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Quaternary evolution of the Danube along Lower Danube Gorge (Iron Gates) and Oltenia Plain (Romania, SE Europe) – a literature review

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Recent investigations on the sedimentary infill of the western Dacian Basin suggest that between ~4.8 Ma and 4.2 Ma (Dacian) the Danube and its tributaries formed a deltaic front at the exit from the Lower Danube Gorge (LDG) known also as Iron Gates. The appearance of a large fluvial system (the proto-Danube) connecting the two basins was dated to ~4.0 Ma with the water course becoming fully formed and discharging into the Black Sea after ~3.7 Ma.

In the present paper, the emphasis falls on the Quaternary history of the Danube in the area of the LDG and the Oltenia Plain, the western extremity of the Dacian Basin. The proposed review summarizes investigations of geomorphology and fluvial sedimentology in the region performed during the last 100 years. Morphological, sedimentological, tectonic, and relative chronological information is brought together to advance an overview of the spatial distribution of terrace fragments, their relative altitudes, associated sedimentary structures, available relative chronological frameworks (based mainly on macro- and microfossils) and documented minor deformations associated with local tectonic structures.

During the Quaternary, incision of the Danube at the LDG was estimated to be over 250 m. This incision corresponds to a number of at least 7 levels of strath terraces, preserved in a fragmentary way along the narrow passages but better conserved in the successive local tectonic depressions along the LDG. Here 7-10 terraces have been described, among which the lowest 5-6 were attributed to the Quaternary.

Downstream of the LDG, the Danube developed a large alluvial fan during the Early Quaternary, the remains of which are currently located at over 180 - 200 m r.a., while in the last ~1 Ma it developed a system of 7 (8?) terraces from ca. 140 - 170 m to 4-7 m r.a. These alluvial terraces attest for a constant southward migration of the Danube to its current position, under the influence of local subsidence and/or of large amount of incoming sediments deposited by the tributaries arriving from the north, draining the southern flanks of the uplifting Southern

Carpathians.

Through this analysis, we aim to highlight the characteristics of the Quaternary history of the Danube in two distinct sectors: the LDG and the area downstream to it, the Oltenia Plain down to Jiu River, the first important tributary of the Danube downstream to the LDG. The final objective of this exercise is to create the framework for the first investigations of numerical age determination of terraces along the lower sector of the Danube.

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