



BORDER HEALTH NEWSLETTER – JULY 2021

WELCOME!

Kia Ora Koutou,

It was great meeting the Trainees and HPOs at the Border Health course in Wellington recently. It is always a pleasure to get together and hear from your experiences while conducting mosquito surveillance or responding to suspected interceptions. Please remember that you are all welcome to come to the NZB lab for more hands-on training and gain real-time experience of what happens in the lab behind the scenes.



In the news this month read about a successful experiment to control *Anopheles gambiae*, a major malaria vector, and the unexpected effect of climate change on the spread of dengue fever. Also, learn how mapping dengue fever hot spots can predict future outbreaks of Zika and chikungunya. Finally, read about the new textile technology that can protect you from mosquito bites without using chemicals.

This month we congratulate Heather Parker and Paul Du Preez from the Nelson Marlborough DHB for their dedication and perseverance. Paul and Heather, we present you with the inaugural award "The most complete weather data of the year". Well done!

Don't forget to scroll down to check the know your mosquito section and learn about *Aedes polynesiensis*, a mosquito that is on the unwanted list and is so famous that it has its own

stamp. Also, see the best mozzi picture of the month and learn what to look for to recognise an *Aedes notoscriptus* mosquito.

Happy reading!



SURVEILLANCE

During July 836 samples were collected by staff from 11 DHBs (Figure 1). The samples included 25 positive larval samples and 6 positive adult samples, leading to a total of 7 adults and 1591 larvae identified over the past month (Table 1). As is common over the cooler months, *Aedes notoscriptus* is now the dominant larval species (Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during July 2020 & 2021

Species (common name)	Adults		Larvae	
	July 21	July 20	July 21	July 20
<i>Ae notoscriptus</i> (striped mosquito)	-	-	1537	3632
<i>Cx pervigilans</i> (vigilant mosquito)	2	-	39	1129
<i>Cx quinquefasciatus</i> (southern house mosquito)	5	14	15	48
<i>Culex</i> sp.	-	1	-	-
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	-	38
Total	7	15	1591	4847

In total, three mosquito species have been collected this month (Table 1), that is two less than last month.

The highest number of larvae sampled this month was obtained in Northland DHB (1561 larvae) followed by Taranaki Health (18 larvae) (Figure 1).

Compared to last month, mosquito larval and adult numbers have shown a 58% and 77% decrease.

Compared to this same month last year, the total number of larvae and adults have shown 204% and 114% decrease respectively (Table 1).

