

Ecological Characteristics And Viral Transmission Capability of *Aedes aegypti* And *Ae. albopictus*

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Abstract

In Taiwan, dengue fever vector species, *Aedes aegypti* and *Ae. albopictus*, are also capable of transmitting yellow fever virus, chikungunya virus and Zika virus. These two species cause a public health concern. It is critical to understand the ecological characteristics and viral transmission capability of both species. We searched the keywords "*Aedes aegypti*" or "*Aedes albopictus*" in MEDLINE complete database. Under summer temperatures (24–35°C) in southern Taiwan, mosquitoes develop fast and adults live longer. Population density of mosquitoes increase rapidly within short period of time, which increases the risk of mosquito-borne diseases. Although the distribution of *Ae. aegypti* is limited in some areas of Taiwan, this species has the properties of anthropophilia, endophilia (70–80%), multiple feeding behavior and higher viral transmission capability. *Aedes aegypti* is the primary vector in the regions with the presence of *Ae. aegypti*. Therefore, both indoor and outdoor controls are critical. On the other hand, *Ae. albopictus* is widely distributed throughout Taiwan. Characteristics of outdoor preference (≥98%), single feeding behavior, lower viral transmission ability and high proportions of *Wolbachia* infections make this species not an important vector in the coexistent regions of these two species and the only vector in the regions of the *Ae. albopictus* presence. Outdoor control is recommended against *Ae.*

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albopictus. It is estimated that under the optimal condition within 30 days, one female *Ae. aegypti* along with high population density around is capable of infecting 84 persons with dengue virus and 2,442 persons with Chikungunya virus. *Aedes albopictus* can transmit 8 and 32 persons with dengue virus and Chikungunya virus, respectively. As for such high disease transmission efficiency, *Ae. aegypti* requires specific preventive strategies to reduce its population density to decrease the human-virus contact. Due to the wide distribution of *Ae. albopictus*, the risk assessment of the mosquito-borne diseases should be carried out. The preventive strategy for the high-risk areas should be launched.

Keywords: *Aedes aegypti*, *Aedes albopictus*, ecological characteristics, viral transmission capability, Taiwan