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EFFECT OF THIOSULFONATE-BIOSURFACTANT COMPOSITIONS ON PLANTS GROWN IN OIL POLLUTED SOIL

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Abstract

The work is devoted to the search and investigation of the properties of the effective environmentally friendly phytoremediation activators. An integrated approach was used to evaluate the effect of the compositions of thiosulfonates with rhamnolipid biosurfactant on remediation plants. The biochemical and biophysical analysis of the rapeseed and ryegrass plants grown in the oil polluted soil – photosynthetic pigments, indicators of oxidative reactions and electrical impedance characteristics were determined. When applied via pre-sowing seed treatment the thiosulfonate-biosurfactant compositions have contributed to the reduction of the indicators of oxidative reactions in plants (malondialdehyde and hydrogen peroxide content) and the increase of photosynthetic pigments content. The electrical impedance characteristics of the plants were consistent with the data of the biochemical parameters. The composition of allylthiosulfanilate with rhamnolipid biocomplex was the most effective preparation. The results testify to the effectiveness of the thiosulfonate-biosurfactant compositions for the improvement of the adaptive capability of plants to adverse conditions and prospects of their application as environmentally friendly means for soil phytoremediation.

Key words: biosurfactants, electrical impedance spectroscopy, phytoremediation, polluted soil, rhamnolipid, thiosulfonates

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