NEW JERSEY STATE MOSQUITO CONTROL COMMISSION

Vector Surveillance Report

MOSQUITO RESEARCH AND CONTROL

Vol. 2 No. 5 Period August 29-30, 1977

Introduction

The last brood of Aedes sollicitans reached some of the highest vector potential ratings recorded in the three years that the system has been employed. The mosquitoes appeared to obtain their first bloodmeal more quickly than usual, thus large numbers survived to feed again. Under normal circumstances, maximum parity in a biting population does not occur until 2 1/2-3 weeks after the main emergence. By that time, extensive mortality has occurred and landing rates are usually well below 10 per minute. The August brood of Ae. sollicitans behaved quite differently. At most of the sites, nearly 90% of the biting population was seeking its second bloodmeal in less than 10 days of the main emergence and landing rates remained high for more than 2 weeks. The introduction of fresh specimens through repeated emergences did not depress the overall parous rate of the population as much as one would expect. Data indicated that these later emergences also blood fed and oviposited more quickly than usual.

The reasons for the apparent accelerated progression of the gonotrophic cycle are not clear. Increased temperature would speed up the cycle but the ambient temperatures during the period were below normal at most of the sites. It is possible that Ae. sollicitans has a preferred temperature range where host-seeking and oviposition become more efficient. This would be difficult to investigate under field conditions. Laboratory studies might be more informative in terms of the physiological aspects, but duplicating host seeking behavior in the laboratory would pose numerous problems.

The high vector potential ratings of Ae. sollicitans in August was not a special concern because of the absence of virus in the reservoir cycle. Culiseta melanura populations were well below normal for most of the year and no indications of virus activity has been documented during the summer.

The Virus Testing Program

The mosquito populations that are being sampled by the Vector Surveillance Program have been screened for the presence of EE virus since late July. All of

the Cs. melanura that are taken in the resting box collections are saved for virus assay. Ae. sollicitans are collected by sweep net for virus tests only if ovarian dissections indicate that vector potential is high.

The specimens are anesthetized with chloroform in the mobile laboratory at the collection site. The mosquitoes are then sorted and speciated on wax paper. Separate sterile aspirators are used for each sample to avoid cross contamination and forceps are dipped in alcohol and flamed at frequent intervals.

Any Cs. melanura which contain blood are pooled separately. Isolations from blooded mosquitoes provide useful data but do not definitively show that the mosquito is infective. There is also no guarantee that a blooded mosquito will live long enough to oviposit and seek another host. Isolations from nonblooded mosquitoes are more meaningful. The nonblooded mosquito is usually seeking a host at the time of capture and represents the stage where direct transfer of virus is possible. Any isolation from Cs. melanura, however, is an indication that virus is present in the avian population.

Each pool of mosquitoes is transferred to a sterile glass tube and immediately frozen on dry ice. The collections from the various sites are kept frozen and submitted for virus tests at the end of each trip.

The initial virus screenings are being conducted by the New Jersey Agricultural Experiment Station at their Poultry Health Laboratories in Vineland, N. J. The mosquitoes are triturated in a tissue grinder and then centrifuged. To avoid the possibility of false positives by contamination during the testing procedure, the supernatant is divided into 2 subsamples. One subsample is tested immediately; the other is frozen and saved for confirmation by an independent laboratory if the preliminary screening indicates virus activity.

Fluid from the triturated mosquitoes is innoculated into a minimum of five 10-day old chick embryos. The eggs are candled daily and harvested on the 7th day after innoculation. Abnormal embryos are retested by blind passage and all fluid from positive eggs is saved until the results from confirmation tests are received.

The confirmation and positive identification of the virus is conducted by the New Jersey State Department of Health. The State Health Laboratories will test the second subsample as well as the original fluid and type the virus by tissue culture.

The results of the virus tests are included as a separate table at the end of each Vector Surveillance Report. Ae. sollicitans and Cs. melanura are treated separately; the information includes the date of the collection, number of specimens submitted and results of the preliminary screening. The results of the preliminary screenings are known within 2 weeks. Confirmation of positive samples will be added as soon as the data are available.

Results for the Period August 29-30, 1977

Aedes sollicitans

The vector potential ratings of the Ae. sollicitans brood that emerged in early August have finally dropped to low levels at most of the sites. The most drastic drop occurred at Tuckahoe and the data suggest that natural mortality has eliminated the remnants from that brood. Under normal circumstances, this would be a period of low mosquito populations but floodings have occurred on the marshes and a new brood is in the process of emergence.

