

# **Lutzomyia** sand flies in the subgenus **Evandromyia** Mangabeira with descriptions of a new species from Brazil (Diptera: Psychodidae) (\*)

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## Abstract

The **Lutzomyia** sand flies in the subgenus **Evandromyia** Mang. are separated into two groups — the Series **infraspinosa** and the Series **monstruosa**. These are defined and the included species are catalogued. A Brazilian species, **L. inpai** n. sp. is described and illustrated. An identification key to the adult **Evandromyia** males is provided.

The classification of the **Lutzomyia** sand flies in the subgenus **Evandromyia** Mang. has been discussed by several authors. Mangabeira (1941) erected the subgenus to accommodate two species — **L. infraspinosa** (Mang.) type species, and **L. brachiphalla** (Mang.). These were originally placed in the genus **Phlebotomus** Rondani but presently most investigators including ourselves follow Theodor (1965) in restricting members of the genus to the Old World.

Here we recognize 9 **Lutzomyia** spp. as belonging in the subgenus **Evandromyia**. These appear to form two groups which are informally designated the Series **infraspinosa** with 7 species and the Series **monstruosa** with 2 species.

In 1955 Fairchild placed four species in the Series **infraspinosus** (= **Evandromyia**) in the subgenus **Brumptomyia** França & Parrot of **Phlebotomus**. One of these, **L. lenti** (Mang.), is now believed to be more closely related to **L. evandroi** (Costa Lima & Antunes) and is not treated here. **L. bourrouli** (Barretto & Coutinho) was placed with **L. cruciata** and its allies in the Series **cruciata**.

Forattini (1971) included **L. infraspinosa** and **L. bourrouli** in the subgenus **Lutzomyia**

França and later (1973) added **L. brachiphalla**. He treated **L. monstruosa** and **L. teratodes** Martins, Falcão & da Silva as members of the genus **Pressatia** Mang. **L. cerqueirai** (Damasceno & Causey) was not placed in any subgenus.

In our opinion, the **Evandromyia** species constitute a natural group distinct from other subgenera or species groups of **Lutzomyia**. In some respects (i.e. the spermathecae, palpi, cibaria and, to a lesser extent, the male genitalia) these species, especially those in the Series **infraspinosa**, are similar to some species in the **vespertilionis** Group. This latter group is primarily centered in Central America but one species, **L. vespertilionis** (Fchid. & Herzig), ranges south into northwestern Ecuador. The **Evandromyia** species are totally South American with the center of distribution being the Amazon Basin. Based on present evidence, the females feed on mammals such as bats (some **vespertilionis** Group species) and rodents (species in both groups). It is interesting that no close association between bats and sand flies has been noted outside the range of the **vespertilionis** Group species.

The following definitions of the Series **infraspinosa** and Series **monstruosa** will also serve to define the subgenus **Evandromyia**.

Genus **Lutzomyia** França

Subgenus **Evandromyia** Mang., 1941

Series **infraspinosa**

Small to medium sized, generally pale sand flies, wing length less than 2.0 mm. Palpal segment 5 longer than segments 3+4; Newstead's scales loosely grouped on middle

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of third segment. Antennal ascoids simple, paired on all flagellar segments except the last, their tips ending slightly before, at the same level of or slightly beyond the end of their respective antennal segments (3-15). Femur unarmed. Coxite of male genitalia with or without (only *L. cerqueirai*) a setal tuft; the tuft associated with a small sclerotized "plate" at base in those species having a tuft. Style with 4 major spines, the proximal spine isolated from others; subterminal seta present. Paramere simple or bifurcate, moderately to heavily sclerotized distally, with numerous fine hairs on the dorsobasal surface. Aedeagus simple, lacking ventral or lateral extensions. Genital filaments partially striated or smooth, sometimes very thick and heavily sclerotized, the tips enlarged or not. Lateral lobe usually curved upwards, pointed at tip and with 2 — 4 long spatulate setae at end. Cibarium of female with 4 sharp, equidistant horizontal teeth, a transverse row of 15 or fewer vertical teeth, a complete cibarial arch and a rather slender, moderately sclerotized pigment patch. Genital fork often with a rather short stem; spermathecae sac-like or tubular with irregular to nearly complete annuli; individual ducts shorter than the common duct.

None of the species in the series is known to be anthropophilic although *L. infraspinosa* has been reported infrequently feeding on man in Surinam (Wijers & Linger, 1966). Data from Disney trap collections using rodents as bait indicate that these mammals serve as hosts for some *Evandromyia* spp. (Shaw & Lainson, 1972; Ward *et al.*, 1973; Aitken *et al.*, 1975).

#### Species in the Series *infraspinosa*

##### 1. *Lutzomyia bourrouli* (Barretto & Coutinho)

*Phlebotomus bourrouli* Barretto & Coutinho, 1941:237, ♂, ♀, Palmeiras, São Paulo State, Brazil. Barretto, 1947:189 (full reference). Floch & Abonnenc, 1947:4 (keyed). Barretto, 1950:104-105, 113-114 (♂, ♀ figured, keyed). Barretto, 1951:213 (distribution). Floch & Abonnenc, 1952:31, 45 (♂, ♀ figured, keyed). Fairchild, 1955:195.

*Sergentomyia bourrouli*, Barretto, 1955:181.  
*Lutzomyia bourrouli*, Barretto, 1962:93. Martins & da Silva, 1964:128 (Brazilian records). Theodor, 1965:190. Forattini, 1971:99. Martins & da Silva, 1971:417. Martins & Morales-Farias, 1972:367, 368. Forattini, 1973:208, 212, 249, 250, 360, 367 (distribution, figured, keyed, redescribed).

*Known distribution:* Brazil; States of Acre, Amazonas, Goiás, Mato Grosso, São Paulo.

