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Agricultural Production Characteristics of Soils in The South Slope of The Great Caucasus On The Example of The Sheki District of Azerbaijan

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ABSTRACT

The article presents the results of soil-ecological and geobotanical studies of the main types of soils in the Sheki region, describes the natural conditions and diagnostic indicators of soils in vertical zoning from intrazonal landscapes to subalpine meadows.

Key words: humus, particle size distribution, hygroscopic moisture, absorption capacity

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"We need to clearly realize that the anthropogenic transformation of the biosphere in a certain sense has the character of a global catastrophe and the anthropogenic landscape is the landscape of the future. In all likelihood, within 100 - 200 years it will occupy the entire territory of the earth's surface, with the exception, perhaps, of eternal ice and mountain peaks. The reasons for this lie in the uncontrolled and progressive growth of the population of the Earth, in the non-stop growth of industry and agriculture, in the constant human need for energy sources, and other processes accompanying the "triumph of civilization" [7].

The actions taken by individuals, stakeholders and governments are important, complementary steps to protect life support systems that not only ensure human well-being, but also the richness of the diversity of life on this planet [3]. Soil, as an integral part of the ecosystem, is also an important component, the formation of which takes place in the interconnection and interaction of environmental factors in the Sheki region corresponds to vertical zoning.

The Sheki region, selected as an object of study, is located on the southern slope of the Greater Caucasus (Fig. 1), bordered in the north and northeast by the Main Dividing Ridge of the Greater Caucasus, in the west by the Gakh regions, in the east by the Oguz regions, between elevations of 500–850 m, in places reaching on snowy peaks up to 3000-3500 m above sea level and occupies a total area of 2432.75 km^2. In geological and geomorphological terms, the region has a rather complex structure, where high mountains and steep slopes alternate with foothill territories and plains, which in turn contributes to the development of a rather variegated climate and a variety of vegetation cover.

The complexity of the geomorphological structure, the presence of steep slopes, as well as anthropogenic impact, have a significant value in the intensity of surface runoff, which in turn enhances the development of erosion processes, as a result of which wide ravines are created, which in the final stage appear as gullies, changing the geomorphological appearance of the region as a whole.

The highlands are located at an altitude of 2000-3500 m above sea level. The relief is represented by a highly dissected erosion-denudation form. Parent rocks are mainly composed of clays, limestones and shales. This zone is characterized by intense mudflows, causing significant damage to the environment, especially in the destruction of soil fertility.

The mid-mountain region is located at an altitude of 1000-2000 m above sea level and is characterized by the presence of a domed and stepped watershed. The mountain slopes are strongly dissected and the erosion-denudation relief dominates. Parent rocks are represented by shales, limestones and sands; there are basalts, gabbros, hydromica, andesites, etc.

The low mountains are located between isohypses 600-1000 m above sea level. The surface is represented by narrow belt islands, separated by wide valleys. The soils are formed on the sediments of the Jurassic and Cretaceous periods of the Mesozoic and the 3-tic (Paleogene, Neogene) and 4-tic periods of the Cenozoic.

The flat zone is located at an altitude of 200-600 m above sea level, where alluvial-proluvial deposits are mainly represented, on which fertile soils are developed, which are intensively used in agriculture.

In general, in the Sheki-Zakatala zone, EM Shikhlinsky [7] distinguishes 3 types of climate: 1) moderately warm, characteristic of the plain areas of the zone with relatively mild winters; 2) moderately warm wet type with a uniform distribution of precipitation throughout the year, covers the foothill part of the zone; and 3) cold climate with humid winters, typical for the foothill and mountainous areas of the zone.

The minimum air temperature is 0.50C in January, and the maximum is 23.60C in July. The average monthly soil temperature ranges from -10C to -30.70C. The minimum soil temperature of -10C is in January, the maximum is 30.00C (July) and August is 30.70C. The annual amount of precipitation is 692 mm, the largest amount of which falls in the months of April - June. The annual evaporation rate is 825 mm. Average annual relative air humidity is 71%, fluctuating over time ode from 59 to 87% [7]. Hydrogeographically, the rivers of the Sheki region are characterized by mudflows. The source of the region's rivers is located on the Main Caucasian ridge.

