Purification and Partial Characterization of a Low Molecular Weight L-Asparaginase Produced From Corn Cob Waste

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ABSTRACT
l-asparaginase (E.C.3.5.1.1) is an important enzyme often used to treat acute lymphoblastic leukemia. This paper describes the production, purification and partial characterization of l-asparaginase by Streptobacillus sp. KK2S4. The highest l-asparaginase production was achieved with 0.2% (w/v) of lactose, 0.1% (w/v) of sodium nitrate, 6% (w/v) of pre-treated corn cob powder and 4% (v/v) of KK2S4 bacterial suspension in 50 ml of MM9 media at pH 5 and 40 °C. The enzyme was purified by ammonium sulfate precipitation followed by DEAE-cellulose and Sephadex G-50 column chromatography. The specific activity of the pure enzyme was recorded to be 21.77 U/mg with 39.58-fold purification and 39% of yield. SDS-PAGE demonstrated a single band with molecular weight of 11.2 kDa. The optimum activity of purified enzyme was recorded at pH 8.5 and 35 °C. This is the first report of a very low molecular weight microbial l-asparaginase produced from corn cob as the main carbon source.

KEYWORDS: Corn cob; Microbial l-asparaginase; Purity; Molecular weight

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