New Zealand BioSecure

BORDER HEALTH NEWSLETTER

SEPTEMBER 2025

NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

Spring has arrived, bringing longer days, blooming flowers, and a noticeable rise in temperatures. As the weather warms, conditions become ideal for mosquitoes, and the lab has received more samples to ID as well as suspected interceptions.

In the news this month read about how sentinel-chickens actively contribute to virus surveillance. Then, discover how the genetic study of modern and historic *Anopheles funestus* could lead to new malaria control strategies, that could be particularly useful for countries like Rwanda, struggling with a malaria resurgence. Finally, learn about trained immunity after a dengue infection and the impact it could have on the design of new safer vaccines.

This month in the "Know your entomologist" segment, meet Ian Yen, the youngest member of our team, whose curiosity and tinkering skills have been a great asset to the lab. Also, have fun while using your sharp senses to find six mosquito-related words in our own Strands-like little game and to spot an AI generated mosquito.

Happy reading!

SURVEILLANCE

During September 1122 samples were collected by staff from 12 NPHUs (Figure 1). The samples included 62 positive larval samples and 16 positive adult samples, leading to a total of 2301 larvae and 30 adults identified over the past month (Table 1).

Aedes notoscriptus is the dominant larval species this month, which is the same as the previous month and August last year (Table 1).

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

Compared to this same month last year, the total number of larvae and adults have increased (22% and 76% respectively) (Table 1).

Compared to the previous month, mosquito larval and adult numbers have shown an increase (17% and 67% respectively).

The highest number of larvae sampled this month was obtained in Northland (2025 larvae) followed by MidCentral (79 larvae) (Figure 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during September 2024 & 2025

Species (common name)	Adults		Larvae	
	Sep 25	Sep 24	Sep 25	Sep 24
Aedes antipodeus (winter mosquito)	4	2	-	-
Ae notoscriptus (striped mosquito)	-	2	1952	1494
Culex asteliae (no common name)	-	-	-	**8**
Cx pervigilans (vigilant mosquito)	20	6	259	338
Cx quinquefasciatus (southern house mosquito)	4	4	43	2
Culex sp. (damaged)	2	2	-	-
Culex sp. (inc. mixed features & *Cx pipiens* sp.)	-	-	33	-
Opifex fuscus (rock pool mosquito)	-	1	14	51
Total	**30**	**17**	**2301**	**1893**

