



BORDER HEALTH NEWSLETTER

OCTOBER 2023

NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

This month we had the pleasure of meeting a whole bunch of amazing HPO's at the Medical Vectors Surveillance Workshop for 2023 in Auckland. We hope you enjoyed the workshop as much as we did! The lab also had a great time participating in the mega surveys at Auckland International Airport and RNZAF Whenuapai with Auckland Public Health. Once you are done having a look at the fantastic collection of photos below, scroll down to find a wonderful collection of practice mosquito photos that were taken during the "How to Take a Mosquito Photo" section of the workshop. Then have a look at the "Know Your Mozzie" to learn about the mosquito that was used as a model, *Aedes notoscriptus*.



In the news this month, read about how the release of mosquitos carrying *Wolbachia* has decreased the rate of dengue, and how atovaquone could be a promising, long-acting "chemical vaccine" to target malaria. Then take a look at how different species of gut bacteria have been linked to an increased risk of severe malaria. Also read about how Zika virus is requiring enhanced surveillance and control, particularly in South America, as sporadic increases have been observed in recent years, how dengue is expected to become a major threat in many new areas of the work and how the incredibly invasive *Anopheles stephensi* may be spreading a variation of malaria that was historically non-existent in sub-Saharan Africa. Then head across the ditch to read about the annual statewide mosquito survey that is occurring in New South Wales, Australia.



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Happy reading!

SURVEILLANCE

During October 1193 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 121 positive larval samples and 19 positive adult samples, leading to a total of 4655 larvae and 25 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, five mosquito species have been collected this month (Table 1), one less than collected last month.

Compared to this same month last year, the total number of larvae has shown an increase (328%) while adult numbers have shown a decrease (84%) (Table 1).

Compared to the previous month, mosquito larval and adult numbers have shown an increase (52%) and (19%) respectively.

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

Species (common name)	Adults		Larvae	
	Oct 23	Oct 22	Oct 23	Oct 22
<i>Aedes antipodeus</i> (winter mosquito)	7	65	-	-
<i>Ae notoscriptus</i> (striped mosquito)	3	3	2434	608
<i>Cx pervigilans</i> (vigilant mosquito)	5	65	1331	419
<i>Cx quinquefasciatus</i> (southern house mosquito)	9	19	875	54
<i>Culex</i> sp.	1	7	-	-
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	15	6
Total	25	159	4655	1087

The highest number of larvae sampled this month was obtained in Northland (3484 larvae) followed by Wellington (383 larvae) (Figure 1).



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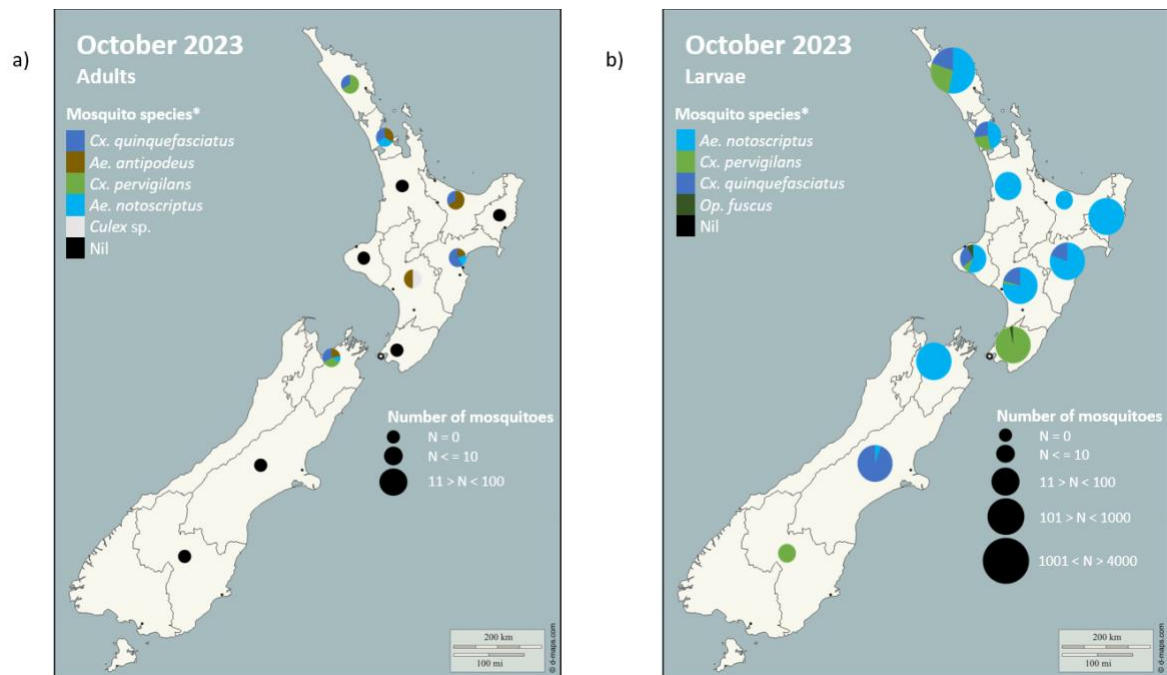


