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## A Report on a Collection of Ceratopogonidae (Diptera) from Rondonia (Brazil) and Iquitos (Peru) 1. Tribes Palpomyiini and Stenoxenini

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**A Report on a Collection of Ceratopogonidae (Diptera)  
from Rondonia (Brazil) and Iquitos (Peru)  
1. Tribes Palpomyiini and Stenoxenini**

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**Abstract:** Examination of two large collections of Ceratopogonidae from Rondonia, Brazil, and Loreto, Peru, resulted in records of 15 species in the tribes Palpomyiini and Stenoxenini, including three previously undescribed: *Bezzia schmitzorum* Dippolito & Spinelli, *Palpomyia pseudolacustris* D. & S., and *Stenoxenus aductus* D. & S. from Rondonia. The hitherto unknown male of *Palpomyia versicolor* Macfie is described and figured.

### Introduction

This is the first paper in a series comprising a taxonomic study of ceratopogonids recently collected by U. Schmitz in Rondonia, Brazil, and by J. Castner and P. Skelley in Loreto, Peru. Data for the collections are as follows: BRAZIL: Rondonia, 62 km SW Ariquemes, vic. Rancho Grande, iv-ix, 1992, U. Schmitz, UV light trap (abbreviated RRG in text below). PERU: Dept. Loreto, 40 km NE Iquitos, Explorama Inn on Rio Amazon, 22.viii-v.ix.1992, J. Castner & P. Skelley (ExI); and 160 km NE Iquitos, Explorama Camp, Rio Sucasari, 2 km from Rio Napo, 27-31.viii.1992, J. Castner & P. Skelley (ExC).

The present contribution deals with the predaceous midges belonging to the tribes Palpomyiini and Stenoxenini. For general ceratopogonid terminology see Downes & Wirth (1981); for special terms dealing with the tribes Palpomyiini and Stenoxenini see Wirth et al. (1974). The holotypes and allotypes of the new species from Brazil are deposited in the Instituto Oswaldo Cruz, Rio de Janeiro, Brazil; those from Peru are deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. Paratypes and other specimens examined are in the Florida State Collection of Arthropods, Gainesville.

### Tribe Palpomyiini

#### *Bezzia clavipennis* Spinelli & Wirth

*Bezzia clavipennis* Spinelli & Wirth, 1989: 775 (female; Brazil, Colombia, Ecuador, Venezuela).

**Distribution.** Brazil, Colombia, Ecuador, Venezuela.

**Specimen Examined.** One female from Rondonia (RRG).

#### *Bezzia mazaruni* Macfie

*Bezzia mazaruni* Macfie, 1940a: 193 (female; Guyana); Lane, 1958: 27 (in key); Spinelli & Wirth, 1989: 766 (redescribed; figs.; synonymy; distribution).

*Bezzia coloradensis* Wirth, 1952: 238 (male, female; California); Dow & Turner, 1976: 131 (redescribed; figs.; distribution); Wirth, 1983: 301 (redescribed; figs.; distribution).

**Distribution.** Belize, Brazil, Cayman Islands, El Salvador, Guyana, Haiti, Honduras, Jamaica, Venezuela, USA (California and Florida).

**Specimens Examined.** Two females from Rondonia (RRG).

***Bezzia megatheca* Spinelli & Wirth**

*Bezzia megatheca* Spinelli & Wirth, 1990: 22 (female; Colombia).

**Distribution.** Brazil, Colombia.

**Specimens Examined.** One female from Rondonia (RRG) which represents the first record of *B. megatheca* from Brazil.

***Bezzia pulchripes* Kieffer**

*Bezzia pulchripes* Kieffer, 1917: 330 (female; Paraguay); Lane, 1958: 27 (in key); Mayer, 1959: 232 (pupa; Brazil); Wirth, 1959a: 234 (male; Brazil); Spinelli & Wirth, 1989: 768 (re-described; figs.; distribution).

