

DESCRIPTION OF *LUTZOMYIA (COROMYIA) DISNEYI*, N. SP. (DIPTERA: PSYCHODIDAE – PHLEBOTOMINAE) FROM BELIZE, CENTRAL AMERICA

PAUL WILLIAMS

Departamento de Parasitologia, Instituto de Ciências Biológicas da Universidade Federal de Minas Gerais, Caixa Postal 2486, 31270 Belo Horizonte, MG, Brasil

The commonest sand fly in limestone caves in Belize, Central America, previously, referred to as Lutzomyia beltrani (Belize form), is described as Lutzomyia (Coromyia) disneyi n. sp.

Key words: Diptera – Psychodidae – Phlebotominae – *Lutzomyia (Coromyia) disneyi*, n. sp. – morphological description

In discussing a newly described phlebotomine sand fly from Central America, Young & Murillo (1984) commented: "The status of the form described as *L. beltrani* (Vargas & Nájera, 1951) (Belize form) by Williams (1976) remains undetermined". This remark stimulated a review of notes prepared in 1968-69, a study of the two specimens of *Lutzomyia beltrani* (Belize form) in the Belo Horizonte reference collection of sand flies, and examination of a paratype female of *L. steatopyga* (Fairchild & Hertig, 1958). The results of these studies indicate that the form described in 1976 (Williams, 1976a) deserves recognition as a species and descriptions are given of the holotype male and allotype female. Whenever possible, measurements are given for both members of paired structures.

The new species is dedicated to Dr. R. H. L. Disney, whose studies on phlebotomines and small mammals in Belize provided a basis for subsequent observations on the epidemiology of cutaneous leishmaniasis in the Americas.

Lutzomyia (Coromyia) disneyi
Williams, new species
(Figs. 1-12)

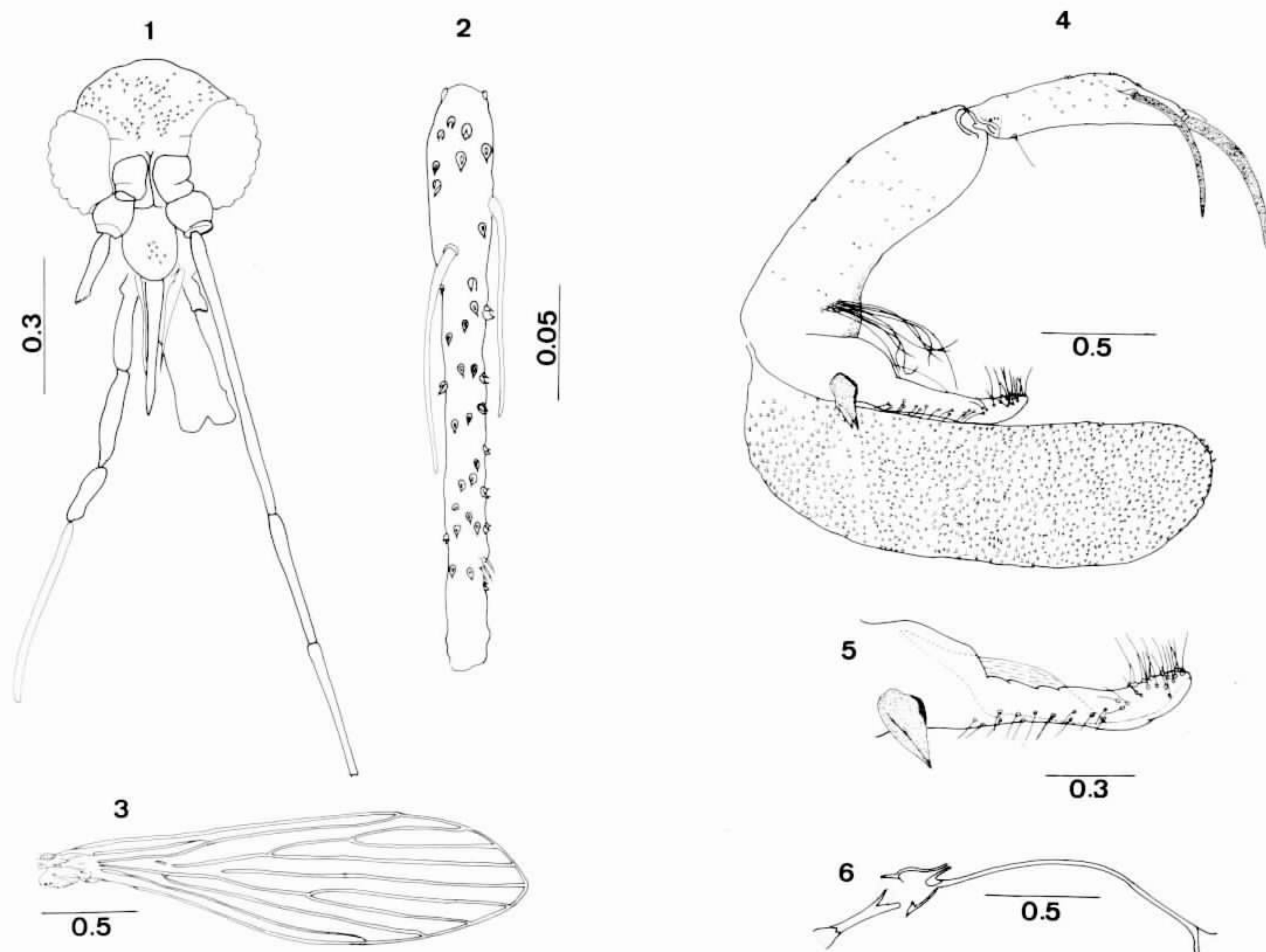
Lutzomyia beltrani (Belize form) Williams, 1976a- *Bull. Ent. Res.*, 65 :595-597 (♂). (Cayo District, Belize, Central America).

