

# 罗山不同森林群落叶功能性状及其环境响应机制

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**摘 要:**【目的】探讨罗山不同森林群落叶功能性状特征, 探明植物功能性状与环境之间的关系, 基于功能性状-环境相互关系揭示荒漠草原过渡带山地森林群落植物的生长对策和资源利用能力, 以期为罗山自然保护区的生态恢复和重建提供科学依据和理论基础。【方法】以罗山自然保护区内主要的森林群落类型(青海云杉纯林、油松纯林、青海云杉×油松混交林、油松×山杨混交林、山杨纯林)为研究对象, 测定叶面积(LS)、叶干物质质量(LDMC)、比叶重(SLW)、叶碳含量(LCC)、叶氮含量(LNC)和叶磷含量(LPC)等6种功能性状在海拔的变化规律和变异特征, 分析叶功能性状间相互关系。【结果】(1)叶功能性状间存在极显著的相关性;(2)叶功能性状在不同森林类型中可能有不同的表现, 青海云杉纯林中叶面积、比叶重、叶干物质含量相较与其他3个林分是最高的, 且叶片氮、磷含量是最低的;(3)随着海拔的上升和坡度的增加, 比叶重(SLW)、叶干物质含量(LDMC)和叶片碳含量(LCC)都有所增加;相反叶面积(LA)、叶片氮含量(LNC)和叶片磷含量(LPC)有所减少。【结论】本研究表明叶功能性状间的相互作用强烈, 植物采用不同的叶性策略来适应生境。

**关键词:** 森林群落; 叶功能性状; 地形因子; 响应机制

## Leaf functional traits and environmental response mechanisms of different forest communities in Luoshan Mountain

**Abstract:** 【Objective】 The characteristics of leaf functional traits of different forest communities in Luoshan Mountain were discussed, and the relationship between plant functional traits and environment was explored. Based on the relationship between functional traits and environment, the growth strategies and resource utilization ability of mountain forest communities in desert steppe transition zone were revealed, in order to provide scientific basis and theoretical basis for ecological restoration and reconstruction of Luoshan Nature Reserve. 【Method】 The main forest community types in Luoshan Nature Reserve (*Picea crassifolia* pure forest, *Pinus tabulaeformis* pure forest, *Picea crassifolia* × *Pinus tabulaeformis* mixed forest, *Pinus tabulaeformis* × *Populus simonii* mixed forest, *Populus simonii* pure forest) were taken as the research objects. The variation rules and variation characteristics of six functional traits such as leaf area (LS), leaf dry matter mass (LDMC), specific leaf weight (SLW), leaf carbon content (LCC), leaf nitrogen content (LNC) and leaf phosphorus content (LPC) at altitude were measured, and the relationship between leaf functional traits was analyzed. 【Result】 (1) There was a significant correlation between leaf functional traits. (2) Leaf functional traits may have different performances in different forest types. The leaf area, specific leaf weight and leaf dry matter content in the pure forest of Qinghai spruce were the highest compared with the other three forest types, and the leaf nitrogen and phosphorus contents were the lowest. (3) Specific leaf weight (SLW), leaf dry matter content (LDMC) and leaf carbon content (LCC) increased with the increase of altitude and slope. On the contrary, leaf area (LA), leaf nitrogen content (LNC) and leaf phosphorus content (LPC) decreased. 【Conclusion】 This study shows that the interaction between leaf functional traits is strong, and plants adopt different leaf strategies to adapt to habitats.

**Key words:** Forest communities ; leaf functional traits ; topographic factors ; response mechanism.