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METHODS OF CONSERVATION OF MICROALGAE AND CYANOBACTERIA

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Microorganisms are one of the most essential components of the biosphere. The creation and maintenance of a collection of microorganisms plays an extremely important role in the study of microbial diversity, as well as in the conservation of genetically stable producers used in biotechnological production, medicine and environmental biotechnology. Of the 50,000 species of microalgae, it is estimated that about 2.5% are found in culture collections. The development of methods for the conservation of cyanobacteria and microalgae is less intensive than for other groups of microorganisms. Conservation methods can be divided into two groups: periodic cultivation and long-term conservation methods. Periodic cultivation of cyanobacterial and microalgae cultures is used to maintain healthy, physiologically, morphologically and genetically representative specimens. It is attractive to researchers due to its simplicity, the constant availability of crops for work and the ability to control their purity and properties. The needs to maintain the genetic stability of the species, the high costs and the laborious re-sowing of algae have led to the development of methods for their long-term conservation, which have different efficiencies.

The freeze-drying method is a method of storing dry cells, which allows them to be stored for a long time at low temperatures, usually at 4 ° C, without access to oxygen, humidity and light. Lyophilization does not ensure 100% preservation of the viability of microorganism cells and the highest quality of a dry product. It leads to the selection of the most resistant cells in culture, which may not have the desired properties. This method is used successfully to preserve cyanobacteria that reproduce by akinetes (spores), as well as for those species that are able to synthesize exopolysaccharides. Freeze-drying for many algae ensures extremely low levels of crop viability (0-1%) during storage and is not suitable for long-term storage. Therefore, lyophilization is an effective preservation method only for some algae strains. Suspension of cells with protective agents before lyophilization (skim milk, sucrose) increases the number of surviving cultures. Cryopreservation methods are performed by direct immersion of ampoules with microorganisms and cryoprotective solution in liquid nitrogen at −196 ºC Cryoprotectants increase the viability of cells at cryogenic temperatures. The most commonly used cryoprotective compounds are dimethylsulfoxide (DMSO), glycerol and methanol.

Thus, the issue of long-term conservation of microalgae is relevant, current and attractive to researchers and is one of the basic objectives of the national collection of non-pathogenic microorganisms that constantly seeks to improve conservation methods for long-term storage of microalgae and other microbial resources valuable.

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