OPTIMIZATION OF HYDROLYSIS CONDITIONS OF WHEAT STRAW BY ENZYME PREPARATION FROM *Fennellia* sp. 2806


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The aim of the work was to optimize the hydrolysis conditions of wheat straw by complex enzyme preparation from *Fennellia* sp. 2806 with endo-, exoglucanase, xylanase and β-glucosidase activities. Bioconversion of wheat straw was carried out by an enzyme preparation obtained from the culture filtrate of *Fennellia* sp. 2806. The two methods of statistical optimization of the experiment — the Plackett-Burman (determination of significant factors) and Box-Behnken (determination of optimal values of defined significant factors) methods were used consequentially to optimize the hydrolysis conditions. Endo-, exoglucanase, xylanase and β-glucosidase activities were assayed in enzyme preparation. Reducing sugars were determined by the modified Bertrand method. As a result of two-stage optimization of the bioconversion process of wheat straw by enzyme preparation from *Fennellia* sp. 2806, it was found that the highest reducing sugars values were formed at temperature 50 °C, pH 5.0, substrate concentration 100 mg/ml, endoglucanase activity — 0.012 u/mg substrate, process duration — 18 h and pre-treatment by 4.5% alkali solution with further exposure to a microwave irradiation 6 W/g WS for 10 min. So it was established that temperature, pH, substrate concentration, pre-treatment of wheat straw by alkali solution and microwave irradiation were the significant factors for the hydrolysis process of substrate by enzyme preparation from *Fennellia* sp. 2806. Reducing sugars concentration was increased 1.5–2.0 times compared with the results obtained for the native wheat straw.

**Key words:** wheat straw, optimization of hydrolysis conditions, bioconversion, enzyme preparation.

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