



## BORDER HEALTH NEWSLETTER – AUGUST 2022

### NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

This month we again had the great pleasure of meeting with another group of HPOs during the second Border Health & Ship Sanitation Certificate Course here in Wellington. We hope you all learned something new and enjoyed the course as much as we did!



In the news this month, learn about the usefulness of human landing catch as an alternative method to collect mosquitoes that are potent vectors of West Nile virus. Also, learn about the unexpected organisation of the mosquito olfactory system and how this explains why mosquitoes are so good at sniffing out humans to bite. Then read about a new mathematical model that predicts genetic resistance to antimalarial drugs and its potential as part of preventive malaria treatments. Also relating to the fight against malaria, learn about the clinical trial to assess the safety of a new monoclonal antibody to prevent malaria.

Scroll down and check out the collage we have made with some of the mozzie photos taken by attendees during the mosquito practice session at the Border Health Course, and some great photos sent in from various people from Te Mana Ora – Waitaha Canterbury.

Happy reading!

## SURVEILLANCE

During the month of August, 902 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 37 positive larval samples and 29 positive adult samples, leading to a total of 78 adults and 631 larvae identified over the past month (Table 1). The dominant larval species this month is *Aedes notoscriptus*, the same as last year (Table 1).

Table 1. Number of adult and larvae sampled by the New Zealand surveillance program during August 2021 & 2022

Species (common name)	Adults		Larvae	
	August 22	August 21	August 22	August 21
<i>Aedes antipodeus</i> (winter mosquito)	30	-	-	-
<i>Ae notoscriptus</i> (striped mosquito)	1	-	573	1594
<i>Culex</i> sp. (likely <i>quinquefasciatus</i> or <i>pervigilans</i> , missing key ID features)	2	1	-	-
<i>Cx pervigilans</i> (vigilant mosquito)	16	3	47	338
<i>Cx quinquefasciatus</i> (southern house mosquito)	19	33	10	86
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	1	24
<b>Total</b>	<b>78</b>	<b>37</b>	<b>631</b>	<b>2042</b>

In total, five mosquito species have been collected this month (Table 1), this is one more than last month.

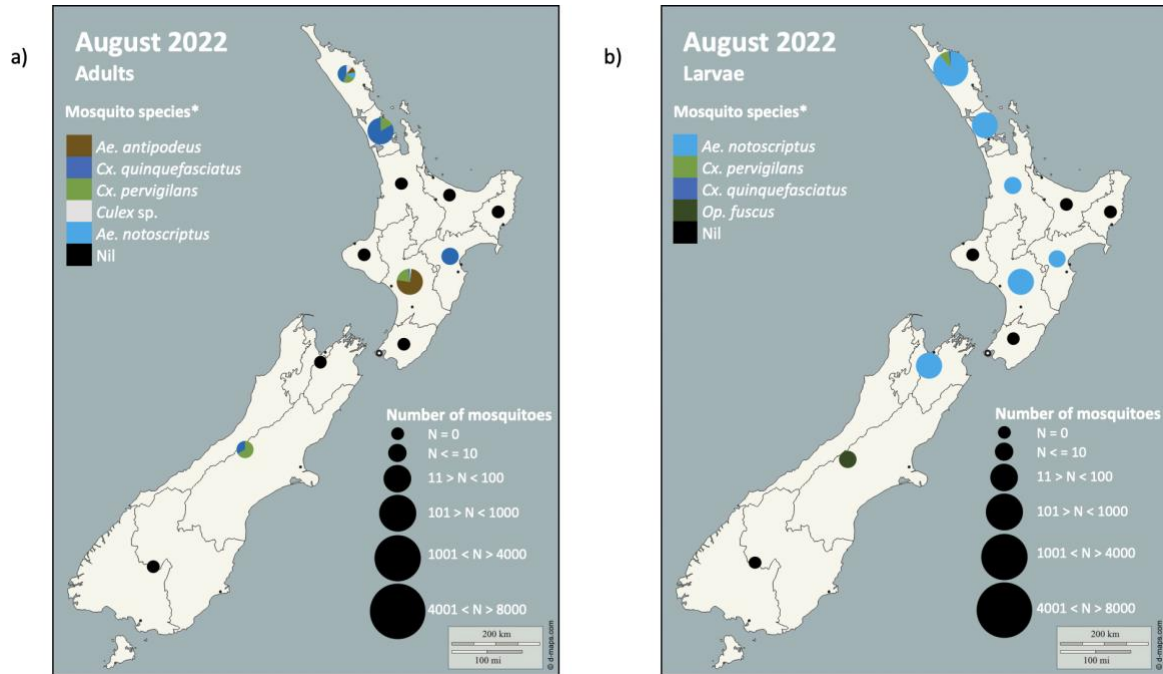
Compared to this same month last year, mosquito larval numbers have shown a decrease (69%) while adult numbers have shown an increase (105%) (Table 1).

Compared to the previous month, mosquito larval numbers have shown a decrease (56%), while the total number of adults has shown an increase (95%).

