

TO THE STUDY OF PHYTOPLANKTON OF URBAN PONDS IN THE SOUTH-EAST OF THE REPUBLIC OF TATARSTAN IN RUSSIA

К ИЗУЧЕНИЮ ФИТОПЛАНКТОНА ГОРОДСКИХ ПРУДОВ ЮГО-ВОСТОКА РЕСПУБЛИКИ ТАТАРСТАН РОССИИ

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The purpose of this work was to determine quantitative indicators and assess the quality of water of ponds located in the central part of the cities of Aktanysh, Leninogorsk and Bugulma of the Republic of Tatarstan of the Russian Federation by phytoplankton organisms. Phytoplankton samples were taken in June 2016, 10 stations were selected from each reservoir - coastal and deepwater, confined to different habitats.

Collection and processing of phytoplankton samples were carried out according to conventional hydrobiological methods (Method of study..., 1975). When determining the taxonomic affiliation of each species, determinants of freshwater algae were used (Hollerbach, Polyansky, 1951; Zabelina et al, 1951; Kiselev, 1954; Matvienko, 1954; Popova, 1955; Dedusenko-Schegoleva et al, 1959; Kosinskaya, 1960; Dedusenko-Schegoleva, Gollerbach, 1962; Gollerbach et al, 1963; Palamar-Mordvintseva, 1982; Diatoms ..., 1988, 1992; Genkal, 1992; Tsarenko, 1990.)

In the phytoplankton samples from pond in Aktanysh, 30 algae taxons were determined below the genus of six divisions. Numerically species were dominated by the green ones - 14 taxons (47% of the total number of species), diatoms - 7 species (23%), followed by euglenic - 4 species (13%), blue-green and golden algae - 2 species (7 %), 1 species belongs to the department of dinophyte (3% of the total number of species encountered in the

pond). The number of species from the stations of research varied from 13 (at st. 1) to 23 species (at st. 3).

The phytoplankton abundance at the research stations varied from 214.83 t. cells / l at the station 3 to 1679 t. cells / l at station 5.

The following representatives prevailed among the species: at stations 2, 5, 6, the species from the Euglena texta department (Duj.) Hubner predominated with a contribution to the total number on the station - 19, 47, 16%, respectively; at station 3 prevailed species from the department of green Coelastrum reticulatum (P.A.Dangeard) Senn., 1899 accounting for 18% and Volvulina steinii (Playfair) - 19.5%; At st. 10 - dominated the green alga Scenedesmus quadricauda (Hegew.) Hegew. - 21%; also, on station 6 the green Chlorella sp. dominated, forming 20% of the total value. The total biomass in the stations varied from 1.907618 mg / l at the station 3 to 16.45238 mg / l at the station 10.

In biomass, the predominant species were: at stations 2, 3, 10, the green alga Volvulina steinii (Playfair), forming 61, 82 and 64% of the total biomass, respectively; at stations 5, 6 euglene Euglena texta (Duj.) Hubner predominated in biomass (54% and 44%, respectively); also on st. 10 blue-green Oscillatoria limnetica dominated in biomass (20%).

