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Imrani Z. T., Zeynalova K. Z., Mammadova G. Sh., Vysotskiy O. Y.

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Opportunities and prospects for the development of speleotourism in Azerbaijan

Zaur T. Imrani¹, Kamala Z. Zeynalova¹, Gulnare Sh. Mammadova², Oleksandr Y. Vysotskiy³

¹*Institute of Geography named after acad. H.A. Aliyev of National Academy of Sciences of Azerbaijan, Baku, Azerbaijan.*

²*Lankaran State University, Lankaran, Azerbaijan.*

³*Oles Honchar Dnipro National University, Dnipro, Ukraine, vysalek@gmail.com*

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Abstract. Tourism has a positive impact on many sectors of the world economy because it unequivocally affects the growth of life and economic activity of the local population, increasing the socio-economic indicators of the region, improving the road infrastructure, and necessitating infrastructural development. Tourism is growing and diversifying around

the world, people are not only traveling to have fun, relax or spend their free time, but also because of their interest in alternative types of tourism. This approach requires the further development of regions rich in tourism and recreation resources, which, in turn, paves the way for sustainable development in the regional context. From a regional point of view, one of the important conditions for the development of tourism is the presence of unique natural monuments. One type of these natural monuments is caves, on the basis of which it is possible to develop speleotourism. Speleotourism is a complex type of tourism, the difficulty of which depends on limitations of natural light, high relative humidity, low air temperature, relief forms, and the degree of difficulty of routes. Speleotourism requires careful and trained hiking, as well as strength, endurance, agility, and the ability to use technical means of insurance. The article presents for the first time information on the classification of caves, states the importance of determining their status, and examines the caves in Azerbaijan which are distinguished by high values of speleotourism. In addition, the article examines the use of caves as shelters by primitive people and as sources of creation of legends and myths, their value as shrines and temples, as historical and cultural heritage, their use for sports and recreation purposes, as well as their use in enhancing the attractiveness of tourism. The authors prove the importance of using caves in Azerbaijan as a tourist product for the development of speleotourism, sites which are distinguished by their natural attractiveness, geological structure, historical past and archaeological finds, as well as convenient transport infrastructure. Scientific studies show that speleotourism is a promising tool for the development of regional tourism. The authors predict that in the future speleotourism in Azerbaijan will be an aspect of the country's international tourism.

Keywords: natural monument, cave, spelotourism, tourism, Azykh, Taghlar, Damjili, Gazma.

Можливості та перспективи розвитку спелеотуризму в Азербайджані

Імрані З. Т.¹, Зейналова К. З.¹, Маммадова Г. Ш.², Висоцький О. Ю.³

¹*Інститут географії імені академіка Х.А.Алієва Національної академії наук Азербайджану, м. Баку, Азербайджан.*

²*Ленкоранський державний університет, м. Ленкорань, Азербайджан.*

³*Дніпровський національний університет імені Олеса Гончара, м. Дніпро, Україна. vysalek@gmail.com*

Анотація. Туризм робить позитивний вплив на багато секторів світової економіки та однозначно впливає на зростання життя і економічної активності місцевого населення, підвищуючи соціально-економічні показники регіону, покращуючи дорожню інфраструктуру і вимагаючи їх розвитку. Туризм зростає і диверсифікується по всьому світі, люди подорожують не тільки для того, щоб повеселитися, відпочити або провести вільний час, але і для того, щоб освоїти альтернативні види туризму. Такий підхід вимагає подальшого розвитку регіонів, багатих туристичними та рекреаційними ресурсами, що, в свою чергу, прокладає шлях до сталого розвитку в регіональному контексті. З регіональної точки зору, однією з важливих умов розвитку туризму є унікальні природні пам'ятки. Однією з таких природних пам'яток є печери, на базі яких можна розвивати спелеотуризм. Спелеотуризм – це складний вид туризму, складність якого залежить від природного освітлення, високої відносної вологості, низької температури повітря, форм рельєфу і ступеня перетину доріг. Спелеотуризм вимагає обережного і підготовленого пішого туризму, а також сили, витривалості, спритності та вміння користуватися технічними засобами страхівки. У представленій статті, перш за все, наводиться інформація про класифікацію печер, вказується на важливість визначення їх статусу, а також вивчаються печери, що відрізняються цінностями спелеотуризму в Азербайджані. Крім того, в статті досліджується використання печер в якості притулків первісними людьми та як джерела створення легенд і міфів, їх

