



# BORDER HEALTH NEWSLETTER

February 2024

## NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

Phew! What a busy month February has been! Have a look below to see how many mosquitoes have been collected throughout the month. With multiple instances of enhanced surveillance happening, alongside all the usual routine samples that summer brings, there has been a lot of hard mahi going on all around the country. Of course, enhanced surveillance also means the lab receives an abundance of photos for preliminary ID, and we have had some absolutely stunning photos sent in during the month of February. So many that it was hard to pick just one, so scroll down to check out a selection of our favourites (and of course there are a few tips!). Also check out a fantastic photo sent in from Christchurch of the team while out checking some of their enhanced surveillance traps.

In the news this month have a look at how the detection of Zika virus in a neighbourhood in Singapore has caused renewed vigilance for the virus, and how a prior infection with Zika virus increased the risk of severe dengue. Also have a look at how deforestation increases the risk of childhood malaria, and the effects of climate change on the expansion of West Nile virus in Europe. Finally have a look at how a group of immune systems cells fight diseases such as malaria.

Happy reading!

## SURVEILLANCE

During February a total of 1649 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 413 positive larval samples and 134 positive adult samples, leading to a total of 39527 larvae and 835 adults identified over the past month (Table 1).

**Table 1.** Adult and larvae sampled by the New Zealand surveillance program during February 2023 & 2024

Species (common name)	Adults		Larvae	
	Feb 24	Feb 23	Feb 24	Feb 23
<i>Aedes antipodeus</i> (winter mosquito)	-	14	-	-
<i>Ae australis</i> (saltwater mosquito)	-	1	1	-
<i>Ae notoscriptus</i> (striped mosquito)	25	135	5165	4299
<i>Culex asteliae</i> (no common name)	-	-	1	6
<i>Cx pervigilans</i> (vigilant mosquito)	25	330	2388	1242
<i>Cx quinquefasciatus</i> (southern house mosquito)	755	2770	31885	12512
<i>Culex</i> sp.	30	50	-	-
<i>Opifex fuscus</i> (rock pool mosquito)	-	1	87	52
<b>Total</b>	<b>835</b>	<b>3301</b>	<b>39527</b>	<b>18111</b>

*Culex quinquefasciatus* is the dominant larval species this month, which is the same as this



# BORDER HEALTH NEWSLETTER

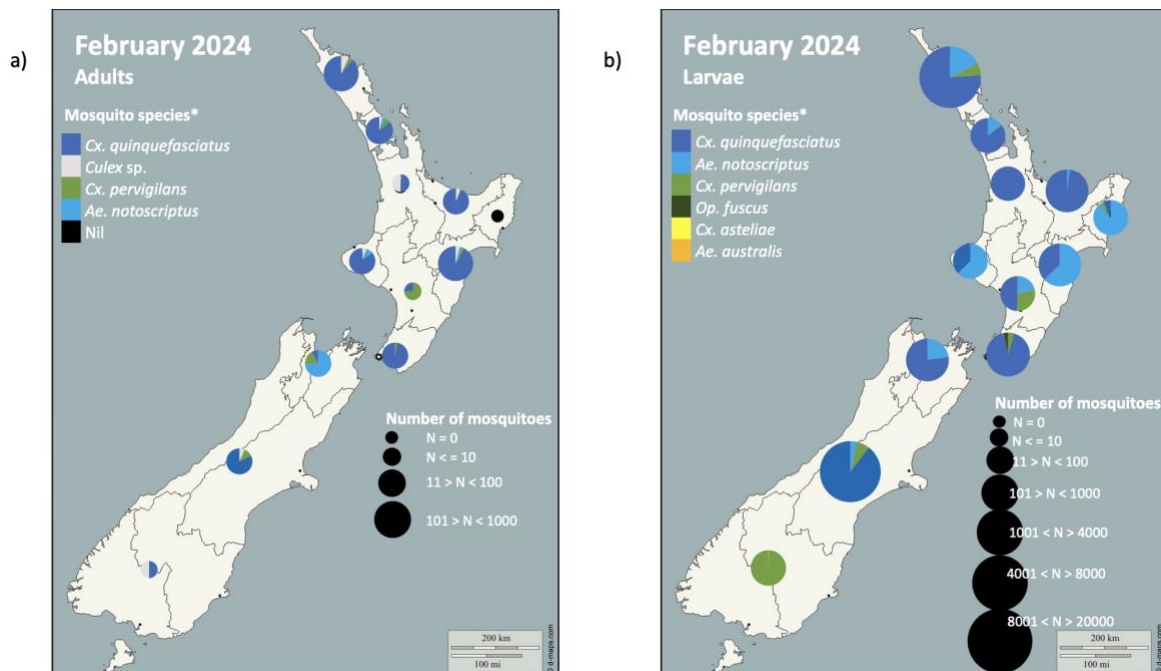
month last year and the previous month (Table 1).

