



BORDER HEALTH NEWSLETTER – FEBRUARY 2022

WELCOME!

Kia ora koutou,

In the last newsletter, we looked at natural containers as breeding habitats for mosquitoes, this month, our *Know Your Breeding Habitat* segment is focusing on the natural ground water bodies that become habitats for mosquitoes. In the *Know Your Mosquito* segment learn about *Aedes tormentor*, a crepuscular exotic mosquito which is undistinguishable from *Aedes atlanticus*. On a separate note, this month we congratulate Tamara Taka Brown, for her excellent mozzie photos, scroll down and learn what to look for when taking photos for preliminary ID.

In mosquito news, read about the relentless spread of malaria caused by the “super-mosquito” *Anopheles stephensi* which thrives and breeds easily in urban areas unlike the most common malaria-carrying mosquitoes, which mostly afflicts rural areas. Also, read about the spread of Japanese Encephalitis in mainland Australia, which is proliferating fast in commercial pig farms. On a more positive light, learn about the recent discoveries on the influence of flavonoids in the inhibition of mosquito development, and regarding colours that are attractive to or ignored by mosquitoes. And don’t miss the RNZ podcast about *Opifex fuscus*, our very interesting and unique rock pool mosquito!

Happy reading!

SURVEILLANCE

During the month of February, 1326 routine samples were collected by staff from 10 DHBs (Figure 1). The samples included 299 positive larval samples and 212 positive adult samples, leading to a total of 4200 adults and 29661 larvae identified over the past month (Table 1). The dominant larval species this month is *Culex quinquefasciatus*, the same as last year (Table 1).

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

Compared to this same month last year, the total number of larvae have shown a 27% decrease, while the number of adults have shown an increase (48%) (Table 1).

Compared to the previous month, both mosquito larval and adult numbers have shown an increase (33% and 96% respectively).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during February 2021 & 2022

Species (common name)	Adults		Larvae	
	Feb 22	Feb 21	Feb 22	Feb 21
<i>Aedes antipodeus</i> (winter mosquito)	1	2	-	-
<i>Ae notoscriptus</i> (striped mosquito)	692	536	1779	2689
<i>Ae subalbirostris</i> (no common name)	-	-	2	-
<i>Coquillettidia iracunda</i> (no common name)	24	11	-	-
<i>Culex</i> sp. (likely <i>quinquefasciatus</i> or <i>pervigilans</i> , missing key ID features)	201	96	2	4
<i>Cx pervigilans</i> (vigilant mosquito)	689	194	2148	2450
<i>Cx quinquefasciatus</i> (southern house mosquito)	2593	1977	25613	35127
<i>Opifex fuscus</i> (rock pool mosquito)	-	14	117	31
Total	4200	2830	29661	40301

The highest number of larvae sampled this month was obtained in Toi Te Ora Public Health with a total of 18714 larvae, followed by Community & Public Health DHB (3348 larvae) (Figure 1).

