

## **Abstract**

Production of fuel ethanol from sugar beet juice, using cells immobilized on loofa sponge was investigated. Based on ethanol productivity and ease of cell immobilization, a flocculating yeast strain, *Saccharomyces cerevisiae* IR2 was selected for ethanol production from sugar beet juice. It was found that raw sugar beet juice was an optimal substrate for ethanol production, requiring neither pH adjustment nor nitrogen source supplement. When compared with a 2 l bubble column bioreactor, mixing was not sufficient in an 8 l bioreactor containing a bed of sliced loofa sponges and consequently, the immobilized cells were not uniformly distributed within the bed. Most of the cells were immobilized in the lower part of the bed and this resulted in decreased ethanol productivity. By using an external loop bioreactor, constructing the fixed bed with cylindrical loofa sponges, dividing the bed into upper, middle and lower sections with approximately 1 cm spaces between them and circulating the broth through the loop during the immobilization, uniform cell distribution within the bed was achieved. Using this method, the system was scaled up to 50 l and when compared with the 2 l bubble column bioreactor, there were no significant differences ( $P > 0.05$ ) in ethanol productivity and yield. By using external loop bioreactor to immobilize the cells uniformly on the loofa sponge beds, efficient large scale ethanol production systems can be constructed.

Do you want to **read the rest** of this article?

Request full-text

*Scale up of fuel ethanol production from sugar beet juice....* Available from:

[https://www.researchgate.net/publication/230896423\\_Scale\\_up\\_of\\_fuel\\_ethanol\\_production\\_from\\_sugar\\_beet\\_juice\\_using\\_loofa\\_sponge\\_immobilized\\_bioreactor](https://www.researchgate.net/publication/230896423_Scale_up_of_fuel_ethanol_production_from_sugar_beet_juice_using_loofa_sponge_immobilized_bioreactor)