

Early Cambrian granitoids of North Gondwana margin in the transition from a convergent setting to intra-continental rifting (Ossa-Morena Zone, SW Iberia)

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Abstract Two distinct Cambrian magmatic pulses are recognized in the Ossa-Morena Zone (SW Iberia): an early rift-ER) and a main rift-related event. This Cambrian magmatism is related to intra-continental rifting of North Gondwana that is thought to have culminated in the opening of the Rheic Ocean in Lower Ordovician times. New data of whole-rock geochemistry (19 samples), Sm–Nd–Sr isotopes (4 samples) and ID–TIMS U–Pb zircon geochronology (1 sample) of the Early Cambrian ER plutonic rocks of the Ossa-Morena Zone are presented in this contribution. The ER granitoids (Barreiros, Barquete, Calera, Salvatierra de los Barros and Tablada granitoid Massifs) are mostly peraluminous granites. The Sm–Nd isotopic data show moderate negative ϵ_{Nd} values ranging

from -3.5 to $+0.1$ and TDM ages greatly in excess of emplacement ages. Most ER granitoids are crustal melts. However, a subset of samples shows a transitional anorogenic alkaline tendency, together with more primitive isotopic signatures, documenting the participation of lower crust or mantle-derived sources and suggesting a local transient advanced stage of rifting. The Barreiros granitoid is intrusive into the Ediacaran basement of the Ossa-Morena Zone (Série Negra succession) and has yielded a crystallization age of 524.7 ± 0.8 Ma consistent with other ages of ER magmatic pulse. This age: (1) constrains the age of the metamorphism developed in the Ediacaran back-arc basins before the intrusion of granites and (2) defines the time of the transition from the Ediacaran convergent setting to the Lower Cambrian intra-continental rifting in North Gondwana.

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