

# 塔里木沙漠公路防护林土壤微生物活性分异特征

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## Variation characteristics of soil microbial activities in the Tarim Desert Highway shelter forests, Xinjiang of Northwest China.

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摘要

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摘要

利用Biolog法、熏蒸提取和比色滴定的方法,测定了土壤碳源代谢强度、生物量和酶活性,分析了塔里木沙漠公路防护林土壤微生物活性的分异特征.结果表明:随着防护林定植年限增加,土壤微生物代谢活性(AWCD)和多样性指数明显增加,但不同土层间无明显差异;不同年限林地间过氧化氢酶差异极显著,纤维素酶和蔗糖酶差异显著;随着防护林定植年限增加,土壤微生物生物量增大,不同年限林地间微生物生物量碳和氮的差异极显著和显著,而微生物生物量磷无显著差异;土壤微生物的AWCD值与速效养分显著正相关,但与容重和水分的相关性不大.在现有的管理制度和气候条件下,随定植年限增加,塔里木沙漠公路防护林土壤代谢活性逐渐提高.

关键词: 塔里木沙漠公路防护林 土壤微生物 土壤微生物代谢活性 微生物量 酶活性

Abstract:

By the methods of Biolog, fumigation extraction, and colorimetric titration, this paper determined the soil carbon sources metabolic intensities, microbial biomass, and enzyme activities in the Tarim Desert Highway shelter forests with different plantation times, and analyzed the variation characteristics of soil microbial activities in these shelter forests. With the increasing planting years of the shelter forests, the soil microbial metabolic activities (AWCD) and microbial diversity indices enhanced obviously, but the AWCD values in different soil layers had no significant differences. The soil catalase activity among the forests had no significant difference, but the soil cellulase and sucrase activities varied significantly. The soil microbial biomass carbon and nitrogen increased with the increasing planting years of the shelter forests, having a significant difference among the forests, but the microbial biomass phosphorus had no significant difference. The AWCD values had significant correlations with soil available nutrient contents, but less correlations with soil bulk density and moisture content. It was suggested that under the present management patterns and climate conditions, the soil metabolic activities in the Tarim Desert Highway shelter forests would be improved continuously with the increasing planting years of the forests.

Key words: Tarim Desert Highway shelter forest soil microbe soil microbial metabolic activities microbial biomass enzyme activity.

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