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Process optimization of L-glutaminase production; a tumour inhibitor from marine endophytic isolate *Aspergillus sp.* ALAA-2000

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Abstract : L-Glutaminases have received significant attention recently owing to their potential applications. All endophytic fungi recovered from the marine soft sponge *Aplysina fistularis* were able to produce L-glutaminase. During screening program, *Aspergillus* sp. ALAA-2000 showed the highest L-glutaminase production levels. The production of L-glutaminase by *Aspergillus* sp. ALAA-2000 was evaluated under different fermentation modes and parameters. The L-glutaminase synthesis was increased their yield after the optimization of fermentation parameters. The hot water 40°C was the best leaching agent extracted of soy bean for L-glutaminase production (21.89 U/ml) under solid state fermentation (SSF). The highest L-glutaminase activity (91.92 U/ml) was achieved after two days incubation period under submerged fermentation (SmF). L-Glutamine, dextrose, cysteine, and Magnesium chloride supported the highest L-glutaminase production by *Aspergillus* sp. ALAA-2000 under SmF at pH 4 and 27 °C. Single peak of L-glutaminase was obtained from the culture supernatant of *Aspergillus* sp. ALAA-2000 through ammonium sulfate precipitation and DEAE-cellulose column chromatographyrefer to the monomeric nature of L-glutaminase enzyme. The parameters of purified L-glutaminase were optimized as follow: pH 10, stable at 40°C to 50°C, reaction time 30 min, and substrate concentration 4.38 mg/ml. Whereas the maximum activator cation is Na^+ and different EDTA concentrations have no effect on L-glutaminase activity which means that L-glutaminase enzymes was represent as a non metallicenzyme.
Keywords: L-glutaminase; marine endophytic *Aspergillus* sp.; fermentation; optimization; purification.

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