Tectonic evolution of mafic dykes in a suture zone, southern Iberia: implications for the formation of Pangea

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The formation and emplacement of syn-collisional mafic dykes that intrude suture zones and their association with orogenic processes are enigmatic. Southern Iberia records the Late Paleozoic amalgamation of Pangea and exposes today a fragment of Laurussia (South Portuguese Zone), which is spatially juxtaposed with autochthonous Gondwana. Fault-bounded oceanic metasedimentary rocks, mélanges and ophiolite complexes characterize the suture zone and are in turn crosscut by intrusive granitoid rocks and mafic dykes. The generation and emplacement of these mafic dykes and their relationship to the suture zone are undetermined. Field evidence shows the dykes were emplaced at high angles to pre-existing orogenic fabrics in the mélange, granitoid and metasedimentary rocks. Geochemical analyses (major, trace, REE) indicate the dykes exhibit a MORB signature. U-Pb zircon geochronology reveals the crystallization age of the dykes is ca. 350 Ma and Sm/Nd isotopic analysis suggests a deep mantle source. Taken together, these data give insight into complex tectonic processes at work during the waning stages of continent-continent collision.

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