

Origin of the Pleistocene/Holocene dunes in the floodplain of the Dyje river (South Moravia, Czech Republic)

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Floodplain alluvia represent important archives of natural and anthropogenic processes. The archaeological locality Pohansko (South Moravia, Czech Republic) provides evidence of a significant Early Medieval centre in the core area of the Great Moravian Empire, 9th century AD (interpreted as a munitio, emporium and palatium of the Moravian Early Medieval rulers). The site lies at an altitude of about 155 to 157 m a.s.l. and is situated within an extended flood plain near the confluence of the Morava and Dyje rivers filled with Holocene flood loams. The beginning of flood loam sedimentation is estimated to be about 3000–4000 BP at the initial phase of the Subboreal period. The marginal slopes of the valley protrude some 5 m above the flood plain and are composed of Middle Pleistocene (Riss) fluvial sandy gravels with Late Würmian dunes. In some places these dunes also protrude from under Holocene flood loams in the flood plain; one of them was used to build the Early Medieval fortified site. Originally the sand dunes had a height between 6 and 8 m, but recently because of younger flood loam deposits, they are only 1–2 m above the flood plain. Some lower dunes were even buried under the flood loams. The bedrock of the Quaternary deposits in the area of Pohansko is represented by grey clays of the Pannonian Age (8.5–11.5 Ma) of the Vienna Basin.

The yellowish to brownish fine- to medium-grained sands, forming the dunes, are traditionally interpreted as eolian in origin formed by wind-blown sands. Newly outcropped profiles produced during the archaeological research were subjected to detailed lithofacies analyses. Surface textures of quartz grains were studied in selected samples. Based on these results, fluvial units predominate in the sedimentary succession and the dunes are interpreted as levees and point-bars. Aeolian origin of some part (?) of Pleistocene/Holocene dunes is therefore questioned.

Age interpretations based on optically stimulated luminescence (OSL) analyses proved that dunes were formed during a relatively long period (7000–16 000 BP). The significant variations in the climatic/hydrological conditions could be supposed during their formation.

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