091 THE GENETIC STRUCTURE, DENGUE VIRUSES, AND SEASONAL FACTOR OF AEDES AEGYPTI POPULATION IN CEBU CITY, PHILIPPINES

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Background Dengue is a pervasive infectious disease in the Philippines. Understanding the seasonal genetic changes of dengue vector population and its dengue viruses provides insights into the timing of vector control interventions.

Objectives Here, we performed two studies of Aedes aegypti population in selected sites in Cebu city, Philippines. We examined their genetic changes during the wet (2011–2012) and dry seasons (2012 and 2013) and determined the vertical transmission of dengue virus (DENV) in mosquitoes during the wet-dry-wet season (2011–2012).

Methods Field-collected mosquito subadults were laboratory reared and were analyzed using 11 microsatellite loci. Another set of subadults were sampled from household and field premises, laboratory reared until adults, and their viral RNA extracts were assayed by hemi-nested RT-PCR.

Result Results showed that gene flow was higher in the wet than in the dry season. Due to selection in the dry season, reduced population size favored heterozygotes leading to small refugia that showed random genetic differentiation. The expanded refugia that survived the preceding dry season reconstituted the genetic composition of mosquitoes in the wet season. The minimum infection rate (MIR) of DENV-1, -3, and -4 ranged from 0 in wet months to 48.22/1,000 mosquitoes in mid-dry season. More DENV+ mosquitoes were collected from household premises ($p<0.001$) and in the dry season ($p<0.05$) than in the fields and wet season, with significant interaction ($p<0.05$) between sites and premises but no interaction between sites and seasons. The premises nested in sites and monthly total rainfall were significant predictors ($p<0.05$) of dengue cases and not MIR, season, temperature, and relative humidity by Generalized Linear Mixed model.

Conclusion Detecting the natural foci of DENV and source reduction of mosquitoes in the dry season are relevant to prevent dengue re-emergence in the following wet season.