NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER – AUGUST 2020

WELCOME!

Kia Ora Koutou,

World Mosquito Day is observed annually on the 20th August in commemoration of British doctor Sir Ronald Ross, who discovered in 1897 that malaria is transmitted between humans through the bite of female mosquitoes, and laid the foundation for the method of combating the disease.

Last month we announced that NZBEL was starting the preparations to visit all PHUs, with Northland the first to be visited. However, with the country coming back into alert level two, we have decided to be cautious and postpone the visits until we are at alert level one. As mentioned before, in preparation for the visit, managers will receive emails from the MoH and the lab. We are very much looking forward to seeing you all soon!

In the news this month, the Centre for Disease Control and Prevention (CDC) warns about an urban malaria vector that invaded Djibouti and Ethiopia and is spreading to Eastern Africa. In Florida, after a process which took almost a decade, the authorities have approved the release of millions of genetically modified mosquitoes. Meanwhile in Indonesia, more than two years after completion of mosquito releases in the city of Yogyakarta, Wolbachia remains at a very high level in the local mosquito population. In Sweden, scientist have created the first cell atlas of mosquito immune cells to understand how mosquitoes fight malaria and other infections, while in the USA the CDC discovers active ingredient which repels and kills ticks and mosquitoes.

In the mosquito of the month section and in line with the focus of world mosquito day, we want to call attention to the urban malaria vector: *Anopheles stephensi* which is spreading rapidly through Africa.

SURVEILLANCE

During August 702 samples were collected by staff from 12 DHBs (Figure 1). The samples included 48 positive larval samples and 3 positive adult samples, leading to a total of 37 adults and 2042 larvae identified over the past month (Table 1). The dominant larval species this month, this year and last year is *Aedes notoscriptus*.

Compared to this same month last year, the total number of larvae and adults has shown an increase (26% and 92% respectively, see Table 1).

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

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

Species (common name)	Adults		Larvae	
	Aug 20	Aug 19	Aug 20	Aug 19
Aedes notoscriptus (striped mosquito)	-	-	1594	1398
Culex pervigilans (vigilant mosquito)	3	2	338	53
Cx quinquefasciatus (southern house mosquito)	33	1	86	49
Culex sp. (missing their abdomens, likely to be *quinquefasciatus* or *pervigilans*)	1	-	-	-
Opifex fuscus (rock pool mosquito)	-	-	24	12
Total	**37**	**3**	**2042**	**1512**

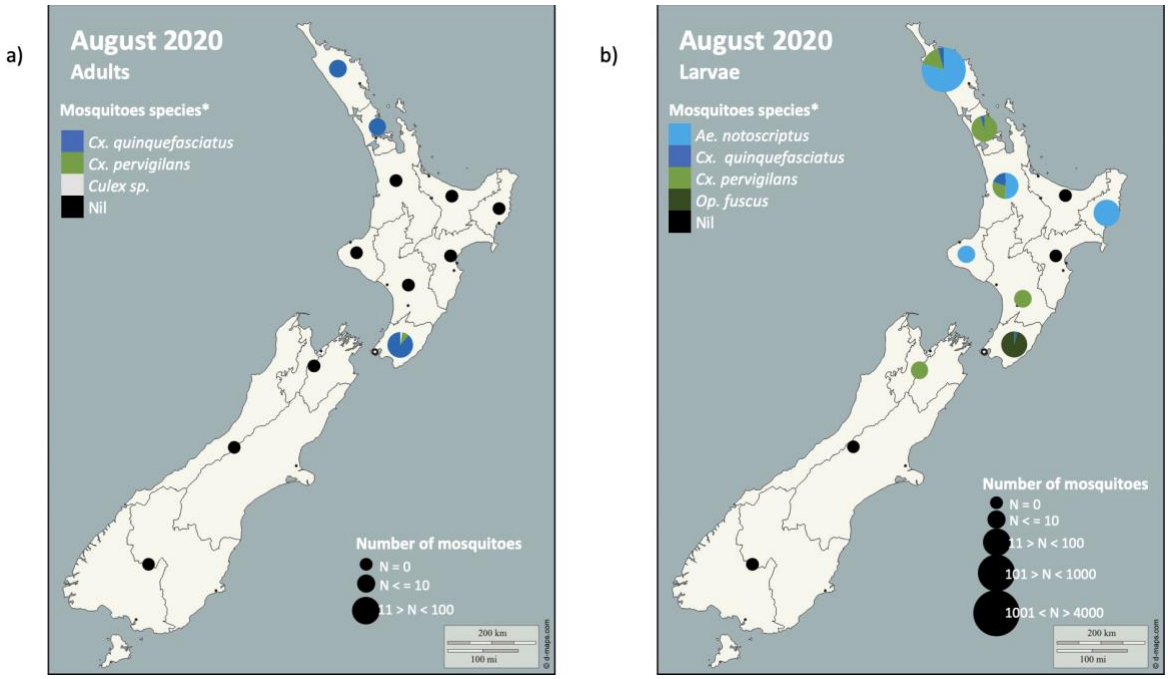


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the August 2020 surveillance period.

