



## **U/Pb dating in the post- Variscan volcanic successions of the Ligurian Alps (Italy).**

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New in situ U-Pb ages by Laser Ablation (LA) ICP MS on zircon were carried out on post Variscan ignimbrites of the Briançonnais domain in the Ligurian Alps. They belong to continental volcano-sedimentary sequences and are presently structured in Alpine tectonic units issued from the Paleo-European innermost continent.

In the intermediate Briançonnais the medium- to high-grade Variscan basement is unconformably covered by early rhyolites and minor rhyodacites (Case Lisetto ignimbrites), in turn covered by conglomeratic-sandy-pelitic, fluvial-lacustrine deposits ("Ollano Fm."). Directly on the basement, or at the top of the Ollano Fm., fine-grained sediments ("Murialdo and Viola Schists") follow. The sediments are intercalated with andesitic lavas and pyroclastites ("Eze Fm."). The following third magmatic episode is represented by calc-alkaline ignimbrites ("Melogno Porphyroids"), confined in the outer and intermediate Briançonnais sectors, over an area exceeding 1000 km<sup>2</sup>. The formation is mostly made up, by three lithozones, bottom up: i) "A Lithozone": thin and discontinuous levels of frequently silicified fine-grained rhyolites; ii) "B Lithozone": up to several hundred metres of coarse to very coarse-grained rhyolitic-rhyodacitic ignimbrites, locally rhyodacitic/dacitic breccias, or granophyric bodies; iii) "C Lithozone": up to a few hundred metres of mainly rhyolitic, fine to medium-grained ignimbrites, representing the most common facies.

The Late Palaeozoic igneous activity ends with an ignimbritic episode represented by few hundred metres of massive, welded, reddish rhyolites ("D Lithozone") with high

modal K-feldspar and alkaline potassic character.

An erosional surface separates the volcano-sedimentary succession from the Permo-Mesozoic sedimentary covers, which begin with the Uppermost Permian (-lowermost Triassic ?) Verrucano conglomerates (Cortesogno et al., 1993).

Zircons were separated from two samples of Case Lisetto Rhyolites, one from Eze Fm., two from C Lithozone, three from D Lithozone. The CL analysis generally reveals that the zircons have oscillatory zoning likely derived from igneous precipitation. The zoned veneers are often cut by the homogeneous rims. Trace elements and Th/U compositions indicate that rims are related with non-magmatic crystallization.

The U-Pb analysis carried out on the magmatic textural domain yielded ages of about 290 Ma for the Case Lisetto Metarhyolites, 275 Ma for C Lithozone and 270 for D Lithozone. These can be considered the crystallization ages of the volcanites emplaced in three different episodes.

The spots carried out on rims or on the altered cores give consistently younger ages (ca. 265-245 Ma), that may be related to recrystallisation during the Late Permian and Mesozoic rifting and subsidence of the Briançonnais margin, associated with uplift of the isotherms and regional emplacement of late Permian and Triassic igneous bodies (Corsica-Sardinia, Provence, Southalpine).

The Eze Fm. contains zircons with ages spreading between 769 and 476 Ma, probably inherited cores from the basement that provided the lower crustal component of the andesite magma (Buzzi and Gaggero, in press). Only one spot yielded the age of  $296 \pm 10$  Ma, consistent with the Early Permian emplacement of the andesites.

## References

Buzzi L. and Gaggero L. *Petrogenesis of post-orogenic Late Paleozoic andesite magmatism: a contribution from the Ligurian Alps*. In press, *Periodico di Mineralogia*.

Cortesogno L., Dallagiovanna G., Gaggero L., Vanossi M., (1993). *Elements of Palaeozoic History of the Ligurian Alps*. In "Pre-alpine geology" Eds. von Raumer JF. & Neubauer D. Springer Verlag, 258-276