NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER – NOVEMBER 2019

WELCOME!

Kia Ora Koutou,

The summer season is here! The mozzie numbers are slowly increasing, and the first adults are coming to the lab mainly from Northland (thanks Debe for the very well-preserved samples you are sending to the lab).

At the beginning of the month, Mariana joined the Auckland HPOs for a Mega-survey. ARPHS conduct Mega-survey's to locate, treat and eliminate potential mosquito breeding sites around the Auckland International Airport.

In the news this month, read about how rising temperatures contribute to multiple outbreaks of dengue fever globally. Researchers demonstrated that insulin could be vital in targeting the spread of flaviviruses, due to its virus-suppressing downstream effects. Researches in various cities around the globe are gathering evidence that Wolbachia-treated mosquitos are reducing the number of dengue cases. Traditional soup broths are tested to prove their antimalaria properties and finally scientist are monitoring the behaviour of mosquitoes trying to bite a sleeping person, helping increase the efficiency of the mosquito insecticides used on bed nets and more.

The Lab is closed for routine activities during Statutory Holidays and open on days in between and following.
As always, the on-call response is available throughout the period including Public Holidays.

PS: *Aedes aegypti* and *Aedes albopictus* you are not welcome in New Zealand.

SURVEILLANCE

During November 1054 samples were collected by staff from 12 DHBs with 11% of the samples being positive, that is 0.4% more positive samples than last month. The samples included 92 positive larval samples and 26 adult samples, leading to a total of 526 adults and 2845 larvae identified over the past month (Table 1). The lab is waiting for one sample from Queenstown that got lost during transport. The dominant larval species this month, and this month last year was *Aedes notoscriptus.*

Compared to this same month last year, the total number of larvae and adult mosquitoes have shown an increase (18% and 35% respectively) (Table 1).
In total, nine mosquito species have been collected this month (Table 1), that is three more than last month. Northland DHB detected the highest number of mosquito species, which was eight (Figure 1).

Compared to last month, mosquito larvae have shown a decrease (23%), and adults have shown an increase (2187%) (Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during November 2018 & 2019

Species (common name)	Adults		Larvae	
	Nov 19	Nov 18	Nov 19	Nov 18
Aedes antipodeus (winter mosquito)	6	20	8	-
Ae notoscriptus (striped mosquito)	277	107	1581	1197
Ae subalbirostris (no common name)	2	-	10	3
Coquillettidia iracunda (no common name)	57	14	-	-
Co tenuipalpis (no common name)	1	-	-	-
Culex pervigilans (vigilant mosquito)	37	17	1093	1069
Cx quinquefasciatus (southern house mosquito)	141	178	102	43
Culex sp. (missing their abdomens, likely to be *quinquefasciatus* or *pervigilans*)	3	6	-	-
Culiseta tonnoiri (no common name)	1	-	-	-
Opifex fuscus (rock pool mosquito)	1	1	51	31
Total	**526**	**343**	**2845**	**2343**

The highest number of larvae sampled this month was in Northland DHB (1617), followed by Public Health South DHB (527) (Figure 1).

As expected *Aedes notoscriptus* has not been recorded this month, this year or last year in Public Health South (Figure 2).

Aedes notoscriptus larval numbers have shown an increase in five DHBs from this same month last year and a decrease in four DHBs and is absent in MidCentral DHB (Figure 2) this year.

Culex quinquefasciatus larval numbers have shown an increase in Auckland DHB from this same month last year and were collected this year in Community and Public Health, Hutt Valley Health, Taranaki Health and MidCentral DHB (Figure 2).

