

Modification of Disney trap for capture of sand flies (Diptera: Psychodidae: Phlebotominae)

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This paper describes the modifications made to the original model of the Disney trap, with a view to easier handling of the same, greater practicability in the collection of sand flies, protection of the animal bait and durability of the trap in the field.

Key words: Psychodidae - Phlebotominae - Disney trap - animal bait

Phlebotomine sand flies are diptera of great significance in public health, because, beyond being vectors of protozoa of the genus *Leishmania*, etiologic agents of leishmaniasis, they are also incriminated as vectors of arboviroses and bartonellosis (Miles et al. 1983, Tesh 1988, Killick-Kendrick 1990, Lainson & Rangel 2005).

Different methods of capture are necessary for the studies of sand fly-parasite relationships, vector behavior, taxonomy and ecology (Alexander 2000).

Among the traps that use animal as baits, the Disney's (Disney 1966) consists of a metal tray with a cage, holding the chosen bait, in the middle. Castor oil, for the capture of the insects attracted to the animal bait, is sprayed onto the tray. The insects, before or after contact with the bait, stick to the oil when they land on the surface of the tray.

At the beginning of the project on the sand fly fauna in a cutaneous leishmaniasis endemic area, Disney traps (as described by Maroli et al. 1997) were used to capture those species of low flight and zoophilic habits. However, the traps installed in forested areas were damaged by predators and did not thus offer sufficient security to the animal used as bait (normally a hamster, *Mesocricetus auratus*).

To solve this problem, the trap was modified as follows. The cage was placed between two galvanized zinc sheets (50 × 50 cm), with aluminum corners, which formed the roof and floor of the same. These sheets were placed so as to slide in such away as to facilitate cleaning

and the visualization and collection of the insects captured. Both of the sheets were sprayed with castor oil. The feet of the trap were removable to facilitate its installation (Figs 1, 2). In this study, the animals were housed in plastic boxes about 30 cm from the ground covered with an iron mesh, individually in accordance with the population density recommendations of Iar (1996), and on beds of wood (*Pinnus* sp.) shavings, being fed on Nuvilab CR-1 commercial food (Nuvital, Curitiba, PR, Brazil) and receiving water ad libitum. This type of box protected the animal better and prevented food residues and excrement from falling onto the lower sheet, damaging the insects, and making the visualization and withdrawal of the flies more difficult. The boxes were cleaned and the food replenished every week. An iron cage was constructed for the greater safety of the bait and was locked so as to prevent the traps being disturbed and the animals being removed or attacked (Fig. 3). As a result only two of the 36 animals used as sentinels died.

With the modified trap 1,191 sand flies (representing 59.6% of the total specimens collected) were caught in it. The remaining percentage was caught in Shannon and automatic light traps (unpublished observations). This may be explained by the fact that the modified Disney trap captured insects continuously whereas the others were only installed periodically and at night. Beyond having been effective, the modified trap showed selectivity in relation to the capture of certain species (Table). *Evandromyia bourrouli* (Barretto & Coutinho, 1941) contributed 57.3% of the total of sand flies captured on this project and it was captured exclusively with this trap.

Bichromomyia flaviscutellata (Mangabeira, 1942), known as a rodentophilic species, although it was also collected by the other two methods, accounted for 94.1% of the specimens captured in the modified Disney trap, 81.7% of them being females.

The continuous use of this type of trap, with the periodical removal of the zinc sheets, makes the study of the nictemeral behavior of the sand fly species possible.

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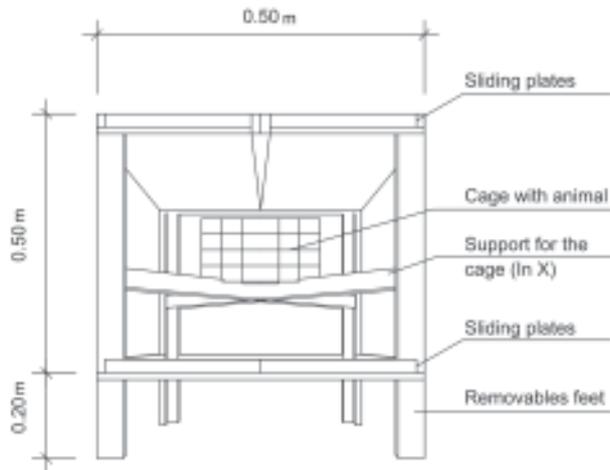


Fig. 1: schematic drawing of modified Disney trap.



Fig. 2: artistic drawing of modified Disney trap.

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TABLE

Relative abundance by species of sand flies captured with modified Disney trap in the municipality of Bela Vista, Mato Grosso do Sul, Brazil, from May 2004 to January 2006

Species	Males	Females	Total	%
<i>Bichromomyia flaviscutellata</i>	28	465	493	41.40
<i>Brumptomyia avellari</i>	4	0	4	0.34
<i>Brumptomyia brumpti</i>	3	1	4	0.34
<i>Evandromyia bourrouli</i>	582	100	682	57.26
<i>Evandromyia lenti</i>	1	1	2	0.17
<i>Lutzomyia longipalpis</i>	1	1	2	0.17
<i>Psathyromyia campograndensis</i>	0	1	1	0.08
<i>Psathyromyia punctigeniculata</i>	0	1	1	0.08
<i>Psathyromyia shannoni</i>	1	0	1	0.08
<i>Sciopemyia sordelli</i>	1	0	1	0.08
Total	622	569	1191	100

Fig. 3: modified Disney trap, installed in a forested area of the 10^o Regimento de Cavalaria Mecanizado, Bela Vista, MS, Brazil.

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