TECTONICS, MAGMATISM, AND SEDIMENTATION IN THE CENTRAL ESPINHAÇO, NORTHERN MINAS GERAIS, BRAZIL

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Abstract: The Espinhaço basin preserves important records of the Paleo to Neoproterozoic evolutionary history of São Francisco block which was supposed to have been part of Columbia and Rodinia supercontinents. Geological field mapping and geochemistry, geochronologic, and petrographic investigations has been conducted along the central part of the Espinhaço basin, including the Central Espinhaço range and Central ridge, as well the Archean-Paleoproterozoic basement separating both domains.The studied area comprises the northwest end of the external domain of the Araçuaí belt, with low grade metamorphosed rocks, and basement-involved,west vergence fold and high angle reverse faults. The results achieved so far indicate the recording of four basin formation events and two related episodes of magmatism in this region, from 1.8 Ga. The first event comprises a Statherianvolcano-sedimentary succession of the Terra Vermelha Group, with mainly sandstone and conglomerate of alluvial nature. Intercalated there are acidic and mafic volcanic rocks with ages around 1750 Ma, characterizing a bimodal volcanism in the depositional site here interpreted as a rifte. An extensive deposit of eolian sandstones (Pau d' Arco Formation), covering this unit are interpreted as sag filling during post-rift thermal subsidence.Detrital zircons obtained from this unit reveal maximum depositional U–Pb ages of 1675 ± 22 Ma. The second event comprises a Calymmian volcano-sedimentary succession of the Mato Verde Group consisting by basal conglomerates with interlayered sandstones and subordinated mudstones associated with alluvial fans, braided fluvial and lacustrine environment. The top of the basin is characterized by volcanic and volcanoclastic rocks that record ages of 1524 ± 6 Ma, which finalized the Mato Verde rift evolution. The deposits of aeolian nature recorded in the Vereda da Cruz Formation covering this unit are interpreted a stage of the rift thermal subsidence. Detrital zircons obtained from this unit reveal maximum depositional U–Pb ages of 1616 ± 30 Ma. The third event includes siliciclastic succession of the Sítio Novo Group, with stratified sandstones and minor mudstones and conglomerates with characteristics that indicate deposition in coastal to shallow-marine environments. Detrital zircons obtained from this unit reveal maximum depositional U–Pb ages of 1070 ± 15 Ma.Mafic rocks occur intrusive as large sill body in this unit and show U-Pbages around 900 Ma, defining the minimal age for sedimentation of the Sítio Novo Group. The last event records the filling of an intracontinental rift represented by Santo Onofre Group, which consists of the carbonaceous mudstones, sandstones and conglomerates associated with a deep water and shallowing upward sedimentation phases. Detrital zircons obtained from this unit reveal maximum depositional U–Pb ages around865 Ma. Thanks to"Rede de Estudos Geotectônicos da Petrobrás", Fapemig (CRA-APQ-00125-12), and Geological Survey of Brazil (CPRM) for the financial support, and UFOP for the institutional support.