

**NEOTYPE DESIGNATION, GENERIC REALIGNMENT AND
DESCRIPTION OF *DENDROMYIA SCHNUSEI* MARTINI (DIPTERA:
CULICIDAE)¹**

RALPH E. HARBACH²

*Walter Reed Biosystematics Unit, Department of Entomology, Walter Reed Army Institute of
Research, Washington, DC 20307-5100*

ABSTRACT. A neotype specimen is selected for *Dendromyia schnusei* Martini. The species is transferred from the genus *Wyeomyia* to the genus *Sabethes*, and the adult female is redescribed and illustrated.

INTRODUCTION

The New World sabethine mosquito originally named *Dendromyia schnusei* Martini is an obscure species known only from the original description (Martini 1931) and a single occurrence record from Bolivia (Cerqueira 1943). The type material of *schnusei* is non-extant (Mattingly 1955, Belkin 1971b) and the brief original description provides only limited criteria for the correct delimitation and fixation of the species concept. Fortunately, Martini's description, probably that of a female, includes several critical morphological clues for the proper generic placement and recognition of *schnusei*. Lane and Cerqueira (1942) and Lane (1953) misinterpreted these clues and misplaced *schnusei* at the generic level.

Lane and Cerqueira (1942) introduced *Davismyia* as a subgenus of *Wyeomyia* Theobald to include *schnusei* and *Miamyia petrocchia* Shannon and del Ponte, the designated type form, based on the presence of metallic scutal scales in these species. *Wyeomyia arborea* was later described and placed in this subgenus by Galindo et al. (1951). These three species were regarded as consubgeneric by Lane (1953) and all later authors until *Da-*

vismyia and *petrocchia* were recently recognized as valid taxa of the genus *Sabethes* Robineau-Desvoidy (Harbach and Peyton 1991a) and *arborea* was subsequently included in a new subgenus of *Wyeomyia* (Harbach and Peyton 1991b). As a result of these actions, *schnusei* was left in *Wyeomyia* without subgeneric assignment.

What is *Dendromyia schnusei* Martini? From the original description, Harbach and Peyton (1991a) inferred that *schnusei* is probably a species of *Sabethes*. Since then, I have received and examined a collection of *Sabethes* from Peru that includes 14 females which agree with Martini's description of this species. This identification seems so certain that one of the specimens is selected below to serve as the reference standard (neotype) for the correct application and usage of the name *schnusei*. For completeness, a translation of Martini's original description and a more detailed portrayal and illustrations of the adult female are included to ensure and enhance the correct taxonomic interpretation and recognition of this species. Neotype selection is made in the interest of nomenclatural stability, and in connection with a revisionary study of the genus *Sabethes* (Harbach and Peyton 1990, 1991a, 1991b; Harbach 1991a, 1991b).

Martini (1931) described *schnusei* from an undisclosed locality. Since the lack of type material (Belkin 1971b) precluded the determination of the type locality from label data, Belkin (1971a) restricted the type locality of this species to San Carlos, Mapiri (La Paz),

¹ The views of the author do not purport to reflect the views of the Department of the Army or the Department of Defense.

² Reprint requests: Walter Reed Biosystematics Unit, Museum Support Center, Smithsonian Institution, Washington, DC 20560.

Bolivia based on inferential data. It is possible, however, that Martini described *schnusei* from specimens collected in Peru, Bolivia, or both Bolivia and Peru since he listed localities in both countries for several sabethines treated concomitantly with *schnusei*. With the neotype designation, the provenance of the type is fixed within the National Park of Manu, Department of Madre de Dios, Peru. This locality lies about 600 km north-northwest of the locality which Belkin chose to represent the type locality.

TAXONOMIC TREATMENT

Sabethes (Sabethes) schnusei (Martini)

schnusei Martini, 1931:202 (*Dendromyia*).