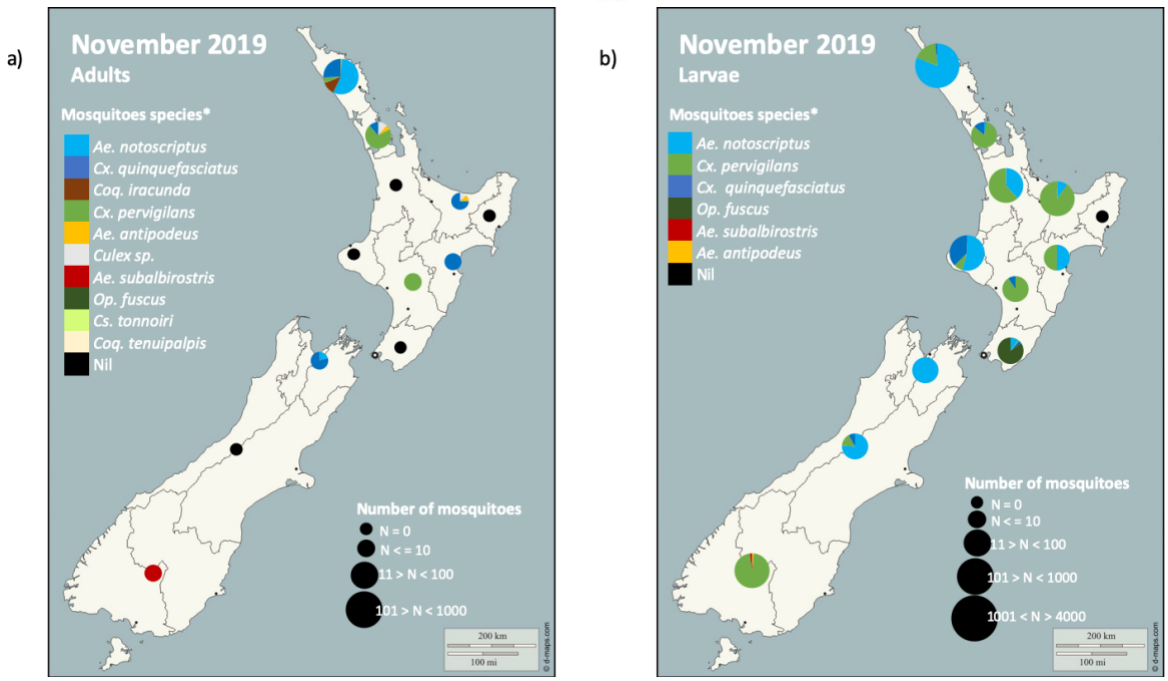


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the November 2019 surveillance period.
* The mosquito species are listed in order from the most abundant to the least abundant.
Please note that the markers represent the DHBs and not the specific sites where the samples have been taken.

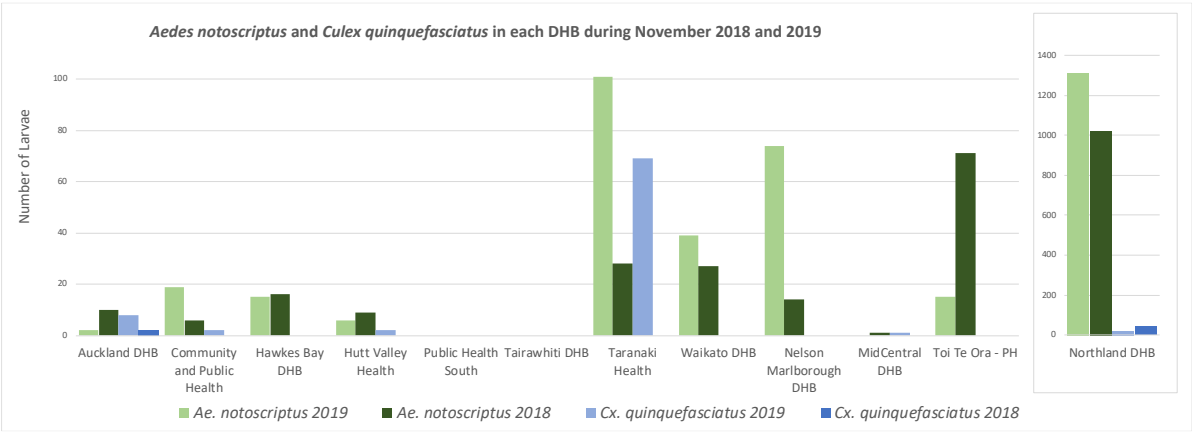


Figure 2. Comparison between introduced mosquitoes sampled in each DHB New Zealand during November 2018 and 2019.
*Please note the different scale for the number of larvae present in Northland in comparison to the other DHBs.

