

**NEW RECORDS OF PHLEBOTOMINE
SAND FLIES FROM PERU WITH A DESCRIPTION
OF *LUTZOMYIA OLIGODONTA*, N. SP., FROM THE
RIMAC VALLEY (DIPTERA: PSYCHODIDAE)¹**

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Abstract. One species of *Brumptomyia* and 14 species of *Lutzomyia* sand flies from Tambopata Reserve, Madre de Dios, Peru, are reported in Peru for the first time. Twenty-three other *Lutzomyia* species were taken at the same site. A new species, *Lutzomyia oligodonta*, is described based on males and females found in a small cave located in a leishmaniasis and bartonellosis endemic site in the Rimac Valley. This new species has an unusual combination of morphological characters and cannot be placed in any existing subgenus or species group of *Lutzomyia*.

Phlebotomine sand flies have been implicated as vectors of bartonellosis and leishmaniasis in the Peruvian highlands for more than 200 years (Palma 1908, 1909; Herrer & Christensen 1975), but it was not until 1913, when Townsend (1913) described *Lutzomyia verrucarum* (as *Phlebotomus verrucarum*), that serious studies of these insects began. Shannon (1929) and Hertig (1942, 1943, 1948) studied the Andean fauna, especially the 3 *Lutzomyia* França species then known from the Rimac Valley near Lima where, to date, bartonellosis and leishmaniasis (uta) remain endemic. Alexander (1944), Blancas & Herrer (1959-1960), and Llanos (1973) described or reported additional sand flies from other areas of Peru. All of the known species in Peru (72) except *L. hirsuta* (Mangabeira) (see Young 1979) were listed by Llanos (1981), who also gave references to earlier works on Peruvian sand flies.

In this paper, we add 16 previously unreported species to the fauna based on recent collections at the Tambopata Reserve, Madre de Dios Departamento, and at Coca-chacra, Lima Departamento, in the Rimac Valley where *L. oligodonta*, n. sp., described below, was discovered. Terminology follows that of Young (1979). All measurements are in millimetres.

***Lutzomyia oligodonta* Young, Pérez & Romero, new species**

Fig. 1-14

Holotype ♂. Wing length 2.43; width 0.72. A well-pigmented, dark sand fly, pleura nearly as dark as mesonotum. Head height from vertex to tip of clypeus, 0.44; width 0.39. Eyes large,