Neotype female, hereby designated, bearing the following data: "PERU: 1990/PE 685A/Wilkerson, Gaffigan & /Mallampalli ACC1445//PERU: Madre de Dios/Parque Manu, Pakitza/1°55'48" S 71°15'18" W// 11-13-90/ground level, forest/11 am-2 pm" (NMNH).

Wyeomyia (Davismyia) schnusei of Lane and Cerqueira 1942:536, 583, 584 (♀, key); Cerqueira 1943:21 (Bolivia; coll. rec.); Lane 1953:867, 936 (♀, key); Stone et al. 1959:83 (? South America, Bolivia; info. on type, lit.); Knight and Stone 1977:327 (Bolivia; info. on type, lit.).

Wyeomyia (Dendromyia) schnusei of Lane 1939:147 (list).

Wyeomyia schnusei of Harbach and Peyton 1991a:149-150 (tax. note); Mattingly 1955:28 (info. on type); Belkin 1968:42, 52 (info. on type); Belkin 1971a:26 (Bolivia; type loc. restriction).

Dendromyia schnusei of Belkin 1971b:31 (info. on type).

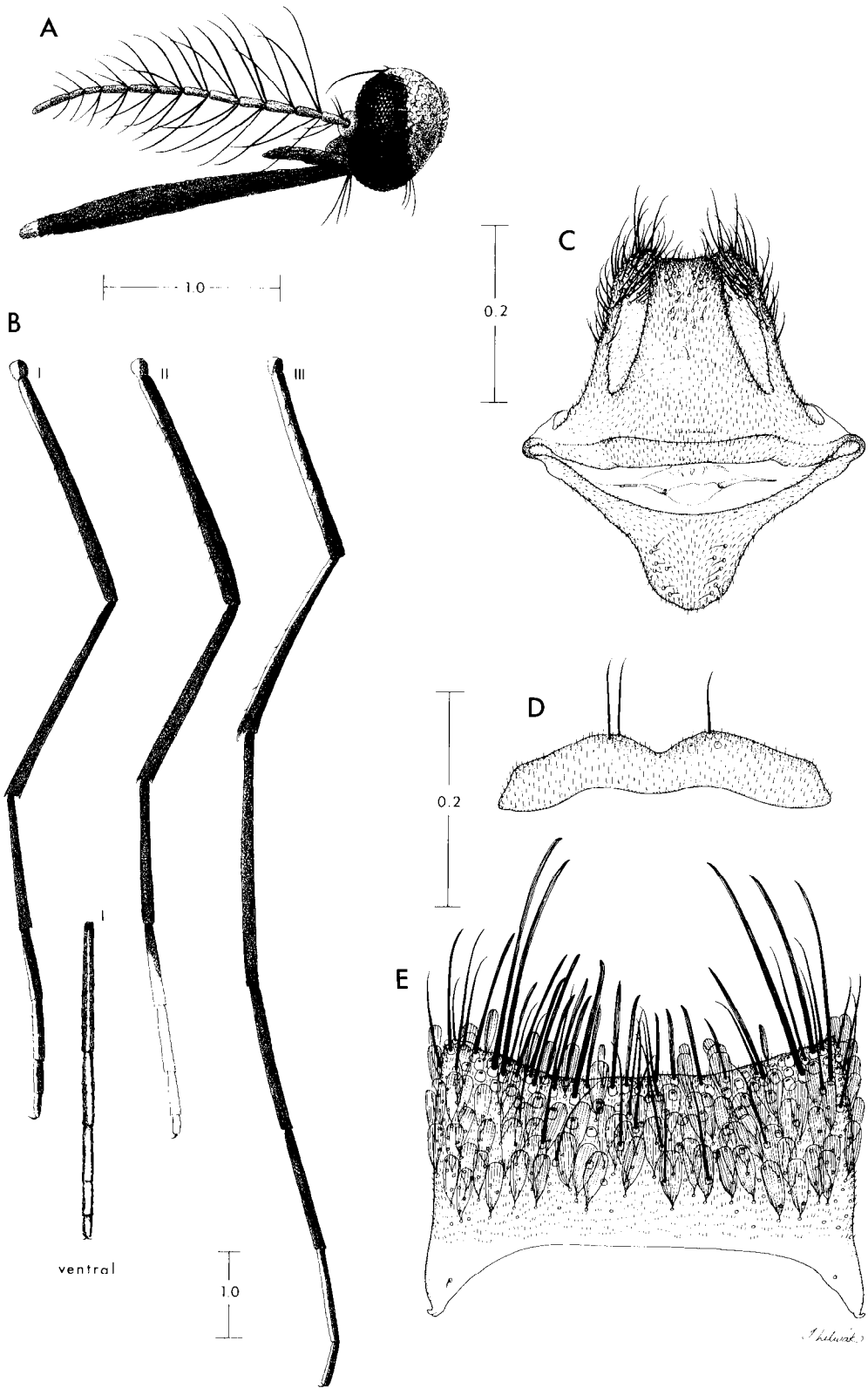
The following translation of Martini's orig-

