



# NEW JERSEY VECTOR SURVEILLANCE

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Vol. 1 No. 5

1986 Season Summation

## INTRODUCTION

Eastern equine encephalitis (EEE) virus was most active in the southern United States during 1986. Florida experienced the single human case reported during the year. Equine involvement was mainly southern in distribution. Reports from the Centers for Disease Control documented equine cases from Florida (48), Louisiana (13), Mississippi (9), Alabama (4), North Carolina (4), Indiana (1) and New Jersey (1).

The New Jersey Vector Surveillance Program to monitor EEE virus and its mosquito vectors was expanded in 1986. The methods employed and the results of the survey are included in this report.

## METHODS OF THE SURVEY

Culiseta melanura populations were monitored with lines of resting boxes in 8 areas of New Jersey. The boxes were placed in the field during the month of May and collections were made twice weekly from 3 June to 31 October. CDC light traps baited with dry ice were used to collect additional specimens from selected regions along the eastern coast, western coast and inland sector of the state. All specimens were frozen on dry ice at the collection site and transported to the laboratory for speciation and pooling.

Coastal populations of Aedes sollicitans were monitored twice weekly from 8 collection sites to identify major broods and population levels over the course of the season. On each collection date, specimens were also taken for ovarian dissection and physiological aging. Virus tests were conducted at the New Jersey State Health laboratories in Trenton. Results were made available to county mosquito control agencies throughout the encephalitis season.

## MOSQUITO SPECIES TESTED DURING 1986

Prior to 1986, virus surveillance was conducted mainly with resting boxes. When virus appeared, the resting boxes were supplemented with landing rate and sweep collections primarily to collect Ae. sollicitans for virus assay. The inclusion of light traps in the surveillance effort increased the number of mosquito species tested this year. Table 1 lists the totals that were screened for EEE virus in 1986.

Virus isolation attempts did show that Cs. melanura remains as the main indicator of EEE activity in the state. Of the 22 isolations made during 1986, 21 were obtained from Cs. melanura.

TABLE 1. Mosquito species tested for EEE virus in New Jersey during 1986.

Species	Total tested
Genus <u>Aedes</u>	
<u>Ae. sollicitans</u>	7,931
<u>Ae. cantator</u>	7,319
<u>Ae. canadensis</u>	6,411
<u>Ae. vexans</u>	169
<u>Ae. taeniorhynchus</u>	41
<u>Ae. triseriatus</u>	38
<u>Ae. trivittatus</u>	12
<u>Ae. thibaulti</u>	10
<u>Ae. cinerius</u>	6
<u>Ae. grossbecki</u>	6
<u>Ae. sticticus</u>	5
Genus <u>Anopheles</u>	
<u>An. bradleyi</u>	6,725
<u>An. quadrimaculatus</u>	549
<u>An. punctipennis</u>	385
Genus <u>Coquillettidia</u>	
<u>Cq. perturbans</u>	10,847
Genus <u>Culiseta</u>	
<u>Cs. melanura</u>	23,000
<u>Cs. inornata</u>	1
Genus <u>Culex</u>	
<u>Cx. salinarius</u>	40,448
<u>Cx. restuans</u>	1,868
<u>Cx. territans</u>	614
<u>Cx. erraticus</u>	266
<u>Cx. pipiens</u>	78
Genus <u>Psorophora</u>	
<u>Ps. columbiae</u>	5
<u>Ps. ferox</u>	1
Genus <u>Uranotaenia</u>	
<u>Ur. sapphirina</u>	9

CULISETA MELANURA AND EEE VIRUS

New Jersey experienced a dry spring for the second straight year and EEE cycling was minimal during the early season. Culiseta melanura

populations were well below average during the month of June when the survey began and dropped to record low levels throughout most of July. The increased surveillance effort collected large numbers of specimens for assay but no virus isolations were made from any of the sites during the first half of the season.

Culiseta melanura populations remained low at all of the inland sites where early season equine cases have been common in the past. In coastal areas, however, the resting box collections showed a sharp increase during the month of August. The increase in Cs. melanura was accompanied by late season EEE amplification in some areas.

TABLE 2. EEE virus isolations from Culiseta melanura in New Jersey during 1986.

Location	Total positive pools	Earliest isolation	Latest isolation
East Coast			
Green Bank	16	Aug 12	Oct 14
Bass River	1	Aug 22	-
Corbin City	1	Sep 30	-
West Coast *			
Dennisville	3	Aug 26	Sep 30
Fishing Creek	0	-	-
Inland			
Jackson	0	-	-
Williamstown	0	-	-
Centerton	0	-	-

\* A single EEE isolation was also made from a pool of 100 Culex salinarius collected by CDC light trap at Dennisville August 20, 1986.

