

POST-OROGENIC HYDROTHERMAL FLUID-FLOW IN THE EASTERN SÃO FRANCISCO CRATON: IMPLICATIONS FOR ORE MINERALIZATION

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The Araçuaí orogen (AO) in Brazil is a Neoproterozoic belt developed during the Brasiliano orogeny (0.7-0.45 Ga), that fringes the eastern border of the São Francisco craton (SFC). It is known for extensive granitoid generation that occurred from its pre- to post-collisional stages. After collision and crustal thickening, gravitational collapse took place between 520-480Ma and was responsible for generation and emplacement of the post-collisional (G5) granitoids, pegmatites and intense fluid-flow that generated quartz veins that cross-cut the greenschist facies rocks of the external part of the AO (Espinhaço Range-ER). Here we focus on the timing and regional distribution of these fluids by analyzing hydrothermal minerals along the eastern border of the SFC. U-Pb ages of monazite, rutile and xenotime from a Au-Pd belt along the ER and the Quadrilátero Ferrífero (QF) in the SFC ranged from 520-485Ma, with a peak at ca. 495Ma. This age is identical to monazite ages previously obtained from the core of the AO, interpreted here as resetting during fluid-mediated processes. Temperature around 400°C were estimated from Titanite and Zr-in-rutile from the quartz-veins. Sm-Nd composition of hydrothermal monazites are highly evolved ($\epsilon_{Nd_{495}} = -17 \pm 1$). We suggest that the collapse of the AO produced a large scale fluid-flow that affected an area of 300 km² at ca. 495 Ma, including the Neoproterozoic/Paleoproterozoic rocks of the QF. The fluids were probably deep-sourced, decompression-melting related and migrated upwards around the high geothermal gradients of the G5 granitoids and then towards lower temperatures, to the border of the SFC. The fluids used previous shear zones and faults as pathways, reaching upper crustal levels. During their transport, fluids were specialized and enriched in metals, forming the Au-Pd belt and other mineralizations in the border of the SFC (e.g. "Imperial" topaz in the QF).