



ABSTRACT

The present work describes the optimized production, characterization and partial purification of uricase produced by *Aspergillus niger*. The solid state fermentation was carried out using various agroindustrial waste as substrate. The waste was moist with salt solution (uric acid (0.3%), KH_2PO_4 (0.05%), K_2HPO_4 (0.2%), $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ (0.01%), CaCl_2 (0.01%) and NaCl (0.01%) at 1:1. Among all the evaluated agroindustrial waste maximum uricase production was achieved with alkaline pretreated wheat straw as substrate. *Aspergillus niger* produces both extracellular as well as intracellular uricase but concentration of extracellular enzyme (187.2 U/g) was higher as compare to intracellular enzyme (64.2 U/g). Nutritional and physical parameters were optimized for maximum production of extracellular uricase. Best results were obtained when 0.3% uric acid used as inducer, sucrose used as carbon source, peptone used as nitrogen source at pH 8 and media was incubated at temperature 30°C for 96 hour. Ammonium sulphate precipitation resulted 4.67 fold purification with enhancement of specific activity of 301.5 U/g. The molecular weight of uricase is 33 kDa determined by SDS poly-acrylamide gel electrophoresis. Uricase showed maximum activity at 35°C and pH 9. Kinetic characterization of uricase revealed uric acid as the highly specific substrate for enzyme with K_m and V_{max} value of 0.08 and 39.7 $\mu\text{mol}/\text{mL}\cdot\text{min}$ respectively.