



# NEW ZEALAND BIOSECURE

## Entomology Laboratory



*Aedes (Finlaya) japonicus* (Theobald)

Japanese rock pool or Asian bush mosquito

**NZ Status: Not Present – Unwanted organism**



photo by Mike Sardalis, USAMRIID

### Vector and Pest Status

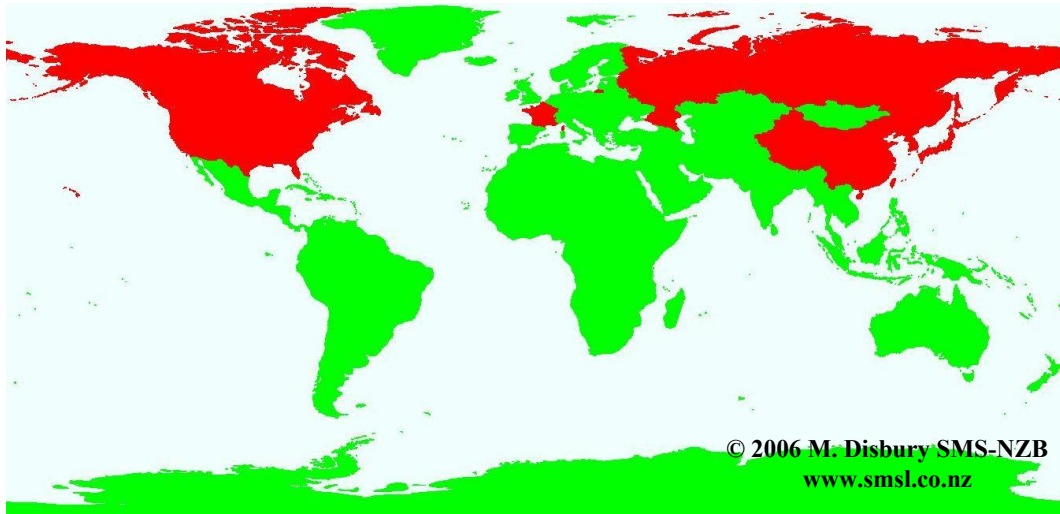
*Aedes japonicus* is a known vector of Japanese encephalitis (JE) (Sucharit *et al.*, 1989) and can also transmit St. Louis encephalitis (Sardelis *et al.*, 2003), Eastern Equine encephalitis (Sardelis *et al.*, 2002b) and La Crosse virus (Sardelis *et al.*, 2002a) in the laboratory. It is a highly efficient laboratory vector of West Nile virus and wild specimens have been found containing this virus (Turell *et al.*, 2001a; 2001b; Sardelis and Turell, 2001). *Ae. japonicus* is also susceptible to infection with Getah virus (Takashima and Hashimoto, 1985).

### Geographic Distribution

*Aedes japonicus* is widespread throughout Asia and is found in Japan, Korea, the Ryukyu Archipelago (Okinawa and associated islands), Taiwan, South China, and Hong Kong. In 2000, larvae of *Ae. japonicus* were discovered in a village in north western France in recycled tyres from the USA and Japan (Schaffner *et al.*, 2003).

Larval stages found in the area indicate that this species is reproducing locally (Schaffner *et al.*, 2003).

The subspecies *Ae. japonicus japonicus* was found in New York and New Jersey, the United States in 1998, and spread to 19 states and Quebec, Canada by the end of 2003 (Peyton *et al.*, 1999; Savignac *et al.*, 2002; Thielmann and Hunter, 2006). It has been suggested that the method for this species may be via the international transport of used tyres (Peyton *et al.*, 1999; Thielmann and Hunter, 2006). In 2003, *Ae. japonicus japonicus* was also found on the island of Hawaii, it is the 8<sup>th</sup> exotic species to become established in that state (Larish and Savage, 2005).



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

### Incursions and Interceptions

*Aedes japonicus* has been intercepted in New Zealand on ten occasions since 1993. The specimens were collected from a water tanker, used tyres (Laird *et al.*, 2004), and used machinery, all offloaded from ships originating from Japan (Derraik, 2004; NZ BioSecure, unpublished data, 2007).

### Taxonomy

*Aedes japonicus* belongs to the subgenus *Finlaya* and contains several morphologically similar subspecies. Tanaka *et al.*, (1979) describes the four subspecies that occur throughout most of Japan, Taiwan, Korea, eastern China. They are:

*Aedes japonicus japonicus* – Palearctic Japan and Korea

*Aedes japonicus yaeyamensis* – Ryukyu Archipelago

*Aedes japonicus amamiensis* - Ryukyu Archipelago

*Aedes japonicus shintiensis* - Taiwan

### Habits and Habitat

*Aedes japonicus* is a container breeding species which breeds in natural containers such as tree holes, leaf axils, bamboo stems and rock holes, as well as artificial containers such as tins, tyres, drums, water tanks, vases, bird baths and roof gutters (Kano *et al.*, 1954; Tanaka *et al.*, 1979; Andreadis *et al.*, 2001; Scott *et al.*, 2001). It has also been collected from subterranean catch basins, surface water rain pools and spring fed depressions (Andreadis *et al.*, 2001) Rock holes appear to be the most favoured immature habitat (Tanaka *et al.*, 1979). This species usually prefers shaded breeding areas and water rich in organic matter (Tanaka *et al.*, 1979), and is commonly encountered breeding with other species such as *Aedes atropalpus* in the USA (Andreadis *et al.*, 2001).

Females of this species lay their eggs just above the water line. The eggs are desiccation resistant and may survive for several months in dry conditions. A study of oviposition activity of the subspecies *Ae. j. japonicus* in the field found that egg laying occurred at sunrise and sunset (Scott, 2003). Tanaka *et al.* (1979) indicated a preference by larvae for shaded locations, however they have also been observed in containers in sunlit areas in the USA, Japan and Korea (Andreadis *et al.*, 2001 and references there in).

Tanaka *et al.* (1979) suggested *Ae. japonicus* has adapted to colder conditions and is capable of surviving snowy winters. This species overwinters as eggs in north eastern Japan and larvae in south western Japan (Kamimura, 1976 in Tanaka *et al.*, 1979). In the USA (Connecticut) this species is multivoltine (Andreadis *et al.*, 2001), as it is in Japan (Iriarte *et al.*, 1991). Its presence in Connecticut from late May to early November further indicates that this species is cold tolerant under these climatic conditions (Andreadis *et al.*, 2001)

Dispersal of adults depends on the availability of habitat available, but is usually within 30-300m from the emergence site. They will disperse further if there is no suitable habitat nearby.

Adults live in forested areas and are day biters (Tanaka *et al.* 1979). Females feed on an array of species including humans, pigs, dogs, chickens, deer and rodents (Scott, 2003). They have been recorded as being reluctant to bite humans (Tanaka *et al.*, 1979) and in the laboratory they have been observed to feed on chickens and mice, but not on reptiles or amphibians (Miyagi, 1972). Host feeding preferences in the field are unknown (Andreadis *et al.*, 2001).

## References

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