

NYMPHAEA Folia naturae Bihariae	XLVI-XLVII	49 - 54	Oradea, 2020
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Morphology of Hoanca Urzicarului Pit, Bihor Mountains

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Abstract. Hoanca Urzicarului pit is located in the central part of Bihor Mountains, in a massive Jurassic limestone in Galbena Valley. With a depth of 290 m, it is not only one of the deepest cave in Romania, but its 85 m drop is also one of the longest, continuous vertical pit in the country.

Introduction

Hoanca Urzicarului pit is located at the southeastern edge of the Galbena Basin, in the central part of Bihor Mountains, which host some of the largest caves in Romania. Hoanca Urzicarului is a typical alpine pit, with a succession of large shafts. Lack of visibility in the sump halted the exploration at -288 m, preventing a possible connection with Păulesei resurgence, 3 km away. The cavity contains a wide range of calcite speleothems and crystals.

History of exploration

The cave was discovered in 1977 by Speleological Club „Speodava“ Ștei - Dorel Săsână, Petre Brijan and Ovidiu Cuc (Brijan 1978). Initially the cave was named the Independence pit (Avenul Independenței), but Liviu Vălenaș renamed it three

years later as Hoanca Urzicarului pit, according to the geographical situation. By 1977, the cavers from Speodava mapped the pit to a depth of -317 m, the cavity becoming the second deepest in the country after Tăușoarelor cave in the Rodnei Mountains. In 1980, Liviu Vălenaș, Petru Brijan, Nicolae Sasu, Nicolae Stoica-Negulescu and Horia Mitrofan produced a more accurate survey of the cave, which reduces the depth to -286 m. In the same year two other branches were discovered, one with a small stream explored by Liviu Vălenaș and Nicolae Sasu, who crossed two very narrow spots and were stopped by an inaccessible passage at -267 m. The second fossil branch ending at -254 m was explored later by L. Vălenaș and P. Brijan. In 1981 Liviu Vălenaș with a team of Polish cavers discovered at the upstream end of the Crystals Gallery (-200 m) a large hall (Sala Urodzinowa). In late 1980, the cave was 1125 m long, and by the end of 1981 it reached 1300 m in length. In 1997 a Swiss diver-caver dove the terminal sump at -286, but almost immediately, at -2 m abandoned the exploration as the underwater passage became too narrow and the water had no visibility. Presently, the total vertical range of the pit is 290 m (-288; +2).

Cave description

The pit is located at an elevation of 1170 m a.s.l., in the left side of Luncșoara Valley in Bihor Mountains, a few meters away from the basin divide, which delineates the Crișul Negru (Băița) Basin. The entrance begin with a subhorizontal passage, which after five meters ends on the edge of a 85 m vertical drop, one of the deepest in the country. In many of the tight spots down the pit, numerous tree logs and limestone boulders are present, thus, descending must be perform with great caution.

At the base of the 85 m pit, upstream is an ascending gallery (the Marten Gallery/Galeria Jderilor), along which a small stream flows all the way down to the sump at -286 m. The main passage descends at 50°, the floor being punched by a few vertical shafts, the deepest being 28 m, and ends in the Goliath Hall (Sala Goliat). At the end of the Goliath Hall, for the first time is intercepted a relatively horizontal section, where three branches began: a descending one (the Rimstone Gallery/Galeria Gururilor) ends at -254 m, a horizontal passage (Crystals Gallery/Galeria Cristalelor), which downstream ends with an extremely narrow path that becomes impenetrable at -267 m. Upstream, the Crystals Gallery continues with a high chimney and a large hall, Sala Urodzinowa.

The main passage continues downstream along a 50-60° slope, interrupted by two drops of 7 and 10 m, respectively. Along this passage, a small stream flows

