



Aedes (Finlaya) notoscriptus (Skuse)

striped, or ankle biting mosquito

NZ status: Introduced



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Vector and Pest Status

Aedes notoscriptus is the major vector of dog heartworm (*Dirofilaria immitis*) in Australia (Russell and Geary, 1997), a filaroid which is not present in New Zealand. *Ae. notoscriptus* is also a known vector of Ross River Virus, Barmah Forest virus (Kay *et al.*, 2007) and Murray Valley encephalitis, although there is no record of the latter occurring in the field (Liehne, 1991).

Aedes notoscriptus has been shown to be a competent vector of Yellow Fever virus in the laboratory, with it being as effective at passing on the virus as *Aedes aegypti* (van den Hurk *et al.*, 2011). *Aedes notoscriptus* was readily infected with zika virus in the laboratory, however it did not transmit the virus at all, making it unlikely to be a vector for this virus (Hall-Mendelin *et al.*, 2016). This species has been shown to transmit chikungunya virus in the laboratory, however the transmission efficiency is low. This low transmission efficiency could be negated by this being a

common mosquito in urban environments, particularly in its native environment in Australia (van den Hurk *et al*, 2010).

Studies have also shown that vector competence can be highly variable. While some populations of *Ae. notoscriptus* are viable vectors other pools have not been proven competent (Watson and Kay, 1998; 1999).

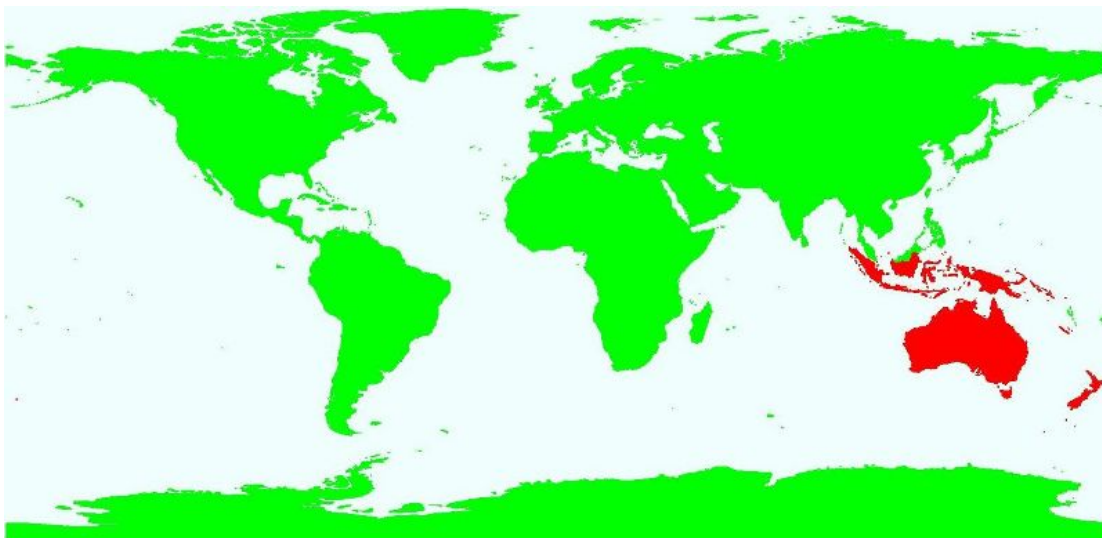
Ae. notoscriptus also vectors dengue but is not considered to be an important vector as infection levels in this species are very low (Watson and Kay, 1999).

Geographic Distribution

Aedes notoscriptus is an introduced species which was first collected in New Zealand in 1918 by Miller (Laird & Easton 1994). This species is believed to have entered New Zealand through shipping and was originally found in Auckland (Laird & Easton 1994) and later around ports (Belkin, 1968). Currently, this species is widespread throughout the North Island, and in the South Island it is found as far south as Lyttleton (Weinstein, 1997, Holder, 1999, Reinert, 2004).

Aedes notoscriptus also occurs throughout the South Pacific (Lee *et al.*, 1989), in New Guinea, New Caledonia, Indonesia and the Solomon Islands (Bullians & Cowley, 2001; Liehne, 1991), and in Australia including the Torres Strait Islands (Russell, 1997).

In late 2014 *Aedes notoscriptus* was discovered in California near Los Angeles after a complaint by a member of the public who was being bitten during the day (Farned & Sun, 2014). It has since established but has not spread outside of Orange County and San Diego County areas.



NB. This map denotes the general areas where this species has been recorded, not actual distribution.

Incursions and Interceptions

Aedes notoscriptus has been intercepted at New Zealand borders at least 11 times since 2001, however not all these interceptions are believed to be specimens of exotic origin, but local specimens occurring in high risk areas e.g. ports. Two are considered to be most likely interceptions from Australia, and several others very likely to be of exotic origin.

Although this species is now well established in New Zealand, it seems likely that repeated exotic introductions will continue to occur, increasing the chance of disease agents such as dog heartworm being introduced with them.

Taxonomy

Aedes notoscriptus belongs in the subgenus *Finlaya*. It was moved to the proposed genus *Ochlerotatus* by Reinert (2001), but general uncertainty around the proposed changes has seen this species replaced back in the genus *Aedes* subgenus *Finlaya*, awaiting further evidence.

Adult females can be distinguished from other species in New Zealand by their characteristic lyre shaped scutal pattern, bright white stripes on very dark legs and pale band on the proboscis.

The banding on the proboscis differentiates *Aedes notoscriptus* from exotic mosquito species with similar scutal patterns such as *Aedes aegypti* (Russell, 1993).

Habits and Habitat

Aedes notoscriptus is a freshwater container breeder that prefers vegetated containers in well shaded sites (Belkin, 1968). It can be found in natural containers e.g. tree holes or rock pools but it has adapted to breeding in man-made containers including plant pot saucers, old jars and blocked roof gutters. In New Zealand this species breeds frequently around domestic environments, where it commonly comes into contact with man (Montgomery *et al.*, 2002; Derraik, 2004). This shift into breeding in man-made habitats has helped to make this species more widespread. It is also able to colonise the natural environment in these newly occupied areas, where natural containers are often underutilised by native species (Laird, 1996).

Overwintering occurs in the larval stage, but this is only characteristic of the species in cooler climates, including New Zealand. Development is ongoing throughout the year in more temperate environments with peaks in numbers during warmer months (Liehne, 1991; New Zealand BioSecure, unpub. data).

Eggs are laid at the water level around the edges of containers. They are laid individually and are desiccation resistant (Liehne, 1991). A study by Faull *et al.* (2016) found that 9-13% of eggs collected from Sydney and Adelaide remained viable for one year after being dried.

The optimum temperature range for development of *Aedes notoscriptus* from larvae to adults which maximised fitness has been shown to be between 18 and 29 degrees. In the laboratory, larvae could complete development at 15°C, however they took around 50 days to pupation, while at 29°C degrees they only took approximately 10 days (Williams and Rau, 2011).

Aedes notoscriptus females will readily feed at night and in shaded areas during the day, but the preferred biting time is in the evening and early morning - crepuscular activity (Foot, 1970). *Aedes notoscriptus* can be a serious pest as it is an avid biter of both humans and animals, including stock and poultry (Laird, 1996). Adults have been recorded travelling up to 238m from release sites (Watson *et al.*, 2000).

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