New Zealand BioSecure

BORDER HEALTH NEWSLETTER

SEPTEMBER 2023

NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

This month, we are introducing a new section called Tips from HPOs for HPOs. This section aims to share techniques and tips not found in the manual that are used locally and might benefit other HPOs. For the first Tips from HPOs for HPOs, we share a tip from Michel Martin in Bay of Plenty. We hope you find this helpful!

In the news this month, read about the latest release of mosquitoes carrying Wolbachia in Honduras as a measure of controlling dengue. Read about how increased heat and extended monsoon periods worsen dengue outbreaks in South Asia. Learn why scientists are closely studying the biting rate of *Aedes aegypti* and the implications it might have. Also, look at a discovery that shows that removing specific proteins in mosquitoes can cause them to get sick from the viruses that generally do not harm them. Finally, learn about the spread of *Aedes albopictus* and bedbugs in Paris.

For the best mozzie photo section this month, look at a capture by Michel Martin from Toi Te Ora and learn what entomologists are looking for when receiving photos during suspected interceptions. Finally, in the Know Your Mozzie section, we feature *Culex gelidus*, an unwanted mosquito that seems to be covered in frost; if you don't believe us, scroll down and check it out!

Happy reading!

SURVEILLANCE

During September 842 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 65 positive larval samples and 14 positive adult samples, leading to a total of 3069 larvae and 21 adults identified over the past month (Table 1). *Aedes notoscriptus* is the dominant larval species this month, which is the same as last month and this month last year (Table 1).

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

Compared to this same month last year, the total number of larvae has shown an increase (6%) while adult numbers has shown a decrease (56%) (Table 1).

Compared to the previous month, mosquito larval numbers has shown and increase (386%) while adult numbers and adult numbers has shown a decrease (73%).

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

Species (common name)	Adults		Larvae	
	Sep 23	Sep 22	Sep 23	Sep 22
Aedes antipodeus (winter mosquito)	6	22	-	-
Ae australis (saltwater mosquito)	-	-	12	-
Ae notoscriptus (striped mosquito)	-	-	2732	2367
Cx pervigilans (vigilant mosquito)	4	15	314	501
Cx quinquefasciatus (southern house mosquito)	11	7	3	19
Culex sp.	-	4	-	-
Opifex fuscus (rock pool mosquito)	-	-	8	4
Total	**21**	**48**	**3069**	**2891**

The highest number of larvae sampled this month was obtained in Northland (2452 larvae) followed by Hawke's Bay (193 larvae) (Figure 1).

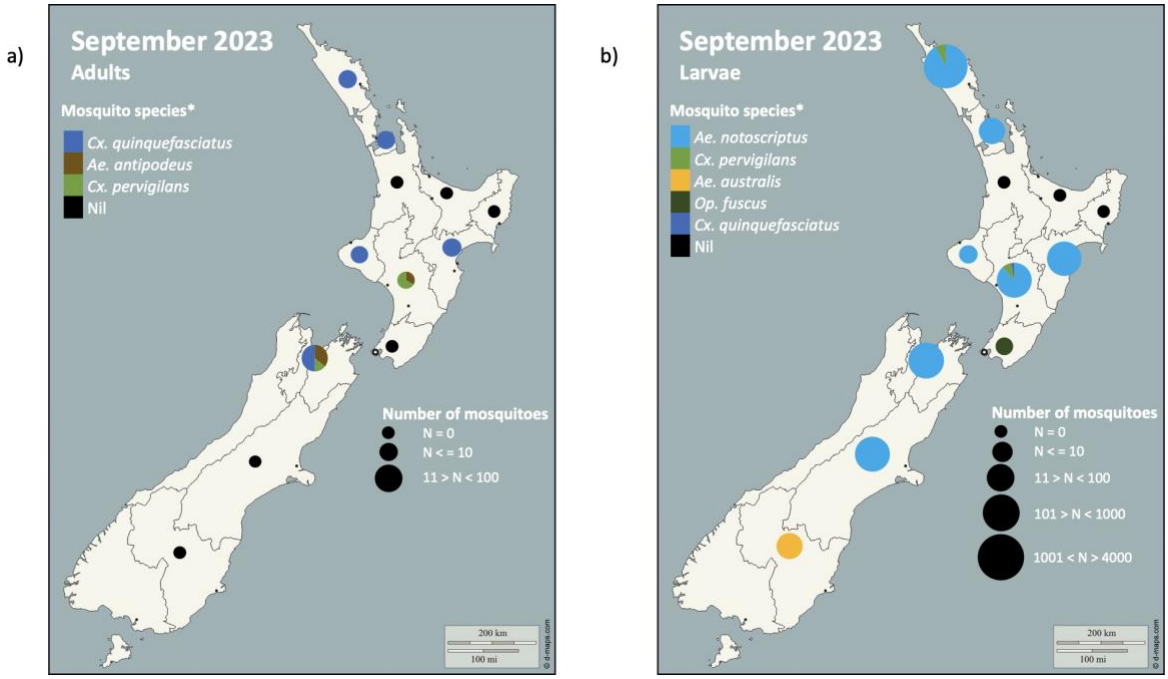


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during September 2023 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.
* The mosquito species are listed in order from the most abundant to the least abundant.