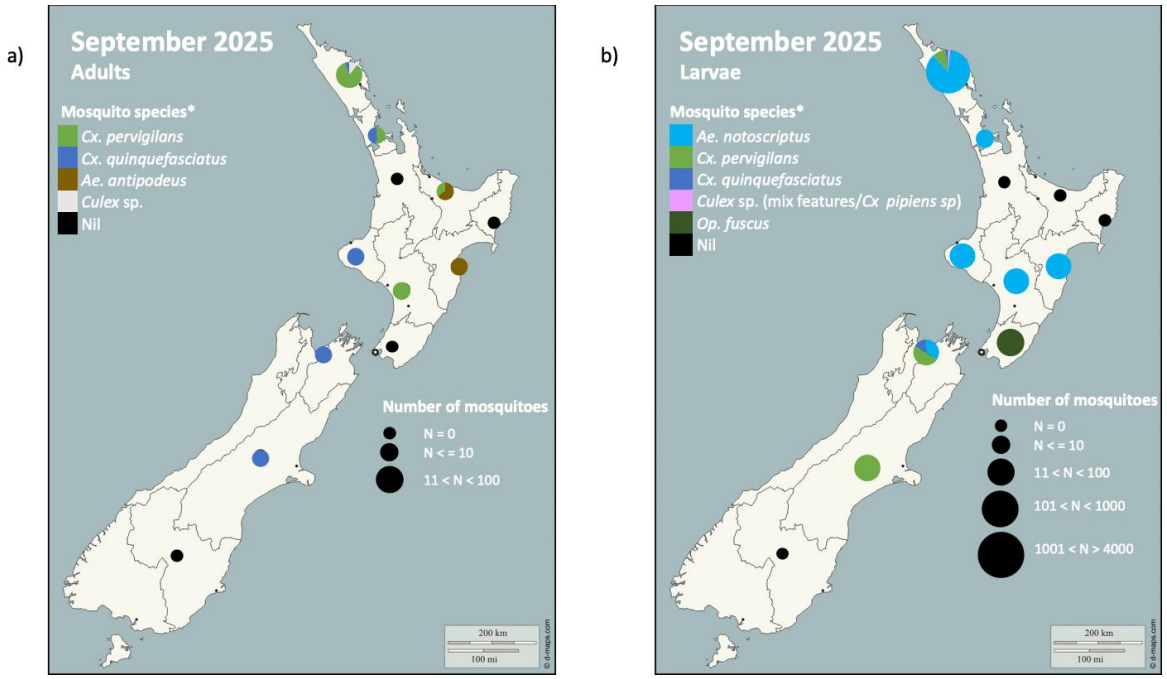


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during September 2025 surveillance period. Please note that the markers represent the NPHUs and not the specific sites where the samples have been taken.
* The mosquito species are listed in order from the most abundant to the least abundant.
Culex sp. (damaged) refer to mosquitoes that are damaged and cannot be identified to the species level.

Aedes notoscriptus larval numbers have shown an increase in three NPHUs and a decrease in five NPHUs and remained the same in four NPHUs compared to the same month last year (Figure 2).

Aedes notoscriptus and *Culex quinquefasciatus* were not recorded in Southland in September of this year or last year (Figure 2).

Culex quinquefasciatus larval numbers have shown an increase in two NPHUs and remained the same in ten NPHUs compared to the same month last year (Figure 2).

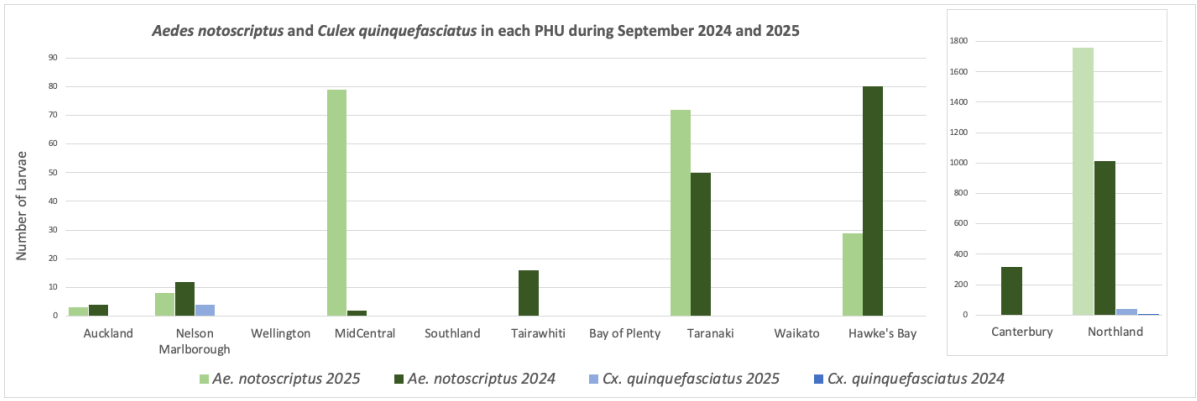


Figure 2. Comparison between introduced mosquito species sampled in each NPHU during September 2024 and 2025. *Please note the different scale for the number of larvae present in Canterbury and Northland in comparison to the other NPHUs.

INCURSIONS AND INTERCEPTIONS

During September, HPOs responded to seven suspected interceptions (Table 2), including various non-mosquitoes and two locally occurring mosquito species from exotic origin (in blue).

