

## 气相色谱-质谱技术分析香稻特征化合物2-乙酰基吡咯啉

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## Determination of 2-acetyl-1-pyrroline in aroma rice using gas chromatography-mass spectrometry

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**摘要** 建立了气相色谱-质谱技术(GC-MS)分析香稻特征化合物2-乙酰基吡咯啉的方法。在香稻中加入内标物2,4,6-三甲基吡啶,密闭,经无水乙醇-二氯甲烷(体积比为1:1)在80℃水浴中提取3 h。考察了温度和时间对2-乙酰基吡咯啉提取的影响。提取液经毛细管气相色谱柱HP-5MS(30 m×0.25 mm×0.25 μm)分离,全扫描监测模式GC-MS测定。以内标物计,方法的平均回收率为82.57%,相对标准偏差为5.09%,最低检出限为0.01 mg/kg。将该方法应用于11份香稻育种材料中2-乙酰基吡咯啉的测定,结果表明,清香米、泰香R207、Texmati、桂香丝糯和中健2号等5个品种中含有2-乙酰基吡咯啉,含量分别为0.097、0.098、0.699、0.045和0.047 mg/kg。该方法样品处理简单、快速、灵敏、样本和试剂消耗少,尤其适合于通过测定2-乙酰基吡咯啉含量进行香稻育种前的大批量品种筛选。

**关键词:** 气相色谱-质谱法 2-乙酰基吡咯啉 香稻

**Abstract:** A gas chromatography-mass spectrometry method was developed for the determination of 2-acetyl-1-pyrroline in aroma rice. 2,4,6-Trimethylpyridine (TMP) was added into the sample of aroma rice as internal standard, and the compound was extracted by the mixture of anhydrous ethyl alcohol and methylene chloride (1:1, v/v) at 80 °C for 3 h under sealed condition in water bath. The effects of the temperature and time on the extraction were investigated. The analyte was separated and determined using gas chromatography-mass spectrometry on an HP-5MS capillary column (30 m×0.25 mm×0.25 μm) in scan monitoring mode. Calculated as 2,4,6-trimethylpyridine, the average recovery of the method was 82.57% with the relative standard deviation of 5.09%, and the detection limit of method was 0.01 mg/kg. The method was employed for the determination of 2-acetyl-1-pyrroline in 11 aroma rice breeding varieties. The results showed that 2-acetyl-1-pyrroline was detected in 5 aroma rice varieties, including Qingxiangmi, Taixiang R207, Texmati, Guixiangsinuo and Zhongjian 2, with the contents of 0.097, 0.098, 0.699, 0.045 and 0.047 mg/kg, respectively. The method is simple, rapid and sensitive with low sample and reagent consumption. It is suitable for screening a lot of aroma rice varieties in breeding through the determination of 2-acetyl-1-pyrroline content.

**Keywords:** gas chromatography-mass spectrometry (GC-MS) 2-acetyl-1-pyrroline aroma rice

Received 2010-04-02; published 2010-06-30

Fund:

国家自然科学基金项目(No. 30700486)和浙江省分析测试科技计划项目(No. 2008F70016).

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引用本文:

应兴华<sup>1\*</sup>, 徐霞<sup>1</sup>, 陈铭学<sup>1</sup>, 欧阳由男<sup>2\*</sup>, 朱智伟<sup>1</sup>, 闵捷<sup>1</sup>.气相色谱-质谱技术分析香稻特征化合物2-乙酰基吡咯啉[J] 色谱, 2010,V28(08): 782-785

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链接本文:

http://www.chrom-china.com/CN/10.3724/SP.J.1123.2010.00782 或 http://www.chrom-china.com/CN/Y2010/V28/I08/782

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