

New Jersey

Vector Surveillance

NEW JERSEY AGRICULTURAL EXPERIMENT STATION
MOSQUITO RESEARCH AND CONTROL

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Season Summation

INTRODUCTION

Eastern equine encephalitis (EEE) virus activity was minimal in most regions of the United States during 1985. New Jersey and Massachusetts were the only states in the northeast with documentation of virus from field collection mosquitoes. Although New Jersey did have some equine involvement during the course of the season, horse cases were otherwise limited to 7 southeastern states. Reports from the Centers for Disease Control showed that Florida led the nation with 46 equine cases in 1985. Other southeastern states with confirmed equine involvement included Alabama (3), Arkansas (3), Mississippi (3), Georgia (2), North Carolina (1) and South Carolina (1).

New Jersey experienced an exceptionally dry spring during 1985 which appeared to inhibit the cycling of EEE during the early season. EEE did not appear in Culiseta melanura until mid August and virus isolations were well below the levels seen in previous years. A late season surge in virus activity was documented during the fall and 3 of the 4 confirmed New Jersey equine cases showed onset in October. No human cases were reported from any area of the United States.

The Vector Surveillance Program to monitor EEE virus and its mosquito vectors was continued in 1985. The methods employed and the results of the season-long survey are the subjects of this summation.

METHODS OF THE SURVEY

Virus Levels in Cs. melanura

Culiseta melanura populations were monitored with lines of resting boxes in key areas of the State. The boxes were placed in the field during late May and collections were made once weekly from June 1 to November 4. In 1985, the collection sites were expanded to include inland areas of the state where equine activity has been documented in the past. The sites that were monitored included:

Coastal Sites

Green Bank, Burlington Co.
Corbin City, Atlantic Co.
Fishing Creek, Cape May Co.
Dennisville, Cape May Co.

Inland Sites

Jackson, Ocean Co.
Williamstown, Gloucester Co.
Parvin, Salem Co.

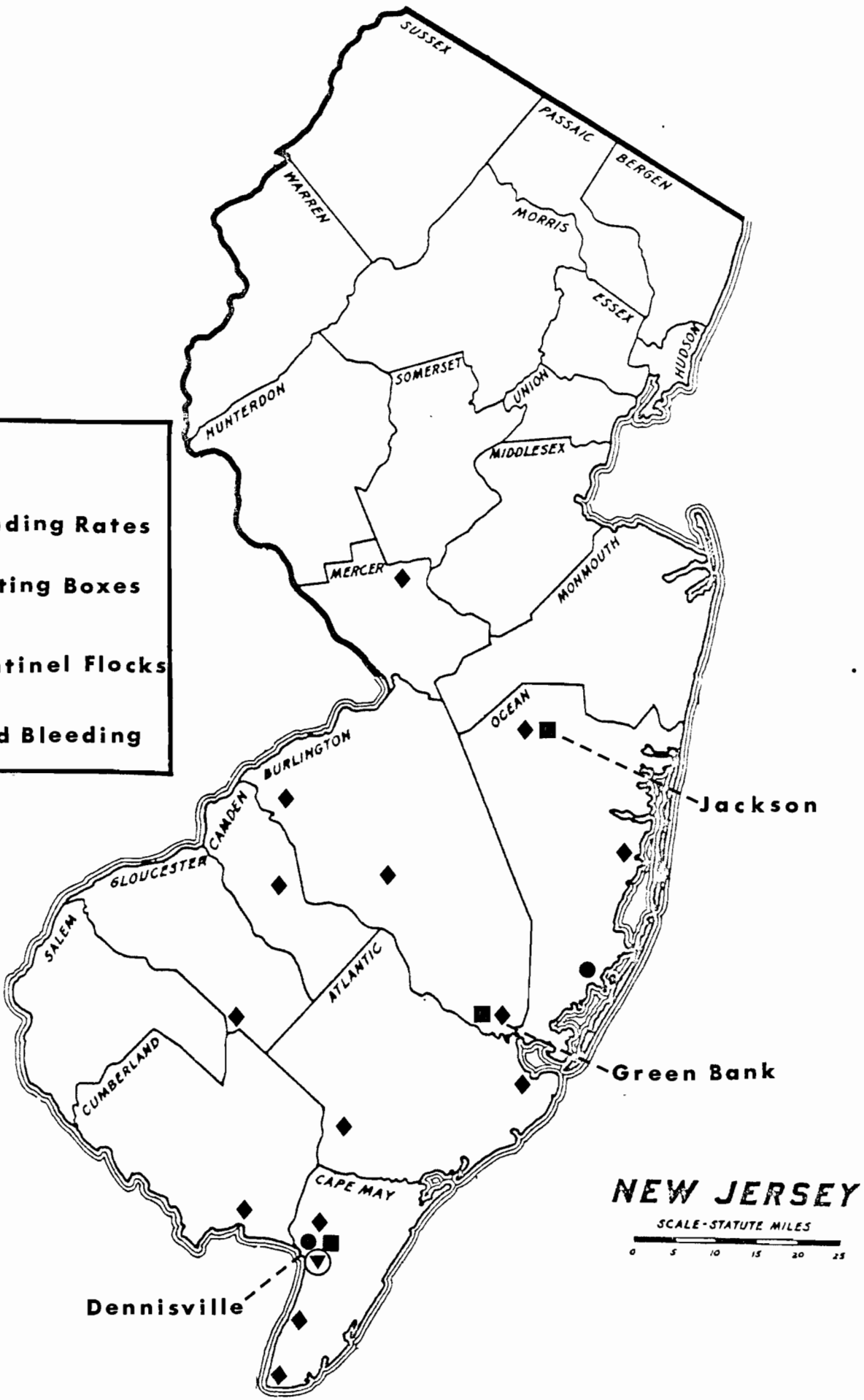
All specimens were frozen on dry ice at the collection site and transported to the laboratory for speciation and pooling. Culiseta melanura and Coquillettidia perturbans were tested for virus at the New Jersey State Health Laboratories in Trenton.

