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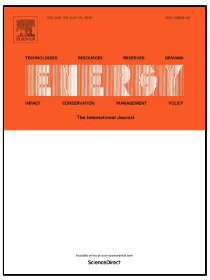

Evaluation of Pomegranate Peel in Ethanol Production by *Saccharomyces cerevisiae* and *Pichia stipitis*

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Evaluation of Pomegranate Peel in Ethanol Production by *Saccharomyces cerevisiae* and *Pichia stipitis*

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ABSTRACT

Conversion of pomegranate peel (PP), which is an abundant and valuable by-product of fruit juice industry to value added product such as ethanol, instead of discharging as agro-industrial waste was aimed in this study. Some important parameters such as H_2SO_4 pretreatment (0.5%, 1%, 1.5% v/v), fermentation period (6, 12, 24 h), initial substrate loading (from 2.5 to 150 g/L) were optimized in the first fermentation experiments performed with *S. cerevisiae* and *P. stipitis* yeasts. After finding the optimum conditions for ethanol production of the yeasts, effect of different nitrogen sources [yeast extract – peptone and $(NH_4)_2SO_4$] and metal salts (combination of K^+, Mg^{2+}, Ca^{2+}, Zn^{2+}) on the production were also investigated to improve the yield, up to 44.9% for *S. cerevisiae,* which reached to 5.58 g/L at the end of 12 hours fermentation, corresponding to 0.46 g/L/h productivity, whereas *P. stipitis* could produce 2.95 g/L ethanol. This study shows that pomegranate peel is a promising feedstock for second generation ethanol production.

Keywords: ethanol, pomegranate peel, biofuel, waste

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