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General Concepts about the Evolution of Plants and their Structure

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Abstract: This article contains information about eukaryotic and prokaryotic cells, unicellular, colonial and multicellular plants, plant nutrition.

Key words: Prokaryotes, eukaryotes, hematrophic organisms,autotrophic and heterotrophic types of nutrition.

Since the 50s of the last century, a number of scientists (De. Freeze, G. Curtis, E. Dotson, A. Takhtadjyan, etc.) suggest dividing the organic world into four to nine worlds. The famous scientist academician Artur Takhtadjian created the modern evolution system in his work published in 1973. This system is as follows: 1 Prokaryotes are a large world of organisms without a nucleus. 2. Organisms with a real nucleus are eukaryotes.

The large world of prokaryotes consists of Procoriota and is divided into 3 sub-worlds: archaebacteria, true and oxyphytobacteria. The world of eukaryotes is divided into three sub-worlds - animals, fungi and plants.

Prokaryotes include bacteria and blue-green algae. The cell of prokaryotes is from 2-3 μm to 10 μm. There is no clearly visible nucleus in their cytoplasm. In the cell, there is only one or several DNA aggregates, which is called nucleoplasm. In the cells of prokaryotic plants there are mesosomes consisting of a cytological membrane. The main difference from eukaryotic cells is that their genetic material is located in the cytoplasm.

Eukaryotic cells are larger than prokaryotic cells. Their size ranges from 10 μm to 100 μm and even larger. Cells of these organisms are divided by mitosis and meiosis. The eukaryotic cell has an improved nucleus, which contains chromosomes. Chromosome consists of DNA and histone protein. Cell cytoplasm of eukaryotes contains cell organelles - mitochondria and plastids, Golgi apparatus. Depending on their nutrition, the plant world is divided into heterotrophs and autotrophs. The body of initially formed heterotrophic nutrition is complex. A simple cell is fed by ready-made organic matter. This kind of nutrition is called saprophytic (from Greek capro-humus, trophe-nutrition) nutrition. All animals, fungi, bacteria and some algae are saprophytes. At present, many scientists recommend separating fungi from the world of plants and including them in a separate world, because they do not have mobile cells during their life. But taking into account some signs of fungi: non-stop cell growth, reproduction, similarity to bottom plants, they are studied by adding them to plants. Nutrition of higher plants with the participation of fungi is called mycotrophic nutrition. Fungi surround the roots of tall plants and provide them with water and mineral salts. Parasites are also found among heterotrophic plants and fungi. They live at the expense of plants and animals. For example: from flowering plants - zarpechak, devpechak, shumgia; Among the fungi, black moth and rust fungi are free-parasitic feeders.

Mixed mixotrophic nutrition is also found among plants. Such organisms feed on ready-made organic substances in addition to organic substances formed as a result of photosynthesis.

The emergence of life on earth depends on autotrophic organisms. The cells of early autotrophs were more complex than those of today's autotrophs. Some types of autotrophic organisms live in deep darkness, underground. Such organisms are called hematrophic organisms. Hematroph organisms

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take into account the energy needed for nutrition. This is called chemosynthesis. Chemosynthesis was first discovered in science by the Russian scientist C.N. Vinogradsky. Chemotrophic plants include iron, sulfur bacteria and nitrogen-fixing bacteria.

As a result of the long-term evolutionary development, for the first time among the prokaryotic groups, single-cell bottom plants were found in the world's water bodies. But their remains were not preserved. Single-celled phototrophic bottom plants developed and thrived in the middle of sea basins rich in carbon, hydrogen and oxygen molecules. Due to the abundance of nutrients at the bottom of the water, single-celled algae grew very quickly. Cells divide and form colonies without separating from each other. The cell of unicellular plants is surrounded by a skin made of cellulose. There are very small holes in the skin, through which water, carbon dioxide gas and other mineral substances pass into the cell. During the development of the plant world, the differentiation of organs, that is, the distribution of forms and functions, created colonies. Colonies are organisms between unicellular and multicellular forms. If the cells do not separate from each other after division, a colony is formed. Pandarina and Eudorina are examples of colonial algae. The colony of Pandarina consists of sixteen cells that are closely attached to each other, and that of Eudorina is composed of thirty-two cells that are more loosely attached. Cells in the colony connect to each other with the help of thin plasma-like threads (plasmodeomas). Colony consists of vegetative cells performing the functions of nutrition, movement and reproduction. Multicellular algae developed due to differentiation in the phylogenetic development of plants. This process is estimated at 650 mln. It happened a year ago on the slopes of the world's water basins. The cells of the primitive multicellular autotrophic algae are surrounded by a thick skin and are attached to the substrate, which made it possible to preserve various environmental factors (wind, water waves, etc.). Gooksonia fossils of multicellular benthic plants with a simple structure were found. Modern multicellular algae, if we do not take into account reproductive organs, consist of two or three cells. Only red and brown algae that grow in seawater with a complex structure have up to ten cells. Differentiation of plant cells causes them to grow continuously. Unlike animals, plants grow and form new cells throughout their life.

Summary: Multicellular algae and fungi developed as a result of cell division during long evolution.

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