



THE LEVEL OF SPELEOTURISM STUDY OF THE KARST PROCESS IN THE HISSAR SYSTEM

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ABSTRACT:- The Gissar ridge is located in the south-eastern part of Uzbekistan and has a unique geological structure and natural conditions. Along with the geological structure of the region and a number of natural geographical processes that occur in connection with it, various manifestations of the karst phenomenon have emerged. The article analyzes the history of development of karst formations in the Gissar ridge, the results of research conducted for their scientific study and the scientific and practical significance of the analysis of karst processes in the region in terms of karstological speleolitogenesis and speleotouristic direction of ecotourism.

KEYWORDS: Gissar ridge, geological structure, karst process, cave, karstological research, hydrogeology, karstological speleolitogenesis, ecotourism, speleotourism.

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INTRODUCTION

The information about the karst formations of the Gissar ridge, caves, described by Diodorus and Quintus Curtius Rufus, who lived and worked in the III century BC, is very interesting (MA Hashimov-1976, p.). The works of the great sages of the East Abu Rayhan Beruni, Abu Ali ibn Sino, Mirza Babur also contain information about the caves, underground rivers, springs studied in the region (N.A. Gvozdetskiy i dr.-1977, pp-55, A.Nizomov-2018, P. 81).

Scientific karstological research in the region began in the late XIX and early XX centuries. Because the Gissar ridge covers the mountainous areas of the Surkhandarya and Kashkadarya oases, which form the south-eastern parts of the republic, at that time the priority was to conduct geological prospecting for the use of existing natural resources, in particular, mineral resources. Therefore, the works of IV Mushketov "Turkestan" (1905), VI Weber "Useful excavated Turkestan" (1913), along with the geological structure of the study area and a number of natural geographical processes associated with it, the informant should be recognized as the primary scientific source.

Later studies by geologists AV Danov (1936), NP Petrov (1955), PU Akhmedov (1968) have a similar feature.

The political turmoil of the early twentieth century continued throughout Gissar as a mountainous region until the 1930s. Later the situation stabilized somewhat P.P. Geological data collected during geological field search expeditions led by Chuenko (1931), N.P.Tuaev (1937) were mapped, details of the karst process developed at some points specific to the region were monographed. In particular, P.P. Chuenko (1931) provides information about the Jurassic sulphate and carbonate karst products of the Gissar ridge - pits, caves, lakes (P.P. Chuenko, 1937, p. 383).

METHODS

Views of the karst process in the area, in particular karst caves, began to appear as interesting objects of study for archaeologists as well. Because they could have yielded important scientific results as primitive settlements. Therefore, AP Okladnikov (1940) proved that the Teshiktash cave in the Machaydarya valley replaced the Neanderthal settlements by examining the skull of a 9-year-old boy found here.

Karst terraces typical of carbonate deposits formed along the right bank of the Zarautsoy gorge, starting from the eastern slope of the Kokhitang ridge (Sherabaddarya basin), provided shelter for primitive people in the Mesolithic and Neolithic periods. It was first studied in 1912 by military topographer M. Fyodorov, and in 1940-1945, archaeologist GV Parfenov examined it and copied on paper in black pencil pictures of more than 200 hunting scenes. Images of hunter-gatherers, hunting dogs, leopard-wild boar, and deer, painted on the walls of the cave with ocher-red mineral paint, were well preserved (A. Roginskaya-1950). This study serves as an important source in assessing the ancient and modern significance of the caves located in the Gissar ridge.

After the Second World War, the Gissar ridge was recognized as a less scientifically studied and at the same time developed mountainous region of Kashkadarya and Surkhandarya regions, and it was decided that it should be studied in terms of natural and geographical special. Therefore, the study was investigated by a large expedition consisting of scientists from the Faculty of Geography at SaSU. Geological structure of the fortress - SV Ekshibarov, O. Yu. LI Shalatova,

geomorphological structure - O.Yu. Poslovskaya, soil agro-zoning – N.T.Muraveva, vegetation – II Granitov, A.D.Pyataeva, A.I.Aleksandrova, natural geographical zoning N. Two volumes of monographs "Kashka-Darinskaya oblast" (1959) and "Surkhandarya oblast" (1959) were published by D.Dolimov. Lower Jurassic (J3) and Cretaceous (Cretaceous) carbonate, sulphate, and chloride deposits that occur in mountainous and partly foothill areas are recognized to be strongly karsted despite the dominance of arid climates. Although it was not formed, it was able to provide sufficient scientific evidence for the strong development of this process in the Gissar ridge and therefore serves as a cornerstone for further development of karstological research.

Shortly afterwards, the results of an interesting study by A.A. Kreiter (1958) on the formation properties of sulfate karst in the Shurab Valley were published. The study of karst from a geomorphological point of view also aroused great interest in science after the researches of I.S. Shchukin (1936, 1964) as a result of scientific researches of V.A. Vakhrameev (1937), P.S. Makeev (1951) on the example of Gissar mountain.

