MULTIPLE GENERATION OF HYPERSTHENE-BEARING ROCKS, NEOPROTEROZOIC ARAÇUAÍ-RIBEIRA OROGEN, BRAZIL

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Two metamorphic hypersthene-bearing rock associations occur in the central and eastern domains of the Araçuaí-Ribeira collisional orogenic belt: 1) a garnet-hypersthene-cordierite enderbite-charno-enderbite suite, with quartzite, kinzigite and calcsilicatic gneisses, inferred to be derived from metasedimentary protoliths; 2) an expanded suite of hypersthene-plagioclase granulites grading from meta-norite to charnockite, inferred to be derived from igneous protoliths. U-Pb systematics in zircons suggest the peak of granulite facies metamorphism ocurred at 586+/-2 Ma in the central domain (Caparaó Complex) and 558+/-2 Ma in the eastern domain (Coastal Complex), following amphibolite facies metamorphism around 600 and 570 Ma, respectively. Granulite formation was accompanied by dehydration melting that produced hypersthene-bearing leucosomes, which suggests temperatures 850 C at intermediate pressures. Relict mineral assemblages suggest a retrograde history of isobaric cooling that changed to isothermal decompression. We relate this change to slab detachment or lithospheric delamination, and consequent uplift and exhumation - an interpretation supported by the magmatic history. Two peaks of magmatism are recognized: 1) predominantly calc-alkaline pre- to syn-collisional magmatism (620-580 Ma)- main deformation at 600-590 Ma), followed by high-grade metamorphism that generated weakly foliated charnockitoid rocks; and, 2) late- to post-collisional magmatism (560-480 Ma), related to enhanced mantle heat flux during orogenic collapse, which started with charno-enderbitization (558+/-2 Ma), including magmatic charnockite (535-520 Ma) and a high-K bimodal suite (c.500 Ma).