* 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.

Compared to last month, mosquito larval number have shown a decrease (58%), while adult numbers have shown an increase (147%) (see Table 1).

The highest number of larvae sampled this month was obtained in Northland DHB (1923) followed by Tairawhiti DHB (43 larvae) (Figure 1).

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

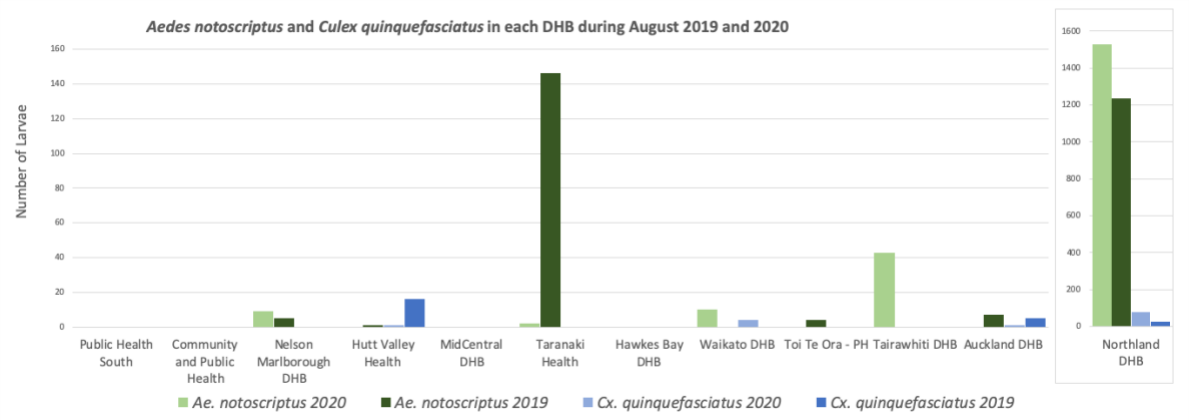


Figure 2. Comparison between introduced mosquitoes sampled in each DHB New Zealand during August 2019 and 2020. *Please note the different scale for the number of larvae present in Northland DHB in comparison to the other DHBs.

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 four DHBs from this same month last year and a decrease in three DHBs (Figure 2).

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

INCURSIONS AND INTERCEPTIONS

During August two suspected interception have been recorded (Table 2).

Table 2. Suspected interceptions during August 2020.

Date	Species	Location	Circumstances
07.08.2020	Non-mosquitoes	Pengellys Limited, Hornby, Christchurch.	Found dead by MPI in a container of barrels of insecticide, the suspected mosquito was contained in some of the insecticide residue.
20.08.2020	23 female *Culex quinquefasciatus* 8 male *Culex quinquefasciatus* 3 female *Culex pervigilans* 1 *Culex* sp. (only thorax)	Brentwood Transport Ltd. 11 Barnes Street, Seaview, Lower Hutt	Found originally dead in a container of gib board from Sydney. The container was devanned in January 2020. The sample was obtained by MPI while auditing the TF and checking the quarantine waste disposal.

NEWS ARTICLES FROM AROUND THE WORLD

World Mosquito Day 2020: The Spread of *Anopheles stephensi* and the Fight Against the World's Deadliest Animal

In the enduring struggle against malaria, the primary enemy is, of course, the mosquito – The world's deadliest animal. In recognition of World Mosquito Day 2020, we call attention to the troubling spread of one mosquito species in particular: *Anopheles stephensi*. Read more.

First cell atlas of mosquito immune cells created to help fight malaria

Scientists have created the first cell atlas of mosquito immune cells, to understand how mosquitoes fight malaria and other infections. Researchers from the Wellcome Sanger Institute, Umeå University, Sweden and the National Institutes of Health (NIH), USA, discovered new types of mosquito immune cells, including a rare cell type that could be involved in limiting malaria infection. They also identified molecular pathways implicated in controlling the malaria parasite. Read more.

