

A New Sand Fly, *Lutzomyia campograndensis* sp. n. (Diptera: Psychodidae: Phlebotominae) from the State of Mato Grosso do Sul, Brazil

Alessandra Gutierrez de Oliveira, José Dilermando Andrade Filho*,
Alda Lima Falcão*^{+/}, Reginaldo Peçanha Brazil*

Centro de Controle de Zoonoses, Secretaria Municipal de Saúde, Campo Grande, MS, Brasil *Centro de Pesquisas René Rachou-Fiocruz, Av. Augusto de Lima 1715, 30190-002 Belo Horizonte, MG, Brasil

During studies of the phlebotomine sand fly fauna of Campo Grande, State of Mato Grosso do Sul, Brazil, a new species was captured with CDC light trap and is described here. The new species resembles Lutzomyia lutziana (Costa Lima) and is named Lutzomyia campograndensis sp. n. after the type locality.

Key word: *Lutzomyia campograndensis* sp. n. - Phlebotominae - taxonomy - Brazil

Material from light trap collections from Campo Grande, State of Mato Grosso do Sul, Brazil, was included on undescribed species of *Lutzomyia* França. The description of this new species is based on morphological characters proposed by the Cipa Group (1990) and Galati (1995). All measurements are given in mm. Figure in parentheses refer to means of all specimens measured.

DESCRIPTION

(Figs 1-4)

Holotype (male): sand fly with total length of 3.307. Head and notum dark brown, pleurae and coxae paler than notum.

Head: length 0.273 (0.261 ± 0.016; n = 14), not including the clypeus of length 0.114 (0.115 ± 0.006; n = 14). Ratio head/clypeus 2.40: 1. Interocular distance 0.093 (0.086 ± 0.004; n = 14). Labrum length 0.183 (0.172 ± 0.006; n = 16). Lengths of palpomeres: 1 - 0.028 (0.032 ± 0.003; n = 17); 2 - 0.090 (0.085 ± 0.003; n = 17); 3 - 0.114 (0.113 ± 0.006; n = 17); 4 - 0.066 (0.069 ± 0.006; n = 17); 5 - 0.217 (0.192 ± 0.008; n = 15). Palpal formula 1.4.2.3.5 (1.4.2.3.5; n = 15). Fifth palpomere longer than palpomeres 3rd + 4th and shorter than palpomeres 2nd + 3rd + 4th. Newstead's spines present on palpomere 2nd and 3rd. Antennae with ascoids absents in AXV and

AXVI, proximal prolongation of ascoids short, not reaching the base of the flagellomere, distal prolongation long, extending to next flagellomere. Internal ascoids situated more distally than external ones on AIII. Papillae present on segments AIII, AIV, AV, AXIII - AXVI. Length of flagellomere AIII - 0.293 (0.291 ± 0.019; n = 15); AIV - 0.166 (0.161 ± 0.010; n = 16); AV - 0.166 (0.160 ± 0.011; n = 16). AXV longer than AXVI. Ratio AIII/LE 1.60: 1. Flagellomeres AIII-AV without simple setae.

Cervix: ventrocervical sensillae absent.

Thorax: notum dark brown. Pleurae and legs paler than notum. Hind femur longer than others, length 0.866 (0.892 ± 0.045; n = 15). Fore femur length 0.809 (0.868 ± 0.047; n = 14). Middle femur shorter, length 0.724 (0.790 ± 0.039; n = 12). Width wing maximum 0.724 (0.688 ± 0.030; n = 14). Length of principal wing sections: α (R2) - 0.639 (0.657 ± 0.037; n = 14); β (R2 + 3) - 0.241 (0.211 ± 0.022; n = 16); γ (R2 + 3 + 4) - 0.227 (0.223 ± 0.020; n = 15); δ (part of R1 extending beyond junction of R2 + R3) - 0.298 (0.260 ± 0.030; n = 14); R5 - 1.320 (1.305 ± 0.064; n = 15).

Abdomen: coxite length 0.362 (0.371 ± 0.011; n = 17), without tuft of cerdae. Style length 0.228 (0.223 ± 0.008; n = 17) with four strong spines, one being apical, one intermediate inserted on a process and two inserted on basal third of structure, but not at same level. Subterminal setae absent. Paramere simple, wide at the base, tapered in the middle and expanded at the end of structure, where a distal group of setae is present. Lateral lobe extends beyond coxite, length 0.411 (0.456 ± 0.025; n = 17). Aedeagus cone-shaped, its apex reaching beyond the middle of paramere. Genital pump length 0.197 (0.206 ± 0.009; n = 17). Genital filaments lightly

This work was supported by CNPq, Fiocruz, Funasa, Sesau/CG.

