

# *Wyeomyia luteoventralis* Theobald, the Type Species of the Subgenus *Dendromyia* Theobald (Diptera: Culicidae)

Monique Albuquerque Motta, Ricardo Lourenço-de-Oliveira

Laboratório de Transmissores de Hematozoários, Instituto Oswaldo Cruz, Av. Brasil 4365, 21045-900  
Rio de Janeiro, RJ, Brasil

*Wyeomyia* (*Dendromyia*) *luteoventralis* is redescrbed from females, males, larvae and pupae collected at the type locality, in Brazil, and compared to the closely related species. At least six species - *Wy. luteoventralis*, *Wy. ypsipola*, *Wy. testei*, *Wy. trifurcata*, *Wy. complosa* and *Wy. jocosa* - apparently, belong to a monophyletic group, the subgenus *Dendromyia*. All other species previously included in *Dendromyia* are hereby excluded from this subgenus and retained in genus *Wyeomyia* without subgeneric placement.

Key words: *Dendromyia* - *Wyeomyia luteoventralis* - *Wyeomyia ypsipola* - mosquito taxonomy

*Wyeomyia luteoventralis* was described by Theobald (1901), from three females collected in Pará (=Belém, State of Pará, see Belkin et al. 1971), Brazil. Only one female is remaining in the collection of The Natural History Museum (NHM), marked as type by Theobald and selected as lectotype by Belkin (1968). *Wyeomyia luteoventralis* is the type species of *Dendromyia* Theobald (1903) by subsequent designation (Blanchard 1905). Nearly 50 species of *Wyeomyia* have been grouped in the Neotropical subgenus *Dendromyia*, under an obviously unnatural classification. Most species presently regarded as belonging to *Dendromyia* were described superficially from only a few specimens and, in general, their immature stages and the morphological characters of both males and females are poorly known or unknown. Because of this, the subgenus certainly contains species whose phylogenetic relationships are unknown. Even the type species is poorly known: its larva and pupa, behavior and geographical distribution have never been described. In order to fix the concept of the subgenus *Dendromyia* we are re-describing *Wy. luteoventralis* and studying the related species.

*Wyeomyia* (*Dendromyia*) *luteoventralis* Theobald

*luteoventralis* Theobald, 1901: 348. Lectotype female (designated by Belkin, 1968): Belém, Pará, Brazil (NHM). Belkin et al. 1971 (type locality restriction).

*quasiluteoventralis* Theobald 1903: 317 (*Dendromyia*).

*Dendromyia luteoventralis* of Theobald, 1903: 318.

**FEMALE.** - *Head:* vertex covered with darkish broad scales with blue and green reflections; a spot of white scales on median area of vertex and occiput; this spot generally triangular in shape, but sometimes resembles an irregular longitudinal stripe; side of eyes and postgena with white broad scales; ocular line with white scales and many darkish setae; two dark, strong and long interocular setae. Proboscis covered by darkish brown scales, length 0.8-0.9 of forefemur, expanded distally; basal labial setae long, brown. Maxillary palpus same color as proboscis, about 1/7 proboscis length. Clypeus ovate, blackish, pruinose, nude. *Antenna:* pedicel brownish to blackish, pruinose, with some bronzy scales. Flagellum slightly plumose, a little shorter than proboscis, with 13 flagellomeres. *Thorax:* integument pale brown. Antepnotum largely covered with darkish scales with bluish reflections, sometimes with few white scales ventrally; setae dark. Postpronotum densely covered with whitish scales. Scutal integument pale brown, much darker than pleura, covered with darkish broad scales with blue and green reflections (same as antepnotal scales), except for a group of few white scales on anterior promontory; median anterior promontory and median scutal fossal setae dark, numerous; supraalar setae long, strong, dark. Scutellum darkish-scaled, same color as scutum; 3 or 4 developed setae on each lobe. Mesopostnotum pale brown, with about 10 (8-14) slightly dark setae of different sizes; the longest and turned upward mesopostnotal setae reach or cross the median scutellar setae. Pleural sclerites with very pale, yellowish integument, densely covered with whitish scales; pleural setae pale, mostly yellowish or light tan: 3 or 4 tan prespiracular setae; 5 (3-7) very pale, yellowish, elon-

Received 20 July 1994

Accepted 9 November 1994

gate lower mesokatepisternal setae inserted below and above upper margin of mesomeron; 4 or 5 tan upper mesokatepisternal setae; 9 (9-11) very pale, yellowish upper mesepimeral setae. *Wing*: upper calypter without seta. Scales of veins brown, broad.  $R_s$ ,  $R_{2+3}$ ,  $R_2$ ,  $R_3$ ,  $M_{1+2}$ ,  $M_1$  and  $M_2$  with both lateral anterior and appressed scales broad and spatulate;  $M$  with broad appressed scales;  $Cu$  with narrow, long spatulate scales;  $1A$  with spatulate scales. Distal third of all veins with broad appressed scales dorsally. *Halter*: scabellum yellowish; pedicel yellowish, dark-scaled on one side; capitellum with dark scales. *Legs*: coxae and trochanters with very pale integument, partially covered by whitish scales, setae pale. Femora, tibiae and tarsi largely dark-scaled. Femora and mid- and hindtibiae with a stripe of white scales ventrally. Foretibia with a tenuous and incomplete stripe of white scales ventrally, very indistinct distally. Mid- and hindtarsomeres I with a few white scales ventrally. Ungues simple. *Abdomen*: densely covered with brownish broad scales with blue and green reflections above, whitish scaled below, the colors separated on sides in nearly straight line. Terga I and VIII with numerous long brownish setae. *Genitalia* (Fig. 1A-C): tergum IX spiculose with a median lobe bearing 8 setae; postgenital lobe short, evenly rounded, spiculose, with a median triangular area densely covered with minute setae arising from conspicuous alveoli; cercus digitiform, spiculose, with elongate setae apically.

