



The Supra-Detachment Sedimentary Evolution of hyper-extended Rifted Margins: the Example of the Alpine Tethys Fossil Analogue Exposed in the Alps (SE Switzerland)

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Rifting processes leading to the formation of deep-water hyper-extended, magma-starved rifted margins are poorly constrained due to the lack of data from present-day rifted margins. In many present-day examples the classical models remain unable to predict the observed tectonic, sedimentary and subsidence history. Therefore, finding good field analogues, which preserve primary relationships between structures and syn-tectonic sediments is a key to understand the timing and evolution of these margins.

Our study focuses on the Jurassic Adriatic rifted margin, which is preserved in the Central Alps in SE Switzerland. The margin architecture can be restored and rift structures with their associated syn- to post- tectonic sedimentary sequences can be mapped through three main paleogeographic domains. A “proximal domain” with classical fault bounded basins, a “necking zone” dominated by thinning structures, and a “distal domain” with exhumed crustal rocks overlain by extensional allochthons that pass oceanwards into an exhumed subcontinental mantle domain. The low syn-rift sedimentation rate of the whole Adriatic margin gives an opportunity to study the exhumation history and its related tectono-sedimentary record.

In our poster we constrain the tectono-sedimentary evolution of a supra-detachment rift basin, which is preserved between the necking zone and the exhumed subcontinental mantle in the so-called ocean continent transition. The syn-tectonic record can be divided into four main stratigraphic units on top of an evolving detachment system:

- (1) the Bardella Fm records the delamination of the hanging-wall blocks (pre-rift platform) on top of an active detachment system, leading to the formation of local debris-flows in fault bounded basins.
- (2) the Saluver A Fm records the first exhumation of the detachment and its footwall (the basement) which becomes an efficient new source feeding the debris-flows.
- (3) the Saluver B Fm consists of the onset of axial sand-dominated turbiditic systems consecutive of the migration of sedimentary sourcing continentward (toward the necking zone). Upsection it records a progressive starving of local debris-flows (i.e. Bardella and Saluver A) due to the migration of the active detachment faulting oceanwards.
- (4) the Saluver C Fm post-dates local tectonic activity and illustrates the retrogradation of turbiditic systems within a subsiding basin (e.g. sag basin). The whole margin including the adjacent embryonic oceanic crust is finally sealed by pelagic post-rift sediments.

The study of this fossil analogue shows the close relationship between tectonic and sedimentary processes during thinning, exhumation and onset of seafloor spreading within a sedimentary starved magma-poor rifted margin. By comparing this evolution with those of other fossil and modern analogues showing variable amount of terrigenous influx, structural inheritances and/or magmatic additions, we aim to investigate the general evolution of the sedimentary record of hyper-extended rifted margins.