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Collections of Bruchomyiinae and Phlebotominae (Diptera: Psychodidae) from the north-central portion of the State of Veracruz, Mexico, with the description of a new species

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Abstract

An entomological survey was carried out in the municipalities of Juchique de Ferrer and Colipa in the north-central area of the State of Veracruz, Mexico, where some human cutaneous leishmaniasis cases have been recorded. These sampling efforts were undertaken to identify potential vectors of *Leishmania* species in that area. A total of 123 specimens were obtained, corresponding to one species of the Bruchomyiinae genus *Nemapalpus* Macquart, and six species of the Phlebotominae genus *Lutzomyia* França. Additional morphological characters of the poorly known male of *Nemapalpus dampfianus* Alexander and a description of *Lutzomyia leohidalgoi* **sp. nov.**, based on male and female characteristics, are presented with illustrations. This is the first record from Veracruz of *Nemapalpus dampfianus* Alexander, *Lutzomyia serrana* (Damasceno & Arouck) (species group *Verrucarum*), *Lutzomyia* (*Psathyromyia*) *cratifer* (Fairchild & Hertig), and *Lutzomyia* (*Helcocyrtomyia*) *oppidana* (Dampf). *Lutzomyia* (*Lutzomyia*) *cruciata* (Coquillett) and *L.* (*Psathyromyia*) *shannoni* (Dyar) are anthropophilic species already known from Veracruz.

Key words: Psychodidae, Bruchomyiinae, Phlebotominae, Mexico, *Nemapalpus*, *Lutzomyia*, new species

Introduction

In April 2005, an entomological survey was carried out in the municipalities of Juchique de Ferrer and Colipa in the north-central area of the State of Veracruz, Mexico, where some human cutaneous leishmaniasis cases had been recorded. Additional captures were made in January, February, and March 2006. These sampling efforts were undertaken to

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identify potential vectors of *Leishmania* sp. in that area.

Juchique de Ferrer is located on the Gulf of Mexico slope, in the north-central portion of the state of Veracruz at 19° 50' N and 96° 42' W, with an elevation average of 380 m. This area is part of the foothills of Sierra de Chiconquiaco and comprises about 259.10 km^2. It is limited to the North by Colipa and Vega de Alatorre, to the South by Tepetlán and Alto Lucero, to the East by Vega de Alatorre and Alto Lucero, and to the West by Yecuatla and Chiconquiaco municipalities. It is crossed by the small river Lechuguillas, which is a tributary of the river Juchique. The climate is hot and wet, with an annual mean temperature of 25º C and about 999.8 mm of rainfall per year. The original flora corresponds to a subtropical forest, but today there are important coffee plantations. There were 18,971 inhabitants in the year 2000, with a density of 73.219 individuals/km^2; nearly all the people live in rural localities, with only one urbanized town, with 16,110 persons living in the country and 2,861 in the town (Gobierno del Estado de Veracruz 2002a)

The municipality of Colipa is near Juchique de Ferrer and is located at 19° 55' N and 96° 43' W, with an elevation average of 200 m, comprising an area of about 143.94 km^2 of the foothills of Sierra de Chiconquiaco. It is limited to the North by Vega de Alatorre, to the South by Juchique de Ferrer and Yecuatla, to the East by Vega de Alatorre, and to the West by Vega de Alatorre and Misantla municipalities. It is crossed by the river Colipa. The climate is hot and wet, with an annual mean temperature of 22.4° C, and about 1,671 mm of rainfall per year. The original flora is similar to that of Juchique, and it now has some coffee plantations. There were 5,610 inhabitants in the year 2000, with a density of 43.046 individuals/km^2; nearly all the people live in 61 rural localities (about 3,610 people), with only one urbanized town (with 2,000 habitants) (Gobierno del Estado de Veracruz 2002b).

The rural condition of more than 50% of all the inhabitants of both municipalities, living inside the coffee plantations or near the forest, with economical activities based on wild resources or agriculture, constitute one of the most important risk factors for infection by *Leishmania* parasites. This condition is related to the vertebrate host richness still available in the zone, as well as the presence of anthropophilic Phlebotomine sand flies.

Materials and methods

The April (2005) and January (2006) collections were made by Mr. Julio César Bernabé Plácido and Mr. Jorge A. Guevara López of the Entomological Unit of the Sanitary Jurisdiction N° IV of Veracruz Health Services, using the following techniques: sticky-light traps near burrows of wild rodents at the base of trees, direct capture in natural holes and crevices where the insects rest, and human attraction. The February (2006) collection was supplemented by Fredy Mendoza, using CDC miniature UV light traps and human

bait landing-capture. The March (2006) collection was made by direct capture in refuges by the same personnel.

A total of 123 specimens were captured and processed for taxonomic study, following the procedure described by Ibáñez-Bernal (2005). As result of the taxonomic study, one species of *Nemapalpus* Macquart (Bruchomyiinae) and six species of *Lutzomyia* França (Phlebotominae) were recognized, including a new species of Phlebotomine sand fly. One female specimen could not be determined.

An annotated list of the species found is presented, as well as the description of a new species. We follow the classification used by Young and Duncan (1994) and the general morphological nomenclature of Quate and Vockeroth (1981), in accordance with McAlpine *et al*. (1981), but we used some more descriptive terms for genital structures, following Quate and Alexander (2000) in the case of Bruchomyiinae. Measurements are given in millimeters. All material was permanently mounted on microscope slides, and is deposited in the Insect Collection of Instituto de Ecología, A. C., Xalapa, Veracruz, Mexico (IEXA).

