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STUDY OF PHYSICAL-CHEMICAL PARAMETERS, GREEN MASS AND BIOLOGICAL ACTIVITY ON RECULTIVED LANDS IN THE TERRITORY OF ABSHERON PENINSULA

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Abstract. Today one of the biggest problem in the world is the increasing of the pressure on the environment as a result of technogenic development's reaching a larger scale. In other words, the role of anthropogenic influences in the ecological crisis has reached its peak that it manifests itself shows in abnormal climatic conditions, increasing natural disasters, and so on. Most countries have already been forced spending more power for overcoming these consefuences. Of course, it has also been materializing various measures to solve environmental problems in our country that have existed for many years. In spite of this environmental problems in the country are still actual.A number of activities have been carried out to determine the biological activity in the reclaimed areas of Bibi-Heybat OGEİ. First, the names of natural cenoses and their species were identified among the tree trunks. Here are some of them: saline-solsola pestifer Nels; garden butterfly-portulaca oleraceal; leafless killer-anabasis solsa (C.A May) Beuth ex Volkens; willow, water reed-Rudmace cots tail Typha L.; gavan-barkhausia rhoeadifolia Bub; unnuca-diacece Less-Chenopodium ollum; lamb-sow thisthe SonchusL.Ocom; clover-; wormwood Artemisia L.; invitation-Alhagi camelorum and others. It grows 1-1.5 m in the area. Research work was carried out in the reclaimed area of SOCAR Bibi-Heybat OGEİ. Samples were taken to determine the tota l number of microorganisms in every 10 cm of soil to a depth of 0-30 cm, and soil samples were taken and analyzed to study the amount of organic matter and the physical and chemical properties of the soil, depending on the degree of contamination. The cut area is 3.2 hectares. The morphogenetic profile of the placed sections is given.

Key words: oil pollution, nutrition elements, bio-recultivation, microorganisms, fertility.

INTRODUCTION

The increase in the world's population and the consequent rapid development of industry and agriculture, as well as the negative impact of human activities on the environment, can be considered one of the most difficult global problems of our time. Thus, people are constantly using nature and natural resources for their lives and activities. As a result of this activity, they have a negative anthropogenic impact on the environment.

This worsens the environment, reduces the activity of biogeocenoses, renews fertile soil, and requires significant labor and material resources to improve it. Currently, oil and oil products are the main toxic substances in the soil, which have a negative impact on fauna and flora.

Increasing control over the use of land resources in the Republic of Azerbaijan, restoration, increase, protection of natural fertility of lands that lost their fertility and degraded lands during the period of social economy, etc. Many such issues have been studied in depth and comprehensively for the first time [1].

Due to the increase in oil and gas production in Azerbaijan, environmental problems are more prominent, and the solution of these problems is a priority, especially in the Absheron Peninsula, because the Absheron Peninsula (especially the territories of oil and gas departments) is one of the most ecologically tense regions of the country.

Oil pollution has a profound effect on natural components, changing the components of the landscape. In this case, along with the change of land cover, flora and fauna, it leads to a complete change in the morphological layers of the landscape, desertification of large areas. This, in turn, is a system of measures aimed at restoring

the landscape, creating a fertile soil layer, increasing productivity, and protecting nature, taking into account all the requirements of society. One of the main components of landscape optimization is the reclamation of oil-contaminated lands.

Experience has shown that agro-hydro and bio-ameliorative measures (phytomelioration-planting of perennial grasses, phytoremediation-oil-oxidizing microorganisms and reduction of pollution with oil-tolerant plants) should be added to the processes of cleaning, rehabilitation, rehabilitation and return of oil-contaminated soils. mechanical reclamation (area cleared of oil sludge, oil-contaminated soils and wastewater, the depressions formed are smoothed with a pin, and then covered with a certain level of imported soil) and biological remediation (soil is softened by mixing, organic and inorganic fertilizers, emulsifiers, enzymes, enzymes, enzymes). is added, straw is sprinkled, then the area is irrigated, trees and shrubs are planted in accordance with the season and climatic conditions of Absheron, permanent care is carried out) stages are expedient. It should be noted that while 25 % of trees are allowed to grow on lands where no trees have ever been planted, 70 % of trees planted in Bibiheybat zone are likely to turn green, and therefore about 80,000 trees have been planted in a short time in Bibiheybat cleared area.