The highest number of larvae sampled this month was obtained in Ngā Tai Ora - Public Health Northland with a total of 524 larvae, followed by Nelson Marlborough Public Health Service with 59 larvae (Figure 1).

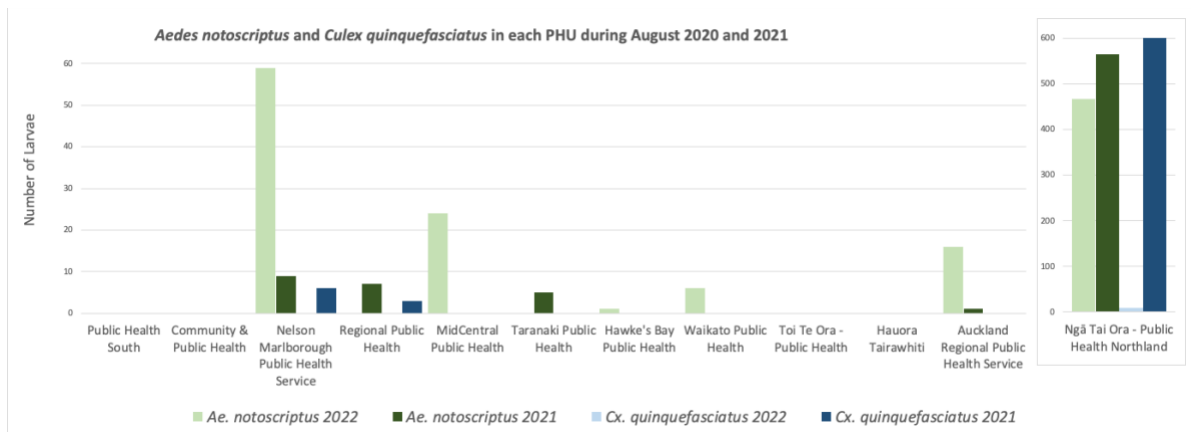
*Aedes notoscriptus* larval numbers have shown an increase in five PHUs and a decrease in three PHUs from this same month last year (Figure 2). As expected, *Aedes notoscriptus* has not been recorded this month, this year, or last year in Public Health South (Figure 2).

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



**Figure 1.** Total mosquito adults (a) and larvae (b) sampled in New Zealand during the August 2022 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.



**Figure 2.** Comparison between introduced mosquito species sampled in each PHU during August 2021 and 2022.

\*Please note the different scale for the number of larvae present in Ngā Tai Ora - Public Health Northland in comparison to the other PHUs.



## INCURSIONS AND INTERCEPTIONS

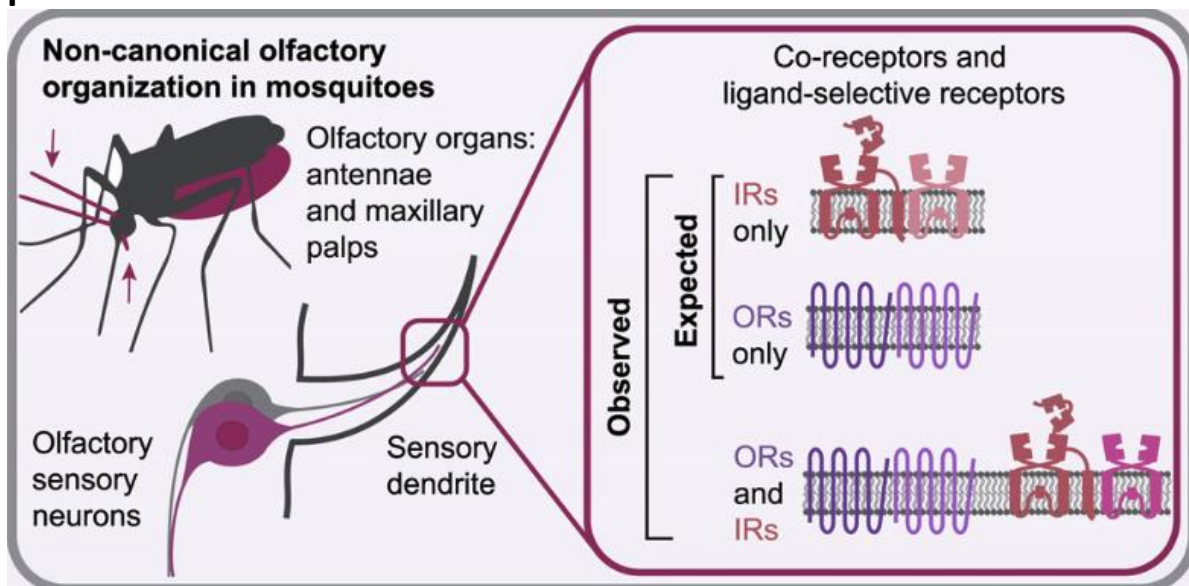
During August, HPOs responded to two suspected interceptions (Table 2).

