

SHORT COMMUNICATION

First Record of *Lutzomyia evansi* (Nuñez-Tovar 1924) in Mexico (Diptera: Psychodidae, Phlebotominae)

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The phlebotomine sand fly Lutzomyia evansi is recorded in Mexico for the first time. This species is a suspected vector of Leishmania infantum in other parts of its geographical range and was captured in a focus of American visceral leishmaniasis where the principal vector, Lu. longipalpis sensu lato, was also found. The relative public health importance of the two species in the study area (Chiapas state, Southern Mexico) is discussed.

Key words: *Lutzomyia evansi* - Phlebotominae - new record - Mexico

To date 37 species of phlebotomine sand flies of the genus *Lutzomyia* Franca 1924 have been recorded from Mexico, representing 9.7% of all the New World species described (Ibáñez-Bernal 2000). This list is the product of medical entomologists interested in the endemic public health problem of different clinical types of leishmaniasis. More systematic research is needed not only to record the species present in the country, but to determine their geographic and temporal distributions and demonstrate the role of each species in the enzootic and endemic transmission of *Leishmania* spp. in Mexico.

Chiapas is one of the Mexican states with the highest prevalence of cutaneous leishmaniasis. It is also one of two Mexican foci for transmission of *Leishmania infantum*, the etiological agent of American visceral leishmaniasis (Mauricio et al. 2000). The town of Galecio Narcia in the municipality of Chiapa de Corzo (16°34.190'N, 93°01.124'W) is situated at 385 masl and has one of the highest prevalences of American visceral leishmaniasis (AVL) in Mexico. In this and other towns within the same region, an epidemiological survey was conducted during the year 2001 to record cases of human leishmaniasis. A total of 244 suspected cases of leishmaniasis was identified, of which five patients were confirmed as having American cutaneous leishmaniasis (ACL) and 10 AVL. Eight cases were from Galecio Narcia and the other two from Terán Tuxtla. All the AVL patients were children between two months and 13 years old.

Galecio Narcia and surrounding areas are hot and humid, with annual mean temperatures of 28-30°C. Most precipitation occurs from May to September with about 900 mm of rainfall per year. The original vegetation type is tropical deciduous forest, but has been largely replaced by corn, *Spondias myrobalanus* fields, and pasture.

A preliminary sampling study was undertaken to identify potential vectors of *Leishmania* in Galecio Narcia. A total of 443 phlebotomine sand flies belonging to three species was mouth-aspirated from a yearling calf during 8 h of collecting on 8/9 November 2001. The species obtained were: *Lutzomyia longipalpis* (Lutz and Neiva, 1912) morphospecies complex (Uribe 1999), *Lu. cruciata* (Coquillett, 1907), and *Lu. evansi* (Nuñez-Tovar, 1924). The most abundant species was *Lu. longipalpis* (251 males, 48 females), followed by *Lu. evansi* (100 males, 26 females), and finally by *Lu. cruciata* (13 males and 5 females). The abundance of each species per hour of collection is presented in the table. A strong breeze from 22:00-24:00 probably reduced the number of sand flies collected during this period.

The most noteworthy of the three species was *Lu. evansi*, of which 100 males and 26 females were collected, representing 28.4% of the total sample. The highly skewed sex ratio (4:1 in favour of males) suggests that the latter form mating aggregations on the host and await the arrival of females seeking a blood meal, as has been noted for *Lu. longipalpis* (Jarvis & Rutledge 1992). This is the first record of *Lu. evansi* from Mexico, although this species is already known from Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Colombia, and Venezuela (Young & Duncan 1994). It is a member of the *Lu. verrucarum* species group and a suspected vector of *Le. infantum* in both Colombia (Travi et al. 1990) and Venezuela (Bendezu et al. 1995), in AVL foci where *Lu. longipalpis* is absent. However in Colombia the two species co-exist in the departments of Guajira, Norte de Santander, Santander, and Sucre (Montoya-Lerma & Ferro 1999). In Mexico *Lu. evansi* could only be confused with *Lu.*