цінність як святинь і храмів, як історичної і культурної спадщини, їх використання в спортивних і оздоровчих цілях, а також для посилення привабливості туризму. Автори доводять важливість використання печер в Азербайджані як туристичного продукту для розвитку спелеотуризму, що відрізняється своєю природною привабливістю, геологічною будовою, історичним минулим і археологічними знахідками, а також зручною транспортною інфраструктурою. Наукові дослідження показують, що спелеотуризм є наочним інструментом розвитку регіонального туризму. Автори прогнозують, що в майбутньому спелеотуризм в Азербайджані буде використовуватися для міжнародного туризму.

Ключові слова: пам'ятник природи, печера, спелотуризм, туризм, Азих, Таглар, Дамджили, Газма.

1. Introduction

In modern times, the growing dynamism of people's lifestyles and the deteriorating environmental situation in cities and large metropolises have led to an increase in demand for the tourism sector. The tourism sector is focused on such issues as the development of various areas, improving the quality of tourism services, training professionals, solving visa problems, creating new routes to take tourists to natural and historical-cultural monuments, active participation of tourism companies and hotels in exhibitions, etc. (Imrani and Zeynalova, 2014). Each form of tourism is characterised by the specific needs of tourists and provides an appropriate set of services that meet these needs. In this regard, there is a need for long-term research to meet the needs of tourists and create an appropriate service complex. However, the fact that a large amount of money is not required for the organisation of tourism is one of the factors that stimulate its development. At present, various types of tourism are being developed in the world tourism market. Among them, the interest in speleotourism has increased significantly.

Despite the fact that Azerbaijan has sufficient potential for the development of speleotourism, this area lags far behind other types of tourism. From this point of view, systematic research into speleotourism and determination of its development directions, organization of infrastructure, etc. are among the most important issues.

2. Materials and methods

During the research, geological, geomorphological, paleogeomorphological, geographical, and anthropological materials have been collected and analysed in indoor study conditions. The historical-geographical approach, comparative and systematic analysis and other methods have been used in the analysis.

3. Classification and status of caves

Natural monuments are considered unique tourist objects. However, not all objects created by nature are considered unique natural monuments. As a rule, unique natural monuments are created as a result of internal and external natural processes. One of the main features of rare natural monuments is their geological, historical, and scientific significance (Ravshanov and Usmanov, 2021). One type of these natural monuments is caves.

Caves are unique in their beauty, but are ecologically very vulnerable objects. Stalactites, stalagmites, and other deposits that are often found in caves form over hundreds of years. In many caves, the same temperature, humidity, chemical composition of air and water are preserved for decades and centuries. (Glushko and Sazykin, 2002). Caves are underground cavities that can develop horizontally, at angles or vertically, extending from a few meters to several kilometers. According to the International Speleological Association, a cave is considered to be a large underground space that allows people to pass through a hole in the rock (Bart's research report on caves, 2018).

Caves have been known to humankind from the earliest stages of its development, which in many respects took place in caves, which were widely used as shelters and dwellings. In historical times, caves were used for various pragmatic and spiritual purposes, and the first topographical plans of the caves date back to the 16th century. However, until the end of the 19th century, only the most easily accessible caves, both in terms of the position of the entrances and in terms of internal conditions, were known to science and practice (Klimchuk et al., 2007).

Caves appear in different ways. Cavities can appear simultaneously with the formation of the rock itself, for example, gas bubbles and tunnels in lava erupted from a volcano, or cavities in coral reefs developing on the bottom of the seas, as well as small caves in calcareous tufas deposited by a river or spring. These cavities are called primary ones. The secondary ones include caves that arise in the already formed rock as a result of various geological processes. These are weathering caves, i. e., the destruction of less stable rock under the influence of temperature fluctuations, freezing of water in cracks, exposure to gases and atmospheric water; eolian – as a result of wind activity; abrasion on the sea coasts, due to the impact of surf waves on the rocks; hydrothermal ones, developed by hot underground waters rising along faults from great depths. The most common among the secondary ones are karst caves in limestone, gypsum, marble, and salt, in the development of which groundwater plays the main role (Gorbunova and Maksimovich, 1991). However, the lack of a single classification to determine the form of existence, affiliation, origin, and other parameters of caves creates some confusion in this regard. Although

a number of studies have been conducted on caves, they make it difficult to draw a general conclusion.

