NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER – MARCH 2021

WELCOME!

Kia Ora Koutou,

This month we have admired HPO and mozzie photographer Aaron Guanlao photos and share his tips on macro photography, Thanks Aaron! And we present some facts about the African *Aedes mcintoshi* mosquito responsible of transmitting Rift Valley Fever.

In the news this month; NASA is using weather satellite data to alert African countries about potential outbreaks of Rift Valley fever, what is the mechanism behind the efficacy of catnip as a mosquito repellent and the University of Otago report the increasing numbers of people arriving in New Zealand carrying vector-borne diseases. Lastly find out about the latest addition to the native mosquito list in New Zealand first found over ten years ago by an NZB mozzie hunter.
Scroll down and enjoy!

SURVEILLANCE

During February 1317 samples were collected by staff from 11 DHBs (Figure 1). The samples included 264 positive larval samples and 121 positive adult samples, leading to a total of 1271 adults and 27787 larvae identified over the past month (Table 1). The dominant larval species this month and last month is *Culex quinquefasciatus.*

Compared to this same month last year, the total number of larvae has shown an increase (51%) while the number of and adults a decrease (36%) (Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during March 2020 & 2021

Species (common name)	Adults		Larvae	
	March 21	March 20	March 21	March 20
Aedes notoscriptus (striped mosquito)	27	311	2684	1917
Ae antipodeus (winter mosquito)	82	1	-	-
Ae australis (saltwater mosquito)	-	-	-	1
Coquillettidia iracunda (no common name)	109	6	-	-
Coquillettidia tenuipalpis (no common name)	5	-	-	-
Culex asteliae (no common name)	53	-	-	-
Cx pervigilans (vigilant mosquito)	100	291	3186	1056
Cx quinquefasciatus (southern house mosquito)	808	1044	21829	10533
Culex sp.	45	73	1	-
Culiseta tonnoiri (no common name)	42	1	-	-
Opifex fuscus (rock pool mosquito)	-	-	87	39
Total	**1271**	**1727**	**27787**	**13546**

In total, nine mosquito species have been collected this month (Table 1), that is three more than last month. This difference is due to the fact that Northland HPOs have been sampling in areas of native forest where routine surveillance does not commonly occur. This sampling campaign was activated after eDNA matching *Aedes albopictus* was detected in water samples from the Waipoua river. These samples were originally collected to evaluate fish diversity for the Northland Regional Council.

Compared to last month, mosquito larval numbers and adult numbers have shown a decrease (31% and 53% respectively), (Table 1).

The highest number of larvae sampled this month was obtained in Community and Public Health DHB (11893 larvae) followed by Northland DHB (4962 larvae) (Figure 1).

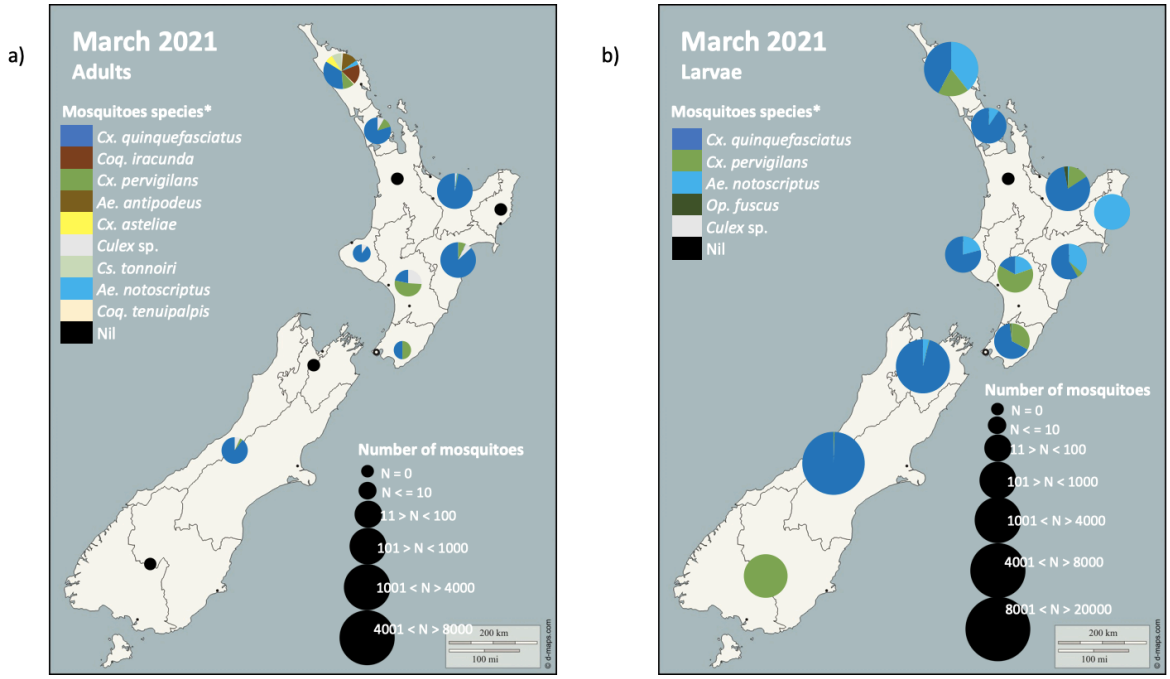

Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the March 2021 surveillance period.
* The mosquito species are listed in order from the most abundant to the least abundant.
Please note that the markers represent the DHBs and not the specific sites where the samples have been taken.

