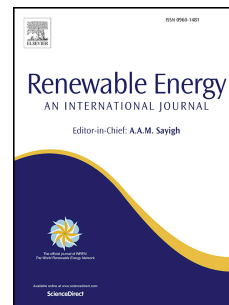


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Performance evaluation of fungal cellulases with dilute acid pretreated sugarcane bagasse: A robust bioprospecting strategy for biofuel enzymes

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1 **Performance evaluation of fungal cellulases with dilute acid pretreated sugarcane bagasse: A robust**
2 **bioprospecting strategy for biofuel enzymes**

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9 **Abstract**

10 Bioprospecting is lucrative tool to explore novel, efficient and cheap cellulases catering "second generation
11 biofuels" sector. In this study we propose performance evaluation of fungal cellulases with dilute acid pretreated
12 sugarcane bagasse, as robust bioprospecting strategy for biofuel enzymes. Nine cellulolytic fungi were purified
13 from wood decaying and termite rich zones of CSIR-IIP, India. Microscopic examination revealed that
14 *Penicillium* and *Aspergillus* were the predominant genera among various cellulolytic fungi. After primary and
15 secondary screening under submerged and solid state fermentation respectively, Isolate 3 (*Aspergillus* sp.)
16 emerged as best hypercellulolytic strain. Under SSF, it exhibited a maximum of ~956 U/g endoglucanase and
17 167 U/g cellobiase activities on 5th day under optimized assay conditions. However, benchmarking shortlisted
18 fungal cellulases by saccharifying acid pretreated sugarcane bagasse yielded surprising results. In spite of
19 exhibiting maximum endoglucanase and cellobiase activity of 207 U/g and 37U/g respectively on day 4th,
20 cellulase cocktail of Isolate 4 released 6.83 g/L and 5.41 g/L of total reducing sugars and glucose respectively at
21 60°C (pH 4.0) after 72 h. These results showed that Isolate 4 phylogenetically confirmed as *Talaromyces*
22 *verruculosus* IIPC 324 produced robust and specific cellulase cocktail for efficient hydrolysis of sugarcane
23 bagasse.

24 **Key words:** Solid State Fermentation (SSF), acid pretreated sugarcane bagasse (SCB), enzymatic
25 saccharification, cellobiohydrolyases (CBH), Carboxy methyl Cellulase (CMC'ase)

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