

TABLE 1.—Effectiveness of several insecticides against fourth-instar *Aedes nigromaculis* and *Culex tarsalis* larvae in field tests. Average of 2 or 3 tests.

Insecticide	Percent mortality in 24 hours at indicated dosage per acre					
	0.4 lb.	0.3 lb.	0.2 lb.	0.1 lb.	0.05 lb.	0.025 lb.
<i>Aedes nigromaculis</i>						
<i>Chrysanthemum acid esters</i>						
6-bromopiperonyl	97		86			
Piperonyl	56		75			
6-chloropiperonyl	98		91			
6-chloropiperonyl plus piperonyl butoxide	—		97			
6-bromopiperonyl plus piperonyl butoxide	—		98	98	85	
2,4-dimethylbenzyl plus piperonyl butoxide	—		99	98	82	
o-methylbenzyl plus piperonyl butoxide	—		—	86	69	
<i>Organic phosphorus compounds</i>						
Am. Cyanamid 12008	—		—	—	97	69
Dow ET-57 (sampled as ET-14)	—	100	80	72	—	
Trithion (Flowable 4)	—	—	—	62	46	
<i>Culex tarsalis</i>						
<i>Chrysanthemum acid esters</i>						
6-bromopiperonyl	82					
6-chloropiperonyl	44					

Bureau of Vector Control of the California Department of Public Health. David M. Hawbecker, field aid of the California Bureau of Vector Control, assisted with most of these experiments.) A number of new materials were tested as mosquito larvicides in California in 1957. The most promising were the chrysanthemum acid esters. Chrysanthemum acid is a synthetic material similar to that found in the chrysanthemum flowers, from which pyrethrum is obtained.

The chrysanthemum acid esters have a very low toxicity to warm-blooded animals. They are only one-eighth as toxic as pyrethrum and one-third as toxic as allethrin.

The tests were made on fourth instar *Aedes nigromaculis* and third and fourth instar *Culex tarsalis* larvae in irrigated pastures. The test plots were 1/16 acre in size, and the water ranged from 2 to 10 inches in depth. The insecticides were applied as emulsions with a 1-gallon compressed air sprayer. Pretreatment and post-treatment counts were made by taking 20 dips in each plot. The results are presented in table 1.

Against *Aedes nigromaculis* some of these materials were effective at 0.4 pound per acre. Their effectiveness was increased by the addition of piperonyl butoxide, 5 parts to 1 part of the toxicant. Tests with *Culex tarsalis* indicate that they may be less effective against this species. However, heavier grass growth and floatage may have been

partially responsible for the reduced mortality in these tests.

Three organic phosphorus compounds were also tested. American Cyanamid 12008 was the most effective of these materials. Mortalities of *nigromaculis* in these tests were slightly lower than those obtained by Labrecque *et al.* (LABRECQUE, G. C. GAHAN, J. B. and NOE, J. R. Toxicity of some new organic phosphorus compounds to anopheline larvae. N. J. Mosquito Extermin. Assoc. Proc. 43:172-175.), against *Anopheles crucians* and *quadrimaculatus*. C. M. Gjullin, Entomology Research Division, Agr. Res. Serv., U.S.D.A. and Lawrence L. Lewallen, Bureau of Vector Control, California Department of Public Health.

RELATIONSHIP BETWEEN APPARENT MORTALITY AND DDT CONCENTRATION IN *Anopheles* LARVAE.—Parker made the interesting observation that 15 to 25 percent of *Aedes aegypti* larvae, showing signs of being mortally affected by DDT immediately after a one-hour exposure to 0.025 to .04 p.p.m., could completely recover within 24 hours. (A. H. Parker, 1957, The susceptibility of *Aedes aegypti* larvae of different ages to DDT and dieldrin, and the relevance of the results to the formulation of standardized susceptibility tests for mosquito larvae. Ann. Trop. Med. and Parasitol. 51(2):201-215.)

This preliminary note is concerned with the differences in apparent mortality of randomly selected, freshly fasting, unsexed third stage *Anopheles quadrimaculatus* Say (LTD strain) one hour and 24 hours after a one-hour exposure to ascending concentrations of DDT in ethanolic suspensions and subsequent washing in two 1-liter rinses of distilled water. The exposures were made by placing ten larvae in 50 ml. beakers containing approximately 20–25 ml. of freshly prepared toxicant; ethanolic content 0.1 percent.

