

## Genetic diversity affects seedling survival but not growth or seed germination in the Bornean endemic dipterocarp *Parashorea tomentella*

### Abstract

**Background:** Logging and habitat fragmentation of tropical rain forests may disrupt patterns of gene flow and genetic diversity. Consequently, inbreeding in tree populations may reduce fitness and increase extinction risks, especially among species that are predominantly outcrossing, dependent on biotic pollination and/or display limited seed dispersal such as species of the Dipterocarpaceae.

**Aims:** To test the hypothesis that heterozygosity of individual progeny affects their likelihood of germination and the growth and survival of seedlings.

**Methods:** Standardised measure of multilocus heterozygosity (sMLH) was estimated from seven microsatellite loci for individual progeny collected from 18 mother trees of the large dipterocarp *Parashorea tomentella*. The relationships among sMLH, germination and seedling growth and survival were determined for the progeny.

**Results:** Seedling survival over 18 months increased with greater sMLH and fresh fruit weight. This result was expressed under all experimentally controlled combinations of light and nutrient availability in the nursery and in the shaded understorey of primary forest where survival overall was much lower than in the nursery. sMLH did not affect the probability of germination or seedling growth rate in any experimental treatment.

**Conclusions:** These results provide evidence that reduced heterozygosity is associated with reduced seedling survival in a tropical forest tree species.