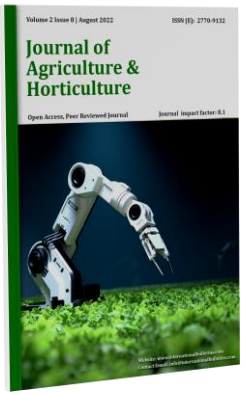

PROSPECTS OF THE USE OF AQUATIC PLANTS IN THE BIOLOGICAL TREATMENT OF WASTEWATER.

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Abstract. In this article, the results of the scientific research carried out for the purpose of breeding eichhornia (Eichhornia crassipes) and azolla (Azolla caroliniana) plants in laboratory conditions in Urganch city of Khorezm region and studying their water purification levels are described.
Keywords. Eichhornia, Azolla, wastewater, biological treatment methods, biomass, algae, microorganisms.

Enter. Wastewater is a secondary product of industrial production and economic activity, water with additional compounds that deteriorate the primary composition and physical properties of water. [1]

Contaminated industrial and agricultural wastewater is being dumped into some open water bodies. If the contaminated water is not cleaned in time, it can spread various diseases, become a source of germs and harmful substances. The problem of rational, comprehensive use and protection of water is becoming one of the most urgent and important scientific and technical tasks of today[2]. Biological treatment methods are based on cleaning by decomposing organic substances into mineral substances and neutralizing them with the help of oxygen produced by algae and microorganisms and other artificial structures [1].

Material and methods. Experiments were carried out in laboratory conditions on waste water released from household enterprises of Urganch city, Khorezm region (Uzbekistan) for the purpose of biological treatment of wastewater and reuse of purified water and plant biomass in the national economy.

Eichhornia (Eichhornia crassipes) and Azolla (Azolla caroliniana) plants were selected for use in biological treatment of wastewater.

Eichhornia genus (Hyacinth) is a floating plant that grows semi-submerged in the tropical regions of South America.

The body of Eichhornia plants grows 10-20 centimeters in height, sometimes it can reach 1 meter in favorable conditions. It is a semi-submerged, upright floating perennial aquatic plant. Thick glossy leaves can be 12-15 centimeters wide and 30-50 cm long. The length of the roots can be 50-60 cm and more. The most common type is thick-stemmed eichhornia (Eichhornia crassipes Solms) [3]. Experiments were conducted in this way.

Azolla grows well in natural conditions in the waters of North America, Western and Central Europe, South America and the Galapagos Islands. This plant is mainly grown as a biofilter and feed. Azolla is a small, beautiful, spore-reproducing, floating plant with a size of up to 2.5 cm and a leaf plate size of up to 1 mm [4]. Azolla caroliniana WLLD type was used in the experiments, there are about ten species of the Azolla family. Both plants are acclimatized to the conditions of Uzbekistan.

In determining the productivity of plants, V.M. Katanskaya's recommendations were used [5]. The growth and development of Eichhornia and Azolla in wastewater, and the resulting biomass were determined by measuring on a scale after every 3, 7, 14, 28, 30 days of observation. The physical and chemical composition of waste water, the composition before planting and after planting was determined based on the general hydrochemical methods of Yu. Yu. Lure and N. S. Strogonov[6][7].

Research results. The experiments were continued for 1 month (30 days) and the growth, development, biomass formation and water purification level of eichhornia and azolla in wastewater were monitored. The following changes were observed in the physico-chemical composition of wastewater. (Table 1-2).

Changes in the physico-chemical composition of Urganch municipal wastewater before and after planting Eichhornia crassipes

Table 1

T/r	Indicators	Until the experiment: Wastewater composition	After the experiment: Wastewater composition
1.	pH	6,0±0,07	7,0±0,08
2.	Smell, score	5,0±0,03	yo‘q
3.	Color	red	Flow
4.	Temperature, 0C	25,0±0,25	26,0±0,21
5.	Suspended substances, mg/l	92,0±3,2	No
6.	Oxygen dissolved in water, mg/l	No	5,7±0,16
7.	KBS5, mgO2/l	121,4±3,9	24,4±1,5
8.	Oxidation, mgO2/l	104,6±3,3	26,0±0,68
9.	Ammonia, mg/l	6,0±0,14	No
10.	Nitrites, mg/l	0,08±0,001	No
11.	Nitrates, mg/l	5,2±0,12	No
12.	Chlorides, mg/l	58,5±1,9	42,3±1,6
13.	Sulfates, mg/l	47,5±1,8	25,6±1,5
14	Phosphates mg/l	8,3±0,06	2,4±0,03
15.	Plant biomass, g/m2	150±5,6	2704±7,3

Changes in the physico-chemical composition of urban household wastewater in Urganch before and after planting Azolla (Azolla caroliniana)

Table 2.

T/r	Indicators	Until the experiment: Wastewater composition	After the experiment: Wastewater composition

1.	pH	6,0±0,07	7,0±0,08
2.	Smell, score	5,0±0,03	No
3.	Color	red	Flow
4.	Temperature, 0C	25,0±0,25	26,0±0,21
5.	Suspended substances, mg/l	92,0 ±3,2	1,5 ±0,05
6.	Oxygen dissolved in water, mg/l	No	5,7 ±0,16
7.	KBS5, mgO2/l	121,4 ±3,2	14,4 ±1,2
8.	Oxidation, mgO2/l	104.6 ±3,3	26,8 ±1,3
9.	Ammonia, mg/l	6,0 ±0,14	No
10.	Nitrites, mg/l	0,08±0,006	No
11.	Nitrates, mg/l	5,2±0,12	No
12.	Chlorides, mg/l	58,5±2,1	21,5±1,2
13.	Sulfates, mg/l	47,5±1,8	21,5±1,4
14	Phosphates, mg/l	8,0±0,08	3,8±0,03
15.	Plant biomass, g/m2	150±5,6	634±2,13

Conclusion: When the results were analyzed, in the experiments carried out for 1 month (30 days), the growth, development, biomass production and water purification levels of Eichhornia and Azolla in urban household wastewater were monitored. It was found that the amount of biomass accumulated up to 150 g and the degree of purification of wastewater from organic-mineral substances reached 92%, and the level of purification of wastewater from organic-mineral substances reached 88%. It can be seen that the biological treatment of wastewater with the help of tall plants gives effective results. Treated wastewater can be used to irrigate agricultural crops, and the resulting biomass can be used as additional feed in animal husbandry.

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