



Evolution of an Early Permian braided fluvial system and its correlation with lacustrine deposits of the Vrchlabí Fm., Krkonoše Piedmont Basin, NE Czech Republic

Kateřina Schöpfer (1), Roland Nádaskay (2,3), and Karel Martínek (2)

(1) University of Vienna, Geodynamics and Sedimentology, Vienna, Austria (katerina.schoepfer@univie.ac.at), (2) Institute of Geology and Paleontology, Charles University, Prague, Czech Republic, (3) Czech Geological Survey, Prague, Czech Republic

The Krkonoše Piedmont Basin (KPB) is located in the eastern region of an extensive basin system that spans from western Bohemia to the central Sudetes. The KPB formed as a result of extension/transension during early post-Variscan (c. 310–280 Ma) times and comprises up to 1800 m of Upper Carboniferous (Moscovian/Kasimovian) to Lower/Middle Triassic non-marine deposits. The KPB originated as a half-graben with maximum subsidence adjacent to a major NE-SW normal fault that constituted the N-NE basin margin during late Carboniferous and early Permian (Asselian) times. This study focuses on the Vrchlabí Fm. (Asselian, up to 300 m thick) in the southern part of the basin and presents results of sedimentological and architectural element analysis of a fluvial system which entered an extensive lake that occupied the northern region of the KPB. The lake deposits record frequent drying up and periodic shallowing/deepening. Fluvial deposits consist of arkosic sandstones and conglomerates interpreted as multi-storey or single channel fills and transverse bars deposited by braided river system with variably preserved floodplains recorded in vertical profiles. Successive channel fills are arranged into three architectural units, where unit No. 1 and 3 are characterized by multistorey channel bodies that incised floodplain sediments, while unit No. 2 does not contain floodplain deposits and typically exhibits single channel bodies that show higher cementation rates than the other units. In order to improve our understanding of the main factors controlling the fluvial system and its interaction with a lake located in the northern KPB (e.g., base level changes controlled by drying up of the lake), ‘transitional’ facies consisting of alternating grey parallel- to ripple-laminated sandstones and up to 10’s of cm thick dark grey mudstones were studied in detail. These sediments represent bottomsets of lacustrine microdelta/mouth bars deposited by traction and recurrent gravity currents triggered by seasonal floods supplying turbid suspension from fluvial feeder system to the lake. A detailed correlation of existing well and newly acquired outcrop gamma-ray logs revealed complex lateral and vertical relationships between the fluvial, the ‘transitional’ and the lake facies in the southern and central parts of the KPB. Our study illustrates the usefulness of an interdisciplinary approach to reconstruct a basin’s history in a region with sparse outcrops and very limited fossil record.