

Abstract

Aedes aegypti L is a common species of mosquito of many residential areas in southern part of Taiwan. The larvae of this mosquito usually breed in various containers within or around the houses, and its adults has endophilic and endophagic habitats. Therefore, this mosquito becomes the main vector for dengue fever in these areas. Source reduction is an efficient and safe method in the control of *Ae. aegypti* and prevention of dengue fever transmission. This strategy may lead that production of *Ae. aegypti* carrying special genetic traits in natural populations because many of them are raised from a small group. Adults of *Ae. aegypti* approximately fly around within 50-100 meter. However, the availability of the oviposition sites may affect the moving distance of the females. In case the egg-laying sites are not available, the females may fly longer than this limitation. To investigate the genetic traits of mosquitoes in natural population could help us realizing the effects of source reduction on the ecology and behavior of *Ae. aegypti* in Taiwan. Central Mountain Range divides Taiwan into two main areas, western and eastern part, many organisms in these two areas are found to have distinguishable phenotypical or genotypic characters. This phenomenon may also occur in *Ae. aegypti*. In the project, *Ae. aegypti* was collected by setting ovitraps in Tainan, Kaohsiung and Taitung. We have examined the scale patterns for collected mosquitoes. Total DNA of mosquito was extracted individually and used as a template for random amplified DNA polymorphisms by polymerase chain reaction (RAPD-PCR) with 10-bp primers. The genetic variation is determined by the analyses of frequency of the scale patterns and the amplified fragments in each population. Population density fluctuation had been shown during the period of investigation. A positive correlation was also shown of ovitraps between the positive rate and number of eggs. Moreover, when a comparison was made for the number of patients and the positive rate of ovitrap, it also indicated a positive correlation. Most of the time, *Ae. aegypti* was a dominant species in Kaohsiung and Tainan. However, *Ae. albopictus* was a predominant mosquito in Taitung. The scale pattern of the *Aedes aegypti* was found to be CKM 1 since the extra white scale only distributed in the first abdominal tergite. However, the mosquitoes from Taitung had more numerous white scale than that of Kaohsiung and Tainan. Different DNA banding patterns of mosquitoes were also derived by RAPD-PCR. The results showed that mosquitoes in each city had various banding patterns except the common bands, at the sizes of 1300 bp, 1100 bp and 500 bp. This indicated that *Ae. aegypti* contained special genetic traits due to the source reduction and pesticide application.

**Keywords : *Aedes aegypti* ; population fluctuation ; scale pattern ; RAPD-PCR.
patterns**