Aedes notoscriptus larval numbers have shown an increase in six PHUs and a decrease in two 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 (Figure 2).

Culex quinquefasciatus larval numbers have shown an increase in three PHUs and a decrease in one PHUs from this same month last (Figure 2).

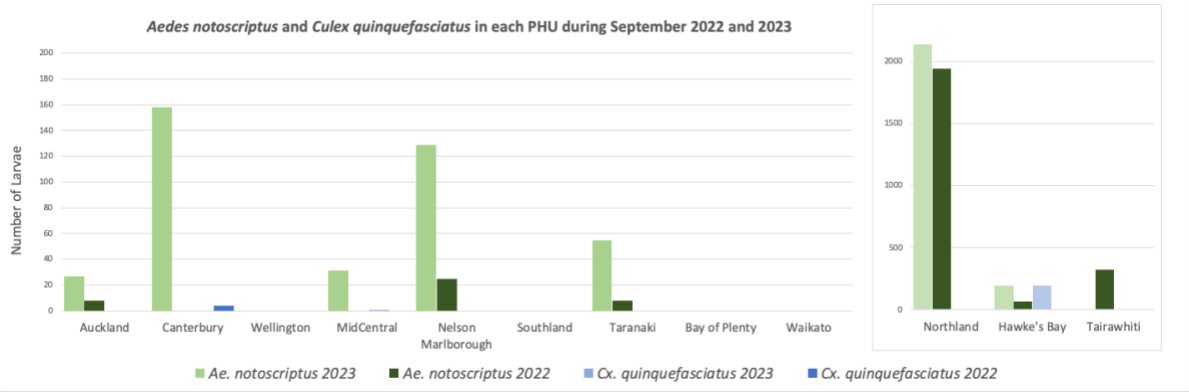


Figure 2. Comparison between introduced mosquito species sampled in each PHS during September 2022 and 2023. *Please note the different scale for the number of larvae present in Northland, Hawke's Bay and Tairawhiti in comparison to the other PHSs.

INCURSIONS AND INTERCEPTIONS

During September, HPOs responded to two suspected interceptions. Unwanted species are shown in red (Table 2).

Table 2. Suspected interception during September 2023

Date	Species	Location	Circumstances
06.09.2023	1 Non-mosquito (Chironomidae)	Private residence, Hornby, Christchurch 8042	A swarm of non-biting midges insects was observed at the property.
28.09.2023	5 female *Culex gelidus* 4 male *Culex gelidus* 1 *Aedes* sp possibly *vexans* (only a thorax remains) 2 female *Culex quinquefasciatus* 2 male *Culex quinquefasciatus*	Transitional Facility at 12/36 Izone Drive, Rollerston, 7675	Multiple found dead, stuck to tape on the floor in a container from India. Container arrived in Christchurch on 19th September holding towels and cotton. A few mosquitoes were damaged and incomplete as they were embedded in the sticky tape.

NEWS ARTICLES FROM AROUND THE WORLD

The biting rate of Aedes aegypti and its variability: A systematic review (1970–2022)

Half of the world's population is now at risk of dengue infection, which transmits to humans mostly through the bite of an infected female *Aedes aegypti* mosquito. Disease transmission models have played an important role in understanding the dynamics of dengue transmission and helping to develop control measures. The mosquito biting rate is one of the central parameters used in these models. Mosquito biting rates used in existing works are taken from a variety of studies, each with its strengths and limitations. To understand

how existing study designs are used to estimate biting rate and how these estimates may vary over time, space, and environmental factors, scientist perform a systematic review of biting rate studies. Read more here.

Special mosquitoes are being bred to fight dengue. How the old enemies are now becoming allies

Honduras has become one of the latest countries in the world to release mosquitoes carrying Wolbachia, a bacteria that interrupts the transmission of disease. Doctors Without Borders have been working with locals in Honduras to release *Aedes aegypti* mosquitoes that are infected with Wolbachia. It is hoped that the release will show similar results as another trial in Indonesia, which showed a 76% decrease in reported dengue cases. Read more here.

