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Effective Delignification of Agro-industrial Plant Residues With Stable Enzymes of Basidial Fungi

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Abstract

Bioconversion of plant wastes is one of the most important processes among the modern enzyme technologies. The purpose of conducted work was to study pretreatment parameters for agro-industrial plant residues with higher basidiomycetes under the conditions of solid state fermentation (SSF). was selected as a result of screening three strains of producers of Lacasse enzymes fungi. Two of them *Ganoderma* sp. GV 01 and *Pleurotus drynus* IN-11 proved to be the best lignin polymer destructors. From plant residues, wheat straw, rice straw, corn straw, aboveground mass of potatoes (AMP) and sunflower lignocellulosic wastes (SLW) were tested. The results showed that the decrease in the percentage of lignin depended on fungi species, the duration of cultivation and the type of substrate. The best delignification result was obtained on the corn straw substrate. In 15-day fermented biomasses of *Pleurotus drynus* IN-11 the content of lignin decreased from 18.0% to 7.6% and in biomass delignified by *Ganoderma* sp GV 01 to 6.5%. *Pleurotus drynus* IN-11 was found to be a better lignin destructor in wheat straw, in which the content of lignin decreased from 19.0% to 11.6%. In the case of delignification of the upper parts of potatoes, the reduction of biopolymer by 4-6.7% was obtained. Considerable delignification ability of sunflower lignocellulosic residue was revealed in the biomass fermented with *Pleurotus drynus* IN-11, in which reduction of lignin from 19.7% to 8.6% was found.

Keywords: Agro-industrial wastes, Basidial fungi, Delignification, Pre-treatment.