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Mosquito and Arbovirus Activity in 2014

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Mosquito and Arbovirus Activity in 2014

Abstract

Mosquitoes are public health concerns as vectors of arthropod-borne viruses (arboviruses) and/or as nuisances to humans, so surveillance efforts are important to determine areas and times that may pose a risk to humans. The ISU Horticulture Research Station (HRS), Ames, Iowa, consistently yields mosquitoes that are positive for West Nile Virus (WNV). Objectives were to continue to assess human risk by monitoring mosquitoes, which are vectors that transmit this virus to people.

Keywords

Entomology

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences | Entomology | Horticulture | Natural Resources and Conservation

Mosquito and Arbovirus Activity in 2014

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Introduction

Mosquitoes are public health concerns as vectors of arthropod-borne viruses (arboviruses) and/or as nuisances to humans, so surveillance efforts are important to determine areas and times that may pose a risk to humans. The ISU Horticulture Research Station (HRS), Ames, Iowa, consistently yields mosquitoes that are positive for West Nile Virus (WNV). Objectives were to continue to assess human risk by monitoring mosquitoes, which are vectors that transmit this virus to people.

Materials and Methods

A New Jersey Light Trap (NJLT), which monitors mosquito species and abundance, was in operation daily June 2–October 7. A NJLT uses light as a mosquito attractant and functions from 6 p.m. to 8 a.m. every day through an automatic timer. Collection cups were brought to ISU, where mosquitoes were identified to species and counted for measures of abundance.

A gravid trap, which collects mosquitoes to be tested for arbovirus, operated May 28–October 9. A gravid trap uses organically infused water to specifically attract females ready to lay eggs, thus targeting those that have recently fed on blood and may have been exposed to arbovirus. Mosquitoes were stored at -80°C and processed on refrigerated tables

to preserve virus. Mosquitoes of *Culex* species were grouped into pools and sent to the University Hygienic Lab (UHL), Iowa City, Iowa, for WNV testing.

Results and Discussion

Mosquitoes were of average abundance at the research farm in 2014 (Table 1). The most common mosquito was *Aedes vexans*, the common nuisance mosquito. Second and third in abundance were the two most important vector species of WNV, *Cx. pipiens* and *Cx. tarsalis*. The presence of these two species accounts for all of the WNV that has been isolated from mosquitoes at HRS in recent years.

West Nile virus was isolated from one pool of mosquitoes in 2014 (Table 2). The pool contained 98 *Culex pipiens* mosquitoes collected from September 3 to September 5. West Nile Virus is typically isolated from mosquitoes between June and mid-September. The HRS typically yields multiple WNV-positive mosquito pools.

Despite low WNV-infection rate among moderately abundant vector mosquitoes, virus activity was observed in vectors at HRS. Vector habitat is plentiful there. The activity of WNV in Iowa is unpredictable, and HRS continues to be an important location for monitoring the epidemiology of the virus.

Acknowledgements

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Table 1. New Jersey light trap-collected mosquitoes in 2014.

Mosquito species	Female	Male	TOTAL
<i>Aedes sticticus</i>	25	3	28
<i>Ae. trivittatus</i>	27	1	28
<i>Ae. vexans</i>	1,693	304	1,997
<i>Aedes</i> unidentified	91		91
<i>Anopheles punctipennis</i>	36	3	39
<i>An. quadrimaculatus</i>	8	1	9
<i>Culex erraticus</i>	1	0	1
<i>Cx. pipiens group</i>	334	1	335
<i>Cx. tarsalis</i>	308	24	332
<i>Culiseta inornata</i>	2	1	3
<i>Psorophora horrida</i>	0	1	1
<i>Uranotaenia sapphirina</i>	1	0	1
TOTAL	2,526	339	2,865

Table 2. Gravid trap-collected mosquitoes in 2014.

Species	Pools	Individuals	WNV + pools
<i>Aedes japonicus</i>	-	4	-
<i>Ae. sticticus</i>	-	8	-
<i>Ae. triseriatus</i>	-	15	-
<i>Ae. vexans</i>	-	15	-
<i>Anopheles punctipennis</i>	-	6	-
<i>Culex pipiens group</i>	32	1755	1
<i>Cx. restuans</i>	3	9	0