Importation of *Aedes Albopictus* in Townsville, Queensland

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The mosquito *Aedes albopictus* (*Ae. albopictus)* is a vector of dengue virus in southeast Asia. However, it is most notable for its accidental introductions into and subsequent colonisation of new areas. *Ae. albopictus* importations, primarily via used tyres infested with eggs, have been documented in the United States of America,[1,2] Europe[3] and Australia.[4] The vector has become established in the southeastern part of the United States of America and parts of southern Europe.[1] In the USA, the establishment of *Ae albopictus* in temperate regions has extended the area at potential risk for the introduction of dengue and other arboviral diseases. To date, in these newly colonised areas, there has been no evidence of dengue transmission and the vector has not been implicated in outbreaks of other arboviral diseases. However, eastern equine encephalomyelitis (EEE) virus has been isolated from wild populations of *Ae.albopictus* in the United States of America.[1]

The establishment of *Ae. albopictus* in Australia would be likely to have less impact in the tropical areas than in the temperate zones. Moore and Mitchell[1] state 'in areas where *Ae. aegypti* is abundant, this species might be expected to play a far more important role in dengue transmission than *Ae. Albopictus*'. The major impact of the establishment of this vector would be the extension of the dengue receptive area from tropical Australia into southern coastal areas, and the possibility that it could become involved in the transmission of other arboviruses, such as Ross River virus. In cities with heavy international air traffic, there is a risk of travellers arriving with dengue viraemia. The presence of *Ae.albopictus* in these cities creates the potential for dengue transmission. However, explosive urban epidemics, such as those that occur in the tropics associated with *Ae. aegypti*,[5] would be very unlikely.

To prevent the introduction of exotic vectors, Australia has long maintained a strict policy of aircraft disinsection. The Australian Quarantine and Inspection Service (AQIS) also requires the fumigation of shipments of imported used tyres and unprotected new tyres with methylbromide, and inspects cargoes for mosquito larvae. As a result, importations of *Ae. albopictus* in Australia have been recognised early and subsequently controlled.[4]

This report describes an unusual importation of *Ae. albopictus* into Townsville, Queensland. On 10 May 1997, a shipment from Papua New Guinea arrived at the Townsville Port. The cargo included a cement truck agitator bowl that had been loaded on in Port Moresby, PNG, on 2 May 1997. An inspection on 15 May 1997 by AQIS personnel revealed that the agitator bowl contained water with a large number of mosquito larvae and pupae.

The bowl was fumigated with 128 g/m^3 of methylbromide that day, while temephos was used to kill the larvae. Larvae were identified by Queensland Health (QH) vector control personnel and a Queensland Institute of Medical Research entomologist, as *Ae. albopictus*.

In response to the finding, an extensive mosquito survey and control program commenced on 22 May 1997 in the Townsville Port precinct and surrounding area. AQIS, QH and Townsville City Council (TCC) personnel conducted house-to-house searches for water-holding containers within 1 km of the wharf. No *Ae. albopictus* larvae were found in the water-holding containers within 1 km of the wharf although some *Ae. notoscriptus* and *Ae. aegypti* larvae were present. TCC personnel conducted ultra low volume fogging with bioresmethrin in the area to kill any adult *Ae. albopictus*. Seven ovitraps made of used tyres were set on 24 May 1997 in the area and monitored weekly for potential oviposition over a two month period. No *Ae. albopictus* eggs were found in the ovitraps. The larval and ovitrap surveys suggest strongly that *Ae. albopictus* did not establish a population in the Townsville Port area.

It is perhaps fortuitous that *Ae. albopictus* did not establish a population in the area surrounding the port. The large agitator bowl contained numerous larvae and pupae. Adult mosquitoes were also noted inside the bowl, and had 5 days (10-15 May) to disperse. A heavy rain on 16-17 May (45 mm) could have hatched recently laid eggs. However, subsequent weather was cool and dry; June had a mean temperature of 20.2^{o}C, with only 7.6 mm of rain. Overall, these weather conditions would have minimised egg hatching and rapid development of larvae.

In response to the time delay from ship arrival until inspection, AQIS have instigated procedures to ensure that cargo is inspected within 24 hours of arrival. While it appears that establishment of *Ae. albopictus* in Australia was avoided on this occasion, this event highlights the fact that mosquitoes can be transported in cargo other than tyres, and that a quick, thorough response can prevent colonisation.

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