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BITING MIDGES FROM DOMINICAN AMBER. II. SPECIES OF THE TRIBES HETEROMYIINI AND PALPOMYIINI (DIPTERA: CERATOPOGONIDAE)

RYSZARD SZADZIEWSKI AND WILLIAM L. GROGAN, JR.

(RS) Department of Invertebrate Zoology, University of Gdańsk, Pilsudskiego 46, 81-378 Gdynia, Poland. (WLG) Department of Biological Sciences, Salisbury State University, Salisbury, MD 21801, U.S.A.

Abstract.—**Three new fossil species** of predaceous midges from Dominican amber are described and illustrated: ***Heteromyia dominicana,*** in the tribe Heteromyiini, and ***Palpomyia wirthorum*** and ***Phaenobezzia wirthi,*** in the tribe Palpomyiini. These are the first fossil species in the genera *Heteromyia* and *Phaenobezzia.*

Key Words: Diptera, Ceratopogonidae, predaceous midges, Dominican amber, fossil species, Neotropical

This is the second in a series of papers in which we describe the biting midge fauna in Dominican amber. Readers should refer to our first paper (Szadziewski and Grogan 1994) for a review of the literature on this subject and a discussion of our materials and methods. In that paper, we also presented tables of numbers of species of Nematocera in Dominican amber in the National Museum of Natural History, Washington, D.C. (USNM) and a list of genera and numbers of Ceratopogonidae from the five collections that we have studied thus far.

For an explanation of general ceratopogonid morphological structures and abbreviations, see Downes and Wirth (1981); for more detailed information on specimens preserved in amber, see Szadziewski (1988).

