

FLORISTIC ANALYSIS OF PHYTOPLANKTON OF THE MEZHDURECHENSK RESERVOIR

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Abstract

The article covers the floristic analysis of the phytoplankton of the Mezhdurechinsk reservoir. Found 462 species, varieties and forms, of which the leading algae are Bacillariophyta - 158, Chlorophyta - 118, Cyanophyta - 105, in other divisions of algae species are noted in smaller quantities - from 2 to 33. The algae found are of great importance in fisheries.

Keywords: Flora of algae, Mezhdurechinsk water storage.

INTRODUCTION

Relevance of the topic. The morphology and dynamics of the Mezhdurechinsky reservoir of Karakalpakistan may be of certain interest for understanding the development of the hydro geographic network of the Amu Darya delta as a whole. It is located between Kypchak and Akdarya and was built by the "Aralvodstroy" Department according to the project developed by the "Uzbekgiprovdokhoz" Institute in the late 70s of the last century. The bases are divided into more than a dozen large and small natural reservoirs, like Shchegekul, Koksus and Koshpeliyadin, Balta ketken, etc. The reservoir is currently fed by the Akdarya River in the area through the Shuak Dam. The dam site is located in the area between Shchegekul and Kyzyljar, and is closed in the most active drain-forming part of the catchment area of the lakes. The area of the middle reaches of the Schegekul River is practically weakly inflowed. The phytoplanktons of the Mezhdurech'insky reservoir were studied for the first time by A.E. Elmuratov and A.A. Elmuratova [1,2,3] (2001-2012). We (Alimjanova Kh. A., Elmuratova A.A.) continued the study of the phytoplankton of the Mezhdurechinsky reservoir from 2018 to 2021. The reservoir consists of several reservoirs, such as Shchegekul, Koksus, Koshpeliyadin, Autel, Balta ketken, Nogai, Zhideliuzyak and Shuak. The study of the algal flora of the Mezhdurechinsky reservoir is currently a topical issue. In this regard, we have studied and analyzed the species composition of the reservoir's phytoplankton. For this, monitoring stations were identified and sampling was carried out according to the hydrobiological method [4,5] of research using plankton sets of the GAZ brand No. 78. As a result, algological samples were collected and processed and the species composition of phytoplankton was investigated under a Carl Zeiss microscope. For this, temporary and permanent preparations were prepared [4,5].

RESULTS AND DISCUSSION

During the study, we identified only 462 species, varieties and forms of phytoplankton algae in the Mezhdurechinsky reservoir.

In terms of the number of species composition in phytoplankton, the leading divisions are Bacillariophyta, which includes 158 species, varieties, forms, which is 34.20 percent of the total amount of phytoplankton algae. They are followed by Chlorophyta (118 species: 25.54%) and Cyanophyta (105 species: 22.73%). The remaining divisions have a small number of species composition, such as the algal divisions Euglenophyta (33 species: 7.14%), Dinophyta (22 species: 6.71%), Xanthophyta (12 species: 2.60%), Chrysophyta (3 species: 0.64%) and Cryptophyta (2 species: 0.43) (table).

The floristic compositions of reservoirs were compared, which is Mezhdurechinsk reservoir from 4 large research monitoring stations, such as

- Shchegekul;
- Koksus;
- Koshpeliyadin, Autel, Balta ketken;
- Nogai, Zhideliuzyak and Shuak.

Analysis of the distribution of algae in the areas of the reservoir shows that in terms of species, the most diverse lake. Shchegekul (443 species, varieties and forms), the least (268) - on periodically drying lakes Koshpeliyadin, Autel and Balta ketken (Table 1). The relatively large species diversity of algae inhabiting the former largest lakes Shchegekul and Koksus (443, 422) is explained by the fact that unequal and rather changeable ecological conditions are created in their pelagial and non-heretical zones. One of the leading environmental factors is water temperature. In the study area, due to shallow water, transitions from cold-water completely warm water to hot are observed, which ensures the development of algae in reservoirs in winter under ice at a temperature of 1.6-3.5⁰C, in spring and autumn, at a temperature of 6.7-19.5⁰C and finally, in the summer from 26.4 to 29.0⁰C. The most diverse in these lakes are eurythermal forms and those living in certain ranges of water temperature, the least - stenothermal forms. Diversity of species composition of algae in Lake Koksus and Shchegekul is also explained by their greater dynamism of the hydrological and hydrochemical regimes of this reservoir in terms of areas and seasons. In addition, the lake. Shchegekul is constantly, almost directly, enriched with forms brought into the lake from the Amudarya River, the phytoplankton of which is much more abundant and more diverse than in other coastal water bodies.

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Table 1. Distribution of the number of species and intraspecific taxa of algae in the areas of the Mezhdurechinsk reservoir

Algae department	Shchegekul	Koksu,	Koshpeliaydin, Autel, Baltaketken	Nogai, Zhideliuzyak and Shuak	Total number of species and percentage of the total number of species,%
Cyanophyta	103	99	52	75	105: 22,73
Chrysophyta	3	2	-	-	3: 0,64
Bacillariophyta	146	137	71	84	158: 34,20
Xanthophyta	10	11	8	6	12: 2,60
Cryptophyta	2	2	2	2	2: 0,43
Dinophyta	31	28	20	22	31: 6,71
Euglenophyta	32	30	26	28	33: 7,14
Chlorophyta	116	113	49	51	118 : 25,54
Total:	443	422	228	268	462 : 100
Percentage of the total number of species,%	92, 88	91,34	49,35	59,29	462 : 100

