SCIENTIFIC NOTES

THE EFFECT OF VARIOUS CONTAINER MATERIALS ON DILUTE DDT SOLUTIONS [1]

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In the course of the program of testing mosquitoes for possible resistance to larvicides, using the standard World Health Organization kit, it frequently happens that tests must be conducted far from headquarters. This involves the transportation of the full complement of glassware into sometimes remote and rugged terrain. To improve the portability of the outfit and reduce breakage, nesting twelve-ounce containers made of other materials were considered in place of the glass vessels specified in the WHO procedure. These would be usable only if they could be relied upon to give results at least as valid as those resulting from the use of glass. Bowman *et al* (1) have shown that even in glass containers there is a rapid degradation of dilute DDT suspensions.

A bio-assay technique was used in this study to compare the practical results obtained through the use of glass, aluminum, polyethylene, enamelled steel, and waxed paper containers for the test insects in the WHO procedure. The larvae used were 3rd and 4th instar *Aedes aegypti* L. of a laboratory strain, 25 to a container. Containers were replicated three times at each concentration. The DDT, used at concentrations of 0.02 p.p.m. and 0.004 p.p.m. was obtained from a fresh WHO kit. The containers were as follows:—(a) glass crystallizing dishes with vertical sides and an inside diameter of 3¾"; (b) cylindrical aluminum measuring cups, i.d. 3½"; (c) half-pint waxed paper freezer cartons, i.d. 3⅜"; (d) 12-ounce polyethylene vessels with tapering sides and a water-line diameter of 3⅜" (e) white enamel pudding dishes with tapering sides and a water-line diameter of 6¾".

In order to determine if the polyethylene containers could accumulate appreciable amounts of DDT from previous use by adsorption, one set of these vessels was repeatedly exposed to solutions of 0.5 p.p.m. DDT for 24-hour periods, separated by normal laboratory washings. The other set was brand new. Between tests of the two concentrations all vessels were thoroughly scoured with detergent, and all but the used polyethylene were rinsed with iso-octane. The

TABLE 1.—Percentage mortality of 3rd and 4th instar larvae of *Aedes aegypti* L. after exposure in various containers to DDT at concentrations of 0.02 and 0.004 p.p.m. for 24 hours

Container material	Concentration p.p.m.	Total of 3 test groups *					
		Alive	Moribund	Dead	M + D	Percentage M + D	
Aluminum	0.02	0	49	26	75	100.0	..
	0.004	68	5	2	7	..	9.3
Glass	0.02	0	42	8	50	100.0**	..
	0.004	63	9	3	12	..	16.0
Polyethylene (new)	0.02	2	46	27	73	97.3	..
	0.004	75	0	0	0	..	0.0
Polyethylene (used)	0.02	9	59	7	66	88.0	..
	0.004	74	0	1	1	..	1.3
Paper	0.02	2	70	3	73	97.3	..
	0.004	75	0	0	0	..	0.0
Enamel	0.02	0	51	24	75	100.0	..
	0.004	64	11	0	11	..	14.6†

* Corresponding control groups of 25 living specimens each showed no deterioration of condition or mortality during the test periods.

** Two containers only.

† Higher surface ratio.

L.S.D., 0.02 p.p.m.: 1%—12.29 5%— 8.77 L.S.D., 0.004 p.p.m.: 1%—8.78. 5%—6.72.

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standard WHO procedure was followed throughout the tests.

The mortalities obtained at the two concentrations are shown in Table 1.

At the 0.02 p.p.m. concentration, the percentage kill in none of the containers differed significantly at the 1 percent level, although used polytheylene showed a difference at the 5 percent level. At the 0.004 p.p.m. dilution the glass, enamel, and aluminum containers were significantly superior to the others but did not differ markedly from each other. In the used polyethylene set there was some indication of the effect of accumulated DDT, though not at a statistically significant level. It would appear, therefore that glass is definitely the material of choice. Schmidt and Weidhaas (2) have shown that an increased ratio of surface to volume markedly reduces the rate of kill. This factor should be considered in the case of the enamel dishes. However, due to its weight and chipping propensity, enamel offers no material advantage in portability over glass.

References

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2. SCHMIDT, C. H., and WEIDHAAS, D. E. 1959. Effect of varying conditions in a laboratory testing technique on the mortality of mosquito larvae. J. Econ. Ent. 52(5):977–979.

Culiseta melanura (COQ.) BREEDING ON LONG ISLAND, N. Y.

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The isolation of eastern encephalitis (EE) virus from Pekin ducks on Long Island by Dr. E. Daugherty III and co-workers at the Duck Disease Research Laboratory in 1959 (Collins, 1960), suggested the advisability of locating areas where *C. melanura* was breeding, since this mosquito is the chief suspect in bird to bird transmission of the disease.

This species breeds in restricted habitats often overlooked in routine mosquito control work. Typically, these habitats are located in cold water, especially sphagnum bogs, either in depressions in the sphagnum or in the holes left when trees are knocked down or blown over (stump holes). Although these breeding sites may contain large amounts of water, the openings at ground level are often rather small so that they are difficult to locate.

Figure 1 shows all of the *Culiseta melanura* breeding areas found up to April 1961 and also sites from which EE has been isolated. These include records of larval collections by the personnel of the N. Y. State Museum and Science Service, Suffolk County Mosquito Control Commission and Nassau County Mosquito Control Commission. Records of virus isolations were ob-

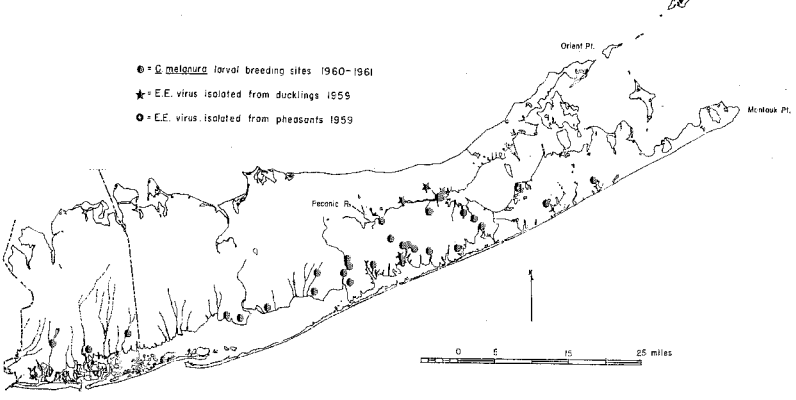

FIG. 1.—Outline map of Long Island, New York showing *Culiseta melanura* breeding locations and sites from which EE was isolated.