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Using *Pennisetum alopecoides* as fermentation substrate for cellulosic-ethanol production

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This study is done to investigate the bioethanol production from *Pennisetum alopecoides* powder by using two-stage fermentation co-culturing systems of cellulolytic strain and ethanolic strain. Firstly, we used ethanolic strain WLP041 and the cellulolytic strain *Bacillus subtilis* for the feasibility of co-culturing two-stage and period. In the two-stage of co-culturing, we found that the maximum ethanol production concentration was 244.7 mg/L. In the period of co-culturing, the maximum ethanol production concentration was 257.9 mg/L. It was proved that the feasibility of period of co-culturing have higher ethanol yield. Secondly, *Saccharomyces cerevisiae* and *Trichoderma* sp. were co-cultured with ethanol production and use the immobilized technique. The optimal hardening time of gel beads was 15 min, which has the ability to protect yeast to produce ethanol. The initial culture condition was pH 5~5.6, at 30 °C and 150 rpm, and got higher ethanol yield. The result showed that in order to increase the ethanol production, the ethanol content was 652.3 mg/L under 10 g/L *P. alopecoides* powder. The experimental results show that the immobilized yeast for ethanol production, after the third day found the maximum ethanol content is 1,106.9 mg/L. In the other method, the *P. alopecoides* powder is used in 0.2 M HCl aqueous solution, the shaking time was kept for 60 min, at 100 °C, which can be hydrolyzed to higher reduce sugar content of the hydrolyzate. The hydrolyzate and acid-treated powder with the period of co-culturing systems produced ethanol, after the third day found that the maximum ethanol production concentration was 1,266 mg/L, which was the highest in this experiment.

Biography

Ching Piao Liu has completed his PhD from Taiwan University. He is the Chairman of Department of Food Science, China University of Science and Technology. He has published more than 38 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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