

TAPHONOMY OF A NUCULID BIVALVE CONCENTRATION FROM THE CAPE MELVILLE FORMATION (EARLY TERTIARY), KING GEORGE ISLAND, ANTARCTICA

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Bivalves are an important and yet poorly studied component of the invertebrate fauna of the Early Tertiary Cape Melville Formation, cropping out at Cape Melville, northern King George Island. The unit consists of about 200m of shales and silty shales with subordinate intercalation of siltstone and fine-grained sandstone of glacial-marine facies. Invertebrate taxons represented in the rich and diversified fauna of the Cape Melville Formation include mollusks (bivalves, gastropods, cephalopods and scaphopods), brachiopods, crustaceans, solitary corals, echinoderms and bryozoans. Bivalves studied occur dispersed or as relatively loose shell concentrations in the sediments, at various levels within the upper part of the formation. We present herein the results of a qualitative and quantitative analysis of a bivalve concentration obtained from the lower part of a section denominated Hard Ground (HGS), exposed on the upper plateau area of the Melville peninsula. The HGS (11 meters thick) comprises several 3-4 meters cycles of massive sandy-silty mudstone with abundant dropstones and thin (3-4 cm) calcareous bioturbated sandstone. They represent respectively periods of continuous marine deposition by settling of muds and sporadic distal diluted turbidity currents, alternating with intervals of formation of hard ground associated with starved basin condition. The fossiliferous bed (50 cm thick) consists of a relatively continuous dark gray to black, fine to very fine sandstone that transitionally overlies afossiliferous similar sandstone. Bioclasts occur mostly dispersed in the sandstone and only rarely weakly packed. The concentration is politypical and made up of species of nuculoid bivalves (70%, n=139). Other taxa present are solitary corals, gastropods and crabs. Taphonomic data were collected in the field on a previously prepared taphonomic table. Data on biofabric and taphonomic signatures as orientation, articulation, fragmentation, and shell dimensions, were taken for nearly two hundred specimens. The nuculid bioclasts show no preferred orientation, being almost equally represented by specimens with the commissure plane vertical, oblique or horizontal with relation to the bedding plane. Nearly 95% of shells were found with closed articulated valves. Signs of abrasion, bioerosion and dissolution are absent. Rare clusters of fragmented specimens were found. Size frequency points to absence of selection among nuculid bioclasts. The assemblage is considered of archaic-style and simple internal structure. If we consider the life position of nuculid bivalves as with dorsal margin upward and commissure plane oriented vertically to the bedding plane, than the random three-dimensional arrangement of bioclasts may be indicative of a reoriented assemblage. Taphonomic signatures as low disarticulation, absence of signs of abrasion, bioerosion and size selection, point out to short or no transport and minimal to no exposition in the substrate before burial. Bioturbation may be an explanation for the random three-dimensional arrangement by the life mode of nuculid as a mobile detritus-feeding component of the infauna. A tube filled with fragmented shells, interpreted as resulting from activity of homolodromiid crabs, may be accountable additional bioturbation. Extant nuculid bivalves are rarely found living obliquely and even with dorsal margin directed downward, opening the possibility for interpreting the concentration as including specimens *in situ*. Taphonomic features of the associated fauna, that includes numerous randomly oriented solitary corals, are also indicative of a reoriented or even of introduction of allochthonous constituents in the assemblage.

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