

## REVIEWS AND ABSTRACTS

AREA CONTROL OF MOSQUITOES BY AIRCRAFT IN SUB-ARCTIC CANADA. By C. R. Twinn, A. W. A. Brown and H. Hurtig. N. J. Mosquito Extermination Assn. Proceedings, 1950. Pp. 113-140. This article presents the results of experimental air spray projects carried out cooperatively by the Division of Entomology, Science Service, Department of Agriculture, Canada, the Defence Research Board and the Royal Canadian Air Force. Spray projects were conducted at five R.C.A.F. stations, namely: Fort St. John and Ft. Nelson in British Columbia; Whitehorse and Watson Lake in Yukon Territory and Goose Bay in Labrador.

About 10 square miles around each of these stations were sprayed, some of them twice, with a dosage of about 0.25 lb. DDT per acre. The first treatment was larvicidal and the second adulticidal. A total of 27,600 acres were treated with 19,159 gallons of 4 per cent DDT fuel oil solution. The average application was 0.7 gallon of spray with 0.235 lb. of DDT per acre. The average larval mortality ranged from 83 per cent to 99 per cent with the overall average being 91 per cent. The larviciding resulted in a significant reduction of adult mosquitoes for two weeks to as much as two months from the date of spraying. In two areas there were indications that the larviciding reduced the adult population by approximately 50 per cent throughout the season. Adulticiding resulted in an immediate reduction of 86 per cent in mosquito numbers at Ft. Nelson, B. C., and Watson Lake, Y. T., and a 65 per cent reduction for three weeks at Watson Lake.

The report includes information on apparatus and materials, methods, operational data, assessments of DDT deposits and effects of spraying on other insects. It is well illustrated with pictures, maps, charts and graphs. Of particular interest are the graphs of mosquito landing rates and biting rates in sprayed and unsprayed areas.—Edgar A. Smith, Merced Co. M.A.D., Merced, Calif.

FURTHER TESTS OF INSECTICIDES AGAINST BLACK FLIES (DIPTERA: SIMULIIDAE) AND A CONTROL PROCEDURE. By B. Hocking. Scientific Agriculture 30:489-508. 1950. This paper is of interest to mosquito workers chiefly in the presentation of information on the toxicity of the newer insecticides to the fauna of streams, showing that all materials tested kill some beneficial insects and fish. The insecticide dispenser described in the appendix might have application in some places in mosquito work. The author summarizes the paper as follows:

"Various formulations of DDT, parathion, gamma benzene hexachloride, methoxychlor, aldrin, dieldrin, and 1, 2, 4-trichlorobenzene were tested in the field for toxicity to the larvae and

pupae of several species of black flies (Simuliidae). Laboratory tests of parathion suspension and benzene hexachloride emulsion showed that these materials have some ovicidal properties. Against larvae, DDT in oil solution is still by far the most satisfactory insecticide. Parathion; benzene hexachloride; aldrin; and trichlorobenzene at high concentrations show some toxicity to pupae, but the practical value of this and of the ovicidal materials is doubted.

"DDT, benzene hexachloride, and parathion were tested on the fry and adults of several species of fish. The absence of any immediate permanent effects at the dosages required to kill black fly larvae is encouraging.

"Observations on the effects of all insecticides except DDT on other fauna in the streams treated are recorded. The results do not suggest that the toxicity of any of the materials is more selective to black fly larvae than that of DDT.

"A dispenser for the convenient and accurate application of insecticides to streams is described in an appendix, and simplified instructions for its use are given."—Elton J. Hansens, Rutgers University, New Brunswick, New Jersey.

EGG-LAYING HABITS, OVERWINTERING STAGES, AND LIFE-CYCLE OF *Simulium arcticum* MALL. (DIPTERA: SIMULIIDAE). By F. J. H. Fredeen, J. G. Rempel, and A. P. Arnason. The Canadian Entomologist 83(3), March 1951. Studies conducted along the Saskatchewan River from 1947 to 1950 indicate that *Simulium arcticum* Mall. oviposits generally over the surface of the river water during July. The eggs are laid singly, sink to the bottom, and may become embedded several inches in the sand. The species overwinters almost entirely in the egg stage. The eggs begin to hatch in the spring soon after the ice clears from the river, and the larvae move downstream and attach themselves to rocks in rapids to complete their development. The control of this black fly may require repeated applications of larvicide because of a long hatching period.—Authors' summary.

