

MINERALOGY OF THE CAVE No. 4 FROM RUNCULUI HILL (METALIFERI MTS., ROMANIA)

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Trestia-Baita is a metallogenetic region located in the central part of the Metaliferi Mountains (South Eastern Apuseni Mts.), characterized by a complex geological setting: Tithonic reef limestone blocks are disposed over an Early Jurassic ophiolitic basement. Both limestones and ophiolites are part of Capalna-Techereu Nappe (BALINTONI, 1997), affected by the Neogene volcanic activity (andesitic pyroclastic deposits and lava flows). The hydrothermal activity associated to the Neogene volcanism resulted in the formation of several sulfide veins, emplaced both within limestones and basalts.

Cave No. 4 (D = 127.4 m, H = 10 m), discovered in 2002, is the largest cave in the Trestia-Baita karst area. One of the cave passages connects with a 13 m long mine gallery with collapsed entrance, which ends in a hydrothermal vein.

Thirteen samples taken from the cave and from the old mine gallery were analyzed by means of X-ray powder diffraction, optical and scanning electron microscopy (including EDX), electron microprobe, infrared and Raman spectroscopy. Apart from calcite, aragonite and gypsum – the most common minerals in limestone caves – in Cave No. 4 an interesting range of other minerals were reported from both cave and mine gallery. These minerals are sulfates: barite - BaSO₄, serpierite - Ca(Cu,Zn)₄(OH)₆(SO₄)₂ · 3H₂O; sulfides: galena - PbS, pyrite - FeS₂; carbonates: cerussite - PbCO₃, smithsonite - ZnCO₃; quartz and goethite. Along with these minerals some silicates such as kaolinite, montmorillonite and muscovite form a consistent clay layer covering the floor and partially the walls of the cave (Table 1).

It is worth mentioning that cerussite has not been previously reported from a Romanian cave environment, whereas serpierite is also the first known occurrence in Romania.

Furthermore, serpierite is a relatively rare mineral that was documented only from two other occurrences in the area of the Carpathians (Hungary and Slovakia, SZAKÁLL, 2002).

Table 1: Minerals found in Cave No. 4 and in the mine passage

Mineral group	Mineral name	Occurrence (1-cave, 2-mine gallery)
Carbonates	Calcite	1, 2
	Aragonite	2
	Cerussite	1
Sulfates	Gypsum	1, 2
	Barite	1, 2
	Serpierite	2
Sulfides	Galena	1
	Pyrite	1, 2
Oxides, hydroxides	Quartz	1, 2
	Goethite	1
Silicates	Kaolinite	1, 2
	Montmorillonite	2
	Muscovite	2

References

- BALINTONI, I. (1997). *Geologia terenurilor metamorfice din Romania*, Carpatica, Cluj-Napoca.
 SZAKÁLL, S. (ed.). (2002). *Minerals of the Carpathians*, Granit, Prague, 480 p.