REVIEWS AND ABSTRACTS

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PRELIMINARY OBSERVATIONS ON THE USE OF THE SQUASH TECHNIQUE FOR THE STUDY OF THE CHROMOSOMES OF MOSQUITOES. By Breland, O. P. Tex. J. Sci. 11(2):183–190. 1959. The squash technique was used in this work, which was undertaken primarily to determine the most suitable stages and tissues for study, and to develop methods for use in later and more comprehensive investigations.

Dissections were made under 18x magnification on a black background. Instructions for the operation are detailed for larval brain, salivary glands, and Malpighian tubules, and adult ovaries and testes. The tissues were stained with a 1 percent solution of aceto-orcein and a 1 percent solution of aceto-carmine, both of which fixed as well as stained. The brain only was prefixed in a modified Carnoy's fluid to ensure a firmer, opaque tissue, easily discernible and manipulated. Squashing is accomplished by applying pressure to the cover slip which has been placed over the stained tissue.

The author explains that confusion has resulted from the interchange of the terms "smear" and "squash" and points out that smearing is done with an instrument such as a scalpel which spreads out tissue on a slide.

A summary of findings is best given, for the most part, in the author's words:

Orthopodomyia signifera and *O. alba*. Tissue examined: Brains, salivary glands, Malpighian tubules, gastric caeca, and miscellaneous material of 4th instar larvae, including prepupae, brains of pupae; ovaries and testes of newly emerged adults. Results: Mitotic figures observed in brain of prepupae; meiotic figures and mature sperm in testes; meiotic figures in ovaries. Figures quite comparable to the one of *Culiseta inornata*, illustrated in the text, have been seen for both species. The diploid chromosome number of both species of *Orthopodomyia* is 6.

Toxorynchites rutilus septentrionalis: Tissue examined: Brains, salivary glands, and Malpighian tubules of 4th instar larvae; only 2 larvae available. Results: good salivary gland type chromosomes found in Malpighian tubules.

Culiseta inornata: Tissue examined: Brains, salivary glands, and Malpighian tubules of 4th instar larvae including prepupae; only a few larvae available. Results: mitotic figures in the brain of prepupae. The diploid chromosome number is 6.

Culex quinquefasciatus: Tissue examined: Brains and Malpighian tubules of 4th instar larvae, only 2 larvae available; ovaries of one female captured indoors in December. Results: negative.

As always, Dr. Breland has reported in clear, concise manner, some interesting, good work. His paper provides a method of procedure as well as incentive to other investigators.—H. L. T. Durkee.

LA FIEBRE AMARILLA EN MÉXICO Y SU ORIGEN EN AMÉRICA. By Miguel E. Bustamante. Monografía mim. 2. Instituto de Salubridad y Enfermedades Tropicales. Secretaría de Salubridad y Asistencia. Preface by Dr. N. Martinez Báez. I–X. pp. 1–217 incl. index. 19 figs. and large plates with numerous small text illustrations. This epidemiological review begins with comments on Popol-Vuh, the Mayan and Maya-Quicha manuscripts, and includes extracts from the chronicles of the conquerors and friars, extending to the work of Ignacio Fosbo (1871), Ramon Rodriguez Rivera (1877), and Ignacio Alvarado (1878, 1879) that start the Mexican bibliography on yellow fever. Dr. Miguel E. Bustamante gives us his point of view on a theme that has claimed his attention for a long time. There are also numerous references to foreigners which tell their terror and confusion on account of yellow fever, the contemporary of conquerors, slave traders, colonists, adventurers, explorers, etc. To give proportion to the "black vomit," the epidemiological picture includes other plagues, such as small-pox, typhus, and malaria, mentioning royal orders, foundations or locations of towns, hospitals, wars and conquests. There are many necessary references to the Caribbean, Central America, Panama, South America, Canary Islands, etc.

In the first part of this monograph, evidence of the American origin of yellow fever is based on Mayan and Maya-Quicha sources that often refer to epidemic outbreaks of "nekik" or blood-vomit, commonly associated with yellow fever.

The fruitful residence of Dr. Bustamante in the Public Health Unit of the Port of Veracruz, and the importance of this Port, explain the numerous references. Because of deplorable health conditions, it used to be the custom to unload cargo as quickly as possible and to leave the Port immediately for Jalapa, where there was a market for the goods.

Graph no. 1, page 53, presents data to distinguish between the epidemics of yellow fever and malaria, this latter occurring during the second half of the year, while the former shows a climax from June to August.

In the Chapter on Vertebrates and in the Bibliography occur some typographical errors that nevertheless do not diminish the value of this reference.—L. Vargas, Instituto de Salubridad y Enfermedades Tropicales, Mexico, D. F.

REACTIONS OF INSECTS TO THE OLFACTORY STIMULI FROM THE COMPONENTS OF AN INSECTICIDAL SPRAY. By Hocking, B. and Lindsay, I. S. Bull. ent. Res. 49(4):675–683. 14 refs. 1958. Clearly, there are components in diesel fuel oil, in the auxiliary solvent tested, and in technical DDT which are markedly repellent to several

insects, including species against which these materials are regularly used. The olfactory response to the completed spray is intermediate between the responses to the ingredients. In the field, this repellent property may be expected to result in a reluctance of insects to settle in a sprayed area (vertical wind-tunnel) and in a tendency to move downward (T-tube).

Although repellent effects of DDT have long been known (Gahan and others, 1945; Kennedy, 1947) the effect reported here differs in that contact with the solid substance was precluded in both methods of test. Equally, in both methods, however, the effect may be due to a relatively volatile impurity, probably without insecticidal activity.

The 3 series of tests with mosquitoes, in which both kinds of equipment were used, all indicated that Velsicol AR50 was considerably more repellent than fuel oil.

Whatever the true nature of the materials which caused the reactions observed, the practical implications are clear: that many spray ingredients contain materials which tend to defeat the object of the spray by inducing such reactions in insects exposed to their vapour that the insect will not come into contact with the toxicant.

This provides an additional argument for the procedure, usually recommended in aerial and sometimes in other methods of spraying, of moving upwind on each successive pass (Anon. 1954), since by this procedure insects repelled out of the later swaths have to pass through the already sprayed area. With the reverse procedure the odours of the first swath, carried downwind through the target area, would provide warning in time to permit insects to move out through the unsprayed territory. Selective survival of individuals showing these reactions may be a factor in the development of behavioural resistance to insecticides. Our resistant strain of house flies, however, showed a somewhat lower sensitivity than did the supposedly normal strain. It is suggested that the elucidation of the true nature of the materials responsible for these reactions, with a view to eliminating them and perhaps replacing them by attractive ingredients, would be worthwhile.

Two kinds of equipment for measuring the reaction of insects to the olfactory stimuli provided by some common components of insecticidal sprays are described in the text. One of these, consisting of a T-tube carrying a current of odorous air across the top and admitting insects up the stem, is new, can be used in the field, and gives rapid and reproducible evaluation.

Mosquitoes tested were: laboratory-reared *Culex tarsalis* Coq., *Aedes aegypti* (L.), *Aedes* spp., & wild-caught blood hungry females consisting principally of the following species: *A. vexans* (Mg.) *A. stimulans* (Wlk.) *A. excrucians* (Wlk.), *A. fitchii* (Felt & Young), *A. canadensis* (Theo), and *A. intrudens* Dyar.—Excerpts from text, discussion, and summary.