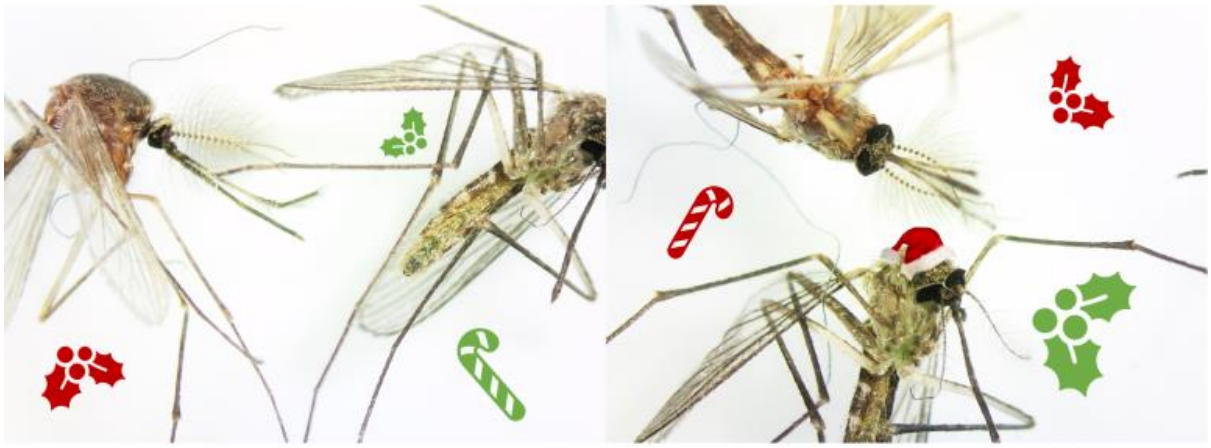
NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER – December 2021

WELCOME!

Kia ora koutou,

Happy New Year from the NZB Lab! We hope that everyone has had a great holiday period. Some of the mozzies in one of our December samples certainly got into the festive spirit… Can you spot the red and green hued mosquitoes? (Disclaimer - Santa hat not included!)



As the summer heats up, the mosquito numbers are starting to increase. You may have noticed this in your backyard as well. Have a look at the "Know your Breeding Habitat" section to see what types of places may be breeding mosquitoes in your backyard.

In the news this month read about: the disruption COVID-19 is causing in African countries fighting yellow fever and malaria, why Researchers are reviewing the transmission, origin, pathogenesis, animal model and diagnosis of Zika virus, about the research related to new *Plasmodium* species that have been discovered in African apes, some of which may be transmitted to humans in the future. And finally, have a look at some research showing why some people may be more attractive to mosquitoes than others.

In this issue you can also find the yearly charts for the 2021 Mosquito Surveillance season. Also, don't forget to scroll down and get your laughter dose with the Bite of Humour section.

Happy reading!

SURVEILLANCE

During the month of December, 1,297 routine samples were collected by staff from 11 DHBs (Figure 1). The samples included 191 positive larval samples and 95 positive adult samples, leading to a total of 2,437 adults and 14,949 larvae identified over the past month (Table 1). *Culex quinquefasciatus* are the dominant larval species this month, which was also the dominant larval species last year (Table 1).

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

Compared to this same month last year, both the total number of larvae and total number of adults have shown an increase (143% and 120% respectively) (Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during December 2020 & 2021

Species (common name)	Adults		Larvae	
	Dec 21	Dec 20	Dec 21	Dec 20
Ae antipodeus (winter mosquito)	35	10	-	-
Ae australis (saltwater mosquito)	1	-	-	-
Ae notoscriptus (striped mosquito)	144	598	3816	2400
Coq iracunda (no common name)	160	3	-	-
Coq tenuipalpis (no common name)	4	-	-	-
Cx asteliae (no common name)	-	-	8	-
Cx pervigilans (vigilant mosquito)	1129	93	3806	956
Cx quinquefasciatus (southern house mosquito)	846	378	7128	2768
Culex sp.	118	28	1	-
Opifex fuscus (rock pool mosquito)	-	-	190	31
Total	**2437**	**1110**	**14949**	**6155**

Compared to the previous month, both mosquito larval and adult numbers have shown an increase (286% and 64% respectively).

The highest number of larvae sampled this month was obtained in Toi Te Ora Public Health (7,259 larvae) followed by Northland DHB (4,109 larvae) (Figure 1).

