

Multiproxy Reconstruction of the Middle Miocene Požega Palaeolake in the Southern Pannonian Basin (NE Croatia) Prior to the Badenian Transgression of the Central Paratethys Sea

Oleg Mandić¹, Valentina Hajek-Tadesse², Koraljka Bakrač², Bettina Reichenbacher³, Anita Grizelj² & Mirjana Miknić²

¹ Natural History Museum Vienna, Geological-Palaeontological Department, Burgring 7, 1010 Wien, Austria

² Croatian Geological Survey, Sachsova 2, 10 000 Zagreb, Croatia

³ Ludwig-Maximilian-University, Department of Earth and Environmental Sciences, Richard-Wagner Str. 10, 80 333 Munich, Germany

*corresponding author: oleg.mandic@nhm-wien.ac.at

The Pannonian Basin of Croatia is the largest back-arc extensional basin on the European continent, located between the Alps, Carpathians and Dinarides. Syn-rift subsidence started at ~18 Ma and predated the onset of the Miocene Climatic Optimum (MCO; 17-14.7 Ma). In this study, we investigate the evolution of the fluvial-lacustrine palaeoenvironment just prior to the transgression of the Central Paratethys Sea. Studies are based on a 17-m-thick section of the Požega palaeolake in the Southern Pannonian Basin using palaeobiological (mollusks, ostracods, palynomorphs, fish otoliths), mineralogical and sedimentological data. Our results reveal fluctuating freshwater and brackish conditions and a pulsating water budget, which we relate to phases in which the basin was, alternatively, hydrologically open and closed.

We infer that the alternating environmental conditions can be best-explained by dry and wet periods, respectively. Droughts produced stagnant conditions, algae overproduction and increased salinity levels, supporting the survival of sporadically invading brackish water species. The wet

periods, on the other hand, led to lake highstand episodes, expansion of its area, and to the onset of profundal settings. The lake basin eventually became overfilled and connected through outflowing rivers with the Central Paratethys sea. However, the absence of brackish-marine assemblages in the Požega palaeolake nevertheless indicates that there was no marine water inflow from the Central Paratethys at that time.

Acknowledgements

The present investigation is part of the research, supported by the Department of Geology, Croatian Geological Survey, and the Ministry of Science, Education and Sports project no. 181-1811096-1093: “Basic Geological Map of the Republic of Croatia 1:50,000”, and published in MANDIĆ et al. (2019).

Keywords: *Central Paratethys, Burdigalian-Langhian, Miocene Climatic Optimum, Palaeogeography, Palaeoecology*

References

- MANDIĆ, O., HAJEK-TADESSE, V., BAKRAČ, K., REICHENBACHER, B., GRIZELJ, A. & MIKNIĆ, M. (2019): Multiproxy reconstruction of the middle Miocene Požega palaeolake in the Southern Pannonian Basin (NE Croatia) prior to the Badenian transgression of the Central Paratethys Sea. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 516, 203-219, DOI: S0031-0182(18)30430-9.