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## **Aggregated adult-recruit spatial pattern of *Shorea* species explained by dispersal limitation process**

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Aggregated spatial patterns are commonly observed in tropical rainforests and studying mechanisms related to them advances the understanding of species coexistence in plant communities. Bivariate spatial patterns of recruits relative to conspecific adults of six *Shorea* species, *Shorea affinis*, *S. congestiflora*, *S. cordifolia*, *S. disticha*, *S. megistophylla*, *S. worthingtonii*, which is one of the dominant genera in the lowland rainforest, Sri Lanka were studied using the data from four censuses (1996, 2001, 2006 and 2011) of a 25-ha Sinharaja Forest Dynamic Plot. Dispersal limitation, i.e., adults serve as cluster centers of recruits was assumed during the analysis. Since adults are aggregated, the univariate simple and double cluster Thomas processes were fitted to the adults' pattern, and the most parsimonious model was selected based on the minimum AIC value. To evaluate whether the adult-recruit spatial pattern can be explained by dispersal limitation, we fitted the bivariate Thomas process with known parents. Based on the univariate analysis of adults, the univariate double cluster process was selected for all species. Among the six species, the bivariate adult-recruit pattern of *S. congestiflora*, *S. disticha*, and *S. megistophylla* could be explained well by dispersal limitation at 1-50m scale. However, for the other three species, a goodness-of-fit test indicated a significant departure between the observed pattern and the fitted model at a 5% significance level, and graphical representations of the simulation envelope test suggested additional small-scale clustering between 1-5m. Our results convey that aggregated adult-recruit patterns at the species level revealed different insights into the dispersal limitation process.

**Keywords:** Aggregated, Adult-recruit bivariate spatial pattern, Dispersal limitation, Univariate double cluster process

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