



## BORDER HEALTH NEWSLETTER

NOVEMBER 2023

### NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

Now that bed bugs are spreading in Europe, especially in France where the Olympic Games will be held next year, we have prepared some information for you to learn more about bed bugs. Do not miss next month's newsletter to learn how to protect yourself against these creepy creatures. Also, scroll down to have a look at the new section "This is how we do it" to learn about the best way to transfer mosquitoes from a BG catch bag, Light Trap catch cup or sort mosquitoes from non-mosquitoes without damaging them.



In the news this month, read about how the warmer and wetter weather has made Europe more welcoming to mosquitoes and the deadly pathogens they transmit. Then, take a look at how a simple soap solution could be a game-changer in the fight against malaria. Also, read about the use of mathematical models to analyse dengue virus transmission during the Indonesia Wolbachia trial, showing the potential for greater dengue reduction. Then head across the ditch to read about the use of sentinel chickens as a first line of defence against mosquito-borne disease in South Australia and also surprise yourself by learning about an Australian mosquito that targets the nostrils of tree frogs for a blood meal. Finally, read about the London library that was forced to close due to a bed bug infestation.



## BORDER HEALTH NEWSLETTER

We wish you all a safe and happy time over the Christmas and New Year break

The NZB lab is closed for routine activities during Statutory Holidays and open on days between and following.

As always, the on-call response is available throughout the period including Public Holidays.

As always, *Aedes aegypti*, *Ae albopictus* and friends are not welcome in New Zealand

Happy reading!

### SURVEILLANCE

During November a total of 1226 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 136 positive larval samples and 16 positive adult samples, leading to a total of 7115 larvae and 21 adults identified over the past month (Table 1). *Aedes notoscriptus* is the dominant larval species this month, which is the same as last month and this month last year (Table 1).

In total, seven mosquito species have been collected this month (Table 1), two more than collected last month.

Compared to this same month last year, the total number of larvae has shown an increase (20%) while adult numbers have shown a decrease (99%) (Table 1).

Compared to the previous month, larval numbers have shown an increase (53%), while adult numbers have shown a decrease (16%).

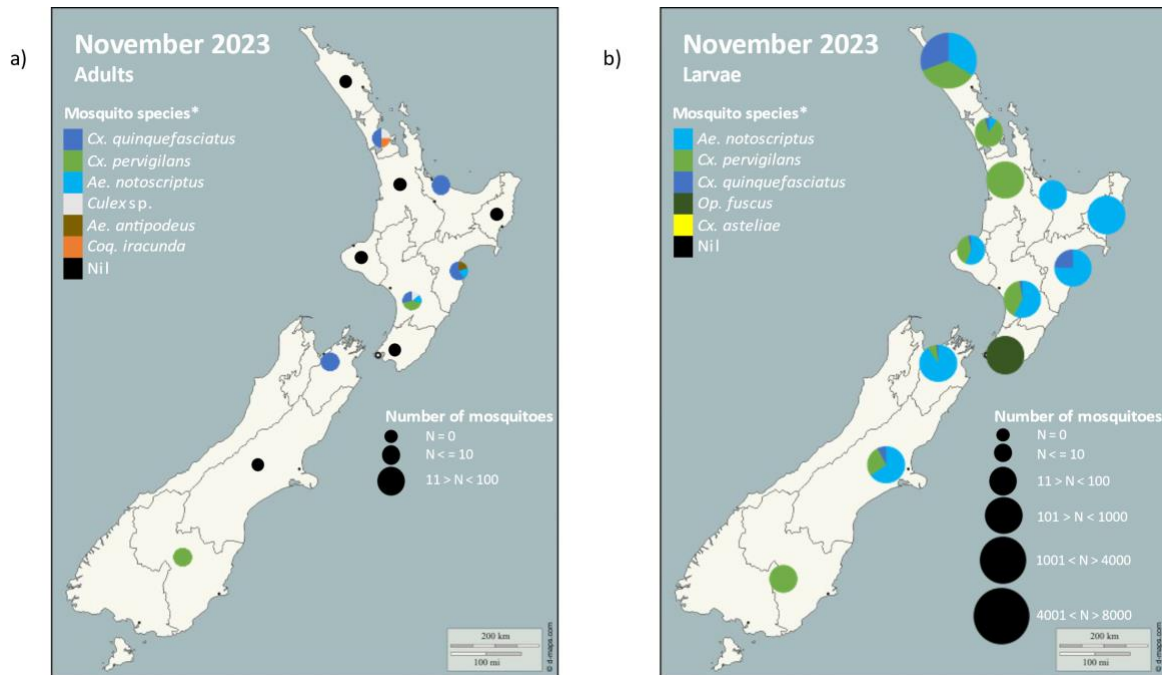
**Table 1.** Adult and larvae sampled by the New Zealand surveillance program during November 2022 & 2023