Subfamily Bruchomyiinae

***Nemapalpus dampfianus* Alexander**
(Figs. 1–9)

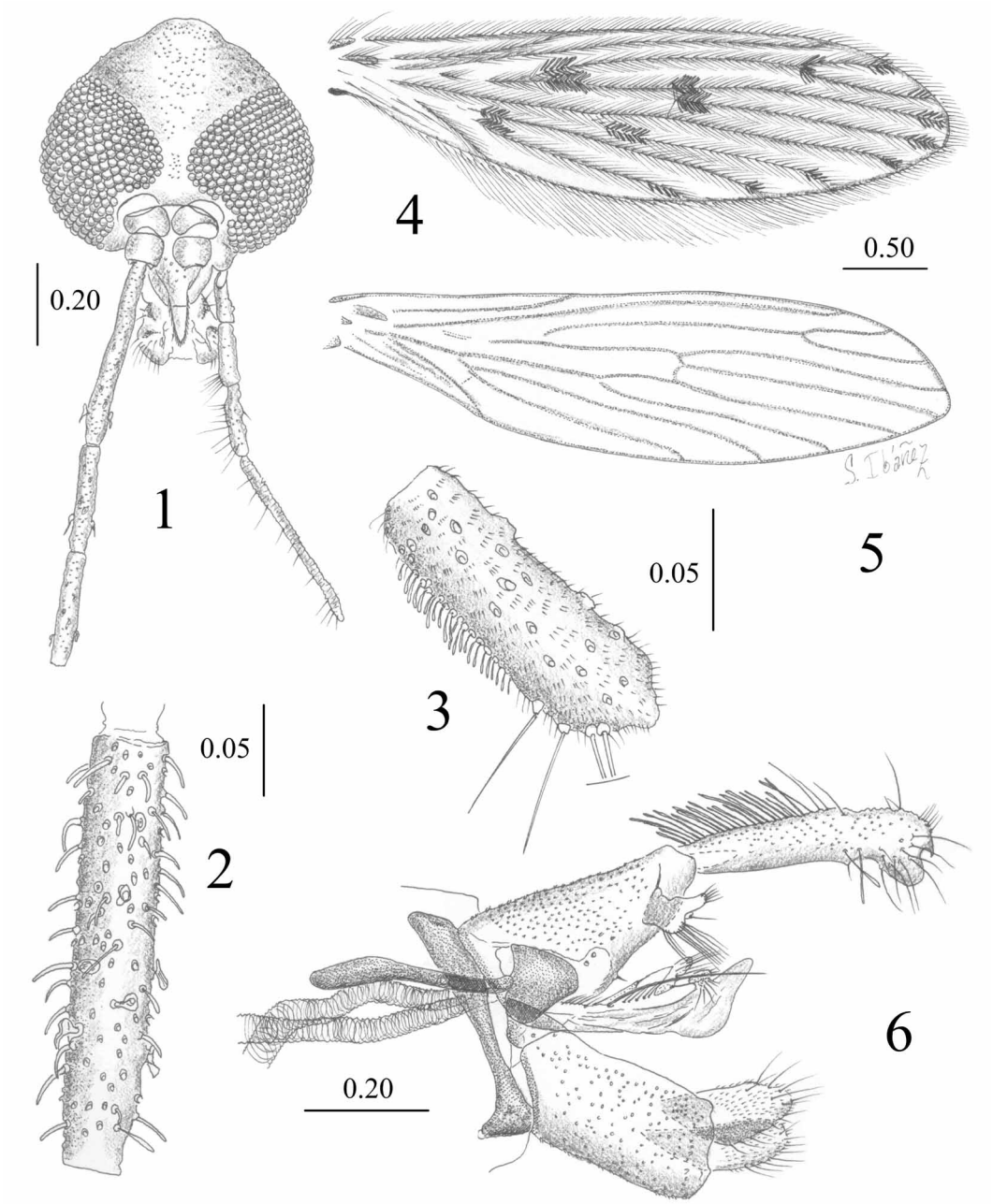
Nemopalpus [*sic*] *dampfianus* Alexander, 1940: 796, Figs. 2, 4 (male description). Type-locality: Finca El Vergel, Chiapas, Mexico. Additional references: Barretto and D´Andretta 1946: 59; Fairchild 1952: 272, Figs. 12, 13, 21–25, 36 (female description); Duckhouse 1973: 3 (Neotropical catalogue)
Nemapalpus dampfianus Alexander: Quate and Alexander, 2000: 186 (revision)

This species was known only from the male holotype from Finca El Vergel (near Huixtla) (Chiapas), described by Alexander (1940), and by one female specimen from Palenque (Chiapas), described by Fairchild (1952). This is the third finding of the species and the first record in the State of Veracruz, extending considerably its known distribution to the north of the country.

The description presented by Alexander (1940) is short, referring principally to the coloration of the body vestiture, the number and general form of the flagellomeres, the wing vein R_{2+3}, and the morphological characteristics of the gonopod, illustrating the wing, the apical portion of the gonocoxite, and the gonostylus, as well as tergite 10. Twelve years later, Fairchild (1952) associated the female and described it as *N. dampfianus*, based as he said "mainly on the basis of the wing venation and the presence of dark hair tufts on the wings, noted before mounting". Quate and Alexander (2000) in their "Synopsis of New World *Nemapalpus*", include this species and mention, as recognition characters, the wing venation, absence of an oval sclerite in the pleurites, and morphological details of the

gonopods. All these characteristics permit accurate identification of the species; nevertheless, in their key to males of New World *Nemapalpus*, couplet 3 for *N. dampfianus* reads "gonostylus without bristles at base", which is not true and must instead read "gonostylus with bristles at base but without enlargement" (as in *N. pilipes* Tonnoir). Additional characteristics that are taken into account in the modern descriptions of the species of this genus, not mentioned previously anywhere, are as follows:

Male. Eyes separated by ± 3 facets diameters; frons with cluster of 10–19 seta alveoli between eyes, that is separated from other seta alveoli of frons and vertex; palpal segments proportions: 1.0: 1.2: 1.3: 3.7 (Fig. 1); Newstead scales present on central portion of inner margin of palpal segment 2 (Fig. 3); antenna with 14 cylindrical flagellomeres; apex of first flagellomere at same level of apex of palpal segment 3; proportion of first three flagellomeres: 11: 6: 7 (Fig. 1); each flagellomere with 2 kinds of ascoids, the typical *Nemapalpus* mushroom-shaped ascoids, and many short, digitiform, simple ascoids (similar to those observed in *Maruina* Müller or *Pericoma* Walker *s. l.* (Psychodinae)) (Fig. 2); mushroom-shaped ascoids present on flagellomeres as follows (pairs): F1 (2), F2 (2), F3 (4), F4 (4), F5 (3), F6 (3), F7 (3), F8 (3), F9 (3), F10 (3), F11 (1), F12 (1), F13 (1), F14 (1); flagellomere 14 with apiculus. Thorax with all pleural sclerites covered with microtrichia, propleuron with line of 4–7 setae alveoli near spiracle; prosternum with setose conical projection directed forward between fore coxae. Wing with Sc extending beyond base of R_{2+3} and connected to C; R_{2+3}, with base incomplete and 2.75X length of R_2; base of R_5 beyond level of medial fork, so r-m reaches M_1; base of M_2 not attached to vein M_{1+2}; cu-m developed; CuA_2 with base incomplete and apical portion taken from transverse vein shorter than basal portion (Figs. 4, 5). Abdomen without setae tufts on lateral margin. Hypandrium simple and narrow, heavily sclerotized (Fig. 6); gonocoxite with subapical internal lobe, with its apex divided into rounded fore lobe covered with patch of setae, which are as long as gonocoxal lobe, and conical rear lobe having short spiniform setae at apex (Figs. 6 and 7); gonostylus 1.2X length of gonocoxite; in dorsoventral view, gonostylus shows external margin nearly straight, just curved near apex, and internal margin only slightly convex with some long lanceolate rigid squamae in basal two-thirds, followed by small setose lobe, shallow preapical concavity, and preapical setose lobe; apex of gonostylus curved inward ending in sclerotized claw (Figs. 6, 7). Parameres slightly longer than gonocoxite, both forming oval structure, with dorsal margin less sclerotized and giving rise, from middle to apex, to row of long posterior directed setae, of which first pair reaches apical level of paramere (Figs. 6, 9); this dorsal margin has a mesad setose preapical lobe and ends in another blunt setose lobe; ventrally, paramere presents laminar keel thickened near its apex and, in dorsoventral view, both are fused to form spoon-shaped structure (Figs. 6, 9). Aedeagus with simple rod basiphallus and distiphallus shaped as equilateral triangle with blunt apex (Fig. 9). Epandrium little longer than wide, covered with large alveoli; cercus oval in lateral view; tergite 10 triangular (Fig. 8).