*MALE* - Similar to female. The white spot on vertex and occiput generally resembles an irregular longitudinal stripe. Antenna slightly more plumose than in female, with 14 flagellomeres; pedicel darkish brown, pruinose, with small bronzy scales. Proboscis 0.8 - 0.9 of forefemur length. Maxillary palpus darkish, 0.15 proboscis length. Legs similar to female, except midtarsomeres II-V white-scaled. *Genitalia* (Figs 1D, E and 2): tergum VIII covered with broad scales and minute setae, strong and long setae distally. Tergum IX with broad interlobar space; each lobe bearing 2 stout, strongly sclerotized setae with round apices, inner seta stronger than outer. Paraproct sclerotized at apex, with a single strong tooth or sometimes with a less developed second one; 3 or 4 small setae. Gonocoxite short; inner surface covered with minute setae; sternal surface with numerous setae; tergal surface with minute setae and 3 long, strong tergomesal setae. Basal mesal lobe slightly sclerotized, with a row of about 15 small setae and 2 prominent distal setae. Gonostylus short, essentially without stem, divided into 4 lobes: one narrow, long, laterally bent lobe, fringed at apex (homologous in part with lobe C[?]) of Belkin et al. 1970); a slightly flat, nude, bifurcated lobe, broadened to apex and forming a gutter on mesal side (homologous with

lobe C[?]); a cylindrical lobe (lobe *M*), acorn-shaped at apex, with numerous short, spiniform, and longer setae mainly on distal mesal and tergal sides; a digitiform slender tergal lobe (probably homologous with lobe *A, E*), arising from the cylindrical lobe, with about 10 setae, most at apex. Aedeagus roughly round in tergal view; apical tergal arms joined and forming a rather broad apical tergal bridge, with a small process on each side of apex; submedian tergal arms not joined; median sternal plate simple, membranous, rugose laterally.

*PUPA* (Fig. 3) - Number of branches of setae in Table I. *Cephalothorax*: pale; seta 5-CT nearly as long as 1-CT, with 3-5 (3) aciculate branches. *Trumpet*: slightly and evenly tanned; short, cylindrical; index about 4 (3.7 - 5.6) (width measured at midlength). *Abdomen*: pale; anterior margin of sterna darker. Seta 1-I strongly developed; 2-II-VII very near posterior margin of tergum, 2-II between and nearly in line with setae 1 and 3, 2-III mesad of seta 1 which in turn is mesad of seta 3, 2-IV-VII far mesad of seta 1; 6-II usually single, long; 6-III-VII short, weak; 3-I slightly aciculate, 3-IV well anterior to seta 1, 3-V-VII only slightly anterior to seta 1; 5-IV-VI long, single, about 1.5 length of following tergum, slightly aciculate; 9-VII, VIII aciculate, 9-VII strongly developed, about length of paddle; 9-VIII considerably longer than paddle. *Genital lobe*: moderately tanned; same length or slightly longer than segment VIII in male. *Paddle*: pale, long, narrowed and strongly produced beyond midlength, spiculose at margins; spicules better developed distally; inner margin only slightly curved compared to outer margin.

*LARVA* (Figs 4, 5) - Number of branches of setae in Table II. *Head*: wider than long, pale. Maxilla (Fig. 5C, D): elongate, with a prominent apical tooth (AT); dorsomesal surface normally with 8 teeth (laciniarastrium, LR), progressively longer apically; dorsal surface with numerous long and moderately long setae on mesal and apicolateral margins; maxillary brush represented by 1 or 2 more strongly developed (stouter) setae borne dorsolaterally at base of AT. Setae 2-4, 6-Mx single; seta 1-Mx spiniform, bifid at tip. Mandible as figured (Fig. 5 A, B); 3 or 4 developed mandibular sweeper setae in 2 groups. Dorsomentum generally with 8 teeth on each side of slightly more prominent median tooth. Hypostomal suture complete; occipital foramen with dorsolateral slitlike extension on either side, margins heavily pigmented laterally. Seta 1-C stout, curved; 4-6-C single; 7-C single or double, all simple; 11, 14-C long, aciculate, 14-C posterior to 15-C. *Antenna*: short, cylindrical: Setae single; 1-A very close to apex. *Thorax*: integument smooth. Setae 4, 7-P and 7, 13-T on individual pigmented basal plates; pleural groups 9-12-