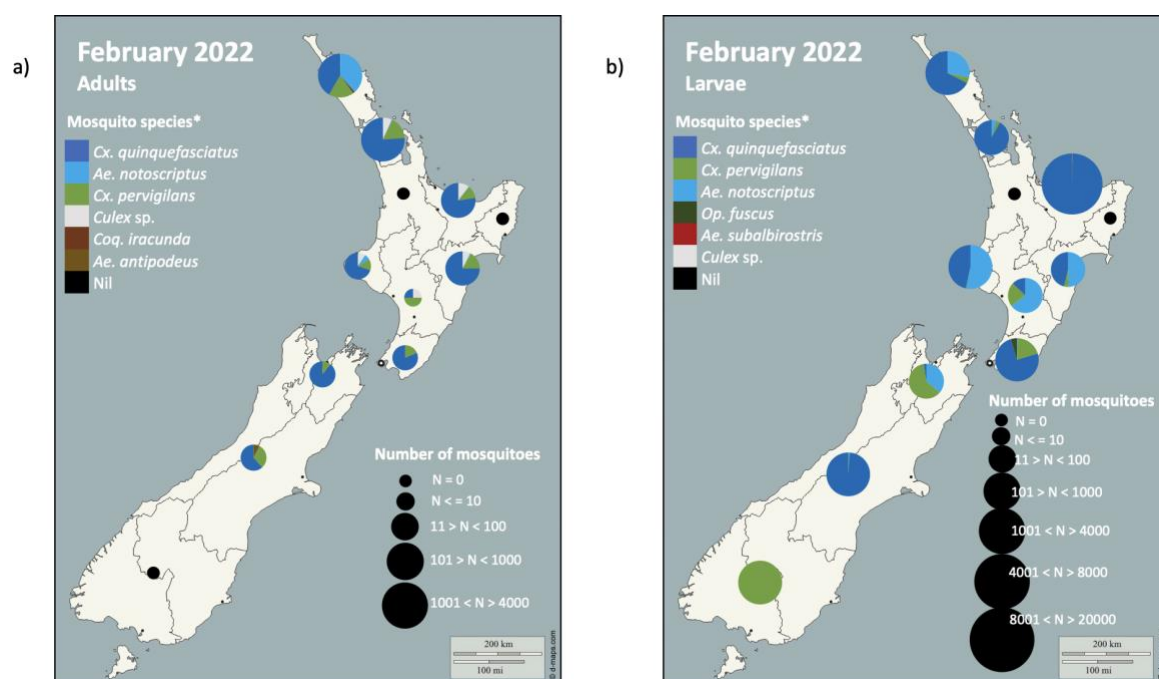


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the February 2022 surveillance period. Please note that the markers represent the DHBs and not the specific sites where the samples have been taken.

* 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 DHBs and a decrease in three DHBs from this same month last year (Figure 2). No sampling occurred in Tairāwhiti DHB or Waikato DHB this month and *Aedes notoscriptus* is therefore shown as absent. 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 DHBs and a decrease in five 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).

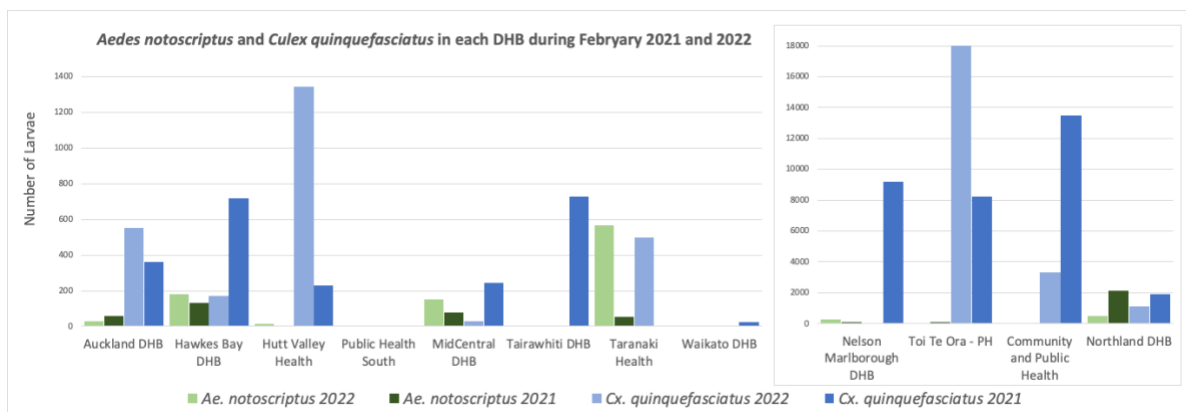


Figure 2. Comparison between introduced mosquito species sampled in each DHB during February 2021 and 2022. *Please note the different scale for the number of larvae present in Nelson Marlborough DHB, and Toi Te Ora PH, Community & Public Health and Northland DHB, in comparison to the other DHBs.

INCURSIONS AND INTERCEPTIONS

During February, HPOs responded to five suspected interceptions; Two of them involving exotic mosquitoes, including the discovery of larvae in routine surveillance traps belonging to the unwanted species *Aedes aegypti* (Table 2). Unwanted species are highlighted in red, exotic species are highlighted in blue.

Table 2. Suspected interceptions during February 2022.

Date	Species	Location	Circumstances
23.02.2022	1 female <i>Culex quinquefasciatus</i>	ITB Terminal B Auckland International Airport	Found alive by MPI officer, flying inside the terminal B, on the work floor where passengers come through.
10.02.2022	7 4 th instar Larvae <i>Aedes aegypti</i>	Auckland International Airport	Found in Tyre 10 during routine surveillance. As tyre is located in the NZ Air Customs area.
05.02.2022	1 female <i>Culex pervigilans</i>	Auckland International Airport	Found alive in Terminal B in the MPI Lab.
02.02.2022	1 female <i>Culex nigripalpus</i> 1 female <i>Aedes tormentor/Aedes atlanticus</i> (females morphologically identical)	Tauranga Port	Two adult mosquitoes found dead during ship sanitation inspection of bulk carrier FENGNING ex Panama. Some standing water found on ship, however no other live insects or signs of larvae/pupae found.
02.02.2022	2 female <i>Culex quinquefasciatus</i>	Unit D14 Mohuia Crescent, Elsdon, Porirua	Flying insect discovered near end of devanning of container of water bottles from China. Insect sprayed and door was closed, however insect may have flown out of container. Later during further inspection, two dead adult mosquitoes were discovered within container.