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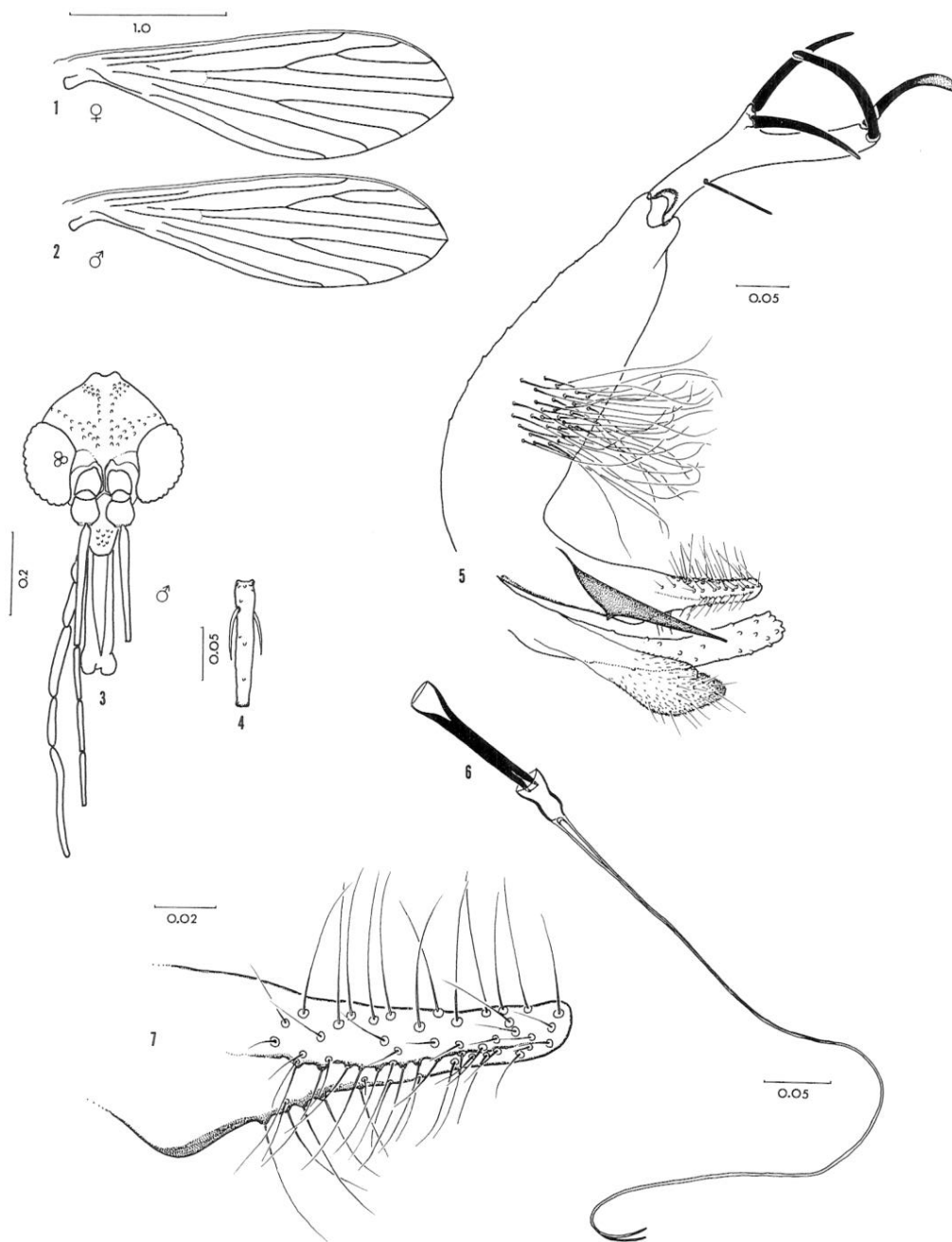


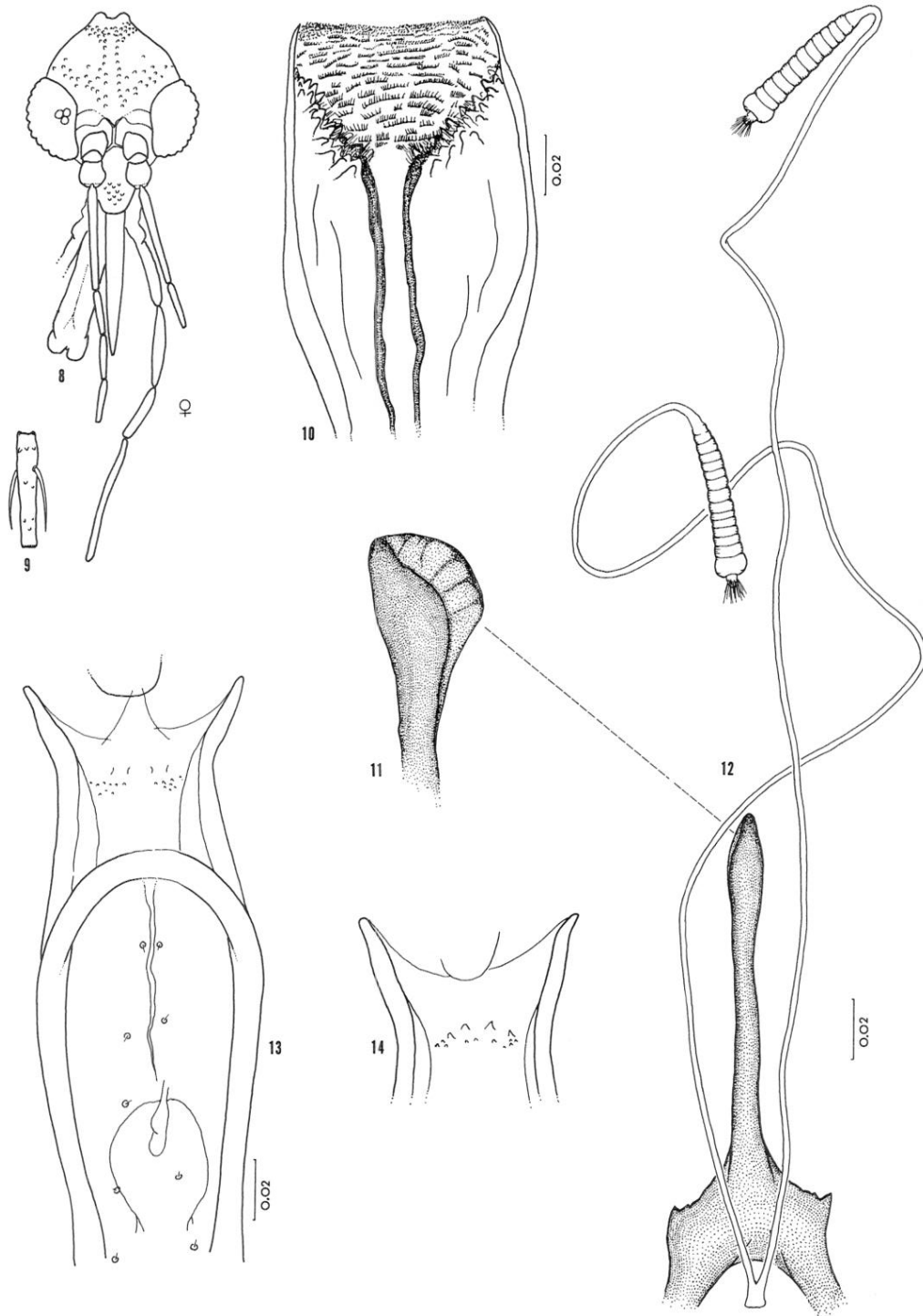
FIG. 1-7. *Lutzomyia oligodonta*: 1, ♀ wing; 2, ♂ wing; 3, ♂ head; 4, ♂ flagellomere II; 5, ♂ genitalia, lateral view; 6, genital pump and filaments; 7, paramere. Scale in millimetres.

