

## SUMMARY OF THESIS\*

---

**SILVA**, Onilda Santos da - Studies on sandflies (Diptera: Psychodidae) of the Parque Estadual do Turvo, RGS, Brazil, and their role in *Leishmania* transmission. Tübingen, Germany, 2000. (Thesis presented to Department of Medical Entomology, Hygiene Institute of the Eberhard-Karls-University, to obtain a Doctor Degree in Biological Sciences).

---

### STUDIES ON SANDFLIES (DIPTERA: PSYCHODIDAE) OF THE PARQUE ESTADUAL DO TURVO, RS, BRAZIL, AND THEIR ROLE IN *Leishmania* TRANSMISSION

To identify the local sandfly fauna of the Parque Estadual do Turvo, and estimate their role in *Leishmania* transmission in the Park's marginal forest zone (27°10' - 27°20' S and 53°40' - 54°10' W), sandflies were collected during three summer seasons (Nov 1996 to Feb 1997, Nov 1997 to Jan 1998 and Nov 1998 to Jan 1999). Domicile sites sampled by aspirator were the indoor and outdoor surfaces of the walls of the house. Peridomicile sites were a chicken pen and cattle shelter. The forest site was sampled by a Shannon trap 3 km west of the lodge.

Polymerase chain reaction (PCR) probes were applied to 2,270 females to identify natural infection by *Leishmania* (*Viannia*), the causative agent of ACL.

A total of 5,244 specimens were collected comprising 12 *Lutzomyia* and 2 *Brumptomyia* species. The species belonged to *Lu. migonei*, *Lu. pessoai*, *Lu. lanei*, *Lu. misionensis*, *Lu. neivai*, *Lu. shannoni*, *Lu. monticola*, *Lu. fischeri*, *Lu. bianchigalatae*, *Lu. schreiberi*, *Lu. correalimai*, *Lu. alphabetica*, *B. pintoï* and *B. nitzulescui*. All three surveys revealed that *Lu. migonei* and *Lu. pessoai* predominate in the domicile and peridomicile areas, while *Lu. misionensis* was the most numerous species in the forest.

Naturally infected females were only found during the first survey. From 920 females examined *Leishmania* (*V.*) infections were detected by kDNA amplification in two *Lu. pessoai* females from the domicile area and one *Lu. misionensis* female from the forest area. *Lu. misionensis* has never been found before carrying a natural infection of *Leishmania* (*V.*).

While identifying the sandflies it was noticed that one male had blood in the alimentary canal. By careful examination of 1,743 males collected, 62 were found to have blood in the gut (55 *Lu. migonei*, 5 *Lu.*

*pessoai*, 1 *Lu. fischeri* and 1 *B. pintoï*). The presence of mammalian erythrocytes was confirmed by examining the gut by Giemsa-stained smears. All blood-fed males were caught in the peridomicile area.

To obtain more information about the mechanism of blood feeding in males, the mouthparts of both males and females of *Lu. migonei* were compared by scanning electron microscopy and light microscope. Mandibles are present in both sexes but in males they are reduced and in contrast to females no teeth were observed. As in females, the laciniae in males are highly sclerotised, but the number of lateral teeth are reduced and retrorse teeth are absent. Only females present teeth at the tip of the hypopharynx while in males they are substituted by spicula. Except for the length from the junction with the hypopharynx to the tip, that is shorter in males than in females, the labrum is similar in both sexes in terms of form and sensilla. On the labrum of males sensilla could be detected, similar to the apical sensilla of females which might play a role in the identification of blood. However, further studies should identify if the function of these sensilla in males *Lu. migonei*, are homologous to those in females.

Because of the epidemiological importance of *Lu. migonei* on *Le. (V.) braziliensis* transmission, studies were conducted to investigate DNA polymorphism in samples originating from three areas of Brazil (São Paulo, Turvo park and Santa Maria, RGS), and one sample reared in laboratory, originating from Venezuela. The studies were conducted using random-amplified polymorphic DNA polymerase chain reaction (RAPD-PCR). From ten decamer primers tested, only three were able to discriminate between the samples. In the Brazilian samples, only constant fragments were obtained when compared with Venezuelan samples. This differentiation among the samples could be associated with geographical distribution or be may due to particular adaptive strategies related to the biology of these species.

---

\*This thesis is available at the Library of the Instituto de Medicina Tropical de São Paulo