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THE INFLUENCE OF GEOLOGICAL, LITHOLOGICAL AND GEOMORPHOLOGY STRUCTURE ON THE DEVELOPMENT OF SOILS OF THE LEFT COAST OF YAKKABADARYA

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Annotation: In this article, the influence of the geological, lithological and geomorphological structure on the development of the soils of the left bank of the Yakkabog Darya formed in the neogene deposits, which differ in their lithological composition, is studied through the analysis of literature and explained with theoretical ideas.

***Keywords*:** left bank of Yakkabog Darya, Neogene deposits, Alpine orogeny, sandy-muddy layer, brick-red sands, calcareous-red siltstones, marls and clays, egate-hilly, Khontog ridge, egate-hilly mountain.

In the Middle Ages (9th-10th centuries), 17 encyclopedic scholars of the East, Abu Rayhan Beruni and Abu Ali ibn Sina, Mahmud Kashgari, the book "Avesta", Timur's books, and other sources have many opinions about soil. Beruni's books talk about the origin and properties of the main soil-forming rocks in Central Asia. Abu Ali ibn Sina's opinions about the mechanical composition and physical properties of soil are also valuable. He writes: “There is nothing colder and drier than the earth. The earth itself is not warm. Inherited from itself, it is cold by nature, otherwise it would not be dense and heavy. Then Ibn Sina spoke about the structure of the earth's crust and soil: "In the middle of the globe, there should be a clean earth that is completely in accordance with the simple nature of the earth." On top of it there should be clay, if the earth is mixed with water. There is more water or land (soil) on it. This land is the basis of living beings." From these points, it is known that Abu Ali Ibn Sina separated the soil from other layers of the lithosphere. Ibn Sina gives a scientific understanding of the layer of mineral substances (the primary basis of all existence) in the "Enlightenment". In addition, in the works of Ibn Sina, there are elements of the thermodynamic law about the movement of soil and water in the soil layer.

It is known from the researches of great encyclopedic scientists and scientists who contributed to the development of soil science that Uzbekistan includes diverse physical-geographical and geological regions. Orographically, Uzbekistan consists of mountain ranges crossing the vast plains to the west and south-west, which adjoin the steppes and deserts. The mountain ranges of Uzbekistan belong to the Tien-Shan mountain system. The main pillar of the Tien-Shan southern migration is the Aloy range, and it is divided into three tributaries - the Turkestan, Zarafshan and Hisar ranges. The Hisar mountain range enters the territory of Uzbekistan with its western end. In the south it is limited by a wide and long depression and in the east by Bobotog. In the north it adjoins the southern slopes of the Hisar range, where some of the hills and watersheds of streams show signs of flattening characteristic of regions covered with Quaternary loess loess and clays.

Gorizdro-Kulchitskaya (1925), Weber (1929), Kudryavtsev (1932), Popov (1932), Klunnikov (1937),

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Vasilevsky (1937), Shvemberger (1934), Burachek (1934, 1939) It was carried out by Vyalov (1935, 1936), Korsakov (1948), Geller (1958), Schultz (1959), Chikaev (1959), Mirkamalov (1973), Pak (1978), Borisenko (1980) and others.

It is known from the literature that the first explorations in the area were started by famous geologists - Mushketov and Romanovsky. Mushketov explored the Hisar ridge in 1879 in the direction of Karshi-Guzor-Boysun-Termiz. It describes the widespread occurrence of Mesozoic rocks in the southwestern foothills of the mountain range, and is the first to provide general details of the geological structure of the area. In 1861, they were the first to make a geological map of Turkestan on a scale of 1:1260000. These studies served as the basis for further geological studies of the southwestern ridges of Hisar mountain.

