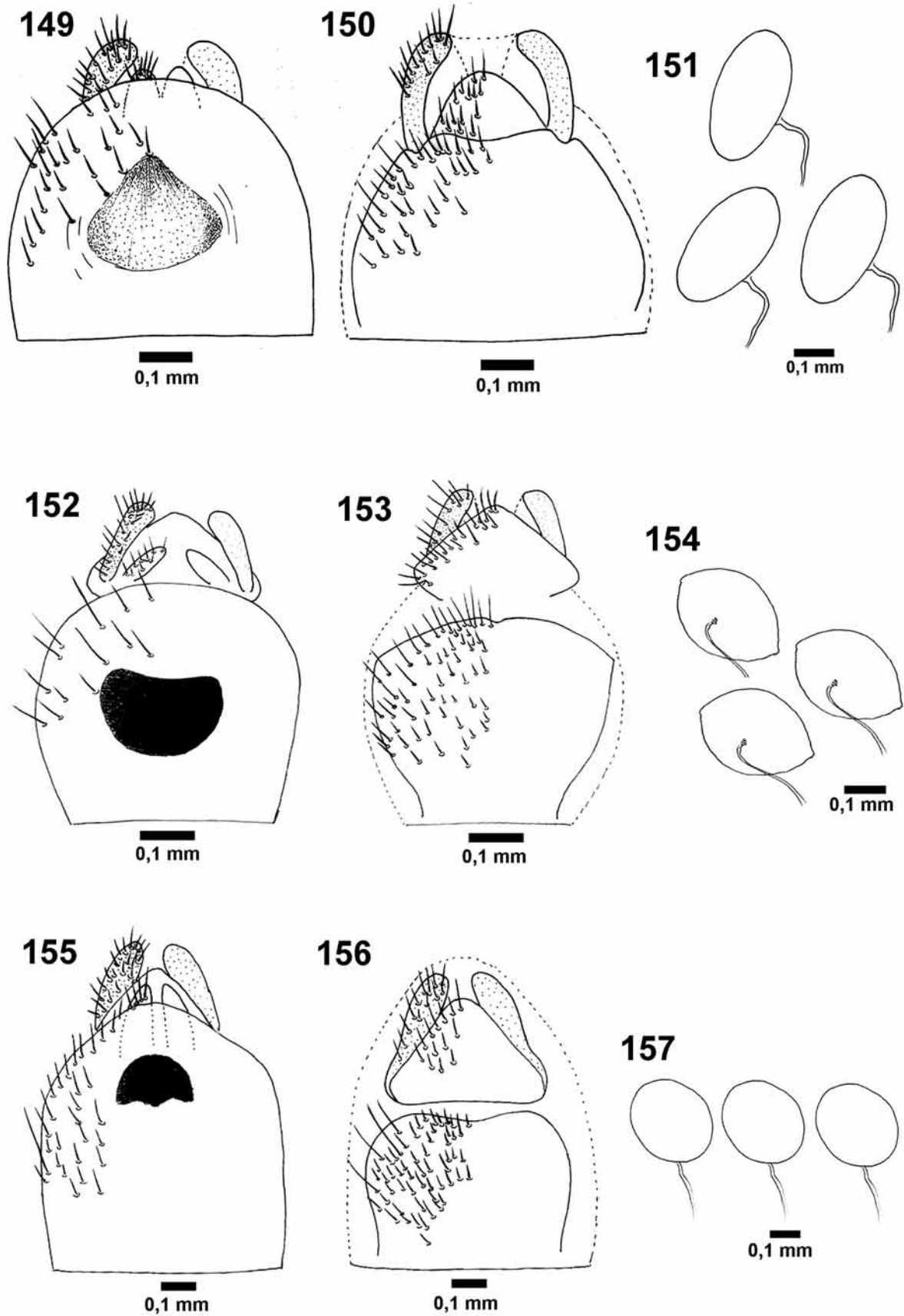
FIGURES 122–130. Female genitalia, dorsal and ventral view and spermataecae. 122–124, *Toxomerus papaveri*. 125–127, *Toxomerus paraduplicatus*. 128–130, *Toxomerus pictus*.



