Co-immobilization of cellulase extracted from *Schizophylum commenfr* and *Saccharomyces cerevisieae* in the bioconversion of sugar cane bagasse to ethanol.

Egwim E. C., R. Garba, A. M. Ogunmolasuyi and Tope Caleb.

Biochemistry Department, School of Life Sciences, Federal University of Technology, PMB 64, Minna, Nigeria

Abstract.
The production of ethanol from sugar cane bagasse using co-immobilized yeast cells (saccharomyces cerevisieae Y300) and crude cellulase enzyme extracted from mushroom, Schizophylum commenfr, was studied. The yeast cell and cellulase enzyme were immobilized on activated bone for simultaneous saccharification of sugar cane bagasse and ethanol production. The preliminary bagasse hydrolysis, cellulase enzyme extraction from mushroom, effect of bagasse concentration and immobilization on glucose yield and ethanol yield from co-immobilization of enzyme and yeast cells were determined. From the result, glucose yield from hydrolysis of bagasse with immobilized cellulase enzyme increased from 225.20g to 1531.36g within 2 to 10hrs, while glucose yield with free enzyme decreased from 4296.81g to 3319.44g within 6 to 10hrs. Immobilized enzyme and free yeast cells showed an increased ethanol yield from hydrolyzed bagasse 28% in 12hrs to 44% in 48hrs, but co-immobilized enzyme and yeast cells gave a higher ethanol yield of 38% in 12hrs to 48% in 48hrs. There was significant difference between the use of free yeast cells and immobilized enzyme and that of co-immobilized enzyme and yeast cells ($p<0.05$).

Keywords: Co-immobilization, Cellulase, *Schizophylum commenfr, Saccharomyces cerevisieae,* Bagasse and Ethanol

Email: evanschidi@gmail.com; c.egwim@futminna.edu.ng
Received: 2016/07/04
Accepted: 2017/02/07
DOI: http://dx.doi.org/10.4314/njtr.v12i1.9