THE THEORETICAL AND PRACTICAL ASPECTS OF THE TREATMENT OF SEWAGE BY THE MEANS OF ALGAE

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Abstract: This article examines the theoretical and practical aspects of purification of wastewaters by using aquatic plants. The results of research on wastewater purify in Bukhara using aquatic plants were analyzed, and suggestions and recommendations for the use of these algae were developed.

Keywords: environment, wastewater, pool, microorganisms, algae, bacteria, ryaska, textile, azole, biomass, phytoplankton

Introduction:

One of the most global environmental problems today in the world is the prevention of pollution of water and ponds with various wastes. As a result of the expansion of production, the level of pollution of fresh water, environmental problems associated with it also affect the health of the population. In such conditions, all kinds of waste water directly from residential areas, industrial enterprises, irrigation systems and communal and agricultural enterprises to natural and artificial reservoirs are polluted and turned into wastewater as a result of untreated or incomplete purification.

Discussion

Today, in the world, such waters contain a large number of harmful substances for the health of the population, which, in addition to making it difficult to use them for human consumption, cause a violation of the ecological balance. One of the current challenges is to treat such waters using biological methods and to create opportunities for the reuse of treated waters. One of the environmental problems in factories and factories is the reduction of clean water consumption, the economic efficiency of the extracted wastewater and at the same time the use of methods that are cheaper than the recognized price in the interests of human beings. Microscopic algae living in autotrophic conditions develop in biological wastewater purify pools, enriching them with oxygen dissolved in water during photosynthesis and creating aerobic conditions for microorganisms. It was noted that it is possible to separate and increase the amount of algae growing in water basins, and in various areas of animal husbandry, fisheries, poultry, as well as to treat various contaminated waters from organo-minerals and disease-causing bacteria.

It should be noted that the leaf length of the Small ryaska is 2 - 4.5 mm, width 2 - 3 mm. Because small ryaska plants are photoautotrophic, they thrive mainly in mineral environments. For the rapid development of small ryaska temperature should be around 28-320S and light 20-60 thousand lux. The small ryaska plant has been found to thrive even at low temperatures and in shady places. The small ryaska plant has been studied for its active development in water bodies that store organic matter. This plant reproduces vegetatively, and every two days a new root emerges from the

leaf stem, forming a new ryaska. In order to increase the number of small ryaska plants, research work was carried out in the laboratory, semi-production and production conditions [1].

According to observations, when the pistachio plant was propagated in laboratory and field conditions, some of its adult representatives were 20-40 centimeters in height. Its root system has poppy-like, long, ciliated roots. The root is light, brightly colored and can grow from 0.5 to 0.6 meters and longer. The body is short, the leaves have a pony-like appearance. The leaves are 15-22 cm long, the leaves near the root are thick, the upper part is velvety green, and the lower part is silvery-green with 9-12 convex veins. Because the structure of the leaf is porous, the leaf cell is filled with air. There are also air bubbles between the leaf and the root, and therefore the pistachio is a plant that grows on the surface of the water [2].

It should be noted that after poultry, silk, textile enterprises converted the organic matter of wastewater into mineral matter by microorganisms using active sludge, higher aquatic plants were purified using pistachio, eucalyptus, azole and ryaska plants. It has been studied in laboratory and semi-manufacturing conditions and recommended for production. It has been found that wastewater treated with the help of high-water plants can be used for technical purposes in irrigation of agricultural crops, development of fisheries, enterprises. It has also been studied that the biomass of plants that multiply in wastewater and form in large quantities can be used in livestock, poultry, fisheries and to increase soil fertility (as bio-fertilizer) [3].

The results of the study show that in the conditions of Khorezm region in the purify of wastewater in biological pools were used plants such as pistachio, azole and eucalyptus, imported from tropical and subtropical countries with high biofiltering properties. The study also found that higher aquatic plants purify wastewater from biogenic salts, ie: - ammonia, nitrite, nitrate, sulfates, chlorides, as a result of photosynthesis, the amount of oxygen in the water increases several times. In addition, the purification of pathogenic intestinal and other organ-causing bacteria in wastewater, the absorption and purification of suspended solids in water, the reduction of water-insoluble substances have been studied [4].

In this case, the biomass of pistachio, azole, eucalyptus plants, which are the main feed units in the main areas of animal husbandry - cattle, sheep, pigs, furs, poultry, fisheries, rabbits - was used. It was also studied the possibility of irrigating agricultural crops (cotton, wheat, rice) and high yields from treated wastewater, as well as saving water used in agriculture [5].

According to the results, phytoplankton grows and develops due to organisms, minerals in water and carbon dioxide, absorbs various mineral elements in wastewater during photosynthesis and reduces their content in water. After that, phytoplankton enriched the water with oxygen, creating aerobic conditions for microorganisms, and micro organism, in turn, in connection with the decomposition of organic substances into mineral substances, the purification of wastewater with a large number of organic substances was determined [6].

Of course, it is very difficult to study the number and type of plants growing in the water, as well as the physical and chemical composition of wastewater. Therefore, in subsequent years, special climatized plants are used in the biological purification of wastewater. Consequently, the biofiltering levels of acclimatized ryaska, pistachio, azole, and eucalyptus plants were found to be very high [7].

Results

Our research was conducted in 2018-2021 in the field and in laboratory conditions. Samples were taken from the flowing water of sewage Poultry Enterprise of the Oil Refining Plant of Bukhara region and their physico - chemical composition was analyzed in the analytical laboratory of the Department of environmental pollution manitoring under the Department of Ecology and Environmental Protection of Bukhara region and the research laboratory of Biotechnology and ichthyology under the Department of biology of Bukhara State University.

Thus, in the study, pistachio *(Pistiya stratiotes L.*) and small ryaska (*Lemna minor L.*) plants from higher aquatic plants were used to treat wastewater of industrial and agricultural enterprises on the basis of biotechnological methods. As a result, their growth, development, reproduction, and water purification levels from organo-minerals were determined in wastewater. The plant Pistiya (Pistiya stratiotes L.) was actively developed in the effluents of oil refineries, poultry farms and Bukhara city waterworks, producing 100-120 to 800-900 grams of biomass per $1m^2$ of water surface. It has also been found to be used in the purify of wastewater by higher aquatic plants.

Conclusion

During the research, it was found that water absorbs minerals from plant water, purifies water from various contaminants and produces more plant biomass. Plant biomass was collected and fed to herbivorous fish. Thus, in order to use the small ryaska (*Lemna minor*) plant in large-scale fisheries, special biological ponds have been established at fish farms, ryaska plants have been propagated and used as fodder for fish. In summary, it was recommended to propagate small ryaska plants on fishery farms and use them as feed for white grass carp.

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