inal description of the adult female of this species is given in support of the present interpretation of the name *schnusei*. A more comprehensive description ensues for comparison and further delineation of the species concept.

"Proboscis strong, short and thick, with the tip swollen, black with violet and coppery reflections, palpus approximately $\frac{1}{6}$ as long as the proboscis, likewise scaled. Occiput covered with flat dark steel blue scales, which in another light, especially between the eyes, reflect coppery violet. Prothoracic lobes [antepronota] metallic violet with golden reflections on the apex. Scutum metallic green scaled with golden reflections. Pleura and coxae blackish with broad glimmering white scales and golden setae. Scutellum brown with metallic green scaling. Postnotum [mesopostnotum] brown with brown golden reflective bristles. Abdomen black-brown scaled with weak bluish metallic luster dorsally, gradually turning violet on the sides. Venter white-yellow, pure white toward the sides, the colors become blurred at the boundary. Legs dark with violet and coppery glimmer. Midtarsomeres 3-5 white on all sides, hindtarsomere 4 in distal half and hindtarsomere 5 white on the underside, also the underside of foretarsomeres 4-5 with a white longitudinal stripe."

Female. Head (Fig. 1A): Eyes contiguous above antennae. Vertex, occiput and postgena covered with broad decumbent scales; scales of vertex and occiput dark with violet, blue, green and gold reflections depending on angle of reflected light, occiput with transverse fan-like row of short erect truncate scales at back of head; scales of postgena silvery white. Ocular setae small, black, inconspicuous; 2 prominent golden-brown interocular setae project well forward. Antenna 1.58-1.90 mm (mean 1.79 mm); pedicel large, brownish, darker dorsally, covered with aculeae (pubescence), mesal surface with distinct line of fine golden

Fig. 1. *Sabethes (Sabethes) schnusei* (Martini), adult female. A, Head (left side), note distally swollen proboscis. B, Legs (anterior aspect of each left leg, coxae omitted, and ventral surface of foretarsus). C-E, Genitalia (C, cerci, postgenital lobe (ventral aspect), vaginal lips and insula (caudal aspect); D, tergum IX; E, sternum VIII). Scales in mm.



