Use of response surface methodology to optimize culture medium compositions for production of beauvericin by Beauveria b

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ABSTRACT

In this study, beauvericin (BEA) was produced by Beauveria bassiana A1 in shake flasks. The two-time interaction test of carbon-nitrogen sources and the response surface methodology (RSM) were used to investigate the suitable compositions of culture medium and the optimal concentrations of medium compositions, respectively, for increasing the BEA productivity by B. bassiana A1. With the originally designed medium (initial pH 5.7) composition comprising 5.0mL/L corn steep liquor, 10.0g/L NZM broth, 2.0g/L K2HPO4, 25.0g/L sucrose, 25.0mL/L molasses, 10.0g/L malt extract, the yield of BEA production was 0.75mg/L after 6 days at 26°C and 150 rpm. After the two-time interaction test of carbon-nitrogen sources, the factors chosen for optimization were corn steep liquor, NZM broth, K2HPO4 and glucose. The optimum concentrations were determined by RSM and were found to be 5.0mL/L corn steep liquor, 10.0g/L NZM broth, 2.0g/L K2HPO4 and 25.0g/L glucose. With these components and initial pH 5.7, the average BEA production was 4.18mg/L after 6 days at 26°C and 150 rpm. The predicted optimal concentrations as obtained from the maximum point of the RSM model were calculated to be 5.24mL/L corn steep liquor, 10.01g/L NZM broth, 1.98g/L K2HPO4 and 25.56g/L glucose. With the predicted optimal medium whose initial pH adjusted to 5.7, the predicted maximum yield of BEA production shall be 4.47mg/L after 6 days at 26°C and 150 rpm

Keywords : Beauveria bassiana ; Beauvericin (BEA) ; Response Surface Methodology (RSM) ; cyclodepsipeptide

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