

QUANTITATIVE ESTIMATION OF EXTRACELLULAR ENZYME ACTIVITIES OF BACTERIAL STRAINS ISOLATED FROM MANGROVE SEDIMENTS IN PUTTALAM LAGOON, SRI LANKA

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Mangrove ecosystems provide habitats for diverse bacterial populations with extensive abilities to produce various secondary metabolites and extracellular enzymes such as amylases, proteases, cellulases, and lipases. These secondary metabolites and extracellular enzymes are known to harbour great biotechnological potential making them good candidates for various industrial applications. The present study was focused on the quantitative estimation of extracellular enzyme production capabilities of eight bacterial strains isolated from mangrove habitats located in the Puttalam lagoon, Sri Lanka. In a previous study, these bacterial isolates were screened qualitatively for the production of amylase, protease, and cellulase enzymes, and isolates positive for each of the selected enzyme production were quantitatively analyzed using the spectrophotometric methods. Out of the four amylase-positive bacterial isolates, the highest amylase activity was observed with PUTS1_2 (1.397 ± 0.055 U/ ml), whereas the minimum amylase activity was given by the PUTS2_10 (0.573 ± 0.032 U/ ml). According to the qualitative screening, seven isolates produced protease, while the highest and the lowest protease activities were detected with PUTS1_1 (1.743 ± 0.010 U/ ml), and PUTS2_12 (0.093 ± 0.011 U/ ml), respectively. The highest cellulase activity was given by the PUTS2_6 (3.229 ± 0.081 U/ ml), whereas PUTS2_5 had the lowest activity (0.792 ± 0.042 U/ml) among the five cellulase-positive isolates. Isolate PUTS2_2 exhibited comparatively higher activities for all the three enzymes quantified. Further studies are needed to understand the potential use of these extracellular enzymes in various large-scale industrial applications.

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