

粤北亚热带山地森林土壤有机碳沿海拔梯度的变化

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Variation of Soil Organic Carbon Content Along Altitudinal Gradient in Subtropical Montane Forest in North Guangdong

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摘要

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摘要 选择位于南岭国家级自然保护区的广东第一峰——石坑崆, 从海拔300 m起到山顶部的1900 m范围, 每隔100 m高程设置1条10m×120 m的样带, 共17条样带, 研究土壤有机碳含量沿海拔梯度的变化规律及其与植被类型和凋落物层厚度的关系。结果表明, 0~20 cm和>20~40 cm土层有机碳含量均随海拔梯度呈极显著差异 ($P < 0.001$), 并随林分类型不同而呈高度显著差异 ($P < 0.01$), 土壤有机碳含量总体上呈随海拔上升而升高的变化趋势。凋落物层厚度仅对0~20 cm土层有机碳含量有显著影响 ($P < 0.05$)。可见, 海拔梯度变化是影响土壤有机碳含量的综合和主导因素, 而最表层土壤有机碳含量还易受林分因子的影响, 这些因子反映了土地利用变化及自然保护历史。该项研究结果提示, 减少人类活动的干扰和保持林地适合的凋落物层厚度有助于增加森林生态系统的碳储量。

关键词: 土壤 有机碳 山地森林 海拔梯度 凋落物层厚度

Abstract: To explore distribution pattern of soil organic carbon(SOC)contents along altitudinal gradient and its relationships with vegetation type and litter thickness,17 transects(10m×120m each)were set up,one in every 100m in altitude from 300 m to 1900 m along a slope of the Shikengkong Mountain,the highest peak of Guangdong in the Nanling National Nature Reserve and soil litter samples collected in all the transects for analysis.Results show that SOC contents in the 0-20 cm and >20-40 cm soil layers varied sharply($P<0.001$)along the altitudinal gradient and between the four types of forest stands ($P<0.01$).Generally SOC content increased with elevation,and thickness of the litter layer showed significant effect only on the SOC content in the 0-20cm soil layer.Obviously elevation is the leading factor that determines distribution of SOC contents,and type of the forest stand is another that affects organic carbon content in the topsoil.All these factors reflect changes in the land use and history of the nature conservation.All the findings suggest that reducing anthropogenic interference and maintaining a litter layer proper in thickness may help increase the carbon pool in the forest ecosystem.

Keywords: soil organic carbon montane forest altitudinal gradient litter thickness

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