

COMUNICACIONES.

**Peridomestic latrines and Phlebotominae sandflies (Diptera: Psychodidae) in a focus of Leishmaniasis in Costa Rica.**

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**Resumen:** Las letrinas peridomiciliarias son sitios de reposo de flebótomos en Nazareth (Guanacaste, Costa Rica). Un total de 622 individuos fueron colectados y clasificados en cuatro especies, *Lutzomyia cayennensis* (58.68 %), *Lutzomyia chiapanensis* (35.53 %), *Lutzomyia longipalpis* (5.62 %), *Lutzomyia evansi* (0.17 %).

**Key words:** Leishmaniasis, Phlebotomine sandflies, diurnal resting places, Costa Rica.

In 1986-1987 more than two hundred cases of a cutaneous disease were found in a few neighborhoods of the town of Liberia, Guanacaste, Costa Rica. Forty-three of these were sampled and four parasite isolations were achieved; two were identified as *Leishmania infantum* (Zeledón *et al.* 1989; M. Rodgers, Pers. Comm. 1989). Preliminary collections in the area showed the occurrence of four species of sandflies: *Lutzomyia longipalpis* (Lutz and Neiva), *Lutzomyia evansi* (Nuñez-Tobar), *Lutzomyia cayennensis* (Floch and Abonnenc) and *Lutzomyia chiapanensis* (Dampf) (Zeledón *et al.* 1989).

Management of resting places has been successfully used during integrated pest management programs for many vectors (Metcalf 1982) including sandflies (Ready *et al.* 1985); proper identification of resting areas is the first step to identify target areas in control programs; here we report on diurnal resting places in human dwellings.

The study was conducted in Nazareth (Liberia; Guanacaste); it is a marginal neighborhood (10 37' 54" N; 85 26' 18" W). Its total area is approximately four square kilometers and it is divided into irregular plots, each

surrounded by dusty rural roads. Each plot has been fractionated in a variable number of 300 square meters lots for human occupation. Human dwellings have a domiciliary and a peridomestic area. Its peridomestic area may have a small garden, a latrine, a small area where domestic waste is abandoned or burned and some animal installation where domestic animals such as dogs, pigs or chickens sleep. Its domiciliary area is small (less than 100 square meters); the condition of the houses is poor.

**Standardized sampling:** We conducted diurnal trapping of sandflies in the domiciliary and peridomestic environments. Each dwelling was inspected every two months during one year and sticky traps were located in selected places to detect and collect sandflies resting during diurnal hours. Based on preliminary trapping data and due to the fact that latrines are a common structure in all houses, we selected them as sampling units. Diurnal collection of sandflies were conducted in 42 latrines selected at random during daily hours using a blow type aspirator (same operator every time) during five minutes, every two months (February - December, 1989). Sandflies were collected in

alcohol, cleared in phenol (90 %), counted, sexed and identified based on genitalia and cibarial structures (Murillo y Zeledón 1985).

The only resting places found during this study were peridomestic latrines; other areas inspected do not have sandflies. *L. cayennensis*, *L. chiapanensis*, *L. longipalpis* and *L. evansi* were found in and around human dwellings.

Table 1 shows the annual collection data and sex proportion for each species captured; *L. cayennensis* is the most abundant. Changes in the number of latrines with sandflies (Fig. 1) and in the number of haematophagous females per latrine (Fig. 2) were observed during the year.

Originally described from Neotropical savatic or forested areas, Phlebotominae sandflies

TABLE 1

Annual collection data for sandflies (Diptera: Psychodidae) in Nazareth (Guanacaste: Costa Rica); they were captured in peridomestic latrines during diurnal hours.