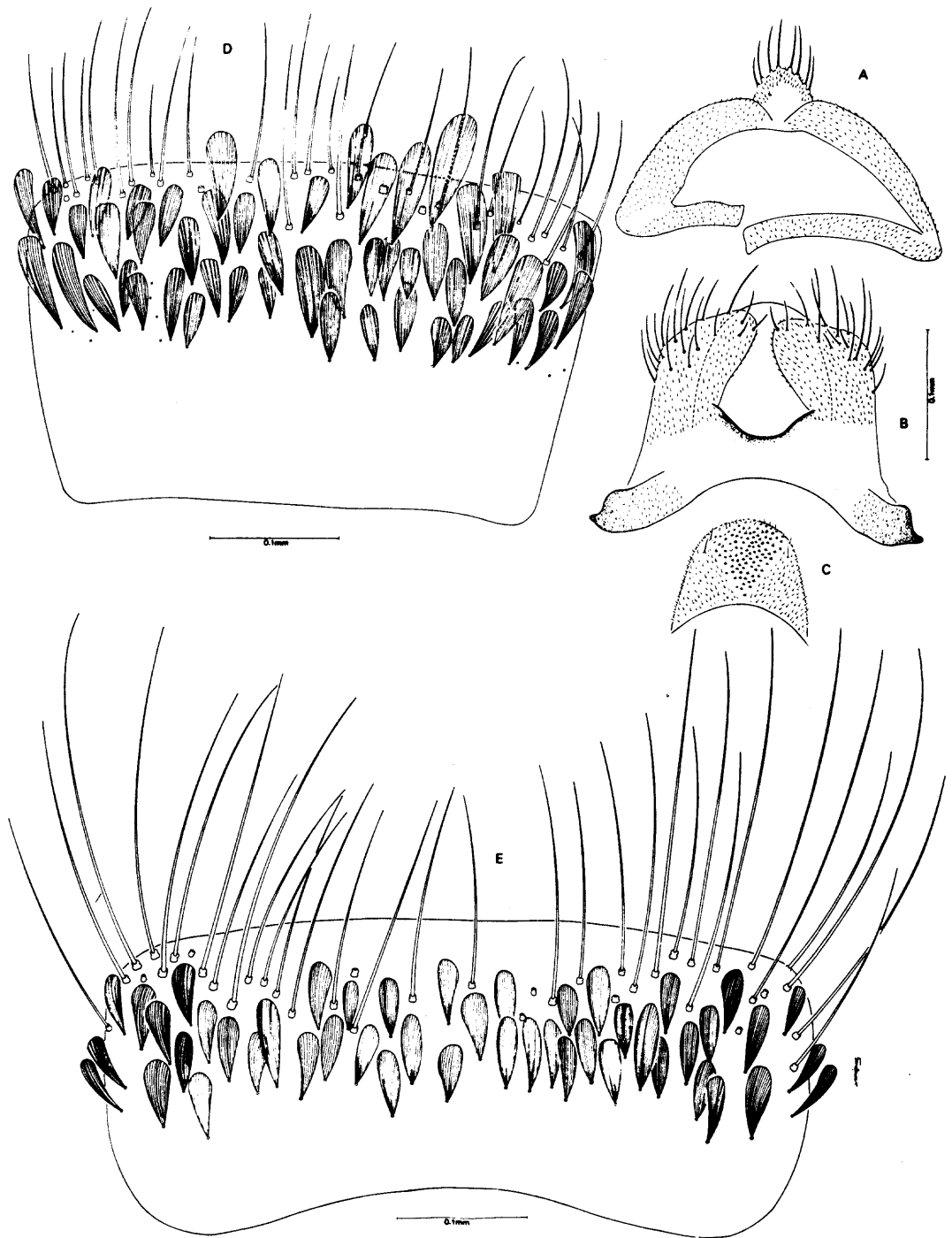


Fig. 1: *Wyeomyia (Dendromyia) luteoventralis* A-C female genitalia. A: tergum IX. B: cerci. C: postgenital lobe. D-E male genitalia. D: sternum VIII. E: tergum VIII.

P,M,T on common basal plates; 11-P,M,T spiniform. Seta 1-P single or double, usually single, borne close to and slightly laterad of 2,3-P; 4-P short, about 0.5 length of 7-P, heavily aciculate. Seta 13-T well developed but short, less than 0.5

length of thorax. *Abdomen*: integument smooth. Seta 1-I-II very small and usually triple, 1-III longer and double, 1-IV-VI longer still and generally with more branches on each succeeding posterior segment, 1-VI,VII slightly barbed; 2-I-

VII short, single, 2-III-VII far mesad of seta 1; 3-I short, 3-II longer, 3-III,IV longer still, 3-V very long, single and developed like 3-VII, 3-VII aciculate; 5-I-VI usually double, 5-I short, 5-II-VI longer; 6-I-VI and 7-I,II on pigmented basal plates, aciculate; 6-I,II with numerous branches, 6-III-V usually double, 6-VI usually triple; 13-I far cephalad of seta 9, more strongly developed than 13-II-V,VII; 13-II weakly developed, very short and usually single; 13-III-V,VII longer and usually double; 13-I,V sometimes slightly barbed. *Segment VIII*: setae 2,4-VIII long, aciculate; seta 5-VIII sometimes forked close to apex. Comb with 13-20 spinelike scales in uneven single or partially double row; scales shorter and blunt ventrally, with minute spicules at sides. *Siphon*: index about 4 (3.3 - 5.1) (width measured at midlength); short, widest at base, slightly spiculate, evenly pale. Pecten of 6 (5-7) spines in ventral median row from near base of seta 1-S to near apex; spines elongate, minutely spiculate on both sides (not evident from lateral view of siphon). Seta 1-S near base, with 3-5 slightly aciculate branches, out of line with ventral accessory setae (1a-S); 1a-S in straight row of 4 double (2,3) branched setae; 4 dorsal accessory setae (2a-S) in a straight row, most basal 2a-S very small, hairlike, single; other 3 2a-S stout, lanceolate, strongly pigmented, single, sometimes forked near apex; 2-S single, sharply pointed. *Segment X*: saddle incomplete; same pale color as siphon. Setae 1-4-X aciculate, 4-X moderately long, about 0.5 length of 3-X.

**TAXONOMY** - The three females used by Theobald (1901) for the original description of *Wy. luteoventralis* were collected by Dr Herbert

Edward Durham during a yellow fever expedition to Pará, Brazil, in 1900-1 (Durham 1902). These specimens were included with about 90 Brazilian mosquitoes taken with Durham to Theobald, in London, in August, 1901 (Theobald 1901:349-50). The original specimens of *Wy. luteoventralis* were definitely collected in Belém (the capital of the State of Pará, in the Brazilian Amazon), sometimes erroneously confused with the name of the State, and called "Pará" by Durham (1902:46,49,58). We have read all available literature about the mosquito collections performed by Durham in Brazil as well as all correspondence between him and Theobald presently in the NHM library. We are convinced that the type specimens of *Wy. luteoventralis* were caught on human bait by Durham at some of the sites he visited within the city or in the surrounding forests of Belém (Durham 1902: 51,52,55,57; Theobald 1901: 346). This indicated that *Wy. luteoventralis* is somewhat anthropophilic, so we performed some captures on human bait in forests in Belém and collected females indistinguishable from the lectotype specimen. We were surprised to learn that these specimens were different from those described as *Wy. luteoventralis* by Lane and Cerqueira (1942: 590).