Large sand fly, very pale in colour, with small eyes and relatively long flagellomeres.

Holotype ♂. Head height including clypeus: 0.48 mm; maximum width of head: 0.46 mm; eye height: 0.24/0.24 mm. Eyes separated by a space of 0.14 mm, equivalent to the diameter of about five eye facets. Clypeus 0.16 mm long, 0.13 mm wide, bearing eight setae. Labrum,

from distal margin of the clypeus, 0.30 mm long. Flagellomere I: 0.64/0.65 mm long extending well beyond the distal tip of the labrum; flagellomere II: 0.29/0.29 mm; flagellomere III: 0.30/0.30 mm. Ascoids simple, paired on flagellomeres I-X (terminal flagellomeres missing from holotype but, in other specimens, ascoids paired on I-XIII, not present on XIV). On flagellomere II, inner ascoid arising at 0.05/0.05 mm from the proximal articulation and 0.10/0.10 mm long; outer ascoid arising at 0.07/0.08 mm from proximal articulation and 0.10/0.10 mm long. Inner and outer ascoids arising at different levels on other flagellomeres. Total palpal length 0.97/1.02 mm, distal tip of palpomere 5 reaching about the middle of flagellomere III. Lengths of palpomeres: 1 - 0.04/0.04 mm; 2 - 0.16/0.17 mm; 3 - 0.22/0.22 mm; 4 - 0.14/0.14 mm; 5 - 0.42/0.46 mm. Palpal formula 1-4-2-3-5, with 5 longer than 3+4 and 2+3. Palpal sensillae (Newstead's scales) spatulate and sparsely arranged between 0.29 and 0.78 of the length of palpomere 3 (Williams, 1976a, Fig. 3). Cibarium without horizontal or vertical teeth but with clusters of the lateral denticles; pigment patch not visible; cibarial arch well defined and flared laterally (Williams, 1976a, Fig. 5). Pharynx 0.21 mm long, 0.06 mm wide at its broadest level, with numerous posterior ridges (Williams, 1976a, Fig. 4).

Thorax, measured from the anterior edge of the mesonotum to the posterior margin of the scutellum, 0.54 mm long. Mesonotum very lightly infuscated, almost as pale as the pleura. Pleura with 7/10 upper and 3/3 lower episternal setae. Wing length 2.36/2.36 mm, maximum width 0.64/0.66 mm. Ratio of wing length: maximum width 3.58/3.69: 1. Lengths of wing sections: R_2 (*alpha*) – 0.55/0.56 mm; R_{2+3} (*beta*) – 0.41/0.39 mm; R_{2+3+4} (*gamma*) – 0.28/0.27 mm; R_1 tip (*delta*) – 0.17/0.22 mm. Wing pattern: *alpha* > *beta* > *gamma* > *delta*.