Species	Individuals (number).	% Males.	% Females.
<i>L. cayennensis</i>	362	55.2	44.7
<i>L. chiapanensis</i>	219	41.1	58.9
<i>L. longipalpis</i>	33	36.3	63.6
<i>L. evansi</i>	1	0.0	100.0

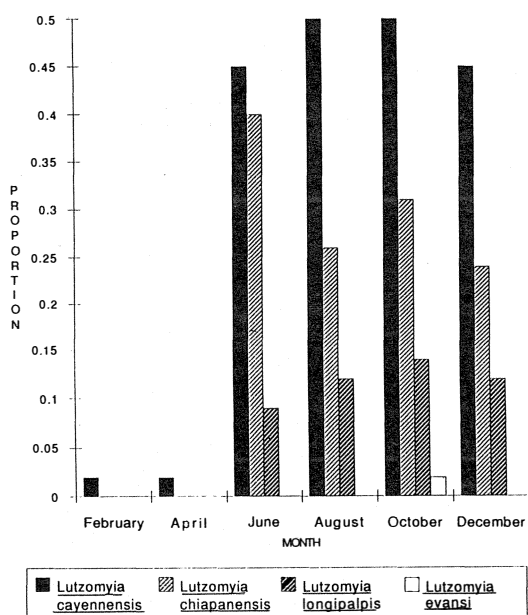


Fig. 1: Bimonthly proportion of infested latrines (# of latrines with at least 1 sandfly / n ; n=42) in Nazareth

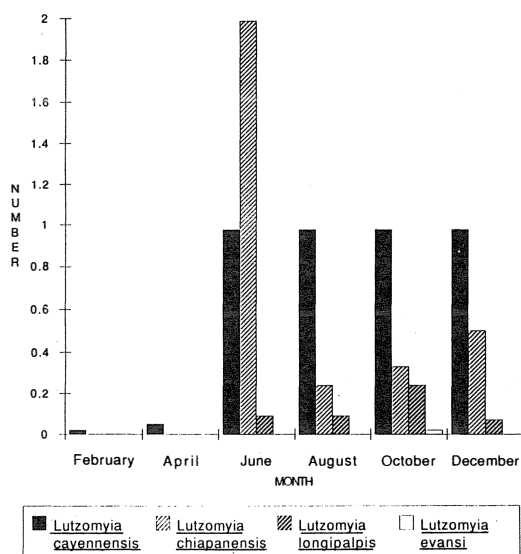


Fig. 2: Bimonthly relative abundance of haematophagous female sandflies / n ; n = 42) in Nazareth (Guanacaste: Costa Rica)

are a highly diverse group in Costa Rica (Murillo and Zeledón 1985); their adaptation to secondary growth forested (or cropped) areas may facilitate a domiciliary and/or peridomestic transmission cycle for cutaneous leishmaniasis (Zeledón *et al.* 1985).

In Guanacaste, habitat characteristics and vector occurrence were used to suggest that visceral leishmaniasis occurs in the area (Zeledón *et al.* 1984). Human dwellings provide shelter and sources of food (blood meals from humans or domesticated animals) for sandflies; haematophagous females of four species were found during diurnal hours in latrines which could have some implications for visceral leishmaniasis. In Nazareth, there had been two isolations of *Leishmania infantum* from nodular lesions (Zeledón *et al.* 1989); during the rainy season we found *L. longipalpis* and *L. evansi* in latrines; they have been previously reported as antropophilic (Zeledón *et al.* 1985). Feeding habits of the other two species are unknown.

Environmental factors such as temperature, humidity and wind may limit phlebotomine activity and adaptation to a particular habitat (WHO 1980); the ecological characteristics of Nazareth are different from any area previously studied in Costa Rica. Hard environmental conditions (semiarid, dry open area with strong

winds) may explain why only four species were collected. Changes in the number of females (Fig. 2) captured by month could also indicate a seasonal trend.

In Nazareth, latrines were the only diurnal resting places identified during this study in the human dwellings either in the peridomiliary or the domiciliary environments. During the dry season they may represent a humid and protected place for adult sandflies and a possible breeding place for immatures. Observed changes in the number of latrines with sandflies (Fig. 1) may indicate distributional differences among months due to dispersion or emergency.

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