



# BORDER HEALTH NEWSLETTER

MAY 2023

## NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

From the 8<sup>th</sup> to the 14<sup>th</sup> of May the Pan American Health Organization together with the World Health Organisation are conducting the Caribbean Mosquito Awareness Week in an effort to raise awareness about the connection between mosquitoes and diseases they transmit, such as dengue, chikungunya, and Zika, and to work with the community to prevent mosquito breeding. [Click here](#) to access and download useful communication resources, such as posters, postcards, flyers and videos.



In the news this month, read about the role the wind might be playing facilitating the dispersion of the Asian invasive mosquito *Aedes stephensi* to African countries. Learn about the TAH virus currently causing outbreaks in southern Moravia and southern/eastern Slovakia. Also, learn about why bed-nets infused with chlorfenapyr give better protection against malaria-carrying mosquitoes than any other type of net. Finally read about a study that has identified potential broad-spectrum antiviral agents that can target multiple families of RNA viruses.

This month we have prepared a Mizzie-logic-Puzzle for you to sharpen your logic skills while refreshing your mosquito knowledge, scroll down and give it a go! Taking mosquito photos is usually challenging, and taking great photos of specimens that are still alive, could be even more of a challenge, scroll down and check the mizzie photo of the month, this time captured by Aaron Guanlao, one of the most celebrated photographers in this newsletter. Finally, learn all about *Aedes alboannulatus*, an Australian mozzie that was intercepted in Hamilton this month.

Happy reading!

Biosecurity Specialists



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## SURVEILLANCE

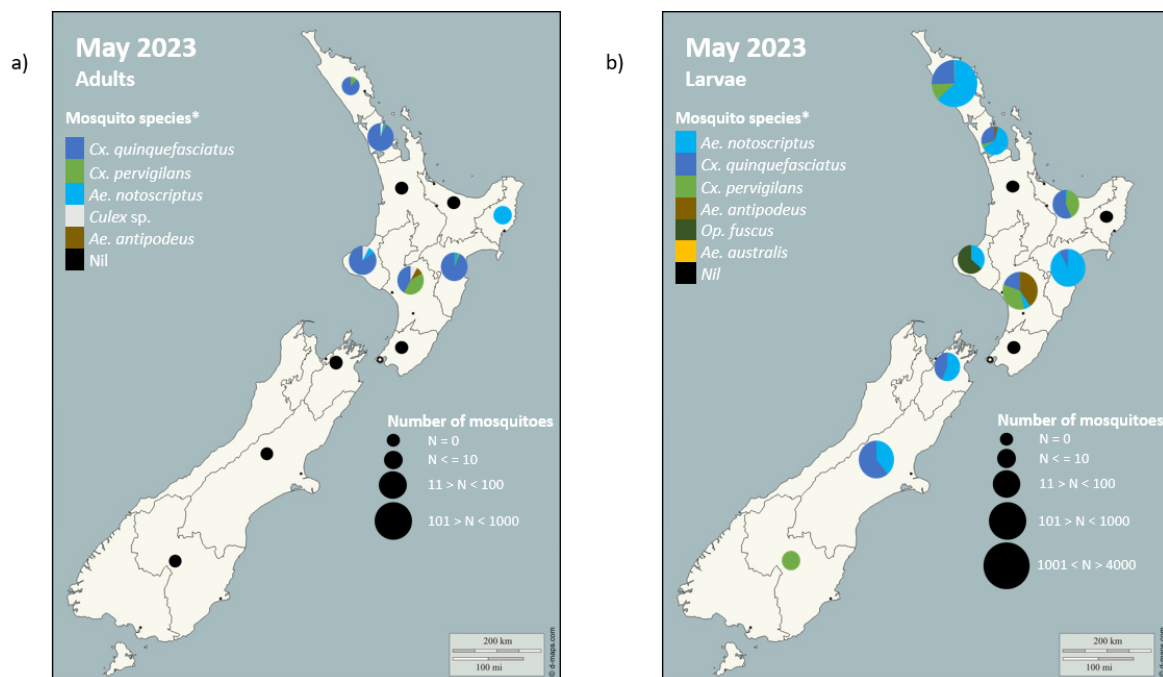
During May 1056 routine, enhanced surveillance samples were collected by staff from 11 PHUs (Figure 1). The samples included 90 positive larval samples and 45 positive adult samples, leading to a total of 162 adults and 2717 larvae identified over the past month (Table 1). *Aedes notoscriptus* is the dominant larval species this month, which is different to last month but the same as this month last year (Table 1).

