



BORDER HEALTH NEWSLETTER – SEPTEMBER 2022

NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

This month the NZB team has been busy visiting Taranaki PH, Nga Tai Ora – PH Northland and Hauora Tairāwhiti PH. It was great to be able to spend some time with HPOs and learn more about the particularities of each POE and the Surveillance and Interceptions plans in place.

In the news this month, learn about the blood-feeding pattern in *Aedes koreicus* an invasive species that has been spreading its range in Europe since 2008. Also, read about the hidden linkage between the amphibian decline and the spike in malaria cases in parts of Latin America in the 1980s and 2000s. Then read about a new Zika vaccine technology that has proved to be safe in mouse trials and about genetically modified *Anopheles gambiae* that slow the growth of malaria-causing protozoans in their gut, reducing the possibility of spreading the disease. Finally, learn about the importance of including microclimatic conditions when making predictive distribution models for *Aedes albopictus* in urban areas.

Scroll down and check the Know Your Mosquito Trap section, this month learn how to keep your Gravid Aedes Trap (GAT) in an ideal working condition. In the Know your Mosquito section, learn about *Aedes antipodeus*, also known as the winter mosquito, an endemic species that has been in samples quite a lot over the past few months.

Happy reading!

SURVEILLANCE

During the month of September, 809 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 46 positive larval samples and 18 positive adult samples, leading to a total of 48 adults and 2891 larvae identified over the past month (Table 1). The dominant larval species this month is *Aedes notoscriptus*, the same as last year (Table 1).

In total, five mosquito species have been collected this month (Table 1), this is the same number than last month.

Compared to this same month last year, both mosquito larval numbers and adult numbers have shown an increase (72% and 700% respectively) (Table 1).

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

Species (common name)	Adults		Larvae	
	Sept 22	Sept 21	Sept 22	Sept 21
<i>Aedes antipodeus</i> (winter mosquito)	22	-	-	-
<i>Ae notoscriptus</i> (striped mosquito)	-	-	2367	1474
<i>Culex</i> sp. (likely <i>quinquefasciatus</i> or <i>pervigilans</i> , missing key ID features)	4	1	-	-
<i>Cx pervigilans</i> (vigilant mosquito)	15	2	501	188
<i>Cx quinquefasciatus</i> (southern house mosquito)	7	3	19	12
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	4	9
Total	48	6	2891	1683

Compared to the previous month, mosquito larval numbers have shown an increase (358%), while the total number of adults has shown a decrease (38%).

The highest number of larvae sampled this month was obtained in Ngā Tai Ora - Public Health Northland with a total of 2180 larvae, followed by Hauora Tairāwhiti with 321 larvae (Figure 1).

