THE CULTIVATION OF ALGAE DUCKWEED (LEMNA MINOR L.) AND WATER CABBAGE (PISTIYA STRATIOTES L.) AND THEIR USAGE IN THE TREATMENT OF WASTE WATERS

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Abstract: This article analyzes the problem of reproduction of duckweed (lemna minor l.) and pistachio (pistiya stratiotes l.) aquatic plants, based on the results of their use in water purification. The article also develops recommendations for the reproduction of water cabbage aquatic plants and their effective use in several areas based on the results of research.

Keywords: Nature, carbohydrates, farming, minerals, laboratory, pollution, biology, wastewater, duckweed, herbivorous, ponds, biomass

Introduction

It should be noted that the duckweed plant is a plant that lives on the surface of the water, which is widespread in Uzbekistan. The duckweed plant is very rich in nutrients due to its nature. The body of this plant contains 21-30% of proteins, 20-35% of carbohydrates and 4-20% of fats. In addition, the duckweed plant stores large amounts of various vitamins and carotene at the expense of 85-103 mg / kg dry matter. Duckweed plant was found to contain micro and macro in addition to the basic biopolymers listed above. Green duckweeds are of great benefit in poultry farming, especially in fisheries. It is noteworthy that no complex devices are required to grow duckweed plants. They produce large amounts of biomass in normal water bodies, in places where there is enough nutrients, for 8-9 months in the open air. In addition, duckweed is common in water bodies rich in minerals and organic matter [1].

Discussion

The favorable climatic conditions in Uzbekistan for the growth and development of these plants have led to the spread of duckweed. They can be found in large numbers in ponds, pools, lakes and river banks. It should be noted that high water plants are divided into 3 groups.

Hence, the following floating on the surface of the water have been studied: water cabbage (Pistia stratiotes L.) duckweed (Lemna minor L.), azolla (Azolla carolipiapa Willd.), eichhornia (Eichhorpia crassipes L.) and others. Underwater inhabitants: cuv net, Ceratophyllum demersum L., hydrilla (Hydrilla verticillata L.), elodeya (Elodia canadensis Michx.) and others. Semi-submersible plants: reeds (Phragmites australis L.), reeds (Typha angustifolia L.), hornbeam (Ceratophylum demerzum L.), seeds (Myriophyllum spicatum L.), rdest (Potamageton perfoliatus L.) and others were studied [2].

Our research was conducted in 2018-2021 in the field and in laboratory conditions. Samples were taken from the flowing water of poultry, seweage Enterprise, Oil Refining Plant in 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.

The purpose of the study was to grow and propagate pistachios (Pistiya stratiotes L.) and duckweed (Lemna minor L.) from high aquatic plants in the wastewater of industrial, agricultural and municipal enterprises, and to purify water from organo-minerals. In addition, pistachio (Pistiya stratiotes L.) and duckweed (Lemna minor L.) plants were used as the object of research in the treatment of wastewater from the poultry farm in Bukhara region and the Bukhara city waterworks and oil refinery.

During the research, the physicochemical composition of industrial, agricultural and municipal wastewater was determined, the growth, development and productivity of water cabbage (Pistiya stratiotes L.) and duckweed (Lemna minor L.) plants in the laboratory of industrial wastewater were studied. The growth, development and productivity characteristics of water cabbage (Pistia stratiotes L.) and duckweed (Lemna minor L.) plants in biological pools were also determined. In addition, the degree of purification of wastewater from organo-mineral substances using higher aquatic plants was compared.

It is noteworthy that during the research, pistachio (Pistiya stratiotes L.) and duckweed (Lemna minor L.) were grown from high aquatic plants in the effluents of industrial enterprises in Bukhara region, wastewater treatment, use of treated water in the national economy and biologically active the use of nutrient-rich plant species as feed in fisheries has been scientifically substantiated.

The duckweed (Lemna minor L.) plant was planted in various wastewater and actively developed, as well as produced a large amount of biomass, as well as the degree of purification of wastewater from organo-minerals. Also, the growth and development of the water cabbage (Pistia stratiotes L.) plant in wastewater and the degree of wastewater purification have been scientifically substantiated.

Also, based on the results of the study, it was noted that the duckweed (Lemna minor L.) plant propagated in wastewater was used as fodder in fisheries, and the treated wastewater can be used for irrigation of agricultural crops. Pistia is a genus of aquatic plant in the arum family, Araceae. It is the sole genus in the tribe Pistieae which reflects its systematic isolation within the family. The single species it comprises, Pistia stratiotes, is often called water cabbage, water lettuce, Nile cabbage, or shellflower. Its native distribution is uncertain, but probably pantropical; it was first discovered from the Nile near Lake Victoria in Africa. It is now present, either naturally or through human introduction, in nearly all tropical and subtropical fresh waterways and considered an invasive species as well as a mosquito breeding habitat. The genus name is derived from the Greek word πιστός (pistos), meaning "water", and refers to the aquatic nature of the plants.

Thus, recommendations have been developed for the reuse of wastewater treated from high aquatic plants using pistachios and duckweed as secondary technical water in industrial enterprises and for the irrigation of trees around enterprises. As a result, it was recommended to use high water plants used in wastewater treatment as a raw material in the production of biogas from the biomass of pistachios, as well as in the preparation of biohumus.

Results

One of the more such results was that the increase in the number and mass of eggs was achieved when the protein was fed from the biomass of the duckweed plant, which was used in the purification of water, to the poultry that was fed in the direction of the egg.

It is noteworthy that today scientists of Bukhara State University are working hard on the plant of duckweed (*Lemna minor*). The regional wastewater purification plant is designed for physical and chemical treatment of water. In addition, several biological pools have also been prepared. Lemna minor was planted in the biological ponds of Bukhara and its growth, development and reproduction were observed for 5-6 days.

Conclusion

In summary, during the observations, it was found that the plant assimilates the minerals in the water, purifying the water from various contaminants and producing a greater amount of plant biomass. Plant biomass was also collected and fed to herbivorous fish. According to the study, in order to use the duckweed (*Lemna minor*) plant in large-scale fisheries, special biological ponds have been established at fish farms, and the duckweed plant has been propagated and used as fodder for fish. Thus, according to the results of the study, it was recommended to propagate duckweed plant on fish farms and use it as feed for white grass carp.

Reference

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