Aedes notoscriptus larval numbers have shown an increase in nine DHBs from this same month last year (Figure 2). As expected, *Aedes notoscriptus* has not been recorded this month, this year, or last year in Public Health South (Figure 2).

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

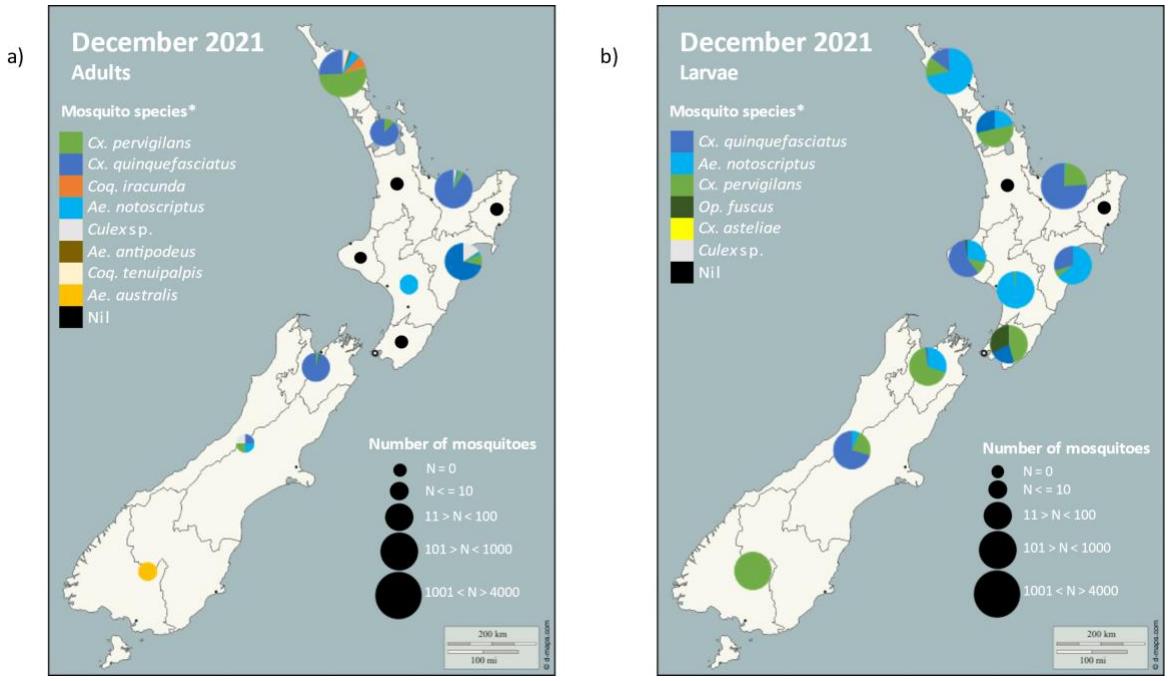


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the December 2021 surveillance period. Please note that the markers represent the DHBs and not the specific sites where the samples have been taken.
* The mosquito species are listed in order from the most abundant to the least abundant.