*Specimens examined:* 2 ♂♂, near Campo Grande, Mato Grosso, Brazil, 18 Oct. 1960, da Silva & Ferreira coils.

*Remarks:* See *L. pinottii*.

##### 2. *Lutzomyia brachiphalla* (Mangabeira)

*Phlebotomus brachiphallus* Mangabeira, 1941:219, ♂, Piratuba, Pará, Brazil. Barretto, 1947:189-190 (full reference). Floch & Abonnenc, 1947:4 (keyed). Damasceno *et al.*, 1949:820,840 (distribution N Brazil). Barretto, 1950:104 (keyed). Barretto, 1951:213 (distribution). Floch & Abonnenc, 1952:20, 25, 31, 77 (keyed, described). Fairchild, 1955:195. de Lucena, 1960:77.

*Sergentomyia brachiphalla*, Barretto, 1955:181.

*Lutzomyia brachiphalla*, Barretto, 1962:93. Theodor, 1965:190. Forattini, 1971:103. Martins & Morales-Farias, 1972:367 (distribution). Ward *et al.*, 1973:178. Lainson *et al.*, 1973:190 (examined for *Leishmania*, negative, Pará, Brazil). Forattini, 1973:212, 249, 251, 256, 367 (distribution, keyed, figured, redescribed).

*Known distribution:* French Guiana, northern Brazil.

*Specimens examined:* None.

*Remarks:* See *L. inpai* n. sp.

##### 3. *Lutzomyia cerqueirai* (Causey & Damasceno)

*Phlebotomus cerqueirai* Causey & Damasceno, 1945:653, ♂, Utinga, Belém, Pará, Brazil. Barretto, 1947:193 (in catalog). Floch & Abonnenc, 1947:4 (keyed). Damasceno *et al.*, 1949:822, 840 (distribution). Barretto, 1950:104 (keyed). Barretto, 1951:214 (distribution). Floch & Abonnenc, 1952:32 (keyed). Fairchild, 1955:194.

*Sergentomyia cerqueirai*, Barretto, 1955: 182.

*Lutzomyia cerqueirai*, Barretto, 1962:93. Theodor, 1965:190. Martins *et al.*, 1965:2 (Rondonia, Brazil). Forattini, 1971:103. Martins & Morales-Farias, 1972:367. Forattini, 1973:340, 349, 351, 352, 374 (distribution, redescribed, keyed, figured).

*Known distribution*: Brazil; Rondonia Territory, States of Pará, Amazonas, and Bahia (The latter State listed by Forattini, 1973).

*Specimens examined*: None

*Remarks*: Very little is known about this species. The female has not been discovered. The male differs from the other species in the Series *infraspinosa* mainly in the nature and placement of the spines on the style and in the lack of a coxite tuft. Its definite status in relation to the other species should become clear when the female is discovered.

#### 4. *Lutzomyia infraspinosa* (Mang.)

*Phlebotomus infraspinosus* Mangabeira, 1941:216, ♂, (Aura, Belém, Pará, Brazil). Floch & Abonnenc, 1943:19 (♀ described, French Guiana). Barretto, 1947:204 (full references). Floch & Abonnenc, 1947:4 (keyed). Damasceño *et al.*, 1949:826, 841, (distribution N Brazil). Barretto, 1950:104, 113 (keyed). Barretto, 1951:218 (distribution). Floch & Abonnenc, 1952:20, 24, 25, 32, 45, 74 (keyed, redescribed). Fairchild, 1955: 195. Forattini, 1959:160 (Amapá Terr., Brazil). Forattini 1960:478. Wijers & Linger, 1966:505-506 (Surinam).

*Sergentomyia infraspinosa*, Barretto, 1955: 184.

*Lutzomyia infraspinosa*, Barretto, 1962:93. Theodor, 1965:190 (figured). Lewis *et al.*, 1970: 215 (age grading). Fraiha *et al.*, 1971:99. Martins & Morales-Farias, 1972:367 (general distribution). Shaw & Lainson, 1972:710-714 (Belém, Brazil, positive for flagellates). Ward *et al.*, 1973:178. Forattini, 1973:209, 213, 258, 351, 360, 367 (distribution, redescribed, keyed, figured). Ward & Killick-Kendrick, 1974:219 (larval resistance to fungi). Aitken *et al.*, 1975:361 (virus isolation attempts, negative results, Belém, Brazil). Lewis, 1975:500,505 (mouthpart morphology).

*Known distribution*: Surinam, French Guiana, Brazil.

*Specimens examined*: 2 ♂♂, near Marabá, Pará, Brazil, 27 Sept. 1972, light trap, D.G. Young coll. 1 ♂, Montabo, French Guiana, 23 Dec. 1945, E. Abonnenc leg.

*Remarks*: See *L. begoniae* (Ortiz and Torres).

