

# High-resolution stratigraphy of the Lower Badenian deposits in selected cores of the Carpathian Foredeep

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Drill cores from IK-1 Iváň and LOM-1 Lomnice u Tišnova (Lower Badenian) was evaluated by several various proxy methods (X-ray fluorescence spectrometry XRF, gamma spectrometry, grain size analysis, RTG diffraction and chemical analysis) in order to obtain data about paleoclimatic and paleogeographic conditions of sedimentation as well as to verify applications of these methods on monitored Neogenous sediments. Both wells are situated in the southern part of the Carpathian Foredeep in the Czech Republic. IK-1 is situated in the central area of the basin while LOM-1 lies on the western border of it. According to the biostratigraphic data, both of the observed wells belong to the NN5 zone (Tomanová Petrová & Švábenická 2007). Facial and litologic studies (Nehyba et al. 2007) point to similar sedimentary conditions (shallow-sea sediments of inner and outer shelf) and similar source of clastic material settling in the basin. Results from the X-ray fluorescence spectrometry were used as proxy date for grain size, weathering, oxide-reductive ratios and changes of high of sea-level. For the study, chemical elements were used, especially those which has been confirmed as reliable for given methods, specifically Al, Si, S, K, Ti, Mn, Fe, Rb and Zr. On the other hand, elements showing higher deviations during measuring were excluded, for example Cr, V, T or Ni. According to the results of grain analysis, the sediments can be classified as clay silts and, in only a fraction of cases, silt clays. Medium size of Mz grain (Folk & Ward 1957) was counted and was used to confirm grain proxies. Chosen ratios Si/Al, Ti/Al and Zr/Al

(Ver Straeten et al. 2011) were used as grain proxies. Mutual correlations were insignificant, only in case of LOM-1 higher correlation between Mz and Ti/Al was proved. Therefore, the grain proxies cannot be considered reliable. Proxies for weathering show the effects of chemical weathering, which is also proved by high values of the CIA index. For surface-level changes, we used proxy Fe/Al (Clarkson et al. 2014). In IK-1, the results were compared with ratio of plankton and benthos (Nehyba et al. 2007) and stronger similarity of trends was established. To sum it up, proxy data of studied sediments can be considered partially reliable.

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