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New field evidences of transpressional regime at the Alps/Apennine boundary (Voltri Massif, NW Italy)

L. Federico, C. Spagnolo, L. Crispini, G. Capponi

Dipartimento per lo Studio del Territorio e delle sue Risorse, University of Genova, Italy (federico@dipteris.unige.it / Fax: +39 010352169 / Phone: +390103538292)

The metaophiolitic Voltri Massif underwent a complex tectono-metamorphic evolution, starting from subduction to collision events during the alpine orogenic cycle and was subsequently involved in the first stages of the Apennine orogeny. So this is a key-area to investigate the late-orogenic Alpine tectonics and its time relationship with the first Apenninic deformation events.

A detailed mapping and kynematic analysis at the macro, meso and microscale has been performed in a study-area located at the eastern border of the Voltri Massif, where ultramafites are the most representative lithology. Here we have recognized two main generations of reverse shear zones, acting at different structural levels. Many of these show evidence of a long period of tectonic activity and reactivation: thus several types of fault rocks overprint in a single shear zone. The first set of reverse shear zones (RSZ1) is characterized by a ductile to brittle-ductile behaviour and is associated to mylonites and protomylonites (*sensu* Sibson, 1977), with top to N-NW or to SW movement. The second set of reverse shear zones (RSZ2) is linked to shallower structural levels and is characterized by fault breccia, crush breccia or protocataclasite (*sensu* Sibson, 1977), with variable sense of tectonic transport.

The RSZ1 structures are particularly well exposed in the study area. They are locally folded by 10 m-scale open chevron folds with fold axes gently plunging to SW, that can be referred to the D3 deformation event of the Voltri Massif. The D3 folds are coeval with low greenschist facies metamorphic conditions and developed during the post-uplift collapsing stage of Alpine orogeny (Capponi & Crispini, 2002). This therefore points to an early development of the RSZ1 structures coeval with greenschist to low-greenschist facies metamorphism; they are probably related to the last stages of

Alpine nappe emplacement.

RSZ2 structures often reactivate RSZ1 with a more brittle behaviour and produce a huge volume of fault rock. They are younger than D3 deformation and coeval with low-greenschist to zeolite-facies metamorphic conditions. The RSZ2 can be linked to a transpressional regime active at least after D3 deformation and during the first stage of the Apennine orogeny.

Multiple reactivation of reverse shear zone in the area can therefore be linked to a transpressional regime hypothesized for the Late Alpine/Early Apennine tectonic evolution of this "end" sector of the Western Alps (Spagnolo et al., submitted).

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