

# 凝胶渗透色谱净化超高效液相色谱-串联质谱法检测甘草及其提取物中的11种氨基甲酸酯类农药残留

杨如箴<sup>1</sup>, 王金花<sup>2\*</sup>, 张蓉<sup>2</sup>, 王明林<sup>1\*</sup>, 黄梅<sup>2\*</sup>

1. 山东农业大学食品科学与工程学院, 山东 泰安 271018; 2. 北京出入境检验检疫局技术中心, 北京 100026

## Determination of 11 carbamate pesticide residues in Glycyrrhizae radix et rhizoma and its extracts using ultra performance liquid chromatography-tandem mass spectrometry with gel permeation chromatographic clean-up

YANG Ruzhen<sup>1</sup>, WANG Jinhua<sup>2\*</sup>, ZHANG Rong<sup>2</sup>, WANG Minglin<sup>1\*</sup>, HUANG Mei<sup>2\*</sup>

1. College of Food Science and Engineering, Shandong Agricultural University, Tai'an 271018, China; 2. Technology Center, Beijing Entry-Exit Inspection and Quarantine Bureau, Beijing 100026, China

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**摘要** 建立了甘草及其提取物中11种氨基甲酸酯类农药多残留的超高效液相色谱-串联质谱(UPLC-MS/MS)分析方法。以11种氨基甲酸酯类农药为目标分析物,样品经乙腈超声提取、凝胶渗透色谱(GPC)净化后,用UPLC-MS/MS检测。以甘草及其提取物为例,分别进行了0.02、0.04和0.1 mg/kg 3个添加浓度的11种目标分析物的加标回收率实验,甘草中11种目标分析物的回收率为72.2%~94.0%,相对标准偏差为0.7%~7.8%;甘草提取物中11种目标分析物的回收率为73.8%~94.7%,相对标准偏差为1.5%~12.7%。该方法灵敏度高、准确度好,符合农药多残留检测的技术要求,适用于甘草、黄芪等中药材及其提取物中氨基甲酸酯类农药残留的检测。

**关键词:** 凝胶渗透色谱 超高效液相色谱-串联质谱 氨基甲酸酯类农药 甘草 黄芪; 提取物

**Abstract:** An ultra performance liquid chromatography-electrospray ionization tandem mass spectrometric method (UPLC-ESI MS/MS) has been developed for the determination of 11 carbamate pesticide residues in Glycyrrhizae radix et rhizoma and its extracts. After extracted by acetonitrile and cleaned up by gel permeation chromatography (GPC), the samples were determined by UPLC-ESI MS/MS. Glycyrrhizae radix et rhizoma and its extracts were analyzed as model examples. When the spiked levels were 0.02, 0.04, and 0.1 mg/kg in the samples, the average recoveries of 11 carbamate pesticides from Glycyrrhizae radix et rhizoma were obtained from 72.2% to 94.0%, the relative standard deviations (RSDs) ranged from 0.7% to 7.8%. The average recoveries of 11 carbamate pesticides in Glycyrrhizae radix et rhizoma extract ranged from 73.8% to 94.7% and the RSDs ranged from 1.5% to 12.7%. The sensitivity, accuracy, and precision of this method can meet the requirements of the pesticide residue analysis, and the method can be applied to determine carbamate pesticide residues in Glycyrrhizae radix et rhizoma, Astragali radix and their extracts.

**Keywords:** gel permeation chromatography (GPC) ultra performance liquid chromatography-tandem mass spectrometry (UPLC-MS/MS) carbamate pesticide Glycyrrhizae radix et rhizome Astragali radix extract

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Corresponding Authors: 王金花,博士,高级工程师. Email: wangjh@bjciq.gov.cn; wangjh2008@yahoo.com.cn

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