ГЕОГРАФИЯ И ГЕНЕЗИС ПОЧВ

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CLASSIFICATION OF DARK GRAY-BROWN (CHESTNUT) SOILS SPATTERED IN SHAMKIRCHAY WATER RESERVOIR BASIN (IN SHAMKIRCHAY WATER RESERVOIR BASIN AREA)

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Abstract. The territory of the Republic of Azerbaijan is mainly characterized by an arid climate. Dark gray-brown (chestnut) soils are widespread in the foothills of the Greater and Lesser Caucasus Mountains, formed in large ranges throughout the country.One of the local areas where these lands are spread is the Shamkirchay reservoir basin. The introductory part of the article provides brief information about these soils, analyzes the climatic features (air temperature, atmospheric precipitation and evaporation) that play a key role in their formation, and the effect of relief.The article studies the classification of dark gray-brown (chestnut) soils, their physical and geographical conditions, description of morphological features of soils, diagnostic indicators.Dark gray-brown (chestnut) soils with an area of 2886.09 ha were taken as the object of research. As all soils which are alredy formed in the Shamkirchay reservoir basin (dark gray-brown (chestnut) soils) are considered to be areas with economic potential for agricultural development in the region. For many environmental reasons, the regulation of nature and economic relations in the Shamkir district requires the preparation of proper scientific and scientific-applied works. The article is of scientific-theoretical and practical importance in the assessment of soils, analysis of diagnostic indicators and monitoring of changes in these territorial units. Based on the results of the chemical analysis of the selected samples of soil were analyzed the main physical, chemical and nutritional elements in the upper layer of the soil, compiled a table and analyzed the results.

Key words: water reservoir basin, environmental assessment, dark gray-brown (morphological), morphological description, heavy clay, light clay, humus layer, fertility parameters, granulometric composition, diagnostic indicator, soil section.

INTRODUCTION

Dark gray-brown (chestnut) soils in the Shamkirchay reservoir basin are located in the north-west of the Republic of Azerbaijan between the northeastern slopes of the Lesser Caucasus and the gray mountains. The study area is bordered by Tovuz and GoyGol regions in the north, Dashkasan and Gadabay regions in the south, and Tovuz and Gadabay regions in the west [1].

The study area is predominant in different areas of the agrarian sector and has the second largest development in this sector of the country only after the Aran economic region.

The main areas of the region are viticulture, cotton growing, grain growing and cattle breeding. Auxiliary farms include fruit, poultry, and potato and cereal industries. As these basin soils are formed in plains, they are mainly used in irrigated agriculture. The main reason for irrigation is the climate characteristics of the area. Most of the areas described are in the plains, and the relatively small areas are about 300-400 meters above sea level. The winters are mild, with absolute minimum air temperature (-16 ^{0}C) - (- 18 ^{0}C). The temperature can rarely fall below (-19 ^{0}C) - (- 22 ^{0}C). Annual atmospheric sediments range from 300 mm to 400 mm. Most precipitation is observed in spring and early summer. During the year, the evaporation threshold is 800-1000 mm [1, 2].

The relief of the area with dark gray-brown (chestnut) soils consists of low mountain areas and plains with varying degrees of inclination. The complexity of the relief has been the result of the inevitable anthropogenic changes in the area that has historically been considered an agricultural area. So, the current leveling has been done in the areas of crop rotation, vine-

yards, orchards, perennial grasses have been planted in water collectors. In the northern and northeastern part of the study area, the surface of the Shamkirchay reservoir basin plains, and in the estuary parts, sometimes forms an underground water stream that flows along rough and light alluvial-proluvial sediments. These streams reach the surface in the plains and sediment areas between the alluvial cones, or they approach and mix with groundwater. In sloping plain areas the ground water level reaches 5-10 meters, and to the north it reaches 28 meters [2].

Surface structure and climate diversity of the Shamkir region of the new Shamkirchay reservoir also has influenced the formation of vegetation. The flora has a great impact on the soil cover. Thus, in accordance with the climate of the region, the law of vertical zoning has been observed in the spread of vegetation. The area is surrounded by hornbeam, fraxinus, oak, maple (tree), paliurus, crataegus, wild elaeagnus, prunus spinosa, rosa (bushes). In the plains areas are mainly arid subtropical climatic zones, where desert and semi-desert ephemera, a group of wild cereals are spread. In addition, there are widespread species of xerophytes, such as artemisias, alhagis, barbareas and etc.

