



Variable responses of fluvial systems to late Quaternary climate changes in NW Romania

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In this paper, we discuss the similarities and differences in timing and style of fluvial processes (incision, terrace detachment, changes in the sedimentation styles) manifestation for different reference moments during the Late Quaternary history of two neighboring, medium size rivers from the NW part of Transylvanian Depression (Someşul Mic River, 175 km long, drainage surface of 3773 kmp, and Arieş River, 167 km long, drainage surface of 2970 kmp).

In the case of Someşul Mic River, a shallow, coarse gravel, braided channel was active at the level of the first terrace (T1, 5-8 m relative altitude), at least as early as MIS 3. After incision and formation of the present valley bottom, a low energetic river was active (meandering or anabranching), which was later replaced by a shallow, coarse gravel braided channel (similar with the one on T1), active before LGM and maintained until the Younger Dryas (or the early Holocene). During the early Holocene, the braided channel was replaced by a transitional one, slightly incised in the previous phase's alluvial materials, further abandoned for an incised, narrow meandering channel. The last channel type change is probably related to the large scale arrival and development of deciduous trees species in the area (~10.kyrs BP), implying a few hundred years delay of the final fluvial adjustment to the new temperate conditions associated to the YD/Holocene transition.

Along Arieş River, a comparative shallow, coarse gravel, braided river was active at the level of T1, during MIS 3. However, erosional features on the top of the gravel sheet and some palaeomeanders are visible on the terrace surface, and suggest the existence of a transitional / meandering channel before this surface was completely abandoned. In the floodplain perimeter, an absolute age of the upper part of the coarse gravel sediments suggests this river style was functional at least during LGM, possibly earlier. This age, and the morphological and sedimentological evidences for generations of palaeomeanders imposed erosively on the upper part of the sedimentary sequence, suggest a meandering pattern probably starting with the Bolling - Allerod Interstadial.

The results show that two very similar rivers, in terms of their location and present-day morphometric characteristics, do have similar large reactions to Late Quaternary climate changes, however, significant differences can be found in details of reaction time and the involved processes. The existing data suggest that Arieş River is a more sensitive one than Someşul Mic River. The more conservatory behavior in the last case (e.g., no channel change during the Bolling – Allerod Interstadial, delayed reaction in the early Holocene) is probably explained by the slightly higher slope of this particular river, related to the presence of a large scale knickpoint in the medium part of the longitudinal profile (ca. 380 m), imposed by local geological conditions.