The researches of the scientists were divided into three regions, different in structure, in the area under study and its surroundings. In the north, in the Karatepa mountains, sediments of the Paleozoic period and volcanic formations belonging to the Oloy-Kokshol structural-facies region are exposed. Mesozoic and Cenozoic deposits are widespread in the southeastern part of the field, on the southwestern ridges of the Hisar mountain, only in smaller areas are Paleozoic effusive and intrusive formations, which indicate the development of rocks characteristic of the facies region of the Hisar structure. Many areas are covered with Quaternary formations, as well as Neogene deposits typical of anticlinal structures, which are washed according to the tectonic plan. Thus, the need to consider soil-forming rocks further increased the interest of soil scientists in studying the geological structure of the area. As accurate materials in soil science become scarcer, it becomes important to study the geological structure of some parts of the country for their correct interpretation. Mountains, foothills and plains in the territory of Uzbekistan are geologically quite young. Our mountains were formed at the end of the Tertiary period, at the beginning of the Quaternary period, based on the strong tectonic movements of the Alpine orogeny. After that, in the Neogene period, marine regression, which fully covers the territory of the country, and the covering of flat areas with continental deposits brought from the mountains began.

Alpine folds have in many places received older uplifts consisting of significantly dislocated older rocks. But in the current terrain, the old twisted structures have not been preserved. Marine regression covered the mountain structures with ash after the Varictian and during long-term continental development in the Mesozoic. The Tertiary marine transgression, which began in the Eocene and lasted until the end of the Tertiary period, covered a large part of the present-day Turanian province, leaving behind sediments of a different character, which we now call "Tertiary diversity".

As a result of the Alpine orogeny, the formation of high mountain ranges in the eastern part of the country led to the gross uplift of the area and marine regression. The period of continental development is manifested in the strong denudation that occurred in the mountainous and flat areas. Tertiary plateaus in large areas were washed by river waters, and their valleys were filled with thick layers of alluvial deposits. The process of restoration of the old relief also took place in the foothills, where Tertiary sediments were washed and buried with a thick layer of delluvium and prolluvium. The slopes of most mountains are covered with a fresh alluvial mantle covering the vein rocks.

According to Weber (1929) and other researchers, a thick layer of continental sediments consisting of conglomerates was accumulated in the foothills at the end of the Tertiary period as a result of the rapid breakdown of Alpine structures. During the new tectonic movements that took place in these regions, conglomerates were washed away and formed the basis of the Western Tien-Shan folded hills. The uplifts below the Hisar range are of a slightly different geological formation. The folds of the hills here consist of a layer of sandy-muddy sediments of salty Tertiary colorful rocks and are associated with another type of migration of mountain structures on the ridge.

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The territory of Uzbekistan includes several Tertiary sea basins separated from each other. These are Fergana, Upper Amudarya, Kyzylkum, Tashkent and Zarafshan-Hisar basins.

Scientists say that Tertiary deposits in the studied region consist of sediments of two different cycles. The lower part of the section consists of marine deposits formed from the beginning of the Paleogene to the Oligocene. The surface of the section is covered by the continental layer, which began in the Oligocene and continues to this day. The boundary between Paleogene and Neogene is determined by the massaget layer.

For this reason, Neogene deposits in Uzbekistan and its surrounding areas are not well studied.

Neogene deposits in the Kashkadarya region are divided into four layers differing in their lithological composition: sandy-clay, clayey, sandy-conglomerate and clayey-patum.

The sandy-muddy layer was formed by successive deposition of brick-red sands, calcareous-red siltstones, marls and clays. Under this layer of white plaster 4 m there is a specific layer of thickness. marine and freshwater ostracods are found in the lower layer. layer thickness360 m south of150 m decreases to, and in parallel, the cross section is enriched with clay particles, the rocks become darker in color. The clayey layer consists mainly of reddish-brown clay minerals, interspersed with layers of gray sometimes gravelly sand, and more gypsum veins. Light brown and brown siltstones and clays (sloping layer with gray sand layer) are also observed. Total thickness 180-750 m constitutes sandy-conglomerate layer is made of light brown and brown conglomerates, clay and sands, and the lower part is gray sands and reddish-brown with sloping layers. The thickness of 450-1400 m. The shale layer is composed of strong calcareous shale with a yellowish tinge, and is 250-300 mis equal to

