



## The Permian volcanism of Sardinia revisited: new geochronological and geochemical data as a key for geodynamic evolution of the western Peri-Tethian sector

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### Abstract

Recent studies have confirmed the important role played by magmatism affecting Sardinian basins during the latest Carboniferous and Permian age (Cortesogno et al. 1998; Buzzi et al., 2008; Casini et al., 2012). To-date, most of the geochronological analysis performed on the Permian volcanic events in the island are methodologically overcome and frequently not in tune with the stratigraphy.

In the north-western and central-southeastern Sardinian basins (Nurra, Perdasdefogu, Seui-Seulo and Escalaplano), the late-post Variscan tectonic collapse favored the emplacement of a calc-alkaline products not only in the form of generally shallow intrusions but also volcanism within intramontane strike-slip basins. This magmatism is expressed both as pyroclastic rocks-lava flows filling small half-graben basins and hypabyssal intrusions (lava-domes and dykes). These volcano-sedimentary troughs generally include both external and internal igneous eruptions as well as the detrital products eroded from the surrounding structural highs. Rhyolites, andesites and dacites are the main rock types while trachydacites and trachyandesites are less represented.

Our goal is to couple the petrographic and geochemical features of 17 selected samples stratigraphically constrained and new U–Pb ages data on zircons from the post-Variscan effusive rocks in Sardinia. The whole-rock and REE geochemical features confirm a progressive evolution in the post-Variscan extensional, trans-tensile regime in with and fits an origin in a stacking of nappes associated with thermal re-equilibration of lithospheric mantle and telescopic partial melting of the thickened crust. The process is dominated by AFC.

As far as the geochronological analysis is concerned, a preliminary cathodoluminescence study has been performed on all mounted crystals in order to select the precise location of the shot points. Each crystal has been analyzed for U, Th and Pb in the epoxy mount by laser-ablation inductively coupled plasma mass spectrometry (LA ICP-MS) at the Institute of Geosciences and Earth Resources IGG–CNR of Pavia. The time lag of Permian ages recorded along the Sardinia cross section is significant in the modeling of the post- Variscan tectonic, sedimentary evolution and in the perspective of the geodynamic evolution of Southern Variscides.

### REFERENCES

Casini L., Cuccuru S., Maino M., Oggiano G., Tiepolo M 2012. Emplacement of the Arzachena Pluton (Corsica–Sardinia Batholith) and the geodynamics of incoming Pangaea. *Tectonophysics* 544–545 (2012) 31–49.

Buzzi L., Gaggero L., Oggiano G. 2008. The Santa Giusta ignimbrite (NW Sardinia): a clue for the magmatic, structural and sedimentary evolution of a Variscan segment between Early Permian and Triassic. *Italian Journal of Geoscience* 127(3), 683–695.

Cortesogno L., Cassinis G., Dallagiovanna G., Gaggero L., Oggiano G., Ronchi A., Seno S., Vanossi M. 1998. The Variscan post-collisional volcanism in Late Carboniferous–Permian sequences of Ligurian Alps, Southern Alps and Sardinia (Italy): a synthesis. *Lithos* 45, 305–328.