The study of the cover of the Shamkirchay reservoir basin is similar to that of the Lesser Caucasus. Extensive fundamental research has been carried out in these areas by V.V. Dokuchayev, M.M. Sibirtsev, M.P. Babayev, H.C. Baghirov, H.Ə. Giyasi, Q.SH. Mammadov, A.B. Jafarov, H.M. Hajiyev, B.G. Shakuri, K.A. Alakbarov, V.R. Volobuyev, M.E. Salayev, A.A. Ibrahimov, A.M. Shikhlinski, A.N. Izyumov and other scientists [3, 4].

OBJECTS AND METHODS

The main purpose of the research is the study of classification of dark-brown (chestnut) soils belonging to Shamkirchay reservoir basin, determination of the physical and geographical conditions of these soils, analysis of the current state of vegetation, description of the morphological characteristics of the soils, the description and so on. activities within the borders of Shamkir region.

The main purpose of writing the article is to study the soil-ecological conditions of dark brown brown (chestnut) soils within the Shamkirchay reservoir basin within the Shamkir region and at the same time, to study morphological characteristics and to analyze the fertility parameters.

The area of the New Shamkirchay basin within the Shamkir administrative district has been surveyed as a study area and dark gray-brown (chestnut) soils with an area of 2,886.09 ha has been taken as a survey site [5, 6].

In the course of the study, the morphological characteristics of soils on one profile (by profile № 12) have been highlighted in depth on dark gray-brown (chestnut) soils within the basin of the New Shamkirchay reservoir and soil thickness, granulometric composition, color, structure, hardness and a number of morphological signs have been studied on 6 profiles. The geographic coordinates of the sampled soil samples have been determined using the Garmin GPS map 62s. The soil samples on genetic layers have been taken from the laid sections. The removed soil sections have been dried in the air and then grinded and milled into a 2 mm sieve and they have been transferred to the Laboratory of Land Reclamation (Soil Analysis) and Soil Agroecology and Bonitization of the Institute of Soil Science and Agrochemistry of the Azerbaijan National Academy of Sciences for physical and chemical analysis and required procedures have been implemented based on accepted methodologies [7, 8].

In the field studies, general humus in soil has been studied by the I.M Tyurin's method, total nitrogen – kjeldahl method, carbonates - calcimeter. $CaCO_3$ form has been analyzed by titration method, total phosphorus (P) and total potassium (K) – by the ICP-MS (agilent) device and one of

the most important factors is the granulometric composition - by N.A. Kachinski's method. The cations absorbed to determine soil absorption capacity have been determined by D. Ivanov method, hygroscopic moisture has been determined by thermal method (the soil was dried at x 05 ° C) and soil reaction of the soil has been determined in pH meters (1: 5) in aqueous solution. As well as, the ammoniacal absorption from nitrogen forms has been analyzed by the Konyev method, the ammoniacal water solubility has been analyzed by Nesler method and nitrates have been analyzed by the method of Grandval and Lajoux. The accuracy of the results have been determined using the mathematical statistical method (B.A. Dospekhov) [9].

RESULTS AND DISCUSSION

Dark gray brown (chestnut) soils are spread over 2,886.09 ha in the Kolkhozkend, Tatar, Dallar-Chardakhli, Karachamirli, Konullu, Morul, Seyfali villages of Shamkir region. These soils are thick, medium and thin. Most of them are used under cultivation [2, 8, 9]. To illustrate the morphological signs of dark brown (brown chestnut) soils, the following are the signs of profile 12 digging in the planting area of the Dallar-Chardakhli village:

0-23 cm: dark brown, heavy cylindrical, lumpy, mildly humid, stem and root, poorly boiling, transitions are gradual.

23-38 cm: brown, medium loamy, small lumpy, slightly solid, slightly humid, humus of the stem and the root, white peephole, poorly boiling, transition is gradual.

38-64 cm: relatively light brown, walnut, medium-sized, slightly solid, slightly damp, root, white peephole, poorly boiling, the transition is gradual.

64-96 cm: straw, clumpy, solid, slightly humid, root, white peepholes, poorly boiling, the transition is gradual.

96-125 cm: light strawy, the structure is non-selective, solid, slightly humid, and boiling weaker than NSE acid.

Clayey and heavy loamy dark gray-brown (chestnut) soils. On the territory of Shamkir administrative district fertility characteristics on various parameters of soil profiles of dark gray brown (chestnut) soils in typical locations have been analyzed in Table 1 by the diagnostic indices.

