



BORDER HEALTH NEWSLETTER - JANUARY 2019

WELCOME!

Kia Ora Koutou

This January we have recorded even more mosquitoes than this same month last year and February is looking warm and cosy for mozzies, so get ready for more!

In the news, scientist are finding new and quick ways to detect vector-borne diseases in patients and researchers have found a molecule made by a bacteria found in soil nematodes that can repel mosquitoes as effectively as DEET.

Do not forget to visit our direct access to risk maps and diseases outbreaks.

In the section “Know your mosquito” learn about *Aedes notoscriptus*, an introduced mosquito in New Zealand often mistaken for *Aedes aegypti* and in the section “A bite of humour” have fun with Gary Clark’s cartoons.

OPORTUNITY

Institute Pasteur launches a new session of the MOOC Medical Entomology#2, a free online course on insect and tick vectors and transmission of pathogens. This MOOC will start on **March 18th 2019** for 6 weeks. You can subscribe now at:

<https://www.fun-mooc.fr/courses/course-v1:pasteur+96003+session02/about>

SURVEILLANCE

During January 1316 samples were collected by staff from 12 DHBs with 386 positive samples. This included 91 adult samples and 295 larval samples, leading to a total of 7496 adults and 17973 larvae identified over the past month (Table 1).

Table 1. Adult and larvae numbers found by the New Zealand surveillance program during January of last year and this year.

Species (common name)	Adults		Larvae	
	Jan. 19	Jan. 18	Jan. 19	Jan. 18
<i>Aedes notoscriptus</i> (striped mosquito)	1046	2434	2729	2509
<i>Ae. antipodeus</i> (winter mosquito)	1	18	6	0
<i>Ae. Subalbirostris</i>	0	0	6	1
<i>Coquillettidia iracunda</i>	213	84	0	0
<i>Coq. Tenuipalpis</i>	1	2	0	0
<i>Culex pervigilans</i> (vigilant mosquito)	509	667	6422	4959
<i>Cx. quinquefasciatus</i> (southern house mosquito)	5636	1927	8703	10313
<i>Culex sp.</i> (missing their abdomens, likely to be <i>quinquefasciatus</i> or <i>pervigilans</i>)	86	544	0	0
<i>Cx. asteliae</i>	3	0	0	0
<i>Culiseta tonnoiri</i>	0	1	0	0
<i>Opifex fuscus</i> (rockpool mosquito)	1	1	107	19
Total	7496	5678*	17973	17801

* This total now includes the 544 *Culex sp.* that have been recorded during January 2018.

Compared to this same month last year, both adult and larvae numbers have shown an increase (24% and 1% respectively, Table 1).

In total 10 mosquito species have been found this month, that is two more than last month. Northland DHB was the most specious DHB this month with 7 mosquito species (three more than last month), followed by Hutt Valley and Toi Te Ora DHBs with 5 mosquito species each (Figure 1).

MidCentral is the DHB with the highest numbers of larvae (4230) showing a 422900% increase compared to last month (only 1 larva was registered on December 2018), followed by Toi Te Ora with 3795 larvae recorded, that is 480% more than last month. Northland is by far the DHB with the highest number of adults (6760), followed by Auckland DHB (537; Figure 1).

