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In the Rhizosphere, the Taxonomic Composition and Species of Algae

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Abstract: The article provides information on cyanobacteria and algae in the rhizosphere of herbaceous plants in the watershed of the Namangan region of Uzbekistan. In the rhizosphere, the taxonomic composition and species of algae ecobiomorphos and cyanobacteria are unique for each investigated rhizosphere of plants, they are distributed taxonomically and ecobiofirms.

Keywords: algae cyanobacteria, pool, rhizosphere.

The root of the plant interacts with the surrounding soil algae. Groups of soil algae are formed under the influence of existing conditions and vegetation. In this respect, algae in soil act like other microorganisms, the historical relationship between microorganisms and plants around algae in the rhizosphere of trees and grasses leads to the formation of a stable ecosystem that is beneficial for both plants and microorganisms. The microbiota of the rhizosphere, along with metabolic products, simultaneously affects the soil microflora secreted by the plant.

The study of the rhizosphere microsphere begins with the identification of its constituent species, relationships are established. In this study, we provide information on the taxonomic composition of cyanobacteria and algae in the rhizosphere of herbaceous plants in the Chartak river basin, which flows mainly from the Chartak district of the Namangan region.

The composition of algalology in the rhizosphere has been studied on the basis of generally accepted methods. In the course of our study, plant samples were taken for analysis in October 2019 for the rhizosphere and comparison. Samples of the rhizosphere include the following herbaceous plants: Equisetum arvense; bitter wormwood - Artemisia absinthum; Achilles millitalium, maymunjon (Parmachak) - Fragaria viridis; Rumex confertus. Simultaneously with the sampling of the rhizosphere, we also complied with the geobotanical recommendation. We used the research method to collect and analyze algal material in practice. We also performed an ecobiomarker for soil algae. We have identified taxa of cyanobacteria and algae using the appropriate "Detectors". We performed statistical analysis using a statistical program. According to the flora of synabacteria and algae of the studied plants, 30 species of cyanobacteria and algae were identified in the rhizosphere of all plants. The rhizosphere of each plant contained 8 to 12 taxa. Of these, 14 are cyanobacterial species, 11 are green algae, 4 are yellow-green algae and 3 are diatoms. From the soil that we took under control, 15 species were identified, which consisted mainly of 8 species of cyanobacteria, 5 species of green algae, 1 species of yellow-green algae and 1 species of diatoms. At the root of the plant, 15 species were identified, of which 9 species are cyanobacteria and 6 species are green algae. The dominant species were differentiated by comparing the algal flora of the sample with that found in the rhizosphere of plants between tugai. In the rhizosphere, the dominant species Anobaena Constrictr, Trichormus variabilis, Comet Anagn, Chlorosarcinopsis minor, Rumex variabilis, Cardus crispus were identified with a score of 3 points.

The composition of the algoflora in the rhizosphere of the studied plants and the compared ecobioforms also slightly differs.

Composition of the ecobioform in the rhizosphere of plants and in comparable plants

Table 1.

Ecobioforms	Artemisietea vulgaris ruderal plants		Monicio Arrihenathfetea Meadow plants		Plantabinetea majoris Sinantron Plants	
	Q	R	Q	R	Q	R
P	22	24	27	22	28	17
CH	18	16	20	29	18	17
C	18	20	13	26	9	23
Hydr	18	8	13	7	9	9
B	6	4	-	4	-	4
M	6	12	13	4	9	13

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CF	6	4	-	7	27	13
PF	6	-	7	-	-	-
X	-	8	7	1	-	4
H	-	4	-	-	-	-
Total	100	100	100	100	100	100

(Note: Q - comparison, R - percentage in the rhizosphere)

The rhizosphere is richer than the algal flora, if we compare the figures given in percentages. At the same time, the percentage of CH and S forms in the rhizosphere is high. In comparison, the percentage of forms C and P is high.

Algocenoses of the rhizosphere also differ in their taxonomic composition. Algae and cyanobacteria typical of plants studied in pastures have been identified.

In the rhizosphere of Artemisia absentum, these are the P-form of Leptoeyngbya foveolarum (mont ex gorn), Phormidium breve (Kuetz), Phormidium kuetzingianum (kutz) cyanobacteria.

C, P, PF forms of cyanobacteria and algae in the rhizosphere of Fragaria viridis Chlorococceum minitus (Kuetz.) Leptolyugbya notata (Schmidla) Anagn et Kom, Calothrix marchica, Lemrat Dictyochelaris Fragrans Vasch, Neochlosarcinia deficiency. In the rhizosphere of other plants, the algae of the three taxa are unique. In the rhizosphere, Rumex contertus sinobacteria forms C, CF, X, Ch of yellow-green and green algae: Chlorococcum minor (Kuetz), Anabaena coustricta (Kutr), Trichormus variabilis (Kuetz), Com et Anagnors, Ellipsoion solitare (Gent) aggregate, Arce et Bold, Spongtonchloris spongiosa. The rhizosphere of Cordais crispus is characterized by forms of yellow-green and green algae Plemrochlaris magna Boye Pet, Chlorosarcinopsis minor (Gern) Hernd, Chlorosarcinopsis disoneata Hernd.

