

研究报告

沙冬青群落土壤有机碳和全氮含量的空间异质性

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摘要 应用地统计学的基本原理与方法, 分析了干旱荒漠地带沙冬青群落0~5和50~70 cm土壤有机碳(SOC)和全氮(TN)及C/N空间异质性. 结果表明, 0~5 cm的SOC和TN的平均含量分别为0.744和0.259 g·kg⁻¹, 平均变异系数分别为0.280和0.213; 50~70 cm的SOC和TN的平均含量分别为1.425和0.295 g·kg⁻¹, 平均变异系数分别为0.195和0.206, 反映出该植被区土壤肥力较为贫瘠. 该沙生植被区土壤SOC和TN含量存在高度空间异质性, 其空间异质性主要由自相关因素引起. 0~5 cm土层 SOC和TN含量空间变异尺度分别为20.99和29.19 m; 50~70 cm土层分别为42.9和62.1 m. 变异尺度未集中在沙冬青冠幅范围, 未反映出荒漠地带沙生植物种的“肥岛”效应, 为其他物种的入侵创造了障碍. 这种空间分布格局和尺度为维持沙冬青在干旱荒漠沙生植被区的优势度提供了保障, 解释了其长期存在的机制.

关键词 [沙冬青](#) [地统计学](#) [空间异质性](#) [土壤有机碳](#) [全氮](#)

分类号

Spatial heterogeneity of soil organic carbon and nitrogen under *Ammopiptanthus mongolicus* community in arid desert zone

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Abstract

Based on the principles of geo-statistics, this paper studied the spatial heterogeneity of soil organic carbon (SOC) and total nitrogen (TN) under *Ammopiptanthus mongolicus* community in arid desert zone. The results showed that the mean contents of SOC and TN at the depth of 0~5 cm were 0.744 and 0.259 g·kg⁻¹, with the co-variation coefficient being 0.280 and 0.213, and those at the depth of 50~70 cm were 1.425 g·kg⁻¹ and 0.295 g·kg⁻¹, with the co-variation coefficient being 0.195 and 0.206, respectively, reflecting the oligotrophic condition of soil fertility at this habitat. The self-correlation factors resulted in the high spatial heterogeneity of SOC and TN. The dimensions of SOC and TN were 20.99 m and 29.19 m at the depth of 0~5 cm, and 42.9 m and 62.1 m at the depth of 50~70 cm, respectively. The dimensions were beyond the confine of canopy and inter-space of shrub, without the efficacy of “islands of fertility”, which would block the intrusion of other plant species, and support the *A. mongolicus* shrub live at this habitat. These distribution pattern and dimension of SOC and TN can interpret the long-term living mechanism of *A. mongolicus*, and supply some theoretical bases for protecting and moving this relic species.

Key words [Ammopiptanthus mongolicus](#) [Geo-statistics](#) [Spatial heterogeneity](#) [Soil organic carbon](#) [Total nitrogen](#)

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