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THE EGG-LAYING HABITS OF *AEDES AEGYPTI* (LINNAEUS) IN CENTRAL TEXAS[1]

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INTRODUCTION. Until recently, larval survey and adult resting and biting collections have been the only means of sampling an *Aedes aegypti* population. Measurement of *Ae. aegypti* populations by adult resting and biting collections is productive only in areas where this species is very abundant. Larval surveys are effective only when rainfall or other moisture is sufficient to flood eggs previously deposited in artificial containers. Recognizing the need for a surveillance method of detecting this species at low population levels, Fay and Perry (1965) at the Technical Development Laboratories in Savannah, Georgia, attempted to develop an attractive egg-laying site. The selection of an egg-laying site was based on female *Ae. aegypti* preference for texture, color, and shape of container, as well as the odor and taste characteristics of the contents. Based on the work of Fay and Perry and the additional studies of the Aedes aegypti Field Research Station at Perrine, Florida, an attractive oviposition site was successfully developed.

This oviposition site, or ovitrap, consists of a black, tapered, pint jar containing one inch of water; a two-dram vial containing reagent grade ethyl acetate as an attractant; and a hardboard paddle, the oviposition site.

The egg-laying site developed by Fay and Perry was employed in the present study, conducted in central Texas, to determine the effects of temperature and rainfall on the ovipositional behavior of *Ae. aegypti*. In addition, a limited test was conducted comparing results of ovitraps operated with and without the ethyl acetate attractant. This study was made during the period of June 23 to November 21, 1966, in an area in Austin, Texas, known to have a heavy infestation of *Ae. aegypti*.

METHODS. Larval surveys were made on June 2, 1966, and July 7, 1966, to determine the degree of infestation in the study area. In all, 203 premises were inspected.

[1] From the Aedes aegypti Eradication Program, National Communicable Disease Center, Public Health Service, U. S. Department of Health, Education, and Welfare, Austin, Texas.

Fifty-three (26 percent) were infested with *Ae. aegypti*. The percent positive will be referred to below as the *Ae. aegypti* index. On blocks that had ovitraps without ethyl acetate, the *Ae. aegypti* index was 28. On blocks that had ovitraps with ethyl acetate, the *Ae. aegypti* index was 24.

On June 23, 1966, 24 ovitraps were placed in six noncontiguous blocks at a rate of four traps per block. Twelve traps in three blocks contained ethyl acetate. The remaining 12 traps were operated without ethyl acetate.

The traps were located in backyards of premises, in partial or total shade, and in close proximity to other *Ae. aegypti* producing containers.

The traps were serviced twice a week. Servicing consisted of adding water and ethyl acetate, if necessary, and the replacing of used paddles with new ones. The collected paddles were placed into plastic bags and taken to the laboratory for detection of eggs with a dissecting microscope. The plastic bag prevented egg contamination among paddles and the desiccation and collapse of the egg.

RESULTS AND DISCUSSION. The limiting effect of low temperatures and absence of precipitation on the oviposition of *Ae. aegypti* is shown in Figure 1. Following 0.27 inch of rain on June 24, there was little precipitation recorded until 2.40 inches fell on August 3. There was a marked decline in oviposition on the paddles from the first week in July, when 80

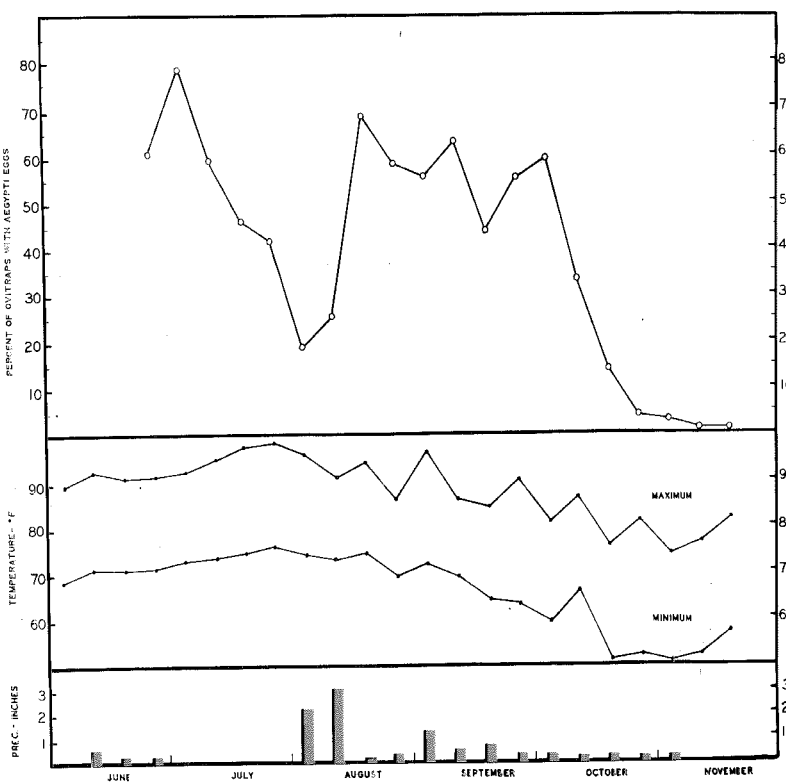

FIG. 1.—The percent of ovitraps found with *Aedes aegypti* eggs, together with temperature and precipitation data, Austin, Texas, 1966.

percent of the paddles were infested with eggs, through the first week in August, when only 19 percent of the paddles were infested. Under these dry conditions there was little opportunity for this species to complete its life cycle and thus add to the existing adult population. Also, during this dry period it appeared that the existing adult population gradually decreased, as indicated by the reduced oviposition rates. The oviposition that did occur may be explained by the presence of containers in which water was added artificially (e.g. plant cuttings, evaporative coolers, and bird baths).

