NEW JERSEY VECTOR SURVEILLANCE

Vol. 12 No. 1 Period: Spring Survey 1987

ABSTRACT: Culiseta melanura populations have been well above average at all of the sites that are being monitored for EEE in New Jersey. The high populations suggest favorable conditions for virus amplification this year. A single isolation of Highlands J virus was made from a pool of Cs. melanura collected at Dennisville late in June. No EEE isolations have been obtained from any of the specimens to date.

INTRODUCTION

Beginning in 1976, the New Jersey Agricultural Experiment Station implemented a program to monitor the mosquito vectors of eastern equine encephalitis virus (EEE). The program was originally funded solely by the New Jersey State Mosquito Control Commission with the charge to make information on the status of EEE virus available to the mosquito control community during the summer season. The New Jersey State Department of Health supported the surveillance effort by providing virus isolation attempts on all specimens collected. Over the years, the program has expanded by including new sites for virus monitoring efforts, a computer analysis of the data base and weekly summary reports in addition to the monthly New Jersey Vector Surveillance Report.

The virus monitoring program will continue in 1987 and make the information available on a continuing basis throughout the season. The three agencies (Health, Environmental Protection and Experiment Station) will maintain close contact and virus information will be distributed on a weekly basis to mosquito control groups within New Jersey and monthly to all that are interested in receiving the data.

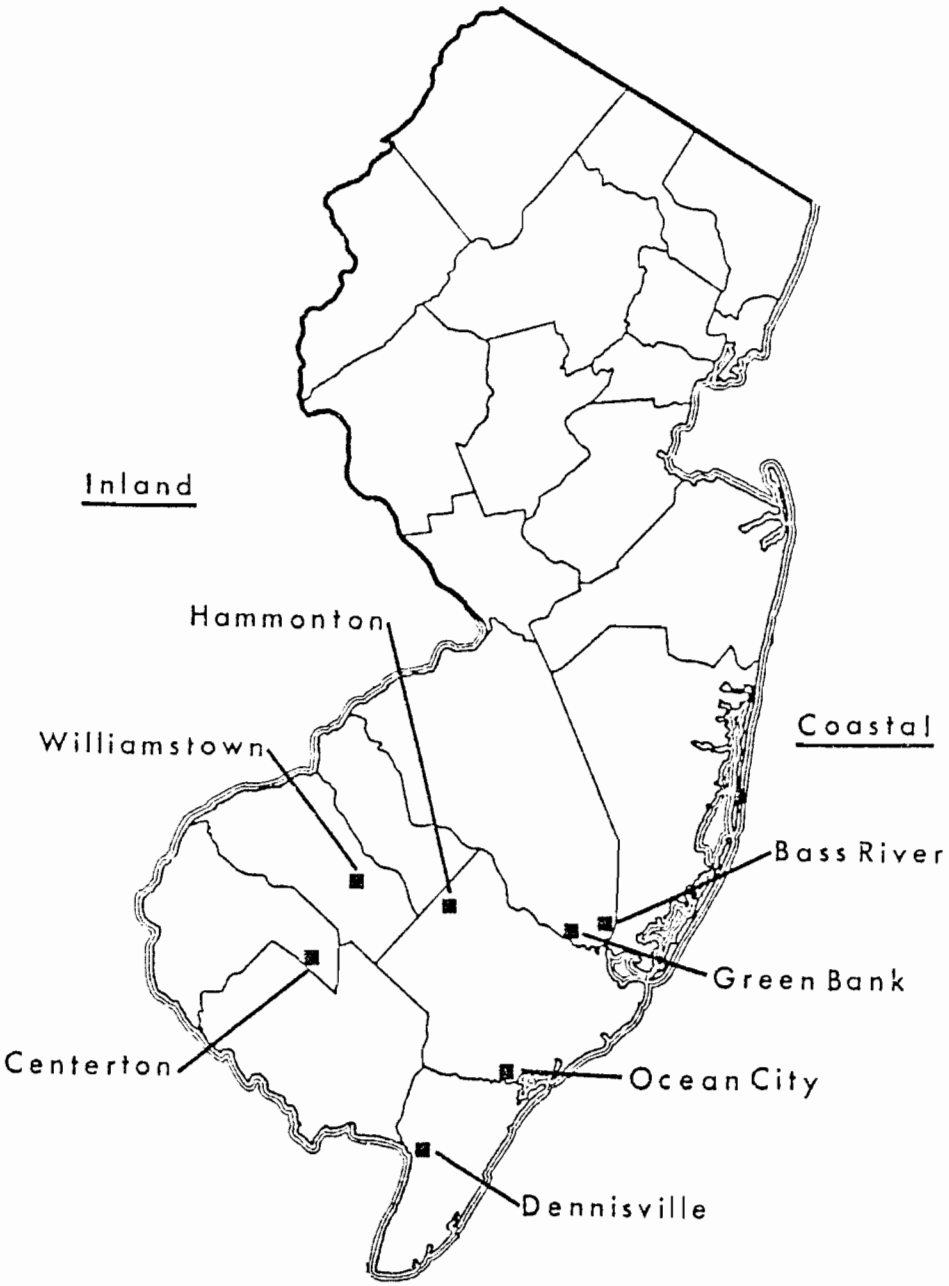
In 1986, the New Jersey Vector Surveillance Report adopted a new format that included the distribution index returning to Volume 1. This year, the program has elected to restore the original volume index to reflect the number of years that the program has been in effect. If you are maintaining files of the New Jersey Vector Surveillance Report, last year's Volume 1 should be re-numbered to indicate Volume 11. The 1987 series will continue the original numbering system as Volume 12.