**Distribution.** Widely distributed, from Mexico to northern Argentina.

**Specimens Examined.** Nine females from Rondonia (RRG).

***Bezzia schmitzorum* Dippolito & Spinelli,**  
new species (Figs. 1-4)

**Description. Female.** Wing length 2.05 (1.97-2.13,  $n = 2$ ) mm; breadth 0.73 (0.71-0.75,  $n = 3$ ) mm. Head: Dark brown. Eyes separated by a distance equal to diameter of 1.5 ommatidial facets. Antenna dark brown, bases of flagellomeres pale; lengths of flagellomeres in proportion of 16-14-12-12-13-13-14-16-26-29-33-32-43; antennal ratio 1.48. Palpus (Fig. 1) dark brown, narrow apex of segments 3-4 whitish; lengths of segments in proportion of 5-12-15-12-12; 3rd segment with sensilla implanted in small, irregular pits. Mandible with 8 strong teeth.

Thorax: Dark brown. Scutum covered by fine pubescence and small hairs, with minute anteromedian spine; 3 prealar setae, one postalar. Legs (Fig. 2) dark brown, fore femur slightly paler; narrow pale rings subbasally on mid and hind femora and all tibiae, fore tibia slightly pale subapically; fore femur armed with 3 ventral spines of similar length; hind tibial comb with 8 bristles. Tarsi yellowish brown, tarsomeres 4-5 dark; ventral palisade setae absent on fore tarsus, in one row on tarsomeres 1-3 of mid leg, in 2 rows on tarsomeres 1-3 of hind leg; hind tarsal ratio 2.40 (2.30-2.50,  $n =$

2); claws short, slightly curved, each with internal basal tooth. Wing (Fig. 3) with costal ratio 0.86 (0.84-0.88,  $n = 2$ ); vein M2 just sessile, membrane slightly infuscated. Halter with knob dark brown.

Abdomen (Fig. 4): Dark brown. Three pairs of gland rods (well visible in paratype). Two spermathecae plus vestigial 3rd, ovoid with long necks, unequal, measuring 0.067 by 0.055 mm, neck 0.019 mm, and 0.051 by 0.043 mm, neck 0.016 mm.

**Male.** Unknown.

**Distribution.** Brazil; known only from the type locality.

**Types.** Holotype female, Brazil, Rondonia, 62 km SW Ariquemes, vic. Rancho Grande, 20.ix.1992, U. Schmitz, UV light trap. Paratype female, same data except 25.ix.1992.

**Etymology.** This species is named after the Harald Schmitz family, owners of the Fazenda Rancho Grande, and especially for their daughter Uta, who operated the light trap by which the insects were collected.

**Discussion.** *Bezzia schmitzorum* belongs to the *venustula* group of the subgenus *Homobezzia*. It is very similar to *B. cayoensis* Spinelli & Wirth, from which it can be distinguished by the paired, rounded, glabrous areas of the 8th sternite, by possessing 3 pairs of gland rods (one in *cayoensis*), and by the different pattern of leg coloration.

***Pachyhelea pachymera* (Williston)**

*Ceratopogon pachymerus* Williston, 1900: 224 (female; Mexico). *Probezzia pachymera* (Williston); Malloch, 1914a: 137 (combination).

*Pachyhelea pachymera* (Williston); Wirth, 1959b: 50 (combination; re-described; synonymy); Lane, 1961a: 42 (Brazil records); Wirth, 1962: 275 (in key); Wirth, 1974: 53 (distribution); Wirth et al., 1974: 604 (in list, key); Grogan & Wirth, 1980: 74 (re-described; figs.; synonymy; distribution); Spinelli, 1983: 17 (pupa; Argentina).

*Ceratopogon magnus* Coquillett; 1905: 61 (female; Texas).

*Johannseniella magna* (Coquillett); Malloch, 1914b: 227 (in key; combination).

*Johannsenomyia magna* (Coquillett); Malloch, 1915: 333 (in key; combination); Johannsen, 1943: 784 (in list N. Amer. species).

*Sphaeromyias albidiventris* Kieffer, 1917: 316 (female; Colombia).

*Homohalea albidiventris* (Kieffer); Kieffer, 1917: 364 (combination).

*Johannsenomyia latifemoris* Ingram & Macfie, 1931: 231 (female; Argentina; Macfie, 1940b: 75 (male description).

