

AN INCREASE OF *CULISETA MELANURA* COINCIDING WITH AN EPIZOOTIC OF EASTERN EQUINE ENCEPHALITIS IN CONNECTICUT¹

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ABSTRACT. In a 5-year study of fluctuations in the mosquito population in Connecticut, a build-up of *Culiseta melanura* occurred in 1972. At an index study site this species reached a

peak, during the third week in July, that was 12 times higher than the average for the preceding 4 years and coincided with the onset of an epizootic of eastern equine encephalitis.

INTRODUCTION. The first recovery of eastern equine encephalitis (EEE) virus from the mosquito, *Culiseta melanura* was made 22 years ago (Chamberlain, *et al.*, 1951). Since then, numerous isolations have been obtained from this species (Wallis, 1965, Joseph and Bickley, 1969, Saugstad, *et al.*, 1972). Only recently, Howard and Wallis (1973) reported experimental infection and transmission of EEE virus in the laboratory and confirmed that *C. melanura* is an excellent potential vector. As the circumstantial evidence accumulates incriminating this mosquito as to the endemic vector of EEE, it was of considerable interest to determine how epizootic activity of the virus in the field might relate to unusual fluctuation in numbers of *C. melanura*. To accomplish this, routine sampling of an index population of *C. melanura* formed a part of Connecticut field studies in recent years. The purpose of this communication is to report the coincidence of an unusual increase in the population of a vector with the occurrence of an epizootic of EEE in Connecticut during 1972.

MATERIALS AND METHODS. Since 1968, during the summer and fall mosquito sea-

son, regular weekly collections were made at the Farmington field study site in central Connecticut. Adult mosquitoes were obtained from diurnal resting places in man-made animal dens at an abandoned wildlife zoo near Scott Swamp. The 12 dens are all approximately 4 feet wide by 3 feet high and are lined with mortar and field stone. Four dens are shallow (3 feet deep) and the other eight are deeper (8 feet). Both types are favorable collecting places for diurnally resting adult mosquitoes during the summer season (Wallis, 1957), and the deeper dens are known to be regularly utilized as resting sites for mosquitoes (Wallis, *et al.*, 1958).

Collections were made with the aid of a flashlight and an oral glass aspirator. The mosquitoes were blown into pint-size gauze-topped ice cream cartons provided with moist cotton pads for transporting alive to the laboratory. Upon return to the laboratory, the mosquitoes were knocked down with cigarette smoke or chloroform, identified and numbers recorded. They were then pooled by species for eventual testing for presence of virus(es).

RESULTS AND DISCUSSION. Mosquitoes collected at Farmington for the period 1968-1972 are summarized in Table 1. The mosquito population at the sampling site differed in one respect in 1972 from those during the previous 4 years. Between May and mid-October, 4,299 mosquitoes were collected. This figure was only slightly higher than the total of 3,072 collected dur-

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TABLE 1.—Adult mosquitoes collected in Farmington, 1968–72 diurnal resting sites.

	1968	1969	1970	1971	1972
<i>Culiseta melanura</i>	1159	1044	1216	932	2838
<i>Culiseta morsitans</i>	2719	1974	864	706	114
<i>Culiseta sylvestris</i>	1	5	0	0	0
<i>Anopheles punctipennis</i>	159	1512	613	72	113
<i>Culex</i> spp.*	820	4222	1163	1354	1295
<i>Culex territans</i>	96	340	2	8	39
Totals	4954	8897	3858	3072	4299

* *Culex* spp. indicates number of *C. pipiens*, *C. restuans* and *C. salinarius* pooled together.

ing 1971, but it is unusual in that there were three times as many *C. melanura* in 1972.

Since a major outbreak of EEE in Connecticut pheasants and horses began in July of 1972, it is of interest to ascertain more precisely when the adult *C. melanura* population at the Farmington index site may have reached its peak. In Table 2, the numbers of this species taken each week in 1972 are compared with those for the corresponding weeks in 1971. It can be seen that in 1972 there were no unusual numbers of *C. melanura* found through the month of June, but there was an increase in the first week in July. By the third week of July (July 21) there were 647 *C. melanura* as compared with 25

taken in the comparable week (July 25) of 1971—or 25 times as many. Table 2 also shows for the third week in July and the two following weeks the average number of *C. melanura* collected in corresponding weeks during the previous 4 years since the numbers taken during 1971 were somewhat lower than the average for the 4-year period. The figure of 647 *C. melanura* taken on July 21, 1972 was over 12 times the average number for the corresponding week during the past 4 years and significant differences are also evident for the other 2 weeks. Furthermore, the 1972 collections of *C. melanura* exceeded those of 1971 for every week from July until the end of the season.

As shown in Table 1, there was no

TABLE 2.—Comparison of weekly collections of adult *C. melanura* from Farmington during 1971 and 1972.

1971			1972		
Month	Day	No. collected	Month	Day	No. collected
June	9	460	June	16	208
June	17	88	June	26	19
June	30	57	June	29	43
July	5	10	July	7	53
July	12	6	July	12	62
July	25	25 (52)*	July	21	647
July	30	69 (63)*	July	27	267
August	6	42 (24)*	August	8	566
August	13	14	August	17	56
August	23	29	August	24	442
August	31	14	August	31	282
September	6	40	September	8	106
September	17	46	September	16	60
September	21	32	September	22	37
October	5	1	October	4	35
October	12	1	October	14	15
Totals		932			2,838

* Average number per week during corresponding weeks 1968–71.

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build-up in 1972 of other species found in the diurnal resting places that coincided with the increase of *C. melanura*. It is of considerable interest that the population peak occurred in the third week of July just prior to the onset of widespread EEE virus activity among pheasants and horses in the state (Bryant, *et al.* 1973). The population increase and timing provide an additional bit of circumstantial evidence attesting to the importance of *C. melanura* as a vector of EEE.

In summarizing the reported evidence, there have been numerous isolations of EEE virus from this species with only occasional isolations from other mosquitoes, experimental study in the laboratory confirms the high infective and transmission potential of this species, and now evidence reported here calls attention to an unusual build-up of *C. melanura* just prior to an EEE epizootic.

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