setae; flagellum dark, whorls comprised of long setae, flagellomere 1 with cluster of rather inconspicuous dark scales on dorsomesal margin. Clypeus prominent, noticeably aculeate. Proboscis black-scaled with subdued reflections of blue and violet, ventral surface sometimes with indication of pale streak approximately 0.2–0.4 from base; length 1.48–1.88 mm (mean 1.73 mm), about 0.6 length of forefemur; distinctly swollen distally, distal half more than twice as broad as proximal portion in dorsal view; labella distinctly 2-segmented, about 0.1 length of prementum, proximal segment scaled like rest of proboscis. Maxillary palpus entirely dark-scaled like proboscis; length 0.38–0.48 mm (mean 0.42 mm), very nearly 0.25 length of proboscis. *Thorax*: Integument dark brown. Scutum and scutellum completely covered with broad, dark, decumbent scales which are distinctly larger laterally and posteriorly, particularly on supraalar area and scutellum, scales strongly metallic, generally bright blue but also appearing green or gold, predominantly so in some specimens; anterior promontory, supraalar area and scutellum with golden-brown setae, rather short and numerous on anterior promontory, well developed on supraalar area and lobes of scutellum; mesopostnotum without scales, with cluster of 6–12 (mode 8) prominent golden-brown setae. Antepronota well developed and closely approximated, crest of each with close-set row of 11–18 (mode 16) prominent golden-brown setae, scales predominantly metallic blue with violet reflections but distinctly golden and less reflective on dorsal and ventral areas; postpronotum with rather subdued golden scales like those on lower part of antepronotum. Pleura with somewhat transparent metallic silvery-white scales, no scales on lower proepisternum, anterior margin of mesokatepisternum, mesomeron, metapleuron and metameron; upper proepisternal scales contiguous with scales covering most of preprocoxal membrane; postprocoxal scales absent. Upper proepisternal, prespiracular, lower mesokatepisternal and upper mesepimeral setae present, prespiracular setae small, dark brown and inconspicuous, others yellow or light gold and conspicuous: 2–5 (mode 3) prespiracular, 1–3 (normally 1) prominent upper proepisternal, 1–5 (mode 3) lower mesokatepisternal and 9–19 (mode 14) upper mesepimeral which project to marginal area of mesopostnotum. *Wing*: Length 3.28–4.25 mm (mean 3.93 mm); entirely dark-scaled with blue iridescence; alula with fine setae on margin distally; calypters without setae. *Halter*: Scabellum without scales, integument pale; pedicel and capitellum dark-scaled. *Legs* (Fig. 1B): Generally dark-scaled with blue and violet reflections; without paddles of erect scales. Coxae with silvery-white scales like those of pleura. Trochanters mainly white-scaled, with dark scales distally on dorsal surface. Femora white-scaled ventrally; forefemur length 2.28–3.00 mm (mean 2.74 mm), about 1.6 length of proboscis; midfemur essentially same length as forefemur, length 2.20–3.0 mm (mean 2.72 mm); hindfemur shorter, length 1.75–2.33 mm (mean 2.15 mm). Fore- and midtibiae entirely dark-scaled, hindtibia narrowly white-scaled ventrally; hindtibia essentially same length as hindfemur. Ventral surface of foretarsus with complete stripe of white scales, stripe generally narrower and less distinct on tarsomeres 1 and 2; midtarsomeres 3–5 and distal half of 2 completely white-scaled, white scaling extended proximally on ventral surface of midtarsomere 2; hindtarsomeres 4 and 5 white-scaled ventrally, hindtarsomere 1 longer than either hindfemur or -tibia, length 2.13–2.98 mm (mean 2.62 mm). Ungues small, simple, black. *Abdomen*: Terga mainly dark-scaled with rather large basolateral patches of white to silvery-white scales which become much larger (longer) and distinctly yellowish along tergal margins, dark scaling with metallic blue and some violet reflections; sterna covered with white to silvery-white scales. *Genitalia* (Fig. 1C-E): Tergum VIII (not figured) narrow, width more than 2.5 length; anterolateral corners acutely angled, posterolateral corners evenly rounded; anterior margin slightly produced in middle; posterior margin slightly emarginate in middle and lined with row of strong setae,

with one or 2 irregular rows of shorter setae anterior to these in posterior midregion. Sternum VIII biconcave, covered with setae and scales as illustrated. Tergum IX, vaginal lips, insula, postgenital lobe, cerci and membranous areas densely spiculate; tergum IX narrow, posterior margin rather deeply emarginate in middle, with 1–4 setae on either side of emargination; insula slightly wider than long, slightly narrowed and evenly rounded distally, with slight depression in middle and 7–10 minute setae on either side; postgenital lobe about as long as cerci, narrowed distally and square-shouldered at tip, distal half of ventral surface with scattered short setae, distal part of dorsal surface with few longer setae which tend to be aligned in submedian rows; cercus borne obliquely and covered with setae which are slightly longer and less numerous on outer surface.

