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KARSTING ROCKS AND THEIR ROLE IN THE INTENSITY OF KARST PROCESSES IN THE MOUNTAIN CHECHNYA

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Abstract

Karst processes arise as a result of the action of surface and groundwater on practically soluble rocks. Processes can proceed very slowly, despite the contact of water with soluble or even readily soluble rocks. The sloping occurrence of layers often contributes to the penetration of water into the depth of the karsting strata and their circulation, and limits the geographic distribution of the karst. The horizontal or almost horizontal bedding of the layers in the presence of drainage systems ensures a wide circulation of waters in the lateral direction and a large area spread of the canvas.

Keywords: precipitation, surface karst, aggressive water, factors, erosion, propagation, carbonate, morphology, dissolution.

Karst phenomena - the process of dissolution of rocks (carbonates, gypsum and salt) and the emergence of peculiar forms of relief and water regime. Systems of folded structures in which fissured (due to the tensile forces) zones of arches of anticlines are absorbed by waters that go deep into their wings, in the presence of drainage systems, as a rule, are even more favorable for the development of karst. Drainage systems are eroded valleys and tectonic depressions, which cut folded structures, circulating water.

The features of bedding are the determining factor of the morphology of subterranean and surface karst forms, and since layers of different composition and structure can be leached to varying degrees, very characteristic morphological details are formed. One of the main conditions for the development of karst is the presence of factors that ensure water circulation and water exchange, carrying out the removal of dissolved matter and the influx of new portions of unsaturated, aggressive water. In dense karstic rocks the water circulation is ensured by porosity and fracturing. Fracture in many ways also determines the morphology of the underground and superficial karst forms.

Water must be continuously circulated, which is determined by geological and geomorphological conditions, but water itself as a solvent is an element of runoff, surface and underground, which is closely related to the climate. The amount of precipitation and the amount of runoff are the most important factors determining the intensity of karst development under equal solubility conditions and the rate of dissolution of rocks.

Investigations of the Upper Cretaceous sediments of the Pasture and Rocky Mountains of mountainous Chechnya found that a large fracture is characteristic for zones of kinked layers, for areas complicated by dislocation dislocations. The most widespread karst craters are common in areas with a weak slope (up to 2-5 °). On the Banduk ridge, composed of Upper Cretaceous limestones, the karst funnels and hollows are distributed mainly on slopes with a steepness of about 10-15 ° and more, whereas on its almost flat surface they are usually absent. In the area of the ruins of Yalhara-mokhk, the basin of the Akki-chu river, composed of carbonate rocks of the Lower Cretaceous and the Upper Jurassic, several small funnels [4].

In the interfluvium of the rivers Gekhi - Shalazhi there are several dozen karst craters and hollows. Most of them are on slopes with a slope of 15 to 20 degrees. The interfluvial rivers Yaryk-Su and Benoy-Iasi are composed of Lower Cretaceous limestones and strongly karstic, and most of the karst craters are confined to the vertex part of the slopes of the watershed spaces.

Due to the infiltration of surface water into the karst massifs, the water discharge can be drastically reduced, while in others it can sharply increase as a result of the emergence of large karst springs. An example of such a change in runoff can be observed at the mountain rivers Chanty-Argun, Bassa and Hulhulau. The level of the flow of the Chanty-Argun River from the village Itum-Kali to Chishki varies in the direction of increase and to a certain extent, this is due to the confluence of many spring springs and most of the karstic origin. The degree of influence of karst on river runoff depends on the moisture content of the catchment area [6].

Intensive karsting in gypsum deposits in subsequent valleys is explained by the fact that when the river cuts into these strata, some part of the channel water seeps into fractured carbonates, replenishing underground waters. Examples of this intensity can be observed in the vicinity of the villages of Goukhoye, Ulus-Kert, Mahket, Nashkhoy.

Frequently encountered in mountain karst areas, underground rivers are of two types. Some drain the ground karst water like the surface rivers flowing among the karst rocks, others are not connected with the groundwater and are "separate watercourses". However, among the surface rivers in the karst regions there are also "suspended" streams flowing above the zone of constant full saturation [3].

With a small amount of water, such rivers can all go into pedestal emptiness, for example, the Bassa River, which is lost three times in the karst

limestones of the Upper Cretaceous. The first time the river goes to the karst 200 meters from the source, which represents the karst spring. After it under the ground flows about 200 m. Comes to the surface in the form of three sources. Then after 100 m it again disappears and comes to the surface, passing 80 m. Still lower the river disappears by 30 m along the current.

The mountainous areas of Veden, Shatoi and Galanchozh regions are characterized by the presence of lakes, the genesis of the basins of which is closely connected with the karst processes. Some of the lakes occupy karst funnels or saucers of different origin (surface leaching, failure, suction, etc.) and in this case are usually round in shape. An example is Lake Galanchozh in Galanchozh region, Lake blue in Shatoi district and a lake in the vicinity of the village of Borzoy. There are karst lakes of complex shape, the basins of which are formed more often by the fusion of several karstic funnels [2].

