

## BOOK REVIEW

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JANSSEN, ARIE W., 2012. Systematics and biostratigraphy of holoplanktonic Mollusca from the Oligo-Miocene of the Maltese Archipelago. – *Bollettino del Museo Regionale di Scienze Naturali - Torino* 28(2): 197-601. Price unknown.

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Since the early 1980's A.W. Janssen has specialized in fossil holoplanktonic Mollusca. These open sea organisms, with very thin shells, have little fossilization potential in near-shore sandy sediments, but may be abundant in fine-grained offshore deposits. During his studies of the Mediterranean, Janssen discovered rich Tertiary deposits on Malta. He moved to that island and here are the results of his long stay there: he increased the known holoplanktonic taxa from Malta from 1 to 85!

In his introduction Janssen shortly mentions the importance of holoplanktonic molluscs and in particular the pteropods in stratigraphy. As planktonic organisms they have on average a larger distribution than benthic. Compared with other planktonic microorganisms used in stratigraphy such as coccoliths, planktonic foraminifera, radiolaria and dinoflagellates, their fragility is an advantage: they do not easily survive transport to a secondary locality which makes them very suitable for stratigraphy. If they are transported, their internal moulds usually will show the marks of being transported. They first appeared in the Late Paleocene, bloomed in the Miocene with more taxa even than extant now. They have a very thin aragonitic shell, which dissolves and breaks easily. During fossilization usually their shell dissolves and only internal moulds survive. On Malta most holoplanktonic molluscs are found as fos-

foritic or limonitic moulds.

In his method section Janssen explains the best way to extract fosforitic fossils from their chalk matrix: use formic acid, but acetic acid is cheaper and works as well. His overview of the geology and stratigraphy of Malta and complete list with pictures and coordinates of all the localities studied (60 pages) will be very useful for all who want to study the geology of Malta and collect fossils. The appendix illustrates that in these localities more is to be found than only holoplanktonic molluscs. Malta was once famous for its shark's teeth, sold as tongstones!

The description of the holoplanktonic gastropods forms understandably the principal part, with 200 pages text, 20 plates of drawings by the author and 6 plates with SEM pictures. Amongst the finer fraction of the samples many protoconchs of pteropods were found. These gave many problems in identification, in particular because it is now known that probably all Gymnosomata, which live as adults without shell (hence their name), for a very short period have a larval shell. Janssen describes 14 types of such protoconchs that could not be assigned to Thecosomata; he names 5 protoconchs of Gymnosomata and describes another 11 types of gymnosome larval protoconchs. It is clear that more work is needed on the Recent Gymnosomata which includes the difficult task of culturing these species in aquaria. The work of pioneers Lalli & Conover in the 1970s in this field is not continued. Apparently no funds are to be found now for such fundamental and 'useless' work.

A couple of range-charts give the distribution in time of the 85 taxa on Malta. They are based on samples collected in different ways and the size of the samples (not given, but not standardized) may influence the observed vertical distribution of taxa, which of course differs from their real occurrence in time, because the first and last ones may not be preserved at all. Nevertheless, these range charts enabled the author to distinguish biozones on Malta and compare these with those for the whole Mediterranean area and the North Sea basin. This makes his work an interesting contribution to Tertiary stratigraphy and a plea for the use of holoplanktonic gastropods.