Title:	Examining the Role of Intraspecific Trait Variation in Shaping Tree Species' Distribution in a Dry Tropical Ecosystem of India
Authors:	Rajendra, Radhika
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Abstract:	Climate change poses a significant threat to the stability of forest ecosystems. However, our understanding of how tree populations respond to their abiotic environment remains limited. Recent research suggests that including intraspecific trait variation (ITV) within species can enhance our ability to address key issues in community ecology. Despite this progress, a comprehensive picture of the prevalence of ITV in plant communities and its influence on abundance is still lacking. The importance of studying ITV arises from the fact that environmental filtering primarily affects the individual level rather than the entire species. Studying the consequences of ITV in species distribution and abundance is relevant in the face of global environmental change, where the ability of a species to adapt to changes may hinge on the range of traits exhibited by its members. High levels of ITV can allow individual trees to exploit a broader range of resources, potentially increasing their chances of survival in heterogeneous or changing conditions. Notably, while trait-based ecology has seen significant global advancement, only a handful of studies have explored functional trait patterns within tropical dry ecosystems. Additionally, the majority of trait-based research has focused on variation between species, neglecting the potential role of ITV. We focused on four key traits known to influence tree performance across three sites in the Eastern Ghats. We examined and characterized patterns of ITV, then explored the mechanisms linking it to abundance. To understand the mechanisms by which ITV affects abundance, we analysed how ITV translates into niche width across environmental gradients, how niche width relates to abundance and how ITV relates to abundance. Our results revealed a substantial contribution of ITV to total trait variation across the four traits, and linear models uncovered a significant relationship between ITV, niche width and abundance. The results emphasise the importance of considering ITV in future studies.
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