Table 2. Suspected interception during August 2022.

Date	Species	Location	Circumstances
11.08.22	1 female <i>Culex pervigilans</i>	MAC Transport & Warehousing, 30 Birmingham Drive, Middleton, Christchurch 8024	Found alive while devanning a container of Keraflex bags on pellets. Container was from Malaysia.
01.08.22	1 female <i>Culex quinquefasciatus</i>	12 George Bellew Road Yaldhurst Christchurch	Found alive in a container of log burners ex India via Singapore

## NEWS ARTICLES FROM AROUND THE WORLD

### Study reveals the unique and unconventional way mosquitoes process odours



"Mosquitoes are highly specialized," says Meg Younger, a Boston University College of Arts & Sciences assistant professor of biology who studies mosquito olfaction. Younger is working to crack the code on how mosquitoes use their sense of smell to track us in order to better understand how we can repel them more effectively. In a new paper published in *Cell*, Younger and her colleagues describe the unique and previously unknown way *Aedes aegypti* mosquitoes process smell at the biological level; their findings are a departure from the central theories that previously guided our understanding of insect olfaction. [Read more here. Access full article.](#)



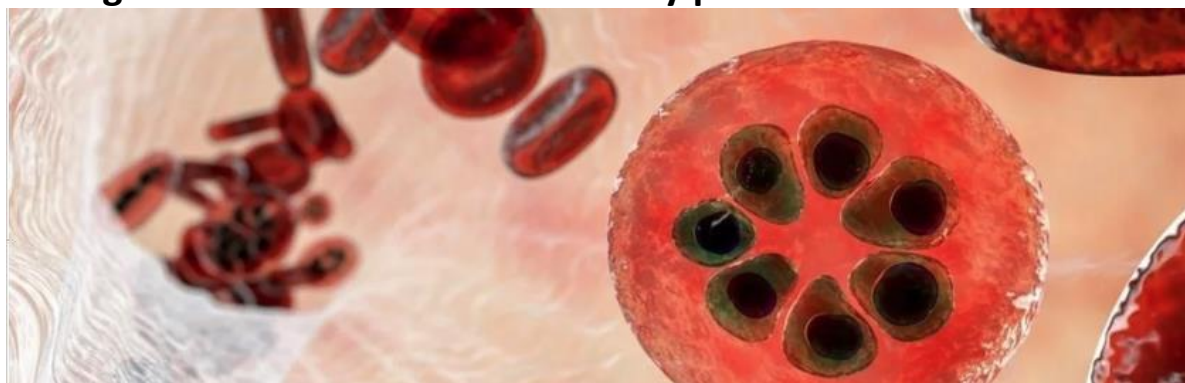
## Human landing catch method provides important insight into the complement of human-biting mosquitoes in a region with consistent West Nile virus epidemics

A team of US-based scientists has described the usefulness of human landing catch as an alternative method to collect mosquitoes that are potent vectors of West Nile virus. In the US, the surveillance of West Nile virus is primarily done by gravid traps and CO<sub>2</sub>-baited light traps. In this study, scientists have evaluated the effectiveness of human landing catch collection methods in attracting and capturing *Culex* mosquitoes. [Read more here.](#) [Access full article.](#)

## Scientists create a mathematical model to predict genetic resistance to antimalarial drugs

Researchers have created a mathematical model to predict genetic resistance to antimalarial drugs in Africa to manage one of the biggest threats to global malarial control. In research published today in *PLOS Computational Biology*, an international research team used data from the WorldWide Antimalarial Resistance Network (WWARN), a global, scientifically independent collaboration, to map the prevalence of genetic markers that indicate resistance to *Plasmodium falciparum* – the parasite that causes malaria. [Read more here.](#) [Access the original journal here.](#)

## Next-generation monoclonal antibody prevents malaria



In a recent study published in *The New England Journal of Medicine*, researchers investigate the pharmacokinetics and safety of L9LS, a monoclonal antibody (mAb) to prevent malaria. The primary objectives were to assess the safety and side-effect profiles of L9LS. The secondary objectives included pharmacokinetic and efficacy analysis after a controlled infection with the malarial parasite two to six weeks post-administration of the mAb. [Read more here.](#) [Access the original article.](#)



## MOZZIE PHOTO PRACTICE TIME

### Photo Practice Time! Border Health and Ship Sanitation Course August 2022



## BEST MOZZIE PHOTOS OF THE MONTH

A selection of photos received from Christchurch

Overview showing features

Shape of larva shown

Close ups of features

Clear photo

Abdomen visible

Purple: Olivia Walker – ID *Culex pervigilans*  
 Light blue: Hannah Landers – ID *Opifex fuscus*  
 Yellow: Ayan Hussein & Georgina Harnett – ID Fungus gnat (non-mosquito)  
 Green: Jimmy Wong - *Culex pervigilans*  
 Red: Talia Madritsch – *Culex quinquefasciatus*



NEW ZEALAND BIOSECURE



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## 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

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## 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

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