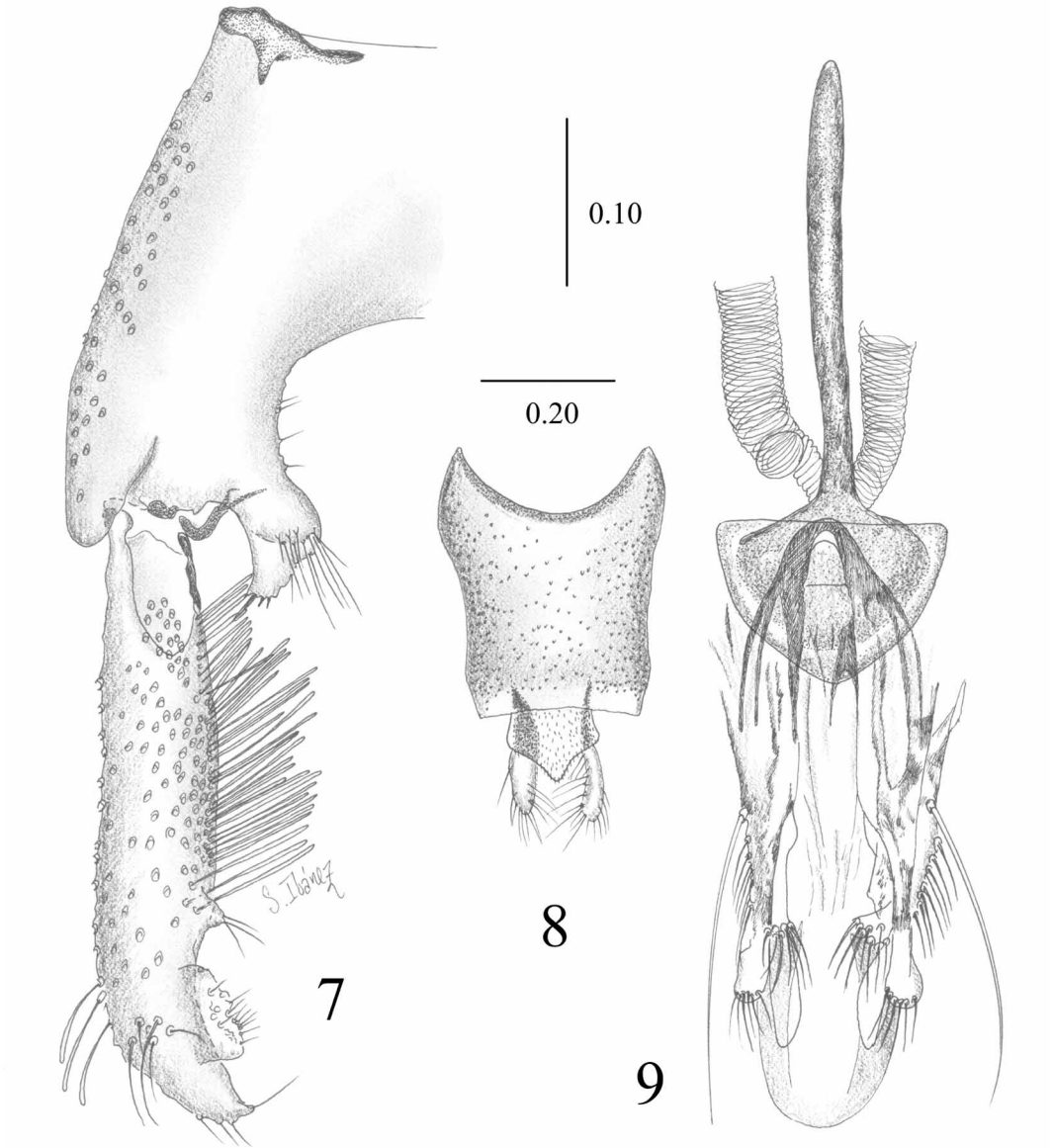


FIGURES 1–6. *Nemapalpus dampfianus* Alexander, male. **1.** Head, frontal view. **2.** Flagellomere 2, showing ascoids. **3.** Palpal segment 2, showing Newstead scales. **4.** Wing vestiture before mounting. **5.** Wing after mounting, showing veins, **6.** Male terminalia, lateral view.

Measurements (in mm). Wing length: 3.93 ± 0.05 (3.9–4.02) *n* = 8; wing width: 1.08 ± 0.05 (1.04–1.19) *n* = 8; head height: 0.53 ± 0.01 (0.52–0.56) *n* = 8; head width: 0.61 ± 0.03 (0.56–0.65) *n* = 8; palpus length: 0.88 ± 0.031 (0.86–0.93) *n* = 8; flagellomere 1 length: 0.42 ± 0.035 (0.39–0.50) *n* = 8; flagellomere 2 length: 0.26 ± 0.007 (0.26–0.28) *n* = 7;

flagellomere 3 length: 0.28, *n* = 7; gonocoxite length: 0.36 ± 0.02 (0.34–0.39) *n* = 8; gonostylus length: 0.42 ± 0.01 (0.41–0.43) n = 8; aedeagus length: 0.40 ± 0.025 (0.39–0.43) *n* = 8; paramere length: 0.42 ± 0.009 (0.41–0.43) *n* = 8; epandrium length: 0.27 ± 0.019 (0.26–0.30) *n* = 8; surstylus length: 0.20 ± 0.01 (0.19–0.21) *n* = 8.

Material examined. 21 males. Mexico, Veracruz: Municipality of Juchique de Ferrer, El Tacahuite, 523 m a.s.l., April 13, 2005, light trap, Bernabé and Guevara, colls. 2 males; Loma de San Nicolás, coffee plantation, March 2, 2006, refuge between tree roots, 13 males; Municipality of Colipa, El Zapotal, February 14, 2006, Mendoza, Bernabé and Guevara, colls., attracted to human, 4 males; refuge between tree roots, 2 males.



FIGURES 7–9. *Nemapalpus dampfianus* Alexander, male. **7.** Gonopod dorsoventral view. **8.** E pandrium, surstylus, and tergite 10, ventral view. **9.** Aedeagus and parameres, dorsoventral view.

Subfamily Phlebotominae

***Lutzomyia* (*Lutzomyia*) *cruciata* (Coquillett)**

Flebotomus cruciatus Coquillett, 1907: 102 (female description). Type-locality: Trece Aguas: Cacao, Alta Vera Paz, Guatemala. Additional References: Barretto 1947: 194 (taxonomic history to that year)

Lutzomyia cruciata (Coquillett): Theodor, 1965: 182. Additional references: Young and Duncan 1994: 67(taxonomic history from 1947 to 1994); Ibáñez-Bernal 1999: 78 (taxonomy and Mexican records)

This species is widespread in Mexico except the northeastern portion in which *Lutzomyia diabolica* (Hall) is distributed. *Lutzomyia cruciata* is common in human-bait collections. It has been collected in nearly all the Mexican human cutaneous leishmaniasis foci, and for this reason it possibly has an important role in the transmission of *Leishmania* spp. in the area here studied. The unique published record of *L. cruciata* in Veracruz is from the southern locality of Juan Díaz Covarrubias, but the senior author also collected specimens in Xalapa (not published). As there is a record of this species from southern Tamaulipas (Santa Engracia, see Ibáñez-Bernal 1999), this species probably is distributed throughout the State of Veracruz. In the studied area, *L. cruciata* was the most abundant species.

Material examined. 4 males, 53 females. Mexico, Veracruz: Municipality of Juchique de Ferrer, El Tacahuite, 523 m a.s.l., April 13, 2005, light trap, Bernabé and Guevara, colls. 1 male, 13 females; January 16, 2006, coffee plantation, Bernabé and Guevara, colls. 1 male, 13 females; El Pensamiento, January 19, 2006, coffee plantation, Bernabé and Guevara, colls. 1 males, 6 females; Dos Arroyos, February 22, 2006, coffee plantation, Mendoza, Bernabé and Guevara, colls., 2 females; Loma de San Nicolás, February 23, 2006, Mendoza, Bernabé and Guevara, colls., 7 females; March 2, 2006, Bernabé and Guevara, colls., 6 females; Municipality of Colipa, El Zapotal, February 14, 2006, Mendoza, Bernabé and Guevara, colls., attracted to human, 7 females; refuge between tree roots, 1 male, 6 females.

