



NEW JERSEY VECTOR SURVEILLANCE

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ABSTRACT: New Jersey experienced a very dry Spring in 1988 that was followed by a long period of hot wet weather. *Culiseta melanura* populations began the season at high levels but dropped dramatically during the heat wave experienced in June and July. Repeated thunderstorms triggered broods of floodwater mosquitoes during the summer months but *Cs. melanura* populations remained low. Virus amplification did not take place during the critical period, thus, vector potential remained low even though numerous potential vectors were present. EEE virus did appear during the month of August but virus isolations were infrequent and Minimum Field Infection rates remained low at most sites. No equine involvement accompanied the brief epornitic period during the latter portion of the season.

INTRODUCTION

Eastern equine encephalitis virus (EEE) was restricted to the southeastern United States in 1988 with a single human case reported from Florida and equine cases from Florida, Georgia, Alabama, Arkansas and Virginia. No epizootic activity was reported from any state in the northeast.

The New Jersey Vector Surveillance Program monitored EEE virus and its mosquito vectors throughout the 1988 season at locations where EEE activity has been reported in the past. EEE virus was detected at several of the study sites late in the season but virus amplification did not extend beyond the *Cs. melanura* - wild bird cycle in any portion of the State.

METHODOLOGY OF THE SURVEILLANCE EFFORT

The epornitic vector, *Cs. melanura* was monitored with resting boxes at 7 collection stations in southern New Jersey from late

May to mid October. (Fig. 1) Collections were made once weekly during the surveillance period. CDC light traps baited with dry ice were used to collect a broad spectrum of mosquito species at one coastal site (Dennisville) and one inland site (Centerton). Mosquito specimens were frozen on dry ice at the collection site and transported to Rutgers University for speciation, pooling and trituration.

Coastal populations of *Aedes sollicitans* were monitored twice weekly at 6 collection stations to identify the periods of peak emergence during the season. On each collection date, specimens were also taken for physiological aging by ovarian tracheolation. Virus isolation attempts were conducted on all specimens collected during the survey period by the New Jersey State Department of Health Laboratories in Trenton. Collection data were collated with a database system for rapid analysis and the information was distributed to county mosquito control agencies in the State throughout the encephalitis season.

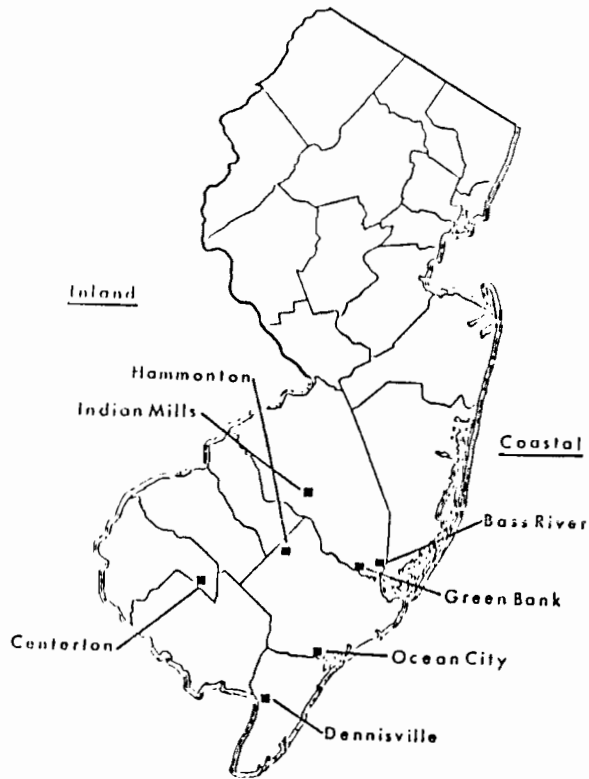


Fig. 1. Resting box sites for arbovirus surveillance in 1988.

MOSQUITO SPECIES TESTED FOR VIRUS DURING 1988

A total of 85,189 mosquito specimens were tested for Highlands J (HJ) and EEE virus during 1988. Table 1 lists the totals by species for all sites combined. *Cs. melanura* was the only species found positive with 3 HJ and 6 EEE isolations over the course of the season.

CS. MELANURA AND THE SEASONAL PROGRESSION OF EEE VIRUS

New Jersey experienced a relatively dry Spring in 1988 that was followed by a period of very hot but rainy weather. *Cs. melanura* populations were higher than average at the beginning of the season at most of the sites but dropped substantially after the first major heat wave. Heavy rains produced multiple broods of floodwater mosquitoes during the month of July but *Cs. melanura* populations remained low at most sites. Recovery appeared to be slow and the populations were much lower than normal during the late summer period when EEE virus is normally

Table 1. Mosquito species tested for EEE and HJ virus in New Jersey during 1988.