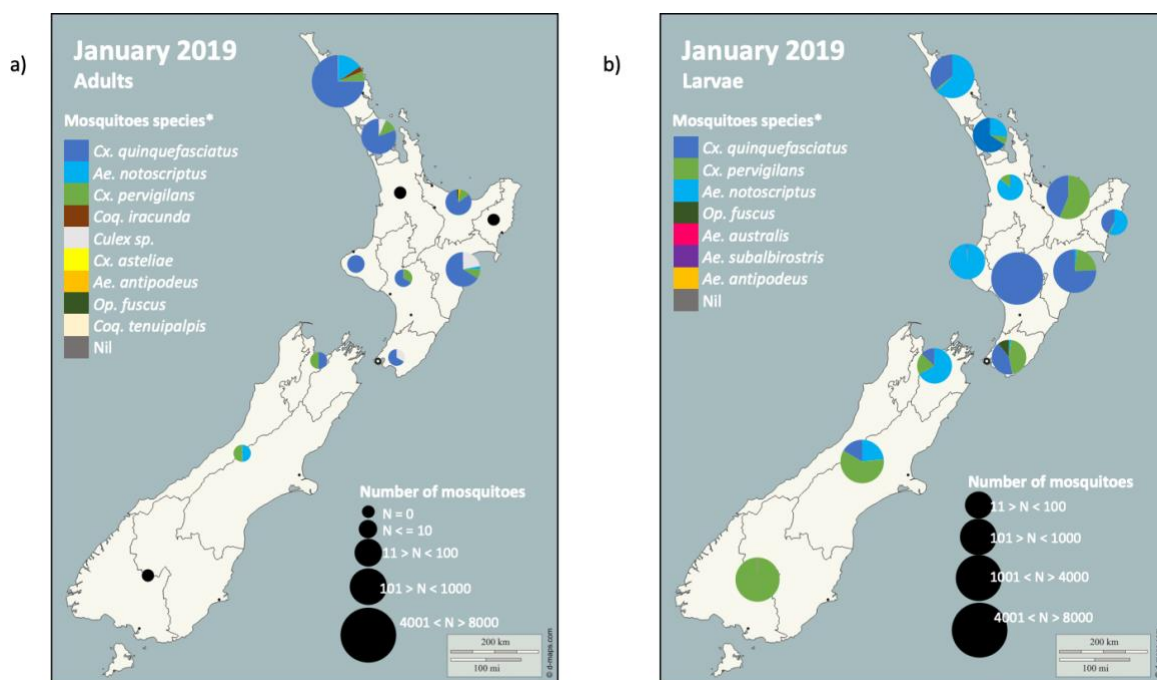


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the January 2019 surveillance period.

* 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.

The introduced species for January are represented by *Aedes notoscriptus*, *Culex quinquefasciatus* and *Aedes australis* (Table 1, Figure 1).

As expected *Ae. notoscriptus* and *Culex quinquefasciatus* have not been recorded during January this year and last year in Public Health South, with routine sampling showing that it has not yet established populations in this area (Figure 2).

Larvae numbers for the most representative introduced mosquitoes *Aedes notoscriptus* and

Culex quinquefasciatus, have shown opposite patterns this month compared to the same month last year, with *Ae. notoscriptus* showing an 17% increase and *Cx. quinquefasciatus* a 33% decrease (Table 1).

Aedes notoscriptus larval numbers have shown an increase in 4 DHBs from this same month last year (Auckland, Community and Public Health, Taranaki Health and Northland), and shown a decrease in Hawkes Bay, Waikato, Nelson Marlborough and Toi Te Ora – PH. In comparison with this same month last year, *Ae. notoscriptus* was detected in Hutt Valley Health and Tairawhiti and was not detected in Mid Central DHB (Figure 2).

Compared to this same month last year, *Culex quinquefasciatus* larval numbers have shown an increase in 3 DHBs (Hawkes Bay, Northland and MidCentral) and shown a decrease in 5 DHBs (Auckland, Community and Public Health, Hutt Valley Health, Nelson Marlborough and Toi Te Ora – PH; Figure 2). *Cx. quinquefasciatus* was detected in Taranaki Heath and Tairawhiti this month in comparison with this same month last year and is now absent in Waikato (Figure 2).

