



SEASONAL CHANGE OF ALGAE IN THE TREATMENT FACILITIES OF PONDS IN BUKHARA

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Abstract

The problem of preserving the environment is currently focusing the attention of researchers. Rapid population growth, an increase in the area of irrigated agriculture and the development of industries and others led to an unprecedented use of water resources. Along with this, methods of biochemical treatment of wastewater from organic and other pollutants using activated sludge or biofilm have become universally recognized. Their use allows you to reduce the content of organic and other substances in wastewater.

Introduction

However, industrial wastewater after its treatment, even using the most modern technology, can all be sources of anthropogenic impact on the natural composition of water bodies. This necessitates the development and implementation of various methods of tertiary treatment of wastewater. Biological ponds were used as biological methods for tertiary treatment of domestic and industrial wastewater.

The processes of biological self-purification occurring in them are carried out as a result of the vital activity of all groups of organisms that are part of the ecosystem of the water body.

Due to the vital activity of aquatic organisms, the chemical composition of water is formed, and thereby its quality is determined.

Biological ponds have become widespread, both in our country and abroad. They are used to treat wastewater from settlements, they are called biological, stabilizing, oxidizing or buffering.

The microflora of water bodies performs the function of a primary oxidizer or restorer of pollutants entering the water body.



On the basis of the collected 520 algological samples of biological ponds in Bukhara (2010-2018) and as a result of treatment, 357 taxa of algae belonging to 5 systematic groups were identified, such turned out to be; blue-green – 105, diatomaceae – 100, dinophytes – 10, euglenics – 30, green – 112.

The greatest occurrence is observed by the predominance of green algae, followed by blue-green and diatom algae. A small number are euglenic and dinophyte. As you can see, the species diversity of bioponds is large.

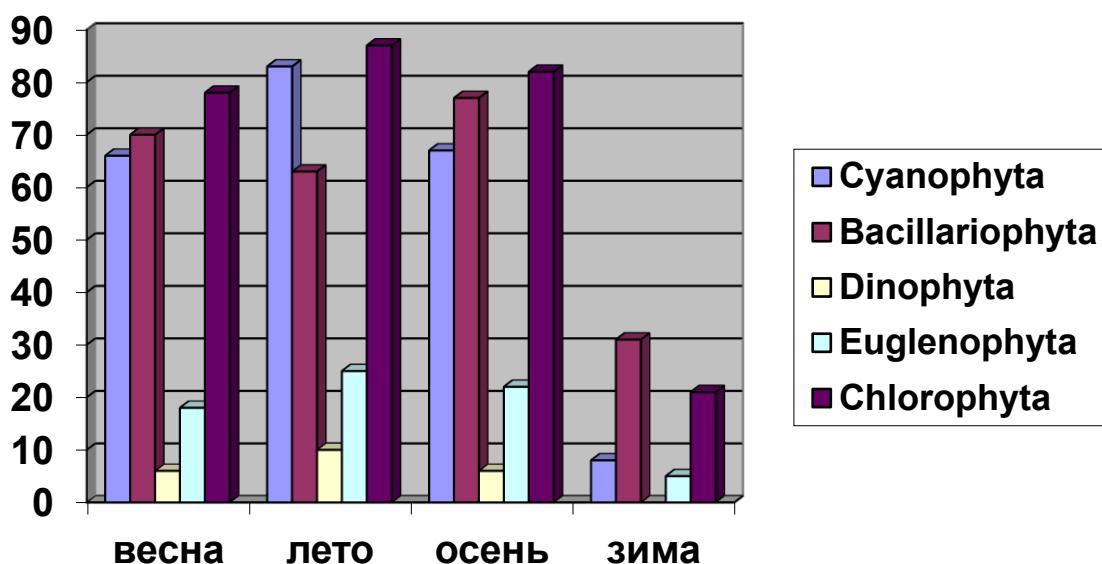
Phytoplankton of bioponds is one of the most important producers of organic matter, on the basis of which the subsequent links of organic life develop. The role of phytoplankton in general, the circulation of consumer substances, abundance, distribution in the water body, seasonal periodicity of development and their production capabilities.

In spring (March-May) the water temperature was from 8 to 20° C, the air temperature was 15-29° C. In the early spring period, the water temperature was still low 8-14° C. At this time, the composition of algae was insignificant, mainly cold-water diatoms and some accompanying green algae were found. Such as *Cyclotella operculata*, *Diatoma vulgare*, *D. vulgare* var.*productum*, *D. elongatum*, *Synedra ulna*, *S. pulchella*, *Stephanodiscus hantzschii*, *S. aстраea* var. *minutialis*, *Rhoicopsphenia curvata* and others from diatoms, *Chlamydomonas ehrenbergii*, *Ch. reinhardii*, *Chlorella vulgaris*, *Scenedesmus quadricauda*, *Stigeoclonium tenue* and others from green algae.

