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Purification and Characterization of a Levan-degrading Enzyme from Bacterial strain No. 43

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A bacterial strain No. 43 was isolated from soil samples as a levan-assimilating microorganism producing an extracellular levan-degrading enzyme(LDE), hydrolying levan to levanbiose. LDE was purified to approx. 182-fold by ammonium sulfate precipitation, DEAE-Toyopearl 650M, and Phenyl-Toyopearl 650M column chromatography. The enzyme had a molecular weight of 36,000 and isoelectric point of 5.7. The maximum temp. and pH for the enzyme reaction were 40℃ and pH 7.0 respectively. The purified enzyme was stable within a pH range of 6.0 to 9.0 and at up to 50℃. The enzyme activity was inhibited by $MnCl_2$, $CoCl_2$, $AlCl_3$, EDTA, and $KMnO_4$. The enzyme showed strict substrate specificity towards levan. The limit of hydrolysis of levan was 80%.

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Glucoside Synthesis by Transglycosylation reaction of Amyloglucosidase

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Glucosides were synthesized using transglycosylation reaction of amyloglucosidase in water system. Starch as a glycosyl donor and o-, m-, p-hydroxybenzylalcohol as an acceptor were selected as substrates of transglycosylation reaction. Two main products from the reaction systems were purified and their structures were identified as o-, m-, p-hydroxybenzylalcohol-α-glucoside and o-, m-, p-hydroxybenzylalcohol-α-maltoside. Optimal conditions for synthesis of hydroxybenzylalkyl glucoside in water system were starch, 50mg/ml : hydroxybenzylalcohol, 50mg/ml : temperature, 45℃ : enzyme amount, 10unit/ml : pH5.0 : reaction time, 16hrs. Under these conditions, the yields of products were 2.01mg, 2.26mg, 1.29mg from o-, m-, p-hydroxybenzylalcohol.