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

Compared to this same month last year, the total number of larvae have shown an increase (4%) and adults have shown a decrease (92%) (Table 1).

**Table 1.** Adult and larvae sampled by the New Zealand surveillance program during May 2022 & 2023

Species (common name)	Adults		Larvae	
	May 23	May 22	May 23	May 22
<i>Aedes antipodeus</i> (winter mosquito)	1	6	89	-
<i>Ae australis</i> (saltwater mosquito)	-	3	-	1
<i>Ae notoscriptus</i> (striped mosquito)	7	278	1490	1541
<i>Culex asteliae</i> (no common name)	-	-	3	-
<i>Cx pervigilans</i> (vigilant mosquito)	9	205	313	137
<i>Cx quinquefasciatus</i> (southern house mosquito)	141	1498	767	902
<i>Culex</i> sp.	4	36	-	-
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	55	21
<b>Total</b>	<b>162</b>	<b>2026</b>	<b>2717</b>	<b>2602</b>



**Figure 1.** Total mosquito adults (a) and larvae (b) sampled in New Zealand during the April 2023 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.



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Compared to the previous month, both mosquito larval and adult numbers have shown a decrease (16% and 91% respectively).

The highest number of larvae sampled this month was obtained in Northland (1,780 larvae) followed by Canterbury (293 larvae) (Figure 1).

*Aedes notoscriptus* larval numbers have shown an increase in seven 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 Public Health South (Figure 2).

*Culex quinquefasciatus* larval numbers have shown an increase in four PHUs and a decrease in six from this same month last year.

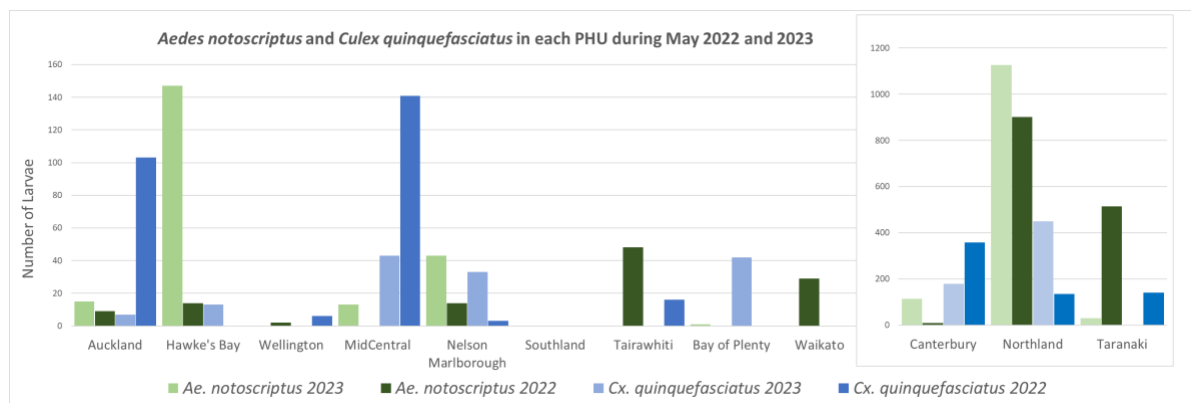


Figure 2. Comparison between introduced mosquito species sampled in each PHU during May 2022 and 2023.

\*Please note the different scale for the number of larvae present in Canterbury, Northland, & Taranaki in comparison to the other PHUs.

## INCURSIONS AND INTERCEPTIONS

During May, HPOs responded to three suspected interceptions (Table 2). Including the interception of one exotic mosquito not previously detected in New Zealand – shown in green.

Table 2. Suspected interception during May 2023

Date	Species	Location	Circumstances
10.05.2023	1 Male <i>Culex quinquefasciatus</i>	Warehouse secure holding area at Sanitarium Health Food Company, Auckland.	Found alive by MPI Officer in the secure holding area of the warehouse. The insect was associated with a 3 container shipment of rice from Australia..
30.05.2023	No sample	Pengelly's Global Logistics, Māngere, Auckland.	Several live suspected mosquitos sighted in a container of cooking oil from Singapore. The container arrived in Auckland via Malaysia.
30.05.2023	1 Female <i>Aedes alboannulatus</i>	CoolDrive Auto Parts NZ - Hamilton. Avalon, Hamilton.	Found alive in a container of auto parts from Melbourne, Australia