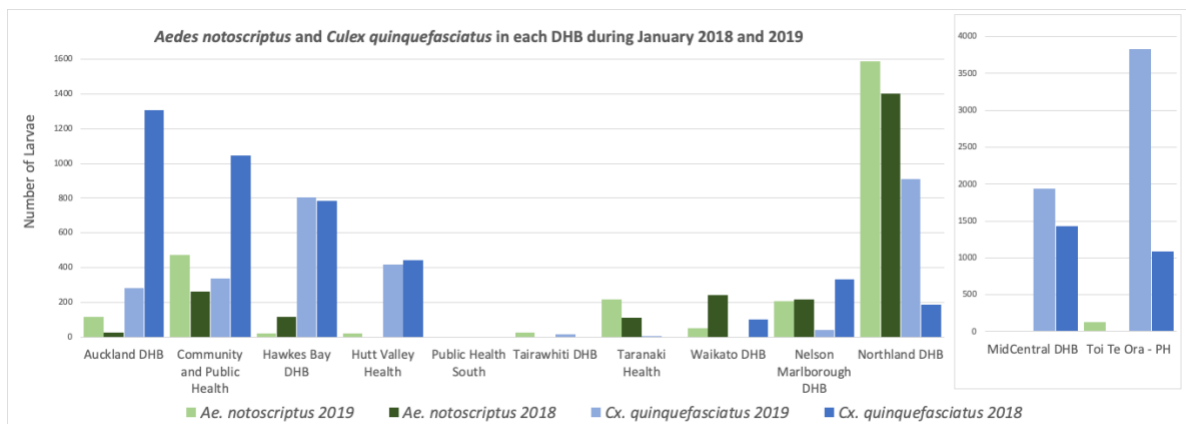


Figure 2. Comparison between introduced mosquitoes sampled in each DHB New Zealand during January 2018 and January 2019.

* Please note the different scale for the number of larvae present in MidCentral DHB and Toi Te Ora – PH in comparison to the other DHBs.

INCURSIONS AND INTERCEPTIONS

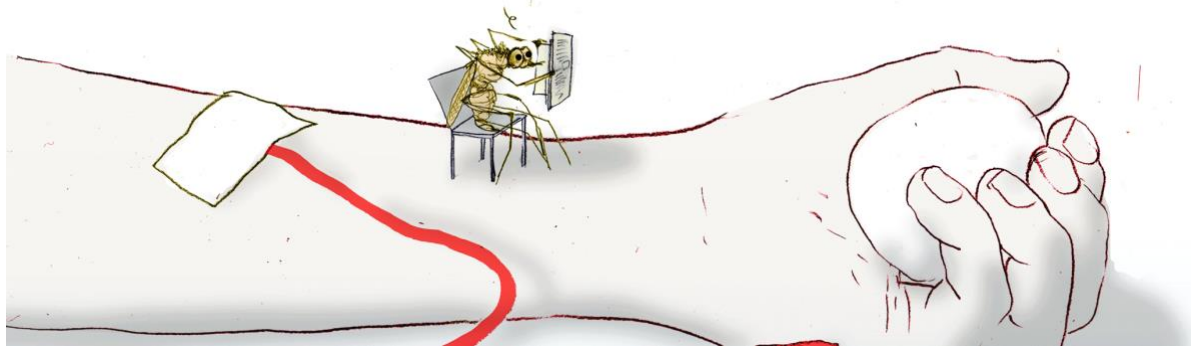
During January, 3 suspected interceptions have been recorded (Table 2). Not unwanted or exotic species have been intercepted this month.

Date	Species	Location	Circumstances
30.01.2019	1 Female <i>Culex quinquefasciatus</i>	Ports of Auckland	Found alive by MPI staff in imported car at the Ports of Auckland.
26.01.2019	1 Adult Non-mosquito	Eastern Cape Ship -Tauranga Port	Found dead on ship when carrying out an inspection
24.01.2019	1 Female <i>Culex pervigilans</i>	Christchurch Airport	Found by MPI alive, flying around in MPI the staff toilet in Airport.



NEWS ARTICLES FROM AROUND THE WORLD

Scientists' "Craziest Experiment Possible" Actually Works On Mosquitoes



Credit: Leif Parsons for NPR

Neurobiologists at Rockefeller University have found that human diet drugs can also act as an appetite suppressant in mosquitoes, which limits the number of eggs a female will lay in her lifetime, through limiting the number of times she feeds. [Read more.](#)

Bacterial compounds may be as good as DEET at repelling mosquitoes

Researchers have found a molecule made by a bacteria (*Xenorhabdus budapestensis*) found in soil nematodes can repel *Aedes aegypti*, *Anopheles gambiae*, and *Culex pipiens*. The bacteria works as a symbiote, weakening the hosts immune system when the nematode finds an insect to parasitise. The bacteria was found to be as effective as DEET (diethyl-3-methylbenzamide), a compound widely used in insect repellents. [Read more.](#)

