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Late Pleistocene and Holocene climatic variability in the Carpathian-Balkan region. Abstracts volume



**Late Pleistocene and Holocene Climatic Variability
in the Carpathian-Balkan Region**

ABSTRACTS VOLUME



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Paleoenvironmental Malakofaunistic Records of Late Pleniglacial on the Upper Paleolithic Site Doroshivtsi 3 (the Middle Dniester Basin)

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Fauna of molluscs is one of the most important paleoenvironment indicators, which is very sensitive to environmental conditions. It relatively quickly and accurately reflects changes in characteristics and structure of landscapes, their types, etc. The importance of this method in the study of Pleistocene sediments is determined by few factors: 1) shellfish, especially terrestrial, are quite sensitive to environmental conditions (heat, humidity, etc.) and pretty good indicate them in sediments; 2) among fossil faunal remains the molluscs are the most common group of organisms; 3) the features of fine-grained sediments contribute to the good preservation of shells, facilitating their study.

During 2007-2010, an international scientific team conducted a complex, archaeological, geological, and paleontological study of the Upper Palaeolithic site Doroshivtsi III, at western outskirts of Doroshivtsi Village in Zastavniivsky district of Chernivtsi region (Fig. 1, C). The site is situated on the top of 26 m high river terrace in the Dniester River valley, at 124 m a.s.l. (Fig.1, A). The multilayered loess-paleosol sequence of about 12 m thickness, and contains 14 lithofacial units and 7 Upper Palaeolithic cultural layers (Fig. 1, B). We carried out a detailed analysis of malakofaunistic remains only from the cultural layer 6, bedding 7.90-8.10 m deep (Fig. 1, D). It correlates to the 12th lithofacial unit and chronologically corresponds to the first half of the Late Pleniglacial. The ^{14}C data of 22300 ± 100 kyr BP was obtained after charcoal from this layer (Kulakovska et al., 2011; Haesaerts et al., 2013).

The samples collected during archaeological excavations. We have identified ten major types of fossil gastropods from 10 samples (totally 11641 individuals). The malacofauna is mixed. The terrestrial and freshwater species are available as well. During the sediments formation, ubiquists, living in a wide range of temperatures, dominated in the malaco-cenosis. There are such species as *Succinea oblonga elongata* (75.6%), and *Succinea putris* (2.9%). However, these eurythermal species are very demanding on moisture, pronounced psychrophiles (Kunitsa, 2007). Under present conditions, they live close to the water: on the banks of rivers and streams, in swamps, wet meadows. The other species refers to amphibiotic forms. Among the guidelines terrestrial stenoecic species the cryophilic species dominated: *Pupilla loessica* (7.66%) – indicates the process of accumulation of aeolian loess material, *Vallonia tenuilabris* (3.08%) and *Columella columella* (2.16%), indicating the cold climate in time of deposits formation. Also, *Pseudotrachia rubiginosa* (1.08%) is quite common. This species is characteristic for the Pleistocene tundra, and it often occurs near water bodies. Locally, in small quantity, but in good preservation, shells of *Trichia hispida* (0.3%) were found. These species are mesophilous, but rather thermophilic (Kunitsa, 2007), which may indicate short-lived and minor, judging by the number of individuals, periods of warming. Fragmented and poorly preserved for accurate species determination the

remains of *Clausilia* sp. (0.017%) were also found. The presence of individuals of the latter species and the state of its preservation prove the moving of material.

