

# Stratigraphy, Sedimentology and Facies of the lacustrine to playa-like Arnstadt Formation (Norian) in the eastern Central European Basin (CEB)

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The analysis of sedimentology and facies of the Arnstadt Formation has been difficult in the past due to different stratigraphic concepts in Germany and Poland. Based on a new lithostratigraphic concept comprising pedogenic horizons as markers of non sedimentation a correlation is now possible and enables a detailed sedimentological and facial analysis in the eastern CEB. Further progress has been made concerning the correlation of the Arnstadt Formation with the Norian using a preliminary conchostracan zonation after Kozur & Weems (2007). Taxa from the lowermost Arnstadt-Formation reject a large time gap at the base (Early Cimerian Unconformity). In combination with Milankovitch-type cyclicity the duration of the Arnstadt Formation is comparable to the Norian.

The Arnstadt Formation is characterised by three main facies: a) the Thuringian; b) the Central Polish; and c) the Pomeranian facies, with gradual changes in-between. The Thuringian facies occurs from Thüringen (Thuringia) to southeast Brandenburg, and consists of reddish shales with a thick greyish interval between. Sand and silt are sparse, but pedogenic dolomite crusts (dolcrete) are common. The Central Polish facies occurs from Central Poland to Gorny Śląsk, consisting mainly of red shales with sandy layers, conglomeratic beds of reworked marly and dolomitic pebbles in a shaly matrix, and pedogenic dolomite crusts (dolcrete). The Pomeranian facies extends from NE Germany and NW Poland to the Baltic Sea and consists mainly of greyish shales with interbedded oncoidal layers in the lower part and greyish shales with pedogenic dolomite crusts in the upper part.

The Thuringian and Central Polish facies suggest a deposition in a playa system with strong reduced sedimentary influx during an

arid to semiarid climate. Sparse clastic input was controlled by Bohemian-Vindelician source areas to the south and Scandinavian source areas to the north. Silty, sandy and reworked marly and dolomitic conglomerate beds are thought to represent deposits of sheetflow, fluvial and alluvial regimes (Shukla et al. 2006). Increasing humidity and intermittent fresh water input from the Scandinavian source areas led to perennial lakes with lakustrine facies which dominate the lower part of the Pomeranian facies. Two maximum lake extensions are marked by lakustrine onkoids and can be used for event stratigraphy. In the upper part greyish (Pomeranian facies) and reddish to multicoloured shales (Thuringian and Central Polish facies) are pedogenic overprinted and interbedded with pedogenic dolomite crusts, resulting from seasonal semiarid climate with high evaporation rates.

## Literature

- KOZUR, H. & WEEMS, R. E. (2007) Upper Triassic conchostracan biostratigraphy of the continental rift basins of Eastern North America: Its importance for correlating Newark Supergroup events with the Germanic Basin and the international geologic time scale. In: Lucas SG Spielman JA (eds): The global Triassic. New Mexico Museum Natural History and Science Bulletin 41: 137-188.
- SHUKLA, U. K., BACHMANN, G. H., BEUTLER, G., BARNASCH, J. & FRANZ, M. (2006): Extremely distal fluvial sandstones within the playa system of Arnstadt Formation (Norian, Late Triassic), Central Germany. *Facies* 52: 541–555.