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CYANOPROCARIOTES AND ALGAE OF FIELDS PLANTED WITH COTTON

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ANNOTATION

Soil fertility is one of the pressing issues of today. This article presents the types and derivatives of soil algae, their Systematics, determined from the soils of fields where acorns are planted. Activities such as the conduct of agrotechnical activities on field soils planted with Acorns, the implementation of irrigation, the feeding of acorns with mineral fertilizers caused the development of algoflora on these soils.

Keywords: algoflora, soils of acorns, soil samples, irrigation, arable land, water cultures.

INTRODUCTION

A number of issues, such as population growth from the largest global problems on Earth, greenhouse effect, freshwater problems, are also affecting the agricultural sector. New problems arise due to soil degradation, such as a decrease in crop yields, the occurrence of various diseases, it is important to determine from their optimal solutions the prospects for the study and practical introduction of previously poorly studied soil algae into the soil and the positive impact on crops in it.

LITERATURE ANALYSIS AND METHODS

For the first time, the taxonomic composition of algae distributed in the steppe, chalachol regions of Central Asia hususan Uzbekistan.A.Studied by Keller [118; P.223]. The Cyanophyta section, which is distributed on the soil surface, is described as standing on the Nostoc commune of the family Nostocacea of the Class Hormogoniophyceae, forming a component of the desert and chala desert flora.

N.N. Bolyshev and T.N.Yevdokimova was the first to identify algoflora of taqir soils distributed in our republic [5;128-135B.]. It has been found that the coverings on the surface of the ridges were formed by taxa of the order Cyanophyta Oscillatoriales.

The flora of algae distributed in the cultivated areas of Uzbekistan, hususan Tashkent region.Yu. Musayev learned. A monographic work dedicated to algoflora of cultivated fields in rich soils is a program for research application. The work substantiates the relationship of the taxonomic composition of algoflora with the irrigation system [67;129-133-b; 71:26-29.].

K.Yu.Musayev's scientific research is devoted to Boz soil and Mirzachol on the territory of the Samarkand region. The first work describes the taxonomic composition of algae identified in the typical gray soil and dark gray soils, detailed information on the distribution of algae in relation to environmental factors [63:58-62-b; 64:27-39-b.]. As a result, 97 taxa were identified and, according to their systematic composition, taxa from the Cyanophyta branch led numerically. The second work is in the ecological direction, and the distribution of algae,

depending on salinity in the soil, is described as generating changes in the composition of the dominant species. In the spring and autumn seasons, the number of species in the soil is noted to be higher than the others.

K.Yu. Musayev, V.P. Booth devoted his work to the study of the patterns of distribution of algae species across steep regions. On dark gravelly soils 1300 m above sea level, the Cyanophyta section is distinguished from the Oscillatoriceae family by the large number of species of filamentous taxa from others. Taxa of the order Nostocales, which can absorb molecular nitrogen from the Cyanophyta section, heterocystal from the Cyanophyta section, as well as orders from the Xanthophyta section, have recorded a high prevalence in soils at elevations of 2,000 meters and above [66; 48-54 b.].

When the composition of algae taxa distributed in the soils of the mountain area was studied, differences in the composition of taxa from different slopes were identified. The number of algae taxa on wet Northern Slopes has been known to be high in their drier southern areas.

When analyzed by studying the systematic composition of sovot taxa in the territory of the South West Tyan-Shan mountain range belonging to Uzbekistan, taxa belonging to the Cyanophyta section in the peat soils from 230 meters in height to 500 meters led among them in terms of the number of species of the order Phormidium, Oscillatoria, Borzia, belonging to the order In soils between 1300-2000 meters of the mountain region, Chlorophyta, Xanthopyta have partially recorded the dominant occurrence of species of their order belonging to the Cyanophyta sections. In the plateau soils of 2,500 and above sea level, the Chlorophyta and Xanthopyta sections of the Cyanophyta section have been reported to have a widespread distribution of succulent sediments of their order.

The taxonomic composition of algoflora distributed in Myrzachal soils, the newly acquired land that has been under cultivation for many years.Yu. Musayev learned. About the distribution of algae taxa in the tproq of arable land in the Karakol District of Bukhara region K.Yu. Cited in Musayev's data [70; 94-97 P.].

K.Yu. Musayev's U.N. Research work in collaboration with Toshmuhammedov has found that species of their order from the Chlorophyta section to the Chlorococcales and Cyanophyta section are abundant from their undeveloped soils. Acorn fields with a long period of cultivation have been found to have high biodiversity of species of the Cyanophyta Section [68; 82-84-b.].