**Distribution.** Widely distributed, from southern Texas to Argentina.

**Specimens Examined.** Three females, 4 males from Rondonia (RRG).

***Palpomyia oliveirai* Lane**

*Palpomyia oliveirai* Lane, 1947: 443 (female; Brazil); Lane, 1960: 383 (in key).

**Distribution.** Brazil.

**Specimen Examined.** One female from Rondonia (RRG).

***Palpomyia pseudolacustris***

**Dippolito & Spinelli, new species (Figs. 5-6)**

**Description. Female.** Wing length 2.35 mm; breadth 0.75 mm. Head: Reddish brown. Eyes separated by a distance equal to diameter of 3 ommatidial facets. Antenna dark brown, bases of flagellomeres pale; lengths of flagellomeres in proportion of 12-12-12-11-11-12-13-14-24-26-29-29-35; antennal ratio 1.47. Palpus brown, lengths of segments in proportion of 21-35-39-29-37. Mandible with 10 teeth.

**Thorax:** Scutum blackish, without anterior spine. Legs dark brown, base and narrow apex of fore femur slightly paler; fore and mid femora with 3, hind femur with 5-6 ventral spines; hind tibial comb with 7 bristles. Tarsi yellowish, 5th tarsomeres slightly infuscated; hind tarsal ratio 3.30; ventral palisade setae absent on fore tarsus, in one row on basitarsus of mid leg, in two rows on tarsomeres 1-2 on hind leg; a pair of stout, black, apical spines on tarsomeres 1-3 of mid leg; 5th tarsomeres with paired ventrolateral bristlelike setae, one on fore leg, 2 on mid leg, 3 on hind leg; claws equal, curved, with internal basal tooth. Wing (Fig. 5) with costa extending to 0.88 of total length; membrane deeply infuscated, veins dark brown; venation as figured. Halter knob dark brown.

**Abdomen:** Dark brown; apparently with 2 pairs of gland rods. Two ovoid spermathecae with short necks; unequal, measuring 0.098 by 0.091 mm, and 0.082 by 0.073 mm.

**Male.** Wing length 1.30 mm; breadth 0.43 mm. Similar to female with usual sexual differences. Fore femur with 2 ventral spines, mid and hind femora unarmed.

**Genitalia (Fig. 6):** Ninth sternite ribbon-shaped, with deep caudomedian excavation, membrane spiculate; 9th tergite tapering to conical shape; cerci elongated. Gonocoxite straight, 3 times longer than broad, with a small ventroapical lobe; gonostylus short, tapering distally, with a ventromesal cluster of short, black setae. Aedeagus triangular, heavily sclerotized; basal arms recurved, basal arch 0.5 of total length, tip caplike. Parameres narrowly fused anteriorly, heavily sclerotized; basal apodemes nearly horizontal; distal portion divided, each with bulbous tip, then recurved in a long slender projection.

**Distribution.** Brazil, known only from the type locality.

**Types.** Holotype female, allotype male, Brazil, Rondonia, 62 km SW Ariquemes, vic. Rancho Grande, 25.iv.1992, U. Schmitz, UV light trap. Paratypes, 9 males, as follows: same data as types, 4 males; same data except 27.iv.1992, 1 male; 1.v.1992, 3 males; 20.ix.1992, 1 male.

**Discussion.** This species, a typical member of the *Palpomyia tibialis* group, is very similar to *P. lacustris* Lane, Forattini & Rabello, from which it can be distinguished by elongated gonocoxite with ventroapical lobe, and by the parameres with bulbous tip and recurved projection.

***Palpomyia versicolor* Macfie**

(Figs. 7-9)

*Palpomyia versicolor* Macfie, 1939a: 215 (female; Brazil); Lane, 1960: 382 (in key).

**Diagnosis. Female.** A medium-sized species of the *Palpomyia distincta* group. Thorax blackish, abdomen pale brown. Legs yellowish brown, distal 1/3 of hind femur dark brown; base and apex of tibiae brown, these markings more extensive on hind leg; tarsomeres 3-5 infuscated; fore femur swollen, fore tibia arcuate; all femora armed with ventral spines, 14-17 on fore leg, 1 on mid leg, 1-2 on hind leg. Second radial cell 3 times longer than 1st. Halter knob whitish. No gland rods visible. Two spermathecae.

