NEW JERSEY STATE MOSQUITO CONTROL COMMISSION

A STATE MOSQUITO SURVEILLANCE PROGRAM FOR NEW JERSEY

FINAL WEEKLY REPORT FOR 2003 – SPECIES SUMMARIES

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NEW JERSEY STATE SURVEILLANCE

Final Weekly Report for 2003

Including data for Week 44, ending 31October.

Submitted by Lisa Reed and Wayne Crans
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Purpose: Data from 84 New Jersey light traps contributed by county mosquito control agencies are used to calculate trends in mosquito populations for species of nuisance or health concerns.

Calculations are based on regional distributions, with emphasis on mosquito habitat and land use. Trends will allow a statewide evaluation of changing mosquito populations, in response to control and/or changes in habitat.

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Figure 1a: Map of ten regions selected for the New Jersey Surveillance Program overlaid with county boarders.

Figure 1b. Trap lat-long locations.

Summary table

	Aedes vexans		*Culex complex*		*Coquillettidia perturbans*		*Ochlerotatus sollicitans*	
Region	This Week	Average*	This Week	Average*	This Week	Average*	This Week	Average*
Agricultural	**0.24**	**0.36**	**0.33**	**1.34**	**0.00**		**0.00**	**0.04**
Coastal	**1.86**	**0.05**	**1.05**	**0.85**	**0.00**		**0.05**	**0.05**
Delaware Bayshore	**0.00**		**1.19**		**0.00**		**0.02**	
Delaware River Basin	**0.14**	**0.55**	**0.43**	**2.41**	**0.00**		**0.00**	**0.09**
New York Metro	**0.00**	**0.02**	**0.46**	**0.94**	**0.00**		**0.00**	**0.00**
North Central Rural	**0.00**		**0.00**		**0.00**		**0.00**	
Northwest Rural	**0.00**		**0.00**		**0.00**		**0.00**	
Philadelphia Metro	**0.37**		**0.31**		**0.00**		**0.00**	
Pinelands	**0.43**	**0.00**	**0.38**	**0.10**	**0.00**		**0.00**	
Suburban Corridor	**0.03**	**0.03**	**0.04**	**0.10**	**0.00**		**0.00**	

- Complete data not yet available.

Please Note: Historical data is being entered and not yet complete. These values and graphics will change as more data is entered.

The State Surveillance Program Overview

This program relies on the cooperation and effort of county mosquito control agencies. These agencies use New Jersey light traps to monitor certain nuisance and health-risk mosquito species. Agencies have many years worth of experience in the placement, use, and interpretation of light traps and their data as monitoring mosquito populations is an essential part of an integrated pest management approach. But county agencies are limited to county data, and a landscape-wide view of changing mosquito trends is not available. The purpose of this program is to cover that gap and provide information of nuisance and health-risk mosquito populations on a regional level.

Although 83 traps are involved in the state surveillance system, one trap did not go into effect the entire year. We expect this trap will go online next year and will participate. Most agencies provided data in a timely matter. However, we found that most agencies were at times pressed to get the data to Headlee Labs. Therefore, interpretation of the data is more robust at the previous weeks' report than during the current week. This is not a consideration if people are aware that care must be taken with the interpretation of the most current week's data.

This year's data showed that 41 species of mosquitoes were caught in the light traps throughout New Jersey. As represented by more than 316,000 mosquitoes Ranges in the number of mosquitoes trapped per region vary from as few as 19 in the Northwest Rural to as high as 36 in the Suburban region. This likely represents the variability in the habitats (less in the Northwest regions, more in the Suburban region) as well as the number of traps in the region.

Region	***Number of Traps***	***Number of Species***
Agricultural	6	31
Coastal	9	33
Delaware Bayshore	6	21
Delaware River Basin	4	22
New York Metro	10	26
North Central Rural	8	22
Northwestern Rural	6	19
Philadelphia Metro	6	24
Pinelands	11	31
Suburban	17	36
Total	83	41

Historical data was entered for 6 counties, as represented, when available, by solid red lines.

Mosquito Species Collected during the 2003 Season

The mosquitoes collected in county operated light traps belong to a series of very different life cycle types: Early Season Species, Fresh Floodwater Species, Salt Marsh Floodwater Species, Multivoltine Culex Species, Multivotine Anopheles Species, Container Breeding Aedines and a Miscellaneous Group. Each of these mosquito life cycle types has a seasonal distribution that reflects a biological strategy.

Early Season Species: Members that belong to this group overwinter as eggs and have a single generation in early spring. The eggs hatch when water temperatures are still quite cold and the adults are usually on the wing during the month of May. In most species, the eggs laid in May and June enter diapause and do not hatch until they are flooded the following year. Some of the members in this group have a generation that reappears in the fall. Most biologists feel

that these are eggs that did not hatch during the spring flooding and were left behind as survival insurance. Mosquito species collected in light traps that belong to this group include: *Oc. stimulans, Oc. canadensis, Oc. sticticus & Oc. cinereus*.

Fresh Floodwater Species: Members of this group also overwinter as eggs but do not hatch until later in the season when water temperatures rise to ideal levels. These mosquitoes have multiple generations during the summer months that are regulated by flooding patterns. Each period of excessive rainfall produces a major brood. Minor floodings can generate overlapping broods that are usually localized. Mosquito species collected in light traps that belong to this group include: *Ae. vexans, Oc. trivttatus, Ps. ferox, Ps. columbiae, Ps. ciliata*

Salt Marsh Floodwater Species: Members that belong to this group overwinter as eggs but lay them on tidal marshes where lunar tides provide a method to inundate the eggs. There are multiple generations during the summer months with as many as 2 broods each month from May to October. Rainfall can produce egg hatch which complicates the picture. As a result, the distinct broods seen in fresh floodwater areas become muddled and biting populations can include mosquitoes of mixed age. Mosquito species collected in light traps that belong to this group include: *Oc. sollicitans & Oc. cantator.*

Multivoltine Culex Species: Members that belong to this group overwinter as mated females so the season distribution is very different from any of those listed above. Populations in early spring are represented by mosquitoes that survived the winter and the numbers are at relatively low levels. These mosquitoes cannot become active until night time temperatures enter the 60's, thus host seeking and oviposition is delayed until late May or June. The first generation of larvae take time to develop and populations do not build until mid-summer a t the earliest. As soon as night time temperatures begin to cool down, the mosquitoes mate, seek winter hibernaculae, enter diapause and hibernate. Only the females survive in this group. Males will not appear until the eggs hatch very late the following spring. Mosquito species collected in light traps that belong to this group include: The *Culex* Complex*, Cx. territans & Cx. erraticus.*

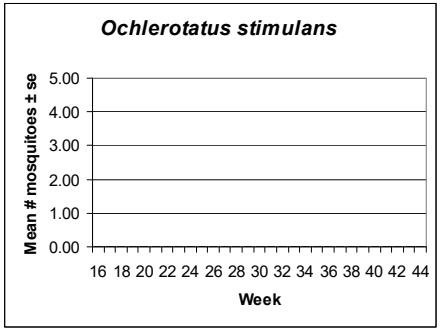
Multivoltine Anopheles Species: Members that belong to this group have a life cycle strategy that is very similar to the Multivoltine *Culex*. They overwinter as mated females and build their populations over the course of the summer. They are included as a separate group because they represent an entire genus. Mosquito species collected in light traps that belong to this group include: A*n. quadrimaculatus, An. punctipennis& An. bradleyi..*

Container Breeding Aedines: These mosquitoes glue their eggs to the sides of containers above the water line and rely on rains to raise the water level and hatch the eggs. Like other Aedines, they overwinter as eggs and reappear each Spring when water temperatures begin to rise. Most members of the group are active during the day and are enter light traps in very low numbers. Mosquito species collected in light traps that belong to this group include: *Oc. triseriatus & Oc. japonicus.*

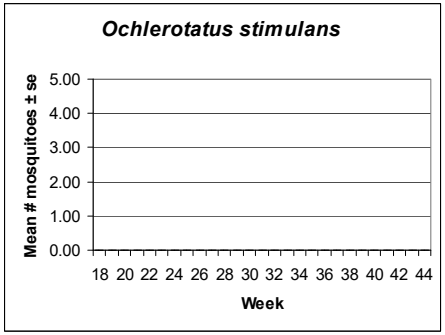
Miscellaneous Group: The members in this group have little in common because each utilizes a unique life cycle strategy. The mosquito species collected in light traps that we have included in the group include: *Cq. perturbans, Cs. melanura & Ur. sapphirina*

Ochlerotatus stimulans - Early Season Species

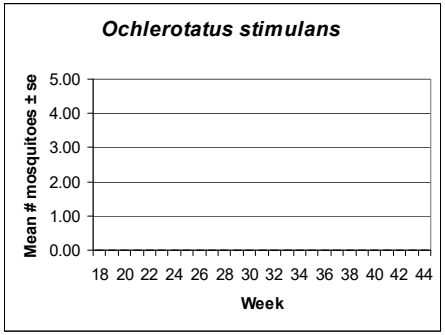
Agricultural



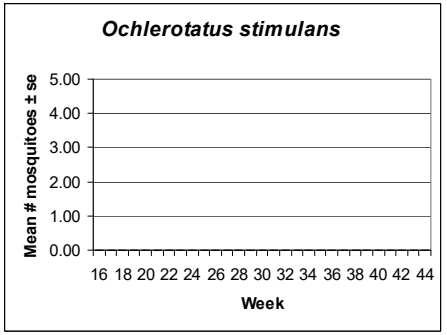
Coastal



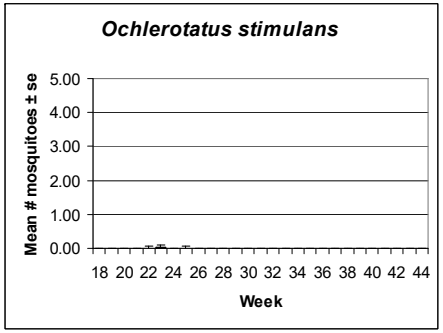
Delaware Bayshore



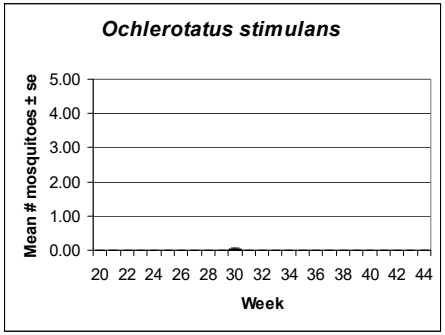
Delaware River Basin



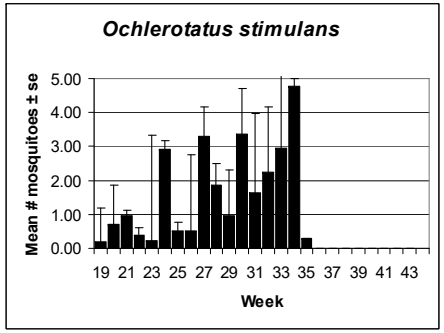
New York Metro



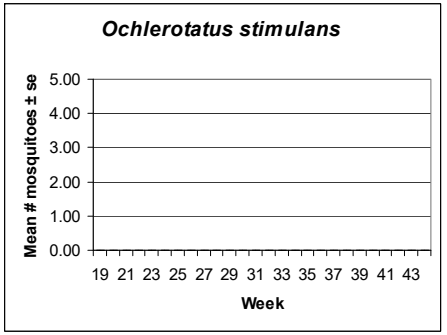
North Central Rural



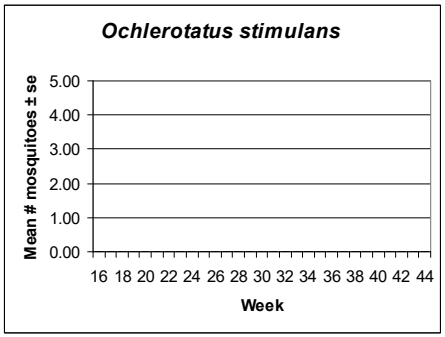
Northwestern Rural



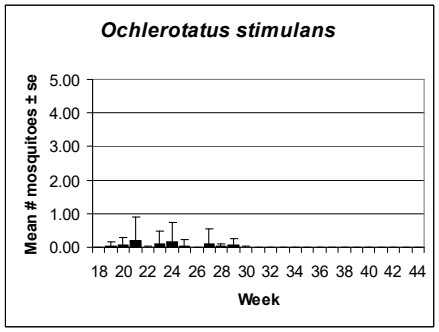
Philadelphia Metro



Pinelands



Suburban Corridor

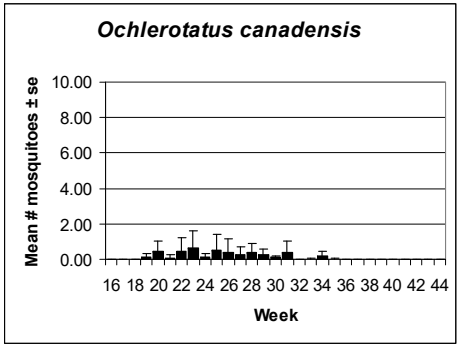


Comments

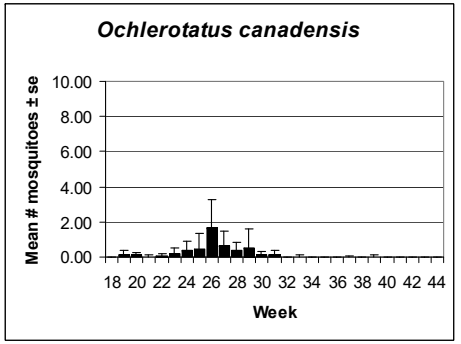
Oc. stimulans is a snowpool species that reaches greatest numbers in the northern counties of the state. The mosquito is univoltine but is very long lived. Data from the Northwestern Rural Region, where the species occurs in greatest numbers show that the mosquito appeared in light trap collections in early May and persisted through the month of August. The late season population increase that *Oc. stimulans* demonstrated this year is atypical and warrants further investigation. Fewer numbers were evident in the Suburban Corridor Region but the seasonal curve is more typical.

