RS Global Journals

Scholarly Publisher
RS Global Sp. z O.O.
ISNI: 0000 0004 8495 2390

Dolna 17, Warsaw, Poland 00-773
Tel: +48 226 0 227 03
Email: editorial_office@rsglobal.pl

JOURNAL	World Science
p-ISSN	2413-1032
e-ISSN	2414-6404
PUBLISHER	RS Global Sp. z O.O., Poland

ARTICLE TITLE	ENVIRONMENTAL ASSESSMENT OF THE GRAY-BROWN SOILS OF THE COAST OF THE APSHERON PENINSULA
AUTHOR(S)	Alieva Narmina Tarlan, Sadigov Ramil Ali, Abdullaeva Maya Yadigar, Ibragimov Sattar Kamala
ARTICLE INFO	Alieva Narmina Tarlan, Sadigov Ramil Ali, Abdullaeva Maya Yadigar, Ibragimov Sattar Kamala. (2022) Environmental Assessment of the Gray-Brown Soils of the Coast of the Apsheron Peninsula. World Science. 4(76). doi: 10.31435/rsglobal_ws/30062022/7832
DOI	https://doi.org/10.31435/rsglobal_ws/30062022/7832
RECEIVED	18 May 2022
ACCEPTED	21 June 2022
PUBLISHED	28 June 2022
LICENSE	This work is licensed under a **Creative Commons Attribution 4.0 International License.**

ENVIRONMENTAL ASSESSMENT OF THE GRAY-BROWN SOILS OF THE COAST OF THE APSHERON PENINSULA

Alieva Narmina Tarlan
PhD in Technical Sciences, Azerbaijan State University of Oil and Industry, Baku

Sadigov Ramil Ali
Doctor of Philosophy in Agrarian Sciences, Azerbaijan State University of Oil and Industry, Baku

Abdullaeva Maya Yadigar
PhD in Chemical Sciences, Azerbaijan State University of Oil and Industry, Baku,
ORCID ID: https://orcid.org/0000-0002-1380-1216

Ibragimov Sattar Kamala
Doctor of Philosophy in Agrarian Sciences, Azerbaijan State University of Oil and Industry, Baku
ORCID ID: https://orcid.org/0000-0002-7298-952X

DOI: https://doi.org/10.31435/rsglobal_ws/30062022/7832

ARTICLE INFO

Received: 18 May 2022
Accepted: 21 June 2022
Published: 28 June 2022

KEYWORDS

Granulometric Analysis, Absheron Peninsula, Gray-Brown Soils, Humus, Diagnostic Indicators.

ABSTRACT

The article presents data on the morphogenetic features of soils, presents the characteristics of ecological factors of the coast in the villages of Turkan and Shikhovo of the Apsheron Peninsula. The analysis of the granulometric composition of gray-brown soils, as well as the diagnostic composition of the soil of the coastal zone of the Apsheron Peninsula, was carried out. The article analyzes the diagnostic indicators of two soil sections taken from the characteristic places of the studied regions, and gives a comparative description of the results obtained, as well as presents the indicators of the granulometric composition of soil sections.

Citation: Alieva Narmina Tarlan, Sadigov Ramil Ali, Abdullaeva Maya Yadigar, Ibragimov Sattar Kamala. (2022) Environmental Assessment of the Gray-Brown Soils of the Coast of the Apsheron Peninsula. *World Science.* 4(76). doi: 10.31435/rsglobal_ws/30062022/7832

Introduction.

Climate change and its consequences, including sea level change, have a significant negative impact on the soil, as well as on the environment in the Caspian region. Fluctuations in the level of the Caspian Sea and associated fluctuations in the level of groundwater, their mineralization are potent environmental factors that determine the dynamics of soil and plant complexes [1].

One from most important natural resources' planet is soil. her as well as and other natural resources must be taken into account, protected and rationally used. While for recovery biodiversity required decades for restoration layer soil in 2.5 cm required centuries. Scientists from Germany and the Netherlands have built a model showing how climate change affects inland seas and lakes. The Caspian Sea was taken as an example. The study showed that the water level in the sea by the end of the 21st century will fall by 9-18 meters, and the sea area will accordingly decrease by 23-34%. According to the authors of the model, the rapidly growing rates of evaporation of lakes will cause a "Caspian catastrophe", which cannot be compensated by an increase in river flow or precipitation [2].

Figure 1 shows a model for the reduction in size of the Caspian Sea due to climate change.