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

INCURSIONS AND INTERCEPTIONS

During November one suspected interception has been recorded. (Table 2).

Table 2. Suspected interception during November 2019

Date	Species	Location	Circumstances
17-11-2019	1 non-mosquito (fungus gnat)	SKU Ltd, Wiri, Auckland	Found alive in a shipment of bananas from Mexico

NEWS ARTICLES FROM AROUND THE WORLD

Global heating driving spread of mosquito-borne dengue fever

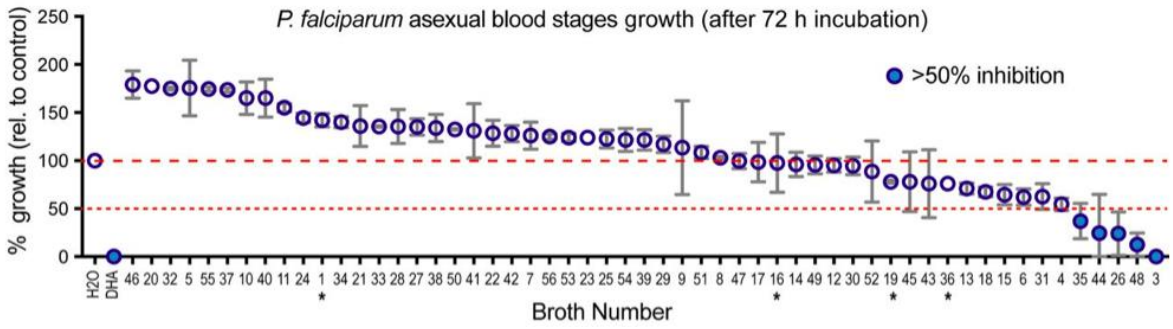
Asian tiger mosquito (*Aedes albopictus*). Photograph: Gordon Zammit/Alamy

Rising temperatures across Asia and the Americas have contributed to multiple severe outbreaks of dengue fever globally over the past six months, making 2019 the worst year on record for the disease. In 1970 only nine countries faced severe dengue outbreaks. But the disease, which is spread by mosquitoes that can only survive in warm temperatures, is now seen in more than 100 countries. There are thought to be 390 million infections each year. Read more.

Tiger mosquitoes spotted at three motorway parking stations in Belgium

Tiger mosquitoes have been spotted at three motorway parking stations in Wallonia and Flanders, researchers from the Antwerp Institute of Tropical Medicine confirm. A total of 200 eggs and three larvae of tiger mosquitoes were discovered in Namur, Sprimont and Marke."This is the first time that the tiger mosquito has appeared so far inland. The closest regions where the species is established are the Aisne area in France and the federal state of Baden-Würtemberg in Germany," Dr. Isra Deblauwe, the scientist responsible for the project that monitors mosquitoes in Belgium, explains in a press release. Read more.

Screen of traditional soup broths with reported antipyretic activity towards the discovery of potential antimalarials



A double-blind study to identify potential ingredients with antimalarial activity from traditional remedies with reported antipyretic properties. Recipes of clear broths, passed down by tradition in families of diverse ethnic origin, were sourced by school children. Broths were then tested for their ability to arrest malaria parasite asexual growth or sexual stage development in vitro. Clear broth extract was incubated with in vitro cultures of *Plasmodium falciparum* asexual or mature sexual stage cultures and assayed for parasite viability after 72 hours. Read more.

Could insulin prevent the spread of dengue, Zika and West Nile Virus?

