



Micro and mesostructural evidences of north-verging folds in the eastern sector of Pallaresa massif. Axial zone, central Pyrenees

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The Pallaresa massif is a large E-W trending elongated antiformal variscan structure, located in the Axial zone of the central Pyrenees. The studied area is the transitional zone between Pallaresa massif and Aston and Hospitalet gneissic domes. Cambro-ordovician succession outcropping in this sector consists of an unfossiliferous, monotonous alternation of quartzites and shales with some intercalations of marbles in the middle part. A vertical structural zonation was recognized by De Sitter and Zwart (1960) in the Axial zone of the Pyrenees. They distinguished two different structural domains: i) infrastructure, seated deep with medium to high metamorphic grade and main flat-lying foliation and ii) suprastructure, a shallow domain with lower metamorphic grade and main steep foliation. Different interpretations have been proposed to explain this structural zonation. These interpretations may show completely contradictory kinematic and tectonic regime (Carreras & Capellà, 1994). But the main disagreement is the deformation event giving rise to the flat-lying infrastructural foliations.

The geological mapping, detailed cross sections and microstructural study have allowed us to identify three deformation events and to establish the deformational sequence for the studying area. So the first structures are slaty cleavage (S1), observed in microscopic scale, associated with south-verging structures. This cleavage is defined by lattice preferred orientation of quartz and mica grains. Under a microscope we can see this slaty cleavage folded by a crenulation foliation (S2). Because of high quality of outcrops in the study area, north-verging structures can be deduced by sedimentary polarity data. We can observe this foliation S2 associated with large recumbent north-

verging folds with E-W trend. This foliation is ubiquitous in the study area and can be considered the main foliation. Both the north-verging folds and the main foliation are folded by upright folds with NE-SW to E-W trend. This folding can be observed to all scales. Thin sections show a crenulation foliation associated with upright folds (S3).

On the other hand, a lot of thin sections show preferential biotite grain growth in the direction of the S2 cleavage domains and biotite grain folded by S3 foliation. Therefore, at this point we can consider a first option: the metamorphism in this area is approximately simultaneous with main deformation (D2) development and earlier than third deformation event.

These new evidences described here are relevant clues for the interpretation of the main flat-lying foliation associated with north-verging recumbent folds in the infrastructure. Moreover similar structures have been observed in other areas in Central Pyrenees (Garona dome). Finally, we think that this structural setting brings into question the models previously presented by others authors.