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# pre-Mesozoic evolution of the basement of the Catalan Coastal Ranges: implications from geochemical and Sm-Nd isotope data of the Palaeozoic succession of the Collserola Range

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In the whole of the Western Europe and neighbouring areas numerous studies have addressed the provenance of pre-Mesozoic sedimentary rocks and the Palaeozoic geodynamic evolution using the Sm-Nd systematics. However, at present, there are still large areas of the Variscan mountain chain without systematic determinations of their whole—rock Sm-Nd isotope signatures. This is the case of the Palaeozoic blocks of the Catalan Coastal Ranges (NE Iberia).

In the context of the Variscan belt many authors interpret the Palaeozoic basement of the Catalan Coastal Ranges as part of the southern foreland basin of the mountain belt. The pre-Mesozoic rocks in the Catalan Coastal Ranges exhibit important stratigraphical affinities with those outcropping in the Eastern Pyrenees, Montagne Noire, Sardinia and Iberian Range. Paleogeographic reconstructions predict that the Catalan Coastal Ranges were located in a transitional area between the northern branch of the Ibero-Armorican arc and the core of the arc.

The Collserola Range, located in the metropolitan area of Barcelona, includes a representative Palaeozoic stratigraphic section, from Cambro-Ordovician to Carboniferous, of the central part of the Catalan Coastal Ranges. In this presentation we present an up-to-date review of the stratigraphy and structure of the Palaeozoic of the Collserola Range, and provide geochemical and Sm-Nd isotope data to constrain the Pre-Mesozoic crustal evolution of this sector of the Variscan belt.

Geochemical compositions indicate that the Palaeozoic siliciclastic rocks of the Collserola Range were fed by a relative mature heterogeneous source of sediment, comprising from quartz-rich sediments to intermediate igneous rocks. The siliciclastic rocks of the Collserola Range show great geochemical affinity with the turbidites of passive margins.

The Sm-Nd signature of the siliciclastic rocks is compatible with those of the Palaeozoic and Late Proterozoic fine grained siliciclastic rocks of the neighbouring terrains of SW Europe. There is a small decrease of the $\varepsilon$NdT with decreasing age of sedimentation, from the Cambro-Ordovician to the Carboniferous, suggesting an increase of the amount of more ‘juvenile’ material. The presence of small volumes of alkaline basaltic rocks provides evidence for the input of juvenile material in the Early Palaeozoic basin and suggests that an extensional tectonic regime prevailed during the Cambro-Ordovician sedimentation.

From a geodynamic point of view, overall, the analysis of the data evokes that the Palaeozoic rocks of the Catalan Coastal Ranges were part of the Northern Gondwana passive margin before the closure of the Rheic Ocean and the subsequent Variscan orogeny.