The Western Alps exhumation history detailed through the eyes of glaucophane-bearing eclogitic rocks: preliminary metamorphic data from the Internal Piedmont Zone

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The understanding of the metamorphic evolution of subducted and exhumed oceanic lithosphere is paramount to developing coherent tectonic models of collisional orogens. It is also crucial for understanding deep chemical cycles at convergent margins and the interplay between crustal and mantle wedges. The Western Alps constitute an ideal area for studying subducted and exhumed oceanic units that recorded different P-T conditions and several fundamental studies on the tectono-metamorphic evolution of Alpine units (and subduction zones in general) have been developed. Nevertheless, multiple aspects are still debated, such as the occurrence and the meaning of a late heating event. In this contribution, we present preliminary petrographic and minero-chemical data on a glaucophane-bearing eclogite cropping out in the middle Ala Valley, in the Internal Piedmont Zone, not far from the Gran Paradiso Massif (Caso et al., 2021). These starting data will be fundamental for thermobarometric estimates of this portion of the Internal Piedmont Zone, using the isochemical phase diagram approach. In the studied sample, the main schistosity (Sp) generally occurs as a coarse-grained continuous foliation defined by alternate omphacite- and glaucophane-rich levels, with scattered granoblastic quartz domains and abundant apatite and rutile. The Sp wraps around zoned, almandine-rich, garnet porphyroblasts. They include rutile, apatite, omphacite, and minor paragonite associated with zoisite. Relationships between foliation and garnet suggest that garnet could be interpreted as pre-, syn- to post-tectonic with respect to the metamorphic event related to Sp. Euhedral post-Sp glaucophane crystals have been observed. The retrograde assemblage is represented by local albite, ilmenite, which systematically rims all rutile grains, and by both the sin- and post- tectonic glaucophane characterized by a first thin katophorite mantle, followed by a tremolite/whincite final rim. These preliminary results highlight a polyphasic evolution from HP to LP conditions. The chosen sample is very promising for constraining a detailed exhumation P-T-path of the Internal Piedmont Zone in this less-investigated portion of the Western Alps.

Caso, F., Nerone, S., Petroccia, A., & Bonasera, M. (2021). Geology of the southern Gran Paradiso Massif and Lower Piedmont Zone contact area (middle Ala Valley, Western Alps, Italy). *Journal of Maps*, 17(2), 237-246.