Researchers from Washington State University (WA, USA) have suggested that insulin used at the mosquito level could help prevent the spread of Zika, West Nile and Dengue Virus. When the researchers fed mosquitoes with insulin-rich blood, the team demonstrated that this insulin-like receptor, when activated, suppressed cellular West Nile, dengue and Zika virus infections. Therefore, this provides a potential target for researchers hoping to develop interventions against the spread of these deadly diseases. Read more.

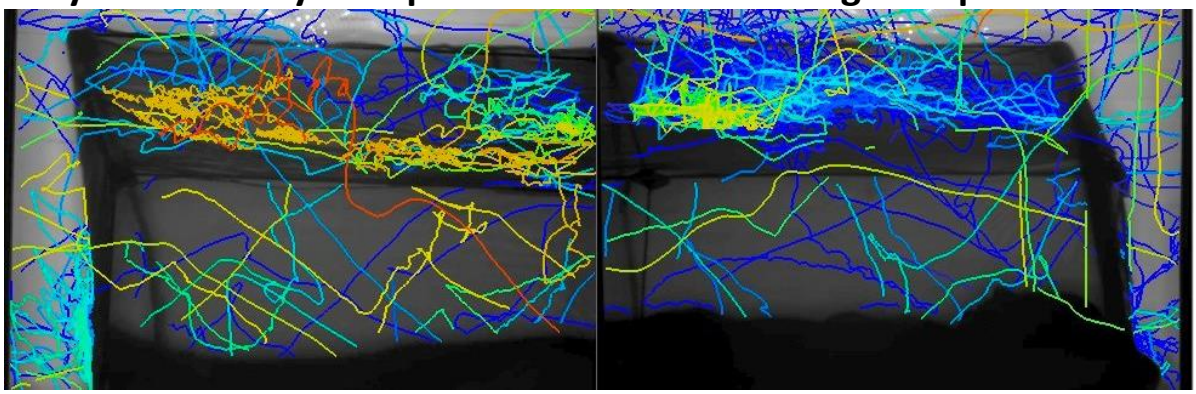
Mosquitoes armed with bacteria beat back dengue virus

In a handful of cities around the world, mosquitoes have been armed with a microscopic weapon against disease. The bacterium *Wolbachia pipientis* blocks the insects' ability to spread fearsome viruses such as dengue, Zika, and chikungunya. Since 2011, researchers have been injecting *Wolbachia* into the eggs of *Aedes aegypti* mosquitoes and releasing the hatched insects, which spread this protection to their offspring. But the field has been waiting for evidence that this approach actually reduces disease in people. Read more.

New facility to produce up to 5 million Wolbachia mosquitoes weekly in fight against dengue

SINGAPORE: A new S$5 million mosquito production facility opened on Monday (Dec 2), as part of the National Environment Agency's (NEA) latest efforts to combat dengue.
This comes in the wake of a surge of dengue cases in Singapore this year, with close to 15,000 cases and 20 deaths reported, said Senior Minister of State for Environment and Water Resources Amy Khor, who spoke at the opening. Read more.

