NEW JERSEY VECTOR SURVEILLANCE

VOL. 13 NO. 1 PERIOD: 1988 SPRING SURVEY

ABSTRACT: New Jersey experienced an extremely 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 hot weather. No virus isolations have been obtained to date.

INTRODUCTION

The New Jersey Vector Surveillance Program is entering its 13th year of providing information on mosquitoes and arbovirus activity in the state. The original charge was to make information on the status of eastern equine encephalitis virus (EEE) available to the mosquito control community during the summer season. Over the years, the program has expanded by including new sites for virus monitoring efforts, a computer analysis of the field collected data base and weekly summary reports to supplement the monthly New Jersey Vector Surveillance report.

This year, the New Jersey State Mosquito Control Commission has funded an ELISA project which will allow virus testing to be done at the Headlee Research Laboratories on an experimental basis. The New Jersey State Department of Health will provide back-up testing of all specimens during this trial period to assure that the results from ELISA are accurate. It is hoped that the protocol for a 48 hr turnover of results will be established for use in the future.

METHODOLOGY OF THE SURVEILLANCE EFFORT

Culiseta melanura will be used as the main indicator of EEE virus. Specimens will be collected weekly from resting boxes that are placed in areas of the state where human and/or equine cases have occurred in the past.

The resting box collection sites for 1988 are listed in Fig. 1. Brief descriptions of each of the habitats follow:

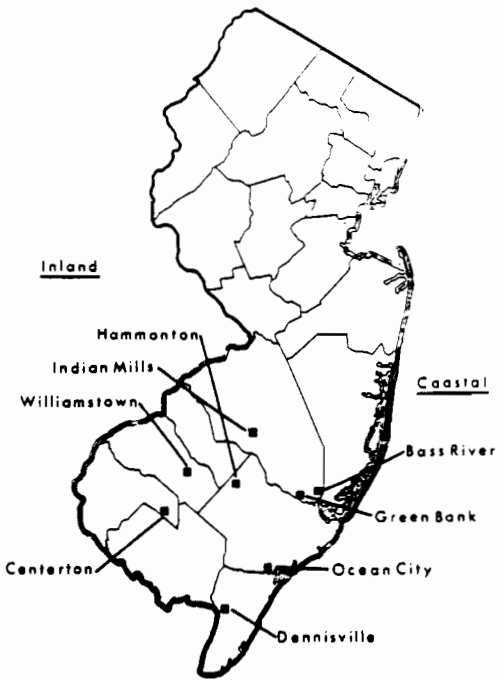

Fig. 1. Resting box sites for arbovirus surveillance in 1988.

Coastal sites

Bass River, Burlington County - 25 Boxes

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

Green Bank, Burlington County - 25 Boxes

The Green Bank resting box collection site is located in a White Pine plantation within the Green Bank State Forest and serves as a monitor for the Mullica River drainage to the northwest of Atlantic City. Although some Atlantic White Cedar can be found in the area, much of the *Cs. melanura* population emanates from Red Maple habitat. The area was first explored as a study site in 1983. Its location on the border of Atlantic and Burlington Co. 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 virus activity in the Ocean City area of Cape May County, the resting boxes are actually located just across the county line in Atlantic County. The area encompasses a mixture of Red Maple and Atlantic White Cedar on the border of an extensive brackish marshland. The Atlantic County Mosquito Control Unit 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, 6 CDC Traps

The Dennisville resting box collection site is located in a White Pine plantation within the Belleplain State Forest and serves as a virus monitoring station for the salt hay farming region along Delaware Bay. The study site is located on a peninsula of upland forest that juts out onto the salt marsh. An extensive Atlantic White Cedar swamp borders the entire area and produces the largest *Cs. melanura* populations in the state. The Cape May County Mosquito Control Commission is conducting a series of behavioral studies with *Cs. melanura* in the area and is coordinating their studies with the Vector Surveillance Program. The Dennisville site has been monitored since 1976 and has been a reliable indicator of virus activity for the Delaware Bay region.

Inland sites

Indian Mills, Burlington County - 25 Boxes, 6 CDC Traps

The Indian Mills study site was introduced this year because of the numerous equine cases of EEE in that area of the state. The study region encompasses a thorough-bred horse farm where several equine deaths were confirmed to EEE in 1987. In addition to the routine collection of mosquitoes for virus isolation attempts, a Ph.D. candidate is conducting his thesis research on the farm to determine the events that lead to equine epizootics. Preliminary results indicate fairly low *Cs. melanura* populations in the presence of *Coquillettidia perturbans* in the general vicinity of the farm.

Hammonton, Atlantic County - 25 Boxes

The Hammonton resting box collection site is located in an extensive Red Maple swamp in Hammonton Township where equine deaths were confirmed to EEE in 1985. Western Atlantic County appears to be unique in that early season equine involvement is often reported before there is any evidence of EEE in *Cs. melanura*. This study site will complement the Indian Mills site in terms of the geographical similarities and differences of virus activity

within a belt where equines repeatedly contract EEE.

