191-10 - FATE OF BIOGENIC CARBONATES FROM COMMON BENTHIC PHYLA IN IMMATURE SEDIMENTS: AN EXAMPLE FROM LATE TRIASSIC NEW ZEALAND

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Abstract

In the South Island of Aotearoa (New Zealand), the preservation of biogenic carbonate in Late Triassic sedimentary rocks is rare to non-existent; however, differential preservation modes between common phyla are commonly observed and serve to elucidate the stratigraphic and diagenetic history of these often poorly-exposed immature sandstone units. The Taringatura Group sandstones from Southland and Otago range from sandy siltstones to silty arkosic sandstones that commonly host molluscan and brachiopod macrofossils as well as rare echinoderms, bryozoans, and foraminifera. Additionally, there is a hypothesized unconformity between the lower Oretian and Otamitan age (227.7–217.0 Ma) and the overlying Warepan age (217–208.5 Ma) deposits indicated by an abrupt change in composition, grain size, and fossil assemblage.
Molluscs from the Oretian and Otamitan deposits exhibit fine-detail preservation on external and internal molds. Thin-shelled taxa, such as *Halobia*, exhibit some shell replacement by clay minerals, likely from the dissolution of feldspars in the surrounding rock. Conversely, larger and thicker-shelled brachiopods and bivalves such as *Manticula* and *Hokonuia* do not present as casts. When preserved, foraminifera and rare bryozoans are typically silicified. The overlying Warepan sandstone beds frequently contain fossils of the bivalve *Monotis* which exhibit a similar preservation style to older molluscs, though lacking clay minerals.

Presently, the fossiliferous Taringatura sandstones exhibit low porosity and low permeability, as is expected from the subsequent compaction of sandstones after burial. However, the dissolution of biogenic carbonate implies a past permeability. The presence of clay minerals in Oretian and Otamitan fossils may indicate a period of subaerial exposure and infiltration of meteoric water prior to the deposition of Warepan units. Notably, clay replacement occurs more frequently in the thinnest fossils. Original carbonate material may have persisted for longer in the more robust taxa, allowing them to resist most deformation from compaction prior to the final loss of carbonate. Differential diagenesis of biogenic carbonates supports the existence of a significant unconformity between Otamitan and Warepan units in the Taringatura sandstones.

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