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浙江天童受损常绿阔叶林实验生态学研究

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浙江天童受损常绿阔叶林实验生态学研究 (VI): 不同干扰下植被恢复初期主要优势种叶性状及其生态适应

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Experimental ecology research on destroyed evergreen broad leaved forests in TNFP, Zhejiang (VI): Leaf traits and ecological adaptation of five main dominant species during the early stage of restoration after different disturbances

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摘要 以浙江天童国家森林公园人工模拟受损常绿阔叶林样地为研究地点, 分析了不同干扰下(择伐大树、清理下木、皆伐、皆伐及去除表土层)植被恢复初期5种主要优势树种最大净光合速率(Amax, net photosynthesis based on area)、比叶面积(SLA, specific leaf area)和叶片氮、磷含量(N, P, leaf nitrogen and phosphor concentration)等叶性状, 以期揭示不同树种对干扰的生态适应性. 结果表明: (1) 干扰后光照强度的增加导致叶片SLA降低, Amax和叶N含量增加; (2) 表土层的去除使得土壤磷有效性的减少, 从而导致叶P含量的下降, 但对Amax的影响较小; (3) 高Amax, SLA以及叶N, P含量的落叶树种山胡椒(Litsea cubeba)具有很强的资源获取能力和高的生产力, 从而在植被恢复早期占据竞争优势. 木荷(Schima superba)叶N, P含量最低, 但在不同干扰下Amax都高于其他常绿树种, 且与叶N含量之间存在具有显著正相关性. 干扰样地中石栎(Lithocarpus glaber)叶N含量较对照显著增加, 并维持在较高水平, 与Amax存在显著正相关性, 且其叶片抵御强光伤害的能力较强. 米槠(Castanopsis carlesii)的Amax, SLA, 叶N, P含量均为中等水平, 其Amax和SLA对环境具有较强的可塑性, 但叶N含量在多样地中较为稳定. 栲树(Castanopsis fargesii)的叶性状可塑性较差, Amax小, 且利用高光强的能力弱.

关键词: 常绿阔叶林 恢复 最大光合速率 比叶面积 叶氮磷含量 常绿阔叶林 恢复 最大光合速率 比叶面积 叶氮磷含量

Abstract: The maximum of net photosynthesis based on area (Amax), specific leaf area (SLA), and leaf nitrogen and phosphor concentration (N, P) of 5 main dominant species under 4 different degradation plots (removing trees, H>8 m; removing trees, H<8 m; removing all above ground plant; removing all above ground plant and 0-10 cm depth surface soil) were studied in Tiantong National Forest Park, Zhejiang province, China. The main results as follows. (1) Amax increased and SLA decreased along disturbance levels. (2) The low content of soil available P in plot III (removing all above ground plant and 0-10 cm depth surface soil) caused the significant declining of leaf P concentration. (3) Different main woody species owned different ecological adaptation to disturbance. Deciduous Litsea cubeba grew fast and dominated at the early stage of restoration with higher Amax, SLA, leaf N and P concentration. Schima superba had low leaf N and P concentration, while its Amax was high and had significant positive relationship with Amax. Lithocarpus glaber had high leaf N concentration in degradation plots, which maintained at higher degree and was related positive with Amax significantly, and had high ability of defending leaf against high light. Castanopsis carlesii had medium Amax, SLA, leaf N and P concentration; its Amax and SLA had high plasticity, while leaf N concentration was steady. Castanopsis fargesii had low Amax and ability of the utilization of high light.

Key words: restoration the maximum of net photosynthesis based on area specific leaf area leaf nitrogen and phosphor concentration evergreen broad leaved forest restoration the maximum of net photosynthesis based on area specific leaf area leaf nitrogen and phosphor concentration

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