The impending emergence was most evident in the data obtained from West Creek in Ocean County. Landing rates rose from 3 per min to 15 per min during the week and the parous rate dropped from 95% to 60%. This population was apparently sampled in the earliest stages of the new brood. Within 24 hours the landing rates increased markedly according to data from the Ocean County Mosquito Commission and the area received a State Airspray the following day. Data from the Dennisville site was similar but the population was sampled immediately after the airspray rather than before. As a result, the landing rates were low but parity data suggest that additional mosquitoes will be added to this population over the next several days.

As these fresh broods age, vector potential will show another peak in early September. If EE virus had been active this year, these late season Ae. sollicitans would have posed a serious threat in terms of transmission potential.

Culiseta melanura

The resting box collections show that Cs. melanura populations are still building at New Gretna and Dennisville. The increase at New Gretna is somewhat surprising since this population was severely stressed during the dry weather of mid summer. In 1976, Cs. melanura was similarly stressed at New Gretna and never did recover, even after the hurricane in early August. This year, the numbers have increased steadily since the rains and the populations are higher now than they were in the spring. The Dennisville populations of Cs. melanura are very high, but nowhere near the levels obtained a year ago.

Status of Culex tarsalis in New Jersey

Three additional Culex tarsalis were collected by the Ocean County Mosquito Commission in the past week. Two of the specimens were taken in light traps at Beach Haven, the site of the original record in 1975. The third specimen was collected in a light trap at Cattus Island, more than 30 miles to the North. To date 5 Cx. tarsalis have been identified this year. Three of 5 have come from Long Beach Island where breeding habitat is minimal. The remaining 2 were collected on the mainland to the north and south of the Island. Breeding habitat in these areas is extensive and difficult to sample.

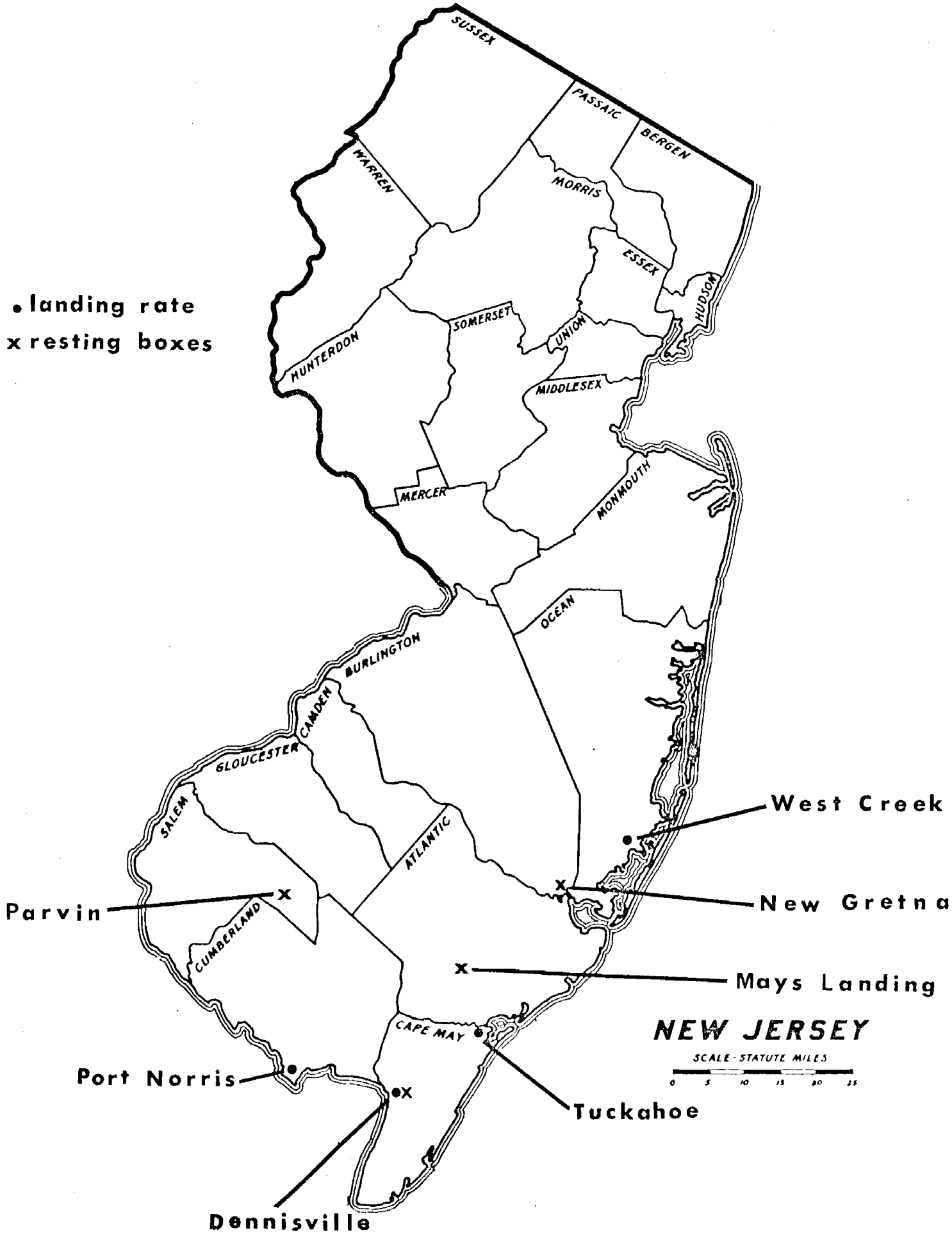
The Ocean County Mosquito Commission and the Experiment Station are currently using CDC light traps baited with dry ice to locate additional specimens and eventually pinpoint the breeding habitat. The traps are operated 3-4 nights each week in areas where specimens have been taken as well as habitats where Cx. tarsalis is likely to breed. A dry ice baited trap collected one of the specimens at Beach Haven. Since Cx. tarsalis usually shows a population increase in late summer and early fall, additional specimens will probably be collected over the next several weeks.

