Study on Beauvericin Production by Beauveria bassiana in Air-lift Fermentor

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ABSTRACT

In this study, beauvericin (BEA) was produced by Beauveria bassiana A1 in shake flasks. The interaction test of phenylalanine-isovaleric acid addition was used to investigate the optimal concentrations of amino acid and organic acid for increasing the BEA productivity by B. bassiana A1. With 0.1 g/L isovaleric acid only added to the main medium (25.0 g/L glucose, 10.0 g/L NZM broth, 5.0 mL/L corn steep liquor and 2.0 g/L K2HPO4 with initial pH 5.7), which was optimized by RSM (response surface methodology) in the previous study, for B. bassiana A1 cultivation at 26°C and 150 rpm after 6 days, the BEA production could be increased to 5.02 mg/L. This result was higher than that (1.34 mg BEA/L) without any addition of phenylalanine or isovaleric acid. Based on this result for the addition of isovaleric acid to the the main medium, the experiments of 5-L stirred-tank-reactor (STR) and 8-L airlift-reactor (ALR) fermentations were further studied. The BEA production was increased to 6.60 mg/L in 5-L STR for 6-day cultivation at 26°C under the optimal condition: 0.6vvm aeration rate, 150 rpm agitation rate and pH controlled at 5.7±0.1, while the BEA production was 8.60 mg/L in 8-L ALR for 6-day cultivation at 26°C under the optimal condition: 0.9vvm aeration rate and pH controlled at 5.7±0.1. Comparison with 5-L STR, 8-L ALR should be one good fermentor type for BEA production by Beauveria bassiana A1, which may be due to the good gas absorption efficiency with high aeration rate in ALR

Keywords : beauvericin (BEA) , air-lift fermentor, Beauveria bassiana, stirred-tank fermentor

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