separated by 0.14 or distance equal to 6.9 facet diameters. Interocular suture nearly complete but middle $\frac{1}{3}$ noticeably less developed than at either base (unlike that of the *Brumptomyia* or *Warileya* spp.). Flagellomere I, 0.29 long, II + III = 0.25; ascoids on II extending to 0.60 of segment, simple, on all flagellomeres except terminal one (XIV). Labrum 0.25 long. Lengths of palpomeres: 1, 0.04; 2, 0.12; 3, 0.18; 4, 0.13; 5, 0.27; palpal sensilla (7) grouped at middle $\frac{1}{3}$ of palpomere 3. Cibarium without teeth or pigment patch; cibarial arch complete as in ♀. Pharynx 0.21 long, no visible spicules or punctiform teeth present. Pleura with 6 upper and 5–6 lower episternal setae on each side. Lengths of wing vein sections: *alpha*, 0.45; *beta*, 0.25; *delta*, 0.13; *gamma*, 0.52. Lengths of femora, tibiae, and basitarsi: foreleg, 0.81, 0.89, 0.49; midleg, 0.84, 1.09, 0.74; hindleg, 0.97, 1.42, 0.79; femora without spines. *Genitalia*. Style 0.22 long, with 5 spines; basal isolated spine at 0.27 of segment, thinner than others, a pair of large, spatulate median spines borne on a short process, individually inserted, 2 terminal spatulate spines; no subterminal seta. Coxite 0.39 long, with a median group of about 25 long simple setae. Paramere simple, 0.24 long. Aedeagus slender with acute tip, well sclerotized, 0.15 long. Genital pump 0.18 long, each filament thin, 0.87 long or about 4.8× length of pump with simple, pointed tip. Lateral lobe 0.29 long.