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Hydrogeologist LS Balashov's monograph "Surkhandarya Artesian Basin" (1960) showed that the author's research on mineralized karst springs, karst caves, such as Khojai Pok, Khojilor, Chashmai Garmob, Khudji, Sangiosiya, Khojaikonbulak, . However, these scientific studies were of no purely karstological significance. The first scientific research in this area was published in the dissertation of AM Mamatov "Karst mountain ash levoberejya reki Kashkadarya." In this dissertation, the developmental characteristics of the karst process along the mountainous right bank of the Kashkadarya on the basis of natural geographical factors were studied. As the first researcher of the cave of Amir Temur, the author studied it in four parts: "Small Hall", "Large Hall", "Dome Hall", "Lake Hall" (AM Mamatov, 1968).

At the end of 1969, GIDROINGEO was included in the Uzbekhydrogeology Scientific Production Association in order to unite the scientific research institute, production and scientists. A special department of "Engineering Geodynamics" was established at this institute, which consisted of such laboratories as "Flood currents", "Slope and slope stagnation", "Karst and speleology" (A. Nizomov -2015, p. 9). The Karst and Speleology

Laboratory is the only research center in Central Asia. M.Mamatkulov (since 1983 g.f.d.) was in charge. In the 1970s, researchers in this laboratory M. Hoshimov - Gissar ridge (1976), Il Atajonov (1975) - Western Tianshan ridge, A. Alimov (1974) - Nurata and Central Kyzylkum fossil mountains, KA Aripov (1974)) - were consistently studying the developmental characteristics of the karst process along the Alay ridge. In general, the karst process was studied on a large scale in Uzbekistan and adjacent regions at that time. Following in the footsteps of N.A. Gvozdetsky (1994), O.Yu. Poslavskaya (1954) MA Abdujabarov (1965), P.Ataev (1972), Z.S.Sultonov (1972) scientifically studied the development of karst processes in different regions of the republic. , have also had some success in this regard. Although not all of this research was conducted along the Gissar ridge, it meant that the development of karst in the mountainous regions of Uzbekistan, including Gissar, was based on natural geographical laws, such as neighboring countries. Although the research of AT Chikishev (1973) was based on the analysis of the results of previous scientific research in the Gissar ridge, it was an important innovation in creating a theoretical

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basis for the development of the karst process for mountainous areas.

Due to the scientific and practical significance of the karst process and the gaps formed under its influence, the interest of researchers in this area has been growing. As a result, large scientific monographs covering the content of scientific issues related to karst and speleology until the 1980s were very rich in number and content. I.S.shchukin (1938, 1964), N.A.Gvozdetskiy (1954, 1972, 1981), G.N.Gigineyshvili (1987), V.N.Dublyanskiy, A.A.Lomaev (1980), Z. K.Tintilozov (1976), K.A.Gorbunova (1979), G.A.Maksimovich (1963, 1969), D.S.Sokolov (1962), A.V.Stupishchin (1967), N.P.Torsuev (1964), M.M. The study of aspects has left a deep mark on science. As a result, the 1960s and 1970s were a turning point in the history of karst research in Uzbekistan, especially along the Gissar ridge. Initially, AM Mamatov (1968) successfully defended his dissertation for the degree of Candidate of Geographical Sciences on the topic "Karst of the Gorno-Zapadnogo Gissara" (1976). defended his dissertation for the degree of Candidate of Sciences. As a result, 45 caves, many karst wells, caves, karst views such as karr fields were studied and developed by GA Maksimovich (1958, 1962),

N.A. Gvozdetsky (1962), AG Chikishev (1976). studied on the basis of zoning procedures divided into sub-districts, districts, sub-districts and micro-districts (MA Khashimov - 1976, p. 22)

Recognized for his subsequent scientific work, this researcher was able to create a number of monographs and popular scientific works not only in the Gissar Mountains, but also in the surrounding areas due to the karst process and its relentless work on recreation and ecotourism (MA Hoshimov 1979, 1991, 2009, 2012).

O. Yu. In this book, the authors provide scientific information about a number of karst caves in the Surkhandarya valley of Gissar.

CONCLUSION

Researcher A.Nizomov (1989) has been conducting continuous field research along the Gissar ridge for several years, using a special fluorescein (C₂₀H₁₂O₁₃) dye at more than a dozen points in the formation of 167 karst springs along the right bank of the Surkhandarya River alone. As a result, he studied the formation of karst water, the mapping of transport and surface areas, karst formations, their hydrological and hydrogeological role, the occurrence of karst

on the basis of natural geographical laws. In this regard, the author's work "Springs of Gissar" (1989) is also of great scientific and practical value.

Although MM Mamatkulov (1991, 2016) did not study the features of the karstological speleolithogenesis of the Gissar ridge in the field, his works play an important role in creating a theoretical basis for the development of karst processes in the study area and highlighting its practical significance.

From the above, it can be seen that the development of karst, karst processes in different regions of the republic, including the Gissar ridge, dates back to prehistoric times. However, the scientific study of the development of the karst process has been going on since the end of the XIX century, and in our country from 1960 to 1970 to the present day. The research provided a scientific and theoretical basis for the development of karst in the mountainous regions of Uzbekistan, including the Gissar ridge, on the basis of natural geographical laws.

Now the analysis of karst processes in the mountainous regions of Uzbekistan, including the Gissar ridge, in terms of karstological speleolitogenesis and the study of the

speleotouristic direction of ecotourism appreciates its interesting scientific and practical significance.

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