核农学报 2011, 25(2) 337-341 DOI: ISSN: 1000-8551 CN: 11-2265/S

论文

树儿梁小流域坝地土壤颗粒的分形特征

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摘要：

土壤颗粒的分形维数是重要的土壤物理特性, 为研究坝地土壤颗粒分形维数的内涵和利用土壤颗粒的分形维数来描述与土壤性质的关系，本研究计算了树儿梁小流域坝地土壤颗粒的分形维数,并分析了分形维数与各粒级组成及其土壤养分的关系。结果表明：树儿梁坝地土壤颗粒的分形维数随土壤黏粒的增加而增大，坝前、坝中、坝尾土壤颗粒的分形维数分别为2.7278、2.7184和2.685，符合Stokes沉降原理，坝地颗粒组成各粒级含量及变化范围整体差异较小，在垂直剖面上变化都很微弱。坝地土壤颗粒的分形维数与有机质含量呈显著正相关;与阳离子代换量、全钾、缓效钾、速效钾呈极显著正相关。利用土壤颗粒的分形维数来描述土壤性质具有积极的应用意义。

关键词： 坝地 土壤颗粒 分形维数

THE FRACTIONAL CHARACTERISTIC OF SOIL PARTICLE ABOUT DAM LAND IN SHUERLIANG SMALL RIVER VALLEY

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Abstract:

Soil particle is one of the important physical properties of soil. In order to study the connotation of soil particle fractal dimension and the description soil properties by using soil particle fractal dimension,this study calculated the soil particle fractal dimension of dam land in Shuerliang small river valley,and analyzed the relation of fractal dimension and composition of various soil particle and nutrient.Results showed that the fractal dimensions of particle size distribution (PSD) of soils increased with the increase of soil clay content in dam land in Shuerliang,and the fractal dimensions of PSD in the front, the middle and the end of the dam respectively were 2.7278, 2.7184 and 2.685，which met the Stokes’ rule. The overall difference of the various size particles content of particle constitution of dam land and the change range were very small，the changes in the vertical profile were very weak. There was significantly positive correlation between the fractal dimensions of PSD and the content of soil organic matter in dam land. The fractal dimensions of PSD were highly significantly positiverelated with the soil cation exchange capacity, total potassium, slowly available potassium and readily available potassium. So it is positively significant to describe soil nature with the fractional dimension of soil particle.

Keywords: dam land soil particle fractal dimension

收稿日期 修回日期 网络版发布日期

DOI:

基金项目:

山西省淤地坝建设资助项目（2007HX13）

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