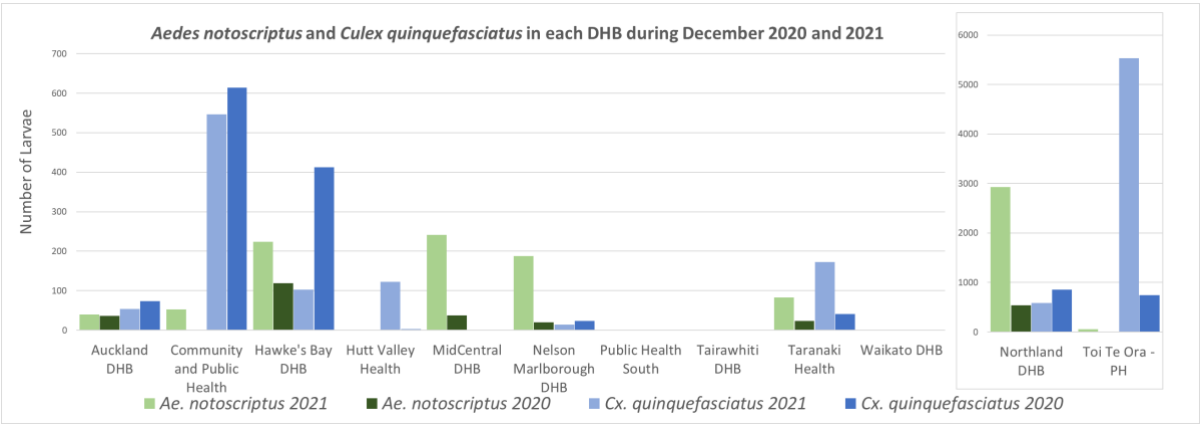


Figure 2. Comparison between introduced mosquito species sampled in each DHB during December 2020 and 2021.
*Please note the different scale for the number of larvae present in Northland DHB and Toi Te Ora PH in comparison to the other DHBs.

MOZZIE NUMBERS FOR THE YEAR 2021

During 2021, a total of 131,153 larvae (Figure 3) and 15,348 adults (Figure 4) were collected by Public Health Units and identified in the NZ BioSecure Entomology Laboratory, that is 32% more larvae and 221% more adults than last year. The increase in adults collected is likely due to resumed adult sampling in locations that stopped due to the COVID-19 response, along with some very large adult samples collected in Northland.

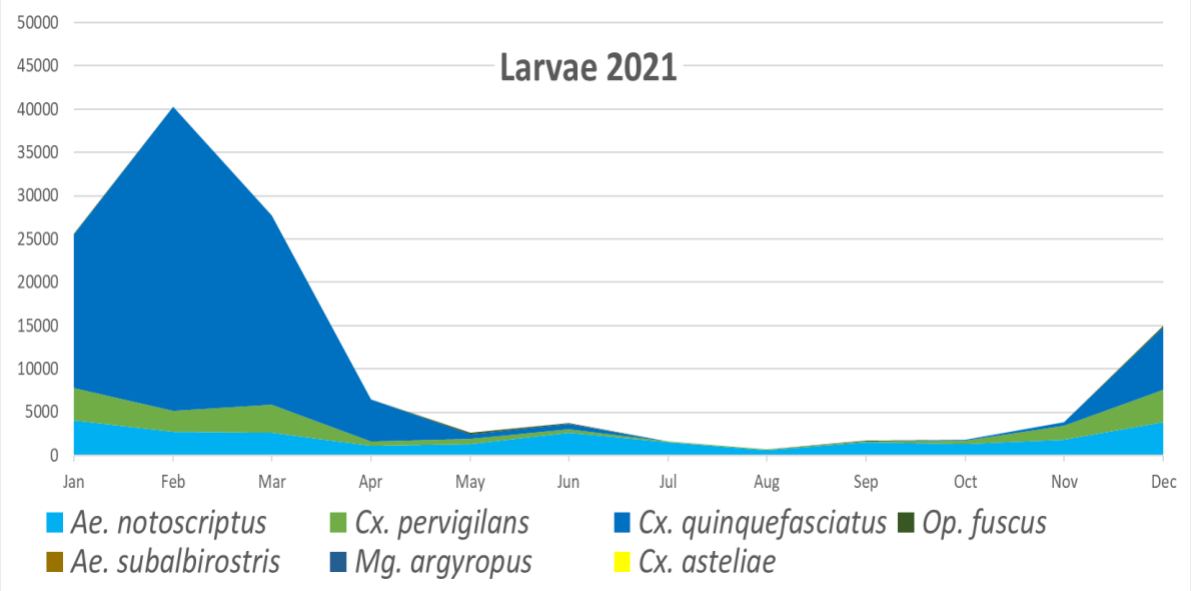


Figure 3. Variation in total mosquito larvae numbers thought 2021.

A total of 13 species of mosquitoes were collected this year (2 more than last year) with *Culex quinquefasciatus* the best represented with 67% of the larvae and 65% of the adults, followed by *Aedes notoscriptus* with 19% of the larvae, and *Culex pervigilans* with 18% of the adults. The least represented mosquitoes were the endemic *Aedes subalbirostris* (6 larvae) and the introduced *Aedes australis* (1 adult).

The highest number of mosquitoes collected (larvae plus adults) in 2021 was in February (43,131) followed by January (32,159) while in 2020 the highest number was in February (31,459) followed by January (17,299). For 2021 the highest number of species was recorded in March and December (10 species) and the least was recorded in July (3 species).