EFFECTIVENESS OF REPELLENTS AGAINST SEVERAL SPECIES OF *Anopheles* MOSQUITOES. B. V. Travis, Jour. Nat. Malaria Soc. 10(3):197-205. 1951. Out of 4,313 compounds screen tested for repellence of *Anopheles quadrimaculatus* only the following four materials were effective for as long as three hours when laboratory tested: p-isopropoxybenzaldehyde, alpha-amylcinnamaldehyde, methyl beta-diethylaminocrotonate, and N-amylsuccinimide. The latter substance was also effective against *gambiae melas*. Attempts to incorporate the test materials into unspecified creams and powder pastes were not encouraging.

Forty-nine materials were tested for repellence against *freeborni*, eight of which were effective for more than seven hours. Five of the 12 materials screen tested against *punctipennis* were effective for more than seven hours. It is not possible from the data presented, however, to compare effective test repellents against the different species used since most of the test repellents effective against *quadrifasciatus* were not tested against the other species, nor were repellents against *freeborni* and *punctipennis* tested against *quadrifasciatus*.

Field tests on the repellency of dimethyl phthalate, Indalone, and 6-12 against *albimanus*, *gambiae*, and *aquasalis* are reported. Dimethyl phthalate lost its repellency for *albimanus* in 40-60 minutes in laboratory tests, and in the field was effective for the first hour. Its average repellency for *gambiae* was 45 minutes, and for *aquasalis* 2½ hours. The repellent 6-12 was effective 8-100 minutes against *albimanus* in the laboratory, and had a field repellence of 2-3 hours. Against *gambiae* its average repellency was 20 minutes. Against *aquasalis* 6-12 was the most effective repellent with an average repellency of 2½ hours. Indalone was not very effective against *albimanus* or *gambiae*. However, it was effective against *aquasalis* for 2½ hours and was better than no treatment after 8 hours.—Jack Colvard Jones, National Institutes of Health, Bethesda, Md.

**SUMMARY OF THE SIXTEENTH ANNUAL REPORT—DADE COUNTY ANTI-MOSQUITO DISTRICT, 1950.** 16 pp. Fred H. Stutz, Director; James H. Heidt, Entomologist, Rm. 905 Dade County Court House, Miami, Fla. The report contains some information on the behavior of salt marsh mosquitoes which seem to be Dade County's greatest problem. For three years there were noticeably fewer mosquitoes until 1949-50, when there were frequent heavy flights, which has caused the Commission to wonder if they were becoming immune to DDT. Observations show that excessive dry periods are followed, with few exceptions, by an increase in mosquito densities.

*Aedes aegypti* control continues unremittingly, although inoculation of travellers and the surveillance of the U. S. Public Health Service, particularly at the International Airport, is being depended upon for protection against the introduction of disease.

Dade County has a very perplexing problem with year-round mosquito breeding but it is handling the job in a very efficient and economical manner, which is shown by the listed routine of work, the inspections, the description of plant and equipment, and expenditures.

The district mixes a 35 per cent DDT-emulsion concentrate for a stock insecticide. A dilute concentrate of 2½ per cent DDT-emulsion is used in mist sprayers as an adulticide or larvicide. Ground-space spraying, operating three mist sprayers at a cost of \$146 per acre, was employed.

Airplane spraying was utilized for the salt marsh area to control numerous flights of *Aedes taeniorhynchus* and also for *Psorophora ferox*. In addition to 5 per cent DDT-oil, benzene hexachloride, mixed directly in fuel oil, .1 lb. of gamma per gallon, was employed, very good results being obtained by both mixtures.

Drainage is being systematically carried out, but hydraulically filled land for development is presenting problems. Inspection of premises, some space spraying in certain districts of Miami, and collection of small containers are routine. Street catch basins are sprayed by a motorcycle operator to control *Culex* mosquitoes.

Light traps are employed, with *Anopheles albimanus* showing up, the presence of this malaria vector is causing much alarm.

Fly control is part of the County routine.

Mention is also made of the cooperative sand fly research work by the Division of Entomology of the Florida State Board of Health, with technical direction by the Orlando Laboratory of the U. S. Bureau of Entomology. During 1950 control tests on small plots were conducted, using three of the newer insecticides, Chlordane, Hexachloride and Dieldrin, with excellent results. Tests will continue to determine the most effective materials, dosages, formulations and methods of applications. More basic information on the insects is also desired.—J. S. Gibson, Warwick County, Virginia.

