STUDY ON THE KARSTIC RELIEF OF VADU-CRIŞULUI AREA (BIHOR COUNTRY)

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Abstract. *The area we studied with our students lied in the north of the Pădurea Craiului Mountains, in the Crişul Repede Gorges, on the territory of Şumcuiuş and Vadu Crişului commune. The area is located in the north-west of the Apuseni Mountains; respectively in the north of Pădurea Craiului Mountains and is easily accessible from the road E60 from Oradea or Cluj. This area is a protected natural area, because there are many natural elements that attract tourists (caves, waterfalls, doline, clints and others). The most famously is Izbîndişul, the cascade from Vadu Crişului; this is one of the most important objectives of this area. With the remarkable touristic potential, that area of Romania was literally invaded by tourists no matter the season. Because of chaotic touristic activities, as well as because of the economic ones, landscape underwent obvious degradation. That was why the study trips and the field trips that we organized with our students have not only the purpose of studying endo-and exokarstic form, but also the impact of touristic activities upon that area. Moreover, as textbooks did not pay much attention to karst related processes and phenomena in general; we considered that such activities had a significant role in completing student's knowledge without neglecting the recreational part. The results of our activity were in the form of albums, papers, Power-Point presentations. This paper presents the reference, operational and framework objectives of this educational trip and are described the most important three objectives from this area: Crişul Repede Gorge, Izbucul and Izbîndişului Valley and Crişul Repede Gorge.*

Key words: *karst, exokarst, endokarst, landscape*

INTRODUCTION

The systematic study of karst phenomenon in Romania began with the establishing of first institute of speleology in the world in Cluj, 1920, by Professor Emil Racoviță. The base of speleology has been started since 1907 true his famous work "Essei sur les problemes biospeologique". Later together with professor Rene Jannel, conducted an extensive research work of the Caves in the Apuseni Mountains, in particular, Bihor Mountains, where he turned his attention to the Cave Scărişoara, then published a monograph about this cave (BLEAHU, M., 1982).

His work was continued by a number of outstanding researchers such as: Professor PhD. Iosif Viehmann, Professor Gheorghe Racoviță, Professor PhD. Pompei Cocean, Professor PhD. Bogdan Onac.

MATERIALS AND METHODS

In a rather interesting way the geography textbooks used in Romanian education treated extremely shallow the problems regarding the karst phenomena and the relief created on karst rocks (limestone, dolomite, gypsum and salt).

If we analyze, for example, the manual of V class and that used in the first year of high school, this "looks" only tangentially in several rows (8-9) the karst phenomenon. In comparison the old books, are also used as a source of inspiration for teachers, provides much more information about this spectacular phenomenon.

Note that there are many requests from students about this phenomenon casrtic, we decided to organize a field trip in the Pădurea Craiului Mountains (Apuseni) at Şumcuiuşu.

The area is located in the north-west of the Apuseni Mountains; respectively in the north of Pădurea Craiului Mountains, that area is easily accessible to the road E60 from Oradea or Cluj.

A separate note to the Ethnographic landscape of area, is given by the villages and hamlets scattered, with fireplaces that covers miles, running almost continuously and Valleys surrounding Pădurea Craiului Mountains, villages that give to this region a high degree of humanization.

The purpose of the trip. The area considered for study is a protected natural area, because there are many natural elements that attract tourists. These include: the end of the canyon between the village Bîlcana and Vadul Crisului and the many endokarst phenomena (caves: Vîntului Cave, Ungurului Cave, Vadu Crisului Cave, Casa Zmîncului Cave ...). Besides the shapes and sizes of caverns, have a special attraction the speleothems, the most known are the stalactites and stalagmites. Also we can not overlook the exokarstic relief (doline, clints, vertical walls, valleys, caves ... etc.). The most famously is Izbîndişul, the cascade from Vadu Crişului, is one of the most important touristy objects of this area.

The most of our activities have consisted in visiting caves, springs, waterfalls, sinkholes, and the human impact on this area.

Preparatory Stage

The trip we organized with a number of five high school students, XII class of Doamana Stanca High School, from Satu Mare County and with 10 students in the second year of study, at Tourism Geography, UBB, Cluj. All of them have expressed interest in knowing the karst phenomenon.

In the first phase we have shown the area where we will spend three days during the trip, and will conduct activities during those days. Thus, we used a Power Point presentation with various photos of the area.

