

Utilization of Agricultural and Algal Feed Stocks for the Production of Various Biological Metabolites

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ABSTRACT

Agro-industrial residues are primarily composed of complex polysaccharides that strengthen microbial growth for the production of industrially important enzymes. Agricultural biomass is a broad category of biomass. It includes food-based portion of crops, nonfood-based portion of crops, perennial grasses, and animal waste. In animal waste, algae are the original source of the earth's crude oil. Algae-derived biofuels recreates and speeds up that process. Therefore, the basic purpose of this research work was to produce useful biological metabolites from different feedstock which are actually a cheap source. In this research, three different biological metabolites were produced by utilizing two types of feed stocks. First, algal feed stock which include two varieties of algae. One is from sandy portion of the sea shore and the other from the shallow water of the coastline. The second type of feedstock includes agricultural waste i.e. apple peels and pear peels. Pectinases, cellulases and amylases are groups of enzymes that have been successfully utilized for production of enormous range of commercial products. Due to wide commercial applications of these enzymes especially in biofuel production, current study was designed to utilize agricultural and algal biomass for the production of commercially important class of hydrolases using two different fungal sources. Several bacterial and fungal strains were screened for the production of hydrolase and among them *Aspergillus niger* and *Aspergillus fumigatus* were selected on the basis of maximum enzyme production. Then physical parameters of fermentation were optimized (pH: 7.0; temperature: 37°C and feedstock 10.0 g/L). Among different feedstocks the production of glucose and bioethanol was highest agricultural biomass as compared to algal. Hence this study suggested that both of these stocks can be used for commercial production of valuable metabolites.
