



BORDER HEALTH NEWSLETTER - OCTOBER 2012

WELCOME!

Greetings, everyone! I hope you're all prepared for the silly season - it will be upon us before we know it! The mozzies are increasing in all areas it seems during the somewhat short bursts of nice weather we seem to be getting in between all these southerly fronts and so it's good to see that sampling is again being carried out in all areas of the country.

INCURSIONS/INTERCEPTIONS

There was one interception callout during October which involved live adult mosquitoes biting residents in a house where overseas luggage had just been unpacked. Specimens collected were adult female *Culex pervigilans* and *Aedes antipodeus*.

ADVANCED VECTOR SURVEILLANCE WORKSHOP

The course was well received by those who attended which included one member of the NZ Defence force, however it was disappointing to see not all PHU's were represented.

The course is very much hands on with the aim to up-skill personnel in the biological and disease profile of a wide range of potential disease causing public health vectors. Emphasis was placed on up-skilling the technical aspects of vectors surveillance including conducting mosquito delimit surveys as well as the surveillance and control methods for other vectors such as rodents, cockroaches, bed bugs, ticks, mites etc. While exotic mosquitoes still remains an important part of the course the focus and been extended to cover vectors that do have an influence on public health at our borders.

Those who attended all performed well in both the Testing of Experimental Training and theoretical assessment exercises and from responses received from attendees all found the experience well worthwhile.

SAMPLES

During October, 598 samples were collected by staff from 12 District Health Boards, with 71 positive. Sampling numbers were up on last month and on this time last year. The specimens received were:

Species	Adults	Larvae
NZ Mozzies		
<i>Aedes antipodeus</i>	13	0
<i>Ae. notoscriptus</i>	2	1529
<i>Culex pervigilans</i>	1	375
<i>Opifex fuscus</i>	0	15
Exotics	0	0
TOTAL MOSQUITOES	16	1919

WEBSITE

The weather is improving and mosquitoes are making their presence known in backyards! Mosquitoes, mouse traps, and the ever present nits are of most interest on the website, as we continue to add more information to the web pages. Aquatain for mosquito control is a great product, very handy for a quick kill and residual. Tanglefoot is a great option for sticky traps!

Newsletters and reports are all able to be downloaded from the website and if you find something you think should be listed, we'd love to hear from you.

PHS and Government departments' commercial clients are able to use the purchase order option for any supplies that are required; this is followed up with an invoice direct to you. Please ensure you include an order number for referencing in the invoice. If a product is listed as please enquire, there are generally restrictions on its sale. We hope you are finding this on-line service useful and are always happy to address any enquiries or matters you may wish to discuss. Please feel free to contact us through the website, or email us directly at enquiries@smsl.co.nz or taxonomy@nzbiosecure.net.nz.



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MOSQUITO-BORNE DISEASES

ROSS RIVER VIRUS – WESTERN AUSTRALIA

Source: The West [edited] 29 Sep 2012 reported on ProMED Mail 30 Sep 2012

<http://au.news.yahoo.com/thewest/a/-/breaking/14991504/huge-rise-in-ross-river-cases/>

Outbreaks of a serious mosquito-borne disease have exploded in WA [Western Australia state] this year [2012], with 5 times more people contracting Ross River virus than 3 years ago. The virus, which can leave victims with a lifetime of debilitating symptoms and side-effects, infected 1570 people across the State in 2011-2012.

Public health officials in Mandurah branded the 2011-2012 mosquito season the worst on record.

WA cases of Ross River virus reached 332 in 2009-2010 and the number more than doubled to 770 in 2010-2011.

Department of Health entomologist Peter Neville said there had been more mosquitoes over the past 2 years. "It's largely to do with weather events," he said. "Over the last 2 years we have been under La Nina weather conditions." Those conditions meant more rain and higher minimum temperatures, leading to more mosquitoes. He said there was a spike in Ross River virus cases every 3-4 years.

Infected people get a fever, headaches, rashes and painful, swollen joints. "In some cases it can last up to 12 months," Dr Neville said.