Groundbreaking study uses small chip to immediately detect Zika, stage of infection



The Texas Biomedical Research Institute in San Antonio is working with a team at the University of California Santa Cruz to help find an immediate way to diagnose Zika and determine the infection's stage. The chip is only a few inches long, but local researchers are proving its power by taking bodily fluids infected with Zika and letting the chip detect the virus. Very small amounts of fluid, and the device just looks at what's in the fluid and detects it immediately. [Read more.](#)

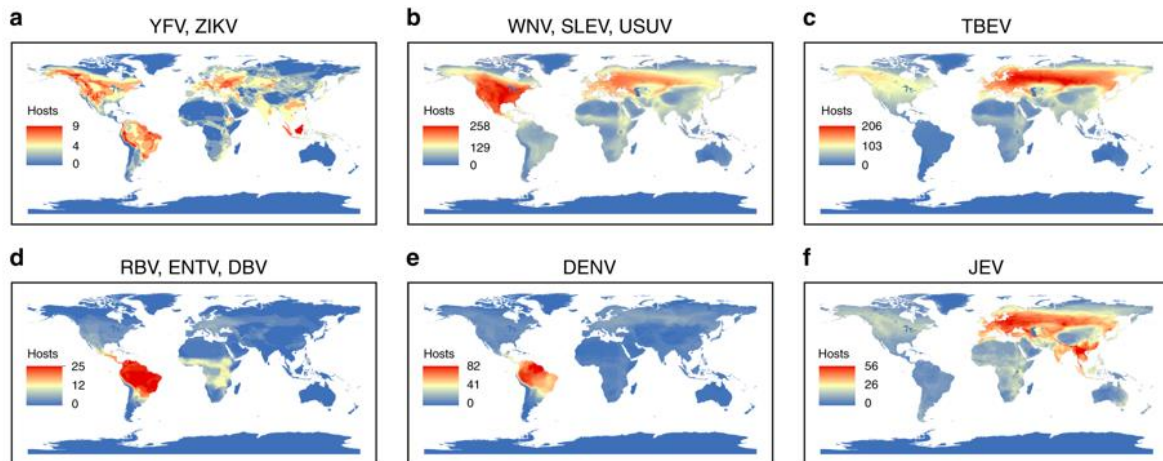


Fighting human disease with birth control ... for mosquitoes



Researchers at the University of Arizona have discovered a protein in mosquitoes that is critical to the process of producing viable eggs and could pave the way for "mosquito birth control." When researchers selectively blocked the activity of the protein in female mosquitoes, the mosquitoes laid eggs with defective egg shells, leading to the death of the embryos inside. [Read more](#), [other option](#), [original article](#).

Predicting wildlife reservoirs and global vulnerability to zoonotic Flaviviruses



Geographical distribution of predicted flaviviral host richness.

Researchers created a model based on known non-human hosts of flaviviruses and used common important host traits (including environmental and physiological features) to predict possible host species for these flaviviruses. This included potential host species that have not been observed to carry the viruses and could be a useful tool to monitor potential wildlife hosts. [Read more](#).

ERADA launches first diagnostic saliva test for malaria

ERADA Technology Alliance Ltd (ERADA) have developed a saliva based test to detect malaria in people before symptoms appear. The Saliva-based Malaria Asymptomatic and Asexual



Rapid Test (SMAART) detects a protein that is essential for the parasites survival which should avoid the influence of mutations, which has affected detection in blood tests. [Read more.](#)

Insecticide resistance genes affect *Culex quinquefasciatus* vector competence for West Nile virus

Resistances to insecticides has previously been reported to have an impact on the mosquitoes and their pathogens, however the vector competence for arboviruses had not been look at. Researchers from the Institut Pasteur looked at how two different insecticide resistances mecanisms in *Culex quinquefasciatus* effected vector competence for Rift Valley Fever virus and West Nile virus. They found no significant effect for Rift Valley Fever virus. However, in West Nile virus they found that insecticide resistance amplified the amount of virus in the mosquitoes body, and enhanced the vector competence for West Nile virus. [Read more.](#)