Ochlerotatus canadensis - Early *Season Species*

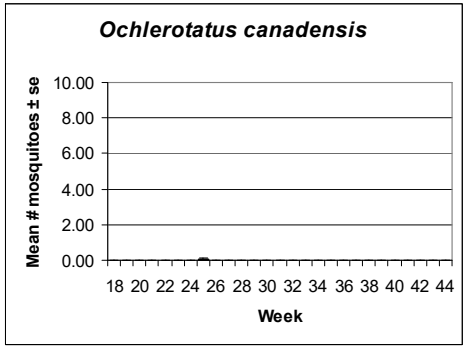
Agricultural



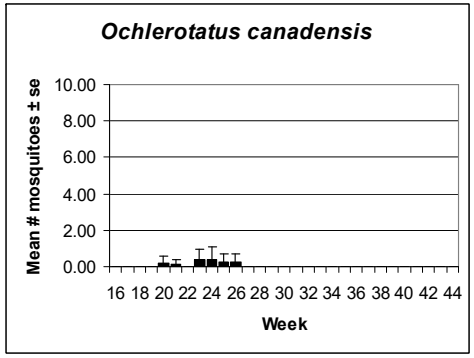
Coastal



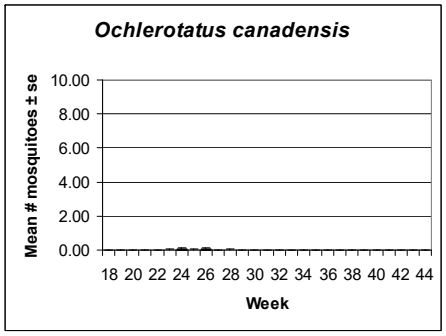
Delaware Bayshore



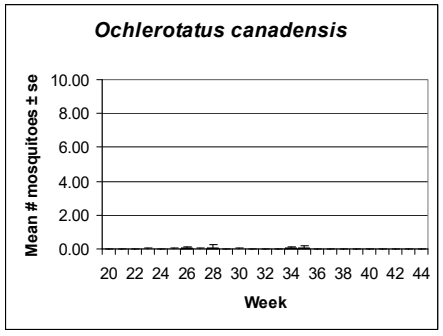
Delaware River Basin



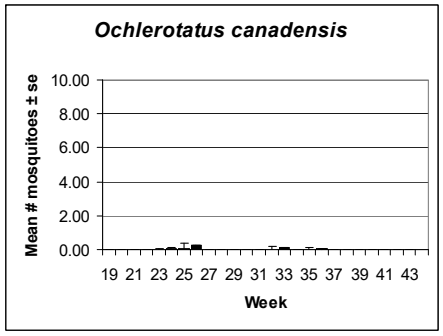
New York Metro



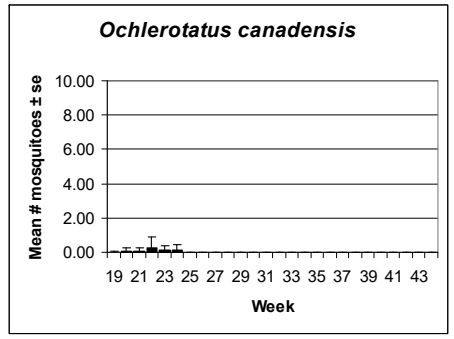
North Central Rural



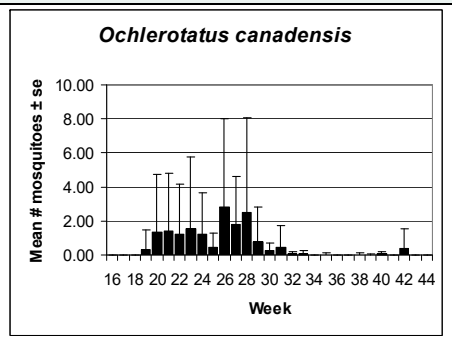
Northwestern Rural



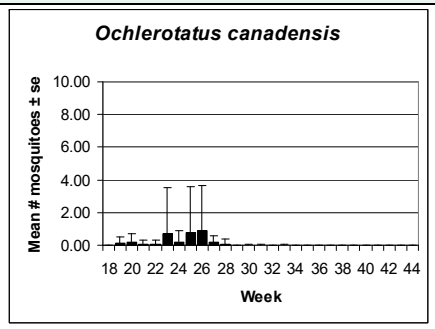
Philadelphia Metro



Pinelands



Suburban Corridor

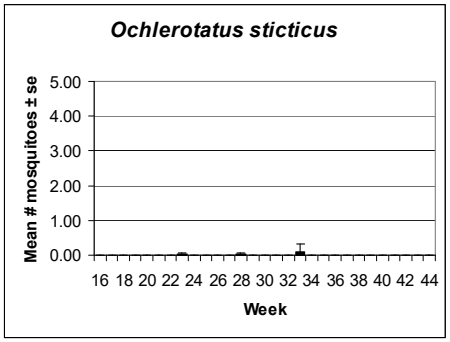


Comments

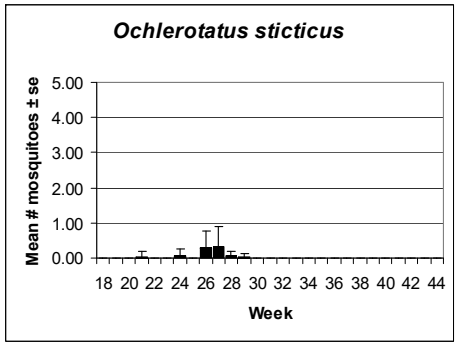
Oc. canadensis is New Jersey's most common univoltine mosquito. The species has an extended generation in early spring and occasionally re-appears late in the season. The late season appearance of this species probably comes from eggs that failed to hatch in the Spring. The mosquito is not attracted to light, thus, light trap collections are not a good indicator of actual numbers. This year's State Surveillance data show that nuisance levels were present from mid-May through early July with highest populations in the Pine Barrens Region. The species did re-appear in low numbers during August and September but this year's fall populations appear to be quite low.

Ochlerotatus sticticus - Early Season Species

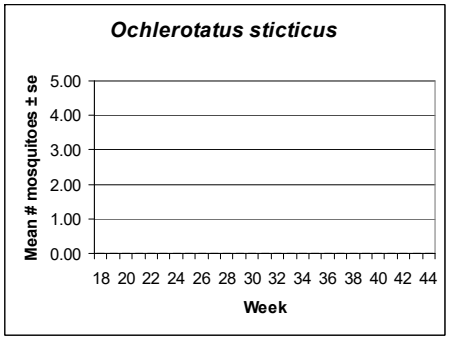
Agricultural



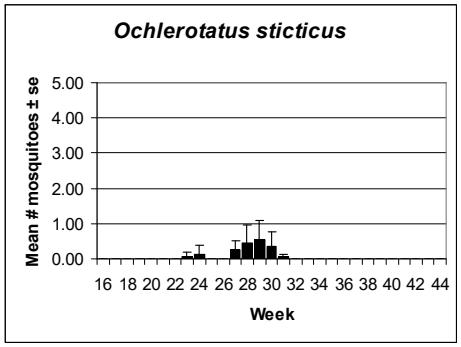
Coastal



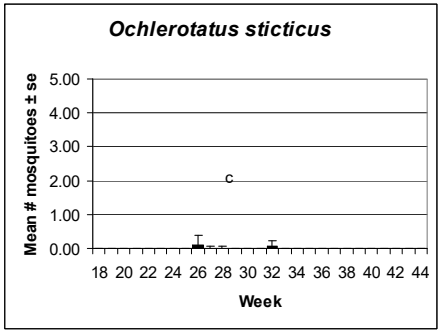
Delaware Bayshore



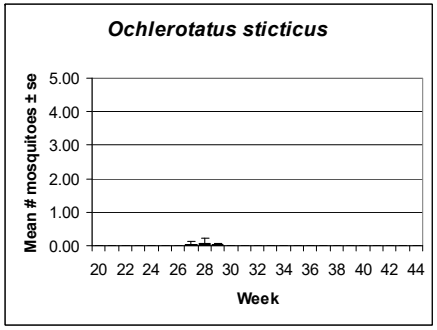
Delaware River Basin



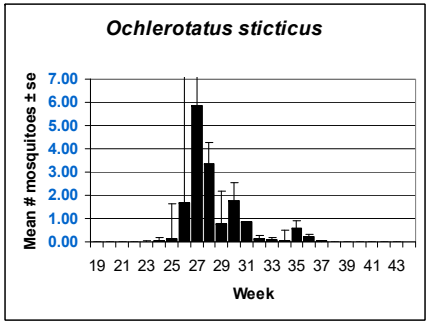
New York Metro



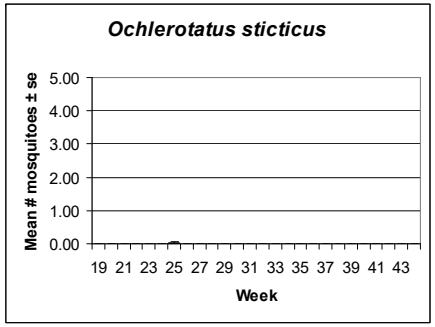
North Central Rural



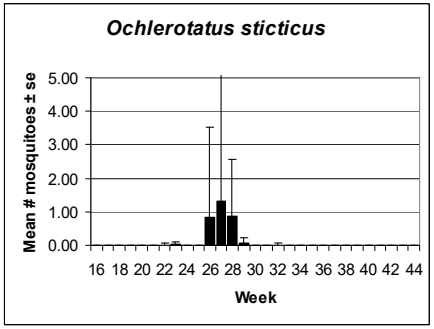
Northwestern Rural



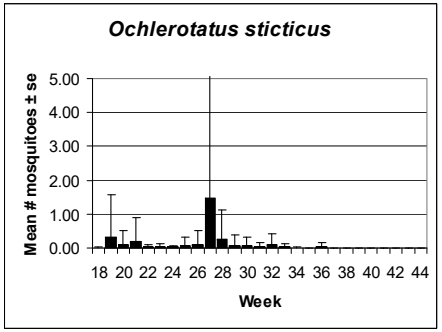
Philadelphia Metro



Pinelands



Suburban Corridor

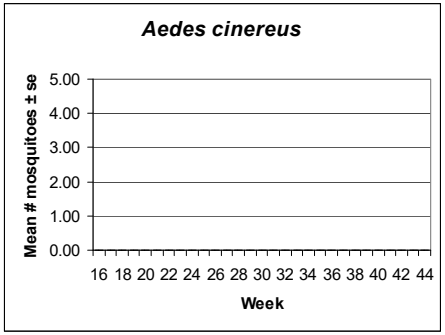


Comments

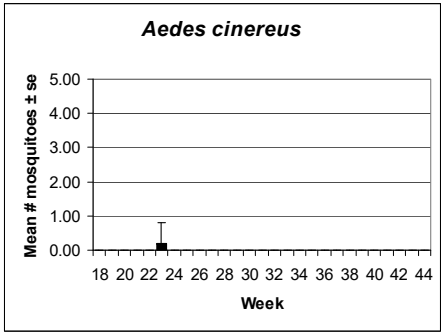
Oc. sticticus is an early season floodwater mosquito that often re-appears in the fall. The mosquito is a severe biter and a major pest along many of the floodplains in the state. State surveillance light trap records indicate that the extended rains we experienced in June produced a major brood in several areas that peaked in early July. Light trap records from the Northwestern Rural Region show that the species re-appeared in lesser numbers during the latter part of August.

Aedes cinereus - Early Season Species

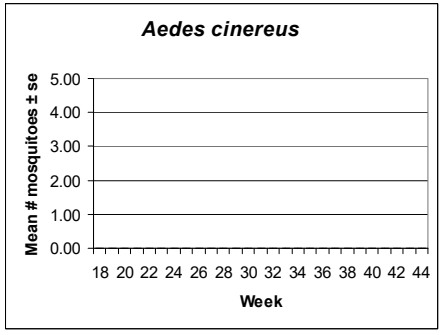
Agricultural



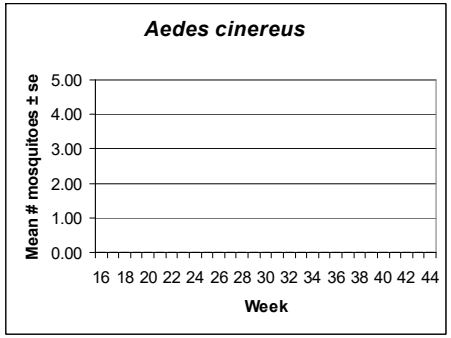
Coastal



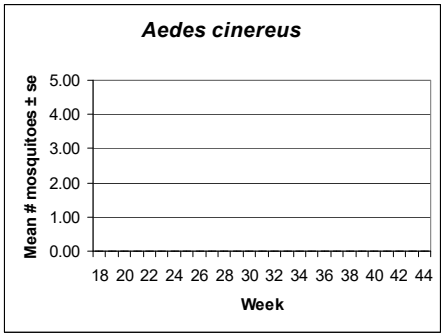
Delaware Bayshore



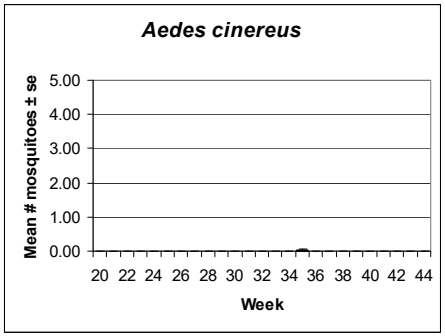
Delaware River Basin



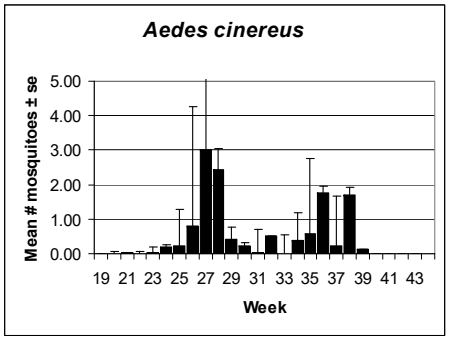
New York Metro



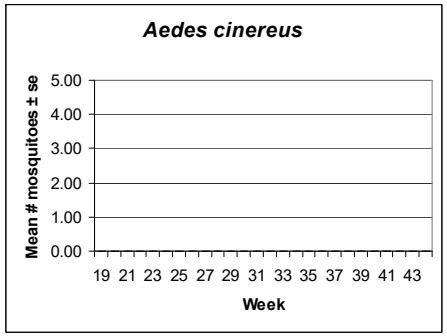
North Central Rural



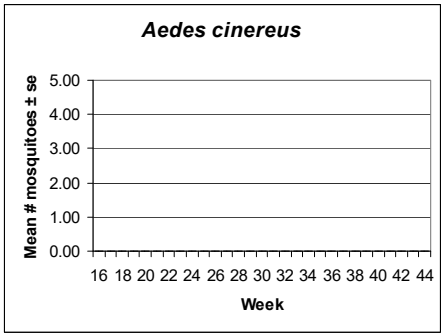
Northwestern Rural



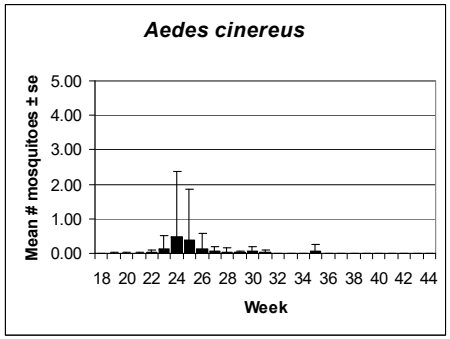
Philadelphia Metro



Pinelands



Suburban Corridor

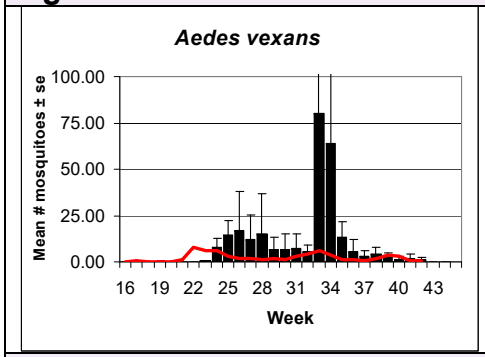


Comments

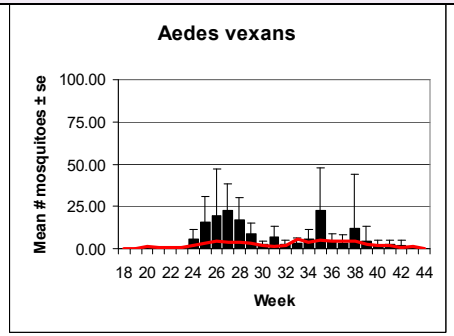
Ae. cinereus is an irritating early season species that sometimes re-appears in the fall. The mosquito utilizes a variety of larval habitats but is most common in swamps and bogs before they become heavily vegetated. The population curve for the Northwest Rural Region is typical with early and late season peaks. The same curve is repeated in the Suburban Corridor Region but the numbers are smaller making the peaks less evident.