The large rivers of the zone also include the rivers. Airichai, Kishchay, Okhutchay, Garasu, Boyukgobu, Shinchay, etc. These rivers with branches, especially on steep slopes, erode the soils under forest and meadow formations, which is observed especially intensively during periods of prolonged and intense precipitation.

The complexity of natural conditions and a variety of hydrothermal regimes contributed to the formation of various types of soils with different genetic properties. The soils of the studied region were studied in detail by academician GA Aliev [1,2].

On the basis of field and laboratory studies on mountain pastures of the region, the following types and subtypes of soils have been identified, as follows: 1. Leached primitive mountain meadow; 2. Leached soddy mountain meadow; 3. Leached dense soddy mountain meadow, which, in turn, are subdivided into varieties according to their granulometric composition and thickness. Leached primitive mountain meadow soils, spreading in different areas of summer pastures, covers 1893.0 hectares or 0.76% of the total area of the region.

The relief of the studied region is strongly dissected by a gully-ravine network, where the parent rocks are deluvial deposits, and the soils are used for grazing.

The soils are medium and light loamy in terms of particle size distribution. The content of physical clay (<0.01 mm) along the profile varies from 28.44 - 40.08, and physical silt (<0.001 mm) 7.88 - 11.24% [5]. In accordance with the particle size distribution, the profile-tracing hygroscopic moisture varies between 2.7 - 4.2%. Leached primitive mountain meadow soils are sufficiently provided with organic matter, where the value of humus in the upper layer is 5.37 - 5.67%, and in the lower layers 5.02%, the value of total nitrogen along the soil profile is 0.27 - 0, 38%.

The absorption capacity of leached primitive mountain meadow soils is different, where the sum of absorption bases (per 100 g of soil) along the profile is 24.50 - 32.98 mg eq.

Leached soddy mountain meadow soils, amounting to 6781.6 hectares or 2.73%, are distributed in various parts of summer pastures. The relief of the territory is expressed by slopes gradually lowering to the northeast.

Leached soddy mountain meadow soils are also rich in organic matter, where the presence of humus varies between 7.35 - 10.0%, and total nitrogen 0.37 - 0.50%. The sum of absorbed bases along the soil profile was 16.98 - 35.88 mg.eq.

Leached dense soddy mountain meadow soils make up 4033.9 hectares or 1.62% and are distributed in various places of summer pastures.

The relief of the territory is dissected in various directions. Parent rocks are represented by proluvial-deluvial sediments. The territory is used only for grazing.

This type of soil is medium loamy in terms of particle size distribution. The presence of fractions (<0.01 mm) of physical clay along the profile ranges between 42.12-45.65%, physical silt (<0.001 mm) 9.40-11.80%, and hygroscopic moisture 4.3-4.5 %. Has a sufficient supply of organic matter. The presence of humus in the upper soil layer is 10.37%, slightly decreasing to the lower layers of 9.51%, the total nitrogen content along the profile is 0.46-0.52.

The absorption capacity of leached dense soddy mountain meadow soils is different, the sum of which varies along the soil profile between 30.40-40.60 mg.eq. After gaining independence in the Republic of Azerbaijan on June 16, 1996, the MilliMejlis adopted the Law "On Land Reforms" on the basis of which three forms of ownership were distinguished: a) state; b) municipal; c) private property [5]. Summer pastures, being state property, in exceptional cases under the established legislation, can be used and leased. The allocation of these soils to the municipality and to private ownership is also established by law.

Along with other factors of soil formation, the vegetation cover also plays a significant role. Plant residues, creating humus, which is the basis of soil fertility, also plays a significant role in soil formation, because taking on the destructive effects of atmospheric precipitation, neutralizes their effects.

By absorbing the main part of the precipitation, the vegetation cover creates conditions for their further absorption into the soil, preventing the action of surface runoff. In the formation of the vegetation cover on the territory in accordance with climatic conditions, a certain vertical zoning is distinguished: a) alpine and subalpine meadows; b) forests; c)

semi-desert (dry steppe). These zones are also subdivided into sub-zones. Those in the alpine and subalpine zone (highlands) are subdivided into subalpine and alpine meadows, alpine cover and subnival (alpine and rocky plants).