#### 5. *Lutzomyia inpai* Young & Arias n. sp. (Fig. 1)

*Male*: A small pale sand fly. Cibarium unarmed; cibarial arch complete; pigment patch subtriangular, as in female. Pharynx about 0.11 mm long, unarmed. Eyes separated by distance = to about 5.2 facet diameters. Antennal segment 3, 0.18 - 0.20 mm long, subequal in length to segments 4+5, ascoids simple, their tips reaching to or beyond the ends of their respective segments (3-15). Proboscis length 0.15 mm. Length of palpal segments, in mm: 1 (0.023-0.027), 2 (0.075-0.093), 3 (0.103-0.118), 4 (0.075-0.078), 5 (0.28-0.24); Newstead's scales, about 10, on middle third of segment 3. Pleuron pale with 11-17 upper & 2-4 lower episternal setae. Mesonotum faintly pigmented, appearing pale. Wing length 1.37-1.51 mm, width about 0.42 mm; length of wing sections, in mm: alpha (0.30-0.35), beta (0.15-0.19), delta (0.04-0.10), gama (0.17-0.20). Length of femorae, tibiae & basitarsi of slide 400 in mm: foreleg, 0.01,0.61,0.39; midleg, 0.59,0.76,0.42; hindleg, 0.66,0.93,0.49. Genital filaments (about 0.33 mm long) heavily sclerotized, the distal two-thirds striated & thick as shown; pump about 0.15 mm long. Style with 4 major spines & subterminal bristle. Coxite tuft of 14-24 setae associated with a proximal sclerotized plate. Aedeagus as shown, rather broad at end. Proximal, undivided portion of paramere with numerous fine hairs, mostly dorsal; the distal bifurcate portion more heavily pigmented than the proximal portion, especially well sclerotized is the lower arm. Lateral lobe (about 0.28 mm long), pointed at tip & bearing 3 distal modified setae (1 specimen has only 1 such seta). Cercus as shown.

*Holotype Male*: As described above — certain measurements and characteristics of

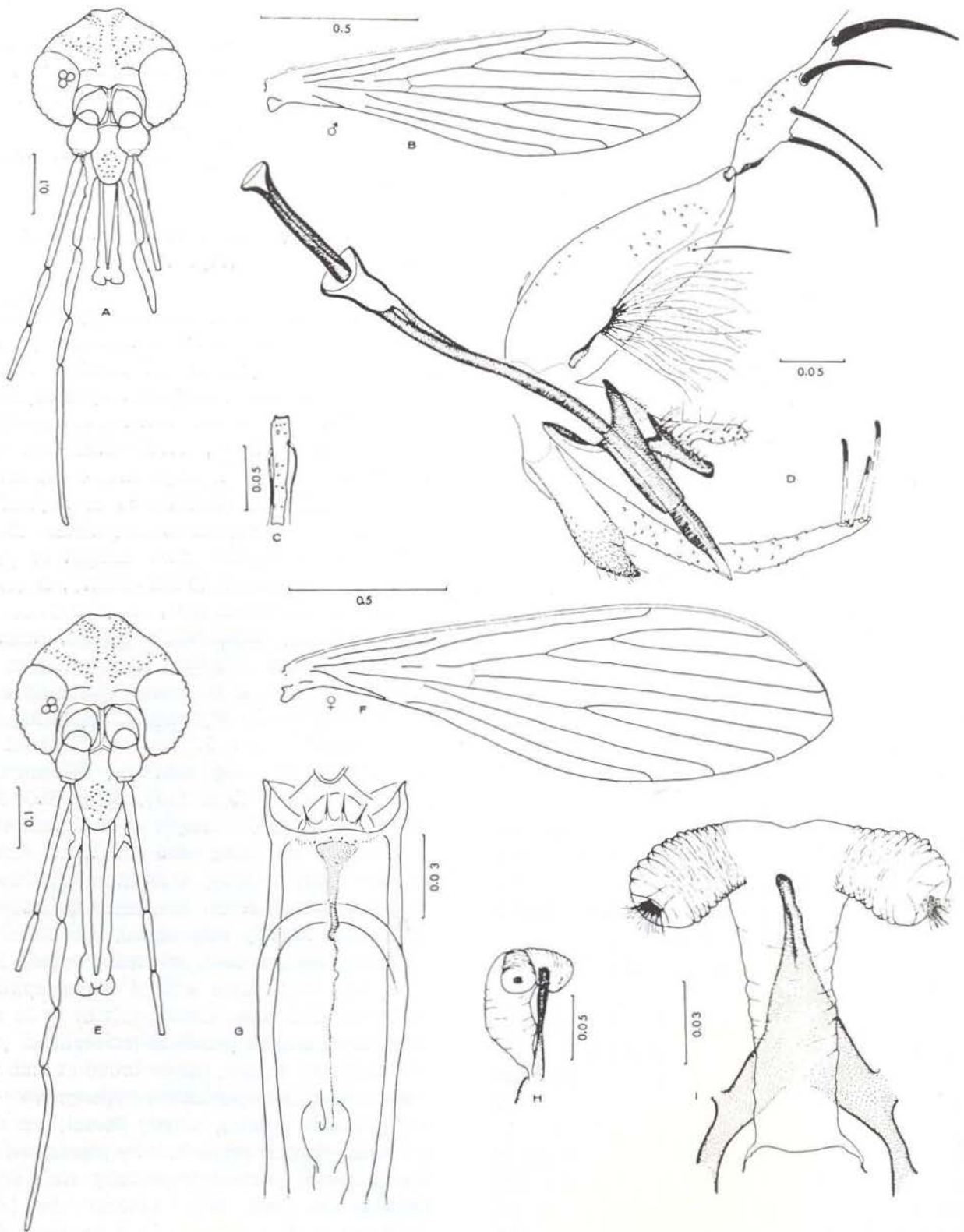


Fig. 1. *Lutzomyia inpai* n. sp. A. Male head (N.º 431). B. male wing (N.º 469). C. male antennal segment, 4 (N.º 431) D. Male genitalia, lateral view drawn in phenol (N.º 470). E. Female head (N.º 439). F. Female Wing (N.º 451). G. Female cibarium (N.º 449). H. Spermathecae, lateral view drawn in phenol. (N.º 441). I. Spermathecae, dorsal view (N.º 441). Scale in millimeters.

specimen as follows (in mm): pharynx length, 0.11. Eye separation = 5.4 facet diameters. Length of antennal segment 3, 0.19. Proboscis length 0.15. Length of palpi, 1 (0.027), 2 (0.088), 3 (0.114), 4 (0.078), 5 (0.21). Pleurae with 14-16 upper and 2 lower episternal setae. Wing length 1.44, width 0.416; length of vein sections: alpha (0.36), beta (0.15), delta (0.08), gamma (0.20). Coxite tuft with 16 setae. Genital filaments 0.30 long, pump 0.15 long, lateral lobe 0.28 long with 3 specialized, apical setae.