METHODOLOGY OF THE SURVEILLANCE EFFORT IN 1987

As in the past, Culiseta melanura will be used as the main indicator of EEE virus. Specimens will be collected primarily from resting boxes in areas of the state where human or equine cases have been detected over the years. Collections will be made once weekly and all specimens will be speciated, pooled and sent to the New Jersey Department of Health for virus isolation attempts. This year's resting box collection sites will include:

RESTING BOX SITES

1987



COASTAL SITES

Bass River, Burlington County - 25 Boxes

The Bass River resting box collection site is located in a dense plantation of experimental Black, Red and White Pine within the Bass River State Forest and serves as a monitor for the coastal region north of Atlantic City. The area is bordered by numerous Atlantic White Cedar bogs which produce Cs. melanura in large numbers. The pine stand is approximately 2 mi. from coastal salt marsh habitat. The study site was used as a monitor from 1976 - 1982 under the name of New Gretna but was dropped from the regime in 1983. The collection site was re-established in 1986 when the program expanded.

Green Bank, Burlington County - 25 Boxes

The Green Bank resting box collection site is located in a dense White Pine plantation within the Green Bank State Forest and serves as a monitor for the Mullica drainage to the northwest of Atlantic City. Although some Atlantic White Cedar can be found in the area, much of the Cs. melanura population originates from Red Maple habitat. The area was first explored as an experimental study site in 1983 because of documented early season virus activity from that region. Its location on the border of Atlantic and Burlington provides a useful monitor for both counties.

Ocean City (Corbin City), Atlantic County - 25 Boxes

The Ocean City resting box collection site was selected in 1984 following a human case of EEE from that area. The site serves as a monitor for the Great Egg Harbor drainage to the south of Atlantic City. Although the site monitors the Ocean City area of Cape May County, the resting boxes are actually located just across the county line in Corbin City, Atlantic County. The area contains a mixture of Red Maple and Atlantic White Cedar on the border of an extensive area of brackish marshland. The Atlantic County Mosquito Control Agency makes all of the collections from this series of resting boxes and coordinates with the Vector Surveillance team to assure that the specimens are pooled and processed on schedule.

Dennisville, Cape May County - 50 Boxes, 4 CDC Traps

The Dennisville resting box collection site is located in a large White Pine plantation within the Belleplain State Forest and serves as a monitor for the salt hay region along Delaware Bay. The study site is located on a penninsula of upland forest that juts out into the salt marsh. An extensive Atlantic White Cedar swamp borders the entire area and produces the large populations of Cs. melanura that are routinely collected each year. The Dennisville site has been monitored since 1976 and has been a reliable indicator of virus activity over the years.

INLAND SITES

Centerton, Salem County - 25 Boxes

The Centerton resting box collection site is located in a young White Pine stand within Parvin State Park. The site was established in 1985 to investigate the dynamics of early season virus activity at an inland site. Numerous equine cases have been reported from Salem County over the years and follow-up surveys showed that EEE virus was common in Cs. melanura after the equine cases had been confirmed. No data, however, are available to document the events that precede transmission to equines. The Centerton site will, hopefully, provide answers to the epidemiology of EEE in a non-coastal area. Some Atlantic White Cedar provides breeding habitat for Cs. melanura but lowland Red Maple swamps are common and produce sizeable Cs. melanura populations when the water table is high.