Allotype ♀. Wing length 2.55; width 0.81. Coloration as in ♂. Head height 0.48; width 0.42. Eyes separated by 0.17 or distance equal to 8.3 facet diameters. Interocular suture as in ♂. Flagellomere I 0.26 long, II + III = 0.23; ascoids on II longer than in ♂, reaching to 0.87 of segment, simple, without proximal spurs, on all flagellomeres except terminal one (XIV). Labrum 0.35 long, with 8 distal sensilla. Lengths of palpomeres: 1, 0.04; 2, 0.16; 3, 0.19; 4, 0.15; 5, 0.35; palpal sensilla (10) grouped at middle $\frac{1}{3}$ of palpomere 3. Cibarium unusual for genus, with poorly defined, nearly invisible teeth, a group of about 8 small inconspicuous dotlike vertical teeth anterior to each pair of small curved “horizontal teeth” (actually may be remnants of horizontal teeth); pigment patch absent; cibarial arch complete; 9 basal sensilla prominent within cibarium as shown (Fig. 13). Pharynx 0.22 long, with numerous spicules, punctiform teeth and ridges at posterior end. Pleura with 9 upper and 6 lower episternal setae. Lengths of wing vein sections: *alpha*, 0.40; *beta*, 0.33; *delta*, 0.05; *gamma*, 0.47. Lengths of femora, tibiae, and basitarsi: foreleg, 0.86, 0.81, 0.48; midleg, 0.89, 1.07, 0.58; hindleg, 1.04, 1.60, 0.76; femora without spines. Spermathecae as shown, each with 12 annulations, terminal one slightly larger than others; sperm ducts thin and long, each greater than 8× length of spermatheca, common duct short as shown (Fig. 12). Stem of genital fork enlarged at apex, most noticeable when viewed laterally.

Type data. Holotype ♂. PERU: Department of Lima, Cocachacra, 1460 m, in small cave nr southern edge of town, 24.IV.1983 (G. Romero & D. Young). Allotype ♀, same data except 5.VI.1983 (E. Pérez). Paratypes (all from type-locality). 2♂, 1♀, same data as holotype; 9♂, 5♀, same data but 1.V.1983 (Pérez & G. Romero); 10♂, 3♀, 7.V.1983 (Pérez); 2♀, 15.V.1983 (Pérez); 2♂, 6♀, 22.V.1983 (Pérez); 1♀, 30.V.1983 (Pérez); 1♀, 5.VI.1983 (Pérez). Holotype, allotype, and some paratypes in collection at the Museo de Historia Natural, Lima; other paratypes to be deposited in collections at the Florida State Collection of Arthropods, Gainesville, The British Museum (Nat. Hist.), London, and the U.S. National Museum (Nat. Hist.), Washington, D.C.

FIG. 8–14. *Lutzomyia oligodonta* ♀: 8, head, same scale as Fig. 3; 9, flagellomere II; 10, posterior end of pharynx; 11, tip of genital fork stem, lateral view; 12, spermathecae (drawn from specimen in liquid phenol); 13, cibarium; 14, cibarial armature (paratype). Scale in millimetres.



Discussion. The specific name, *oligodonta*, refers to the few cibarial teeth of the female, a distinctive feature among *Lutzomyia* spp. females but somewhat similar to the condition in some *Phlebotomus* Rondani & Berté and *Warileya* Hertig females. The teeth are very lightly pigmented, often difficult or impossible to see with phase contrast microscopy, and resemble the remnants of teeth seen in many *Lutzomyia* spp. males. One paratype has broader teeth than those of the allotype (Fig. 14) but in all individuals they are inconspicuous, a character state that readily distinguishes the female of *L. oligodonta* from other known *Lutzomyia* or *Brumptomyia* França & Parrot females.

The spermathecae and thin ducts of the female and the arrangement of the spines on the male style resemble those of *Brumptomyia* species, but the antennal ascoids are simple, the interocular suture is incomplete, the female cibarial armature is different, the lateral lobe of the male genitalia is relatively short, and there are no long, persistent setae beyond the coxite tuft. The distribution, size, and number of labrocibarial adoral sensilla of *L. oligodonta* are characteristic of the *Lutzomyia*, not the *Brumptomyia* species (Lewis 1975).