The original description of *Wy. luteoventralis* by Theobald (1901) was very superficial, and could not be used to identify a single mosquito species. Because of this, *Wy. luteoventralis* has rarely been reported in biological, ecological and taxonomic studies carried out on South American mosquitoes. Dyar (1924), discussing the identity of *Wy. luteoventralis*, stated that "No species with these characters [referring to the broad

TABLE I  
Ranges of numbers of branches for setae of pupa of *Wyeomyia luteoventralis*. Mode in parenthesis

Seta	Abdominal segments								
	Cephalothorax	I	II	III	IV	V	VI	VII	VIII
0	-	-	-	-	-	-	-	-	-
1	1-3(2)	d	1,2(1)	1-5(4)	1-3	1-3(2)	1-4(2)	1,2(1)	-
2	1-3(2)	1,2(1)	1	1	1	1,2(1)	1	1	-
3	2,3(2)	1,3(1)	1,2(1)	1-3(1)	2-4(3)	1-4(3)	1-3(2)	1-3(1)	-
4	2-4(2)	3-7(5)	2-5(2,4)	1-4(2)	1-3(2)	2-4(4)	1-3(2)	1	1,2(1)
5	3-5(3)	1,2(1)	1-3(2)	1-4(1)	1	1	1	1-4(1)	-
6	1,2(1)	1	1,2(1)	1-4(2)	1-4(2)	1-4(2)	1-5(2)	1,2(1)	-
7	1-3(3)	2-4(3)	2-4(2)	2-5(3)	2-4(2)	2-6(4)	1-3(2)	1-3(1)	-
8	1,2(1)	-	-	2-5(4)	2-4(4)	1-5(3)	2-5(3)	4-7(6)	-
9	1-3(2)	1	1	1	1	1	1	12-21	16-28
10	1	-	1-3(2)	1,2(2)	1,2(2)	1-3(2)	1,2(2)	1,2(1)	-
11	1	-	1,2(1)	1,2(1)	1-3(1)	1,2(1)	1-3(1)	1-4(1)	-
12	1-3(2)	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	1

d=dendritic

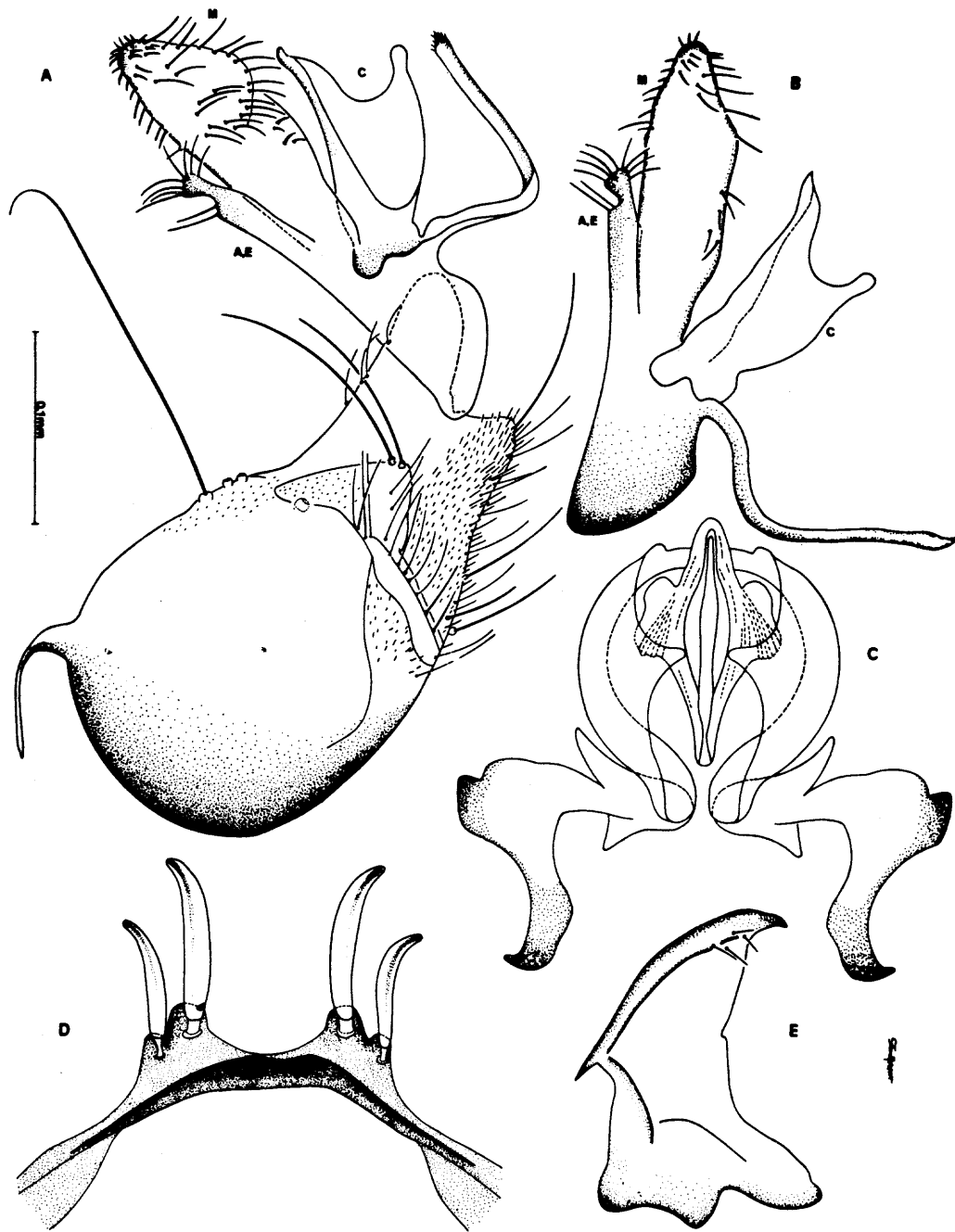


Fig. 2: *Wyeomyia (Dendromyia) luteoventralis*. Male genitalia. A: gonocoxopodite (mesal aspect). B: gonostylus (lateral aspect of lobes AE, C and M). C: aedeagus (sternal aspect). D: tergum IX. E: paraproct (lateral aspect).

scales on the wing veins] is known to me, and it may be that *luteoventralis* remains to be rediscovered. Until this is done and the male made known, the proper application of *Dendromyia* perhaps cannot be made".

