NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER – JANUARY 2020

WELCOME!

Kia Ora Koutou,

Are you sure you are doing it right? NZBEL has proudly produced two new references for HPOs that can be found in the SMS web page. Sample sheet examples contains examples on how to enter accurate information into the Online National Mosquito Surveillance Database. Processing tyres traps contains a complete step by step guide on how to obtain the perfect larval samples to be sent to the lab. We hope you will find them very useful ☺

This month, in the "know your mosquito section", we have a very rare and special New Zealand mosquito species which larvae develops in very mineralised waters and adults are almost undistinguishable from *Culex pervigilans*. Do you know what mosquito are we talking about? Scroll down and you will find out. Also, test your knowledge about Zika with a CDC quiz.

In the news this month, scientists reveal how mosquitoes are able to sense human warmth and are planning to use this knowledge against them. Researches are testing a cream used to treat warts and skin cancer against vector-borne diseases. In NSW, the mosquito numbers had increased abruptly after the recent rains, while in the Marshall Islands the dengue outbreak took two lives.

SURVEILLANCE

During January 1247 samples were collected by staff from 12 DHBs with 23% of the samples being positive, that is 66% more positive samples than last month. The samples included 229 positive larval samples and 61 adult samples, leading to a total of 588 adults and 16710 larvae identified over the past month (Table 1). The dominant larval species this month this year and last year is *Culex quinquefasciatus*.

Compared to this same month last year, the total number of larvae and adult mosquitoes have shown a decrease (8% and 1175% respectively) (Table 1). The difference in adult mosquito numbers is highly influenced by the difference in adult samples taken in Northland. This year only 5 samples where obtained, in contrast with the 21 obtained last year.

In total, eight mosquito species have been collected this month (Table 1), that is one more than last month. Northland DHB detected the highest number of mosquito species, which was five (Figure 1).

Compared to last month, mosquito larvae and adult numbers have shown an increase (121% and 61% respectively) (Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during January 2019 & 2020

Species (common name)	Adults		Larvae	
	Jan 20	Jan 19	Jan 20	Jan 19
Aedes antipodeus (winter mosquito)	12	1	-	6
Ae australis (saltwater mosquito)	-	-	4	-
Ae notoscriptus (striped mosquito)	79	1046	2807	2729
Ae subalbirostris (no common name)	-	-	-	6
Coquillettidia iracunda (no common name)	3	213	-	-
Coquillettidia tenuipalpis (no common name)	-	1	-	-
Culex asteliae (no common name)	1	3	-	-
Culex pervigilans (vigilant mosquito)	35	509	3157	6422
Cx quinquefasciatus (southern house mosquito)	444	5636	10596	8703
Culex sp. (missing their abdomens, likely to be *quinquefasciatus* or *pervigilans*)	14	86	-	-
Opifex fuscus (rock pool mosquito)	-	1	146	107
Total	**588**	**7496**	**16710**	**17973**

The highest number of larvae sampled this month was in Community and Public Health (6821), followed by Toi Te Ora - PH (3281) (Figure 1).