Compared to this same month last year, the total number of larvae has shown an increase (118%) while adult numbers have shown a decrease (75%) (Table 1).

Compared to the previous month, both larval and adult numbers have shown an increase (68% and 8% respectively).

The highest number of larvae sampled this month was obtained in Canterbury (15575 larvae) followed by Northland (11375 larvae) (Figure 1).

In total, six mosquito species have been collected this month (Table 1), same number as collected last month.



**Figure 1.** Total mosquito adults (a) and larvae (b) sampled in New Zealand during February 2024 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.

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

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

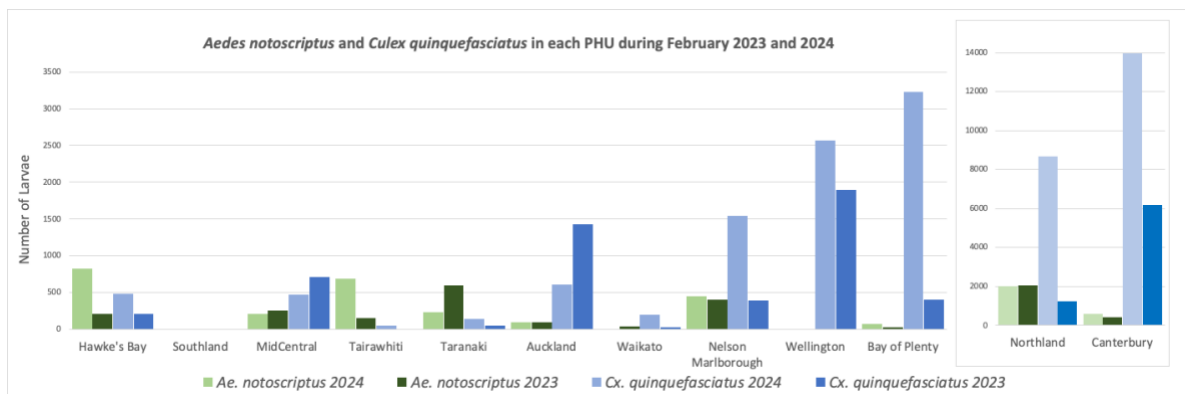
As expected, *Aedes notoscriptus* has not been recorded this month, this year, or last year in Southland (Figures 1 and 2).

Contrary to the expectations, *Culex quinquefasciatus* larvae have been recorded last year in Southland, and a male *Cx quinquefasciatus* has been collected at Dunedin Airport this month (Figures 1 and 2).

*Culex quinquefasciatus* larval numbers have shown an increase in eight PHUs and a decrease in four PHUs from this same month last year (Figure 2).



# BORDER HEALTH NEWSLETTER



**Figure 2.** Comparison between introduced mosquito species sampled in each PHS during February 2023 and 2024.

\*Please note the different scale for the number of larvae present in Northland and Canterbury in comparison to the other PHSs.

## INCURSIONS AND INTERCEPTIONS

During February, HPOs responded to eight suspected interceptions, including the discovery of an unwanted species, *Aedes aegypti* (shown in red) in a routine surveillance trap, the interception of an exotic *Aedes* (shown in blue) and a *Culex quinquefasciatus* of very likely exotic origin (shown in purple) (Table 2).

**Table 2.** Suspected interception during February 2024

Date	Species	Location	Circumstances
06.02.2024	Non mosquitoes (Chironomidae)	Port Chalmers, Dunedin	Multiple dead insects found stuck on a wall of a drain on a vessel that had come from Australia.
10.02.2024	1 Female <i>Culex quinquefasciatus</i>	Foodstuff, Christchurch	Found alive in a container of chocolate from Melbourne, Australia.
16.02.2024	1 Female <i>Culex pervigilans</i>	Foodstuff, Christchurch	Found in relation to a container of rice.
16.02.2024	1 Female <i>Aedes aegypti</i>	Christchurch International Airport	Caught in a routine surveillance trap at Christchurch International Airport.
19.02.2024	1 Male <i>Culex quinquefasciatus</i>	Value Tyres, Otahuhu, Auckland	Live mosquitoes were seen resting on the packaging of new tyres inside a container.
25.02.2024	1 Female <i>Culex quinquefasciatus</i>	Christchurch International Airport	Found alive at Christchurch International Airport by an Air New Zealand staff member near the check in area.
28.02.2024	1 Female <i>Aedes (Stegomyia) sp.</i>	Hellman Worldwide Logistics, Auckland	Found alive in a box of betel leaves from Fiji along with other live insects.
29.02.2024	1 Female <i>Culex quinquefasciatus</i>	LPC City Depot, Christchurch	Found alive in a container of building materials from Brisbane.

