入侵植物加拿大一枝黄花与乡土植物芦苇的相互化感作用

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Allelopathic interactions between invasive plant *Solidago canadensis* and native plant *Phragmites australis*.

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摘要

以加拿大一枝黄花和芦苇的共优群落和各自单优群落的种子为化感受体，分析其分别在加拿大一枝黄花和芦苇5个浓度梯度(12.5、25、50、100和200 mg·mL^{-1})浸提液处理下的发芽率和芽长差异，研究2种植物的相互化感作用规律.结果表明：2种植物在共优群落中的千粒重和蒸馏水培养下的发芽率均比单优群落大.加拿大一枝黄花的浸提液对自身种子发芽率在单优和共优群落中均具有在低浓度下(12.5、25 mg·mL^{-1})轻微促进、中高浓度下(50、100和200 mg·mL^{-1})强烈抑制的作用，其中对共优群落种子的抑制作用尤为显著；而芦苇浸提液对加拿大一枝黄花种子的影响无明显规律.加拿大一枝黄花的种子芽长在单优和共优群落中均随自身浸提液浓度的升高趋于减小，随芦苇浸提液浓度的升高呈波动减小趋势.在芦苇和加拿大一枝黄花浸提液处理下，芦苇种子发芽率在单优群落中均显著大于共优群落（$P<0.05$），但2种浸提液处理间无显著差异.

关键词： 植物入侵 化感 群落恢复 加拿大一枝黄花 芦苇

Abstract:

Taking the seeds of invasive plant *Solidago canadensis* and native plant *Phramites australis* from their mono- and co-dominant communities as allelopathic acceptors, this paper analyzed the differences in the seed germination rate and sprout length after treated with five level (12.5, 25, 50, 100, and 200 mg·mL^{-1}) *S. canadensis* and *P. australis* extracts, aimed to understand the allelopathic interactions between the two species. The 1000-grain weight and seed germination rate under distilled water treatment of the two species in co-dominated community were greater than those in mono-dominant community. Low level (12.5 and 25 mg·mL^{-1}) *S. canadensi* extracts slightly promoted the seed germination rates of *S. canadensis* in both mono- and co-dominant communities, but high level (50, 100, and 200 mg·mL^{-1}) *S. canadensi* extracts had strong inhibition effect, especially for the *S. canadensis* in co-dominated community. No significant patterns were observed about the effects of *P. australis* extract on *S. canadensis* seed germination. The sprout length of *S. canadensis* seeds in both mono- and co-dominant communities decreased with increasing level of *S. canadensis* extract, but decreased in a fluctuation way with increasing level of *P. australis* extract. After treated with the extracts of *P. australis* or *S. canadensis*, the seed germination rate of *P. australis* in mono-dominant community was significantly greater than that in co-dominant community ($P<0.05$), but there was no significant difference between these two extracts.

Key words: plant invasion allelopathy community restoration *Solidago canadensis* *Phragmites australis*

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