Lutzomyia disneyi n. sp. holotype ♂ – Fig. 1: head. Fig. 2: flagellomere II. Fig. 3: wing. Fig. 4: terminalia in lateral view. Fig. 5: inner aspect of paramere. Fig. 6: genital pump and filaments. Scale lines in mm.

with *alpha* 1.34/1.44X *beta*, *beta* 1.46/1.44X *gamma*, *delta* 0.31/0.38 of *alpha*. Lengths of femora, tibiae and basitarsi: foreleg (one detached from the thorax) – 1.11/1.08 mm, 1.00/0.98 mm, 1.09/1.09 mm; midleg – 1.68/1.67 mm, 2.06/1.96 mm, 2.15/2.19 mm; hindleg – 1.09/1.06 mm, 1.23/1.13 mm, 1.19/1.19 mm. Hind femora unarmed.

Second abdominal sternite complete (Williams, 1976a, Fig. 6). Dististyle 0.22/0.22 mm long, with a terminal spine, a subterminal bristle, a second major spine at 0.16/0.16 mm from the proximal articulation, and a much reduced spine at 0.04/0.04 mm from the proximal articulation. Basistyle 0.31/0.31 mm long, with an inner basal tuft of 9/10 long, fine, curved, hair-like setae. Paramere, measured along the ventral margin, 0.27/0.27 mm long, with hyaline setae on the distal fifth of the dorsal surface, very fine setae along most of the length of the lateroventral surface, and with a lateral membranous expansion directed dorsally. Aedeagus weakly chitinized, conical in shape, 0.06/0.06 mm long, 0.03/0.03 mm at its widest. Genital pump weakly chitinized, with a narrow genital apodeme and a broad

sperm pump. Genital filaments 2.27/2.27X the length of the genital pump, finely striated distally, with expanded tips resembling the horn of a trumpet (Williams, 1976a, Figs 10 & 11). Lateral lobe greatly inflated, 0.44/0.46 mm long, with a maximum width of 0.14/0.14 mm, length thus being 3.14/3.29X the maximum width.

Allotype ♀. Head height including clypeus: 0.65 mm; maximum width of head: 0.55 mm; eye height: 0.28/0.31 mm. Eyes separated by a space of 0.19 mm, equivalent to the diameter of 9-10 eye facets. Clypeus 0.23 mm long, 0.16 mm wide, bearing six setae. Labrum 0.40 mm long. Flagellomere I: 0.68 mm, extending slightly beyond the distal tip of the labrum; flagellomere II: 0.26 mm; flagellomere III: 0.26 mm. Ascoids simple, paired on flagellomere I-IX (terminal flagellomere missing from allotype but ascoids paired I-XII in other material examined). On flagellomere II, inner ascoid arising at 0.04/0.04 mm from proximal articulation and 0.15/0.15 mm long; outer ascoid arising at 0.07/0.07 mm from proximal articulation and 0.15/0.15 mm long. Inner and outer ascoids arising at different levels on all other flagel-

lomeres. Only one palp complete. Total palpal length 1.05 mm, with the distal tip of palpomere 5 (palp curved) extending almost to the distal end of flagellomere III. Lengths of palpomeres: 1 – 0.08 mm; 2 – 0.19 mm; 3 – 0.24 mm; 4 – 0.15 mm; 5 – 0.39 mm. Palpal formula 1-4-2-3-5, with 5 subequal to 3+4 and slightly shorter than 2+3. Cibarium with four closely set, finely pointed horizontal teeth, two lateral groups of numerous, very small, vertical teeth, and without lateral denticles. Pigment patch poorly defined, in the shape of a narrowly based, elongate triangle. Cibarial arch well marked, laterally flared. Pharynx 0.29 mm long, 0.13 mm at its widest, with numerous posterior ridges.

