



BORDER HEALTH NEWSLETTER – MARCH 2019

WELCOME!

Kia Ora Koutou

Did you spot the very special larva we got at NZBEL last month? Peter Haslemore from Public Health South collected a *Culiseta novazealandiae* in one of his regular surveillance samples. This is a unique native mosquito species and it is the first time a larvae have been found in a sample. Find out more about this rare species in the section “Know your Mosquito”.



In the news this month, in Singapore the number of people infected with dengue is three times higher than last year same period, researches are getting closer to a dengue vaccine and to the understanding of how mosquitoes perceive humans.

In the section “Spot the difference” delight your senses with one of Peter Haslemore’s mosquito larval samples from Public Health South. If your larval sample looks like that one in the picture you are on the correct track 😊.

SURVEILLANCE

During March 1185 samples were collected by staff from 12 DHBs with 411 positive samples. This included 90 adult samples and 321 larval samples, leading to a total of 881 adults and 25061 larvae identified over the past month (Table 1). The dominant larval species this

month, last month and this month last year was *Culex quinquefasciatus*.

Compared to this same month last year the total number of adults have shown a decrease (189%) and larvae have shown an increase (19%; Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during March 2018 & 2019

Species (common name)	Adults		Larvae	
	Mar 19	Mar 18	Mar 19	Mar 18
<i>Aedes notoscriptus</i> (striped mosquito)	18	61	3391	4276
<i>Ae. antipodeus</i> (winter mosquito)	-	24	-	-
<i>Ae. australis</i> (saltwater mosquito)	-	-	-	100
<i>Culex pervigilans</i> (vigilant mosquito)	75	344	1515	2740
<i>Cx. quinquefasciatus</i> (southern house mosquito)	730	1884	20135	13263
<i>Culex sp.</i> (likely to be <i>quinquefasciatus</i> or <i>pervigilans</i>)	58	231	-	-
<i>Opifex fuscus</i> (rock pool mosquito)	-	1	20	25
Total	881	2545	25061	20404

In total four mosquito species have been collected this month (Table 1), that is four less than last month. Hutt Valley Health DHB detected the highest number of mosquito species (4; Figure 1).