Culex quinquefasciatus larval numbers have shown a decrease in six DHBs from this same month last year and an increase in four DHBs. *Culex quinquefasciatus* has not been found this month in Public Health South (Figure 2).

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

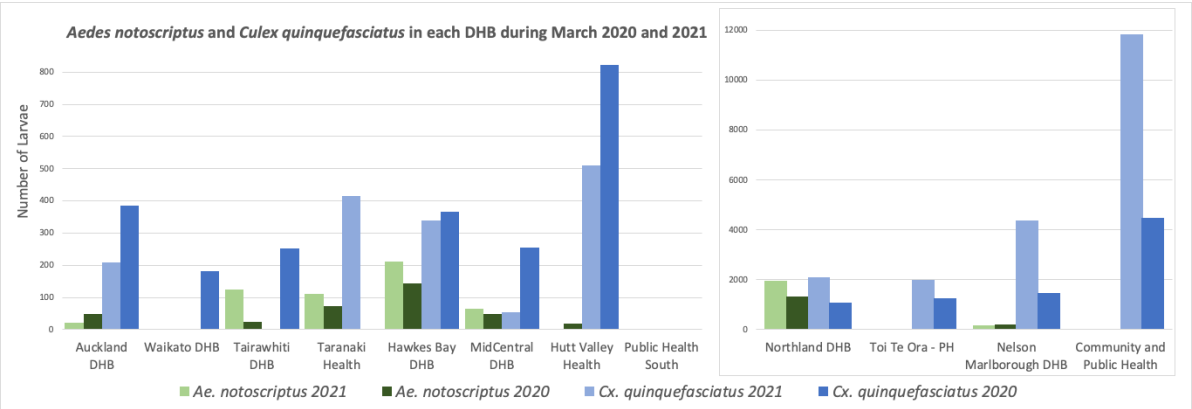

Figure 2. Comparison between introduced mosquitoes sampled in each DHB during February 2020 and 2021. *Please note the different scale for the number of larvae present in Northland DHB, Toi Te Ora – PH, Nelson Marlborough DHB and Community and Public Health in comparison to the other DHBs.

Disclaimer: Note that all comparisons made have not been statistically tested and can be due to sampling effort.

INCURSIONS AND INTERCEPTIONS

During March, HPOs responded to seven suspected interceptions, including the discovery of DNA traces of *Aedes albopictus* in the Waipoua River in Northland. This finding initiated a sampling and trapping campaign in the area, with no further evidence of exotic mosquitoes detected (Table 2).

Table 2. Suspected interceptions during March 2021.

Date	Species	Location	Circumstances
03.03.2021	1 non mosquito	MG Marketing, Waterloo Road Christchurch	Found dead in bananas from Ecuador.
03.03.2021	eDNA *Aedes albopictus*	Waipoua stream Northland water sample	DNA detected in a water sample taken for the Northland council for fish monitoring purposes.
05.03.2021	No sample provided	Sorted Logistics, Hornby, Christchurch	Found alive in a container of Kmart goods from China. The insect was sprayed and not recovered.
05.03.2021	1 non mosquito (Crane-fly)	Cardinal Logistics, Waterloo Road, Christchurch.	Found alive in container of goods from France.
16.03.2021	1 Female *Culex quinquefasciatus*	Ports of Auckland	Found alive in an empty container from PagoPago. The container had been open for some time prior to the discovery of the mosquito.
19.03.2021	1 Female *Culex quinquefasciatus*	GVI Logistics, Jamison Place, Christchurch	Found alive in container while devanning boxed clothes from the United Kingdom. Container was sprayed and closed. No further insects found.
22.03.2021	1 Male *Culex quinquefasciatus*	Ports of Auckland	Found alive by MPI in an imported car from Japan. Car had been at the port for a number of days.