Tribe Heteromyiini

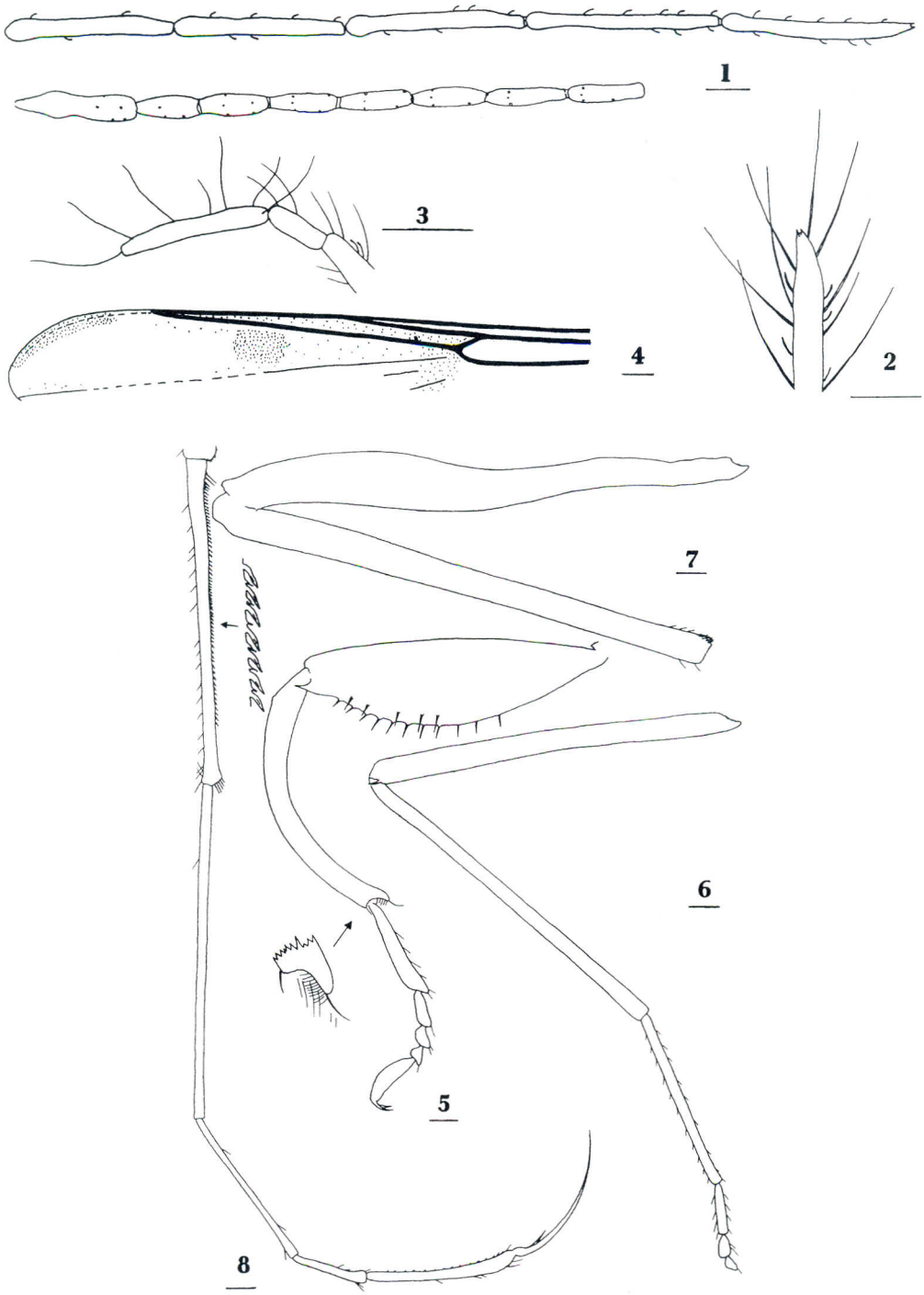
Genus *Heteromyia* Say

Heteromyia dominicana **Szadziewski and Grogan, NEW SPECIES**

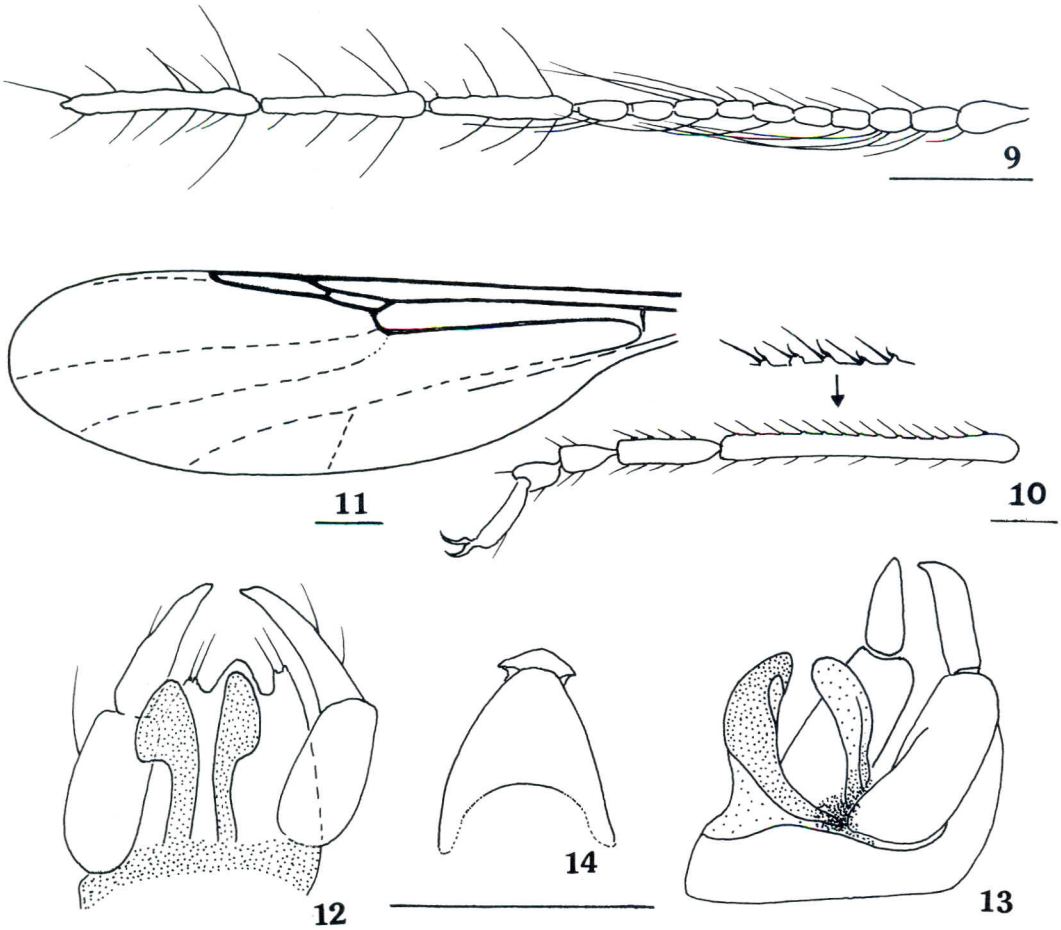
(Figs. 1–8)

Diagnosis.—The smallest species in the genus; female wing length 2.4 mm.

