



## BORDER HEALTH NEWSLETTER – SEPTEMBER 2018

### WELCOME!

Kia Ora Koutou

The 13<sup>th</sup> Conference of the Mosquito Control Association of Australia was held in Kingscliff, NSW, Australia, gathering experts in mosquito biology, ecology, the diseases they transmit their control and new technologies implemented in their management [Read more](#). Below a picture of the New Zealand team that attended the conference.

News this month focuses on the fight against malaria: Scientists are releasing male *Anopheles* in Africa to help reduce malaria; Researchers have identified compounds that could prevent malaria parasites from being able to infect mosquitoes; Scientists altered part of a gene in *Anopheles gambiae* to block reproduction in the female mosquitoes, and more!

In the new section “Know your mosquito” learn more about *Aedes albopictus*.



Happy reading!

### SURVEILLANCE

During September 661 samples were collected by staff from 11 DHBs with 64 positive samples. This included 9 adult samples and 55 larval samples, leading to a total of 9 adults and 2064 larvae identified over the past month (Table 1). The dominant larval species this month, last month and this month last year was *Aedes notoscriptus*.

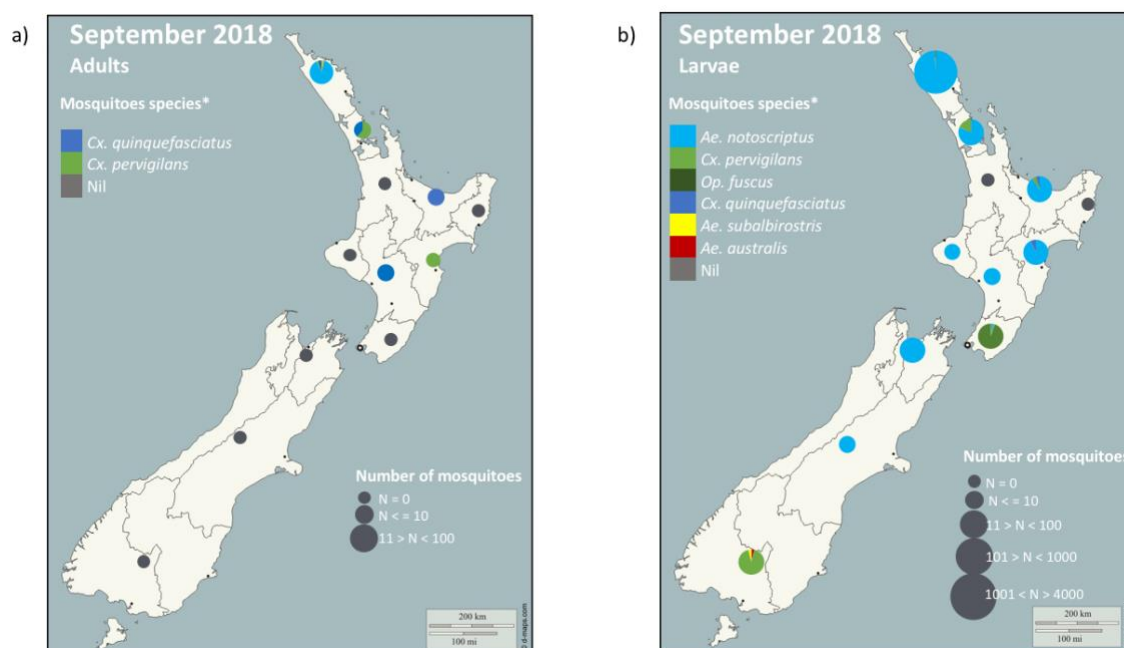
Compared to this same month last year the total number of adults have shown a decrease (111%) while larvae have shown an increase (54%; Table 1). Compared to August both adult and larvae numbers have shown a decrease (94% and 1% respectively).

**Table 1.** Adult and larvae sampled by the New Zealand surveillance program during September of last year and this year.

Species (common name)	Adults		Larvae	
	Sep 18	Sep 17	Sep 18	Sep 17
<i>Aedes notoscriptus</i> (striped mosquito)	-	-	1975	857
<i>Ae. antipodeus</i> (winter mosquito)	-	2	-	-
<i>Ae. subalbirostris</i> (no common name)	-	-	1	-
<i>Ae. australis</i> (saltwater mosquito)	-	-	1	-
<i>Culex pervigilans</i> (vigilant mosquito)	3	9	40	40
<i>Cx. quinquefasciatus</i> (southern house mosquito)	6	8	12	1
<i>Opifex fuscus</i> (rockpool mosquito)	-	-	35	13
<b>Total</b>	<b>9</b>	<b>19</b>	<b>2064</b>	<b>911</b>

In total six mosquito species have been collected this month (Table 1), this is one species less than last month. Three was the maximum number of mosquito species detected per DHB (Figure 1).

Northland DHB had the highest number of larvae this month (1458, 23% less than last month) followed by Taranaki Health (357, that is 1685% more than last month, Figure 1).



**Figure 1.** Total mosquito adults (a) and larvae (b) sampled in New Zealand during the September 2018 surveillance period.

\* The mosquito species are listed in order from the most abundant to the least abundant.