K.Yu. Musayev and Sh.U. The umarovs recorded that the biological diversity of algoflora in Acorns planted soils consisted of 212 species [67; 129-133b]

Sh.J. Tagibayev, K.Yu. Musayev has identified 67 species of blue-green, 27 species of Green, 7 species of diatom, 7 species of yellow-green and 3 species of Euglena algae from soils in the rhizosphere of higher plants in 14 families. 41 species have been recorded from the rhizosphere of plants in the family Virgo, 37 taxa from the fern, and 35 taxa from the compound Fern. Families of tomatoes, Saltmarsh, labguldash, the presence of 21-27 taxa in the rhizospheres of plants, 7-14 taxa from the rhizosphere part of representatives of gulhyridosh and umbrella family have been recorded. In all cases, there were many people with filamentous structures. The distribution of algae in the rhizosphere was influenced by the vegetation period of the plants [90; 128-129-b.].

The method of determining soil algae is divided into 3 stages:
1) collection of soil samples;
2) determination of the taxonomic composition of soil algae;
3) determination of the amount of algae.

The generally accepted rules for collecting soil samples for algological research were followed, namely, procedures for proper sample collection, sterility, sample labeling and storage, plant layer, and soil study. Plants of the place of choice for collecting specimens, land area, agrotechnics, soil characteristic were studied. All this information was recorded in the field journal. Analysis of soil and microflora and plants was carried out simultaneously when collecting a sample during studies. When studying the seasonal dynamics of algae at the same time as collecting soil samples, the moisture content of the soil, the general appearance of the surface, the level of moisture, the mechanical composition of the soil were taken into account.

Initially, samples were taken from the surface part of their soil (0-2.3 cm), a "cut" was prepared for sampling. First of all, the soil surface was surveyed. Green, blue-green or brown coatings on the soil, the presence of spots visually indicate the degree of coverage, in particular, to the mycorrhoean assessment. Then, at the most typical place, a soil surface was collected with algae 1cm thick. The soil was obtained by removing samples from the surface layer without damaging the surface covered with algae and keeping the soil sample intact. The sizes of such samples vary, and the more algae are mixed and evenly spaced, the smaller the size of the sample can be. Samples were taken from a sample area of 10-50 cm2. Samples were placed in special packages pre-sterilized by adding an S horizon over genetic horizons. Sampling began from the upper horizon.

Figure 1. According to the first method of determining soil algae, taking samples of soil from surface layers

The samples were made dry. This does not affect the determination of the taxonomic composition of algae in it in full [14; 223-225-b; 43; 144-b.]. To obtain samples of soil and algae, solid papers, closed envelopes, sachets were used as packaging material. Such packaging was sterilized before going out into the field. Long-distance transportation of samples was placed in a box or cardboard box to avoid damage. The collection was inscribed withthe sample number, depth and Horizon, and the date of collection.

According to the second method of determining soil algae, the water culture method was used to determine the taxonomic composition of soil algae. The samples obtained were planted in the method of aquaculture and stored in places where light fell. During the study, S.N. Vinogradsky and E.A. Shtina methods were used [43; 144-b; 44; 62-68-b.]. Before calculating algae in the soil, it was divided into fractions by centrifugation. For this, fractions were used that kept algae in themselves. The soil sample was shaken in 4 ml of water for 2 minutes (in formalin if the samples were attached), after half a minute of tinting, the suspension on the sediment was poured into a cenrtrifugation container, 3 ml of water was added to the remaining soil, 1minute was shaken, half a minute was infused, and again placed in a centrifugal container. After 3 washes the sink was abandoned because this sink does not contain algae in itself, the attached suspension was separated into 2 or 3 centrifugal tanks, manually mixed for 2 minutes, taking into account its density at the same capacity. Each of the remaining sediment was transported to Meyor with a certain amount of distilled water, which was studied according to the thickness of the suspension (10-20 ml). After thoroughly rinsing the sediment, a drop of the drug was studied, and the taxonomic composition of the algae seen in it was determined using the appropriate “clarifiers” [2; 3-10-B; 9; 329-335-b; 10; 335-339-b; 11; 248-b; 12; 350-b; 23; 200-201-B; 24; 249-258-b; 27; 405-407-b; 288; 406-418-B; 29; 816-915-B; 30; 51; 600-604-B.]. A total of 159 species of algoflora were identified from the samples taken.