Based on the research work of N. A. Gvozdeskiy, V. N. Dublyanskiy, S. N. Zamyatin, K. A. Gorbunova, A. B. Klimchuk, G. N. Amelichev, N. G. Maksimovich,

F. D. Ayyubov, M. A. Museyibov, R. Y. Guliyev, T. N. Kangarli, Sh. A. Babani, Kh. A. Khalilov, Z. T. Imrani and other researchers, we have classified the caves, and the importance of determining their status is reflected in the classification (Table 1).

Table 1. Classification and status of caves

Form of existence	Belonging	Origin	Class	Type	Kind	Status		
Abiotic (lifeless)	Natural	Endogenous	Geological	Magmatic	Crystallized	Of global importance	Of national importance	Of local importance
				Volcanic	Extrusion			
					Explosive			
					Fluction			
				Tectonic	Disjunctive			
					Plicative			
		Hypergenic		Dilatation				
				Gravity				
				Denudation				
				Hydration				
		Eologic		Corrosion				
				Defoliation				
	Fluviogenic	Erosion						
		Abrasion						
	Carstogenic	Sedimentation						
	Suffozogenic	Suffusion						
	Glaciogenic	Dislocations						
		Ablation						
	Pyrogenic	Pyrolysis						
	Biogenic	Vegetation						
Extensive								
Artificial (cultural)	Anthropogenic	Archaeological	Mechanogenic	Excavation	Of global importance	Of national importance	Of local importance	
			Hemogenic	Solvation				
				Liquidation				
				Cremation				
Eruptive	Constructed							
Complex	Natural-anthropogenic	Natural-art						

Note: Classification and status of caves is given by the authors

Although the karst process is more or less developed in the mountainous regions of Azerbaijan, the typical karst landscape is spread over very small areas (only in areas where carbonate rocks are distributed). Karst has developed in the zone of carbonate rocks of the Side Range of the Greater Caucasus, and on the southern slope, where Jurassic and Cretaceous limestone layers come to the surface. In the Lesser Caucasus, karst processes occur mainly in areas and zones where Jurassic and Cretaceous limestone layers in the Shinikh-Dastafur synclinorium, gypsum layers in the Agjakend synclinorium, and thick carbonate rocks in the Karabakh range rise to the surface or lie at shallow depths. The karstic rocks in Nakhchivan include the Mesozoic and Paleozoic carbonate rocks of the Daralayaz Range and west of it (Museyibov, 1998). Although the caves are not so large in size, they are very different in origin

and are represented by such forms as karst, abrasion, erosion, denudation, etc. (Kangarli and Babayev, 2015). Caves with different forms of sedimentation (stalactites, stalagmites, etc.) are not so rich. However, in some caves and mines, it is possible to come across these and more complex forms of sedimentation (Museyibov and Guliyev, 2018).

4. Speleotourism

At the end of the 19th century, there was a growing interest in many caves (this included more than 3,000 caves in Europe alone), which entailed study of underground cavities with complex structures, as well as geological, paleogeological, archaeological finds, etc. and their use as a tourist attraction. People were trying to learn the secrets of the underground world, for which they were exploring underground with the

help of special technical equipment, which laid the foundation for the creation of a new organisation. In 1879, the Scientific Association for Speleology was established in Vienna, which was tasked with studying Austrian caves, expanding knowledge about them, and organising excursions. In 1890, E. Riviere proposed the term «speleology», and in 1892, M.de Nussac coined the term «speology» in a shorter form, which is still used by some biospeleologists. After E. Martel's speech at the XII Congress of the «French Association for the Support of Scientific Research» on August 4, 1893, the term «speleology» became known worldwide (Dublyansky, 2000).

Speleotourism (from the Greek *Spelaion* – cave) means visiting caves. Depending on its complexity, speleotourism can be an excursion, amateur or a sport activity. Speleology studies the origin of caves, geological (composition of rocks, their fracturing) and hydrogeological (underground karst waters) conditions for their development, the shape and size of cavities, deposits and minerals, living conditions for organisms in them, the history of development, and the possibility of practical use (Gorbunova and Maksimovich, 1991).

