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L-ASPARAGINASE PRODUCED FROM *BACILLUS* SPECIES IN CHEESE WHEY PRODUCTION MEDIUM SHOWS POTENT CYTOTOXIC ACTIVITY AGAINST HELA CELL LINES

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ABSTRACT

L-asparaginase (Systematic name L-asparaginase amidohydrolase) is used in treatment of acute lymphoblastic leukemia (ALL). Different species of bacteria and fungi have been reported to produce L-asparaginase. Currently, L-asparaginase produced from E.coli and Erwinia species have been used in ALL. Because of Allergies & liver toxicity associated with commercially available L-asparaginase, it requires further research to discover novel bacterial strains producing l asparaginase with less toxic effects. In the present study, L-asparaginase enzyme was produced from soil isolates of *Bacillus* species, by using cheese whey as substitute of asparagine in production media; Bacillus species isolated in this study are *Bacillus subtilis* (LC425423), *Bacillus aerophillus* (LC425427), *Bacillus endophyticus* (MG928501), respectively. L-Asparaginase enzyme produced from these three Bacillus species was purified by using dialysis technique, and the purified enzyme was tested for its anticancerous activity against HeLa cell lines by MTT assay. Surprisingly, the enzyme tested inhibited the cell growth effectively; the concentration of enzyme used to inhibit 50% of cell culture growth was 65.44, 131.35 & 60.78µg/ml. Therefore, the result obtained in this study indicates possible use of these Bacillus species in the industrial production and in anticancerous therapies. In addition, this study also has demonstrated that cheese whey can be used for cost effective production of L asparaginase enzyme.

KEYWORDS: L-asparaginase, Bacillus Species, HeLa-Cells, Acute Lymphoblastic Leukemia & Cheese whey