From the samples taken, the amount of algae was determined. The number of algae cells in the soil is E.A.Calculated by the method of Shtina (1969). To determine the amount of algae, several squares with an area of 1sm2 and a thickness of 1-2 mm were cut and recorded for the calculation. In the presence of a macroscopic layer, for example Nostoc commune or N. by collecting sphaeroides from a specific region – 1dm2 or 1m2-they were found to be mass [44; 62-68-b.].

To determine algae in the soil thickness, samples with a specific mass of 20-50 G were taken, the number of samples depends on the size and uniformity of the determined area. From the planted soils, a mixed sample weighing 20-50 g was taken from 8-10 initial samples. To determine the amount of soil, an average sample was taken – from 1G or 1sm2. Taking into account the sharp decrease in the amount of algae in the depth of the soil cut, each sample was taken from a specific soil layer and the entire soil profile. Samples were taken from soil layers at depths of 0-10, 10-20 cm. Soil culture is the simplest method (Fritsch John 1942). The soil studied was placed in a sterilized Petr or Cox's Cup and placed in a bright spot in a wet state. Distilled water and a nutrient solution were used for soaking. Advanced algae were seen in microscopy. In order to determine the number of algae cells, samples are stored in a 4% formalin.


Figure 2. Soil culture preparation samples taken to identify algae

In addition to these methods, research of algae in the rhizosphere has also been carried out. To do this, the root system of the plant in the research area was dug out from a depth of 10-15 cm, leaving a layer of 1-2 mm and tripping the soil from the root, which was collected and used for research with a sterile scalpel. In all cases, samples were taken with a sterile instrument - a knife, spoon, cool. In field conditions, sterilization was carried out only by immersion in alcohol and then burning. The algae in the samples were placed in a test tube or sklyanka for registration and fixed with 4% formalin. 1sm3 used a specially designed chalk to measure the soil (Afanasyev).

RESULTS

Many species of algae have been identified from the soils of the fields where acorns were planted compared to other fields. Activities such as the conduct of agrotechnical activities on these field soils, the implementation of irrigation, the feeding of acorns with mineral fertilizers caused the development of algoflora on these soils. More than 48 samples were taken from these fields.
Winter soil samples 19.01.2020. at 0-5 cm the surface temperature is 1 0C, at a depth of 10-12 cm 2 0C, at a layer of 45-50 cm 5 0C, humidity 50%. All the soil samples taken were planted in flasks with all the rice of algae, Nostoc linckia, f. muscorum, N. punctiforme, Anabaena variabilis, A. variabilis f. the rotundospore developed in a curtain on the surface of the solution. Apart from these, all flasks from Green chlorococci contain Dictyococcus mucosus, Protosiphon botrydioides, Chlrococcum humicola, Chlorella vulgaris, Ch. representatives of the order ellipsoidea, Palmella miniata and Chlamydomonada Ch. ablonga, Ch. spesiosa, Ch. atoctagama and Ch. globose evolved. Chlorococum humicola, Chlorella vulgaris cells Lyngbya martensiane f. in combination with edaphyca threads, a lot was met. In the veil on the surface of the solution, along with other algae, representatives of the family Ulothrichaceae – Microspora tumidula, Chlorhormidium flaccidum, Ulothrix tenerrima, Stichococcus minor-were recorded in much larger quantities. On the surface of the soil planted at the base of the flask are Cylindrospermum catenatum, Phomidium molle, Ph. angustatum, PH. foveolarum, Ph. jadinianum, Lyngbya limnetica, L. martensiana f. edophyca, Calothrix elenkinii developed. In the surface curtain, along with the above, the diatom is represented by algae Navicular atomus, N. eryptocephala, N. minima, N. muralis, Pinnularia silvatica, Hantzschia amphioxys, H. amphioxys f. capitate, Nitzschia amphibia, N. linearis, N. palea et al. In addition to these, the soil can be grown from its own Diatoma vulgare, Denticula elegans, Navicula atomus, N. cryptocephale, N. minima, N. muralis, Hantzschia amphioxys, H. amphioxys f. capitate, Nitzschia amphibia, N. linearis, N. palea cells were found.

In aquatic cultures, Hantzschia amphioxys cells developed by barking, which is commonly found in Phomidium molle, PH. recorded with angustatum threads.