Speleotourism is a type of tourism that preserves or enhances the geographical character, environment, heritage, aesthetics, cultural associations and well-being of caves. This means that speleotourism is a diverse form of tourism, ranging from enjoyment of natural areas, historical attributes of a place, archaeological excavations, aesthetic landscapes, traditional architecture, local cuisine, music, art and dance. At the same time, it is able to protect the environment and enrich the region's economy (Emeka et al., 2017).

The main features of speleotourism are the difficulty of underground routes due to the different relief forms of caves and high relative humidity (up to 100%) at low temperatures. Speleotourism requires tourists to have physical strength, endurance, agility, the ability to use all possible means and insurance for underground safety, as well as the ability to swim and climb rocks. The route of the speleotour consists of two parts, top layer and underground. The difficulty, crossing conditions, and duration of the first part of the route depend on the location of the cave, ie. the distance from settlements and the season. The second part of the route is characterised by several categories of difficulties, which are determined by the length of the cave, the shape of the terrain, and climatic conditions. Routes with interesting and suitable excursion areas are prepared before the speleotour (Imrani and Agakishiyeva, 2021). Depending on the purpose, speleotourism has two directions: 1) Sports tourism (in this case, it is still necessary to conduct scientific research); 2) Scientific research (all requirements in sports tourism must also be met). The development of speleotourism is possible

in two main directions: 1) Mass tourism: aimed at entertainment, recreation, and sightseeing; 2) Special tourism: provided with a guide, equipped with special equipment, walking for a limited time (3–7 hours) and in small groups (10–12 people).

In general, speleotourism is carried out in difficult-to-reach areas and in caves outside settlements, combining some features of hiking and mountaineering trekking. However, the development of speleotourism is more likely to take place in areas close to tourist settlements. In addition to the level of service provided to the tourist, the entrance and surroundings of the cave should be regulated, and information about the cave should be provided to the tourist during the visit. Speleotourists, in turn, must pay attention to their behaviour and comply with special requirements in relation to the underground environment. This is due to the extreme fragility of the cave ecosystems they are interested in, its various natural formations, minerals, and ice crystals. For example, fractured stalactites can only be restored after decades or even hundreds of years. Caves, which have very valuable, unique and sensitive features from a scientific and ecological point of view, should be protected in general, and no activities should be carried out in these caves.

5. Analysis and discussion

The best way to better protect caves that span millions of years in the promotion and marketing of the natural and cultural resources of Azerbaijan should be using them for tourism purposes. Caves have great potential in terms of tourism diversity. Geomorphological elements, exotic and rare forms of relief make caves extremely attractive as a free recreation reserve or a natural object.

Caves are widespread in Azerbaijan and are found mainly at altitudes between 500–2600 m. In the highlands, caves are rarely encountered, and their size is not usually so great. In total, 240 caves have been registered in Azerbaijan. About 40 caves with a total length of 800 m have been studied to date (Eyyubov, 1978). However, only 30 caves in Azerbaijan have been approved and registered as historical and cultural monuments. Four of them are preserved as monuments of global importance, 18 as national, and 8 as of local importance (Approved by, 2001).

Cave tourists around the world are encountering an evolution and transformation in the context of tourism destinations. The focus of tourism now emphasises the issue of how interactions between tourism organisations can act as mechanisms for tourism destination management by themselves (Rindam, 2014). At present, one of the alternative directions of tourism development in Azerbaijan is related to speleotourism. The country has great potential for this. Underground travel to

wells, frosts and cliffs with a karst layer surrounded by stalactites and stalagmites looks very attractive for lovers of active recreation because speleotourism is a type of tourism that requires endurance and has many standard features and characteristics.

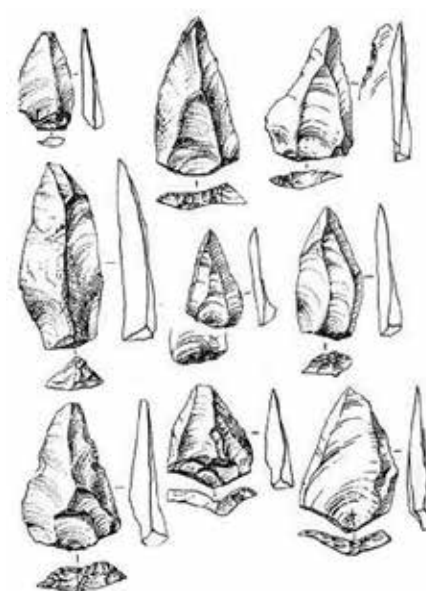
Azykh cave in the Guruchay gorge of Khojavend region, 3 km from the river between Azykh and Salaket villages, **Taglar cave** in the south of Boyuk-Taglar village of Khojavend region, in the Caucasus and Middle East monuments, 3 km east of Buzeyir village of Lerik region **Buzeyir cave** near Dalikli-Dash peak (1640 m), **Shusha cave** near Dashalti village on the left bank of Dashalti river near Shusha city, **Duzdag cave** near Boyukduz village of Kangarli region 12.2 km from Nakhchivan city, 5 km from Novorobotka village of Gadabay region cave, 9.5 km south-east of **Koroglu cave**, Ordubad city, on the left bank of Araz river, near Kilit village, **Kilit cave**, Gobustan region,

