

Dynamics of Changes in Algae Structures Depending on Seasonal Changes

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ANNOTATION

Phytoplankton and phytobenthic groups of algae are of great importance in the process of self-purification of contaminated water bodies. But until recent years, biological factors have not been given due attention in the self-cleaning of rivers, canals, ponds, reservoirs and lakes. According to our observations, representatives of all systematic groups of algae developing in a particular reservoir participate to varying degrees in the processes of self-purification of wastewater. Even species of the same genus are characterized in different ways. This indicates the need for comprehensive and deep floristic studies of the natural algal population of water bodies used as biological ponds - reservoirs, sedimentation tanks and filtration fields.

We studied the algoflora of biological ponds of sewage treatment plants in Bukhara for the first time. The composition of the dominant algae of biological ponds of purification plants varies in seasons as follows. In the spring, 14 taxa are dominant, as in spring, the prevailing algae are blue-green algae. In the summer, the prevailing algae of biological puddings of purifying structures turned out to be 18 species and varieties. These predominant algae include blue-green-8, diatom-2, euglenic-2, and green-6.

Most of these predominant algae are dominant in the spring, for example, *Microcystis aeruginosa*, *M.pulverea*, *Aphanothece clathrata*, *Oscillatoria irrigua*, *O.brevis*, *O.lemmermanii*, *O.woronichinii*, *Nodularia spunigena* from blue-green algae; *Nautococcus grandis*, *Palmellocystis planctonica*, *Oocystis marssonii*, *O.lacustris*, *Scenedesmus quadricauda*, *Ankistrodesmus acicularis* of the green; *Cyclotella kuetzingiana*, *Nitzschia hungarica* of diatoms; *Euglena acus*, *E. oxyuris* from euglene algae.

Along with them, *Aphanothece clathrata* often occurs in summer. *brevis*, *Nodularia harveana* f. *sphaerocarpa* from the blue-green; *Chaetopeltis orbicularis*, *Chlamydomonas globosa*, *Ch.simplex*, *Coelastrum microporum*, *Scenedesmus obliquus*, *S. obliquus* var. *alternans* of green; *Melosira varians*, *Synedra ulna*, *Cocconeis placentula*, *Nitzschia linearis* from diatoms; The

species *Nitzschia linearis* was dominant in the spring, but this species is often observed in the summer.

Euglena caudata, *E. caudata* var., was often recorded from euglene algae in summer. minor *bucharica*, *E. acus*, *E. oxyuris* and others. In summer the leading role belonged to blue and green algae. Along with them, euglenic, diatom and dinophyte algae became common.

In autumn, the dominant group includes -12 taxa, of which the largest number is found in representatives of diatoms such as *Synedra ulna*, *Nitzshia hungarica*, *N. linearis*, *Navicula cryptocephala*. Then the blue-green algae, *Microcystis aeruginosa*, *Oscillatoria irrigua*, *O. brevis*, *Phoromidium foveolar*, from the green algae during this period, the dominants turned out to be *Palmellocystis planctonica*, *Coelastrum microporum*, *Scenedesmus quadricauda*.

Here the leading position is occupied by diatoms and blue-green algae. Blue-green and green algae dominated in early autumn, after the second half of October, the dominant position was occupied by diatoms. Representatives of euglenic and dinophyte algae are rarely seen in the autumn period, it was not predominant. The winter period was not dominant, some representatives of diatoms and green algae were rare. It should be noted that most of these prevalent algae biological ponds purification plants in Bukhara somewhat coincide with the dominant algae of fishponds Kalgan Chirchik of the Tashkent region (Saksen, 1965), ponds of the Kolkhoz farm. Sabira Rakhimova of the Denau district of the Surkhandaryn region, ponds of the Yakkabag district of the Kashkadarya region, ponds of the fish farm of the Akkurgan district of the Tashkent region, [9, 10], algal flora of the bioproducts of the city of Chimkent of the Republic of Kazakhstan (Tazhiev) algae biological ponds of industrial sewage of the Chirchik production association [8]. Let us briefly characterize the dominant algae found in ponds of biological treatment facilities of the city of Bukhara [10].