Aedes vexans - Fresh Floodwater Species

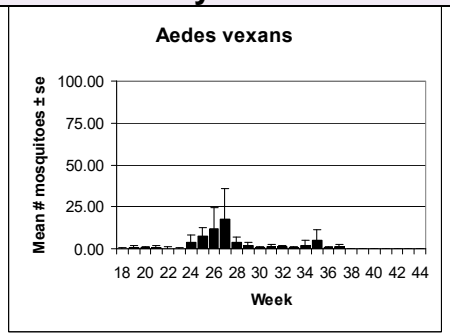
Agricultural



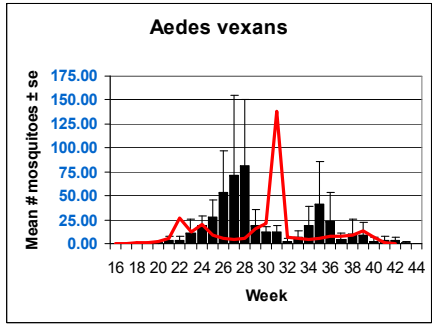
Coastal



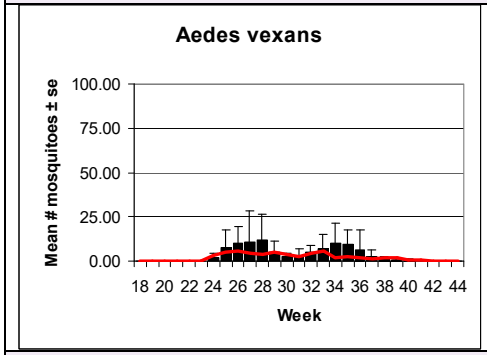
Delaware Bayshore



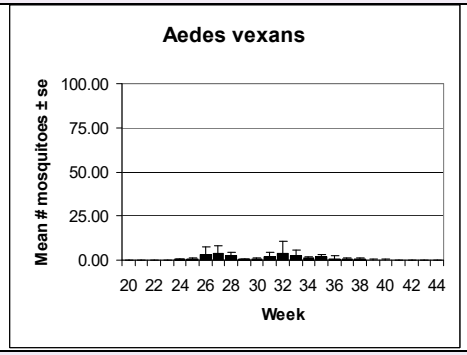
Delaware River Basin



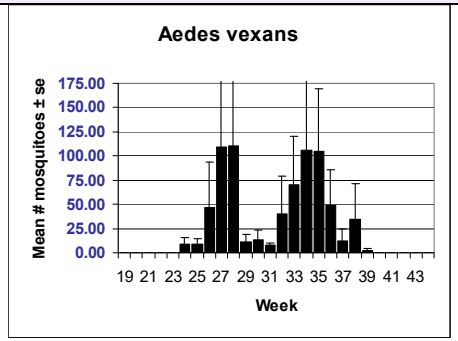
New York Metro



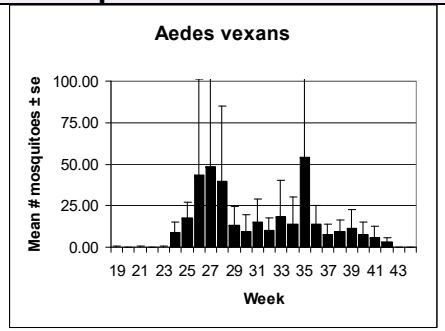
North Central Rural



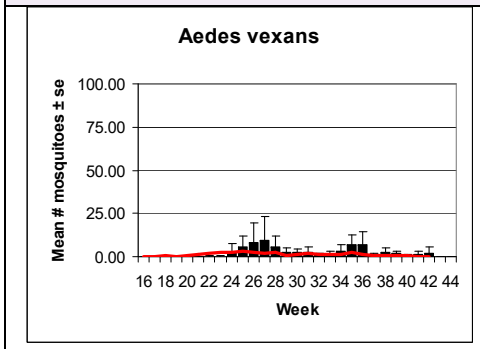
Northwestern Rural



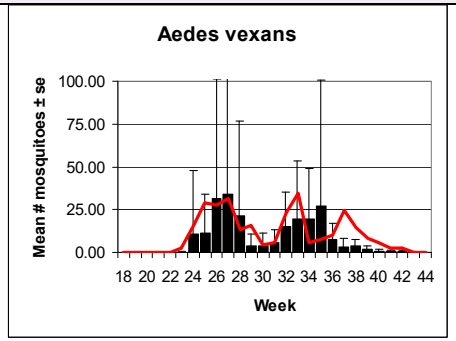
Philadelphia Metro



Pinelands



Suburban Corridor

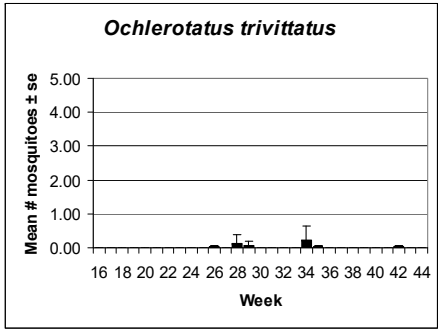


Comments

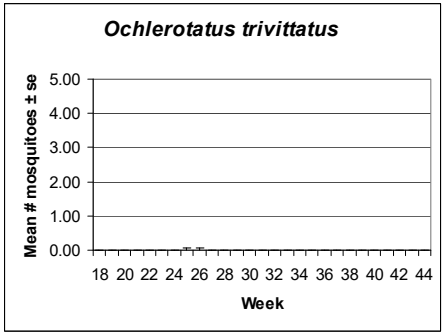
Ae. vexans is the model for the fresh floodwater mosquito life cycle type with repeating broods that are driven by rainfall. Most of the regions monitored by this program experienced 2 major broods of *Ae. vexans* in 2003 with intermittent minor emergences from localized rains. An extended period of rain during the month of June produced nuisance levels that persisted for nearly a full month in many areas of the state. The Northwest Rural Region had the highest population levels with over 100 mosquitoes per trap night during the 1st two weeks of July. The Delaware River Basin Region had populations nearly as high generated primarily from dredge spoil habitat. The 2nd major brood of *Ae. vexans* appeared in late August, exacerbated, in part, by Hurricane Isabel. Populations were again highest in the Northwest Rural Region but the Agricultural Region showed an exceptional peak that went well above the long term average for that time of year.

Ochlerotatus trivitattus - Fresh Floodwater Species

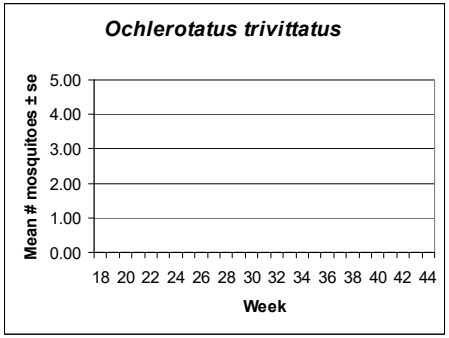
Agricultural



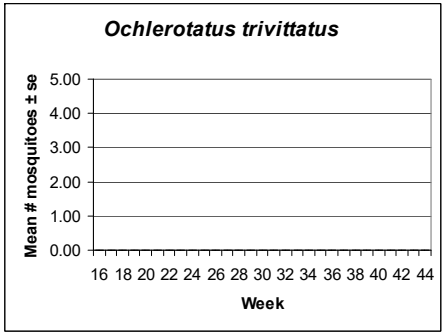
Coastal



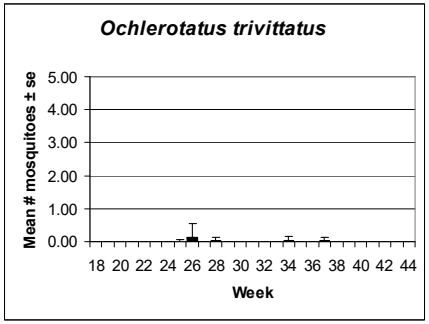
Delaware Bayshore



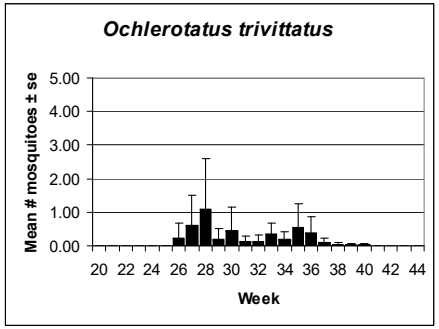
Delaware River Basin



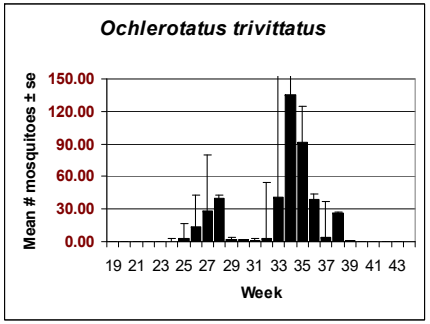
New York Metro



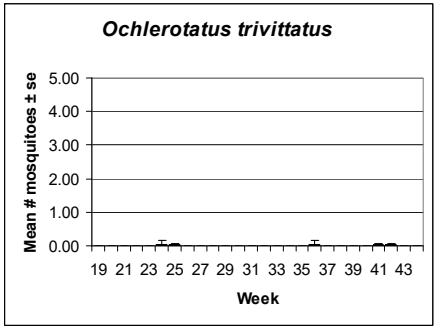
North Central Rural



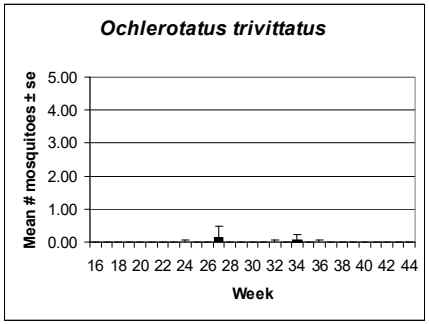
Northwestern Rural



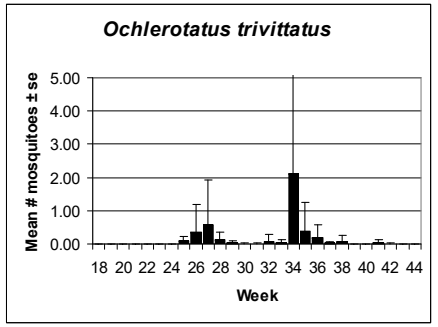
Philadelphia Metro



Pinelands



Suburban Corridor

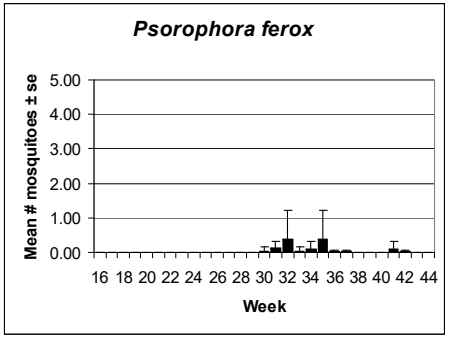


Comments

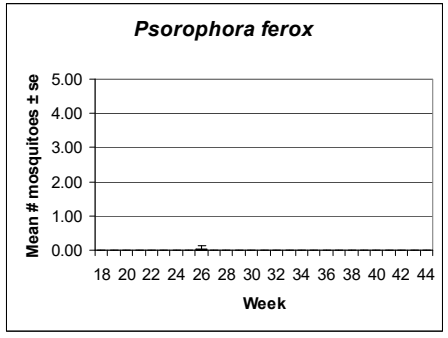
Oc. trivittatus is a fresh floodwater species that is limited to the northern half of the state. The species utilizes woodland pools as breeding habitat but does not appear until the trees leaf out and the pools are shaded. Major rain events produce successive broods during the summer months that can cause considerable nuisance. The species has a life cycle that is very similar to that of *Ae. vexans* and showed a similar population curve to that species with 2 broods associated with the 2 main rain events. The Northwestern Rural Region typically has the largest populations which peaked at nearly 150 mosquitoes per trap night during the month of August.

Psorophora ferox - Fresh Floodwater Species

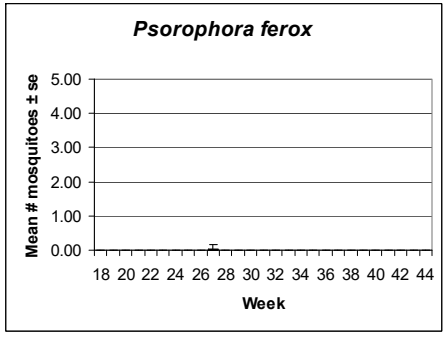
Agricultural



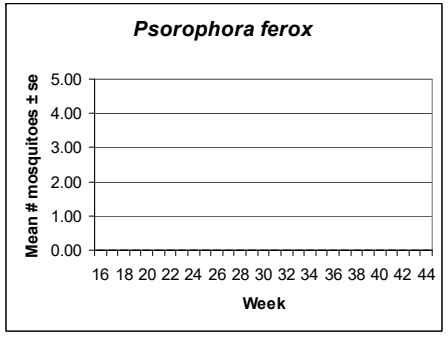
Coastal



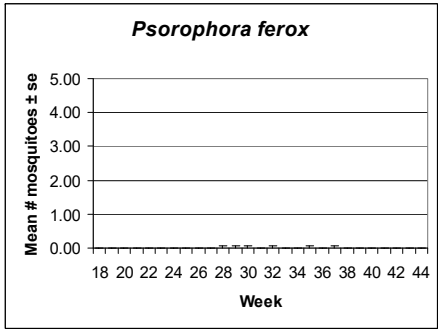
Delaware Bayshore



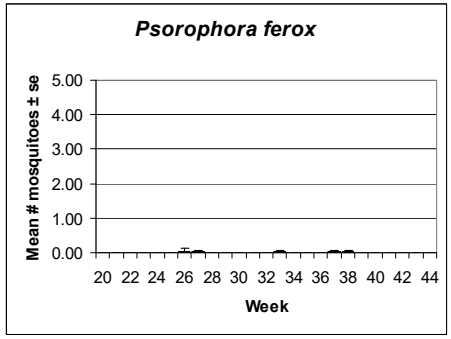
Delaware River Basin



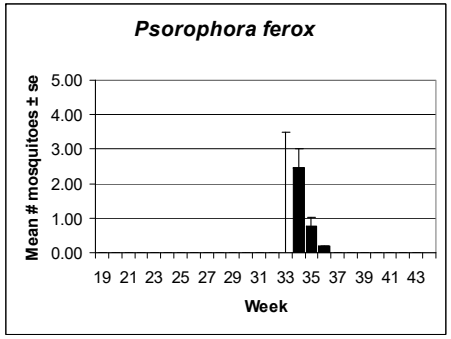
New York Metro



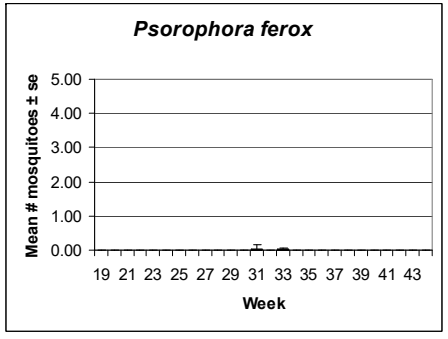
North Central Rural



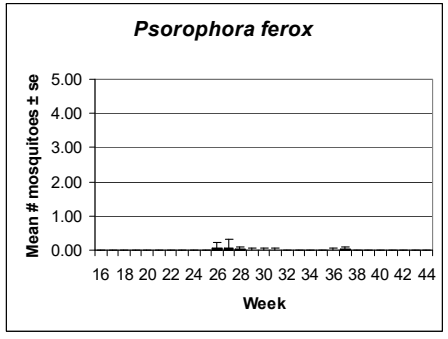
Northwestern Rural



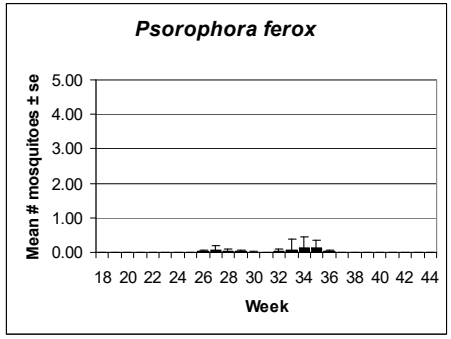
Philadelphia Metro



Pinelands



Suburban Corridor

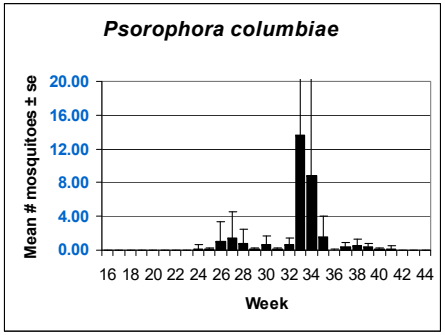


Comments

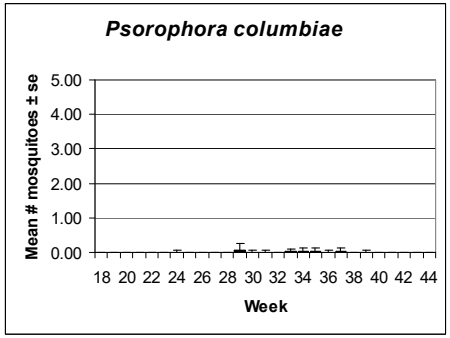
Ps. ferox is a fresh floodwater species that prefers shaded woodland pools and, therefore, often shares habitat with *Oc. trivittatus*. The species was not abundant in 2003 but appeared in low numbers in several regions after this year's major rain events. The Northwest Rural Region had the highest numbers but the species has a statewide distribution. Combining *Oc. trivittatus* with *Ps. ferox* causes nuisance levels that demand control.

