
Tectonic significance of a mafic *mélange* in the Pangean suture zone, southwestern Iberia

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Pangea formed in the Late Paleozoic by the closure of the Rheic Ocean, which resulted in the collision between Gondwana and Laurussia and is expressed by the Appalachian and Variscan orogens. The Pangean suture zone is exposed in southwestern Iberia, where the South Portuguese Zone, a fragment of Laurussia, is spatially juxtaposed against para-autochthonous Gondwana. The suture zone is characterized by fault-bounded units of oceanic metasedimentary rocks, *mélange*, and mafic complexes. Despite the tectono-stratigraphic sequence being well known, a number of key units exist, the origin and evolution of which remain poorly understood, including the Peramora *Mélange* and the Pulo do Lobo Schist, which structurally overlies the *mélange* in a regional antiform.

Detailed geologic mapping of the Peramora *mélange* (exposed in southwestern Spain) reveals a complex pattern of imbricated schist and mafic block-in-matrix *mélanges*. Age constraints are provided by two cross-cutting plutons, recently dated at ca. 339 Ma. Geochemical signatures of the Pulo do Lobo schist (PDL) display a range in TiO_2 and $\text{Fe}_2\text{O}_3 + \text{MgO}$, and are consistent with derivation from both mafic and continental sources. Detrital zircon analyses of key PDL samples do not display an exotic origin similar to those of other metasedimentary rocks from the suture zone. The mafic block-in-matrix *mélange* displays normal mid-ocean ridge basalt (N-MORB) geochemical signature and a range of zircon ages similar to those observed in the PDL, suggesting a sedimentary component. Taken together these data suggest a complex tectonic history characterized by erosion of a N-MORB source, *mélange* formation, and imbrication during underplating occurring during the final stages of continent-continent collision. These data help deduce the age, origin, evolution, and provenance of the Peramora *Mélange* and Pulo do Lobo schist within the suture zone and contribute to a better understanding the processes involved in the formation of Pangea.