

持续收割对上海九段沙湿地芦苇生长特征、生物量和土壤全氮含量的影响

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Effects of Continuous Harvesting on Growth and Biomass of *Phragmites australis* and Soil Total Nitrogen Content in Jiuduansha Wetland, Shanghai

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摘要

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摘要 为揭示长期芦苇 (*Phragmites australis*) 收割对芦苇湿地的影响, 对上海九段沙湿地芦苇10 a持续收割区与天然未收割区芦苇生长特征和生物量以及土壤全氮含量进行比较研究。结果表明, 芦苇收割能够显著促进芦苇秆密度的增加 ($P<0.05$), 但对芦苇秆高和秆径无显著影响。收割区芦苇地上生物量显著高于未收割区 ($P<0.05$), 但地下生物量却显著低于未收割区 ($P<0.05$)。芦苇收割不但能够显著降低表层 (0~5 cm) 土壤全氮含量, 而且还能影响土壤全氮含量的垂直分布。收割区不同深度 (0~50 cm) 土层全氮含量均低于未收割区, 其中0~10 cm和>10~20 cm土层收割区和未收割区间差异均达显著水平。此外, 未收割区土壤全氮含量随土层深度的增加而降低, 而收割区中浅层 (0~20 cm) 土壤全氮含量低于其他土层。因此, 长期芦苇收割能够影响芦苇地上和地下生物量的分配, 并降低芦苇湿地土壤全氮含量。应考虑采取更合理的收割策略。

关键词: 九段沙湿地 芦苇收割 生长特征 生物量 全氮含量

Abstract: To explore effects of continuous harvesting on *Phragmites australis*-dominated wetland, growth and biomass of *P. australis* and variation of content of soil total nitrogen were monitored in two plots of reed wetland, one subjected to continuous harvesting for 10 years and one left intact, in Jiuduansha, Shanghai for comparison. Results show that reed harvesting significantly promoted density of *P. australis* ($P<0.05$), but had no much effect on shoot height and basal shoot diameter of the plants. The above-ground biomass of *P. australis* was significantly higher in the harvested plot than in the intact plot ($P<0.05$). However, a reverse trend in below-ground biomass was observed. Reed harvesting not only significantly reduced the content of total nitrogen in the surface soil (0-5 cm), but also affected the vertical distribution of soil nitrogen. The total nitrogen content was generally lower in the harvested plot than in the intact plot in all the soil layers (0-50 cm), and the difference was especially significant in soil layers of 0-10 cm and >10-20 cm. In addition, in the intact plot, soil total nitrogen content tended to decrease with increasing soil depth, while in harvested plots, it was found lower in superficial and middle soil layers (0-20 cm) than in the other layers. Therefore, the practice of long-term continuous harvesting may affect the allocation of biomass between the above- and below-ground parts of *P. australis*, and reduce the content of soil total nitrogen in *P. australis*-dominated wetland. It is advisable to develop a more reasonable strategy for harvesting reeds in the wetland.

Keywords: Jiuduansha Wetland *Phragmites australis* harvesting growing characteristics biomass total nitrogen content

Received 2012-07-03; published 2013-03-25

Fund:

中国科学院战略生物资源科技支撑体系运行专项(CZBZX-1)

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引用本文:

马华, 陈秀芝, 潘卉, 孙瑛, 吴捷. 持续收割对上海九段沙湿地芦苇生长特征、生物量和土壤全氮含量的影响[J] 生态与农村环境学报, 2013, V29(2): 209-213

MA Hua, CHEN Xiu-Zhi, PAN Hui, SUN Ying, WU Jie. Effects of Continuous Harvesting on Growth and Biomass of *Phragmites australis* and Soil Total Nitrogen Content in Jiuduansha Wetland, Shanghai[J] Journal of Ecology and Rural Environment, 2013, V29(2): 209-213

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