

Nov. 2014

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



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

ABSTRACTS VOLUME



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A high-resolution Early Holocene-late MIS 3 environmental rock- and palaeomagnetic record from Lake Sf. Ana, Carpathian Mts, Romania

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Introduction

Lacustrine sediments are excellent sources of palaeoenvironmental and palaeoclimatic information because they usually provide continuous and high-resolution records. In central-eastern Europe however lacustrine records that extend beyond the Holocene are rather sparse. Palaeomagnetic records from this region are also insufficiently explored, and usually associated with terrestrial deposits such as loess. In this context, the lacustrine record of Lake Sf. Ana, a volcanic crater lake in the East Carpathians, Romania, provides an important archive for reconstructing past paleomagnetic secular variation in the region from early Holocene to late Marine Isotope Stage (MIS) 3.

Methods and results

The aim of this study is to explore the relationship between rock-magnetic parameters and elemental (Itrax-derived elemental data) and palaeobiological data (pollen assemblages) of Lake Sf. Ana record in order to develop a basin evolution model of sediment provenance and lake-level changes related to past hydrological and climatic fluctuations. We therefore discuss one of the first high-resolution and multiproxy rock and palaeomagnetic record based on investigations of lake sediments in this region. We provide detailed u-channel-based palaeomagnetic inclination,

declination, and relative palaeointensity (RPI) reconstructions with the aim of complementing the radiocarbon and luminescence based age model(s) of this record, mainly through comparisons with other RPI records. A series of rock-magnetic proxies including SIRM, S-ratio, Curie temperature and hysteresis curves provide information on the magnetic mineralogy and magnetic grain-size variations. Most rock-magnetic parameters show distinct down-core changes that correlate well with shifts in magnetic susceptibility; however, several distinct intervals show the imprint of diagenetic features like selective reductive dissolution of magnetite and the concentration of detrital hematite that might be related to past fluctuations in lake levels. These features (partly visible also in the magnetic susceptibility record) are complemented by information from the Itrax-based chemical stratigraphy of this record that provides important insights into the nature of the depositional environment and origin of sediments.

Furthermore, demagnetization and rock-magnetic data reveal over most of the record the dominance of a stable single component magnetization most likely carried by a low coercivity ferromagnetic mineral such as magnetite. Moreover, the low MAD values combined with inclination close to the GAD value for the latitude of the site indicate the recording of a genuine palaeomagnetic signal. Our new RPI record is compared with regionally representative lacustrine and marine records as well as with paleomagnetic stacks from the mid- to high-latitudes of Northern Hemisphere. The comparison reveals consistent millennial-scale variability and identification of common features in the RPI curve that allow for the synchronisation of records for the last 30 ka. The results also illustrate the value of a multiproxy approach in understanding both catchment-wide sediment dynamics and variations in the lake internal physical and chemical processes during rapid climate changes such as Greenland stadials and interstadials.

Acknowledgements

We wish to thank support from PROLONG project, supported by the OTKA Research Funds (PD73234, NF101362) to E.M., and project PN-II-ID-PCE-2012-4-0530 'Millennial-scale geochemical records of anthropogenic impact and natural climate change in the Romanian Carpathians' to D.V.