Please note that the markers represent the DHBs and not the specific sites where the samples have been taken.

As expected *Aedes notoscriptus* has not been recorded this month, this year or last year in Public Health South. No further *Culex quinquefasciatus* larvae have been recorded in

Queenstown this month (Figure 2).

*Aedes notoscriptus* larval numbers have shown an increase in six DHBs from this same month last year and a decrease in three DHBs (Figure 2).

*Culex quinquefasciatus* larval numbers have shown an increase in Northland DHB, and has now been recorded in the Hawkes Bay and Toi Te Ora (Figure 2). Nil *Cx. quinquefasciatus* have been registered in Auckland, Community and Public Health, Hutt Valley, Taranaki, Public Health South, Mid Central, Waikato or Nelson Marlborough this month or this same month last year (Figure 2).

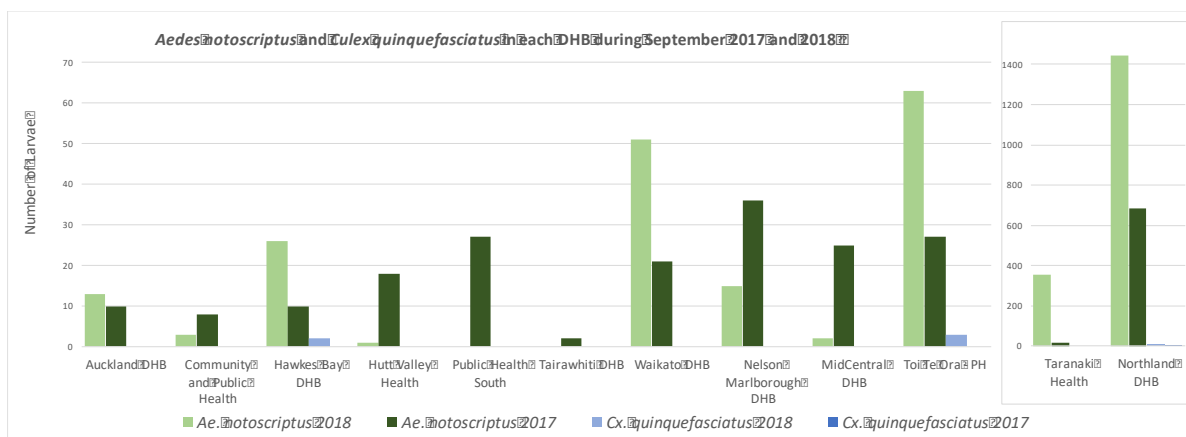


Figure 2. Comparison between introduced mosquitoes sampled in each DHB New Zealand during September 2017 and 2018. \* Please note the different scale for the number of larvae present in Taranaki and Northland in comparison to the other DHBs.

*Disclaimer: Note that all comparisons made have not been statistically tested and can be due to sampling effort.*

## INCURSIONS AND INTERCEPTIONS

During September, two suspected interception has been recorded (Table 2).

Table 2. Suspected interceptions during September 2018

Date	Species	Location	Circumstances
13.09.2018	1 Chironomid	SKU LTD, Wiri, Auckland	Found alive by MPI while inspecting a box of Mangoes from Mexico
20.09.2018	1 Fungus gnat	196 Middleton Road, Johnsonville, Wellington	Found alive by MPI while devanning a container

## NEWS ARTICLES FROM AROUND THE WORLD

### Understanding mosquitoes’ mating behavior is key for developing vector control strategies

The researchers studied three mosquito species: the malaria-carrying *Anopheles gambiae*, the Zika virus and dengue carrying *Aedes aegypti*, and the West Nile virus carrying *Culex*



*quinquefasciatus*. All three mosquito types mate in swarms, which are typically mostly formed of males with only one or a few females entering at a time, so the males need to pick out the sound of an approaching female from the noise of surrounding males. [Read more.](#)

### First genetically modified mosquitoes set to be released in Africa



Some 10,000 sterile male mosquitoes will be released in Burkina Faso, a country at the front line of the war against malaria. Last year there were 9.8m cases here, resulting in almost 4,000 deaths. [Read more.](#)

### Gene editing wipes out mosquitoes in the lab



*Anopheles gambiae* is one of the species responsible for spreading malaria.

Researchers have used gene editing to completely eliminate populations of mosquitoes in the lab. The team tested their technique on the mosquito *Anopheles gambiae*, which transmits malaria. They altered part of a gene called doublesex, which determines whether an individual mosquito develops as a male or as a female. This allowed the Imperial College London scientists to block reproduction in the female mosquitoes. [Read more.](#)