⁺Corresponding author. Fax: +55-31-295.3566. E-mail: alda@cpqrr.fiocruz.br; rlemos@nin.ufms.br

Received 31 May 2000

Accepted 12 July 2000

grooved measuring 0.321 in length (0.355 ± 0.015 ; $n = 17$) and with tip expanded, the width maximum being 0.010 (0.10 ± 0.000 ; $n = 17$). Ratio genital filaments/genital pump 1.63: 1.

Allotype (female): smaller than male, total body length 2.966. Coloration similar to that of male.

Head: length 0.273 (0.263 ± 0.016 ; $n = 9$), not including clypeus of length 0.121 (0.123 ± 0.006 ; $n = 10$). Ratio head/clypeus 2.26: 1. Interocular distance 0.100 (0.092 ± 0.007 ; $n = 9$). Labrum length 0.193 (0.196 ± 0.011 ; $n = 10$). Maxilla: lacinia with a row of external longitudinal teeth. Length of palpomeres: 1 - 0.035 (0.034 ± 0.002 ; $n = 8$); 2 - 0.097 (0.089 ± 0.004 ; $n = 8$); 3 - 0.117 (0.118 ± 0.008 ; $n = 8$); 4 - 0.066 (0.067 ± 0.004 ; $n = 8$); 5 - 190 (0.187 ± 0.008 ; $n = 8$). Palpal formula 1.4.2.3.5. (1.4.2.3.5; $n = 8$). Fifth palpomere long than 3rd + 4th and shorter the palpomeres 2nd + 3rd + 4th. Newstead's spine present on palpomere 2nd and 3rd. Ascoids absent on AXV and AXVI, proximal prolongation short and distal prolongation long, extending to next flagellomere. Internal ascoids situated more distally than external ones on AIII.

Papillae present on segments AIII, AIV, AV, AXIII - AXVI. Length of flagellomere AIII - 0.255 (0.259 ± 0.017 ; $n = 8$); AIV - 0.135 (0.146 ± 0.008 ; $n = 8$); AV - 0.135 (0.146 ± 0.010 ; $n = 8$). AXV longer than AXVI. Cibarium with four small horizontal teeth and irregular direction. Vertical teeth arranged on the lateral area of cibarium and also below the horizontal teeth, the latter group being larger than the former. Lateral teeth absent. Cibarium arch complete and prominent pigment patch present. Pharynx unarmed.

Cervix: ventrocervical sensillae absent.

Thorax: as in the male. Hind femur longer than others, length 0.894 (0.901 ± 0.035 ; $n = 7$). Fore femur length 0.880 (0.898 ± 0.052 ; $n = 7$). Middle femur shorter, length 0.809 (0.805 ± 0.048 ; $n = 7$). Width wing maximum 0.766 (0.754 ± 0.023 ; $n = 8$). Length of principal wing sections: α (R2) - 0.695 (0.717 ± 0.044 ; $n = 8$); β (R2 + 3) - 0.227 (0.215 ± 0.016 ; $n = 8$); γ (R2 + 3 + 4) - 0.199 (0.224 ± 0.033 ; $n = 8$); δ (part of R1 extending beyond junction of R2 + R3) - 0.298 (0.300 ± 0.032 ; $n = 8$); R5 - 1.306 (1.378 ± 0.063 ; $n = 8$).

