

生物技术 生命科学

生防枯草芽孢杆菌CAB-1抑菌蛋白产生条件及其稳定性研究

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摘要:

枯草芽孢杆菌CAB-1是一株对番茄灰霉病有显著防效的生防菌株,抑菌蛋白是其产生的主要抑菌物质之一。研究表明,菌株CAB-1产生抑菌蛋白的最佳培养条件为:接种量2%,培养温度30℃,转速180 r/min,装液量100 mL/250 mL,培养时间48 h。考马斯亮蓝法测得最佳培养条件下菌株CAB-1产生的粗蛋白浓度为0.16 mg/mL。该粗蛋白对胰蛋白酶及蛋白酶K不敏感,胃蛋白酶处理使其活性降低14%;抑菌蛋白在100℃以下处理30 min活性变化差异不显著,而121℃处理30 min其抑菌活性为对照的72%。抑菌蛋白对酸碱的耐受范围广,在pH值3~12的范围内抑菌活性均能保持在75%以上,pH值2时抑菌活性降低为对照的59%。经甲醇、氯仿、乙醚、乙酸乙酯及丙酮处理后该粗蛋白的抑菌活性变化不大。

关键词: 枯草芽孢杆菌;抑菌蛋白;培养条件;稳定性

Optimization of Antifungal Protein Production by *Bacillus subtilis* Strain CAB-1 and its Stability Analysis

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Abstract:

Bacillus subtilis strain CAB-1 exhibited an effective inhibitory activity against *Botrytis cinerea*, which caused tomato gray mold, and the antifungal protein produced by it was the major active compound against *Botrytis cinerea*. In this paper, the results showed the optimum culture condition was 2% inoculums volume, 100 mL loading amount in a 250 mL flask, at 30℃ for 48 h on a rotary orbital shaker with 180 r/min speed. The concentration of the crude protein was 0.16 mg/mL by Bradford method. Crude protein produced by strain CAB-1 was not sensitive to Trypsin and Proteinase K, while the antifungal activity was reduced 14% by Pepsin. The crude protein showed stable activity at 100℃, and retained 72% antifungal activity at 121℃ for 30 min. The antifungal activity of crude protein kept stable over a wide pH value, which could contain above 75% at pH 3~12 and decreases to 59% of control at pH 2. The antifungal activity maintained in organic solvents such as methanol, chloroform, ethyl, ethyl acetate and acetone.

Keywords: *Bacillus subtilis* antifungal protein culture condition stability

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