TEMPERATURE; ITS INFLUENCE ON LIGHT TRAP CATCHES OF *AEDES VEXANS* (MEIGEN) [1]

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For a number of years the New Jersey light trap has been used as a practical and popular device to sample some mosquito populations. Huffacker and Back (1943) reviewed the literature and discussed means of improving light trap collections for certain species of mosquitoes. Southwood (1966) discusses the use of light traps in ecological studies.

The light trap is an effective tool to sample *Aedes vexans* (Meigen), a crepuscular mosquito that is a serious nuisance pest in many areas. Thompson and Dicke (1965) reported that this mosquito at Madison, Wisconsin is very active at dusk and vigorously seeks blood meals at this time. Its peak activity appears to be 30–40 minutes after sunset; yet very few *A. vexans* were attracted to light traps prior to 10 p.m. as compared to the period of time from 10 p.m. to dawn. Temperatures during this period were not given.

Williams (1939) reported the number of insects caught in light traps was doubled for every 5° F rise in temperature. Except for some Lepidoptera, he identifies the insects only to orders.

While it is obvious that mosquito behavior is influenced by environmental conditions prevailing during the period that the light traps are operating, the authors are not aware of any reports where temperatures were reported during such a sampling period.

Materials and Methods. This study was carried out at Point Beach State Forest two miles north of Two Rivers, Wisconsin. Light traps employed are described by Thompson and Dicke (1965). The light was switched on at 8:00 p.m. DST and the trap was manually emptied at 2-hour intervals until 2 a.m., then again at 7 a.m. Temperatures were recorded at the beginning of each interval. Sunset time for 44° 15′N latitude and 87° 30′W longitude, the study area, was obtained from the U. S. Naval Observatory, Washington, D.C.

Since both temperatures and light intensity are known to influence insect activity, analysis of covariance was used to determine whether differences exist between time periods when temperature is constant. The fourth interval, unlike others, was 5 hours in length because a smaller light trap catch was expected after 2 a.m. (Williams, 1939). The numbers of *A. vexans* (males plus females) caught were converted to logarithms, base ten, to transform the data to a normal distribution (Williams, 1940). Traps were operated only on those nights when sunset temperature was above 62° F, as from past experience it was learned that poor catches were obtained when temperatures were 62° F or lower at sunset.

Results. Data are summarized in Figure 1. The analysis of covariance reveals a nonsignificant F value of 0.51 for the variation between time intervals. This means that when the catches are adjusted for temperature, there is no essential difference between time periods in numbers of *A. vexans* attracted to light. Temperature does influence the size of the light trap catches. The F value for regression is 4.16, significant at the 5 percent level. The slope of the regression line was 0.079 which when transformed from logarithms to actual numbers indicated that there was an increase of 1.2 times more *A. vexans* for each degree rise in temperature independent of the time period.

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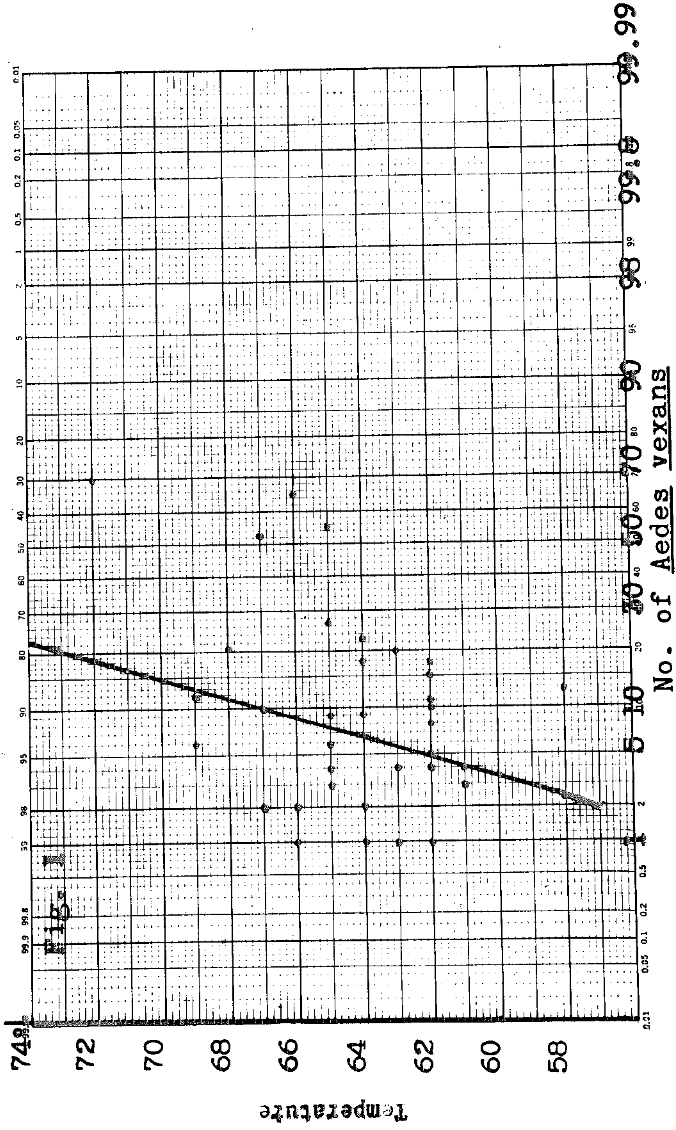

FIG. 1. The influence of temperature on the number of *Aedes vexans* caught in a light trap.

SUMMARY AND CONCLUSIONS. Temperature during the period that a light trap is operated is an important factor and should be considered if light traps are to be used in a quantitative manner in ecological studies. Above 62° F a rise of 1 degree F increased the trap catch by 1.2 times.

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