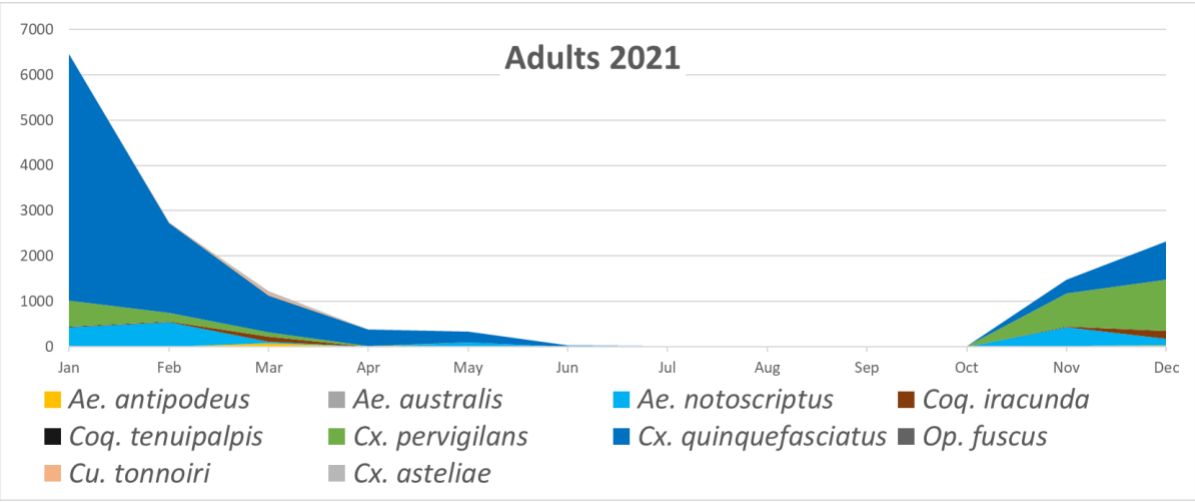


Figure 4. Variation in total mosquito adult numbers thought 2021.

INCURSIONS AND INTERCEPTIONS

During December there were nil interceptions.

NEWS ARTICLES FROM AROUND THE WORLD

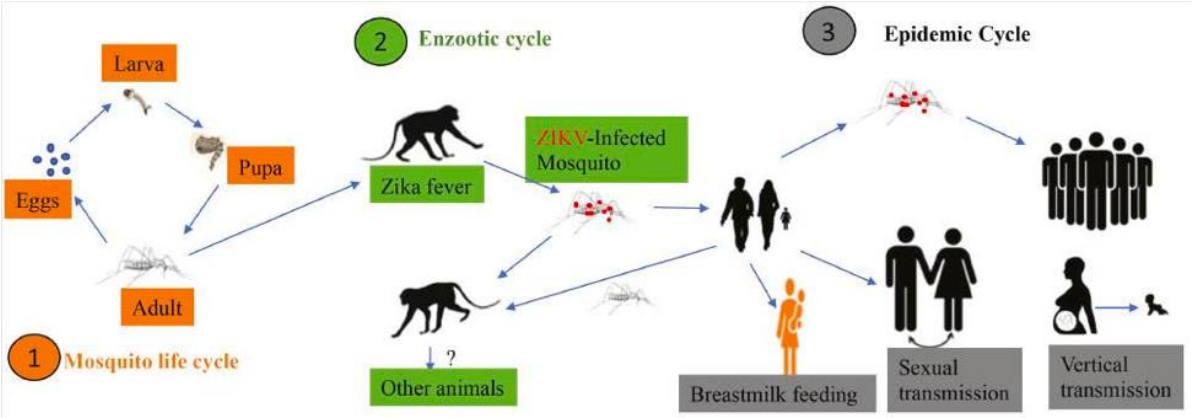
Why mosquitoes find certain people more attractive than others

A team of researchers from the University of Sargodha, Sargodha, Pakistan, tested human blood from each of the four blood groups – A, B, AB, and O – to see whether female mosquitoes had a preference. To do this, they released batches of about 100 mosquitoes at the downwind end of a wind tunnel. The study suggests that the blood group makes people more or less attractive to female mosquitoes seeking blood. Read more. Access the original article.

