

DYNAMICS OF BIOMASS AND EXOPOLYSACCHARIDES PRODUCTION BY *XYLARIA POLYMORPHA* IN SUBMERGED CULTURE

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Xylaria polymorpha is one of the most widespread representatives of the largest genus in *Xylariaceae* family, which is known for the production of a wide range of bioactive compounds by its representatives. Latest studies have shown that due to the abundant production of a large variety of secondary metabolites, *Xylaria* fungi have potent pharmacological properties with antioxidant, antimicrobial, anti-inflammatory, antiviral, and other effects (Wangsawat et al., 2021; Jayasekara et al., 2022). Some of these activities, like antioxidant and antitumor, are connected with polysaccharides. The aim of our study was to investigate biomass accumulation and exopolysaccharide synthesis in submerged culture by two strains of *X. polymorpha* from the Mushroom Culture Collection (IBK) of the M.G. Kholodny Institute of Botany of the NAS of Ukraine.

Mycelia of studied strains were cultivated under submerged conditions in flasks containing 100 ml of glucose-yeast-peptone medium (g/L: glucose – 25, yeast extract – 3, peptone – 3, MgSO₄ – 0.25; KH₂PO₄ – 1; K₂HPO₄). The culture liquid was separated from mycelium by filtration on the 3rd, 5th, 7th, and 9th day of cultivation and evaporated using a vacuum evaporator at 40 ± 0.1 °C in 2-3 times, after which it was precipitated with 96% ethanol in the ratio 1:2 to volume for 24 h at 4 ± 0.1°C. The obtained fraction of exopolysaccharides was dried to constant weight at 60 ± 0.1 °C. The total amount of exopolysaccharides was determined gravimetrically.

The results demonstrated similar dynamics of biomass production for two *X. polymorpha* strains. For strain 2720 biomass accumulation grew from 2.9 to 9.74 g/L on the 5th and 7th days of cultivation, respectively. The maximum was recorded on the 9th day and amounted to 10.69 g/L. For strain 2736 analogical values were 4.72 and 8.7 g/L, respectively, with the slightly higher maximum of biomass production on the 9th day – 11.07 g/L. Almost no difference in the dynamics of exopolysaccharide synthesis was observed between two studied strains, and for both the maximum value 1 g/L was obtained on the 9th day of cultivation. The increase in the amount of exopolysaccharides was observed in the exponential phase of growth from 0.62 g/L on the 5th to 0.97 g/L on the 7th day for *X. polymorpha* 2720 and for *X. polymorpha* 2736 from 0.66 to 0.93 g/L, respectively. Meanwhile, it was noted that the pH value during cultivation dropped by 0.52 for strain 2736 and 0.36 for strain 2720.

Thus, the production of biomass and exopolysaccharides in submerged culture were determined for *X. polymorpha* strains as potential producers of important for biotechnological application compounds.