OPERATIONAL AND SCIENTIFIC NOTES

A SMALL MOSQUITO TRAP FOR USE WITH ANIMAL OR CARBON DIOXIDE BAITS

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INTRODUCTION. The trap described in this paper was developed at the Trinidad Regional Virus Laboratory in 1966 to meet the need for a small, simple mosquito trap which could be easily carried for long distances by one person. At that time the trap was required for surveys plotting the distribution of rodent-biting forest mosquitoes in Trinidad, when it was hoped to set a number of traps at different locations each night.

It was found that one man could carry up to ten of these "No. 17" traps, as they came to be called, and that one trap when baited with two adult white mice, caught about half the number of mosquitoes as the "Double-Baited Cage Trap" (Worth and Jonkers 1962) baited with four mice which was in general use at that time. The trap is even simpler to construct than the "Versatile Mosquito Trap" of Sommerman and Simmet (1967).

Over the past two years the No. 17 Trap has superseded the Double-Baited Cage Trap in Trinidad as a general collecting method for mosquitoes for virus studies, and has been used successfully with other baits such as baby chicks, sentinel baby mice and solid carbon dioxide. The No. 17 Trap has been used on a regular basis in the forest near Belém, Brazil (J. P. Woodall, personal communication), and for a short period in British Honduras (D.S. Bertram, personal communication).

In the forests of Trinidad one No. 17 Trap, when baited with two adult mice will often catch two or three hundred mosquitoes of about thirty species per night. A few simuliids, phlebotomines, horseflies and calliphoriids may also be taken.

CONSTRUCTION DETAILS. The trap consists of three basic parts, lid, net with spreader ring and the bait cage which also acts as a baffle. These items are shown in Fig. 1.

Lid. The lid is simply a disc of ¼ inch (6mm) plywood, diameter 12 inches (30.5cm) with a small central hole through which the suspension wire or string is attached. The under surface should be painted white and the edges sanded smooth. The upper surface may be painted any color; black is a very serviceable color. Although not strictly necessary, the paint serves to protect the plywood from the weather.

Net. Made from a simple tube of Terylene net. It has been found that the choice of net is very critical. (The use of nylon mosquito netting with knitted construction giving a round opening greatly reduced the catch.) The most efficient is made of Terylene having square openings with 22 meshes to the inch, (8.5 per cm). This material is widely sold for making net curtains. Start with a rectangle 38 inches by 18 inches (96.5cm by 54.7cm) sew a hem ½ inch (1.3cm) wide along both long sides, then fold the net and join the two short sides with 1 inch (2.5cm) overlap. Into the top hem slip 28 inches (71.0cm) of flexible curtain wire, joining the ends by flattening them onto a short wire insert. A piece of ¼ inch (0.6cm) elastic about 9 inches (23cm) long should be threaded into the lower hem and tied in a knot. The tension on this should be sufficient to give a tight fit on the base of the animal cage. A hole is required in the side of the net through which insects can be aspirated. The simplest outlet is made by cutting out the bottom of a small 1 inch diameter plastic vial, and cementing it with contact cement into a slit in the net. The lid of the vial can then be used to close the opening.

Spreader Ring. This should be made carefully. Its diameter should be the same as the lid, and the cross-wires should clip firmly over the raised rim of the base of the bait-cage. To make, take a piece of 16 gauge galvanized iron wire 39 inches (99cm) long, bend it into a circle, diameter 12 inches (30.5cm). The ends may be lightly soldered or twisted together where they overlap, and bound with tape. Two cross-wires are bent to the shape shown in Fig. 1. This is best done against a completed bait cage so that the U-shaped slots in the wire are a snug fit on the tin. Care should be taken to ensure that the slots are at least ½ inch (1.3cm) deep otherwise there will be too small a rim projecting below the trap for the elastic edge of the net to grip.

Bait Cage. This is based on a 1 U.S. quart motor oil tin. Cut out both ends, and cut the remainder in half. This gives two open-ended cylinders diameter 4 inches, length 2¾ inches (10.2cm by 7.0cm). Cut a piece of galvanized hardware cloth, mesh size ½ inch (1.3cm), 4 inches by 13 inches (10.2cm by 33.0cm), and bend it around the tin, joining where the edges overlap by binding with fine wire. The cage thus formed should overlap the cut end of the cylinder by ½ inch (1 mesh) and can be held in place by tape or small bolts. The floor of the bait cage is a circle of ¼ inch mesh hardware cloth wired in place, 1½ inches (3.8cm) or three meshes from the cut end of the cylinder. This leaves a bait container 2 inches (5.1cm) high. Make a solid roof to the bait cage with plywood or galvanized iron. If two adult mice are to be used as bait, a partition will be required to prevent them from fighting.