Larval surveys are also underway but no Cx. tarsalis immatures have been found to date. It is hoped that the portable CDC traps will reveal a focus which will make larval surveillance easier.

List of Personnel:

Project Leader:	Wayne J. Crans
Surveillance Specialist:	Jere D. Downing
Mosquito Program Coordinator:	Anthony A. Di Edwardo
Mosquito Program Acting Director:	Harry D. Brown
State Airspray Program Director:	Donald J. Sutherland
Associate Mosquito Program Staff:	Bunnie Hajek, Sherry Smith, Robert Kent, Noel Shubert, Ned Jacobson, Leon Blaustein
Cooperating Experiment Station Personnel:	David Tudor, Otto Schwabe
Cooperating State Health Personnel:	Ronald Altman, Walter Gusciora, Oscar Sussman, David Adams
State Health Associate Staff:	Barry Cherney, Richard Meyer, Gregory Siwinski
Cooperating County Mosquito Control Superintendents:	Frederick Lesser, Ocean County Brian Gooley, Burlington County Judy Hansen, Cape May County Joseph Mason, Atlantic County Patrick Slavin, Cumberland County William Fisher, Salem County
State Mosquito Control Coordinator:	Kenneth W. Bruder
State Mosquito Control Commission:	Eleanore Renk Grant Walton Aaron Rappaport Theodore Czech Leonard Spiegel Benjamin Hiatt James Gaspari

