2014 Arbovirus Surveillance in Vermont

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http://www.vermontagriculture.com
Overview

- Trapping Details
- Arbovirus Activity
- Deer and Moose Sero Survey
- Arbovirus Plan
Goals for 2014 Season

- Focus on EEE virus
- Increase trapping throughout the state
- Double number of mosquito pools tested
- Locate Cs melanura habitat
- 5th year of Moose and Deer sero survey for EEE antibodies
Mosquito Traps

- **Resting Box Traps**
  - Locate hardwood swamps

- **Reduced CDC Light Traps**
  - Same Sites as RBTs
  - CO2 pellets but no light bulb

- **Gravid Traps**
  - Wastewater Treatment Plants in Urban Areas
  - Cow Manure/Rabbit Food Attractant
2014 Trap Sites

- 67 Trap Locations
- 54 Towns
- 12 Counties
  - Missing Bennington and Essex Counties
Nearly State-wide Surveillance

- 67 CDC Light Trap Sites
- 51 Resting Box Trap Sites
- 10 Gravid Trap Sites
- Two Elevated Risk Areas
  - Addison/Rutland Counties
  - Franklin County
Risk Map for 2014 Season

- 5 mile radius from EEE+ pool sample
Interest Area

- Addison/Rutland County Wetland Complex
  - Hardwood Swamps
  - Acidic Hardwood Swamps
- History of EEE activity
Risk Map for Northwest Vermont

- 2013 EEE+ Results
- Single mosquito in Milton
- 2 horse deaths in Highgate

Vermont Department of Health
Trapping Statistics

- 67,335 Mosquitoes Trapped
- 31 Species
- 3,245 Mosquito Pool Samples
- 41,700 Mosquitoes Tested
- 12 Species Tested for EEE and WNV
- 3,953 Cs melanura Collected
80% of Species Collected Represented by 7 Species

- 33.00% Cq. perturbans
- 14.75% Ae. vexans
- 9.10% Cx r/p
- 6.97% Oc. canadensis
- 5.92% Oc. trivittatus
- 5.87% Cs melanura
- 4.00% Ae cinereus

<table>
<thead>
<tr>
<th>Species</th>
<th>Collected</th>
<th>% Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coquillettidia perturbans</td>
<td>22222</td>
<td>33.00%</td>
</tr>
<tr>
<td>Aedes vexans</td>
<td>9934</td>
<td>14.75%</td>
</tr>
<tr>
<td>Culex pipiens-restuans</td>
<td>6126</td>
<td>9.10%</td>
</tr>
<tr>
<td>Ochlerotatus canadensis</td>
<td>4691</td>
<td>6.97%</td>
</tr>
<tr>
<td>Ochlerotatus trivittatus</td>
<td>3988</td>
<td>5.92%</td>
</tr>
<tr>
<td>Culiseta melanura</td>
<td>3953</td>
<td>5.87%</td>
</tr>
<tr>
<td>Aedes cinereus</td>
<td>2692</td>
<td>4.00%</td>
</tr>
<tr>
<td>Anopheles quadrimaculatus</td>
<td>2145</td>
<td>3.19%</td>
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<tr>
<td>Anopheles punctipennis</td>
<td>1554</td>
<td>2.31%</td>
</tr>
<tr>
<td>Culex territans</td>
<td>1452</td>
<td>2.16%</td>
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<tr>
<td>Anopheles walkeri</td>
<td>1322</td>
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</tr>
<tr>
<td>Ochlerotatus sticticus</td>
<td>1320</td>
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<tr>
<td>Ochlerotatus stimulans</td>
<td>1241</td>
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<tr>
<td>Ochlerotatus japonicus</td>
<td>1198</td>
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<td>Culiseta morsitans</td>
<td>959</td>
<td>1.42%</td>
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<tr>
<td>Ochlerotatus triseriatus</td>
<td>843</td>
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<tr>
<td>Culex salinarius</td>
<td>668</td>
<td>0.99%</td>
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<tr>
<td>Uranotaenia sapphirina</td>
<td>326</td>
<td>0.48%</td>
</tr>
<tr>
<td>Psorophora ferox</td>
<td>172</td>
<td>0.26%</td>
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</table>
Culiseta melanurura in Resting Box Traps

Average Culiseta melanura per RBT Trap Night
Culiseta melanura in CDC Light Traps

Average Culiseta melanura per rCDC Trap Night
Precipitation and Temperatures

2014 Arbovirus Activity

No Human Cases
No Veterinary Cases
2014 EEE Activity in Vermont

- 8 EEE positive mosquito pools
- 6 Wetland sites
  - Grand Isle – 6/17
  - 3 Whiting – 8/19, 8/19, 9/9
  - Colchester – 9/3
  - Swanton – 9/26
  - Cornwall – 10/8
  - Whiting – 10/8
Information about Grand Isle
trap site on June 17

- Reduced CDC Light Trap
  (No light bulb, pellet CO2)
- EEE detected at just above threshold level
- Sample was retested
- 11 Oc canadensis in EEE+ pool sample
# Grand Isle June 17 Confirmation Results

