

## 加拿大一枝黄花入侵对杭州湾地区土壤线虫群落的影响

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## Effect of *Solidago canadensis* invasions on soil nematode communities in Hangzhou Bay

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摘要

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**摘要** 近年来随着地下生态学的发展,生态学家们逐渐重视生物入侵导致的地下生物多样性及其相关生态系统功能的改变。为探究加拿大一枝黄花(*Solidago canadensis*)入侵对土壤线虫的影响,我们在杭州湾地区选取镇海、平湖、慈溪、奉贤、海盐和杭州6个研究地点,比较外来种加拿大一枝黄花群落与土著种芦苇(*Phragmites australis*)群落土壤中的线虫群落结构和功能。结果显示:两种植物群落土壤中的线虫属数和多样性没有显著差异,而线虫营养多样性、大多数营养类群百分比以及线虫群落结构均存在显著差异,表明加拿大一枝黄花的入侵在一定程度上改变了杭州湾地区土壤线虫的群落结构;加拿大一枝黄花群落中土壤食真菌线虫比例趋于增加,植食性线虫比例降低,表明加拿大一枝黄花的入侵可能对土壤生态系统的能流途径产生影响,在入侵地抗寄生线虫能力强于土著植物芦苇;采样地点与植物的交互作用对线虫多样性和群落结构的影响显著,表明入侵地点是决定加拿大一枝黄花对土壤生物影响的重要因素之一;土壤颗粒组成、碳含量和氮含量是影响线虫群落结构的主要环境因子。

**关键词:** 植物入侵 *Solidago canadensis* 线虫 多样性 群落结构

**Abstract:** Ecologists are increasingly focusing on the effects of biological invasions on soil biodiversity and ecosystem functioning. We compared soil nematodes under plant communities dominated by invasive *Solidago canadensis* and native plant *Phragmites australis* at 6 sites (Zhenhai, Fengxian, Pinghu, Haiyan, Cixi and Hangzhou) in Hangzhou Bay to assess the effects of *S. canadensis* invasions on soil nematode communities. The total number of genera and diversity of soil nematode did not differ between *S. canadensis* and *P. australis* communities. Trophic diversity, most of the proportions of trophic groups and nematode community structure varied between the two plant communities. These results suggested that the invasion of *S. canadensis* changed soil community structure and functioning in Hangzhou Bay. Compared to *P. australis* communities, the proportion of fungivores tended to increase in soil under *S. canadensis* communities, suggesting that the invasion might modify soil nutrient cycling. The proportion of herbivores decreased in soil dominated by *S. canadensis*, suggesting that the exotic *S. canadensis* is less vulnerable to parasitic nematodes than the native *P. australis*. Interactions between plant community type and site were significant for nematode diversity and community structure, which indicated that site was an important factor in determining the impact of the invasive plant on soil fauna. Soil grain composition, soil carbon and soil nitrogen were identified as the most important factors in shaping nematode communities.

**Keywords:** plant invasion *Solidago canadensis* nematodes diversity community structure

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