

Paper Number: 5437

Volcaniclastic-epiclastic rocks related to the Paraná continental flood volcanism: the Early Cretaceous Volta Alegre Formation, Jacuí Basin, southern Brazil

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The Jacuí Basin, of Early Cretaceous age, is a probable interior sag basin whose origin is related to the breakup of Gondwana and the opening of the South Atlantic in southern Brazil. With an area of approximately 22,000 km², the basin developed as a result of a northwest-southeast-oriented regional extensional stress field and is coeval to the late stages of the Paraná flood volcanism (Serra Geral Formation, in Brazil).

The basin fill comprises two interfingering stratigraphic units, the Volta Alegre and Tupanciretã formations. The Volta Alegre Formation, with a maximum preserved thickness of 50 m, occurs along the eastern and southern parts of the basin and includes volcaniclastic rocks related to the Serra Geral Formation: volcaniclastic tuffites (tuffaceous breccia and subordinate tuffaceous conglomerate) containing a mixture of pyroclastic and epiclastic constituents. In order of abundance, pyroclasts are mainly rhyodacite lapilli, ash, blocks, and bombs, and are probably sourced from the Santa Maria subgroup of Palmas acidic volcanism. Toward the top of the unit, fluvial conglomerate and sandstone dominate. Deposition of the Volta Alegre Formation began in the Early Cretaceous (ca. 135 Ma). The Tupanciretã Formation is composed of sandstone with minor conglomerate and muddy sandstone, related to alluvial fan, fluvial braided channel, and aeolian deposits, with a maximum preserved thickness of more than 60 m. Paleocurrent data indicate transport of sediments towards the north-northwest.

The Jacuí Basin is probably a part of a set of Early Cretaceous basins of a similar nature distributed from north to south in Brazil that represent either the beginning of the extension in the inner part of the continent that subsequently migrated to the east or the far-field impact of extensional processes that preceded the breakup of Gondwana and the opening of the South Atlantic Ocean. (With financial support from FAPESP, grant 07/58319-1 and CNPq, grant 307871/2010-0).

