

*Thematic course: Bioconversion of biomass of *Helianthus tuberosus L*
(Jerusalem artichoke) into sugars for biofuel production. Part 1.*

Jerusalem artichoke tubers bioconversion

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Abstract

A comparison of the effectiveness of enzyme preparations with different substrate specificity and their compositions in hydrolysis of biomass artichoke tubers. Set the effect of complementarity of action of cellulolytic, pectinolytic preparations and complex own hydrolases Jerusalem artichoke, leading to a total and indiscriminate destruction of structural polysaccharides, which contributes to the achievement of high speed hydrolytic reactions, increasing the yield of reducing sugars and the degree of conversion of the enzymatic hydrolysis of biomass Jerusalem artichoke tubers.

References

- [1] B.M. Kakhana, V.V. Arasimovich. Artichoke biology. *Izd. Shtiintsa. Kishinev.* **1974**. 88p. (russian)
- [2] J.S. Edelman, J.S.D. Bacon. The action of a hydrolytic enzyme system from *Helianthus tuberosus L.* on carbohydrates present in the tubers. *Biochem J.* **1951**. Vol.49. P.446-451.
- [3] J.C. Edelman, T.G. Jefford. The metabolism of fructose polymers in plants. 4. β -fructofuranosidases of tubers of *Helianthus tuberosus L.* *Biochem J.* **1964**. Vol.93. P.148-154.
- [4] A.G. Dontsov. Physical-chemical activation methods of pectinolytic enzymes. Part 1. Ion exchange on strong ionites. *Butlerov Communications.* **2013**. Vol.33. No.2. P.27-32. ROI: jbc-02/13-33-2-27
- [5] A.G. Dontsov. Physical-chemical activation methods of pectinolytic enzymes. Part 2. Thermo-chemical activation of polygalacturonases. *Butlerov Communications.* **2013**. Vol.33. No.2. P.33-35. ROI: jbc-02/13-33-2-33
- [6] A.G. Dontsov. Physical-chemical activation methods of pectinolytic enzymes. Part 3. Application of calcium-containing agents for coagulation and adsorption purification of polygalacturonases. *Butlerov Communications.* **2013**. Vol.34. No.4. P.140-143. ROI: jbc-02/13-34-4-140
- [7] A.G. Dontsov. Physical-chemical activation methods of pectinolytic enzymes. Part 4. Production of highly-efficient preparations of polygalacturonases. *Butlerov Communications.* **2014**. Vol.37. No.3. P.97-104. ROI: jbc-02/14-37-3-97
- [8] A.G. Dontsov, A.P. Karmanov, L.S. Kocheva, A.V. Rudkovslii, S.A. Kuznetsova, V.V. Volodin. The impact of ultrasonic cavitation on the reaction ability of lignin-cellulose substrates during plant biomass bioconversion. *Butlerov Communications.* **2014**. Vol.39. No.9. P.52-57. ROI: jbc-02/14-39-9-52
- [9] N. Nelson. A photometric adaptation of the Somogyi method for the determination of glucose. *J. Biol. Chem.* **1944**. Vol.163. P.375-380.
- [10] M. Somogyi. A new reagent for the determination of sugars. *J. Biol. Chem.* **1945**. Vol.160. P.61-68.
- [11] A.G. Dontsov, D.V. Tarabukin, E.V. Vanchikova. Optimization of protein identification conditions in enzyme solutions by the Louri method. *Zavodskaya laboratoriya. Diagnostika materialov.* **2009**. Vol.75. No.2. P.18-20. (russian)
- [12] A.G. Dontsov. The recovery method of sugar-containing hydrolysates for production of biofuel (bioethanol). *Patent RF.* No2538390. MPK, S13K 1/02, S13K 1/06, S13K 11/00. Appl. 03.07.2012. Published in BI. No1 10.01.2015. (russian)