People need to take active and purposeful measures to create a new productive and sustainable natural complex that will meet human needs in a relatively short period of time in areas degraded by the oil industry. In this case, an urgent problem is raised, such as land reclamation. Land reclamation is a relatively new direction in practice, especially in theory. Recently, practical steps have been taken in our country to clean the lands from oil products. In the Absheron Peninsula, where there is a lack of productive lands for agriculture and farming, the reclamation of lands contaminated with large oil products for many years is of great economic importance today.

The area of oil-contaminated lands in Absheron is 11 % of the peninsula's territory. The depth of the layer contaminated with oil and oil products reaches 2.0-2.5 meters. The amount of oil products in the soil is up to 26 % [2].

In order to study the morphological-genetic and agrochemical properties of this type of pollution, the area was selected in the territory of Bibi-Heybat OGEI and land plots were laid.

Along with the man-made degraded soils of the Absheron Peninsula, many researchers have been engaged in the study of normally developed soils. They commented on the prevalence of gray-brown soils and the role of clayey Caspian sediments in the formation of these soils. A number of researchers [3, 4] have reported that normally developed (gray-brown) soils are more susceptible to degradation as a result of anthropogenic impacts.

In general, anthropogenic impacts on land cover have been predicted to increase over the next 3,000 years as human demand for agricultural products increases.

Therefore, some researchers recommend the use of a three-field crop rotation system when using land.

MATERIALS AND METHODS

In order to study the agrochemical properties of semi-desert primitive gray-brown soils contaminated with oil wastes and covered with these wastes, we studied the granulometric composition, humus, fatty-resinous substances, absorbed Ca, Mg, Na, total water content, carbonate, soil and soil-soil environment Fertility indicators such as (pH) and nutrients (N, P, K) were analyzed.

One of the key issues is to study the biological activity of lands contaminated by the oil industry after recultivation of oil -contaminated lands in the Bibi-Heybat OGEİ in order to restore the productivity of lands contaminated by the oil industry and

return them to use for various agricultural crops. The biological activity of soils is mainly biological activity. Although the fertility of soils contaminated with oil and its products depends on its physical and chemical properties, the role of widespread microorganisms is undeniable, because microorganisms play a role in soil structure and biochemical processes. active participation leads to its revival. Microorganisms are an integral part of the soil.

Although microorganisms are subject to quantitative and qualitative variability in unfavorable environmental conditions, they are not completely destroyed. However, this process is very long and takes hundreds of years [5].

The complete mineralization of oil in the soil by natural microorganisms, its decomposition into carbon dioxide and water is a biochemical process. Thus, microorganisms that break down hydrocarbons are considered permanent components of soil biocenoses and are used as a catalyst in the recovery of oil-contaminated soils. Cleaning of oil-contaminated soils can be carried out by microorganisms in two ways: I-increase the metabolic activity of natural microflora by affecting the physical and chemical properties of the soil; II-transfer of active oil-oxidizing microorganisms from natural microflora to oil-contaminated soils [6].

RESULTS AND DISCUSSION

A number of activities have been carried out to determine the biological activity in the reclaimed areas of Bibi-Heybat OGEİ. First, the names of the natural cenoses and their species were identified among the tree trunks [7]. Here are some of them: salty-solsola pesticide Nels; garden butterfly-portulaca oleraceal; leafless killer-anabasis solsa (C.A May) Beuth ex Volkens; willow, water reed-Rudmace cots tail Typha L.; gavan-barkhausia rhoeadifolia Bub; unnuca-diacece Less-Chenopodium ollum; lamb-sow thisthe SonchusL.Ocom; clover-; wormwood Artemisia L.; invitation-Alhagi camelorum and others. It grows 1-1.5 m in the area. Research work was carried out in the reclaimed area of SOCAR Bibi-Heybat OGEI. Samples were taken to determine the total number of microorganisms in every 10 cm of soil to a depth of 0-30 cm, as well as the amount of organic matter depending on the degree of contamination and soil samples were taken and analyzed in order to study the physical and chemical properties of the soil. . The cut area is 3.2 hectares. The morphogenetic profile of the placed sections is given.

We give a morphogenetic description of the section. Section 1 is located on a smooth terrain near the road to the AZFen plant to the right of the checkpoint when it enters the oil field from the east of the site. The plant is buried in sparse wormwood, ephemerals, dahlias, sam and olive trees in the field.