Species (common name)	Adults		Larvae	
	Nov 23	Nov 22	Nov 23	Nov 22
<i>Aedes antipodeus</i> (winter mosquito)	1	1770	-	-
<i>Ae notoscriptus</i> (striped mosquito)	2	96	2658	2706
<i>Coquillettidia iracunda</i> (no common name)	1	65	-	-
<i>Coq tenuipalpis</i> (no common name)	-	5	-	-
<i>Culex asteliae</i> (no common name)	-	-	1	10
<i>Cx pervigilans</i> (vigilant mosquito)	4	136	2495	2345
<i>Cx quinquefasciatus</i> (southern house mosquito)	11	71	1808	801
<i>Culex</i> sp.	2	20	-	1
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	153	65
<b>Total</b>	<b>21</b>	<b>2163</b>	<b>7115</b>	<b>5928</b>



# BORDER HEALTH NEWSLETTER

The highest number of larvae sampled this month was obtained in Northland (5707 larvae) followed by MidCentral (278 larvae) (Figure 1).

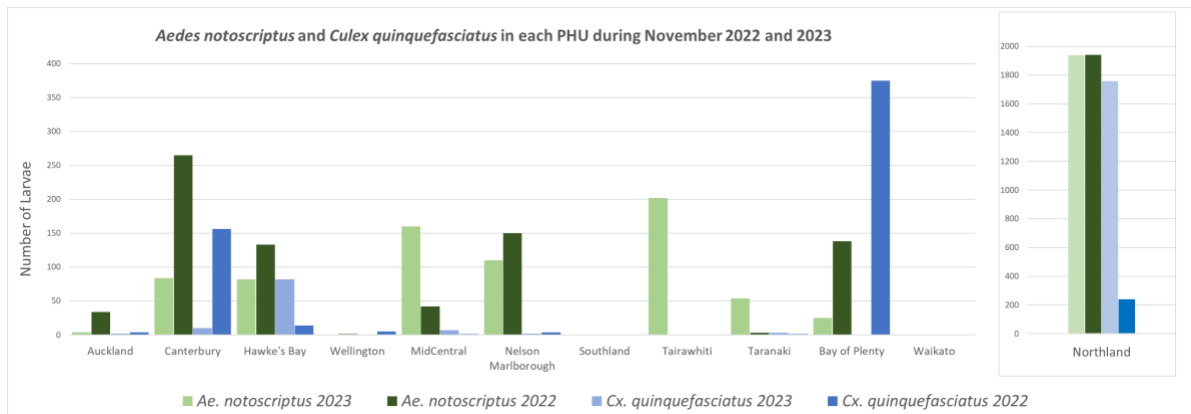


**Figure 1.** Total mosquito adults (a) and larvae (b) sampled in New Zealand during November 2023 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.  
 \* The mosquito species are listed in order from the most abundant to the least abundant.

*Aedes notoscriptus* larval numbers have shown an increase in three PHUs and a decrease in seven PHUs from this same month last year (Figure 2).

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

*Culex quinquefasciatus* larval numbers have shown an increase in four PHUs and a decrease in five PHUs from this same month last year (Figure 2).



**Figure 2.** Comparison between introduced mosquito species sampled in each PHS during November 2022 and 2023.  
 \*Please note the different scale for the number of larvae present in Northland in comparison to the other PHSs.



