PAGES
PAST GLOBAL CHANGES

cirques & lakes

PN-II-RU-TE-2012-3-0386

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

ABSTRACTS VOLUME

Ştefan cel Mare University Press

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

Nov. 2014

Ştefan cel Mare University Press

Recognition and interpretation of paleosols sequences in a floodplain from the low tableland of Transylvania Depression, Romania

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Palaeosols reflect quite accurately the paleogeographic conditions in which they formed and evolved. Many studies were focused on this target in different settings (lakes, loess plateaus and plains, floodplains and archaeological sites).

Here we present the palaeosols sequences in the floodplain of Partoț River, situated in the low tableland of Transylvania Depression. The observations were performed on three cores, one located at ca. 1 km downstream from the Știucilor Lake (profile no. 3) and the other two at 1 km (profile no. 1), respectively 4 km (profile no. 2), upstream from the lake.

The thickness of floodplain sediments is ca. 12 m upstream from Stiucilor Lake, and ca. 6 m downstream from this lake. In the bottom are present cobbles and pebbles, covered by 1-2 m thick sequence of fine and medium sands, followed by 5 to 10 m thick fine silty – clayey materials. The alluvial and lacustrine sediments suggest that the vertical aggradation was the main process on the surface of this floodplain.

The maximum age of fine silty-clayey sediments, indicate that this sedimentary sequence starts in Bolling – Allerod interstadial. A very low sedimentation rate characterised the first part of the sequence, as only ca. 1 m of materials seams to be accumulated between Bolling – Allerod interstadial and Mid Holocene.

After ca. 6000 yrs BP, when Stiucilor Lake has formed, the sedimentation rate increased dramatically, both upstream and downstream from it. Upstream from the lake, the tickness of lacustrine/alluvial materials is ca. 9 to 10 m, while downstream, the sedimentation rate was slighlty reduced, and the thickness of fluvial/torrential sediments are of ca. 5 m.

The pedological observations were made on the very fine materials, covering mainly the last few thousand years, and consist in comparison of the sedimentary layering and the distribution of carbonates and organic matter content, and determination of the morphological properties (colour, structure, consistency, plasticity) of the soil material. Many sequences indicate alternated presence of the carbonates, as consequence of climatic variability: dryer climate determined carbonates accumulation, wet climate favorized carbonates levigation (migration, depletion).

The main pedological characteristic in the three profiles is the large scale gleic processes, as a consequence of groundwater stagnation, in general, more intensity at the bottom of the palaeosol sequences.

The oldest palaeosol sequence was found in the bottom of profile no 2 (the only core which intersect the base of fine materials), most probably a gleiosoil, as the intensive gleization process

suggest. It was formed before the appearance of Stiucilor Lake and the dramatic increase of the sedimentation rate in the floodplain perimeter.

The following palaeosols reflect the floodplain history during the past ca. 6000 years. Three clear palaeosol sequences were recognised along the profile no 2, interrupted by sequences of silty and sandy materials, sometimes affected by incipient pedogenetic processes. A well developped chernozem palaeosol, 60 cm thick, is located at ca. 760-625 cm along the profile no. 2. Based on the absolute ages, this soil was formed after ca. 3200 yrs BP. The next two palaeosols, located at 420-350 cm and 260-125 cm along the profile, are very young in age, being formed during the last few hundred years.

Also, profiles no 1 and no 3 were analysed and compared with profile no 2 and present many similarities with it. These correlations allowed us to reveal periods of pedogenesis in the last ca 6000 years.