Sector 9. Section 1. 0-20 cm layer light gray, granulometric composition lightly clayey, unstructured, firm, root, rhizomes, gradual transition, dry, very heavy boiling. 20-38 cm - light clayey, soil structure, light yellowish, hard , weak eyes, small stones, roots, moist, clear transition, severe boiling. 38-75 cm - sandy, dark yellow, unstructured, hard, smooth, single shell, transition gradually, medium boiling. 75-120 cm- the top layer is the same. Section 2. 0-16 cm - granulometric composition lightly clayey, color light gray, unstructured, hard, dense root, rhizomes, small smooth stones shell, (small and large), clear transition very severe. 16-45 cm - lightly clayey, (bottom part sandy), color light gray, unstructured, hard, white kip eyes, weak roots, wet, clear transition, severe boiling. 45-90 cm - sandy, light gray-brown, unstructured, hard, shell, clear transition , severe boiling. 90-110 cm - sandy, sandy, gray-brown, unstructured, grayish, moist, small stones, clear transition, severe boiling. Section 3. 0-30 cm- granulometric composition is clayey, color gray-brown, unstructured, fine-grained, firm, root, rhizomes, dry, very

small stones, gradual transition, boiling point (10 % HCl) is severe. 30-64 cm - clayey, light gray-brown, unstructured, hard, weak roots, small stones, shell, sparse very weak eyes, weakly moist, gradual transition, severe boiling. 64-95 cm - light clayey, light gray-brown, unstructured, soft, weak eyes, small roots, moist, medium boiling. 95-125 cm - sandy, light gray, unstructured, soft, moist, gradual transition, weak boiling.

Table 1 shows the granulometric composition of contaminated soils in the territory of Bibi-Heybat OGEI. The amount of physical clay in section 1 (<0.01) is between 8.20-12.60 % and varies in the soil profile. The analysis shows that this section is sandy soils. The granulometric composition of the soil in section 2 is considered to be sandy soils according to the amount of physical clay. Here the amount of particles varies between 9.40-15.40 %. In section 3, the granulometric composition of the soil in the top layer of 0-30 cm is 26.72 % clayey layer. However, the granulometric composition of the soil towards the lower layers is sandy and loamy.

Table 1 - Granulometric composition of gray-brown soils contaminated with oil in the territory of Bibi-Heybat OGEI

Particle size (mm)								
Depth (cm)		1,0-0,25	0,25-0,05	0,05-0,01	0,01-0,005	0,005-,001	< 0,001	< 0,01
Sector 9								
1	0-20	23,15	31,89	36,76	2,72	4,00	1,48	8,20
	20-38	7,61	46,39	33,40	3,92	7,88	0,80	12,60
	38-75	5,02	56,86	27,16	2,16	7,66	1,14	10,96
2	0-16	23,43	46,85	21,32	3,36	5,24	0,80	9,40
	16-45	21,04	29,56	34,00	8,68	5,52	1,20	15,40
	45-90	25,06	26,54	33,10	7,58	4,52	3,20	15,30
	90-110	20,26	35,02	30,40	6,45	5,30	2,57	14,32
3	0-30	6,62	36,82	29,84	10,04	14,00	2,68	26,72
	30-64	26,76	28,36	28,27	5,64	8,16	2,80	16,60
	64-95	6,16	20,64	35,00	8,04	8,56	1,60	18,20
	95-125	2,50	44,90	38,96	6,84	5,28	1,52	13,64

As can be seen from the table, these soils are low in humus. The amount of humus is 1.21-1.16 % in the upper layer and 0.82-0.60 % in 20-30 cm in the lower layers. Salinity of 3 % contaminated soils was determined in the established vegetation experiment.

Table 2 - Brief water content in the lands of Bibi-Heybat OGEI (3 % pollution)

Depth (cm)		CO_3^{11}	HCO_3^1	Cl^1	Dry residue %
clayey					
1	0-20	no	0,021 0,35	0,114 3,25	1,100
	20-40	-	0,024 0,40	0,131 3,75	1,133
	40-60	-	0,015 0,25	0,126 3,60	1,560
2	0-20	-	0,015 0,25	0,378 10,80	2,623
	20-40	-	0,021 0,35	0,168 4,80	1,205
	40-60	-	0,021 0,35	0,147 4,20	1,168

As can be seen from table 2, the dry residue in clayey soils is between 1,100 % and 1,560 %, and in sandy soils, 0.6 cm in the upper layer and 2.623 % in the lower layers, gradually decreasing to 1.168 %. The salt content is sulphate-chloride-calcium. Compared to previous years, the amount of salts in these soils has increased.

