

STRATIGRAPHIC RECORD OF GLACIAL CYCLES IN THE PARANÁ BASIN, DOUTOR PEDRINHO REGION, SANTA CATARINA STATE, SOUTHERN BRAZIL

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ABSTRACT: During the Late Paleozoic, the Gondwana supercontinent was affected by multiple glacial and deglacial episodes known as “The Late Paleozoic Ice Age” (LPIA). In Brazil, the evidence of this episode is recorded mainly by widespread glacial deposits preserved in the Paraná Basin that contain the most extensive record of glaciation (Itararé Group) in Gondwana. The Pennsylvanian to early Permian glaciogenic deposits of the Itararé Group (Paraná Basin) are widely known and cover an extensive area in southern Brazil. The Doutor Pedrinho area is located in the Santa Catarina State, Southern Brazil, and exposes glaciomarine deposits of the Itararé Group. The outcrops belong to the Mafra and Rio do Sul formations. The succession is composed of five main units characterized by distinct lithologies: sandstones, diamictites, shales and mudstones, rhythmites and conglomerates. In the study area, three high frequency glacial cycles are recorded. Each cycle comprises deglacial deposits related to ice retreat (Deglacial Systems Tract) and eventual deformational or scour features related to glacial advance. The base of Sequence 1 comprises about 30 meters of marine mudstones and siltstones with ice raft debris (IRD) interbedded with massive, matrix-supported conglomerates ascribed to rain out processes. These deposits are overlain by an expressive, more than 80 m thick ressedimented diamictite composed of a siltstone matrix and dispersed, up to boulder size clasts. Sequence 2 is marked at the base by an expressive package of granule- to- boulder size conglomerates followed by up to 20 meters of sandstones. These deposits are covered by thin heterolithic deposits with dropstones. The top of Sequence 2 is composed of blackish, fine-grained strata that corresponds to the Lontras Shale and represents a well-known, basin wide stratigraphic marker. The entire Sequence 2 shows a fining-upward trend associated with a deglacial episode and ensuing transgressive tract. Sequence 3 comprises a basal sandstone package interpreted as turbidites followed by thick heterolithic, largely ressedimented deposits with dropstones. This depositional sequence is unconformably covered by the Rio Bonito Formation that consists of fluvial to coastal beds related to warmer conditions. The glacial influence in these sequences is remarkable. Deposits related to each depositional sequence show a progressive climate amelioration illustrated by the gradually smaller influence of the ice through time as a result of the Gondwana drift to the north. Paleocurrent data in all sequences indicate an average northeastward meltwater flow, nearly parallel to the mean ice movement in the eastern part of the basin.

PALAVRAS-CHAVE: LATE PALEOZOIC GLACIATION; ITARARÉ GROUP; GLACIAL CYCLES.