Mem. Inst. Oswaldo Cruz, Rio de Janeiro, Vol. *88* (4): 509-512, oct./dec. 1993

STUDIES ON THE SANDFLY FAUNA OF SAMUEL ECOLOGICAL STATION, PORTO VELHO MUNICIPALITY, RONDÔNIA STATE, BRAZIL

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In a study of sandfly species in the Samuel Ecological Station, in Porto Velho, Rondônia State, the following species were identified: Lutzomyia braziliensis, L. evangelistai, L. gomezi, L. anduzei, L. flaviscutellata, L. richardwardi, L. shawi, L. umbratilis, L. yuilli yuilli, L. dendrophyla, L. puctigeniculata, L. shannoni, L. amazonensis, L. ayrozai, L. carrerai carrerai, L. claustrei, L. davisi *and* L. lainsoni.

L. richardwardi, L. umbratilis *and* L. c. carrerai *were the predominant species captured of man forming 60.3%, of the total catch.* L. richarwardi *was the most frequent at ground level (29.9%), while* L. umbratilis *predominated in the canopy (48.5%).*

Key words: Sandfly fauna – *Lutzomyia* – Rondônia State

American cutaneous leishmaniasis (ACL) has been considered as one of the major parasitic diseases occurring in the Amazonian region (Eletronorte, 1990). In Central Amazônia, ACL is a zoonosis caused by *Leishmania (V.) guyanensis,* which is transmitted by *Lutzomyia umbratilis* (Lainson et al., 1979). *L. whitmani* and *L. anduzei* have been considered as secondary vectors, maintaining the transmission among silvatic mammals (Lainson, 1983).

As with much of the Amzonian region, Rondônia State has been settled recently because of national economic pressures. The disease in this region is an occupational hazard and it is related to colonization.

With the objective of amplifying knowledge of the sandfly fauna of Northewestern Brazil, the present paper reports a study of sandfly species captured in the Samuel Ecological Station, Rondônia State.

MATERIALS AND METHODS

Study area – The Samuel Ecological Station has 28.865 ha and it is located in Porto Velho Municipality (8°50' – 9°04'S and 63°08' – 63°19'W). It is bounded to the north and east by the Gleba Jacundá, to the south by Jamari National Forest, and to the west by the Jamari river (Fig.). This is an area of "Tropical Forest" and the predominant vegetation type is "floresta densa de terra firme".

Meteorological data – It has a tropical wet hot climate, with three dry months (June-August) and four very rainy months (December-March).

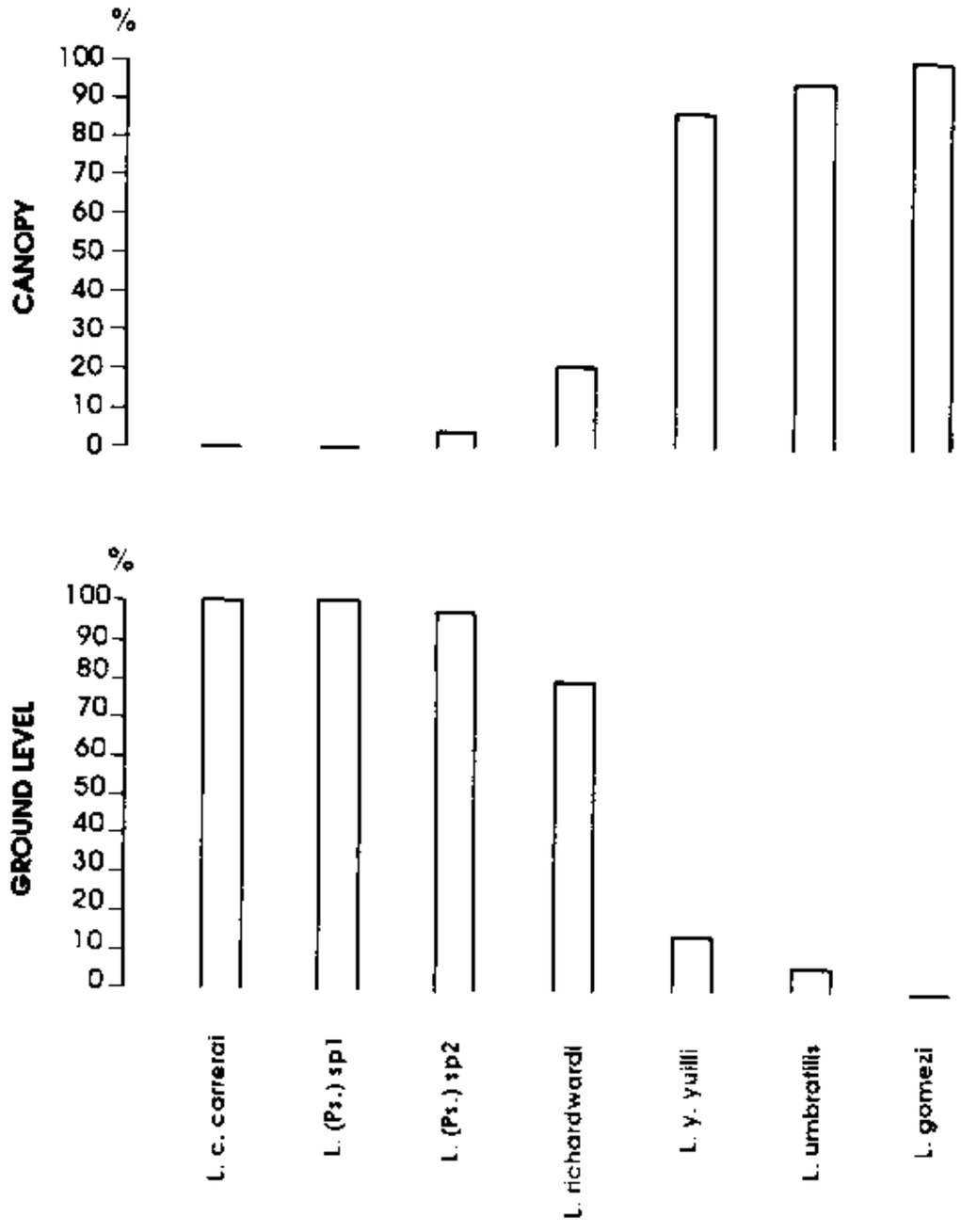
According to more recent data (Eletronorte/ Sondotécnica, 1988) the annual rainfall was 2,010-2,950 mm; the average temperature ranged between 24.8 °C – 26.3 °C; the relative humidity was 74.2 – 90.2%.

