

**SIGNIFICANCE OF INTRASPECIFIC TRAIT VARIABILITY IN  
TRAIT-BASED COMMUNITY ASSEMBLY**

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The link between plant traits and resource gradients has greatly enhanced our understanding of plant community assembly. While plant trait variation encompasses both interspecific and intraspecific differences, ecological research generally considers that intraspecific variations (ITV) are negligible compared to interspecific variations (BTV). However, growing interest in ITV has revealed its significant role in plant community assembly. A direct comparison between BTV and ITV in plant species is lacking, especially in tropical rainforests. This study compared the inter and intra-specific variations of four key leaf traits, *viz.*, Leaf area (LA), Specific leaf area (SLA), Leaf dry matter content (LDMC), and Leaf thickness (LT) in 15 dominant tree species across two topographic habitats (ridge and valley) in the Sinharaja tropical lowland rainforest. Trait data from 30 randomly selected individuals (1-5 cm DBH) were collected for each species from the ridge and valley. It was hypothesized that while BTV would be greater than ITV, ITV would still show substantial variation across topographic habitats. The contribution of intraspecific variability in traits relative to total trait variation was quantified using a linear model, and the coefficient of variation (CV) was used to compare the BTV and ITV across two habitats. The coefficient of Variations for between-species in LA, SLA, LDMC, and LT were 5.70-, 4.00-, 5.83-, and 16.69- fold higher than their CV of within-species variation, respectively. This confirmed that trait values vary more between than within species. However, intraspecific variations explained 35%, 18%, and 13% of the total variation of SLA, LDMC, and LA across two habitats, respectively, supporting the hypothesis that significant role of ITV in plant community assembly. Intraspecific variation adjusts species' responses to environmental gradients, allowing them to thrive in various habitats. This study provides new evidence emphasizing the importance of intraspecific variation in trait-based community assembly in tropical lowland rainforests.

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