The development of cyanoprocariotes is also evident in winter soil samples from fields where acorns are planted. Of these, Nostoc linckia f. muscorum, N. punctiforme, Anabaena variabilis, A. variabilis f. rotundospora, Cylindrospermum catenatum, Calothrix elenkinii, Phormidium angustissimum, Lyngbya limnetica are from cyanobacteria, from green algae Chlomydomonas speciose, Ch. species have evolved from atoctogama, Palmella miniata, dictyococcus mucosus, Chlorococcus humicola, Chlorella ellipsoidea, Microspora tumidula, Ulothrix tenerria, diatom algae to Navicula atomus, Hantzschia amphioxys and others. In winter specimens, Nostoc linckia f. muscorum, N. azotfixators such as punctiforme, Anabaena variabilis have developed well.

In winter specimens, 47 species were identified from the soils of the Acorn fields, species Hill, 16 species from under the evicted floor.

Spring soil samples on April 19, 2020 15-16 0C at 0-5cm surface, 14 0C at 10-12 cm depth, 12 0C at 45-50 cm layer, humidity 42%. The spring soil evolved in the specimens from green algae to algae of the Chlorococcales and Chlamydomonadales orders in the tube wall in a prominent way. In cultures, Gloeocapsa turgida f. subnuda, Anabaena variabilis f. rotundospora, A. cylindrical f. hollerbachiana, Nostoc linckia f. muscorum, Cylindrospermum lichoniforme, Tolypothrix tenuis, Oscillatoria amoena, Phormidium farealorum, lyngbya martensiana f. edaphyca, Chlamydomonas speciose, Ch. atoctogama (abundant), Dictyococcus mucosus, Protociphon botryoides, Chlorella vulgaris (abundant), Characium strictum, Trochiscia granulate (scarce), Scenedesmus bijigatus, Ankitrodesmus convolutes var. minimum, A. falcatus f. terrestris diatom from algae Navicula atomus, N. silicea, Hantzschia amphioxys and other species developed.

In addition to those noted above in the soil samples obtained Cylindrospermum catenatum, Plectonema puteale f. edaphycum, P. boryanum, Microspora tumidula, Ulothrix tenerrima, Microtamnion kuetzingianum, Bumillariopsis brevis, Heterothrix baristoliana and together with them from diatom algae Navicula atomus, N. cryptocephala var. Intermedia, Pinnularia silvatica, Hantzschia amphyoxys, Nitzschia lincapus were identified.

In spring soil samples taken in Acorn field areas, the species of the order Chlamydomanada with the species of the order chlorococci from green algae also developed well, they were recorded many times. In addition to these, Gloeocapsa turgida f from cyanoprocariotes. Subnuda, Anabaena cylindrical f. hollerbachiana, Cylindrospermum lichoniforme, Tolypothrix tenuis, Plectonema puteale f. edaphycum was also recorded on most march.

Thus, a total of 50 species, species varieties, were identified from spring soil samples taken from Acorn fields. 14 species of algae were recorded from the soil under the expelled layer.

Summer soil samples from the Acorn field on June 20, 2020, the soil temperature on the surface of 0-5 cm was 24 0C, at a depth of 10-12cm-23 0C, in a layer of 45-50 CM-21 0C, humidity 40% (the day after watering). Algae are well developed due to the fact that irrigation is carried out despite the air temperature of 30-35 0C. After each watering, the rows of acorns with a tractor are loosened and mineral feeding is carried out on demand. The agrotechnical activities carried out, along with the Acorn, also have a positive effect on the activity of algae in its soil. In flasks with summer soil samples from cyanoprocariotes Phormidium foreolorum, PH. Lamminosum,

Ph. Tenua Lyngbya martensianaf. Edaphyca L. lagerhemii f. edaphyca, Plectonema boryanum, chlorococcus, humicula and chlorella vulgaris developed. The curtain on the solution surface in the flask contains Protosiphon botryoides, Scenedesmus cuadricanda, S. Bijugatus, Ankistrodesmus falcatus f. terrestris, A. from brauni, Chlorhormidium flaccidum, Ulothrix tenerrima, Bumilleriopsis brevis, Tribonema minus, Heterothrix bristoliana and diatom algae, Navicula atomus, Hantxzschia amphioxys, Nitzschia palea, etc. In the veil formed at the base of the flask, Cylindrospermum michailovskence, Oscillatoria nigra, Borzia trilocullaris, Phormidium, etc. Here Cyclotella cuetzingiana Diatoma vulgare from diatom algae, Synedra tabulate var. facciculata, S. ulna, Achnanthes linearis, Navicula atomus, N. minima, N. sillecia, N. radiosa, Pinnularia gibba, Hantzschia amphioxys, Hitzschia palea, etc. In addition in summer specimens from diatoms Cyclotella cuetzin giana, tabellaria flocculosa, T. tenestrata, Meridian cicrulara and Diatoma vulgare, Synedra tabulata var. facciculata, S. ulna, Navicula bacillum var. elongate, N. radiosa, N. viridula var. pamiriensis, Pinnularia gibba, P. viridis var. fallé et al.

