

CAMBRO-ORDOVICIAN EXTENSIONAL TECTONICS IN THE CABO FRIO TERRANE (SE BRAZIL)

Renata da Silva Schmitt¹; Juliana Maceira Moraes²; Rudolph Allard Johannes Trouw³; W.R. Van Schmus⁴

¹ UNIVERSIDADE FEDERAL DO RIO DE JANEIRO - UFRJ; ² CPRM; ³ UNIVERSIDADE FEDERAL DO RIO DE JANEIRO; ⁴ UNIVERSITY OF KANSAS - EUA

RESUMO: A collisional orogen consists of an outstanding compressional phase and also an emphatic extensional period. Both represent contrasting tectonic styles and thermal dynamics still to be recognized and fully understood. The Cabo Frio Terrane, located in the southeastern Brazilian margin, is constituted by a Paleoproterozoic orthogneissic basement interleaved tectonically with Neoproterozoic metasedimentary and metavolcanic rocks from an ancient basin, the Búzios-Palmital Basin. Prior to collision, a subduction zone may have developed evidenced by medium to high pressure metamorphism recorded in the supracrustals. The Precambrian units record the collision during Mid-Cambrian between the Congo Craton (in Africa) and the Ribeira belt terranes, a collision event defined as the Búzios Orogeny, at ca. 525 Ma. U-Pb dating (ID-TIMS) in zircons from leucosome within all units gave a time interval of 525 to 515 Ma for the metamorphic peak (granulite facies with minimum conditions of 12 Kbar and 900°C). This was coeval to the main D1-D2 deformational phases related to nappes, fold and thrusts, inverting the stratigraphy. U-Pb data from monazite, sphene and rutile provided a cooling curve for this terrane, starting at a fast cooling rate of 20°C/Ma in the first 10 my after collision. After 510 Ma the cooling rate diminishes to 10°C/Ma and gradually to 5°C/Ma after 480 Ma. The deformational subhorizontal ductile structures are cross cut by subvertical NW-SE shear zones. These are transpressional dextral zones dated at 505 Ma, related to D3. The 570-480 Ma magmatic intrusions are abundant in the Oriental Terrane (Ribeira Belt), to northwest, which is overridden by the Cabo Frio Terrane in a NE-SW thrust zone. The only pluton that cross cut the Cabo Frio Terrane gneisses is the Silva Jardim granite, located in the contact between the terranes and dated at 505 Ma. The granite presents a NE-SW oriented igneous flow and a sub-parallel elongated shape on map, and is considered a syn to late-collisional pluton. Therefore, the Cabo Frio Terrane main thrust zone is previous to this age, coherent with the shift in the cooling rate at 510 Ma, and the start of the extensional tectonics in the Cabo Frio Terrane. The orthogneissic basement exhibits extensional shear zones NE-SW with movement top to SE, indicated by drag folds. Some shear zones are considered reactivations from D2 thrust zones, and the opposite movement suggests an orogen collapse. A pegmatitic province of dikes and lenses is recognized cross cutting all ductile structures and the granite. These veins are mostly E-W and NW-SE oriented, dipping medium to high angle. U-Pb dating on zircon and Ar-Ar dating on biotite give ages between 480 and 450 Ma for these veins. Considering the metamorphic peak, this collisional orogeny lasted ca. 70 my, and could be a Himalayan analog. The last 40 my period is related to extension. The heat source for the pegmatites and the granite is interpreted as related to the decoupling of the subducted lithosphere, which is still on debate.

PALAVRAS-CHAVE: CABO FRIO TERRANE; EXTENSIONAL TECTONICS; LATE TECTONIC MAGMATISM.