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

ABSTRACTS VOLUME

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Preliminary results on sediment and settlement dynamics in the environs of the fortification enclosure Corneşti-Iarcuri, western Romania

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Introduction and objectives

Corneşti-Iarcuri is the largest known fortification enclosure of prehistoric Europe. The site is located in the Romanian Banat, at the southeastern edge of the Mureş alluvial fan (Fig. 1). Four earth filled wooden ramparts with a total length of about 33 km enclose an area of more than 17.2 km². Even today, after centuries of intensive arable farming, these walls represent significant obstacles in the undulating landscape of the Vinga plain. Radiocarbon dates, most recently achieved by ongoing archaeological research date the construction to the Late Bronze Age (Szentmiklosi et al. 2011, Heeb et al. 2008, Micle et al. 2009).

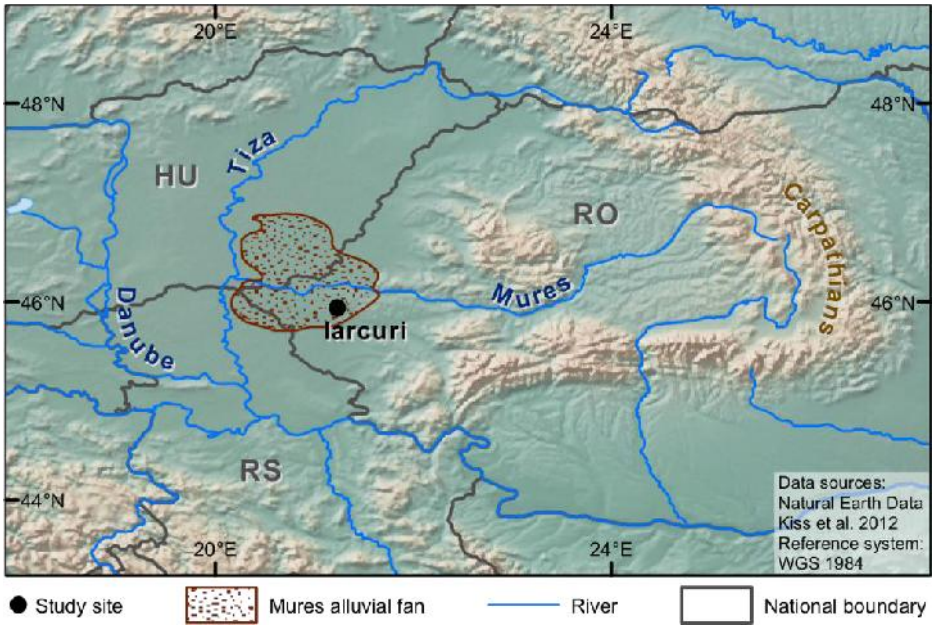

Fig. 1 Location of the study site in the southeastern part of the Mureş alluvial fan (W Romania).

The Mureş alluvial fan started to develop in the Pliocene and with its extent of about 10.000 km² it is one of the most extensive landscape features of the eastern Pannonian Basin (Urdea et al. 2012). Extensive parts of the fan are covered with Quaternary loess and loess-like deposits. Thick chernozem or chernozem-like soils have developed in these sediments (Borsy 1990).

In the area of Iarcuri two creeks that periodically flow in wide saucer-shaped valleys dissect the Vinga plain. Their gully-like tributaries have cut their beds into the loamy material and formed well-pronounced alluvial fans.

The goal of the present research is to study the sediment and settlement dynamics in the environs of the Late Bronze Age enclosure Corneşti-Iarcuri. We aim to determine the formation periods of the valley fillings and secondary fans and localize the main settlement areas.

Material and methods

Geomorphological field mapping and LiDAR DEM-based terrain analyses were performed to record the geomorphic situation and to identify sediment archives. Undisturbed sediments were obtained by percussion drilling, described macroscopically and laboratory analyses (e.g.: pH, magnetic susceptibility, LOI, pED-XRF) were used to characterize their chemical and physical composition. The chronology was set up by 14C AMS-dated charcoal remains. Archaeological field surveys and excavations within the ramparts were performed to document and date the cultural remains. Magnetic prospections were done to record the subsurface structures of the enclosure and settlements, in turn, LiDAR-scanning was done to record the structures on the terrain surface.

Results and discussion

Extensive LiDAR scanning enabled the precise mapping of the entire enclosures for the first time. Magnetic prospections and archaeological surveys served to record the subsurface settlement structures within the inner two walls and assign them to the prevailing cultural epoch. The most densely settled areas are situated on the high plain, usually close to the shoulder of the adjacent valley, and date to the Chalcolithic, Middle and Late Bronze Age periods. In the vicinity of different settlement concentrations sediment cores were extracted from the high plain, the alluvial plains and selected alluvial fans.

Generally, these sediments show deeply weathered and decalcified profiles with a silty to loamy texture. Signs of redoximorphic conditions and secondary precipitated carbonates usually characterize the lower part of the profiles while the upper parts have reduced pH values and high contents of organic matter. The occurrence of charcoal is rather poor. Nevertheless, the upper and middle sections of most cores contain charcoal, frequently accompanied by daub. The core sections that contain daub show high magnetic susceptibility (MS) values. Increased MS values are also apparent in sections where soil formation takes place, which is additionally indicated by low pH and high LOI_{550} values.

The basis of the core from the high plain is formed by very pale brown carbonate rich silt. These sediments are interpreted as loess or loess-like deposits that form the non-weathered parent material of the high pain. Above, secondary precipitated carbonates form abundant nodules. The

middle and upper sections show signs of intensive chemical weathering and strong soil formation, which points to rather stable geomorphic conditions with little erosion.

Rounded gravels, most likely of Pleistocene age, form the bases of the sediments from the alluvial plains. This is, to some extent, confirmed by a 14C dating from 427 cm depth pointing to about 25.000 cal. BP. The other radiocarbon dates from the alluvial plains and fans come from ca. 260-150 cm depth and are considerably younger. They roughly cover the time period 5.500-1.000 cal. BP.

Conclusion

The results of our study show that the deposits from the lowermost sections of the cores from the alluvial plains date to the Pleistocene. However, due to the scarcity of charcoal remains it is difficult to set up a concise chronology of alluvial deposits covering the entire Holocene. Only after 5.500 cal. BP charcoal becomes more common in the sediments. Hence, the Late Chalcolithic to Late Bronze Age settlement activities, which are documented for the area, coincide with the sediment record that comes from the middle and upper sections of the alluvial and fans sediments.

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