Summer Sample flasks contain Cylindrospermum michailovskoense, Oscillatoria nigra, Phormidium foveolarum, laminosum, Ph. Tenue, Lyngbya marten siana f. edaphyca, L. lagerhemii f. edaphyca, Plectonema boryanum from cyanobacteria; Scenedesmus quadricanda var from green algae. africana, Ankistrodesmus falcato fiter restris, A. Braunii, Chlorhormidium flaccidum, Ulothrix tenerrima, Microtamnion cuetzingina, bumillariopsis brevis from yellow greens, Tribonema minus, Heterothrix bristoliana and Synedra tabulate var from diatom algae. Fasciculate, Navicula atomus, Nisilicae, Hantzschia amphioxys, Nitzschia amphibia developed well. Named species and species varieties have become abundant in our specimens, developed well in cultures.

A total of 67 species and subspecies were identified from summer specimens from Acorn fields. 17 species were recorded from the soil under the plowed soils.

Autumn soil samples were taken on October 21, 2020 at a surface temperature of 0-5 18 0C, a depth of 10-12 cm 17 0C, a layer of 45-50 CM with a humidity of 32%. By autumn, the acorns had not been irrigated. There was not much precipitation. In October, “germination” of acorns consisting of green chlorococci was also noted on some soils of acorns. In autumn soil sample cultures, the solution line in the flask includes Merismopedia tenuissima from cyanoprocariotes, Gloeocapsa punctata, Oscillatoria brenis, O. Amoena, Phormidium curtum: Chlorococcum humicola from green algae, Ch. infusionum, Chlorella vulgaris, Ch. terricola, Chloroplana terricola, Characterium ovatum f. minus, Scotiella levicosta, Keratococcus bicandatus, etc. The curtain, which completely covers the surface of the solution, contains Nostoc linckia f. Muscorum, N. Linckia f. Humifusum, N. Punctiforme f. Populorum, Anabaena cylindrical f. Hollerbachiana, Plectonema tenue, Lyngbya martensiana, Protosiphon botryoides, Scenedesmus obliquus var. alternans, Chlorhormidium floccidum, Ulothrix tenerrima, Stichococcus minor, Bumillariopsis brevis, Heterothrix bristoliana and with them from diatom algae Navicula atomus, N. minuscula, N. miniata, Niradiosa, Denticula elegans, Hantzschia amphyoxys, Nitzschia amphibia, nipalla developed. Microcystis pulverea f in the curtain, which is characteristic of the inside of the solution and at the base of the flask. minor, Nodularia harveyana f. Sphaerocarpa, Scytonema ocellatum, Gleothrichia natans, Phormidium circum, Plectonema radiosum, Hypomonas chlorococcoides and others, Cyclotella kuetzingiana from

diatom algae, C. Moneghiniana, Synedra amphicephala, S. tabulate var. Acuminate, Navicula minuscula, N.radiosa, Pinnularia gibba, Hantzschia amphyoxys, Nitzschia amphibia, N. vermicularis and N. palea defined. Soil samples were taken from itself by Cyclotella meneghiniana, C. cuetzingiana, Tabellata flocculosa and Synedra amphicephala, Achnantes hungarica, Stauroneis anceps, Navicula contenta, N. Exigua, N. Minuscula, N. Empty cells of Radiosa, Gomphonema constrictum, Rhapolodia gibba, Nitzschia ventricularis and others were identified.

DISCUSSION

Out of a total of 48 soil samples, 143 species and species belong to Chile, of which cyanoprocariotes 52, Greens 37, yellowtails 3, and 51 species of diatom algae were identified.
The information provided indicates that the soils of the Acorn fields are rich in species of algae. Algae cells also come to this when watered from the irrigation network of acorns. Therefore, real water forms were also recorded a lot.

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