WHO supports Nigeria in responding to the yellow fever outbreak amidst a global pandemic

Nigeria is a high-risk country for yellow fever and is a priority country for the global eliminate yellow fever epidemics (EYE) strategy. The re-emergence of the virus there in September 2017 has been marked by outbreaks throughout the country. The county has taken great strides toward boosting yellow fever protection and has vaccinated approximately 70 million people through reactive and preventive activities since 2017. However, with COVID-19 response efforts underway, the country's health system and human resources are being strained, making the response a challenge. Read more. Access the original article.

Researchers review transmission, origin, pathogenesis, animal model and diagnosis of Zika virus

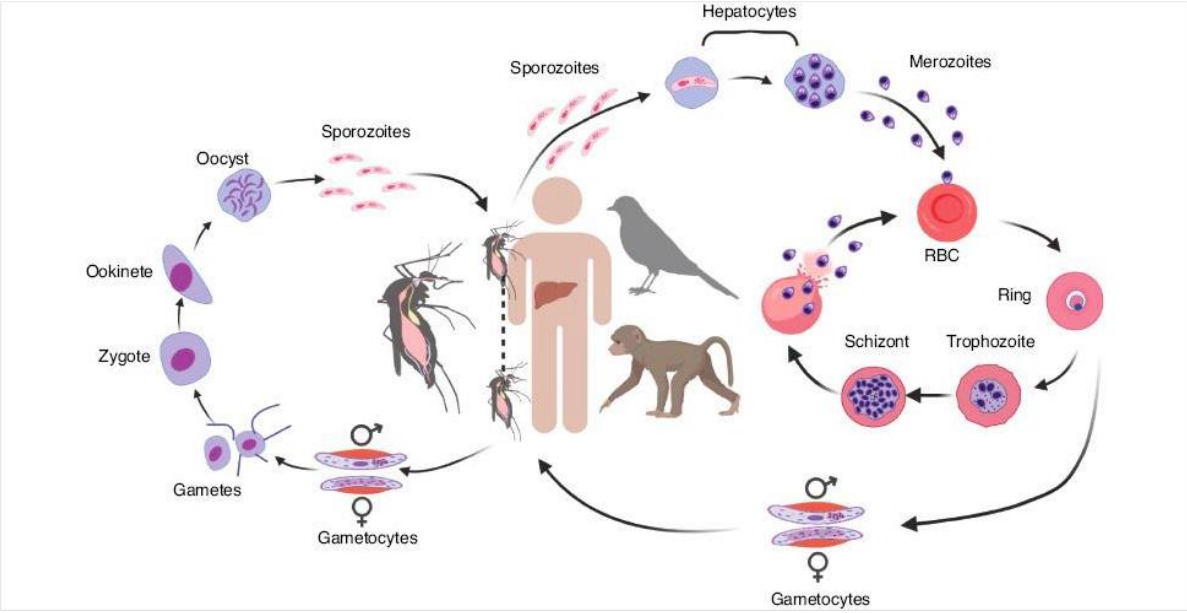


Zika virus (ZIKV) was first discovered in 1947 in Uganda. ZIKV did not receive substantial attention until Brazil hosted the 2016 Summer Olympic Games, and ZIKV reached a global audience. ZIKV is a flavivirus transmitted chiefly through mosquito bites, sexual intercourse and, to a lesser extent, breastfeeding. The recent discovery of how ZIKV causes congenital neurodevelopmental defects, including microcephaly, has led to re-evaluation of the importance of the interaction of ZIKV with centrosome organization, because centrosomes play an important role in cell division. Access original article.

More malaria cases and deaths in 2020 linked to COVID-19 disruptions

New data from the World Health Organization reveal that the COVID-19 pandemic has disrupted malaria services, leading to a marked increase in cases and deaths. According to WHO's latest *World malaria report*, there were an estimated 241 million malaria cases and 627 000 malaria deaths worldwide in 2020. This represents about 14 million more cases in 2020 compared to 2019, and 69 000 more deaths. Approximately two-thirds of these additional deaths (47 000) were linked to disruptions in the provision of malaria prevention, diagnosis and treatment during the pandemic. Read more.