Psorophora columbiae – Fresh Floodwater Species

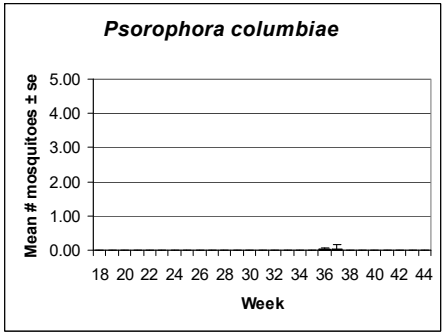
Agricultural



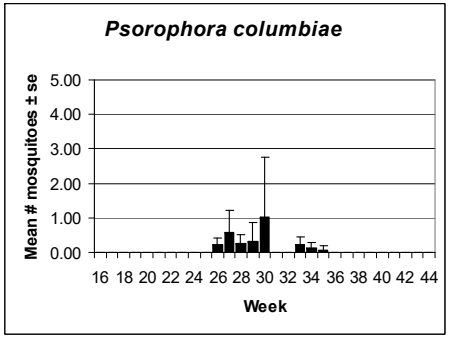
Coastal



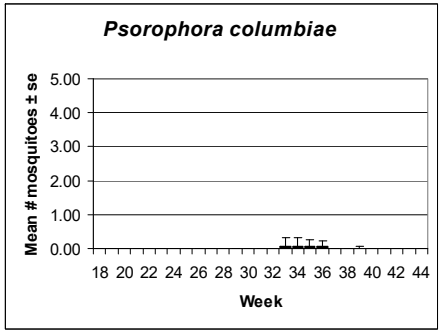
Delaware Bayshore



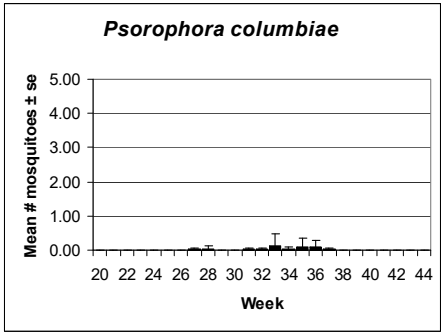
Delaware River Basin



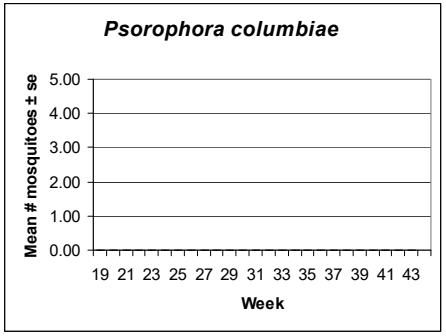
New York Metro



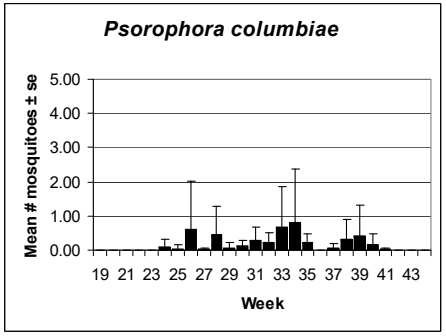
North Central Rural



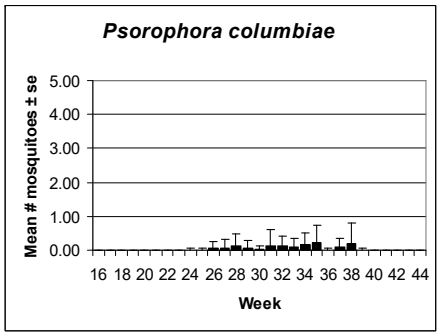
Northwestern Rural



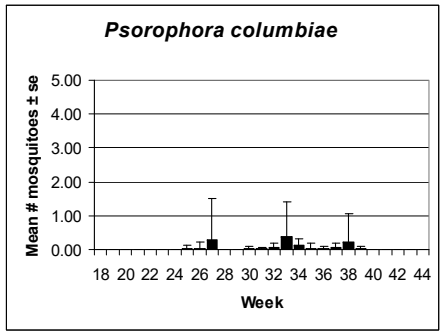
Philadelphia Metro



Pinelands



Suburban Corridor

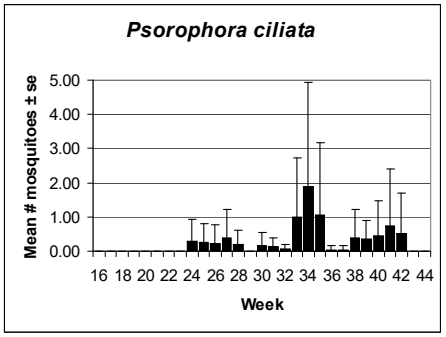


Comments

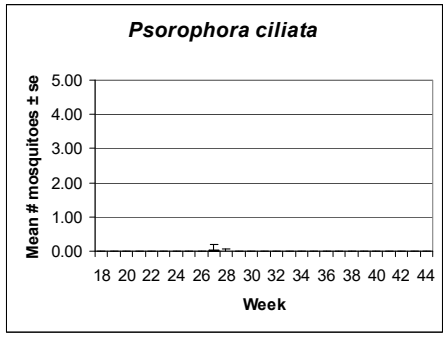
Ps. columbiae is a fresh floodwater species that does not normally hatch in numbers until ambient temperatures reach 80° F. The species utilizes a variety of floodwater habitats in open areas exposed to the sun and is often found with *Ae. vexans*. *Ps. columbiae* took advantage of the same rain events as other floodwater species but showed a somewhat different population curve. Egg hatch was minimal during the early season because ambient temperatures were probably less than ideal. The second brood was considerably larger, particularly in the Agricultural Region where open pools exposed to direct sun are most common.

Psorophora ciliata - Fresh Floodwater Species

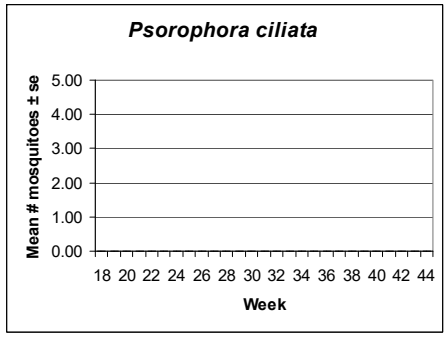
Agricultural



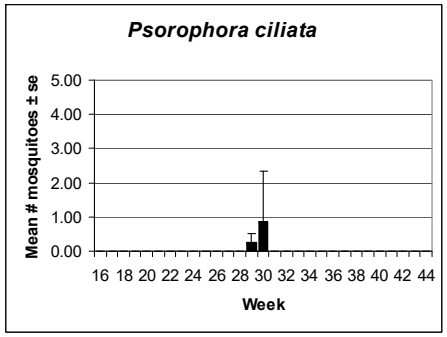
Coastal



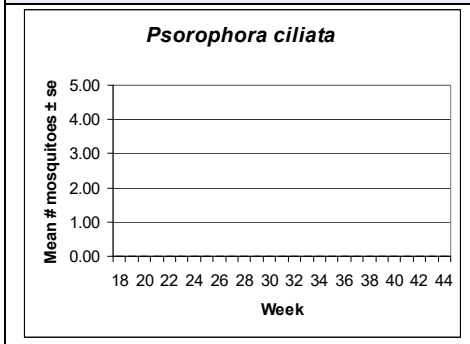
Delaware Bayshore



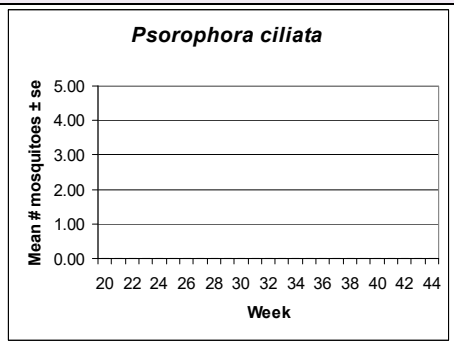
Delaware River Basin



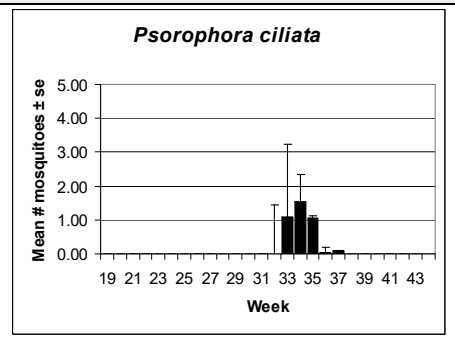
New York Metro



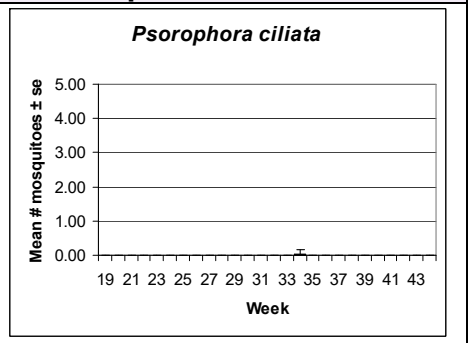
North Central Rural



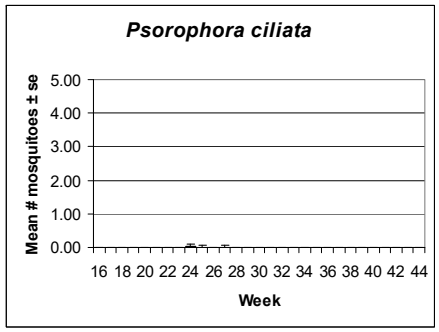
Northwestern Rural



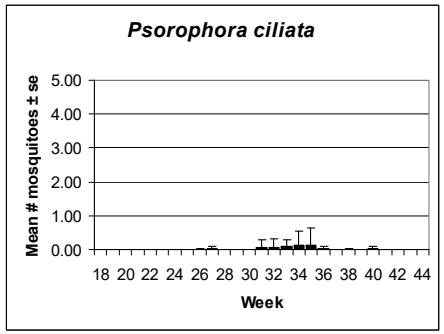
Philadelphia Metro



Pinelands



Suburban Corridor

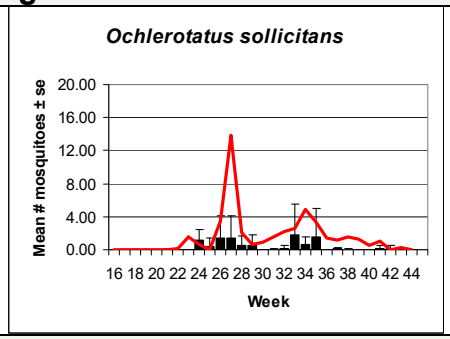


Comments

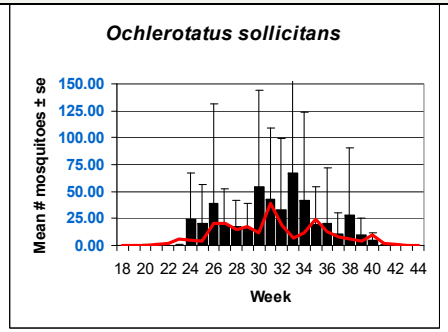
Ps. ciliata is a fresh floodwater species that is predacious in the larval stage. The species is usually found with *Ae. vexans* and *Ps. columbiae* in open areas but occasionally invades shaded pools. The larva is more than 5 times the size of other floodwater mosquitoes and functions as a biological control agent. Unfortunately, the exceptionally large adult is a blood feeder that can inflict a painful bite. Ps. ciliate reached highest numbers in the Agricultural Region where is preferred larval habit is most common. It took advantage of the 2 major rain events but also fit in one extra generation very late in the season.

Ochlerotatus sollicitans - Salt Marsh Floodwater Species

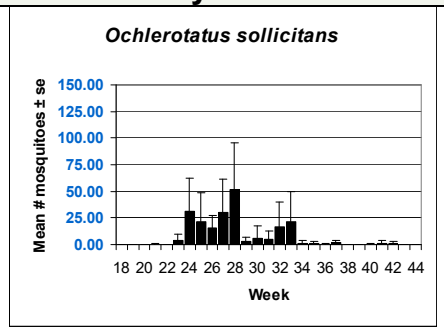
Agricultural



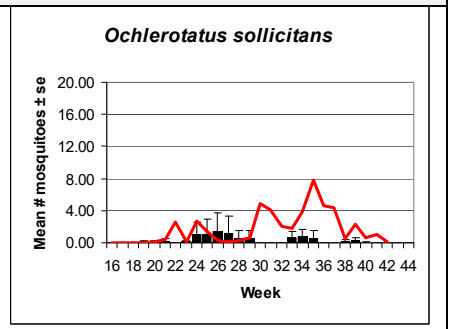
Coastal



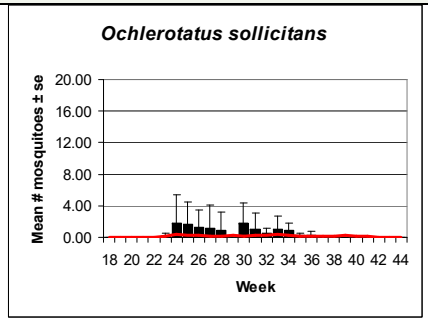
Delaware Bayshore



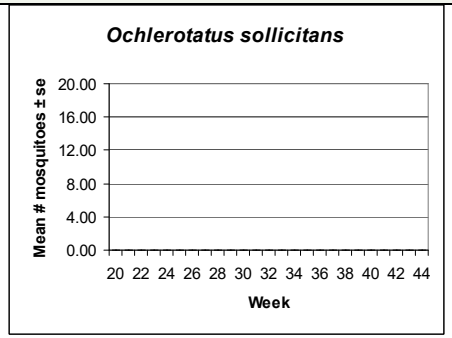
Delaware River Basin



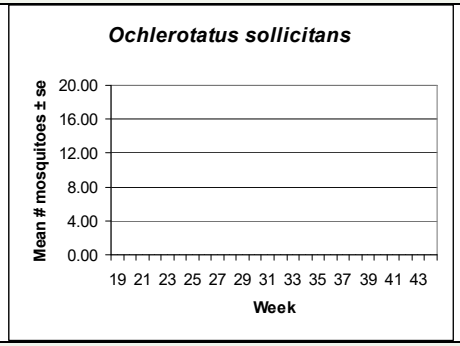
New York Metro



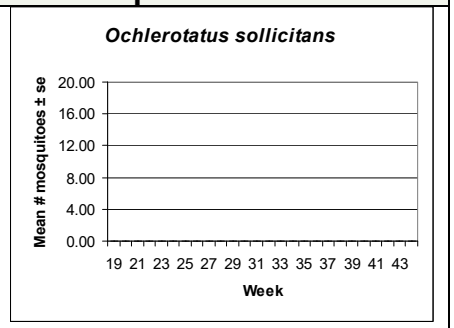
North Central Rural



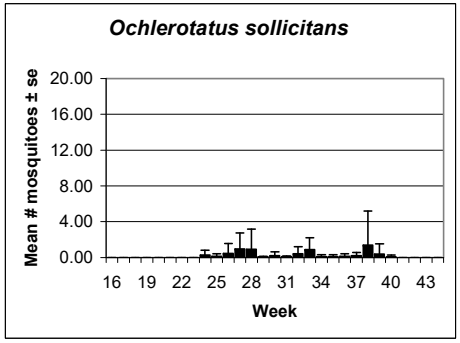
Northwestern Rural



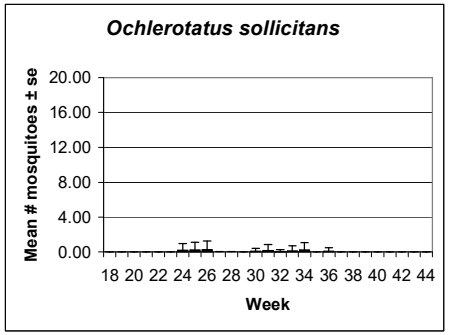
Philadelphia Metro



Pinelands



Suburban Corridor

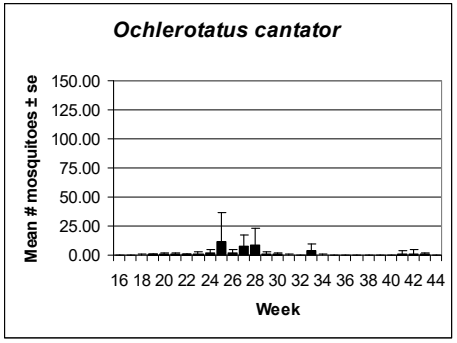


Comments

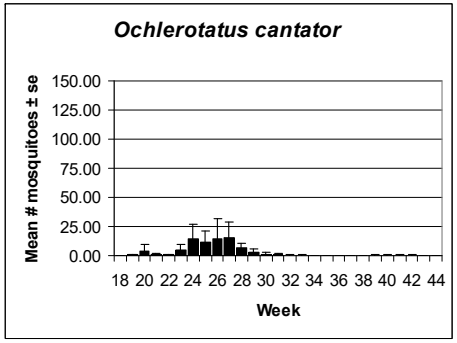
Oc. sollicitans is the model for salt marsh floodwater species with bi-weekly broods in coastal areas that are generated by lunar tides. Only 2 regions of the state (Coastal & Delaware Bayshore) are directly impacted by this species but the mosquito can cause minor nuisance when its migratory habits temporarily introduce it to inland areas. The Atlantic Coastal Region had overlapping broods from early June through late September with populations that exceeded 50 mosquitoes per trap night in late July and again in late August. The Delaware Bayshore Region showed a similar seasonal pattern with peak nuisance in early June and early July.