Mammal fauna – According to Eletronorte/ Sondotécnica (1988) there are 33 types of mammals in the region; some of them could be *Leishmania* reservoirs.

Sandfly captures – During October/November/December 1990 and May/June/July 1991, captures were performed daily between 6 p.m. and 8 p.m., using a manual aspirator. Sandflies that bit man, were caught simultaneously at ground level and at 20 m above ground level, in the canopy.

Work supported by ELETRONORTE (RO and DF); FUNASA (RO) and CNPq grant no. 40.0649/89.6

Received 5 April 1993.
Accepted 26 July 1993.



Stratification of sandflies collected on human bait in Samuel Ecological Station, in Porto Velho Municipality, Rondônia State. October-December 1990 and May-July 1991.

RESULTS

Sandfly fauna – A total of 1,143 sandflies were captured in 112 hr of which 99.73% were females. According to the classification given by Young & Ducan (1992), the following species were found:

Subgenus *Psychodopygus* Mangabeira, 1941
Lutzomyia amazonensis (Root, 1934)
L. ayrozai (Barretto & Coutinho, 1940)
L. carrerai carrerai (Barreto, 1946)
L. claustrei Abonnenc, Lèger & Fauran, 1979
L. davisi (Root, 1934)
L. lainsoni (Fraiha & Ward, 1974)
L. spp.

Subgenus *Nyssomyia* Barretto, 1962
Lutzomyia anduzei (Rozeboon, 1942)
L. flaviscutellata (Mangabeira, 1942)
L. richardwardi Ready & Fraiha, 1981
L. shawi Fraiha, Ward & Ready, 1981
L. umbratilis Ward & Fraiha, 1972
L. yuilli yuilli Young & Porter, 1972

Subgenus *Psathyromyia* Barretto, 1962

TABLE

Sandflies collected on human bait in Samuel Ecological Station, in Porto Velho Municipality, Rondônia State Brazil October-December 1990 and May-July 1991

	Ground level		20 m above ground level		Total	
	No.	%	No.	%	No.	%
1. *L. richardwardi*	209	29.9	56	12.7	265	23.2
2. *L. umbratilis*	14	2.0	214[a]	48.5	228	19.9
3. *L. c. carrerai*	197	28.1	–	–	197	17.2
4. *L. y. yuilli*	17	2.4	106	24.0	123	10.8
5. *L. (Psychodopygus)* spl	118	16.9	–	–	118	10.3
6. *L. (Psychodopygus)* sp2	86	12.2	3	0.7	89	7.8
7. *L. gomezi*	–	–	33	7.5	33	2.9
8. *L. davisi*	22	3.1	1	0.2	23	2.0
9. *L. ayrozai*	15	2.1	–	–	15	1.3
10. *L. evangelistai*	–	–	10	2.3	10	0.9
11. *L. shannoni*	1	0.1	8	1.9	9	0.8
12. *L. lainsoni*	5	0.7	2	0.4	7	0.6
13. *L. dendrophila*	–	–	6[b]	1.4	6	0.5
14. *L. amazonensis*	5	0.7	–	–	5	0.4
15. *L. shawi*	5	0.7	–	–	5	0.4
16. *L. flaviscutellata*	3	0.4	–	–	3	0.3
17. *L. anduzei*	2	0.3	–	–	2	0.2
18. *L. claustrei*	2	0.3	–	–	2	0.2
19. *L. punctigeniculata*	1	0.1	1	0.2	2	0.2
20. *L. braziliensis*	–	–	1	0.2	1	0.1
Total	702	100.0	441	100.0	1143	100.0
Spent hours	112					
Spent days	56					

a: including 2 ♂♂.
b: including 1 ♂.