"In some people, it can be quite devastating. The virus can reduce people's capacity to work. It's quite debilitating."

A report to the City of Mandurah this week revealed the council has struggled against mosquitoes. "The continuation of the La Nina weather event resulted in local weather and tide behaviour that made mosquito

management very difficult due to consistent inundation of breeding sites and the frequent hatching of salt-marsh mosquito larvae," environmental health officer Brendan Ingle wrote.

Ross River virus cases in the Peel region soared from 68 in 2009-2010 to 206 in 2011-2012.

Mandurah residents complained this week that swarms of mosquitoes make it impossible for them to go outside and warned the city's reputation was being harmed.

Mandurah mayor Paddi Creevey said the council had quadrupled the amount of insecticide sprayed to kill mosquito larvae. "What we can't control is the El Nino/La Nina effect, and when those tides stay up and they inundate the breeding areas, no amount of spraying will kill them," she said.

People are urged to be especially vigilant about mosquitoes at dawn and dusk. [They are advised to] wear long, loose clothing and apply insect repellent.

EASTERN EQUINE ENCEPHALITIS: SNAKES AS VIRUS HARBOURS?

Source: Science Daily [edited] 1 Oct 2012 reported on ProMED Mail 5 Oct 2012

<http://www.sciencedaily.com/releases/2012/10/121001171217.htm?>

Snakes in the wild serve as hosts for the deadly mosquito-borne eastern equine encephalomyelitis virus (EEEV), possibly acting as a "bridge" to the next season, according to researchers studying endemic areas in the Tuskegee National Forest in Alabama. This sets the stage for mosquitoes feeding on the infected snakes -- primarily in the early spring - - to become virus carriers. Scientists have been puzzled as to how the virus survived a harsh winter. With this new link established in the transmission cycle, a viable strategy to counter the virus may be at hand.



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The findings were published today [1 Oct 2012] online in the American Journal of Tropical Medicine and Hygiene and will be published in the December 2012 print issue.

While previous studies demonstrated that snakes experimentally infected with EEEV in laboratories could harbor the virus in their blood through hibernation, this is the 1st evidence documenting wild-caught snakes with EEEV already circulating in their blood. "This study confirms that the snakes carry the live virus across seasons," said study co-author Thomas R. Unnasch, Ph.D., of the University of South Florida's Global Health Infectious Disease Research Program. "So after hibernating all winter, when they emerge in the sun in the spring, they still have the virus in their blood ready to share with a new crop of mosquitoes, which can then spread it on to other animals."

"Triple E is one of the most deadly viruses that's endemic to the United States, and what this result allows us to do is to start thinking about early season interventions to basically eliminate the virus transmission early in the season and interrupt it before it gets going, before it will be a threat to human beings later on in the season," he said.

EEEV has been detected in Central, South and in North America, along the Atlantic and Gulf coasts of the U.S., as well as Michigan and Ohio. Most human cases have occurred in Florida, Georgia, New Jersey, New York and Massachusetts. Currently, in Massachusetts, public health officials have confirmed that at least 7 residents have contracted the virus commonly called "triple E" (EEE), and 2 of them have died from the disease. The number of cases in the state alone has already reached the average number of EEE cases reported annually nationwide.

EEEV is transmitted through the bite of an infected mosquito. The virus can be passed to a wide range of animals including birds, reptiles,

amphibians and mammals. But once infected, horses and humans appear to suffer the most adverse effects. For horses with EEE, there's a 90 percent chance of death.

And although there is a vaccine available, hundreds of horses go unvaccinated. According to the U.S. Department of Agriculture (USDA), on average 200 EEE horse cases were reported annually over the past 5 years. For humans EEE is rare, with approximately 5 to 10 cases reported annually in the U.S., according to the Centers for Disease Control and Prevention (CDC). About 3 percent of the people who contract the disease will die, and among those who survive, 35 percent will have long term severe neurological damage. In severe cases of the virus (involving encephalitis, an inflammation of the brain), symptoms include the sudden onset of headache, high fever, chills and vomiting. The illness may then progress into disorientation, seizures or coma. There is no cure for EEEV, and care is based on symptoms. There is currently no vaccine approved for human use.