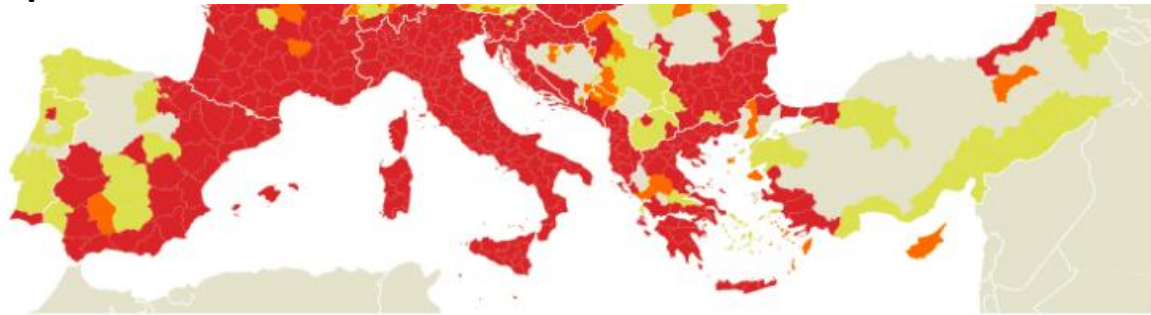
# BORDER HEALTH NEWSLETTER

## INCURSIONS AND INTERCEPTIONS

During November there were nil interceptions.

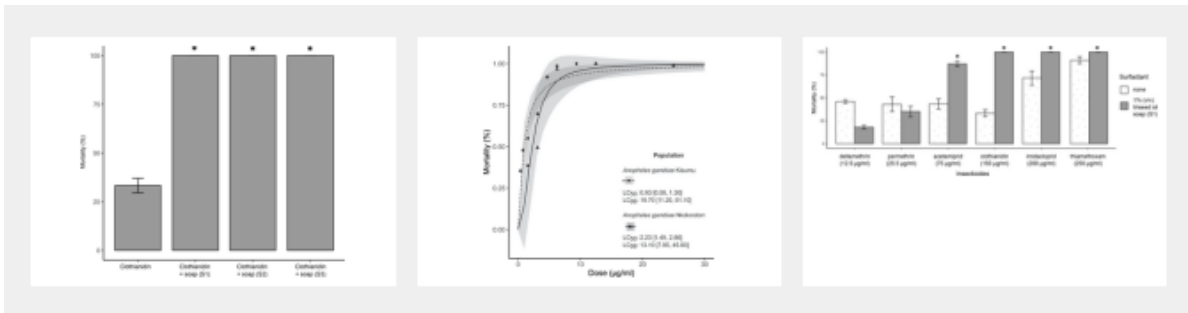
## NEWS ARTICLES FROM AROUND THE WORLD

### Tropical diseases move north



A warmer and wetter climate has made Europe more welcoming to vectors of debilitating and sometimes deadly pathogens. Cases of mosquito-borne diseases that were once confined to the tropics, such as West Nile, Zika, dengue and chikungunya viruses, as well as parasitic diseases such as schistosomiasis, are increasing throughout Europe. Over the past four decades, Europe has seen the spread of invasive mosquito species such as *Aedes albopictus*. Two decades ago, cases of mosquito-borne viruses, such as West Nile, dengue and chikungunya, were mostly imported, but are now being acquired locally. These viruses have the potential to become significant threats to public health. Although most cases of West Nile, dengue and chikungunya are either asymptomatic or mild, for the older population and those who are immunocompromised, it can be fatal. [Read more about this here.](#)

### Simple soap solution could be a game-changer in the fight against malaria



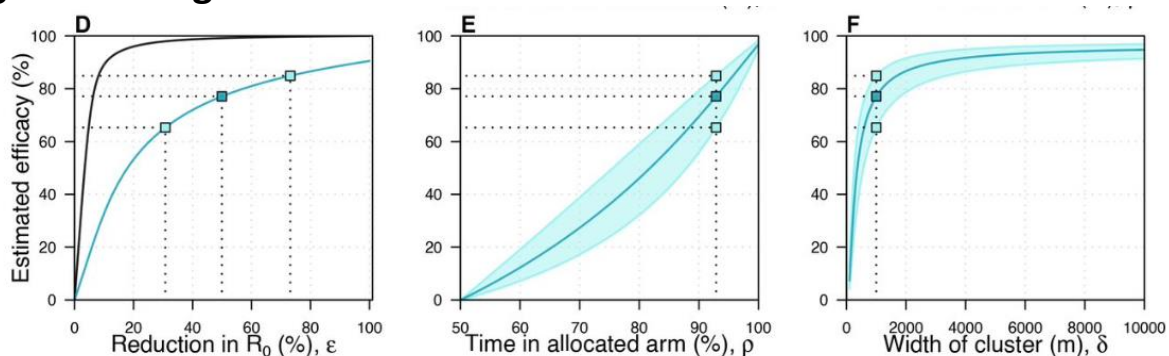
Scientists at The University of Texas at El Paso have found that adding small quantities of liquid soap to some classes of pesticides can boost their potency by more than ten-fold. “Over the past two decades, mosquitoes have become strongly resistant to most insecticides.” “It’s a race now to develop alternative compounds with new modes of action.” Said lead author of the study, Colince Kamdem. “Both laboratory tests and field trials have