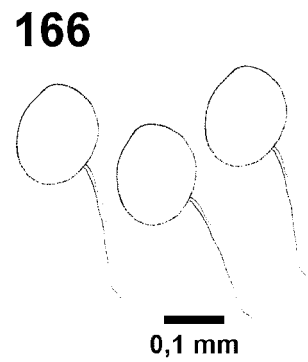
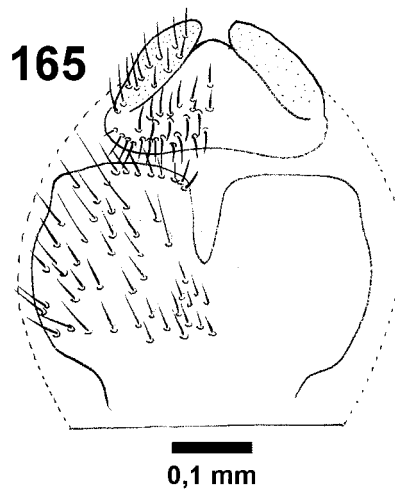
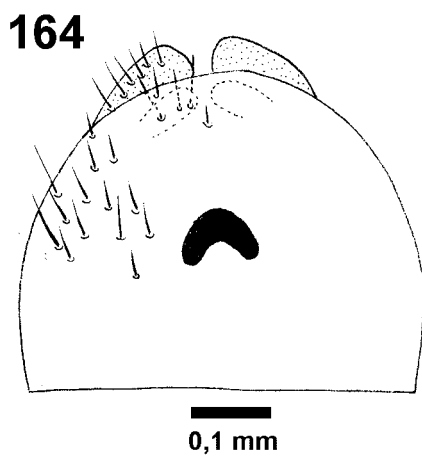
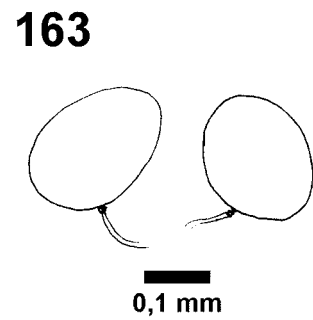
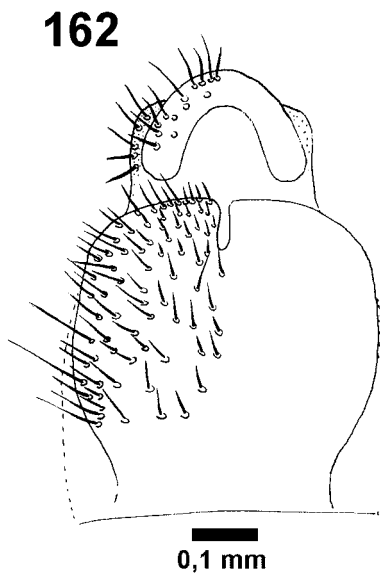
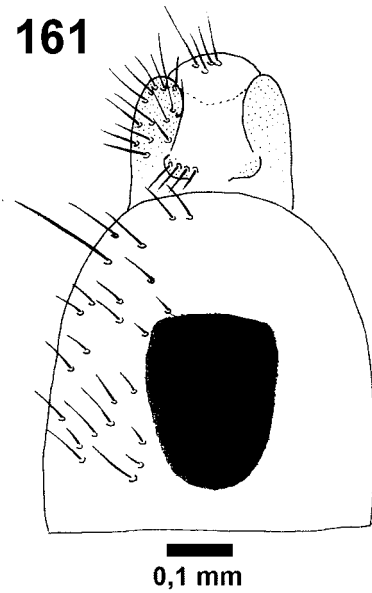
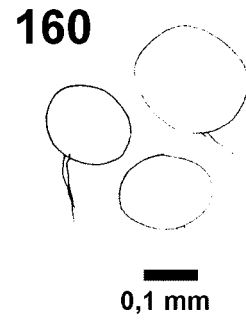
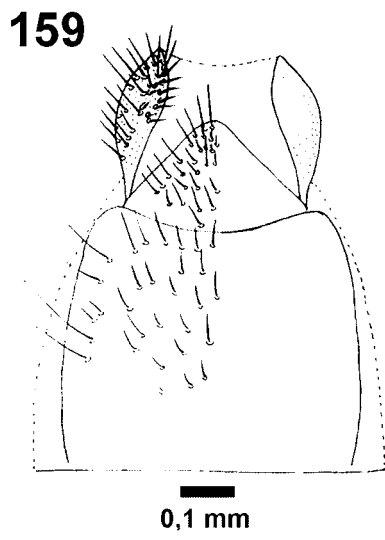
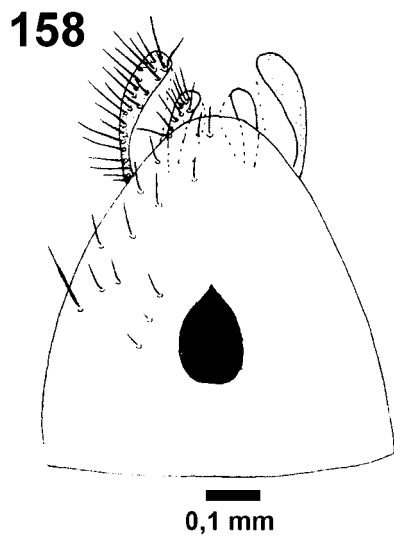
FIGURES 131–139. Female genitalia, dorsal and ventral view and spermatecae. 131–133, *Toxomerus politus*. 134–136, *Toxomerus polygraphicus*. 137–139, *Toxomerus procrastinatus*.



