

from a small focus in Chatham County, Georgia, and was accompanied by a degree of cross-resistance to DDT (Schoof, 1959).

It appears likely that the dieldrin-resistance exhibited by the several species used in this study is largely a result of the use of BHC in mosquito control programs. On the other hand, the rapidity of development of dieldrin-resistance in species from Brazoria County might be partly accounted for by the use of aldrin in connection with extensive rice-growing areas.

Since the use of DDT in these two counties has been confined to the infrequent fogging of only a few communities, the agricultural use of the insecticide may have contributed to the widespread DDT-resistance in *C. fatigans*.

One of the important points to emerge from this study is that insecticide susceptibility test results from the larvae alone can be very misleading and should, therefore, be accompanied by data from the corresponding adults. Although the adults of all species studied were resistant to dieldrin, the larvae, with the exception of two strains did not exhibit resistance.

**SUMMARY.** Adult *Culex fatigans*, *C. salinarius* and *Aedes sollicitans* reared from larvae collected from widely separated localities in Galveston County and Brazoria County, Texas, exhibited resistance to dieldrin. DDT-resistance was also present in *C. fatigans*. Except for two strains of *C. fatigans*, the larvae of this species as well as those of *C. salinarius*, *A. sollicitans* and *A. taeniorhynchus* were susceptible to DDT, dieldrin and BHC.

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## DDT-RESISTANCE IN A STRAIN OF *CULEX PIPIENS* FROM NORTHERN ILLINOIS

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The South Cook County Mosquito Abatement District comprises 340 square miles in the south part of Cook County, Illinois. The District includes approximately all of the area south of 87th Street in the City of Chicago to the Cook-Will County line in the south and west and

the Indiana state border to the east. DDT has been the principal insecticide used by the District during the past six years.

During the 1960 mosquito season, several reports were received from field personnel that they could not achieve control of *Culex pipiens* in certain areas of the District with their routine larviciding dosage rate of 0.2 pound of DDT per acre. Formerly, good control had been possible at this rate of application.

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In order to ascertain if this control failure was due to resistance, it was decided to employ the standard World Health Organization method for determining the susceptibility or resistance of mosquito larvae to insecticides. A laboratory colony of *C. pipiens* was established from numerous larvae and pupae collected from one of the locations in which control difficulty had been reported. The area has a history of heavy exposure to DDT for the past five years. This colony has been named the "Midlothian Creek Strain," and the larvae used in this particular work were taken from the colony when it was in its 8th to 10th laboratory generation. It is believed this strain is made up of the subspecies *C. pipiens pipiens*, as numerous attempts to induce oviposition without a blood meal have ended in failure.

Table 1 indicates the results of four replicated experiments which were performed with the WHO kit and according to the instructions contained therein.

TABLE 1.—Susceptibility of Midlothian Creek Strain of *C. pipiens* to DDT

DDT concentration (p.p.m.)	Total larvae	Moribund and dead	Percentage mortality
.004	150	0	0
.02	200	1	0.5
.10	200	18	9.0
.25	50	23	46.0
.5	200	151	75.5
2.5	200	200	100.0
Control	200	0	0

After plotting the percentage mortalities on logarithmic probability paper a dosage-mortality regression line was

drawn, and the LC-50 value was determined to be 0.28 p.p.m. DDT.

In the fall of 1960 it was possible to perform two replicated tests on *pipiens* larvae collected in the field in another part of the District. This particular area had received considerably less DDT during the past five years than the Midlothian Creek location. An LC-50 value of 0.025 p.p.m. DDT was determined for this population, but this figure is based on the results of only two replicated experiments instead of four.

Burbutis and Davis (1955) found an LC-50 value of 0.2 p.p.m. DDT for a New Jersey strain taken from an area in which DDT had been used for five years. They also obtained an LC-50 of 0.013 p.p.m. DDT for another New Jersey strain of this species taken from an area in which no DDT had been used. Brown, *et al.* (1954) found a value of 0.02 p.p.m. DDT for this species in an area in southern Ontario that had a history of slight exposure to DDT.

Because of the significant difference in the level of susceptibility of the Midlothian Creek Strain as compared to the other strain from the District, the non-resistant strain from New Jersey, and the population tested in Canada, it is the opinion of the writers that the term "DDT-Resistant" should be applied to it.

#### Literature Cited

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