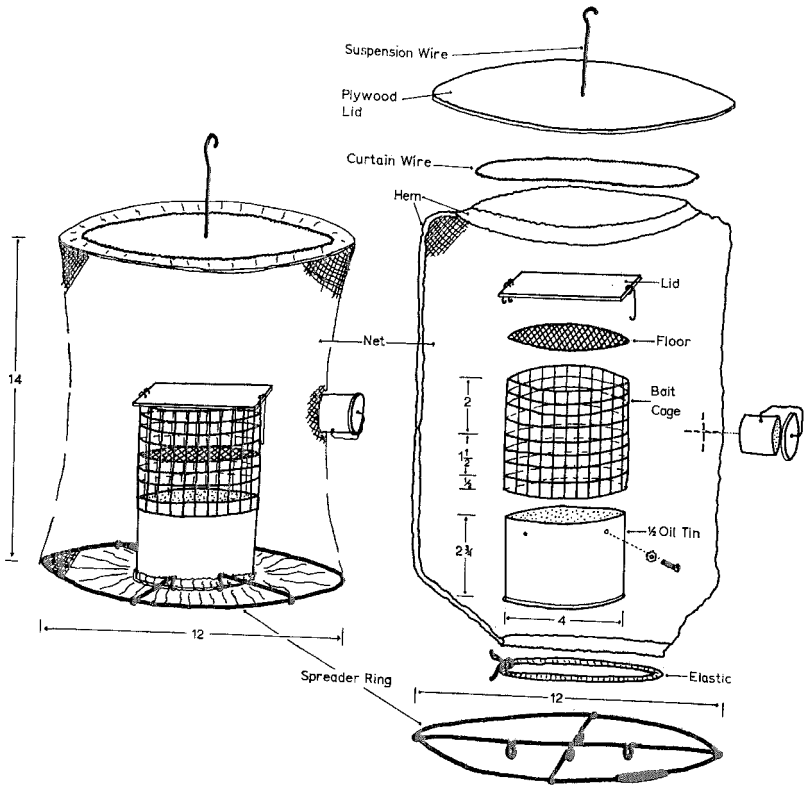

FIG. 1.—Diagram of the No. 17 Trap showing the complete trap, without bait, (left) and an exploded view of the construction details (right). All dimensions are in inches.

In making the cage the following points are important. The floor of the bait cage must be of a smaller mesh than the sides, but it must not be solid. It should lie 1½ inches (3.8cm) above the top edge of the tin and the whole of the cage should lie in the lower half of the trap when fully assembled.

METHOD OF USE. In practice, the spreader ring is kept permanently inside the net. Nets and lids are carried in one container whilst the bait cages loaded with mice or other animal and a little damp food are carried in a second. (If solid CO_2 is to be used, about 2 lbs. wrapped in newspaper may be substituted for the animal.) On reaching a satisfactory site, the net is placed on the ground or on a suitable surface, and the bait cage clipped into the slots in the spreader cross-wires. The elastic bottom of the net is then stretched over the bottom of the tin. Lastly, the wooden lid is slipped into the top of the net, and as the suspension wire is lifted the whole trap falls into shape and is kept rigid by its own weight.

Insects are removed by aspirator from the side opening. If there is a likelihood of the trap being invaded by ants, the suspension wire may be coated with motor grease.

If several traps are to be used for seasonal population studies, much of the possible variation between catching ability of individual traps can be reduced by random exchange of the three basic components between the traps.

ACKNOWLEDGMENTS. The studies on which this note is based were conducted with the support and under the auspices of the Governments of Trinidad and Tobago, Jamaica, Guyana, and the Eastern Carribbean Territories, the Ministry of Overseas Development of the United Kingdom Government, The Medical Research Council, and the Rockefeller Foundation.

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ATTACHMENT OF FIRST INSTAR *Simulium damnosum* (DIPTERA:SIMULIIDAE) LARVAE TO OLDER LARVAE

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First instar larvae of *Simulium damnosum* Theobald, the vector of onchocerciasis in Ghana, usually remain attached to the same substrate upon which the egg mass was laid by the female fly. They feed by browsing upon whatever microorganisms are growing on the substrate, such as diatoms or desmids, or trap plankton with their cephalic fans. The substrates are usually of plant origin, such as leaves, stems, twigs, or roots trailing in the current, but may also include stones, rocks, or the cement or concrete faces of dam spillways (Burton and McRae, 1965), dams proper, bridge abutments, or other supports.

Among a collection of older *S. damnosum* larvae made at Nangodi on the Red Volta River, Upper Region, Ghana, a large, closely-packed mass of mature larvae was found with many first instar larvae attached to their bodies (Fig. 1). Apparently the young larvae had either migrated on to the older ones by laborious locomotion along the grass stem substrate, or else had been deposited among the older larvae by the current. Under the microscope the young larvae were seen behaving as if they were on a normal substrate. They were outstretched in a feeding position, their cephalic fans opening and closing at intervals, trapping food particles and carrying them to the mouth, the microorganisms being raked off by the mandibles. The author is not aware that this type of attachment has been recorded before.

[1] These observations were made while the author was assigned to the National Institutes of Health (U.S.A.)—National Institute of Health and Medical Research (Ghana) Joint Research Program, Accra, Ghana.

FIG. 1.—First instar *Simulium damnosum* larvae attached to two older larvae which had themselves been attached to a grass stem along with a dense mass of other older larvae similarly affected (x7.8)

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A FIRST RECORD OF THE OCCURRENCE OF *Culiseta* (*Culicella*) *silvestris minnesotae* BARR (DIPTERA: CULICIDAE) IN NEW YORK [1]

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The male and female of *Culiseta minnesotae* were described by Barr in 1957 and the larva and pupa by Price in 1958. This species was later grouped with *C. silvestris* Shingarev as a morphologically and geographically distinct subspecies by Maslov (1964) in his revision of *Culiseta*.

Barr listed several Minnesota counties as the known distribution for *C. minnesotae* and stated

[1] Published by permission of the Assistant Commissioner, New York State Museum and Science Services, Jour. No. 131.