Holotype female.—Body slender, dark brown. *Head:* Eyes broadly separated, bare. Antennal flagellum (Fig. 1) with proximal 8 flagellomeres cylindrical, distal 5 more elongate, flagellomere 13 (Fig. 2) with bifid tip; flagellum length 2163μm; antennal ratio 1.46. Palpus (Fig. 3) barely visible, apparently 5-segmented; segment 3 without sensory pit; segment 5 longest, length 176μm. Proboscis barely visible, short. *Thorax:* Scutum somewhat crushed, anterior spine not visible; scutum, scutellum without stout setae. Fore leg (Fig. 5) with greatly swollen femur bearing 16–18 spines in two rows, 11–13 spines in ventral row, 5 in anteroventral row; tibia arcuate with distinct apical prolongation bearing long seta; tarsus short, 5th tarsomere inflated, claws short, equal sized, each with basal inner tooth; lengths of segments and tarsomeres (T) in μm: femur 951, tibia 826, T1 280, T2 117, T3 75, T4 60, T5 minus claws 188. Middle leg (Fig. 6) with slender femur and tibia; 4th tarsomere cordiform, 5th tar-



Figs. 1–8. *Heteromyia dominicana,* female. 1, Flagellum. 2, Tip of terminal flagellomere. 3, Distal segments of palpus. 4, Anterior portion of wing. 5, Foreleg. 6, Middle leg. 7, Femur and tibia of hind leg. 8, Tarsus of hind leg. Scales = 0.1 mm.



Figs. 9–14. *Palpomyia wirthorum*, male. 9, Flagellum. 10, Tarsus of hind leg. 11, Wing. 12, Ventral aspect of genitalia. 13, Lateral aspect of genitalia. 14, Aedeagus. Scales = 0.1 mm.

somere absent; lengths of segments and tarsomeres in μm: femur 1232, tibia 1201, T1 608, T2 172. Hind leg (Figs. 7–8) very long; femur clavate, slightly swollen on distal ½; tibia straight, tibial comb probably weakly developed, tibial spur greatly reduced; tarsus (Fig. 8) greatly elongated, 1st tarsomere slender, with 2 subbasal relatively long setae, and short flamelike palisade setae extending about 0.8 of total length (fig. 8), apex with 5 comblike fine setae; 2nd tarsomere longer than 1st, 4th tarsomere cylindrical, 5th tarsomere slender with greatly elongated outer claw (length 499μm), inner claw shorter; lengths of segments and tarsomeres in μm: femur 1716, tibia 1669, T1 1030, T2 1092, T3 577, T4 250, T5 515; TRI 2.4, TRII 3.5, TRIII 0.9. Wing (Fig. 4) slender, only partly visible due to folding over abdomen; length 2.42 mm; costal ratio 0.84; a single radial cell present; membrane with distinct microtrichia, macrotrichia absent, patterned with brown pigmentation apparently similar to that of *H. fasciata* Say as presented in Fig. 36 by Downes and Wirth (1981). *Abdomen:* Unmodified, with slender base and enlarged median portion.

Male.—Unknown.

Type.—Holotype ♀, Dominican amber, SMNS Do-2698, D, deposited in Staatliches Museum für Naturkunde, Stuttgart (SMNS).

Etymology.—Named for the Dominican Republic, the country of origin of the amber which encloses this midge.

Discussion.—This is the first fossil species known in the genus *Heteromyia,* and the only known species from Hispaniola. The holotype is the specimen that was mentioned by Schlee (1980). Currently, there are 13 extant species, only two of which inhabit North America (Wirth and Grogan 1977, 1979), whereas the other 11 are Neotropical (Duret and Lane 1955). This new species apparently differs from all extant species in being much smaller.

Tribe Palpomyiini

Genus *Palpomyia* Meigen

Palpomyia wirthorum Szadziewski and Grogan, New Species

(Figs. 9–14)

Diagnosis.—A member of the *Flavipes* Group and apparently the smallest species in the genus (male wing length 0.92 mm); fore femur with one ventral spine; parameres separate, proximal portions slender, distal portions expanded, knife-shaped.

Male.—Body dark brown. Total length 1.15 mm. *Head:* Eyes separated. Antennal flagellum (Fig. 9) with short plume; total length 660μm; antennal ratio 1.40. Palpus 5-segmented. *Thorax:* Scutum without anterior spine or tubercle; scutellum with some stout setae. Fore femur with one stout ventral spine on distal third; mid and hind femora unarmed; hind tibial comb barely visible; 1st tarsomere of hind leg (Fig. 10) with palisade setae; 4th tarsomeres (Fig. 10) cordiform; 5th tarsomeres (Fig. 10) with small claws, apices bifid; TRI 3.6, TRII 3.7, TRIII 3.1. Wing (Fig. 11) membrane transparent with distinct microtrichia; a false vein continuing beyond tip of costa; length 0.92 mm; costal ratio 0.68. *Abdomen:* Genitalia (Figs. 12–14) inverted, small. Sternite 9 not visible; tergite 9 extending just beyond parameres and well beyond gonocoxite. Gonocoxite straight, about twice as long as broad; gonostylus nearly straight, as long as gonocoxite, tapering gradually distally to abruptly pointed tip. Aedeagus (Fig. 14) broadly triangular; basal arch low; apex broadly triangular. Parameres apparently separated; proximal portions slender, distal portions expanded, knife-shaped.