Table 1 - Analysis of diagnostic indicators of the clayey and heavy loamy dark gray-brown (chestnut) soils fertility parameters in the territory of Shamkir region

Depth, cm	Humus, %	Nitrogen, %	Hydroscopic moisture	CO_2, %	According to CO_2 $CaCO_3$, %	TAB, mg-eq	pH	Granulometric composition, %		Dry residue
								<0,001 mm	<0,01 mm	
Clayey and heavy loamy dark gray-brown (chestnut) soils										
(Profile № 8)										
AU_a 0-19	4,13	0,222	5,83	8,97	6,85	28,19	7,6	26,08	71,92	0,1013
A/B 19-50	2,49	0,212	6,01	3,50	8,05	28,26	7,6	21,52	66,47	0,1042
B_{ca} 50-73	2,06	0,204	7,01	3,50	8,05	32,84	7,5	34,48	68,73	0,1132
B/C 73-110	1,29	Not. an	5,60	3,59	8,25	Not. an	7,6	20,64	68,08	0,1138
C 110-155	Not. an	-----	4,72	3,55	8,16	-----	7,7	8,56	49,93	0,1154
AU_a 0-23	3,97	0,218	6,80	1,73	3,93	30,78	6,8	18,00	47,97	0,1259
(Profile № 12)										
A/B 23-38	3,12	0,197	7,03	1,72	3,90	31,80	6,9	16,48	44,72	0,1247
B_{ca} 38-64	2,21	0,134	6,61	1,14	2,59	29,06	6,8	8,96	52,12	0,1173
B/C 64-96	2,06	0,102	6,69	1,87	4,25	Not.an	6,7	24,80	46,56	0,1067
C 96-125	Not. an	Not. an	5,71	1,92	4,39	-----	6,8	21,63	40,96	0,0964

The results of the analysis of 6 soil profiles put in characteristic places are given in the area of the district on different subsets of land from different directions.

The analyzes have been conducted along the profiles on 2 profiles in clayey and heavy loamy dark gray-brown (chestnut) soils, 1 profile in sandy dark gray-brown (chestnut) soils, 1 profile in heavy loamy dark gray-brown (chestnut) soils and 2 profiles in heavy loamy, medium saline dark gray-brown (chestnut) soils. It is also clear from the morphological description of the various soil fragments in the clayey and heavy loamy dark gray-brown (chestnuts) soils in the study, as a result of field-soil and cameral laboratory studies, in various micro-relief forms and economic areas there are differences between AU_a -thickness of humus layer, % nitrogen content, B_{ca} layer formation, depth and strength of illuvial carbonate, their structural-aggregates, granulometric composition, hydroscopic moisture and other morpho-diagnostic features. Thus, the amount of humus in the different species identified in the study area is 3.97–4.13 % in the upper AU_a layer, 2.49-3.12 % in A/B layer, 2.06-2.21 % in the B_{ca} layer and 1.29-2.06 % in the B/C layer. Humus has not been analyzed in the C layer. The amount of nitrogen equivalent to humus is 0.218-0.222 % in the upper AU_a layer, 0.197-0.212 % in the A/B layer, 0.134-0.234 % in the B_{ca} layer, and 0.102 % in the B/C layer. The C layer has not been analyzed as in humus (Table 1). Although the profile of soil in the clayey and heavy loamy dark gray-brown (chestnuts) soils is characteristic of surface carbonation, the change in its size depends on the plasticity of the relief and the soil-resilient rocks. The percentage of CO_2 fluctuates between 1.73-8.97 % in the AU_a -layer, 1.72-3.50 % in the A/B layer, 1.14-3.50 % in the B_{ca} layer, 1.87 -3.59 % in the B/C layer and 1.92-3.55 % in C-layer, as well as, according to CO_2 the amount of $CaCO_3$ has been identified 3.93-6.85 % in the AU_a layer, 3.90-8.05 % in the A/B layer, 2.59-8.05 % in the B_{ca} layer, 4.25 -8.25 % in the B/C layer and 4.39-8.16 % in the C-layer.

In the clayey and heavy loamy dark gray-brown (chestnuts) soils, there is a clearly expressed crust on the upper layers. Physical clay in soil profiles (less than 0.01 mm) are limited to 47.97-71.9 2% in the AU_a layer, 44.72-66.47 % in the A/B layer, 52.12-68.73 % in the B_{ca} layer, 46.56-68.08 % in the B/C layer, 40.96-49.93 % in the C layer; for sludge particles (less than 0.001 mm) has been limited to 18.00–26.08 % in the AU_a layer, 16.48-21.52 % in the A/B layer, 8.96-34.48 % in the B_{ca} layer, 20.64-24.80 % in the B/C layer and 8.56-21.63 % in the C layer.

