



Basin connectivity controlling sedimentary architecture during the final stages of orogeny: interplay between sedimentation and mountain building in the Carpathians

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Mountain building processes lead to exhumation of orogenic cores during gradual shortening by nappe stacking. As a result, large oceanic basins and associated passive continental margins become fragmented and reduced in size during active subduction, collision and resulting uplift. Ongoing subsidence after onset of collision may locally preserve syn-orogenic basins, but these basins will be subsequently filled and the submarine depocenter shifted elsewhere. Such processes often lead to the isolation of sub-basins. The parameters controlling the connectivity amongst late orogenic semi-isolated basins, and with open marine environments, respectively, are complex. They are influenced, for example, by interplay between uplift and subsidence creating accommodation space and building sediment source areas, inherited tectonic pathways across mountain chains or climate and sea-level variations. So far, connectivities have been mostly inferred from biostratigraphic events or analysed from a numerical modelling perspective on singular events. However a phenomenological and quantitative link is missing in particular for basins with multiple low amplitude gateways.

Mountain building processes can lead to isolated/endemic evolution of rather large areas, such as the Paratethys, with its various sub-basins, separated by the late-stage orogenic evolution of the Alps/Carpathians. These types of basins are characterised by

multiple potential gateways which functioned in various spatial and temporal domains during the gradual basin fill and migration of the depocenters towards the present-day active sink area, the Black Sea. Large sea-level variations in this main controlling realm generate rather limited local base-level variations in the restricted basins situated near the Carpathians. Such low amplitude connectivity events with short duration such as the ones observed here are seen to be controlled mainly by features such as: evolution of local sea-levels, basin overspill, uplift and fluvial incision of the connecting gateways, drainage capture or (tectonic) migration of drainage divides, gradual filling patterns and transition towards continental environments. These can be demonstrated in particular for the gateways active during the late Carpathians evolution.