Study Sites

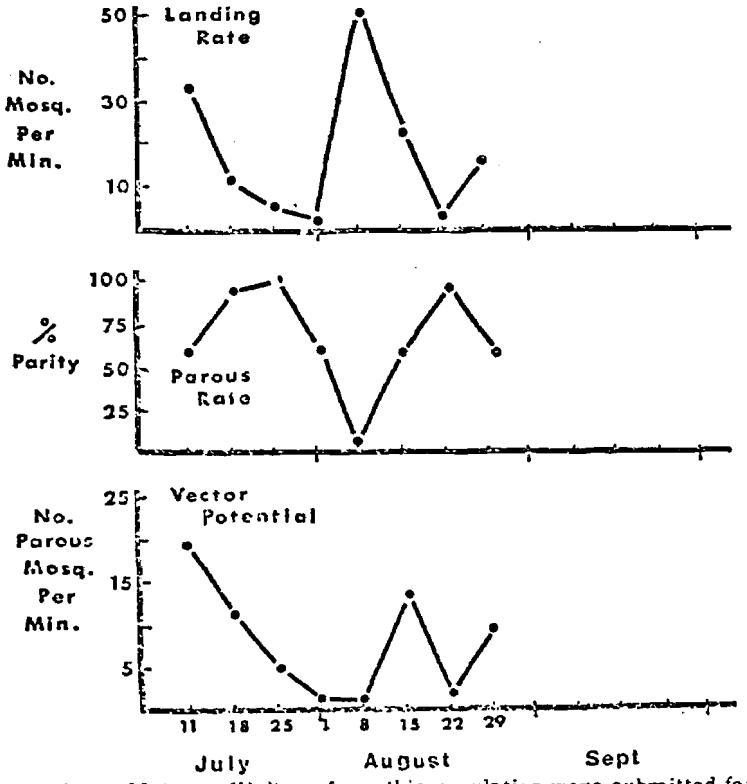

• landing rate
x resting boxes
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
HUNTERDON
SOMERSET
UNION
MIDDLESEX
MERCER
MONMOUTH
OCEAN
BURLINGTON
CAMDEN
GLOUCESTER
SALEM
ATLANTIC
CUMBERLAND
CAPE MAY
West Creek
New Gretna
Parvin
Mays Landing
Port Norris
Tuckahoe
Dennisville
NEW JERSEY
SCALE - STATUTE MILES
0 5 10 15 20 25

Aedes sollicitans

SITE WEST CREEK
COUNTY Ocean
COLLECTION DATA
Date Aug. 29, 1977
Landing Rate 15/min
Parous Rate 60%
Vector Potential 9.0
(Parous Landing Rate)

REMARKS : This population was apparently sampled in the early stages of an emergence Landing rates increased markedly 24 hrs. later and the area received a State Air-spray with Dibrom + HAN on Aug. 30.

CUMULATIVE RECORD



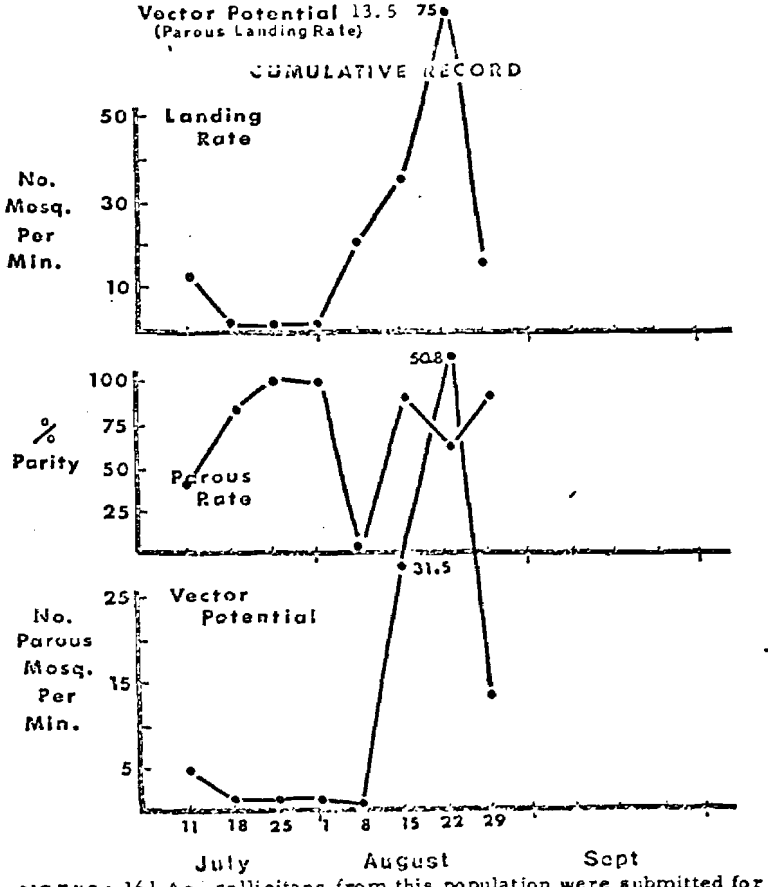
NOTES : 89 Ae. sollicitans from this population were submitted for virus assay.