Quantity of other fertility parameters in the clayey and heavy loamy dark gray-brown (cestnuts) soils has also been studied. Thus, hydroscopic moisture has been detected in these soils 5.83-6.80 % in the AUa layer, 6.01-7.03 % in the A/B layer, 7.01-6.61 % in the B_{ca} layer and 5.60-6.69 % in the C-layer; the total of the absorbed bases have been determined 6.85-3.93 mg-eq. in the AU_a layer, 3.90-8.05 mg-eq. in the A/B layer, 2.59-8.05 mg-eq. in the B_{ca} layer, 4.25-8.25 mg-eq. in the B/C layer and 4.39-8.16 mg-eq. in the C-layer; soil environmental reaction (pH) has been determined 68-7.6 in the AU_a -layer, 6.9-7.6 in the A/B layer, 6.8-7.5 in the B_{ca} layer, 6.7-7.6 in the B/C layer and 6.8-7.7 in the C-layer; dry residue has been identified 0.1013-0.1259 g/m^3 in the AUa layer, 0.1042-0.1247 g /m^3 in the A/B layer, 0.332-0.1173 g/m^3 in the B_{ca} layer, 0.138-0.1067 g /m^3 in the B/C layer and 0.1154-0.0964 g /m^3 in the C-layer (Table 1).

Heavy loamy, medium saline dark gray-brown (chestnut) soils. Diagnostic indicators of fertility parameters of these soils have been analyzed in Table 2. As a result of the researches, the comparative characteristic of the soil profiles 19 and 20 of the heavy loamy, medium saline dark gray-brown (chestnut) soils have been determined. The 19th profile of the heavy loamy, medium saline dark gray-brown (chestnut) soils is under cultivation in the territory of Garachamirli village, and the

20th profile is in the peaceful plantation area in the Sayfali village. Differences between profiles have been analyzed below. The humus content in these soils is 3.54-3.57 % in the upper AU_a layer, 2.11-2.88 % in the A/B layer, 1.52-1.58 % in the middle B_{ca} layer, and 1.58-0.96 % in the low B/C layers. The humus in the C-layer is 0.79 % in the 19th soil profile and 20th soil profile has not been analyzed. The amount of nitrogen equivalent to humus has been determined 0.211-0.228 % in the upper AU_a layer, 0.168-0.193 % in the A/B layer, 0.093-0.193 % in the B_{ca} layer, and 0.101 % in the B/C layer. No nitrogen has been analyzed in the C-layer on this layer and below in profile 20. Humus indicators have not been analyzed in C-fold in profile 19 (Table 2).

The heavy loamy, medium saline dark gray-brown (chestnut) soils are characterized by their carbonate nature. The percentage of CO_2 fluctuates between 1.98-2.40 % in the AU_a -layer, 2.32-2.36 % in the A/B layer, 1.68-3.11 % in the B_{ca} layer, 1.39-3.11 % in the B/C layer and 1.76-3.33 % in C-layer; according to CO_2 the amount of $CaCO_3$ has been identified 4.51-5.45 % in the AU_a layer, 4.27-5.36 % in the A/B layer, 3.75-5.36 % in the B_{ca} layer, 3.14-7.07 % in the B/C layer and 4.00-7.57 % in the C layer.

Table 2- Analysis of diagnostic indicators of the heavy loamy, medium saline dark gray-brown (chestnut) soils fertility parameters in the territory of Shamkir region

Depth, cm	Humus, %	Nitrogen, %	Hydroscopic moisture	CO_2, %	According to CO_2 $CaCO_3$, %	TAB, mg-eq	pH	Granulometric composition, %		Dry residue
								<0,001 mm	<0,01 mm	
Heavy loamy, medium saline dark gray-brown (chestnut) soils										
(Profile № 19)										
AU_a 0-24	3,57	0,211	4,79	1,98	4,51	19,63	6,6	22,56	45,60	Not.an
B_{ca} 24-48	2,88	0,193	4,82	2,36	5,36	20,16	6,7	21,92	43,36	-----
B/C 48-89	1,58	0,101	5,13	3,11	7,07	Not.an	6,6	23,61	56,72	-----
C 89-137	0,79	Not.an	5,51	3,33	7,57	-----	6,8	24,16	54,93	-----
(Profile № 20)										
AU_a 0-28	3,54	0,228	4,01	2,40	5,45	21,73	6,9	15,28	33,84	0,2048
A/B 28-50	2,11	0,168	3,54	2,32	4,27	21,92	6,9	10,16	29,04	0,1506
B_{ca} 50-83	1,52	0,105	3,11	1,68	3,75	Not.an	7,0	6,16	14,41	0,1218
B/C83-118	0,96	Not. an	3,98	1,39	3,14	-----	6,9	Not.an	10,16	0,1247
C 118-150	Not. an	-----	2,73	1,76	4,00	-----	7,1	-----	17,63	0,1782

