

EFFECTS OF COMPACTION IN AMMONITE MOULDS AND THEIR TAPHONOMIC IMPLICATIONS. AN EXAMPLE FROM THE ROSSO AMMONITICO OF THE NORTHERN APPENNINES (EARLY-MIDDLE TOARCIAN, UMBRIA-MARCHE, ITALY).

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Encrustation and/or bioerosion have been observed on both sides of several ammonites sampled from Early-Middle Toarcian Rosso Ammonitico of Umbria-Marche Apennines (Central Italy). The majority of these features are due to the activity of polychaete worms, the simple encrustation is due to serpulids whilst the main simple bioerosion is referable to an unknown ichnogenus similar to *Maeandropolydora* VOIGT. The ornamentation features of the studied samples allowed us to recognise that the recorded upper sides are preserved as composite moulds, while the lower sides as internal moulds. The overprinting of the external shell structures on the internal infillings took place during burial diagenesis.

The presence of boring and/or encrustation in the lower side of an internal mould is classically interpreted as evidence of reworking. Regarding our specimens, if the colonisation phase in their lower sides took place on the internal moulds, it should have occurred after the compaction phase which is characteristic of deep burying. In this case the stratigraphic position of the encrusted and bored moulds should have been sensibly anomalous. Instead, the case-studied specimens are associated with others of the same species which are not encrusted and/or bored, and their stratigraphic position coincide with biostratigraphic data known in literature. Furthermore, none of the studied ammonites display any discontinuity between the body chamber infilling and the surrounding rock and some of them display geopetal structure in agreement with the polarity of the stratigraphic succession.

In our interpretation the phenomena of encrustation and/or boring by polychaete worms occurred before the dissolution of the shells, but it is impossible to ascertain whether the shell was already infilled or not. The encrustation by polychaete worms probably occurred during post-mortem drifting or when the shell was exposed on the sea floor.

The preservation of only half of the boring galleries establish that the shell was in situ when the simple bioerosion phenomena occurred. Similar features have been observed in *Maeandropolydora decipiens* VOIGT, which bores also along the boundary between the calcitic and the aragonitic layers of some bivalve shells and the side of others encrusted to the substrate. In conclusion, there is no need to hypothesise the exhumation of the shell to justify the boring action.

Encrustation and bioerosion cannot be univocally considered as reworking criteria without taking into account other taphonomic evidence, linked to diagenetic processes. It can be seen that the validity of encrustation reworking criterion, is here reinforced: the lower sides of the samples studied (now internal moulds), which are now encrusted, were not originally the surfaces in contact with the substrate at the time of the last sediment burial.

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