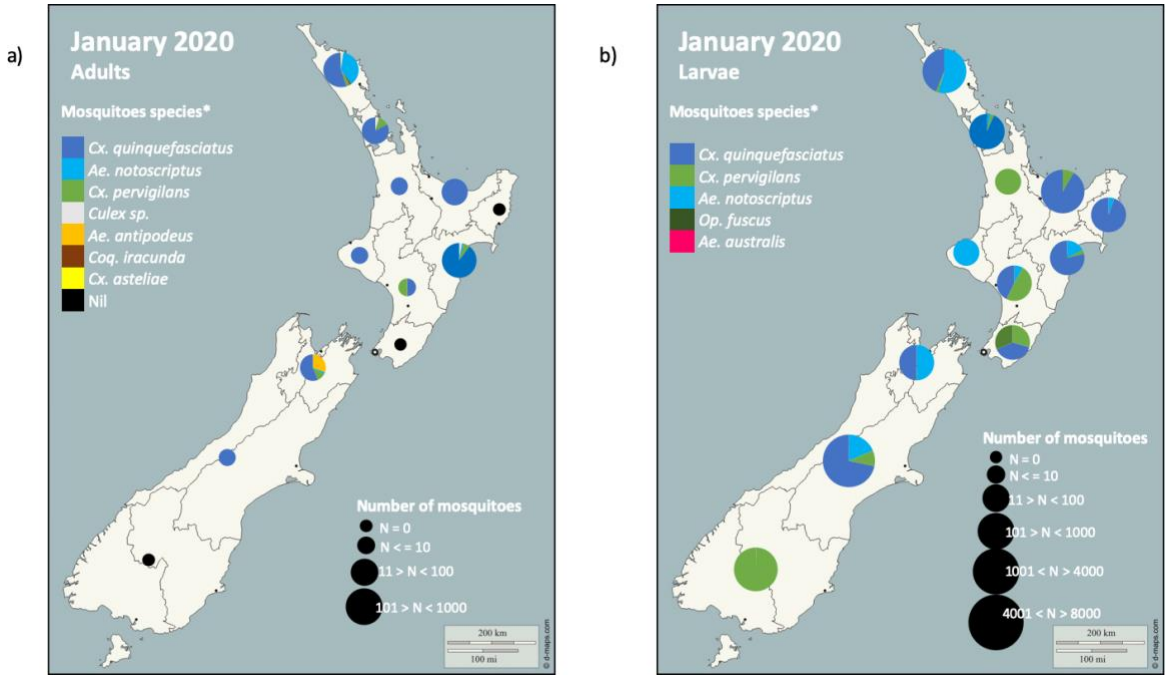


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the January 2020 surveillance period.
* The mosquito species are listed in order from the most abundant to the least abundant.
Please note that the markers represent the DHBs and not the specific sites where the samples have been taken.

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 three DHBs from this same month last year and a decrease in five DHBs and is absent in Waikato DHB and Toi Te Ora - PH (Figure 2) this year.

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

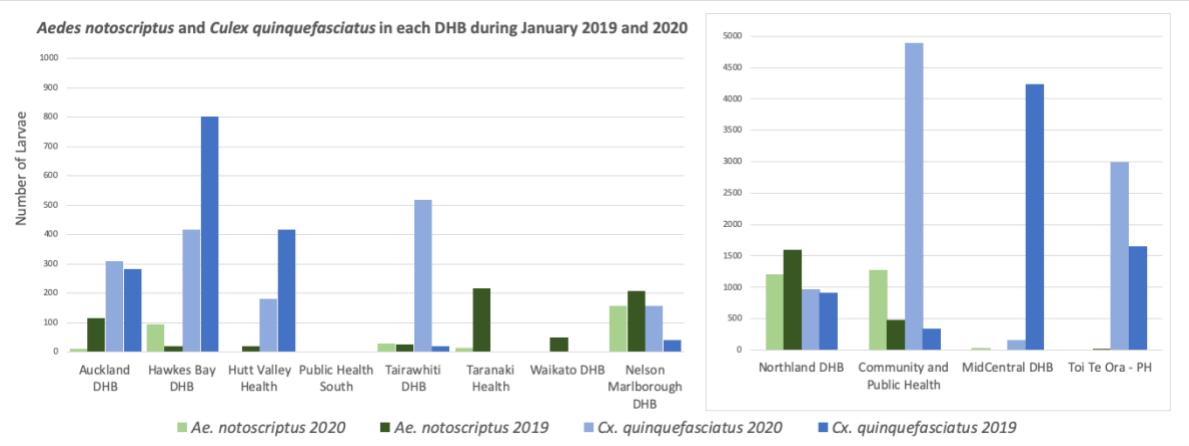


Figure 2. Comparison between introduced mosquitoes sampled in each DHB New Zealand during January 2019 and 2020.
*Please note the different scale for the number of larvae present in Northland, Community and Public Health, MidCentral DHB and Toi Te Ora – PH in comparison to the other DHBs.

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

INCURSIONS AND INTERCEPTIONS

During January two suspected interception has been recorded (Table 2).

Table 2. Suspected interceptions during January 2020.

Date	Species	Location	Circumstances
24.01.2020	1 Male *Culex* sp.	Harvey Norman, Christchurch	Found alive in a container of furniture and electronic goods from China by MPI.
30.01.2020	1 Female *Culex quinquefasciatus* 1 Male *Culex quinquefasciatus*	GVI Logistics, Harewood	Found alive in a TF not associated to any imported goods.

NEWS ARTICLES FROM AROUND THE WORLD

Mosquitoes engineered to repel dengue virus

Scientists have synthetically engineered mosquitoes that halt the transmission of the dengue virus. Biologists developed a human antibody for dengue suppression in Aedes aegypti mosquitoes, the insects that spread dengue. The development marks the first engineered approach in mosquitoes that targets the four known types of dengue, improving upon previous designs that addressed single strains.Read more.