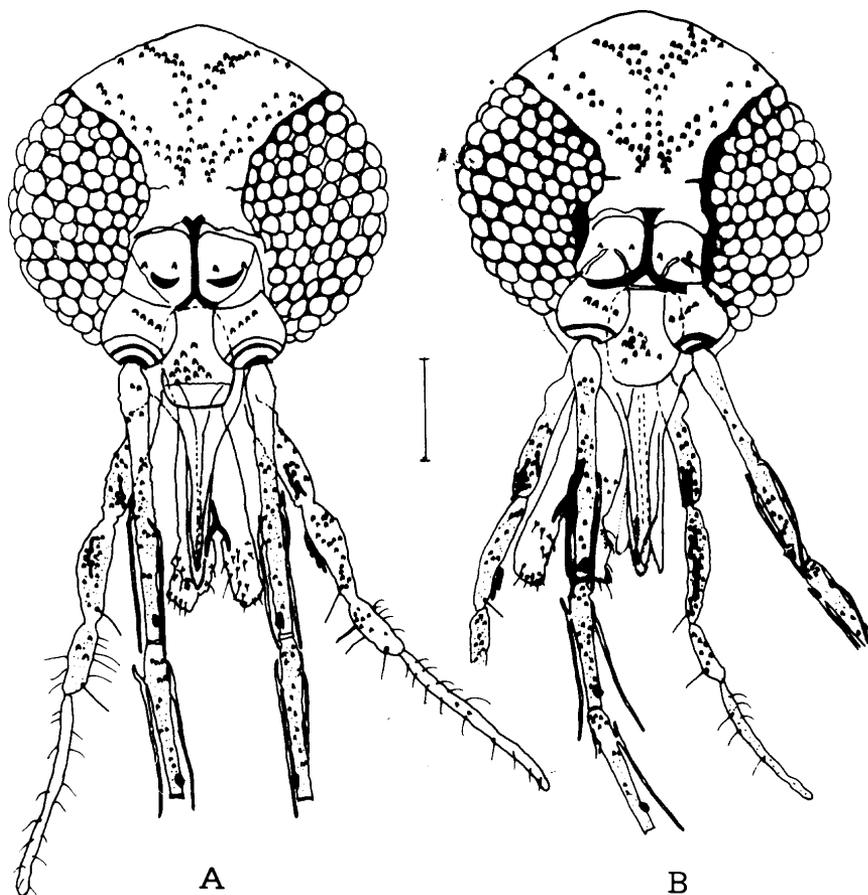


Fig. 1: *Lutzomyia campograndensis* n. sp. - A: head (holotype); B: head (allotype). Bar: 100 μ m

Abdomen: cercus simples, length 0.152 (0.169 ± 0.014 ; $n = 9$). Spermathecae spherical, length 0.041 (0.041; $n = 1$) width 0.048 (0.048; $n = 1$). Head of spermathecae not visible. In various paratypes the spermathecae are wilt, give it a different appearance. Individual ducts with sclerotized region of length 0.031 (0.031 ± 0.001 ; $n = 8$). Entire length of individual and common ducts not visible in allotype. The individual duct was measured in only two paratypes and in only one of these the common duct was visible. Lengths of the individual ducts 0.038 and 0.048 and the common duct 0.028 the latter being wider than individual duct.

Collection data and deposition of type material. Holotype male collected by AG Oliveira in

Zé Pereira forest, municipality of Campo Grande, Mato Grosso do Sul, Brazil, on March 9th, 1999. Allotype female collected by AG Oliveira in Zé Pereira forest, on April 13th, 1999. Seventeen paratype males and ten paratypes females collected by AG Oliveira in Campo Grande were also examined: 13 males and six females were captured in Zé Pereira forest in the following dates: two males on February 23rd, 1999; one male on March 2nd, 1999; two males on March 16th, 1999; one male on April 13th, 1999; two males on August 10th, 1999; one male on August 17th, 1999; one male on September 9th, 1999; one male on September 28th, 1999; one male on December 7th, 1999; one male on January 3rd, 2000; one female