Freshwater hardwood swamps in the Northeast are hotbeds for EEEV, and the virus is maintained through a cycle of *Culiseta melanura* mosquitoes, which primarily get their blood meals from birds. As infection rates rise among more mosquitoes feeding on their avian hosts, the birds spread the virus rapidly and broadly, but it takes a mosquito species (*Aedes*, *Coquillettidia* and *Culex*) capable of bridging the infection from infected birds to uninfected mammals for the virus to be transmitted.

Until now, the mystery of how the virus survived the winter has been an outstanding question, because the virus has appeared in the same locations in several Northeastern U.S. states from year to year.

"There are no mosquitoes there in the winter and not many birds, and there has never been evidence that mosquitoes can carry the virus over the winter," Unnasch said.



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For their research for this study, scientists from the University of South Florida and Auburn University wrangled snakes for blood samples from an area in the Tuskegee National Forest where EEEV has circulated for years. They found that the infected snakes, mostly cottonmouths, hibernate the virus in their blood during winter. They also discovered that the virus in snakes peaked in April and September. Unnasch said when the major transmission agents, migratory birds, leave the area in the fall, the mosquitoes turn to the snakes -- feeding through the eye membranes of the vipers, not through their tough skin -- which is why infection rates peak in September. He added that there is no research on whether the virus can be transmitted by a snake bite, but they plan to use defanged snakes in their next experiments."

Unnasch and his colleagues believe that the virus can be stopped before it becomes a threat. Further study could prove whether early season interventions could be useful in eliminating infections in the summer, which may involve humans. "We'd like to test this experimentally by doing some early season insecticide treatments for mosquitoes in Florida," said Unnasch, adding that according to the CDC, his home state has far more cases of triple E virus than any other.

"This study not only offers insight into the ways to prevent the outbreaks of deadly mosquito-borne viruses like EEEV and West Nile virus, it also provides a path toward finding cures and vaccines that will save lives and money," said James W. Kazura, MD, President of the American Society of Tropical Medicine and Hygiene, which publishes the journal, and director of the Center for Global Health and Diseases at Case Western Reserve University. "We must never forget that the lives of real people are at stake here. Each year, through the generosity of the Labell family, ASTMH's American Committee on Arthropod-Borne Viruses awards a USD 2000 grant to a graduate

student conducting research on EEEV or other mosquito-borne diseases in the name of their daughter, Kelly, a New Hampshire teenager who died tragically in 2005 from EEEV. This research is another step closer to preventing tragedy for another family."

The study was supported by a grant from the National Institute of Allergy and Infectious Diseases.

Journal Reference:

Andrea M. Bingham, Sean P. Graham, Nathan D. Burkett-Cadena, Gregory S. White, and Thomas R. Unnasch. Detection of Eastern Equine Encephalomyelitis Virus RNA in North American Snakes. American Journal of Tropical Medicine and Hygiene, 2012; DOI: 10.4269/ajtmh.2012.12-0257

[An interesting finding, but can it be repeated? How many other types of snakes are involved? The article mentions mostly cotton mouths but does not tell us whether other types of snakes were tested or what percentages of cotton mouths vs. other infected snakes were tested.

The grant proposal must have been interesting, perhaps as much as watching researchers wrangle snakes. I wonder how many of the snake wranglers were bitten?

While the research may present some intriguing ideas, it will be important to verify this work and make sure the alleged antibodies or virus particles are not creating a false positive or false signal on the test that is being used. Also, are these virus particles actually capable of producing disease?

While the article may be a summary, I find it long on sensationalism and short on data that could be more convincing of what may be great research, or may be a lucky break, or may be slippery reptile chase in the mud. The transmission cycle needs to be verified. I remain scientifically cautious until further work is done. - Mod.TG]



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Photo of the Month



Photo ex JR Gardner taken at the Advance Vector Surveillance Workshop.

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BIOSECURITY SPECIALISTS