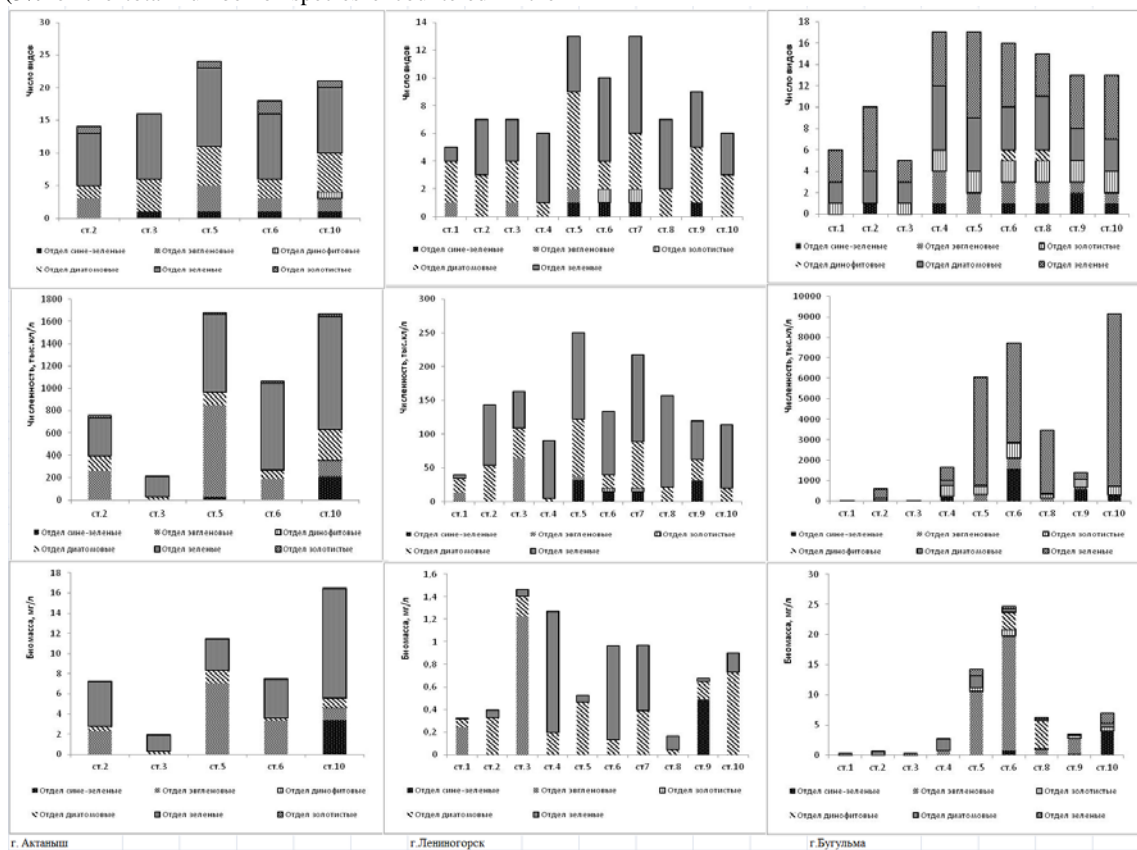


Fig. 1. Dynamics of changes in quantitative indicators (number of species, specimen, number, thousand cells / liter and biomass, mg / l) in the studied reservoirs of Aktanysh, Leninogorsk, Bugulma, respectively

On the whole, the reservoir is characterized as highly trophic, with a moderately high content of organic matter corresponding to the period of the vegetation season in the reservoirs of the Central Russia (the spring peak of "flowering" has already passed and the summer has not yet come). In mass predominant species are representatives of green algae (small-celled colonial forms), quantitatively also among the dominants the euglenic division is distinguished, which also indicates a high content of organic matter.

The representation of the diatom department indicates a flowage. Lack of diversity and massiveness of blue-green algae - indicates that the flowering period is not captured by research.

In 10 samples of the phytoplankton from pond in Leninogorsk, 29 algal taxa were determined below the genus of five divisions. The number of species is dominated by the green ones - 12 representatives (41% of the total number of species), diatoms - 11 species (38%), followed by euglenic, blue-green and golden algae - 2 species (7% each).

The number of species from the stations of research varied from 5 (at st. 1) to 13 species (at stations 5 and 7).

The number of phytoplankton at the stations of research varied from 38.88 t. cells / l on st. 1 to 249.51 t. cells / l at st. 5.

The number of species dominated: at stations 1, 3 - *Euglena schmitzii* Gojdicis euglena algae (33% and 39%, respectively); at stations 2 and 4, the green alga *Coelastrum reticulatum* (P.A. Dangeard) Senn (33% and 38%, respectively); at st. 5 - green alga *Pediastrum boryanum* (Turp.) Menegh. (34 %); at st. 6 - the species from the department of green *Chlorella sp.* Beij predominated (29%); at st. 7 and 8 - the largest species was the species from the department of green *Tetraëdron minimum* (A. Br.) Hansg. (28.6% and 50%, respectively); at st. 9 and 10 the representative from the department of green algae - *Dictyochlorella globosa* (Korsch.) Silva, prevailed, forming 26 and 35% of the total population, respectively. Also, at the station 9 prevailed blue-green alga *Oscillatoria limnetica* Lemmermann (26%); at st. 10 - *Raphidocelis subcapitata* (Korsch.) Nyg predominated (30 %). The total biomass in the stations varied from 0.33485 mg / l at the station 1 to 1.463761 mg / l at the station 3.