## BORDER HEALTH NEWSLETTER

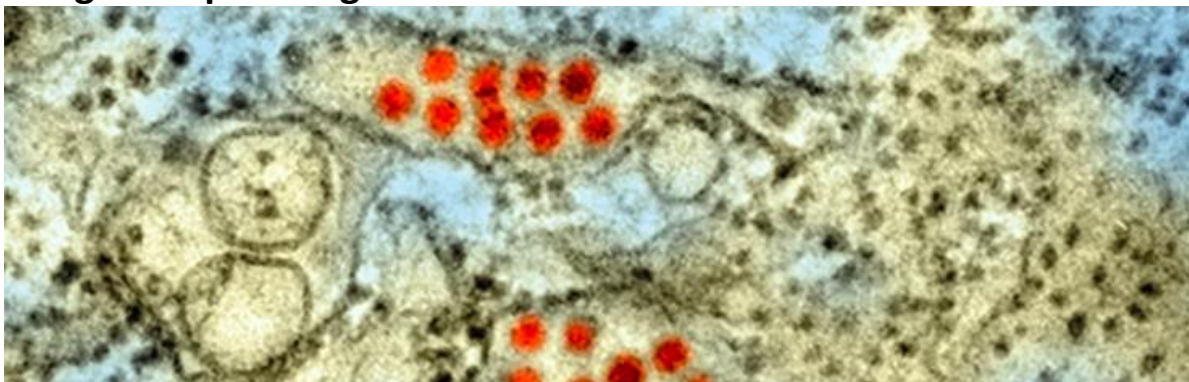
shown that neonicotinoids, a special class of insecticide, are a promising alternative to target populations showing resistance to existing insecticides,” said UTEP Research Assistant Professor Caroline Fouet. Neonicotinoids, however, do not kill some mosquito species unless their potency is boosted, which is where the soap comes in. Kamdem and his team tested three low-cost, linseed-oil based soaps that are prevalent in sub-Saharan Africa. During testing, all three brands of soap increased mortality from 30 percent to 100 percent compared to when the insecticides were used on their own. [Read more here](#). [Access the full article](#).

### New analysis of Indonesia Wolbachia trial shows potential for greater dengue reduction



The fight against dengue fever has a new weapon: a mosquito infected with the bacteria Wolbachia, which prevents the spread of the virus. These mosquitoes have now been deployed in several trials demonstrating their potential in preventing disease transmission. Researchers at the University of Notre Dame have conducted an analysis of the World Mosquito Program's randomized control trial of Wolbachia-infected mosquitoes in Indonesia, looking at how excluding transmission dynamics impacted the original interpretation of the trial's results. The study published in *BMJ Global Health* used mathematical models to analyse dengue virus transmission during the Indonesia trial. They explored three biases that the trial is subject to: human movement, mosquito movement and the combined transmission dynamics between human and mosquito movement. [Continue reading](#). [Full article](#).

### Dengue is spreading. Can new vaccines and antivirals halt its rise?



Dengue is on the rise with more than 4.2 million cases of the disease reported by October 2nd this year, compared with half a million in 2000. The disease, which was once confined



## BORDER HEALTH NEWSLETTER

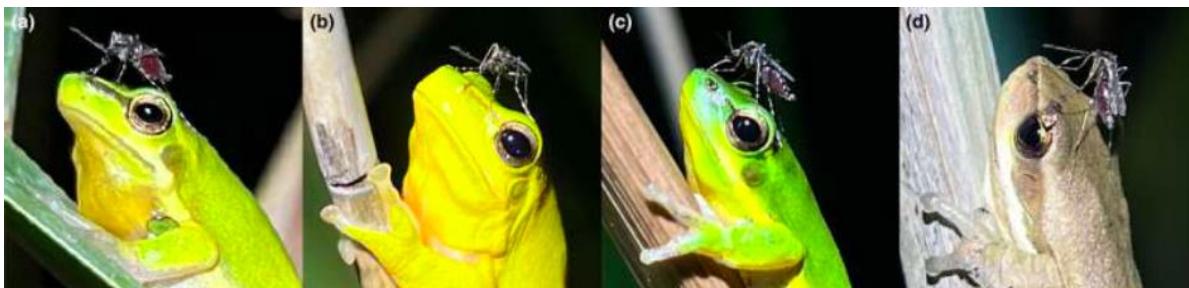
to the tropics, is spreading to new locations around the world, including southern Europe. "We're seeing the emergence of dengue in areas where we've never seen it before," said Adam Waickman, an immunologist at SUNY Upstate Medical University in Syracuse, New York. A key challenge for vaccine development is that dengue is caused by four distinct viral subtypes. "The perfect dengue vaccine would have 90% efficacy across all different serotypes and would have the same level of efficacy for people who have had a previous dengue infection and those who have not," says Timothy Endy, an immunologist also at SUNY Upstate Medical University. "We're not there yet." [Read more about this here.](#)