## NEWS ARTICLES FROM AROUND THE WORLD

### Prior Zika infection ups risk of severe dengue, study finds

A study led by Brazilian researchers shows that people who have had Zika run a higher risk of subsequently having severe dengue and being hospitalized. A second infection by any of the four known dengue serotypes is known to be typically more severe than the first, but until now no correlation between this fact and the occurrence of other diseases had been investigated. The mechanism that exacerbates dengue infection following a case of Zika differs from that of two consecutive infections by the dengue virus. Biological markers suggest that the increase in severity may be due to activation of T cells, key parts of the



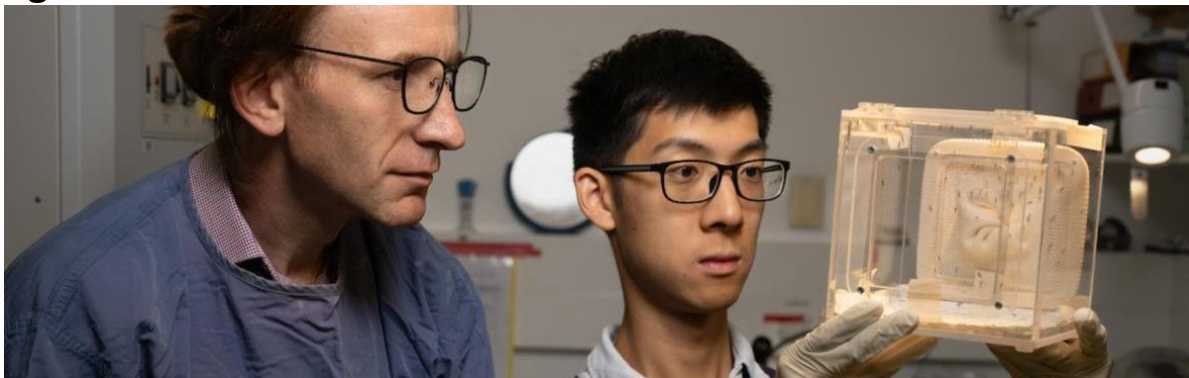
## BORDER HEALTH NEWSLETTER

immune system that help produce antibodies, in a pathogenic immune response that has been termed the "original antigenic sin". Cássia Fernanda Estofolete, an infectious disease specialist at the São José do Rio Preto Medical School (FAMERP) and first author of the article, discussed their findings "Prior zika infection was important and an aggravating factor in a second dengue episode. This led us to suggest novel mechanisms and renew our knowledge of the natural history of the disease." [Read more here.](#) [Access the full article.](#)

### **Zika virus detected in Singapore neighbourhood: 15 cases spark renewed vigilance**

In a recent study published in eBioMedicine, researchers conducted entomological, wastewater, and case surveillance of the Zika virus (ZIKV) in Singapore. The World Health Organization (WHO) declared a public health emergency of international concern in 2016 when over a million ZIKV cases were reported in Brazil and the Americas. The low population immunity and presence of competent vectors in Singapore underscore the risk of ZIKV outbreaks, warranting comprehensive surveillance and vector control measures. While case surveillance is limited to those with symptoms, wastewater and entomological surveillance can provide non-intrusive, comprehensive surveillance. In this study, researchers screened 590 Aedes mosquito pools for ZIKV. These samples comprised 43 pools from the National Gravitrap Surveillance System at the AOC, 128 from its vicinity, and 419 from areas with sporadic cases. The research demonstrates the emerging applicability of wastewater surveillance for ZIKV, suggesting that regular surveillance of wastewater could provide early alerts and facilitate timely measures. [See how the research was carried out.](#) [Access the original article.](#)

### **ANU discovery provides new insight into how the immune system fights malaria**



Researchers from The Australian National University (ANU) have discovered a previously unknown ability of a group of immune system cells, known as Atypical B cells (ABCs), to fight infectious diseases such as malaria. The discovery provides new insight into how the immune system fights infections and brings scientists a step closer to harnessing the body's natural defences to combat malaria. These cells have long been associated with malaria, according to researchers, as malaria patients have more of these cells in their system compared to the general population. Lead author, Doctor Xin Gao said "In this study, we wanted to understand the mechanisms that drive the creation of ABCs in the immune system, but also find out whether these cells are good or bad for us when it comes to fighting infection." "Our research found that ABCs are also instrumental in developing T follicular helper cells. These



## BORDER HEALTH NEWSLETTER

helper cells generate powerful antibodies that help the body fight malaria parasites.” [Read more here](#) or [here](#). [Read the original article](#).