An important role in the formation of karst-suffusion forms in sandstones and conglomerates with calcareous or gypsum cement, when the bulk of the rock is removed mechanically, the transferring action of moving water is played by dissolution, releasing sand and clay from the clutch and preparing them, thus, for transport with flowing water, which also contributes to the processes of landslide formation.

Elementary forms of dissolution of sandstone cement and mechanical sand removal are depressions such as "legends", as well as "honeycomb cells" and "pockets" in the cliffs of the Lower Cretaceous sandstones in the vicinity of the villages of Makhkety, Ulus-Kert and Gukha. First of all, the karst is directly involved in the formation of the relief, which is manifested in the formation of karst craters, hollows, poles, karstic remains, karst-erosion meadows and beams, karst benches, etc. [1].

In the fractured karstic rocks emerging on the surface, the falling rain and thawed waters form a variety of depressions in the form of holes, grooves separated by ridges and ridges. Such forms, which are no longer forms of micro, but mesorelief, are observed in the areas of the middle relief of the Pastbush Ridge and the regions of the cuesta relief of the Rocky Range in the villages of Borzoy, Khal-Kheloy, Kharachoy, and others.

In karst areas, along with negative forms, there are also convex formations in the form of various protrusions and hills, which can often be observed in the mountainous part of the Republic. These are karst remnants in the villages of Guchum-Kale and Gukhaya in the basin of the Chanty-Argun rivers and the Osu-hi of the Nashoha ridge in the Galanchozh district.

Canopies and niches are widespread in the mountainous regions, in particular in places where the Rocky ridge is cut by deep river valleys of the rivers Gekhi, Roshnya, Chantu-Argun and Sharo-Argun and Pastbishny ridge by the rivers Khulhulau, Aksai and Bassa. In the formation of deeper niches, a significant role is played by seepage along the fissures. Corroding activity leads

to the expansion of cracks, as a result of which rocks are crumbling and niches are formed.

It is known that the karst, contributes to the "conservation" of erosion-denudation equalization surfaces. The smoothing of steep slopes in the zones of limestone karst is extremely slow. This is explained by the absence of a concentrated surface runoff of atmospheric water due to the development of karst and the weakness of chemical weathering on steep slopes.

The question of the influence of vegetation on the development of karst has three main aspects. First, vegetation is an important factor in the formation of aggressive properties of natural waters in relation to carbonate rocks. Secondly, it is a hydrological factor that significantly affects surface runoff and infiltration of atmospheric precipitation. Third, it is a factor preventing the washing away of the soil and the formation of a bare karst. In the first case, vegetation affects the chemical processes of karst formation and, as a rule, contributes to the development of karst. In the other two, it has a physical effect. Thus, forest vegetation, which retards surface runoff and protects the soil from freezing, increases infiltration. At the same time, the vegetation cover inhibits the development of karst processes. We can therefore talk about the duality of its influence on the karst. Vegetation as a hydrological factor has a significant influence on the development of not only the carbonate karst, but also its other lithological types [5].

In excessively moistened areas, karst processes improve the properties of the landscape, and in arid places increase the lack of moisture. There is drainage of the territory. The conditions for the formation of the soil-vegetation cover change in the karst areas. Karst has a significant influence on the density of the river network, on the annual natural runoff of rivers, on the thickness and diversity of soil vegetation, and leads to the fact that the area of its development turns into a special kind of landscape in typological terms, so the acute issue is the complex physical and geographical study karst processes of the mountainous part of the republic.

The peculiarity of the relief, drainage, hydrographic network, groundwater regime, lakes and surface watercourses, diversity of microclimatic conditions and soil and vegetation cover, the originality of soils and vegetation in the case of their development directly on karstic rocks allow us to relate the landscapes of karst areas to either subtypes of karst geographic landscapes that are grouped into special types of landscapes or to separate them into special subtypes, groups and species among forest, forest-steppe, steppe landscapes, and so on.

Referecens:

- [1] Gakayev R.A. Forms of karst manifestation in the Chechen Republic and their main characteristics Globalization and geography. Materials of the international scientific conference devoted to the 85th

- anniversary of Professor MA. Museibova, Publishing house of Baku State University, Baku. 2012. pp. 351-355.
- [2] Gakayev R.A. The role of climatic conditions in the activation of landslides in the mountainous part of the Chechen Republic. Global scientific potential. 2012. № 13. With. 9-12.
- [3] Gakaev R.A. To the question of predisposition landslides in mountain landscapes of the Chechen Republic. In the collection: Scientific works, practice, developments, innovations of 2013 Cbornik of scientific reports. Sp. z o.o. «Diamond trading tour». Warszawa, 2013. p. 35-38.
- [4] Gvozdetsky N.A. Karst Landscapes, - M: Moscow State University Publishing House, 1988.-112 p.
- [5] Elmurzaev R.S. The factor of relief and erosional dismemberment in the formation of the Karst of the mountainous Chechnya. In the collection: In the World of Science and Innovation. Collection of articles of the international scientific-practical conference: in 8 parts. 2016. P. 202-206.
- [6] Elmurzaev R.S. Hydrological characteristics of the manifestation of karst in the landscapes of mountainous Chechnya. In the collection: Innovative mechanisms for solving problems of scientific development. The collection of articles of the international scientific-practical conference: in 4 parts. 2016. P. 222.