Williamstown, Gloucester County - 25 Boxes

The Williamstown resting box collection site is located in a dense Red Maple swamp in the Glassboro Wildlife Management Preserve. The site was established in 1985, following extensive equine involvement in that area. Like the Centerton site, the Williamstown study area is being investigated to document the events that precede EEE transmission in a non-coastal area of the state where equine epizootics have been intense in the past.

Hammonton, Atlantic County - 25 Boxes

The Hammonton resting box collection site is located in an extensive Red Maple Swamp in Hammonton Township. The site is new this year and was selected because of equine activity in the area last year. Western Atlantic County has experienced both early and late season cases of EEE over the years but the dynamics of transmission are poorly understood. The Atlantic County Mosquito Control Agency is monitoring water levels within the swamp as an added parameter for the study.

Each of the above study sites will be sampled once weekly from June through October. Mosquitoes will be frozen on dry ice at the time of collection and transported to the Mosquito Research and Control Laboratories for speciation and pooling. Sorting will be conducted on chill tables to maintain living virus. Mosquito pools will be grouped by Site, Date, Physiological State and Trapping Method. Specimens will be sent to the State Health laboratories for virus isolation attempts. The results will then be entered into a computer data base for collation, MFIR calculations and graphics.

Information from the field regarding EEE in horses will be compiled by the New Jersey Department of Agriculture. Collection of tissue specimens from suspect cases will also be coordinated by that agency. The results of equine testing will be included in this report and related to the data obtained from mosquito specimens.

Surveillance for St. Louis Encephalitis virus (SLE) will be conducted through the weekly bleeding of five sentinel chicken flocks that were placed in the urban corridor of New Jersey during May. Sentinel locations include: Mt Ephraim (Camden Co.), Cinnaminson and Mt. Holly (Burlington Co.), West Windsor (Mercer Co.) and Edison (Middlesex Co.).

THE CURRENT STATUS OF EEE AND ITS MOSQUITO VECTORS

New Jersey experienced an exceptionally wet spring and Cs. melanura populations have been well above average at all of the collection sites. Figure 1 compares June populations at the Bass River site with the 8 year mean from that area. Data show that the first generation of the season was abnormally large. Each of the first 3 collection periods in June represented record numbers for the site for that time of year. The population peaked during the 3rd week of the month and returned to normal levels as the generation declined. Data from the first weeks of July, however, (not depicted) show that the 2nd generation is also well above average.

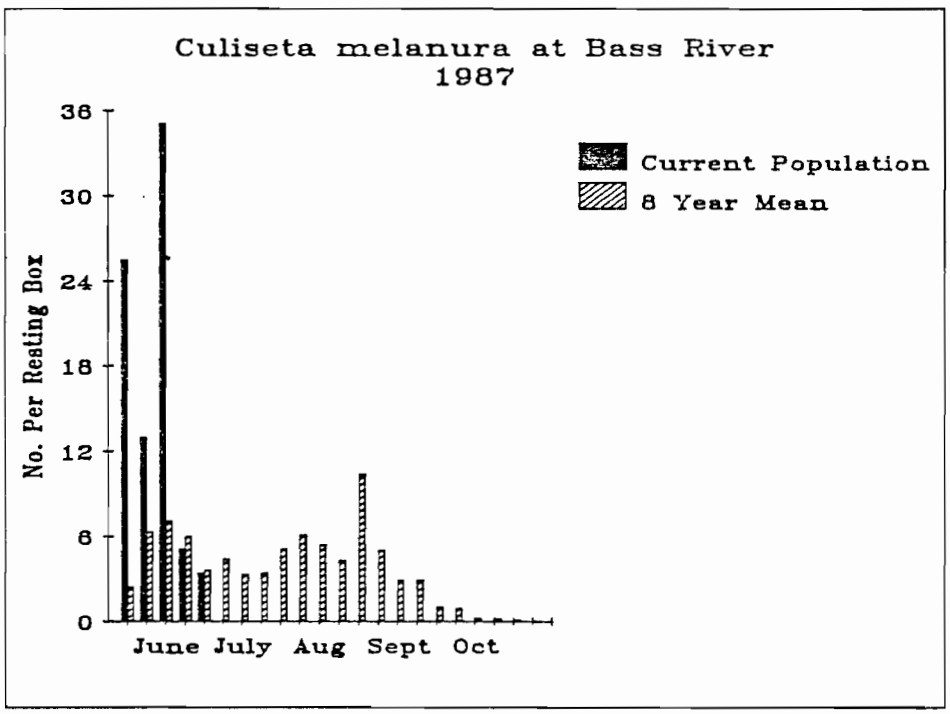


Fig. 1. Resting box populations of Cs. melanura at Bass River in Burlington Co. during June compared with the 8 year mean for that site.

