

研究报告

蚯蚓活动对红壤磷素主要形态及有效磷含量的影响

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摘要

通过盆钵生物试验和采用Hedley磷素分级方法研究了秉氏环毛蚓(*Pheretima pingi*)对红壤磷素主要形态和红壤有效磷含量的影响.结果表明,在蚯蚓和有机物料(稻草、花生秸、油菜秸)的共同作用下,经过100 d培养后土壤有效磷含量显著提高.统计分析结果表明,花生秸接种蚯蚓处理与不接种蚯蚓处理和油菜秸接种蚯蚓处理与不接种蚯蚓处理之间的土壤有效磷含量差异均达显著水平.采用Hedley磷素分级法测得的树脂磷由原土的痕量增加到10.5~17.8 mg·kg⁻¹, NaHCO₃溶解态磷由原土的14.5 mg·kg⁻¹增加到23.5~35.6 mg·kg⁻¹, 微生物细胞磷由原土的1.0 mg·kg⁻¹增加到6.8~9.7 mg·kg⁻¹, 土壤有机磷含量由原土的37.9 mg·kg⁻¹增加到50.7~59.3 mg·kg⁻¹, 而土壤中活性最低的残留磷含量则有所降低.蚯蚓活动对红壤磷素具有较强的活化作用.

关键词 [蚯蚓活动,红壤,磷素形态,磷素有效性](#)

分类号

Effects of earthworm activity on phosphorus fraction and available phosphorus content in red soil

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Abstract

By the methods of incubation test and Hedley's phosphorus fractionation, this paper studied the effects of inoculating earthworm (*Pheretima pingi*) on the phosphorus fractions and available phosphorus contents in red soil. The results showed that during a 100 day incubation, earthworm inoculation combined with organic materials (rice straw RS, peanut residue PR, and rape residue RR) amendment increased significantly the content of soil available phosphorus. Statistics analysis showed that there was a significant difference in soil available phosphorus content between treatments PR or RR with and without earthworm inoculation. Compared with the contents of anion-exchange resin P (trace), NaCO₃-soluble P (145 mg·kg⁻¹) and microbial P (1.0 mg·kg⁻¹) in CK, those in treatments of earthworm inoculation plus organic materials amendment increased to 10.5~17.8 mg·kg⁻¹, 23.5~35.6 mg·kg⁻¹, and 6.8~9.7 mg·kg⁻¹, respectively, organic phosphorus content enhanced from 37.9 mg·kg⁻¹ to 50.7~59.3 mg·kg⁻¹, whereas residual P was reduced. Earthworm performed an activated effect on the availability of phosphorus in red soil.

Key words [Earthworm activity](#) [Red soil](#) [Phosphorus fraction](#) [Phosphorus](#)

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