Aedes sollicitans

SITE TUCKAHOE
COUNTY Cape May
COLLECTION DATA
Date Aug. 29, 1977
Landing Rate 15/min
Parous Rate 90%
Vector Potential 13.5
(Parous Landing Rate)

REMARKS : The vector potential of this population has finally dropped but larval sampling shows that another brood is expected in the next few days.

CUMULATIVE RECORD



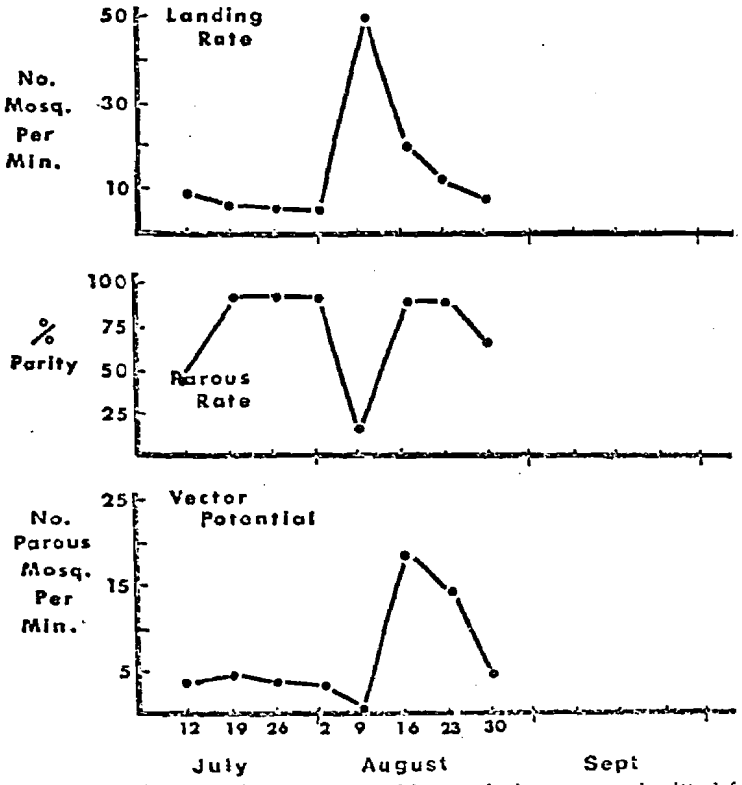
NOTES : 161 Ae. sollicitans from this population were submitted for virus assay.

Aedes sollicitans

SITE DENNISVILLE
COUNTY Cape May
COLLECTION DATA
Date Aug. 30, 1977
Landing Rate 7/min
Parous Rate 65%
Vector Potential 4.5
(Parous Landing Rate)

REMARKS: This population was tested on Aug. 30, immediately after a State airspray with Dibrom + HAN. Landing rates were much higher prior to the treatment. Parity data indicate that emergence will continue.

CUMULATIVE RECORD



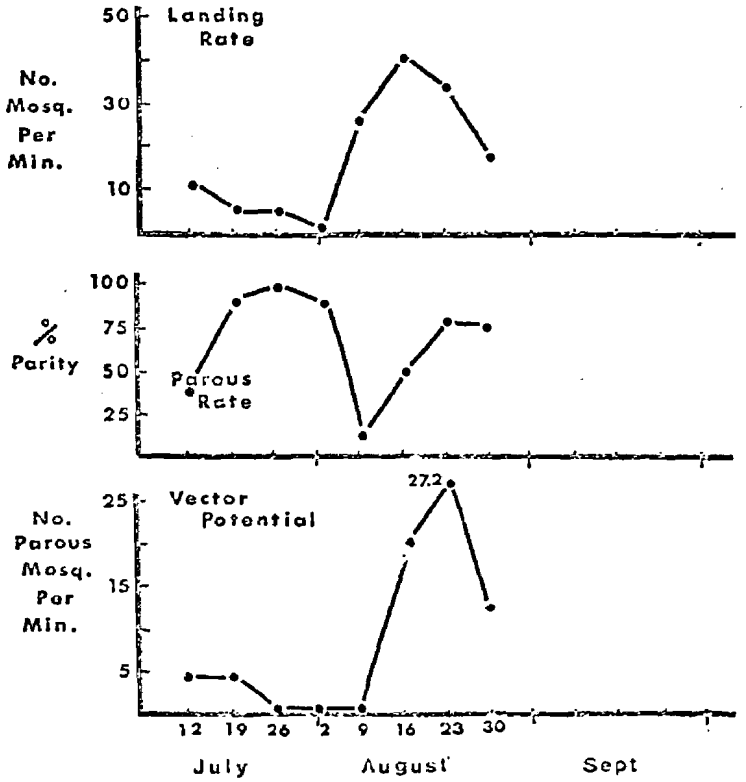
NOTES: 46 Ae. sollicitans from this population were submitted for virus assay.