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### NEWS ARTICLES FROM AROUND THE WORLD

#### Is wind spreading urban malaria?



In a recent opinion article published in *PNAS*, researchers reviewed existing data on *Anopheles stephensi* population establishment patterns in Africa and Asia and proposed that the wind may facilitate mosquito transmission over long distances. Although until now, malaria in Africa has been primarily a rural problem, the recent establishment and expansion of the invasive urban Asian vector *Anopheles stephensi* will likely drastically change Africa's disease risk landscape. Unlike all other African malaria vectors, *An. stephensi* larvae thrive in container habitats (e.g., abandoned tires or cisterns) near human dwellings, similar to the urban yellow fever mosquito, *Aedes aegypti*. Thus, human populations in the continent's rapidly expanding megacities, such as Kinshasa and Lagos, and metropolises, such as Khartoum and Abidjan, are now more vulnerable to malaria. [Read more about these here.](#) [Access the original article here.](#)

#### Ecology, transmission, and diagnosis of mosquito-borne Tahyna virus



TAHV is a human pathogen of the California serogroup (CSG) orthobunyaviruses. TAHV transmission occurs via endemic mosquitos, with mammals as vertebrate hosts. Research attention shifted toward the medical significance of the virus when it was isolated from sick/hospitalized children. TAHV transmission in endemic regions occurs in deciduous/mixed woodland forests with trees withstanding floods. TAHV outbreaks have been mainly recorded in southern Moravia and southern/eastern Slovakia. Serologic investigations report increased TAHV exposure in flooded areas and regions adjacent to rivers, where floodplain mosquitos exist. TAHV was also detected in several biotopes in Asia. TAHV has been isolated



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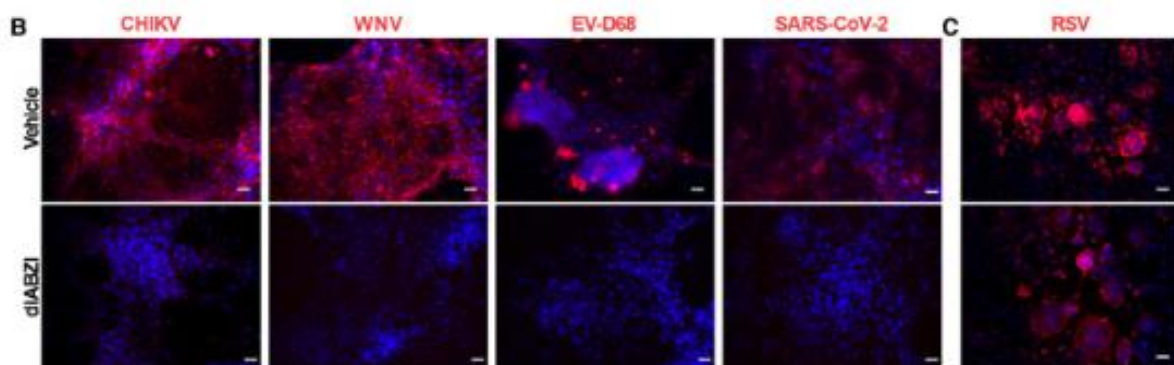
from several mosquito species, including *Aedes vexans*, *A. cinereus*, and *A. caspius*, with many studies implicating *A. vexans* as the primary vector. [Read more about it here.](#) [Access full article here.](#)

### Unravelling malaria resistance to insecticides



Bed nets infused with the insecticide, chlorfenapyr, have consistently been shown to give better protection from malaria-carrying mosquitoes than any other type of net. The use of chlorfenapyr was introduced after 60 countries reported widespread resistance against the pyrethroid insecticides initially used. The latest World Health Organization [Guidelines for Malaria 2023](#), suggests using chlorfenapyr in combination with a pyrethroid "to enhance the effect" of insecticide-treated nets (ITNs) and to combat the development of resistance. [read a summary of the study here](#) or [access the full article here.](#)

### Scientists identify broad-spectrum antiviral agents that can target multiple RNA virus families



A new study has identified potential broad-spectrum antiviral agents that can target multiple families of RNA viruses that continue to pose a significant threat for future pandemics. The study, led by Gustavo Garcia Jr. in the UCLA Department of Molecular and Medical Pharmacology, tested a library of innate immune agonists that work by targeting pathogen recognition receptors, and found several agents that showed promise, including one that exhibited potent antiviral activity against members of RNA viral families. The ongoing SARS-CoV-2 pandemic, which has claimed nearly seven million lives globally since it began, has revealed the vulnerabilities of human society to a large-scale outbreak from emerging pathogens. While accurately predicting what will trigger the next pandemic, the authors say recent epidemics as well as global climate change and the continuously evolving nature of the RNA genome indicate that arboviruses, viruses spread by arthropods such as





