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Treatment of polluted municipal wastewater in Tashkent

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INTRODUCTION

Annotation: This article presents the results of a comparative study of the method of biological treatment using aquatic plants and algae in order to improve the technology of treatment of domestic and municipal wastewater treatment plants formed in urban areas. According to test results, 5 species of aquatic plants and 2 strains of algae tested, pistachio and eucalyptus species and strains of chlorella vulgarius UA-1-6 were found to be resistant to domestic wastewater. This water plant laripistiya and eichorniya species grow well in different concentrations of wastewater (25%, 50%, 100%) in the 100%. At both water treatment stations, have a high yield and treatment levels and It was observed that it reached 90% at the "Binokor" water treatment station and at the water treatment station "Salar" - 82-86%. This is due to the fact that the amount of harmful substances in the wastewater of the "Salar" water treatment station is 5 times higher than the amount of pollutants in the water treatment station "Binokor".

METHODS

The research was conducted at Salar in Tashkent and Binokor aeration station in Orta Chirchik district of Tashkent region. Sewage samples were taken from the entrance to each aeration station treatment plant. To select the type of wastewater resistant as a biological treatment plant, we selected the following species from the collection of aquatic plants (pistachio, eucalyptus, azole, ryaska, wolfia) from the algae chlorella vulgarius UA-1-6 and stsepedesmus obligus UA-2-7 (plants UzFA Botany Institute was taken from the collection). We grew these plants for 5 days in 100% wastewater brought from aeration stations. During this time, we determined the daily growth, morphological condition, and yield of the plants.

RESULTS AND DISCUSSIONS

The experimental results of Binokor aeration station effluent show that the condition, growth and productivity of the 5 species of aquatic plants tested varied when grown in effluent, including pistachio and eucalyptus. It is observed that the yield of pistachios reaches 380 g (Wet biomass) per 1 m2. The yield of eucalyptus plants reached 330 g, and their leaves turned yellow at the end of the experiment.

Picture 1. Laboratory-grown eucalyptus
(a) and pistachio (b) general view

RESULTS AND DISCUSSIONS

Physicochemical composition of pistachio aquatic plants before and after growing in different concentrations (25%, 50%, 100%) of wastewater **(In laboratory conditions for 7 days)**

chemical indicators	experiences	After experiences 25%	Before experience	After experiences 50%	Before experience	After experiences 100%	Сув ўти хло-релла вулга-риус УА-1-6 ўстирилгандан сўнг
smell	1,25	0,3	2,5	0,5	5,0	2	1
color	1	0,57	2	0,95	4,5	2	1
pH	3,32	2,25	4,5	3,1	9,0	6,6	7,0
KBC_5, mgO_2/l (BPK_5)	64,0	14,5	128,0	28,3	256,0	56,1	23,0
Phosphates, mg/l	16,0	4,6	32,0	6,5	63,1	12,3	6,5
copper, mg/l	2,10	1,06	4,20	2,0	8,6	2,15	1,4
Ammonia, mg/l	3,14	1,95	6,41	4,0	12,8	7,1	3,5
Iron, mg/l	1,37	1,07	2,75	1,80	5,5	2,0	1,0
Chlorides, mg/l	12,17	10,15	24,35	18,15	48,7	34,2	24,0
Chrome, mg/l	0,45	0,02	0,92	0,03	1,8	0,9	0,4
Sulfates, mg/l	32,0	10,75	64,2	24,2	128,0	38,0	24,0
Nitrates, mg/l.	1,63	0,21	2,25	0,44	16,5	3,6	0,5
Nitrites, mg/l	0,81	0,08	1,13	0,16	3,9	1,6	0,00

RESULTS AND DISCUSSIONS

General view of laboratory-grown azole (a), ryaska (b), tungsten (v).

CONCLUSION

1. In order to study the technology of biological treatment of wastewater generated in the settlements of Tashkent, out of 5 species of aquatic plants tested, 2 pistachio and eucalyptus species, 2 strains of algae - chlorella vulgarius UA-1-6 strain was found to be water resistant.
2. The results of growing pistachios and eucalyptus plants in different concentrations in the wastewater of Binokor aeration station showed that the plants grew well in the 100% wastewater variant, had high yields and significantly assimilated pollutants in the wastewater (nitrogen-72%, phosphorus 70%, sulfate-60%, iron 50%, chromium 50%, copper 70%) and purification levels were 90-92%. The pistachio plant was characterized by better growth in effluents, higher yields and higher absorption of harmful substances than eucalyptus. This may be due to the fact that the root of the pistachio is well developed and vigorous, and the thickness and width of the fit is resistant to sewage.

CONCLUSION

3. Based on the results of experiments at the Binokor aeration station, we tested the pistachio plant at different concentrations in the sewage system at Salar station because the pistachio plant is resistant to domestic wastewater. relatively good growth, productivity, purification levels were also found to be high. However, the level of pistachio plant treatment was observed to be lower than the aeration sewage treatment rate in Binokor. This is due to the fact that the amount of pollutants in the wastewater at Salar aeration station is higher than in the wastewater at Binokor aeration. For example, the amount of nitrogen in the wastewater of the Salar aeration station is - 20.4 mg / l, in the Binokor aeration station - 4.5 mg / l, phosphorus - 63.0 mg / l - 13.1 mg / l, sulfate - 145 mg / l-39 , 0 mg / l, respectively. Therefore, it can be shown that the level of wastewater treatment is 82-86%. In order to further increase the efficiency of wastewater treatment at the Salar aeration station after the aquatic plant was removed from the pistachio, it was proved that the treatment of wastewater in the 2nd biological pool reached 90-92% (KBBT5-56-23.0 O2 / l, nitrate 3,). 6-0.5 mg / l, nitrate 1.6-0.00 mg / l, phosphorus12.3-6.3 mg / l, sulfate 58.0-24.0 mg / l).

4. So, the technology of biological treatment of wastewater at Binokor aeration station in Tashkent is one-stage, it is enough to use pistachio water plant. We consider it expedient to grow chlorella.

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