### UVM study links deforestation with higher risk of childhood malaria



New research conducted at the University of Vermont (UVM) and published today in the journal *GeoHealth* suggests forests can provide natural protection against malaria transmission, particularly for the most vulnerable children. Tafesse Estifanos, lead author, former postdoc at UVM's Gund Institute for Environment, partnered with UVM faculty members to analyse the prevalence of malaria in six sub-Saharan African countries where the disease is endemic. These countries included Côte d'Ivoire, the Democratic Republic of the Congo, Guinea, Mozambique, Rwanda, and Togo. They linked demographic and health survey data of over 11,500 children with mosquito range maps and land-use changes to determine how wealth, temperature, precipitation, and forest cover influenced infection rates. “One of the takeaways from this study is in order to have good public health policy it is also important to consider environmental conservation- not degrade the land and make it suitable for breeding mosquitoes,” said Estifanos. [Explore their findings here](#). [Get the full story](#).

### A BITE OF HUMOUR

What do you call six HPOs in lift?



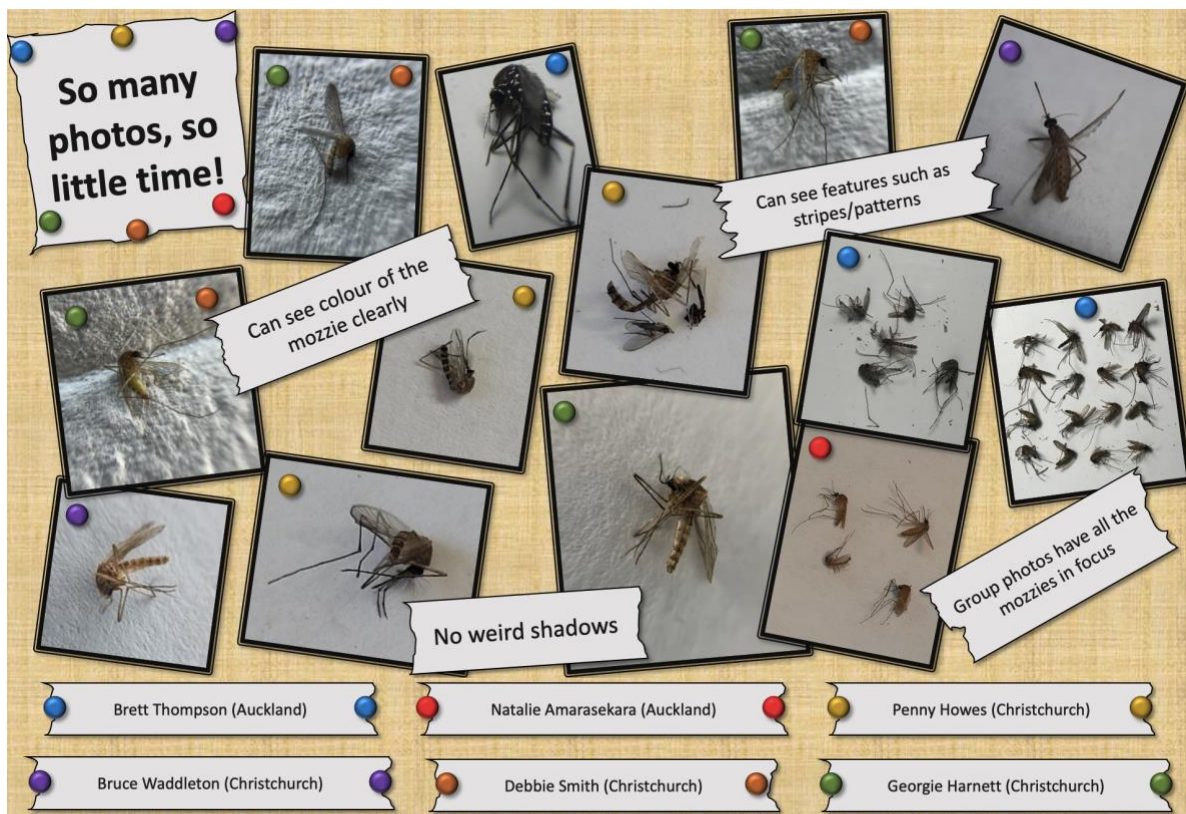
We aren't sure either, but it looks like they are having a great time even though they were stuck for several minutes!

Thanks to Penny, Angela, Olivia, Georgie, Jimmy, and Debbie for brightening our day with the photo!



## BORDER HEALTH NEWSLETTER

### BEST MOSQUITO PHOTOS OF THE MONTH



### 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