

[ENV08]

Biotechnological production of xylitol from oil palm empty fruit bunch, a lignocellulosic waste

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Empty Fruit Bunch (EFB) waste from oil palm industry was found to be a potential raw material for xylose production. Hydrolysis of EFB at 120°C using sulfuric acid various concentrations (1-6%) and reaction time period (30-90 min) yielded mainly xylose together with glucose and byproduct components such as acetic acid and furfural. Kinetic parameters of mathematical models for predicting the concentration of xylose, glucose, acetic acid and furfural released in the hydrolysate was studied. Hydrolysate containing optimum concentration of xylose was used as media for biological conversion of xylose to xylitol using *Debaryomyces hansenii* NRRL Y-7426 as fermentative organism. Activated charcoal adsorption treatment was applied for removal of byproduct components such as acetic acid and furfural from the resulting hydrolysate. The best product yield (Y_p/s) and productivity (Q_p) for both raw wood and charcoal treated hydrolysate was identified. Charcoal treated hydrolysate with high substrate concentration allowed an effective bioconversion of xylose to xylitol which gave $Q_p=0.06 \text{ gL}^{-1}\text{h}^{-1}$ and $Y_p/s=0.61 \text{ gg}^{-1}$.