### Sentinel chickens a first line of defence against mosquito-borne disease in South Australia



Luke Bailey's chickens play an important role in defending South Australia against mosquito-borne diseases. Luke Bailey is a regional mosquito surveillance and control officer for SA Health and his flock in Mannum makes up one of ten troops of chickens scattered along the Murray River and around the state's regions. From November to April, the chickens have their blood tested monthly to check for antibodies from viruses like Japanese encephalitis. If the blood tests reveal antibodies for these diseases, SA Health can issue public health warnings advising people to protect themselves from bites. "Because the chickens suffer no symptoms from the virus, they're basically our first line of defence." [Read more about this here.](#)

### A little on the nose: A mosquito targets the nostrils of tree frogs for a blood meal



A pair of environmental and life scientists, one with the University of Newcastle, in Australia, the other the German Center for Integrative Biodiversity Research, has found that one species of mosquito native to Australia targets only the noses of frogs for feeding. In their



# BORDER HEALTH NEWSLETTER

paper published in the journal *Ethology*, John Gould and Jose Valdez describe their three-year study of frogs and *Mimomyia elegans*, a species of mosquito native to Australia. The researchers note that prior research has shown that mosquitos may be carriers of types of fungus that are deadly to frogs; thus, learning more about how they feed on them could assist in research involved in protecting them. [Continue reading. Full article.](#)

## Bed bug infestation forces local library to close




Bed bugs have forced Ealing library to close for at least four days as pest control was called in to treat the infestation. The library was shut on October 30 at 1.30pm and the council say it should open again on Friday, November 2 after the building has been treated. The library would only reopen after a full course of treatment has been applied by contractors Rentokill, the council said. [Read more here.](#)

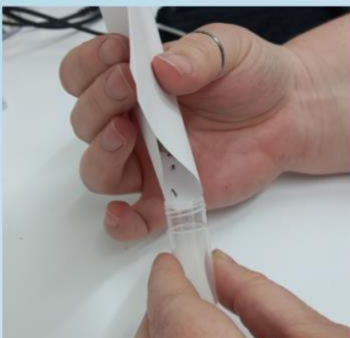
## THIS IS HOW WE DO IT

### This is how we do it


Uses for a paintbrush and paper



Lightly brush stuck insects off the BG bag



Easily transfer mosquitoes. Great for large samples



Sort non-mosquitoes and mosquitoes without causing damage




## BORDER HEALTH NEWSLETTER

### KNOW YOUR BED BUG

# Bed Bugs

*Cimex* spp. Order Hemiptera (True bugs)



© CDC

Bed bugs are small, flat, ectoparasites that feed on the blood of people and animals while they sleep.

Bed bugs are found across the globe from North and South America, to Africa, Asia and Europe.


Bed bugs are a public health nuisance, rather than a public health risk and are not thought to transmit infectious diseases.

Bed bug infestations usually occur around or near the areas where people sleep. These areas include apartments, shelters, rooming houses, hotels, cruise ships, buses, trains, and dorm rooms. Usually harbouring within 2-3m of where people sleep.

For a feed bed bugs can travel up to 30 meters up walls, across ceilings, through air conditioning ducts, along wiring, behind walls, and even out one window and into another.

Bed bugs do not have nests like ants or bees but tend to congregate in habitual hiding places. These areas are characterised by dark spotting and staining due to the bed bug blood-filled faecal material excreted on the mattress or nearby furniture.

Bed bugs can substantially reduce quality of life by causing discomfort, sleeplessness and anxiety. Sometimes, the itching can lead to excessive scratching, sometimes increasing the chance of a secondary skin infection. Some people may be allergic to bed bugs and react adversely to the bites.



### 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

### 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