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Abstract. An important task for the Russian economy in the coming decades is the problem of the development of the Arctic territories. The increasing pace of human impact on the natural and urban ecosystems of this region require the study of the causes, mechanisms and consequences of such impacts. Minimizing the negative impacts on aquatic ecosystems, as being the most vulnerable, in the course of developing this region is one of the most important tasks, for the solution of which an inventory of existing biodiversity is needed. In subpolar waterbodies, algae are one of the main sources of primary production. Given the short growing season, it is the algae that are able to create a large amount of primary production almost immediately after the ice cover melts. Being producers, they will be the first to respond to any changes in the ecosystem. This study identified 35 species of algae from the divisions of Bacillariophyta, Cyanobacteria, Charophyta, and Chlorophyta. Dominated by the number of species (19) diatoms, which is typical for this region.

1. Introduction

In subpolar waterbodies, algae are one of the main sources of primary production, since aquatic vascular vegetation is not developed. Planktonic algae are able, under favorable conditions, to rapidly increase their numbers. Given the short growing season, it is the algae that are able to create a large amount of primary production almost immediately after the ice cover melts (Vasser et al, 1989). The diatoms, which are the first to actively share at the very beginning of the growing season, are rich in oils, which makes them a valuable source of nutrition for aquatic animals. Cyanobacteria are capable of fixing atmospheric nitrogen and converting it into forms accessible to other organisms, enriching the ecosystem with this deficient nutrient. All this allows algae to play a leading role in the structure and functioning of the aquatic ecosystems of the region.

An important task for the Russian economy in the coming decades is the problem of the development of the Arctic territories. At the same time, the Yamal region, possessing significant reserves of hydrocarbons and ore minerals, is one of the most important. The increasing rates of human impact on the natural and urban ecosystems of this region require the study of the causes, mechanisms and effects of such impacts (Alekseev, 2017), since they can be very negative. Under the conditions of active anthropogenic impact during the exploration, development and exploitation of oil and gas fields, many species of flora and fauna may be under threat of downsizing and extinction, because Polar ecosystems are particularly vulnerable due to the short growing season and low temperatures. In

the systems for assessing the ecological status of ecosystems and the methodology for monitoring in many countries in Europe and the world, there is a transition from physical and chemical control to biological control based on the study of the structural and functional organization of various biota components (Bogdanov, 2015). One of the most important tasks in the development and operation of fields is to minimize the negative impacts on aquatic ecosystems, since they, as the accumulating units of the hydrographic chain, will accumulate various pollutants (Regional problems…, 1999). First of all, to solve it, it is necessary to determine the background state of ecosystems and determine the species inhabiting them.

The biodiversity of algae in this region, despite its vastness and great significance, has been studied rather poorly. Only a few authors conducted research on various biotopes (Yarushina, 1995; Naumenko, Semenova, 1996; Genkal, Yarushina, 2014). In this regard, the continuation of the study of the biodiversity of algae in the Yamal region is highly relevant. That was the purpose of this study.

2. Material and Methods

The material for the study was selected in small reservoirs during the expeditionary work in the Yamalo-Nenetski Autonomous District in 2016. The material selection sites are located in the South Yamal.

Cameral processing was performed by direct microscopy of fixed samples using a Leica DM 1000 transmitted light microscope with x10, x20, x40, x63, x100 magnifications. The identifications of algal taxa were principally accomplished with the aid of the following systematics works: Kosinskaya (1960); Qualifier of algae of the USSR Vol. 11(2) (1982); Tsarenko (1990); Komárek and Anagnostidis (1999, 2005); Kulikovskiy et al (2016).

3. Results

In the samples, 35 algae taxa were found from the diatom (Bacillariophyta), cyanobacteria (Cyanobacteria), chara (Charophyta - class Conjugatophyceae) and green (Chlorophyta) algae divisions. The largest number of species were diatoms - 19 species. The rest of the divisions had biodiversity: cyanobacteria - 9 species, charaeous - 5 species, green - 2 species.

List of algae species found:

1. Achnanthes subatomoides (Hustedt) Lange-Bertalot & Archibald
2. Acutodesmus acutiformis (Schröder) Tsaren. et D.M.John
3. Aphanocapsa holsatica (Lemm.) Cronb. et Kom.
4. Asterionella formosa Hassall
5. Aulacoseira alpigena (Grunow) Krammer
6. Aulacoseira subarctica (O. Müll.) E.Y. Haw.
7. Cavinula cocconeiformis (W.Gregory ex Greville) D.G.Mann & A.J.Stickle
8. Cavinula vincentii Antoniades & P.B.Hamilton
9. Chamaepinnularia mediocris (Krasske) Lange-Bertalot & Krammer
10. Closterium directum W.Archer
11. Closterium parvulum Näg.
12. Cosmarium sp.
13. Cymbopleura anglica (Lagerstedt) Krammer
14. Encyonema minutum (Hilse) D.G.Mann
15. Eunotia minor (Kützing) Grunow
16. Geissleria thingvallae (Østrup) Metzeltin & Lange-Bertalot
17. Genkalia digitulus (Hustedt) Lange-Bertalot & Kulikovskiy
18. Gloeocapsa alpina Näg.
19. Limnothrix planctonica (Wołosz.) Meff.
20. Microcystis pulverea (H.C.Wood) Forti
21. Mougeotia sp.
22. Navicula radiosa Kützing

23. Neidium longiceps (W.Gregory) R.Ross
24. Oscillatoria tenuis C. Ag. ex Gom.
25. Placoneis anglophila (Lange-Bertalot) Lange-Bertalot
26. Planktolyngbya limnetica (Lemm.) Kom.-Legn. et Cronb.
27. Planktolyngbya sp.
28. Planktothrix agardhii (Gom.) Anagn. et Komárek
29. Scenedesmus quadricauda (Turp.) Bréb.
30. Staurastrum paradoxum Meyen ex Ralfs
31. Staurosirella pinnata (Ehrenberg) D.M.Williams & Round
32. Synechocystis aquatilis Sauv.
33. Tetracyclus glans (Ehrenberg) F.W.Mills
34. Tabellaria fenestrata (Lyngbye) Kützing
35. Tabellaria flocculosa Roth (Kütz.)

4. Conclusions

Diatoms appeared to be the most diverse in taxonomic terms. This distribution by department is typical for northern cold-water reservoirs. For many species it is indicated (Kulikovskiy et al, 2016; AlgaeBase, 2018) that they are related to the polar regions, oligotrophic or dystrophic reservoirs.
In this study, the authors have just begun the study of this region. In the future, more detailed studies are planned with a large number of samples, as well as the measurement of hydrochemical parameters.

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