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Proteases of bacteria, fungi and viruses are increasingly studied due to its importance and subsequent application in the food, detergent, leather and pharmaceutical industries. Commercial application of microbial proteases is attractive due to the relative ease of large scale production as compared to proteases from plants and animals. There is a considerable current interest on the exploration of proteases that can catalyze reactions in mild conditions. The search for such enzymes is a challenge at this time.

Due to economic significance and research importance of proteolytic enzymes, the present study is an attempt to study the screening, selection, culturing, maintenance, testing of microorganisms for the production of protease activity, identification of morphological and biochemical characteristics, optimization of enzyme activity and effect of immobilization on enzyme production.

1. Screening for protease producing bacteria was done by serial dilutions of various soil samples collected from industrial effluents of SANGAM DAIRY, GUNTUR, ANDHRA PRADESH and adjacent to SAGAM DAIRY(Control). Bacterial population from two soil samples were compared and it was found that effluent sample contains more number of bacterial populations compared to control. Among numerous bacterial populations eight bacterial colonies were selected from soil sample enumerated with effluents for further studies. Among the eight isolates, four were Gram +ve bacilli, two Gram -ve bacilli and two Gram +ve cocci. Protease production of these eight isolates were analyzed by Lowry method to select the microorganism which produces maximum amount of protease.
2. The organism which produces maximum amount of protease was identified by morphological and biochemical characteristics and identified as *Bacillus cereus*.

3. Cultural conditions for better protease yields from *Bacillus cereus* were optimized for pH, temperature, carbon and nitrogen sources, inoculum size and metal ions. From the results it is concluded that the isolate is efficiently producing protease at pH 8.0 and temperature 35°C. Among the carbon sources tested, rice bran and sucrose were found to be the best inducers of protease production. Casein and soymeal were found to be the best nitrogen sources for protease production. Among the metal ions tested, manganese sulfate and calcium chloride were found to be best inducers of protease production.

4. Protease activity of *Bacillus cereus* was enhanced with immobilization state in calcium alginate compared to that in suspended state.

However detailed studies on purification and characterization of enzyme, industrial and biotechnological applications are required.