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Isolation, screening and optimization of alkaliphilic cellulolytic fungi for production of cellulase
(2024) *Green Processing and Synthesis*, 13 (1), .

DOI: 10.1515/gps-2023-0153

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Abstract
This study concerns with the production and partial characterization of alkaline cellulase from alkaliphilic cellulolytic (AC) fungi isolated fromsoil in Perlis, Malaysia. The best fungi strain was selected on the basis of producing the highest cellulase at high pH conditions. Cellulase from the selected fungi strain was further characterized under saccharification but varies in operating parameters. Finally, the kinetic model describing the growth of the AC fungi strain was studied by employing the logistic model. Among the tested fungi strains, Basidiomycetes strain (BK1) showed high potentiality for the production of maximum alkaline cellulase production at pH 9 after 72 h of incubation at 30°C containing 6 g·L-1 carboxyl methyl cellulose. The saccharification process showed that the enzyme favour high alkaline condition and proves thermotolerant properties, while 15% (v/v) enzyme loading and 1% substrate concentration recorded the highest glucose production at about 1.2-1.3 mg·mL-1. The novelty of the study is to identify and optimize a unique indigenous fungi that emit alkaliphilic cellulase as alternative usage in biotechnology industries due to its capacity to adapt to the extreme conditions of specific industrial processes. There are revolutionary options for use in biotechnological businesses that involve high pH and therefore have substantial biotechnological promise. © 2024 the author(s), published by De Gruyter.

Author Keywords
alkaline cellulase; alkaliphilic cellulolytic fungi; enzyme; logistic growth model; saccharification

Index Keywords
Alkalinity, Biotechnology, Fungi, Saccharification, Strain, Substrates; Alkaline cellulase, Alkaliphilic, Alkaliphilic cellulolytic fungus, Cellulolytic fungus, Fungi strains, High pH, Logistic growth model, Malaysia, Optimisations, Partial characterization; Enzymes; Capacity, Cellulase, Fungi, Glucose, Methyl Cellulose, Ph, Production, Saccharification

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Publisher: Walter de Gruyter GmbH

ISSN: 21919550
Language of Original Document: English
Abbreviated Source Title: Green Process. Synth.
2-s2.0-85185402886
Document Type: Article
Publication Stage: Final

Source: Scopus