

Superposition relations of microfabrics in the northern hanging-wall block of the Évora Massif (Ossa-Morena Zone)

Relaciones de superposición de microfibras en el bloque septentrional a techo del Macizo de Évora (Zona de Ossa Morena)

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Abstract: This study reports alternation of D₂ extension-related and D₃ contraction-related microfabrics in the northern hanging wall block of a gneiss dome-like structure recognized in the Évora Massif (Ossa-Morena Zone). In the Arraiolos – Santo Antonio de Alcorrego traverse high- to low-grade mylonites are dominant. Microfabrics related to D₂ ductile deformation and M₂ high-amphibolite to greenschist facies characterize an extensional shear zone with telescoping metamorphic isograds. D₂ microstructures indicate shear sense with top-to-SE. Superposition of D₃ contraction developed under greenschist facies (M₃) producing folding of D₂ microfabrics, mylonitization of granites along strike-slip shear zones and retrogression of M₂ mineral assemblages.

Key-words: Gneiss dome, high- to low-grade mylonitization, D₂ microfabrics, D₃ microfabrics, Variscan Orogen

Resumen: Este trabajo describe la alternancia entre microfibras relacionadas con la extensión D₂ y compresión D₃ en el bloque septentrional a techo de una estructura-tipo domo gneísico, reconocida en el Macizo de Évora (Zona de Ossa-Morena). En el corte Arraiolos – Santo António de Alcorrego, dominan las milonitas de alto y bajo grado metamórfico. Las fábricas relacionadas con la deformación dúctil D₂ y con el metamorfismo M₂, que varía desde la facies anfibolítica-alta hasta los esquistos verdes, caracteriza una zona de cizalla extensional con isogradas metamórficas condensadas. Las estructuras D₂ indican un sentido de cizalla de techo al SE. La superposición en facies de los esquistos verdes (M₃) de la contracción D₃ ha producido plegamiento de las microfibras D₂, milonitización de granitos a lo largo de zonas de cizalla de desgarre y retrogradación de las asociaciones minerales M₂.

Palabras clave: Domo gneísico, milonitización de alto- y bajo-grado, microfibras D₂, microfibras D₃, Orógeno Varisco.

INTRODUCTION

Gneiss domes are important features in orogenic systems which generally occur in extensional settings (Harris et al., 2002). Microfabric information in shear zones is essential for reconstructing processes of crustal deformation. This kind of data is also relevant for understanding the possible relationship between gneiss dome development and its potential effect on structural fabrics and changes in metamorphism of the related ductile shear zones (Yin, 2004).

This study presents micro-structural data from a transverse performed along the northern hanging-wall block of a gneiss dome-like structure defined in the Évora Massif (Pereira et al., 2007; Ossa-Morena Zone, Iberian Variscan belt).

Alternation of extensional and contractional tectonic events may occur in collisional orogens. Although unrecognized in previous geodynamic models for SW Iberia this alternation is present in the

Évora Massif (Pereira et al., 2009, 2012) The obtained data is complementary to the description of the macrostructure described along the Arraiolos - Santo António de Alcorrego traverse by Dias da Silva et al. (this issue), reinforcing the existence of superposition of extensional and contractional deformation linked to changes in metamorphism during the development of Variscan Orogen in Iberia.

GEOLOGIC SETTING

The Évora Massif represents a Variscan gneiss dome-like structure with a 45km-wide and 75km-long core composed of high-grade metamorphic rocks (footwall) that is bounded by southern and northern hanging-wall blocks (Pereira et al., 2009, 2012). Stratigraphy includes strongly deformed and metamorphosed Ediacaran to Ordovician (?) sedimentary and igneous rocks.

The structural history of the northern hanging wall block is defined in Dias da Silva et al. (this issue). D₁