**Male.** Genitalia (Figs. 7-9): Ninth sternite 3.5 times broader than long, with broad, shallow caudomedian excavation; 9th tergite long, slightly tapering, cerci elongated. Gonocoxite 2.5 times longer than broad, with prominent mesoventral setose lobe; gonostylus slender, curved, with pointed tip, 0.5 as long as gonocoxite, with mesoventral stout hairs. Aedeagus (Fig. 8) stout, subrectangular, basal arch low; basal arms heavily sclerotized, recurved; distal portion very slender, tip caplike. Parameres (Fig. 9) divided, each with heavily sclerotized, recurved basal apodeme; distal portion stout with blunt tip.

**Distribution.** Brazil.

**Specimens Examined.** One female, 2 males from Rondonia (RRG).

**Discussion.** The female here recorded agrees perfectly with Macfie's description of *P. versicolor*. This is the first description of the male of this species.

***Phaenobezzia maya* Spinelli & Wirth**

*Phaenobezzia maya* Spinelli & Wirth, 1986: 234 (female, male; Belize).

**Distribution.** Belize, Brazil, Costa Rica, El Salvador, Honduras, Mexico, Panama, Texas.

**Specimens Examined.** Two females from Rondonia (RRG), which represent the first record of *P. maya* for Brazil.

**Tribe Stenoxenini**

***Paryphoconus aemulus* Macfie**

*Paryphoconus aemulus* Macfie, 1940a: 180 (male; Guyana); Lane, 1946: 206 (female; Brazil); Wirth & Ratanaworabhan, 1972: 1371 (female notes; figs.; records Brazil); Spinelli & Wirth, 1984: 888 (female notes; in key).

**Distribution.** Brazil, Guyana, Peru.

**Specimen Examined.** One female from Iquitos (ExI), which represents the first record of *P. aemulus* for Peru.

***Paryphoconus mayeri* Wirth**

*Paryphoconus mayeri* Wirth, 1959a: 236 (female; Brazil); Mayer, 1959: 232 (pupa); Lane, 1961b: 454 (in key); Spinelli & Wirth, 1984: 884 (in key).

**Distribution.** Brazil.

**Specimens Examined.** Two females from Rondonia (RRG).

***Paryphoconus nigripes* Macfie**

*Paryphoconus nigripes* Macfie, 1939b: 8 (female; Argentina); Lane, 1956: 303 (in key; Brazil records); Lane, 1961b: 455 (in key); Spinelli & Wirth, 1984: 886 (in key).

**Distribution.** Argentina, Brazil, Guyana.

**Specimen Examined.** One female from Rondonia (RRG).

***Paryphoconus subflavus* Macfie**

*Paryphoconus subflavus* Macfie, 1940c: 23 (female; Guyana); Lane, 1956: 300 (in key); Lane, 1961b: 455 (in key); Wirth & Ratanaworabhan, 1972: 1376 (redescribed; figs.; distribution); Spinelli & Wirth, 1984: 887 (in key; synonymy; wing photo).

*Paryphoconus travassosi* Lane, 1956: 304 (female; Brazil); Lane, 1961b: 458 (in key; record type-locality); Wirth & Ratanaworabhan, 1972: 1378 (redescribed; figs.; Brazil).

**Distribution.** Brazil, Colombia, Guyana.

**Specimen Examined.** One female from Rondonia (RRG).

***Stenoxenus aductus* Dippolito & Spinelli,  
new species (Figs. 10-13)**

**Description. Female.** Wing length 3.04 mm; breadth 1.06 mm. Head: Dark brown, clypeus yellow. Antenna with flagellomeres in proportion of 26-15-15-14-14-12-12-13-45-45-43-44-49; antennal ratio 1.87; flagellomeres 3-10 blackish with numerous stout black hastate setae, 11-15 pale brown with fine scattered hairs (Fig. 10). Palpus (Fig. 11) yellowish, external side brownish; lengths of segments in proportion of 6-14-24-26. Mandible with 5 teeth.