Mosquito-borne diseases could be prevented by skin cream

A skin cream used to treat warts and skin cancer could help protect people against viral diseases such as Zika and dengue, according to new research from the University of Leeds. They used two different models to understand the effect of the skin cream - human skin samples and mice. In both cases, applying the skin cream acted like a warning signal which caused a rapid activation of the skin's immune response that fights any potential viral threats. This prevented the virus from spreading around the body and causing disease. Read more. Read the original article.

Mozzies on the increase in parts of NSW as rain, tides roll in after dry summer

Dr Cameron Webb's mosquito traps have gone from catching dozens of the insects to "thousands" at some sites.

The most recent NSW Arbovirus Surveillance and Mosquito Monitoring Report found a high number of mosquitoes had been detected in various areas at NSW. The recent rain and high tides have provided the ideal conditions for mosquito numbers to boom. Read more.

Dengue fever outbreak claims lives in the Marshall Islands

Red Cross volunteers have gone house-to-house on Ebeye Island to raise awareness about dengue fever. Photo / Giff Johnson

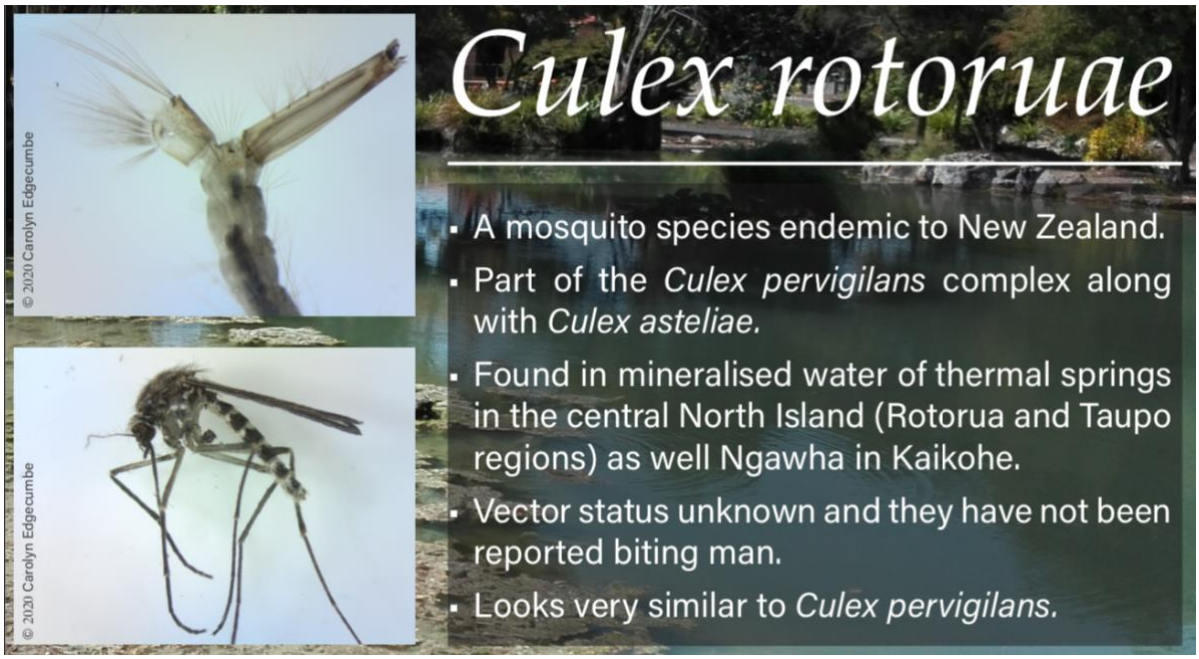
Two Marshall Islanders died from dengue fever this week at Majuro hospital emphasizing the severity of the outbreak now in its eighth month. A primary-aged girl from Arno, a remote atoll about 15 miles from the capital Majuro, and a 67-year-old woman in Majuro are the latest victims bringing the death toll to three since the outbreak started last July on Ebeye

Island. The number of confirmed and suspected cases of dengue fever has risen to over 2,500. Read more.

How mosquitoes find humans to bite

New research reveals the molecular mechanism that draws the insects to human warmth. The discovery holds out the possibility of one day being able to fool or knock-out the insects' temperature sensors so they don't spread disease. Read more. Read original article.

KNOW YOUR MOSQUITO



FROM THE Centers For Disease Control And Prevention

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