Delignification of oil palm empty fruit bunch (OPEFB) using chemical and microbial pretreatment methods.

ABSTRACT

In this study, Oil Palm Empty Fruit Bunch (OPEFB) were subjected to chemical and microbial pretreatment for bioconversion of lignocellulosic biomass to fermentable sugars. For chemical pretreatment, 2% (w/v) sodium hydroxide (NaOH) was been used for delignification while for microbial pretreatment, Phanerochaete chrysosporium ATCC 32629 was used as model microorganism by liquid and solid state culture techniques. Microbial pretreatment showed significant lignin removal with longer delignification time as compared to chemical pretreatment. For the same value of Klason lignin, delignification by chemical pretreatment need only 3 h as compared to 7 days for microbial pretreatment. The optimum value of Klason lignin for microbial pretreatment and chemical pretreatment were 5.89 and 5.93, respectively. In conclusion, delignification of OPEFB can be achieved via chemical and microbial pretreatment.

Keyword: Oil palm empty fruit bunch; Delignification; Chemical pretreatment; Microbial pretreatment; Klason lignin.