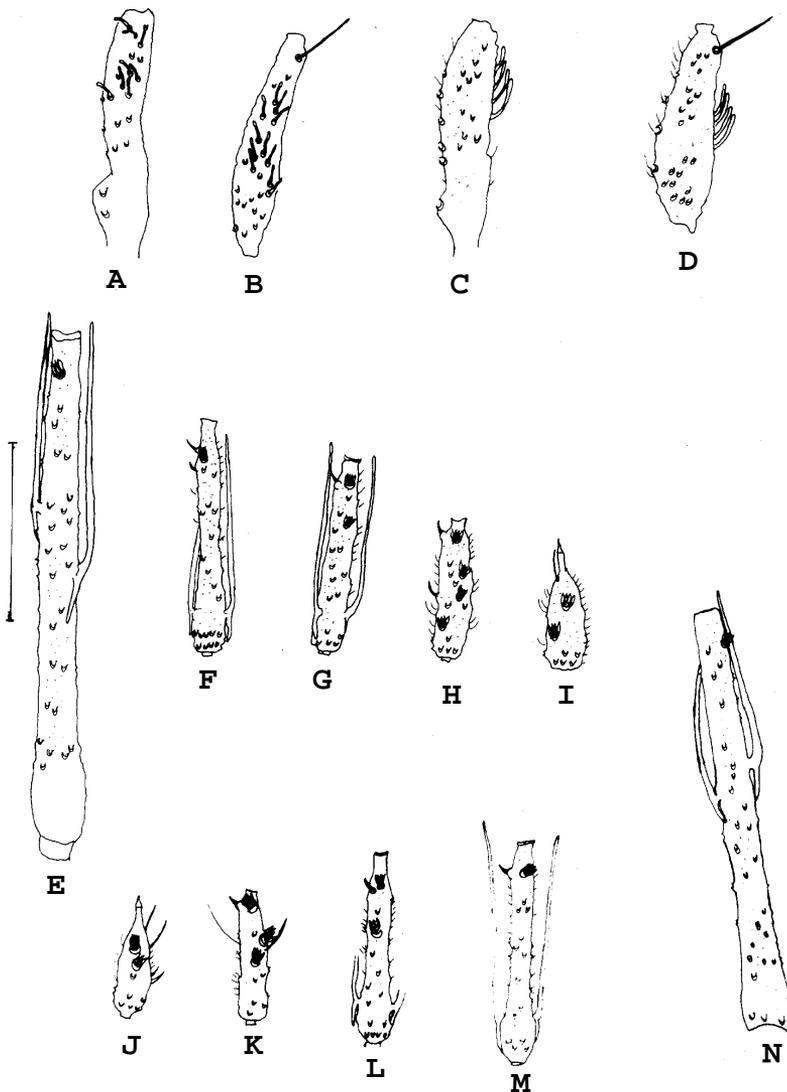


Fig. 2: *Lutzomyia campograndensis* n. sp. - A: 1st and 2nd palpomeres (allotype); B: 3rd palpomere (allotype); C: 1st and 2nd palpomeres (holotype); D: 3rd palpomere (holotype); E: AIII (holotype); F: AXIII (holotype); G: AXIV (holotype); H: AXV (holotype); I: AXVI (holotype); J: AXVI (allotype); K: AXV (allotype); L: AXIV (allotype); M: AXIII (allotype); N: AIII (allotype). Bar: 100 μ m

on February 18th, 1999; one female on June 1st, 1999; one female on August 3rd, 1999; one female on September 28th, 1999; one female on December 14th, 1999 and one female on December 21st, 1999. Three males and two females were captured in the “Reserva Ecológica do Parque dos Poderes” on the following dates: one male on June 28th, 1999; one male on November 8th, 1999; one male on December 6th, 1999; one female on November 8th, 1999; one female on January 31st, 2000. Two females were captured in Chácara das Palmeiras, one on September 7th, 1999 and the other on January 5th, 2000. One male was captured in the Botanical Garden of Campo Grande on January 3rd, 2000. Holotype and allotype are deposited in the phlebotomine sand flies collection at the Centro de Pesquisas René Rachou, together with 19 paratypes (13 males and six females). One pair of paratypes each consisting of one male and one female, was donated to the collection of the Faculdade de Saúde Pública, Universidade de São Paulo, Brazil; Instituto Oswaldo Cruz, Rio de Janeiro, Brazil; Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil and Natural History Museum, London, United Kingdom.

Type locality: the municipality of Campo Grande, capital of the State of Mato Grosso do Sul (20°26'34''S; 54°38'47''W). Geographically located in the central portion of the state, occupying 2.3% of the total area. The predominant climate of Campo Grande, according to the classification of Köppen is of rainy tropical savanna, subtype AW, characterized by uneven annual distribution of rain, with one well defined rainy season between No-

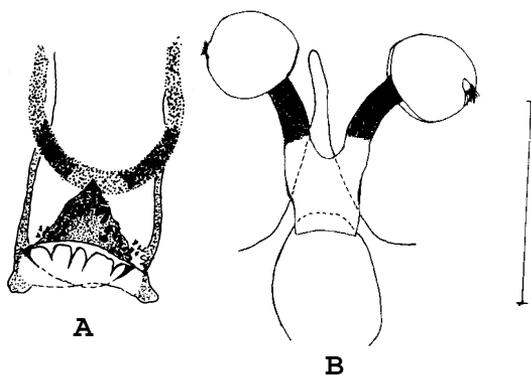


Fig. 4: *Lutzomyia campograndensis* n. sp - A: cibarium (allotype); B: espermathecae (allotype). Bar: 100 µm

