SEASONAL VARIATIONS IN SUSCEPTIBILITY OF SALT-MARSH MOSQUITO LARVAE TO INSECTICIDES[1]

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Several mosquito-control districts in Florida have encountered seasonal changes in the susceptibility of salt-marsh mosquitoes, *Aedes taeniorhynchus* (Wied.) and *sollicitans* (Wlkr.), to aerial sprays of DDT and BHC. Usually both larvae and adults were reported to be more easily controlled in the winter and spring than in summer and fall, irrespective of any resistance that might have been developed through the use of insecticides.

To study these variations under laboratory conditions, larvae of mixed populations of *Aedes taeniorhynchus* and *sollicitans* were collected at various times between January and September 1953 from three salt marshes in Brevard County, Fla., and were tested for susceptibility to several insecticides. Two marshes, North Causeway and Yoder, were in the Cocoa Beach area, which has been intensively treated with insecticides for several years, and larval resistance to DDT was considered to be exceptionally high (Deonier and Gilbert 1950). The third marsh, No. 8 in the Shiloh area, had been treated occasionally and the larvae were considered to be slightly or moderately resistant to DDT (Keller and Chapman 1953). The three marshes were sprayed two or more times from the air between the first and last collections.

Larvae were collected when they were in the late third or early fourth instar and transported to the laboratory. The test procedure consisted of exposing 25 fourth-instar larvae in 250 ml. of a colloidal suspension of an insecticide made by adding an acetone solution to distilled water. Duplicate tests at concentrations ranging from 0.05 to 0.001 p.p.m. were made with DDT, lindane, toxaphene, dieldrin, aldrin, EPN, malathion, parathion, chlordane, or heptachlor. Mortality counts were taken after 48 hours of exposure at 70° F., and the results were plotted on log-probability paper. The concentrations required to cause 70-percent mortality (LC-70) as read from a line fitted by eye are given in table 1.

Larvae collected from North Causeway marsh in March and April were considerably more susceptible to all the insecticides than larvae collected in July. Larvae collected from Yoder marsh in January were more susceptible than those collected in August, and both lots were more susceptible than a lot collected in September. In both of these marshes resistance was higher than at marsh No. 8, particularly at the end of the season. Larvae collected from this marsh in February were more susceptible than those collected in July and August.

In general, the seasonal trend was similar in the three areas. Larvae tested in the winter and spring were more susceptible to all the insecticides than those tested in the summer and fall. The seasonal increase in resistance was more pronounced with the chlorinated hydrocarbon than with the organic phosphorus insecticides.

References Cited

DEONIER, C. C., and GILBERT, I. H. 1950. Resistance of Salt-Marsh Mosquitoes to DDT and other insecticides. Mosquito News 10(3):138–43.

KELLER, J. C., and CHAPMAN, H. C. 1953. Tests of selected insecticides against resistant salt-marsh mosquito larvae. Jour. Econ. Ent. 46(6): 1004–6.

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TABLE 1.—Estimated LC-70 (in p.p.m.) of 10 insecticides to mosquito larvae from three salt marshes

Insecticide	North Causeway marsh			Yoder marsh			Marsh No. 8		
	Mar. 26	Apr. 30	July 27	Jan. 26	Aug. 24	Sept. 21	Feb. 12	July 23	Aug. 24
Aldrin	0.0011	0.0015	0.0058	0.0023	0.0046	0.016	<0.001	0.0022	0.0024
Chlordane	.0055	.0020	>.025	.0041	.011	>.05	.0021	.012	.014
DDT	.011	.0067	>.05	.015	>.05	>.05	.0070	.027	.050
Dieldrin	.0015	.0012	.0049	.0019	.0022	.0090	.0010	.0021	.0019
EPN	<.001	<.001	.0018	<.001	.0011	.0036	<.001	.0016	.0017
Heptachlor	.0011	.0012	.0036	.0025	.0042	.....	<.001	.0013	.0016
Lindane	.0022	.0041	.018	.0018	.011	>.025	.0037	.014	.011
Malathion	.045	.0090	>.05	.019	>.05	>.05	.030	>.05	>.05
Parathion	.0014	.0016	.0022	.0012	.0014	.0034	.0010	.0027	.0013
Toxaphene	.0022	.0038	>.025	.0054	.0050	>.025	.0039	.012	.0080