These higher algae were found at a water temperature of 8-14°C, and are dominant in early spring. Along with them, blue-green ones were slightly found, such as *Microcystis pulvorea*, *Oscillatoria lemmermanii*, *O. brevis* and others. Low temperatures in early spring probably affect the overall poverty of phytoplankton composition and quantity.

In April and May, with an increase in water temperature of 18-25°C, at an air temperature of 24-29°C and an increase in sunlight and an increase in transparency, heat-loving representatives of blue-green, green and some euglenic and dinophyte and diatom algae begin to develop.

Table 1 Chemistry of algae changes by seasons of bioponds of treatment facilities in Bukhara.



In May, the diatom complex of phytoplankton decreases, green, blue-green, euglenic and some dinophyte algae increase quantitatively.

В это время фитопланктон обогащается *Chlamydomonas globosa*, *Palmellocystis plantonica*, *Oocystis marssonii*, *Coelastrum microporum*, *Scenedesmus acuminatus*, *Ankistrodesmus acicularis*, *Gomphosphaeria aponina*, *Coelosphaerium kuetzingianum* и другие из зеленых. Наряду с ним также отмечено *Trachelomonas volvocina*, *Euglena aculeata*, *E. caudata*, *E. bucharica* и другие из эвгленовых. Наряду с ними появляются преобладательно некоторые теплолюбивые диатомовые водоросли как; *Melosira granulata*, *Cyclotella kuetzingiana*, *Coccconeis placentula*, *Mastogloia baltica*, *Caloneis amphisbaena*, *Navicula cryptocephala*, *Amphora veneta*, *Nitzchia hungarica*, *N. linearis* и другие. Из диатомовых появляются *Glenodinium penardii*, *G. conspicum*, из пиррофитовых *Peridinium cinctum*, *P. inconspicuum* и другие. These above-mentioned spring enrichment of green, blue-green and some diatoms and other algae, most of them are dominant in spring.

It should be noted here that the smallest amount of algae occurrence differs for the first and second ponds, because the water of the city discharge through the



flumes enters the first pond, then the second. The water is very turbid, the water transparency is 5-10 cm and the algae of the first and second ponds are 22-30 taxa. In the third pond, the number of occurrence of algae is 38-44 taxa.

In the spring, a total of 234 taxa were recorded, of which 66 are blue-green, 70 diatoms, 6 dinophytes, 18 euglena, and 78 green. Green algae are characterized by a large number of occurrences, followed by diatoms and blue-greens, the least dinophyte and euglenic algae.

Table 2 SEASONAL CHANGE OF ALGAE IN THE BIOPONDS OF THE TREATMENT FACILITIES OF BUKHARA

№	Departments of microalgae	Total species	Number of species			
			Spring	In summer	Autumn	In winter
1	Cyanophyta	105	66	83	67	8
2	Bacillariophyta	100	70	63	77	31
3	Dinophyta	10	6	10	6	-
4	Euglenophyta	30	18	25	22	5
5	Chlorophyta	112	78	87	82	21
	Total	367	234	267	254	65

There are only 31 species that occur only in spring, of which 9 are blue-green, 8 are diatoms, 4 are euglenic, and 9 are green.

Такие оказались, как *Woloszynski leopoliensis*, *Nodularia spumigena*, *N. harveyana*, *N. horveana* f. *sphaerocapsa*, *Oscillatoria chalybea*, *O. putrida*, *O. terebriformis*, из синезеленых; *Chlamydomonas nostigama*, *Ch. atactogama*, *Heleochloris pallida*, *Oocystis crassa*, *Coelastrum reticulatum*, *Tetraedron regulare*, *T. incus*, *Ankistrodesmus pseudomirabilis* var. *gracilis*, *Kirchneriella contorta* из зеленых; *Melosira islandica*, *Cyclotella comta*, *Stephanodiscus hantzschii*, *St. aстраea* var. *minutilis*, *Diploneis smithii*, *Navicula cincta*, *Synedra tabulata*, *Gomphonema constrictum* var. *capitatum* из диатомовых; *Strombomonas urceolata*, *Eutreptia lanowii*, *Euglena aculeata*, *Colacium vesiculosum* из эвгленовых водорослей. Эти выше указанные водоросли в другие сезоны года не были обнаружены.



In summer (June-August) the transition from the spring to the summer season, at an air temperature of 30-39°C, the water temperature was 25-33°C. At this time, solar radiation increases, water transparency ranges from 0.4 to 1.2 m, mineralization -1800-2200 mg and others.

At this time, the temperature, solar radiation, transparency and others increase. The phytoplankton complex of the flight season is much richer than the spring one, and its components have a longer vegetation range.