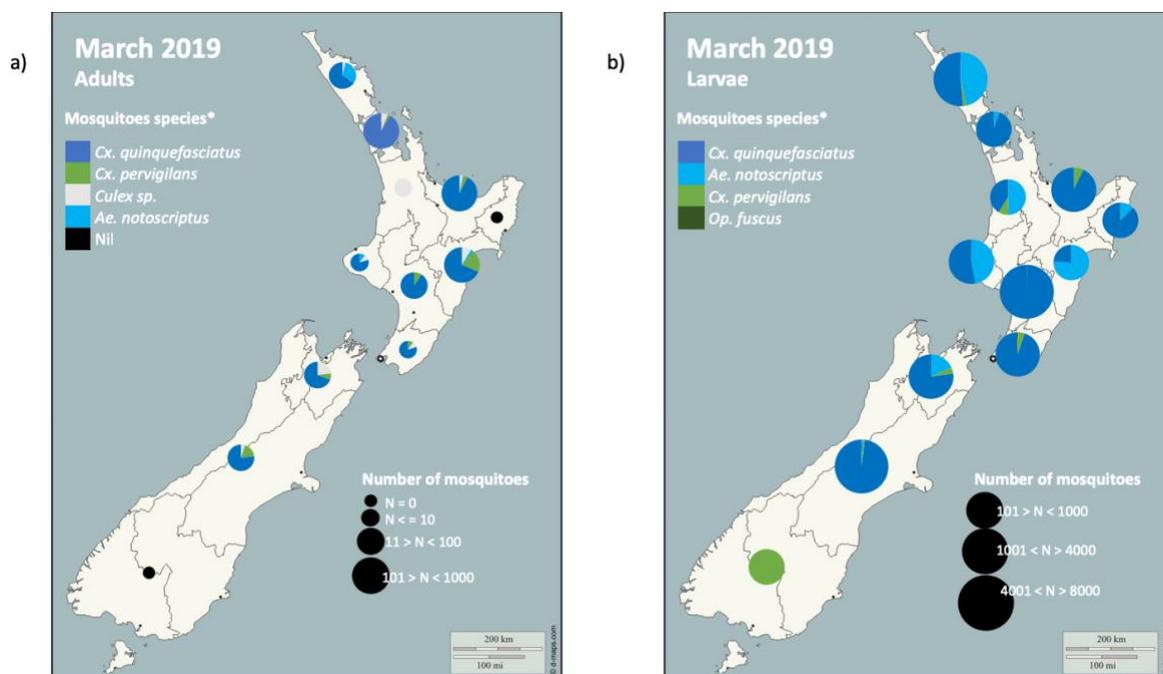


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the March 2019 surveillance period.

* 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.

Compared to last month larvae and adult mosquito numbers have shown a decrease (6% and 51% respectively).

Community and Public Health DHB had the highest number of larvae this month (5499), followed by MidCentral DHB (4821) (Figure 1).

As expected *Aedes notoscriptus* has not been recorded this month, this year or last year in Public Health South. In comparison to last year this month, no further *Culex quinquefasciatus* larvae have been recorded in Queenstown (Figure 2).

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

Culex quinquefasciatus larval numbers have shown an increase in six DHBs from this same month last year a decrease in three (Figure 2).

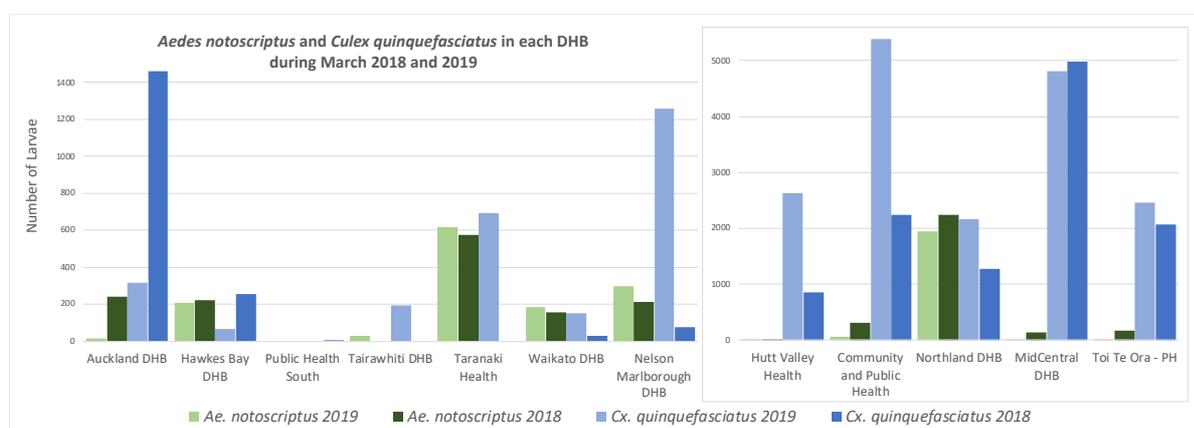


Figure 2. Comparison between introduced mosquitoes sampled in each DHB New Zealand during March 2018 and 2019. *Please note the different scale for the number of larvae present in Hutt Valley, MidCentral, Toi Te Ora – PH, Community and Public Health and Northland in comparison to the other DHBs.

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

INCURSIONS AND INTERCEPTIONS

During March, four suspected interceptions have been recorded (Table 2).

Table 2. Suspected interceptions during March 2019

Date	Species	Location	Circumstances
28.03.2019	1F <i>Culex quinquefasciatus</i>	Wellington Airport	Found alive by MPI baggage claim area.
24.03.2019	1F <i>Culex quinquefasciatus</i>	Auckland international Airport	Found alive by MPI X-ray Machine in ITB
18.03.2019	1F <i>Culex quinquefasciatus</i>	Wellington Airport	Found alive inside MPI inspection lab
07.03.2019	2M <i>Culex quinquefasciatus</i>	Allied Pickfords TF, Christchurch	Found alive in container of personal effects from Singapore. Other mosquitoes also seen.



