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SCREENING FOR CELLULOSE UTILIZING EFFICIENCY OF BACTERIA ISOLATED FROM DIFFERENT NATURAL SOURCES BY ENRICHMENT WITH DIFFERENT LIGNOCELLULOSE SUBSTRATES

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Abstract

Lignocellulose is a promising feedstock to produce biofuels and other bio-based products and it is the most abundant sustainable and economical alternative to fossil resources. It is the sole source of some of these bio-based products. Many of these products are obtained from the sugars hydrolysed from the celluloses and hemicelluloses and this bioconversion is a major factor that determines effective production. Among different methods of conversion microbial conversion is more effective and a consortium is more effective than a single strain. This study aimed at isolating efficient cellulose utilizing bacteria (CUB) from coir retting water, compost, and cow dung by enrichment with three lignocellulosic substrates i.e. factory tea refuse, grass clippings, and Palmyra husk. Four enrichments (each with five days incubation at 37°C) in a basal culture media with the respective cellulosic substrates as the sole source of carbon. The populations of CUB were determined by plate count method using Congo-red agar medium (in triplicates per treatment) from which bacteria with larger clear zones were isolated. CUB densities were subjected to ANOVA followed by comparison using Duncan's test. The cellulose utilizing efficiency of the isolates was tested using the filter paper degradation method. CUB density increased with the number of enrichments and further enrichments may give higher densities of bacteria. Grass clippings were the best lignocellulose substrate supporting CUB and cow dung was the best source of CUB among the tested. The highest cellulose utilizing efficiency too was found in strains isolated from cow dung. The isolates are stored for identification and further testing of cellulose degrading efficiency of different combinations of the isolates that may yield an efficient CUB consortium.

Keywords: *cellulose degrading efficiency, cellulose-utilizing bacteria lignocelluloses*