NEWS ARTICLES FROM AROUND THE WORLD

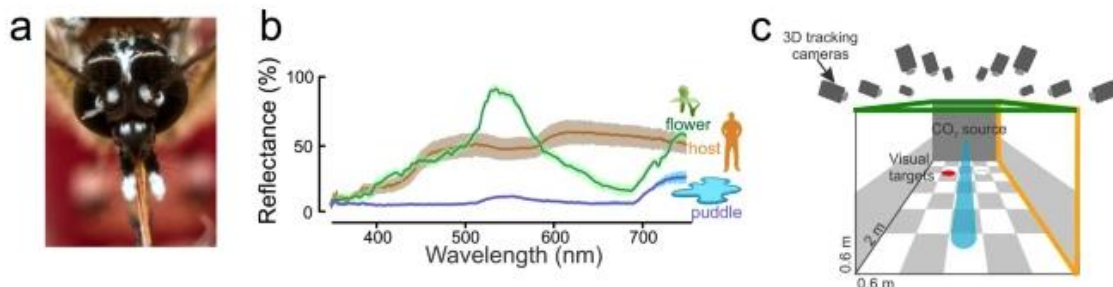
The Mosquito Threatening a Malaria Resurgence



Malaria cases started to climb around Djibouti in 2012, doctors and scientists were perplexed: The country had largely controlled the disease up to this point, but the tried-and-true methods used to quash outbreaks were insufficient. A decade later, malaria cases have skyrocketed to 2,800X previous counts, and some researchers and health workers fear it's only the beginning of a larger resurgence. **The culprit:** A "super-mosquito" from India, *Anopheles stephensi*, which thrives and breeds easily in urban areas—unlike the most common malaria-carrying mosquito on the continent, which mostly afflicts rural areas. **Growing threat:** The mosquito poses the "most urgent and dangerous threat to recent progress in malaria control" across Africa other than insecticide resistance, [one report warned](#). More than 125 million could be at risk if the mosquito makes it to Africa's megacities. [Read more.](#)

Mosquitoes are seeing red: These new findings about their vision could help you hide from these disease vectors

Fig. 1: Olfactory gating of mosquito color preference.



In a recent study published in Nature Communications, a team of researchers found that after a mosquito has been attracted to a person following olfactory cues, it is further attracted by visual aids. Looking at *Aedes aegypti* mosquitoes, the researchers found that after detecting exhaled CO₂, the mosquitoes are attracted towards the colours red, orange, black and cyan. They also found that other colours such as green, purple, blue and white are less attractive or ignored. [Read more here](#) or [access the full article here](#).



Health warnings issued for mosquito-borne disease after virus detected in Queensland, NSW and Victoria

Traces of Japanese encephalitis has been detected in mosquitoes in multiple states in Australia, with the disease being detected in samples from commercial pig farms in New South Wales, Queensland, and Victoria. Health Officers are recommending that people take steps to protect themselves from being bitten by mosquitoes to prevent infection. [You can read the news article here.](#)

All Abuzz: Larvicidal Flavonoids Inhibit Key Enzyme in Yellow Fever Mosquitoes



When most people think of flavonoids, natural compounds found in plants and other organisms, their nutritional benefits probably come to mind first. But these compounds may have another health benefit: researchers from Japan have discovered that certain flavonoids inhibit development in mosquitoes that can spread disease. [Read more here](#) or [access the original article here.](#)

Critter of the Week: The saltwater mosquito



The endemic Saltpool Mosquito (*Opifex fuscus*) featured as the RNZ Critter of the Week earlier in February. The Saltwater Mosquito are a very primitive mosquito species that breed in rock pools along New Zealand's coastlines. Have a listen to learn some more about this fascinating mosquito species here. [Listen to the podcast here](#)

