Secondly the great agricultural industry in the cou as well as the presence of many industrial plants workin in defense orders makes it necessary to continue to pers ently prosecute the Commission's program of control. Th is essential not only from a standpoint of public health but also to create comfortable working and living conditi as much as possible for the Army, Navy and Civilian resi dents.

Maryland

Dr. E. N. Cory, State Entomologist reports no mosqu work going on in the state although an engineer of the Public Health Service has been assigned to the State Department of Health for surveying conditions around Army camps.

Rhode Island

Mr. Milton Price, Supervisor of Mosquito Control fo Rhode Island Department of Agriculture and Conservation wrote that shortage of W.P.A. men, necessary to pursue t projects, has delayed the National Defense projects on m quito control in Rhode Island. Mr. Price also reports n legislation under consideration for transferring mosquit control work from the Department of Agriculture and Conservation to the Department of Health.

DEVELOPMENTS IN MOSQUITO CONTROL

Tests with Carbon Dioxide and Light as Attractants for Mosquitoes, with Special Emphasis on the Malaria Mosquito, Anopheles Quadrimaculatus

by C. B. Huffaker
Delaware Agricultural
Experiment Station, Newark

The New Jersey mosquito trap has been used very ext sively as an index to the total mosquito population and the relative importance of different species in a given area of annoyance. A photograph of this trap was presen

by Mulhern (1934) and also by King, et al (1939). Headlee (1934) and (1941) published date which revealed the tremendous attraction of CO_2 for female mosquitoes. The marked effectiveness of this trap, with or without the additional of CO_2, is not questioned. However, it has not found acceptance for use in determining Anopheles quadrimaculatus populations in the malaria areas of the South.

The writer operated three of these traps, one with a light, one using Dry Ice without a light, and one with both light and Dry Ice, at Delaware City, Delaware, for four hours on the nights of September 24 and 25 and throughout the night of October 7, 1941. The results may not be considered critical, because of the time of the year. July or August would undoubtedly have been better. Nevertheless, these data strongly indicate that A. quadrimaculatus is not appreciably attracted to the New Jersey mosquito trap either with or without Dry Ice.

The traps were operated on nights that were generally favorable for mosquito activity, in a district where this species was found breeding in 72 per cent of the places inspected during the months of September and October. The corresponding figure for Anopheles crucians was 23 per cent; and for Culex salinarius, 55 per cent. Furthermore, in the nearest, large, permanent breeding area, A. quadrimaculatus represented 57 per cent of the total anophelines present, whereas A. crucians represented only 31 per cent for these months. Total anopheline breeding was nearly 2 larvae and/or pupae per dip.

In addition to the breeding records, weekly inspections for adult mosquitoes were made in a barn near which these traps were operated. For the period in question, A. quadrimaculatus represented 49 per cent; A. crucians, 44 per cent; A. punctipennis, 1 per cent; and C. salinarius, 6 per cent of the total estimate of 3752 females for the three inspections.

It is certain, therefore, that A. quadrimaculatus was the most abundant anopheline mosquito in the vicinity

and perhaps almost as abundant as C. salinarius. Yet, may be seen in Table 1, the 3-night catch for a 4-hour period for A. quadrimaculatus was only 1.3 per cent of total catch for Dry Ice; 0.1 per cent, for Dry Ice and light; and 0.3 percent, for light without Dry Ice. The corresponding percentages for A. crucians were 41.1, 18 and 13.5, respectively; for C. salinarius, 24.0, 62.9, 64.7, respectively; and for A. walkeri, 7.4, 3.5 and 2. respectively.

According to these data, A. crucians showed a rela ly high degree of attraction to carbon dioxide, while C salinarius showed a high degree of attraction to light, slightly greater number of A. quadrimaculatus in the Dr trap may mean that this species was repelled by the lig of the other two traps, or may be the result of purely chance distribution.

Inspections of the barn before and just after thes tests showed that both A. quadrimaculatus and A. crucia were active, and had moved out of their resting quarte

The trap collections on the night of October 7, fr 9:45 until morning, were essentially the same as the fo hour period.

Table 1. - Female Mosquitoes Collected on Three Nights by Traps Near a Cattle Barn Containing Large Numbers of Anopheles quadrimaculatus, with dry ice and Light as Attractants.

3 - Night totals, 5:45-9:45 E.S.T.

	Dry Ice		Dry Ice and Light		Light	
	No.	%	No.	%	No.	%
A. quadrimaculatus	13	1.30	8	0.09	4	0.26
A. crucians	412	41.12	1626	18.16	211	13.49
A. walkeri	74	7.39	317	3.54	44	2.81

C. Salinarius	251	25.05	5628	62.85	996	63.68
Other species	252	25.14	1375	15.36	309	19.76
	1002	100.	8954	100.	1564	100.00

[1]The dipping method used in primarily suited to Anopheles inspections, and the relative abundance of C. salinarius was probably greater.

[2]A. quadrimaculatus and A. crucians are the only species in this area that gather in barns in great numbers.

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King, W. V., C. H. Bradley, and T. E. McNeil, 1939. The Mosquitoes of the Southeastern States. U.S.D.A. Misc. Pub. 236: 1-91.

Mulhern, T. D. 1934. A New Development in Mosquito Traps. Proc. N. J. Mosq. Exter. Ass'n. 21: 137-140.

PUBLISHED ARTICLES OF INTEREST

Mr. Thomas D. Mulhern, Secretary reports the following published article:

> Jan. 2, 1942, "Science" - article entitled "The Work of the Rockefeller Foundation in Brazil".

The article refers to yellow fever and to work against Anopheles gambiae, the "worst vector of malaria" as well as other health activities of the Rockefeller Foundation.

PERSONAL NOTES

Mr. W. A. Connell of the Department of Entomology at the University of Delaware, who, since October 16, 1941 had been engaged in a study of mosquito larvicides under

a fellowship sponsored by Hercules Powder Company of Wilmington, Delaware was recalled to active duty in the Army on January 31, 1942. He had previously served from June 5 to September 18, 1941, and had been released under the age limitations then in effect.

The research commenced by Mr. Connell was assumed by Mr. C. B. Huffaker of the same department on February 1, 1942. Mr. Huffaker, who came to Delaware on April 16, 1 with a background of several years experience with the Tennessee Valley Authority, has had charge of mosquito trapping work in the State and has been investigating Anopheline breeding and activity as well. He is now responsible for all lines of endeavor in this particular field.

Mr. H. Joseph Stevens, formerly with the Suffolk Co (Long Island) Mosquito Commission is now with the U. S. Public Health Service and is stationed in their New York City office.

Mr. John W. Scott of the Union County (New Jersey) Mosquito Commission has been called to active duty with the U. S. Army.