

ATTI

SIMPOSIO INTERNAZIONALE SUL CARSISMO NELLE EVAPORITI

Bologna, 21-26 ottobre 1985

Federazione Speleologica Regionale dell'Emilia-Romagna
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THE EVAPORITES KARST FROM ROMANIA

ABSTRACT - The paper presents the distribution of the evaporites karst in Romania with elements of exokarstic and endokarstic morphology and hydrogeological works which was done in these types of rocks. It is presented the map of the cave 6 S from Minzalesti, developed in salt, on a lenght of 1.220 m and — 32 m difference level.

RIASSUNTO - Il lavoro presenta la distribuzione del carsismo nelle evaporiti rumene, di cui vengono presi in considerazione sia le morfologie esterne che ipogee. Viene anche presentato e discusso il rilievo della più grande grotta in salgemma della Romania: la Grotta 6S di Minzalesti.

INTRODUCTION

In Romania, the karst cover a limited area of 4.400 km² (M.D. BLEAHU, 1964) (see Fig. 1) which represent only 1,4% of the total surface. The karst is developed mainly on limestones and dolomites and even on salt, gypsum, sandstone, conglomerate and eruptive rocks.

Karst in evaporitic rocks is developed on small areas, which represents 5% of the Romanian karst.

Elements of exokarstic morphology

Exokarst in gypsum formations is not so widely spread. We can mention some sinkholes occurences in the Southeren SubCarpathians, near the Cumpana village area., and even small lapies.

Salt karst occurs more frequently than gypsum under the form of salt rocks, in Miocene formations. These massifs sometime outcrop in the Eastern and Southern SubCarpathians Bend, but mostly are overlained by unkarstifiable rocks.

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In the area of Slanic Prahova, outcrop a large salt massive, in the ax of Slanic syncline.

Three century before, in these area the salt was overlain by non-karst-forming rocks.

