

A SIMPLE APPARATUS TO SEPARATE MOSQUITO LARVAE FROM FIELD COLLECTED SAMPLES

RAUL E. CAMPOS¹ AND JUAN J. GARCIA^{2,3}

Ecological studies of larval mosquitoes usually require collecting numerous samples. Many samples containing mosquito larvae contain substantial quantities of debris which must be separated from the larvae. This can be a tedious and time consuming task. Water clarity may also make separation of larvae and pupae from the sample difficult. We developed a simple and inexpensive apparatus that can be used to separate larvae and pupae from field collected samples during ecological studies of larval mosquitoes in Argentina. The apparatus is reliable and saves time.

The separator (Fig. 1) is constructed of a wide mouth, transparent, screw top glass jar (A) of the desired volume. Plastic may be used but

glass is preferable because the weight of the glass container helps to keep the separator submerged. The center of the screw top is removed leaving a lip around the inner edge to which an inverted plastic funnel is attached with water insoluble glue (B). The narrow end of the funnel should be no more than 2-3 cm in diameter. Several small holes are made along the bottom edge of the funnel with a hot metal nail (C).

The field sample (immatures and debris) is placed into the jar and the screw top with funnel is attached. Care must be taken that the jar is not packed too tightly. The separator is then placed into a larger container (bucket, pail etc.) (D) that is wider and deeper than the separator. The larger container is slowly filled with water until the level is approximately 5 cm above the top of the funnel. The small holes around the base of the funnel allow water to fill the apparatus without disturbing the debris.

Larvae and pupae in the sample rise from the settled debris and exit the sample into the larger container by passing through the small opening in the top of the funnel. Eighty-one percent (± 2.71) of larvae and pupae were extracted from 5 tire samples containing *Aedes albopictus* (Skuse), *Culex quinquefasciatus* Say and *Cx. territans* Walker after 15 minutes. After 60 min, $99.0 \pm 0.3\%$ of the larvae and pupae were extracted. All of the pupae and fourth instar larvae were removed in the first 15 min, while early instar larvae require longer periods. When the separator is removed from the larger container, the larvae and pupae remain behind and can be concentrated by using a sieve.

Bidlingmayer (1954) described a method for the separation of immature *Mansonia* from associated plants in the field. Dislodged larvae and pupae were confined in a metal cylinder and obliged to surface through an inverted cone or pyramids that impeded their return to the bottom. This technique was miniaturized by Morris et al. (1985), who placed siphoned samples containing *Coquillettidia perturbans* (Walker) and other plant-associated mosquitoes into polyvinylchloride cylinders fitted with an inverted funnel. Clean water was then added to 5 cm above the funnel, and mosquito immatures collected from the surface after 24-h exposure. The apparatus described in this report operates on the same principle as these previously described devices but is easily constructed and can provide a simple, inexpensive and reliable method for separation of immature mosquitoes from debris. We have used this apparatus to separate con-

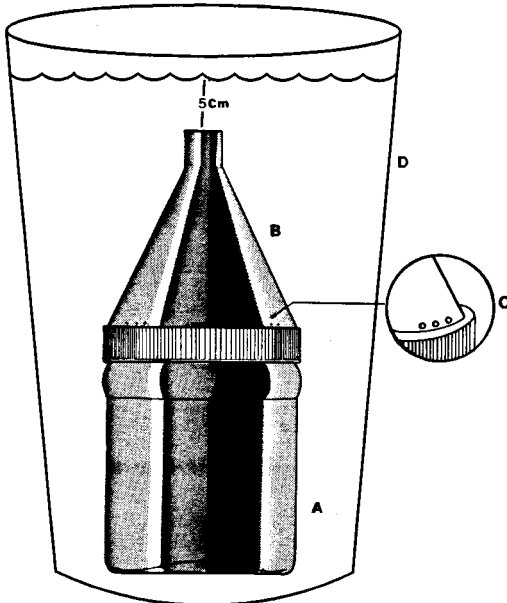


Fig. 1. Apparatus to separate mosquito larvae from field collected samples. Glass jar (A); attached funnel (B); enlargement of small holes on bottom edge of funnel (C); large container filled with water (D).

¹ On fellowship from CONICET at CEPAVE, 2 No. 584 (1900) La Plata, Argentina.

² On fellowship from CONICET and presently at the USDA ARS, Medical and Veterinary Entomology Research Laboratory, Gainesville, FL 32604. Permanent address is CEPAVE, National University of La Plata, Calle 2 No. 584, (1900) La Plata, Argentina.

³ Investigator for the Commission of Scientific Investigations (CIC) from the Province of Buenos Aires.

tainer-inhabiting mosquitoes (*Aedes* spp.) from leaves and silt, and to separate *Culex* spp. larvae and pupae from debris in polluted water. This apparatus is particularly useful in remote locations.

We thank P. Lounibos, D. Kline, T. Jensen and J. Becnel for editorial comments and helpful suggestions in preparing this report.

REFERENCES CITED

- Bidlingmayer, W. L. 1954. Description of a trap for *Mansonia* larvae. *Mosq. News* 14:55-58.
- Morris, C. D., J. L. Callahan and R. H. Lewis. 1985. Devices for sampling and sorting immature *Coquillettidia perturbans*. *J. Am. Mosq. Control Assoc.* 1:247-250.