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

ABSTRACTS VOLUME

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Rockmagnetic correlation between Holocene cave sediments at the mountain and loess soil deposits in Piedmont Crimea (on example of the trap cave Emine-Bair-Khosar and archaeological site Biyuk-Karasu-XIX)

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Modern soils and paleosols, loess and uncemented aeolian caves sediments are carriers of a paleoclimatic signal (Evans, Heller, 2003). The saturation degree of a layer with humus material, depending on the temperature, correlates well with magnetic susceptibility and different types of magnetization of deposits (Tang et al., 2003, Bosak&Pruner, 2011).

On the base of rockmagnetic measurements of soil-containing samples, collected from sections at Biyuk-Karasu-XIX (Piedmont Crimea) and Emine-Bair-Khosar Cave (lower plateau of Chatyrdag mountain massive in Crimea) (Ridush et al., 2013), correlation of sediments done in the context of common climate changes in the region during Holocene.

The process of sediments accumulation in the sections covers roughly the same period. The loess soil section Biyuk-Karasu-XIX contains findings of hand shaped pottery and flintstones. The section structure has characteristic features of Holocene soil formation for which received a definite chronological anchor. The section of cave deposits in the Emine-Bair-Khosar Cave was dated by radiocarbon and paleomagnetic methods (Ridush et al., 2013). For saiga bone from the depth of 2.0 m radiocarbon (^{14}C) date 10,490 +/- 170 (Ki-13063) obtained. At -1.1 m deep the paleomagnetic excursion, dated 2.8 kyr BP, was recorded (Bondar, Ridush, 2010).

Sediments of both sections are horizontally-layered. They contain darker units, which color is controlled by organic material, and lighter units of loess-like loam.

Section Biyuk-Karasu-XIX consists of the following lithofacial units: 1, 2 - hlb2 – meadow alkaline chernozem, where unit 1 - horizon Hegl, unit 2 - horizon Hp, Pikgl, Pkgl; 3, 4 - hlb1 - the soil has features of grey or sod-calcareous soil forming, unit 3 combines horizons He and Eh, unit 4 – illuvial horizons Ihp and Pigl; 5 - pc-bg? - silty-sandy light loam. Lithofacial units are named according to "Stratigraphic scheme of Quaternary deposits of Ukraine" (Veklich et al., 1993), soil horizons are named according to Dokuchaev soil classification (Dokuchaev, 1883).

Section of unconsolidated sediments in the Emine-Bair-Khosar Cave consists of the following lithofacial units: unit A - dark gray, loose, structureless, moist, light-loamy texture, contains much of organic matter. Unit B - sequence, which consists of eight packs of clay+clastic layer, reddish-brown in color, size of limestone rubbles in clastic layers increases from 1-2 mm at the top of

unit, to 1 cm at the bottom. Unit C is light, fawn, homogeneous clay, with a low content of clastic material. There are two clastic units in the section, D and F, and they are formed by chaotically accumulated acute limestone debris up to 5 cm in diameter. Unit E has similar morphology as unit C. Unit G composed with the grayish-brown clay with thin clastic beds.

The vertical structures of both magnetic susceptibility sections are similar. The highest values 40 ... 92 * 10-8m^3/kg observed in the upper units. Increase of [illegible] also recorded in the second, deeper, soil from Biyuk-Karasu-XIX section (units 3 and 4), as well as in C and E units of the cave section. The lower stratigraphic units in sections differ in magnetic susceptibility behavior, they are of different age.

In the structure of Holocene climatic epoch in the Crimea there are three periods, which correspond, in chronological order, with sediment series having the similar magnetic characteristics.

The first period covers the time from the beginning of Holocene (11 kyr BP) to the end of Subboreal (cal. 2.5 kyr BP). This period was relatively warm, and wet forest-steppe conditions existed in the Piedmont Crimea, and the grey soil formed on Biyuk-Karasu-XIX site. During this time, humus-rich material was transported by wind to cave on the Chatyrdag plateau. Tere were also temporary water streams (probably due to the seasonal melting of the snow cone, periodically formed in the entrance pit), that formed units D and F containing washed debris.

The second period began with cooling in early Subathlantic, when the temperature gradually rose.

The third period corresponds to the thermal conditions of the present time, when in both sections units with the highest magnetic susceptibility formed.

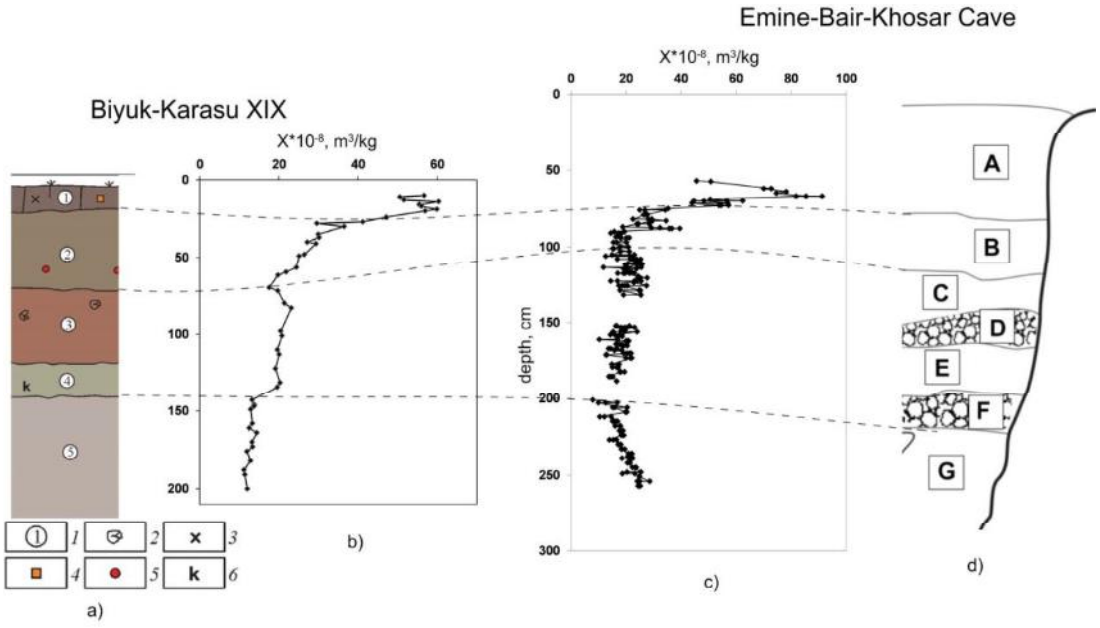

Fig. 1 Comparison of loess soil section from archaeological site Biyuk-Karasu-XIX and section of cave infill in near-entrance part of the Emine-Bair-Khosar Cave: a) sketch on stratigraphy of the Biyuk-Karasu-XIX section with artifacts: 1 – lithofcial unit; 2 – shells Helix (?), 3 – flintstones, 4 – wheeled pottery fragments, 5 – hand shaped pottery fragments, 6 – bones; b) magnetic susceptibility profile of Biyuk-Karasu-XIX section; c)

magnetic susceptibility of the «Museum» profile trench in Emine-Bair-Khosar Cave; d) sketch on stratigraphy of «Museum» trench with marked facial units.

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