Table 2 lists EEE isolations from Cs. melanura during the 1986 season by collection site. Data show that EEE was not evident in any of the specimens tested until mid-August. Virus isolations were most frequent at the Green Bank site, just north of Atlantic City and totally absent from any of the inland areas where equine cases are frequently contracted. Although EEE virus was detected at Dennisville, the period of amplification was relatively brief.

Minimum field infection rates (MFIR) for Cs. melanura confirm that EEE virus was an east coast phenomenon during 1986. Table 3 lists the MFIR values (virus isolations per 1000 specimens tested) by region. Although the values are low compared to epizootic years, the data emphasize the geographic concentration of virus activity along the eastern seaboard. Virus activity in the western region was minimal in 1986, an area of the state where EEE is normally documented at very high levels.

TABLE 3. Minimum field infection rates (MFIR) for Culiseta melanura during 1986.

Location	Total tested	No. Pools	Positive Pools	MFIR
East coast				
Green Bank	3909	192	16	4.09
Bass River	2970	168	1	0.34
Corbin City	431	106	1	2.32
West Coast				
Dennisville	12,712	474	3	0.24
Fishing Creek	240	43	0	0
Inland				
Jackson	231	69	0	0
Williamstown	626	104	0	0
Centerton	1875	134	0	0

Table 4 shows the seasonal progression of EEE virus at the Green Bank site, the only area where virus reached epizootic proportions in 1986. No isolations were obtained during June or July when Cs. melanura were experiencing low population levels. In August, when population levels increased abruptly, EEE virus was isolated at a rate of 5.61 isolations per 1000 specimens tested. Isolation rates declined somewhat during the month of September but increased to 10.51 in October. An equine case was confirmed late in the season less than 10 mi. from the study site where high levels of EEE virus had been documented in Cs. melanura.

Table 4. Monthly progression of EEE virus in Culiseta melanura at Green Bank, Burlington County, during 1986.

Month	Total Tested	No. Pools	Positive Pools	MFIR
June	249	27	0	0
July	121	22	0	0
August	1781	57	10	5.61
September	1568	63	4	2.55
October	190	23	2	10.51

## EQUINE CASES OF EEE DURING 1986

The single confirmed equine case in 1986 was contracted in Hammonton Township, Atlantic County. The case involved a 10 year old thoroughbred gelding that had been moved from the Atlantic City Race Track to the Hammonton farm 3 weeks before symptoms became evident. Onset of CNS disfunctions were noted September 26 and the animal was euthanized later that same day. EEE virus was isolated from brain tissue, confirming the case. The horse had no documented vaccination history. Two unconfirmed horse cases were also reported during the latter part of the season. Both involved unvaccinated animals that were stabled in the general vicinity of the east coast focus, but brain tissue was not available for confirmation.

### DISCUSSION

The 1986 season was reminiscent of 1985 with low level populations of Cs. melanura during the early spring. In each year, virus amplification did not take place until mid-August and minimum field infection rates remained below 5.00 on a season-wide basis. Under these circumstances, EEE was transmitted beyond the avian cycle on a limited basis with most activity late in the season.

In 1986, no evidence of early season horse cases could be documented at inland areas, thus, the importance of that phenomenon is still poorly understood. In epizootic years, equine cases frequently appear in Gloucester, Salem and western Atlantic counties during the month of July. In many cases, the inland horse cases precede any evidence of EEE virus in the Cs. melanura that are being monitored. The New Jersey Vector Surveillance program has been modified to concentrate on the early appearance of EEE at inland sites and its possible influence on late season cycling in coastal areas. To date, little information has been gathered and the dynamics of transmission at inland areas remains unresolved.

ACKNOWLEDGEMENTS: This document is the result of a cooperative effort among the following State and County Agencies: New Jersey State Mosquito Control Commission, New Jersey State Department of Health, the Mosquito Research and Control Unit of NJAES, the New Jersey Department of Environmental Protection, the New Jersey Department of Agriculture, the County Mosquito Control Agencies of Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester, Ocean, Middlesex and Salem Counties.

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New Jersey Agricultural Experiment Station Publication No. R-40500-01-87 supported by the New Jersey State Mosquito Control Commission, the New Jersey Department of Health and State funds.