Discovery in Mosquitoes Could Lead to New Strategy Against Dengue Fever and Other Mosquito-Borne Viruses

Unlike in humans, when mosquitoes are infected with an arbovirus such as dengue, they are able to move around and feed normally, in other words, the mosquito remains healthy despite having the viruses in their bodies. Researchers at the John Hopkins Malaria Research Institute at the Johns Hopkins Bloomberg School of Public Health have found a protein in *Aedes aegypti* mosquitoes that is responsible. It was found that *Aedes aegypti* without the Argonaute 2 (Ago2) protein gene had more severe arbovirus infections, and the ability to transmit them dropped sharply as the mosquito sickens, feeds less and often dies within days. Read more here. Access the original article here.

Mosquito-borne dengue grows deadlier in South Asia as planet warms

The threat posed by Dengue fever is increasing in South Asia, particularly in locations such as Bangladesh and Nepal, with heat and longer monsoon periods worsening outbreaks. Both locations have had an increase in cases with Bangladesh having the deadliest year since the first recorded epidemic in 2000, and Nepal seeing cases in areas the disease has not previously been recorded. Read more about this here.

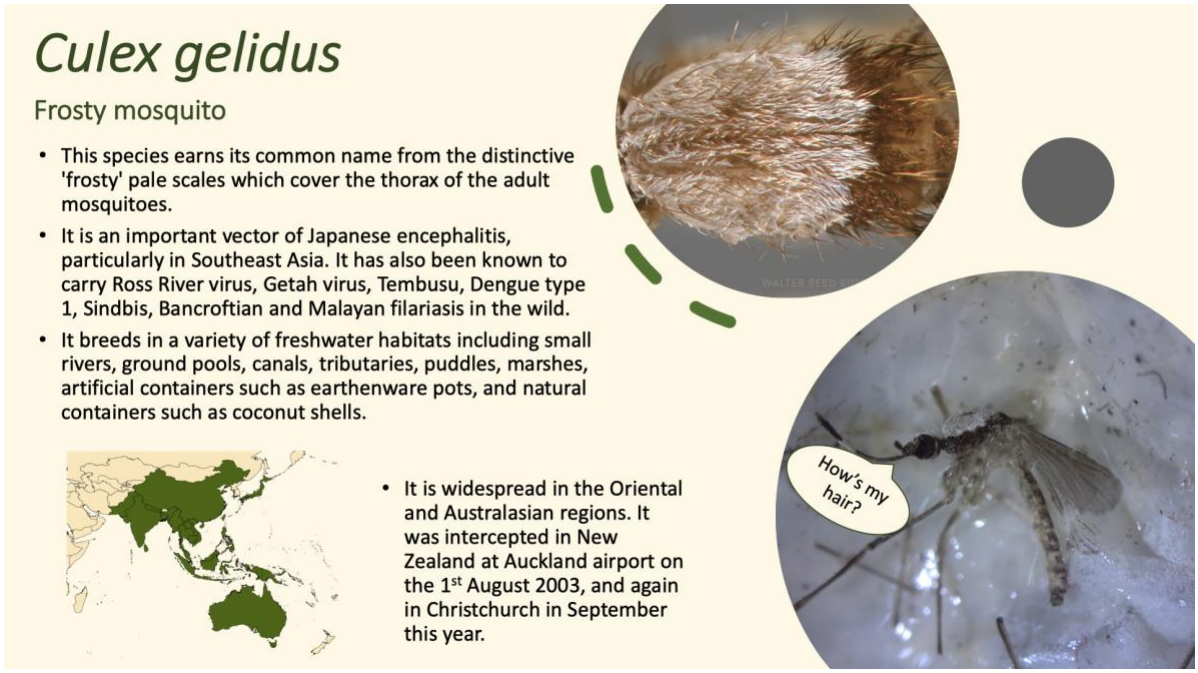
'A first in Paris': city fumigates for tiger mosquitoes as tropical pests spread, bringing disease

As *Aedes albopictus* continues to spread throughout France, Paris has been fumigated for the first time as a measure to control the mosquito. While other areas of France have been fumigated in the past, especially southern France where albopictus has been present for some time, it is a first for the capital, triggered by travellers who had returned carrying dengue fever in an effort to prevent any local transmission of the disease. Read more about this here.

Paris is crawling with bedbugs. They're even riding the trains and a ferry.

Paris is currently suffering from a widespread outbreak of bed bugs. The insects were originally reported in multiple hotels and vacation rental apartments, and there are now reported sightings on trains, a ferry, and in movie theatres. Pest control companies are saying that they are also being overwhelmed with treating infestations as Parisians are finding the insects in their houses. [Access the original news article to learn more.]

