

研究报告

## 西双版纳不同土地利用方式下土壤氮矿化作用研究

李明锐; 沙丽清

中国科学院西双版纳热带植物园昆明分部, 昆明 650223

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### 摘要

氮在森林生态系统的养分循环中很重要, 常把土壤氮矿化速率作为生态系统中氮有效性和氮损失的指标. 在云南省中国科学院西双版纳热带生态站周围, 用顶盖埋管法, 对季风常绿阔叶林、季节雨林、橡胶林、受过严重干扰的季节雨林、鸡血藤次生林和旱谷地的氮矿化速率进行研究. 结果表明, 在6种土地利用方式下, 净氮矿化速率和硝化速率由大到小依次为受过严重干扰的季节雨林 > 鸡血藤次生林 > 季节雨林 > 季风常绿阔叶林 > 橡胶林 > 旱谷地. 在西双版纳地区橡胶林和旱谷地被认为是受人为干扰较严重的土地利用方式, 这两种土地利用方式与各种森林下土壤中的氮矿化速率和氮储量相比均低, 达到显著水平. 较低的氮矿化速率与土壤本底氮储量低有关, 也与土壤中真菌数量较少有关. 对西双版纳6种常见土地利用方式的土壤氮储量和氮循环速率的研究表明, 受过严重干扰的季节雨林在恢复多年后土壤中养分的转化速率与原生林接近, 而林地被转化为农业或经济林用地后氮储量和氮矿化速率均显著降低.

关键词 [氮矿化; 土地利用方式; 人为干扰](#)

分类号

## Soil nitrogen mineralization under different land use patterns in Xishuangbanna

LI Mingrui, SHA Liqing

Kunming Division, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Kunming 650223, China

### Abstract

Nitrogen (N) cycle is very important for forest ecosystem, and soil N mineralization rate is often used as the index of soil N availability and its losses. Using Close-Top incubation method, we measured the N mineralization rate in soils (0~15 cm) of monsoon evergreen broadleaf forest, seasonal rain forest, rubber plantation, heavily disturbed seasonal rain forest, *Millettia laptobotrya*-secondary forest and upland rice field. The results showed that the net N mineralization rate and N nitrification rate were decreased in the sequence of heavily disturbed seasonal rain forest > *Millettia laptobotrya*-secondary forest > seasonal rain forest > monsoon evergreen broadleaf forest > rubber plantation > upland rice field. Rubber plantation and upland rice field were the most seriously disturbed land use patterns. Their soil N storage and mineralization rate were very low and exhibited significant variations, compared with other land use patterns. Lower net N mineralization rate correlated with lower N storage, and also, with lower fungi numbers. The N mineralization rate in disturbed forest soil which had recovered for several years was similar to that in primary forest soil, but decreased significantly when the forests were converted to agricultural land.

### Key words

[Nitrogen mineralization](#) [Land use pattern](#) [Human disturbance](#)

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