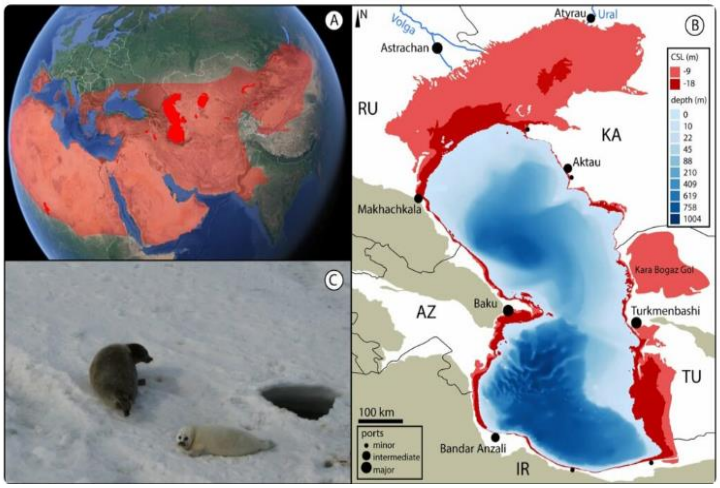

Fig . 1 Model of the decrease in the size of the Caspian Sea due to climate change
A) Regions most severely affected by the drying up of lakes (highlighted in red).
B) The size of the Caspian Sea by the end of the 21st century
(areas that will dry up are highlighted in red).
C) The Caspian seal is one of the endemic species of the region.

The drying up of the sea will lead to a reduction in the population of fauna. The predicted decline in the level of the Caspian Sea and the corresponding loss of the shelf of the western part of the Caspian Sea on the territory of the Absheron Peninsula will seriously affect the unique ecosystem of the region. In particular, populations of the endangered Caspian seal, as well as local and endemic fish species, will be affected. To protect the existing fauna and flora in the Caspian Sea, on the initiative of the non-governmental organization IDEA, the Apsheron National Park was created on the Absheron Peninsula. The main goal is to protect the endemic composition of plants and wildlife (especially Caspian seals) on the peninsula.

The climate of the Apsheron Peninsula is hot, semi-desert and dry steppe with hot summer. The number of hours of sunshine - 1906-2005 and more, there is a shortage moisture content. Average annual temperature air on the Apsheron +13.8-14.0°C, maximum 38-44°C. The amount of precipitation is 150-250 mm per year. On the flat parts of annual rainfall - 144-218 mm, in mountainous areas amounting to 430 mm, distributed throughout the seasons very unevenly. playing huge role in air purification on the Absheron wind predominantly northern "Khazri ", "Gilavar " [3].

For the processes taking place in the Caspian Sea, an increase in water temperature is of great importance, which occurs simultaneously with an increase in air temperature over its water area.

The Apsheron peninsula occupies big territory in Azerbaijani Republic which was formed from two administrative districts of Baku and Absheron- Khizi , extends from coasts Caspian seas, covering Gobustan plateau, area 169610 ha, or 2.1% from general area countries.

Materials and Methods.

The objects of study are the gray-brown soils of Tyurkan and Shikhovo adjacent to the territory of the Caspian Sea. In the course of field research, a series of soil profiles was used. In all main sections, the morphological features of genetic horizons are described in detail according to generally accepted methods [4 - 6]. In soil samples, analyzes were carried out using the following methods: determination of the general physical and water-physical properties of soils - granulometric composition according to the method of N.A. Kachinsky (pipette method), determination of the physicochemical properties of soils - pH by the potentiometric method, determination of calcium and magnesium by the complex metric method, humus according to Tyurin, carbonate content by the gas - volumetric method, water extract - by the method of K.K. Gedroits , as well as agrochemical indicators by conventional methods. Determination of readily hydrolysable nitrogen is carried out according to the method of I.V. Ivanov (Table 2).

Grain size analysis composition of gray-brown soils of the Apsheron Peninsula in the shelf areas of the Caspian Sea is presented in table 1. Studies were carried out at 3 different depths (0 - 20 cm, 0-50 cm, 0-100 cm) at different densities (> 10 mm, 10 - 7 mm, 7 - 5 mm, 5 - 3 mm, 3 – 2 mm, 2 - 1 mm, 1 - 0.5 mm, 0.5 - 0.25 mm, <0.25 mm).

Table 1. Grain Size Analysis gray-brown soil Absheron Peninsula (irrigated)

Indicators aggregated particles (mm) and them % expression									
Definition sieve in air dry able									
Depth	>10	10 - 7	7 - 5	5 - 3	3 - 2	2 - 1	1 - 0.5	0.5 - 0.25	<0.25
0-20 cm	29.7	8.6	12.6	10.8	12.7	9.2	3.1	6.1	7.2
20-50 cm	22.7	9.8	14.2	11.4	9.9	11.6	9.7	5.4	5.3
50-100 cm	19.4	12.4	15.2	12.8	8.4	8.2	12.9	4.6	6.1

Thus, the largest particles with a percentage in the upper layer are particles larger than 10 mm and make up 29.7% of the total soil mass. Accordingly, the smallest particles are found in the range of 1-0.5 mm. This particle makes up 3.1% of the total mass of the soil.