According to the results of the research, Neogene sediments are distinguished by their diversity. In all studied soil sections, there is a change in color, that is, dark brown and red colors in the lower layers are replaced by gray, pink, reddish and yellow colors in the upper layers. Burachek (1939) attributed this phenomenon to the replacement of warm temperatures during the Neogene by later cold temperatures. In the process of observing the deposition of Neogene deposits, it is possible to distinguish areas of washing and deposition. The mountain ranges located north of Fergana and in front of Tashkent can be indicated as a washing area in the Neogene period. Washout areas are characterized by the absence of Neogene deposits and their weak development. The Fergana depression and plain surrounding the Zarafshan-Hisar mountain region from the north and west, as well as the depression with thick neogene deposits in Yakkabog and Guzor districts, can be indicated as sedimentary areas. The settlement areas are characterized by strong development of Neogene sediments. They consist of a layer of marls, sands, and conglomerates, which turns pale and reddish toward the top, and is several hundred meters thick. Such a change in color is due to the presence of a massaget layer. Thus, marine Paleogene deposits are covered by a thick complex of red continental sediments.

Kudryavtsev (1932) distinguished two suites in the Neogene deposits of Southern Uzbekistan. the lower suite is associated with the gradual passage of the brick-red deposits of the massaget layer and has a red color. Although conglomerates predominate in this suite, especially in its lower part, sand and clay layers are common, the thickness of which is estimated to be2000 m.

Burachek (1939) wrote in his work that "to the north of Surkhan, between Sherabad and Guzor, and near Yakkabog, a thick layer of Neogene deposits described by Schweiberger (1934) can be found." The main part of the lower layer of the beds is composed of conglomerates and gravels of local Mesozoic rocks and is completely included in the "Oligocene", that is, the massaget horizon. According to the thickness of the last layer and the composition of the gravel, the massaget horizon includes only its lower part, and the upper part is characteristic of the Neogene.

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Upper Tertiary deposits are completely included in the surface area. Their formation may have occurred in a harsh continental dry climate, corresponding to the current desert and desert climate. As a proof of this, it can be shown that all the rocks involved in the formation of the layer have a red tint and the presence of gypsum layers.

In the described area, the sedimentary deposits are not evenly distributed. Their main areas are found in the western and pre-mountain parts. The eastern part of the territory is occupied by mountain constructions and has a thin cover of new deposits. The origin of all deposits is continental in nature.

Thus, along with soils on loess deposits, soils formed on Tertiary Neogene reddish deposits are widespread in the study area. Their characteristic heavy (sludgy) mechanical composition, super-densification creates relatively extreme regimes. This has a significant impact on soil formation and fertility. However, insufficient study of soils formed in neogene deposits in mountainous conditions of Kashkadarya region limits the solution of theoretical and practical problems in agricultural production. Only on the basis of the study of the origin, composition, properties and fertility of the studied soils, taking into account the soil-forming rock, scientifically based measures and protection methods for the rational use of the soil can be developed.

Thus, Kashkadarya region is divided into three geomorphological regions according to its geological structure, history of development, current relief, orography and hypsometry: mountainous, sub-mountainous and plain (Shultz, 1959). The research area is located in the second geomorphological region and occupies the southern part of the Kashkadarya region, the edge of the Khontakhta range. From a geological point of view, it is a region of Mesozoic and Tertiary sedimentary deposits. In the process of studying the gross character of the surface structure, the connection between relief forms and geological structure is clearly visible. For example, flat, concave areas are areas that have not been affected by tectonic movements and are naturally dominated by sediment accumulation. Mountainous or significantly branched relief is observed in sections where folding is strongly manifested, and their high points go back to regions of ancient rocks. In the relief, the structural forms associated with extremely hard, hard-to-disintegrate rocks have a strong development. (Schultz, 1959). It should be noted that the formation of the relief occurs with the help of exogenous factors, against the background of the geological structure, and the level and character of their development is related to modern and ancient physical-geographical factors. In particular, the relief is strongly influenced by the difference in climatic conditions, which are primarily related to the absolute altitude and the main orographic elements. This is the reason for the participation of the erosion process in the formation of the relief of the foothills.