In biomass prevailed: at stations 1, 3 - euglena alga *Euglena schmitzii* Gojdicis (73% and 84%, respectively); at st. 2 - a species from the department of diatoms *Synedra ulna* (Nitzsch) Ehrenberg (66%); at stations 4, 6, 7, 8 - green *Volvulina steinii* (Playfair) - (84%, 84%, 57%, 59%, respectively); at st. 5 - diatom *Cyclotella comta* (Ehrb.) Kütz. (39%); at st. 9 prevailed blue-green alga *Oscillatoria limnetica* Lemmermann (73%); on st. 5 - diatom *Synedra acus* Kützing (75%). Also, in biomass at st. 1, the euglenous alga *Trachelomonas intermedia* Dang dominated (51.2%); at st. 2 - blue-green *Microcystis aeruginosa* (Kütz.) Kütz. (37.9%); at st.3 - diatom *Stephanodiscus hantzschii* (25.6%).

In general, over the water body, clearly the prevalence of chlorococcal algae.

At stations 1 and 3 - the representatives of euglene both in numbers and in biomass clearly dominate. Blooming blue-green is not yet observed, but at the station 9 - the filamentary form dominates.

Representation of diatom species, as well as their dominance in biomass at stations 2, 5, 10 - indicates the flowage of the reservoir, favorable for them temperature regime - the water temperature is not high relative to the season and climatic conditions.

In the samples of phytoplankton from the pond in Bugulma, 28 taxons of algae were determined below the genus of six divisions. The number of species is dominated by the green ones - 11 representatives (39% of the total number of species), diatoms - 8 species (28%), followed by euglenic - 4 species (14%), blue-green and golden algae - 2 species (7 %), 1 species belong to the department of dinophyte (3%).

The number of species from the stations of research varied from 5 (at station 3) to 17 species (at stations 4 and 5).

The phytoplankton abundance at the research stations varied from 45.44 t. cells / l at the station 1 to 9145.66 t. cells / l at st. 10.

In terms of numbers, the following prevailed among species: at st. 1 - species of *Navicula sp.* from the department of diatoms and *Chlorella sp.* from the department of green algae (each share - 25% of the total number at station); at stations 2, 5, 6, 8 and 10 - green alga *Volvulina steinii* (Playfair) - (52%, 70%, 57.5%, 80% and 79.5%, respectively); at st. 3 prevailed species from the department of green - *Dictyochlorella globosa* (Korsch.) Silva and *Raphidocelis subcapitata* (Korsch.) Nyg. (28.6% and 50%, respectively); at st. 4 - the species from the department of golden algae *Mallomonas majorensis* predominated (30%); at st. 9 - representative of golden algae *Dinobryon divergens* Imhof. Also, at the station 6 the dominant was the blue-green *Oscillatoria limnetica*, forming 20% of the total value.

The total biomass at the stations varied from 0.234613 mg / l at the station 3 to 24.7027 mg / l at the station 6th.

In biomass among the species, the following species dominated the stations: at stations 1,2 and 4, the species *Navicula sp.* from the department of diatoms (86.3, 28.3 and 24.7%, respectively); at st. 3 - green *Raphidocelis subcapitata* (Korsch.) Nyg. (35%); at stations 5, 6 and 9, the euglena alga *Euglena texta* (Duj.) Hubner (74, 76 and 72%, respectively); at st. 8 - dinophyte *Peridinium sp.* (71%); at st. 10 - blue-green *Oscillatoria limnetica* (56%) and green *Volvulina steinii* (Playfair) (21%).

Also, at the station 2 as a dominant, diatom *Pinnularia sp.*, was contributing 28% of the total biomass value; at st. 4 - diatom *Cocconeis placentula* Ehrb. (23%).

In general, small-cell colonial forms predominate in the water body, mainly from the green department - spring "flowering" as a response to the supply of nutrients with surface runoff in spring, along with a large number of representatives of the diatom department, which may indicate the presence of groundwater recharge.

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