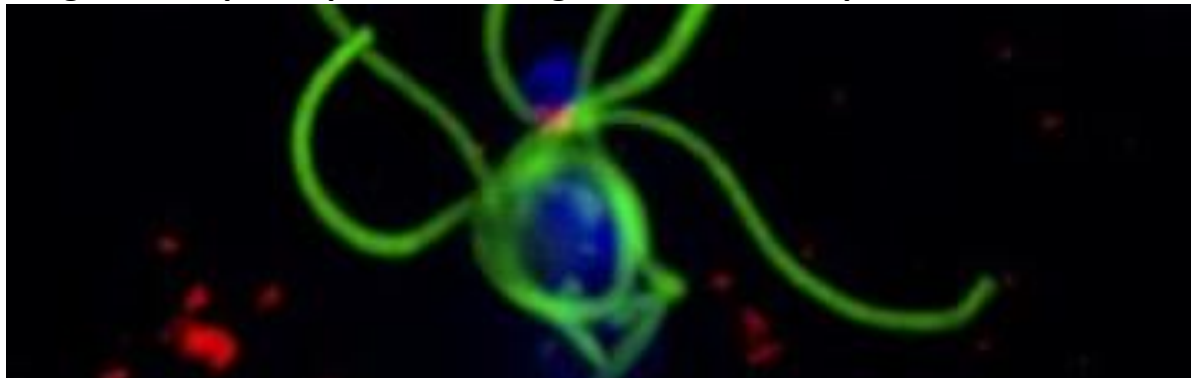
### Dengue virus infection changes *Aedes aegypti* oviposition olfactory preferences

*Aedes aegypti* mosquitoes, have olfactory preferences and are capable of olfactory learning especially when seeking their required environmental conditions to lay their eggs. This study showed that semiochemical conditions during *Aedes aegypti* larval rearing affected future female choice for oviposition: water-reared mosquitoes preferred to lay eggs in water or p-cresol containers, while skatole reared mosquitoes preferred skatole sites. [Read more.](#)

## Immunologist to study how Chikungunya causes devastating effects in older adults

When an individual becomes infected, the virus causes arthritis-like symptoms, such as joint and muscle pain, swelling and rash. Symptoms can last months to years and are particularly prolonged and severe in older adults. East Africans aptly named the virus "Chikungunya," meaning a crooked person unable to stand straight. With no vaccine or treatment, individuals can recover only with bed rest, fluids and pain relievers, such as acetaminophen. Chikungunya masquerades as arthritis, but can be far more destructive. [Read more.](#)

## Drugs that stop mosquitoes catching malaria could help eradicate the disease



A male malaria parasite becoming active - a process called exflagellation that happens inside the mosquito stomach- Photo Credit: Sabrina Yahiya

Preventing transmission of malaria is a key part of efforts to eliminate the disease. A person can be cured of the disease using drugs that wipe out the replicating form of the parasite, but still carry dormant, sexual forms. These are responsible for transferring the parasite to the mosquito when it bites them. [Read more.](#)

## Symposium to Highlight Global Challenge of Managing Insecticide Resistance

Each year, the Annual Meeting of the Entomological Society of America features a symposium organized by members of the ESA Student Affairs Committee (SAC). This year's topic is "[Tackling Insecticide Resistance through Science, Extension, and Collaboration.](#)" As it delves into a serious issue that truly does not abide by political boundaries, this symposium dovetails neatly with the overarching theme, "Crossing Borders: Entomology in a Changing World," of the 2018 Joint Annual Meeting of the Entomological Societies of America, Canada, and British Columbia, which will take place November 11-14 in Vancouver, British Columbia, Canada. [Read more.](#)

## Yellow fever virus can be transmitted via tiger mosquitoes, shows research

Since December 2016, Brazil has been grappling with its worst yellow fever outbreak for several decades. To date, there have been 2,043 human cases including 676 fatalities, mainly occurring in ten Brazilian states including Rio de Janeiro and São Paulo. These two states, the most heavily populated in Brazil, had been free of yellow fever for nearly 70 years. Research



by scientists at the Institut Pasteur and the Institut Oswaldo Cruz has demonstrated that the yellow fever virus can be transmitted via *Aedes albopictus*, the tiger mosquito. This opportunistic species is capable of colonizing both urban and forest areas. [Read more.](#)

## KNOW YOUR MOSQUITO



- A vector of many diseases including dengue, Chikungunya, Yellow Fever, Ross River virus, Japanese encephalitis, Eastern and Western equine encephalitis, Cache Valley and West Nile Virus.
  - Adult Female bites during the daytime
- Breeds in natural tree hole depressions and leaf litter on forest floor and also takes advantage of urban habitats for breeding using artificial containers such as tyres, roof gutters and plant bases.
- *Aedes albopictus* has been intercepted 18 times in New Zealand since 2001 with the majority of interceptions coming from the Ports of Auckland.

*Aedes albopictus*

(Asian tiger mosquito)  
Exotic and Unwanted

## RISK MAPS

[Dengue Map](#) – Centres for Disease Control and Prevention

[Zika Map](#) – Centres for Disease Control and Prevention

[Malaria](#) – Centres for Disease Control and Prevention. Choose a country to display the current distribution of Malaria.

## DISEASE OUTBREAKS

To find out where the latest disease outbreaks have occurred visit:

[Epidemic and emerging disease alerts in the Pacific region](#) - Produced by the Pacific Community (SPC) for the Pacific Public Health Surveillance Network (PPHSN).

[World Health Organization](#) – World Health Organization.

[Public Health Surveillance](#) - Institute of Environmental Science and Research (ESR) - Information for New Zealand Public Health Action.