

STUDY OF ANTIMICROBIAL PROPERTIES OF CERTAIN SPECIES OF HIGHER SAPROPHYTIC MARINE FUNGI

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In the modern world there is a necessity in bioactive substances, widely used in pharmaceutical, food, agricultural and many other industries.

The perspective direction is their search among the natural sources, in particular among the representatives of marine microorganisms – microfungi, that responds to living conditions of these microorganisms. A world ocean is the habitat of enormous amount of life-form, existing in the conditions of extreme pressure, pH and temperature. Therefore, coexisting with the different forms of life, marine microorganisms are able to product substance with unusual structure and properties which are not met at terrestrial kinds, and potentially can show antimicrobial properties.

In the region of the Black sea the distribution of marine fungi on large taxon of reign of Fungi corresponds to general law of taxonomical structure of fungi in the World ocean, so qualitative and quantitative composition of mycocomplex is the indicator index of the ecological state of the region. For this reason mycologies of the Odessa Branch of the A.O. Kovalevsky Institute of Biology of the Southern Seas National Academy of Science of Ukraine have conducted the screening of bioactive compounds in more than five thousand marine isolates of bacteria and in more than three thousand marine fungi-micromycete. In this direction the higher marine fungi of the Black sea are studied well enough.

From more than 80 selected and studied kinds, for our aim such traditional kinds for the region of the Black sea as *Arenariomyces trifurcata*, *Ceriosporopsis halima*, *Corollospora maritima*, *Halosphaeriopsis mediosetigera*, *Nia vibrissa* have large interest. These types of marine organisms were provided by Odessa Branch of the A.O. Kovalevsky Institute of Biology of the Southern Seas National Academy of Science of Ukraine after collection of water samples, bed silt, cellulose containing substrates, selection and preparation of pure cultures by the method of accumulation in the form of carposomes of ascomycetes and basidiomycetes which can be stored for 3-5 months in sterile sea water.

Kinds of *Arenariomyces trifurcata*, *Ceriosporopsis halima*, *Corollospora maritima*, *Halosphaeriopsis mediosetigera* refers to the Ascomycota (ascomycetes or

cap fungi), class of Sordariomycetes, order of Halosphaeriales, family of Halosphaeriaceae. The fifth organism – *Nia vibrissa* – refers to the Basidiomycota (basidiomycete or basidium fungi), class of Agaricomycetes, order of Agaricales, family of Niaceae. Along with ascomycetes basidiomycete refers to the higher fungi.

The investigation of the Ascomycetes by a lot of scientists has shown that there are great variations in the morphology and development of both fruit bodies and reproductive organs, and a sharp distinction may be made as to whether the sexual organs, associated with ascocarp formation, occur singly or in groups.

At our microscopic study of Halosphaeriaceae family types it was mentioned the presence of fruit bodies (ascocarp) – a perithecium, containing prototunicate asci with sporules. Perithecium appears on the surface of understratum or partly submerged in it. They are small, round or pear-shaped, often with a long proboscis which is several times more than the diameter of perithecium. Covers of asci which are contained in an ascocarp, – peridia– lyse, and ripen perithecium contain ascospores, submerged in mucus. While swelling of mucus ascospore go out from a perithecium through the narrow opening on the top in the form of mucous drops or long mucus cords. Ascospores are two-celled with sprouts, amount and the location of which depend on the type of ascomycete. *Nia vibrissa* is characterized by the presence of spores in club-shaped structures – basidia.

On this stage of work the study of antimicrobial activity was conducted by the method of joint cultivation of the probed marine fungi with test strains of microorganisms in a liquid growth medium and by the method of diffusion in an agar (by the method of «wells»).

The results of the experiment to study the antimicrobial activity by the first method have shown that the number of series of test strains of microorganisms in the control cultures was 2-5 times more than while co-culturing with marine fungi. Antimicrobial activity, studied by the second method was not detected for any species that may be caused by a variety of nutrients components and temperature conditions which are necessary for growth and reproduction of fungi studied and test strains of microorganisms.

We are planning to repeat these experiments for a longer period of cultivation, we continue to develop new methods for determining of antimicrobial activity of higher marine fungi, taking into account the different culture conditions for the studied species of fungi and test strains (temperature, pH), the different nutritional needs, different terms of cultivation.