Lane and Cerqueira (1942) described the female and male of a species they identified as *Wy.*

*luteoventralis* from reared specimens collected as larvae in the axils of *Montrichardia arborescens* (aninga plant) on Marajó Island (Currálinho and Canaticu river), Santarém and S. Isabel, State of Pará, but outside the type locality (Belém). We compared the lectotype of *Wy. luteoventralis* with the specimens used by Lane and Cerqueira,

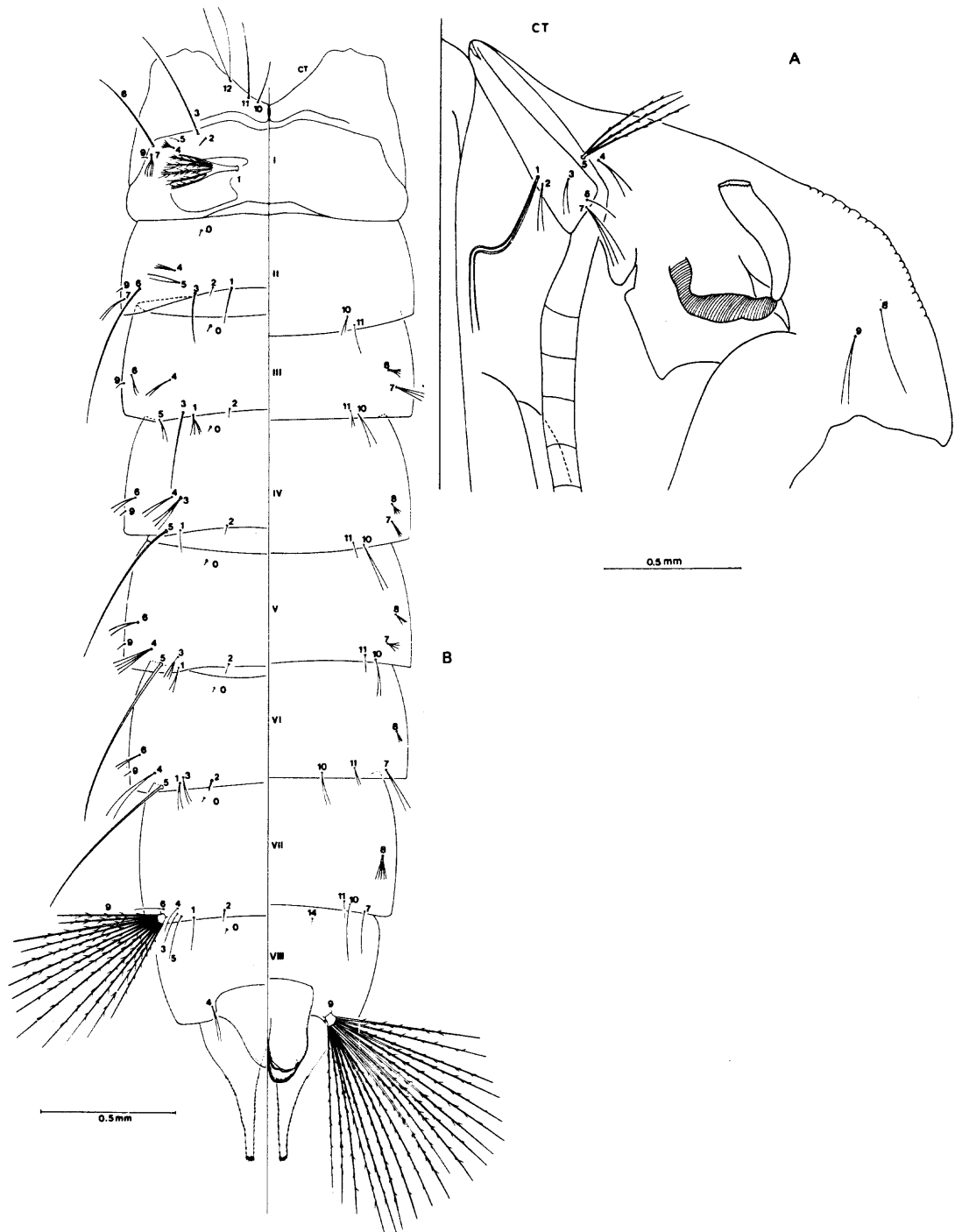


Fig. 3: *Wyeomyia (Dendromyia) luteoventralis*. Pupa. A: cephalothorax. B: metanotum and abdomen.