In the heavy loamy, medium saline dark gray-brown (chestnut) soils, the granulometric composition is quite diverse. Thus, in these soils, the amount of physical clay and sludge can be seen, depending on the depth, the granulometric composition is composed of sandy, light loamy, medium loamy and heavy loamy structure. Clayiness is not observed. Physical clay in soil profiles (less than 0.01 mm) are limited to 33.84-45.60 % in the AU_a -layer, 29.04-43.36 % in the A/B layer, 14.41-43.36 % in the B_{ca} layer, 10.16-56.72 % in the B/C layer, 17.63-54.93 % in the C-layer; for sludge particles (less than 0.001 mm) has been analyzed 15.28-22.56 % in the AU_a layer, 10.16-21.92 % in the A/B layer, 6.16-23.61 % in the B_{ca} layer, 20.64-24.80 % (profile 19) in the B/C layer and the C-layers. The granulometric composition in the B/C and C layers is not determined in profile 20 (Table 2). As can be seen from the table, in the heavy loamy, medium saline dark gray-brown (chestnut)

soils, other quantitative parameters have been studied. Thus, hydroscopic moisture has been detected in these soils 4.01-4.79 % in the AU_a layer, 3.54-4.82 % in the A/B layer, 3.11-4.82 % in the B_{ca} layer and 2.73-5.51 % in the C-layer; the total of the absorbed bases have been determined 19.63-21.73 mg-eq. in the AU_a layer, 20.16-21.92 mg-eq. in the A/B layer and B_{ca}, B/C and C-layers have not been analyzed; soil environmental reaction (pH) has been determined 6.6-6.9 in the AU_a -layer, 6.7-6.9 in the A/B layer, 6.7-7.0 in the B_{ca} layer, 6.6-6.9 in the B/C layer and 6,8-7,1 in the C-layer. Dry residue has not been analyzed in the profile 19. In the profile 20, dry residue has been identified 0.2048 g/m^3 in the AU_a layer, 0.1506 g/m^3 in the A/B layer, 0.1218 g /m^{3}in the B_{ca} layer, 0.1247 g/m^3 in the B/C layer and 0.1782 g/m^3 in the C-layer (Table 2).

Sandy dark gray-brown (chestnut) soils. To obtain soil samples in sandy dark-brown (chestnut) soils (profile 14), Tatar village studies have been conducted in the area formed under a cotton crop. The results obtained on the profile are as follows: the amount of humus is 3.55 % in the upper AU_a layer, 2.05 % in A/B layer, 2.02 % in the middle B_{ca} layer, 1.93 % in the B/C layer, and 1.72 % in the C-layer. Respectively, the amount of nitrogen is 0.187 % in the upper AU_a layer, 0.132 % in the A/B layer, 0.124 % in the B_{ca} layer, 0.108 % in the B/C layer and 0.086 % in the C-layer . According to CO_2 the amount of $CaCO_3$ has not been analyzed (Table 3).

Table 3 - Analysis of diagnostic indicators of the sandy dark gray-brown (chestnut) soils fertility parameters in the territory of Shamkir region

Depth, cm	Humus, %	Nitrogen, %	Hydroscopic moisture	CO_2, %	According to CO_2 $CaCO_3$, %	TAB, mg-eq	pH	Granulometric composition, %		Dry residue
								<0,001 mm	<0,01 mm	
(Profile № 14)	Sandy dark gray-brown (chestnut) soils									
AU_a 0-15	3,55	0,187	2,19	1,09	2,48	Not.an	7,2	6,56	2,64	0,0987
A/B 15-35	2,05	0,132	1,04	1,31	2,48	-----	7,2	0,81	5,04	0,0946
B_{ca} 35-60	2,02	0,124	5,15	1,60	3,64	-----	7,1	23,68	5,64	0,1148
B/C 60-85	1,93	0,108	5,84	3,02	6,89	-----	7,3	24,08	54,01	0,1763
C 85-125	1,72	0,086	4,31	3,02	6,89	-----	7,2	15,92	42,48	0,2081

