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MARTYNIVKA: A NEW CAVE SITE WITH LATE PLEISTOCENE SMALL MAMMALS' FAUNA IN THE MIDDLE DNIESTER AREA (UKRAINE)

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Although the karst cavities, especially the numerous huge maze-caves, are widespread in the Middle Dniester area's sulphate deposits, the caves containing Pleistocene faunal remains in the area are rare (Ridush, 2009, 2014). Therefore, discovering a new cave site with the Pleistocene fauna is essential for reconstructing local landscapes in the Pleistocene.

Martynivka Cave is a karst cave, developed in the Miocene gypsum strata, in the Middle Dniester area (48° 32′ 22.52″N, 25° 58′ 0.54″E). The two cave entrances with the height of human growth are in the gypsum cliff, 30 m above the valley bottom, on the right bank of the Chornyi Potik River, a right tributary of the Dniester River. The 10 m thick gypsum strata in this area is represented with white and light-grey microcrystalline nodular gypsum. According to the morphology of the cave it is of the hypogenic origin but also is strongly modified by the weathering processes. The total length of all cave galleries is 80 m, but the main gallery is just 25 m long, 2-5 m wide, and 2-3 m high (Ridush and Kuprich, 2003). The gallery ends with a large rock blocks collapse.

Stratigraphy. From 1960th the archaeological layers of the 7-8th, 13th, and 17th centuries are known (Ridush B, 2000). The up to 1,0 m thick cultural layer of the 17th century overlaps the rock-fall. During human inhabiting of the cave in the 13th century, all the natural sediments in the entrance part of the cave were removed, and the cultural layer of that period was bedded immediately on the rock floor. In the 17th century, most of the 13th-century cultural layer was also removed. The undisturbed sediments were preserved only below the large blocks in the inner part of the gallery. The excavation of the gypsum blocks gave numerous faunal remains of small mammals deposited in loose sediments between blocks and the cave wall and between the blocks. The bone-bearing sediments are represented by 0.3-0.6 m thick alevritic loess-like yellow, sometimes light brown, sediment and fine gypsum cryogenic debris, with inclusions of coarse debris.

There are three orders represented: Insectivora, Chiroptera and Rodentia. Pikas (*Ochotona pusilla*) and hamsters (*Cricetus cricetus*) dominate; fewer water voles (*Arvicola amphibius*) and voles (*Alexandromys oeconomus = Microtus oeconomus*). Forest forms are sporadic: dormice (*Glis glis*), squirrels (*Sciurus vulgaris*), and red forest voles (*Clethrionomys glareolus*). Very few voles (*Microtus arvalis*). The presence of lemmings (*Dicrostonyx henseli*), steppe lemming (*Lagurus lagurus*) and narrow-headed vole (*Lasiopodomys gregalis*) is unique. The species assemblage indicates the ecologically mixed nature of the fauna with the dominance of the species of mesophilic habitats and the predominance of steppe species over cold-loving species (lemmings and narrow-headed voles).

It can be considered that this is the extreme southern area of periglacial fauna in Eastern Europe (including the northern part of Moldova where lemmings were also known (Lozan, 1971)) in the late Pleistocene, probably its final stages (MIS 2). A typical periglacial fauna of Eastern Europe is the fauna of Novgorod Siverskyi in northern Ukraine: a unique combination of tundra and steppe biocenoses with minimal mesophilic biocenoses (Krokhmal' et al., 2021). The Martynivka biocenosis is dominated by mesophiles, which is typical of the more western regions of Europe. This fauna can also characterize the transition between the steppe faunas of southern and eastern Europe and more western, even more mesophilic faunas. On the one hand, it is an extreme version of the periglacial, and on the other – it characterizes the transition to western fauna, which have many forest forms, and which are not (practically) in Novgorod Siverskyi and Martynivka. Ecologically, the fauna of Martynivka is specific. Taxonomically, picas (steppe) and hamsters (mesophiles, but also more

inclined to moist steppe stations) predominate. Steppe lemming (*L. lagurus*) are also well represented in the west, but in Martynivka, it may be a feature of taphonomy that they are so few.

Taphonomy. Nowadays, the site is situated in the semi-aphotic part of the cave. Considering the regular slope regression that is characteristic for the area, 20-30 kys BP, the site was further from the entrances, in the aphotic zone. The bone accumulation could be connected to the activity of troglophilic small carnivores like foxes or mustelids, which are inhabiting the cave or visiting it. Such animals as picas and dormice are also troglophilic species and could die during winter hibernation. The nesting of the birds of prey in this place is very unlikely because of low ceiling of the gallery.

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References

Krokhmal', O., Rekovets, L., Kovalchuk, O., 2021. An updated biochronology of Ukrainian small mammal faunas of the past 1.8 million years based on voles (Rodentia, Arvicolidae): a review. Boreas 50, 619-630, doi:10.1111/bor.12511

Lozan, M.N., 1971. Gryzuny Moldavii. Istoria stanovlenia fauny i ekologia retsentnykh vidov [Rodents of Moldavia. History of fauna formation and ecology of recent species]. Shtiintsa, Kishinev.

Ridush B, 2000. To the question about cult caves of Slavs in the Dnister area. In: Tolochko, P.P., Baran, V.D., Kozak, D.N., Kryzhytskyi, S.D., Myhailyna, L.P., Motsia, O.P., Murzin, V.Y., Pyvovarov, S.V. (Eds.), Arheologichni Studii. Prut, Chernivtsi, pp. 184-193.

Ridush, B., 2009. "Bear Caves" in Ukraine. Slovenský Kras Acta Carsologica Slovaca 47, 67-84.

Ridush, B., 2014. "Bear Caves" of South-Eastern Europe. Speleology and Karstology 12, 26-41.

Ridush, B., Kuprich, P., 2003. Pechery Chernivetskoi Oblasti [Caves of Chernivtsi Region]. Prut, Chernivtsi.