

VOLCANIC ARC DEVELOPMENT WITHIN AN INLAND-SEA BASIN (RIO DOCE ARC, ARAÇUAÍ OROGEN, SOUTHEASTERN BRAZIL)

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The Araçuaí orogen (SE Brazil) and the West Congo belt (SW Africa) are counterparts of a confined orogenic system developed within an inland-sea basin (a gulf of the Adamastor ocean) carved into the São Francisco-Congo paleocontinent in Neoproterozoic time. In apparent disagreement with such a peculiar geotectonic setting (that, at first glance, would suggest a fully ensialic evolution), the Araçuaí orogen includes ophiolite slivers and the Rio Doce calc-alkaline arc. We present a thorough synthesis with new lithochemical and isotopic data for the Rio Doce arc, which discloses quite anomalous geochemical and geochronological patterns in relation to typically zoned volcanic arcs of active continental margins. Data from 189 samples of plutonic and volcanic rocks record a non-zoned pattern for a medium- to high-K, expanded calc-alkaline suite formed in a pre-collisional to collisional, volcanic arc to intraplate setting. Zircon U-Pb ages for 29 samples suggest three phases of arc development: i) discrete eastward migration of the arc front (ca. 632-617 Ma), ii) non-zoned magma production widespread through the whole arc (ca. 607-585 Ma), and iii) late I-type plutonism in the western arc region (ca. 582-576 Ma). Although operating in a confined orogenic system, these phases may be explained by usual processes of volcanic arc generation and growth, like subduction of oceanic lithosphere under a continental margin, followed by asthenosphere ascent related to the slab retreating and break-off.