***Lutzomyia serrana* (Damasceno & Arouck)**

Flebotomus serranus Damasceno and Arouck, 1949: 843 (male description). Type-locality: Serra da Pifiabas, Pará, Brazil

Syn. *Phlebotomus guayasi* Rodríguez, 1956: 76 (male, female). Type-locality: Guayas, Ecuador; Fairchild and Hertig 1961: 237 (as synonym of *P. serranus*)

Lutzomyia serrana (Damasceno and Arouck): Young and Duncan, 1994: 177 (taxonomic history, taxonomy, distribution); Ibáñez-Bernal 1999: 103 (taxonomy, distribution in Mexico)

This species was known in Mexico only from the locality of Palenque (Chiapas), and Tepozal (Nayarit) (Ibáñez-Bernal 1999). This is the first record in the state of Veracruz.

This species tends to feed on human blood but was not abundant in the collections.

Material examined. 1 male, 5 females. Mexico, Veracruz: Municipality of Juchique de Ferrer, El Tacahuite, 523 m a.s.l., April 13, 2005, light trap, Bernabé and Guevara, colls. 2 females; April 28, 2006, human bait, Bernabé and Guevara, colls. 2 females; Municipality of Colipa, El Zapotal, February 14, 2006, Mendoza, Bernabé and Guevara, colls., attracted to human, 1 female; refuge between tree roots, 1 male.

Lutzomyia (*Psathyromyia*) *cratifer* (Fairchild and Hertig, 1961)

Phlebotomus cratifer Fairchild and Hertig, 1961: 242 (male and female). Type-locality: Palenque, Chiapas, Mexico

Lutzomyia (*Psathyromyia*) *cratifer* (Fairchild and Hertig, 1961): Young and Duncan 1994: 344 (taxonomic history and revision); Ibáñez-Bernal 2002: 150 (taxonomy, distribution in Mexico)

This species was known in Mexico from only three localities in Chiapas and one locality in Quintana Roo (Ibáñez-Bernal 2002). This is the first record in Veracruz.

Material examined. 19 males, 4 females. Mexico, Veracruz: Municipality of Juchique de Ferrer, El Tacahuite, 523 m a.s.l., April 13, 2005, light trap, Bernabé and Guevara, colls. 3 males; April 20, 2005, attracted to human, 1 male; January 16, 2006, coffee plantation, Bernabé and Guevara, colls. 4 males, 1 female; February 13, 2006, attracted to human, Mendoza, Bernabé and Guevara, colls., 1 male; Arroyo Chilares, February 2, 2006, Bernabé and Guevara, colls., 1 male, 1 female; Loma de San Nicolás, March 2, 2006, Bernabé and Guevara, colls., 1 female; Municipality of Colipa, El Zapotal, February 14, 2006, Mendoza, Bernabé and Guevara, colls., attracted to human, 6 males, 2 females, refuge between tree roots, 3 males.

Lutzomyia (*Psathyromyia*) *shannoni* (Dyar, 1929)

Phlebotomus shannoni Dyar, 1929: 121 (male). Type-Locality: Canal Zone, Panama. Additional references: Fairchild and Hertig 1950: 524 (male and female)

Syn. *Phlebotomus limai* Fonseca, 1935: 61 (female). Type-locality: Sao Paulo, Brazil

Syn. *Phlebotomus bigeniculatus* Floch and Abonnenc, 1941: 3 (male and female). Type-locality: Cayenne, French Guyana

Syn. *Phlebotomus microcephalus* Barretto and Duret, 1953: 341 (male). Type-locality: Presidencia Roca, Chaco, Argentina

Syn. *Phlebotomus pifanoi* Ortiz, 1972: 21 (male). Type-locality: Sierra Parima, Amazonas, Venezuela

Lutzomyia (*Psathyromyia*) *shannoni* (Dyar): Young and Duncan, 1994: 349 (taxonomic history and revision); Ibáñez-Bernal 2002: 152 (distribution in Mexico)

Lutzomyia shannoni is widely distributed in America, from Argentina to the United States of America. In Mexico, it is known from the states of Campeche, Guerrero, Nayarit,

Oaxaca, Puebla, Quintana Roo, and Veracruz. This species was recorded in the municipalities of Minatitlán, Cosoleacaque, and Playa Vicente (Ibáñez-Bernal, 2002), all in the southern portion of Veracruz. We collected some specimens in the study area (see material examined). The females of this species are human biters, and flagellates compatible with human isolates were isolated from it in Guatemala (Rowton et al. 1991). It is also a probable vector of *Endotrypanum schaudinni* (Arias et al. 1985; Rogers et al. 1988).

Material examined. 6 males, 4 females. Mexico, Veracruz: Municipality of Colipa, E l Zapotal, February 14, 2006, Mendoza, Bernabé and Guevara, colls., attracted to human, 3 males, 1 female; refuge between tree roots, 3 males, 3 females.

Lutzomyia (*Helcocyrtomyia*) *oppidana* (Dampf, 1944)

Phlebotomus oppidanus Dampf, 1944: 247 (female). Type-locality: San Jacinto, Distrito Federal, Mexico

Lutzomyia (*Helcocyrtomyia*) *oppidana* (Dampf): Theodor, 1965: 183 (classification); Young and Duncan 1994: 725 (taxonomic history and recognition); Ibáñez-Bernal, 2003: 134 (Mexican records, taxonomy)

This species apparently has a wide distribution from Canada to Mexico. In Mexico it was known from Mexico City (the type locality), Gruta de García, near Monterrey in Nuevo León, and from two municipalities of Nayarit (Ibáñez-Bernal, 2003). In our study, we found only one female specimen, being the first record for the state of Veracruz. The females of *Lutzomyia oppidana* are not anthropophilic.