In granulometric composition on the sandy dark gray-brown (chestnut) soils, sludge particles is observed with sand, sandy, and light loam; clay particles is observed with sand, medium loam, heavy loam and light clay on the lower floors. Physical clay in soil profiles (less than 0.01 mm) is 2.64 % in the AU_a layer, 5.04 % in the A/B layer, 5.64 % in the B_{ca} layer, 54.01% in the B/C layer, 42.48 % in the C-layer; for sludge particles (less than 0.001 mm) are 6.56 % in the AU_a layer, 0.81 % in the A/B layer, 23.68 % in the B_{ca} layer, 24.08 % in the B/C layer and 15.92 % in the C-layer. The amount of other fertility parameters in sandy dark gray-brown (chestnut) soil has also been determined. Hydroscopic moisture has been detected in these soils 2.19 % in the AU_a layer, 1.04 % in the A/B layer, 5.15 % in the B_{ca} layer, 5.84 % in the B/C layer and 4.31 % in the C-layer; the total of the absorbed bases have been determined 7.2 in the AU_a layer, 7.2 in the A/B layer, 7.1 in the Bca layer, 7.3 in the B/C layer and 7.2 in the C-layer; Dry residue has been identified 0.0987 g/m^3 in the AU_a layer, 0.0996 g/ m^3 in the A/B layer, 0,1148 g /m^{3}in the B_{ca} layer, 0.1763 g/m^3 in the B/C layer and 0,2081 g/m^3 in the C-layer.

The total of the absorbed bases has not been analyzed (Table 3).

Heavy loamy dark grey-brown (chestnut) soils. Heavy loamy dark grey-brown (chestnut) soils are common in the villages of Yukhari-Seyfali, Morul, Kolkhozkand and Tatar. Soil samples have been taken from the same villages. At the article has been analized analyzed the 15th profile soil samples taken from a typical location on the roadside of Seyfali village. Here are the results for profile 15: The amount of humus is 3.47 % in the AU_a layer, 3.09 % in A/B layer, 2.45 % in the B_{ca} layer, 1.45 % in the B/C layer, and 0.97 % in the C-layer. The amount of nitrogen is 0.194 % in the AU_a layer, 0.183 % in the A/B layer, 0.127 % in the B_{ca} layer, 0.098 % in the B/C layer and it has not been specified in the C-layer . The percentage of CO_2 - does not exist in AU_a, 0.26 % in the A/B layer, 2.51 % in the B_{ca} layer, 3.56 % in the B/C layer and 3.87 % in the C-layer. According to CO_2 the amount of $CaCO_3$ - has not been identified in the AU_a layer, 0.59 % in the A/B layer, 5.70 % in the B_{ca} layer, 8.02 % in the B/C layer and 8.66 % in the C-layer. (Table 4).

Table 4 - Analysis of heavy loamy dark grey-brown (chestnut) soils fertility parameters in the territory of Shamkir region

Depth, cm	Humus, %	Nitrogen, %	Hydroscopic moisture	CO_2, %	According to CO_2 $CaCO_3$, %	TAB, mg-eq	pH	Granulometric composition, %		Dry residue
								<0,001 mm	<0,01 mm	
(Profile № 15) Heavy loamy dark grey-brown (chestnut) soils										
AU_a 0-25	3,47	0,194	6,42	Not.an	Not.an	31,21	6,8	20,80	54,86	0,1169
A/B 25-47	3,09	0,183	6,58	0,26	0,59	29,33	6,8	18,42	55,35	0,1191
B_{ca} 47-67	2,45	0,127	7,43	2,51	5,70	35,84	6,8	26,91	60,98	0,1234
B/C 67-90	1,46	0,098	7,87	3,56	8,02	Not.an	6,7	30,89	65,94	0,1249
C 90-131	0,97	Not.an	8,04	3,87	8,66	-----	6,8	36,15	69,37	0,1175

