Ahlam S Al Azkawi et.al., J Fundam Renewable Energy Appl 2018, Volume 8
DOI: 10.4172/2090-4541-C1-053

Waste cardboard as carbon source for cellulase production by a wild strain of *Bacillus subtilis* and its potential in consolidated bioprocessing for biofuel production

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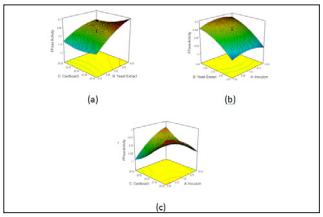
Waste paper is very useful and potential carbon source for bacterial growth and cellulase production. Considering its huge abundance in the environment, utilizing it to produce useful products became a trend in the global community. Previous studies have mainly utilized office paper and/or newspaper as substrate for bio products or biofuel production while very few have explored the cardboard. In this study cardboard has proved to be a suitable carbon source for cellulase production using a wild soil bacteria isolate, *Bacillus subtilis*. Under optimum conditions, a filter paper activity (FPA) of as high as 3.99 FPU/ml with cardboard concentration of 25 g/L was achieved in shake flask experiments after 30 hours cultivation. Purification of the crude enzyme has yield a total enzyme activity of 70 FPU/ml which could be very promising for enzymatic hydrolysis of waste paper to produce biofuel. This work has also proved the ability of the isolated strain to directly hydrolyze waste cardboard and produce up to 1 mg/ml reducing sugar which could be fermented to ethanol after further optimization experiments. This achievement may promote the implementation of consolidated bioprocessing as a strategy where enzyme production and hydrolysis take place in a single flask hence reducing the cost of biofuel production.



Biography

Ahlam S Al Azkawi is the Head of Central Analytical and Applied Research Unit at College of Science, Sultan Qaboos University (SQU). She has completed her MSc in Biology in 2008 and currently she is pursuing her PhD studies in Biotechnology at Biology Department, SQU. Her topic of interest is utilizing waste papers in production of bio products with special focus on waste cardboard hydrolysis using wild cellulase producing bacteria.

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