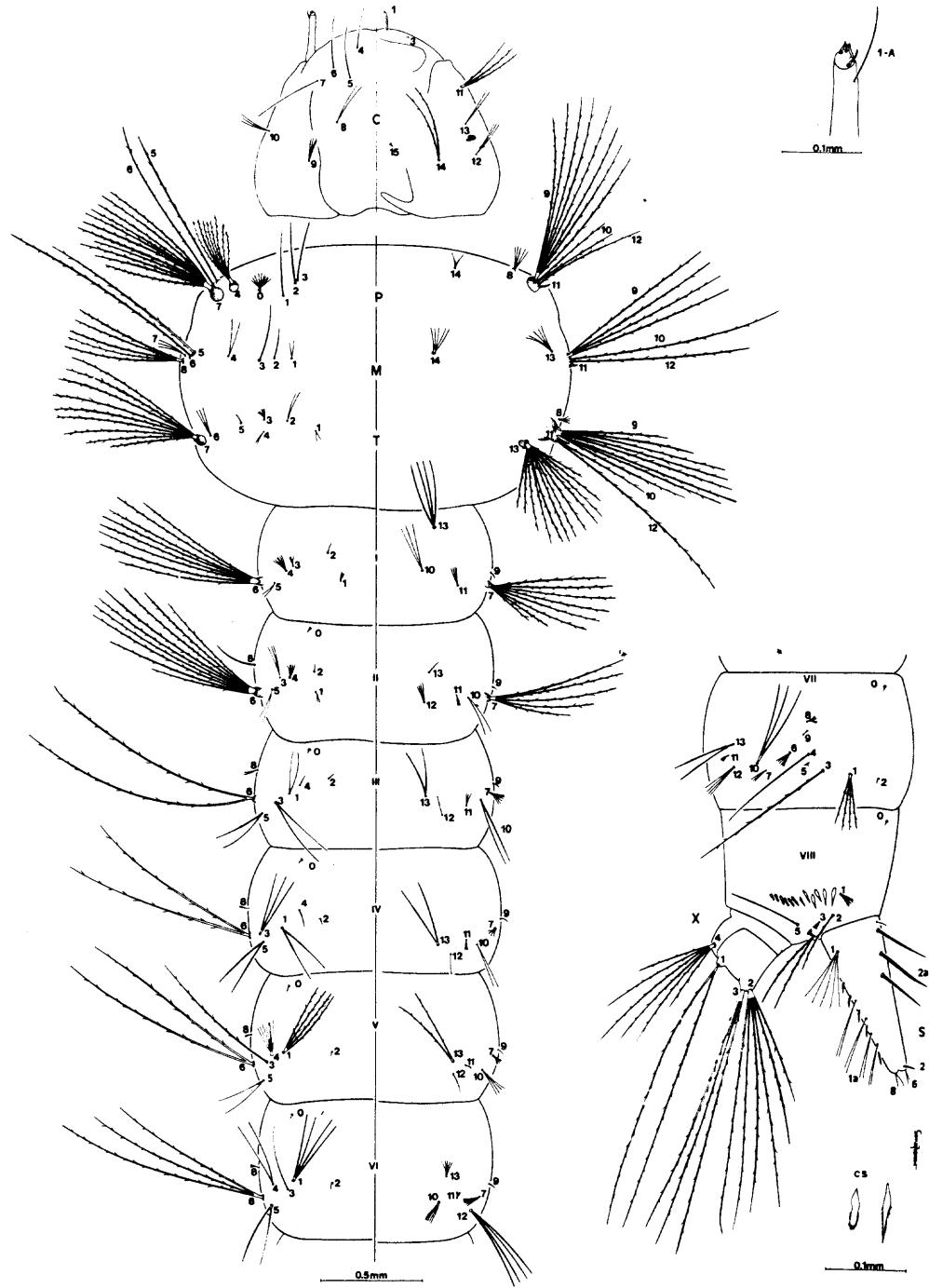


Fig. 4: *Wyeomyia (Dendromyia) luteoventralis*. Larva. CS: comb scales.

as well as numerous examples identical to those described by these authors, which we recently collected in aninga plants in Belém, and noted that they are unmistakably different. The adults of larvae from the aninga plant (i.e. *Wy. luteoven-*

*tralis* of Lane and Cerqueira 1942 and Lane 1953) have vertex and occiput without spot of white scales, base of antepronotum conspicuously white-scaled; integument of scutum darkish brown, pleural integument frequently pale brown

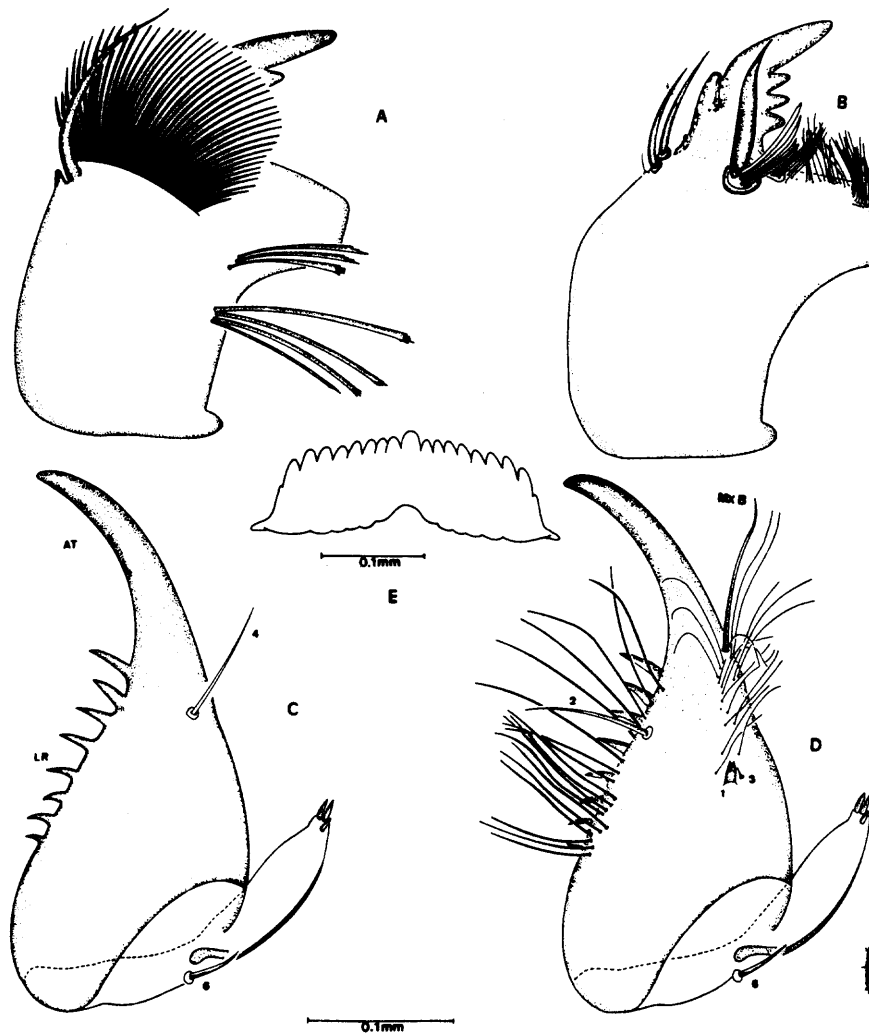


Fig. 5: *Wyeomyia (Dendromyia) luteoventralis*. Larval mouthparts. A-B: mandible. C-D: maxilla (A and C: ventral; B and D: dorsal views). E: dorsumentum.

to darkish, lower mesokatepisternal setae tan (paler than upper mesokatepisternals but darker than upper mesepimeral setae), and mesopostnotum darkish and bearing 6-8 short and pale brown setae with a few whitish decumbent scales among them. Additionally, the male genitalia, larva and pupa of the species from the aninga plant are completely different. This species will be re-described and named as new in another paper.