The largest percentage of particles in the middle layer are particles larger than 10 mm and account for 22.7% of the total soil mass. Accordingly, the smallest particles include particles smaller than 0.25 mm. This particle makes up 5.3% of the total mass of the soil.

In the lower layer, the largest percentage of particles is even larger than 10 mm and amounts to 19.4% of the total soil mass. Accordingly, the smallest particles have a diameter of 0.5 - 0.25 mm. These particles make up 4.6% of the total soil mass.

In the table 2 the diagnostic composition of soils is presented coastal zones (settlements Tyurkan and Shikhov about) Absheron peninsulas.

Table 2. Diagnostic composition of soils in the coastal zone of the Apsheron Peninsula

Sampling depth in cm.	Humus, %	Gross, %		Movable in mg on the 100 gr. soil		$CaCO_3$ in %	pH
		nitrogen	phosphorus	phosphorus	k ali y		
section 1 (Turkan)							
A 1 0-18	1.98	0.104	0.086	0.93	56.00	1.33	7.51
At 1 18-38	1.52	0.101	0.055	0.87	38.00	1.69	7.5
At 2 38-61	0.96	0.063	0.012	0.55	42.00	2.89	7.0
Sun 61-93	0.74				33.00	3.02	7.5
FROM 93-132	0.16					3.67	7.5
section 2 (Shikhovo)							
A 1 0-13	1.58	0.103	0.094	1.10	36.00	6.56	7.41
At 1 13-25	1.35	0.095	0.046	0.02	33.60	5.02	7.47
At 2 25-46	0.20	0.062	0.046	0.02	33.60	5.02	7.47
sun 46-97	0.63		0.030	0.02	31.20	5.79	7.5
FROM 97-110	0.17			0.01		6.72	

Continuation of Table 2.

Depth sample in cm.	Humus, %	Devoured grounds mg/ eq per 100 gr. soil				Devoured grounds in % from amounts or eat bones		
		Ca	mg	Na	Sum	Ca	mg	Na
section 1 (Turkan)								
A 1 0-18	1.98	4.78	2.15	0.03	7.06	67.71	30.45	0.42
At 1 18-38	1.52	2.28	1.13	0.03	3.44	66.28	32.85	0.87
At 2 38-61	0.96	1.37	0.47	0.03	1.87	74.46	25.13	1.60
Sun 61-93	0.74	1.00	0.42	0.04	1.46	68.49	28.77	2.73
FROM 93-132	0.16	0.95	0.40	0.06	1.41	67.38	28.37	4.26
section 2 (Shikhovo)								
A 1 0-13	1.58	7.20	5.40	0.73	13.33	54.01	40.51	5.48
At 1 13-25	1.35	5.80	3.80	0.74	10.34	56.09	36.75	7.16
At 2 25-46	0.20	5.05	3.72	0.74	9.51	53.10	39.12	7.78
sun 46-97	0.63	5.08	3.68	0.80	9.56	53.14	38.49	8.36
FROM 97-110	0.17							

Conclusions.

Although both sections were made on the same type of gray-brown soils, the results show that there are differences in the fertility parameters of the settlements of Turkan and Shikhovo: for example, while in the territory of the settlement of Turkan , humus is 1.98% in layer 0.20 cm, in the village of Shikhovo - 1.58% in a layer of 0.20 cm. At the same time, easily hydrolysable nitrogen in the village of Turkan is 0.004%, and in the village of Shikhovo - 0.003%.

REFERENCES

1. Alizade E. TO., Tarikhazer FROM. BUT. Ecogeomorphological danger and risk on the big Caucasus (in within Azerbaijan). M.: MAKS Press, 2015. 207 p.
2. Manafova F. A. On the contrast of the soil cover of Apsheron // Agrarian science Azerbaijan. 2004. No. 1-2. pp. 383-387.
3. Babaev M.P., Gurbanov E.A., Hasanov V.Kh. Land degradation and protection in Azerbaijan. Baku: Elm, 2010, p. 174-183.
4. Babaev M.P., Akhmedov V.A. Research and restoration of oil-contaminated soils of Absheron by agro-reclamation methods. // Land degradation and protection in Azerbaijan. Baku: Elm, 2012, p. 174-183
5. Terpelets V.I., Slyusarev V.N. Educational and methodological manual for the study of agrophysical and arochemical methods of soil research. - Krasnodar: KubGAU , 2010. - 65 p.
6. Baibekov R.F., Savich V.I., Ovcharenko M.M. Methods for studying urban soils. M.: RGAU- MSA im.K. A. Timirzyaeva, 2007. -202 p.