**PUPAE OF THE CULICINE MOSQUITOES OF THE NORTHEASTERN UNITED STATES\* (DIPTERA, CULICIDAE, CULICINI).** Richard F. Darie, Jr. Memoir 304, Cornell University, Agricultural Experiment Station, June 1951. The pupae of 32 species are described, 8 of which have not been studied previously. The abdominal chaetotaxy, paddles, and respiratory trumpets are illustrated. A brief discussion is given on the external morphology of the pupal exuvium, adequate for understanding the descriptions.

In instances where earlier pupal work has been done on a species, references are cited by the author. The bibliography includes 51 titles. Tables of variations in setal branching are given for each species. Keys to the genera and all 32 species, as well as to the subgenera of *Aedes*, are included.

The author is to be complimented on his thorough observations, the publishing of which will go far toward enlightening American workers on the taxonomic characters to be found on the mosquito pupa. This paper is the first in this country to bring together and describe adequately a regional group of culicine pupae so that characters can be compared and keys for identification devised.

It is the reviewer's opinion, however, that the paper could have been improved by an analysis of the significance of the characters. The reader is apt to be misled by the keys, as Darsie fails to stress that many of his series of specimens

were small and from single collections. In some instances, from series of fewer than 20 specimens, species are separated on the basis of a slight difference in range of hair branches.

The tables of variations in setal branching should include the number of specimens under observation and the number of separate collections these specimens represent. If only a single series from a single breeding place is examined, less variation is to be expected than from several series from different localities.

Proof of the reliability of Darsie's keys will be tested through their use by many workers, some of whom probably will be able to make suggestions for improvement on the basis of their own experience. It is hoped that those in a position to do so will take advantage of the start that Darsie's study has given them in understanding the culicine pupa and using it in the taxonomy of the group.—Roy W. Chamberlain, U. S. Public Health Service, Montgomery, Ala.

STUDIES ON THE SWARMING HABITS OF MOSQUITOES AND OTHER NEMATOCERA. E. T. Nielsen and H. Greve. Bull. Ent. Res. 41(2):227-258. Sept. 1950. The principal object of this work was to elucidate the swarming behavior of *Aedes cantans* and other mosquitoes, *Chaoborus crystallinus* and certain Chironomids. In addition, ancillary studies were made of the general ecology of these species. The swarms were found to consist entirely of males and to bear no direct relationship to mating or to the search for food. There was no noticeable difference between the swarming habits of the different species of mosquitoes and even the differences between the Culicids and Chironomids were very slight. Swarming was observed to take place at about sunset in the evening and sunrise in the morning. The evening swarms appeared to be formed in response to decreasing light intensity and to disperse at a light intensity of about 7 Lux. Low

temperatures may delay the start of swarming. The morning swarms started at about the same threshold of light intensity and at this time also their duration was reduced by low temperatures. Below about 50° F. they were not formed at all. Atmospheric humidity appeared to be of minor importance.—Authors' summary.

(Editor's note: The work described above was done from 1938-40 and from 1945-48 in Northern Denmark.)

LOS MOSQUITOS DEL GENERO *Haemagogus* WILLISTON 1896 EN AMERICA DEL SUR. Roberto Levi-Castillo, published by Don Bosco, Cuenca, Ecuador, 1951, 78 pp., 114 refs. The mosquitoes of the genus *Haemagogus* are described. A new subgenus, *H. longipalpis* is described. The species having short palpi, *H. panachys*, *H. equinus* and *H. tropicalis* remain in the original subgenus, *Haemagogus* Williston 1896. Thirteen species and 1 subspecies are described in all known phases of their life cycle. The larvae of *H. uriaitei* Shannon and Del Ponte are described for the first time. Keys are included for male terminalia and the known larvae of the species. Notes on the ecology and breeding places are included. A distribution map of the species is also given. All known references are included.—Author's abstract.

Editor's Note: Apparently there is considerable interest in the genus *Haemagogus*, to judge from correspondence reaching the editorial office regarding Dr. Levi-Castillo's monograph. It is noted that there is some disagreement with Dr. Levi-Castillo's position on certain points. Some authorities feel that the keys are difficult to follow, and at critical points are based on characters that are not constant. Since disagreement among taxonomists is not unusual, these criticisms are mentioned herewith so that others will be aware of some of the differences of opinion on the treatment of *Haemagogus*.

Turn back to Page 224 for information on the AMCA 1952 convention.