MOSQUITO SPECIES	TOTAL TESTED	NO. POOLS	POSITIVE POOLS	
			HJ	EEE
<i>Genus Culiseta</i>				
<i>Cs. melanura</i>	8460	771	3	6
<i>Genus Aedes</i>				
<i>Ae. canadensis</i>	5865	199	0	0
<i>Ae. cantator</i>	5323	179	0	0
<i>Ae. grossbecki</i>	2	2	0	0
<i>Ae. sollicitans</i>	19070	356	0	0
<i>Ae. taeniorhynchus</i>	679	85	0	0
<i>Ae. thibaulti</i>	9	3	0	0
<i>Ae. triseriatus</i>	120	63	0	0
<i>Ae. vexans</i>	295	65	0	0
<i>Genus Anopheles</i>				
<i>An. bradleyi</i>	3048	164	0	0
<i>An. punctipennis</i>	154	87	0	0
<i>An. quadrimaculatus</i>	1301	276	0	0
<i>Genus Coquillutia</i>				
<i>Cq. perturbans</i>	9251	208	0	0
<i>Genus Culex</i>				
<i>Cx. pipiens</i>	294	43	0	0
<i>Cx. restuans</i>	208	135	0	0
<i>Cx. sinuarius</i>	30116	536	0	0
<i>Cx. territans</i>	101	63	0	0
<i>Genus Psorophora</i>				
<i>Ps. columbiana</i>	6	4	0	0
<i>Ps. ferox</i>	2	2	0	0
<i>Genus Uranotaenia</i>				
<i>Ur. sapphirina</i>	5	5	0	0

amplified in nature. Fig. 2 compares the 1987 and 1988 populations of *Cs. melanura* at Hammonton and clearly shows the general trend for the species this year. Fig. 3 compares the 1988 populations at Green Bank with the 4 year mean for that site. Although the trend is similar, *Cs. melanura* did recover somewhat during the latter part of the season and the Green Bank site was one of the few that yielded any EEE isolations.

Table 2 compares EEE isolations from *Cs. melanura* by collection site during the 1988 season. Data show that virus occurred only at Green Bank and Bass River on the eastern seaboard. No isolations were obtained from any of the inland sites and no activity was detected at Dennisville, an area where EEE is normally maintained at the enzootic level every year. Table 3 lists the MFIR values (virus isolations per 1000

specimens tested) by month for each site. The data show that sufficient specimens were sampled at most sites and that EEE was clearly a late season phenomenon only along the eastern seaboard this year.

DISCUSSION

The 1988 season was an abnormal encephalitis year for New Jersey in a number of respects. Despite the heavy rains experienced during the Summer, *Cs. melanura* populations remained low and virus amplification did not take place when vector populations were at their highest. As a result, vector potential remained low for lack of virus, even though numerous potential vectors were available to make the transfer from the avian cycle. When virus did appear late in the season, epornitic activity was detected only in one local

Table 2. EEE virus isolations from *Culiseta melanura* in New Jersey during 1988.

LOCATION	POSITIVE POOLS	EARLIEST ISOLATION	LATEST ISOLATION
Coastal Sites			
Green Bank	4	Aug. 1	Sept. 20
Bass River	2	Sept. 5	Oct. 10
Ocean City	0	-	-
Dennisville	0	-	-
Inland Sites			
Hammonton	0	-	-
Indian Mills	0	-	-
Centerton	0	-	-

Table 3. Minimum Field Infection Rates (MFIR) for *Culiseta melanura* by month during 1988.

LOCATION	TOTAL TESTED	MFIR VALUE				
		June	July	Aug	Sept	Oct
Coastal Sites						
Green Bank	932	0	0	18.63	3.98	0
Bass River	1354	0	0	0	5.81	37.04
Ocean City	79	0	0	0	0	0
Dennisville	3469	0	0	0	0	0
Inland Sites						
Hammonton	1282	0	0	0	0	0
Indian Mills	253	0	0	0	0	0
Centerton	1091	0	0	0	0	0

