
Hydrolysis of raw tuber starches by amylase of *Aspergillus niger* AM07 isolated from the soil.

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Abstract

Eight *Aspergillus niger* strains which produced strong starch degrading amylase were isolated from the soil using a medium containing Remazol Brilliant Blue (RBB) starch as substrate. Amylase production was detected by the disappearance of the blue colour around the colony. Among the isolates, *A. niger* AM07 produced the largest clear zone (7.0mm) on Remazol Brilliant Blue (RBB) agar plate and also gave the highest amylase yield (806 U/ml) in solid-state fermentation process, hence it was selected for further studies. The crude amylase preparation of *A. niger* AM07 had temperature and pH optima activities at 60°C and 4.0 respectively. The optimum substrate concentration was 3 %. The action of the crude amylase of *A. niger* on raw tuber starches of yam, cassava, sweet potato and cocoyam were studied in comparison with the well known maize starch which is a cereal starch. The crude amylase was able to hydrolyze all the raw starches tested. Hydrolysis was significantly ($p < 0.05$) dependent on starch source and length of incubation. At 72-h incubation time, raw cassava starch gave the highest yield of 200.1 mg/g with a conversion efficiency of 198.91% while raw maize starch gave a yield of 109.6 mg/g with 108.95 % conversion efficiency. Raw cocoyam starch was more resistant to hydrolysis and incubation of cocoyam starch beyond 24 h, resulted in decreased yield of reducing sugars. Thin layer chromatography showed glucose as the main sugar produced with low level of maltose.

Keywords

hydrolysis, amylase, Remazol Brilliant Blue, tuber starches, fermentation, glucose.