FIGURES 140–148. Female genitalia, dorsal and ventral view and spermatocae. 140–142, *Toxomerus productus*. 143–145, *Toxomerus pulchellus*. 146–148, *Toxomerus sedmani*.



FIGURES 149–157. Female genitalia, dorsal and ventral view and spermatecae. 149–151, *Toxomerus steatogaster*. 152–154, *Toxomerus sylvaticus*. 155–157, *Toxomerus teliger*.



FIGURES 158–166. Female genitalia, dorsal and ventral view and spermatecae. 158–160, *Toxomerus tibicen*. 161–163, *Toxomerus undecimpunctatus*. 164–166, *Toxomerus virgulatus*.

***Toxomerus watsoni* (Curran)**

(Figs. 167–169)

Mesogramma watsoni Curran, 1930: 5 (descr.); 1934: 399 (key); Hull, 1943b: 7, 32 (key and ill.).

Mesogramma lanei Hull, 1942: 74 (descr.).

Mesograpta watsoni Fluke, 1956: 233 (cat.).

Toxomerus watsoni Thompson *et al.*, 1976: 54 (cat. & n. comb.); Thompson, 1981: 99 (key).

Mesograpta Fluke, 1956: 2224 (cat.).

Toxomerus lanei Thompson *et al.*, 1976: 51 (cat. & n. comb.), **syn. nov.**

Male. Head: face 1/2 as long as eye width, yellow, shiny except sparsely white pollinose and pilose laterally; gena black; frontal triangle yellow, white pilose; vertical triangle black, white and bronze pollinose, black pilose; occiput black, silver pollinose, with thick white pile, with a short row of brownish pile superiorly; antenna yellow to brownish, black pilose, arista brown.

Thorax: postpronotum yellow; proepisternum black, white pollinose; proepimeron yellow; scutum black except broadly yellow laterally, bronze pollinose except for bluish-white pollinose medial vitta, yellow pilose; scutellum yellow, black pilose; anterior anepisternum black, long yellow pilose; posterior anepisternum black on anterior 1/2, yellow pilose dorsally, posterior 1/2 yellow, yellow pilose; katapisternum black except dorsal 1/3 yellow, dull, yellow pilose; anterior and dorsomedial anepimeron yellow; posterior anepimeron black; plumula yellow, calypter yellowish with yellowish fringe except brown fringe on dorsal lobe; posterior mesothoracic pleuron (katepimeron, meron, katatergum, anatergum and postscutellum) black, anatergum yellow posterodorsally; methatoracic pleuron yellow; metasternum yellow; halter yellow. Legs: pro- and mesocoxae black on basal 2/3, yellow apically, yellow pilose; metacoxa yellow, yellow pilose; trochanters yellow, yellow pilose; pro- and mesofemora yellow, yellow pilose, mesofemur black pilose on apical 1/3; metafemur usually yellow, sometimes with black annulus on apical 1/3, yellow and black pilose; pro- and mesotibiae yellow, yellow pilose; metatibia usually yellow, sometimes brownish on medial 1/3, black pilose; protarsus yellow to brown, black pilose, mesotarsus yellow, black pilose; metatarsus brown, black pilose. Wing: hyaline, extensively microtrichose, bare only: on basal 1/2 or less of cell C, basal 1/5 of cell R1, basal 2/3 or less of cell R and basal 3/4 or less of cell BM; alula broader than cell BM apically, microtrichose.