Ochlerotatus cantator - Salt Marsh Floodwater Species

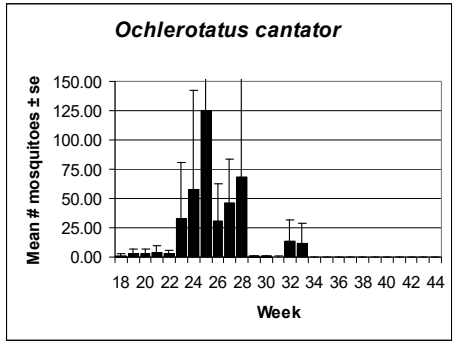
Agricultural



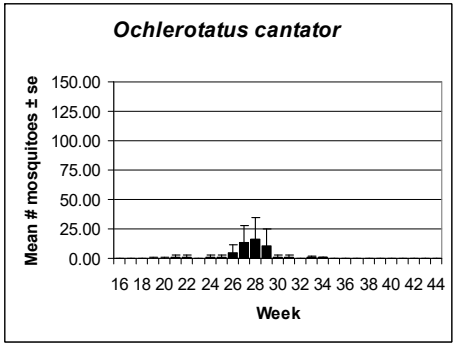
Coastal



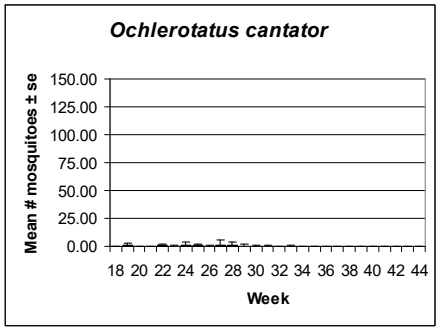
Delaware Bayshore



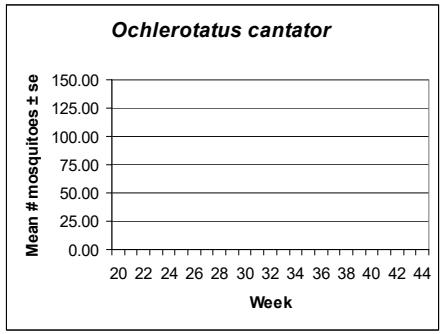
Delaware River Basin



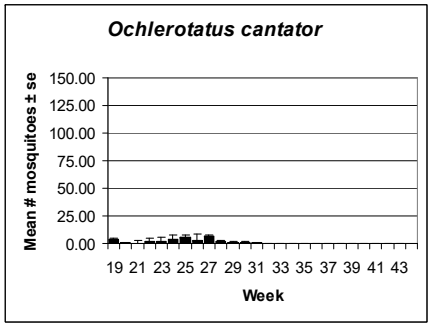
New York Metro



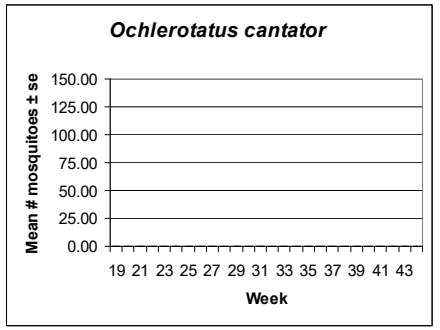
North Central Rural



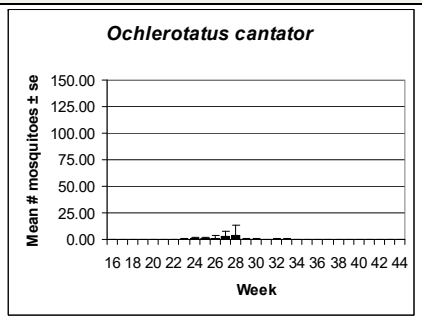
Northwestern Rural



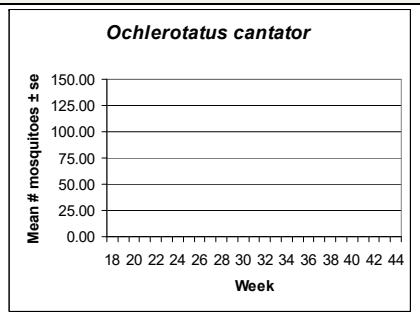
Philadelphia Metro



Pinelands



Suburban Corridor

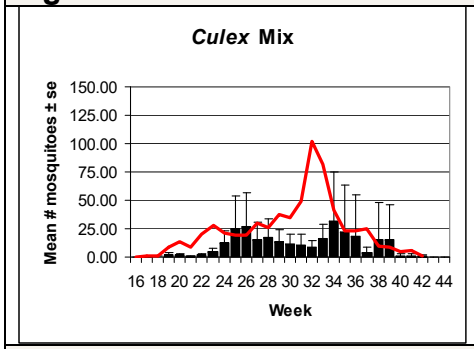


Comments

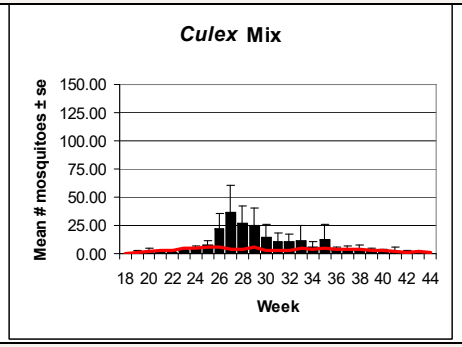
Oc. cantator is a salt marsh mosquito that reaches highest numbers during the early part of the season. This year's State Surveillance data show a clear picture of the species' typical seasonal distribution appearing in late April and phasing out in early July. Nuisance from *Oc. cantator* was greatest in the Delaware Bayshore Region where light trap collections reached 125 mosquitoes per trap night during the 2nd week of June. The early season distribution of this mosquito is underscored by the population curves in the 6 other regions where breeding habitat was available.

Culex Complex - Multivoltine Culex Species

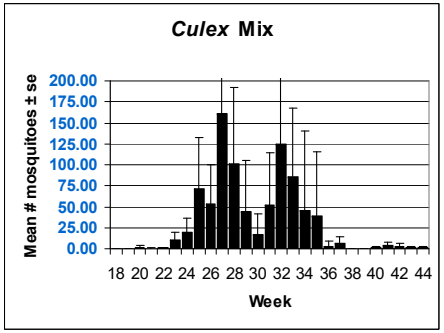
Agricultural



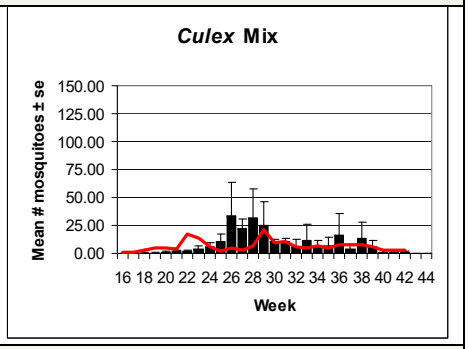
Coastal



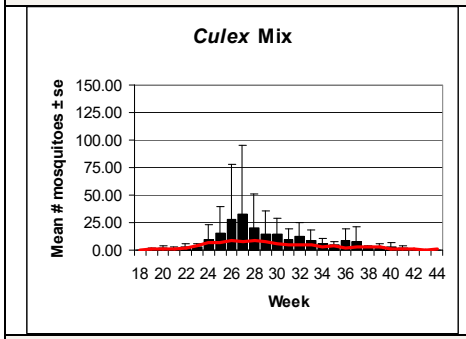
Delaware Bayshore



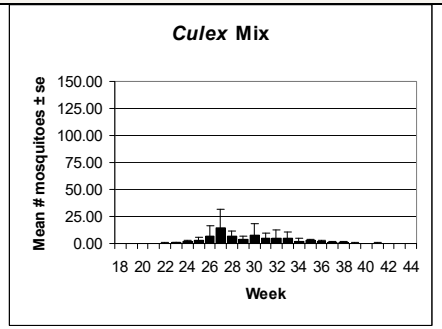
Delaware River Basin



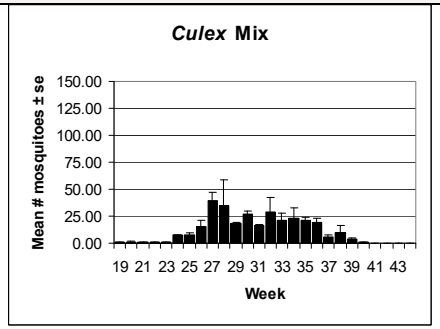
New York Metro



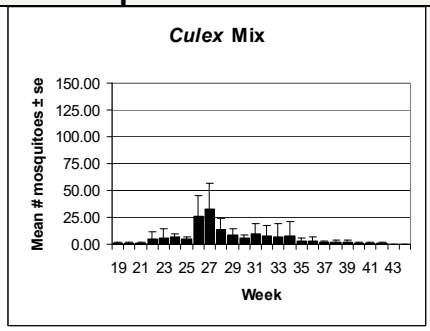
North Central Rural



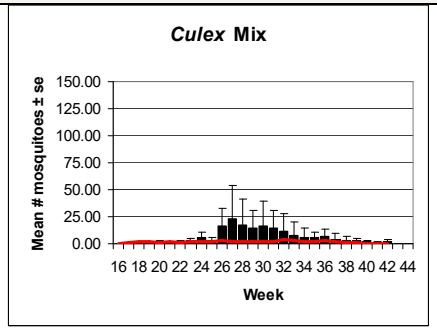
Northwestern Rural



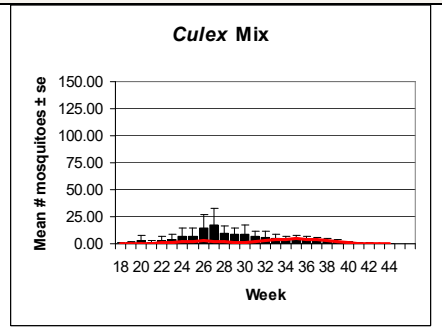
Philadelphia Metro



Pinelands



Suburban Corridor

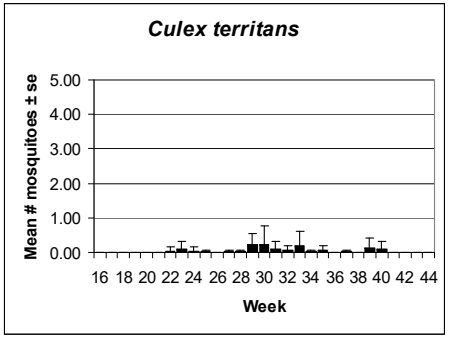


Comments

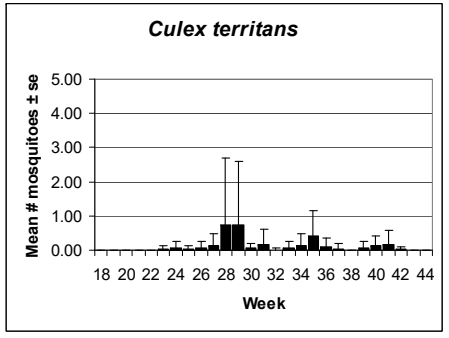
The *Culex* Complex is composed of *Cx. pipiens, Cx. restuans and Cx. salinarius,* 3 distinct mosquito species that are difficult to separate after passing through light traps. *Culex* populations generally build in numbers as the season progresses reaching peak populations during the month of August followed a steady decline as the adult mosquitoes begin entering their winter hibernaculae. The general trend for this group is well depicted in the historical data for the Agricultural Region. This year's rainfall patterns produced a very different population pattern for *Culex* in most geographic regions of the state. Excessive rains during the month of June produced extensive breeding habitat and a population surge not unlike the brooded floodwater species. *Culex* populations showed a steady decline from that point on in the season in most of the regions monitored by this program. *Culex* in the Delaware Bay Region showed an atypical late season surge, most likely the result of *Cx. salinarius* habitat created by t late season rains.

Culex territans - Multivoltine Culex Species

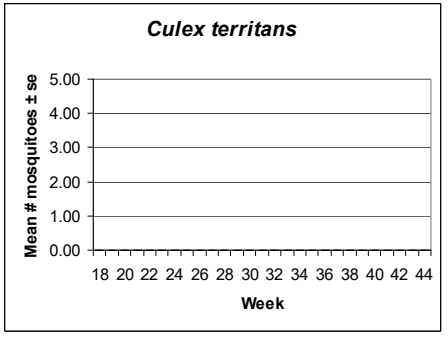
Agricultural



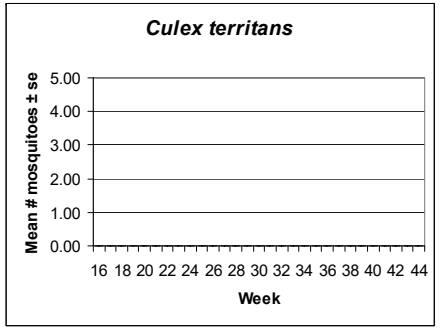
Coastal



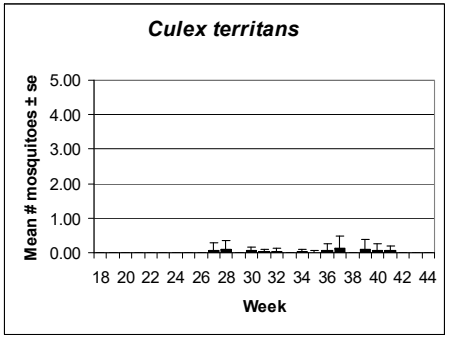
Delaware Bayshore



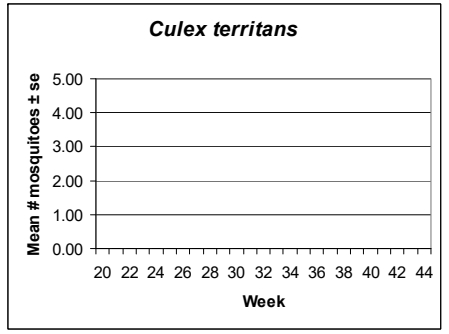
Delaware River Basin



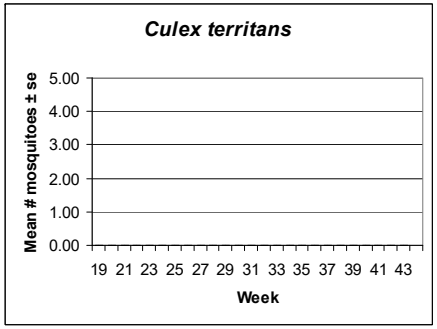
New York Metro



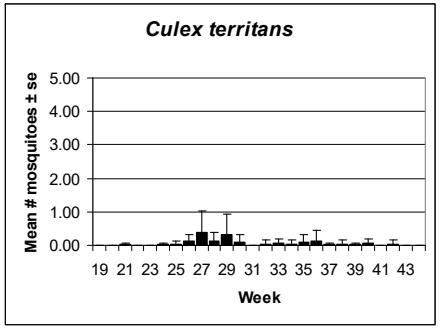
North Central Rural



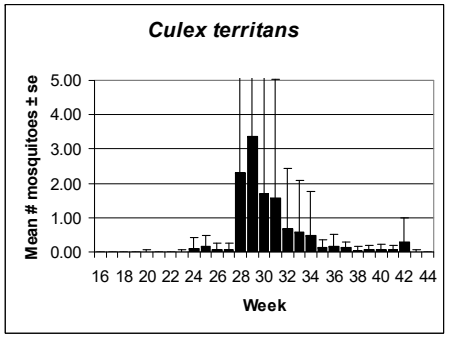
Northwestern Rural



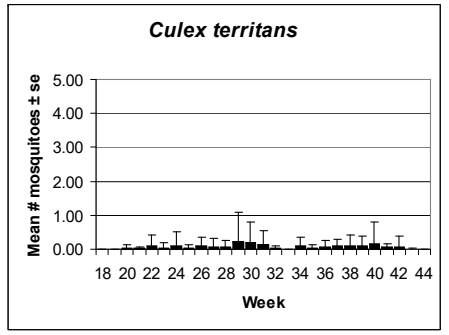
Philadelphia Metro



Pinelands



Suburban Corridor

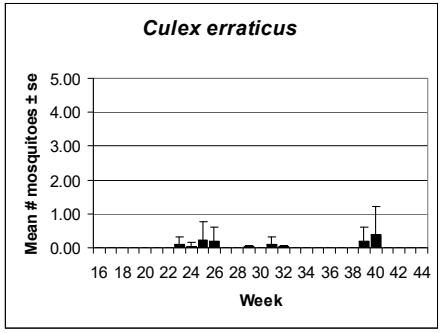


Comments

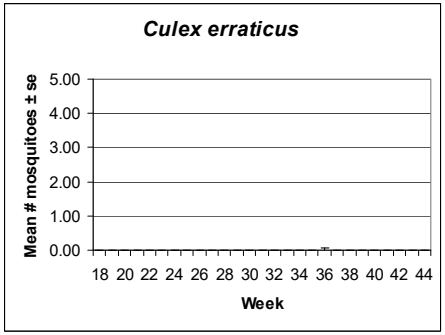
Cx. territans is a frog feeding species that is recognized primarily as a scientific curiosity. The unique banding patterns found on this mosquito allow it to be reliably separated from other members of the *Culex* complex. The mosquito appears earlier in the season than any other mosquito that overwinters as an adult. The species remains on the wing well into the Fall and larvae can be collected well into the month of October. State light trap records give a good depiction of the seasonal distribution with collections that begin in May and extend through the month of October. Populations were highest in the Pine Barrens Region where both breeding habitat and pond dwelling frog populations are readily available.