Thorax: Blackish. Legs yellowish brown, narrow apex of hind tibia brown; tarsomeres 1-3 of fore and mid legs and 5th tarsomere of hind leg infuscated. Wing (Fig. 12) with membrane hyaline;

costal cell much broadened anterior to medial fork; r-m crossvein obsolete; medial fork broadly sessile; vein M2 sharply elbowed near base, well separated from vein M3+4; distal section of vein M3+4 1.2 times as long as its stem; anal lobe well developed. Halter (pedicel and knob) dark brown.

Abdomen: Dark brown. Five pairs of gland rods, the one extending from segment 8 more sclerotized. Spermatheca (Fig. 13) oval, without sclerotized neck; very large, measuring 0.230 by 0.092 mm.

**Male.** Unknown.

**Distribution.** Brazil, known only from the type locality.

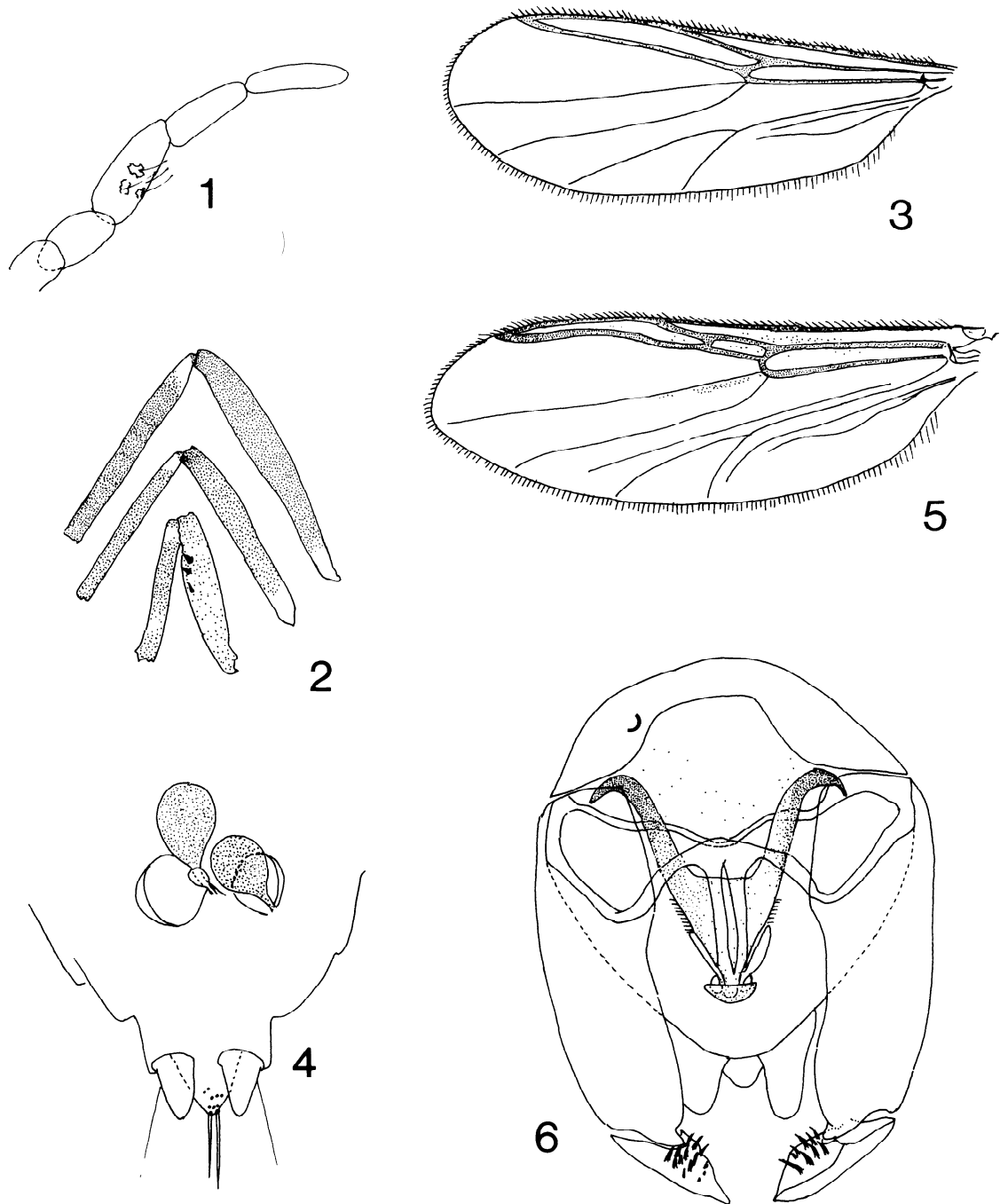
**Type.** Holotype female, Brazil, Rondonia, 62 km SW Ariquemes, vic. Rancho Grande, 1.v.1992, U. Schmitz, UV light trap.