Material examined. 1 female. Mexico, Veracruz: Municipality of Colipa, El Zapotal, February 14, 2006, Mendoza, Bernabé and Guevara, colls., refuge between tree roots, 1 female.

Lutzomyia (*Dampfomyia*) *leohidalgoi* sp. nov., Ibáñez-Bernal, Hernández-Xoliot & Mendoza

(Figs. 10–23)

Male (Figs. 10–15). General coloration light brown. Head in frontal view pyriform, vertex standing out but not greatly enlarged, with alveoli patches at base extended downward by pair of rows separated from each other at midline and meeting supraocular alveoli patch. Supraocular suture at each side and long intraocular suture present. Palpus long, reaching level of apical margin of flagellomere 7; palpomere proportions: 5.0: 15.0: 20.0: 17.0: 50.0 (Fig. 10). Labrum-epipharynx reaching middle of palpomere 3 and nearly middle of flagellomere 2. Cibarium without teeth, arch nearly complete, pigmented area small and transverse, and pharynx with squamate surface. Antenna with flagellomere 1 as long as

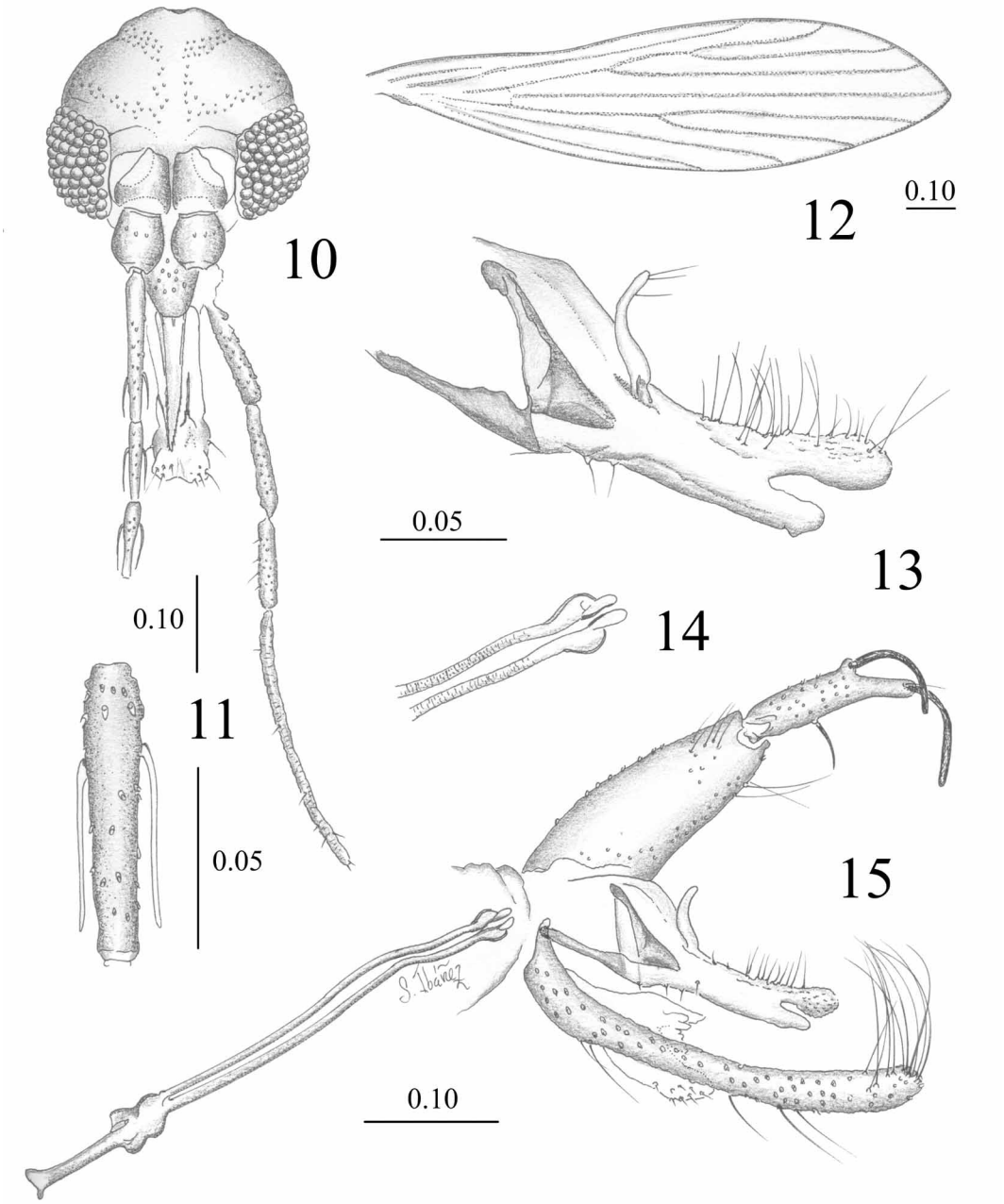
labrum-epipharynx; each flagellomere 1–11 with pair of ascoids, having small retrograde spine, those of flagellomere 2 originating nearly at same level and not reaching apical margin of flagellomere (Fig. 11).

