

## RESEARCH OF THE FUNGUS ASPERGILLUS NIGER AS A PERSPECTIVE PRODUCER OF A CITRIC ACID

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**Introduction.** Citric acid is a white crystalline substance, a natural or synthetic antioxidant (chemical formula -  $C_6H_8O_7$ ). Salts and esters of citric acid are called citrates. When heated above  $175^\circ C$ , it decomposes into carbon dioxide and water. Citric acid is an important metabolic product in living organisms, participates in a cycle of tricarboxylic acids and a glyoxylate cycle. Along with other components of the tricarboxylic acid cycle, citric acid is contained in small amounts in the mitochondria of all cells. Another function of citric acid is the maintenance of acid-base balance in the body and ionic composition. Unlike animals, a number of plants and microorganisms are able to accumulate citric acid in large quantities (5-6% in lemon juice, 3-14% in tobacco leaf, up to 10% in culture fluid of fungus *Aspergillus niger*). Citric acid is used in the food industry, medicine (for canning blood) and photography. In industry, citric acid is obtained from tobacco (after extraction of nicotine), more often by fermenting sugar or molasses with *Aspergillus niger* or other type of fungus.

**Aim.** Investigation of the properties of the main producer of citric acid *Aspergillus niger* for the further possibility of introduction of biotechnological production in Ukraine.

**Materials and methods.** Mycelial fungus *Aspergillus niger* is used as a model producer. The study of the possibility of culturing the fungus was carried out by the method of surface cultivation of the producer on such media: hydrolyzed grinding of native grain of wheat, hydrolyzed grinding of native grain of rye, molasses, glucose.

**Results and discussion.** It was found that the biggest difference between the initial pH of the medium and the final one was for the samples under study (with deliberate acidification), that is, for the producer, the acidic medium is more optimal, then in the process of vital activity, it produces more acids. Comparing all the prototypes with each other, we see that the biggest difference between the initial pH of the medium and the final one is characteristic of molasses, and even some alkalization occurs for the medium with glucose. Also for all variants, the best quality indicators (the size of the mycelium in the flask and its mass) are characteristic in a more acidic version, only for the medium with glucose solution (there is a slight alkalization of the medium due to fungal metabolism and uneven consumption of the same type of sugar - only glucose) not positive in comparison with the control.

**Conclusions.** For all the results, we see that the following conditions are the best for the cultivation of the fungus *Aspergillus niger* as a producer of citric acid: molasses medium, temperature  $30^\circ C$ , pH initial 5.5-6.5 (with additional acidification). It is under these conditions that the producer forms a larger amount of organic acids, including citric acid. These experiments can be used to develop a domestic method for the production of citric acid by a biotechnological method.

## THE STUDY OF THE THERAPY EFFECTIVENESS VACCINES BASED ON *C. ALBICANS* AND *C. TROPICALIS* FUNGI

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**Introduction.** Candidiasis appears in various forms, the most dangerous of them are systemic and visceral candidiasis. Many researchers believe that using drugs that are able to stimulate a protective immune response against candidal infections, i.e. immunobiological drugs, is a promising direction in the fight against candidiasis, and that these drugs are an alternative to antifungal agents.

**Aim.** The aim of the work was to compare the therapeutic properties of the inactivated and subunit vaccines of cells of *C. albicans* and *C. tropicalis* fungi.