

The Studies of Caves in the Union Territory of Jammu and Kashmir and their Significance

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Abstract: *Caves are formed by erosion of rocks continuing for years to form different Geological Structures like Stalagmite, Stalactite, flowstones, etc. Caves have over centuries been an area of interest in terms of religion, culture and science. India being land of diverse culture faith and beliefs harbors caves and many rocks considered to be the symbols of Hindu Deities and worshiped. If cave exploration here in J&K is taken on an extensive level it will be very helpful to consider the area for promotion as tourist resort for the attraction of the tourists and pilgrims. It will definitely provide means of employment to people and also contribute in exchequer of Jammu and Kashmir. In all eight-nine caves have been discovered in the districts of Rajouri and Resai during the field visit. Two caves were found adjoining village Badough, Two in village Kalakot, Two adjoining village Tatapani, One in village Khyoon and two in village Kotla. Detailed Geological Exploration and research on these caves if conducted on the initiative and support of the Department of Tourism of Jammu and Kashmir as well as Government of India will definitely boost the tourism at National as well as International level and would be a great supplement to the economy by providing employment to locals in Jammu and Kashmir*

Keywords: Caves, Kalakot, Jammu and Kashmir, Stalagmite, Stalactite

1. Introduction

Caves are formed by erosion along a conspicuous line of weakness in a cliff, such as along the joints and faults. Continuing erosion for years together may form an arch as cave, Rhodes, F H T. Speleology is the science which deals with the study to explore all the aspects of the caves and their ecology and environment.

The caves especially in the carbonate rocks are originated due to erosion by the solution enrich in chemical and acids. In carbonate rocks the erosion takes place on the surface as well as subsurface. But the underground erosion which is active by means of physical or chemical weathering is most significant in the formation and origin of the caves. The mechanical work involves the mass movement of land, when the soil/rock is over saturated with water which acts lubricant aiding gravity to move rock causing landslide, avalanches, or soil creeping.

Due to chemical process decomposition of the rock forming minerals takes places. Salt deposits are easily reacted with pure water whereas the water containing CO_2 forming weak carbonic acid H_2CO_3 is well known solvent for carbonate and calcareous rocks leading to the formation of caverns, sinks, swallow holes, solution valleys and channels along weaker planes i.e. joints, faults, fractures and sometime even at the crest or trough of the fold, unconformity etc. Besides this, weak carbonic acid solution is also responsible for the replacement of one substance (mineral) to other substance. On the completion of the erosive work the underground water plays significant role for the transportation of the solution i. e. dissolved minerals and substances. The transportation work continues, till the precipitation of the dissolved salts and solid material takes place.

The deposition of the dissolved salts or substances depends upon various factors such as evaporation of water, loss of CO_2 , increase or decrease of pore pressure and temperature, rate of the chemical reactions, besides Geological structures such as joints, faults, folds, unconformity permeability,

porosity, attitude of the rock beds i.e. dip and strike, joints spacing, condition of joints and space between joints /fractures, depth of joints. Various structures which are formed due to the deposition process of the chemical solutions are as under:

Stalagmite and Stalactites

Water solution enrich in mineral dripping from the top i.e. from the roof of the caves, shaft or a fracture gives rise to the formation of a column of CaCO_3 , etc. growing upward from the floor of the cave known as stalagmite. Whereas a stalactite is cylindrical structure comprised of CaCO_3 hanging from the roof of the caves. The stalagmites and stalactites when united together give rise to the formation of a vertical pillar like structure. The deposits either stalagmite or stalactites are also called dripstones. Sometimes during the process of transportation of water solution flowstones are also developed.

Importance of the caves

Caves are most important from Religious as well as cultural point of view. The caves are also important from Geological point of view since the study of the caves is most significant to determine the palaeo-environment as well as Geological Age and Formation of the host rocks.

Religious Significance:

The Stalagmite formations found in natural limestone caves have resemblance with "Shiv Linga" represented as Hindu God Shiva. Due to the presence of stalagmite in various caves in India have been considered of religious significance and remain the source of attraction of a lot of pilgrims. People consider the Stalagmite as "Shiv Ling" and worship it. The Religious attraction took people to even smaller and smaller caves. In addition, in India there exist a number of caves which are related to Buddhism.

Cultural significance

Many caves in India are very popular from tourist point of view. The caves of Ajanta, Ellora, Udaygiri, Barabar, Pandavleni, and so on are world famous for archaeological finds and ancient architectural values.

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Geological significance:

The geological study of the caves reveals the origin of the caves besides palaeo-environmental condition and age of the host rock. The study of the caves also play significant role to determine the Geological characteristics of the rocks and their surroundings. The source of formation of mineral solution, transportation and deposition can also be determined which has a lot of significance.

