

Optimization of cyclodextrin glycosyltransferase production by response surface methodology approach.

ABSTRACT

The aim of the study was to optimized cyclodextrin glycosyltransferase (CGTase) production using local isolated strain MK6 which was identified as *Bacillus* sp. Optimum activity obtained at temperature of 70 °C and the enzyme shows a wide range of pH stability ranging from 4-10 when stored at 4 °C for 24 h and temperature stability ranging from 30-80 °C at 1 h incubation period. The CGTase activity was even maintained at 0.4 U mL⁻¹ at 90 °C for 40 min incubation. Prior to optimization of CGTase production, selection for the best carbon source through detection using modified phenolphthalein method containing different types of starch were performed. Sago starch gave significant result and was used for further optimization using statistical analysis namely Response Surface Methodology (RSM) approach. The optimal calculated values were 3.34% sago starch, initial pH of 10.15 and agitation speed of 187 rpm; with predicted activity of 2.07 U mL⁻¹ of CGTase. These predicted optimal parameters were confirmed in the laboratory and the final CGTase activity obtained was very close to the predicted value of 2.56 U mL⁻¹.

Keyword: Cyclodextrin glycosyltransferase (CGTase); Optimisation; Response Surface Methodology (RSM).