

Structure and petrology of the Edolo diabase and implications for the Alpine tectonics in the Southern Alps, from rifting to continental collision

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Ti-rich amphibole-, biotite- and clinopyroxene-bearing mafic dykes, historically known as "Edolo diabase", are widespread in the northern part of the central Southern Alps.

In this area, the dykes crosscut all the Variscan structures affecting the basement rocks in different tectonic units. Alpine folds and thrusts system deeply affects the central Southern Alps, from the syn-subductive to the late-collisional phase. Although this tectonic domain has long been considered devoid of Alpine metamorphism, an Alpine foliation (S₃) is locally developed in the Variscan basement rocks, Permian-Triassic sedimentary sequences, and Edolo diabase dykes. Here, S₃ is supported by upper-greenschist facies mineral assemblages, including Al-rich actinolite, biotite, and epidote. Preliminary P-T estimates (T = 420 – 450°C and P = 0.15 – 0.40 GPa) suggest a barrovian metamorphic imprint related to the Alpine collision.

In this contribution, we present structural, microstructural, mineral-chemical, and geochemical data aimed at (1) describing the Edolo diabase in the framework of the Permian-Triassic magmatism in the Alps, (2) speculating on the tectonic setting accountable for this magmatic event and on the composition of the source mantle rocks at the end and after the Variscan cycle, and (3) constraining the Alpine metamorphic evolution of the northern part of the central Southern Alps.

Mots-Clés : central Southern Alps, Triassic rifting, lamprophyre dykes, Alpine collision, greenschist facies metamorphism