**Female:** Larger than male, color the same. Cibarium with 4 sharp & equidistant horizontal teeth & with 4-8 small medial vertical teeth in one transverse row plus a group of smaller teeth on each side; cibarial arch complete; pigment patch as figured. Pharynx nearly 0.15 mm. long, unarmed. Eyes separated by distance = to about 6.2 facets. Length of antenna 3, 0.21-0.22 mm, subequal in length to segments 4+5; ascoids as in male. Proboscis length 0.23-0.24 mm, considerably shorter than head height from tip of clypeus to vertex. Length of palpal segments, in mm: 1 (0.035), 2 (0.11-0.12), 3 (0.14-0.15), 4 (0.09-0.10), 5 (0.23-0.29); Newstead's scales as in male. Pleuron with 17-21 upper & 2-4 lower episternal setae. Wing length 1.69-1.80 mm, with about 0.55 mm; length of vein sections, in mm: alpha (0.42-0.49), beta (0.17-0.22), delta (0.12-0.16), gamma (0.21-0.29). Length of femorae, tibiae & basitarsi of slide 450, in mm: foreleg, 0.67, 0.71, 0.44; midleg, 0.69, 0.83, 0.48; hindleg, 0.75, 1.05, 0.56. Spermatheca sac-like, only slightly longer than wide, irregularly wrinkled, seemingly implanted directly on the large common duct; terminal knob recessed as shown.

**Allotype Female:** As described above. Certain measurements and characteristics as follows (in mm): pharynx length 0.146. Eye separation = to 6 facet diameters. Length of antennal segment 3, 0.21. Proboscis length 0.23. Length of palpal segments, 1 (0.035), 2 (0.114), 3 (0.14), 4 (0.09), 5 (0.21). Pleurae with 17 upper and 2-3 lower episternal setae. Wing length 1.69, width 0.54; length of vein sections: alpha (0.42), beta (0.20), delta (0.12), gamma (0.21), length of femorae, tibi-

ae and basitarsi: foreleg missing; midleg, 0.66, 0.86, 0.44; hindleg, 0.75, 1.004, 0.54.

**Type Data:** *Holotype* male (NO. 400), 4 km south of Estrada Torquato Tapajós at km 54, near COSAC training Base II, Amazonas, Brazil in Disney trap baited with a Golden Hamster (*Mesocricetus auratus*), 21 Oct. 1975, Rui A. de Freitas & João F. Vidal colls. *Allotype* female (No. 401), same data. *Paratypes*, 37 ♂♂, 29 ♀♀ (Nos. 402-467), same data. One male (No. 468), Maua, Estrada do Aleixo (Km 10), Manaus, Amazonas, Brazil, in Disney trap baited with rodent (*Tylomys* sp.), 8 Aug. 1974, J. Arias & R. Freitas colls. 1 ♂ (No. 469) same data as No. 468 except collected on 3 Sept. 1974. 2 ♂♂ (Nos. 470-471), same as No. 468 except collected on 18 Dec. 1974, R. Freitas coll. *Holotype* and *allotype* to be deposited in the Museu de Zoologia, Universidade de São Paulo, Brazil. *Paratypes* in the collection at INPA, Manaus, Brazil; The British Museum (Natural History); U.S. National Museum (Natural History) and the Florida State Collection of Arthropods, Gainesville, Florida. *L. inpai* is named for the Instituto Nacional de Pesquisas da Amazonia.

**Remarks:** The male of *L. inpai* resembles *L. brachiphalla* in structure but the two species can be distinguished as follows. The coxite tuft of *L. inpai* consists of 14 + setae; instead of only 4-6. There are normally 3 distal spatulate setae, on each lateral lobe. *L. brachiphalla* has 2 such setae. The lower branch of the paramere is somewhat rounded apically in *L. inpai*, not acute as it appears to be in *L. brachiphalla* (see Mangabeira, 1941). The genital filaments of *L. inpai* are distinctly swollen at the distal ends whereas in *L. brachiphalla* they appear to be subequal in width throughout.

The female of *L. brachiphalla* remains undescribed but it is probably very similar to that of *L. inpai* in details of the cibarium and spermathecae. The sexes of *L. inpai* were associated by color, by metrical characters and by collection data.

#### 6. *Lutzomyia begoniae* (Ortiz and Torres) (Fig. 2 A-D, F-1)

*Phlebotomus begoniae*: Ortiz and Torres, 1975: 101, ♂, "El Gavilán", Terr. Federal Amazonas, Venezuela.

*Known Distribution:* Venezuela (Type locality), Northern Brazil.

*Specimens examined:* 10 ♂♂, 25 ♀♀, Mauá, Estrada do Aleixo (Km 10), Manaus, Amazonas, Brazil, in *Tylomys* sp.. baited disney trap, Aug., Sept. and Dec., 1974, J. Arias and R. Freitas colls.

*Remarks:* *L. begoniae*, recently described from a single male, closely resembles *L. infraspinosa* but can be separated from it by the shape of the parameres (compare Fig. 2 D with Fig. 2 E).

Based on the original description, the holotype of *L. begoniae* differs mainly from the Brazilian *L. begoniae* males in the length of the genital filaments and in the better developed ventral process of the paramere. It remains to be determined whether or not these character states represent specific differences. But for the present, we prefer to treat the Brazilian specimens as *L. begoniae*, believing that these differences probably reflect geographic variation.

The male and previously undescribed female of *L. begoniae* from Manaus, Brazil are described below. At this time we are unable to separate females of *L. infraspinosa* and *L. begoniae* without associated males.