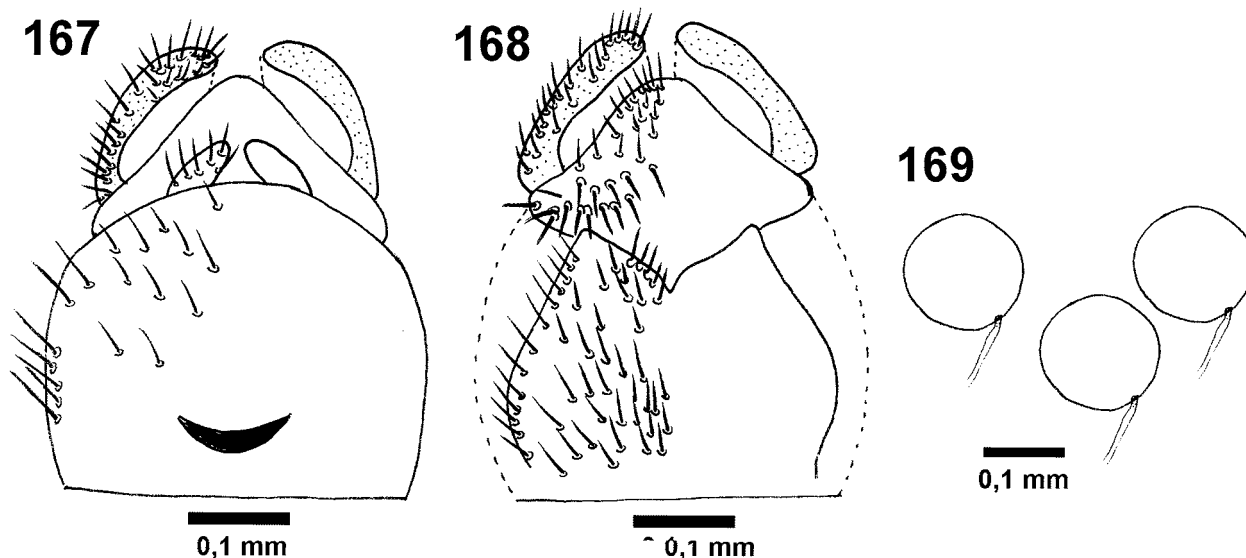
Abdomen: terga yellow and black pilose; 1st tergum black except yellow anteriorly and laterally; 2nd tergum black with medial yellow fascia extended medio-posteriorly; 3rd to 4th terga black with yellow fascia on anterior 2/3 with two medial black macula; 5th tergum yellow with black macula medially. Male genitalia: surstylus flattened apically in dorsal view, with scattered short setae; postanal process almost as long as surstylus; aedeagus enlarged, proeminent dorsally; superior lobe somewhat quadrangular with dorsal extension, forked distad, with hairs along anterior, ventral and posterior margins.

Female. Similar to male except for the frons black, bronze pollinose, black pilose. Anterior anepisternum bare. Female genitalia: 9th tergum with a concave-convex black macula; epiproct somewhat elliptical; cercus slender; hypoproct somewhat triangular; 9th sternum as in Fig. 168; three rounded spermatacae similar in size (Figs. 167–169).

Length. Body 5.0–5.5 mm, wing 4.5–5.0 mm.

Discussion. No specimen of *Mesogramma lanei* was found labeled as holotype, however one specimen labeled as “*Mesogramma dora* has the same data label of *M. lanei* (“Tinguá, R. Janeiro, Brasil”, “Maio, 1940”, [pink square]) and was recognized as the holotype and properly labeled. The synonymies were based on the examination of the female holotype of *Mesogramma lanei* and male holotype, female allotype and male paratype of *Mesogramma watsoni*.