south of Sundi village, **Guyla cave** on Gahla mountain, etc. have excellent potential. Along with these caves, there are caves in the territory of our republic based on which it is possible to develop speleotourism at a high pace.

As a result of complex scientific research conducted in the territory of Azerbaijan, it was found that 2.5 million years ago, primitive people settled in the Azykh and Taglar camps, which are natural karst caves. During the camp excavations of the Azykh Paleolithic, more than 300 stone products, bones of hunted animals, rough hand tools, cubic tools, rough blades, well-preserved fragments of the impact surface, etc. were found (Figure 1). Furthermore, based on the remains of material culture found in the Taglar camp, it is possible to study the techniques, typology, and features of the formation of tools of the camp residents (Jafarov, 2018).



Azykh cave, Guruchay stone (labor) tools



Taglar cave, Levallua sharp edges

Fig.1. Stone (labour) tools found in caves

The Stone Age Shusha cave is located in the gorge of the I Zarisli (Dashalti) River at an altitude of 1400 m above sea level. At the mouth of the cave, there are the remains of a medieval fortification and castle walls. During the archaeological excavations, two rough pieces of the Paleolithic period, microlith knives of the Mesolithic period, clay vessels of the V–IV millennia, fragments of pottery of the Bronze and Iron Ages, etc. were found in the cave (Velishov, 2003).

One of the caves with the potential for speleotourism in Azerbaijan is Buzeyir Cave. Clay vessels, bone fragments, stone products, and other items belonging to the Middle Ages and the Eneolithic period were found during archaeological excavations in the cave. However,

these findings are still the first historical information, and future research will lead to the discovery of new scientific materials (Jafarov, 1990).

Health tourism, one of the alternative tourism activities, has been developing globally in recent years. Speleotherapy tourism, one of the health tourism's activities, and salt cave treatment are spreading rapidly worldwide. Duzdag Cave, located 12 km north of Nakhchivan, consists of two parts, aboveground and underground (Shimshek, 2020). The cave is well provided with infrastructure, and a medical facility providing treatment for asthma and shortness of breath (bronchial) has been established on its basis. In addition, those who come to Nakhchivan, the oldest

historical city of Azerbaijan, for alternative tourism or other purposes are acquainted with the potential opportunities of speleotourism because this type of tourism is an accessible tool for discovering the deep secrets of history, becoming familiar with archaeological excavations and is attractive to fans of extreme tourism.

Tourism is growing and diversifying around the world, and people are not only traveling to have fun, relax or spend their free time, but also to engage in alternative types of tourism. Taking into account this factor, it is necessary to assess the possibilities of speleotourism in Azerbaijan because speleotourism is an alternative type of tourism that can cause an influx of tourists to the country.

Azerbaijan does not have a legal regulation mechanism for the use of caves. Nevertheless, the attractiveness of caves in Azerbaijan is realised in various aspects. As an example, the following can be shown (Figure 2).

5.1. Presence of shelters for primitive people (Azykh, Damjili, Taghlar, Gazma, etc.).

During the first archaeological excavations in 1953, the remnants of the material culture of the highest scientific significance were found in the Damjili cave in the area called Yatag, south-east of Mount Avey in the Gazakh region (Zamyatnin, 1958). The area of the cave is 360 m², its length is 17 m, and its height from the front is 4 m. The entrance to the semi-circular Damjili cave was destroyed. During archaeological excavations in the cave camp, more than 8,000 archaeological artifacts were found: stone-cutting tools, core, sharpened blades and knife tools, plate-shaped fragments, arrowheads, awls, etc. and bones of more than 2,000 different animals (Almammedov et al., 2017). Archaeological and paleontological finds from the sediments of the Damjili cave camp prove that the Stone Age people settled here, made their tools, and hunted. This, in turn, confirms that the territory of Azerbaijan has one of the oldest settlements.