Culex erraticus - Multivoltine Culex Species

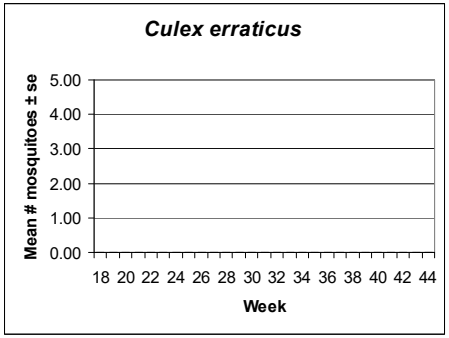
Agricultural



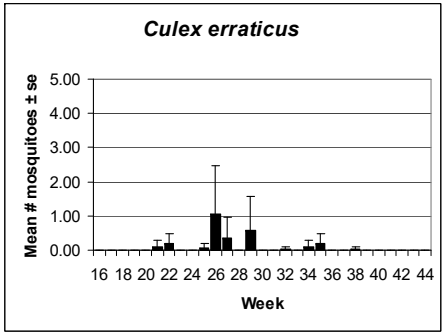
Coastal



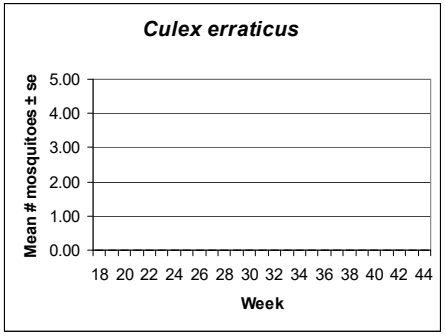
Delaware Bayshore



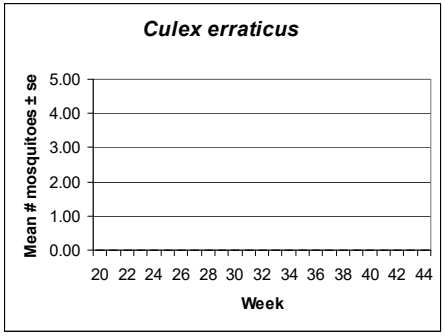
Delaware River Basin



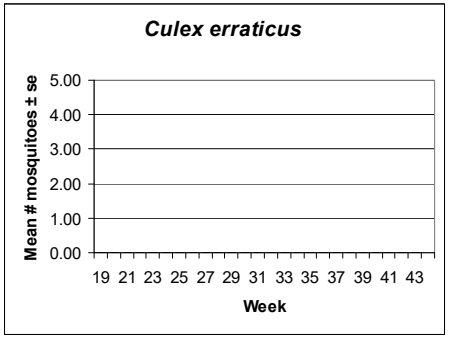
New York Metro



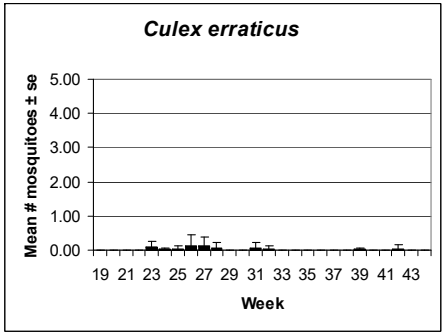
North Central Rural



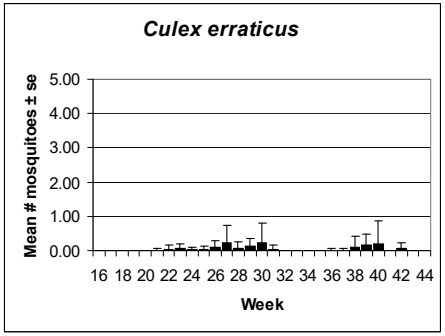
Northwestern Rural



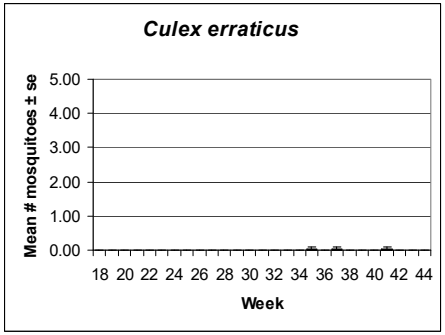
Philadelphia Metro



Pinelands



Suburban Corridor

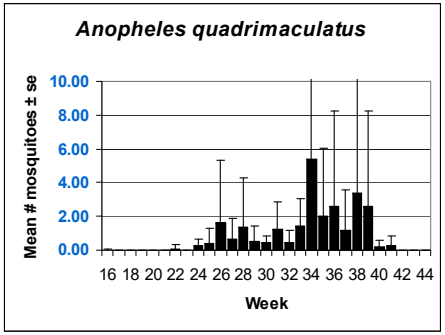


Comments

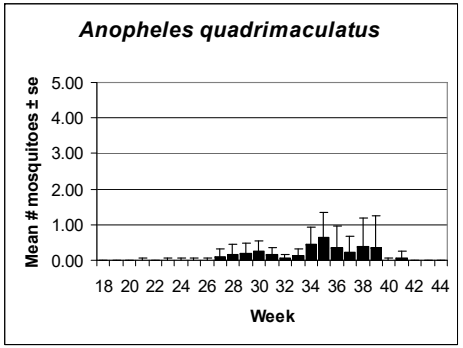
Cx. erraticus is a mosquito species that is regarded as rare. The adult was collected in New Jersey 1970 and the larvae were not located until 1988. The mosquito sometimes appears in resting box collections but not until very late in the season and from relatively few areas in the state. Like *Cx. territans*, this mosquito has diagnostic characters that allow it to be easily separated from other members of the *Culex* complex. This year's State Surveillance data indicate that the species is quite widespread. Although numbers are low, light traps detected *Cx. erraticus* in the Agricultural, Delaware River Basin, Philadelphia Metro, Pinelands and Suburban Corridor Regions. The data also show an unexpected seasonal data. *Cx. erraticus* began entering light traps in early spring and was collected well into October.

Anopheles quadrimaculatus - Multivoltine Anopheles Species

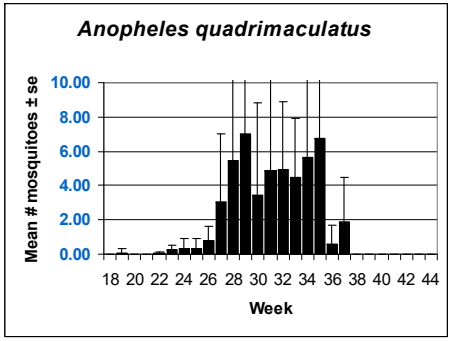
Agricultural



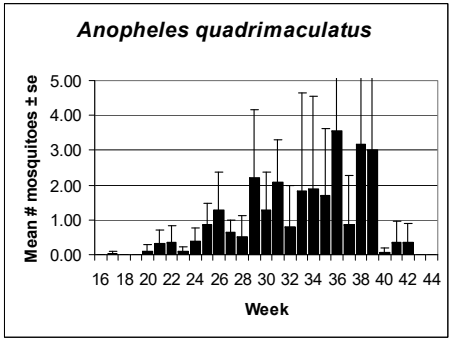
Coastal



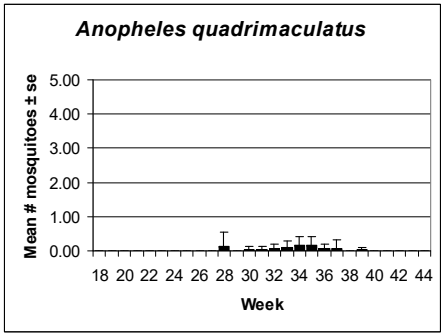
Delaware Bayshore



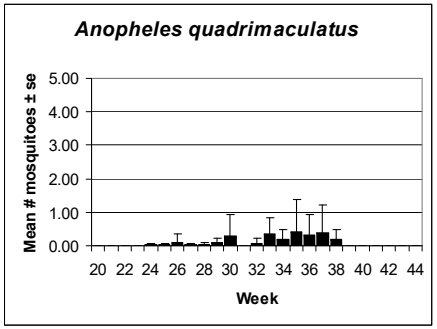
Delaware River Basin



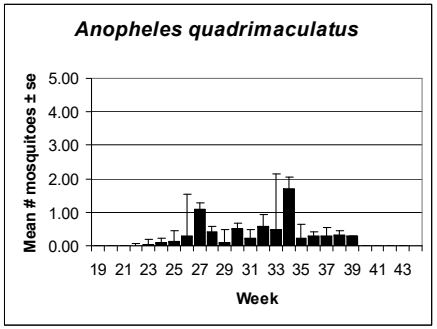
New York Metro



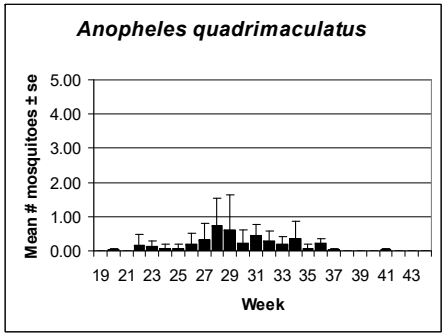
North Central Rural



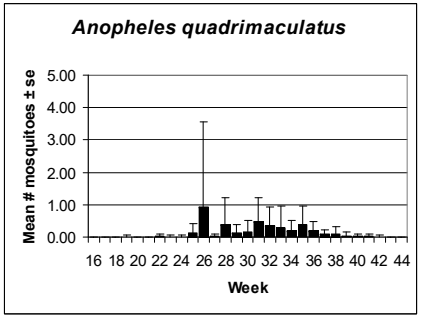
Northwestern Rural



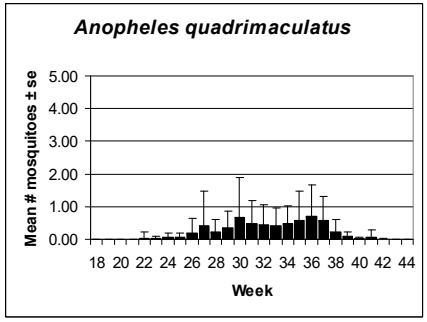
Philadelphia Metro



Pinelands



Suburban Corridor

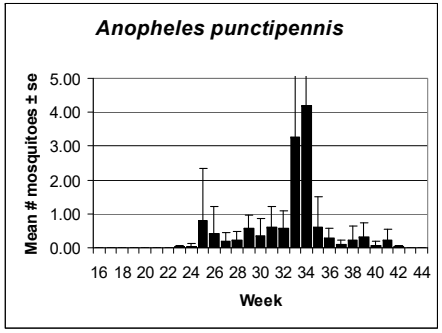


Comments

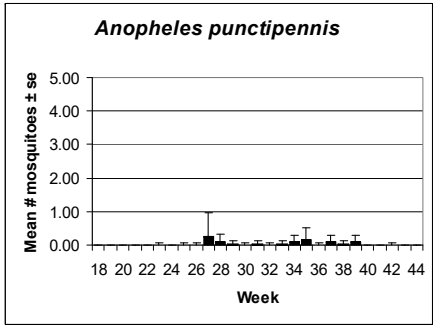
An. quadrimaculatus overwinters as an adult female and gradually builds in numbers as the season progresses. The mosquito is considered the model for a multivoltine *Culex*/*Anopheles* life cycle. This years' State Surveillance database shows a typical trend for that life cycle type in most of the regions in the state. Population levels of *An. quadrimacularus* remained below 1 mosquito per trap night in most regions all year. Populations in the Delaware Bayshore and Delaware River Basin Regions were the highest ranging between 3 and 6 mosquitoes per trap night at their peak.

Anopheles punctipennis - Multivoltine Anopheles Species

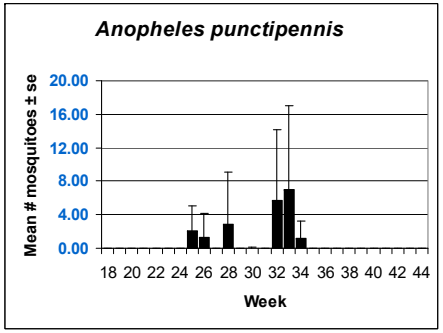
Agricultural



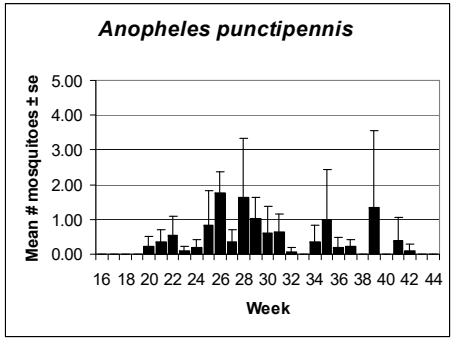
Coastal



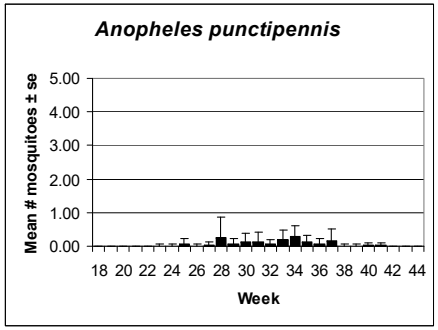
Delaware Bayshore



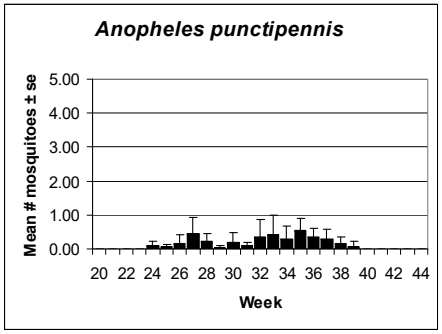
Delaware River Basin



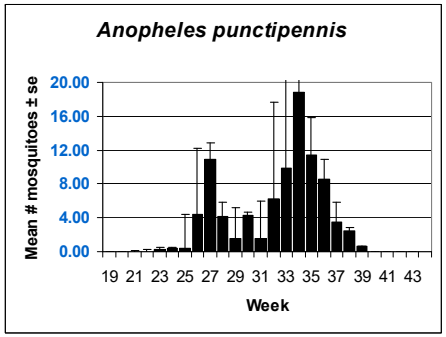
New York Metro



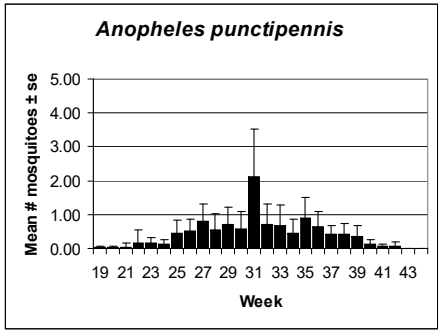
North Central Rural



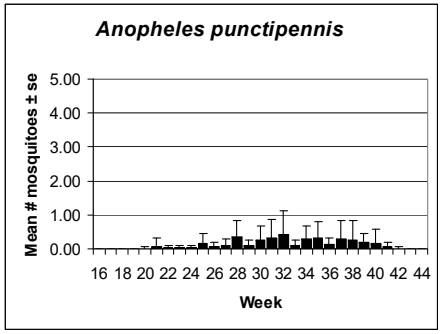
Northwestern Rural



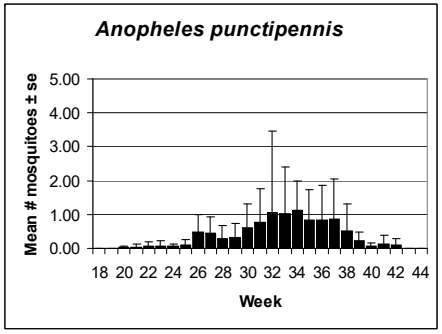
Philadelphia Metro



Pinelands



Suburban Corridor

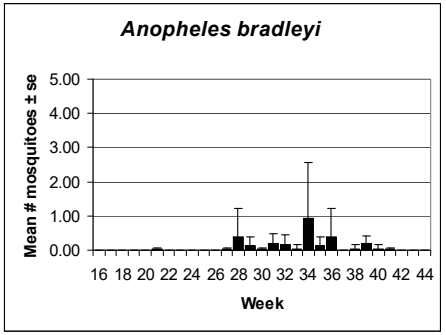


Comments

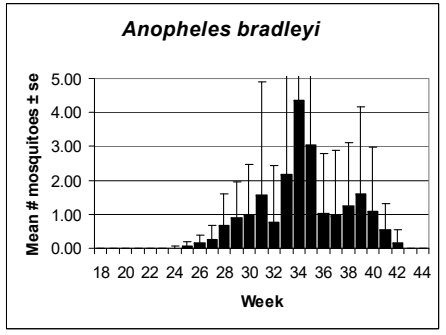
An. punctipennis, like most species that overwinter as adults, progressively builds in numbers as the season progresses and tapers off as the species begins preparations for entering hibernaculae. That trend was depicted in most of the regions monitored by this program in 2003. Populations of *An. punctipennis* in the Northwestern Rural Region appear to reflect available breeding habit rather than the normal population curve. In that region, the mosquito reached largest population levels after each of the year's major rain events.