Physical clay in soil profiles (less than 0.01 mm) have been identified 20,80 % in the AU_a layer, 18,42 % in the A/B layer, 26,91 % in the B_{ca} layer, 30,89 % in the B/C layer, 36,15 % in the C-layer; for sludge particles (less than 0.001 mm) have been analyzed 54,86 % in the AU_a layer, 55.35 % in the A/B layer, 60,98 % in the B_{ca} layer, 65,94 % in the B/C layer and 69,37 % in the C-layer. In these soils, the hydroscopic moisture has been detected 6,42 % in the AU_a layer, 6,58 % in the A/B layer, 7,43 % in the B_{ca} layer and 7,87 % in the B/C layer and 8.04 % in the C-layer; soil environmental reaction (pH) has been determined 6.8 in the AU_a layer, 6.8 in the A/B layer, 6.8 in the B_{ca} layer, 6.7 in the B/C layer and 6.8 in the C-layer; dry residue has been identified 0,1169 g/m^{3}in the AU_a layer, 0,1191g/m^3 in the A/B layer, 0,1234 g/m^3 in the B_{ca} layer, 0,1249 g/m^3 in the B/C layer and 0,1175 g/m^3 in the C-layer. The total of the absorbed bases have been determined 31.21 mg-eq. in the AU_a layer, 29.33 mg-eq. in the A/B layer, 35.84 mg-eq. in the B_{ca} layer and B/C and C-layers have not been analyzed (Table 4). The results of the analysis revealed that there are differences between the two soil cuts analyzed in clay and heavy gray-brown (chestnut) soils: (Table 5). When analyzing heavy loamy, medium saline dark gray-brown (chestnut) soils, as in the clayey and heavy loamy dark gray-brown (chestnut) soils, there are differences in soil profiles, and the results have been analyzed in Table 6.

Table 5 - Indicators of differences between the two soil profiles analyzed in the clayey and heavy loamy dark gray-brown (chestnut) soils

Profile, №	Humus, %	Nitrogen, %	Hydroscopic moisture	CO_2, %	According to CO_2 $CaCO_3$, %	TAB, mg-eq	pH	Granulometric composition, %		Dry residue
								<0,001 mm	<0,01 mm	
Clayey and heavy loamy dark gray-brown (chestnut) soils										
AU_a	0,16	0,004	0,97	7,24	2,92	2,92	0,8	8,08	23,95	0,0246
A/B	0,63	0,015	1,02	1,78	4,15	4,15	0,7	5,04	21,75	0,0205
B_{ca}	0,15	0,100	0,40	2,36	5,46	5,46	0,7	25,52	16,61	0,0041
B/C	0,77	Not.an	1,09	1,72	4,00	4,00	0,9	4,16	21,52	0,0071
C	Not.an	----	0,99	1,63	3,77	3,37	0,9	13,07	8,97	0,0190

Table 6 - Indicators of differences between 2 soil profiles analyzed in heavy loamy, medium saline dark gray-brown (chestnut) soils

Profile, №	Humus, %	Nitrogen, %	Hydroscopic moisture	CO_2, %	According to CO_2 $CaCO_3$, %	TAB, mg-eq	pH	Granulometric composition, %		Dry residue
								<0,001 mm	<0,01 mm	
Heavy loamy, medium saline dark gray-brown (chestnut) soils										
AU_a	0,03	0,027	0,78	0,42	0,94	2,07	0,3	6,28	11,76	Not.an
A/B	0,77	0,025	1,28	0,04	1,09	1,76	0,2	11,76	14,32	-
B_{ca}	0,06	0,100	1,71	0,43	1,61	Not. an	0,3	17,45	28,95	-
B/C	0,62	Not.an	1,15	1,72	3,93	-	0,3	10,16	46,56	-
C	Not. an	-	2,78	1,57	3,57	--	0,3	17,63	37,30	-

CONCLUSIONS

Based on the results of chemical analyzes of soil samples taken from dark brown (windy) soils in different conditions in Shamkir region, the main physical and chemical and nutritional elements have been analyzed using modern methods, and the results have been analyzed.

As can be seen from Table 1, all morpho-genetic characteristics of the soils vary considerably, depending on the microrelief conditions in the clayey and heavy loamy dark gray-brown (chestnut) soils in the Shamkir region studied.

In the analysis of diagnostic indicators of fertility parameters of sandy dark gray-brown (sooty) soils in the Shamkir region, it was found that there are genetic disturbances in these soils. Thus, the regularity of humus, nitrogen and dry residue has not been violated, and there has been a decrease in the horizontal surface. The hydroscopic humidity has increased towards the lower layers, the carbonation has been a minority in this hemisphere, and the TAB has not been analyzed. The environment is mostly low-grade, with granometric composition having great contraindications for genetic layers. Although there is sand on the upper layer, sandy and light clay on the lower layers have been replaced by medium and heavy clay rocks on silt particles.

