Book review

Janssen A.W., 2012. Systematics and biostratigraphy of holoplanktonic Mollusca from the Oligo-Miocene of the Maltese Archipelago. *Bolletino Museo regionale di Scienze naturali Torino* 28: 197-601.

A book review about what is technically a journal article is not standard practice, but this publication does merit such an exception. This is the third 'major' monographic work of Arie W. Janssen on holoplanktonic molluscs from Europe (the earlier ones are Janssen, 1995 on the Italian Neogene, based on the Bellardi & Sacco collections, and Cahuzac & Janssen, 2010 on the Eocene-Miocene of the Aquitaine Basin). The current publication is over 400 pages and actually *feels* like a book in your hands. It is the product of two decades of work by the author in Malta and Gozo and it reads as a definitive guide to the Maltese holoplanktonic molluscs.

The 'material and methods' section includes a description of the tedious formic acid-treatment of carbonate rock samples to release the contained phosphoritic fossils. EU antiterrorism regulations made the supply of formic acid impossible in 2009 and Janssen had to rely on acetic acid. In order to prevent the dissolution of the phosphorite of which most of the moulds consist, he had developed his own method of buffering the acid with phosphorite remains from earlier samples. These kinds of details are testimony to the sheer unending efforts the author has spent in the collection and study of the fossil planktonic gastropod groups. It even played a role in the move to Gozo, where he and his wife Edith live in a house built from pteropod-bearing limestones and that, not surprisingly, is named after one of those fossils: *Cavolinia cookei*.

Janssen treats 85 species, twenty of which are described as new. The species have been collected from Chattian to early Tortonian deposits (*c*. 27-9 Ma) of Malta and Gozo. The fauna also includes five species of gymnosome slugs that only have tiny embryonic shells. For that group Janssen also summarizes and illustrates all published gymnosome fossils, often in remote publications. The descriptions of all fossils are well structured as well as meticulous and accompanied by characteristic and clear dotted drawings by the author as well as SEM micrographs.

The holoplanktonic molluscs in this paper contribute in two ways to stratigraphy. First, they have enabled more refined age estimates to be made for the Maltese succession, including crude estimates for the hiatuses that separate major lithostratigraphic units and are present within units such as the Globigerina Limestone Formation. As such, this work is highly relevant for anyone working on Maltese stratigraphy. The extensive introduction on the localities from which Janssen retrieved his material (all of 56 pages!) reads as the definitive guide to Maltese marine fossiliferous outcrops.

The second point of stratigraphic relevance is the introduction of a Mediterranean pteropod biozonation. It is entirely due to the author's efforts that a pteropod zonation of the area could be developed for the Oligocene-Neogene with zones of typically one to three million years duration. Combined with the existing nannoplankton and foraminiferan biostratigraphic schemes this makes the stratigraphic subdivision of the Mediterranean marine units more robust and precise. The Mediterranean zonation presented is termed 'preliminary', although a 26 page section in the paper reviewing the pteropod faunas from all major Neogene localities in the Mediterranean Basin suggests that the zonation is more than that.

An unfortunate point in the description of the taxa is the use of the indication 'Genus Clionidarum' (explained as: 'a genus of the Clionidae') for the gymnosomatous taxa. Janssen does argue very clearly on p. 452 his choice to use such an 'open generic name'. However, this solution for applying a genus name is controversial in the practice of zoological nomenclature, despite its widely and long accepted use in *e.g.* otolith works. Janssen describes five species of gymnosomes as 'Genus Clionidarum'. Future work that will allow the attribution of these species to genera will lead to relatively minimal change in names and should not affect authorship, and as such the choice of the author seems justified. However, it might have been wiser to circumvent any uncertainty by referring the species to *e.g*. *Clione* and discuss the problematic status of such an attribution. Exactly that is done in a follow-up publication by Janssen in the current issue of Cainozoic Research that formally makes the five species available, luckily still in 2012. The section on the gymnosomatous shells serves as a base for any palaeontologist wishing to work with these tiny snails worldwide.

In summary, Janssen's work on the Maltese holoplanktonic molluscs from Malta is a milestone. I recommend it as a must-read for anyone working with the Oligocene-Miocene stratigraphy of the Maltese islands and on Gymnosomata palaeontology and a must-have for anyone working with Chattian-Neogene Mediterranean marine biostratigraphy.

I am grateful to Steven Tracey (ICZN Secretariat, London, UK) for linguistic help.

References

Cahuzac, B. & Janssen, A.W. 2010. Eocene to Miocene holoplanktonic Mollusca (Gastropoda) from the Aquitaine Basin, southwest France. *Scripta Geologica* 141: 1-193.

Janssen, A.W. 1995. Systematic revision of holoplanktonic Mollusca in the collections of the 'Dipartimento di Scienze della Terra' at Torino, Italy. *Monografie Museo regionale di Scienze naturali Torino* 17: 1-233.

Janssen, A.W. 2012.Validation of holoplanktonic molluscan taxa from the Oligo-Miocene of the Maltese Archipelago, introduced in violation of ICZN regulations. *Cainozoic Research* 9(2): 189-191.

Frank Wesselingh