Data from other collection sites show that the trend is widespread in the state. Figure 2 compares June populations at the Centerton site with the 2 year mean from that area. The first generation of Cs. melanura was well above average at this inland site and collections from early July show that the 2nd generation is also exceptionally large. In general, data indicate similar trends at all of the sites this year. Under these conditions, the potential for early season amplification of EEE virus would appear ideal.

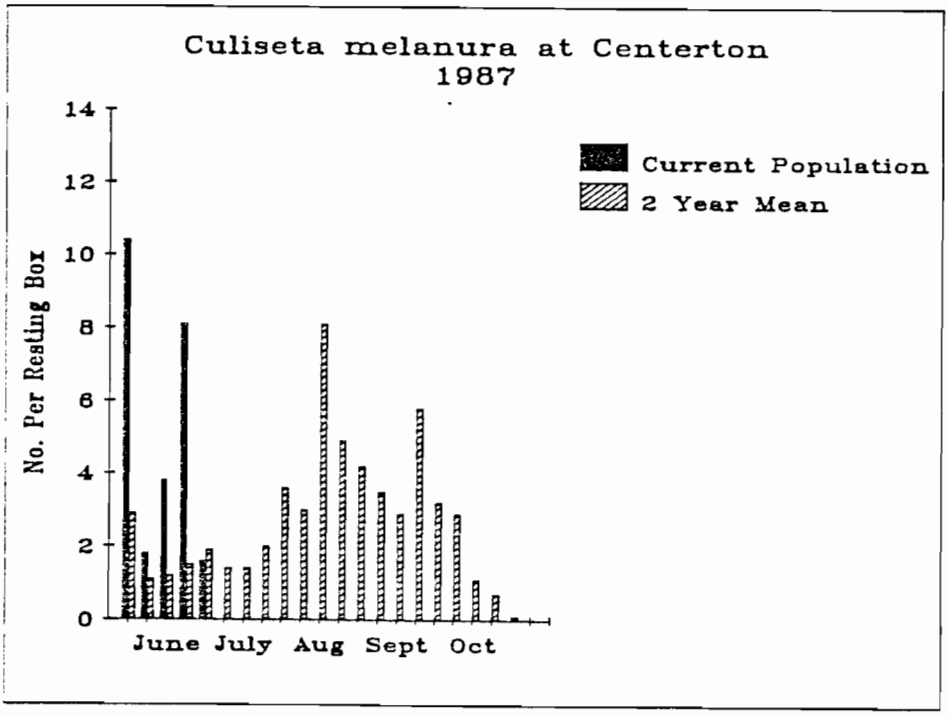


Fig. 2. Resting box populations of Cs. melanura at Centerton in Salem Co. during June compared with the 2 year mean for that site.

During the month of June, 18,390 total specimens were processed for virus isolation attempts in 631 pools. Table 1 lists all species that have been processed to date. Table 2 summarizes the Cs. melanura in the sample by site. A single Highlands J (HJ) isolation was obtained from a pool of 50 unengorged Cs. melanura collected at Dennisville on June 30. No EEE isolations have been obtained from any of the specimens to date.

Table 1. Total specimens tested for EEE virus through the month of June 1987.

MOSQUITO SPECIES	TOTAL TESTED	NO. POOLS
Cs. melanura	5273	196
Cq. perturbans	2765	74
Ae. sollicitans	1245	29
Ae. canadensis	2020	52
Ae. cantator	662	26
Ae. taeniorhynchus	5	2
Ae. triseriatus	2	2
Ae. vexans	2	2
Cx. pipiens	8	5
Cx. restuans	468	63
Cx. salinarius	3921	57
Cx. territans	94	31
An. bradleyi	1392	24
An. punctipennis	93	27
An. quadrimaculatus	414	31
Ae. thibaulti	3	3
Cs. inornata	1	1

Table 2. Culiseta melanura tested for EEE virus in New Jersey during June, 1987.

	TOTAL TESTED	NO. POOLS	POSITIVE POOLS HJ	POSITIVE POOLS EEE
COASTAL SITES				
Green Bank	561	19	0	0
Bass River	2225	55	0	0
Ocean City	109	14	0	0
Dennisville	1118	47	1	0
INLAND SITES				
Hammonton	645	25	0	0
Williamstown	86	14	0	0
Centerton	528	21	0	0

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