

**Variations of leaf and stem traits in relation to altitudinal distributions of 12
Fagaceae species of Mount Kinabalu, Borneo**

ABSTRACT

Fagaceae in Southeast Asia shows diverse distributions along altitude, but the underlying mechanisms remain unclear. Since species traits (morphological and physiological characteristics) can dictate their resource use strategies (e.g., the way of resource acquisition and allocation), they potentially influence their distributions along altitude. Here, to examine the linkage between species traits and altitude, we quantified the variation of 10 leaf and stem traits of 12 Fagaceae species growing in Mount Kinabalu, Borneo and related traits to species lowest and highest limits and altitudinal range. Species with high leaf dry mass per area (LMA) and lamina thickness showed higher upper limits of altitudinal distribution whereas no traits were correlated with the lower limits. LMA, lamina thickness, leaf carbon concentration, and nitrogen content positively covaried with species' altitudinal range. These results demonstrate that species with conservative resource use had higher altitudinal limits and wider altitudinal range, highlighting the role of leaf traits in the diversification of altitudinal distributions among closely related species. We further suggest that diversifications in leaf traits potentially lead to the coexistence of Fagaceae species in tropical montane forests.