*Wyeomyia ypsipola* Dyar is the species that appears to be most closely related to *Wy. luteoventralis*. Although the female, male and male genitalia are distinct from those of *Wy. luteoventralis*, the fourth-instar larva and the pupa are practically identical. The adult of *Wy. ypsipola* has been described and illustrated previously (Dyar 1922ab, Lane & Cerqueira 1942, Lane

1953, Bruijning 1959). The female of *Wy. ypsipola* has white scaling on midtarsomeres II-V, the male has a continuous stripe of white scales on one side of midtarsomeres I-V (tarsomeres IV, V may be whitish on both sides), the male genitalia are distinct and very different from those of *Wy. luteoventralis*. The larva of *Wy. ypsipola* has the maxilla developed like that of *Wy. luteoventralis* (Harbach & Peyton 1993). It differs from *Wy. luteoventralis* in having seta 4-P generally with more than 10 branches (10-14[13]), 4-M 2,3(3) branched, 13-T 12-18 branched, 3,4,5-II 3-5, 1,2 and double, respectively, 6-III double, 6-IV 3-5(4), 8-V 3,4, 4-VIII single and 5-VIII triple. The pupa of *Wy. ypsipola* has seta 7-V generally triple (1-4), 11-VII 2-4(3) branched and 9-VIII with 24-30 branches.





*Wyeomyia testei* Senevet and Abonnenc is also closely related to *Wy. luteoventralis*. In *Wy. testei* both female and male have a spot of white scales on vertex and occiput, anterior promontory with numerous whitish scales, midtarsomeres I,II whitish on one side; pupa with tanned cephalothorax and abdomen (dorsal), paddle not abruptly narrowed distally, but with developed apical spicules; larva with maxilla developed as in *Wy. luteoventralis*, comb with only spinelike scales.

*Wyeomyia trifurcata* Clastrier is very similar to both *Wy. luteoventralis* and *Wy. testei* in female, larval and pupal characters, but has distinct male genitalia. According to the original description (Clastrier 1973), the larva of *Wy. trifurcata* has pecten scales restricted to the distal third of siphon and seta 2a-S composed of 2 laceolate and one hairlike seta; the pupa has a short paddle and seta 9-VIII with strongly developed branches.

Based on morphological characters of the adults, male genitalia (as redescribed by Lane 1953) and larva (EL Peyton, personal communication), *Wy. complosa* (Dyar) and *Wy. jocosa* seems to belong to the same group of *Wy. luteoventralis*.

*Wyeomyia luteoventralis*, *Wy. ypsipola*, *Wy. testei*, *Wy. trifurcata*, *Wy. complosa* and *Wy. jocosa* apparently form a monophyletic group, the subgenus *Dendromyia*. We hereby recognize and restrict this subgenus to include only these five species, because of their affinities in the adult, larval and pupal stages. These species have adults generally with white scales on the ocular line and scales forming a spot on the vertex and occiput; wing veins densely covered with broad spatulate scales; mesopostnotal setae long and numerous; antepnotum dark-scaled, rarely with a few whitish scales ventrally; and the abdomen with dark dorsal and pale lateral scallig separated in almost a straight line. The larvae have a prominent apical tooth on the maxilla; seta 14-C developed, posterior to 15-C; seta 1-P placed far mesad or caudomesad of 2,3-P; a short siphon with a single midventral row of pecten spines, and seta 2a-S chiefly or completely composed of dark lanceolate setae. The paddles of the pupae are elongate and densely spiculose on the margins.

Since the type species of *Dendromyia* is now properly defined, the correct interpretation and application of the subgeneric name is hereby established. The many unrelated *Wyeomyia* species previously included in *Dendromyia* are hereby excluded from the subgenus, and are retained in *Wyeomyia* without subgeneric placement.

We have been collecting and studying all life stages of those *Wyeomyia* species now excluded from the subgenus, with a view of understanding their relationships and establishing a more natural system of classification. The subgenus *Den-*

*dromyia* as now defined seems to be related to the subgenus *Caenomyiella* Harbach and Peyton and the *Cleobonnea* and *Prosopolepis* Series of Lane and Cerqueira (1942). The non currently recognized subgenus *Shropshirea* Dyar is now the only junior synonym of *Dendromyia*.

**Bionomics:** *Wyeomyia luteoventralis* may be collected on human bait in forest during the daytime. Many more females of this species were caught during our survey at the type locality, Belém, than those included in the list of material examined. Several blood fed wild-caught females died without laying eggs, even when traumatized by removing one wing. These specimens were damaged and were excluded from the morphological analysis. Larvae and pupae of *Wy. luteoventralis* were found only in the axils of *Heliconia* sp. and *Calathea* sp. The eggs are curiously elongate and shaped like grains of rice.

**Distribution:** *Wyeomyia luteoventralis* is known only from the type locality, Belém, State of Pará, Brazil.

**Material examined:** *Wyeomyia luteoventralis*: Lectotype female, Pará, Brazil, H. Durham, 1901, NHM, London; 1 male Le Pe G and 1 female Le Pe, Estrada do Mosqueiro, DER (1°15'S 48°13'W), near Paricatuba River, Belém, Pará, Brazil, XI-1992, reared from larvae collected in *Heliconia* sp., respectively deposited at NHM and Instituto Oswaldo Cruz (IOC), Rio de Janeiro, det. MA Motta and R Lourenço-de-Oliveira, 1993; col. MA Motta and OV Silva; 5 females Le Pe, same data as above; 1 male Le Pe G, same data as above except 28-III-1993; reared from larvae collected in *Calathea* sp.; 3 females Le Pe, 1 female Le Pe G, same data as preceding male, collected in *Heliconia* sp. and *Calathea* sp.; 6 females and 1 female G, same data as above, except 1-VII-1992, caught on human bait, col. RNL Lacerda.

