

Comparison of gene dispersal of four dipterocarp species in a primary tropical rain forest

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Gene dispersal by seed and pollen plays an important role in tree demography, especially at young stages, by influencing inbreeding depression and genetic structure. In spite of the several advantages of seed/pollen dispersal, there are large variations in seed/pollen dispersal distance even among related species is essential.

The Dipterocarpaceae, a dominant family of trees in the tropics of Southeast Asia, have developed a wind-dispersal system that varies greatly among genera and species. For instance, both *Dipterocarpus* and *Shorea* species with and without winged seeds co-occur in the same forest.

This study was conducted in a tropical rain forest at Lambir Hills National Park, Sarawak, Malaysia. We chose four dipterocarp species, *Shorea beccariana*, *S. laxa*, *Dipterocarpus globosus* and *D. tempehes* to contrast the differences in abilities in pollen and seed dispersal. The seeds of *D. globosus* and *S. beccariana* have wings permitting wind-dispersal, while the other two are wingless, suggesting limited seed dispersal distance. As for pollen dispersal, both *D. globosus* and *D. tempehes* are pollinated by giant honeybees (*Apis dorsata*), which fly long distances, whereas two *Shorea* are pollinated by small beetles which are expected to disperse pollen over shorter distances.

The genetic structure of adult trees in a roughly 60 ha plot and saplings in 0.8-4 ha plot in the center of the 60 ha plot was examined using microsatellite makers. In adult trees, the genetic structure by Number of Alleles in Common showed positive genetic structure in all species, but the pattern was different among four species. The spatial scale of genetic patch was small in *D. globosus* and *S. beccariana*, but relatively large in other species. These differences among species were maybe reflected by their and pollen dispersal abilities.

The levels of inbreeding and gene dispersal distance of the four dipterocarp species were estimated by genetic data of saplings. We discuss the relationship between seed/pollen dispersal distance and inbreeding and genetic structure on four dipterocarp species.