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mosquitoes, are prime candidates. These include such as Chikungunya virus (CHIKV), Dengue virus, West Nile virus and Zika virus. The researchers write: "Given their already-demonstrated epidemic potential, finding effective broad-spectrum treatments against these viruses is of the utmost importance as they become potential agents for pandemics." [Read more about it here.](#) [Or download the full article here.](#)

## BEST (ALIVE) MOZZIE PHOTOS OF THE MONTH

**Why are these good (alive) mozzie photos?**

Although the photos were taken with the mosquito alive and inside a plastic sample jar, all body parts are clearly visible

**Final ID: Male *Culex quinquefasciatus***

- No stripes on legs
- Round abdomen
- Bushy antenna and long palps (male kind)
- No stripes on proboscis
- Pale brown body

Thanks to Aaron Guanlao for the photos

## KNOW YOUR MOSQUITO

***Aedes alboannulatus***  
White-kneed mosquito

- Blackish medium-sized mosquito with a mix of white and bronzy scales on the scutum, a mottled proboscis, white bands on the tarsi and a white sub-apical band on the femur which gives the mosquito its common name.
- Found in coastal and inland regions of South Australia, Tasmania, Victoria, New South Wales, and Southern Queensland, as well as in the southern parts of Western Australia.
- Vector status is unknown however Ross River virus and Barmah Forest virus have been isolated from specimens collected in the field.
  - Is known to transmit myxomatosis in rabbits
- Associated with forested habitat and are often found in exposed and sunlit temporary ground pools such as freshwater sandstone rockpools, ephemeral woodland and grassland ground pools after rainfall.
  - Have also been collected from habitat such as large water holding containers like horse troughs, shallow pools that have formed on pathways, and very rarely from large permanent ponds.
- Can be vicious biters, with biting occurring both during the day and at dusk.



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## MOSQUITO LOGIC PUZZLE

Oh no! Some of the lab's resources have gotten mixed up! Help us sort them out by using the clues and grid to match the common name, status, and useful features to each of the species.

Scientific name	Common Name					Status					Useful Features				
	Southern House Mosquito	Malarial mosquitoes	No common name	Yellow fever	Ankle biting mosquito	Endemic	Unwanted species	Introduced (1920s)	Unwanted genus	Introduced (~1830s)	Often speckled or striped proboscis and legs, females with long palps	Band on proboscis and white bands on tarsi	No band on proboscis and white bands on tarsi	No band on proboscis & 4th and 5th hind tarsi are white	No band on proboscis or tarsi
<i>Culex quinquefasciatus</i>															
<i>Aedes aegypti</i>															
<i>Maorigoeldia argyropus</i>															
<i>Anopheles</i> genus															
<i>Aedes notoscriptus</i>															

Useful Features	Scientific name	Common Name	Status
Often speckled or striped proboscis and legs; females with long palps			
Band on proboscis and white bands on tarsi			
No band on proboscis and white bands on tarsi			
No band on proboscis & 4th and 5th hind tarsi are white			
No band on proboscis or tarsi			

Status	Scientific name	Common Name	Useful Features
Endemic			
Unwanted species			
Introduced (1920s)			
Unwanted genus			
Introduced (~1830s)			

**Clues:**

- The species with a band on its proboscis was introduced in the 1920s and likes to bite ankles
- The species without a common name is endemic to New Zealand, and is not speckled or banded
- The Yellow Fever mosquito is an unwanted species, and has white bands on its tarsi but not its proboscis
- Culex quinquefasciatus* was introduced to New Zealand first (possibly on whaler ships), and does not have any bands on its tarsi or proboscis
- The *Anopheles* genus are known as Malarial mosquitoes and, like the species *Aedes aegypti*, are unwanted in New Zealand
- Aedes notoscriptus* is not the Yellow Fever mosquito, though it does have bands on its tarsi

Scientific name	Common Name	Status	Useful Features
<i>Culex quinquefasciatus</i>			
<i>Aedes aegypti</i>			
<i>Maorigoeldia argyropus</i>			
<i>Anopheles</i> genus			
<i>Aedes notoscriptus</i>			

## 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