

Neopilina galathea: Living Fossil from the Ocean

Admittedly all her children are equally precious to Mother Nature. However, in the eyes of the ordinary human being, some animals (dinosaurs, for example) are definitely more newsworthy than others (moss, for example). Therefore, many eyebrows were raised when the scientific community hailed the discovery of a lowly mollusc (cousin to sundry snails, slugs and squids) as, "one of the greatest sensations in the (twentieth) century."

Although molluscs are second only to arthropods in species diversity, new species are still discovered occasionally. This time the discovery pertained to a member of the Class Monoplacophora. Monoplacophora means, "bearing one plate" and refers to the cap-shaped shell that covers the soft-bodied mollusc. Till 1957, all Monoplacophora were considered extinct, as they were known only from fossilized specimens about 550-380 million years old.

The picture changed dramatically, when on 6 May 1952 some molluscs, existing quietly at a depth of 3590 m, were hauled on to the deck of the Danish research ship Galathea. The area was the Middle America Trench off Costa Rica's Pacific coast. The molluscs were nothing much to look at: neither attractively coloured nor beautifully sculpted. They had a single dome-shaped shell rather similar to limpet shells. Still, they managed to catch the attention of the Danish zoologist Dr. Henning Lemche as he sorted through the day's catch. "They seemed to be fragile limpets of a rather uninteresting appearance," he later wrote. "But there was something about them I could not understand."

It would take him five years to understand them! In February 1957, he published a paper identifying the limpet-like deep-sea mollusc as a living Monoplacophora. He named it *Neopilina galathea*. The generic name *Neo-pilina* means new *Pilina* (after *Pilina*, an extinct Monoplacophore that lived about 400 million years ago.) *Neopilina* apparently so closely resembles *Pilina* that, "the differences may prove to be of only sub-generic value." The species name, *galathea* honoured the Danish research ship. At that time, *Neopilina* was the only living Monoplacophore known to science.



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Once the taxonomic identity of these unassuming animals was established, it sent seismic waves through the community of malacologists with eulogies calling the discovery "the most dramatic one in the history of malacology." In a paper written in *Nature* (March 1957), C. M. Yonge wrote, "To a malacologist, at any rate, these dredge-hauls off the west coast of Mexico which secured no less than ten specimens with three extra shells of *Neopilina galathea* in themselves alone, more than justify the voyage of the Galathea around the world."

Neopilina also evoked tremendous interest because its organs such as nephridia (kidneys), heart, gills etc., are repeated serially, as in annelids (earthworms and their ilk) and arthropods (insects, spiders and crabs). Molluscs are not a segmented group and it appeared that *Neopilina* might be an exception and so a potential "missing link" between the molluscs on one hand and the annelids and arthropods on the other. However, this idea has now been dropped, as has the idea of using *Neopilina* as a model archaic-mollusc. Currently, *Neopilina*'s status is somewhat fuzzy although its ancient lineage is in no doubt.

Neopilina has been found in the Pacific Ocean, Indian Ocean, Gulf of Aden, and the Antarctic Ocean. Clearly, living Monoplacophora is widespread and has evaded detection only because it inhabits deep waters. That modern *Neopilina* is virtually unchanged since the early Paleozoic (~542 to 241 million years ago.) makes us appreciate the saying, "Do not judge a book by its cover" ...or a Living fossil by its appearance.



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