



## **Species differences in nitrogen cycling in a humid sub-tropical forest inferred from $^{15}\text{N}$ natural abundance**

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Studies of natural abundance of stable nitrogen isotope ( $\delta^{15}\text{N}$ ) of ecosystems can provide integrated information about N status and N cycling rates within the ecosystems. Plant species with different N cycling traits can affect ecosystem  $\delta^{15}\text{N}$ , but such differences are poorly explored in tropical forests. This study evaluates the extent of variation in plant  $\delta^{15}\text{N}$  among co-occurring sub-tropical tropical tree species in old-growth mixed broadleaved forest in southern China. We compared leaf  $\delta^{15}\text{N}$  values among five co-occurring tree species under ambient deposition (control plots), and variation in plant  $\delta^{15}\text{N}$  response to a decade of N addition (N-plots) and to a one-year enriched  $^{15}\text{N}$  addition to both treatments in the study forest.

We found significant differences in leaf  $\delta^{15}\text{N}$  values among tree species (up to 3‰ both in control and N-plots). Responses of leaf  $\delta^{15}\text{N}$  to N and  $^{15}\text{N}$  addition also differ among the tree species. These differences are explained by differences in N acquisition strategies (dependence on soil N and/or deposition N among the plant species) that is partly related to differences in mycorrhizal association among the studied plants. Our results indicate that plant species in N-rich tropical forests could have distinct N cycling traits as observed in many predominantly N-limited temperate and boreal forests. The finding, therefore, highlights the importance of considering tree species variation in studying N cycling in N-rich tropical forests.