Genetically engineered mosquitoes to be released in Florida Keys

750 Million Genetically Engineered Mosquitoes Approved for Release in Florida Keys

Mosquitoes are known to be vectors or bearers of several viral and protozoal infections such as dengue, Zika, yellow fever, Chikungunya, and malaria. These infections are known to

infect and even kill millions around the world each year. In order to tackle this vector-borne menace, researchers have genetically engineered mosquitoes that could replace the infection carrying species of the mosquitoes. Read more. Watch a video about the project here: https://play.stuff.co.nz/details/ 6183252158001

Breakthrough in eliminating dengue, other mosquito-borne diseases

A 27-month trial in Indonesia of a unique method of mosquito control shows that the strategy can reduce the incidence of dengue — a mosquito-borne viral disease of the tropics that threatens nearly half the world's population — by 77%. The method, which employs *Aedes aegypti* mosquitoes infected by bacteria called Wolbachia, effectively prevents dengue-infected mosquitoes from passing on the virus when they bite people. Read more.

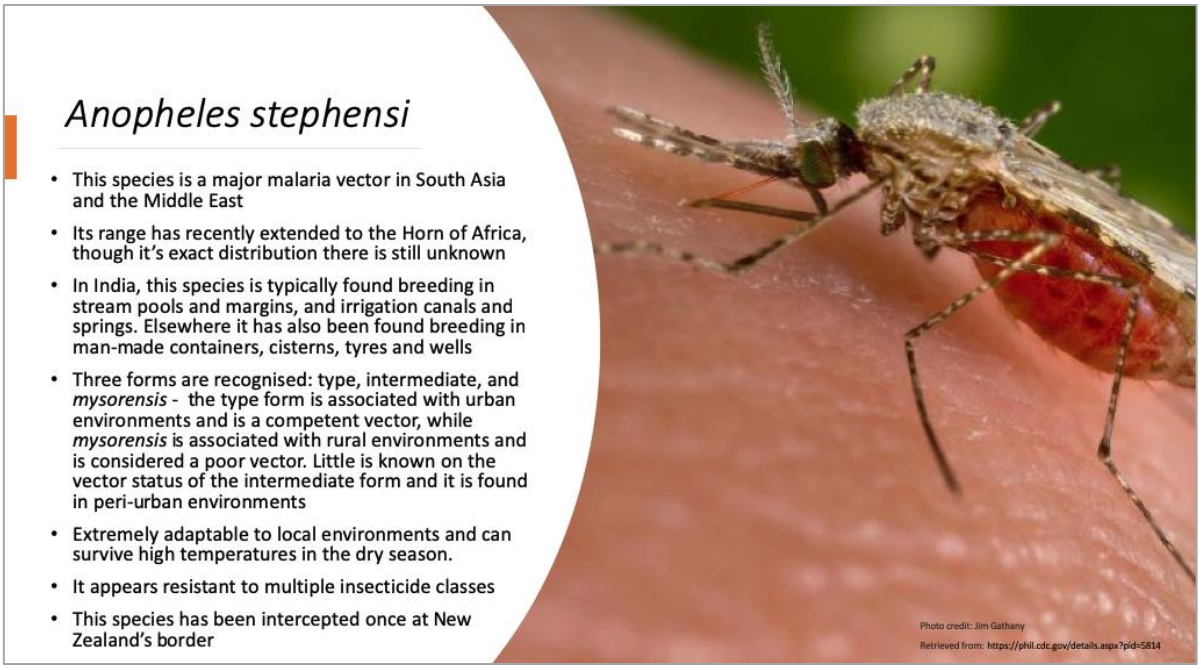
Nootkatone Now Registered by EPA -CDC discovers active ingredient for development into new mosquito/tick insecticides and repellents

A new active ingredient, discovered and developed by the Centers for Disease Control and Prevention (CDC), has been registered by the Environmental Protection Agency (EPA) for use in insecticides and insect repellents. The new ingredient, nootkatone, repels and kill ticks, mosquitoes, and a wide variety of other biting pests. Nootkatone is responsible for the characteristic smell and taste of grapefruit and is widely used in the fragrance industry to make perfumes and colognes. It is found in minute quantities in Alaska yellow cedar trees and grapefruit skin. Read more.

Increased Threat of Urban Malaria from *Anopheles stephensi* Mosquitoes, Africa

Malaria continues to be a major health threat in Africa, mainly in rural areas. Recently, the urban malaria vector *Anopheles stephensi* invaded Djibouti and Ethiopia, potentially spreading to other areas of Africa. Urgent action is needed to prevent urban malaria epidemics from emerging and causing a public health disaster. Read more.

KNOW YOUR MOSQUITO



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