Introduction

During the late Paleozoic-early Mesozoic huge volumes of plutonic and volcanic rocks, as well as widespread basic to acidic dyke swarms, were produced mostly related to extensional tectonics that took place soon after the final stages of the Hercynian continental collision, causing wrenching and faulting of the crust and subsequent continental break-up leading to the definitive Jurassic opening of the Tethys ocean (e.g., *Wilson at al., 2004*)

In south-western Europe the produced magmatic rocks show a well defined time distribution in terms of magmatic affinity (calc-alkaline, alkaline and tholeiitic; *Orejana et al., 2008 and references therein*). Calcalkaline magmas were indeed produced during the Permo-Carboniferous whereas magmatic affinity shifted to alkaline during the late Permian – middle-late Triassic. Generally, alkaline and calcalkaline magmatism did not coexist, except for the Corsica-Sardinia Domain (*Cocherie et al., 2005*) where both magmatic series are found. Finally, a regional tholeiitic magmatism is recorded, around 295 Ma, only in NW Europe (*Heeremans et al., 2004*), while minor volumes of tholeiitic magmas were produced in the SW sector, but not earlier than the late Triassic.

Wide variation in geochemical affinity and compositions of produced magmas can be related to a number of factors: type, composition, depth and melting degrees of involved sources, reflecting different tectonic settings and mantle heterogeneity; composition of parental magmas; differentiation processes during the magma ascent (e.g., fractional crystallization, magma mixing, crustal contamination, AFC).

The sources potentially involved in this widespread and voluminous magmatic event are either the lithospheric mantle as the asthenosphere, the continental crust and the subducted oceanic slab (e.g., *Lorenz and Nicholls, 1984; Finger and Steyrer, 1990, 1991; Bonin et al., 1993; Traversa et al., 2003*). This latter, according to some authors would play a dominant role especially in the production of the calc-alkaline magma (e.g., *Cameron et al., 2003)*. Nevertheless, most authors discard such contribution since subduction is considered too old to influence a post-collisional magmatic activity (e.g., *Cocherie et al., 1994; Rottura et al.,1998; Cortesogno et al., 2004*).

Products of Hercynian post-collisional dyke magmatism also occur in the Calabria Peloritani Orogen (CPO) and in the western-central Sicily, showing a geochemical affinity ranging from calcalkaline to tholeiitic and alkaline, respectively.

Calabrian dykes, outcropping in five different locations of Serre Massif (Mammola, Antonimina, Foletti Valley, San Todaro and Villaggio Zomaro) have been sampled. They intrude the metamorphic basement as well as the late Hercynian granitoids of the CPO with variable shapes and thicknesses and show a composition ranging from basaltic andesite to rhyodacite, with a medium to high-K calcalkaline affinity.

Sicilian dykes, outcropping in two different localities of the Sicilian-Maghrebian chain, have been also studied. The first outcrop occurs in central Sicily (Leonforte area) and consists of a sill intruded into the Ladinian Lercara Formation. It shows a basaltic composition and an alkaline affinity.

The second study area, in western Sicily, consists of two different dyke outcrops occurring in the Roccapalumba – Margana – Lercara area. Studied dykes are intruded within the middle - late Triassic sedimentary sequences of the Lercara Fm. They range in composition between basalt and basaltic andesite and show a tholeiitic affinity.

Field and petrographic features, mineral chemistry, whole-rock major and trace elements and Sr-Nd isotopic composition of both Calabrian and Sicilian dykes have been investigated with the aim to develop a petrogenetic model able to explain their origin and evolution, as well as to try defining a geodynamic context for studied magmatic rocks in the frame of the different phases of magmatic activity that, starting from the initial collapse of the European Hercynian Belt, were sequentially involved in the continental breakup of Pangea and in the subsequent oceanization processes leading to Tethys formation.