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ABSTRACT BOOK

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Role of Late Carboniferous - Early Triassic structural inheritance in the continental break-up of Pangea and exhumation of the Alpine Tethyan mantle: insights from the Canavese Zone, Western Alps

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The formation of rifted continental margin by extension of continental lithosphere, leading to seafloor spreading, is a meaningful component of the plate tectonic cycle. Nevertheless, the discrimination on the role played by structural inheritances in controlling the tectonic evolution and structural deformation pattern of lithosphere and the onset of rifting stage can be difficult to decipher. In fact, polyphasic tectonic, inherited structures may be commonly (*i*) reactivated, and/or (*ii*) masked by thick sedimentary and/or magmatic sequences that prevent detailed observation on pre-rift crustal architectures. Through multiscale, field- and laboratory-based structural studies (from geological map scale to mesoscale and scanning electron microscope scale), and re-definition of the stratigraphic succession, we document the internal architecture, tectono-stratigraphic setting and geological evolution of the Canavese Zone (Western Alps), which represents the remnant of stretching, thinning and dismemberment of the distal passive margin of Adria, occurred during the opening of the Alpine Tethys. We document that the continental break-up of Pangea and tectonic dismemberment of the distal margin of Adria, up to Alpine Tethyan mantle rocks exhumation, did not simply result from the syn-rift Jurassic extension but was strongly favored by older structural inheritances (Late Carboniferous to Early Triassic regional-scale wrench faults; see Festa et al., 2019 for further details), which controlled earlier lithospheric weakness, as also suggested for other sectors of the Southern Alps (e.g., Roda et al., 2018). This should be taken in consideration in models aimed to understand processes and mechanisms of progressive stretching and lithospheric thinning, driving to the sharp decrease in crustal thickness and strong decoupling between upper crust and continental mantle, up to continental breakup and mantle exhumation of the Jurassic Alpine Tethys.

Festa A., Balestro G., Borghi A., De Caroli S. & Succo A. (2019) - The role of structural inheritance in continental break-up and exhumation of Alpine Tethyan mantle (Canavese Zone, Western Alps). Geoscience Frontiers, https://doi.org/10.1016/j.gsf.2018.11.007

Roda M., Regorda A., Spalla M.I. & Marotta A.M. (2018) - What drives Alpine Tethys opening? Clues from the review of geological data and model predictions. Geological Journal. https://doi.org/10.1002/gj.3316