Approximately 2 weeks following the rainfall of August 3, the ovitraps reflected a sharp increase in oviposition. The percentage of paddles on which eggs had been laid increased from 19 during the first week in August to 70 during the third week of that month. From these data, it appears that *Ae. aegypti* required about 14 days to complete its life cycle. The average maximum and minimum temperatures during this period were 93 and 76 degrees respectively. The temperature range was from 97 to 73 degrees. Similar results were obtained by Fay and Eliason (1966), who showed the life cycle to be approximately 14 days in the Miami, Florida, area.

The oviposition rate, as indicated by the percentage of paddles on which eggs were deposited, remained at a relatively high level (between 45–70 percent) through September and the first 2 weeks of October.

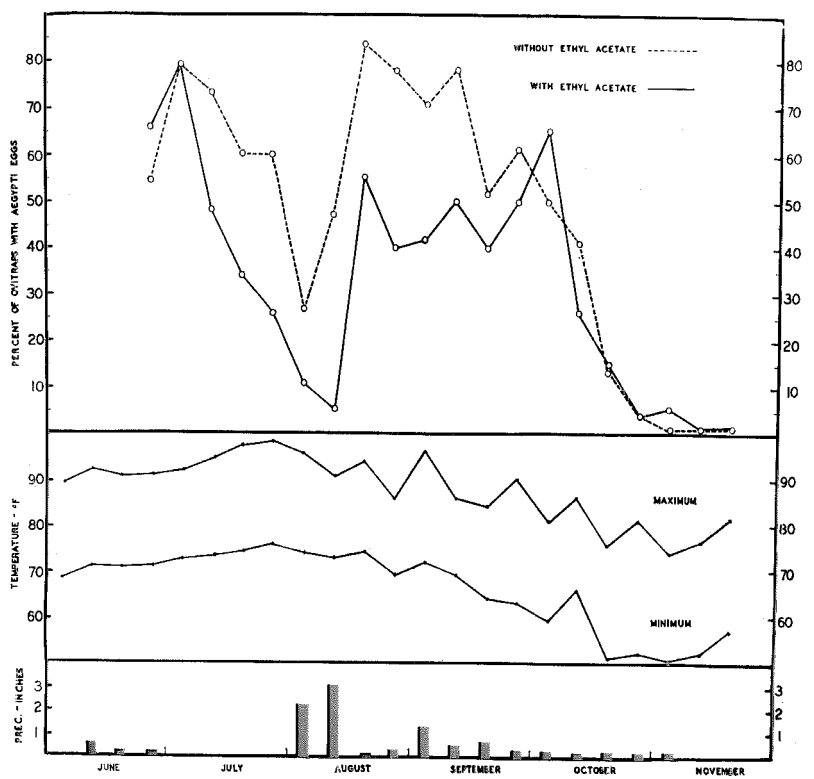

FIG. 2.—The percent of *Aedes aegypti* eggs collected from ovitraps operated with and without ethyl acetate, together with temperature and precipitation data, Austin, Texas, 1966.

Then both inadequate rainfall and low temperatures contributed to the sharp decline in oviposition, which ceased on November 7.

In Figure 2, the effectiveness of ovitraps operated with and without the ethyl acetate attractant is compared. These preliminary results indicate that ovitraps operated without ethyl acetate had an oviposition rate as high as those operated with the chemical. However, it is to be noted that the work was carried out in an area with a heavy infestation of *Ae. aegypti*. In lightly infested areas, the ethyl acetate might be more influential. In addition, larval surveys indicated a slightly higher infestation rate in the blocks with traps operated without the ethyl acetate.

In addition to eggs of *Ae. aegypti*, those of *Aedes triseriatus* (Say) were deposited on the paddles. From a total of 796 paddles examined, eggs of *Ae. aegypti* were found on 333 paddles while eggs of *Ae. triseriatus* were found on 74 paddles. Eggs of both species were found on the same paddle in 55 instances.

SUMMARY. Studies were made from June 23 to November 21, 1966, on the egg-laying behavior of *Ae. aegypti* with particular regard to climatic factors in Central Texas, through the use of standardized oviposition sites. A limited study was also conducted on the effectiveness of ethyl acetate as an oviposition-site attractant to *Ae. aegypti*. Deposition of eggs by this species decreased during periods of little or no rainfall and sharply increased approximately 2 weeks after significant rainfall. A definite reduction in egg laying occurred during periods of cooler temperatures. The ethyl acetate had no apparent effect on the oviposition rate of *Ae. aegypti* under the conditions that existed during the course of this study.

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PRESS ROOM AND HEADQUARTERS ROOM AT ANNUAL MEETING IN NEW ORLEANS

Space has been reserved at the Jung Hotel, Room 263–265, to be used as a Press Room. It is anticipated that this room will be manned on Sunday, Monday and Tuesday, with all authors of papers to be required to submit a copy of their papers to the Press Room. We will ask for advance copies and will arrange meetings with the reporters and authors for publicity on papers.