NEW INSECTICIDES EVALUATED AS NONTHERMAL AEROSOLS AGAINST *AEDES TAENIORHYNCHUS* (WIEDEMANN)

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Six new insecticides were compared with 3 standard insecticides as nonthermal aerosols against *Aedes taeniorhynchus* (Wiedemann). The results probably are also indicative of those that could be expected from thermal aerosols since Mount *et al.* (1966) and Taylor and Schoof (1968) demonstrated that nonthermal and thermal aerosols are equally effective.

MATERIALS AND METHODS. The tests were conducted in an open field near Gainesville, Florida in October and November 1967 and in April and May 1968. The tests were performed between 6 and 10 p.m. during favorable climatic conditions. Temperatures 5 feet above the ground ranged from 74 to 85° F. and averaged about 80° F. Wind speeds ranged from <2 to 12 m.p.h. and averaged about 4 m.p.h.

The insecticides tested were as follows:

Geigy GS-13005	*O,O*-dimethyl phosphorodithioate *S*-ester with 4-(mercaptomethyl)-2-methoxy-Δ^2-1,3,4,-thiadiazolin-5-one
Bay 77488	*O,O*-diethyl phosphorothioate *O*-ester with phenylglyoxylonitrile oxime
Bay 78182	*O,O*-diethyl phosphorothioate *O*-ester with (*o*-chlorophenyl)glyoxylonitrile oxime
Montecatini L561	Ethyl mercoptophenylacetate *S*-ester with *O,O*-dimethyl phosphorodithioate
CIBA C-9643	*o*-(4-methyl-1,3-dioxolan-2-yl)phenyl methylcarbamate
Bromophos	
Fenthion (standard)	
Malathion (standard)	
Naled (standard)	

Commercial emulsifiable concentrates were used with all compounds. The concentrations in pounds per gallon were: Geigy GS-13005 (3.55), Bay 77488 (4.2), Bay 78182 (2.33), Montecatini L561 (4.4), CIBA C-9643 (3), bromophos (4), fenthion (4), naled (12), and malathion (5).

The nonthermal aerosol generator used to disperse the formulations was a Curtis Model 55,000, calibrated to deliver 40 gallons of liquid per hour. The generator was moved at 5 m.p.h. Adult female mosquitoes, 2 to 7 days old were exposed in 16-mesh screen wire cages (25 per cage) suspended on stakes 150 and 300 feet downwind in two rows perpendicular to the line of travel of the generator. Thus, a total of 4 cages per replicate were used, and from 1 to 4 replications were made with each concentration of each insecticide. After the passage of the aerosol generator, the mosquitoes were transferred to plastic tubes lined with clean paper. Except during exposure to the aerosols, the mosquitoes were held in insulated chests containing ice in cans. Absorbent cotton pads moistened with 10 percent sugar-water solution were placed on the holding tubes when they were returned to the laboratory. Mortality counts were made 18 hours after exposure to the aerosols.

RESULTS AND DISCUSSION. The mortalities and estimated LC_{90}'s for each insecticide are presented in Table 1. All compounds gave slightly better kills in the spring tests than in the fall tests, possibly because wind conditions were more favorable. Geigy GS-13005, with an LC_{90} of 0.95 percent, was only slightly less effective than the fenthion standard (LC_{90} value of 0.80 percent). Thus, these results were in agreement with those of Mount *et al.* (1966) who reported previously that Geigy GS-13005 was an effective nonthermal aerosol against *A. taeniorhynchus*. Bay 77488, Bay 78182, and Montecatini L561 (LC_{90}'s ranging from 1.2 to 1.5 percent) were less effective than

TABLE 1.—Mortality of caged adult female *A. taeniorhynchus* after exposure to nonthermal aerosols (water emulsion formulations) of 9 insecticides.

Insecticide	Percentage 18-hr mortality at indicated concentration[a]						LC_{90} (%)
	4	2	1	0.5	0.25	0.1	
			New insecticides				
Geigy GS-13005	99	99	85	86	67	7	0.95
Bay 77488	97	100	73	58	47	..	1.2
Bay 78182	99	91	83	77	30	..	1.4
Montecatini L561	95	93	81	71	67	2	1.5
CIBA C-9643	97	77	69	66	..	..	2.2
Bromophos	89	47	10	..	..	..	4.1
			Standards				
Fenthion	98	100	86	93	53	6	.80
Naled	100	100	57	76	11	..	1.3
Malathion	90	78	40	..	..	..	3.6

[a] Average mortality at 150 and 300 feet; check mortality was 3 percent.

fenthion but about equal to naled (1.3 percent). CIBA C-9643 was much less effective than either fenthion or naled but about 1.5 times more effective than malathion. Bromophos was slightly less effective than malathion. The results with naled at 12 pounds per gallon emulsifiable concentrate (a new formulation provided by the manufacturer) were very similar to those previously reported for the standard (8 pounds per gallon) emulsifiable concentrate of naled by Mount *et al.* (1966) and Mount and Lofgren (1967).

SUMMARY. Nonthermal aerosols of six new insecticides and three standards (fenthion, naled, and malathion) were evaluated against caged adult female *Aedes taeniorhynchus* (Wiedemann). Geigy GS-13005 (*O,O*-dimethyl phosphorodithioate *S*-ester with 4-(mercaptomethyl)-2-methoxy-Δ^2-1, 3, 4,-thiadiazolin-5-one) was only slightly less effective than fenthion. Bay 77488 (*O,O*-diethyl phosphorothioate *O*-ester with phenylglyoxylonitrile oxime), Bay 78182 (*O,O*-diethyl phosphorothioate *O*-ester with (*o*-chlorophenyl)glyoxylonitrile oxime), and Montecatini L561 (ethyl mercaptophenylacetate *S*-ester with *O,O*-dimethyl phosphorodithioate) were less effective than fenthion but about equal to naled. CIBA C-9643 (*o*-(4-methyl-1, 3-dioxolan-2-yl)phenyl-methylcarbamate) was much less effective than either fenthion or naled but was about 1.5 times more effective than malathion. Bromophos was slightly less effective than malathion.

References Cited

MOUNT, G. A., LOFGREN, C. S., GAHAN, J. B., and PIERCE, N. W. 1966. Comparisons of thermal and nonthermal aerosols of malathion, fenthion, and naled for control of stable flies and salt-marsh mosquitoes. Mosq. News 26(2):132–138.

MOUNT, G. A., LOFGREN, C. S., and GAHAN, J. B. 1966. Nonthermal aerosols of new insecticides for the control of *Aedes taeniorhynchus* (Wiedemann). Proc. N. J. Mosq. Ext. Assoc. 53: 131–134.

MOUNT, G. A., and LOFGREN, C. S. 1967. New insecticides as nonthermal aerosols for control of adult mosquitoes. Mosq. News 27(4):470–473.

TAYLOR, R. T., and SCHOOF, H. F. 1968. Evaluation of thermal and nonthermal fogs against four species of mosquitoes. Mosq. News 28(1):8–11.