

THE BAMBUÍ BASIN, BRAZIL: A CONFINED EDIACARAN FORELAND SYSTEM DEVELOPED DURING THE WEST GONDWANA ASSEMBLY

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ABSTRACT: Representing one of the most important sedimentary covers of the southern São Francisco craton (Brazil), the Bambuí Group has been focus of several studies along the last decades. Based on surface and subsurface information, geophysical data, geochronological and chemostratigraphic analyses, these studies have shown that the group records a complex foreland system developed during the edification of multiple Brasileiro/Pan-African orogens, along the late Neoproterozoic/early Paleozoic West Gondwana assembly. According to seismic, well and surface data, two different foreland depocenters might be recognized. Along the eastern margin of the São Francisco craton, mixed carbonate-siliciclastic deposits mark a wide and segmented forebulge depocenter whose architecture and evolution were controlled by preexisting cratonic structures. These structures include the Sete Lagoas and Januária basement highs, which are partially exposed along the southern and northern sectors of the basin, respectively, and separated by the NW-trending Pirapora aulacogen. In this sector, the Bambuí Group comprises an up to a few kilometers-thick and unconformity-bounded 1st-order sequence, composed by four thinner second-order sequences. Its basal deposits commonly contain glaciogenic diamictites covered by organic-rich shales and the carbonate ramp deposits of the Sete Lagoas Formation. These sedimentary units grade upward into transitional to platformal mixed successions, which are mostly associated with the Serra de Santa Helena and Lagoa do Jacaré formations. The dispersal of the basal to middle Bambuí successions in this area are controlled by the extensional reactivation of either Archean (Paleoproterozoic?) orogenic elements of the basement highs or the preexisting structures of the Pirapora aulacogen. The strata of the upper Bambuí Group cover mark increasingly shallower conditions culminating with siliciclastic-dominated deposits of the Três Marias Formation. The entire Bambuí strata exposed in the eastern São Francisco craton seems to represent typical under- to overfilled foreland system deposits. Toward the western cratonic domain, these units pass into the siliciclastic wedges of the Samburá and Lagoa Formosa formations and the entire Bambuí Group may reach up to 3000 m-thick within the Brasília orogen foothills. Recording a major foredeep depocenter, these siliciclastic wedges and associated strata are affected by the Brasília foreland f-t-belt and were mostly fed by metamorphic rocks of the Brasília orogen. Foredeep remnants in the eastern cratonic area associated with the Araçuaí orogen are restricted to the scarce deposits of the Gorutuba Formation. Combined with available tectonophysical modellings, i) the overall tectono-stratigraphic architecture of the Bambuí Group in the southern cratonic domain, ii) macrofossil remnants and iii) zircon grains found within its basal deposits point toward a complex Ediacaran basinal system mostly controlled by the orogenic overload imposed by the Brasília orogen on the west, and partially affected by the Araçuaí orogen, on the east. This configuration also reveals an intricate balance between tectonically-controlled subsidence changes, eustatic variations and extreme climatic conditions in a (partially) confined foreland basinal setting. This confined character suggests unique paleotectonic conditions, which should be considered in paleogeographic reconstructions, paleoecological and paleoclimatic studies, and in the correlation with other events affecting the Earth System during the dawn of the Phanerozoic time.

KEYWORDS: BAMBUÍ FORELAND SYSTEM, TECTONICS, EDIACARAN