25 species of algae and cyanobacteria were identified in areas with 20-30% coverage of various algae of ruderal vegetation. Each plant in the rhizosphere has an average of 4 to 10 species. Of these, 13 species are cyanobacteria, 6 species are green algae, 4 species are yellow-green algae and 2 species are diatoms. For comparison, 17 species were identified, of which 9 were cyanobacteria, 6 were green algae and 2 were yellow-green algae.

The number of algal cells is relatively high. Abundance is high in the rhizosphere of wormwood and little in meadows. The dominant species in the rhizosphere of plants growing in ruderal conditions are distinguished, and the following.

The dominant species (3 points) is Pleurochloris magna in the rhizosphere of Carduus crispus and the dominant Chlamydomonas species in Boye-Pet.

The order of dominance in the rhizosphere and comparative ecobioferms is given. The nature of life forms is different in the algal flora of the rhizosphere. In the area of ruderal vegetation, a high percentage of Ch, C, and P forms are found in the rhizosphere and in comparison.

The taxonomic spectrum of the algal flora differed little from the rhizosphere.

Table 2.

plots	Total number of species	Taxonomic spectrum	Spectrum of ecobioforms
In the rhizosphere of the meadow Manieio Arrhenatheretea	28	Cya_{14} CH_{11} X_4 B_1	CH C_7 P $hydr_2$ CF_3 X B M_1
In comparison	25	Cya Ch	P_4 CH C hydr M X PF
Artemisia vuegaris ruderalli in the rhizosphere	15	Cya CH X B	P C CH M hydr X B H CF
In comparison	17	Cya CH X	P C CH hydr M B CF PP
Sinatroili Peantaginetta rizosferada	24	Cya Ch X B	C CH P M CF hydr B X
In comparison	11	Cyo Ch	P CF CH C hydr M

The number of species, taxonomic spectra, ecobioforms in the study areas of cyanobacteria and algae.

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Only those species of algae were identified that are unique for the rhizospheres of the studied plants. X, H forms of these yellow-green algae in the rhizosphere of Artemista absenthum: Ellipsoidion solitare Pasch, Gongrosiria debaruana Rabcuh.

In the rhizosphere of Fragaria viridis, Lyugbya mucicola Lemar predominates among the P-forms of cyanobacteria. In the rhizosphere of Rumex contertis, the P-form of cyanobacteria Leptoeyngbya, foreolarum (Robenh. Ex gom) Anagen is widespread. The rhizosphere is dominated by the cyanobacterial species Cardeus crispus and the C, Ch forms of the green algae Aphanacapsa conferto (Ct, G, Westi) Com, Chlorella vulgaris Beijer.

Phormidium autumale Gom and Schizothrix eardaceae Gom were found in all specimens when comparing the species in the sample with the area of the ruderal plant.

23 species of 11 species of plants, including 11 species of cyanobacteria, 7 species of green, 4 species of yellow-green and 1 species of diatoms, were identified in the rhizospheres of 11 plant species studied in the territory with 90% projective cover of Plantaginea majoris. For comparison, only 11 rounds were returned. Of these, 9 species were cyanobacteria and 2 species were green algae. The abundance of common algae in the rhizosphere varies significantly. The ecobioform of algae in the rhizosphere was different. The rhizosphere has a high percentage of CH and C forms. The percentage of P and Ch forms in the comparative samples is high. The taxonomic snack of the rhizosphere was different from the comparison. The taxonomic appetizer of the rhizosphere is noted.

The specific species identified in the Plantaginetta majoris area were C-forms of green algae in the rhizosphere Artemistia absentum Chamydomonos globasa (snovi) Docbyochloris frgeens vish. In the rhizosphere of Fragaria viridis, the P-form of cyanobacteria was Lyngbya muscicoba Lemm, in the rhizosphere of the species Rumex contertus, the P-form of cyanobacteria was Leptoeyngbya floveolarum (Rabenh. Ex Gom) Anagen et Com.

M, Ch forms Achillea miceifolium Shizothrix lardacea (Ces) Gom in the rhizosphere. Microcoleus vaginatus (Vauch) gom, Chlorosarcinopsis minor (hern) are unique species. P form of cyanobacteria in the rhizosphere Carduus crispus Leptolyngbya fovealarum, Rabenh. Ex Gom Anagn et Kom is a unique species.

Conclusion

Thus, the total number of algae and cyanobacteria in the rhizosphere of plants exceeds their number. The spectrum of comparative ecobioforms was dominated by unicellular C- and Ch-shaped species of tugai and synanthropic vegetation, while the fibrous structures of cyanobacteria prevailed in all areas. The predominance of life forms in the rhizosphere and in comparison with plants of ruderal vegetation was revealed. The taxonomic spectrum of cyanobacteria and algae is not rich. In the rhizosphere, the taxonomic spectrum of ecobioforms differs in all sections. Certain types of algae and cyanobacteria are unique to the rhizosphere of each plant. They differed in taxon and ecobioform.

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