Male, larva and pupa. Unknown.

Systematics. The description of *schnusei* presented here agrees in every detail with Martini's original description except for the degree of white scaling on the tarsi. Martini did not indicate the presence of white scaling on foretarsomeres 1 and 2, the distal half of midtarsomere 2, or the proximal half of hindtarsomere 4. The condition he described is roughly the appearance observable at low magnification under diffuse light. The more extensive amount of white scaling reported here is readily apparent under direct lighting appropriately filtered to simulate natural

light. Despite this discordance, there is little doubt that the species described here is conspecific with the mosquito Martini described and named *Dendromyia schnusei*. No other described species of the tribe Sabethini in the New World possesses the unique combination of short, swollen proboscis, metallic scutal scales, and peculiar pattern of white markings on all three legs.

Assignment of *schnusei* to the subgenus *Sabethes* is only tentative, as no other species currently included in this group, except *batesi* Lane and Cerqueira, possesses upper proepisternal setae. These setae are highly reduced in *batesi*, and may be absent most of the time in this species. *Sabethes schnusei* is placed in this subgenus because the combination of short proboscis and white tarsal markings is suggestive of a closer relationship with many species of this group than those of the other subgenera. Characteristics of the proboscis and tarsi of species currently included in the five subgenera of *Sabethes* are compared in Table 1. *Sabethes schnusei* falls into group B of Cerqueira (1961) which includes species with white scaling on the tarsi. This is the only species of the group which lacks leg paddles.

Bionomics. Nearly all of the specimens examined in this study were captured as they approached humans stationed at ground level in forest (7 females) or on platforms constructed 12 and 14 m above the ground in forest canopy (6 females). One female was

Table 1. Comparison of characteristics of the proboscis and tarsi of species currently included in the five subgenera of *Sabethes*.

Subgenus	Proboscis	Tarsi
<i>Davismyia</i>	Short	White scaling on midtarsus
<i>Peytonulus</i>	Short	All dark or hindtarsomere 5 with white scaling (most species)
<i>Sabethes</i> group A	Short	All dark
<i>Sabethes</i> group B	Short	All with white markings, except <i>bipartipes</i> *
<i>Sabethinus</i>	Short	All dark
<i>Sabethoides</i>	Long	White scaling on midtarsus

* White on midtarsus only.

collected from a malaise trap. Cerqueira (1943) listed *schnusei* among 126 species of Culicidae collected primarily from human and animal bait during the daytime.

Distribution. *Sabethes schnusei* is recorded from Peru (present study) and Bolivia (Cerqueira 1943). The record from Bolivia is unconfirmed.

Material examined. 14 females. PERU: *Madre de Dios*, Parque Manu, Pakitza, ACC 1445, 11-07-90, R.C. Wilkerson, T.V. Gaffigan, V. Mallampalli, 2♀ (PE 627A, PE 627B), attracted to man, forest canopy, 14 m, 11 am–2 pm. Other specimens with same data except as follows: 11-13-90, 3♀ (PE 650A, PE 650B, PE 650C), ground level, 2–5 pm; 11-11-90, 2♀ (PE 671A, PE 671B), 12 m; 11-13-90, 1♀ (PE 684); 11-13-90, 3♀ (PE 685A = neotype, PE 685B, PE 685C), ground level, 11 am–2 pm; 11-14-90, 1♀ (PE 692), 14 m, 8–11 am; 11-14-90, 1♀ (PE 755), ground level, 9–12 am; 11-16-90, 1♀ (PE 760), malaise trap. The specimens are deposited in the National Museum of Natural History, Smithsonian Institution.

