

## Antifungal and growth-promoting activity of the main waste of the lignocellulosic hydrolysates biodegradation

© Tatiana S. Morozova,\*<sup>†</sup> Elizaveta V. Kuznecova, and Sergey Yu. Semyonov

Biological Institute. National Research Tomsk State University. Lenin Ave., 36. Tomsk, 634050.

Tomsk Region. Russia. Phone: +7 (953) 925-83-85. E-mail: tsmorozova1991@gmail.com

\*Supervising author; <sup>†</sup>Corresponding author

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### Abstract

The antifungal and growth-stimulating activity of biological detoxification waste products of hydrolysates of lignocellulosic raw materials *in vitro* and *in vivo* was evaluated in comparison with reference preparations (Alirin-B, Fitosporin-M) and control (sterile tap water). These wastes are specially adapted micrococenoses of activated sludge, worked out in the process of purification of hydrolysates of lignocellulosic raw materials from inhibitors of acetone butyl fermentation. The agronomic value of biodegradation waste was studied in three prototypes of different nature, using Iren spring wheat as an example. The results showed that detoxification bioagents, regardless of origin, showed fungistatic activity at the *in vitro* and *in vivo* study stages (biotest). In an *in vitro* experiment, all test samples showed significant antifungal activity against the fungus *F. oxysporum*. The most effective was the biodegradation waste obtained on the basis of micrococenosis of activated sludge grown on a nutrient medium containing phenol, formic and acetic acid. As a result of exposure to this bioagent at the end of the experiment, the average diameter of the colonies of the fungus *F. oxysporum* was approximately 34 times less than in the control version. The detoxification bioagent, obtained on the basis of a specially adapted micrococenosis of activated sludge grown on a nutrient medium simulating wastewater, reduced the diameter of phytopathogenic fungus colonies by an average of 16 times. Specially adapted activated sludge from the sewage treatment facilities of the wood processing enterprise, worked out during the detoxification of hydrolysates of lignocellulosic raw materials, was also able to effectively suppress fungus growth, the average diameter of which was 19 times less than the control. The biotest results also confirmed the fungistatic activity of the test samples. The effectiveness of reducing the total infection with seminal infections in different experimental variants ranged from 52 to 84%. The growth-promoting ability of biodegradation waste was weak.

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