Table 2. Suspected interception during September 2025

Date	Species	Location	Circumstances
11.09.2025	1 non-mosquito	Big Save Limited, Transitional Facility, Lower Hutt, Wellington	Insect flew out of container of manufactured wooden furniture from China. It was hovering on one of the boxes at the front of the container. No other insects or contamination was observed during the unloading of the container.
16.09.2025	1 non-mosquito	Simple Freight, Transitional Facility, Māngere, Auckland	Found dead inside container of Squash Pumpkins from Tonga. Other insects observed (Several dead beetles and insect eggs). Container fumigated after discovery.
16.09.2025	1 male *Aedes notoscriptus*	NZ Movers, Transitional Facility, Dunedin	Found dead by MPI while inspecting a container from Australia. The mosquito was inside an outdoor lamp package alongside many other dead insects. No mosquito or insects were found in the container or in other packages in the container.
17.09.2025	1 non-mosquito	Primor Produce, Transitional Facility, Mt Wellington, Auckland	Found alive flying out of a box of mandarins from Australia.
19.09.2025	2 non-mosquitoes	Basick Transport Limited, Transitional Facility, Onehunga, Auckland	Found dead in shrink wrap of cargo (building materials & clothes) from Australia.
23.09.2025	1 male *Culex quinquefasciatus*	Scales Logistcs, Transitional Facility, Māngere, Auckland	Found alive in an aircan containing papayas amongst other fruits. No other insects found. Goods had been stored in chiller room for 24 hours before opened. Aircans were shrink wrapped after mosquito was found.
26.09.2025	1 non-mosquito	NG Group, Transitional Facility, Penrose, Auckland	Found dead at transitional facility in container of grapefruits and mandarins from Australia.

CULEX PIPIENS AND MIXED FEATURES UPDATES

During September, 33 larvae *Culex pipiens* sp./*Culex* sp. showing mixed features were detected in one sample collected at NHPS – Northland (Opua).

NEWS ARTICLES FROM AROUND THE WORLD

Clucking the Forecast

For about 40 years now, chickens have been put to work to help predict West Nile virus (WNV) outbreaks. Chickens can become infected with WNV - and their cells produce antibodies in response – but they do not develop symptoms, nor can they transmit the virus to others. By drawing weekly blood samples from sentinel chickens, health officials check for antibodies and can react more efficiently to potential human outbreaks. However, their approach has been so far only reactive. Using that abundant data (almost lost during a flood), Florida researchers have now trained a model that can forecast elevated virus activity up to six months in advance, giving a much longer lead time than the current system. This new model is a promising tool that can be further refined and added to, to better reflect the complexity of the transmission cycle. Read the full article here or discover the scientific paper here.

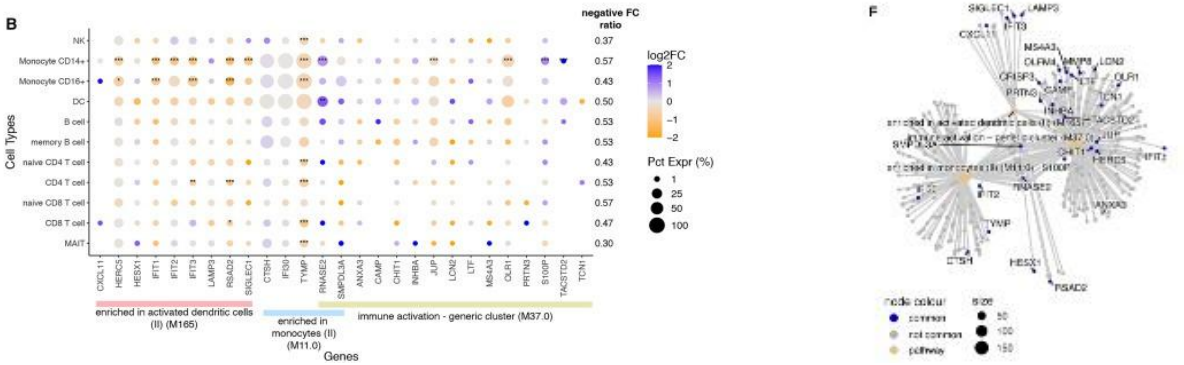
High genetic diversity in malaria vector – another reason to tailor local strategies