*L. begoniae* (Ortiz and Torres).

*Male:* A small sand fly, generally pale but head, mesonotum, ventral border of pleuron & coxa dusky. Cibarium unarmed; cibarial arch complete; pigment patch as in female. Pharynx about 0.13 mm long, unarmed. Eyes separated by distance = to about 6 facet diameters. Antennal segment 3, 0.17-0.19 mm long, less than or = to combined length of segments 4+5; ascoids simple, reaching to or beyond tip of segment 4, present on all flagellar segments except last. Proboscis length 0.16 mm. Length of palpal segments, in mm: 1 (0.035), 2 (0.086-0.126), 3 (0.108-0.126), 4 (0.075-0.096), 5 (0.25-0.29); Newstead's scales (about 10) on middle third of segment 3. Pleuron pale, with 13-21 upper & 2-3 lower episternal setae. Wing length 1.32-1.48 mm, width about 0.41 mm; length of wing sections, in mm: alpha (0.28-0.34), beta (0.14-0.17), delta (0.02-0.05), gamma (0.15-0.19). Length of femore, tibiae & basitarsi of slide 474, in

mm: foreleg, 0.75, 0.57, 0.34; midleg, 0.59, 0.69, 0.39; hindleg, 0.61, 0.73, 0.44. Genital filament 0.32-0.36 mm long; the proximal half of each smooth-walled but well pigmented, the distal half with transverse striations, tip slightly enlarged; pump about 0.16 mm long. Style as shown with 4 major spines & a small subterminal seta. Coxite tuft of 22-28 simple setae associated with a proximal sclerotized plate. Aedeagus subtriangular as shown. Paramere bifurcate, the lower arm with a ventral acute process. Lateral lobe, about 0.25 mm, upturned & pointed at tip, bearing 3 distal spatulate setae. Cercus as figured.

*Female:* Larger than male, degree & distribution of pigmentation the same. Cibarium with 4 sharp horizontal teeth, evenly spaced & with 5-10 vertical teeth placed more or less in a single transverse row; cibarial arch complete; pigment patch subtriangular, moderately pigmented. Pharynx about 0.16 mm long, unarmed. Eyes separated by about 7 facet diameters. Length of antennal segments 3, 0.17-0.20 mm, less than or = to length of segments 4+5; ascoids as in male. Proboscis length, 0.24-0.25 mm, shorter than head height. Length of palpal segments, in mm: 1 (0.035), 2 (0.111-0.123), 3 (0.131-0.141), 4 (0.078-0.093), 5 (0.25-0.30); Newstead's scales as in male. Pleuron with 18-25 upper & 2-4 lower episternal setae. Wing length, 1.15-1.69 mm, width about 0.58 mm; length of vein sections as follows, in mm: alpha (0.33-0.45), beta (0.16-0.20), delta (0.05-0.12), gamma (0.15-0.23). Length of femorae, tibiae & basitarsi of slide 478, in mm: foreleg, 0.59, 0.78, 0.45; midleg, 0.66, 0.95, 0.49; hindleg, 0.71, 0.96, 0.49. Spermatheca tubular, its length over 4x its width, wrinkled with incomplete annulations; individual duct short, smooth-walled; the conspicuous common duct wider, wrinkled in part; stem of genital fork rather short.

#### 7. *Lutzomyia pinottii* (Damasceno & Arouck)

*Phlebotomus pinottii* Damasceno & Arouck, 1956:2, ♂, Rio Capim, Município do Capim, Pará, Brazil. De Lucena, 1960:75 (*not pinottii* Damasceno & Arouck).

*Lutzomyia aroucki*, Barretto, 1962:93 (new name for *pinottii*, unnecessary change).

