

Production Purification And Characterization Of Inulinase

Xylan is the major hemicellulosic constituent of hard and soft wood, and is the next most abundant renewable polysaccharide after cellulose. Xylanases and associated debranching enzymes produced by a variety of microorganisms including bacteria, yeast and filamentous fungi, bring about the hydrolysis of hemicelluloses. Xylanolytic enzymes are receiving increasing attention because of their potential application in pulp bleaching and bioconversion of lignocelluloses into feedstocks and fuels. The xylan degrading system includes endo-1,4-xylanases (1,4-xylan xylanohydrolase; EC 3.2.1.8), which release long and short xylo-oligosaccharides, and other xylanases that attack only longer chains, and -D-xylosidase (1,4-xylan xylohydrolase; EC 3.2.1.37), which remove D-xylose residues from short xylo-oligosaccharides. Cellulase-free xylanases are important in the paper and pulp industry as alternatives to the use of toxic chlorinated compounds. For the last two decades the bleaching of pulp has become an issue of great concern, primarily because of the environmental hazards caused by the release of the adsorbable organic halogens and due to increasing public awareness thereof."

Ever growing biotechnological set up of modern industry has motivated the research towards the comprehensive survey of microorganisms, which could be utilized in extreme conditions of industry. The present study includes the optimization parameters in submerged fermentation of Industrial enzymes (Invertase and Alpha-amylase) using agricultural as well as industrial wastes as sources of carbon. Main outcome of the research is the exploration of new strains of fungi (*Penicillium lilacinum* and *Aspergillus niger*) which have a potential to be used in industries for the economical production of industrial enzymes.

Enzyme activity was not significantly affected by Ca^{2+} , Mg^{2+} , EDTA, and DTT, but it was highly inhibited by Zn^{2+} , Cu^{2+} , and Pb^{2+} . The best crystallization conditions for this purified GA are 15% PEG 3350, 100 mM Tris-Cl, and 200 mM Li_2SO_4 at pH 8.0. Heavy atom derivative studies showed the K_2PtBr_4 derivative is most suitable for further solution of the GA three-dimensional structure. Preliminary analysis of GA crystals suggests that they have the space group P21212 with unit cell parameters of 81.20 x 101.97 x 164.27 Å. This suggests that our crystals contain two molecules of GA in the asymmetric part of the unit cell.

Crystallization of GA with noncrystallographic symmetry suggests that it may exist in solution as a dimer under some conditions. X-ray diffraction and synchrotron data are being collected and the complete solution of this GA structure is probable.

"Conjugated linoleic acid (CLA) has gained much attention recently due to its beneficial health and biological effects on animals and humans. However, the CLA-forming enzyme system has not been studied in details. Six strains of *Lactobacillus acidophilus* L11, L12, L14, L15, *Lactobacillus fermentum* and *Lactobacillus reuteri* were used to study the growth conditions and the production of CLA-forming enzyme in MRS media containing linoleic acid concentrations at 37°C. The purification and characterization of a CLA-forming enzyme were reported for the first time. The results showed that this enzyme has a molecular mass of 72 kDa, and is composed of two subunits. The optimal pH and temperature were 7.0 and 37°C, respectively. Kinetic study indicated that the enzyme has a high affinity for linoleic acid having a K_m value of 1.49×10^{-5} M and the V_{max} was 17.1 $\mu\text{M}/\text{mg}/\text{min}$. The enzyme activity was inhibited by the metal chelators. (Abstract shortened by UMI.)" --

The investigation of exo-laccase production by selected fungal strains, including *Coriolus hirsutus*, *Pleurotus pulmonarius* and *Chaetomium thermophilum*, under liquid-state fermentation was investigated. Among the investigated fungal strains, *C. hirsutus* found to be the most appropriate one in term of its capacity to produce active exo-laccase in the presence of ethanol as the most appropriate inducer. The effects of carbon and nitrogen concentrations on the production of active laccase were also investigated, where 50 mM of glucose and 5 mM of ammonium chloride were found to be respectively, the optimized concentrations. The exo-crude enzymatic extract was recovered and concentrated by ultrafiltration; the partially purified enzymatic extract was obtained by ammonium sulfate precipitation at 60-80% of saturation. The partially purified enzymatic extract of laccase was successively purified by size-exclusion (SEC) and ion-exchange (IEC) chromatographies. The SEC ...

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