

Bioethanol production from *Arundo donax* as a raw material using wood rotting fungus *Schizophyllum commune* NBRC 4928

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Purpose: Pretreatment methods of cellulosic biomass such as delignification and saccharification are mainly performed physically/chemically, but there are problems such as high equipment cost and generation of fermentation inhibitors. Therefore, we examined a method to execute all the steps consistently by using a wood rot fungus which decomposes lignin, cellulose and hemicellulose which are main components of plant cell wall. In this study, we investigated ethanol production from soft biomass giant reed (*Arundo donax*) and water hyacinth (*Eichhornia crassipes*) using the highly fermentable wood rot fungus *Schizophyllum commune* NBRC 4928.

Methods: Sixty milliliter of liquid medium was placed in a 200-ml flask. Mycelial discs of *S. commune*, 12 mm in diameter, were punched out from colonies subcultured on potato dextrose agar. Four discs were put in a flask and then incubated on a rotary shaker (90 rpm) at 30 °C. Semi-anaerobic conditions were generated by an N₂ gas purge and a silicon rubber cap with a fermentation airlock. The concentration of ethanol in the supernatant of liquid medium was measured by using HPLC.

Results and Conclusions: Although *S. commune* NBRC 4928 did not produce ethanol from water hyacinth, ethanol production was observed when a giant reed was used as a raw material. The result that combination of *S. commune* and cellulase enhanced ethanol production from the giant reed suggested that improved saccharification efficiency might increase the yield of ethanol. We concluded that the CBP using the white rot fungus is available in the bioethanol production from cellulosic materials.