The organic content of the soil is mainly humus. Humus is the main factor that ensures soil fertility and nitrogen nutrition of plants. In addition, it is important to determine the humus in the agronomic assessment of the soil. The soils of the study area are low in humus. The amount of humus in the upper layer is 1.46-1.16 %, gradually decreasing by 20-30 cm in the lower layers and is 0.64-0.60 %.

It is known that the role of microbiocinoses and bacteria in the restoration of soils contaminated with oil products is great. It is based on microorganisms that break down oil. Due to the poor supply of nutrients to the soils of the Absheron Peninsula, it is especially noticeable that these soils are poorly supplied with microorganisms. In our research, we also determined the total number of microorganisms in the reclaimed lands in the territory of Bibi-Heybat OGEI. While the total number of microorganisms in these soils is 1922.32-1895.98 thousand/g in the upper layer, the total number of microorganisms decreases sharply as the amount of humus decreases to the lower layers, and their number in 1 gram of soil fluctuates between 1790.60-813.26 thousand. The number of microorganisms in this area depends mainly on the amount of humus in the soil.

Table 3 - Amount of green mass per 1m^2 of reclaimed lands in the territory of Bibi-Heybat OGEI

Names of plants		Wet weight each in grams of the speciesamount	Wet weight each % amount of species
1	Shoranga - *Salsola pestifer Nels*	708,15	7,08
	Garden curtains -*Portulacal Olecracec L*	315,78	98,02
	chiyan-*Rudmace cats tail TyphaL*	620,22	6,20
	Horse feed -*Asteraceu Dumart*	900	9,0
	Wormwood -*Artemisia L*	1112	11,12
	Davatikani-*Alhagi camelorum Fich*	1350	13,50
	Unluca-*Dfiacece Less-Chenopo Odium ollum*	582	5,82
			∑ 55,88.
2	Names of plants	Wet weight each in grams of the species amount	Wet weight each % amount of species
3	Shoranga - *Salsola pestifer Nels*	675,92	6,75
	Garden curtains -*Portulacal Olecracec L*	452,15	4,52
	chiyan-*Rudmace cats tail TyphaL*	792,00	7,92
	Horse feed -*Asteraceu Dumart*	1300	13,0
	Wormwood -*Artemisia L*	920,28	9,20
	Davatikani-*Alhagi camelorum Fich*	850,62	8,50
	Unluca-*Dfiacece Less-Chenopo Odium ollum*	1650	16,50
			∑66,40

Continuation of the table 3

4	Names of plants	Wet weight each in grams of the speciesamount	Wet weight each % amount of species
5	Shoranga - *Salsola pestifer Nels*	282,13	2,82
	Garden curtains -*Portulacal Olecracec L*	175,89	1,75
	chiyan-*Rudmace cats tail TyphaL*	320,12	3,20
	Horse feed -*Asteraceu Dumart*	560,80	5,60
	Wormwood -*Artemisia L*	398,15	3,98
	Davatikani-*Alhagi camelorum Fich*	912,58	9,12
	Unluca-*Dfiacece Less-Chenopo Odium ollum*	985,23	9,85
			∑ 36,34

According to P.A. Samadov's research, the number of microorganisms in oil-contaminated soils varies in different parts of the Absheron Peninsula. This figure depends on the vegetation, the type of cultural and natural cenoses. P.A. Samadov notes that the total number of microorganisms in 10.6-13.0 % oil pollution of the soil decreases by 2835 thousand/g compared to unpolluted soil and falls to 500 thousand/g. In higher soil contamination, the total number of microorganisms decreases to 425-300 thousand/g [8].

During the research, the names of natural cenoses growing in sections on the reclaimed soil were determined and the total amount of green mass per 1 m^2 per plant was determined separately and comparatively. (table 3.)

As can be seen from the table, the green mass of plants per 1 m^2 area around the first section is 708.15 g (7.08 %) of saline, 315.78 g of garden mulch. (3.15 %), licorice 620.22 grams (6.20 %), horse feed 900 grams (9.0 %), wormwood 1112 grams (11.12 %), invitations 1350 grams (13.50 %) , unnuca 582 gr. (5.82 %), while in the other section No. 7 in the area of 1 m2 the above-mentioned plants are relatively minor. In general, as mentioned in the Table, natural cenoses are 55.88 % of the green mass per 1 m^2 area around the first section, relatively 66.40 % in the third section, and very little 36.34 % in the other section.

