

EVIDENCE FOR ICE MARGIN FLUCTUATIONS AND PALEO-ICE FLOW CHANGE AT THE END OF THE LATE PALEOZOIC GLACIATION IN NORTHEASTERN PARANÁ BASIN, BRAZIL

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The late Bashkirian to lower Sakmarian deposits of the Itararé Group (Paraná Basin, southern Brazil) compose the thickest, most extensive and one of the longest records of the Late Paleozoic Ice Age (LPIA) among the late Paleozoic glaciated basins. The upper Itararé Group (Taciba Formation) cropping out in the northeast Paraná State is studied and provides the opportunity to investigate the late stages of glacial sedimentation and sediment dispersion patterns during the LPIA in a southwestern area of Gondwana. The interval is characterized by a diamictite-bearing, c. 100 m-thick succession, capped by post-glacial deposits of the Rio Bonito Formation through a subaerial unconformity. Diagnostic palynomorph species of the basal *Protohaploxypinus goraiensis* Subzone of the *Vittatina costabilis* Interval Zone (VcZ) were recognized and indicate an early Permian (Early Cisuralian) age for this interval. The succession can be divided into four facies associations, each marked by different degrees of glacial influence, comprising, in ascending stratigraphic order: (i) subaqueous outwash deposits, a 50 m-thick unit that encompasses conglomerates, poorly- to well-sorted sandstones, mudstones and diamictites; (ii) mass-transport deposits (MTDs), arranged in two different stratigraphic positions and composed by homogeneous and heterogeneous diamictites, with common allochthonous sandstone blocks; (iii) tide-influenced delta-front, which includes current-rippled rhythmites and flaser-bedded sandstones, commonly with flow reversals and scattered dropstones; (iv) tide-influenced delta-plain deposits, essentially constituted by sandstones and conglomerates with traction-generated structures. Therefore, the stratigraphic stacking of the Taciba Formation in the study area records at least two phases of ice-margin advance into a marine-influenced environment, separated by an interglacial deltaic phase. The marine environment is corroborated by the presence of the algae *Tasmanites* sp., *Deusilites tenuistriatus*, *Leiosphaeridia* sp. and *Navifusa variabilis* within diamictites and rhythmites. Paleocurrent indicators were collected from the lee-side dip azimuth of cross stratifications and current ripples in sandstones and sandy-rhythmites of subaqueous outwash and deltaic deposits (n=726). A main SSW paleocurrent direction was obtained, with a 203 mean azimuth. Furthermore, a total of 121 measurements from the orientation of slump-related deformational structures in diamictites genetically related to the outwash and deltaic deposits were obtained. The results indicate a maximum slump-related stress axis trending NE-SW and, consequently, a paleoslope striking NW-SE. Folds vergence observed in the field and stereographically calculated constrains glacially-derived mass flows towards SW, since the folds verge in the downslope direction. Therefore, a glacial source area to the NE is suggested during the deposition of the Taciba Formation. This sediment dispersal pattern is similar to the postglacial fluvial facies of the Rio Bonito Formation, but markedly different from the lower levels of the Itararé Group, indicating that an important paleogeographic change happened in the Paraná Basin, still during the glacial phase and not only in the postglacial times, as previously suggested.

KEYWORDS: GLACIAL STRATIGRAPHY, PALEOGEOGRAPHY, GONDWANA.