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Multistage tectono-stratigraphic evolution of the Canavese Zone (Western Alps)

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The Canavese Zone (CZ) in the Western Alps represents the remnant of the distal passive margin of the Adria microplate, which was stretched and thinned up to mantle rocks exhumation during the Jurassic opening of the Alpine Tethys. Through detailed geological mapping, structural analysis, stratigraphic and petrographic observations, and documentation of relationships between tectonics and sedimentation, we redefine the multistage tectono-stratigraphic evolution of the CZ, which consists of a Variscan basement, post-Variscan magmatic bodies and a Late-Carboniferous to Cretaceous sedimentary succession (Festa et al., 2020, and references therein). The Variscan basement includes a Lower Unit, wherein micaschist and orthogneiss were metamorphosed under amphibolite-facies conditions and partly transformed into migmatitic gneiss during a post-Variscan high-temperature metamorphic event, and an Upper Unit, consisting of a metasedimentary succession metamorphosed under greenschist- to amphibolite-facies conditions during the Variscan orogeny. The two basement units were intruded by post-Variscan plutons and hypabyssal dykes of both mafic to acidic composition. The Late-Carboniferous to Cretaceous sedimentary succession starts with continental fluvial deposits (Upper Carboniferous Basal Conglomerate *Auct.*) unconformably overlain by Permian volcanic and volcanoclastic rocks (Collio Formation), and it continues upward with Upper Permian to Lower Triassic conglomerates and sandstones (Verrucano *Auct.* and Servino Formation), which are followed by pre-rift Middle Triassic dolostone. The latter is overlain by Lower to Middle Jurassic synrift sediments (Muriaglio Formation) and by Middle Jurassic to Early Cretaceous post-rift sediments, consisting of Radiolarites, Maiolica micritic limestones and Palombini shale. We point out that (i) the whole CZ succession, since the Late Carboniferous, shows significant thickness and facies variations, documenting long-lived tectonic control on sedimentation, and (ii) Late Paleozoic – Triassic structural inheritances playing a significant role in the localization of faults that accommodated both the Jurassic rifting of the Alpine Tethys and the subsequent convergent tectonics.

Festa, A., Balestro, G., Borghi, A., De Caroli, S. & Succo, A. (2020). The role of structural inheritance in continental break-up and exhumation of Alpine Tethyan mantle (Canavese Zone, Western Alps). *Geosciences Frontiers*, 11, 167–188.