

## OPERATIONAL AND SCIENTIFIC NOTES

THE EFFECTIVENESS OF FLIT<sup>®</sup> MLO AGAINST *Aedes taeniorhynchus* LARVAE ON GRAND CAYMAN, BRITISH WEST INDIESJ. A. ARMSTRONG<sup>1, 2</sup>

A series of trials to determine the effectiveness of FLIT MLO against *Aedes taeniorhynchus* was carried out on Grand Cayman, B.W.I. during the months June and July, 1968. The FLIT MLO was provided through the courtesy of the Humble Oil Company. The aims were: (1) to determine the minimum dosages required to give effective control in the various larval habitats under field conditions, and (2) to ascertain the effect of weathering, in particular the effect of sunlight and light rain showers following application, on the oil film. During the period June to October, 1968 Grand Cayman experienced almost daily rain showers. For this period of approximately 150 days the longest continuous dry spell (no rain) was 3 days and this occurred only 5 times. This exceptionally wet season resulted in permanent flooding of the majority of the *A. taeniorhynchus* breeding grounds and effective natural control. As a result it was possible to determine only the effective dosages for control.

Third and fourth instar larvae of *A. taeniorhynchus* were collected in the field and returned to the laboratory for study. Replicates of approximately 30 insects each were set up in 250 ml. of water in 9-inch diameter stainless steel bowls. *A. taeniorhynchus* have been found on Grand Cayman developing in water varying from fresh to a salinity equal to that of sea water

and for this reason larval tests were set up in the following types of water; cistern water (pH 8.7, salinity 0.1 gms./l.), well water (pH 7.4, salinity 1.25 gms./l.), and sea water (pH 7.6, salinity 25 gms./l.).

After the larvae were placed in each pan the required amount of FLIT MLO was added with an Agla micrometer syringe to give the equivalent of 0.5, 1.0 and 2.0 gallons per acre. Mortality counts were taken 24 hours after application of the oil. The results are shown in table 1. Untreated control tests were also set up.

Tests in which pupae were exposed to the equivalent of 2.0 gallons per acre also resulted in a 100 percent mortality. Field trials were carried out on small and large pools. The small pools, with areas of 10 to 50 square feet, were of two main types; flooded mangrove swamp with the surface of the water broken by pneumatophores in concentrations ranging from 50 to 100 per square foot, and open pools formed in rocky or muddy depressions. The mangrove swamp pools were protected from direct sun; the open pools were in the open, or in shady areas. Generally those pools in the direct sun had a light surface scum or algal growth. All pools were checked for the presence of larvae. The large pools were of approximately one ninth and one quarter acre in size. One of the ninth-acre pools was in a flooded mangrove swamp, all other pools were open pools with the surface broken by clumps of grass, sticks etc. Sufficient pools of each type were selected to permit treatment at rates of 0.5, 1.0 and 2.0 gallons per acre.

The FLIT MLO was applied to the large pools using a Hudson sprayer fitted

<sup>1</sup> Canadian International Development Agency, Adviser to the Mosquito Research and Control Unit, Grand Cayman, B.W.I.

<sup>2</sup> Present address: Chemical Control Research Institute, Canada Department of Fisheries and Forestry, 25 Pickering Place, Ottawa, Ontario.

TABLE 1.—Mortality of *A. taeniorhynchus* larvae exposed to FLIT MLO

Amount of FLIT MLO added	Cistern water pH 8.7, sal. 0.1	Well water pH 7.4, sal. 1.25	Sea water pH 7.6, sal. 25
0.5 g.p.a.†	100(58) <sup>*</sup>	100(254)	100(126)
1.0 g.p.a.	100(129)	100(228)	100(206)
2.0 g.p.a.	100(127)	100(103)	100(127)

† Gallons per acre.

<sup>\*</sup> Percentage mortality and number of insects tested (in parentheses).

with an adjustable conical spray nozzle, which was set to deliver a coarse spray. The required amount of FLIT MLO was added to the sprayer for a particular pool and the total volume was delivered to the pool. For the smaller pools the delivery rate of the sprayer was determined and the individual pools were treated using a timed emission of the sprayer. When treating the large pools it was necessary for the operator to walk into the pool; in these cases the operator worked from the center of the pool to the edges and in this way the oil film was not disturbed by the operator walking through it.

An immediate observation was the ability of the oil film to spread through the pneumatophores and to break up a light scum and algal growth. Post-spray checks were made at 24 and 48 hours after treatment.

The results are as follows:

**SMALL POOLS.** Irrespective of the type of pool, or the presence of a light scum or any algal growth, FLIT MLO at the equivalent

of 0.5 gallon per acre provided complete control. The presence of pneumatophores did not inhibit the ability of the oil to spread over the surface. In some cases a heavy scum stopped the oil spread and larvae in these areas were protected.

**LARGE POOLS.** FLIT MLO at 2.0 gallons per acre was necessary to provide control. The large surface area permitted the wind to shift the surface film and larvae were found in the oil-free areas. In the one-quarter acre pools, control was estimated to be 90–95 percent effective.

These laboratory and field trials show that FLIT MLO is effective for the control of *A. taeniorhynchus* larvae. In small pools 0.5 gallon per acre provided complete control; in the large pools 2.0 gallons per acre were necessary to give good control. The less effective control in the large pools was attributed to the effect of wind on the surface film of oil. FLIT MLO was equally effective in water types ranging from fresh water to sea water.

## SEPARATION OF THE FEMALES OF *Aedes hendersoni* COCKERELL AND *Aedes triseriatus* (SAY) DIPTERA: CULICIDAE BY THE TARSAL CLAWS

F. C. HARMSTON<sup>1</sup>

Females of the treehole mosquitoes *Aedes hendersoni* Cockerell and *Aedes triseriatus* (Say) are extremely similar in

size and coloration. Where the range of these species overlaps, as in certain areas of the Midwest, identification of flight-worn or rubbed females is extremely difficult or indeed impossible on the basis of coloration alone.

<sup>1</sup> Biologist, Ecological Investigations Program, National Communicable Disease Center, Public Health Service, U. S. Department of Health, Education, and Welfare, Fort Collins, Colorado 80521.

In comparing specimens of *A. triseriatus*