As shown by the data in table 1 the apparent mortality differences between the 1-hour and 24-hour readings spectacularly increases from 15 to 92.5 percent as the concentration rises from .05 to .5 p.p.m. but that the difference begins to fall sharply when the concentration reaches 5 p.p.m. and apparently is nil at 10 p.p.m.

TABLE 1.—Apparent mortality differences at one and 24 hours after exposing third stage *Anopheles quadrimaculatus* to different concentrations of DDT for one hour

Concentration (p.p.m.)	Number of tests	% appearing mortally affected at	
		1 hour	24 hours
0.05	20	17.5	2.5
0.10	20	37.0	10.0
0.5	20	95.5	3.0
1.25	4	92.5	0.0
2.5	2	100.0	70.0
5.0	6	80.0	56.7
10.0	3	76.7	76.7

The most significant point in this note and in Parker's data is that in dilute concentrations of DDT the larvae do not obtain a lethal dose at the same time they begin to exhibit well-developed symptoms of poisoning. It seems desirable to determine when larvae pick up a lethal dose in dilute concentrations and to study the mechanism by which highly susceptible larvae are able to recover from quantities of DDT sufficient to bring about "knockdown" symptoms. Dr. W. H. Hoskins (personal communication) has recently found that DDT susceptible *Culex* larvae convert toxic DDT to less toxic DDE. Presumably at certain internal doses *Anopheles* larvae can similarly detoxify DDT but at higher doses are unable to do so fast enough.—Jack Colvard Jones, Dept. of Entomology, University of Maryland, College Park, Md. Scientific Article No. A702, Contribution No. 2026 of the Maryland Agricultural Experiment Station, Dept. of Entomology.

A HYBRID BETWEEN *Aedes aegypti* AND *A. albopictus*. In the Proc. R. ent. Soc. London (C) 23(6):29, 1958, the following paragraph appears: "Mr. P. F. Mattingly exhibited some photographs of a hybrid between *Aedes (Stegomyia) aegypti* and *Aedes (Stegomyia) albopictus*. He said that

previous crosses between these species had had one of two results. Either they had failed completely or the offspring had appeared to be identical with the maternal species. The only exceptions were a single  $F_1$  throwback to the paternal species and the one viable offspring of a backcross of the  $F_1$  to the paternal species which again resembled the father. The photographs showed the only known example of a hybrid which was intermediate between the parent species. It was the sole emergent from 21,000 eggs obtained by crossing ♀ *albopictus* with ♂ *aegypti*. It was a male with the characteristic white mesonotal stripe of *Ae. albopictus* super-imposed on the lyre-shaped pattern of *Ae. aegypti*. The male terminalia were also intermediate but much closer to those of the maternal than those of the paternal species. He suggested that the phenomenon was one of rare chromosomal recombinations proving compatible with the maternal cytoplasm."—H.L.T.D.

#### FROM LETTERS TO THE EDITOR:

DR. KNIPE'S ARTICLE IN THE SEPTEMBER *Mosquito News*, just received, interested me greatly, particularly since, as you know, I was for some years engaged in development of this sort of equipment for the Army. During this time I had a chance to discuss sprayers with Dr. Knipe, *re* his use of them in India, and, of course, with Larry Hall of CDC and the WHO specs. Some of the things mentioned in the current article, particularly the idea of putting a second plastic hose around the primary one, instead of a wire coil, as a protection against sharp bending and premature breaking, seemed like an excellent and simple solution to an old worry.

The military model sprayer has a spring-loaded, ball valve for the prevention of dripping, which, I think, is superior to Dr. Knipe's improvisation. It has not been thought to require "too much pressure to be opened" and has been quite effectual. It is a part of the strainer assembly fitting into the nozzle, and is manufactured by the Spraying Systems Company of Bellwood, Illinois (Chicago). Their nozzles are almost universally used or imitated by sprayer manufacturers. We have not found stainless steel orifices to be less durable than brass and I cannot conceive that they are less durable than plastic. Chrome plated brass has worn nearly as well as stainless steel but plastic seems to me to be out of the question. Even brass wears so that a consistent and proper pattern of spray and uniform droplet size is difficult or impossible to maintain.

The military model of some sprayers is also equipped with a coupling which, since it is readily attached as well as detached, is usually called simply a "quick coupling" rather than a "Q.D." coupling. This quick coupling is made according to several patterns, basically about as shown by Dr. Knipe, one of them by Breco Division of the Perfecting Service Co., 332 Atanco Ave., Charlotte 6, North Carolina, or of Baltimore, Maryland.