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Morphological genitalic anomaly in *Lutzomyia longipalpis* sensu lato (Lutz & Neiva, 1912) collected in the State of Rio Grande do Norte, Brazil

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Abstract

XIMENES FM MF, CASTELLÓN EG, FREITAS RA. 2002. Morphological genitalic anomaly in specimens *Lutzomyia longipalpis* sensu lato (Lutz & Neiva, 1912) collected in the State of Rio Grande do Norte, Brazil. Entomotropica 17(2):183-184.

A morphological anomaly on the paramere (three setae) was observed in seven sand fly *Lutzomyia longipalpis* sensu lato (Lutz & Neiva, 1912) collected in the endemic area of visceral leishmaniasis in Rio Grande do Norte, Northeast Brazil.

Additional key words: "longipalpis" complex, Phlebotominae, paramere anomaly, sand fly.

Resumo

XIMENES FM MF, CASTELLÓN EG, FREITAS RA. 2002. Anomalias morfológicas observadas em *Lutzomyia longipalpis* sensu lato (Lutz & Neiva 1912), em área de Rio Grande do Norte, Brasil. Entomotropica 17(2):183-184.

Anomalias morfológicas no parâmero (três setas) foram observadas em sete espécimes de *Lutzomyia longipalpis* sensu lato (Lutz & Neiva 1912), em área de ocorrência de leishmaniose visceral no Rio Grande do Norte, Nordeste do Brasil.

Palavras clave adicionais: Anomalias no parâmero, complexo "longipalpis", leishmaniose visceral, Phlebotominae.

Among the neotropical phlebotomine sand flies the species *Lutzomyia longipalpis* (Lutz & Neiva, 1912) is recognized as the vector of *Leishmania chagasi*, the etiological agent of visceral leishmaniasis. For this species, anomalies in the male genitalia were described as well as deformities in the palpus and antennae. Morphological, genetic and behavioral evidence suggest that *L. longipalpis* represents a species complex (Ward et al. 1983, 1985; Lanzaro et al. 1993; Young and Duncan 1994). Recently, in Venezuela, morphological differences led to the identification of *Lutzomyia pseudolongipalpis* as the first species within the "longipalpis" complex (Arrivillaga and Feliciangeli 2001). Morphological differences or anomalies were also described in other species: *Lutzomyia neivai* (Pinto, 1926) was found with three spermathecae (Taniguchi et al. 1992) and *Lutzomyia intermedia* (Lutz and Neiva, 1912) with anomalies on the style (Marcondes 1997). In Rio Grande do Norte, *L. longipalpis* sensu lato is widely distributed in the geographical regions (Ximenes et al. 2000) and morphologically different populations were found, i.e. with one or two tergal spots and an intermediate form between the first two (Ward et al. 1983). However, no significant differences in isoenzyme frequencies were associated with morphological phenotype (Mukhopadhyay et al. 1998). In the municipality of Lajes Pintadas, Agreste Zone, lat 6° 09' 01'' N and long 36° 07' 02'' W 2,032 specimens of *L. longipalpis* (520 females and 1,512 males) were captured, among these there were seven anomalous males. The anomaly is unilateral, three setae are present on the mid-dorsal surface of the paramere (Figure 1). The frequency of the anomaly (three paramere setae) observed was 7: 1,512 or 1 male anomaly: 290 normal males; a much higher proportion than that observed by Sherlock (1958) for the same species i.e. thirteen different anomalies in the male genitalia in 80,030 specimens of *L. longipalpis*. For *L. intermedia* the frequency of the anomaly (number of style setae) was 9: 705 or 1: 78. The biological role of the described variations is unknown; moreover, we do not know if the presence of an additional seta on the male genitalia of *L. longipalpis* affects sexual behavior and reproduction in this population. Further studies