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ovallesi (Ortiz 1952), another *Lu. verrucarum* group species. However males of *Lu. evansi* can be separated because they have the paramere ornamented with setae only in the distal third and the gonostylus has the two basal spiniform setae implanted at the same level. The females of *Lu. ovallesi* have the spermathecal common duct 3X or more as long as the individual spermathecal duct, whereas the spermatheca is more elongated and shows a median constriction. Detailed descriptions of male and female *Lu. evansi* collected during the present study are as follows:

Male: palpomere V longer than palpomere III+IV; antennal ascoids simple; male genitalia with the lateral lobe thin, about 7X as long as wide; gonocoxite with basal tuft of simple setae; gonostylus with 4 spiniform setae, all located at offset sequential positions and levels, and with subterminal small setae; paramere simple with dorsal setae present on distal half; genital filaments longer than 4X length of pump. Female: flagellomere 1 shorter than labrum; cibarium with 4 acute horizontal teeth and a simple row of small vertical teeth; cibarial arch complete; individual sperm ducts at least 3X length of common duct; spermatheca pyriform, its base not differentiated from the individual spermathecal duct, irregularly striated and with a short and wide capitellum (Feliciangeli et al. 1992, Young & Duncan 1994).

Although *Lu. evansi* is an opportunistic man-biter that occurs in man-made environments, characteristics which favour its role as a *Leishmania* vector, it has been reported to exhibit low rates of natural and laboratory infection (Travi et al. 1996).

Two other species were sampled during the present study. Most of the collection (67.4%) consisted of *Lu. longipalpis* (Lutz & Neiva 1912) sensu lato (Table). This is generally considered to be a complex of morphologically identical species, whose geographical distribution extends from Argentina to Mexico (Uribe 1999). It is currently thought to be the only vector of *Le. infantum* in Mexico (Velasco et al. 1994), and occurs in the states of Chiapas, Guerrero, Michoacan, Morelos, Puebla, Quintana

Roo, and Yucatan (Ibáñez-Bernal 1999). A total of 251 males and 48 females was collected during the present study, the highly skewed sex ratio (5.2:1) presumably due to mating aggregations formed by males on the host.

The third species sampled during the present study was *Lu. cruciata* (Coquillett 1907). Only 18 examples (13 males and 5 females) were captured during the sample period, representing 4.1% of the total collection. This is a common sand fly in Mexico and occurs throughout the country except the north, where it is replaced by the closely related *Lu. diabolica* (Hall 1936) (Ibáñez-Bernal 1999). This species is the most abundant sand fly in many ACL foci and is thought to be one of the most important vectors of *Le. mexicana* in Mexico.

All specimens were deposited in the Entomology Collection at the Instituto de Ecología, A. C., Xalapa, Veracruz (IEXA). Of these specimens, 264 were mounted on slides with Euparal and 179 stored dry in vials.

Our finding of *Lu. evansi* in Chiapas extends the known range of this species northward. It is noteworthy that in Galecio Narcia it co-exists with *Lu. longipalpis* and although the latter was more numerous in our sample, the relative importance of the two species in the transmission of *Le. infantum* remains unknown. This should be resolved by future studies of vector potential and population dynamics.

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TABLE

Number of specimens by species and sex collected by hour in Galecio Narcia, municipality of Chiapa de Corzo, Chiapas, Mexico

Species/hour		19:00- 20:00	20:00- 21:00 (8 Nov 2001)	22:00- 23:00	23:00- 24:00	00:50- 01:50	02:30- 03:30 (9 Nov 2001)	04:10- 05:00	05:00- 06:00	Total specimens
<i>Lutzomyia longipalpis</i>	M	11	90	6	10	80	18	13	23	251
	F	1	10	-	2	16	5	11	11	48
	T	12	100	6	12	96	23	16	34	299
<i>Lutzomyia evansi</i>	M	10	7	19	6	46	11	1	-	100
	F	—	2	-	2	14	4	1	3	26
	T	10	9	19	8	60	15	2	3	126
<i>Lutzomyia cruciata</i>	M	—	1	1	7	4	-	-	-	13
	F	2	—	-	-	3	-	-	-	5
	T	2	1	1	7	7	-	-	-	18
Total specimens	M	21	98	26	23	130	29	14	23	364
	F	3	12	-	4	33	9	4	14	79
	T	24	110	26	27	163	38	18	37	443

M: male; F: female; T: total

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