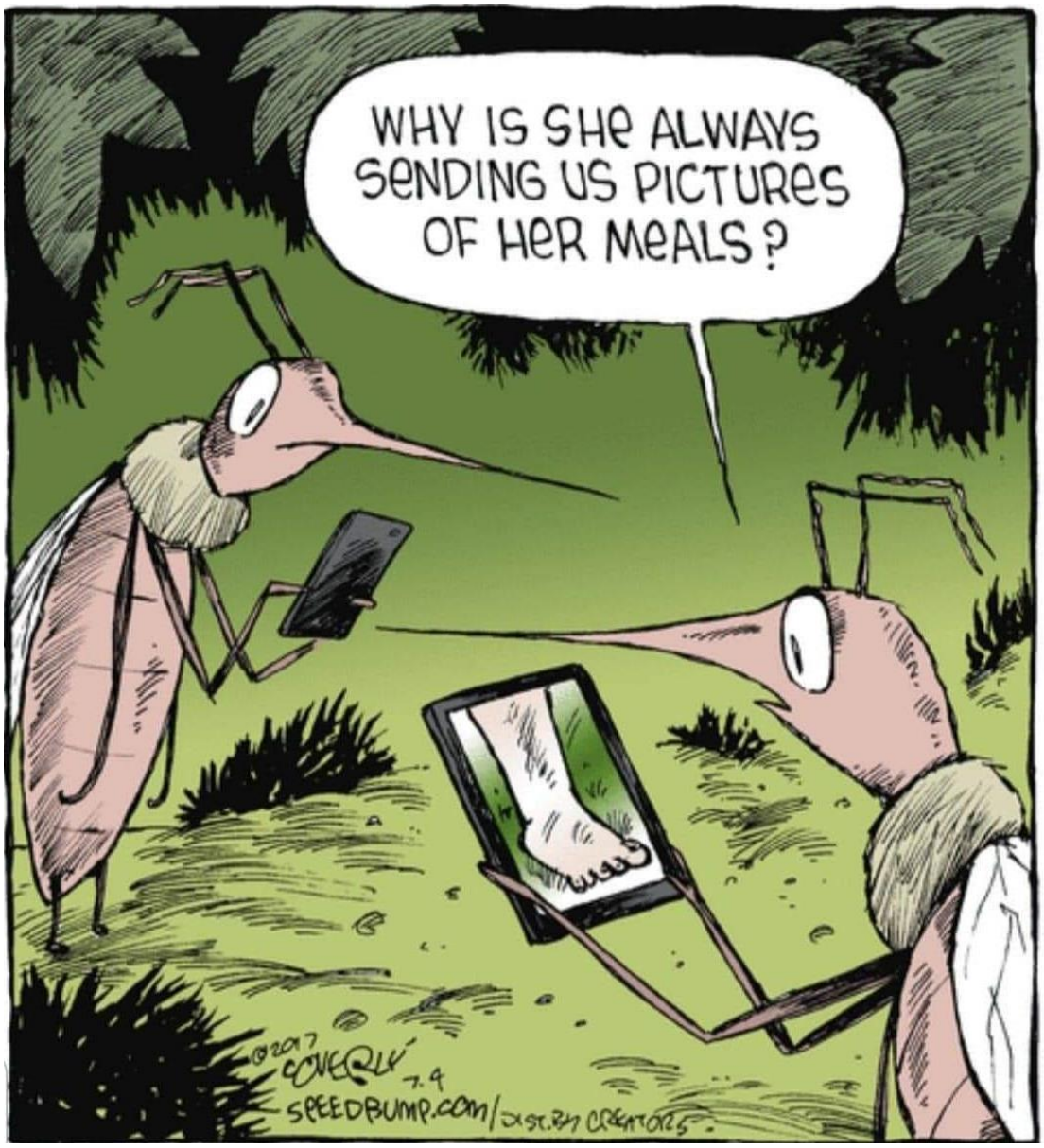
Zoonotic Transmission and Host Switches of Malaria Parasites



Malaria is a deadly disease that affects the health of hundreds of millions of people annually. Five *Plasmodium* parasite species naturally infect humans: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium malariae*, *Plasmodium ovale*, and *Plasmodium knowlesi.* These parasites can also infect various non-human primates. Parasites mainly infecting monkeys, such as *Plasmodium cynomolgi* and *P. knowlesi*, the latter of which was considered to be a monkey parasite for years, can also be transmitted to human hosts. Recently, many new *Plasmodium* species have been discovered in African apes, some of which may be transmitted to humans in the future. Access the original paper.

KNOW YOUR BREEDING HABITAT

A BITE OF HUMOUR



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