**Discussion.** This species is readily distinguished from its Neotropical congeners by its very large spermatheca without sclerotized neck. Because of the wing venation and many other characters it resembles *S. johnsoni* Coquillett, but the latter species has only one pair of gland rods and the vein M2 nearly reaches vein M3+4.

### References

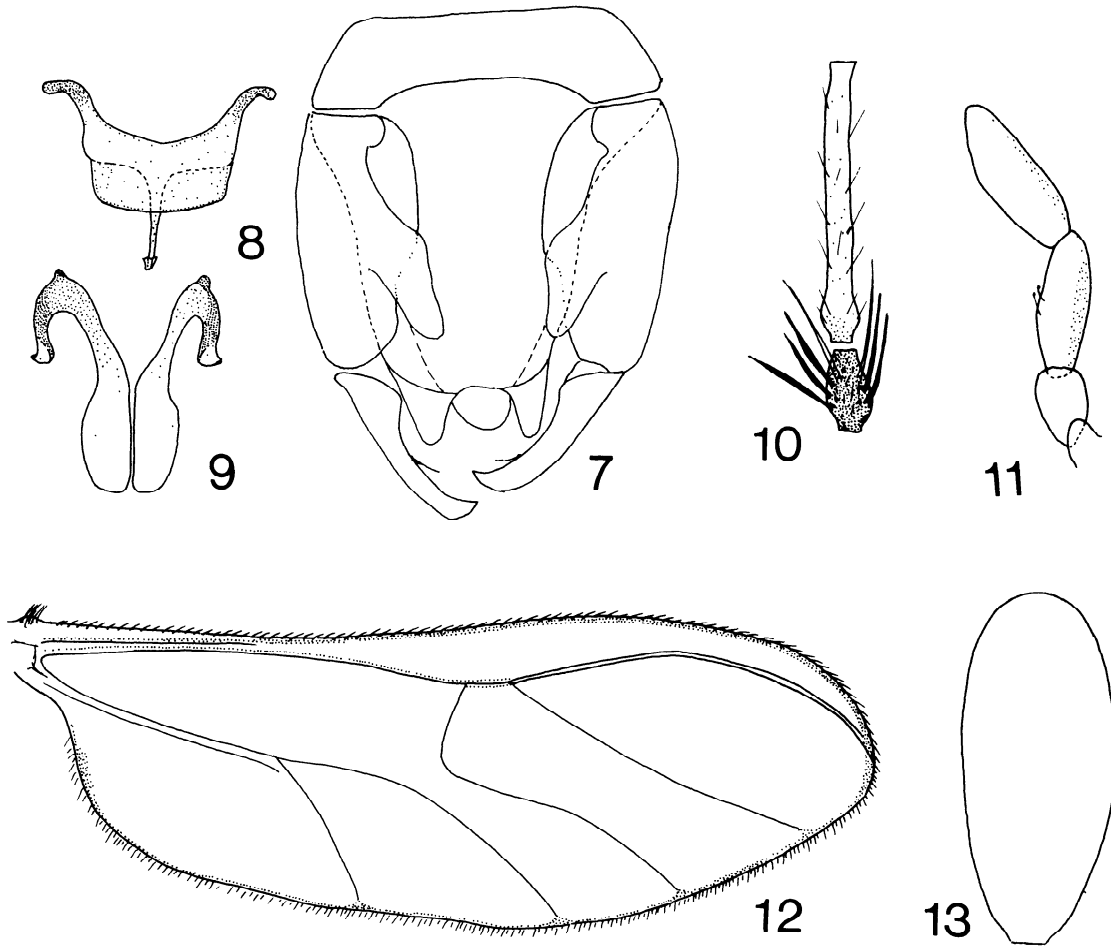
- Coquillett, D. W. 1905. New nematocerous Diptera from North America. *Journal of the New York Entomological Society* 13: 56-69.
- Dow, M. I., and Turner, E. C. 1976. A taxonomic revision of the Nearctic species of the genus *Bezzia* (Diptera: Ceratopogonidae). *Virginia Polytechnic Institute and State University Research Division Bulletin* 103: 1-162.
- Downes, J. A., and Wirth, W. W. 1981. Ceratopogonidae, pp. 393-421, In McAlpine, J. F., et al., eds. *Manual of Nearctic Diptera*, Vol. 1. Agriculture Canada Monograph 27, 674 pp.
- Grogan, W. L., Jr., and Wirth, W. W. 1980. The taxonomic status of the predaceous midge *Pachyhelea pachymera* (Williston) (Diptera: Ceratopogonidae). *Proceedings of the Entomological Society of Washington* 82: 74-80.
- Ingram, A., and Macfie, J. W. S. 1931. *Diptera of Patagonia and South Chile*. Part II, Fasc. 4, pp. 155-232. London.
- Johannsen, O. A. 1943. A generic synopsis of the Ceratopogonidae (Heleidae) of the Americas, a bibliography, and a list of the North American species. *Annals of the Entomological Society of America* 36: 763-791.
- Kieffer, J. J. 1917. Chironomides d'Amerique conserves au Musee National Hongrois de Budapest. *Annales Musei Nationalis Hungarici* 15: 292-364.
- Lane, J. 1946. New Neotropical Ceratopogonidae (Heleidae) (Diptera, Nemocera). *Revista de Entomologia* 17: 202-215.
- Lane, J. 1947. Novas especies de *Palpomyia* do Brasil (Diptera, Ceratopogonidae). *Revista de Entomologia* 18: 438-447.
- Lane, J. 1956. On "*Paryphoconus*" and "*Stenoxenus*" (Diptera, Ceratopogonidae). *Revista Brasileira de Biologia* 16: 299-308.
