عنوان مقاله:

CLONING AND EXPRESSION OF L-ASPARAGINASE II GENE EXTRACTED FROM RHIZOBIUM NEPOTUM STRAIN SHN1 IN ESCHERICHIA COLI BL21

محل انتشار:

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خلاصه مقاله:

Background and Aim:Asparaginase as an enzyme catalyzes hydrolyze L-asparagine to aspartic acid and ammonia and has various applications in medicine and food industry. As a medication, it is used to treat acute lymphoblastic leukemia, acute myeloid leukemia, and non-Hodgkin s lymphoma. Due to some side effects including neurotoxicity, clotting, hepatitis, allergic reactions and adverse possession of a small amount of transglutaminase activity, the search for new sources of microbial transglutaminase lacking enzyme dysfunction is underway.Methods:In this study, L-asparaginase extracellular activity extracted from Rhizobium nepotum strain SHN1 (isolated from the Persian Gulf water) with no transglutaminase activity was measured. In order to assess the capability of extracellular asparagine production, this strain were cultured in M9 medium containing phenol red and asparagine and then were cultured in M9 medium containing glutamine and phenol red. L-asparaginase enzyme activity of the isolate was explored with a colorimetric method.Results:The asparaginase enzyme activity and the specific activity of this bacterium were 0.467 IU/ml and 0.015 IU/mg, respectively. These characteristics increased to more than 50% in anaerobic condition. Gene expression of this enzyme was cloned in pET21a vector and its expression host in E. coli BL21 well stated. The protein molecular weight of 32 kD and enzymatic activity of L -asparaginase in host expression of 10.46 IU/ml unregulated to 56% L- asparaginase enzyme’s production.Conclusion:The results of the present study suggest that R. .nepotum strain SHN1 may be a reliable source for the free glutamine L-Asparaginase

کلمات کلیدی:

L-asparaginase enzyme, Rhizobium nepotum, glutamination, pET21a, E. coli BL 21