5.2. Creation of myths and legends (Ashabi-kahf, Gara inakboghan, etc.).

There are some caves in Azerbaijan, about which there are legends and myths. One of these caves is Ashabi-Kahf cave located in the area between Ilandagh and Nahajir Mountain in the Babek district of Nakhchivan.

The Ashabi-Kahf cave is of pseudocarst origin, and its entrance is located behind a narrow ravine hidden by rocks. The walls of the cave, which is more than five m high, are decorated with large hollows created by both nature and human hands.

According to the legend in Surah al-Kahf (The Cave) in the holy book of the Muslims Quran, young

believers hid in a cave with a dog to escape persecution. God put them to sleep and woke them up a few hundred years later, but the young people saw a different world and fell asleep again. The legend spread in the territory of Nakhchivan has almost the same content (Administrative-territorial units, 2020). From this point of view, people visit the Ashabi-Kahf cave and believe that it is a miraculous place. According to local beliefs, if a drop of water falls on a person sitting in a cave, his/her wishes will come true. There is also a mineral spring of the same name in the cave-sanctuary. Along with those from Azerbaijan, pilgrims from neighbouring Turkey and Iran also visit the Ashabi-Kahf cave-sanctuary. Taking this into account, a mosque was built in the area of the cave.

5.3. Evaluation as a shrine, sanctuary, temple, and place of worship (Ashabi-Kahf, Gara inakboghan, Damjili, Gaur, etc.).

Some caves in Azerbaijan are used by locals as shrines, sanctuaries, and temples. The Gara Inak (Black Cow) Cave near the Amirvar village of the Dashkesan region is visited as a shrine. According to the legend, the milk from the cow's breast inside the cave mixes with the water and comes out like a spring, and its water is healing. The water is rich in iron and is of medical importance. Appropriate conditions have been created for sacrificing near the Gara Inak Cave, which is currently used as a shrine.

5.4. Assessment of history as cultural heritage (Azykh, Taglar, Shusha, Aveydag, etc.).

In 1960, during archaeological excavations in the Guruchay and Kondalanchay valleys of Karabakh and adjacent areas, the Azykh Paleolithic camp was recorded on the left bank of the Guruchay River. During the excavations in the Azykh Paleolithic camp, 10 layers have been recorded and studied. The total thickness of the archaeological layers in the Azykh Paleolithic camp, which has the richest stratigraphy in the Middle East and the Caucasus, is 14 m (Archeology of Azerbaijan, 2008). Azykh Cave is one of the largest karst caves in the Caucasus, consisting of five halls, 230 m long, with a small exit and karst well with a length of 600 m. At the same time, the cave has an entrance and exit. In addition to tools, the bones of various wild animals extinct and not extinct (cave bear, wild horse, Merck's rhinoceros, Pleistocene wood bison, giant deer, Caucasian red deer, Persian fallow deer, *Equus hydruntinus*, various birds, etc.) have been found in the cave. The remains of the oldest hearth found in the Azykh cave are about 700,000 years old (Ganiyev, 2019). Azykh cave has a special place in world archeology. The discovery of a jawbone belonging to prehistoric man in the cave – Azykhanthrop – caused a great scientific breakthrough

in the study of the history of the Caucasus region. Samples of material culture confirm that the first humans inhabited this area about 1.5–2 million years ago. Thus, the first people of *Homo habilis* age, who lived in East Africa two million years ago, settled here (Avsharova and Pirculiyeva, 2010).

5.5. Use for sports and rehabilitation/health purposes (Duzdagh, etc.).

One of the developed types of cave tourism is related to sports and rehabilitation/health. There is Duzdag Physiotherapy Center based on salt deposits in Duzdagh cave, near Boyukduz village, Kangarli region in Nakhchivan. Treatment of bronchial asthma of patients through «Spleotherapy» applied at the center

and visits by tourists from different parts of the world show the vast opportunities of Duzdagh in this field (Jabbarov and Isayeva, 2013). Most of the tourists who visit Nakhchivan for medical purposes come to this place after hearing about the healing properties of rock salt. Duzdag Physiotherapy Center provides a high level of service to visitors, patients and tourists. The center has accommodation and a long tunnel for walking. In order to restore their health in Duzdag cave, patients with bronchial asthma receive various courses of treatment under the supervision of doctors (Zeynalova, 2021). The cave used in the treatment of bronchial asthma has its own characteristics of humidity and weather.



