Determination of Pectinase Activity of Selected Bacterial and Fungal Strains

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Enzymes have been utilized to speed up the biological reactions in industrial productions. Enzymatic methods are environmentally friendly, low cost in production and disposal but the limitation of sources to extract different enzymes is an issue. Therefore, the current research aimed in order to determine the pectinase activity of selected bacterial and fungal strains isolated from a municipal garbage dump. Thirty-four bacterial (B1–B34) and five fungal (F1-F5) strains taken from the culture collection were activated in Nutrient Agar (NA) and Potato Dextrose Agar (PDA) respectively. For the enzymatic assay, the bacterial and fungal strains were re-cultured in NutrientBroth (NB) and Potato Dextrose Broth (PDB) respectively. The culture medium collected on day four was centrifuged and cell free supernatants were then tested for pectinase activity by well diffusion assay conducted in Pectinase Screening Agar medium (PSA) by following the Complete Randomized Design with three replicates. The NB alone was the control. Diameters of halo zones formed around the wells were measured at day four as the data. Data were analyzed by one way ANOVA. The bacterial culture, B16 showed the highest pectinase activity among bacterial strains. F3 showed significant ($p \leq 0.05$) pectinase activity among fungal strains. The study was further elaborated to find out the optimal maturity stage of B16 and F3 with the highest pectinase activity. For that, B16 were re-cultured in NB and F3 was re-cultured in PDB. The crude enzyme was extracted from the subsamples collected from each medium within 6 hr time intervals and used to digest pectine and the amounts of sugar formation after the pectine digestion was evaluated by DNSA method. The B16 showed highest pectinase activity (2.95 AU) at 72 and 78 hours of inoculation whereas F3 showed the highest pectinase activity (1.43 AU) between 54 and 78 hours of inoculation. Thus, the pectinase activity of B16 is higher than that of F3. Therefore, B16 of present study can be introduced as an efficient culture to extract pectinase enzyme in bulk for industrial applications.

Keywords: Bacteria; Fungi; Pectinase

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