Anopheles bradleyi - Multivoltine Anopheles Species

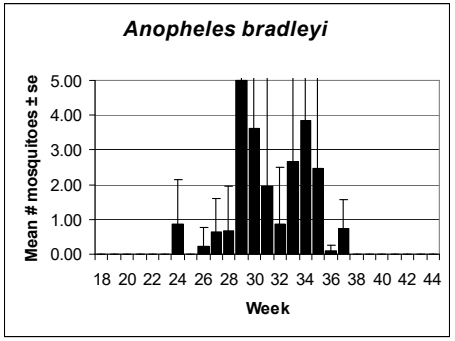
Agricultural



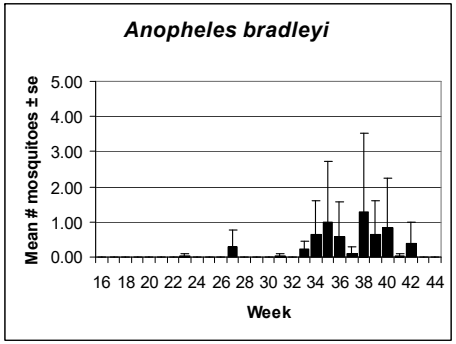
Coastal



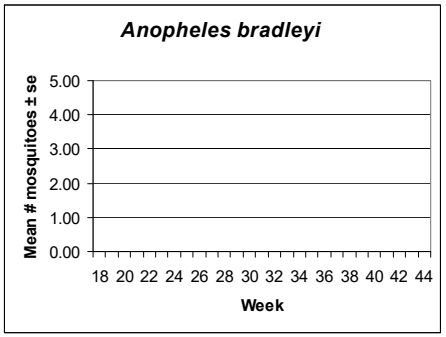
Delaware Bayshore



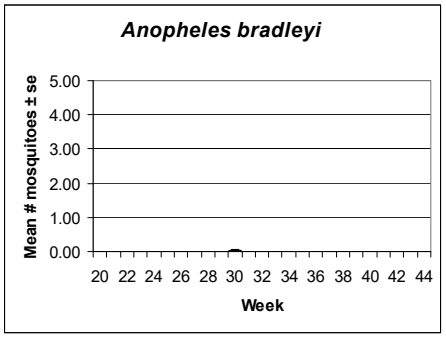
Delaware River Basin



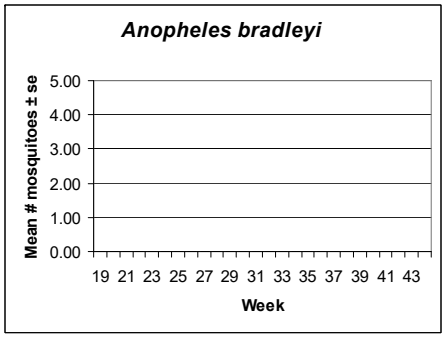
New York Metro



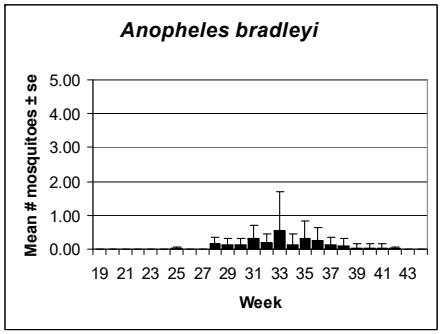
North Central Rural



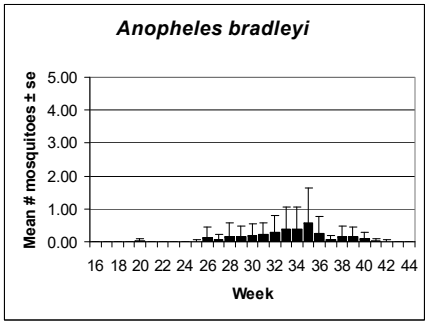
Northwestern Rural



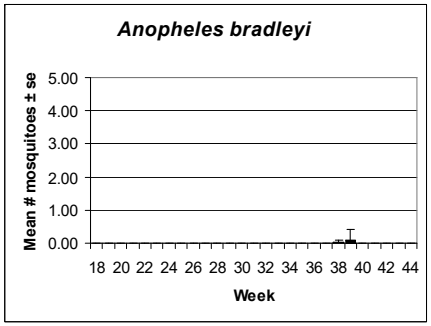
Philadelphia Metro



Pinelands



Suburban Corridor

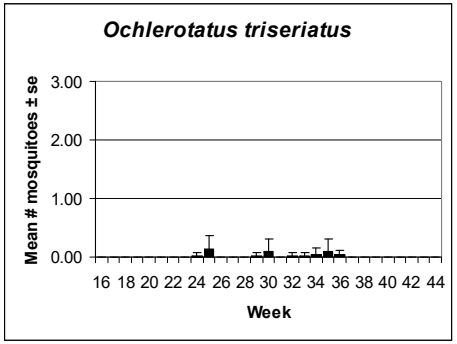


Comments

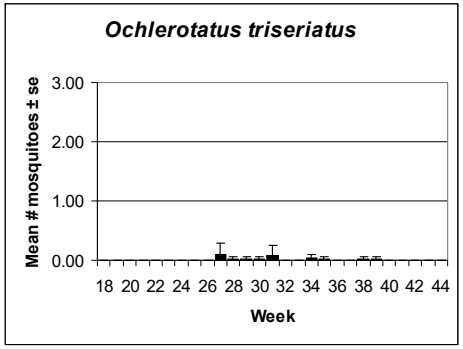
An. bradleyi is a salt marsh anopheline that reaches highest numbers in coastal areas where brackish water impoundments supply ideal breeding habitat. The species is cryptic with *An. crucians*, a freshwater species that cannot be separated in the adult stage by morphological characteristics. The species reached highest population levels in coastal areas of the state where classic brackish water breeding habitat is abundant. The *An. bradleyi* from inland areas of the Agricultural, and Pinelands Regions probably include *An. crucians*.

Ochlerotatus triseriatus - Container Breeding Aedines

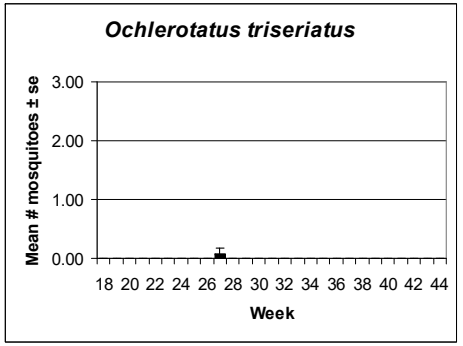
Agricultural



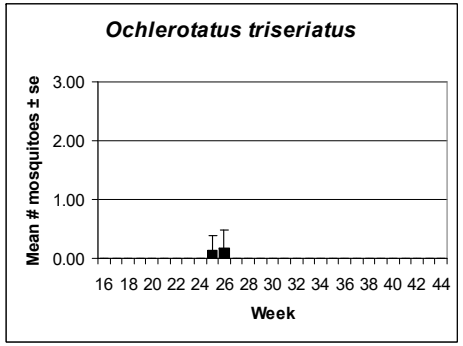
Coastal



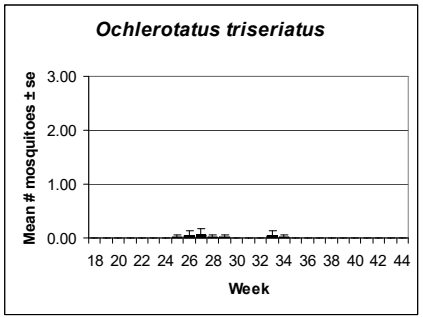
Delaware Bayshore



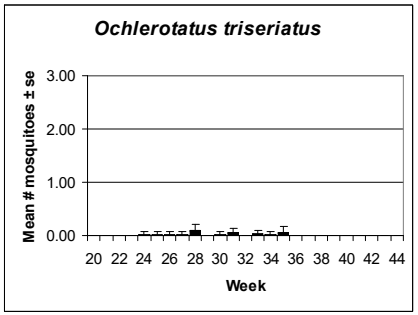
Delaware River Basin



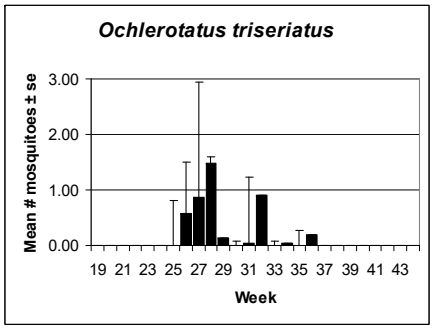
New York Metro



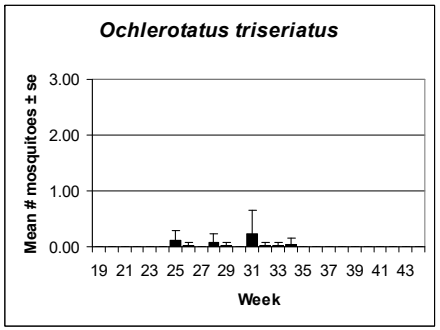
North Central Rural



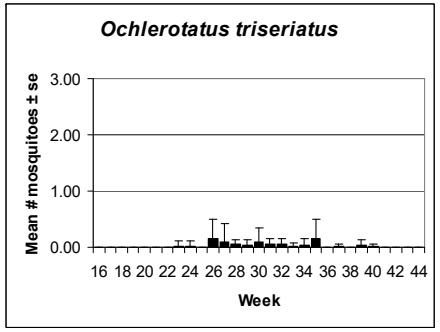
Northwestern Rural



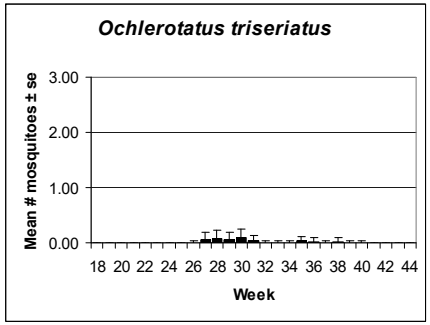
Philadelphia Metro



Pinelands



Suburban Corridor

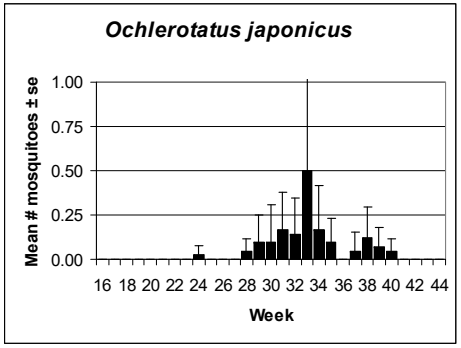


Comments

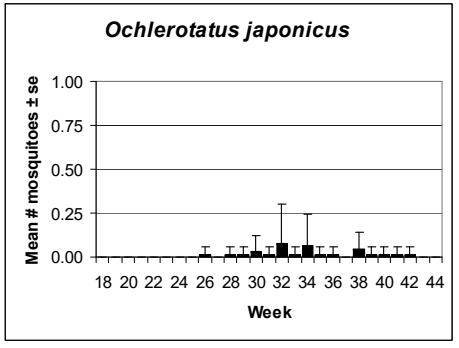
Oc. triseriatus is a treehole species that is not readily attracted to light. Like most natural container breeders, *Oc. triseriatus* readily accepts discarded tires and other leaf-lined artificial containers as breeding habitat. The appearance of *Oc. triseratus* in light trap collections is often an indication that local breeding habitat is nearby. The low numbers in the State Surveillance database severely under-estimate this mosquito's importance as a nuisance species. Although the mosquito does not fly far from its breeding habitat, it feeds readily on individuals that enter its domain.

Ochlerotatus japonicus - Container Breeding Aedines

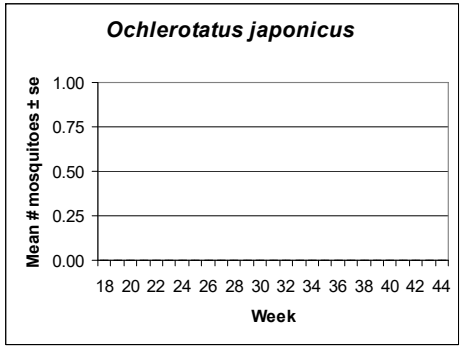
Agricultural



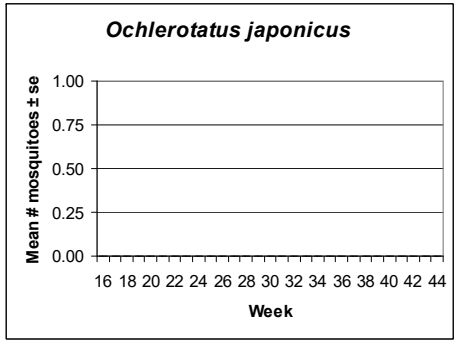
Coastal



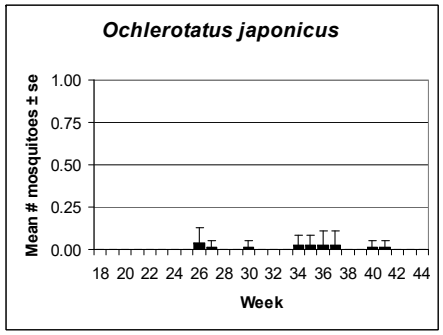
Delaware Bayshore



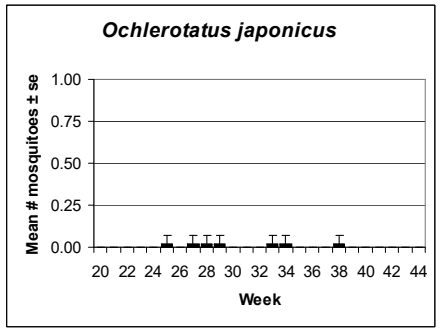
Delaware River Basin



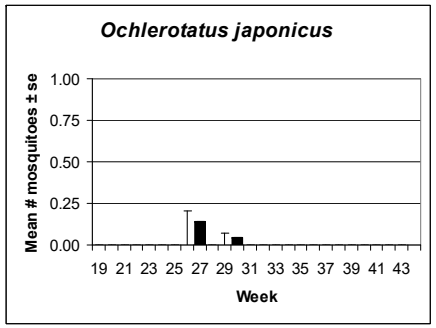
New York Metro



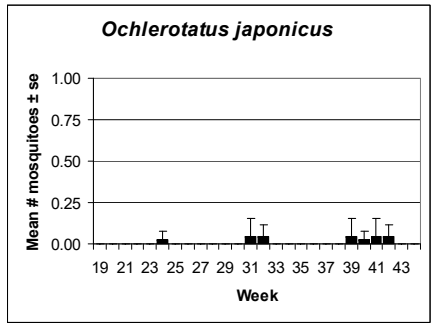
North Central Rural



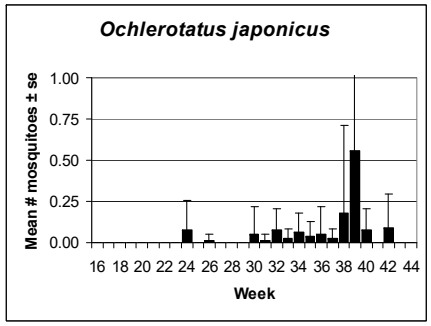
Northwestern Rural



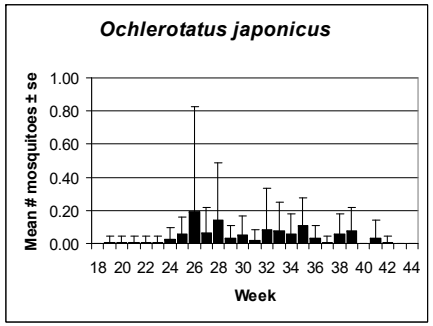
Philadelphia Metro



Pinelands



Suburban Corridor

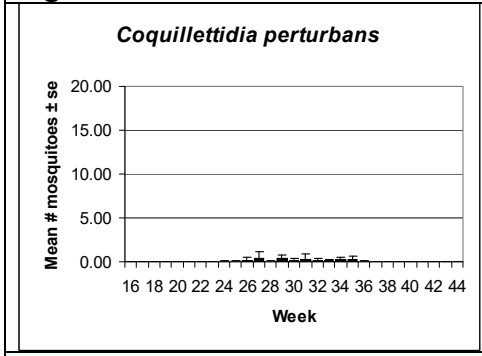


Comments

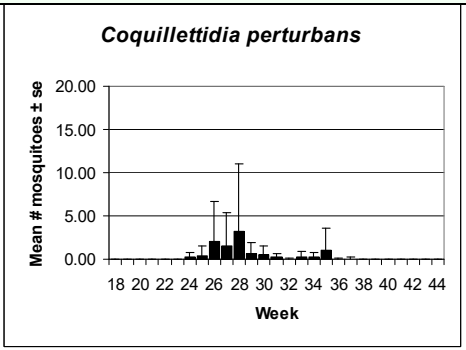
Oc. japonicus is a recently introduced mosquito that breeds in a variety of container habitats. Like *Oc. triseratus*, the mosquito does not readily enter light traps. *Oc. japonicus* is a cold hardy species that is on the wing as early as April and as late as November. State Surveillance light trap collections are well under 1 mosquito per trap night for the entire season, emphasizing the mosquito's unwillingness to enter traps. The species appears to be most numerous in the Agricultural, Pinelands and Suburban Corridor Regions. The apparent population peaks in light trap records are probably not reliable because they represent increases of about ¼ mosquito per trap night.