Parous Rates in Aedes sollicitans

In coastal areas of the state, the salt marsh mosquito, Ae. sollicitans, was monitored to identify major broods and population levels over the course of the season. Once weekly, a team of investigators took a series of 1 min. landing rates at established stations near the salt marsh-upland ecotone. Collection sites included:

KEY

- Landing Rates
- Resting Boxes
- ◆ Sentinel Flocks
- ▼ Bird Bleeding



East Coast

Forked River, Ocean Co.
 West Creek, Ocean Co.
 New Gretna, Burlington Co.
 Leeds Point, Atlantic Co.
 Beesleys Point, Cape May Co.

West Coast

Masons Point, Salem Co.
 Dividing Creek, Cumberland Co.
 Heislerville, Cumberland Co.
 Port Norris, Cumberland Co.
 Dennisville, Cape May Co.

On each collection date specimens were taken from each site for ovarian dissection and physiological aging. The results were made available to county superintendents and the information was used to help assess the need for adult control.

CULISETA MELANURA AND EEE VIRUS

The dry weather conditions that New Jersey experienced in April and May had a direct affect on early season mosquito species in many parts of the state. Early season woodland pools were dry, for the most part, and the water level was markedly low in many of the permanent swamp habitats. As a result, Spring Aedes were severely limited and few Ae. canadensis, Ae. abserratus and Ae. stimulans appeared on the surveillance data sheets. Cs. melanura were not affected along the coast where Atlantic White Cedar remained flooded and provided suitable habitat for this permanent water breeder. Inland populations of Cs. melanura, however, were much lower than normal, presumably because of the low water table in the Red Maple swamps that form the major breeding habitat for the species at inland locations.

The month of July was also dry and Cs. melanura declined markedly at all of the sites that were being monitored. Recovery began at the coastal sites early in August and by mid-month the population levels approached normal levels for that time of year. Populations of Cs. melanura remained low at all of the inland areas, but long term data were not available for accurate analysis.

Virus data paralleled the population trends of Cs. melanura and EEE virus appeared first along the coast and much later at the inland sites. Table 1 shows that EEE virus was not recovered from Cs. melanura at any site until August 19 when single isolations were obtained from the Corbin City collection site and the Dennisville collection site. EEE virus did not appear at Green Bank until September 3, the latest date on record for this normally active coastal location. At the inland sites, virus was detected September 19 at Williamstown and not until October 10 at Parvin.