Azykh cave



Taglar cave



Shusha cave



Ashabi-kahf cave

Fig.2. Speleotourism potential caves of Azerbaijan

In addition to the caves mentioned above, there are many caves in Azerbaijan which are known for their uniqueness, natural attractiveness, historical past and use as places of refuge, as well as for speleotourism. These include Shahnazar, Khazina Gala, Dashsalahli, Khalilli, Chakmag, Maral, Dashgala, Ajdaha, Peygambar, Divlar Sarayi, Khramort, Gizilgaya, Keshikchidag, Mramornaya, Mlynki, Khrustalnaya, Emine-Bair-Khosar, Optimisticheskaya and other caves.

The attractiveness of caves plays an important role in the development of speleotourism, a special type of tourism. Azerbaijan has great potential for the development of speleotourism. However, the country's caves are not currently used for international tourism, only local tourists visit some caves and show interest in their geological structure, historical past, as well as archaeological finds.

Virtually no special equipment is required for use in horizontal cave crossings, which are of great interest to speleotourism enthusiasts. Vertical cave crossings are steep and sloping, and mixed cave crossings are observed with various obstacles, so special equipment is used (Kvartalnov, 2005). Such excursions should be organised under the guidance of mining engineers and speleologists who have been working in the field for many years (Chernikh, 2002). From this point of view, speleotourism is studied in various aspects. A number of researchers have identified participants (pupils, students, nature lovers, athletes, scientists, researchers, etc.) interested in this type of tourism and the purpose of their visits (aesthetic, sports, pilgrimage, research, educational, etc.) to determine the road map of speleotourism. Thus lovers of aesthetic tourism explore the beauties of the underground environment, nature lovers show interest in attractive natural areas, typical visitors – in historically and religiously famous caves, athletes, i. e. adventure lovers – in caves that are difficult to traverse, those who conduct research prefer to travel and study the relief forms, hydrological features, and the cultural heritage of the caves. Pupils, students, and excursion enthusiasts are mainly involved in group speleotourism trips. They prefer educational trips, visit caves which are accessible due to a well-equipped road infrastructure, and get acquainted with the results of archaeological and paleontological research in caves.

In addition to the above, we must not forget that unorganized visits to caves can lead to mechanical, chemical, biological, and other types of pollution. Therefore, even in the initial stages of planning the development of speleotourism, a thorough and multifaceted study of the potential of caves is required to be undertaken by a large number of specialists (Prelovsky, 2018).

In order to develop speleotourism in Azerbaijan, caves should be studied on a scientific basis, their features should be presented to tourists, the road-

transport infrastructure to the cave should be improved, service areas should be organised close to them, caves and adjacent areas should be kept clean, cave entrances should be well signposted, and tourists should be provided with guide services. Only in this case, can it be possible to create a basis for the development of speleotourism.

6. Conclusions.

1. There is a great potential for the use of caves for the purpose of speleotourism, which are rare and unique natural monuments in Azerbaijan. For this purpose, scientifically substantiated geographical and tourist expeditions should be organised on the basis of caves, and attractive speleotourism routes should be prepared to develop speleotourism. Many caves must be equipped with technical equipment for speleotourism.

2. Speleotourism in Azerbaijan is almost undeveloped compared to other types of tourism. The conducted research has shown that the development of speleotourism is not only due to the desire of tourists to visit the caves because of the natural landscape, but also has advantages such as great economic importance, spread of environmental awareness, and environmental control. The caves are able to attract speleotourism fans from around the world. This can lead to additional income and foreign exchange inflows to the country and provide new job opportunities for the local population.

3. The attractiveness of caves in Azerbaijan has been studied in various aspects and potential opportunities for their use have been identified. Thus, the possibilities of using caves include: their role as shelters for primitive people, their preservation as a historical and cultural heritage, their use for sports and health tourism, the legends and myths associated with the caves, the use of caves as sanctuaries, shrines, temples and places of worship. Thus, their development can be used as a visual tool in the preparation of speleotourism routes in the future.

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