## SURFACTANT-FORMING ACTIVITY OF BACTERIA *RHODOCOCCUS* SP. G13

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Bacteria of the genus *Rhodococcus* are widely used in the field of modern environmental biotechnology (bioremediation, utilization of toxic waste) due to their prevalent presence in anthropogenic disturbed ecotopes and availability of adaptive survival mechanisms in unfavorable environmental conditions [1]. Actinobacteria are characterized with the ability to synthesize bacterial cell components that ensure the neutralization of a wide range of xenobiotics in the process of recovery of contaminated ecosystems, due to the formation of gaseous and liquid n-alkanes [2]. One of the mechanisms for increasing the bioavailability of complex organic compounds for microbial cells is the synthesis of biosurfactants that reduce surface and interfacial tension and ensure the emulsification of hydrophobic substrates for their more efficient biodegradation [3].

In this research we investigated surfactant-forming and emulsifying activity of the oil-destroying bacterial strain *Rhodococcus* sp. G13 when cultivated on mineral medium containing various sources of nitrogen ($NaNO_3$, $KNO_3$, $(NH_4)_2SO_4$, $NH_4NO_3$) and phosphorus ($KH_2PO_4$, $K_2HPO_4$, $Na_2HPO_4$) in the presence of several carbon sources (glucose, ethanol, hexadecane). The emulsification index of hexadecane by *Rhodococcus* sp. G13 cells ranged from 23.8±1.5% to 54.1±1.2% depending on the salt composition of the mineral medium and the type of organic compounds as the carbon source are used. At the same time, when cell-free supernatant was used in the experiment, this index was about 2.76±0.16%. The ability of the bacterial cells to reduce the surface tension of the liquid was also evaluated, which was from 13.95±0.8% to 56.04±1.1% compared to the control medium. The colorimetric method [4] demonstrated that the level of biosurfactant synthesis by *Rhodococcus* sp. G13 reached up to 13.54±1.4 mg/L.

Research results indicate that surfactant synthesis, hydrophobic substrate solubilization and surface tension reduction occur most effectively under nitrogen-deficient cell culture conditions and using hexadecane as the sole carbon source. The obtained data also indicate that biosurfactants are located in the bacterial cell structure of *Rhodococcus* sp. G13.

### References

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