

Petrogenesis of the Giglio Island granite (Italy)

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Context

The Giglio Island granite is a small (ca. 20 km²) intrusion located at the northern end of the Tyrrhenian Sea. This poorly-studied pluton form part of the Miocene-Quaternary Tuscan Magmatic Province (Italy); a province mostly consisting of granitoids rocks associated with volumetrically minor mantle-derived products having high-K calc-alkaline or lamproitic affinities.

The goal of the proposed project is to characterise the different intrusive units cropping out at Giglio Island by means of field, petrographic and chemical investigations. The data produced will allow to shed lights on the petrogenetic evolution of the Giglio Island granite and to discuss it in the frame of the evolution of the whole acidic Tuscan Magmatic Province. The latter would be achieved by comparing the finding of the proposed project with similar well-studied rocks cropping out in the Tuscan archipelago and inland.

Objectives and Methods

The main objective of the work is to decipher the relative importance of different rock-forming processes (fractional crystallization, magma mixing...) in the petrogenesis of the young, pristine and perfectly exposed Giglio Island granite. The work involves a field campaign aimed at producing a detailed map of the intrusive units forming the granite (ca. 1 month field work), collection of rock samples, petrographic characterization using conventional optical and scanning electron microscopy. The rock samples will be analysed for major and trace element composition using XRF and ICP-MS techniques. The whole-rock Sr and Nd isotopic composition of selected samples will be determined by MC-ICP-MS. Finally, zircon crystals will be separated, mounted in epoxy resin and analysed in-situ to determine their Hf isotope composition through LA-ICP-MS and possibly their age.

Literature

Westermann et al., 1993. The Pliocene intrusion of the Island of Giglio. Mem. Soc. Geol. It., 49, 345-363.

Farina et al., (2010). Rapid incremental assembly of the Monte Capanne pluton (Elba Island, Tuscany) by downward stacking of magma sheets. Geological Society of America Bulletin, 122, 1463-1479.

Poli and Peccerillo, 2016. The Upper Miocene magmatism of the Island of Elba (Central Italy): compositional characteristics, petrogenesis and implications for the origin of the Tuscany Magmatic Province. Mineralogy and petrology. DOI 10.1007/s00710-016-0426-6.



WEB sites

http://cms.unige.ch/sciences/terre/research/Groups/isotope_geology/isotope%20group.php

Choice of orientation : (supprimer les orientations qui ne conviendraient pas)

GATO: Geochemistry, Alpine tectonics, Ore Deposits