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ABSTRACT BOOK

***Quaternary stratigraphy, paleoenvironments, and
human settlements***

Organizing and Scientific Committee

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The first Early Chibanian cave sites in gypsum karst in evaporites of the Carpathian Foredeep

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The gypsum karst is widespread at the west of Ukraine. It is associated with the strata of Miocene sulphate sediment in the outer part of the Carpathian Foredeep (Klimchouk and Andreychouk, 2017). Besides the development of numerous huge, many-kilometre-long maze caves in the area, the cave sites with Pleistocene megafauna are not numerous. Barely a dozen caves in gypsum contained osteological remains, the oldest of which belonged to the Eemian (Ridush, 2022).

Recently, in 2025, two new cave sites, Vikno and Chornyi Potik, were discovered in the area. Both sites were reviled by the gypsum quarries, which are still active.

The Vikno site is associated with a small karst cavity in the 3-meter-thick gypsum residual cliff, filled in with Quaternary loamy sediments. The stratigraphy wasn't observed exactly, but at least it contains two beds: yellow loess-like loam in the bottom, and the chernozem-like pedosediment, up to 1 m thick. The gypsum bed is covered with the thin layer of Quaternary loess-like loam.

The fauna was represented with badly preserved bones of *Bison priscus* and *Bos primigenius*, isolated teeth of *Ursus deningeri*, *Crocota spelaea*, and *Megaloceros* cf. *savini*, and partial mandibles of *Canis* cf. *mosbachensis*. Small mammals are represented with *Spalax* sp. and *Microtus arvalis*, *Microtus* sp., *Lacerta*.

The Chornyi Potik gypsum quarry unearthed a larger system of unroofed karst caves, developed in a 20-meter-thick alabastrine milk-white gypsum stratum. It contains several sites numbered ChP1, ChP2, etc. The most representative in faunal remains are the sites ChP1 and ChP7. The karst massive has a flat surface, near 100 m above the Dniester River water table. It corresponds with the level of the 10th above flood-plain river terrace, that is dated to Beregov – Berezhany Stage (2430 – 1900 ka) (Tiglian, Gelasian) (Veklych, 1982). Regardless the close position of the Dniester valley, there is not any traces of channel alluvium, and the loess-like loams are bedded immediately on the eroded surface of the gypsum stratum. The only stratified site is ChP1 (Tab. 1).

Table 1

The geological profile at the site ChP1

Layer	Depth, m	Thickness, m	Description
1	0,0 – 1,2	1,1-1,2	Breakdown accumulation of milk-white hypocrystalline (alabastrine)
2	1,2 – 1,8	0,6	Dark brown pedosediment (paleosol), light loamy, mixed with slightly rolled pebbles and gypsum gravel (up to 40%), with inclusions of isolated bones and bone fragments
3	1,8 – 2,5	0,7	Gypsum rubble and blocks with dark brown pedosediment filler (15-20%), with inclusion of bones and bone fragments
4	2,5 – 3,0	0,4-0,7	Black pedosediment (chernozem-like paleosol) with inclusions and interbeds of gypsum and Lithothamnium limestone debris, with inclusions of bones. The roof is sharp and uneven.
5	3,0 – 3,7	0,7	The loam is medium, greenish-yellow, loess-like, without inclusions, with traces of solifluction (?) in the roof, without bones in this part of the section. The roof is sharp and uneven.
6	3,7 – 4,0	>0,3	The same with inclusions of gypsum blocks

On the site ChP1 the Layer 4 contained the bone breccia that included cranial and postcranial remains of *U. deningeri*, *Ursus sp.*, *Panthera cf. fossilis*, *Panthera sp. (middle sized)*, *Canis sp.*, *Crocota sp.*, *B. primigenius*, *Microtus nivaloides*, *Arvicola sp.* (Rodents determination by L. Rekovets). The bone material is badly preserved and strongly destroyed. The different groups of bones in the bone breccia have different fossilisation and could differ in age. Probably, they were initially bedded in a few layers but were mixed and redeposited within the same accumulation by the solifluction flow.

The peculiarities of the Layer 4 bedding suggest that its occurrence is associated with the solifluction filling of the karst cavity. It is likely that the black pedosediment (Layer 4) is associated with the Lubny chernozem-like climatolith (600-500 ky BP), and the brown one (Layer 2) with the Zavadiivka climatolith (410-250 ky BP). In this case, the gravelly horizon between them (Layer 3) is associated with the Tiligul cooling (500-410 ky BP). It is possible



that the beginning of this stage is associated with the solifluction filling of the cave with chernozem-like pedosediment. In this case, the greenish loams at the base of the section Layer 5) are associated with the cold Sula Stage (650-600 ky BP).

The other stratified section ChP7 is built mainly with brown-yellow loess-like loam, with gypsum and limestone debris (up to 10%). It contains broken bones and numerous bone flakes of *Equus cf. latipes*, as well as *Mammuthus* sp., *Coelodonta* sp., *Canis cf. mosbachensis*, *Bos primigenius*, *Bison priscus*, *Lepus* sp., *Marmota marmota*, *Panthera cf. fossilis*, *Ursus* sp., *M. nivaloides*, *Microtus* sp., *Spermophilus* sp. Some broken horse bones bear cut marks that can evidence the human presence. A little lonely flint flake was found in the section. A few other flint flakes were collected within the quarry, but without a stratigraphical reference. The subvertical position of some long bones leads to the conclusion about the solifluction or landslide redeposition of these bone-bearing cave sediments.

So, we have the first Early Middle Pleistocene cave sites with rich bone accumulations in the gypsum karst at the west of Ukraine. On both sites, Vikno and Chornyi Potik, we observe a similar mode of cave filling and fauna of the same age. While the cavity on the Vikno Site is largely destroyed at present, the Chornyi Potik remains promising for further investigation.

References

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