

研究报告

# 化感水稻PI 312777 苗期根系分泌物中化学成分分析

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## 摘要

在接近自然栽培的田间土壤条件下, 以无种植水稻秧苗的田间土壤为对照, 采用循环法分别收集化感水稻品种PI312777 (PI) 苗期 (3~4叶) 根系分泌物和对照土壤溶液, 经乙醚萃取, GC-MS分析和仪器谱图库(NIST98 & WILEY)检索.结果表明, 在水稻PI根系分泌物的乙醚萃取物中检测到36个化合物, 其中萜类9个(峰面积10.97%)、酚醌类8个(5.87%)、酯类6个(10.68%)、醛酮类3个(1.44%)、杂环类4个(68.04%)、醇类2个(1.23%)、醚类2个(0.57%)和其他物质2个(1.20%), 萜类之间、酚醌类之间的化合物结构具有明显的相似性.在对照土壤溶液的乙醚萃取物中检测到39个化合物, 其中有7个化合物与水稻PI根系分泌物中化合物相同.此外, 还讨论了水稻根系分泌物与对照土壤溶液之间物质的差异和各类物质的化感作用机理.

关键词 [水稻; 根系分泌物; 化感作用; 化感物质](#)

分类号

## Chemical components of root exudates from allelopathic rice accession PI 312777 seedlings

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### Abstract

In this study, allelopathic rice accession PI312777 seedlings were grown on a paddy soil under near natural condition, and their root exudates were collected by using circulation method, with the solution collected from no seedlings-planted soil as the control. The ether extracts of the root exudates and soil solution were detected by GC-MS, and identified with the mass spectral database of NIST and WILEY Library. The results showed that there were 36 compounds in the rice root exudates, including 9 terpenoids (peak area 10.97%), 8 phenols or quinones (5.87%), 6 esters (10.68%), 3 aldehydes or ketones (1.44%), 4 heterocycles (68.04%), 2 alcohols (1.23%), 2 ethers (0.57%), and 2 others (1.20%). A distinctly similar structure was observed among the terpenoids and among the phenols or quinones. In the soil solution, 39 compounds were detected, and 7 of them were the same of the root exudates. The difference of the compounds in rice root exudates and soil solution, and the possible allelopathic mechanisms of these compounds were discussed in this paper.

Key words [Oryza sativa](#) [Root exudate](#) [Allelopathy](#) [Allelochemicals](#)

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