

BIOSYNTHESIS OF POLYENE ANTIBIOTICS BY *STREPTOMYCES NETROPSIS* IMV AC-5025 UNDER THE ACTION OF EXOGENOUS INDOLE-3-CARBINOL

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Soil streptomycetes are producers of a large number of biologically active substances, which allows them to enhance protective, growth-stimulating and adaptogenic properties in relation to plants. Primary metabolism is known to be directly connected with secondary metabolism via precursor synthesis. In addition, the pathways of secondary metabolites synthesis may intersect at certain links, which indirectly affects the production of a particular metabolite. To study the correlation dependence between an antibiotic synthesis and other biologically active substances, the factor analysis was conducted. It was shown that the biosynthetic pathways of polyene antibiotics and phytohormones located in the same clusters and linked through specific links. Among all synthesized by the strain compounds, it was identified those classes of substances that have the greatest impact on the polyene antibiotics synthesis. It is known that this synthesis is mostly stimulated by auxin phytohormone – indole-3-carbinol, but the relationships between the polyene antibiotics synthesis and auxins are almost unstudied and require additional investigations. Therefore, the purpose of the study was to research the action of exogenous indole-3-carbinol on the polyene antibiotics and phytohormones synthesis by *Streptomyces netropsis* IMV Ac-5025. *S. netropsis* IMB Ac-5025 was grown by the deep method on synthetic (starch-ammonia) and organic (soy fermentation) liquid nutrient media. In the nutrient media was added indole-3-carbinol in the following concentrations: 0.1 g/l, 0.5 g/l, 2.5 g/l, 5 g/l, 25 g/l. Synthesis of polyene antibiotics and phytohormones was determined by quantitative spectrodensitometric thin-layer chromatography in the stationary phase of bacterial growth. It was analyzed the content of the following phytohormones in the producer biomass: auxins (indole-3-acetic acid, indole-3-acetic acid hydrazide, indole-3-butyric acid, indole-3-carbinol, indole-3-carboxaldehyde, indole-3-carboxylic acid) and cytokinins (zeatin, zeatin-riboside, isopentenyl-adenosine, 2,6-dimethylallylaminopurine). The results were analyzed in Statistica v.10.0 program. Under the action of exogenous indole-3-carbinol in the selected concentrations, the level of antibiotic production ranged from 481 to 1373 μg of absolutely dry biomass on synthetic, and from 4083 to μg to 7888 μg of absolutely dry biomass on organic media. The optimal indole-3-carbinol concentration for the antibiotic synthesis was 5 mg/l on synthetic and 25 mg/l on organic media, the amount of synthesized antibiotic increased in 2.8 or 1.9 times according to the culture and the amount of both candidin and teraene antibiotic grew. At the concentrations of 5 g/l on synthetic medium and 25 mg/l on organic medium, the auxin content increased in 2.9 or 2.0 times, respectively; cytokinin content also increased in 2.8 and 5.6 times in *S. netropsis* IMB Ac-5025 biomass. Thus, the addition of exogenous indole-3-carbinol at appropriate concentrations in nutrient media of soil streptomycetes stimulates the synthesis of both polyene antibiotics and such phytohormone as auxins and cytokinins.