Thorax with 12 upper and 6 lower anepisternal setae; proepimeron apparently nude. All pleural sclerites comparatively paler than scutum, and this with supraalar area pale. Wing as in Fig. 12, length nearly 4X its width; delta positive, with R_1 ending at level of middle of R_2; CuA_1 ending beyond level of radial fork.

Abdomen with tergites simple, without papillae. Terminalia (Fig. 15): Gonostylus with terminal small setae and 3 spines, 1 at apex and 1 at terminal third, both strong, the other in basal third very thin, resembling seta. Gonocoxite without basal tuft. Paramere with basal portion trapezoidal, having dorsally arched, posteriorly directed, digitiform arm with few small distal setae; apical half of paramere with setae on upper margin. Apex of paramere bifurcated into upper thumb-like lobe and keel-like lower lobe. Ducts 2.5X length of apodeme + ejaculatory bulb. Apex of ejaculatory ducts broad, 2 times diameter of ejaculatory duct, spoon-shaped with oval internal projection (Fig. 14). Lateral lobe length 12.5 times width, slightly broader at base and apex. Cercus long, with posterodorsal margin irregular and dorsal accessory projection.

Measurements (n = 1) (in mm). Head height: 0.33; width: 0.27; eye height: 0.12, width: 0.10; interocular distance: 0.12; clypeus length: 0.11; palpomere lengths: 0.02: 0.08: 0.11: 0.10: 0.30; palpus length: 0.61; flagellomeres 1:2:3 lengths: 0.16: 0.08: 0.08; wing length: 1.4; wing width: 0.36; apodeme + ejaculatory bulb length: 0.12; ejaculatory duct length: 0.29; gonocoxite length: 0.20; gonostylus length: 0.13; paramere length: 0.20; lateral lobe length: 0.31; cercus length: 0.17.

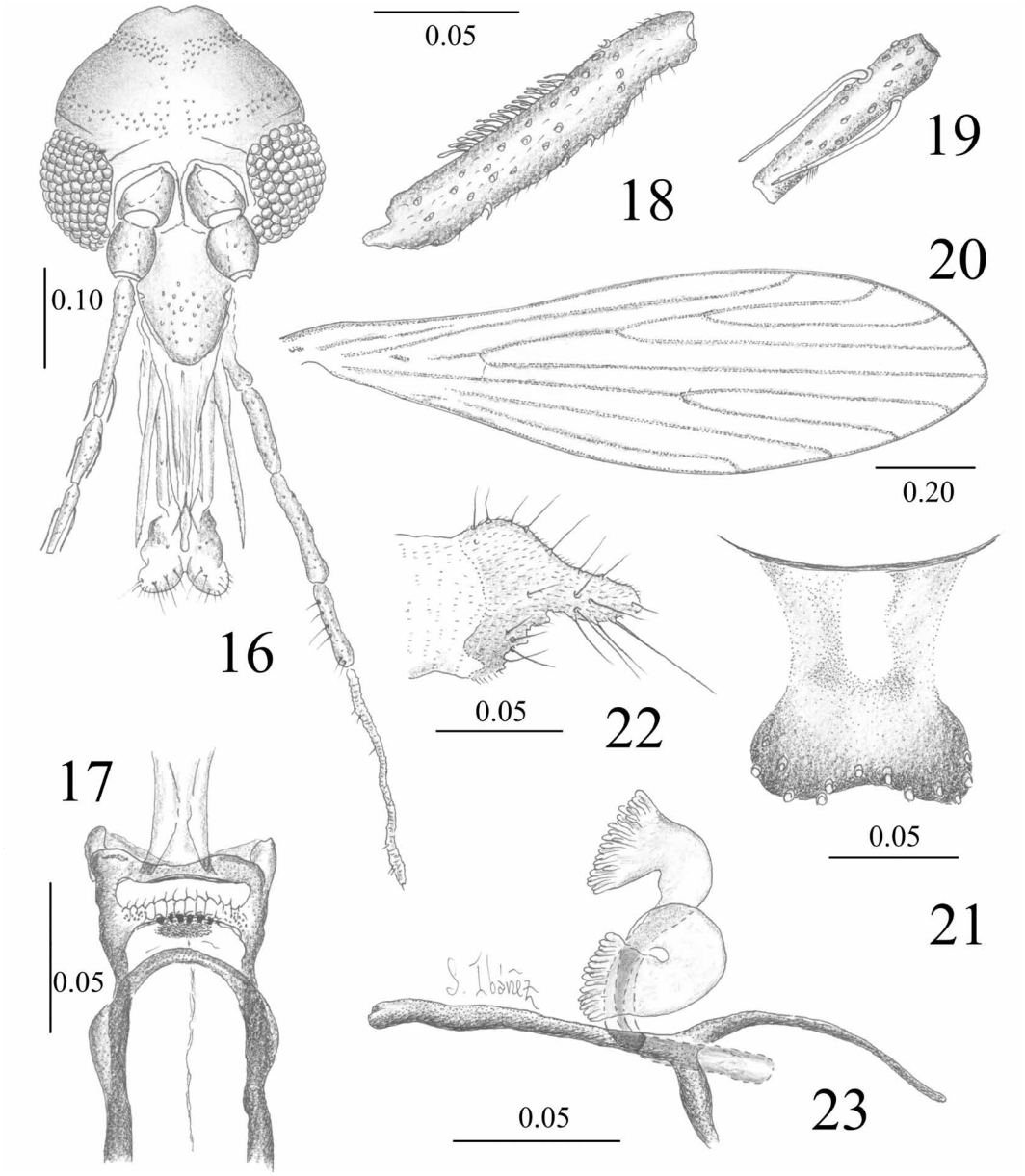
Female (Figs. 16–23). As for male, except for following characteristics: palpus reaching level of flagellomere 8; palpomere proportions: 0.5: 1.8: 2.5: 1.6: 4.1 (Fig. 16); Newstead scales in middle of internal margin of palpomere 3 (Fig. 18). Cibarium with 12 horizontal teeth, each tooth a triangle with terminal hair-like projection, forming compact short row; 6 vertical teeth and group of numerous very small lateral teeth at each side; cibarial arch complete, and pigmented area oval-transverse (Fig. 17). Pharynx with creases. Antenna with flagellomere 1 slightly shorter than labrum-epipharynx (Fig. 16); flagellomere 2 with ascoids nearly reaching apical margin (Fig. 19). Thorax with 16 upper and 11 lower anepisternal setae. Wing 3.71X long as wide (Fig. 20). Sternite 2 as figured, with oval nonsclerotized median area (Fig. 21). Spermathecae with great number of finger-like projections around terminal knob, individual and common ducts half as wide as spermathecal body; individual ducts 2X length of spermatheca, and as long as common duct (Fig. 23). Cercus triangular in lateral view, posteroventral margin irregular (Fig. 22). Measurements (n = 2) (in mm). Head height: 0.38; width: 0.27; eye height: 0.12, width: 0.09; interocular distance: 0.14; clypeus length: 0.14; palpomere lengths: 0.02: 0.11: 0.12: 0.08: 0.28; palpus length: 0.60; flagellomeres 1:2:3 lengths: 0.14: 0.07: 0.07; wing length: 1.7; wing width: 0.44; cercus length: 0.10.