Summer pastures are mainly represented by leached p rimitive mountain meadow, leached dense sod mountain meadow, sod mountain meadow and mountain meadow steppe soil varieties, where erosion processes are widespread.

Summer Pasture Area

N	Designation	Area, ha	N	Designation	Area, ha
1	Tulkyuvar	700	14	Boyukchelenkok	30
2	Dabanybuzlugoyun	850	15	Haranda	100
3	Salavat	370	16	Wedjet	60
4	Tokogoshun	320	17	Dashlydere	130
5	Boyukgeyurlu	610	18	Gas yalag	70
6	Kichikgeyurlu	200	19	Kichikchelengez	70
7	Gaya arasy	1580	20	Boyukbitlije	70
8	Kechel	380	21	Kichikbitlije	70
9	Chagyl	845	22	Khan Yaylagi	250
10	Garaguzay	410	23	Shang-shan	640
11	Goytepe	150	24	Shahan	680
12	Kesher	530	25	Goturlu	50
13	Goy goshun	530	26	Gizildere	50
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As noted above, the summer pastures of the Sheki zone are located in the high mountain zone at an altitude of 2000-3000 m above sea level and differ sharply from the neighboring regions of the zone in terms of the species composition of plants. Since the area under study is from north to south, at a distance of 50 km vertically. Along with desert vegetation, there are meadow, alpine and subalpine plants. It should be noted that about 70-80% of plant communities of all plants of the republic can be found on the territory of the zone. The vegetation groups of the region are formed in accordance with the soil and climatic zone. In this connection, xerophytic plants, shrubs and rare forests are widespread on the dry steppe of the flat part of the semi-desert (belt of low mountains and foothills), in the high mountain zone there are subalpine and alpine meadows, where regular zoning in the vegetation cover is traced.

At the same time, in the Sheki region, introzonality is also traced in the Ganikh - Airichay valley, the vegetation of which is to a certain extent comprised of cultivated and bog plants. Moreover, in the lower tier, at an altitude of 400-600 m above

sea level, you can rarely find cultivated plants. At an altitude above 600 m above sea level, mountain forests are widespread (lower and upper tiers of the belt), and above (1800-3000 m.) There are subalpine and alpine meadows, and even higher are rocky landscapes, which, due to the severity of the climate and the presence of steep slopes are less susceptible to anthropogenic impact.

Conclusions

The analysis of the foregoing implies a certain conclusion about the originality and distinction in its natural and ecological conditions of the Sheki region, among all regions of the Sheki-Zagatala cadastral region, located on the southern slope of the Greater Caucasus, where the presence of biodiversity exceeds all regions of the Greater Caucasus within the Republic of Azerbaijan.

References

1. Aliev G.A. - Soils of the Greater Caucasus within the Azerbaijan SSR., Baku "Elm", 1978, 157 p.

2. Babaev M.P., A.M. Jafarov, Ch.M. Jafarova, S.M. Huseynova, H.M. Gasimov - Modern soil cover of the Greater Caucasus, Baku, 2017, 344 p. (in Azeri)

3. Biodiversity and climate diversity. SVD, UNEP, 2007.http: "www.cbd.int/doc/bioday/2007/ibd-2007-booklet-01-ru.pdf"

4. some properties of summer pastures in Sheki region. Trudy AzNII, N70, Baku, 1992, 4 p. (in Azeri)

5. MamedovG.Sh. - Land reform in Azerbaijan: legal, scientific and environmental issues. Baku, 2000, 371 p.

6. Mamedov R.G. - Agrophysical characteristics of the soils of the Araksin strip. Baku, 1970, 321 p.

7. Flint V.E. and others - Conservation and restoration of biodiversity. Moscow: Ed. Scientific and educational-methodical center, 2002, 282 p.

8. Shykhlinsky E.M. - Climate of Azerbaijan., Baku, 1968, 341 p.