

The volcano-sedimentary succession of the Pajeú Synthem within the Espinhaço aulacogen, northern São Francisco craton (Brazil): the sedimentary record of a Calymmian rift

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RESUMO: The Pajeú Synthem occur along the eastern border of the Northern Espinhaço Range in Bahia State, in the north-central portion of the Brazilian Atlantic shield. This unconformity bounded unit records one of the evolutionary stages of the Espinhaço aulacogen in the northwest part of the São Francisco-Congo paleocontinent. Field studies allowed to analyze the depositional infilling aspects as well the control factors related to its development, clarifying the understanding of an important phase of rifting within a Mesoproterozoic paleocontinent. The base of the package is bound by a regional unconformity, marked by basal conglomerates containing fragments derived from lower units of the Botuporã Supersynthem (volcano-sedimentary successions of Statherian age) as well from Paramirim Complex (crystalline basement rocks older than 1.9 Ga). The upper limit is done abruptly with eolianites of the Bom Retiro Synthem. The distribution of the several sedimentary facies associations allows interpreting the configuration of the basin as two half-grabens, separated by a structural high (Bucuituba high). These half-graben shows maximal depocenters at north and south, being limited by two converging border faults trending around the EW direction. The opposing sides of both sub-basins have sedimentary characteristics more typical of flexural borders. The thickness of the Pajeú Synthem in depocenter located near the fault borders may reach more than 2,500m. The siliciclastic basin-fill succession was divided in two lithostratigraphic units: Riacho Fundo (basal) and Ipuçaba formations. The Riacho Fundo Formation is composed mainly by conglomerates and sandstones deposited through alluvial fan (fed across the fault borders), braided river (axially fed, to the east in the north halfgraben and to the northwest, in the south) and “dry” eolian systems. The Ipuçaba Formation is mainly composed by fine-grained turbidites (sandstone-mudstone couplets) related to a retrogradational delta-lacustrine system, with local diamictites intercalated deposits (debris flow). Detrital zircons indicate two sources areas: one located West in northern hemigraben and other East in Southern hemigraben. The Pajeú basin fill-succession is characterized by sedimentary rocks with a low degree of textural and mineralogical maturity, with an overall sedimentary profile revealing thinning and fining upward, and strong, lateral and vertical variations of the lithofacies associations. In the southern halfgraben the basin-fill succession is completed by a volcanic and volcanoclastic rock succession (Bomba Formation) of Calymmian age. From the analyzed context, the Pajeú Synthem is interpreted as a clearly tectono-controlled unit, developed predominantly under arid to semi-arid climate during sedimentation within an intracontinental setting. We related the Pajeú rifting to a far-field stress mechanism induced by the Calymmian orogeny along the margin of Altantica block (part of Columbia) to explain this intracontinental rifting and associated magmatism. Thanks to CNPq.

PALAVRAS-CHAVE: NORTHERN ESPINHAÇO, SÃO FRANCISCO CRATON, CALYMMIAN RIFT.