

Extracellular Hydrolase-Producing Bacteria Isolated from Chilca Salterns in Peru

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Abstract : Saline environments represent a valuable source of enzymes with novel properties and particular features for application in food, pharmaceutical and chemical industry. This study focuses on the isolation and screening of hydrolase-producing bacteria from Chilca salterns and the evaluation of their biotechnological potential. Soil samples were collected from Chilca salterns in Peru. For the isolation, medium containing 0.2 % of yeast extract, 5 % of NaCl and 10 % of the soil sample was used. After 72 h of incubation at 37 °C, serial dilutions were made up to 10–12 dilutions, spread on agar plates with 0.5 % of yeast extract and 5 % of NaCl, and incubated at 37 °C for 48 h. Screening of hydrolase-producing bacteria was carried out for cellulases, amylases, lipases, DNase, and proteases on specific media. Moreover, protease-producing bacteria were tested using protein extracted from the following legumes as substrate: Glycine max, Lupinus mutabilis, Pisum sativum, Erythrina edulis, Cicer arietinum, Phaseolus vulgaris and Vicia faba. A total of 16 strains were isolated from soil samples. On the screening media; 75, 44, 81 and 50 % were cellulase, amylase, DNase and protease producers, respectively. Also, 19 % of the isolates produced all the hydrolytic enzymes above mentioned. Lipase producers were not found. The 37 % and 12 % of the strains grew at 20 % and 30 % of salt concentration, respectively. In addition, 75 % of the strains grew at pH range between 5 and 10. From the total of protease-producing bacteria, 100 % hydrolyzed Glycine max, Lupinus mutabilis, and Pisum sativum protein, while 87 % hydrolyzed Erythrina edulis and Cicer arietinum protein. Finally, 75 % and 50 % of the strains hydrolyzed Phaseolus vulgaris and Vicia faba protein, respectively. Hydrolase-producing bacteria isolated from Chilca salterns in Peru grew at high salt concentrations and wide range of pH. In addition, protease-producing bacteria hydrolyzed protein from different sources such as leguminous. These enzymes have great biotechnological potential and could be used for different industrial processes and applications.

Keywords : bacteria, extracellular, hydrolases, Peru, salterns

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