

## 放牧对阴山北麓草原植被和土壤理化性质的影响

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**摘要:**【目的】阴山北麓草原是我国北方草原生态系统的重要组成部分, 该地区生态系统稳定性低, 抗干扰能力差。【方法】本研究对草地过度放牧可能导致的植被群落结构和土壤理化性质的变化进行了实验。以希拉穆仁(内蒙古北部)天然草地为研究对象, 采用放牧强度为单因素的完全随机分组试验设计, 共创建了三个区块, 每个区块有 4 个不同放牧强度的地块, 每个区块的面积为  $100\text{m} \times 100\text{m}$ 。通过实验研究了阴山北麓草原过度放牧对植被群落结构和土壤理化性质可能产生的影响。【结果】优势种阿尔泰狗娃花(*Heteropappus altaicus*)和细裂叶莲蒿(*Artimisia gmelinii*)的重要值随放牧强度的增加发生不同程度的变化。随着放牧强度的增加, 地表植被覆盖度显著降低。放牧强度的增加导致土壤中极粗沙粒含量显著增加。重度放牧增加了地表暴露面积, 加剧了风的作用和水的冲刷作用, 导致表层土壤颗粒变粗。在 0-5cm 深度, 土壤容重随放牧强度的增加呈增加趋势。重度放牧样地土壤有机质含量较无放牧、轻度放牧和中度放牧 0-40 cm 土层分别下降 11.74%、11.00%和 14.08%。【结论】研究结果强调了控制放牧强度对土壤和植被恢复的重要性。因此, 短期放牧(如 5 年)对植被群落组成和物种多样性的影响可能不太明显。该研究有助于提高我们对草地管理和草地物种多样性恢复的认识。

## Impacts of Grazing on Vegetation and Soil Physicochemical Properties in Northern Yinshan Mountain Grasslands

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**Abstract:**【Objective】The grasslands at the northern foot of the Yinshan Mountains are an integral component of the northern grassland ecosystem in China. The ecosystem in this region has low stability and poor resistance to disturbance. 【Method】In this study, experiments were conducted to evaluate the possible changes in vegetation community structure and soil physicochemical properties due to overgrazing in the grasslands. Completely randomized group experiments were designed with grazing intensity as the single-factor study was conducted using natural grassland located in Xilamuren (in Inner Mongolia, northern China) as the study area. Three blocks were created, each having four plots of different grazing intensities and each block having an area of  $100\text{ m} \times 100\text{ m}$ . The experiments were conducted to evaluate the possible variances both in the structure of the vegetation community and the soil physicochemical properties resulting from overgrazing in the grasslands at the northern

foot of Yinshan Mountain. **【Result】** The importance values of dominant species, such as *Heteropappus altaicus* and *Artemisia gmelinii*, exhibited varying degrees of change with an increase in the grazing intensity. The surface vegetation cover decreased significantly with an increase in the grazing intensity. The increasing grazing intensity led to a significant increase in the content of very coarse sand grains in the soil. Severe grazing increased the exposed surface area, intensified the effects of blowing wind and scouring action of water, and led to the coarsening of topsoil particles. At 0–5 cm depth, the bulk density of soil exhibited an increasing tendency with an increase in the grazing intensity. The organic matter content of the soil in the heavily grazed plots decreased by 11.74%, 11.00%, and 14.08%, respectively, when compared to that in the 0–40 cm soil layer with no grazing, light grazing, and moderate grazing. **【Conclusion】** The results emphasized the importance of managing grazing intensity for soil and vegetation restoration. Thus, the effects of short-term grazing (for example, 5 years) on vegetation community composition and species diversity may be less pronounced. This study contributes to our understanding of pasture management and the restoration of grassland species diversity.