

Cellulase activity of cellulolytic bacteria from Dun Lamphan No-hunting Area MahaSarakham Province

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Abstract

Cellulase is an enzyme that can be produced from a group of cellulolytic bacteria. This enzyme can break down the β -1,4glycosidic bond of cellulose into monosaccharide. The purpose of this study was to isolate and screen for cellulolytic bacteria with high cellulase activity. Thirty-six samples of soil and plant decays from Dun Lamphan No-hunting Area, MahaSarakham Province were collected in wet and dry season at the same position and subjected to the isolation of cellulolytic bacteria. The Samples were serial diluted and spread on the Nutrient agar (NA), and then the cellulose hydrolysis activity on Basal medium (BSM) based on the Gram's iodine was determined. As a result, 763 isolates of bacteria from samples collected in wet season were achieved. Among them, 557 isolates were cellulolytic bacteria. Samples collected in dry season resulted in 523 isolates of bacteria, and 313 isolates of them were cellulolytic bacteria. Comparative study on the cellulose hydrolysis based on the hydrolysis value equation was carried out, and the high potential isolate with a high value of hydrolysis activity was subjected to enzyme activity tested using di-nitrosalicylic acid reagent method (DNS). The results showed that isolate no. 18.2.3A had a highest enzyme activity of 18.15 U/mL, and isolate no. 2.1.2A had a lowest enzyme activity (0.65 U/mL). This finding suggested that the isolated cellulolytic bacteria had high potential for cellulose hydrolysis with is useful for further study on research and development in order to improve strain for commercial applications.

Keywords: enzyme activity, cellulase, cellulolytic bacteria