



The northern Gondwana margin and Pangaea tectonics revisited: Preliminary results in the Ossa-Morena Zone (SW Iberian Massif)

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Orogenesis involves a continuum of complex natural phenomena within the context of the Wilson Cycle, the backbone of modern plate tectonics. While topographic effects of present-day orogenic cycles are readily visible, eroded old orogens represent windows that expose the crust's interior and facilitate the study of complex lithospheric processes.

The object of this research lies within the Devonian-Carboniferous Variscan collisional orogen that extends from Southern Europe to Northern Africa. This orogenic belt resulted from the convergence and collision between the passive margin of north Gondwana and the active margin of southern Laurussia, forming the Pangea Supercontinent. The Iberian Massif, located in the core of Pangaea, is one of the best exposures of the Variscan orogen in Europe, and a unique natural laboratory to study deep-to-surface geodynamic phenomena. Studying this sector of the Pangea supercontinent raises new important questions about how modern collisional orogens evolve and how their crustal architecture develops.

Field and analytical data compiled in the last 20-30 years in Iberia has revealed a complex basin-cover architecture derived from the deformation and metamorphism of the Ediacaran to Carboniferous stratigraphy. Ongoing research in a critical and representative region of the SW Iberian Massif (i.e. Ossa-Morena Zone), reveals a close relationship between the deformation, metamorphism, magmatism and sedimentary processes involved in deep to shallow lithospheric dynamics, during both orogenic thickening and gravitational collapse.

The systematic study of key outcrops was performed, to define first-order geological contacts between major tectono-metamorphic, stratigraphic and magmatic units. This information made it possible to define the architecture of the crust along a transverse across the central region of the Ossa-Morena Zone (Estremoz, Portugal). With the structural relationships well defined, the main units were sampled to control the ages of the orogenic events and to correlate the tectono-metamorphic fabrics found in the Variscan basement regionally. This research focused on SW

Iberian Massif will give important constraints to develop state-of-the-art conceptual and numerical models of the tectonic evolution of the Variscan Orogen during the assembly of the Pangaea supercontinent. The combination of field and petrography data with numerical modelling can be very useful for better understanding the role of different lithospheric processes in orogenic building and gravitational collapse as Supercontinents are formed.

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