Geophysical Research Abstracts
Vol. 19, EGU2017-11039, 2017
EGU General Assembly 2017

Degraded karst vegetation recovery is limited by insufficient soil available nutrients

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As there are few acid insoluble materials in carbonate bedrock, the soil formation rate is extremely slow in karst areas. As a result, the soil depth as well as nutrients storage are extremely low. However, whether the total amount of soil nutrients is limited to degraded Karst vegetation recovery remains unclear. In this study, we compared ecosystem nitrogen (N), phosphorus (P) and potassium (K) stocks in two typical vegetation types, forest-shrub transition (FS) and secondary forest (F). The results showed that the biomass of FS and F is 70.54 and 210.63 Mg ha^{-1}, respectively; the corresponding N storage is 0.40 and 1.2 Mg ha^{-1}, respectively; the corresponding P storage is 0.051 and 0.15 Mg ha^{-1}, respectively; the corresponding K storage is 0.16 and 0.50 Mg ha^{-1}, respectively. If vegetation recovered from FS to F, required N, P and K amounts were 0.8, 0.1 and 0.34 Mg ha^{-1}, respectively. In FS stand, soil mass and corresponding total nitrogen, total phosphorus, total potassium, available nitrogen, available phosphorus and available potassium storage is 295.69, 1.65, 0.23, 2.75, 0.12, 0.00073 and 0.048 Mg ha^{-1}, respectively. The soil available nutrient storages in FS could not afford the required amounts by vegetation during the restoration. Nutrient deficiency caused by small soil stocks would restrict vegetation restoration in karst area, southwestern China.