KNOW YOUR MOZZIE



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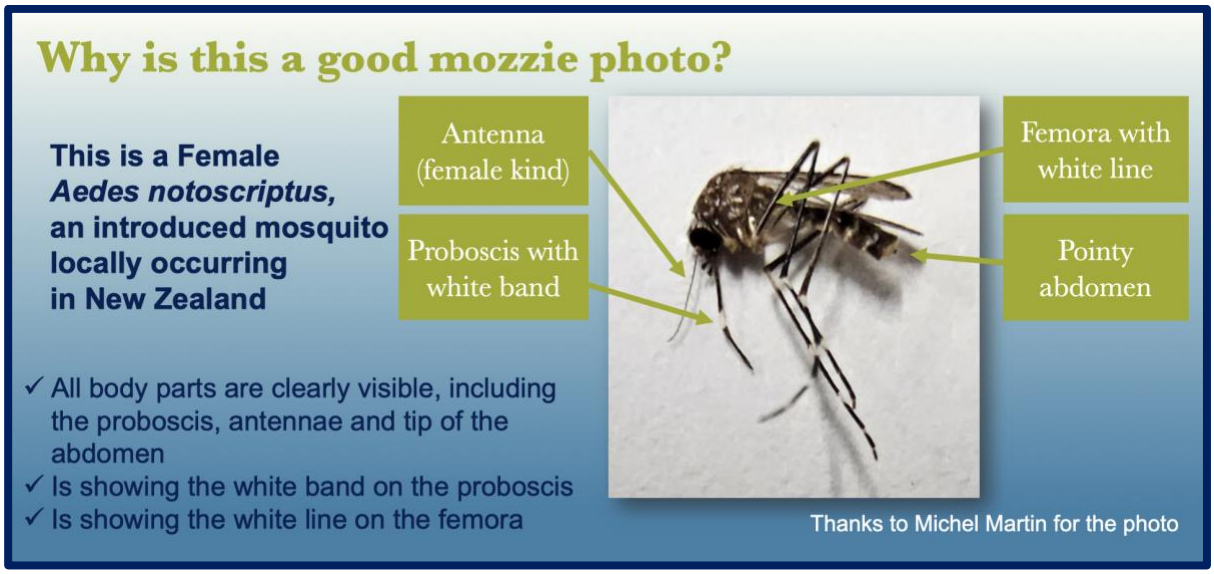
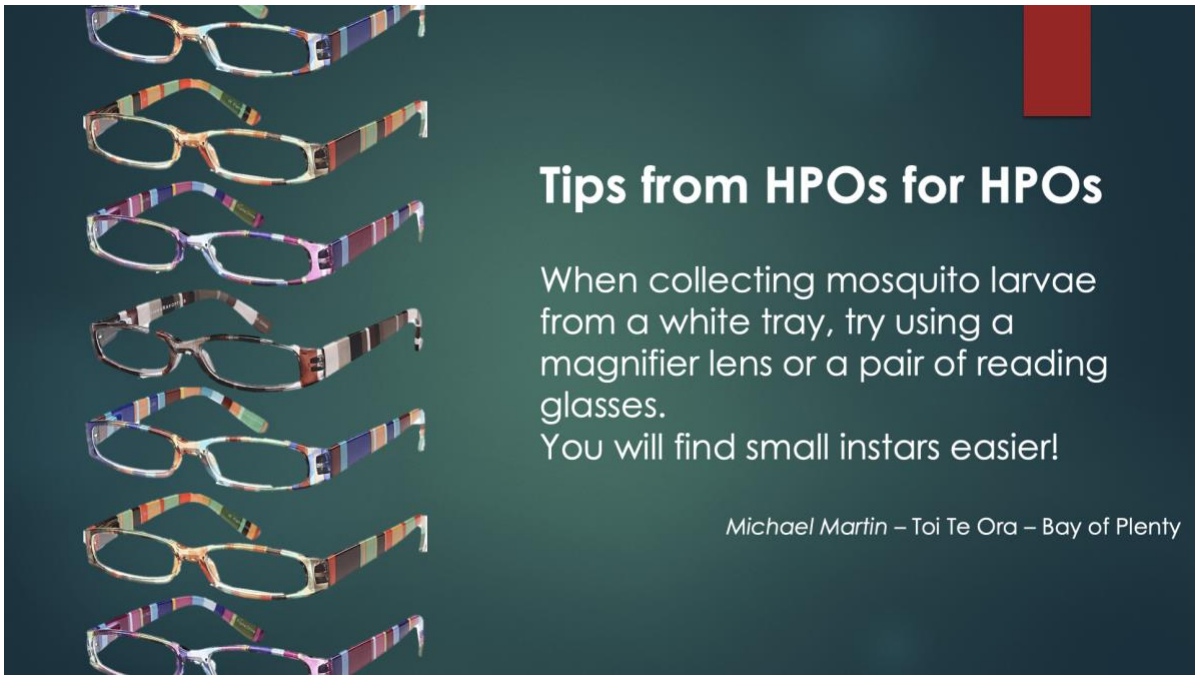
BEST MOZZIE PHOTO OF THE MONTH



TIPS FROM HPOs FOR HPOs



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