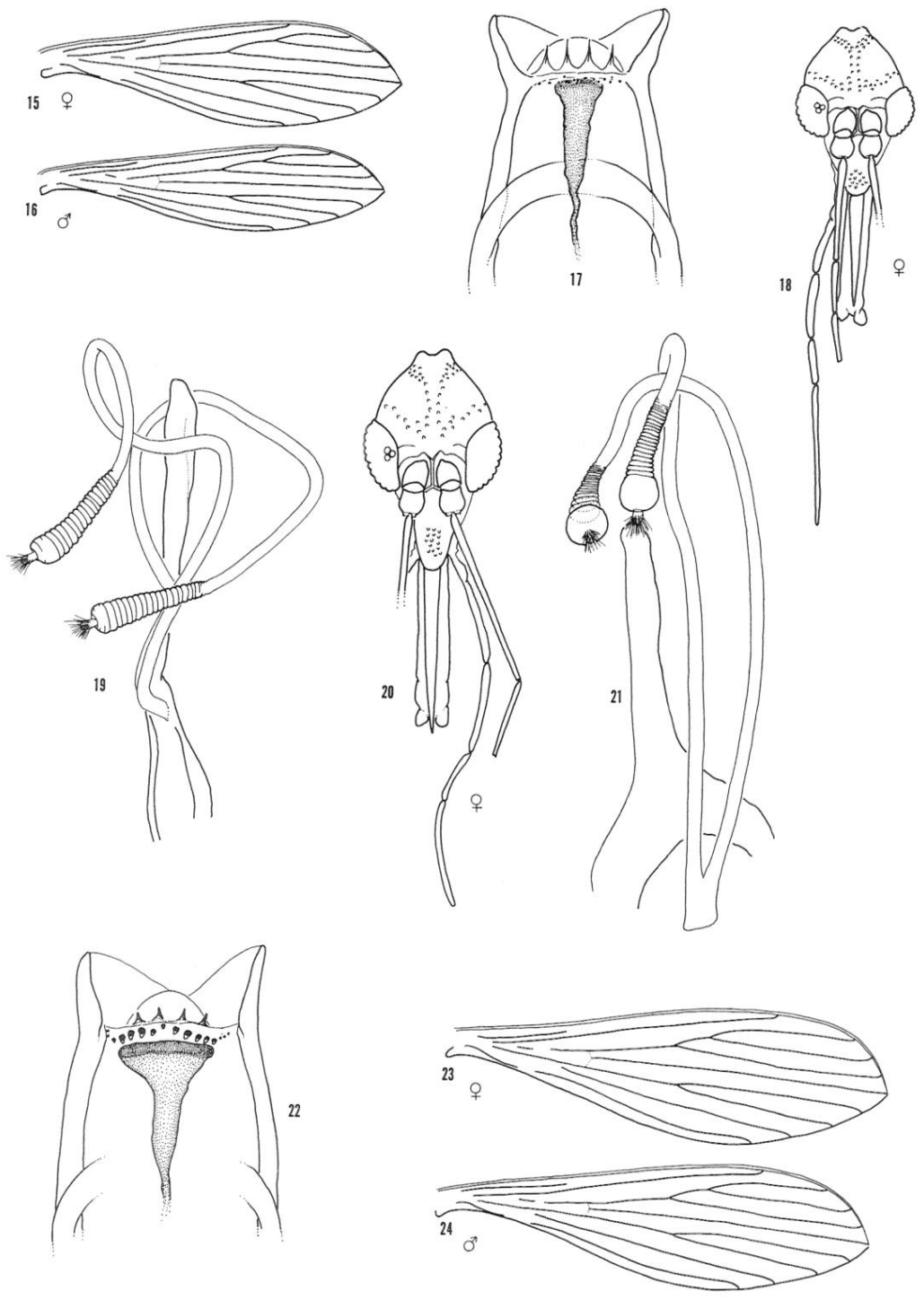
The median spines of the style of *L. oligodonta* are inserted close together on a short arm—an arrangement similar to that of the males of *L. correalimai* Martins, Coutinho & Luz, 1970, *L. rupicola* Martins, Godoy & Silva, 1962 (both Brazilian species), and males in the subgenus *Viannamyia* Mangabeira, 1941. *L. oligodonta* males, however, have only 4 spines on the style and have differently shaped parameres as well as other diagnostic features.

