



Nitrogen input ^{15}N -signatures are reflected in plant ^{15}N natural abundances of N-rich tropical forest in China

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In this study, we tested the measurement of natural abundance of ^{15}N ($\delta^{15}\text{N}$) for its ability to assess changes in N cycling due to increased N deposition in two forest types; namely, an old-growth broadleaved forest and a pine forest, in southern China. We measured $\delta^{15}\text{N}$ values of inorganic N in input and output fluxes under ambient N deposition, and N concentration and $\delta^{15}\text{N}$ of major ecosystem compartments under ambient and increased N deposition. Our results showed that N deposition to the forests was ^{15}N -depleted, and was dominated by $\text{NH}_4\text{-N}$. Plants were ^{15}N -depleted due to imprint from the ^{15}N -depleted atmospheric N deposition. The old-growth forest had larger N concentration and was more ^{15}N -enriched than the pine forest. Nitrogen addition did not significantly affect N concentration, but it significantly increased $\delta^{15}\text{N}$ values of plants, and slightly more so in the pine forest, toward the ^{15}N signature of the added N in both forests. The result indicates that the pine forest may rely more on the ^{15}N -depleted deposition N. Soil $\delta^{15}\text{N}$ values were slightly decreased by the N addition. Our result suggests that ecosystem $\delta^{15}\text{N}$ is more sensitive to the changes in ecosystem N status and N cycling than N concentration in N-saturated sub-tropical forests.