Aedes sollicitans

SITE PORT NORRIS
COUNTY Cumberland
COLLECTION DATA
Date Aug. 30, 1977
Landing Rate 16/min
Parous Rate 75%
Vector Potential 12.0
(Parous Landing Rate)

REMARKS: Data indicate that an emergence is also imminent in this area.

CUMULATIVE RECORD



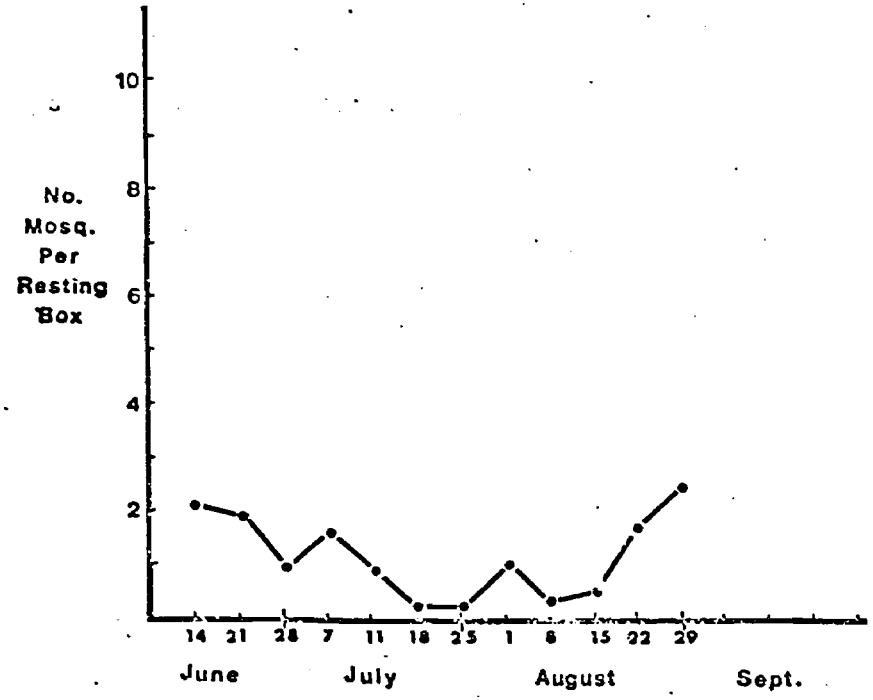
NOTES: 100 Ae. sollicitans from thos population were submitted for virus assay.

Culiseta melanura

SITE NEW GRETNA
COUNTY Burlington
COLLECTION DATA
Date Aug. 29, 1977
No. Boxes -25
Examined:
Total C.mel. 59
C.mel./Box 2.4

REMARKS: The Cs. melanura population at this site is still building as fall approaches.

CUMULATIVE RECORD



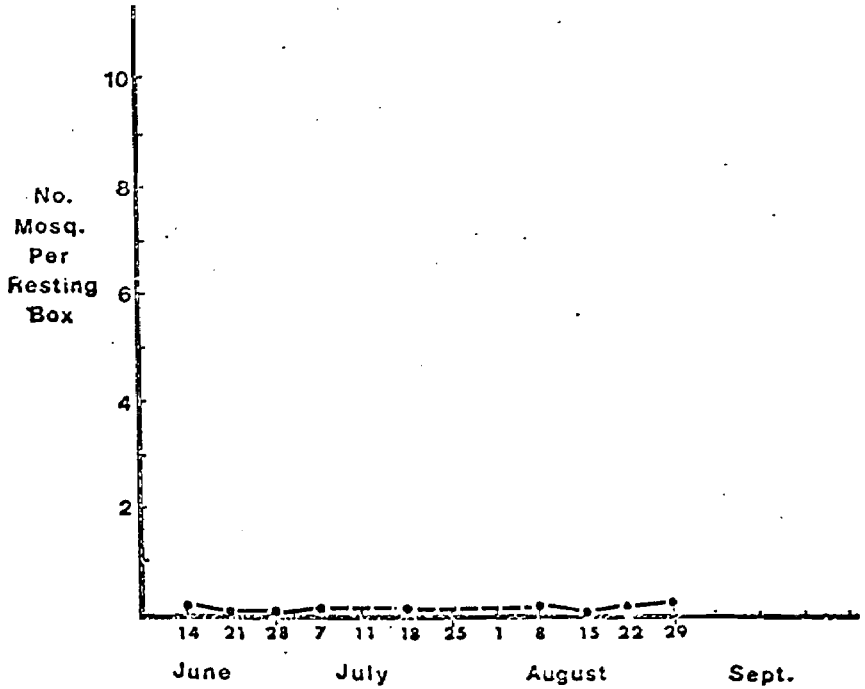
NOTES: Submitted 46 blooded and 13 nonblooded Cs. melanura from this population for virus assay.