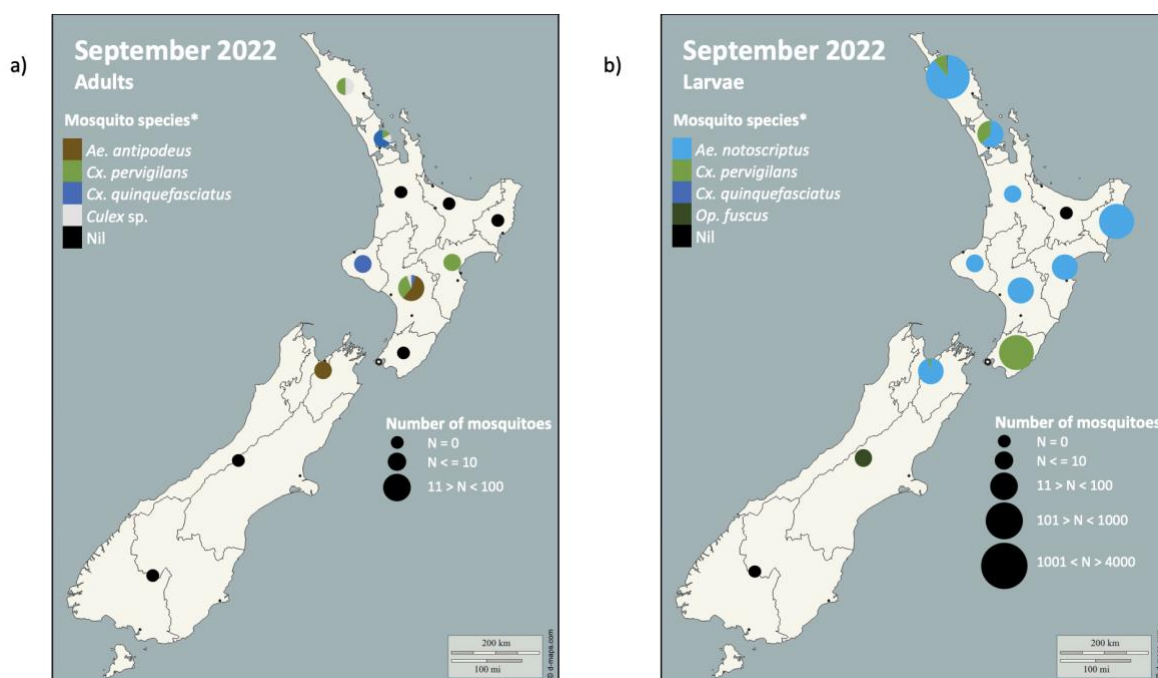


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the September 2022 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.

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

Aedes notoscriptus larval numbers have shown an increase in four PHUs and a decrease in five 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).

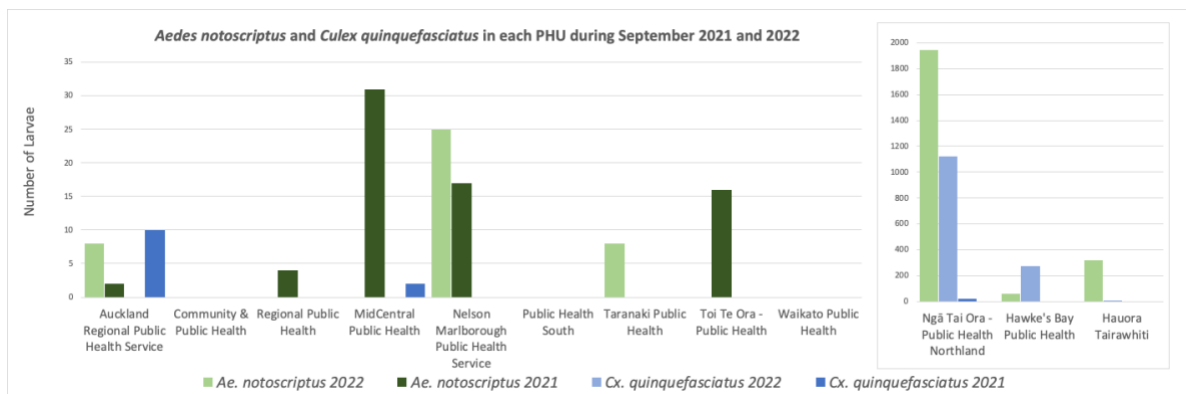


Figure 2. Comparison between introduced mosquito species sampled in each PHU during September 2021 and 2022.

*Please note the different scale for the number of larvae present in Ngā Tai Ora - Public Health Northland, Hawke's Bay Public Health and Hauora Tairāwhiti in comparison to the other PHUs.

INCURSIONS AND INTERCEPTIONS

During September, HPOs responded to one suspected interception (Table 2).

Table 2. Suspected interception during September 2022.