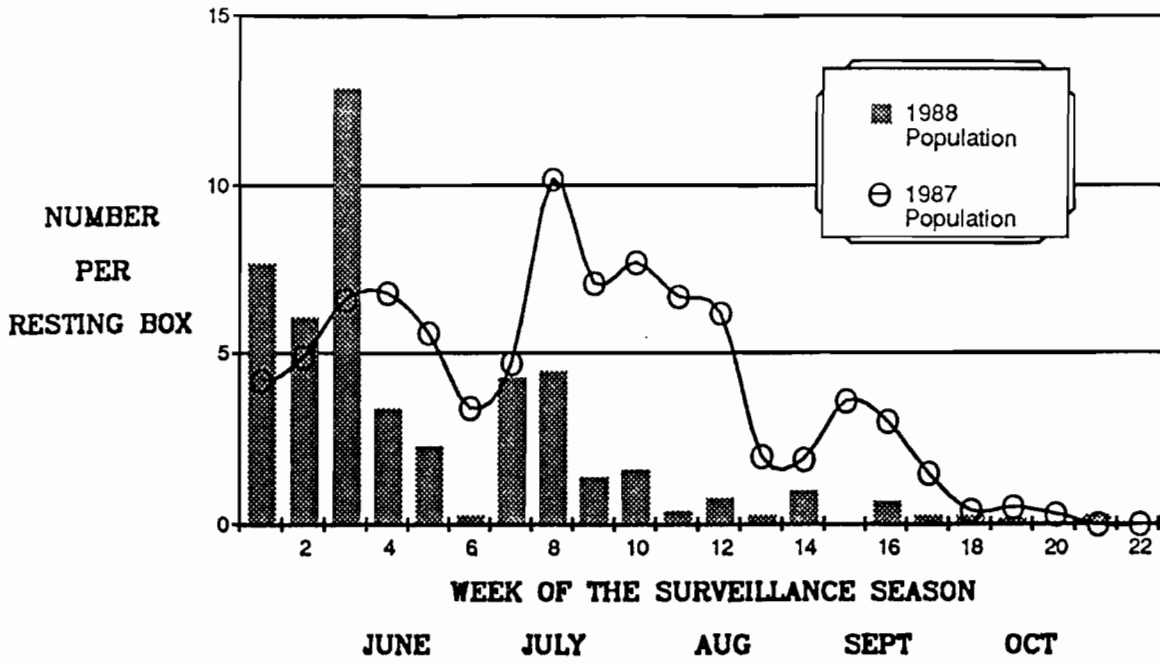


Fig. 2. Resting box populations of *Cs. melanura* at Hammonton in Atlantic County in 1988.

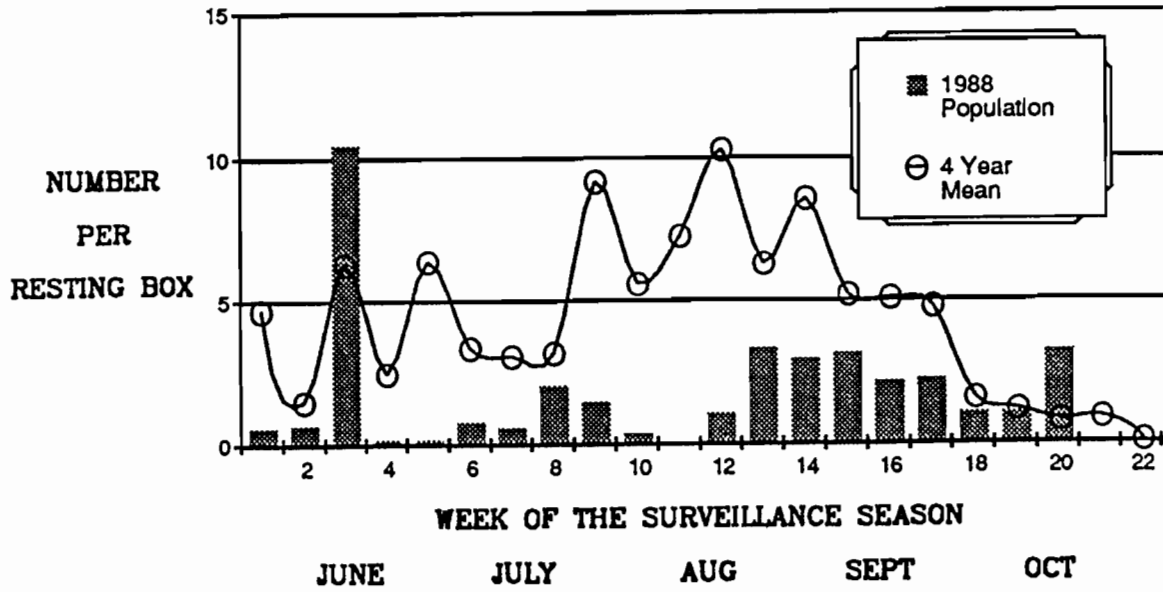


Fig. 3. Resting box populations of *Cs. melanura* at Green Bank in Burlington County in 1988.

geographic area along the eastern seaboard. No equine cases reported from any part of the State, suggesting that lack of virus amplification was essentially state-wide during the 1988 season.

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