ABSTRACT

The present study deals with production, characterization and application of uricase enzyme from *Aspergillus niger*, isolated from sediment sample of pichavaram mangrove environment. The density of uricolytic fungi was found to be $1.0 \times 10^4$ CFU/g. Among 98 different fungal stains tested *A.niger* was selected as the most potential strain. When optimized, incubation time – 96hrs, agitation speed -150rpm, $P^H$ -8, temperature -30$^0$C, salinity -2%, sucrose -10% ( w/v ) as carbon source, ureic acid – 0.4% ( w/v ) as nitrogen source were found to be optimum for biomass production and uricase activity .Solid state fermentation with cheaper agri residues ( sugarcane bagasse, rice straw and corn straw), after pretreatment with alkali and acid showed surprisingly higher uricase enzyme activity in their mycelium free fermentation broth obtained. Extracellular uricase was precipitated using 70% ammonium sulphate. After dialysis, the crude enzyme was further purified using DEAE-cellulose and DEAE sephadex A-50, during which the specific activity increased from 18.8U/mg (crude) to 425U/mg with 22.60 fold of increase in purification. The fungal uricase gene was amplified with oligonucleotide primers showed the presence of uricase gene 980 bp. Native enzyme PEGylated using 8K linear PEG, was found to be more stable. The purified urecase was 34K Da protein, bioconjugated urecase with PEG- 8000 was 67KDa and has diagnostic potential in finding out serum uric acid ( diagnostic agent ) and showed reduced uric acid level in hyperurecemic mouse model, when compared to allopurinol.