Table 1. EEE Virus Isolation from Culiseta melanura in New Jersey During 1985.*

LOCATION	TOTAL POSITIVE POOLS	EARLIEST ISOLATION
COASTAL SITES		
Green Bank	6	September 3
Corbin City	5	August 19
Dennisville	10	August 19
Fishing Creek	0	-
INLAND SITES		
Jackson	0	-
Williamstown	1	September 19
Parvin	1	October 10

*A single isolation was also made from a pool of Cs. melanura collected about August 20 from a farm in Buena, Atlantic County, where an equine death was confirmed to EEE.

Table 2 lists the totals tested by site and the Minimum Field Infection Rates (MFIR) for the season. Data indicate that EEE virus was most active at the Corbin City site with an MFIR of 5.27 isolations per 1000 mosquitoes tested. The Corbin City site represents the nearest Cs. melanura habitat in the vicinity of Ocean City, NJ, the area where a human case of EEE was contracted in 1984. Data suggest that this area may represent a major focus for EEE cycling and should be closely monitored in the future.

Table 2. EEE Virus Surveillance Summary for Culiseta melanura During 1985.

LOCATION	TOTAL TESTED	NO. POOLS	POSITIVE POOLS	MFIR
COASTAL SITES				
Green Bank	3301	108	6	1.82
Corbin City	948	71	5	5.27
Dennisville	6013	156	10	1.66
Fishing Creek	1368	73	0	-
INLAND SITES				
Jackson	73	32	0	-
Williamstown	473	60	1	2.11
Parvin	1846	89	1	0.54

EQUINE CASES OF EEE DURING 1985

Despite the relatively low activity rates for EEE virus in 1985, equine cases of EEE were reported in New Jersey. Table 3 lists the equine cases detected by the New Jersey State Department of Agriculture and the outcome of laboratory tests on the specimens

Table 3. Confirmed and Presumptive Equine Cases of EEE in New Jersey During 1985.

DATE OF ONSET	LOCATION	COUNTY	OUTCOME
July 17	Monroeville	Salem	Presumptive
Aug 10	Buena	Atlantic	Confirmed
Oct 07	Clermont	Cape May	Confirmed
Oct 12	Mays Landing	Atlantic	Confirmed
Oct 22	South Seaville	Cape May	Confirmed

A presumptive equine case in an unvaccinated animal provided the first indication of EEE activity in New Jersey. The animal was stabled at Monroeville in Salem County, an area where numerous early season equine cases have occurred in the past. The date of onset, however, was July 17, approximately 1 month earlier than any isolation from Cs. melanura. Blood taken from the animal yielded a titer of 1:320 for EEE. Unfortunately, the owner refused to have the brain taken for confirmation.

On August 10, approximately 1 week before any isolations from Cs. melanura, an unvaccinated 1 year old thoroughbred case was confirmed by isolation of EEE from brain tissue. The animal had been stabled at a farm near Buena, an inland location in

Atlantic County. A survey conducted by the Atlantic County Mosquito Control Agency revealed high Cq. perturbans populations that were emanating from a shallow lake behind the property. A small patch of Red Maple was breeding Cs. melanura adjacent to the paddock area and 1 EEE isolation was obtained from specimens collected by resting box on August 20.

No further equine activity was documented until October when 3 confirmed cases were found in unvaccinated horses. Two of the cases came from coastal areas in Cape May County where Ae. sollicitans was the dominant mosquito species. The remaining case was from Mays Landing in Atlantic County, an area where late season equine cases have been reported in the past. Cool weather prevented efficient mosquito sampling at any of the farms where the cases were confirmed and no virus isolations were obtained from the small samples that were processed.

DISCUSSION

Data from 1985 raised as many questions as answers regarding the potential for EEE virus. For the third consecutive year, evidence of equine activity at inland areas of the state preceded any documentation of EEE in mosquitoes. In previous years, the early equine cases occurred at inland sites where no virus surveillance was being conducted on mosquitoes. In 1985, mosquitoes were being sampled at inland locations but no isolations were obtained during the early season and season-long surveillance indicated only minimal virus activity in the Cs. melanura that were collected.

Data suggest that EEE activity may have been more intense in 1985 if favorable weather had been experienced during the early portion of the season. The dry Spring conditions stressed Cs. melanura severely and the early Summer dry spell provided further barriers to the normal population peak. Culiseta melanura populations were lower than normal on a season average basis and the MFIR data indicated relatively low rates of virus activity compared to previous years. Despite these factors, EEE virus was successfully amplified and transmitted to equines during the season.

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