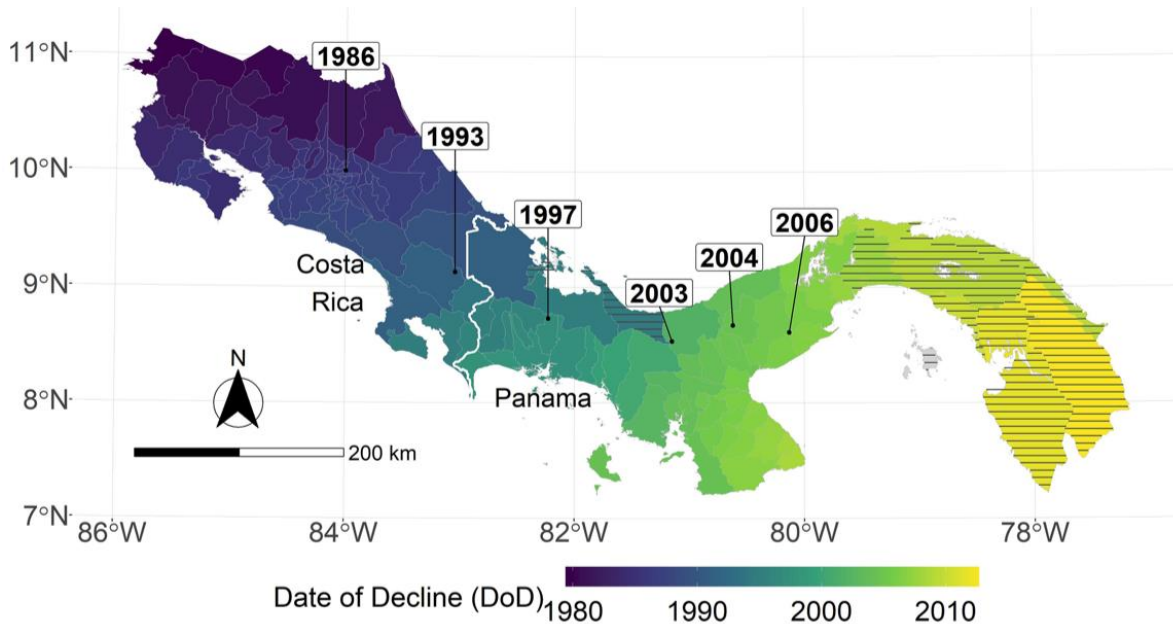
Date	Species	Location	Circumstances
19.09.22	1 non-mosquito (Chironomid)	The Warehouse Distribution Centre Rolleston, Christchurch	Found alive while devanning a container of apparel and knitwear from Shanghai.

NEWS ARTICLES FROM AROUND THE WORLD

New Zika vaccine technology found to be highly effective and safe in preclinical mouse models

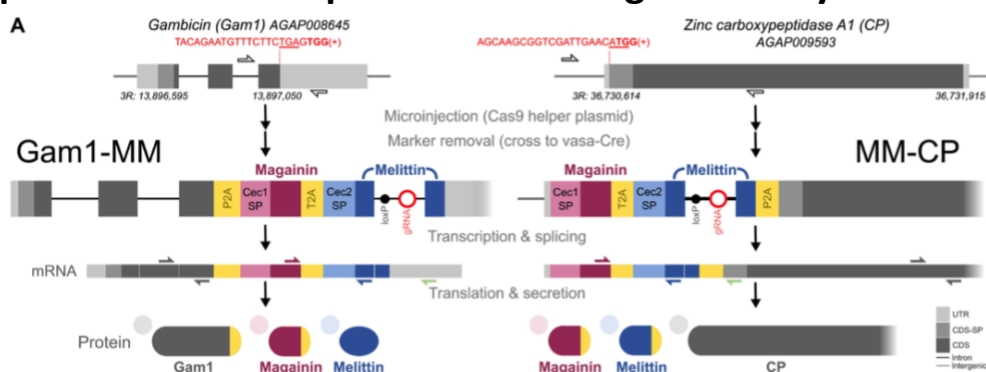
Researchers from the University of California, Los Angeles (UCLA) have developed a Zika vaccine technology that is highly effective and safe in preclinical mouse models. In a pregnant mouse model, the vaccine prevented both the pregnant mothers and the developing foetuses from developing systemic infection. The research is published in *Microbiology Spectrum*, a journal of the American Society for Microbiology. [Read more here.](#)
[Access article here.](#)

Study links amphibian die-off in Costa Rica and Panama with spike in malaria cases



Dozens of species of frogs, salamanders and other amphibians quietly disappeared from parts of Latin America in the 1980s and 2000s, with little notice from humans, outside of a small group of ecologists. Yet the amphibian decline had direct health consequences for people, according to a study from the University of California, Davis. The study, published in the journal *Environmental Research Letters*, links an amphibian die-off in Costa Rica and Panama with a spike in malaria cases in the region. [Read more here.](#) [Access full article.](#)

Mosquitoes that can't spread malaria engineered by scientists



Scientists have engineered mosquitoes that slow the growth of malaria-causing parasites in their gut, dramatically reducing the possibility of malaria spread in a lab setting. If proven safe and effective in real-world settings, the genetic modification could offer a powerful new tool to help eliminate malaria. The innovation, by researchers from the Transmission:Zero