A new genomic study of *Anopheles funestus*, a major malaria-transmitting mosquito in Africa, reveals how this species has evolved in response to malaria control efforts: scientists sequenced hundreds of modern and historic specimens and found that *An. funestus* populations carry high genetic diversity, some gene flow across vast distances, and multiple insecticide-resistance mutations that emerged over time under selection pressure. This diversity suggests that uniform control strategies are unlikely to succeed, emphasizing the need for locally tailored interventions. The research also suggests that a gene drive system developed for *An. gambiae* might be adapted to *An. funestus*, offering a new tool against malaria. Read more here or discover the full scientific article here.

Rwanda's Malaria Rebound Poses New Threats

After nearly a decade of falling numbers, Rwanda has seen a dramatic resurgence of malaria in 2024, with cases rising more than 45% to around 620,000—up from about 430,000 in 2023. This comes despite the country's investments in indoor spraying, mosquito nets, and other control methods. Officials are now worried about growing drug resistance, mosquitoes changing their behaviour (biting outdoors), environmental shifts that favour more breeding, and cross-border transmission. In response, Rwanda is reconsidering its previous decision not to use the malaria vaccine and introducing multiple first-line treatments, all with the goal of returning to its trajectory toward malaria elimination by 2030. Rwanda, as part of the Pan-African "Zero Malaria Starts with Me" movement, urges citizens to take personal responsibility in malaria prevention. Minister of Health Dr. Daniel Ngamije emphasized proper use of long-lasting insecticide nets while plans are underway to distribute over 7.5 million treated nets nationwide. The campaign also embraces innovative control strategies—such as drone-based larvicide spraying—and reinforces Rwanda's commitment to eliminating malaria through community engagement and shared accountability. Read the full article here and discover the Zero Malaria Starts with Me campaign in Rwanda here.

Dengue Leaves a Lasting Genetic Mark on Immunity



A study from Duke-NUS and collaborators shows that a dengue virus infection can permanently reprogramme the immune system, changing baseline gene expression in certain immune cells that the dengue virus infects—an imprint not matched by vaccination alone. People who recovered from dengue showed distinct immune gene activity even before being vaccinated, leading to stronger responses to the vaccine compared to those with no prior infection. This long-term imprinting, also known as trained immunity, has been observed in other infections, like malaria, and this study shows that both the type and intensity of infection matter. These findings will have implications for designing safer and more effective dengue vaccines. Read full article here and discover the study here.

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A LITTLE GAME

THE USUAL SUS-PESTS

Find six words of four letters or more.
Any direction possible.

T	I	O	N	E	N	E
X	P	E	A	E	P	R
E	P	C	G	I	O	H
L	U	R	Y	T	T	E
U	P	E	P	Y	E	M
C	A	T	U	R	V	S
I	N	S	A	G	E	M

MEGASURVEY – S-METHOPRENE – PUPA
INTERCEPTION – CULEX – AEGYPTI –

AI MOSQUITO SPOTTED

Are you able to spot what is wrong with this “Mosquito”? Find the six mistakes that AI made while generating this “mosquito”.

As previously stated in January 2025 Newsletter, AI is becoming prevalent to generate pictures. The following picture, retrieved from this article, gets no mention of being AI-generated.

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Answers

1. Wing venation is not mosquito like 2. The proboscis is too short 3. Eyes are more fly like
4. The palps are not shown 5. The antennae are too short and not segmented 6. 5 legs only

KNOW YOUR ENTOMOLOGIST

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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.

Communicable disease threats report - European Centre for Disease Prevention and Control