



# Biokemistri

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## Partial purification and some properties of $\alpha$ -glucosidase from *Trichoderma longibrachiatum*

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**ABSTRACT:** The use of hydrolase enzyme plays an important role in the industrial production of  $\alpha$ -D-glucose from carbohydrate sources. This study investigated partial purification and characterization of  $\alpha$ -glucosidase from *Trichoderma longibrachiatum* with a view to enhancing its potentials in biotechnological processes. Strains of *Trichoderma longibrachiatum* were cultured on rice bran medium at 30°C for 96 hour for the production of  $\alpha$ -glucosidase. The enzyme was partially purified by eluting the ammonium sulphate (70%) saturation precipitated sample on Sephadex G-75 and Sephadex G-25. Enzyme assay was carried out using p-nitrophenyl- $\alpha$ -D-glucopyranoside (PNP- $\alpha$ -G) as the substrate and protein concentration was determined. Kinetic parameters, molecular weight, pH effect, temperature and thermostability were also determined. The activity of enzyme in the presence of arylglucosides and different cations were monitored. The partially purified protein, migrated as a single band in 10% SDS-Polyacrylamide gel-electrophoresis. The enzyme presented a relative molecular weight of about 58KDa as estimated by PAGE. The extracellular  $\alpha$ -glucosidase showed typical  $\alpha$ -glucosidase activity, hydrolyzing p-nitrophenyl- $\alpha$ -D-glucopyranoside and exhibited optimum catalytic activity (4.89 $\mu$ mol/ml/min), at 40°C and pH 4.5. The enzyme was stable at 40°C for 150 minutes. Carboxymethylcellulose was also hydrolyzed by this enzyme. The  $K_m$  and  $V_{max}$  with p-nitrophenyl- $\alpha$ -D-glucopyranoside were 33.33mM and 20.00  $\mu$ mol/min/mg protein, respectively. This study therefore revealed the presence of  $\alpha$ -glucosidase in *Trichoderma longibrachiatum* which could serve as alternative species for the production of  $\alpha$ -glucosidase enzyme.

**KEYWORDS:** Enzyme purification, characterization,  $\alpha$ -glucosidase, *Trichoderma longibrachiatum*.