The range of variation of some structures of *L. oligodonta* is as follows. Length of labrum varies from 0.31 to 0.39 for females ($n=13$) and from 0.22 to 0.27 for males ($n=10$). Length of palpomere 5 varies from 0.23 to 0.39 for females ($n=9$) and from 0.26 to 0.35 for males ($n=9$). The lower values are the result of shrinkage during slide mounting. Length of flagellomere I is 0.20–0.28 for females ($n=13$) and 0.22–0.27 for males ($n=10$). The genital filaments of 10 males range from 3.94 to 5.18× the length of the pump. Wing length for females ($n=10$) ranges from 2.49 to 2.72; that for males ($n=7$), 2.11–2.40.

The relationship of *L. oligodonta* with other *Lutzomyia* species is obscure and it is not possible at present to place it in any existing subgenus or species group.

So far, specimens have been found only in a small cave (approx. 2 m high, 1.5 m wide, 4 m deep) at the southern edge of Cocachacra Village, about 50 m from a house where 2 of the occupants contracted cutaneous leishmaniasis in 1982. *Lutzomyia noguchii* (Shannon, 1929), a small-eyed species (Fig. 18) with different spermathecae, cibarial armature, and relatively slender wings (Fig. 15–19), was also collected in the

FIG. 15–24. 15–19, *Lutzomyia noguchii*: 15, ♀ wing; 16, ♂ wing; 17, ♀ cibarium; 18, ♀ head; 19, spermathecae. 20–24, *Lutzomyia peruensis*: 20, ♀ head; 21, spermathecae; 22, ♀ cibarium; 23, ♀ wing; 24, ♂ wing. All figures drawn at same scale as comparable structures in Fig. 1–14.



same cave. *Lutzomyia verrucarum*, an anthropophilic species, easily recognized by the saclike spermathecae, also occurs at Cocachacra. *Lutzomyia peruensis* (Shannon, 1929) (Fig. 20-24) is considered to be "very rare below about 1750 m" (Hertig 1942: 35) and has not yet been collected at Cocachacra. The males of these species are easily distinguished from males of *L. oligodonta* by their different coxite setal tufts, parameres, and arrangement of the spines on the styles.

The role, if any, of *L. oligodonta* as a vector of cutaneous leishmaniasis and/or bartonellosis remains to be determined. The first female collected (24.IV.1983) fed to repletion on the arm of a human volunteer when the screen of a 120 ml sand-fly holding cage (Endris et al. 1982) was pressed against the skin. Other females fed readily on white mice in the laboratory. Attempts are now being made to establish a laboratory colony of this sand fly and to study its habits and distribution in the field.

PHLEBOTOMINE SAND FLIES FROM TAMBOPATA RESERVE, MADRE DE DIOS, PERU

Sand flies from the forested Tambopata Reserve, located about 30 km SW of Puerto Maldonado (12°50'S, 069°20'W), 290 m elevation, were collected by Dr R.C. Wilkerson, University of Florida, in flight traps (February, October, and November 1982) and by Dr Terry Erwin, National Museum of Natural History, in canopy fogging collections (1982). In addition, 2 of us (D.G.Y. & E.P.R.) collected over 1500 specimens at Tambopata from 18-22 April 1983, using light and flight traps and by directly aspirating flies from tree trunks, from an animal burrow, and from a lantern-illuminated bedsheet. The species collected are listed below by subgenus or species group, following the classification of Lewis et al. (1977). Species previously unknown in Peru are marked with an asterisk.

Genus **Brumptomyia** França & Parrot, 1921

- *1. **B. galindoi** (Fairchild & Hertig, 1947) (= *B. mesai* Sherlock, 1962). 1♂, flight trap, 18-21.IV.1983. This male agrees with the description of *B. mesai* from Colombia considered a junior synonym of *B. galindoi* by Fraiha et al. (1970) and Young (1979).

Genus **Lutzomyia** França, 1924

Species group **migonei** Theodor, 1965

- 2. **L. migonei** (França, 1920). 1♀, canopy fogging collection, 25.X.1982.

Subgenus **Pressatia** Mangabeira, 1942

- 3. **L. (Pressatia) sp.** 1♀, flight trap, 1-9.XI.1982. Specific identification must await the discovery of the conspecific male.

Subgenus **Evandromyia** Mangabeira, 1941

- *4. **L. (Evandromyia) sp.** 1♀, flight trap, 1–9.XI.1982. The spermathecae resemble those of *L. infraspinosa* (Mangabeira, 1941) but final identification must be based on male characters.