- Lane, J. 1958. On Neotropical *Bezzia*. *Revista Brasileira de Entomologia* 8: 25-36.
- Lane, J. 1960. Additional data on "*Palpomyia*" (Diptera, Ceratopogonidae). *Revista Brasileira de Biologia* 20: 381-389.
- Lane, J. 1961a. Further notes on Neotropical Ceratopogonidae (Diptera). *Revista Brasileira de Biologia* 21: 37-44.
- Lane, J. 1961b. The genera *Stenoxenus* and *Paryphoconus* in the Neotropics (Diptera: Ceratopogonidae). *Studia Entomologica* 4: 452-458.
- Macfie, J. W. S. 1939a. A report on a collection of Brazilian Ceratopogonidae (Dipt.). *Revista de Entomologia* 10: 137-219.
- Macfie, J. W. S. 1939b. A key to the species of Ceratopogonidae akin to *Macropeza* Mg. (Diptera). *Transactions of the Royal Entomological Society of London* 89: 1-12.
- Macfie, J. W. S. 1940a. Ceratopogonidae (Diptera) from British Guiana and Trinidad. *Proceedings of the Royal Entomological Society of London (B)* 9: 179-195.
- Macfie, J. W. S. 1940b. Ceratopogonidae (Diptera) from North-eastern Brazil. *Proceedings of the Royal Entomological Society of London (B)* 9: 73-79.
- Macfie, J. W. S. 1940c. A report on a collection of Ceratopogonidae (Diptera) from British Guiana. *Entomologist's Monthly Magazine* 76: 23-32.
- Malloch, J. R. 1914a. Synopsis of the genus *Probezzia*, with description of a new species (Diptera). *Proceedings of the Biological Society of Washington* 27: 137-139.
- Malloch, J. R. 1914b. Notes on North American Diptera, with descriptions of a new species in the collection of the Illinois State Laboratory of Natural History. *Bulletin of the Illinois State Laboratory of Natural History* 10: 213-243, 3 plates.
- Malloch, J. R. 1915. The Chironomidae, or midges, of Illinois, with particular reference to the species occurring in the Illinois River. *Bulletin of the Illinois State Laboratory of Natural History* 10: 275-543, 24 plates.
- Mayer, K. 1959. Die Puppen brasilianischer Heleiden (Diptera). *Deutsche Entomologische Zeitschrift (N. F.)* 6: 230-233.