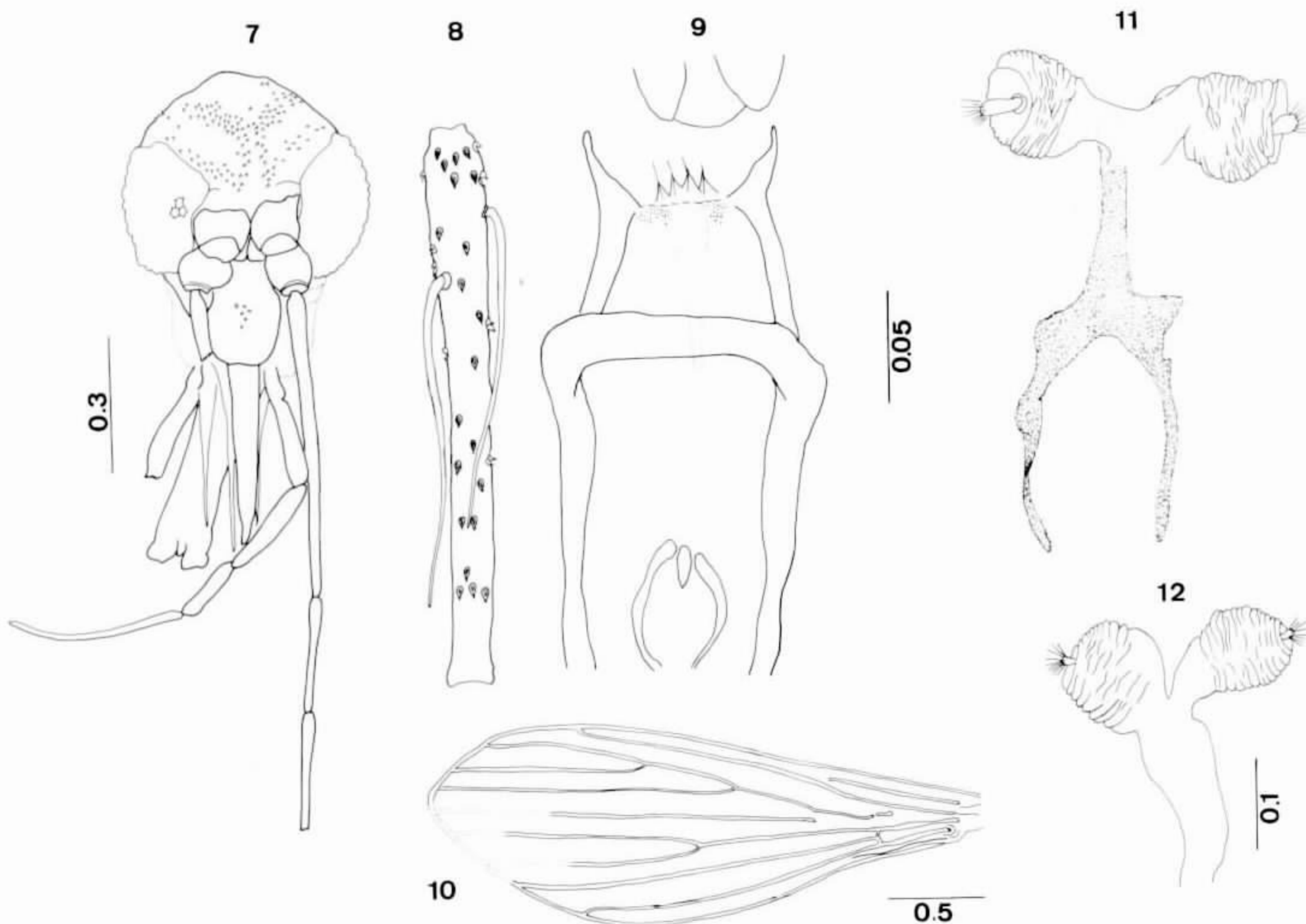
Thorax 0.78 mm long, mesonotum lightly infuscated, slightly darker than in the male. Both wings damaged. Estimated wing length 2.84 mm, maximum width 1.00 mm. Ratio of wing length : maximum width 2.84 : 1. Lengths of wing sections (one wing only): R_2 (*alpha*) – 0.83 mm; R_{2+3} (*beta*) – 0.45 mm; R_{2+3+4} (*gamma*) – 0.44 mm; R_1 tip (*delta*) – 0.36 mm. Wing pattern: *alpha* > *beta* > *gamma* > *delta*, with *alpha* 1.84X *beta*, *beta* 1.02X *gamma*, *delta* 0.43 *alpha*. All legs detached from coxae.

