

Transected folds with opposite patterns in Terena Formation (Ossa Morena Zone, Portugal): anomalous structures resulting from sedimentary basin anisotropies

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Abstract

The Terena Formation is located in the central part of the Ossa-Morena Zone (OMZ) and outcrops in the core of a latter (D3) first order syncline. This Formation is a Lower Devonian flysch and shows an unusual "Z" shape, with a central sector trending nearly N-S, and the tips trending NW-SE. This central sector is crossed by the cleavage (NW-SE) showing an apparent dextral (clockwise) transection pattern, anomalous and opposite to the regional widespread sinistral (anti-clockwise) transpression. The same sector with cartographic dextral transection, shows at outcrop scale, mesoscopic folds with a sinistral transection. During the Lower Devonian a N-S trending basin was developed as an effect of an early tectonic deformation phase. This trough was filled with turbidites and its elongated geometry determined the shape of the main syncline. We propose that the dextral transection pattern, at cartographic scale, result from the superposition of the NW-SE upright S3 cleavage on this major regional structure controlled by a sedimentary trough. The mesoscopic folds, observed on the upper levels of the sedimentary sequence were not influenced by the topographic anisotropy of the basin, and therefore they developed a left transection, according to the regional deformation mechanisms.

The "Z" shape of the syncline could be explained as a consequence of two major tectonic shear zones situated along the north and south boundaries of the OMZ, respectively the Tomar-Badajoz-Cordoba Shear Zone and the South Iberian Suture, lined by the Beja-Acebuches Ophiolitic Complex. Both shear zones have a sinistral transpressive character and were active during late Variscan tectonic events.

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