

杉木采伐迹地造林树种转变对土壤可溶性有机质的影响

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Effects of tree species transfer on soil dissolved organic matter pools in a reforested Chinese fir (*Cunninghamia lanceolata*) woodland.WAN Xiao-hua^{1,2}, HUANG Zhi-qun^{1,2}, HE Zong-ming³, HU Zhen-hong^{1,2}, YU Zai-peng^{1,2}, WANG Min-huang^{1,2}, YANG Yu-sheng^{1,2}, FAN Shao-hui⁴

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摘要

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摘要

以二代杉木林采伐迹地上营造的19年生米老排与杉木人工林为对象,采用冷水、热水和2 mol·L⁻¹ KCl溶液提取0~5、5~10和10~20 cm层土壤中的可溶性有机碳(DOC)和有机氮(DON),研究造林树种转变对土壤可溶性有机质的影响.结果表明:造林树种转变对林地土壤DOC和DON库有显著影响.米老排人工林土壤用冷水、热水和KCl溶液浸提的DOC含量均显著高于杉木人工林.0~5和5~10 cm层土壤用冷水和热水浸提的DON含量显著高于杉木林.不同方法浸提的DOC和DON含量大小顺序均为KCl>热水>冷水.在0~5 cm土层,米老排人工林土壤微生物量碳(MBC)含量比杉木林高76.3%.相关分析结果显示,热水浸提的DOC和DON与土壤MBC之间均呈显著正相关.不同树种人工林间土壤可溶性有机质的差异主要与凋落物输入的数量和质量有关.在杉木采伐迹地上营造米老排,能够明显改善土壤肥力.

关键词: 杉木 采伐迹地 土壤可溶性有机碳、氮 微生物生物量 树种

Abstract:

Based on the comparison between reforested 19-year-old *Mytilaria laosensis* and *Cunninghamia lanceolata* plantations on cut over land of *C. lanceolata*, effects of tree species transfer on soil dissolved organic matter were investigated. Cold water, hot water and 2 mol·L⁻¹ KCl solution were used to extract soil dissolved organic carbon (DOC) and dissolved organic nitrogen (DON) from 0-5, 5-10 and 10-20 cm soil layers. In *M. laosensis* plantation, the concentrations of soil DOC extracted by cold water, hot water and 2 mol·L⁻¹ KCl solutions were significantly higher than that in *C. lanceolata* plantation. In the 0-5 and 5-10 cm layers, the concentrations of soil DON extracted by cold water and hot water in *M. laosensis* plantation were significantly higher than that in *C. lanceolata* plantation. The extracted efficiencies for DOC and DON were both in order of KCl solution>hot water>cold water. In the 0-5 cm layers, soil microbial biomass carbon (MBC) under *M. laosensis* was averagely 76.3% greater than under *C. lanceolata*. Correlation analysis showed that there were significant positive relationships between hot water extractable organic matter and soil MBC. Differences in the sizes of soil DOC and DON pools between the *M. laosensis* and *C. lanceolata* forests might be attributed to the quality and quantity of organic matter input. The transfer from *C. lanceolata* to *M. laosensis* could improve soil fertility in the plantation.

Key words: *Cunninghamia lanceolata* cut-over land soil dissolved organic carbon and nitrogen soil microbial biomass tree species.

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