Second abdominal sternite complete, as in male. Genital fork 0.20 mm long, very weakly chitinized. Spermathecae situated about the same level as the anterior end of the stem of the genital fork, and more or less barrel shape, 0.05/0.05 mm long, with a maximum width of 0.04/0.05 mm, and superficially wrinkled. Individual spermathecal ducts 0.01/0.02 mm long, 0.02/0.03 mm wide, with smooth walls. Common duct not visible in allotype but in other specimens examined similar to that of *L. beltrani* as figured by Fairchild & Hertig (1958).

Type material. Holotype ♂ (slide n° 25/26): aspirated from the wall of a limestone cave, San Antonio, Cayo District, Belize, on 16/08/68. Allotype ♀ (slide n° 25/55): details as for holotype but collected on 07/02/69. Holotype and allotype in the Belo Horizonte reference collection of sand flies at Centro de Pesquisas "René Rachou", Fundação Oswaldo Cruz.

DISCUSSION

The differences between the males of *L. disneyi* n.sp., *L. beltrani* (Vargas & Díaz Nájera, 1951) and *L. steatopyga* were discussed by Wil-



Lutzomyia disneyi n.sp. allotype ♀ – Fig. 7: head. Fig. 8: flagellomere II. Fig. 9: cibarium. Fig. 10: wing. Fig. 11: spermathecae and genital fork. Fig. 12: *Lutzomyia disneyi* n.sp., slide n° 25/49, in British Museum (Natural History): spermathecae and spermathecal ducts. Scale lines in mm. Figs. 8, 9 & drawn at the same scale.

liams (1976a), who tabulated mensural differences in the terminalia of the three. The degree of inflation of the lateral lobe distinguishes *L. disneyi* from *L. beltrani* and *L. steatopyga*. In *L. disneyi*, its length is less than 4X the maximum width (indeed, only 3.1-3.3X in the holotype), in comparison to 4.6X in *L. steatopyga* and 7.0X in *L. beltrani*. In comparison with *L. steatopyga*, *L. disneyi* has a longer dististyle, with the second major spine more distad, and its basistyle is longer (0.31 mm in the holotype) than that of *L. steatopyga* (0.28 mm). A feature of the male of *L. disneyi*, not discussed by Williams (1976a), is the difference in the levels at which the ascoids arise on the flagellomeres.

