

THE POTY QUARRY CONGLOMERATIC BED: THE RECORD OF A TSUNAMI TRIGGERED BY AN IMPACT?

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Introduction: The existence of a conglomeratic bed which separates the Cretaceous and Tertiary sedimentary units in the Poty quarry in the state of Pernambuco, Brasil. This conglomeratic bed was argued by Albertão and Martins Jr. [1], as a possible tsunami sedimentary record triggered by a Cretaceous-Tertiary impact. The recognition of this record was reinforced by the iridium anomaly that was found over the conglomeratic bed. In this opportunity we present petrographic and stratigraphic aspects, relative to the basin general context, which attempt to confirming the unique nature of this record, focusing the hypothesis of a fast and high energy event that strikes the basin, in this time.

Results: The sedimentary record is exposed in two places, along the Paraíba Marginal Basin, Northeast Brasil. The first observation is the extensive range of the record. The two outcrops sites are separated by 30km. Despite the distance, the record in both outcrops are very similar, with the same characteristics: a sharp-base erosional contact, a fining upward of intraclasts and the same textural aspects of the reworked material.

The observation of the stratigraphy along some sections covering the whole basin, revealed the absence of other beds with the same characteristics. The general bedding of the carbonate succession shows a very regular and aggradational platform. The absence of mass flows or tectonic activity invalidates the possibility of some type of debris flow. The lateral regularity of the conglomeratic bed is notable, and could indicate the occurrence of an extensive and regular episode, as a large wave, which instantly deposited a very regular bed (60cm thickness) over an area of at least 30km. The petrographic details obtained by samples of both outcrops reveals the reworking of carbonate fragments, and the mixing of eroded bioclasts of lower beds. Petrography of sampled outcrops and sedimentological studies of the conglomeratic bed, show that the event reach, and generated similar features over a relative marine open shelf in the southern area of the basin, and in a shallow northern area (stipulating that the separated outcrops recorded the effects of the same event).

Conclusion: The occurrence of a conglomeratic bed, deposited by a high energy event, with characteristics which made it a unique record in all the carbonate succession, is not a coincidence. Also, considering that over this bed occur an iridium anomaly, turn it an extraordinary evidence. A possible tsunami could be generated by an earthquake or an impact. The lack of coeval tectonic evidences along the carbonate deposition disable the earthquake hypothesis. The possibility of a debris flow generated origin also is discarded by the stratigraphic and sedimentological observations, as we interpreted. So, the tsunami hypothesis is accepted as the most probable, regarding our sedimentological and stratigraphical data interpretation.

References: [1] Albertão, G. A. and Martins Jr, P. P. 1996. A possible tsunami deposit at the Cretaceous-Tertiary Boundary in Pernambuco, Northeastern Brazil. *Sedimentary Geology*. 104: 189-201.