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Transpression related to irregular borders of the collisional continents: the Variscan evolution of SW Iberia

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The transpressional tectonic regime, indicative of oblique convergence, is due, in the case of SW Iberia (Ibero-Armorican arc southern branch) , to the impingement of the Newfoundland Grand Banks salient which provoked an overall left-lateral transpressional evolution, in contrast with the kinematics characterizing Central Europe and the Moroccan Variscide. The SW Iberian Massif consists of three different continental domains, from NE to SW: SW Central Iberian (CIZ), Ossa-Morena (OMZ), and South Portuguese (SPZ) zones, separated by two main tectonic boundaries striking NW-SE. The main deformation was related, during Late Devonian, to the overthrusting of the CIZ onto the OMZ, whereas during Carboniferous, it was due to the accretion of different tectonic terrains to the southern part of the OMZ (Simancas et al., 2003).

The original CIZ/OMZ contact was a Devonian transpressional crustal-scale shear zone (Central Unit, Azor et al., 1994) that accommodated the main part of the left-lateral component. The main structures accommodating shortening- SW-verging folds and thrusts- developed on the footwall, i.e.: OMZ, with a structural trend slightly oblique to the contact, although the associated mineral lineation shows a steep dip.

From Visean, transpression displays different kinematic styles when northern and southern OMZ are compared. In relation to its northern part, the lateral component is canalized by a left lateral strike-slip fault system mainly concentrated in the very

Central Unit/OMZ contact, obliterating the original contact. Shortening was mostly accommodated by upright folds, trending parallel to this boundary and showing transport directions at high angle to it. A transect axial-plane foliation, coherent with left-lateral transpression, is associated with these folds. A high angle reverse fault of the same orientation and age displays striae that range from N45E to N90E, indicating a main dip-slip component of movement.

The Carboniferous structures of the southern part of the OMZ (folds and shear zones) as well as their kynematics are more diverse. Most shear zones are partly related to the acretion of two allochtonous oceanic domains, i.e.: a MORB basaltic slice and an acretionary prism, and they show a similar WNW-ESE trend, a NE dipping direction and an oblique slip. However, they can be grouped into structures mainly accommodating either left-lateral strike-slip or SW-verging shortening displacements. The main strike-slip dominated shear zone was responsible for the juxtaposition of the basaltic slice onto the former acretionary prism. Thrusting-dominated shear zones show pitch angles ranging from 45º to 90º with a dominant left-lateral strike-slip component. Shear zones bound domains in which shortening is achieved by upright to slightly SW-verging folds whose trend deflects near the shear zones consistently with a left-lateral displacement.

The distribution and kinematic features of the OMZ transpressive structures indicate that 1) Sinistral oblique convergence during the Variscan Orogeny in SW Iberia produced strain partitioning between zones mainly accommodating left-lateral strike-slip, localized in or near the northern and southern OMZ boundaries, and zones accommodating suborthogonal shortening, developed throughout the OMZ; 2) in the northern part of the OMZ, the strain partitioning increased during the late orogenic stage; 3) the structures accommodating Carboniferous shortening are more diverse in the southern OMZ were not only folds but also thrusts of different kinematic regimes are present, and 4) the presence of transpressive structures in southern OMZ suggests less intense strain partitioning than in northern OMZ during Visean times.

References:

Azor A., González Lodeiro F. y Simancas J.F. (1994). *Tectonics*, 13, 45-61.

Simancas J.F, Carbonell R., González Lodeiro F., Pérez Estaún A., Juhlin C., Ayarza P., Kashubin A., Azor A., Martínez Poyatos D., Almodóvar G.R., Pascual E., Sáez R., Expósito I. (2003), *Tectonics*, 22, 22 (6, 1062; DOI: 10.1029/2002TC001479).

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