- Spinelli, G. R.** 1983. Notas sobre Ceratopogonidae (Diptera: Nematocera) de la Republica Argentina. III. Nuevos aportes al conocimiento de la tribu Palpomyiini. *Revista de la Sociedad Entomologica Argentina* 42: 17-24.
- Spinelli, G. R., and Wirth, W. W.** 1984. A review of the Neotropical predaceous midge genus *Paryphoconus* (Diptera: Ceratopogonidae). *Proceedings of the Biological Society of Washington* 97: 882-908.
- Spinelli, G. R., and Wirth, W. W.** 1986. The Neotropical species of *Phaenobezzia* (Diptera: Ceratopogonidae). *The Florida Entomologist* 69: 231-236.
- Spinelli, G. R., and Wirth, W. W.** 1989. The Neotropical predaceous midges of the genus *Bezzia* (Diptera: Ceratopogonidae). Part I. The *glabra* and *brevicornis* groups. *Limnobiots* 2: 762-778.
- Spinelli, G. R., and Wirth, W. W.** 1990. Neotropical predaceous midges of the genus *Bezzia* (Diptera: Ceratopogonidae). Part III. The *gibbera* group of species. *Insecta Mundi* 4: 11-32.
- Williston, S. W.** 1900. Supplement (part), pp. 217-248. In: Godman, F. D., & O. Salvin, eds. *Biologia Centrali Americana. Zoologia - Insecta - Diptera*. Vol. 1, 378 pp. London.
- Wirth, W. W.** 1952. The Heleidae of California. *University of California Publications in Entomology* 9: 95-266.
- Wirth, W. W.** 1959a. New species and records of Heleidae from Brazil. *Deutsche Entomologische Zeitschrift (N.F.)* 6: 234-137.
- Wirth, W. W.** 1959b. *Pachyhelea*, a new genus of American Ceratopogonidae related to *Palpomyia* (Diptera). *Bulletin of the Brooklyn Entomological Society* 54: 50-52.
- Wirth, W. W.** 1962. A reclassification of the *Palpomyia-Bezzia-Macropenza* groups, and a revision of the North American Sphaeromiini (Diptera, Ceratopogonidae). *Annals of the Entomological Society of America* 55: 272-287.
- Wirth, W. W.** 1974. A catalogue of the Diptera of the Americas south of the United States. 14. Ceratopogonidae. *Museum de Zoologia, Universidade de Sao Paulo, Fascicle* 14, pp. 1-89.
- Wirth, W. W.** 1983. The North American predaceous midges of the *Bezzia bicolor* group (Diptera: Ceratopogonidae). *The Florida Entomologist* 66: 292-310.
- Wirth, W. W., and Ratanaworabhan, N. C.** 1972. A revision of the tribe Stenoxenini (Diptera: Ceratopogonidae). *Annals of the Entomological Society of America* 65: 1368-1388.
- Wirth, W. W., Ratanaworabhan, N. C., and Blanton, F. S.** 1974. Synopsis of the genera of Ceratopogonidae (Diptera). *Annales de Parasitologie humaine et comparee* 49: 595-613.



Figures 1-4: *Bezzia schmitzorum*, female; 5-6, *Palpomyia pseudolacustris*, 5, female, 6, male: 1, palpus; 2 femora and tibiae of (top to bottom) hind, mid and fore legs; 3, 5, wing; 4, spermathecae and tip of abdomen; 6, genitalia.





Figures 7-9: *Palpomyia versicolor*, male; 10-13, *Stenoxenus aductus*, female: 7, genitalia, aedeagus and parameres omitted; 8, aedeagus; 9, parameres; 10, antennal segments 10-11; 11, palpus; 12, wing; 13, spermatheca.