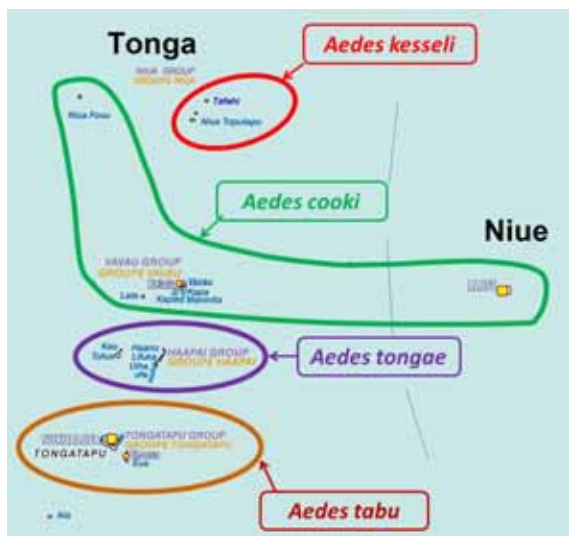


Aedes vectors in Tonga: identification for improved surveillance and control

The Kingdom of Tonga was once again seriously affected by dengue fever outbreaks in 2008 and 2009. In addition to the pan-tropical vector *Aedes aegypti*, no less than four local mosquito species can transmit this arbovirosis. They also transmit lymphatic filariasis, a major public health problem throughout Polynesia. One of these species is *Aedes cooki*, found on Niuafu'ou and in the Vava'u Islands and known only from Niue outside of Tonga (but it is not found in Cook Islands, despite its name). The other three are strictly endemic species whose distribution zones do not overlap. They are *Aedes kesseli*, which can be found only on Niuatoputapu and Tafahi; *Aedes tongae*, found in the Ha'apai group; and *Aedes tabu*, found in the Tongatapu group.



This extraordinary diversity of vectors is probably the result of the isolation mosquito populations found themselves in after they were, most likely, accidentally introduced to Tonga by humans hundreds of years ago. They had to adapt to different environments in each island group.

It is vital to acquire techniques for identifying these four *Aedes* species, which belong to the *scutellaris* group, in order to provide effective surveillance and control of these vector mosquitoes. It is also important to be able to differentiate them from *Aedes aegypti*, which is not part of the same group, as well as from six other mosquito species known in Tonga, most of which are not vectors.

Identification techniques were the focus of a workshop: *Basic entomology, vector-borne diseases — vector identification, surveillance and control*. The training workshop was attended by 22 members of the Tonga Ministry of Health from 28 June to 1 July 2011 at the offices of the Tonga Medical Association, located near Vaiola Hospital in Nuku'alofa.

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In addition to identification, the topics included the bio-ecology of the various mosquito species, appropriate control methods for each species at each life-cycle stage, and information on the diseases these insects transmit. Classroom sessions alternated with hands-on work, both in the field and in the laboratory.

The workshop was part of a series of initiatives carried out in relation to the Joint National Action Plan (JNAP) for climate change and disaster risk management. It was held with the support of SPC's Applied Geoscience and Technology Division (SOPAC) and funded by the European Union as part of the natural disaster facility.

The instructors were Dr Narendra Singh, a training specialist from SPC's Public Health Division; Mr Laurent Guillaumot, entomologist at the New Caledonia Pasteur Institute; and Mr Lucien Swillen, a consultant in vector mosquito control methods.

The workshop was also a follow-up to four other similar courses that were conducted in the western Pacific as part of the Pacific Public Health Surveillance Network: one in Guam in 2005, one in Northern Mariana Islands in 2006 with the participation of trainees from Federated States of Micronesia, one in Cook Islands in 2007 and one in Fiji in 2010. Wallis and Futuna's Environment Department held a similar training session in French on Futuna in 2007.

Two of the participants at the Nuku'alofa workshop are to get additional training at the New Caledonia Pasteur Institute to learn the techniques needed to raise mosquitoes in insectariums in order to carry out insecticide resistance tests.

All of these measures should lead to considerable improvement in the effectiveness of vector-control efforts and limit the impact of the diseases currently transmitted by these mosquitoes, such as dengue fever and lymphatic filariasis. They will also reduce the risks linked to emerging diseases that have not yet reached Tonga, e.g. chikungunya fever.

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