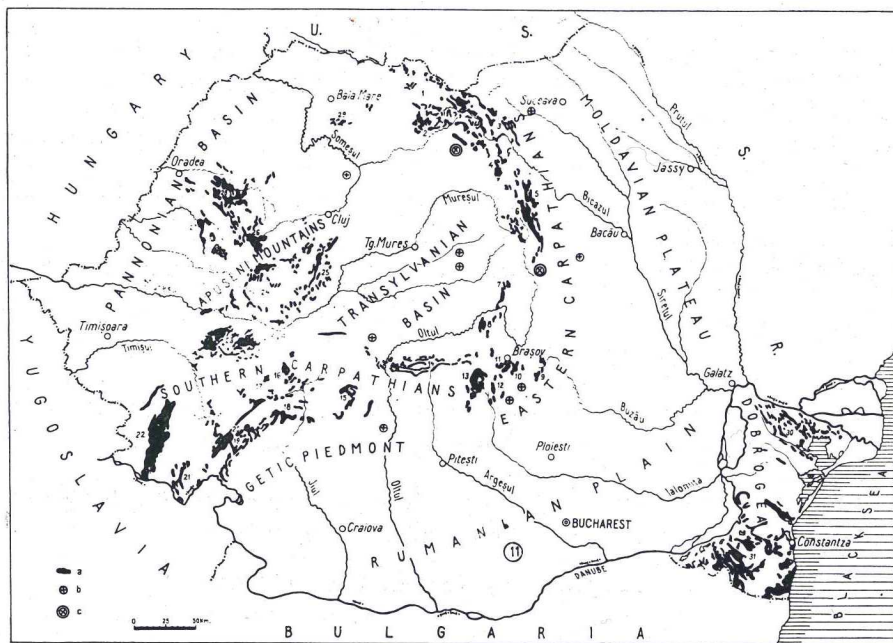


Fig. 1. Distribution of karst-forming rocks in Rumania, a = Limestones and dolomites; b = karst developed on salt and gypsum; c = volcanic rock karst; 1 = Maramuresh Mountains; 2 = Rodna Mountains; 3 = Rarău Massif; 4 = Giurgeu Mountains; 5 = Ceahlău Massif; 6 = Hăghimash Massif; 7 = Virghish Valley Basin; 8 = Pershani Mountains; 9 = Ciucash Massif; 10 = Piatra Mare Massif; 11 = Postavarul Massif; 12 = Bucegi Mountains; 13 = Piatra Craiului Massif; 14 = Făgărăș Mountains; 15 = Lotru and Căpățina Mountains; 16 = Sebes Mountains (Luncani Platform); 17 = Retezat Mountains; 18 = Vulcan Mountains; 19 = Mehedinți Plateau; 20 = Mehedinți Mountains; 21 = Almaj Mountains; 22 = western side of the Banat Mountains; 23 = Poiana Rusca Mountains; 24 = Metaliferi Mountains; 25 = Trascău Mountains; 26 = Bihor Mountains; 27 = Codru-Moma Mountains; 28 = Pădurea Craiului Mountains; 29 = Preluca Massif; 30 = northern Dobrogea; 31 = southern Dobrogea.

During the XVIII-th century, started the exploration of salts, at the begining, on the left side of the Slanic valley, in the place named « Baia Verde », and in the XVIII-th century on the right side, in the place named Baia Baciului.

In the last place were digged two salt mines. The exploitations result a was a bell shape mine, due the work on vertical system, from lowers part to upper one.

These bell shape mine has only an ephemeral existence, being invaded by water. The salt dissolved produced the collapse of the ceiling, in the first mine. Now a salt lake is in that place, used as a spa. Due the collapse, a land slide was done, on the slopes of the second mine, which outcrop an isolated salt mountain. Beginning with this moment, the salt mountain walls is supposed to dissolve and precipitate.

As a result of this work, is the presence of typical dissolution forms, like long and thin lapies and cave corals on the outside walls and the collapse of the ceiling in the mine, which now is like the entrance of a big pothole. The mine was invaded by the water and form a 20 m deep salt lake. The name of the mine is Grota Miresei (M. BLEAHU, et al. 1976).

Salt outcrops, in several places, in the Slanicul de Buzau basin. The largest zone is Sareni-Trestioara, situated between Slanic valley, Sări valley and Meledic valley. It is known under the name of Meledic plateau.

Salt outcrop, in several places, in the Slanicul de Buzau basin. The clays, marls or terrace deposits, on 2-15 m.

The average level of the area is 600 m. It has a hill aspect, with deep valleys whose sides are influence by stream and land slopes.

In this area the karst is represented by precipitation and dissolving forms which can be found on salt adjacent formations too.

Pseudokarst is represented by two groups of forms: the first is a combination between dissolving and precipitation on marls, salty clays; the second is a suffusion phenomena may be produced at the surface by underground solution, thus provoking sinkholes or karstic collapsed sinks and valleys.

Exogen forms are represented by lapies, sinkholes and dissolving recesses.

Lapies is often met on salt karst. The lenght of it varies between a few cm. till 2-3 m and the depth is between 2-8 cm. Among them there are short ridges. Their size vary in function of the salt purity degree. It is obious in the case of salt mountain from Slanic Prahova. Here, in the zones were the salt is dark coloured, lapies completly disappears.

Sinkholes are met in the plateau where salt has a small depth. The largest form is place in salt exclusively. There are long and thin lapies on the slopes of the sinkholes.

In the places where the walls have shelters, cave corrals and salt stalactites are borned.

The sinkholes are 50 m in diameter and some of them attain 30 m in depth. Between the sinkholes, the areas have a chaotic aspect and some time they are reduced to sinuous ridges.

On the botton of the sinkholes impermeabilised with clay, occurred small lakes (maximum 0,7 ha).

When the sinkholes are placed on a tectonically alignment, dolinas valleys are generated.

Owing to the rapidity of the dissolution, these dolinas valleys becomes real valleys with a longitudinal profile. From aa first drainage, reduced to an underground flow, it passes to a surface flow. Sometimes two or three dolines fuses, forming uvala.

The connection between exokarst morphology and endokarst is done by dissolving recesses.

They occurs on the fissures of the vertical walls of salt outcrop and are well decorated.

Elements of endokarstic morphology

Owing the limited extend of the salt and gypsum, the number of caves in this kind of formations is 31 caves in salt and 5 caves in gypsum, distributed in the next way:.

