

TAPHONOMIC ANALYSIS OF AN ARTICULATED MYSTICETE (CETACEA; MYSTICETI) FROM THE LATE MIOCENE PUERTO MADRYN FORMATION, PENINSULA VALDÉS, PATAGONIA, ARGENTINA

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Taphonomic studies of fossil cetaceans in Argentina are scarce and they were focused mainly in odontocetes and mysticetes from the Gaiman Formation (lower Miocene of Patagonia). These analyses propose different factors (i.e., paleoenvironmental, paleobiological and paleoecological) that controlled the preservation of cetaceans. Prospecting fieldworks on the Puerto Madryn Formation (late Miocene) result in the discovery of a well-preserved and articulated baleen whale (= Mysticeti) specimen in Peninsula Valdés, Chubut, Argentina. This specimen was the focus of a taphonomic analysis with a multidisciplinary approach including taxonomical, sedimentological, stratigraphic and ichnological analyses, with the aim of reconstructing the taphonomic processes and the paleoenvironmental conditions that played a role in the preservation of the specimen. The preliminary taxonomic analysis shows that the specimen corresponds to an adult to subadult belonging to the family Balaenidae. It displays a high degree of articulation, a low to moderate degree of fragmentation and a relatively high degree of completeness (i.e., presence of cranial bones, tympano-periotic, mandibles, maxilla, caudal, thoracic and cervical vertebrae, ribs and a fragmented scapula). Our results suggest that after death, the balaenid followed a brief biostratinomic route that can be summarized in four stages: A) death at sea, with an initial decomposition and positive buoyancy of the carcass; B) internal accumulation of putrefaction gases, reorientation, loss of connectivity of the skeletal elements and gas loss; C) sinking and deposition in ventral-up position on the seafloor and; D) a lateral re-orientation (side-up) of the postcranial region due to physical and biological processes. The high degree of bones articulation and association, the presence of mandibles, the moderate fragmentation and the lack of evidence of scavenging, indicate no lateral transport on the seabed. These observations allowed us to dismiss reflation processes of the carcass. Also, the taphonomic features (e.g., high degree of articulation, low degree of fragmentation, polymodal orientation) of the associated invertebrate fossils and the ichnogenera, support this interpretation. The final deposition of the whale carcass on the seafloor did not result in an ecological impact as is known for whale-fall communities' studies. Finally, the collected data indicates a low-energy shelf environment with normal marine oxygenation, productivity and salinity conditions, characterized by a soft bottom and a low to moderate sedimentation rate. This, combined with the high bioturbation activity, resulted in a rapid burial of the carcass because of the sediment removal. Thereby, the fossil diagenetic processes allowed the final conservation of the skeleton.

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