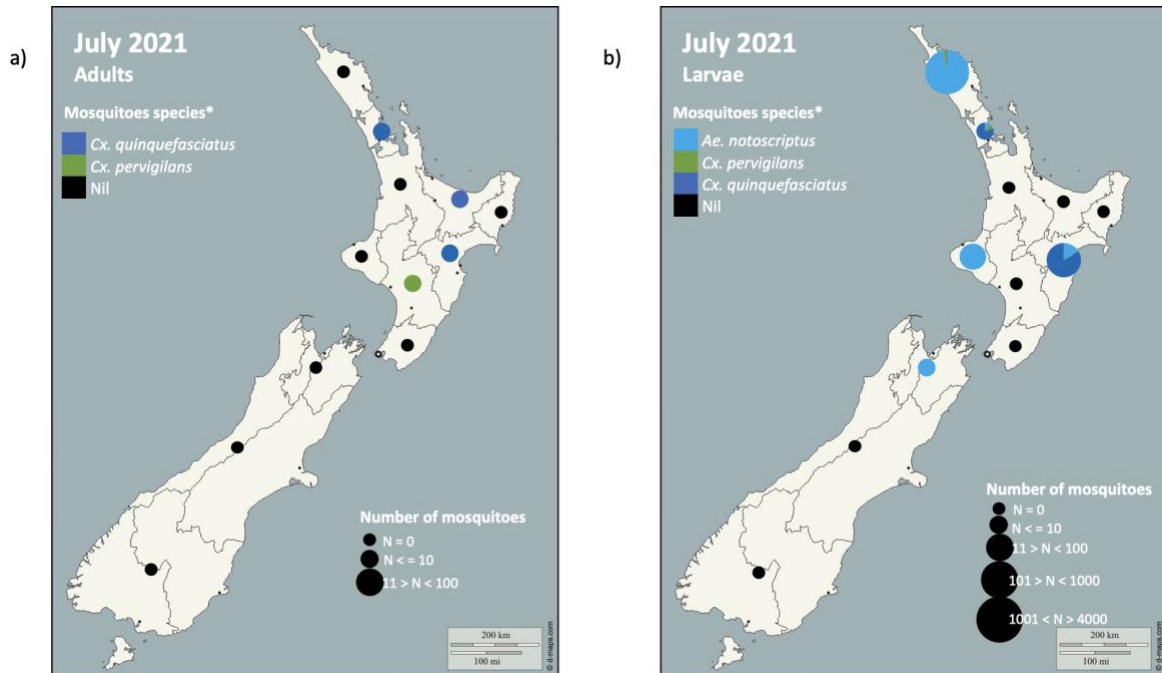


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the July 2021 surveillance period.

* 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.

Culex quinquefasciatus larval numbers have shown a decrease in three DHBs from this same month last year. *Culex quinquefasciatus* has not been found this month in Public Health South (Figure 2).

Aedes notoscriptus larval numbers have shown a decrease in four DHBs from this same month last year (Figure 2). As expected *Aedes notoscriptus* has not been recorded this month, this year or last year in Public Health South (Figure 2).

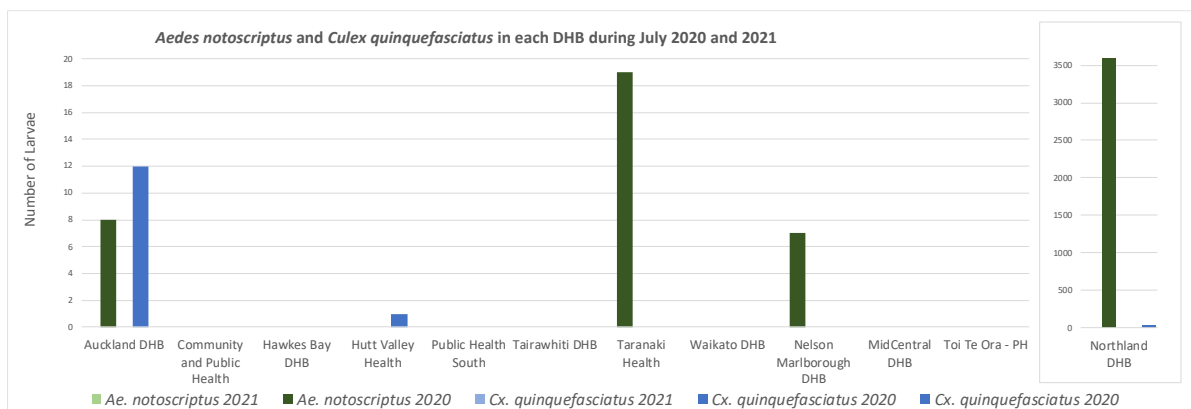


Figure 2. Comparison between introduced mosquitoes sampled in each DHB during July 2020 and 2021.

*Please note the different scale for the number of larvae present in Northland DHB in comparison to the other DHBs.

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

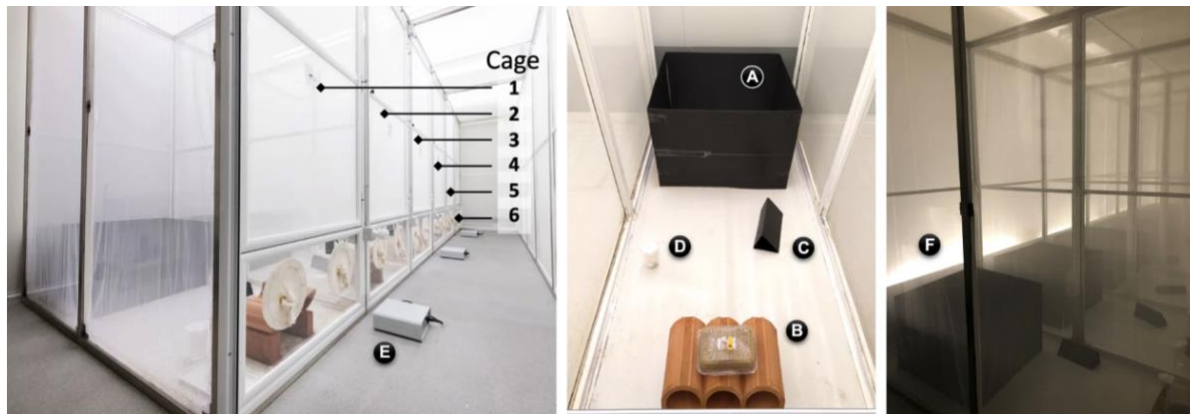


INCURSIONS AND INTERCEPTIONS

During July, there were no suspected interceptions.

