

## The influence of SiO<sub>2</sub> nanoparticles on antioxidant potential of *Bacillus subtilis* IMV V-7023

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It is shown, that *B. subtilis* IMV V-7023 possesses high antioxidant and antiradical properties that allows recommending the bacterial preparations created on the basis of this strain, for agricultural crops which influenced aggressive stress-agents [1]. At introduction in an agroecosystem, bacilli will be under influence dispersible materials of different nature, in particular nanomaterials [2]. Nanosize SiO<sub>2</sub> possesses the row of unique properties. However in modern literature there is some information about a prooxidant effect nano-SiO<sub>2</sub> [3].

It is established, that at entering into a nutrient medium 0.05 – 1 g/L of nanosize SiO<sub>2</sub>, oxidant activity of cultural medium (CM) of bacilli raised on 43,2 – 60.1 %, and antioxidant activity decreased on 4.5 – 11.8 %. The SiO<sub>2</sub> nanoparticles have different influence on antiradical activity of CM *B. subtilis* IMV V-7023. In particular, nano-SiO<sub>2</sub> did not render a substantial effect on ability of CM of bacilli to inactivate of DPPH· (2,2-diphenyl-1-picrylhydrazyl free radical). However this nanomaterial at the concentration of a 0.01 – 1 g/L inhibited the hydroxyl radical scavenging in CM *B. subtilis* IMV V-7023 on 7.2 – 17.6 %, in comparison with control option. The subzero doses of SiO<sub>2</sub> nanoparticles stimulated reducing power of CM *B. subtilis* IMV V-7023, and high – oppressed.

Thus, at cultivation of *B. subtilis* IMV V-7023 with the different weighed quantities of SiO<sub>2</sub> nanoparticles there is the dose-dependent oppressing of antioxidant potential of bacilli on a background growth of oxidative stress.

1. Skorochod I., Roy A., Kurdish I. Antioxidant Potential of the Phosphate-Mobilizing Bacteria *Bacillus subtilis* IMV V-7023 and *Bacillus subtilis* IB-22 // The Journal of Free Radicals and Antioxidants. Photon.–2014.–**141**.–P. 371-377.
2. Kurdish I. K. Introduction of microorganisms in the agroecosystems. – Kyiv: Naukova dymka, 2010. – 253 p.
3. Nel A., Xia T., Madler L. Toxic potential of materials at the nanolevel // Science.–2006.–**311**, № 5761.–P. 622-627.