Mountain	Salt	Gypsum
South Volcanic Mts	1	—
Vrancea Mountains	—	1
Vrancea SubCarpathians	27	1
Buzau SubCarpathians	3	3
Telejen SubCarpathians	—	—
Total caves	31	5.

The five caves in gypsum are situated in Teleajen SubCarpathians and have 10-12 m lenght and 1,2-10,5 m in depth. As we can see, the measurements of the caves are extremely reduced. These sizes are given by discontinuous occurrence of gypsum and anhydrous formations which mostly alternate with impervious rocks.

Most of the salt caves are situated in the Meledic plateau (Sareni - Trestioara Zonne). Here there are known 27 salt caves with a cumulated length of 2169 m and a total vertical development of 300 m.

The longest cave from the area is the cave 6 S from Mînzalesti (Fig. 2).

The cave 6 S from Mînzalesti is situated in the North part of the Meledic plateau. The entrance is situated at the bottom of a dolina where four caves are identified. A narrow passage, which is temporary swallet, leads to a -7 m depth. From here, after the descending of a few steps, an active gallery is reached. The cave is known in this moment on 1.221 m length and -32 m depth. Mostly of the sides passages have not been checked, because a collapse closed the entrance of the cave with more than 100 m³ of rocks (Ica Giurgiu, 1983).

The known part is developed on three levels. The lower one is completely active and the other two are fossiles. The connections between the levels is made through the big chambers and pits.

The gallery is 1-4 m wide and 1.5-5 m high. The maximum difference level of -32 m was attained on the active gallery. The end point of the cave is situated at 80 m from Meledic river, at the same absolute altitude with the river. The extension of the system in this moment is 244 m. The survey of the cave was made by Ica Giurgiu, Gabriel Silvasan, Emil Solomon, Tarquinius Vadeanu and Eva Roman.

The most usual forms in salt caves are stalactites. The shape of them is tubular or conical with or without central supply channel. Their length is maximum 60 cm and 8 cm in diameter.

Anemolites often attain 50-100 cm in length and about 2 cm width and are grown in all directions. Their position in space don't seem to be related only to the presence of an air current with a constant direction, but also to some turbionary currents.

There are also anemolites, 40 cm in length, (Photo 1,2) composed by salt crystals, which grow one on the other's corner. The longest one which was discovered has 2 m length and 20 cm in diameter. (Ica Giurgiu et al, 1984). All types of stalactites appears in various colours: immaculate white, pink, yellowish, bright red, grey, brown.

Stalagmites are not so often met as stalactites. They have a few tens of centimetres in height and 10 cm in width. Generally, the exterior cover of the formations is composed by little crystals.



Photos 1-2 - Halite speleothems in the Pestera 6S de la Minzalesti cave (by Tavi Vadeanu).

There are a few parietal flows and sometimes occurred salt crusts, isolated excentrites and salt powder as well.

Where waters drips intensely, a salt crust occurs on the floor as a crystal carpet.

The formations which is possible to be found in these salt caves are similar to those described by (RADU SIMA et al., 1983) in the paper regarding the genesis of salt formations in Turda salt mine.

Element of hydrology and hydrogeology in salt areas

The discharge of the rivers which cross salt outcrops, is little. On the borders of this valley, even on the both, is formed salts crust. The measurements of these crusts is till 10 m in length and 1-3 m width.

In the largest dolines there are notice water flows, little in discharge, which is going underground through the caves-swallets.

Eight of Meledic plateau caves (Ica GIURGIU et al, 1984) are swallets, but four from these are only temporary. Other two caves have an underground flow.

In the places where were salt mines, the water get in and formed salt lakes. These salt lakes can be found in Meledic plateau (two small lakes) and also in the area of Slanic-Prahova. (Baile Verzi an Baia Baciului).

The place named Baile Verzi include three lakes. These are hydrogeological connected with the swallet named « La Noroaie ».

To demonstrate this connection I. Povara et al, 1982. made two tracing experiments, using fluoresceine. The speed of the tracer was different. The first half of the distance (till a salt spring) was 44 m/h and from that point till the level -19 m of the Baile Verzi lake (underwater spring) is 2 m/h. The variation of the speed will be checked in the future with new tracing experiences.

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