The homogeneity of the algae of the lake. Koshpeliaydin, Autel, Balta ketken is probably associated with more constant living conditions with a rather significant salt content in the water in all seasons, which satisfies the vital needs of mainly brackish algae. Unequal living conditions on different lakes of the reservoir affect the species diversity and ecological groups of algae. So, in the southern section, in the area close to Shuakuzyak lake Shchegekul, 437 species and varieties of algae were found, in the western area - 240, in the north - 339, in the north-east - 398, in the east - 427. A significant species diversity of the algal flora of the southern part of the lake. Shchegekul is caused by the influx of fresh water from the Amudarya river through the Shuakuzyak, which creates favorable conditions for the development of ecologically diverse groups of algae. In the western section of Shchegekul, the species diversity of algae decreases due to the more stable, throughout the year, shallowness of abundant siltation of the soil and significantly high salinity of water in this part of the lake. The increased salinity of water in the western and northeastern parts of the lake does not create favorable conditions for the development of some indifferent and most brackish-water, as well as euryhaline forms. In the lake Koksu, the species diversity of algaeflora increases from the northeastern area (398 species, varieties, and forms) to the western (240), in the Koshpeliaydin - from the northern (218 species) to the southwestern (213). Such a difference in the species composition of the algal flora in these lakes is mainly due to the degree of influence of the relatively rich phytoplankton, which is brought into the reservoir by the waters of the Shuak Canal. Therefore, closer to the narrowest, the composition of the algae is richer. In the western part of the lake. Aydin burrows the influence of the channel is absent and the composition of algae is poorer. In the lake Autel and Koshpeliaydin, the ratio of different ecological groups of algae is also heterogeneous. For example, in the lake Autel, Balta ketken and Koshpeliaydin found 88 and 75 species and varieties of oligogalobes - indifferent algae, respectively, of which 138 in Koshpeliaydin, 143 in Autel, and 145 in Balta ketken. The maximum number of eugalobas - marine euryhaline - 26 species were found, respectively, in Koshpeliaydin and Balta ketken, their minimum in Shchegekul - 22 and Koksu -19. The maximum number essentially live in the Koshpeliaydin, Autel and Balta ketken. They are followed by Nogai, Shuak and Zhideliuzyak. Algae inhabiting fresh and brackish waters are most diversely represented in the waters of Shchegekul (30 species, varieties and forms), Koksu (29) and Koshpeliaydin (31), Autel and Balta ketken, respectively (33). A significant number in this group also contain Nogai, Shuak and Zhideliuzyak. Such distribution of ecological groups of algae between the areas of the reservoir is consistent with the salt regime.

In the Mezhdurechinsk reservoir, all indifferent and oligogalobes species and a part of mesohalobes are permanent inhabitants. Representatives of seaweed and a significant number of marine, euryhaline forms, all of them belong to the species of tolerant autochthonous origin, i.e. they are marine remains and as tolerant forms, which, after the decrease in the level of the Aral Sea, remained separately as a relict body of water. In the lake Shchegekul and Koksu are especially rich in freshwater algae in early spring and early autumn, when the lakes are replenished with freshwater flood waters of the Amu Darya. Marine forms are found here during the period of surge winds from shallower drying up boggy relict more brackish water bodies. Thus, from the above, the following conclusions and conclusions follow: floristic analysis shows that the introduction of indifferent and halophilic forms into the reservoir is almost constantly related to the amount of the Amudarya River tributary. As for the seasonality of the development of phytoplankton in the reservoir, it is due to the temperature regime of the reservoir. As for the seasonality of the development of phytoplankton in the reservoir, it is due to the temperature regime of the reservoir.

Under the conditions of the investigated reservoir, the phytoplankton cycle is directly related to the water temperature and the presence of biogenic elements in it, which come from the tributaries of the Amudarya River, prevailing over green and diatoms in terms of the level of quantitative development. Among other types of algae, the most significant effect was the presence of pyrophytic and euglena, which appeared in the mass only once, and golden and yellow-green ones were found only occasionally. When considering the interannual changes in the structure of the floristic composition in the lakes of the reservoir, it was clear that each year the ratio of the number of representatives of each of the types of algae is presented differently, as well as the quantitative development of phytoplankton in these reservoirs.

Conclusion

- Mezhdurechinsk reservoir consists of 462 types phytoplankton. In terms of species composition, the divisions of algae Bacillariophyta (158) are rich, then Chlorophyta (118), Cyanophyta (105), while the other divisions have a poorer species composition (Euglenophyta - 33, Xanthophyta - 12, Chrysophyta - 3, Dinophyta - 2).
- Mezhdurechinsk reservoir consists of 4 types of reservoirs, such like Shchegekul; Kokcu; Kospeliaydin, Autel, Balta ketken; Nogai, Zhideliuzyak and Shuak. According to the floristic composition of phytoplankton, the richest water bodies are Shchegekul (443) and Koksu (422). In other water bodies, the amount of phytoplankton species

composition is less (Koshpeliyadin, Autel, Balta ketken - 228; Nogai, Zhideliuzyak and Shuak - 268) in comparison with the first and second water bodies;

Recommendations

- The results obtained - the species composition of Mezhdurechinsky we recommend using the reservoirs when feeding herbivorous fish in the fishery industries of the Mezhdurechye reservoir;
- We recommend saving the collected algological samples as algological collections of the Mezhdurechinsky reservoir;
- We recommend using the phytoplankton database of Mezhdurechinsk - reservoirs when compared with phytoplankton of other reservoirs.
- The algae found are of great importance in fisheries.

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