Centerton, Salem County - 25 Boxes, 4 CDC Traps

The Centerton resting box collection site is located in a small White Pine stand within Parvin State Park in northwestern Salem County. The site was established in 1985 as a first attempt 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 are available on the extent of virus activity at any inland site prior to a major equine epizootic. The area includes a combination of Atlantic White Cedar and Red Maple habitat that is surrounded by rural farm land.

Each of the study sites will be sampled once weekly from early June to late October. Mosquitoes will be frozen on dry ice at the time of collection and transported to the Mosquito Research & Control laboratories for speciation and pooling. Sorting will be conducted on chill tables to maintain living virus. Mosquito pools will be grouped by Species,Site, Date, Physiological Status and Trapping Method. *Cs. melanura* pools will be triturated at Rutgers and tested by ELISA before being sent to the New Jersey Department of Health laboratories for virus isolation attempts by standard protocol.

Results will be entered into a computer data base for collation, MFIR calculations and graphics. Information regarding EEE in horses will be compiled by the New Jersey Department of Agriculture. The results of equine testing will be coordinated through the New Jersey Department of Health and included in this report in relation to the data obtained from mosquito specimens.

THE CURRENT STATUS OF EEE

New Jersey experienced an exceptionally dry spring this year which was followed by a period of hot but rainy weather. *Cs. melanura* populations were high at the beginning of the period but quickly dropped to lower than average levels during the drought period. Figure 2 shows the population levels of *Cs. melanura* for the month of June at the Centerton site in Salem County. The data clearly show the declining trend that was witnessed at most of the sites. The hot weather has also interfered with assessing the true levels of this species at any of the study sites. Resting box collections indicate very low numbers but the resting box is not a good population indicator during periods of extreme heat.

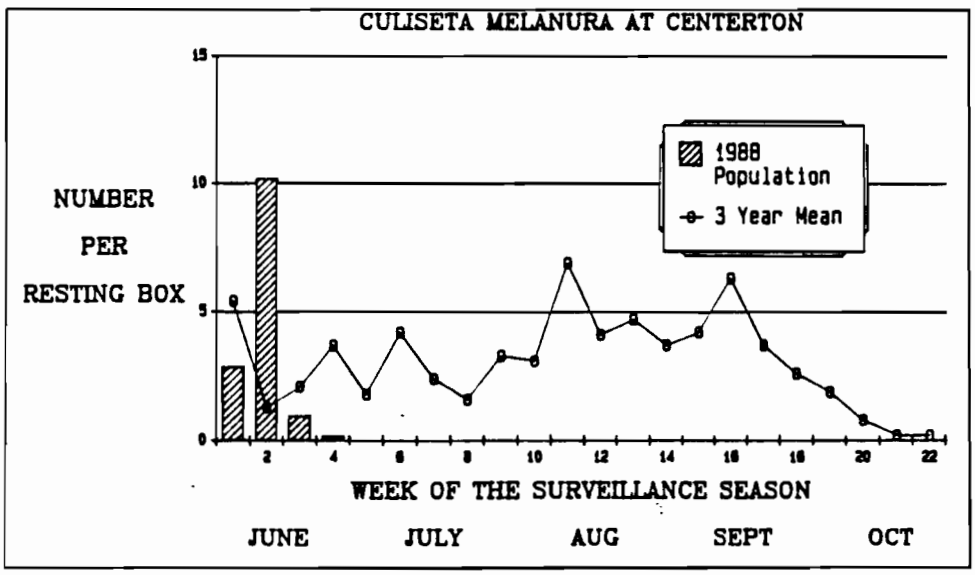

Fig. 2. Resting box populations of *Cs. melanura* at Centerton in Salem County during the month of June.

RESULTS OF VIRUS TESTING

During the month of June, 21,120 total specimens were processed for virus isolation attempts. Large numbers of *Aedes canadensis* and *Coquillettidia perturbans* were included in the spring samples. Table 1 lists all of the species that have been processed to date. No virus has been detected in any of the samples that have been tested to date.

ACKNOWLEDGEMENTS

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Table 1. Total specimens tested for EEE and HJ virus through the month of June, 1988.

MOSQUITO SPECIES	TOTAL TESTED	NO. POOLS
Cs. melanura	3481	206
Cq. perturbans	4827	117
Ae. sollicitans	3529	68
Ae. canadensis	4694	85
Ae. cantator	2809	57
Ae. grossbecki	2	2
Ae. taeniorhynchus	9	3
Ae. thibaulti	9	3
Ae. triseriatus	28	12
Ae. vexans	4	2
Cx. pipiens	1	1
Cx. restuans	63	35
Cx. salinarius	1495	45
Cx. territans	25	17
An. bradleyi	60	10
An. quadrimaculatus	59	18

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