FIGURES 10–15. *Lutzomyia leohidalgoi* Ibáñez-Bernal, Hernández-Xoliot & Mendoza, sp. nov., holotype male. **10.** Head, frontal view. **11.** Flagellomere 2, showing ascoids. **12.** Wing. **13.** Paramere, lateral view. **14.** Apices of ejaculatory ducts. **15.** Male terminalia, lateral view.

Etymology. The name *Lutzomyia leohidalgoi* is given in honor of our good friend Ing. Leopoldo Hidalgo Sosa, who has worked with insect vectors in the state of Veracruz for 47 years, first as Head of the state campaign against malaria in Comisión Nacional para la Erradicación del Paludismo (1959–1984), and later as Head of the Departamento de

Control de Enfermedades Transmitidas por Vector of the Veracruz State Health Services (1985–to date) (formerly Servicios Coordinados de Salud). He has dealt with an enormous number of malaria, dengue, leishmaniasis, and other vector-borne disease outbreaks, and with much interest has promoted the study of insects of medical importance in Mexico. Without doubt, he and his personnel have saved many human beings of different generations, and we express our gratitude.



FIGURES 16–23. *Lutzomyia leohidalgoi* Ibáñez-Bernal, Hernández-Xoliot & Mendoza, sp. nov., allotype female. **16.** Head, frontal view. **17.** Cibarium. **18.** Palpal segment 3, showing Newstead scales. **19.** Flagellomere 2, showing ascoids. **20.** Wing. **21.** Sternite 2. **22.** Cercus. **23.** Spermathecae.

Type locality. Mexico, state of Veracruz, Municipality of Juchique de Ferrer, El Tacahuite (523 m a.s.l., 19º 55'59 N, 96º 40'55 W).

Type specimens. Holotype male: Mexico, Veracruz: Municipality of Juchique de Ferrer, El Tacahuite, (523 m a.s.l., 19º 55'59 N, 96º 40'55 W), 13-April-2005, light trap, Bernabé and Guevara, colls. Allotype female: Municipality of Colipa, El Zapotal (219 m a.s.l., 19º 55'59 N, 96º 40'55 W), 14-February-2006, Mendoza, Bernabé and Guevara, colls., refuge between tree roots. 1 Paratype female: same data as holotype.

Other material examined. One female: same data as holotype. The head of this specimen was lost, but it could be identified by the spermathecae.

The type specimens are deposited in the Entomological Collection (IEXA) of the Instituto de Ecología, A. C., Xalapa, Veracruz, Mexico.

Comments. *Lutzomyia leohidalgoi* sp. nov. fits well in the subgenus *Dampfomyia* Addis (*sensu* Young and Duncan 1994) by having pale body coloration, palpomere 5 longer than 3+4, small eyes, female cibarium with four or more horizontal teeth, each tooth pointed with terminal filament and complete arch, and spermathecae with bubble or finger-like evaginations around the terminal knob, male gonocoxite lacking persistent setae, gonostylus with 3–5 spines and a terminal small seta, paramere with dorsal arm bearing setae. The only difference is that the ascoids in both sexes have a nearly imperceptible retrograde spine.

Six species were included in this subgenus, from which *L. leohidalgoi* sp. nov. can be differentiated by the small retrograde spine of the ascoids; in the male by the paramere morphology, with the dorsal arm being comparatively small with few terminal setae and the paramere apex bifurcate with the lower projection as long as the upper one, and in the female by the size of the spermathecal ducts and the cibarial armature.

The male of the other described *Lutzomyia* (*Dampfomyia*) species have no more than a ventral triangular protuberance, apparently homologous to the ventral keel described for this species. On the other hand, the females of the other species of this subgenus have a different structure of the spermathecae. Nearly all of them have bubble-like projections at the apex, except *Lutzomyia permira*, which has the projections smaller and finger-like, similar to those of *L. leohidalgoi*, but the individual ducts are very short and broad. The medical importance of the species of this subgenus is unknown, but *L. anthophora* was found naturally infected with *Leishmania mexicana* in southern Texas, USA (McHugh & Grogl 1993).

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