



Neogene palaeogeography of SW Anatolia: A case study inferred from Tectonic-Sedimentation-Climate interactions in an array of evolving orogen-top basins

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The neotectonic evolution of western Anatolia was characterized by the development of extensional intramontane grabens. Interpretations of the origin and history of these Neogene basins were based mainly on regional tectonic inferences, rather than detailed stratigraphic analysis of the basin-fill sedimentary successions, and remain controversial. One of the moot points is the timing and tectonic nature of the post-orogenic episodes of crustal deformation in the Western Taurides, in SW Anatolia.

Recent studies of terrestrial basin-fill succession of the post-orogenic grabens show a strong synchronicity and led to the recognition of three pulses of crustal extension from changes in the basin palaeogeography and stratigraphic architecture. Basins' development commenced in Vallesian (early Tortonian: late Miocene) time, involving alluvial-fan, fluvial and lacustrine depositional systems with mammal and molluscan faunas. A second rifting pulse occurred in the late Ruscinian (early-middle Pliocene) and split the basins longitudinally into compartments. The lacustrine environment expanded, coastal peat-forming mires developed and abundant mammal fauna appeared by the early Villanian (middle Pliocene). As the lake gradually shrank due to progradation of deltas, a third rifting pulse generated new normal faults that split the basins into still narrower half-grabens at the end of the Villanian (late Pliocene). The third rifting pulse is estimated to have accounted for little more than 10 % of sub-basinal crustal extension but caused the greatest changes in the basin palaeogeography and drainage pattern. These were the first regional case studies of a post-orogenic terrestrial grabens employing detailed basin-fill analysis and mammal biostratigraphy, and providing a reliable time-stratigraphic framework for the rifting pulses in the Western Taurides.

This study tests the applicability of this framework by analyze stratigraphically the adjacent orogenically related extensional basins, the NE-trending terrestrial grabens filled with late Miocene to Pliocene fluvial, lacustrine and deltaic deposits that have previously attracted little research. The case study focuses on the sedimentation patterns and depositional architecture in those evolving orogen-top basins. This comparative study is a contribution to a better understanding of the development of orogen-top extensional basins array of the Lycian Orogen in SW Anatolia. Finally, this study addresses some of the regional controversies and provides new insights into the tectonic history of the Western Taurides, with analogies drawn to other branches of the Alpine Orogen and palaeo-Mediterranean belt.