Female.—Unknown.

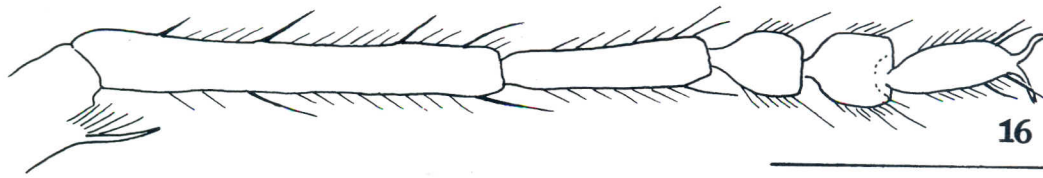
Type.—Holotype ♂, USNM 10073 b. (in 10073 there are also 1 Limoniidae, 2 Psychodidae, plus Homoptera, Coleoptera, and Hymenoptera).

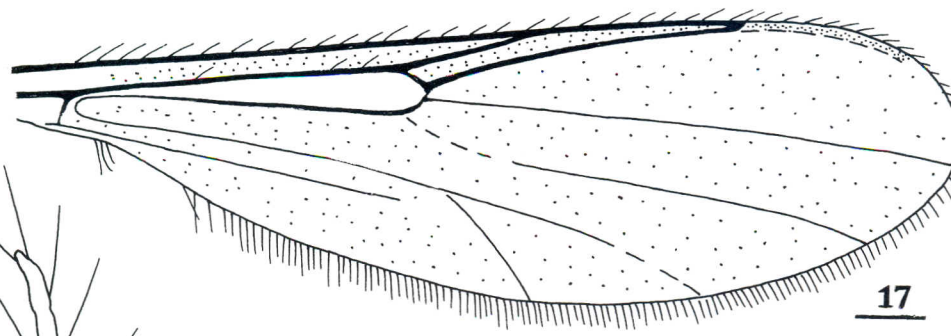
Etymology.—We are pleased to name this new species in honor of Bill and Mabel Wirth, in grateful recognition of their friendship with us.

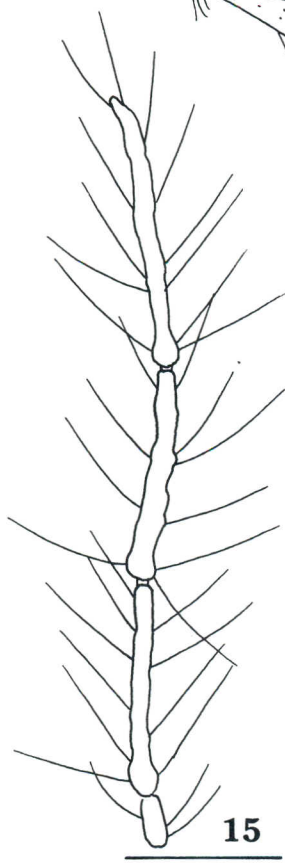
Discussion.—Based upon the basic form of its genitalia, we believe this species to be a member of the *Flavipes* Group as defined by Grogan and Wirth (1979). However, a more definitive character is to be found in females of this group, which are the only species of *Palpomyia* to lack basal inner teeth on their claws. The male of this new species is apparently the smallest among fossil and extant species of *Palpomyia.* The Neotropical species of *Palpomyia* are poorly known and require revision. In their revision of the Nearctic species of *Palpomyia,* Grogan and Wirth (1979) presented detailed descriptions and illustrations of eight species of the *Flavipes* Group, but only recorded wing length and number of femoral spines of females. The smallest available Nearctic specimen of this group, a male of *P. occidentalis* Grogan and Wirth, has a wing length of 1.10 mm.