NEWS ARTICLES FROM AROUND THE WORLD

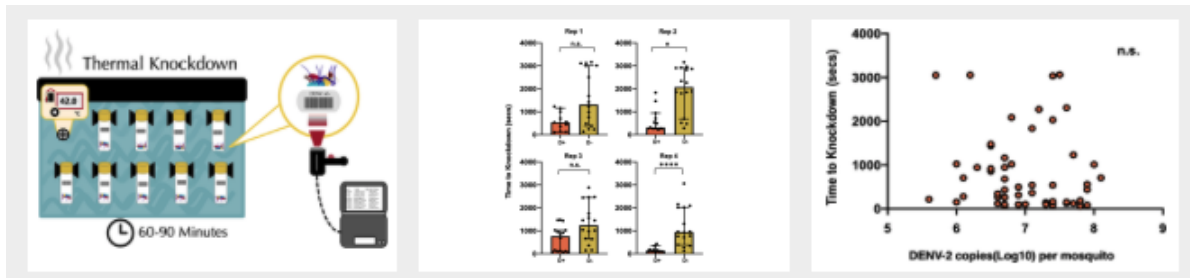
Malarial mosquitoes completely controlled in experiments that mimic natural environments



(A) Swarming arena. (B) Wet resting site (bricks). (C) Dry resting site. (D) Glucose feeder. (E) Hemotek blood feeding system. (F) Sunset simulation

Researchers from Imperial College London, Polo GGB and Liverpool School of Tropical Medicine have shown 'gene drive' technology, which spreads a genetic modification blocking female reproduction, was able to suppress populations of a malaria-carrying mosquito in a year-long experiment mimicking natural environments. The team used multiple life stages of *Anopheles gambiae*, a major malaria vector, and large testing cages which mimicked the mosquitoes natural habitat to determine if there would be any emergence of mutations at a large scale, a common issue occurring with this technology. They found a rapid spread of the gene and observed complete population collapse within a year. [Read more. Access original article.](#)

Global warming may limit spread of dengue fever, new research finds

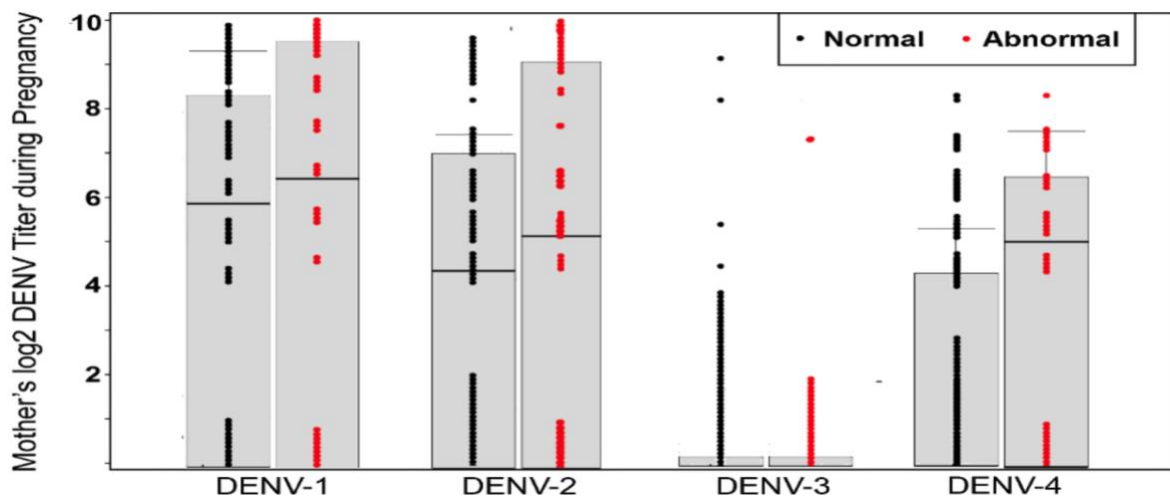


Infection with dengue virus makes mosquitoes more sensitive to warmer temperatures, according to new research led by Penn State researchers. The team also found that infection with the bacterium *Wolbachia*, which has recently been used to control viral