KNOW YOUR MOSQUITO

Aedes notoscriptus (striped mosquito)

- Introduced to New Zealand in the 1920's and now found as far south as Lyttleton.
- Known to carry Dog Heartworm, Ross River Virus, Barmah Forest Virus, Murray Valley Encephalitis and Dengue Fever.
- A very domesticated mosquito which breeds in artificial containers such as plant pots, tyres and gutters. Also breeds in natural containers such as tree holes, leaf axils and bromeliads.
- Aggressive biter which feeds in both the day and night time.
- Looks very similar to *Aedes aegypti* but is distinguished by its white band on the proboscis and pale stripe on each femur.



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. Choose a country to display the current distribution of Malaria.

DISEASE OUTBREAKS

[Epidemic and emerging disease alerts in the Pacific region](#) - Produced by the Pacific Community (SPC) for the Pacific Public Health Surveillance Network (PPHSN).

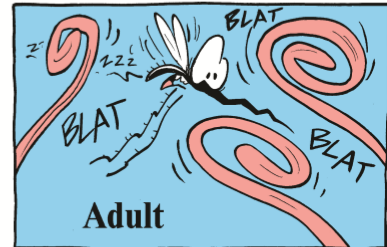
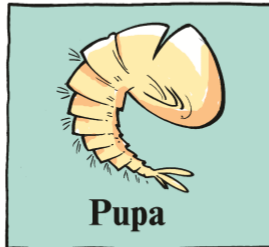
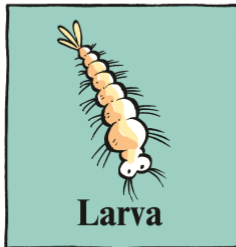
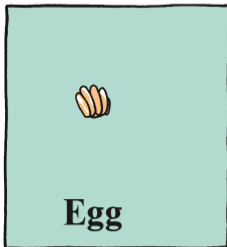
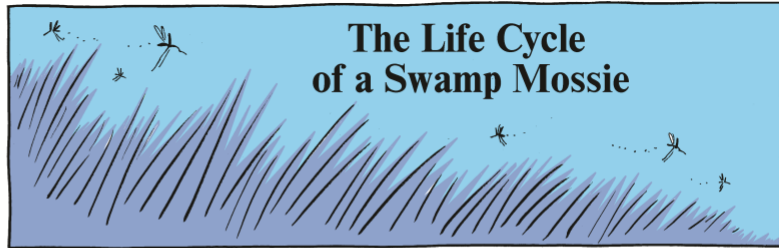


[World Health Organization](#) – World Health Organization.

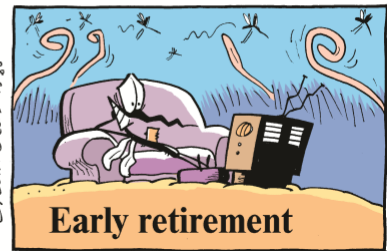
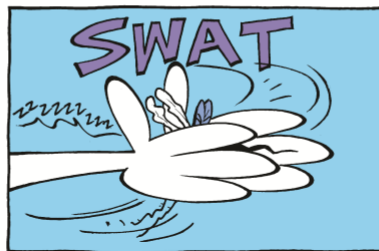
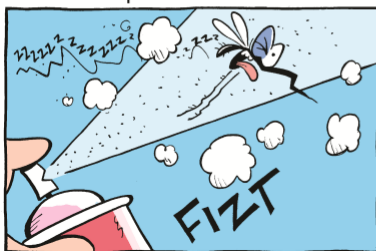
[Public Health Surveillance](#) - Institute of Environmental Science and Research (ESR) -Information for New Zealand Public Health Action.

A BITE OF HUMOUR

SWAMP
by Gary Clark



www.swamp.com.au



Thanks very much Gary Clark for this cartoon!

If you wish to know more about Gary and the Swamp [click here](#).