Technical adaptations of retention traps used to catch drosophilids.

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Introduction

In Brazil, one of the current methods most utilized for the capture of live adult drosophilids in the field is the use of traps based on the model proposed by Tidon and Sene (1988). However, this model presented methodological problems that led to the implementation of structural changes by Klaczko and Medeiros (1999). Nevertheless, some problems remain. In this study, we present innovations aimed to resolve these problems improving the practicality and efficiency of drosophilid retention traps.

Trap Description

For constructing of the proposed model, we use two joined PET two liter soft-drink bottles (Figure 1-A). For a perfect fit, the bottles should have the same format without curves.

The flies retention compartment consists of a whole bottle (Figure 1-B). In the bottleneck there is a wire to hang the traps in the sampling sites (usually trees). Inside the bottle cap there is another wire that anchors a cotton roll wrapped in gauze used by the flies as a landing site (perch). One millimeter holes located next to the bottleneck help eliminate excess moisture inside the bottle (Figure 1-C). The bottom half of this bottle is painted black to induce drosophilids to move toward the translucent region of the bottle, since they have positive phototaxis. In the painted part, there are holes (0.5 cm diameter) arranged in sets of three parallel series allowing for the flies entry (Figure 1-D). These holes are closed with adhesive tape when the traps are removed from the field to prevent the escape of captured specimens. In addition, in the same part of the retention compartment, a wire is traversed from one side of the bottle to the other and tied at each end forming nodes. At the base of the retention compartment, there are five holes about 2.0 cm in diameter, covered by thin mesh screens and fixed with PVC or styrofoam glue. These holes allow for the passage of the bait smell, which is isolated in a specific compartment. This eliminates the direct contact of the flies with the bait (Figure 1-E).

The bottom of the trap is the bait storage compartment. This compartment is completely painted black and it is the bottom half of another bottle. On each side of the bottle there is a wire that is going to be tied to the nodes of the retention compartment when joining the bottles (Figure 1-F).

Advantages of This Model Compared to Previous Models

One of the problems with the Tidon and Sene (1988) model is the flies contact with the bait, since the entry holes are located in the bait compartment. Medeiros and Klaczko (1999) made entry

holes in the retention compartment, and they covered the bait compartment with a piece of panty hose. However, this material proved to be inefficient due to damage caused by coleopterans. In our model, the retention compartment is totally isolated from the bait. Thus, captured flies do not adhere to the bait and oviposition chances outside of laboratory cultures are minimized.

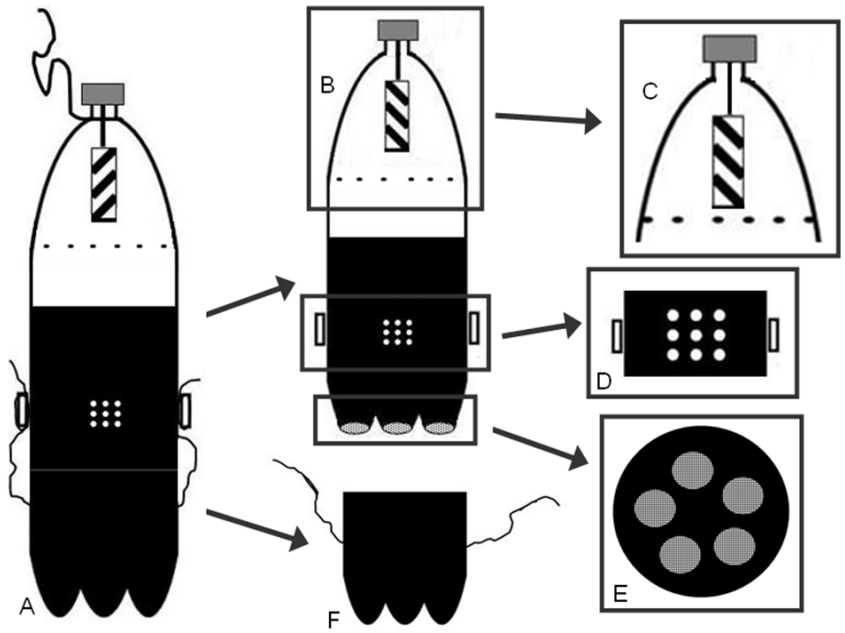

Figure 1. Improved trap model for live drosophilid retention. A: complete trap; B: flies retention compartment; C: perch flies and small holes for moisture elimination; D: holes for flies entry; E: holes for bait smell passage; F: bait storage compartment.

In the previous two models, many specimens escaped due to inadequate joining of the compartments. In our model, there is a tight fit that prevents the flies entry directly into the bait compartment and reduces bait predation by small mammals (*e.g.*, capuchin monkeys, coatis, and marsupials).

Another disadvantage of the previous models is the loss of flies that stay trapped between the funnel and the wall of the upper bottle. In our model, the funnel is unnecessary and its absence minimizes such losses. This still decreases the number of bottles required for the traps manufacture, which saves time and financial resources.

Our trap model is very efficient in retaining drosophilids: Roque and Tidon (2008) obtained 1,050 individuals in a single trap. We recommend its use for field studies collecting drosophilids, considering the abundance of flies caught using our model as well as its technical advantages.

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References**:** Medeiros, H.F., and L.B. Klaczko 1999, Dros. Inf. Serv. 82: 100-102; Roque, F., and R. Tidon 2008, Dros. Inf. Serv. 91: 94-98; Tidon, R., and F.M. Sene 1988, Dros. Inf. Serv. 67: 90.

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