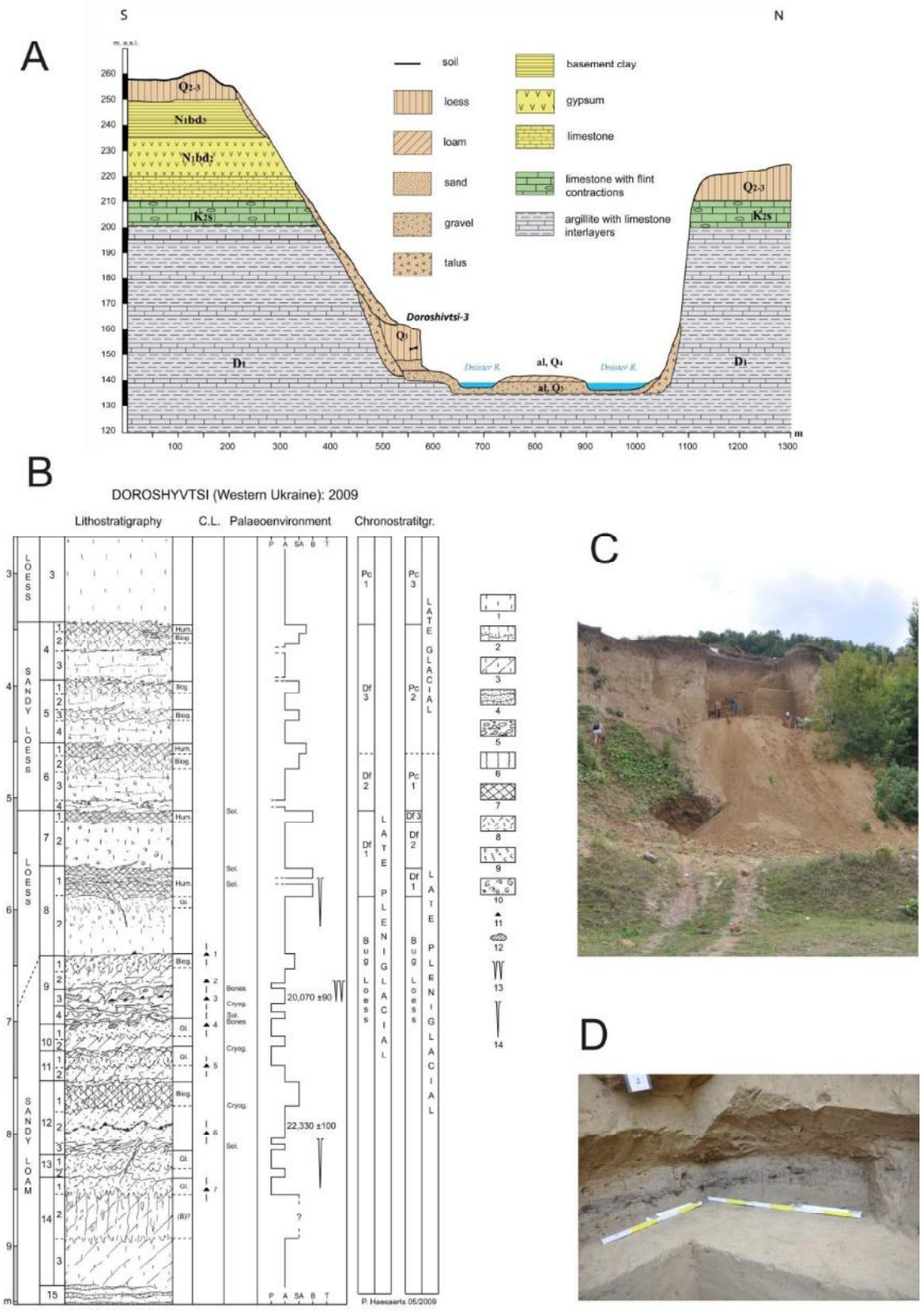


Fig. 1 Location of site Doroshivtsi-3 on the cross-section of the Dniester River valley. B - loess-paleosol sequence of the site (after P.Haesaerts, 2009). C - general view of the site. D - fireplace in cultural layer 6

The numerous findings in the deposits of shells of freshwater molluscs *Anisus spirorbis* (1.38%) and *Lymnaea palustris* (5.54%) are quite useful for paleogeographic reconstructions. Their presence is evidence of the continued existence of subaqueous conditions on this place. There are shallow-water stagnofilic species that prefer standing or slowly flowing reservoirs, when the flow rate does not exceed 0.1 m/s. The optimal conditions for these species are in reservoirs from 0.1 to 0.5 m deep. They are quite hardy to low temperatures. Under the modern conditions they populate mostly periodic and half-periodic reservoirs, and may occur in permanent water bodies (rivers, lakes, ponds) as well, but occupy their marginal wetlands (Berezkyina, Starobohatov, 1988). The preservation of all found shells is very good, indicating their autochthonous bedding.

The available malaco-cenosis of the first half of the Late Pleniglacial sediments allows us to confidently assert the fluctuations of climate change during their formation, leading to significant fluctuations in the water level in the Dniester R. The presence of a significant amount of the freshwater species (6.92%) indicates periodic or quite prolonged flooding of the territory. The stated above leads us to the conclusion, that the conditions of the studied sediments formation were periodically subaqueous (at least flood type).

Quite valuable facts we obtained studying shells of *Columella columella* subspecies. In the loess of Ukraine, this type is present in two morphs: 1) *C. c. columella* during the Pleistocene is the most common on the plains of Ukraine; 2) and *C. c. gredleri* is mostly typical for loess of higher western areas (including the Dniester Podillya), regions close to the Carpathian Mountains (Kunitsa, 2007). As we found, in studied sediments the species is represented only by subspecies *C. c. columella*, indicating a cooling, moving of periglacial zone south, and occupation of the territory by this species from the north across the plain.

So, in addition to conventional reconstruction of paleoenvironments, fossil malaco-cenosis also contains very valuable information about the features of sedimentation, paleorelief, some climatic events. It can explain the features of the population and human habitation in the Palaeolithic.

The malakofaunistic analysis of the Upper Planiglacial sediments on the site Doroshivtsi III demonstrates the complex natural conditions during their formation. The conducted research put a question about revision of the genesis of some Upper Pleistocene sediments that previously were considered as aeolian. A detailed investigation of the malacofauna and facial peculiarities of every lithofacial unit in Late Pleistocene sequences in the Middle Dniester Basin is a subject of further paleogeographic research.

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