Lutzomyia punctigeniculata (Floch & Abonnenc, 1944)
L. shannoni (Dyar, 1929)
L. dendrophila (Mangabeira, 1942)

Subgenus *Lutzomyia* França, 1940
Lutzomyia evangelistai Martins & Fraiha, 1971
L. gomezi (Nitzulescui, 1931)

Group Aragaoi Theodor, 1965
Lutzomyia braziliensis (Costa Lima, 1932)

Table shows that these following species were predominant, using human bait: *L. richardwardi* (23.2%), *L. umbratilis* (19.9%) and *L. c. carrerai* (17.2%), corresponding to 63% of the collected sandflies.

Antropophily of species – Table shows all the species collected biting man. *L. richardwardi* and *L. umbratilis* were the most abundant anthropophilic sandfly species during the captures. *L. richardwardi* was the most active at ground level (29.9%), while with *L. umbratilis* was more common at 20 m (48.5%).

Stratification studies – Figure shows the occurrence of species which are more frequent at ground level compared with the canopy. Collection of species, *L. c. carrerai* (100.0%), *L. (Psychodopygus)* spl (100.0%) and *L. (Psychodopygus)* sp2 (96%) occurred predominantly at ground level. Although *L. richardwardi* was more frequent (79%) at this level, it was taken in the canopy (21%). Only three species were found in high numbers in the canopy: *L. gomezi* (100.0%), *L. umbratilis* (94%) and L. y. yuilli (86%).

These results suggest the high frequency of subgenus *Psychodopygus* species on the ground floor, while the Subgenus *Nyssomyia* was predominantly, in the canopy, with the exception of *L. richardwardi.*

DISCUSSION

The studies performed at the Samuel Ecological Station have indicated the presence of 20 species of sandflies, with a predominance of three species: *L. richardwardi, L. umbratilis* and *L. c. carrerai. L. umbratilis* and *L. flaviscutellata* are confirmed as being important vectors of cutaneous leishmaniasis in North Brazil (Lainson & Shaw, 1968; Lainson et al., 1979).

Some studies on sandflies from Rondônia State have contributed interesting results (Martins et al., 1965; Biancardi et al., 1982).

Sandfly surveys carried out in the past in Rondônia State, paid no attention to the biology of the species. Martins et al. (1965) performed captures and identified 40 species and indicated that *L. shannoni, L. flochi* and *L. wilsoni* were the most frequent. In 1978 Martins et al. cited two more species of the genus *Lutzomyia,* being the total number of species to 42. Biancardi et al. (1982) collected 62 species and showed that *L. antunesi, L. yuilli* and *L. davisi* constituted about 42% of their collection. These authors cite 36 species that had not previously been reported in Rondônia State and suggested the difference was due to collecting methods.

In the present work, we report *L. shawi* and *L. punctigeniculata* for the first time in Rondônia State. We are considering *L. (Psychodopygus)* spl species as belonging to *squamiventris* series and *L. (Psychodopygus)* sp2 as species of the guyanensis series, because we collected only females, and the studies of these series are confused up to now.

Biancardi et al. (1982) worked near to the Samuel Ecological Station and collected males of *L. chagasi* and *L. complexa:* the females were grouped as *L. (Chagasi)* sp. because they can not be separated morphologically. In the same area these authors reported *L. guyanensis,* however Young & Ducan (1992) report the distribution of this species as restrict to French Guyana, thus suggesting that the *L. guyanensis* male in described could be *L. corossoniensis, L. geniculata* or *L. dorlinsis.*

There are few studies about stratification of sandflies in the Amazon region. In Central Amazônia, Arias & Freitas (1977) using human bait and horse bait at ground level, and the human bait in the canopy, foud *L. squamiventris* (cited as *L. maripaensis*), *L. davisi, L. ayrozai* and *L. umbratilis* (cited as *L. anduzei* Floch & Abonnenc) as the predominant species. *L. squamiventris* was the most common species taken off man and horse on the ground level, while *L. umbratilis* was predominant at 15 m above ground floor.

Arias & Freitas (1982) used CDC light traps at 1 m and 15 m height in the Ducke Forest Reserve, near to Manaus City, in Central

Amazon. They observed *L. anduzei* and *L. umbratilis* as the predominant species – 70.6%. It was verified that *L. anduzei, L. rorotaensis, L. ruii, L. umbratilis* and *L. squamiventris* were abundant at one meter. *L. anduzei* and *L. umbratilis* were dominant at 15 m above the ground floor.

Although the different methods of capture may influence the results, and the ecological conditions may cause some modification to the sandfly population, in general, we observed the predominance of subgenus *Psychodopygus* and *Nyssomyia* at ground level and in the canopy, respectively, as was reported by Arias et al. (1982) and Ready et al. (1986).

ACKNOWLEDGEMENTS

To Dr Eunice A. B. Galati, São Paulo University, and Dr Paul Ready, The Natural History Museum, for their critical reading the manuscript.

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