Geologica Acta, Vol.15, Nº 4, December 2017, 409-428, I-VIII
DOI: 10.1344/GeologicaActa2017.15.4.10

geologica acta

Coeval interaction between magmas of contrasting composition (Late Carboniferous-Early Permian Santa Eulália-Monforte massif, Ossa-Morena Zone): field relationships and geochronological constraints

M. F. PEREIRA[1] C. GAMA[1] C. RODRÍGUEZ[2]

[1]Instituto de Ciências da Terra, Departamento de Geociências, ECT, Universidade de Évora
Rua Romão Ramalho 59, 7000-671, Évora, Portugal. Pereira E-mail: mpereira@uevora.pt
Gama E-mail: cgama@uevora.pt

[2]Departamento de Ciencias de la Tierra, Universidad de Huelva
Huelva, Spain. Rodríguez E-mail: carmen.rodriguez@dgeo.uhu.es

ABSTRACT

The Santa Eulália-Monforte massif is a post-kinematic Late Carboniferous-Early Permian calc-alkaline composite massif (LC-EP) located in the Ossa-Morena Zone (OMZ, Portugal). This paper examines the field relationships between pinkish granites and mafic-intermediate rocks from the external ring of this massif and presents new U-Pb zircon age determinations. The estimated $^{206}Pb/^{238}U$ ages, 297±4Ma for the pinkish granite and 303±3Ma for a gabbro-diorite point to a short time interval between the crystallization of both magmas. At outcrop scale, contacts of the mafic-intermediate rocks with the host pinkish granite are sharp and corroborate this age relationship, but do not justify why the host-enclave contacts often has curved and irregular shapes, indicating liquid-liquid interaction. A full analysis of the distribution of U-Pb zircon ages and respective Th/U ratios suggests that the compositionally distinct magmas were roughly contemporaneous. The obtained ages also fit the LC-EP Iberian calc-alkaline suite that was formed contemporaneously to the development of the Iberian-Armorican Arc and when the Paleotethyan oceanic Plate subducted under the Eurasian active margin. Taking this geodynamic setting as a reference, the LC-EP Iberian calc-alkaline magmatism can be interpreted as most probably related to the Cimmerian cycle instead of the traditionally accepted model that ascribe a closer connection of this magmatism with the Variscan cycle.

KEYWORDS | **Iberian Massif. Late Carboniferous-Early Permian. Calc-alkaline bimodal plutonism. Zircon dating. Variscan and Cimmerian cycles.**

INTRODUCTION

The Iberian Massif experienced a polymetamorphic evolution during the Carboniferous as a result of the collision between Laurussia and Gondwana (*e.g.* Variscan Orogeny; Martínez Catalán *et al.*, 2009; Díez Fernández *et al.*, 2016). The Laurussia-Gondwana convergence caused crustal thickening by the stacking of tectonic nappes and the rejuvenation of reliefs. The regional switch from contractional to extensional deformation was followed by an orogenic collapse and the generation of abundant crustal-derived magmatism (Escuder Viruete