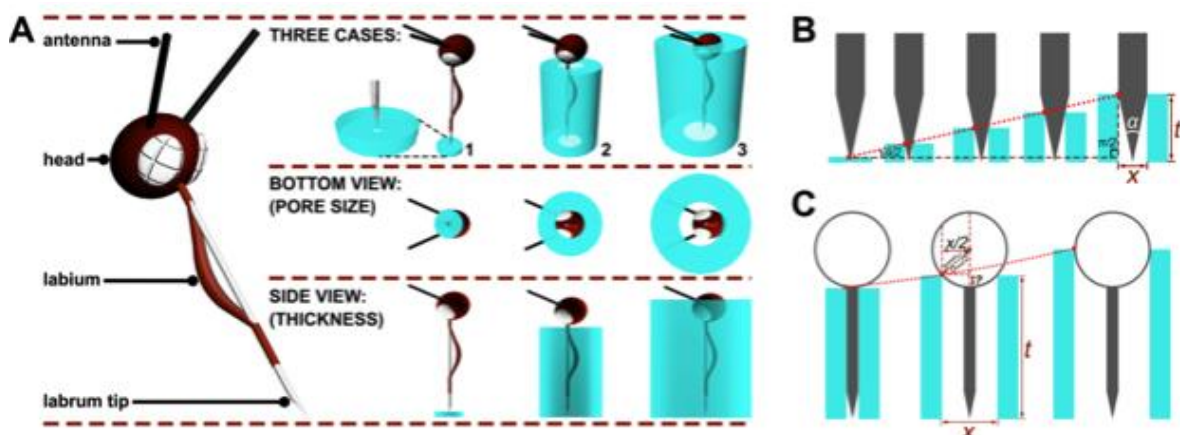
infections in mosquitoes, also increases the thermal sensitivity of the insects. The findings suggest that global warming could limit the spread of dengue fever but could also limit the effectiveness of *Wolbachia* as a biological control agent. [Read more. Access the original article.](#)

Mapping dengue fever hot spots can predict future outbreaks of Zika and chikungunya



A study published in *Lancet Planetary Health*, researchers from Emory University found that identifying hotspots of dengue fever in Mexico can possibly be used to predict future outbreaks of Zika and chikungunya, all of which are spread by *Aedes aegypti*. The study used data from nine Mexican cities from 2008 to 2020 with a high burden of dengue fever, as well as cases of Zika and chikungunya and found an overlap of both dengue and Zika (62%) and dengue and chikungunya (53%). These predictions can be used as part of controlling the spread of these viruses. [Read more. Access original article.](#)

Mosquito-resistant clothing prevents bites in trials



Researchers from North Carolina State University have created clothing that is mosquito resistant, without the use of insecticides. Their aim was to design a garment that was able



to prevent the bite from *Aedes aegypti* while still being comfortable enough to wear. They were able to develop a textile that provided 100% resistance from mosquito bites. [Read more. Access the original article.](#)

BEST MOSQUITO PHOTO OF THE MONTH

Antenna (female kind)

This is a Female *Aedes notoscriptus*, an introduced mosquito locally occurring in New Zealand

Pointy abdomen

Femora with white line

Proboscis with white band

Why is this a good mozzie photo?

- ✓ All body parts are clearly visible, including the proboscis, antennae and tip of the abdomen
- ✓ Is showing the white band on the proboscis
- ✓ Is showing the white line on the femora

Thanks to Tina Hong for the photo

KNOW YOUR MOSQUITO



- Found only in the South Pacific – including island groups in the Cook Islands, Fiji, French Polynesia, Samoa, Wallis and Futuna, and Tuvalu, and Tokelau.
- Genetic studies suggest that this mosquito established in Polynesia with the arrival of people between 1500–3000 years ago.
- It is a vector of filariasis, Ross River virus, and dengue and is a probable vector of Chikungunya virus and Zika virus.
- Has a distinctive single stripe down the middle of its scutum (back) and two distinct silvery lines along the side of the thorax.
- Container breeder, with a preference for natural containers (coconuts, crab holes, tree holes, and leaf axils) but will also breed in artificial containers.
- Has been intercepted 3 times in New Zealand (twice in 2004 and once in 2011). All interceptions were larvae and pupae found at the ports of Auckland in tyres and in one case in a cement mixer truck.

Aedes polynesiensis
Polynesian tiger mosquito
Unwanted species





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

[Malaria](#) – World Health Organisation

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).

[Disease Outbreak News](#) - 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