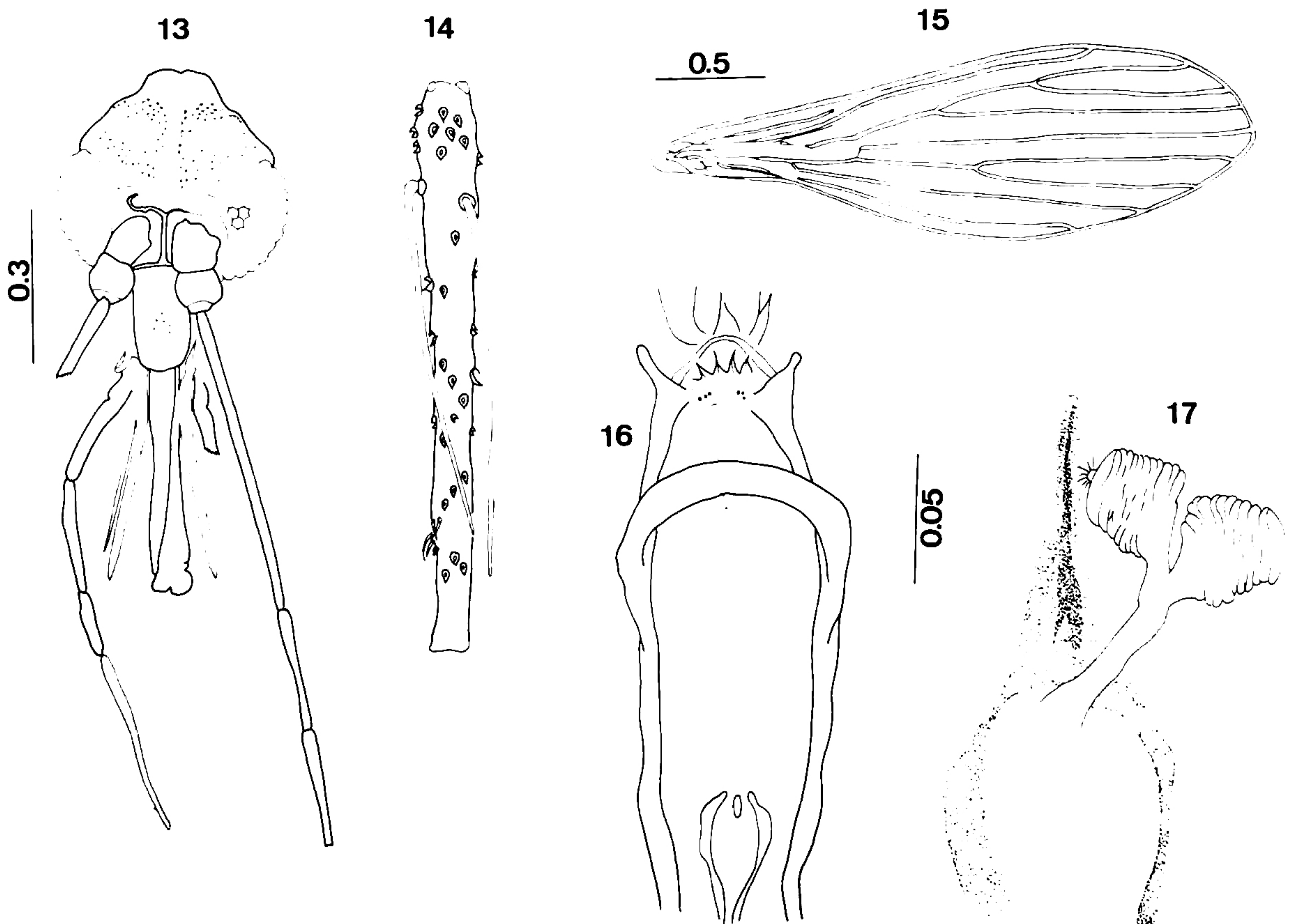
Based on the descriptions and figures of Fairchild & Hertig (1958), Williams (1976a) considered the female of *L. disneyi* to be indistinguishable from those of *L. beltrani* and *L. steatopyga*. Some differences were noted when the allotype of *L. disneyi* was compared with a paratype of *L. steatopyga*. The female of *L. disneyi* has a larger head (compare Figs. 7 & 13) and its cibarium is correspondingly bigger (Figs. 9 & 16). Its wing is broader relative to wing

length (Figs. 10 & 15). As in the male, the ascoids on flagellomere II arise at different levels (Fig. 8) whereas they emerge about the same level in *L. steatopyga* (Fig. 14, and Fig. 5 in Fairchild & Hertig, 1958). The barrel shaped spermathecae are similar in both species but the common duct of *L. steatopyga*, illustrated here for the first time (Fig. 17), is narrower than that of *L. disneyi*. The spermathecae of *L. disneyi* lie about the same level as the tip of the genital fork whereas those of *L. steatopyga* (Fig. 17, and Fig. 15 in Fairchild & Hertig, 1958) do not extend so far.

L. disneyi is the predominant species of sand fly in limestone caves in Belize (Williams, 1976b). Circumstantial evidence suggests that females of *L. disneyi* are the natural insect hosts of *Trypanosoma (Megatrypanum) leonidasdeanei*, a blood parasite of insectivorous bats (Williams, 1976c).

RESUMO

Descrição de *Lutzomyia (Coromyia) disneyi*, n. sp. (Diptera: Psychodidae – Phlebotominae) de Belize, America Central – O flebótomo mais



Lutzomyia steatopyga (Fairchild & Hertig, 1958), paratype ♀, slide n^o 3078 – Fig. 13: head. Fig. 14: flagellomere II. Fig. 15: wing. Fig. 16: cibarium. Fig. 17: spermathecae, spermathecal ducts and genital fork. Scale lines in mm. Figs. 14, 16 & 17 drawn at the same scale.

comum em grutas calcáreas em Belize, América Central, anteriormente descrito como *Lutzomyia beltrani* (forma Belize) é descrito como *Lutzomyia (Coromyia) disneyi* n. sp.

Palavras-chave: Diptera – Psychodidae – Phlebotominae – *Lutzomyia (Coromyia) disneyi*, n. sp. – descrição morfológica

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