
Structure of the Late Paleozoic Pulo do Lobo accretionary prism, southern Iberia: a key to understanding the amalgamation of Pangea

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Determination of the tectonic evolution of accretionary prisms contributes to the understanding of mountain building processes and global plate dynamics. Field mapping and preliminary structural analysis of the Pulo do Lobo (PDL) Formation, associated Beja-Acebuches Ophiolite and suspect “exotic” South Portuguese Zone (SPZ) in southern Iberia suggest that the PDL is an important part of a suture zone associated with the Variscan orogeny, closure of the Rheic Ocean, and the formation of Pangea. Analysis of uplifted strata in the PDL indicates tectonic juxtaposition of diverse deposits such as foreland basin flysch, sedimentary and tectonic mélangé, and passive margin shelf, all separated by distinct structural discontinuities. The entire Pulo do Lobo Zone is dominated by a pervasive late stage vertical to sub-vertical E-W cleavage axial planar to isoclinal and chevron folds which overprint earlier deformation fabrics in the older passive margin units. The age of deformation of PDL units is generally considered to be Late Devonian - Early Carboniferous, however further geochronology is needed to resolve the age relationships between individual units.

Numerous local kinematic indicators within the PDL suggest a complex regional deformation with several enigmatic features. For one, structural data produced by local strain partitioning reveal kinematics that contradicts the overall regional structural style (e.g. spatial juxtaposition of both sinistral and dextral fabrics). When viewed at larger scales (i.e. regional map pattern), however, structural data indicate that significant sinistral strike-slip movement occurred in conjunction with episodes of both extension and compression. Stereographic plots of fabric elements from each distinct tectonic domain,

when combined with regional geological constraints, support this hypothesis and are indicative of progressive deformation imposed on the PDL during the Variscan Orogeny. This analysis is also consistent with plate reconstructions, which indicate regional sinistral transpression with local zones of extension. Geochronologic and geochemical work (currently in progress) should constrain the timing of deformation within the PDL as well as resolve contact relationships between the SPZ and the Iberian Massif. These constraints will help to better understand the geological events leading to the closure of the Rheic Ocean and plate dynamics associated with the formation of Pangea.