CONTROLS ON THE EMPLACEMENT OF MASS-TRANSPORT DIAMICTITES IN THE UPPER ITARARÉ GROUP, PARANÁ BASIN, BRAZIL

Mottin, T.E.[1]; *Vesely, F.F.*[1]

1 Universidade Federal do Paraná

ABSTRACT: The Late Paleozoic Ice Age (LPIA) comprises multiple glacial events 1 to 8 My-long alternated with non-glacial periods that occurred from the Visean (Mississipian) to the earliest-middle-Late Permian. In this context, mass-transport deposits (MTDs) are frequent in the stratigraphic record of the LPIA and have been reported in many basins across the southern domain of Gondwana paleocontinent (e.g. Paganzo, Rio Blanco, Paraná, Karoo and Canning basins). The early Permian uppermost portion of the Itararé Group in northeastern Paraná Basin (Ibaiti locality) contains two distinct diamictite units that provide the opportunity to examine the timing and controlling factors on the emplacement of MTDs and its relationships with glaciation. In this area, the studied stratigraphic interval comprises, from base to top, the following depositional settings: 1) subaqueous outwash fan, 2) lower mass-transport diamictite, 3) tide-influenced delta front, 4) tide-influenced delta plain and 5) upper mass-transport diamictite. The succession is capped by the post-glacial fluvial/estuarine deposits of the Rio Bonito Formation by means of a prominent subaerial unconformity. Diamictite units encompass homogeneous to heterogeneous deposits, up to 25-m-thick, characterized by granules to boulders immersed in a muddy to sandy matrix. Although some aspects of these diamictites point to a glacial affinity (e.g. bullet-shaped and faceted/striated clasts), both units consist of subaqueous mass transport deposits resulting from the resedimentation of previously accumulated sediments. The diamictites contain abundant blocks of conglomerate, sandstone and rhythmite whose characteristics match with the composition of underlying strata. It is interpreted that the mass-flows assimilated blocks both from upslope collapse and basal scouring during major events of disintegration and retreat of an ice-margin. Faceted/striated clasts were supplied initially as ice-rafted debris during early deglaciation and subsequently incorporated in mass flows. The accommodation space necessary to accumulate and preserve MTDs tens of meters thick is interpreted as a result of glacioisostatic subsidence. The occurrence of mass-flow diamictites overlying subaerial delta-plain deposits points to a rapid increase in water depth due to glacioisostatic depression. Considering the thickness and great lateral continuity of the deposits, mass-flows were probably episodic and widespread along the depositional strike. By comparing with examples from the Pleistocene glaciomarine record, the trigger mechanism for failure can be attributed to tectonic movements promoted by glacioisostatic rebound. The two diamictite units identified in the study area are not subglacial but record two main phases of ice-margin advance and subsequent retreat in the upper part of the Itararé Group, testifying a depositional history more complex than previously considered for this interval. The two glacial stages can be both placed in the early Permian based on the palynological content.

KEYWORDS: Late Paleozoic Ice Age, Gondwana, glacial cycles