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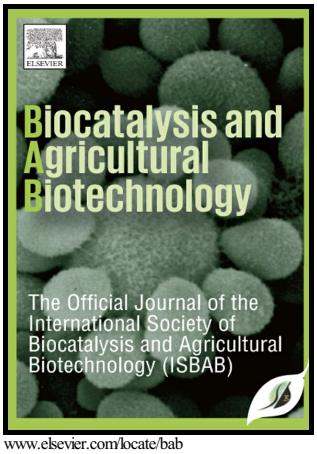

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Glycoside Hydrolases from a Thermophilic Microbial Consortium and their implication in the saccharification of agroresidues.

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Abstract

This study investigates the potential of a thermophilic lignocellulolytic microbial consortium to act as a repository of different Glycoside hydrolases (GHs) for saccharification of agroresidues. An active thermophilic lignocellulolytic microbial consortium (TWC) was bred at 60°C from forest soil using destarched wheat bran as the sole carbon source. TWC was screened for production of extracellular GHs at various pH and temperatures for four days. The consortium produced several extracellular GHs, such as endoglucanase, exoglucanase, β-glucosidase, endoxylanase and β-xylosidase with enhanced activity at 60 °C (as compared with 37 °C) and pH 5 - 6 at 48 h of incubation. Zymogram analysis also indicated the presence of multiple xylanase and β-glucosidase activities at 48 h of incubation. The extracellular cellulolytic enzyme cocktail (CEC) obtained from TWC was implicated in the saccharification of heat treated agro-residues. Among seven agroresidues tested, wheat bran and sugarcane bagasse were efficiently saccharified by the CEC with continued release of reducing sugars till 72 h of incubation at 60 °C. Release of reducing sugars from destarched wheat bran pretreated with moist heat was 359 mg g^{-1} of non-starch polysaccharides, which was about two fold greater in comparison to that released from untreated wheat bran (181 mg g^{-1}). The production of thermophilic GHs by the