Type material examined. Holotype. HAITI. Aux Cayes: *Mesogramma watsoni*, male, 15–20/1922 (AMNH). Allotype. JAMAICA. Yallahs Valley: Blue Mountains, *Mesogramma watsoni*, female, 27/II/1911 (AMNH). Paratypes. JAMAICA. Yallahs Valley: Blue Mountains, *Mesogramma watsoni*, ♂, 27/II/1911 (CNC).



FIGURES 167–169. Female genitalia, dorsal and ventral view and spermatecae. *Toxomerus watsoni*.

Other material examined. MEXICO. **Veracruz:** Fortin de las Flores, ♀, 2/V/1985, A. Freidberg (USNM). **Chiapas:** ♀, 23/IV/1983, W. N. Mathis (USNM). GUATEMALA. Yepocapa: ♂, VI/1950, H. T. Dalmat (USNM). EL SALVADOR. Santa Tecla: ♀, 16/I/1959, Paul Berry (USNM); ♀, X/1959, N. H. L. Krauss (USNM). CUBA. Soledad: Cienfuegos, ♀, I–II/1927, C. T. & B. B. Brues (USNM). JAMAICA. Hardwar Gap: ♂ & ♀, 10/III/1970, Wirth & Farr (USNM). VENEZUELA. **Zulia:** El Tucuco, ♂ & ♀, 5–6/VI/1976, A. S. Menke & D. Vincent (USNM). PERU. Perene: ♂, R. C. Shannon (USNM). BOLIVIA. Cochabamba: 3 ♀, V–VI/1971, R. Hinojosa (USNM). BRAZIL. **Pernambuco:** Olinda, 2 ♂, X/1961, N. L. H. Krauss (USNM); Caruaru, 6 ♀, VII/1974 (MZSP); Caruaru, 3 ♂ & ♀, IV/1972, V/1972, M. Alvarenga (MNRJ). **Bahia:** Serrinha, ♂ & ♀, 6/III/1951, D. Albuquerque (MNRJ); Euclides da Cunha, ♂ & ♀, 16/VII/1951, Comiss. F. G. Munis (MNRJ). **Brasília:** Distrito Federal, ♀, VII/1960, Exp. Formosa (MNRJ); 4 ♂ & ♀, 15/X/1971, Luiz Moojen (MNRJ). **Minas Gerais:** Viçosa, ♂ & 2 ♀, 13/X – 1/XI/1985, T. J. Henry & S. P. Fiuza F. (USNM). **Espírito Santo:** Vitória, ♂, VII/1961, N. L. H. Krauss (USNM); Linhares, 2 ♂ & 8 ♀, IX/1970, P. C. Elias (MZSP). **Rio de Janeiro:** ♂, 3/III/1952, Ayrton (MNRJ); Alto da Boa Vista, ♂, 06/VII/1978, A. Almeida (MNRJ); Petrópolis, ♀, II/1956, D. Albuquerque (MNRJ); Estrada Rio-São Paulo, 2 ♀, 29–30/I/1945, B. Ramos (MNRJ). **São Paulo:** Barueri, ♂, ♀, 28/XI/1954, 5/VII/1955, K. Lenko (MZSP); S. Amaro, ♂, 1957, J. Lane (MZSP). Rio Preto, ♀, 13/I/1977, L. Knutson (USNM); Santos, ♀, VI/1961, N. L. H. Krauss (USNM); 2 ♂, 24/VIII/1961, N. L. H. Krauss (USNM); Guarujá, ♂, 3/VIII/1961, N. L. H. Krauss (USNM). **Santa Catarina:** Ituporanga, 3 ♂ & 3 ♀, 28/XI/1997, Sweeping & Artenio Driutti (USNM); Nova Teutônia, ♀, VI/1970, F. Plaumann (MZSP).

Geographical record. Widespread, from Mexico to southern Brazil.

Acknowledgements

Zuleica M. Borges thanks the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), an agency of the Brazilian Government for the financial support to stay in Washington D.C., USA during four months to study at United States National Museum, and Dr. F. Christian Thompson for all help and contributions with this paper during that time. The Williston Foundation for provide financial support to go to Canada and England to visit The Canadian National Collection, Ottawa; Hope Entomological Collections, University Museum, Oxford; and The Natural History Museum, London.

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