*Wyeomyia ypsipola*: 1 male Le Pe G, Cumutu, Trinidad, 20-VII-1942-4, from *Heliconia* sp. flower, n. 3938, slide 1078, Faculdade de Saúde Pública (FSP), São Paulo, det. J Lane; col. DG Dow; 2 females Le Pe G and 1 female Le Pe, Estrada do Mosqueiro, DER, Belém, Pará, Brazil, XI-1992, from *Heliconia* sp., IOC, MA Motta and R Lourenço-de-Oliveira det.; col. MA Motta and OV Silva; 1 male Le Pe G, same data as above except III-1993, col. OV Silva, from *Calathea* sp.; 1 male Le Pe G, 1 female Le Pe, same date as above except from *Heliconia* sp.; 2 males Pe G, 1 male G, 1 female Pe and 1 female Le Pe, Machadinho (MA-32), Rondônia, Brazil, III-1987, from Aracea, IOC, det. MA Motta, MG Castro and R Lourenço-de-Oliveira, 1989, col. R Lourenço-de-Oliveira; 2 females Le Pe, Estrada Velha da Mibrasa, Itapoã do Oeste, Rondônia, Brazil, IV-1987, other data as above; 2 females Pe, Vila Marechal Rondon, Ariquemes, Ron-

dônia, VII-1987, other data as above; 1 male and 1 female Le Pe, Labelle Park, Vinhais, São Luiz, Maranhão, Brazil, VII-1994, from *Heliconia* sp., IOC, det. MA Motta, col. R Lourenço-de-Oliveira; 2 females Pe, 1 male Pe G and 3 males Le Pe, from *Dieffenbachia picta* (?), other data as above.

*Wyeomyia testei*: 1 male Pe G, 1 female Le Pe, Cujubim (CC-01, Gleba 01), Rondônia, Brazil, V-1988, from pineapple plant, IOC, det. MG Castro and MA Motta, col. MG Castro; 1 male Le Pe and 1 female Le Pe, Linha 651, Candeias do Jamary, Rondônia, Brazil, VII-1994, from pineapple plant, IOC, det. MA Motta & R Lourenço-de-Oliveira, col. DC Lima; 3 males Le Pe and 6 females Le Pe, IX-1994, col. R Lourenço-de-Oliveira, other data as above.

*Wyeomyia* sp. (misidentified as *Wy. luteoven-tralis* by Lane and Cerqueira 1942): Brazil: 1 female, Currálinho, Pará, n. 2539, FSP, det. J Lane and N Cerqueira, 1940; 1 female, São Paulo, NHM, det. J Lane and N Cerqueira, 1940; F Lane col.; 2 males G, Currálinho, Pará, XI-1935, one n. 9800 and another without number; slides n. 2292, 2294; from larvae collected in aninga plant (*Montrichardia arborescens*), deposited at Centro de Pesquisas René Rachou (CPRR), Belo Horizonte, det. N Cerqueira; col. Serviço de Febre Amarela; 2 females and 2 males, same data as above (females numbered 9800); 1 male G, Muri-queira, Bahia, n. 2538, FSP, det. Lane and Cerqueira, 1940 (= *Wy. howardi* Lane & Cerqueira 1942). 10 males Le Pe G, 15 males Le Pe, 30 females Le Pe, from 13 individual rearings, Estrada do Mosqueiro, DER, Belém, Pará, Brazil, XI-1992, IOC, det. MA Motta; col. MA Motta and OV Silva. 12 males Le Pe G, 12 females Le Pe, Catu, Utinga, Belém, Pará, Brazil, XI-91, IOC, det. MA Motta, 1993, col. R Lourenço-de-Oliveira and MG Castro.

#### ACKNOWLEDGEMENTS

To Dr Ralph E Harbach (NHM) for his suggestions and review of the manuscript; to Drs Amelia PA Travassos da Rosa and Nicola Degalier and all technicians from Instituto Evandro Chagas - Arbovirus research group, particularly to Orlando V Silva as well as to Dr Amiraldo Pinheiro from Fundação Nacional de Saúde, for the help in the field work in Belém; to EL Peyton (Walter Reed Army Inst. Research) for examin-

ing larvae of *Wy. complosa* and *Wy. jocosa*; to Drs Oswaldo P Forattini and Maria Anice M Sallum (FSP), Angélica Oliveira (CPRR) and AJ Shelley (NHM), for the loan of specimens; to Mara Lemos for the help in the illustrations.

#### REFERENCES

- Belkin JN 1968. Mosquito studies (Diptera, Culicidae). IX. The type specimens of New World mosquitoes in European museums. *Cont Am ent Inst* 3: 1-69.
- Belkin JN, Heinemann SJ, Page WA 1970. Mosquito studies (Diptera, Culicidae) XXI. The Culicidae of Jamaica. *Contr Am ent Inst* 6: 1-458.
- Belkin JN, Schick RX, Heinemann SJ 1971. Mosquito studies (Diptera, Culicidae). XXV. Mosquitoes originally described from Brazil. *Contr Am ent Inst* 7: 1-64.
- Blanchard R 1905. *Les moustiques histoire naturelle et medicale*. Paris, 673 pp., illus.
- Brujning CFA 1959. Notes on *Wyeomyia* mosquitoes of, Suriname, with a description of *Wyeomyia surinamensis* sp. n. *Studies on the fauna of Suriname and other Guyanas* 3: 99-146.
- Clastrier J 1973. *Wyeomyia (Dendromyia) trifurcata* n. sp. nouveau mostique de la Guyane Française (Diptera, Culicidae). *Nouv Rev Ent* 3: 39-47.
- Durham HE 1902. Report of the yellow fever expedition to Para. *Liverpool Sch Trop Med, Memoir* VII, 4: 479-563.
- Dyar HG 1922a. Illustrations of male hypopygium of certain Sabethids (Diptera: Culicidae). *Insec Inscit Menst* 10: 61-62
- Dyar HG 1922b. Mosquito notes (Diptera, Culicidae). *Insec Inscit Menst* 10: 92-99.
- Dyar HG, 1924. *Phoniomyia* and *Dendromyia* Theobald (Diptera, Culicidae). *Insec Inscit Menst* 12: 107-113.
- Harbach RE, Peyton EL 1993. Morphology and evolution of the larval maxilla and its importance in classification of the Sabethini (Diptera, Culicidae). *Mosq Syst* 25: 1-6.
- Lane J 1953. *Neotropical Culicidae*. São Paulo Brazil, 1112 pp.
- Lane J, Cerqueira NL 1942. Os Sabetíneos da América (Diptera, Culicidae). *Arch Zool S Paulo* 3: 473-849.
- Theobald FV 1901. *A monograph of the Culicidae or mosquitoes*. London. Vol. 2, VIII + 391pp.
- Theobald FV 1903. *A monograph of the Culicidae or mosquitoes*. London. Vol. 3, 359 pp.