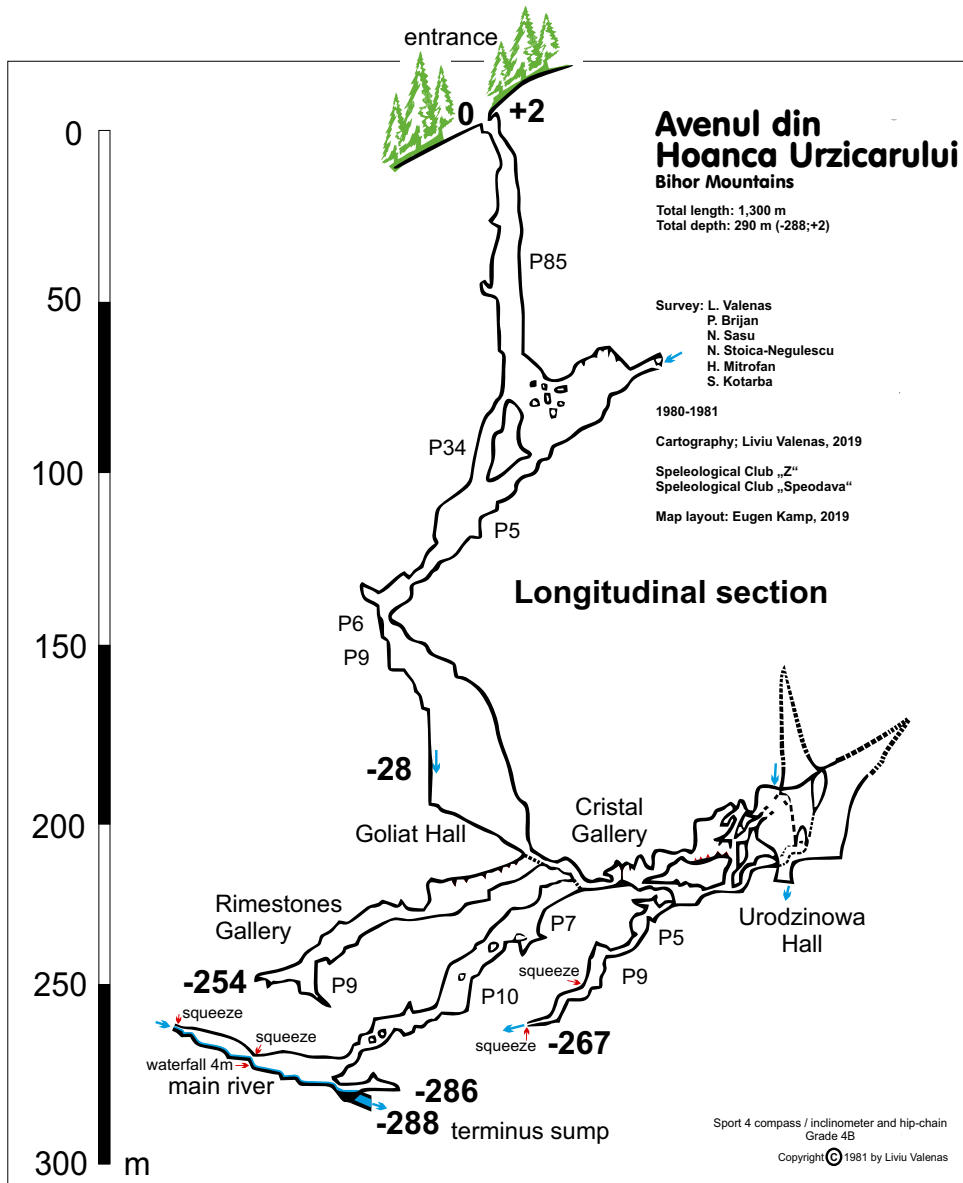


Figure 1. Longitudinal section of Hoanca Urzicarului pit. Cartography by Liviu Vălenaș, 2019.

having its origin in the Main Gallery and has a confluence at -286 m with a slightly larger streamlet (several L/s) coming from a 2 m high waterfall. The downstream section of the cave ends in a muddy sump, declared in 1997 by a Swiss diver as lacking of visibility. Upstream, after enlarging and passing a tight spot, the narrow passage ends after 50 m in yet another very tight passage (-262 m), from which the side tributary emerges. The cave is 1300 m long, with a 290 m (-288; +2) vertical range.

Cave speleogenesis

The cave is excavated in a massive Jurassic limestones, its genesis being controlled by a system of faults and joints. Initially the pit was formed in a phreatic regime from the bottom upward, as shown by the entrance section, followed by a second, vadose phase. The fact that the three branches (two active and one fossil) ends independently one from another at depths ranging between -254 and -286 m indicates that in the initial phase the cave stream recharged a resurgence located somewhere along Luncșoara Valley, a short distance from the cave. Later, the entire Luncșoara stream sunk underground, continuing its flow under the Dry Valley and recharging a new resurgence, the Izbucl Păuleasa spring located in Galbena Valley. No dyes studies were conducted in the cave so far. Between the end of the pit at -288 m, and the Păuleasa spring is a remaining vertical range of 200 m, it is clear that the flow will be in vadose regime. So far, the main collector heading to Păuleasa spring has not been intercepted by any of the cavities known in this region, thus, it remains an important aim for the next generation of cavers. The origin of the two small streams flowing through the main gallery and the Crystal Gallery is a percolation water. The relatively larger stream intercepted at -262 m, which disappears in the sump at -286, most likely originates in the sinkholes of the northern part of Vârtope plateau (1160-1200 m).

Cave climatology

The temperature in the pit ranges between 4.7 and 5.0° C, whereas the humidity is 90%.

Mineralogy

Hoanca Urzicarului pit contains numerous speleothems, including calcite crystals, developed mainly in the Crystals Gallery.

Conclusions

1. The Hoanca Urzicarului pit originally evolved in phreatic conditions, when the water enlarged the major fault lines and joints, then its passages were remodeled in a vadose environment.
2. The main stream of the cave is recharged by the sinkholes of Vârtope plateau, whereas the two smaller flows by percolation water. Initially the pit had the paleo-resurgence at 860-880 m elevation, a paleo-resurgence in Luncoșoara Valley, whose waters subsequently sunk underground heading to a new resurgence, Păulesei spring located at 550 m elevation and 3.5 km away from the cave.

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