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ТҮЙІН

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ШАМКИРЧАЙ СУ ҚОЙМАСЫ АЛАБЫНДА ТАРАЛҒАН КҮҢГІРТ ҚҰБА-ҚОШҚЫЛ ТОПЫРАҚТАРДЫ ТАЛДАУ (ШАМКИРЧАЙ СУ ҚОЙМАСЫ АЛАБЫ АУМАҒЫНДА)

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Әзірбайжан Республикасының аумағы негізінен қуаң климатпен сипатталады. Күңгірт-сұр-қошқыл (қоңыр) топырақтар бүкіл ел аумағы бойынша қалыптасқан Үлкен және Кіші Кавказ тауларының бөктерлерінде кең таралған. Бұл жерлердің таралуының жергілікті аудандарының бірі - Шамкирчай су қоймасының алабы. Мақаланың кіріспе бөлімінде осы топырақтар туралы қысқаша ақпарат беріледі, олардың қалыптасуында шешуші рөл атқаратын климаттық ерекшеліктер (ауа температурасы, атмосфералық жауын-шашын және булану) мен рельефтің әсері талданады. Сондай-ақ, мақалада топырақтардың жіктелуі, олардың физикалық-географиялық жағдайы, топырақтың морфологиялық ерекшеліктерінің сипаттамасы, диагностикалық көрсеткіштері қарастырылады. Зерттеу нысаны ретінде ауданы 2886,09 га құрайтын күңгірт-сұр-қошқыл (қоңыр) топырақтар алынды. Шамкирчай су қоймасының алабында

қалыптасқан барлық топырақтар (күңгірт-сұр-қошқыл (қоңыр) топырақтар) аймақтағы ауыл шаруашылығын дамыту үшін экономикалық әлеуеті бар аумақтар болып саналады. Көптеген экологиялық себептерге байланысты Шамкир ауданындағы табиғи-экономикалық қатынастарды реттеу тиісті ғылыми және ғылыми-қолданбалы жұмыстарды дайындауды талап етеді. Мақала топырақты бағалау, диагностикалық көрсеткіштерді талдау және осы аумақтық бірліктердегі өзгерістерге мониторинг жүргізу үшін ғылыми-теориялық және практикалық маңызға ие. Алынған топырақ үлгілеріне жүргізілген химиялық талдау нәтижелері негізінде топырақтың жоғарғы қабатындағы негізгі физика-химиялық және қоректік элементтер талданып, кесте жасалды және нәтижелері талданды.

*Түйінді сөздер:*су қойма алабы, экологиялық бағалау, күңгірт құба-қоңыр топырақ, морфологиялық қасиеттері, ауыр саздақ, жеңіл балшық, қарашірік қабаты, құнарлылық көрсеткіштері,гранулометриялық құрамы, диагностикалық көрсеткіштері, топырақ кескіні.

РЕЗЮМЕ

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АНАЛИЗИРОВАНИЕ ТЕМНО-БУРО-КОРИЧНЕВЫХ ПОЧВ, РАСПРОСТРАНЕННЫХ НА БАССЕЙНЕ ШАМКИРЧАЙСКОГО ВОДОХРАНИЛИЩА (НА ТЕРРИТОРИИ БАССЕЙНА ШАМКИРЧАЙСКОГО ВОДОХРАНИЛИЩА)

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Территория Азербайджанской Республики в основном характеризуется засушливым климатом. Темно-серо-коричневые (каштановые) почвы широко распространены в предгорьях Большого и Малого Кавказских гор, образованных в широких пределах по всей стране. Одним из локальных районов распространения этих земель является бассейн Шамкирчайского водохранилища. Во вступительной части статьи дается краткая информация об этих почвах, анализируются климатические особенности (температура воздуха, атмосферные осадки и испарение), которые играют ключевую роль в их формировании, и влияние рельефа. А также в статье рассматриваются классификация темно-серо-коричневых (каштановых) почв, их физико-географическое состояние, описание морфологических особенностей почв, диагностические показатели. В качестве объекта исследования были взяты темно-серо-коричневые (каштановые) почвы площадью 2886,09 га. Поскольку все почвы, которые уже сформировались в бассейне Шамкирчайского водохранилища (темно-серо-коричневые (каштановые) почвы), считаются территориями с экономическим потенциалом для развития сельского хозяйства в регионе. По многим экологическим причинам регулирование природно-экономических отношений в Шамкирском районе требует подготовки надлежащих научных и научно-прикладных работ. Статья имеет научно-теоретическое и практическое значение для оценки почв, анализа диагностических показателей и мониторинга изменений в этих территориальных единицах. На основании результатов химического анализа, отобранных проб почвы, были проанализированы основные физико-химические и питательные элементы в верхнем слое почвы, составлена таблица и проанализированы результаты.

Ключевые слова: бассейн водохранилища, экологическая оценка, темно бурокоричневая почва, морфологические свойства, тяжелый суглинок с легкой глиной, слой гумуса, параметры плодородия, гранулометрический состав, диагностический параметр, разрез почвы.