

TABLE I.—Mortality of adult female *A. sollicitans* (Langley AFB) and *A. taeniorhynchus* (Gainesville) exposed to contact sprays of malathion, naled, and fenthion.

Insecticide concentration (%)	Percent 24-hour mortality		
	<i>A. sollicitans</i>		<i>Aedes taeniorhynchus</i> ^c
	P ₁ ^a	F ₁ ^b	
	<u>Malathion</u>		
0.005	5	..	3
.01	27	..	36
.025	37	6	96
.05	20	4	100
.1	29	4	..
.25	41	12	..
.5	36	28	..
1	60	62	..
2.5	100	72	..
5	100	96	..
	<u>Naled</u>		
.005	65	..	20
.01	100	..	85
.025	100	..	100
	<u>Fenthion</u>		
0.0025	100	..	55
.005	100	..	80
.01	100	..	100
	<u>Check</u>		
0	17	0	3

^a Adults reared from field-collected larvae.

^b Adult progeny of field-collected adults.

^c Laboratory colony susceptible to organophosphorus insecticides.

licitans were about 100X and 200X greater than the concentration required to kill 90 percent of the adult females of *A. taeniorhynchus*. Adults of *A. sollicitans* were at least as susceptible to naled and fenthion as *A. taeniorhynchus* adults.

SUMMARY. Contact spray tests were conducted to determine the susceptibility of adult females of *Aedes sollicitans* (Walker) from Langley Air Force Base, Virginia to malathion, naled, and fenthion. A laboratory colony of *Aedes taeniorhynchus* (Wiedemann) susceptible to organophosphorus insecticides was included in the tests for comparison. *A. sollicitans* was highly resistant to malathion (about 100X to 200X at the LC₉₀ level) and was at least as susceptible to naled and fenthion as *A. taeniorhynchus*.

Literature Cited

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Culiseta silvestris minnesotae BAIRD AND *C. morsitans dyari* (COQUILLET) (DIPTERA: CULICIDAE)
IN ALBERTA

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Pucat (1965), lists *C.m. dyari* but not *C.s. minnesotae* as being recorded from Alberta. In 1967 at the suggestion of Dr. J. McLintock, Canada Department of Agriculture, Saskatoon, I examined a series of supposed *C. morsitans* taken during the spring and summer of 1966 and during May 1967. All of those examined proved to be *C.s. minnesotae*. Later, on June 28 and 29, 1967, five specimens of *C.m. dyari* were taken.

C.s. minnesotae appears to be widespread over the Northern United States, but records from Canada are few (Stone, 1965). Curtis (1967), states that it has been taken close to the southern boundary of British Columbia, but that all the specimens he examined from that province were *C. morsitans*. *C.m. dyari* appears to be widely but sparsely distributed over the northern forest region of North America. In Alberta, there are specimens in the Strickland Museum, Dept. of Entomology, University of Alberta; from Flatbush, 100 miles north of Edmonton, Edmonton, and the Cypress hills, an isolated forested area in the southeast part of the province. This indicates that it probably occurs over the entire wooded parts of the province.

C.s. minnesotae appears to overwinter as an adult female, and in both 1966 and 1967 was one of the earliest mosquitoes to appear at George Lake. In both years, the population peak was in early May and they had almost completely disappeared by June. A second generation emerged in late June, but was not conspicuous; very few specimens were taken in 1966 and none in 1967.

The information on *C.m. dyari* is sparse. The European sub-species is known to overwinter as a larva (Bates, 1969), but information on this in North America is not available. The absence of this species in May, and its appearance at the end of June in 1967 at George Lake, indicates that it does not overwinter as an adult female.

In both years the majority of *C.s. minnesotae* were taken in Malaise traps, but a few were taken in Malaise traps baited with carbon dioxide. One

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specimen was taken at light on June 24, 1966. This specimen was nulliparous, showing that it belonged to the newly emerged generation. Of the five specimens of *C. m. dyari*, three were taken in Malaise traps and two in the carbon dioxide baited Malaise traps. None of either species were taken at rat or chicken baited traps in the area or at human bait. No males or larvae were taken at George Lake.

C. s. minnesotae is probably overlooked as it appears to be a secretive species, not strongly attracted to man or to light, the two main methods of sampling adult mosquito populations. Its population peak is over by the time most adult mosquito sampling starts in Canada. In this connection it is interesting to note that *Culiseta alaskaensis* (Ludlow), a species with a similar seasonal distribution, is recorded as rare in Alberta (Hapold, 1963), but at George Lake it was abundant enough to be a distinct nuisance in early and mid-May of both 1966 and 1967.

The finding of *C. s. minnesotae* at George Lake raises the number of mosquito species recorded from Alberta to 39.

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HOLDING TECHNIQUE FOR THE MANIPULATION AND EXCISION OF ADULT ANOPHELINE MOUTHPARTS¹

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Numerous techniques have been employed to restrain partially anesthetized adult mosquitoes in order to treat, cover or excise morphological

members such as eyes, legs, antennae, abdomen, wings and mouthparts (Lavoipierre and Judson, 1965). A simplified and inexpensive technique was used by the writer primarily to handle anopheline mosquitoes. The apparatus designed by Lavoipierre and Judson was not flexible enough to enable manipulation of the type desired.

One pint ice cream cartons, 10 cm. x 9.3 cm. d., bearing pop-off ends, were utilized (Fig. 1). Both ends were removed and the cardboard center of one was popped out. A single piece of organdy mesh, 15 cm. x 15 cm. was placed inside the end ring to replace the cardboard center (Fig. 2). The ring end was then placed back on the pint container and affixed with 3/4" masking tape. This created a round container with one open end and one closed end. The mesh closed end exhibited apertures of varying dimensions, i.e., 135 μ x 220 μ and 250 μ x 250 μ .

Anopheline mosquitoes were partially anesthetized with chloroform for 2 minutes. After immobilization, one mosquito was dropped through the open end of the pint container (Fig. 3). A 15 cm. x 15 cm. piece of organdy was placed inside the container through the open end and the mosquito was moved into position by moving the organdy. The specimen was not bruised, but situated in such a way that the mouthparts protruded through the organdy apertures (Fig. 4). Female *Anopheles stephensi* Liston, the test species, bear a proboscis with mean measurements of 1639 μ L. x 49.5 μ W. and maxillary palpi 1485 μ L. x 60.5 μ W. at the base and 38.5 μ at the apex. Stable separation of these 3 members can be accomplished with this technique. The mosquito, once affixed in this fashion, infrequently released itself. This allowed time to place the entire apparatus on the stage of a binocular stereomicroscope, tape it to the stage, gently place a finger or a #1 or #2 cork against the specimen and make the necessary manipulations or excisions. The hand rested inside the container and steadied it and the mosquito.

Successful manipulations were achieved using

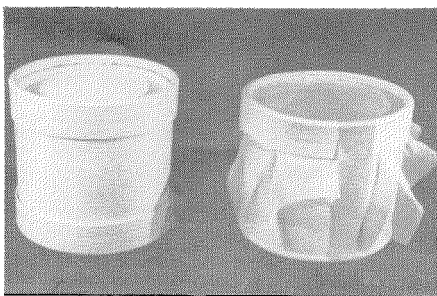


FIG. 1.—Restrainer pint cartons with pop-off ends.

¹This work was part of an investigation in partial fulfillment for the degree of Doctor of Philosophy.

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