Transverse valleys, i.e., tectonic structures, valleys standing transversely to the main direction of orographic elements are prominent in the region. This is especially evident when the Guzor river, Langar, Kyzil river, and Tankhoz rivers cross the corridors formed in different deposits in wide areas. This is due to the fact that the mountain systems arose on the surface after the valleys that cut through them. That is, the valleys are antecedent, and some of them can be considered epigenetic. Because they consist of Mesozoic and Cenozoic deposits, only reflected on the surface of Paleozoic slabs during the eruption process. The same origin is also characteristic of the Yakkabogdarya valley (Chuenko, 1937).

It should be noted that the rate of erosion is much slower in the foothills. The valleys are not very deep, but wide. This is primarily due to the low absolute and relative height of the initial surface, which in turn is related to the slowness of the resulting tectonic movements. In pre-mountain conditions, the distribution of porous deposits consisting of Mesozoic and Cenozoic sedimentary deposits and erosion products of mountain structures is also important. They are easily subjected to denudation, as a result of which the river quickly reaches an equilibrium profile and expands its valley through erosion. Based on the principles of genetic classification, the following types of relief are distinguished in the Ashgadarya region: 1) mountain (erosion-tectonic); 2) structured; 3) erosion-

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denudation; 4) erosion-accumulation; 5) eolian-accumulation. In the foothills, the main part of the area has a structural type of relief alternating with the erosion-denudation type. Only in smaller areas, erosion-accumulative type relief is observed.

In the territory of Yakkabog district, the foot of the mountain directly adjoins the steep mountain slopes. The described farm area is located in the foothills of the Khontog (Khontakhta) range, the western branch of the Hisar range.

Two lithological-geomorphological districts are distinguished in the farm area:

1. Egate-hilly, high foothills of the Khontog range.
2. A hilly mountain.

850-900 to 1500-1600 m located up to the height. The relief consists of a large number of egates branching from Khontog to the north. The tip of the egates is 50-100 mm The watersheds of the egats, which are dense, weakly undulating, and in some places have weak blunt hills, have a slope of 2-50 (in some places 0-20) towards the north. Egates are more common on slopes with eastern and western exposures. The eastern slopes are steep and eroded, and the soil cover is weakly developed. Iron rocks, conglomerates, and red clays are exposed in places. The slope of the slopes varies from 12-180 to 30-35-450. The western slopes are located on a more orderly basis, have fine soil, and according to the studied sections, the slope varies from 12-180 to 20-250. Some flat (5-80 to 180) slopes on the tops of the mountains are occupied by spring crops. Dry farming uses the middle (5-120) and lower parts of the western slopes.

On slopes with a slope of 12-180 to 450, it is usually rainfed or set aside for grazing as reserve land. The depth of the valleys separating the Egates100 m reaches up to, deepens towards the mountain slopes. Egates, as well as valleys, decrease parallel to the north.

Egates are composed of conglomerates, in some places red clays, in watersheds they are covered with loess. Their thickness at water separators is 1.5-1.75 min some places it is even more.

On the surface of the slopes of the Egatas, melcozymic vein rocks, mostly weak-strong skeletal layers of eluvium-deluvium are exposed.

Egate-hilly mountain front, usually 850-900 m from600 m will be up to height. The width of Egat water separators is 150-200 maround 0-20 degrees in some flat places, and 3-50 degrees in some places that go down to the north. The slope of the western slopes varies from 2-50, while on the eastern slopes it varies from 5-80 to 8-120 ha is enough. In both geomorphological districts, the general slopes in the egates are transversely undulating, with the northeast and southeast forming secondary slopes on the general western slope, and the northwest on the general eastern slope.

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