NEWS ARTICLES FROM AROUND THE WORLD

Of Mosquitoes and Models: Tracking Disease by Satellite

Using satellite data, NASA researchers can predict when weather conditions are going to be favourable for *Aedes mcintoshi* - the primary vector of Rift Valley Fever. The symptoms of the virus are usually flu-like fevers, muscle and joint pain, and headaches. In extreme cases, it can lead to blindness, hemorrhagic fever, or even death. The majority of human cases of Rift Valley fever come from contact with livestock that have been bitten by mosquitoes. While there is no current vaccine for humans, there is a vaccine for livestock. In response to the alert, Kenyan officials undertook a mass vaccination program for domestic livestock. Despite large numbers of disease-carrying mosquitoes in Kenya, no human or animal outbreaks were reported. Read more.

Could catnip become the new DEET?

New collaborative research from Northwestern University and Lund University may have people heading to their backyard instead of the store at the outset of this year's mosquito season. Often used as an additive for cat toys and treats due to its euphoric and hallucinogenic effects on cats, catnip has also long been known for its powerful repellent action on insects, mosquitoes in particular. Recent research shows catnip compounds to be at least as effective as synthetic insect repellents such as DEET. Read more. Access the original article.

Covid 19 fears prevent many Africans from accessing malaria treatment

Fears of contracting COVID-19 are preventing people accessing vital health services, experts say. The COVID-19 pandemic has prevented almost a third of people in Sub-Saharan Africa suffering from a fever from accessing malaria treatment in health facilities, health experts say. Malaria continues to be a major global health challenge, with six African countries including Nigeria and Tanzania accounting for around half the 409,000 people globally who died from the disease in 2019, according to the World Health Organization (WHO). Read more.

Kiwi scientists warn dengue fever, mosquito-borne viruses are becoming increasingly common at the border

There has been a "significant" increase in people arriving in New Zealand carrying dangerous viruses such as dengue fever, chikungunya and Zika over the two decades, scientists say. And the warming climate makes an outbreak here increasingly possible. Scientists at the University of Otago looked at 17 years of reports of arboviral infections in New Zealand, from 2001 to 2017. Arboviral diseases are spread by insects like mosquitoes, ticks and fleas. They found more than half of the infections were found in the last four years, mostly in people who'd arrived from the Pacific Islands and southeast Asia. Read more. Access original article.

Description of a new species of mosquito, *Aedes* (*Ochlerotatus*) *arundinariae* (Diptera: Culicidae) from the Chatham Islands, New Zealand

A new mosquito species from the Chatham Islands *Aedes* (*Ochlerotatus*) *arundinariae*, previously misidentified as *Ae.*(*Nothoskusea*) *chathamicus* (Dumbleton, 1962), is described from females only as New Zealand's 13th endemic mosquito species. The new species has been known from a few specimens for more than ten years. It has not been found since, despite further collecting effort. *Aedes (Och.) arundinariae* sp. nov. is easily recognised by a distinctive checked pattern of scales on sternites 3–7. Previous confusion about the habitat preferences of *Aedes* (*Noth*.) *chathamicus* and the new species is clarified, with the former being found in coastal localities and the new species found inland

KNOW YOUR MOSQUITO

Aedes mcintoshi

- A floodwater mosquito widely distributed in Africa.
- Bite at night preferring cattle but will also readily bite humans outdoors.
- Major vector of Rift Valley Fever in Africa. -There is no vaccine for humans but there is one developed for cattle.
- The Female deposits eggs in the upper layer of soil in grassy sites likely to flood.
- Eggs can remain dormant for a long period and are desiccation resistant.
- Larvae are found in grassy pools and residual stream pools.

https://www.wrbu.si.edu/vectorspecies/mosquitoes/mcintoshi

AARONS TIPS FOR TAKING GREAT MOZZIE PICTURES

1. Know the part of the mosquito that can help in identification. Emphasize on these parts.
2. Good quality camera/phone camera and the right lens would be helpful. Those pictures were taken using an iPhone 8 and macro lens (bought for $5 from the Warehouse on clearance, hahaha).
3. Experiment with different angles. Try taking photos from the side or from a 45-degree angle, not just taking photos from above.
4. Lighting is one of the most crucial aspects of photography—too much light and your subject will lose detail, too little and it will come out dark and blurry. Shooting in the macro range requires decent lighting, so consider when and how you are positioning your images and watch out for shadows. Avoid low light as the camera will use a lower shutter speed and any movement will appear as motion blur. Use extra lighting like lamp or torch.
5. Don’t get too close. It will be a bit of trial and error to find the perfect distance for a close-but-not-blurry photograph. I've had the best success with keeping my phone about 30mm or more away from the mosquito. Once I capture a clear picture of the mosquito, I zoom in on the photo and take a screen shot.

Left pictures are the original shot, right pictures are the zoomed in version that was sent to NZBEL for preliminary identification.

Aaron Guanlao
Health Protection / Technical Officer
Environmental Health Team

Characteristics of a good series of Mozzie pictures:

- Different pictures are in focus in different mosquito/non-mosquito body parts.
- The light allows the viewer to interpret different colours.
- All body parts are distinguishable.

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

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