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*Thematical course:* Use of biopulping for pretreatment of wood in bioethanol production. Part 1.

# Sampling of strains of basidiomycetes and micromycetes for biopulping of wood substrates

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## Abstract

Prospects of using producer strains for biopulping is evidenced by plant materials' bioconversion ability due to a complex of lignocellulolytic enzymes. The research was performed using basidiomycetes and micromycetes to determine the most promising strains for pretreatment (biopulping) of various wood substrates along with chemical treatment methods. Screening of some strains of fungi of *Trichoderma, Fusarium, Penicillium, Beaveria* genera has been performed to find their ability to degrade lignocellulose in accordance with testing methods. Strains with maximum oxidase and cellulase activity on agar media with gallic acid and carboxymethyl cellulose have been selected out of the group of micromycetes. In the order of oxidase activity increase, Selected strains are positioned as follows: *Fusarium sp.* < *Penicillium sp.* ≤ *Trichoderma lignorum* (F-98) < *Beauveria bassiana* (F-145). In the order of cellulase activity increase, these strains are positioned as follows: *Fusarium sp.* < *Beauveria bassiana* < *Penicillium sp.* ≤ *Trichoderma lignorum.* Comparative assessment of growth of selected strains of fungi during solid phase fermentation on softwood pulp in the course of 7, 14 and 23 days. Modification of lignocellulosic substrates with chemicals was performed using alkali and acid, as well as with organic solvents. It was found that softwood dust after treatment by alkaline hydrolysis, as well as after resin extraction and alkali treatment, is the most adapted substrate for solid state fermentation with selected strains of fungi. For the first time, use of strain of *Beauveria bassiana*, which belongs to entomopathogenic fungi group, has been considered for the purposes of biopulping. Strains of micromycetes *Penicillium sp*. and *Trichoderma lignorum*, as well as strains of basidiomycetes *Panus tigrinus* (F-8/18) and *Pleurotus eryngii* have been found that demonstrate high lignocellulosic activity and bioconversion ability of poorly hydrolysable wood substrates.

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