SOIL ALGAE INDICATORS

Onarkhon Khusanova
Namangan Institute of Engineering and Technology, Namangan, Uzbekistan
E-mail: onora.xusanova@mail.ru

Abstract
In the article, algae are indicators of the soil environment, different resistance to adverse factors, some species of Cyanophyta, Xanthophyta, Bacillariophyta and Chlorophyta are the most resistant, the degree of manifestation of different types of nutrition in the metabolism of algae, light, the amount of organic and mineral substances in the environment, oxidation-reduction potential and the environment It is thought that depending on the pH level, algae can enrich the soil with nitrogen as a result of fixing nitrogen from the air.

Keywords: soil algae, Cyanophyta, Xanthophyta, Bacillariophyta, Chlorophyta, photosynthesis, detoxification, indicator, toxin, nitrogen.

Algae are indicators of the soil environment. When analyzing any algocenosis, E.A. Shtina and M.M. A number of criteria are used, such as species composition, dominant species and species group, spectrum of algal life forms, specific types of algae, proposed by Gollerbach (1976). R.R. Kabirov et al. (2010) proposed general criteria for assessing the ecological status of soil algocenoses. In this case, at least one of the conditions for the transformation of one algocenose into another is a change in the species composition of more than 50%, changes in the taxonomic structure of algocenoses in the sections, 10% or more of the identified species appear in the sections, ecological changes, and at least one of the conditions under which the species composition of the algal group may disappear by 10% or more occurs when done.
Different types of algae have been found to have different resistance to unfavorable factors. The presence of toxic substances in the soil led to the survival and dominance of the most resistant species. In our research, the development sequence of algocenoses was shown depending on the soil composition and ecological environment of the regions of the steep region. In addition, the soils of the foothills of the Shorsuv Reservoir in southern Fergana are sandy, salty, talc, and the soils of the foothills and mountain regions of western Ferghana are stony, stony, heavily washed, and the vegetation cover is very sparse. Species of algae were also found in the soils of such unfavorable regions.
Since algae are photosynthetic microorganisms, they do not need ready-made organic matter. However, in soil layers where sunlight does not penetrate, some of them are able to switch to a heterotrophic lifestyle and absorb dissolved organic matter. The degree of manifestation of different types of nutrition in the metabolism of algae depends on the light, the amount of organic and mineral substances in the environment, the oxidation-reduction potential and the

pH level of the environment. Therefore, they are sensitive indicators of soil pollution. For example: green algae are sensitive to salinity, blue-green algae are indicators of pH changes, yellow-green algae are indicators of soil contamination with pesticides and other toxins.

It was noted that algocenoses are rich in Cyanophyta species in all soil types. Their number made up more than half of the total algoflora. The reason is that their cell membrane and the presence of active substances are highly resistant, while diatoms, yellow-green and green algae are less resistant.

The wide spread and abundance of algocenoses is associated with the creation of an ecological environment for algae due to the development of higher plants. The maximum species diversity of identified species occurs in areas with dense vegetation cover.

In the section Cyanophyta, Synechocystis, Schizothrix, Microcystis, Gloeocapsa, Nostoc, Oscillatoria, Phormidium, Lyngbya, Plectonema, Microcoleus; Pleurochloris, Tribonema, Bumilleriopsis in the section Xanthophyta; In the section Bacillariophyta, Pinnularia, Achnanthes, Navicula, Nitzschia, Surirella; In the section Chlorophyta, some species of Hypnomonas, Chlorella genera were noted to be the most resistant.

Holopedia, Coccopedia, Aphanocapsa, Gomphosphaeria, Leptobasis from the Cyanophyta section, Polyedriella, Arachnochloris, Monodus, Chlorocloster, Botryochloris, Bumilleria from the Xanthophyta section, Tetracyclus, Fragilaria, Neidium, Frustulia, Diploneis, Denticula from the Xanthophyta section, which are highly sensitive. It turned out that almost all the genera of the division Chlorophyta are species. The species Trachelomonas robusta, Trachelomonas volvociana, Euglena mutabilis and Cryptomonas erosa identified from Euglenophyta and Cryptophyta sections were found only in the foothills and mountain regions of eastern Fergana. Almost no other species of these sections were observed to be viable in the soil.

According to the results of all the analysis, it was scientifically proven that the species and species belonging to the Cyanophyta section are widespread in the external environment due to the presence of the ability to detoxify (remove harmful substances from the cell) and sorb (absorb) moisture under favorable conditions. The indicator of species of Phormidium, Oscilatoria, Plectonema, Nostok, Calothrix and Lyngbya genera turned out to be relatively high. In addition, algae enrich the soil with nitrogen by fixing nitrogen in the air. It was explained by the change in the amount of nitrogen in the habitats where there were many soil algae.

References

1. Kabirov P.P. Formalized description of soil algae communities // Algologiya. 1997 a. - T.7. - No. 4. - S. 365-370.
2. Shtina E.A., Gollerbakh M.M. Ecology of soil algae. M.: Nauka, 1976. - 143 p.

3. Khusanova O., Kurbonov I., Kamoliddinov M. Ecological features of the northern Fergana soil algae // Journal Of Critical Reviews. –2020. – P.539-544.
4. Khusanova O. G. Surveys on soil algoflora in Uzbekistan // International Journal Of Innovations In Engineering Research And Technology. –2020. – P.141-143.
5. Khusanova O., Kurbonov I., Mamajanova Sh., Abdullaeva A. Texonomic Composition Of Soil Algoflora Of The Northern Fergana Valley// Turkish Online Journal of Qualitative. – 2021. – P.7461-7469
6. Onarkhon Khusanova, Muhammadali Kamoliddinov. The Ecological Features of the Soil Seaweeds. // International Conference. -2022. – P. 030003-1, 030003-5 (Scopus & Web of Science Indexed).
7. Onarkhon Khusanova. Comparative analysis of soil algoflora in some regions of Uzbekistan and Central Asia // International Journal of Virology and Molecular Biology 2023; 12(2): – P. 19-21.