Coquillettidia perturbans - Miscellaneous Group

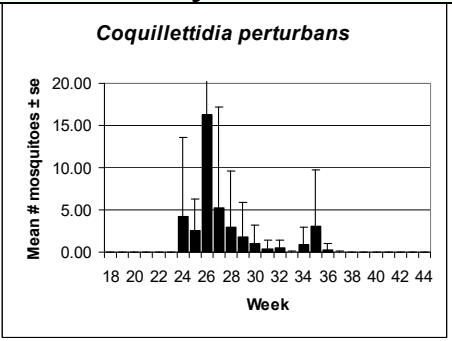
Agricultural



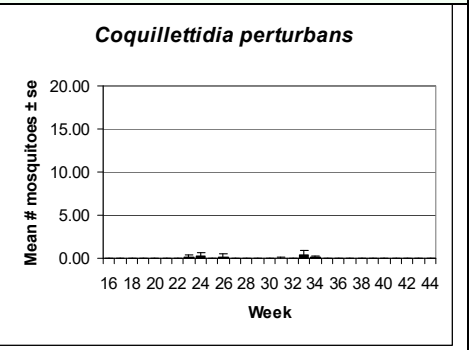
Coastal



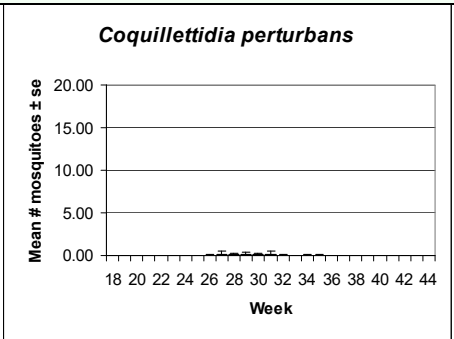
Delaware Bayshore



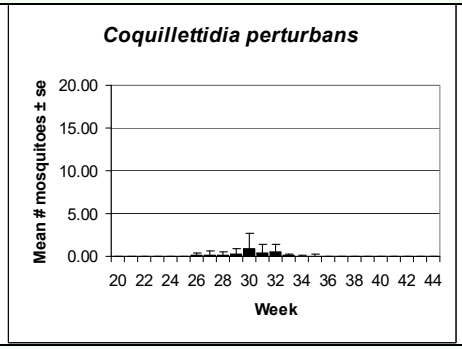
Delaware River Basin



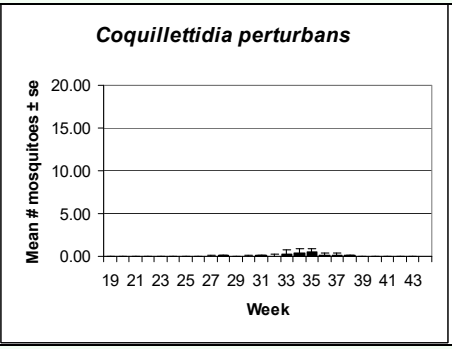
New York Metro



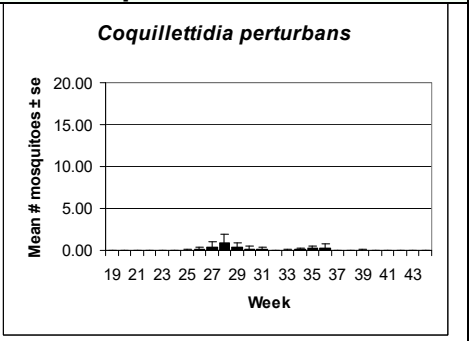
North Central Rural



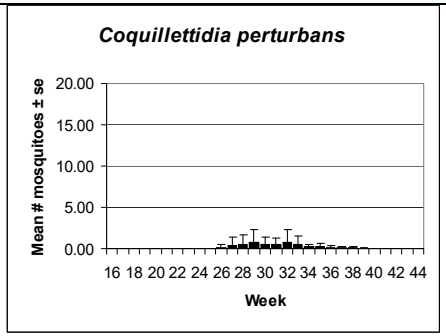
Northwestern Rural



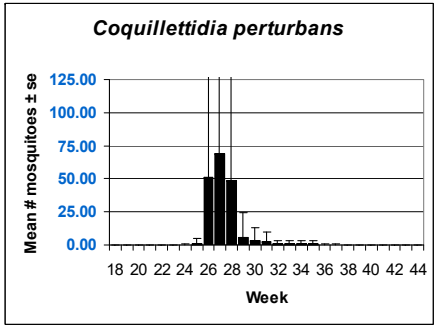
Philadelphia Metro



Pinelands



Suburban Corridor

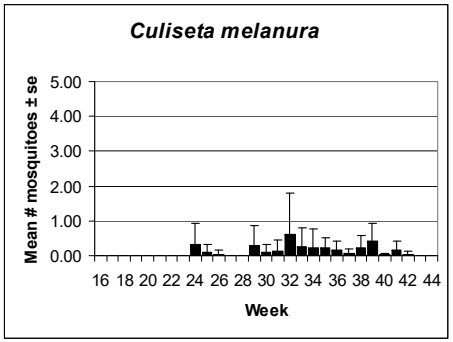


Comments

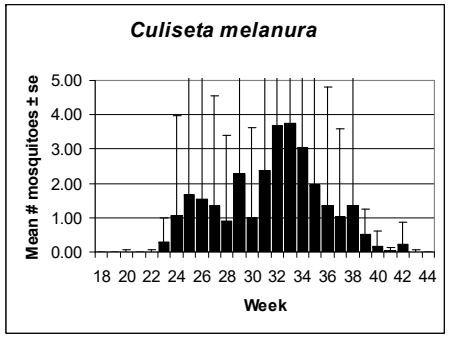
Cq. perturbans is a species that shows up to 3 population peaks during the summer months as adults emerge from larvae that overwintered in three separate instars. Data from this year's State Mosquito Surveillance Program show only 2 population peaks for areas of the state where *Cq. perturbans* are numerous. The June emergence was, by far, the largest indicating that the species overwintered primarily as 4th instar larvae in most areas of the state. Populations were highest in the Suburban Corridor Region reaching nearly 75 mosquitoes per trap night. A minor emergence occurred during the month of August in some regions from larvae that overwintered in earlier instars. The late season emergence is most evident in the Delaware Bayshore Region but remained under 5 mosquitoes per trap night at its peak.

Culiseta melanura - Miscellaneous Group

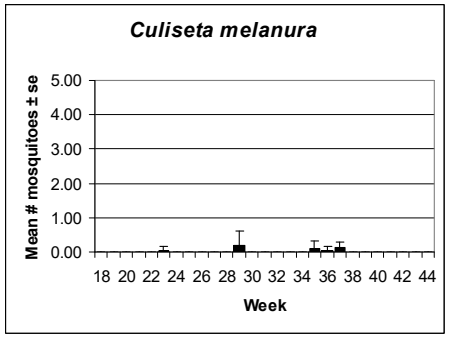
Agricultural



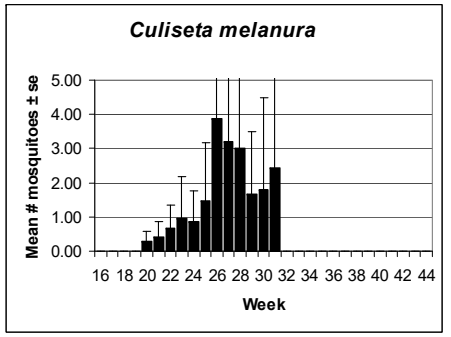
Coastal



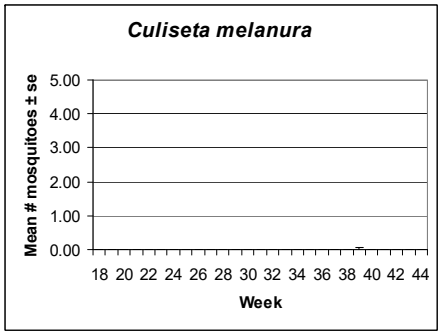
Delaware Bayshore



Delaware River Basin



New York Metro



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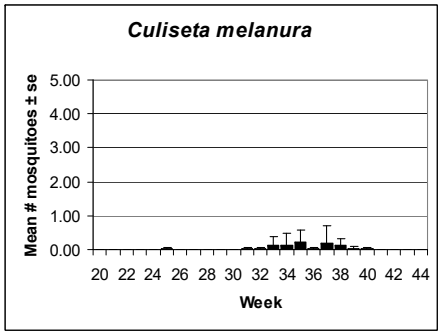
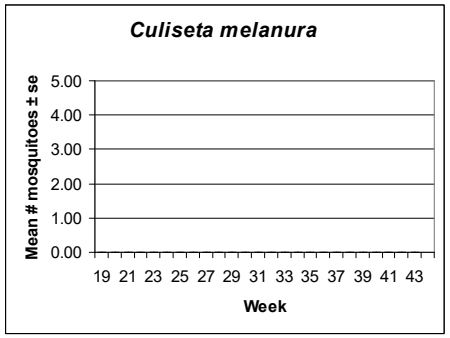
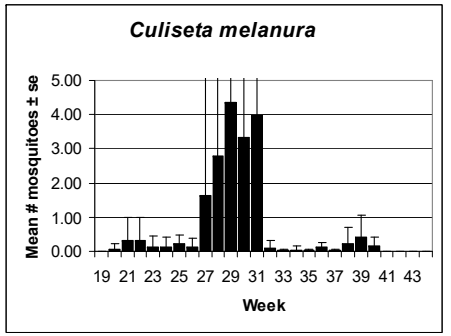


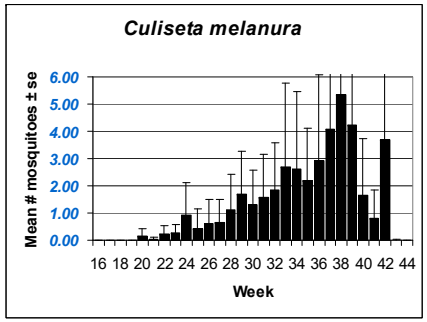
Northwestern Rural



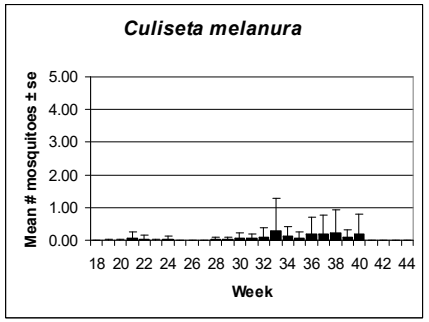
Philadelphia Metro



Pinelands



Suburban Corridor

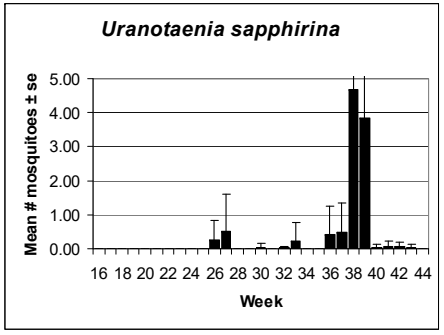


Comments

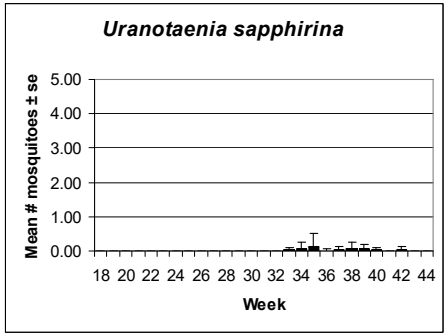
Culiseta melanura is a mosquito that reaches highest numbers in the southern half of the state where Atlantic White Cedar swamps provide ideal acid water breeding habitat for the species. State Surveillance light trap data show that the species was most common in the Atlantic Coastal, Delaware River Basin, Philadelphia Metro and Pinelands Regions this year. *Culiseta melanura* is a cold heady species with a very broad season range. The species appeared in light traps as early as the 2nd week of May and persisted well into October.

Uranotaenia sapphirina - Miscellaneous Group

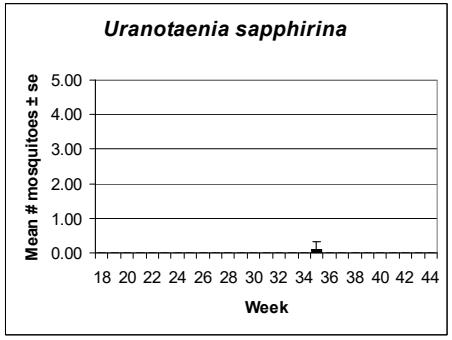
Agricultural



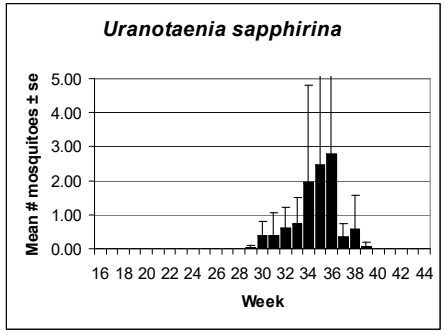
Coastal



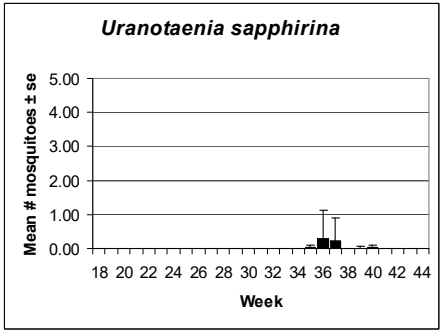
Delaware Bayshore



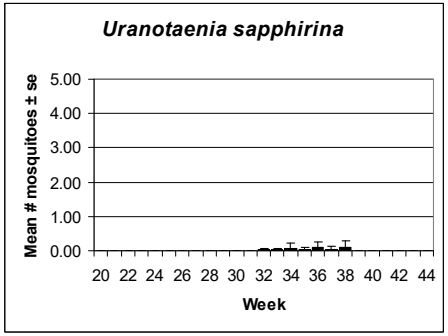
Delaware River Basin



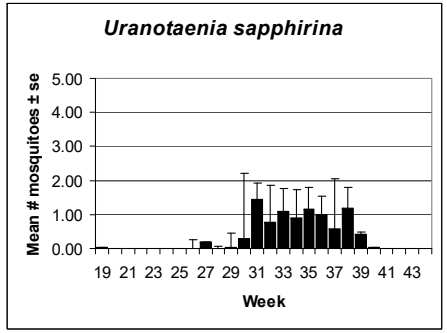
New York Metro



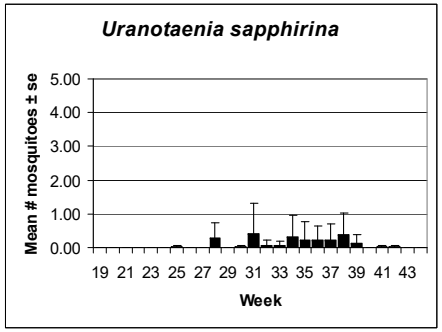
North Central Rural



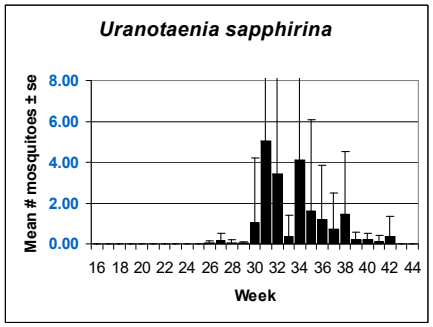
Northwestern Rural



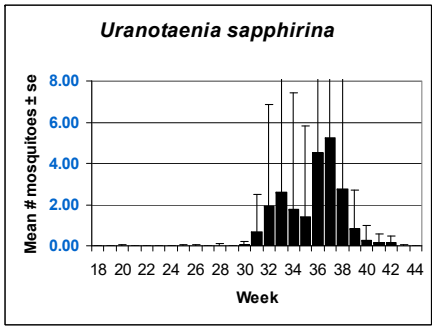
Philadelphia Metro



Pinelands



Suburban Corridor



Comments

Ur. sapphirina is a non-pest species with a statewide distribution. The species reaches highest population levels during the months of July and August of most years. The mosquito possesses metallic blue scales and is regarded primarily as a scientific curiosity. This year's State Surveillance data set indicates that populations peaked in early September in most regions.