Occurrence of caves in India

The caves occur in various states of India. In Chhattisgarh more than twenty caves have been discovered and some of them have been developed by the state for promotion of the tourism. Besides there are various other states and Union Territories where caves have been discovered like Andhra Pradesh, Utterkhand, Madhya Pradesh, Haryana, Jammu & Kashmir and are the best source of attraction of pilgrims and tourists. The Meghalaya state is famous for its caves and attracts so many tourists not only from the state or India even from world too. Some of the caves in the Meghalaya have been listed among the deepest and longest caves of the world. It is well said that the Garo, Jaintia and Khasi hills of the state have been the source of attraction since more than twenty caves have been located in these hill ranges. It is believed that the Meghalaya is one of the most beautiful State of India due to its greenery, weather and presence of the caves which have been explored or discovered by the European (especially by the British, German, and Italian cavers).

Occurrence of caves in Jammu Region

In Jammu region the caves occur almost in limestone or carbonate rocks. A few have been reported in sandstone or other type of rocks. The GREAT LIMESTONE is the host rock of various caves in Jammu region. It extends from village Cherai Muttal in District Reasi in the North East to village Khargala, Tehsil Kalakot, District. Rajouri, in the South West, having general strike NE to SW with dips due N, NW. Its strike length is more than 100 km and is the oldest rock unit of Precambrian age. A lot of opinion was put forwarded by various Geoscientists, and Researchers on the origin of Great Limestone, it is the oldest in age and host rock of occurrence of various caves along its entire length. It has a lot of caves in it which are yet to be discovered and to put on the map of Jammu and Kashmir. A glaring example of the prominent caves which occur in the Great Limestone is the Holly Caves of "Shree Mata Vaishno Devi" at Katra, "Shiv Khouri" Cave of Lord Shiva at Ransuh and Baba Dhansar cave situated along Reasi Katra road District Reasi are the important one. Recently a cave has been discovered adjoining Chenab River near village Salal, District Reasi which has to be investigated to determine its extensions i.e. length and width and other important Geological characteristics. There are a number of caves in and around Kalakot, Badough, Tatapani, Metka, Mahogla, Ransuh, Chakkar Kotla, Salal, Thanpal, Thakrakot, Pannasa district Rajouri and Reasi. A thorough investigation is required to explore entire stretch of Sirban Limestone from Chedai Muttal, distt Udampur to Khadgal, Distt Rajouri to explore caves as well as other Geological Structures. The detailed description of a few caves which are situated at Kalakot, Badough, Khyoon and adjoining areas is given hereunder.

An attempt has been made to explore the caves in Jammu region of Union Territory of Jammu and Kashmir. It is to mention that In Jammu "Shri Mata Vaishno Devi" and "Shiv Khouri" Caves are world famous. These two caves remained source of attraction throughout the year and more than 2.5 to three lacs pilgrims/devotee/tourists in a month for obeisance. Similarly the "Baba Amar Nath" Cave in District Anantnag, Kashmir region is one of the most important caves from religious point of view. "Baba Amar Nath" cave is located in limestone at an altitude of more than 12000 m a.m.s.l. and remained source of attraction for so many pilgrims/tourists. Due to the hostile climatic condition in approach and adjoining the caves pilgrimage is allowed only two to three months in a year. It is to mention that 6-7 caves have been explored in and around Kalakot area of District Rajouri. Two caves in village Kotla adjoining the "Shiv Khori" Caves at Ransugh have also been explored. The detailed description of the each cave is given as:

During the investigation one cave located at the back side of a School near Thermal Power Station adjoining village Badugh having coordinate N 33°13'19" and E 74°25'33" has been explored. It has been found that the entrance of the cave is 6' × 5'.2" located at 826 m a.m.s.l. in the Sirban Limestone the host rock. It has one chamber and almost horizontal at entrance. It is an ideal cave for speleological approach since it has presence of 5-6 stalagmites, white-grey in colour of variable size. The stalagmites inside the cave have prominent rings. It is dry cave and no dripping of water or sweat has been noticed during the visit (Fig. 1). The area adjoining the caves is covered with medium vegetation comprised of Pine trees, Kheir Wood, Thorny bushes besides green grass and seasonal weeds. It is about 2.0 to 3.0 Kilometer from Kalakot Bus stand and easily approachable throughout the year. The site was visited in the presence of the Priest who performs ritual in the caves by worshipping the Stalagmite as representation of "Shiv Ling" as "Lord Shiva" as per Hindu mythology.

It is to mention that at a distance of about 80-100 meters there is another cave having coordinate N 33°13'18" and E 74°25'32". It is also a dry cave located at an altitude of 791 meters a.m.s.l. It is slanting from first to last chamber having 50° angle (Fig. 2). A number of stalactites and flowstone of white to grey colours have been seen whereas no stalagmite of Geological significance has been notice in the cave. Some Bats has also been seen in the cave. Similar type of vegetation as discussed above has been found in the area adjoining the cave.