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during October 2023 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.
 * The mosquito species are listed in order from the most abundant to the least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

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

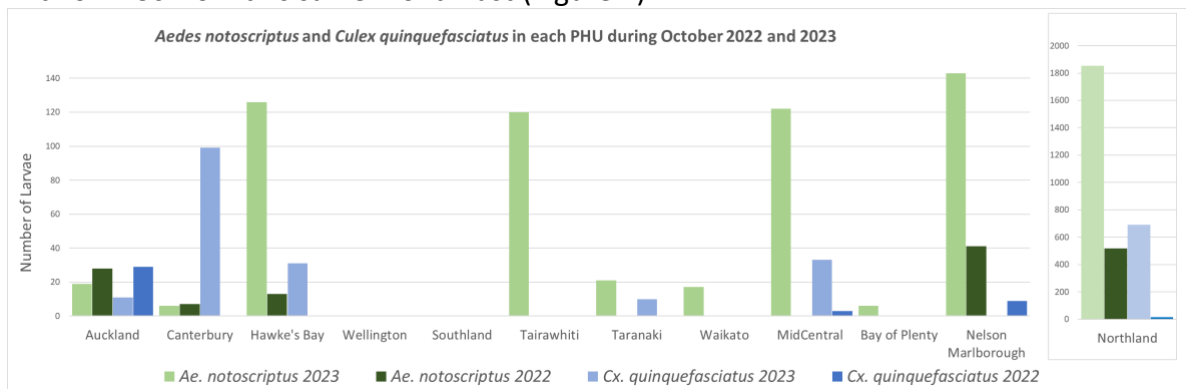


Figure 2. Comparison between introduced mosquito species sampled in each PHS during October 2022 and 2023.
 *Please note the different scale for the number of larvae present in Northland in comparison to the other PHS.



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INCURSIONS AND INTERCEPTIONS

During October, HPOs responded to two suspected interceptions (Table 2).

Table 2. Suspected interception during September 2023

Date	Species	Location	Circumstances
18.10.2023	2 Non-mosquitoes (Tipulidae)	The Baby Factory, East Tamaki, Auckland	Mosquito like insects were seen flying in a container of baby goods when it was opened.
23.10.2023	2 Non-mosquitoes	MG Marketing, Penrose, Auckland	Two suspected mosquitoes found in banana boxes from Ecuador. One found alive, the other found dead.

NEWS ARTICLES FROM AROUND THE WORLD

Dengue rates drop after release of modified mosquitoes in Colombia



Three cities in Colombia saw a dramatic fall in the incidence of dengue in the years following the introduction of mosquitoes carrying *Wolbachia*, a bacterium that prevents the insect from transmitting viruses. In neighbourhoods where the *Wolbachia* mosquitoes were well established, dengue incidence dropped by 94–97%. The *Aedes aegypti* mosquitoes were released by the World Mosquito Program (WMP), a non-profit organization that has been conducting similar experiments in Australia, Brazil, Indonesia and Vietnam, among other countries. [Read more about this here.](#)

Zika: A silent virus requiring enhanced surveillance and control



Despite a global reduction in Zika cases since 2017, the circulation of this mosquito-borne virus has been confirmed in 89 countries around the world. Although incidence levels remain



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low, sporadic increases have been observed in some countries in recent years. Since its first detection in Brazil in March 2015, local transmission of Zika has been confirmed in all countries and territories of the Americas, with the exception of continental Chile, Uruguay, and Canada. Ten countries account for 89% of Zika cases recorded between 2014 and 2023, however, with Brazil, Colombia, and Venezuela leading the list. [Read more about Zika monitoring and control here.](#)

Mosquito survey set to begin in NSW as summer looms



Dr Webb is an associate professor at the University of Sydney and works with NSW Health for statewide monitoring research. The annual mosquito survey is not only used to count the population but also to assess potential threats to human health. Widespread flooding in NSW created ideal breeding conditions for mosquitoes in 2022, and warnings were issued about the risk of viruses such as Japanese encephalitis and Murray River encephalitis. [Read more about the survey here.](#)

