

## 梁子湖湿地土壤养分的空间异质性

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## Spatial variability of soil nutrients in wetland of Liangzi Lake

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**摘要** 2003年10月利用地统计学方法对梁子湖湿地保护区内一块63.9km<sup>2</sup>区域的土壤养分的空间变异进行了研究。以400m×400m的网格采集了101个表层(0—15cm)土壤样品。分析结果表明,土壤养分有较大的空间变异,土壤有机质、全氮、全磷、速效氮变异系数分别是36.0%、30.6%、3.7%和29.3%;速效磷的变异系数最高为50.4%。土壤有机质、全氮、全磷、速效氮和速效磷的理论模型均为球状模型。土壤有机质、全氮、全磷、速效氮具有中等空间自相关性,随机变异分别是68.5%、68.3%、75%和71.5%;速效磷的自空间相关性较弱,变异为82.4%。5种养分的空间自相关距离比较接近,变程在2853m~963m之间。通过克里格插值进行土壤养分空间插值制图显示,土壤养分表现出空间分布的相似性。

**关键词:** 湿地 土壤养分 空间异质性 地统计学 湿地 土壤养分 空间异质性 地统计学

**Abstract:** Understanding distribution of soil nutrients at the wetland is important for studying the ecological processes in wetland and wetland ecosystem function. However, soil nutrients are heterogeneous no matter in large scale or small scale wetland. With the wide application of GIS in the soil science, the soil nutrient spatial heterogeneity has aroused more and more attention in recent year. In order to study the spatial variability of soil nutrients in wetland of Liangzi Lake, an experimental site with area of 63.9 km<sup>2</sup> was selected to conduct the soil investigation. 101 soil surface (0—15cm) samples were collected at October in 2003, on a 400-by 400-m grid. Those soil samples were used for the measurement of (organic) matter, total N, total P, available N and available P. Based on spatial analysis function of GIS, spatial variability of soil nutrients in wetland of Liangzi Lake was studied using geostatistics. Theoretical semivariogram models of soil (organic) matter, total N, total P, available N and available P were spherical model with a sill. Soil properties varied sharply, among which CV of available P was highest, while CV of soil total P was the lowest with the values being 50.4% and 13.7%, respectively. Soil organic matter, total N, total P and available N were of spatial autocorrelation. The ratio of random variance (nugget) to total variance (sill) was 68.5% for soil organic matter, 68.3% for total N, 75% for total P, 71.5% for available N, respectively. The spatial autocorrelation of available P was lowest being 82.4%, no significant differences were found in the distance of spatial autocorrelation of these five soil nutrients, among which the distance of soil organic matter total N, total P, available N and available P was 2906.1 m, 2896.3 m, 2853 m, 2963.3 m and 2890.7 m, respectively. The map of Kriging interpolation indicated that the spatial distribution of those five soil nutrients were similar.

**Keywords:**

## 引用本文:

熊汉锋;王运华.梁子湖湿地土壤养分的空间异质性[J] 植物营养与肥料学报, 2005,V11(5): 584-

XIONG Han-feng;WANG Yun-hua .Spatial variability of soil nutrients in wetland of Liangzi Lake[J] Acta Metallurgica Sinica, 2005,V11(5): 584-

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