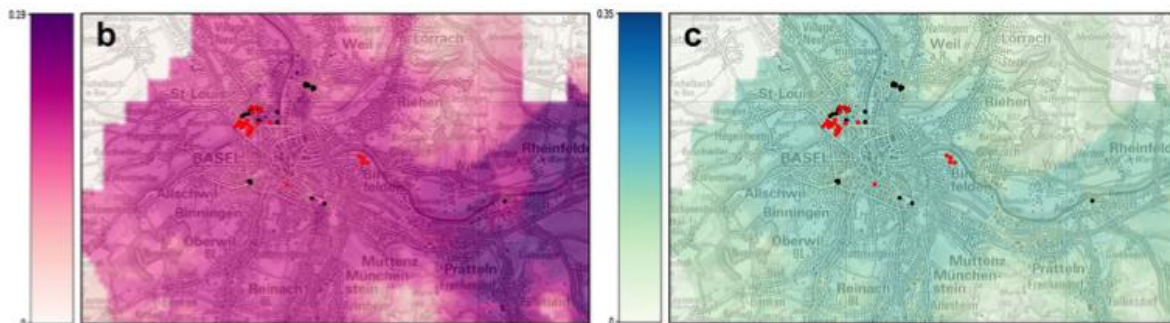
team at Imperial College London, is designed so it can be coupled with existing 'gene drive' technology to spread the modification and drastically cut malaria transmission. [Read more here.](#) [Access journal.](#)

First report of the blood-feeding pattern in *Aedes koreicus*, a new invasive species in Europe



Aedes (Finlaya) koreicus is an invasive species native to Korea, China, Japan, and Russia, reported for the first time outside its native range, in Europe (Belgium), in 2008. Compared to other invasive *Aedes* mosquitoes, little is known of its biology and ecology. Montarsi et al. (2022) aimed to determine the species vectoral capacity in one of the first attempts to evaluate its feeding patterns. [Read the full article here.](#)

The effects of microclimatic winter conditions in urban areas on the risk of establishment for *Aedes albopictus*



The tiger mosquito, *Aedes albopictus*, has adjusted well to urban environments by adopting artificial water containers as oviposition sites. In the last three decades, *Aedes albopictus* (Skuse), originally found in natural habitats of Southeast Asia, has spread to all continents except Antarctica through increased human global trade, travel and rising temperatures associated with climate change. Ravasi et al. (2022) investigate if more precise and realistic risk scenarios for the spread of *Ae. albopictus* can be obtained when considering the winter microclimatic conditions of catch basins, one of the major sites of oviposition and egg overwintering in temperate urban areas. [Read full article.](#)



KNOW YOUR MOSQUITO TRAP

How to care for your Gravid Aedes Trap (GAT)



Mosquito Removal

- First, remove the funnel
- Loosen the catch bag/net and remove it from the transparent chamber
- Remove any mosquitoes from the bag/net using forceps and sort into a sample tube
- Or place the mosquitoes on white paper and then transfer to a sample tube
- If using a catch bag, close it with mosquito inside by pulling the cord tightly
- Send the samples to the lab for identification

Maintenance

- Replace the water once a week
- Use aged water (add 1 rabbit pellet to a 10 litre container and let sit for a week)
- Remove any debris that have fallen into the trap or deters the mosquitoes from entering the trap
- If using sticky cards, replace the card when it is full
- Apply residual spray to the translucent chamber monthly
- Wash the trap regularly



KNOW YOUR MOSQUITO

Aedes antipodeus (Winter mosquito)

- *Aedes antipodeus* is an endemic species to New Zealand
- Adult females are active all year round with breeding mainly occurring in March – October, hence the name winter mosquito
- Found in both country and bush habitats, this species breeds in ephemeral flood water pools following rain events
 - Will breed in shaded floodwater, ground pools, reservoirs, swamp margins and fringes of saltmarsh habitat.
- Found throughout the country from Kaitaia to Stewart Island
- Reported to be a nuisance biter and will bite day and night, both indoors and outdoors
- Adults are often found in routine samples over the colder months





NEW ZEALAND BIOSECURE



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