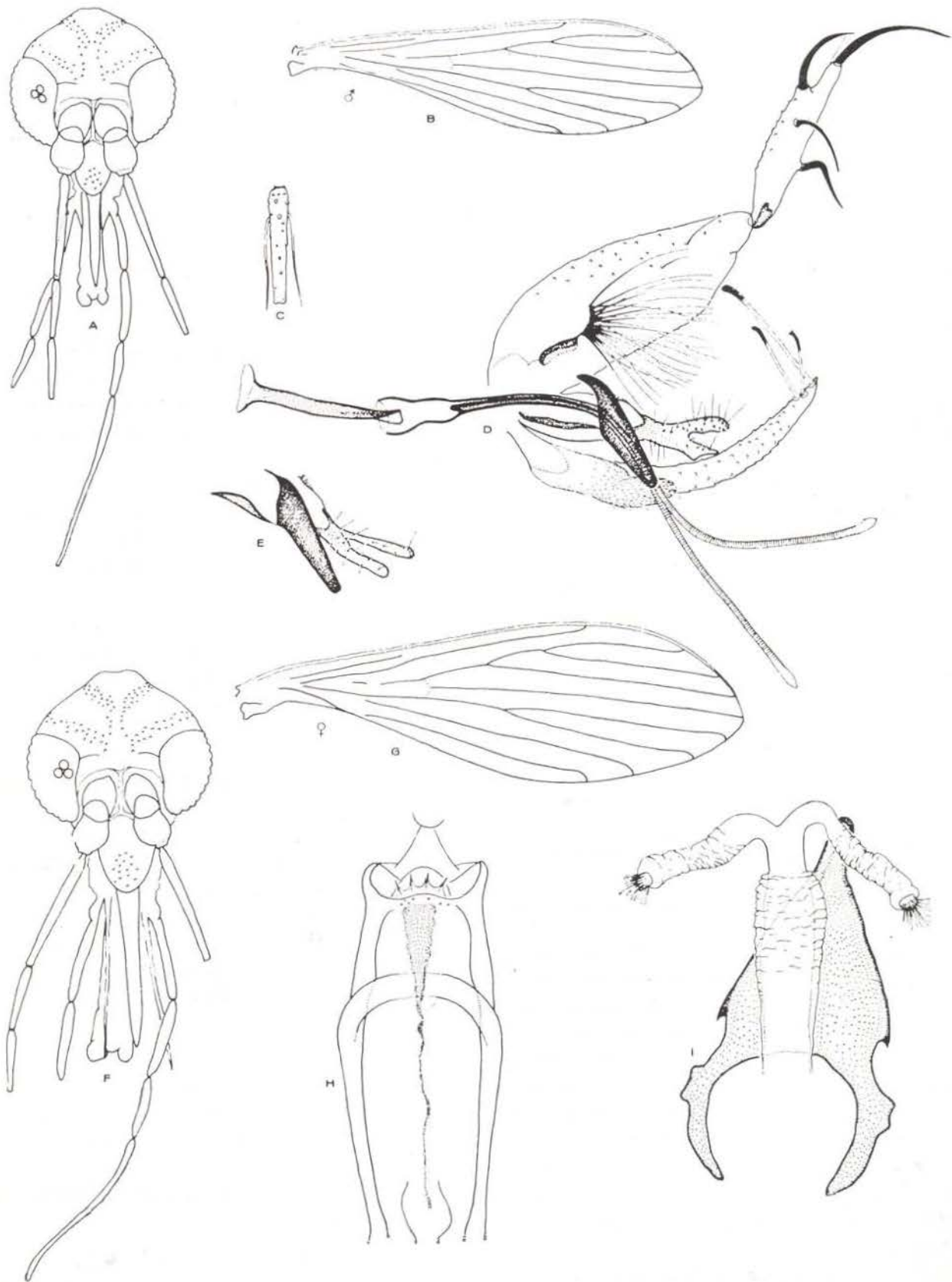


Fig. 2. *Lutzomyia begoniae* (Ortiz and Torres). A. Male head (N.º 480). B. Male wing (N.º 474). C. Male antennal segment 4 (N.º 480). D. Male genitalia, lateral view drawn in phenol (N.º 479). F. Female head (N.º 504). G. Female wing (N.º 491). H. Female cibarium (N.º 504). I. Spermataecae, dorsal view, in phenol (N.º 504). *Lutzomyia infraspinoza* (Mang.). E lateral view of paramere and aedeagus. All structures drawn at same scale as those in Fig. 1.

*Lutzomyia pinottii*, Theodor, 1965:190. Fraiha *et al.*, 1970:215 (Belém, Pará, Brazil). Forattini, 1971:103. Martins & Morales-Farias 1972:367. Shaw & Lainson, 1972:713. Forattini, 1973:249 (as a junior synonym of *L. bourrouli*).

*Known distribution:* Brazil, Pará State.

*Specimens examined:* 1 ♂, Belém, Pará, Brazil. H. Fraiha leg.

*Remarks:* After examining type material, Forattini (1973) considered *L. pinotti* and *L. bourrouli* to be conspecific even though the shape of parameres differs between the two forms.

We prefer to treat them as distinct species, however, because of the difference of the parameres, the geographic distribution, and the fact that the female of *L. pinottii* remains undescribed and may be distinct from that of *L. bourrouli*.

#### Series **monstruosa**

Similar to species in the Series *infraspinosa* except for the following: Eyes very small; male genitalia with a trifurcate paramere; aedeagus with a short or long ventrolateral extension and lateral lobe more or less rounded at tip, lacking long spatulate setae. Female with cylindrical, distally arched, smooth walled spermathecae.

#### Species in the Series **Monstruosa**

##### 1. **Lutzomyia monstruosa** (Floch & Abonnenc)

*Phlebotomus monstruosus* Floch & Abonnenc, 1944a: 1, ♂, Baduel, French Guiana. Barretto, 1947: 213 (full references). Floch & Abonnenc, 1947: 5 (keyed), Damasceno *et al.*, 1949: 829, 830, 841 (distribution, N. Brazil). Barretto, 1951: 220 (distribution). Floch & Abonnenc, 1952: 20, 25, 32, 83 (keyed, re-described). Fairchild, 1955: 195.

*Phlebotomus falsiformis* Floch & Abonnenc, 1944b: 8, ♀, Crique, Anguille, French Guiana. Barretto, 1947: 199 (in catalog). Barretto, 1950: 183. Barretto, 1951: 216 (distribution). Floch & Abonnenc, 1952: 21, 27, 44, 182 (keyed, re-described). Fairchild, 1955: 194. Forattini, 1959: 160 (Amapá Terr., Brazil). Forattini, 1960: 480.

*Sergentomyia falciformis*, Barretto, 1955: 183.

*Sergentomyia monstruosa*, Barretto, 1955: 184.

*Lutzomyia monstruosa*, Martins *et al.* 1962: 381, not *L. monstruosa* (Floch & Abonnenc, 1944). Martins *et al.*, 1964: 324 (compared to *L. teratodes*). Martins *et al.*, 1965: 3. Theodor, 1965: 190. Fraiha *et al.*, 1970: 215 (Belém, Brazil). Forattini, 1971: 103. Shaw & Lainson, 1972: 710-714. Martins & Morales-Farias, 1972: 367. Ward *et al.*, 1973: 178 (in rodent baited traps, Pará, Brazil). Lainson *et al.*, 1973: 190 (♀ examined for *Leishmania*, negative Pará, Brazil). Martins *et al.*, 1975: 515-517.

*Lutzomyia falciformis*, Theodor, 1965: 196. Fraiha *et al.*, 1970: 215 (as ♀ of *L. monstruosa*). Forattini, 1971: 107.

*Pressatia monstruosa*, Forattini, 1971:103. Forattini, 1973: 512, 518-521.