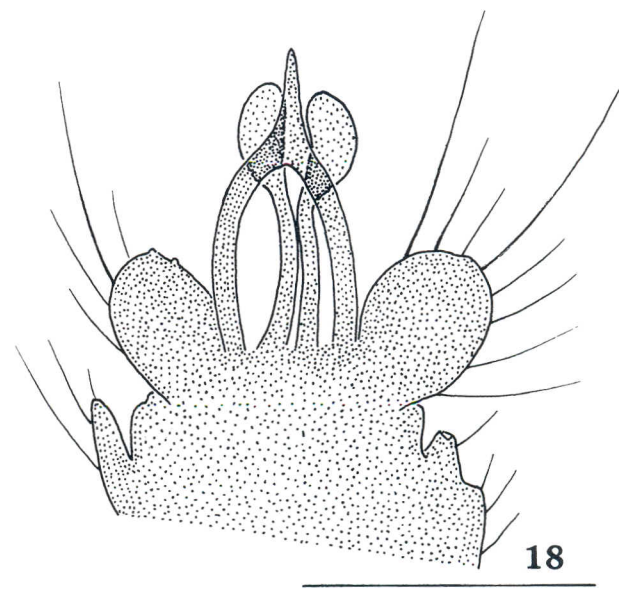
Palpomyia downesi Grogan and Wirth, is the only Nearctic species of the *Flavipes* Group with separate parameres. This species differs from *P. wirthorum* in being larger (female wing length 1.70–2.15 mm), the male allotype has 3 fore femoral spines (2–5 fore femoral spines in females), the aedeagus is broader than long, the gonocoxite is broader, the gonostylus is shorter and curved distally, and the parameres are much shorter with more lobate distal portions.

Fossil *Palpomyia* are known from Eo-









Figs. 15–18. *Phaenobezzia wirthi*, male. 15, Distal four flagellomeres. 16, Tarsus of hind leg. 17, Wing. 18, Genitalia. Scales = 0.1 mm.

cene, Oligocene and Miocene amber as well as sedimentary deposits. The oldest members of the genus are found in Baltic and Chinese amber (Szadziewski 1988). Four fossil species in Miocene siliceous nodules from California were described by Pierce (1966) in the genera *Miopalpomyia, Neopalpomyia,* and *Parapalpomyia.* Unfortunately these were described from pupae, which presently have little taxonomic value, and therefore, Grogan and Wirth (1979) considered these taxa as synonyms of *Pal-*

pomyia. Species of *Palpomyia* are found on all continents except Antarctica and there are nearly 300 recent species, but relationships within the genus are poorly understood (Grogan and Wirth 1979).

Genus *Phaenobezzia* Haeselbarth

***Phaenobezzia wirthi* Szadziewski and Grogan, NEW SPECIES**
(Figs. 15–18)

Diagnosis.—Distinguished from all other species in the genus by the combination of separate parameres with reniform distal portions and absence of gonostyli.

Male.—Body brown, total length 1.5 mm. *Head:* Palpus barely visible, 5-segmented; segment 3 without sensory pit. Antennal flagellum with greatly reduced plume; distal 4 flagellomeres as in Fig. 15. *Thorax:* Scutal spine not visible. Legs slender, unarmed; 4th tarsomeres (Fig. 16) cordiform; 5th tarsomeres (Fig. 16) slender, claws with bifid tips; hind tibial spur long; TRI 2.0, TRII 2.6. Wing (Fig. 17) membrane slightly infuscated except for cell between basal portions of R and M; length 1.15 mm; a single long radial cell, costal ratio 0.77; anal lobe poorly developed. *Abdomen:* Genitalia (Fig. 18) very small. Sternite 9 and tergite 9 not visible. Gonocoxite very short, ovoid; gonostyli absent. Aedeagus Y-shaped or wishbone-shaped, with high basal arch and slender pointed apical projection. Parameres separate; proximal portions long and slender; distal portions reniform.

Female.—Unknown.

Type.—Holotype ♂, AMNH, DR-8–100, labeled "Amber, Dominican Republic, Oligo-Miocene, specific provenance unknown. Purchased in Santo Domingo by D. Grimaldi", deposited in the American Museum of Natural History, New York (AMNH).

Etymology.—We are pleased to name this new fossil species in honor of our dear friend and colleague, Willis W. Wirth.

Discussion.—This is the first fossil species in the genus *Phaenobezzia* and the only known species from Hispaniola. Extant species are mainly inhabitants of tropical and subtropical regions. At present, there are five New World species, four of which occur in North America (Wirth and Grogan 1982), and three in the Neotropics (Spinelli and Wirth 1986, Spinelli 1996). Only one extant New World species, *P. ateles* (Macfie), known from Colombia and Ecuador lacks gonostyli (Spinelli 1996). However, it and all other extant New World species differ from this new extinct species in having fused parameres. Therefore, it is probable that this new species belongs to a plesiomorphic lineage in which males had separate parameres.

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