Culiseta melanura

SITE MAYS LANDING
COUNTY Atlantic
COLLECTION DATA
Date Aug. 29, 1977
No. Boxes
Examined: 20
Total C.mel. 3
C.mel./Box 0.15

REMARKS: Cs. melanura remain low at this site.

CUMULATIVE RECORD



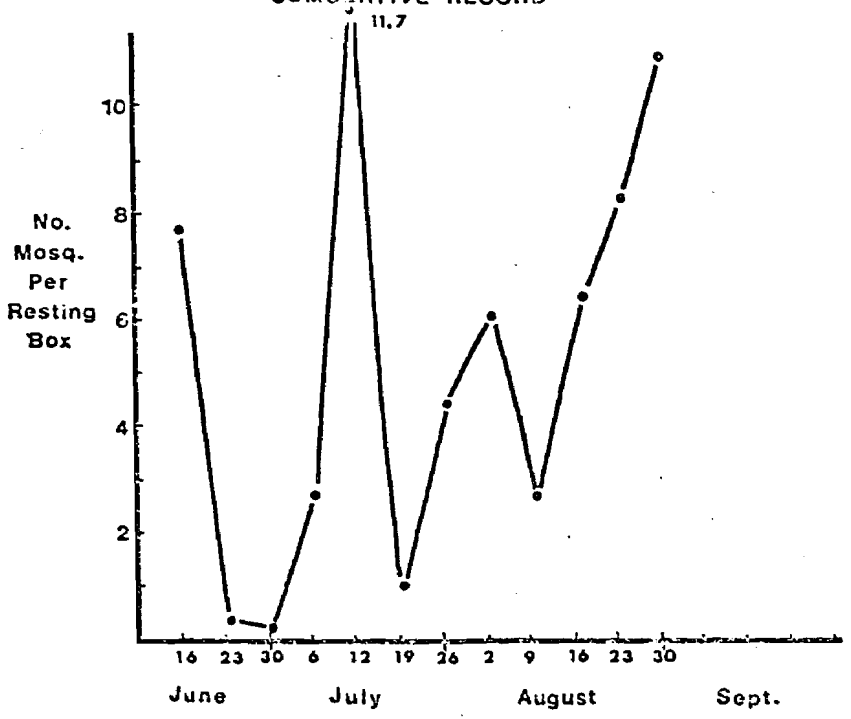
NOTES: Submitted 2 blooded and 1 nonblooded Cs. melanura from this population for virus assay.

Culiseta melanura

SITE DENNISVILLE
COUNTY Cape May
COLLECTION DATA
Date Aug. 30, 1977
No. Boxes
Examined: 20
Total C.mel. 216
C.mel./Box 10.8

REMARKS: This population has increased markedly in the past several weeks. Parous rates recorded at 10%, indicating that most of the mosquitoes are freshly emerged.