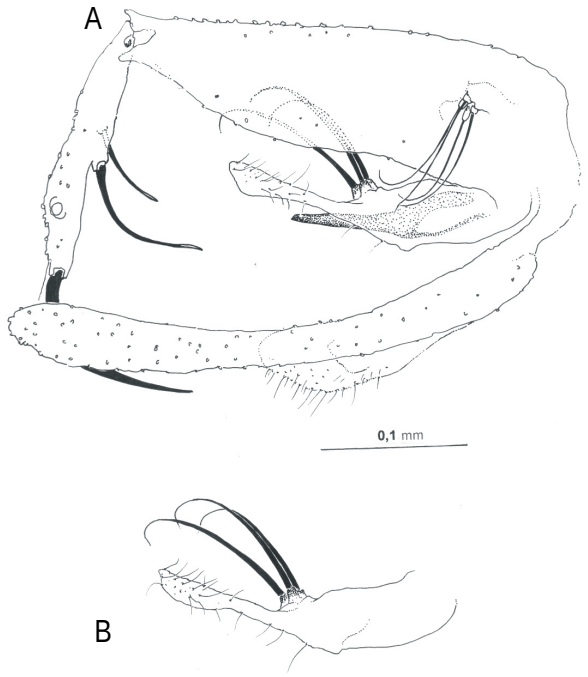

FIGURE 1 **A.** *Lutzomyia longipalpis* genitalia with unilateral anomaly on the paramere, 1**B.** paramere with three setae on the mid-dorsal surface.

may clarify whether the phenotypical variations found in sand flies in Rio Grande do Norte characterize new "longipalpis"complex species or are the result of the introduction of a mutant allele. Different genical compositions may lead to a high adaptive value, thereby allowing the population to evolve towards any one of the stable genetic compositions (Futuyma 1993). The genotypical frequency associated with the behavioral and reproduction characteristics of the sand flies of different geographical areas will allow more precise inferences about the function of the variations and whether the new "longipalpis"complex species belong to the visceral leishmaniasis epidemiological chain in the state of Rio Grande do Norte.

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References

ARRIVILLAGA JC, FELICIANGELI D. 2001. *Lutzomyia pseudolongipalpis*: The first new species within the *longipalpis* (Diptera: Psychodidae: Phlebotominae) complex from La Rinconada, Curarigua, Lara State, Venezuela. J Med Entomol 38(6): 783-790.

FUTUYMA DJ. 1993. Biologia Evolutiva. São Paulo: Sociedade Brasileira de Genética. 631p.

LANZARO GCK, OSTROVSKA MV, HERRERO PG, LAWYER PG, WARBURG A. 1993. *Lutzomyia longipalpis* is a species complex: Genetic divergence and interspecific hybrid sterility among three populations. Am J Trop Med Hyg 48(6):839-847.

MARCONDES CB. 1999. Anomalies of *Lutzomyia intermedia* (Lutz & Neiva, 1912) (Diptera, Psychodidae, Phlebotominae). Mem Inst Oswaldo Cruz 94 (3):365-366.

MUKHOPADHYAY J, GHOSH K, AZEVEDO CR, RANGEL EF, MUNSTERMANN LE. 1988. Genetic polymorphism of morphological and biochemical characters in a Natal, Brazil, population of *Lutzomyia longipalpis* (Diptera: Psychodidae). J Amer Mosq Control Assoc 14 (3):277-282.

SHERLOCK IA. 1958. Anomalias de *Phlebotomus longipalpis* Lutz & Neiva, 1912 (Diptera:Psychodidae). Rev Bras Biol 18(4):433-437.

TANIGUCHI HH, TOLEZANO JE, CORREA FMA, MORAES RHP, VEIGA RMO, MARASSA AM. 1991. Epidemiologia da leishmaniose tegumentar americana no Estado de São Paulo, Brasil. I – Composição da fauna flebotomínica no município de São Roque, região de Sorocaba. Rev Inst Adolfo Lutz 51:23-30.

WARD RD, RIBEIRO AL, READY PD, MURTAGH A. 1983. Reproductive isolation between different forms of *Lutzomyia longipalpis* (Lutz & Neiva, 1912), (Diptera:Psychodidae), the vector of *Leishmania donovani chagasi* Cunha & Chagas and its significance to kala-azar distribution in South America. Mem Inst Oswaldo Cruz 78(3):269-280.

WARD RD, RIBEIRO AL, RYAN L, FALCAO AL, RANGEL EF. 1985. The distribution of two morphological forms of *Lutzomyia longipalpis* (Lutz & Neiva, 1912) (Diptera:Psychodidae). Mem Inst Oswaldo Cruz 80(2): 145-148.

XIMENES MF FM, CASTELLÓN EG, SOUZA MF, FREITAS RA, PEARSON RD, WILSON ME, JERÓNIMO SMB. 2000. Distribution of phlebotomine sand flies (Diptera: Psychodidae) in the State of Rio Grande do Norte, Brazil. J Med Entomol 37(1):162-169.

YOUNG DM, DUNCAN MA. 1994. Guide to the identification and geographic distribution of *Lutzomyia* sandflies in Mexico, the West Indies, Central and South America (Diptera: Psychodidae). Mem Am Entomol Inst. 54. Associate Publishers, Gainesville, FL. 878 p.