ACKNOWLEDGMENTS

The specimens examined in this study were kindly provided by Richard Wilkerson who received funding for field work in Peru from the Biodiversity of Latin America Project (BIOLAT), Smithsonian Institution. Thanks are also expressed to Jayson Glick, E.L. Peyton, Ronald A. Ward and Richard Wilkerson for commenting on the manuscript, Taina Litwak for preparing the illustrations, and Lotte Schiff for assisting with the translation of the original description of *schnusei* from German.

REFERENCES CITED

- Belkin, J.N. 1968. Mosquito studies (Diptera, Culicidae) IX. The type specimens of New World mosquitoes in European museums. *Contrib. Am. Entomol. Inst. (Ann Arbor)* 3(4):1–69.
- Belkin, J.N. 1971a. Type locality restriction of *Wyeomyia schnusei*. *Mosq. Syst. Newslett.* 3:26.
- Belkin, J.N. 1971b. Mosquito types in East Germany. *Mosq. Syst. Newslett.* 3:31.
- Cerqueira, N.L. 1943. Lista dos mosquitos da Bolivia (Diptera, Culicidae). *Mem. Inst. Oswaldo Cruz Rio De J.* 39:15–36.
- Cerqueira, N.L. 1961. Cinco novos sabetinos da Amazônia (Diptera Culicidae). *Rev. Bras. Entomol.* 10:37–52.
- Galindo, P., S.G. Carpenter and H. Trapido. 1951. Descriptions of two new species of *Wyeomyia* and the male of *Sabethes tarsopus* Dyar and Knab. *Proc. Entomol. Soc. Wash.* 53:86–96.
- Harbach, R.E. 1991a. A new subgenus of the genus *Sabethes* (Diptera: Culicidae). *Mosq. Syst.* 23:1–9.
- Harbach, R.E. 1991b. Ontogeny of the larval stage of *Sabethes chloropterus*, with special reference to setal development and phylogenetic implications for the family Culicidae (Diptera). *Mosq. Syst.* 23:10–24.
- Harbach, R.E. and E.L. Peyton. 1990. A new subgenus in *Wyeomyia* (Diptera: Culicidae), with the reclassification and redescription of the type species, *Sabethes fernandezyepezi*. *Mosq. Syst.* 22:15–23.
- Harbach, R.E. and E.L. Peyton. 1991a. Transfer of the subgenus *Davismyia* from *Wyeomyia* to *Sabethes* and description of the type species, *Miamyia petrocchiai* (Diptera: Culicidae). *Mosq. Syst.* (1990) 22:149–159.
- Harbach, R.E. and E.L. Peyton. 1991b. A new subgenus of *Wyeomyia* (Diptera: Culicidae), with the reclassification and redescription of *Wyeomyia (Davismyia) arbores*, *Wyeomyia (Dendromyia) tarsata* and *Sabethes (Sabethes) carrilloi*. *Mosq. Syst.* 23:92–109.
- Knight, K.L. and A. Stone. 1977. A catalog of the mosquitoes of the world (Diptera: Culicidae). 2nd edition. Thomas Say Found. 6:xi + 1–611.
- Lane, J. 1939. Catálogo dos mosquitos neotropicos. *Bol. Biol. Ser. Monogr. No. 1.* xi + 218 pp.
- Lane, J. 1953. Neotropical Culicidae. Vols. 1

- and 2. University of Sao Paulo, Sao Paulo, Brazil.
- Lane, J. and N.L. Cerqueira. 1942. Os sabetíneos da América (Diptera, Culicidae). *Arq. Zool. Estado Sao Paulo* 3:473-849.
- Martini, E. 1931. Ueber einige südamerikanische Culiciden. *Rev. Entomol. (Rio de J.)* 1:199-219.
- Mattingly, P.F. 1955. Mosquitoes (Diptera: Culicidae) from the Tropical Institute of Hamburg. *Proc. R. Entomol. Soc. Lond. B Taxon.* 24:27-33.
- Stone, A., K.L. Knight and H. Starcke. 1959. A synoptic catalog of the mosquitoes of the world (Diptera, Culicidae). *Thomas Say Found.* 6:1-358.