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Effect of Millimeter-Range Electromagnetic Radiation on the Biosynthesis of Extracellular Hydrolytic Enzymes in Aspergillus and Penicillium Micromycetes

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Abstract

The influence of the following parameters of millimeter-range electromagnetic radiation on the biosynthesis of extracellular hydrolases and the life cycle of Aspergillus niger 33 and Aspergillus niger 33–19 CNMN FD 02A fungi (producers of amylases) and Penicillium viride CNMN FD 04P fungus (a producer of pectinases) is studied: the wavelength (λ = 4.9, 5.6, and 7.1 mm), the irradiation mode (periodic and continuous), and the duration of exposure (10–60 min). It is established that the efficiency of the irradiation exposure depends on the physical parameters of the radiation and the properties and functional state of the strains. The optimal irradiation conditions allowing the biosynthesis and secretion of extracellular hydrolases to be enhanced by up to 44.4–49.4% as compared with the control groups are established for each particular strain. Moreover, in the case of Aspergillus niger 33–19 CNMN FD 02A micromycetes, the acceleration of the growth cycle by 48 h is observed.

Keywords: electromagnetic radiation, extracellular hydrolases, Aspergillus niger, Penicillium viride

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