*Known distribution:* French Guiana, N. Brazil.

*Specimens examined:* 1 ♂, 27 km SE of Marabá, Pará, Brazil in burrow, 27 Sept. 1972, D. G. Young coll. 1 ♂, about 100 km S of Santarém, Pará, Brazil, 5 Oct. 1972, D. G. Young coll. 1 ♂, 1 ♀, 47 km W of Altamira, Pará, Brazil, in light trap & tree buttress, 10 Oct. 1972, D. G. Young coll. 1 ♀, Rio Aripuana at Humboldt, Mato Grosso, Brazil, in tree buttress, 19 Aug. 1974, D. G. Young coll. 4 ♀♀, near Bacuri, N of Marabá, Pará, Brazil, light trap, 31 Oct. 1 Nov. 1974. J. F. Reinert coll.

##### 2. **Lutzomyia teratodes** Martins, Falcão & da Silva (Fig. 3)

*Lutzomyia teratodes* Martins, Falcão & da Silva, 1964: 321, ♂, Itapaci, Goiás, Brazil. Forattini, 1971: 103. Martins & Morales-Farias, 1972: 368. Martins *et al.*, 1975: 515-517.

*Pressatia teratodes*, Forattini, 1973: 512, 513, 518, 521.

*Known distribution:* Brazil, Goiás State. Paraguay.

*Specimens examined:* 1 ♂, Aca Poi, San Pedro, Paraguay, on horse, 21 April 1950, Herting & Ottaviano colls. 1 ♂, 1 ♀, Itumbiara, Estado de Goiás, Brazil, 18 Jan. 1975, J. E. da Silva coll.



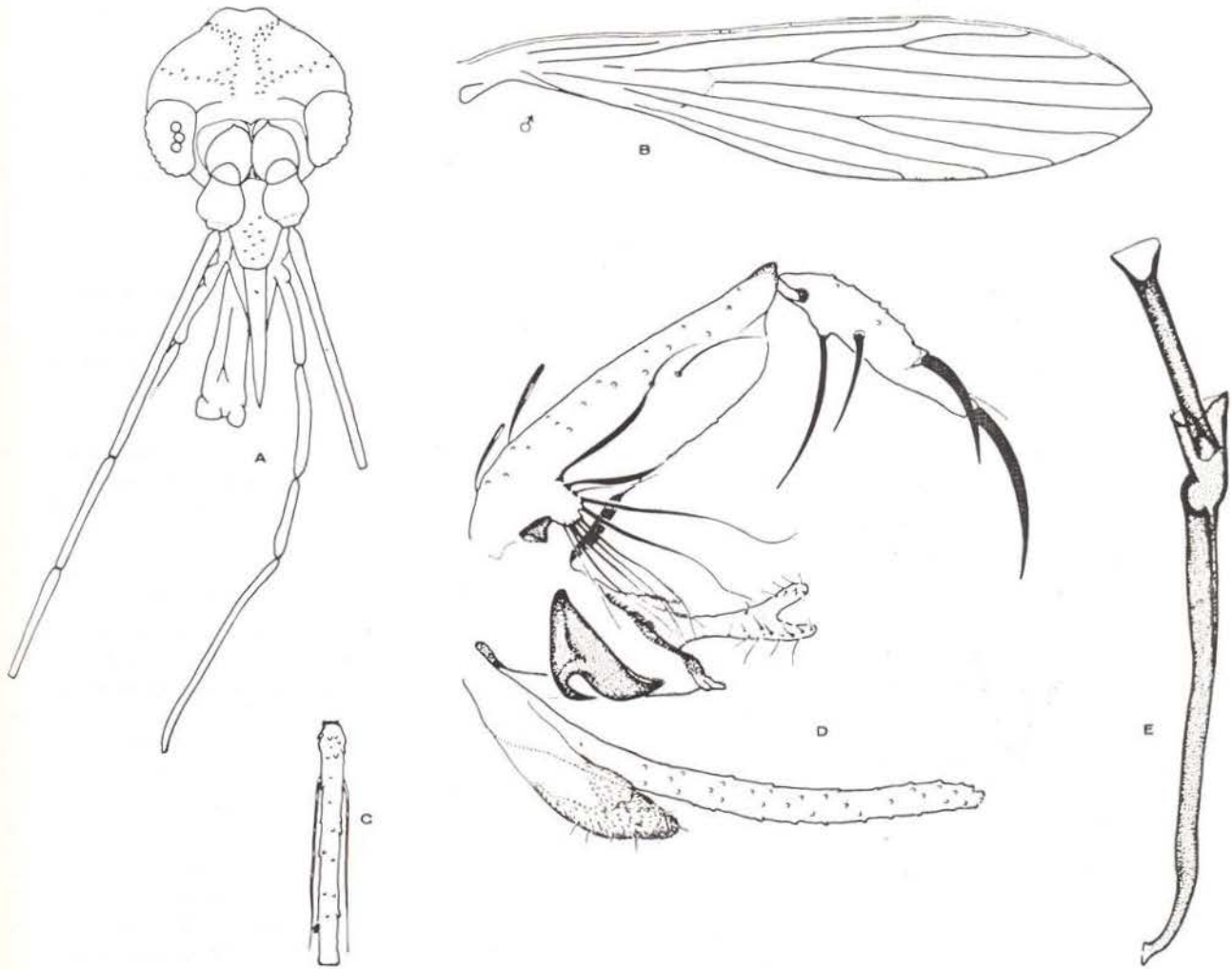


Fig. 3. *Lutzomyia teratodes* Martins, Falcão and da Silva. Male from Aca Poi, San Pedro, Paraguay. A. Head. B. Wing C. Fourth antennal segment. D. Male genitalia, drawn in phenol. E. genital pump and filaments (one filament is hidden behind the other).