Invasive mosquito species may be spreading new form of malaria in East Africa

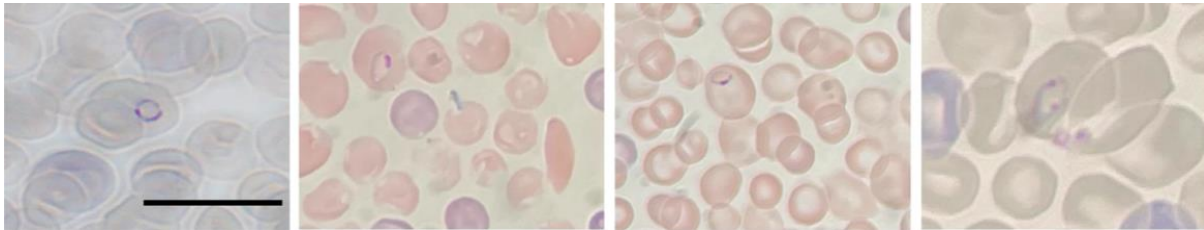


Researchers found that approximately 30 percent of the people they tested in Turkana County had malaria parasites in their blood, indicating that the disease was already endemic in the region. But even more concerning was the type of malaria: Researchers found a small but significant incidence of a parasite called *Plasmodium vivax*, which historically has been almost non-existent in sub-Saharan Africa. The parasite's appearance in Kenya may be connected to an invasive mosquito species known as *Anopheles stephensi*, which migrated to the Horn of Africa during the past decade and has been found in five countries in northern Africa. [Read more about this here. And have a look at the CDC article here.](#)



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Atovaquone "chemical vaccine" for malaria could be more feasible than thought



Researchers found that the same genetic mutation that renders malaria parasites resistant to atovaquone in patients also destroys the parasite's ability to live within mosquito hosts, meaning atovaquone-resistant malaria parasites would not be transmissible. The researchers concluded that atovaquone, despite concerns over resistance, holds promise as a long-acting, injectable "chemical vaccine" that could prevent infection in malaria-endemic areas. [Read more about this here.](#) [Access the original article here](#)

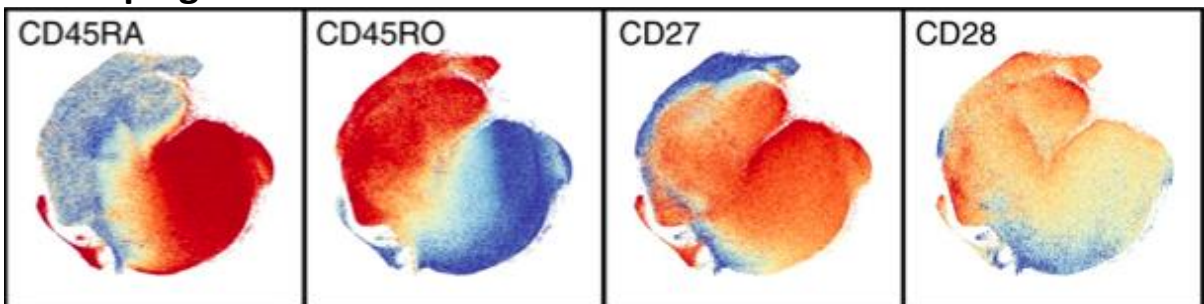
Dengue will 'take off' in southern Europe, US, Africa this decade, WHO scientist says



Dengue fever will become a major threat in the southern United States, southern Europe and new parts of Africa this decade, the WHO's chief scientist said, as warmer temperatures create the conditions for the mosquitoes carrying the infection to spread.

The illness has long been a scourge in much of Asia and Latin America, causing an estimated 20,000 deaths each year. Rates of the disease have already risen eight-fold globally since 2000, driven largely by climate change as well as the increased movement of people and urbanization. [Read more here.](#)

Multiple species of gut bacteria linked to increased risk of developing severe malaria





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In a pivotal 2016 article published in PNAS, Schmidt and his colleagues made a ground-breaking discovery in their experimental models: the gut microbiota has the capability to influence the severity of malaria. This revelation ignited their determination to pinpoint the precise microorganisms, called "Bacteroides," within the intestinal tract that orchestrate this effect. In their latest study, the researchers found mice harbouring particular species of Bacteroides were notably associated with an elevated risk of severe malaria. A similar correlation was also observed in the intestinal tracts of children afflicted with severe malaria. [Read more about malaria and gut bacteria here.](#) [Access the original article here.](#)

MOZZIE PHOTO PRACTICE TIME



KNOW YOUR MOZZIE



- This species is originally from Australia
- Introduced to New Zealand in the 1920's and now found as far south as Timaru
- Has also been introduced to The United States of America, where it is found in Orange County and San Diego County, California
- 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 during the day and sometimes at night-time
- Looks very similar to *Aedes aegypti* but is distinguished by its white band on the proboscis and pale stripe on each femur





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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
