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BLUE-GREEN AQUATIC GRASS (CYANOPHYTA)

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Abstract. *This article discusses the structure, habitat, reproductive characteristics and importance of blue-green algae (Cyanophyta). Their cell structure, pigment system, physiological properties and ecological adaptability are scientifically covered. The biological role of representatives such as Nostochia and Oscillatoria, their nitrogen fixation properties and importance in human activity are also analyzed.*

Keywords: *blue-green algae, cyanophyta, nostochia, oscillatory, photosynthesis, nitrogen fixation, prokaryote, plankton, hormogony.*

Login . Blue-green algae (Cyanophyta or Cyanobacteria) are one of the oldest prokaryotic representatives of the plant world. They are so named because of their blue-green color. However, some species are also dark blue, olive-blue, or black in color. Representatives of this group are capable of photosynthesis and are the first synthesizers of organic substances in living nature.

Blue-green algae are considered one of the most ancient representatives of the plant world. They got their name because of their blue-green color. However, the color of these algae is often black, dark blue, olive-blue. The cell is usually small, cylindrical, round, barrel-shaped and other shapes. Some of its cells or tufts, called trichomes, are usually covered with a mucous membrane. Such a membrane is sometimes clearly visible, sometimes not clearly visible. The mass of the membrane consists mainly of pectin, which is formed by the mucus of the cell membrane or the waste secreted outside the cell through the thin pores of the protoplasm. In most species, trichomes are one or more, covering a rather dense hemicellulose or cellulose. The cell membrane is quite complex. It is provided with an outer and inner membrane composed of pectin substances. This requires the consideration of the cell wall as three-layered . The outer membrane is fox-like in nature, fused with individual points of the wall and connected to the inner membrane by pores.

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In the protoplasm of blue-green algae, the outer colored chromoplasm and the inner colorless centroplasm (central body) are clearly distinguished. The chromoplasm has a complex submicroscopic structure and its main elements are pigment-bearing folded plastids and a layer of cytoplasm separating them. This lamellar structure is similar to the more complex chromatophore of plants, but differs from them in the individualization of the structure of pigments. In blue-green algae, there is no special membrane that limits the formation of colored products, and the chromoplasm gradually turns into a colorless centroplasm. Chlorophyll "A" plays the main role in the pigmentation of blue-green algae. The green pigment consists of carotenoids, among which there are xanthines. The phycobilin pigment, which is a protein product, is especially characteristic of blue-green algae.

The centroplasm has been found to contain nucleic acids (DNA and RNA) and they are arranged in the form of clusters consisting of granules or rods.

This group of bodies forms the chromidial apparatus of the cell. According to some data, during division, the number of filamentous structures increases by twice as much as chromosomes. The centroplasm can be considered as the physiological equivalent of the nucleus. Its only difference from the true nucleus is that the centroplasm has neither a membrane nor a nucleolus separating it from other parts of the plasma. This structure of the protoplast of blue-green algae is similar to the structure of ancient organisms that did not have cells differentiated into organoids, and is considered a relic.

The cell of blue-green algae does not have a central vacuole, vacuolation begins only in the cells that are growing and merging. The plasma itself has the ability to lose its water content in hot and dry environments and to restore it during precipitation.

As a reserve nutrient in the chromoplasm, polysaccharides, which turn brown under the influence of iodine, and volutin, a substance rich in phosphorus and sugars, which turns pale under the influence of methyl alcohol, accumulate.

Blue-green algae cells are often found in colonies and filaments, but sometimes they are found singly. In a colony, each cell appears to be a physiologically independent organism.

Blue-green algae do not reproduce sexually. Reproduction in most algae occurs vegetatively. In unicellular blue-green algae, this process occurs by simple division, in colonial representatives, the colony breaks up, and in filamentous representatives, the filaments divide into several strands. The part of the colony that performs the function of vegetative reproduction is called hormogony. The growth of filamentous blue-green algae occurs due to cell division. During asexual reproduction, spores are formed from simple cells, covered with a thick shell. They are rich in reserve nutrients, and spores can be considered as cells that undergo a dormant period. In this case, about 1400 species of blue-green algae are distributed in nature.

One of the characteristic representatives of blue-green algae is Oscillatoria. Its vegetative body is in the form of an unbranched thread and does not form spores. The threads are capable of moving along the path of sliding. Another representative of these algae, which lives in a plate or cushion-shaped form, is Nostoc. Its filamentous colony consists of several spherical cells that unite. Various types of blue-green algae are found in various freshwater bodies, lakes and seas as plankton and benthos. They use ready-made organic substances that are widely distributed in areas polluted by organic waste as food. Most blue-green algae, which occur as plankton, cause aquatic blooms. In the Red Sea, too, blue-green algae sometimes spread in large numbers in some areas of seawater, forming red spots, which is why it got its name. Blue- green algae, such as Nostochus and some other representatives of the genus, live in symbiosis with fungi, forming lichens. They are also found in some simple animals. Blue-green algae have been known since the Proterozoic, or perhaps even the Archean era, that is, 1.5 - 2.5 billion years ago. Accordingly, these organisms are considered the oldest plants on Earth.

Each chlamydomonas is a cell consisting of a separate green plate. Their movement occurs with the help of two cytoplasmic flagella protruding from the tip of

the chlamydomonas. The cell is oval in shape, with a beak at the end with two white flagella protruding from it.

Its plastid (chromotophore) is saucer-shaped, perenoid. Protoplasm, nucleus, red eye and two vacuoles are visible. Asexual reproduction of Chlamydomonas occurs by simple division, and numerous zoospores are formed inside Chlamydomonas. These zoospores are collected in a slimy mass in the form of a colony. After that, the zoospores leave the colony and become motile.

1- unfaithful ; 2- tolipotrix ; 3- anabena

Picture 1. Blue - green water of grass representatives

With a change in the habitat, a decrease in water, it loses its gills and becomes covered with a thick shell, that is, it becomes palmelloid. The sexual process occurs through iso-, hetero- and oogamy. Copulating gametes can be observed in the prepared preparation.

Blue-green algae, which are simple in appearance, are quite adaptable to adverse environmental conditions. Therefore for also them fresh and salty in water , in soil and his/her on the surface , on rocks , in the snow and boiling in the springs encounter possible .

Central Asia in the deserts blue-green algae soil harvest to be in the processes participates . They atmospheric free nitrogen mastery to the feature has and the soil to nitrogen enriches . Japan and In China of the poor some types feed as is used .

Ecological importance . Blue-green water herbs fresh and salty water in basins , soils , rocks , snow in layers , even boiling in the springs also live They will take . nitrogen fixation to the feature has soil fertility increases . Central Asia in the deserts they soil harvest in being participation will reach .

Some species (e.g. , Nostoc) feed as Japan and In China consumption is done . However plankton in the form of increasingly When the water " blooms " reason will be .

Conclusion . Blue-green water grass — Earth on the face the most ancient photosynthetic organisms is a prokaryote in the structure relic organisms They are not only of the biosphere important part , maybe nitrogen rotation and soil of fertility in the increase also main role plays . This because of them ecological and biotechnological in terms of study big scientific and practical importance profession will reach .

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