Subgenus **Viannamyia** Mangabeira, 1941

5. **L. furcata** (Mangabeira, 1941) or *L. caprina* Osorno, Morales & Osorno, 1972. 1♀, canopy fogging collection, 20.X.1982.

Species group **shannoni** Theodor, 1965

6. **L. abonnenci** (Floch & Chassignet, 1947). 9♂, tree trunks, 19–22.IV.1983.
 7. **L. campbelli** (Damasceno, Causey & Arouck, 1945). 1♀, light trap, 19–22.IV.1983. The female agrees closely with the description given by Llanos et al. (1975).
 8. **L. dendrophyla** (Mangabeira, 1942). 16♂, tree trunks, 19–22.IV.1983. Females of this species, *L. shannoni*, and *L. abonnenci* were not separated by us. A total of 10 females of one or more of these species was taken in April 1983.
 *9. **L. lutziana** (Costa Lima, 1932). 2♂, flight trap, 18–21.IV.1983.
 10. **L. scaffi** (Damasceno & Arouck, 1956). 3♂, 1♀, tree trunks, 19–21.IV.1983.
 11. **L. shannoni** (Dyar, 1929). 22♂, tree trunks, 19–21.IV.1983.

Species group **aragaoi** Theodor, 1965

12. **L. aragaoi** (Costa Lima, 1932). 1♂, flight trap, 15–21.IV.1982. 1♂, animal burrow, 22.IV.1983.
 13. **L. brasiliensis** (Costa Lima, 1932). 1♂, flight trap, 15–21.II.1982.
 *14. **L. runoides** (Fairchild & Hertig, 1953). 2♂, flight trap, 1–9.XI.1982.

Species group **dreisbachi** Young & Fairchild, 1974

- *15. **L. dreisbachi** (Causey & Damasceno, 1945). 1♂, 7♀, flight trap, 15–21.II.1982. 1♂, flight trap, 1–9.XI.1982. 24♂, flight trap, 18–21.IV.1983.

Subgenus **Trichophoromyia** Barretto, 1962

16. **L. auraensis** (Mangabeira, 1942). 9♂, flight trap, 1–9.XI.1982.
 17. **L. omagua** Martins, Llanos & Silva, 1976. 4♂, flight trap, 15–21.II.1982.
 *18. **L. ubiquitalis** (Mangabeira, 1942). 2♂, flight trap, 15–21.II.1982. 1♂, flight trap, 18–21.IV.1983.
 *19. **L. (Trichophoromyia) sp. #1.** 1♂, flight trap, 15–21.II.1982. 6♂, flight trap, 18–21.IV.1983. This species is similar to *L. (Trichophoromyia) sp. #2* but the parameres lack a dorsal hump. Full description of both species will be given elsewhere after females can be correctly associated with males. We collected 32 undetermined females in this subgenus at Tambopata.

- *20. **L. (Trichophoromyia) sp. #2.** 2♂, flight trap, 15–21.II.1982. 1♂, flight trap, 1–9.XI.1982. 5♂, flight trap, 18–21.IV.1983. The male resembles *L. howardi* Young, 1979, described from a Colombian specimen, but the Peruvian males have only 8–12, rather thick, coxite setae and the parameres are slightly different.

Subgenus **Nyssomyia** Barretto, 1962

21. **L. antunesi** (Coutinho, 1939). 1♀, illuminated sheet, 20–21.IV.1983.
 22. **L. flaviscutellata** (Mangabeira, 1942). 1♀, flight trap, 15–21.II.1982. 1♀, flight trap, 18–21.IV.1983.
 *23. ? **L. richardwardi** Ready & Fraiha, 1981. 1♂, light trap; 2♂, flight trap, 18–21.IV.1983. This is a provisional identification. Confirmation of the presence of this species, described from Brazilian material, at Tambopata must await the discovery of the female.
 *24. **L. shawi** Fraiha, Ward & Ready, 1981. 1♂, 1♀, flight trap, 15–21.II.1982. 2♀, tree trunks; 79♂, 204♀, light trap; 19♂, flight trap; 38♂, 181♀, illuminated sheet, 18–21.IV.1983. This species, previously known only from Pará, Brazil, and anthropophilic in habit (Fraiha et al. 1981), was the most common sand fly encountered in April 1983. Seven females captured in light traps and from an illuminated sheet took bloodmeals from a human volunteer.
 *25. **L. whitmani** (Antunes & Coutinho, 1939). 1♀, canopy fogging collection, 20.X.1982.
 26. **L. yuilli** Young & Porter, 1972. 1♀, canopy fogging collection, 8.XI.1982.

