

研究论文

高效液相色谱法测定植物根系分泌物中的有机酸

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收稿日期 2005-6-21 修回日期 2005-9-4 网络版发布日期 2006-6-1 接受日期

摘要 以小麦为例,建立了植物根系分泌物中有机酸的提取和测定方法。小麦根系分泌物由培根法培育收集,先后经阳离子和阴离子交换树脂提取,旋转蒸发至干后用pH 2.1的稀HClO₄溶液溶解、定容,以5 mmol/L H₂SO₄水溶液为流动相,经Bio-Rad Aminex HPX-87H阳离子交换树脂柱分离,在波长210 nm处紫外检测。在小麦根系分泌物中,有机酸的检测限为1~120 μg/L,日内检测精密度为1.2%~4.7%,日间检测精密度为3.3%~10.6%,不同剂量的加标回收率为82.0%~96.2%,相对标准偏差为0.67%~3.31%。该方法简便快速,灵敏可靠,适用于介质复杂的环境样品中有机酸的测定。

关键词 [高效液相色谱法](#) [有机酸](#) [植物根系分泌物](#)

分类号

Determination of Organic Acids Exuded from Plant Roots by High Performance Liquid Chromatography

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Abstract

A simple and highly sensitive method was developed for the determination of organic acids exuded from plant roots by high performance liquid chromatography with ultraviolet (UV) detection. The root exudate was passed through cation and anion exchange resin columns subsequently. The eluant was then concentrated in a rotary evaporator. The residue was dissolved in dilute HClO₄ solution at pH 2.1. The separation was performed on a Bio-Rad Aminex HPX-87H sulfonic column at 50 °C with an eluent containing 5 mmol/L H₂SO₄ at a flow-rate of 0.5 mL/min, and the organic acids were detected at a wavelength of 210 nm by a UV detector. Average recoveries for the root exudates were in the range of 82.0%-96.2% and the detection limits were 1-120 μg/L, and the relative standard deviations (RSD) were 0.67%-3.31% for the seven organic acids. The intra-day precisions were 1.2%-4.7%, and inter-day precisions were 3.3%-10.6%. These results demonstrated that the proposed method is simple, sensitive and reliable for the determination of organic acids in plant root exudates, despite the presence of the particularly complex matrix.

Key words [high performance liquid chromatography \(HPLC\)](#) [organic acids](#) [plant root exudates](#)

DOI:

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