POLYENE ANTIBIOTICS AND PHYTOHORMONES BIOSYNTHESIS BY *STREPTOMYCES NETROPSIS* IMV AC-5025 UNDER THE COMPLEX ACTION OF EXOGENOUS INDOLE-3-CARBINOL AND β-SITOSTEROL

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Streptomyces genus are active producers of a wide spectrum of biologically active substances (BAS) that provide antagonism against phytopathogenes and parasitic nematodes, determines the regulation of plant growth, and induction of their resistance. *Streptomyces netropsis* IMV Ac-5025 was isolated by the researchers from the Institute of Microbiology and Virology, NAS of Ukraine. It produces a wide spectrum of BAS, such as polyene antibiotics, phytohormones, sterols, etc. Sterols play an important role in the vital activity of cells serving as structural elements of membranes. Indole-3-carbinol (IC) is a phytohormone that has an effect on the biosynthesis of other metabolites. To date, the biosynthesis of polyene antibiotics under the complex effects of BAS in soil streptomycetes hasn't been studied.

The aim of the work was to research the effect of the exogenous IC and β-sitosterol complex action on the polyene antibiotics and phytohormones biosynthesis by *S. netropsis* IMV Ac-5025.

The strain was cultivated in synthetic nutrient medium by in-depth method. Concentrations of exogenous substances were the following: 1. Control variant without the addition of exogenous BAS; 2. IC 25 μg/mL; 3. β-sitosterol 10 μg/mL; 4. IC 50 μg/mL; 5. β-sitosterol 20 μg/mL; 6. IC 12.5 μg/mL + β-sitosterol 5 μg/mL; 7. IC 5 μg/mL + β-sitosterol 2 μg/mL; 8. IC 0.5 μg/mL + β-sitosterol 10 μg/mL. The biomass accumulation was determined by the gravimetric method and expressed in grams of absolutely dry biomass (ADB) per 1 liter of the nutrient medium, polyene antibiotics and phytohormones biosynthesis were determined by the thin layer spectrodensitometric chromatography method. The results were analyzed by using Statistica v.10.0 program.

In the culture liquid, the sum of polyene antibiotics ranged from 30.295 to 170.56 μg/mL and was the highest under the action of IC 12.5 μg/mL + β-sitosterol 5 μg/mL (151% of the control value). The lowest amount of polyenes was accumulated under the action of 50 μg/mL of IC (26.8% of the control value). In producer biomass, the sum of polyene antibiotics ranged from 517.6 to 5859.38 μg/g ADB and was the highest under the action of IC 12.5 μg/mL + β-sitosterol 5 μg/mL (240% of the control value). The lowest sum of polyenes was accumulated under the action of 50 μg/mL of IC, also as in the culture liquid. In this case, the biosynthesis of the strain characteristic pigment was blocked. The amount of biomass was ranged from 4.9 to 5.8 g/L, exogenous compounds didn't have a significant effect on it. The auxins sum was ranged from 20.17 to 107.64 μg/g ADB and increased 5.3-fold under the action of IC 0.5 μg/mL + β-sitosterol 10 μg/mL and 4.8-fold – 50 μg/mL of IC. The cytokinins sum was ranged from 3.15 to 107.1 μg/g ADB and was the highest under the action of 50 μg/mL of IC (11.6-fold higher of the control variant). The ABA content was increased 3.6-fold under the action of IC 0.5 μg/mL + β-sitosterol 10 μg/mL.

The results of the work are fundamental for understanding the possible interrelationships of biologically active substances in the biosynthesis by soil streptomycetes and for the possibilities of regulating the accumulation of beneficial metabolites in the biotechnological process.