

Leishmanial infections in *Lutzomyia longipalpis* and *Lu. antunesi* (Diptera: Psychodidae) on the island of Marajó, Pará State, Brazil

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Sporadic cases of visceral leishmaniasis have been recorded on the island of Marajó and, following the recent detection of *Lutzomyia longipalpis* in February 1982 (LAINSON *et al.*, 1983), two subsequent visits were made to the island in October and November, 1983 specifically to investigate the role of this or other sandfly species in transmission. The initial visit concentrated on flies caught in the chicken-houses and savanna in a 500 m radius of a house where a small girl was discovered with visceral leishmaniasis, during our visit in August 1983: four infected *Lu. longipalpis* and three *Lu. antunesi* were captured here. The second visit extended the study site to an area of recent settlement on the edge of the savanna. *Lu. longipalpis* were found to be entering a house which was occupied for only three months, and thus untreated by DDT in the local antimalarial campaign earlier that year. The family living here, two adults and three children aged two, four and six years, complained of numerous biting sandflies, sufficient to cause them to send their nine-month-old daughter to stay with relatives. In this house, on one night, a CDC

Lu. longipalpis has long been regarded as the major vector of *Leishmania chagasi* throughout its geographical range in the Americas, based on epidemiological evidence (LAINSON & SHAW, 1979, for review) and the experimental transmission of the parasite by this sandfly in the laboratory (LAINSON *et al.*, 1977). Final proof, of course, rests on the demonstration of adequate numbers of naturally infected *Lu. longipalpis* in foci of human infection. As far as we are aware, however, the only previous records of natural promastigote infections of this sandfly (DEANE & DEANE, 1954; DEANE, 1956), in Ceará State, north-east Brazil, were unaccompanied by any isolation or identification of the parasites. In our own case, characterization of the Marajó isolates will largely depend on infections in the inoculated hamsters. Local strains are known to develop very slowly in this animal, from our observations on isolations made from wild foxes (*Cerdocyon thous*) and man, and final identification of the parasite from *Lu. longipalpis*, by isoenzyme and monoclonal antibodies, is not anticipated for several months.

Table I—Mean number of female sandflies collected, per trap per night, by different capture methods and the number of leishmanial infections. CDCs were operated 18-06 hrs, Shannons from 19-21 hrs and aspirator catches (in chicken houses) from 18-21 hrs.

Species <i>Lutzomyia</i>	CDC near house & savanna	CDC in chicken-houses	Shannon in woodland	Aspirator in chicken- houses	Total dissected	Total infected
<i>longipalpis</i>	3	63	3	1	1,500	8
<i>antunesi</i>	1	0	0	0	20	3
<i>brasiliensis</i>	1	0	0	0	21	0
<i>marajoensis</i>	1	1	1	0	29	0
<i>oswaldoi</i>	0	0	1	0	3	0

light trap placed in the bedroom with the sleeping family caught 24 female *Lu. longipalpis*, one of which was infected. Three more infected *Lu. longipalpis* were captured in the surrounding chicken-houses. Table I shows the results, and indicates the usefulness of CDC traps in the chicken-houses.

All of the eight *Lu. longipalpis* and three *Lu. antunesi* promastigote infections were suprapylarian (LAINSON & SHAW, 1979) in nature and appeared to be *Leishmania*. In all cases the intestine was cut into pieces and the suspension inoculated into two or three hamsters by intraperitoneal and subcutaneous injection. On the latter visit, a small amount of material from each positive sandfly was also cultured in 'Difco B45' and Hoff's media. Three of the four infections treated in this way, produced cultured promastigotes in both media: on return to Belém, however, the cultures gradually died out and only one has survived passage.

The promastigote infections encountered in *Lu. antunesi* are of particular interest. Their intradermal inoculation into hamsters has so far failed to produce any skin lesions, and there remains the interesting possibility, therefore, that they are promastigotes of *L. chagasi* and that *Lu. antunesi* might represent a secondary vector of this parasite.

References

- Dean, L. M. (1956). *Leishmaniose visceral no Brasil*. Serviço Nacional de Educação Sanitária, Rio de Janeiro, Brasil.
- Deane, M. P. & Deane, L. M. (1954). Infecção natural no *Phlebotomus longipalpis* por leptomonas, provavelmente de *Leishmania donovani*, em foco de calazar, no Ceará. *Hospital (Rio de Janeiro)*, 45, 697-702.
- Lainson, R. & Shaw, J. J. (1979). The role of animals in the epidemiology of South American leishmaniasis. In: *Biology of the Kinetoplastida*, Vol. 2. Lumsden, W. H. R. & Evans, D. A. (Editors). London & New York: Academic Press, pp. 1-116.

Lainson, R., Shaw, J. J., Silveira, F. T. & Fraiha, H. (1983). Leishmaniasis in Brazil. XIX: Visceral leishmaniasis in the Amazon Region, and the presence of *Lutzomyia longipalpis* on the Island of Marajó, Pará State. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 77, 323-330.

Lainson, R., Ward, R. D. & Shaw, J. J. (1977). Experimental transmission of *Leishmania chagasi*, causative agent of neotropical visceral leishmaniasis, by the sandfly *Lutzomyia longipalpis*. *Nature*, 226, 628-630.

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