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Production and partial characterization of extracellular keratinase from Bacillus subtilis FDS15

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Abstract

A Bacillus subtilis FDS15, isolate of poultry waste source was used for keratinase enzyme production. Keratinase enzyme production was optimized by the single factor confirm method with various parameters such as substrate concentration (feather meal at 1%, w/v), pH (at 7.0), temperature (at 37°C), NaCl concentration (1%, w/v) and incubation time (at 8 days). The optimized media at 72h of incubation showed higher enzyme production (155.67 U/ml). Keratinase enzyme protein was precipitated at 60% Ammonium sulphate saturation followed by dialysis, the concentrated protein was further purified with DEAE-Sepharose column and Sephadex G-75 column. SDS-PAGE analysis showed the purified enzyme has a molecular mass of 70 kDa. Optimum enzyme activity was obtained at pH 7.5 and temperature 60ºC and it was stable at 45ºC. Metal ions such as Zn^{2+} and Mg^{2+} enhances the enzyme activity where as Cu^{2+}, Hg^{2+} and Cd^{2+} inhibits enzyme activity. The enzyme activity was significantly inhibited by PMSF and 1-phenonthroline. The purified keratinolytic protease could deeply degrade raw chicken feathers within 48 h at 37°C.

Keywords: *Bacillus subtilis* FDS15, Keratinase enzyme, Keratin azure, Feather meal media.