Enzymatic saccharification of Japanese cedar wood by combined pretreatments using a newly isolated white rot fungus and solvolysis

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The production of ethanol from lignocellulosics has received much attention due to immense potential for conversion of renewable biomaterials into biofuels and chemicals. Since lignin makes the access of cellulolytic enzymes to cellulose difficult, it is necessary to decompose the network of lignin prior to the enzymatic hydrolysis. Japanese cedar (*Cryptomeria japonica*) shares over 60% of forest plantation in Japan. However, it was difficult to obtain sufficient enzymatic saccharification yields from the softwood after conventional thermal pretreatments like microwave irradiation, steaming and steam explosion without the use of strong acids or toxic chemicals. Therefore, we studied a new process using treatments with white rot fungi and solvolysis. When the fungal treatment with *Ceriporiopsis subvermispora* was combined with solvolysis, saccharification yields of Japanese cedar wood increased 7 times than those without the fungal treatment. In addition, we found that a newly isolated white rot fungus was more effective than the biopulping fungus, *C. subvermispora*. The high pretreatment effects with the new strain were found when microwave solvolysis was used, instead of conventional solvolysis in an autoclave.