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侵蚀程度对不同粒径团聚体中养分含量和红壤有机质稳定性的影响

Effect of erosion on nutrient content in aggregates of different particle-size fractions and stability of organic matter in Ultisols

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中文摘要:

以三种侵蚀程度的红壤(轻度、中度、严重)为供试材料,研究其>0.25 mm水稳性团聚体中的养分(全氮、全磷、全钾、有机质)和不同形态有机碳(易氧化态和难氧化态)的含量状况和分布特点。结果表明:随着红壤由轻度、中度到严重侵蚀的变化,>0.25 mm水稳性团聚体中有机质、全氮和全磷含量逐渐降低;>0.25 mm水稳性团聚体中的养分对土壤养分的贡献率为[>4 mm] > [0.5~1 mm] > [1~2 mm] > [2~4 mm] > [0.25~0.5 mm];侵蚀红壤的全氮、全磷和有机质均与>0.25 mm水稳性团聚体含量显著正相关。土壤有机碳、易氧化碳和难氧化碳的含量随着红壤侵蚀程度的增强逐渐降低,并且均与>0.25 mm水稳性团聚体、有机质、全氮、全磷呈极显著正相关。有机质氧化稳定性系数与不同粒径水稳性团聚体、土壤有机质、全氮和全磷均呈负相关。

Abstract:

Contents and distributions of nutrients (total N, total P, total K and OM) and organic carbon of different forms (ready-to-oxidize and hard-to-oxidize) in water-stable aggregates (>0.25 mm) in ultisols different in erosion degree (slight, medium and severe) were studied. Results show that with erosion aggravating, the contents of nutrients (OM, total N and total P) in water-stable aggregates (>0.25 mm) gradually decreased. In terms of contribution to the total of soil nutrients, various fractions of water-stable aggregated a sequence of [>4 mm] > [0.5~1 mm] > [1~2 mm] > [2~4 mm] > [0.25~0.5 mm]. The contents of total N, total P and OM were significantly and positively related to the content of >0.25 mm water-stable aggregates. The contents of soil total organic carbon, readily-oxidation and hard-oxidation organic carbon took on a falling trend with the enhancing of erosion degree and had the marked positive correlation with >0.25 mm water-stable aggregates, OM, total N and total P, while oxidation stability coefficient of organic matter was negatively related to the contents of water-stable aggregates of various fractions, OM, total N and total P.

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