<table>
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<tr>
<th>Test</th>
<th>Extraction Date</th>
<th>Test Date</th>
<th>Ct value</th>
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<tr>
<td>EEE confirm T3,T4, T34 primer set</td>
<td>6/25/2014</td>
<td>6/27/2014</td>
<td>34.6346/34.8956</td>
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<tr>
<td>EEE confirm T3,T4, T34 primer set</td>
<td>6/27/2014</td>
<td>6/27/2014</td>
<td>34.3563/34.9322</td>
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Threshold $\leq 37$
## Other Species Present

<table>
<thead>
<tr>
<th>Species</th>
<th>Count</th>
<th>Lab#</th>
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<tr>
<td>Cq perturbans</td>
<td>50</td>
<td>140199</td>
</tr>
<tr>
<td>Cq perturbans</td>
<td>50</td>
<td>140200</td>
</tr>
<tr>
<td>Cq perturbans</td>
<td>21</td>
<td>140201</td>
</tr>
<tr>
<td>Cs melanura</td>
<td>3</td>
<td>140202</td>
</tr>
<tr>
<td>Oc canadensis</td>
<td>11</td>
<td>140203</td>
</tr>
<tr>
<td>Ae cinereus</td>
<td>40</td>
<td>140204</td>
</tr>
<tr>
<td>Cq perturbans</td>
<td>7</td>
<td>140210</td>
</tr>
<tr>
<td>Ae vexans</td>
<td>1</td>
<td>140211</td>
</tr>
<tr>
<td>Oc canadensis</td>
<td>50</td>
<td>140212</td>
</tr>
<tr>
<td>Oc stimulans</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>Oc provocans</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Oc stimulans</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Oc sticticus</td>
<td>113</td>
<td>0</td>
</tr>
</tbody>
</table>
What do we know about *Oc canadensis*?

- Common species
- Spring through Summer
- Two generations
- Mammal feeder
- May feed on reptiles
- Woodland pools and shaded wetlands
  - Often same habitat as *Cs melanura*
Enzootic Center?

- **EEE Focus wetland**
  - 2012 – 8 pools
    - 6 weeks
  - 2013 – 14 pools
    - 4 weeks
  - 2014 – 3 pools
    - 2 weeks
- **Peripheral EEE activity**
2014 WNV Activity in Vermont

- 8 WNV positive mosquito pools
- 5 sites
  - St Albans 7/29
  - Newbury 8/18
  - Brattleboro 8/21
  - Putney 8/21
  - 3 Rockingham 8/21
  - Springfield 9/2
Vermont Deer Sera Survey

Protocol for collecting blood samples from deer

2010 Vermont Deer Sera Survey

Coordinated by the following agencies:
Vermont Agency of Agriculture
Vermont Department of Health
Vermont Fish and Wildlife Department
Centers for Disease Control

Talk to each hunter about what you would like to do.

There is a handout to give to hunters if they want more information.
2013 Cervid Sero Survey

- 33 Moose
- 369 Youth Weekend deer
- 368 Rifle Season opening deer
- 770 Cervid total
2014 Cervid Sero Survey

- 36 Moose
- 387 Youth Weekend deer
- 414 Rifle Season opening deer
- 837 Cervid total

5th and Final Year

2,400 animals tested
The State of Vermont
Arbovirus Surveillance and
Response Plan

Working Plan June 2014


- Google: health vermont arbovirus surveillance plan
Plan of Action

- Information gathered from surveillance activities
- WNV/EEE – inform local policy makers about level of virus activity and health risk
- Adult mosquito suppression program – only as a last resort – based on good science and advice
Arbovirus Task Force

- Secretary of Agriculture
- Commissioner of Health
- State Epidemiologist
- State Agricultural Veterinarian
- State Entomologist
- VDOH Epidemiologists
- Public Affairs Office
- Vermont Pesticide Advisory Council
Components of Plan

- Education
- Surveillance
- Response
Response – based on Risk assessment

- Notification
  - First positive indicator
  - Positive mosquito
  - Positive domestic animal finding
  - Positive human case

- Vector Management
  - Larval suppression program
  - Adult suppression program
Acknowledgments

- Dr. Erica Berl, Epidemiologist, Vermont Department of Health
- Dr. Patsy Kelso, State Epidemiologist, Vermont Department of Health
- Dr. John-Paul Mutebi, Centers for Disease Control, Fort Collins, CO
- Special thanks to our Vermont Agency of Agriculture Seasonal Field Agents
  - Dan Fraysier
  - Ben Dillner
  - Sophi Veltrop
For More Information

- Vermont Agency of Agriculture
  - Search for “Entomology”

- Vermont Department of Health
  - [http://healthvermont.gov/](http://healthvermont.gov/)
  - Search for “Diseases and Prevention”

- Agriculture - [AlanGraham@state.vt.us](mailto:AlanGraham@state.vt.us)
- Health - [Erica.Berl@state.vt.us](mailto:Erica.Berl@state.vt.us)