

## REFINING OF THE TIMING OF OROGENETIC EVENTS IN NORTHERN RONDÔNIA, SW-AMAZONIAN CRATON, DURING GEONS 17-12: IMPLICATIONS FOR UNDERSTANDING THE EVOLUTION OF THE PROTEROZOIC LITHOSPHERE

J.S. Bettencourt <sup>1\*</sup>, B.L. Payolla <sup>2</sup>, R.M. Tosda, <sup>3</sup>, J.L. Wooden <sup>4</sup>, W.B. Leite Jr. <sup>5</sup>, I. Sparrenberger <sup>6</sup>

<sup>1-6</sup> Instituto de Geociências, Universidade de São Paulo, São Paulo, SP, Brazil (\*jsbetten@usp.br); <sup>2</sup> Centrais Elétricas do Norte do Brasil S/A, Brasília, Brazil; <sup>3</sup> Department of Earth and Ocean Sciences, University of British Columbia, Vancouver, BC, Canada; <sup>4</sup> USGS-SUMAC, Ion Probe Lab, Stanford University, Stanford, CA, USA; <sup>5</sup> Instituto de Geociências e Ciências Exatas, Universidade Estadual Paulista, Rio Claro, SP, Brazil,

New SHRIMP U-Pb zircon geochronological analyses have refined the timing of magmatism and metamorphism during the geons 17-12, in northern Rondônia state. There were two short-lived calc-alkaline plutonic episodes from 1761 to 1745 Ma, 1736 Ma to 1728 Ma and volcanic episodes at 1751-1740 Ma, related to soft-collision/accretion driven by subduction of oceanic crust, assigned to the Juruena Orogeny, and synchronous with the deposition of volcano-sedimentary and sedimentary sequences (Mutum-Paraná, Roosevelt, and Beneficente Groups), after ca.1751 Ma. A younger magmatic episode, 1688 to 1681 Ma and 1665 to 1661 Ma, resulted in partial melting of previous lithosphere and generation of sheet-like and small intrusive bodies of garnet-bearing granite. These data do not allow unequivocal correlation to a collisional regime. Coeval basin sediments deposited between 1.66 and 1.57 Ga - protoliths of the Rio Preto and Machadinho paragneiss belt - have experienced high-T, low-P metamorphism at 1545 Ma (U-Pb monazite), and zircon overgrowths at 1590 Ma and 1524 Ma, related to the Serra da Providência Intrusive Suite (SPIS: 1.60 - 1.53 Ga). These magmatic and sedimentary episodes represent temporal correlatives to the Lomas Maneches granitoid suite (1689-1663 Ma), and paragneisses from the Chiquitania Complex and San Ignacio Group, of eastern Bolivia, deposited after 1690 Ma; metamorphic imprints on these rocks at 1333 and 1310 Ma are documented. Felsic rocks were intruded at ca. 1637 Ma, accompanied by metamorphism and deformation between 1637 to 1617 Ma. Subsequent mangerite-charnockite-granite (MCG) and associated mafic rocks of the (SPIS), define a north-northwest array subparallel to the Mesoproterozoic proto-margin. These rocks were emplaced during extension (transpressive/transtensive strain), while convergence and transpression along the presumed orogen margin continued (Cachoeirinha orogen ~1.58-1.52 Ga), farther southeast. Lower crustal delamination following mafic underplating and partial melting of the deep crust, possibly in a broad back-arc setting or collisional mantle suture is invoked. We confirm the widespread nature of the Rio Crespo Intrusive Suite (RCIS), composed of pink or greenish, fine- to medium-grained, quartz-feldspathic banded gneisses, metamorphosed at amphibolite or granulite facies conditions between 1350 and 1310 Ma. In addition, we propose to attribute orogeny status to this suite, thereby creating the "Rio Crespo Orogeny", including events between 1520 and 1460 Ma. This orogeny is preliminarily interpreted as resulting from subduction along a juvenile continental margin arc, correlated to the Rio Alegre Orogen (1509-1494 Ma), in Mato Grosso. From 1.42 and 1.24 Ga northern Rondônia was under the effect of the Rondonian/San Ignacio Orogeny (1550 -1.320 Ma) and Nova Brasilândia Orogeny (1.25-1.11 Ga), resulting in distal inboard AMCG and mafic magmatism, mainly represented by four intrusive suites. Temporal equivalents are the metagabbros from the Colorado Metamorphic Suite (1352 Ma), farther southeast, and the Pensamiento granites (1400 - 1320 Ma), in eastern Bolivia. In northern Rondônia the 1.41-1.24 Ga magmatism appears to be associated with NNW- SSE transpressional/transtensional strain. A different approach is that they represent early back-arc rift products or some other variety of intracratonic rifting.