CONCLUSION

1. As a result of the research, it was found out that during the extraction, refining and transportation of oil and gas in the Absheron Peninsula.As a result of spilling out of oil and oily mineral water on the surface of the soil and having a sign such as fuel oil -bitumenization, formed cover of fuel oil and bituminous mass on the surfaces.

2. Soil analysis was carried out on samples taken from the territory of Bibi-Heybat OGPD, granulometric composition and salinity of the area were determined in the background and oil-contaminated soils.

3. During the research, the names of natural cenoses growing in sections on the reclaimed soil were determined and the total amount of green mass per 1 m2 per plant was determined separately and comparatively.

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ТҮЙІН

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АБШЕРОН ТҮБЕГІ АУМАҒЫНЫҢ РЕКУЛЬТИВАЦИЯЛАНҒАН ЖЕРЛЕРІНДЕ ТОПЫРАҚТЫҢ ФИЗИКАЛЫҚ-ХИМИЯЛЫҚ ПАРАМЕТРЛЕРІН, ЖАСЫЛ МАССАСЫН ЖӘНЕ БИОЛОГИЯЛЫҚ БЕЛСЕНДІЛІГІН ЗЕРТТЕУ

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Әзірбайжанның экологиялық проблемалары тек ел халқына ғана қауіп төндіріп тұрған жоқ. Олар жаһандық экологиялық проблемалардың бір бөлігі. Экологиялық дағдарыстағы антропогендік факторлар ең жоғары деңгейге жетті және аномалды климаттық жағдайларда, табиғи апаттардың көбеюінде және т.б. Көптеген елдер осы салдарды жеңу үшін көп күш жұмсауға мәжбүр болды. Экологиялық проблемаларды шешу үшін түрлі шаралар, сондай-ақ біздің елімізде көптеген жылдар бойы бар. Осыған қарамастан, елдегі экологиялық проблемалар әлі де өзекті. Бибі-Эйбат МГӨБ мелиорацияланған аумақтарындағы биологиялық белсенділікті анықтау бойынша бірқатар іс-шаралар жүргізілді. Табиғи ценоздардың атаулары және олардың түрлері анықталды-тал, қамыс, беде, жусан және басқалар. Зерттеу жұмыстары SOCAR Бибі-Абат МГӨБ қалпына келтірілген аумағында жүргізілді. 0-10 см тереңдіктен 0-30 см тереңдікке дейін микроорганизмдердің жалпы санын анықтау үшін топырақтың орташа сынамалары алынды. Топырақтың қарашірігі мен физика-химиялық қасиеттерін анықтау үшін топырақ үлгілері алынды. Зерттелген кесінділердің морфогенетикалық профилі келтірілген

Түйінді сөздер: мұнаймен ластану, тамақтану элементтері, биорекультивация, микроорганизмдер, құнарлылық

РЕЗЮМЕ

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ИЗУЧЕНИЕ ФИЗИКО-ХИМИЧЕСКИХ ПАРАМЕТРОВ, ЗЕЛЕНОЙ МАССЫ И БИОЛОГИЧЕСКОЙ АКТИВНОСТИ ПОЧВ НА ОСУЩЕСТВЛЯЕМЫХ РЕКУЛЬТИВИРУМЫХ ЗЕМЛЯХ ТЕРРИТОРИИ АБШЕРОНСКОГО ПОЛУОСТРОВА

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Экологические проблемы Азербайджана приобретают угрожающие масштабы и создают угрозу населению страны и не только. Они часть глобальных экологических проблем. Антропогенные факторы в экологическом кризисе достигли своего пика, и проявляется в аномальных климатических условиях, учащении стихийных бедствий и т. д. Большинство стран уже были вынуждены тратить больше сил для преодоления этих последствий. Различные меры по решению экологических проблем, а также и в нашей стране, существуют уже много лет. Несмотря на это, экологические проблемы в стране по-прежнему актуальны. Проведен ряд мероприятий по определению биологической активности на мелиорированных территориях Биби-Эйбат НГДУ. Идентифицированы названия природных ценозов и их видов - ива, тростник, клевер, полынь и другие. Исследовательские работы проводились на рекультивированной территории SOCAR Биби-Эйбат НГДУ. Взяты усредненные пробы почвы для определения общего количества микроорганизмов из слоя почвы 0-10 см до глубины 0-30 см. Отобраны почвенные образцы для определения гумуса и физико-химических свойств почвы. Приведен морфогенетический профиль исследуемых разрезов.

Ключевые слова: нефтяное загрязнение, элементы питания, биорекультивация, микроорганизмы, плодородие.