Figure 1: Stalagmite located in the cave near Badough



Figure 3: Approach to the Kalakot cave



Figure 2: Occurrence of Flow stone in the cave



Figure 4: Inner view of the Kalakot cave having Stalagmite

During the visit in the village Kalakot two caves with coordinates N 33°13'59" and E 74°24'56" and N 33°14'03" and E 74°25'08" having length 12 and 03 meters were found along the Neari Tawi adjoining village Tata Pani have been explored. The caves are located at an altitude of 839 and 752 meters a.m.s.l. All the caves are dry and exist in Sirban Limestone of Precambrian age whereas the cave having coordinates N 33°13'59" and E 74°24'56" has slight wetness. The caves are used as religious place to worship Lord Shiva since some stalagmite of small size has also been seen (Fig. 3 and 4). During the visit no priest was present in any of the caves but even then visitors were coming for obeisance. The caves adjoining the village Tata Pani are controlled by the villagers. Some alteration has also been noticed and one of cave is fitted with supply of electricity. A lot of bats have also been seen in the cave. Some stalactites have also been found in those caves. There is one more cave adjoining the cave located near Tata Pani. In all there are three caves located within periphery of 2.0 to 2.5 kilometers. These caves have a lot of significance from religious as well as tourism point of view since a number of pilgrims and tourists from adjoining areas are being fascinated and attracted to visit.

There is another cave found in village Khyoon having coordinate N 33°12'52" and E 74°31'37" which is about 35 Kilometers from Kalakot District Rajouri and as well as Shiv Khori caves at Ransugh District Reasi. It is located at an altitude of 1000 m a.m.s.l and exists in Sirban limestone having thickness more than 100 meters. It has almost horizontal floor whereas slanting at about 21° at the entrance. It is a river cave having entrance size 1.3×1.7 meters. It is dry cave and no sweating has been observed during the visit. It is subtropical humid, dry, river cave. It has highly angular to rounded boulders and fragments. No water or its impression has been seen inside the cave. In the cave leaching of calcite has been seen but no prominent stalagmites or stalactites are present. Some teeth of the vertebrate (Mammal) were also present in side of the cave. It is an ideal cave for conducting detailed studies so that it may be promoted as tourists resort. It would be a splendid gift for the poor villagers by putting the features of the cave on the tourists map not only of Jammu and Kashmir but also on the tourist map of India. It would be an interesting and well coming step if taken by the Tourism Department of Government of Jammu and Kashmir as well as Union Government of India.

In Kotla area two more caves have been explored during the field work. It has been observed that both the caves occur in

the Sirban Limestone and are located at about 5-6 kilometers away from Holy Town Ransugh. The world famous “**Shiv Khori Cave of Lord Shiva**” is located at about 5 kilometers in the North East of these caves. Water has also been seen dripping from the roof of these caves during the visit. No prominent stalagmite has been seen where as a number of stalactites are present in one of the explored cave. The area adjoining the caves is covered with medium vegetation comprised of Pine tree, Kheir Wood, Thorny bushes besides green grass and seasonal weeds. Kotla village is located on the top of ridge too have potential to attract the tourists. A meadow covered with pine trees is also located adjoining these caves besides presence of Bauxite deposits at Kotla and Chapparbari Galla. Wonderful sights adjoining village Ikhni may also become the source of attraction of the pilgrims/tourists “Baba Shiv Khori”.

The detailed study of the caves located in area with respect to Geological characteristics, Ecology, Palaeoclimatic conditions, Origin and impact on the environment will definitely play an important role to help the researchers not only in J&K or India but even over the Globe for comparative studies with the caves in India as well as whole world. Although it is well understood that the required attention has not been given for the studies of caves in Jammu and Kashmir whereas various states of country (India) has conducted some exploration and studies of the caves. A few Geoscientists and Researchers are conducting studies/research on them yet a lot has to be done. Initially attention has to be given to explore them and put them on tourist map of J&K as well as India so that advanced research work of national as well international repute has to be carried out by eminent researchers of reputed Universities and Institutes. It is imperative to put them on the tourist map of Jammu and Kashmir to lure more and more tourists besides their advertisement through electronic mode for the awareness among the masses. The Tourism Department should provide financial help to the budding Researchers/interested students of the concerned subject to conduct research on the exploration of the caves with special emphasis on their **Location and approach, Origin, Ecology and environment, Mineral content and other Geological characteristics, Religious sanctity, besides other related aspects having scientific relevance and significance.**

2. Conclusion

From the study of the area and observations recorded during the fieldwork it has been concluded that the entire stretch of Sirban Limestone from Chedai Muttal, District Udhampur to Khargalla, Tehsil Kalakot, District Rajouri have a number of caves irrespective of size and shape. The discovered caves may be explored to put on the tourism map of jammu and Kashmir. It is observed that there may be so many caves of religious as well scientific importance in the Sirban limestone which are yet to be explored. If explored can become a bench mark for development of the area for promotion of Tourism in J&K.

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