

Simultaneous Saccharification and Co-Fermentation of Paddy Straw and Fruit Wastes into Ethanol Production

Authors : Kamla Malik

Abstract : For ethanol production from paddy straw firstly pretreatment was done by using sodium hydroxide solution (2.0%) at 15 psi for 1 hr. The maximum lignin removal was achieved with 0.5 mm mesh size of paddy straw. It contained 72.4 % cellulose, 15.9% hemicelluloses and 2.0 % lignin after pretreatment. Paddy straw hydrolysate (PSH) with fruits wastes (5%), such as sweet lime, apple, sapota, grapes, kinnow, banana, papaya, mango, and watermelon were subjected to simultaneous saccharification and co-fermentation (SSCF) for 72 hrs by co-culture of *Saccharomyces cerevisiae* HAU-1 and *Candida* sp. with 0.3 % urea as a cheap nitrogen source. Fermentation was carried out at 35°C and determined ethanol yield at 24 hours interval. The maximum production of ethanol was produced within 72 hrs of fermentation in PSH + sapota peels (3.9% v/v) followed by PSH + kinnow peels (3.6%) and PSH+ papaya peels extract (3.1 %). In case of PSH+ banana peels and mango peel extract the ethanol produced were 2.8 % and 2.2 % (v/v). The results of this study suggest that wastes from fruits that contain fermentable sugar should not be discarded into our environment, but should be supplemented in paddy straw which converted to useful products like bio-ethanol that can serve as an alternative energy source.

Keywords : ethanol, fermentation, fruit wastes, paddy straw

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