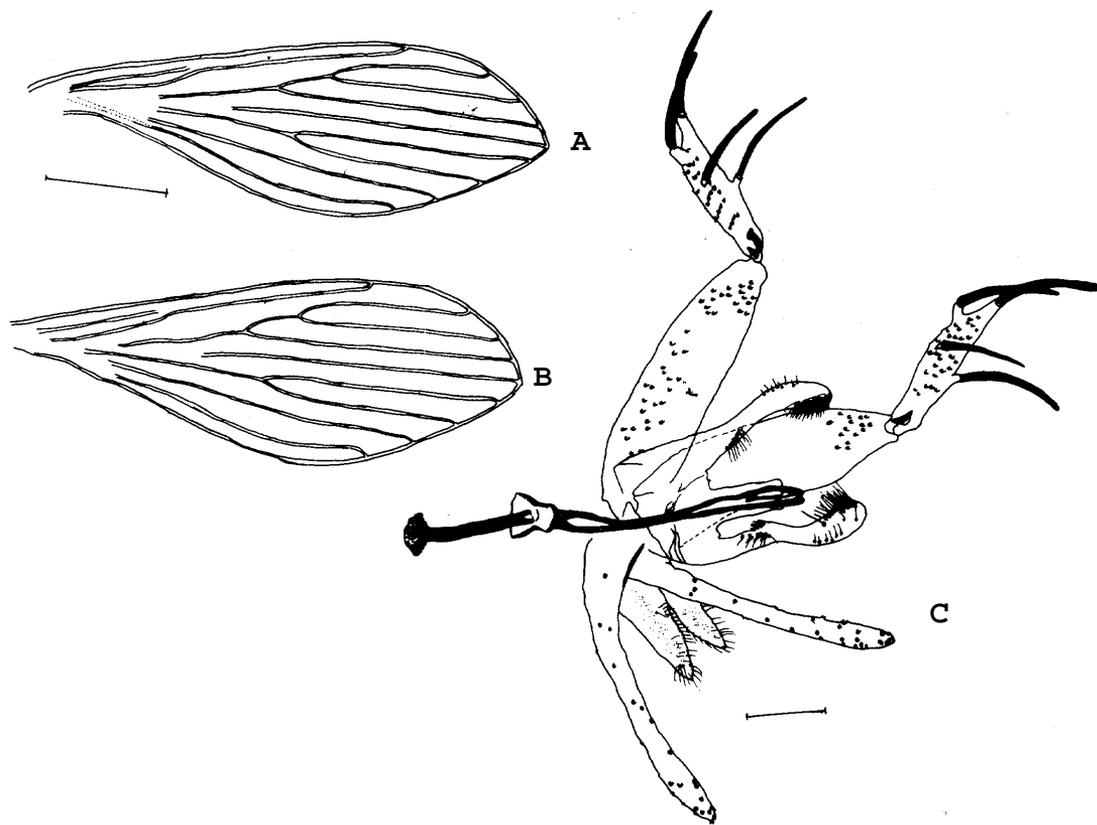


Fig. 3: *Lutzomyia campograndensis* n. sp. - A: wing (holotype); B: wing (allotype). Bar: 500 µm. C: genitalia (holotype). Bar: 100 µm

vember and March. The annual medium temperature is around 23°C, the maximum being around 25°C in December and the minimum 18°C in June. The municipal district lies across two great geomorphologic areas: the plateaus arenitic-basaltic interior plateau of the western border of the Paraná River Basin. The urban area includes extensive areas of modified forest and of some primary remains, the latter in the Reserva Ecológica of the Parque dos Poderes and the Botanical Garden.

