



The demise of the Oligo-Miocene fluvial system of the Levant and its geodynamic significance

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The Levant rift system is a linear assemblage of axial rifts and their mountainous flanks that comprises two structurally distinct sections. The southern segment is built of series of secondary axial grabens, which trend northwards and are separated from each other by poorly rifted threshold zones, which is the northern extension of the Red Sea continental break-up. The northern section comprises the SW-trending Karasu - Hatay rifts, from which the Ghab graben branches southwards, which is tectonically attributed to the westward migration of Anatolia. A system of large rivers transected the southern section of the Levant from central Arabia in the east to the Mediterranean Sea in the west during the Oligo-Miocene, leaving behind 5 km thick series of clastic deposits at sea, and sandstones and conglomerates of variable thickness on land. The demise of that fluvial system was gradual, stretching from the late Miocene to the early Pleistocene, where coastal rivers were truncated from their sources due to the growth of segmented rift. The geodynamic process that constrains the development of the rifts of the southern Levant and their elevated flanks is oblique rifting, where several small rifts start the evolution along a weakness zone concurrently, separated by wide and inactive threshold zones. Gradually the rifts grow along their long axes to interconnect, shrinking the threshold zone to their disappearance. Such geodynamic history best accounts for the observations of relicts of late Miocene fluvial deposits on mountaintops, large river beds dated to the late Miocene-early Pliocene, and large marine fan deposits of early Pliocene age, where rivers continued to flow in the threshold zones, but truncated by the emerging rifts.