The educational project of the trip

Framework objectives:

- Identification of exo-and endokarst forms,
- Observation of hydrographic features,
- Observation of fossils in the mass of the limestone,
- Study of human impact on the environment.

Reference objectives. The participants must:

- Define the meaning of basic terms,
- Use simple words, familiar contexts,
- To describe this phenomenon consistently, using a presentation of its,
- Describe and relate phenomena observed directly or indirectly,
- To use properly the conventional peers.

Operational objectives

a) Cognitive objectives

- The students need to define concepts: endokarst, exokarst, speleothem, sinkholes, lapies, karst, fossil;
- The students must characterize the karstic relief;
- The students must classify the limestones, by the formation way.

b) Methodological objectives

- Students will be able to perform a work during a given time;
- Students will need to identify the main karst areas on the map of Romania.

c) Attitudinal Objectives

- Students must carry out a work during a limited time,
- Students need to argument an essay,
- Students must indicate their attitudes towards the environment,
- Students need to explain the formation of fossils,

Prerequisites:

To make this trip the students must have prior knowledge of karst phenomenon, and a systematization of this knowledge.

The route of trip. During the four days we organized this trip to be able to include all routes and major objectives from this area.

RESULTS AND DISCUSSIONS

1. *Crişul Repede Gorge (Bîlnaca-Şumcuiuş)*

The work started with the visit of Ungurului Cave, with a guide, where we made observations regarding the origin of this cave and the traces left by prehistoric man. Unfortunately, today, these traces are almost completely destroyed, because of repeated actions of tourists. Although the cave not exaggerates in spectacular elements still has a spectacular entrance with a waterfall of nearly two meters tall. At the terminus of the cave you can see an impenetrable trap.

In the front of Ungurului Caves on a promontory rocky is found a funnel - sinkholes type, which can be explained on the basis of this exokarstic phenomenon.

Figure 1. Ungurului Cave (source: www.turismland.ro/ pestera-ungurului-bihor)

The visit then continued with Napiştileu Cave, located not far from the first cave.

The fossil floor - free of water course, is very weak concretinal, but especially dirtied by tourists. It has however the merit of allowing the drop to a lower level galleries through a narrow, short and rather inclined about 45 degrees.

As an important point of the trip was the study of the ecological quality of water from Mişidului Valley. I noticed a lot of micro-invertebrates, some of them very sensitive to pollution, which led to the affirmation that those waters are unpolluted (MOHAN and ARDELEAN, 1993)

2. *Izbucul and Izbîndişului Valley*.

Izbîndiş cave is on route to the locality Zece Hotare, which in addition to fossil floor has one asset, its waters came out to the surface through a siphon, generating an intermittent spring.

The submerged part of the cave has still much hided. Unfortunately here died the famous caver-diver Halasi Gabor in 1984, intending to cross over the spring.

Then we analyze the ecological quality of the area, especially of Izbîndiş brook. The results were particularly pleasing. They identified a number of microvertebrate, which we have not found in the previous day on Mişidului valley.

3. *Crişul Repede Gorge (Şumcuiuş- Vadu Crişului).*

The visit aimed first of all aspects of the canyon, visiting caves, waterfalls and man-made changes in this area.

For example Vadu Crişului cave one of the caves which over the years has been destroyed by tourists, is again in good condition and it can be visited.

The cave is formed on a gash with a length of 1 km, is rich concretioned, although there are a lot of damages done by tourists. Underground water course ends at the mouth of the cave, then of course after a few meters underground, plunge from 8-9 meters in Crişul Repede, forming a waterfall.

The visit then continued with Casa Zmăului Cave. This is an impressive entry, with a centuries-old customs, and then narrows to a few meters, which does not allow continuation of the road.

CONCLUSIONS

Following the trip we observed the following:

- Trips of this kind have strong educational effect on students.
- By direct observation of phenomena, students better understand certain concepts related to these phenomena.
- Students are placed in complex learning situations, using diverse methods and means.
- Field trips have a decisive role in developing the capacity for integration into the group and cooperation among individuals.
- By their way of spectacle, is a good opportunity to draw others into the activities sphere.
- This type of trips does not require large financial resources from parents.
- Trips have a well defined teaching purposes, but not always are valued at their fair value, there is often impaired their intention (SABO, 2011).

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