



Bite me, would you?

Coastal mosquitoes of New Zealand

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Anyone fishing along the coastline of New Zealand is likely to encounter mosquitoes at some point. While New Zealand is fortunate from a human viewpoint to have few mosquito species, there are some here that bite us and are potential disease vectors.

A mosquito starts life as an egg usually laid on the water's surface or a nearby surface that is likely to be flooded. The larva that emerges is legless and commonly known as a 'wiggler' (Fig 1). On its tail is a siphon which it uses to breathe oxygen at the water's surface. Fan-like arrangements of hairs on its tail help it to swim (wiggle) its way around, and it usually feeds on fine particles of food filtered from the water. Once it is ready to begin the transition to adulthood the 'wiggler' becomes a comma-shaped pupa. The adult emerges at the surface by pushing its way through the pupal case and males can usually (though not always) be separated from females by the presence of feathery-looking antennae.

Female mosquitoes cause more trouble for us than the nectar-feeding males, as only females seek blood meals, piercing skin with



Fig 1. Larva (wiggler) of the rock pool mosquito *Opifex fuscus*. (photo: Amy Snell, WSM&HS)



Fig 2. An Asian tiger mosquito female (regularly intercepted at our borders) with its proboscis inserted in human skin. (photo: Yoshikazu Shirai, IPCT, Japan)

their needle-like proboscis (eg Fig 2). Blood provides necessary nutrients for development of the eggs within the mosquito's ovaries.

When they 'bite', infected female mosquitoes may transmit pathogens (viruses, protozoa or filarial worms) to humans. This makes mosquitoes efficient agents in the spread of diseases. We've all heard of malaria, the most infamous of mosquito-borne diseases which causes 300–500 million acute illnesses and kills nearly one million children every year. In addition mosquitoes transmit diseases of domestic and wild animals. Fortunately, there has never been an outbreak of a mosquito-borne disease in humans in New Zealand, but it is likely to be only a matter of time until this happens.

There are approximately 3500 known species of mosquito in the world, but the New Zealand fauna consists of just twelve native and four exotic species. Of these sixteen species, four are found along our coasts in saltmarshes, rock pools and similar brackish or saline habitats.

The native rock pool mosquito *Opifex fuscus* (Figs 3 and 4) is New Zealand's most widespread coastal species, found in brackish and saline rock pools along the coasts of much of New Zealand (Fig 5) and some offshore islands, such as the Kermadecs.

These are relatively large, primitive mosquitoes with distinctive characteristics such as specially developed claws on their fore-legs (Fig 3.). Male *O. fuscus* spend most of their lifetime on the water surface



Fig 3. The rock pool mosquito, *Opifex fuscus* (photo: Amy Snell, WSM&HS)

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competing for emerging females and mating with them before they are fully free from their pupal cases. Females are generally active during the day and their bite is described as being painful.

The Chatham Islands mosquito, *Opifex chathamicus* is unique to those islands and breeds in saline or brackish rock pools above the high tide mark. We know very little about this species but adult specimens were recently caught indoors at night trying to bite one of us.

The Australian rock pool mosquito, *Ochlerotatus australis* was first reported in New Zealand in 1962 and so far it seems to be restricted to the southern half of the South Island. It breeds in saline rock pools but has also been collected from roadside ditches in 90 percent freshwater. In laboratory experiments *O. australis* has been shown to be a vector of dengue and Ross River viruses, but this species rarely bites humans so it is not considered much of a nuisance or a public health risk.

We may not be as lucky with another invader found just a few years ago. The Australian southern saltmarsh mosquito, *Ochlerotatus camptorhynchus* (Fig 6) was discovered in 1998 near Napier, and has since been found in several other localities, most recently near Blenheim.

This species is regarded as a coastal mosquito that prefers habitats such as saltmarshes, but in Australia it is also found in brackish inland waters and is even capable of breeding in fresh water, indicating a wide salinity tolerance. *O. camptorhynchus* is a vicious biter and will readily attack humans. It has the potential to become a serious public health problem in New Zealand, particularly as a vector of Ross River virus, whose infection can cause serious muscle and joint pain, and other flu-like symptoms, which may persist for months or even years. Little wonder *O. camptorhynchus* is the subject of a NZ\$ 30 million government-funded eradication campaign.



Fig 4. Proboscis of *Opifex fuscus* (photo: Amy Snell, WSM&HS)

So, don't quit the beach or bach just yet – so far we are fairly safe from the serious mosquito-borne pathogens that affect many of our neighbours. However, we obviously need to stay vigilant against new invading mosquitoes, as they are regularly intercepted along our borders.



Fig 5. The Wellington south coast – typical rock pool mosquito (*Opifex fuscus*) habitat. (photo: Amy Snell, WSM&HS)

FURTHER READING

Derraik JGB, Calisher CH, 2004. Is New Zealand prepared to deal with arboviral diseases? *Australian and New Zealand Journal of Public Health* 28: 27–30.

Weinstein P, 1996. When will mosquitoes strike? *New Zealand Science Monthly* 7: 6–7.

Weinstein P, Laird M, Browne G, 1997. *Exotic and endemic mosquitoes in New Zealand as potential arbovirus vectors*. Occasional paper, Ministry of Health, Wellington. Available at <http://www.moh.govt.nz/moh.nsf/0/f58acd4e7491ecf34c256671001d87e6?OpenDocument>. ■



Fig 6. The southern saltmarsh mosquito *Ochlerotatus camptorhynchus*. (photo: Richard Toft, Landcare Research)

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