Why I offered myself up as bait to blood-sucking mosquitoes



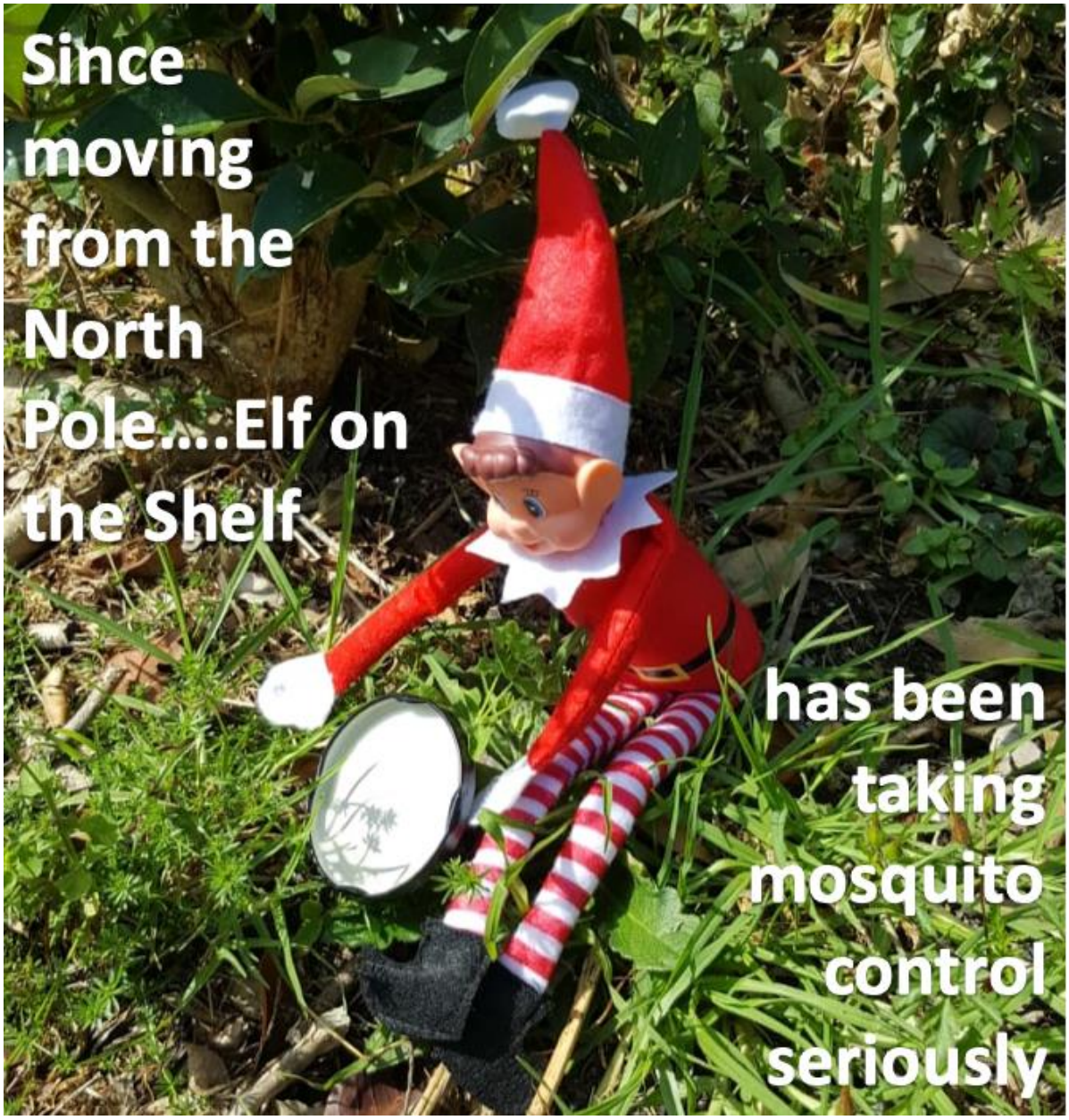
While the nets stop the insects reaching the sleeping humans, it is pyrethroid, a fast-acting insecticide that coats the bed nets, which make them so effective – and deadly. But as resistance to the chemical rises among mosquitoes, the race is on to update the technology. “Resistance was always inevitable,” said Philip McCall, professor of medical entomology at the LSTM. “But bed nets are so good, we cannot afford to lose them.” Read more.

Wiping out the daughters: Burkina Faso's controversial mosquito experiment

A mosquito catcher at work in Bana, Burkina Faso Photograph: Joost Bastmeijer

A radical experiment to genetically modify a strain of mosquito in order to stop them breeding malaria-carrying daughters is one of the latest efforts to tackle the deadly scourge of malaria. “We’re developing mosquitoes here that can only have sons. Those sons will also only be able to produce sons, causing the population of females, the only gender that bites, to dwindle until the mosquito is extinct,” says Moussa Namountougou, head of the insect farm of the Institut de Recherche et Sciences de la Santé (IRSS), just a few kilometres from the hospital. Read more.

This summer, remember to get rid of standing water to help keep mozzies away.



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).

World Health Organization – 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