Subgenus **Psychodopygus** Mangabeira, 1941

27. **L. (Psychodopygus) sp.**, near *L. chagasi* (Costa Lima, 1941). 1♀, flight trap, 1–9.XI.1982. 4♀, light traps; 23♀, illuminated sheet, 19–22.IV.1983. These females may or may not be conspecific with *L. chagasi*; males are needed to confirm its presence or that of another species at Tambopata Reserve.
 28. **L. carrerai carrerai** (Barretto, 1946). 1♂, 4♀ (2 dark ♀) 15–21.II.1982. 2♂, 1♀, canopy fogging collection, 20 & 25.X.1982. 1♀, flight trap, 1–9.XI.1982. 104♂, 36♀, light traps; 9♂, 5♀, flight trap; 36♂, 56♀ (1♂, 9♀ dark forms), illuminated sheet, 18–22.IV.1983. The majority of specimens of this species are very pale, others have very dark mesonota but lack structural distinguishing features.
 *29. **L. claustrei** Abonnenc, Leger & Fauran, 1979. 1♂, flight trap; 1♂, illuminated sheet, 18–21.IV.1983. This is an Amazonian species reported recently from French Guiana and Brazil (Abonnenc et al. 1980).
 30. **L. davisii** (Root, 1934). 2♂, 3♀, flight trap, 15–21.II.1982. 1♂, flight trap, 1–9.XI.1982. 42♂, 86♀, light traps; 1♂, 7♀, flight trap; 24♂, 78♀, illuminated sheet, 19–22.IV.1983.
 31. **L. guyanensis** (Floch & Abonnenc, 1941). 1♀, light trap; 4♀, illuminated sheet, 19–22.IV.1983. We are unable to separate the females of *L. guyanensis*, *L.*

geniculata (Mangabeira, 1941), *L. corossoniensis* LePont & Pajot, 1978, and *L. dorlinsis* LePont & Desjeux, 1982, the latter 2 species being described from males only and apparently closely related. The specimens from Tambopata may represent *L. geniculata*, which has been reported from Peru (Martins et al. 1978).

32. ***L. hirsuta hirsuta*** (Mangabeira, 1942). 7♀, flight trap, 15–21.II.1982. 7♂, 13♀, light traps; 6♂, 12♀, illuminated sheet, 18–21.IV.1983.
- *33. ***L. lainsoni*** (Fraiha & Ward, 1974). 11♂, 31♀, light traps; 10♂, 19♀, illuminated sheet, 18–21.IV.1983. An anthropophilic species, *L. lainsoni* was known previously only in Brazil. Five females took full bloodmeals from a human volunteer at Tambopata Reserve.
34. ***L. paraensis*** (Costa Lima, 1941). 1♀, flight trap, 15–21.II.1982. 1♂, 1♀, light traps; 1♀, illuminated sheet, 18–21.IV.1983.

Species group **cayennensis** Theodor, 1965

35. ***L. micropyga*** (Mangabeira, 1942). 1♂, 1♀, tree trunk, 22.IV.1983. 1♂, canopy fogging collection, 25.X.1982.

Species group **oswaldoi** Theodor, 1965

- *36. ***L. rorotaensis*** (Floch & Abonnenc, 1944). 3♂, 3♀, canopy fogging collection, 25 & 31.X.1982.

Ungrouped species

- *37. ***Lutzomyia* sp.**, near *L. microps* (Mangabeira, 1942). 1♂, flight trap, 1–9.XI.1982. This specimen is conspecific with an undescribed species from Brazil that is being described by Young & Arias (in prep.).
38. ***Lutzomyia nordestina*** (Mangabeira, 1942). 2♂, canopy fogging collection, 25.X.1982.

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