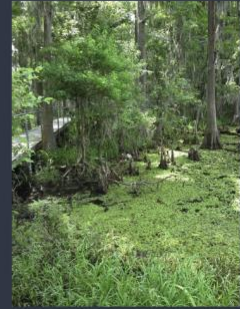


KNOW YOUR BREEDING HABITAT

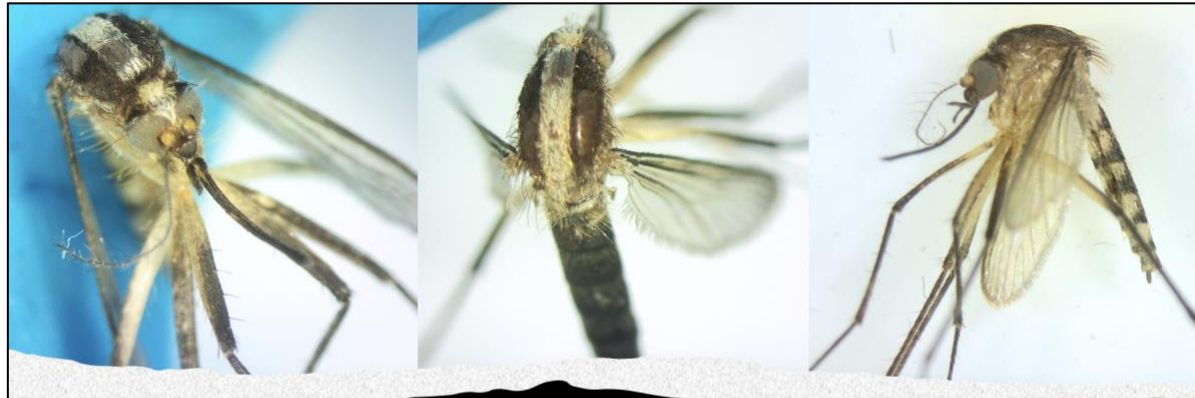


Natural breeding sites:

- Some species of mosquito breed in large natural bodies of water including:
 - Ponds
 - Edges of lakes
 - Swamp marshes
 - Rock pools
- Some "floodwater" species (such as *Aedes vexans*) will lay their eggs in the soil in areas that are prone to flooding.
- Some species of *Anopheles* and *Culex* have even been recorded breeding in animal tracks.



KNOW YOUR MOSQUITO



Aedes atlanticus / *Aedes tormentor*

Distribution: USA, Mexico, Guatemala

Habitat: temporary woodland pools

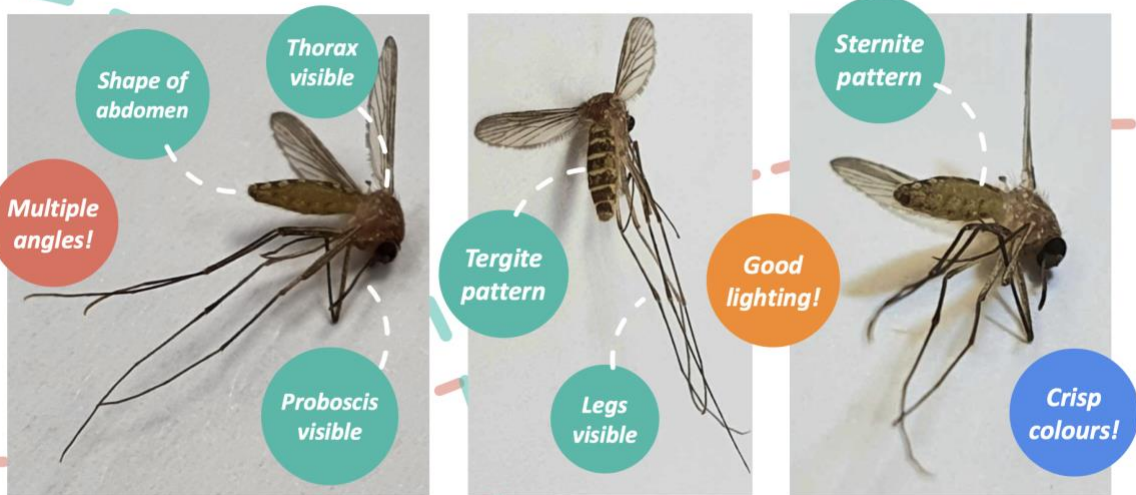
Disease: EEE & WNV (though plays little role in transmission)

- Females of both species are morphologically identical.
- Have broad median stripe of pale scales extending between the eyes & along the entire length of the scutum.
- Crepuscular (biting at dawn & dusk), stays near larval habitat.
- Intercepted in NZ in Feb 2022 at Tauranga Port during sanitation inspection of bulk carrier ex USA via Panama.



BEST MOSQUITO PHOTO OF THE MONTH

Photographer: Tamara Taka-Brown – Auckland Regional Public Health Service
Suspected Interception – mosquito found alive at Auckland International Airport



Preliminary ID from photos: Female *Culex pervigilans* – NZ endemic species.

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