CUMULATIVE RECORD



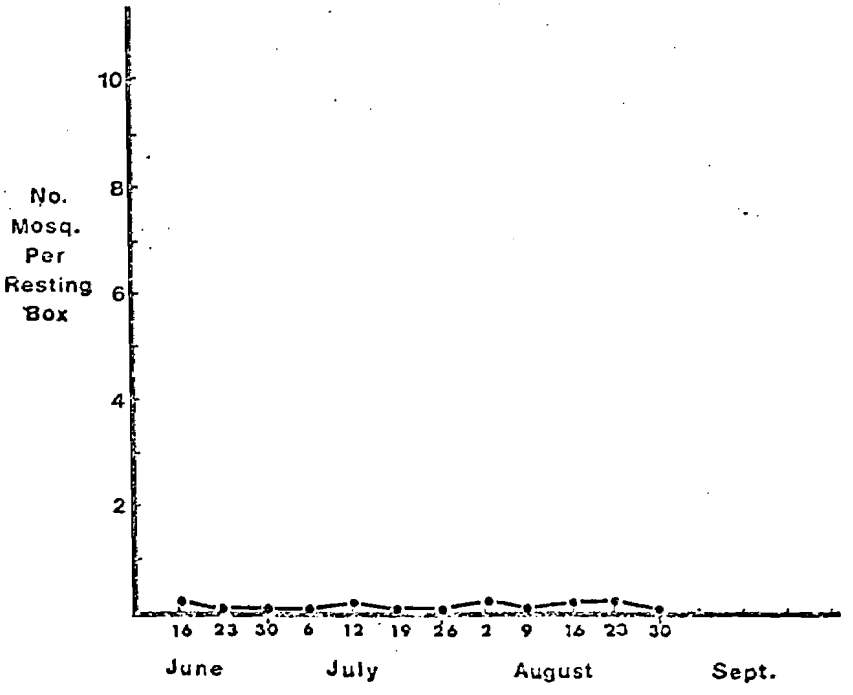
NOTES: Submitted 108 blooded and 108 nonblooded Cs. melanura from this population for virus assay.

Culiseta melanura

SITE PARVIN
COUNTY Salem
COLLECTION DATA
Date Aug. 30, 1977
No. Boxes
Examined: 20
Total C.mel. 0
C.mel./Box 0

REMARKS: No Cs. melanura in any resting boxes at this site.

CUMULATIVE RECORD



NOTES:

Data From Vineland Diagnostic Laboratories

Culiseta melanura tested for EE virus during 1977

Date Collected	Area	No. Tested	Initial Screening	Confirmation of Positive Pools
7/25/77	New Gretna	5 blooded	Negative	
		3 nonblooded	Negative	
7/26/77	Dennisville	19 blooded	Negative	
		186 nonblooded	Negative	
8/01/77	New Gretna	32 blooded	Negative	
		16 nonblooded	Negative	
8/02/77	Dennisville	37 blooded	Negative	
		116 nonblooded	Negative	
8/02/77	Parvin	7 blooded	Negative	
8/08/77	New Gretna	5 blooded	Negative	
		3 nonblooded	Negative	
8/08/77	Mays Landing	3 nonblooded	Negative	
8/09/77	Dennisville	10 blooded	Negative	
		39 nonblooded	Negative	
8/15/77	Warren Grove	2 blooded	Negative	
		1 nonblooded	Negative	
8/15/77	New Gretna	4 blooded	Negative	
		8 nonblooded	Negative	
8/16/77	Dennisville	40 blooded	Negative	
		110 nonblooded	Negative	
8/22/77	New Gretna	23 blooded		
		15 nonblooded		
8/22/77	Warren Grove	2 blooded		
		3 nonblooded		
8/22/77	Mays Landing	2 nonblooded		
8/23/77	Dennisville	49 blooded		
		159 nonblooded		
8/23/77	Parvin	2 blooded		
		1 nonblooded		
8/29/77	New Gretna	46 blooded		
		13 nonblooded		
8/29/77	Mays Landing	2 blooded		
		1 nonblooded		
8/30/77	Dennisville	108 blooded		
		108 nonblooded		

Specimens Submitted for Virus Assay

Aedes sollicitans

Date Collected	Area	No. Tested	Initial Screening	Confirmation of Positive Pools
8/15/77	West Creek	100	Negative	
8/15/77	Tuckahoe	381	Negative	
8/16/77	Dennisville	100	Negative	
8/16/77	Port Norris	175	Negative	
8/22/77	West Creek	30		
8/22/77	Tuckahoe	200		
8/23/77	Dennisville	100		
8/23/77	Port Norris	365		
8/29/77	West Creek	89		
8/29/77	Tuckahoe	161		
8/30/77	Dennisville	46		
8/30/77	Port Norris	100		