1. *Microcystis aeruginosa* Kuetz. Emend. Elenk blue-green algae is a widespread species of dominant in mid-spring, summer and early autumn in the plankton in all ponds. Vegetation of this species begins at a water temperature of 21-31 ° C, thermophilic in the spring the number is 860 thousand KL/l, in the summer of 1860 thousand KL / l. in early spring, late autumn and winter, this species at a water temperature of 0 ° C-12-14 ° C will not be registered.
2. *Microcystis pulverea* (Wood) Fortti. emend Elenk. blue-green algae, vegetation in all ponds begins in spring, summer and early autumn. Mass development reaches at a water temperature of 23-30 ° C thermophilic species in the spring is 810 thousand KL/l, in the summer of 1100 thousand KL / l, autumn 620 tys. CL / L. in late autumn and winter, this species disappears completely from the plankton.
3. *Aphanothece clathrata* Wet G. S. West.- cyanotic algae. Registered very often in late spring, summer and autumn at a water temperature of 23-31 ° C. Thermophilic species the number of population in spring in all ponds is 980 thousand cells/l, in the summer of 1250 thousand cells/l, in the autumn of 970 thousand KL/l In early spring and in late autumn at a water temperature of 12-16 is very rare. In the winter stopped Dating.
4. *Nodularia spumigena* Nert. Blue-green algae develop abundantly in summer at a water temperature of 26-30 ° C. Thermophilic species. The number of all ponds reaches 910-980 thousand cells/L. This species in other seasons of the year were found.
5. *Oscillatoria brevis* Kuetz. Cyanotic algae are observed in all seasons of the year. Abundant occur in spring, summer and autumn at a water temperature of 18-28 ° C. In the spring, the number was 716 thousand cells/l, in the summer of 820 thousand KL/l, in the autumn of 780 thousand KL/l in late autumn and winter the temperature of water °C 8-2 is very rare.
6. *Oscillatoria irrigua* (Kuetz) Gom. Blue-green algae appear in the plankton in early spring 10-

16 ° C and gives an outbreak of mass development in mid-spring, summer and early autumn at a water temperature of 18-26 ° C. The strength of the spring in all the ponds is 620 thousand cells/l, in the summer of 810 thousand cells/l, in the autumn of 715 thousand KL/l. In late autumn and winter ceased to meet.

7. *Oscillatoria lemmermannii* Wolosz. Blue-green algae are widespread. It occurs in all seasons of the year, but very often occur in spring and summer at a water temperature of 18-27 ° C. In the spring the number was 810 thousand cells/l, in the summer of 1.080 thousand cells/L. This species in late autumn and winter when the water temperature is 8-2 is rarely detected.
8. *Oscillatoria woronichinii* Anissim. Cyanotic algae, widely distributed. The species was detected during the year at a water temperature of 4-26 ° C. It develops abundantly in spring, summer and autumn at a water temperature of 18-26 ° C. In spring the number in all ponds is 580 - 720 thousand KL/l.
9. *Nautococeus grandis* Korsch. Green algae thermophilic occur in late spring, summer and early autumn at a water temperature of 20-27°C. In the spring there is the number 580 thousand cells/l, in the summer of 815 thousand KL/l. This kind of early spring, late autumn and winter was found.

Before the start of algolization, we investigated the species composition of the natural algae flora and their distribution over biological ponds; 120 species, varieties and forms of algae that were characteristic of contaminated water bodies were identified.

Phytoplankton and phytobenthic groups of algae are of great importance in the process of self-purification of contaminated water bodies. But until recent years, biological factors have not been given due attention in the self-cleaning of rivers, canals, ponds, reservoirs and lakes.

[3] Noted that during the self-purification of highly polluted waters, not even diluted urban wastewater, one of the indicators of the self-purification process is the development of phytoplankton.

In the summer, the water temperature rises to 25-30 °C. A mixed suspension of algae, such as *Chlorella vulgaris*, *Ch. pyrenoidosa*, *Oocystis borgei*, *O. marssonii*, *Palmellacystis planctonica*, *Pediastrum boryanum*, *P. duplex*, *Scenedesmus obliquus*, *S. acuminatus*, *S. bijugatus*, *Ankistrodesmus acicularis*, *A.densus*, *A.minutissinnus*, other species of the *Chlamydomonas* genus and many others.

In the spring, with an increase in the temperature of water and solar energy in biological ponds, the intensive development of phytoplankton is observed. As microalgae develops in water, the amount of dissolved oxygen increases to 3.0–4.0 mg / l. The amount of organic substances according to BOD₅ decreases to 44.0-50.8 mg O₂ / l.

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