

## THE METAMORPHIC HETEROGENEITY OF THE SCHISTES LUSTRÉS (ENTRELOR AREA, WESTERN ALPS): WHICH IMPLICATIONS FOR THE ALPINE EVOLUTION?

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Eclogites and eclogites-facies rocks in mountain belts provide significant information on the early stages of orogenic processes. Their relationship the eclogites-facies rocks with lower metamorphosed rocks (i.e. blueschist- and greenschist-facies rocks) can provide information on the late stages of orogenic processes. In the Piemontese zone of the Western Alps, the eclogites and the other rocks are classically associated to two different units (figure 1). The first unit, called the Zermatt zone in the north or the Lower Unit in the South, is well known for its high-pressure mineral assemblages (more than 20 kbar, 600°C, REINECKE, 1991). The second and tectonically high unit, the Combin zone in the north or the Upper unit in the South, was metamorphosed under lower conditions (8-10 kbar, 400°C, BALLÈVRE AND MERLE, 1993).

In the Entrelor area, the Piemontese Schistes Lustrés occur as a small piece, pinched between eclogitic rocks of the Gran Paradiso massif below and blueschist rocks of the internal Briançonnais (13 kbar, 500°C, CIGOLINI, 1995) above. On one hand, this zone either represents the contact between the HP and LP units (Figure 1a, Elter, 1972, DAL PIAZ, 1999), or is considered as a piece of the HP unit (Figure 1b, BALLÈVRE AND MERLE, 1993). On the other hand, the contact of the Schistes Lustrés and the internal Briançonnais is interpreted either as a top-E backthrust acting between 34 and 37 My (Figure 2a, FREEMAN AND AL., 1997), or as an top-W extensional shear zone (Figure 2b, CABY, 1996).

A study of the metamorphism in this area, carried out on the metapelites, reveals that these

rocks do not contain mineral assemblages indicating very high-pressure conditions. The mineral assemblage for pressure peak is formed by the association of Ctd, Pg and phengites included in almandine-rich garnets (Alm 60%, Gros 30%). The pressure peak is estimated from this assemblage at around 13-14 kbar for temperatures between 400 and 450°C. Additionally a detailed study of the metabasites shows that these rocks can be divided in two groups. The first is composed of rocks, which contain mineralogical assemblages, well preserved or as relic, which indicate HP metamorphic conditions (18-20 kbar, 500–550°C). The second type of rocks is formed by metabasites, which were never submitted to eclogitic conditions. These rocks contain mineralogical assemblages with glaucophane and tremolite as inclusion in albite. A preliminary estimate of the metamorphic conditions gives a pressure around 10 kbar for temperatures between 400 and 450°C. Such assemblages and conditions have been described for the Combin zone (BALLÈVRE AND MERLE, 1993).

As a consequence of this result there is no metamorphic jump between the Zermatt zone and the internal Briançonnais (Zona Interna). Rather, the Piemontese zone represents a melange, we refer to as the Entrelor melange in this area, consisting of eclogites facies mafic knockers embedded in a blueschist facies matrix consisting of metapelites and prasinities.

Structural data indicate that the Entrelor shear zone is not a backthrust (movement top-to-the-west!), which confirms the idea that there is no metamorphic jump between the metapelites of the Zermatt zone and the Zona Interna.

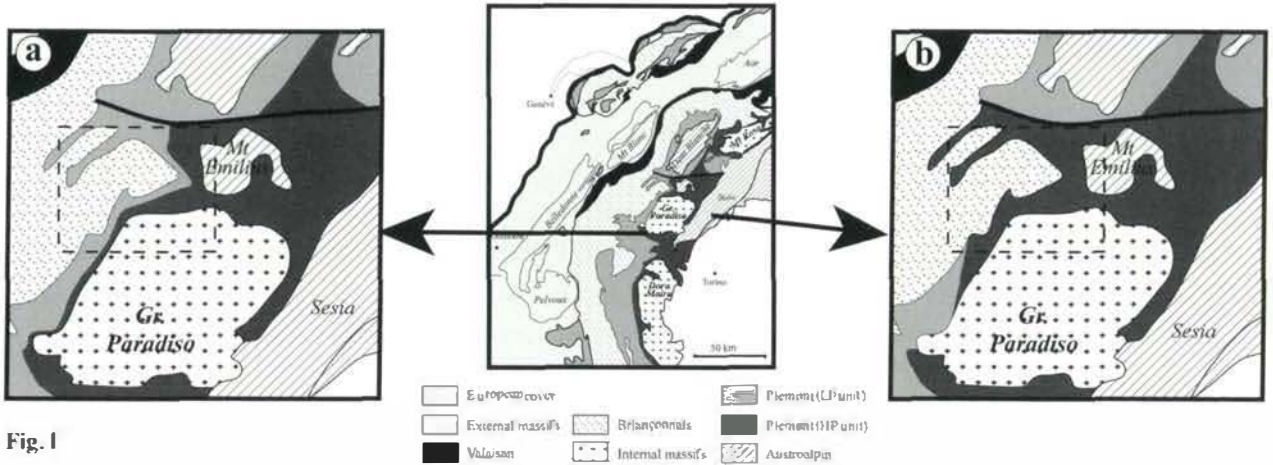


Fig. 1

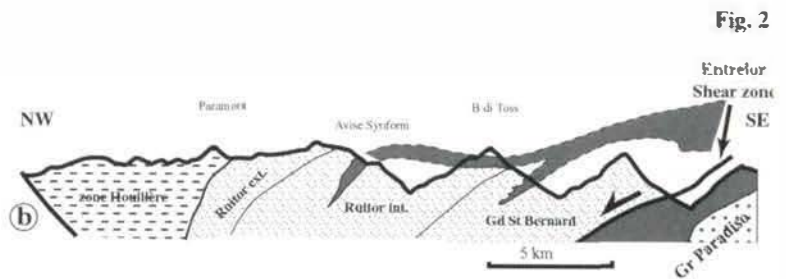
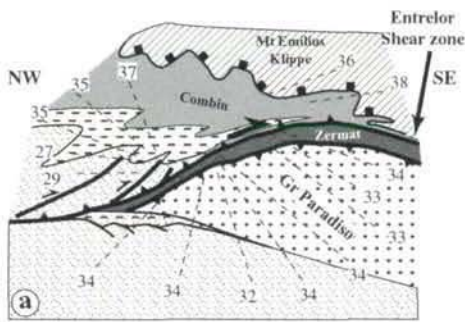


Fig. 2

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