TRACING NEOPROTEROZOIC SUBDUCTION IN THE BORBOREMA PROVINCE (NE-BRAZIL): CLUES FROM U-Pb GEOCHRONOLOGY AND Sr-Nd-Hf-O ISOTOPES ON GRANITOIDS AND MIGMATITES

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The Ceará Central Domain of the Borborema Province is a key tectonic domain within the 5000 km-long West Gondwana Orogen, which extends from Algeria in Africa to Central Brazil. Igneous rocks of the Tamboril-Santa Quitéria Complex, investigated in this study, record a long-lived history of convergent magmatism (up to 350 My). SHRIMP U-Pb dating and Hf-O isotope analyses of zircons from granitoids and migmatites, coupled to whole-rock Sr-Nd isotopes were used to constrain the evolution of this continental margin. Magmatism can be divided into three main periods: i) an early period comprising essentially juvenile arc magmatism at ca. 880-790 Ma, ii) a more mature arc period at ca. 660-630 Ma characterized by hybrid mantle-crustal components, and iii) crustal anatexis at 625-618 Ma continuing until ca. 600 Ma. Oxygen isotopes of detrital zircons in the range of 950 to 650 Ma from the fore-arc deposits indicate that juvenile input persisted throughout whole evolution of the convergent magmatism. Juvenile and mature arc igneous rocks underwent anatexis that gave rise to extensive areas of diatexites within the complex. Anatexis overlap in time with the ages of (U) HP eclogitic metamorphism dated at 625-615 Ma. Eclogites are interpreted to mark the timing of continental collision and therefore indicate that the anatexis of arc rocks took place during continental subduction in a continent-continent collisional setting. Extensive migmatization continued until ca. 600 Ma and are in part synchronous to the exhumation of the (U)HP rocks to shallower crustal levels. Thus the 350 My magmatic records in the Ceará Central Domain records the evolution of the West Gondwana margin of the Borborema Province from a juvenile arc setting through a mature arc to continental collision at around 615-600 Ma.