SPOT THE DIFFERENCE – The best mozzie sample



A good mosquito larval sample is characterised by the following:

- Larvae are complete (not squashed, heads with bodies intact).
- Larvae are not stuck together.
- Limited amount of debris are found (cleaning tyres reduces debris).
- Preserved in 70% ethanol (filled to top of sample tube).
- Larvae have not been allowed to dry out at any point.

NEWS ARTICLES FROM AROUND THE WORLD

Study uncovers details about human immune response to dengue infection

About 40 percent of the global population is at risk for contracting dengue - the most important mosquito-borne viral infection and a close "cousin" of the Zika virus - and yet, no effective treatment or safe licensed vaccine exists. But a new study, reported recently in the Lancet's open-access journal *EBioMedicine*, has uncovered details about the human immune response to infection with dengue that could provide much-needed help to the evaluation



of dengue vaccine formulations and assist with advancing safe and effective candidate vaccines. [Read more. Access the original article.](#)

The city where children are learning to love mosquitoes



Mosquitos infected with *Wolbachia* are being realised in Medellin, Colombia.

Mosquitoes that have been bred to carry a specific bacteria are being released in the Colombian city of Medellin. The aim is to infect wild mosquitoes with *Wolbachia* to stop them spreading viruses such as dengue and Zika. [Watch the video.](#)

More than 2,000 dengue cases reported in first quarter

SINGAPORE: The first quarter of this year saw a three-fold increase in the number of dengue cases compared to the same period in 2018, the National Environment Agency (NEA) said in a media release on Sunday (Apr 7).

More than 2,000 cases have been reported since January while about 600 cases were registered in the first three months last year. [Read more.](#)

How mosquitoes smell human sweat (and new ways to stop them)



The head of an *Aedes aegypti* female mosquito. Credit Alex Wild

Female mosquitoes are known to rely on an array of sensory information to find people to bite, picking up on carbon dioxide, body odor, heat, moisture, and visual cues. Now researchers reporting in the journal *Current Biology* on March 28 have discovered how mosquitoes pick up on acidic volatiles found in human sweat. [Read more. Original article.](#)



Innovative model identifies primate species with potential to transmit Zika in the Americas



The tufted capuchin (*Cebus apella*) was identified as a potential Zika host. These and other primates could infect humans through a bite or fecal contact; however, humans are more likely to become infected by mosquitoes that feed on infected primates than bite people. Credit: Cristina Stoian | Dreamstime.com.

In the Americas, primate species likely to harbor Zika - and potentially transmit the virus - are common, abundant, and often live near people. So reports a new study published today in *Epidemics*. Findings are based on an innovative model developed by a collaborative team of researchers from Cary Institute of Ecosystem Studies and IBM Research through its Science for Social Good initiative. [Read more. Access original paper.](#)

Researchers develop new solution to prevent or reduce malaria deaths



A female *Anopheles* mosquito. (Image courtesy Emily Lund, Harvard University's T.H. Chan School of Public Health.)

For decades, one of the strongest weapons against malaria has been a one-two punch: low-tech mosquito bed nets to physically block biting, treated with deadly insecticides to kill the mosquitoes. With widespread use of this combination, malaria deaths have dropped significantly -- though nearly 445,000 people died from the disease in 2016 alone. But now the threat is again worsening, as the ever-adaptable pest has become resistant to insecticides. [Read more.](#)



KNOW YOUR MOSQUITO



Culiseta novaezealandiae

- One of two *Culiseta* species endemic to New Zealand
- Little is known about their distribution. They have only been found in the past in South East Otago
- Mainly a bird biter but would willingly bite man in laboratory setting
- The adult mosquitoes of both NZ *Culiseta* species are identified by large dark scale patches on wings
- The vector status of *Culiseta novaezealandiae* is unknown
- Recently found in a sample from Public Health South (The first time it has ever been found in a surveillance sample!)

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

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.

[Communicable disease threats report](#) - European Centre for Disease Prevention and Control