REMARKS

This species is very similar to *Lutzomyia lutziana* (Costa Lima). The male of the new species differs from *L. lutziana* having the tips of genital filaments dilated rather than slender. The female is also similar to *L. lutziana*. The female of the sand fly described as *Phlebotomus* sp. de Cayenne by Floch and Abonnenc (1945) is considered to be the female of *L. lutziana* (Forattini 1973, Leger et al. 1977, Martins et al. 1978), but the original drawing of *Phlebotomus* sp. de Cayenne shows that the common duct is longer than individual duct, in contrast with the drawing of the female of *L. lutziana* in Young and Duncan (1994). In the collection of Centro de Pesquisas René Rachou-Fiocruz we studied a male captured by Abonnenc in Cabassou, French Guiana and verified that this specimen is conspecific with our new species. We also examined two females of *L. lutziana* from Lassance (its type locality) and concluded that *Phlebotomus* sp. de Cayenne is not the female of *L. lutziana*. This material will be described later.

The taxonomic placement of the new species is doubtful. *L. lutziana* is placed in the subgenus *Psathyromyia* Barreto by Young and Duncan (1994), but they considered its status to be provisional. According to Galati (1995), *L. lutziana* belongs to the genus *Psathyromyia*, subgenus *Forattiniella* Vargas, series *lutziana*. In this paper we prefer not to include *L. campograndensis* in the subgenus *Psathyromyia* as the group characters in this subgenus clearly require redefinition.

Geographic distribution: the new species was captured in the western and northern regions of Brazil. Beside the type locality, Campo Grande, it has been found in Nioaque and Camapuã (Mato Grosso do Sul); Manaus (Amazonas); Caracará (Roraima); Macapá (Amapá) and Cabassou

(French Guiana). Galati et al. (1996) also captured this species in the municipality of Corguinho, Mato Grosso do Sul.

ACKNOWLEDGEMENTS

To Dr Francisco Gonçalves de Carvalho (Diretor of CCZ), Elaine Araújo e Silva (Laboratório de Entomologia), José Fernandes da Silva (Funasa), Fernando Honorato de Prado (Funasa), Miriam da Silva Santos (CCZ; in *memoriam*) and Francisco (Driver) for technical help. To Dr Eunice A Bianchi Galati, Faculdade de Saúde Pública, Universidade de São Paulo, for help in the drawing of the new species and critical review of the manuscript.

REFERENCES

- Cipa Group-Bermudes H, Dedet JP, Falcão AL, Feliciangeli D, Ferro C, Galati EAB, Gomes EL, Herrero MV, Hervas D, Lebbe J, Morales A, Oguzuku E, Perez E, Rangel EF, Sherlock IA, Torres M, Vignes R, Wolff M 1991. Proposition of a standard description for phlebotomine sand flies. *Parassitologia* 33 (Suppl.): 127-135.
- Costa Lima A 1932. Sobre os phlebotomos americanos (Diptera: Psychodidae). *Mem Inst Oswaldo Cruz* 26: 15-59.
- Floch H, Abonnenc E 1945. Phlebotomes de la Guyane Française (XIII). Description de deux nouvelles femelles. *Inst Pasteur Guyane* 98: 1-4.
- Forattini OP 1973. *Entomologia Médica. Psychodidae. Phlebotominae. Leishmanioses. Bartonelose*, Vol. 4, Edgar Blücher Ltda, São Paulo.
- Galati EAB 1995. Phylogenetic systematics of Phlebotominae (Diptera, Psychodidae) with emphasis on American groups. *Bol Dir Malarial San Amb* 35 (Suppl. 1): 133-142.
- Galati EAB, Nunes VLB, Dorval MEC, Oshiro ET, Cristaldo G, Espíndola MA, Rocha HC, Garcia WB 1996. Estudo dos flebotomíneos (Diptera: Psychodidae), em área de leishmaniose tegumentar, no estado do Mato Grosso do Sul, Brasil. *Rev Saúde Públ* 30: 115-128.
- Leger N, Abonnenc E, Pajot FX, Kramer R, Clautre J 1977. Liste commentée des Phlébotomes de la Guyane française. *Sér Ent Méd Parasitol* 3: 217-232.
- Martins AV, Williams P, Falcão AL 1978. *American Sand flies (Diptera: Psychodidae, Phlebotominae)*, Acad Bras Ciências, Rio de Janeiro, 195 pp.
- Young DG, Duncan MA 1994. Guide to the identification and geographic distribution of *Lutzomyia* sandflies in the Mexico, the West Indies, Central and South America (Diptera: Psychodidae). *Mem Amer Ent Inst* 54: 881.