KEY TO THE LUTZOMYIA SAND FLIES IN THE SUBGENUS EVANDROMYIA (MALE GENITALIA ONLY) (1)

- |  |   |  |                              |
|--|---|--|------------------------------|
| 1. Lateral lobe with distal spatulate setae; paramere undivided or bifurcate; aedeagus simple, without an extension or arm (Series <i>infraspinosa</i> ) | 2 | 3. Lateral lobe with 3 spatulate setae at tip; coxite with 5-8 small setae above base of tuft; paramere thinner. —   | ..... <i>L. bourrouli</i> .  |
| Lateral lobe without spatulate setae; paramere trifurcate; aedeagus with a short or long ventrolateral extension (Series <i>monstruosa</i> )             | 8 | Lateral lobe with 4 spatulate setae at tip; coxite without additional setae above tuft; paramere broader —           | ..... <i>L. pinottii</i> .   |
| 2. Paramere undivided  | 3 | 4. Spines on style implanted on distal third of segment, short and stout; coxite without a definite tuft of setae. — | ..... <i>L. cerqueirai</i> . |
| Paramere bifurcate   | 4 | Spines on style longer, more widely  |                              |

(1) — Some of the character states used in this key are characterized by such relative terms as "thinner", "broader", "longer", etc. In order to understand what is meant by these adjectives, it may be useful, perhaps necessary, to refer to illustrations in original and/or subsequent descriptions.

- spaced, the proximal one implanted on basal third or half of segment; coxite with a definite tuft of setae ..... 5
5. Lateral lobe with 2 spatulate setae; coxite tuft of 4-6 setae *L. brachyphalla*. Lateral lobe with 3 spatulate setae; coxite tuft of 12 + setae ..... 6
6. Genital filament very thick, especially near end; paramere as shown (Fig. 1 D) ..... *L. inpai* n. sp. Genital filament thinner (Fig. 2 D); Paramere otherwise ..... 7
7. Lower arm of paramere with an acute process on ventral margin (Fig. 2 D) ..... *L. begoniae*. Lower arm of paramere without an acute process, (Fig. 2 E) *L. infraspinosa*.
8. Ventral extension or arm of aedeagus longer than dorsal portion of aedeagus, more or less sinuous; coxite tuft of 6-7 setae; paramere broader (see Floch & Abonnenc, 1952 or Forattini, 1973) .. *L. monstruosa*. Ventral extension of aedeagus shorter than dorsal part, not sinuous; coxite tuft of about 12 setae; paramere otherwise (see Martins *et al.*, 1964) (Fig. 3) ..... *L. teratodes*.

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#### Sumário

Flebótomos do gênero *Lutzomyia*, subgênero *Evandromyia* Mang. são separados em dois grupos; os da Série *infraspinosa* e os da Série *monstruosa*. Estes são definidos e todas as espécies são catalogadas. Uma nova espécie brasileira, *L. inpai*, é descrita e ilustrada. A seguinte chave para machos adultos do subgênero *Evandromyia* é incluída:

#### Chave para machos adultos do Subgênero *Evandromyia* (\*)

1. Lóbulo lateral com setas espatuladas distais; parâmero não dividido ou bifurcado; aedeago simples, sem braço ou extensão (Série **infraspinosa**) ..... 2  
Lóbulo lateral sem setas espatuladas distais; parâmero trifurcado; aedeago com uma extensão ventro lateral curta ou comprida (Série **monstruosa**) ..... 8
2. Parâmero simples (não dividido) ..... 3  
Parâmero bifurcado ..... 4
3. Lóbulo lateral com 3 setas espatuliformes na ponta; basistilo com 5 — 8 setas acima da base do tufo basal; parâmero mais estreito ..... **L. bourrouli**.  
Lóbulo lateral com 4 setas espatuliformes na ponta; basistilo sem setas adicionais acima da base do tufo basal; parâmero mais longo .... **L. pinottii**
4. Espinhos do dististilo implantados no tercio distal do dististilo, curtos e grossos; basistilo sem um tufo de setas definitivo .. **L. cerqueirai**.  
Espinhos do dististilo mais compridos, mais amplamente espalhados, e o espinho proximal implantado no tercio ou metade basal do dististilo; basistilo com um tufo de setas definido ..... 5
5. Lóbulo lateral com 2 setas espatuliformes, tufo do basistilo com 4 — 6 setas .. **L. brachyphalla**.  
Lóbulo lateral com 3 setas espatuliformes; tufo do basistilo com 12 ou + setas ..... 6
6. Filamentos genitais muito grossos, especialmente na região distal; parâmero como na Figura 1 D ..... **L. inpai** n. sp.  
Filamentos genitais mais finos (Fig. 2 D); parâmero não como acima ..... 7
7. Braço inferior do parâmero com um processo agudo na margem ventral (Fig. 2 D) ..... **L. begoniae**.  
Braço inferior do parâmero sem processo agudo (Fig. 2 E) ..... **L. infraspinosa**.
8. Extensão ventral ou braço do aedeago mais comprido do que a porção dorsal do aedeago, mais ou menos sinuoso; tufo do basistilo com 6 — 7 setas, parâmero mais largo (veja Floch and Abonnenc, 1952 ou Forattini, 1973) ..... **L. monstruosa**.  
Extensão do aedeago mais curto do que a parte dorsal, não sinuoso, tufo do basistilo com mais ou menos 12 setas; parâmero diferente (veja Martins *et al.*, 1964) (Fig. 3) ..... **L. teratodes**.

(\*) — Algumas das terminologias usadas nesta chave são termos relativos com "mais estreito", "mais largo", "mais comprido", etc. Para melhor entender o sentido destes termos, será de ajuda, ou talvez necessário, referir-se às ilustrações nos trabalhos originais e/ou os posteriores.

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