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Notes on the evolution and higher classification of the subclass Neritimorpha (Gastropoda) with the description of some new taxa

Klaus BANDEL & Jiří FRÝDA

with 3 text-figures and 3 plates

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Neritimorpha represent a subclass of the Gastropoda that regarding its anatomy is close to the Archaeogastropoda, regarding its ontogeny it resembles more the Caenogastropoda. Ontogenetic development includes a larval phase during which a planktotrophic veliger may produce a larval shell. The members of the new order Cycloneritimorpha have a larval shell that is tightly coiled and rounded. The representatives of the other new order Cyrtoneritimorpha have a hook-like openly coiled protoconch. Recognition of these two new taxa splits seemingly well established Palaeozoic gastropod groups like the Platyceratoidea which apparently are polyphyletic. The protoconch shape is evidence for teleoconch convergence between a Carboniferous *Orthonychia* and the Triassic *Pseudorthonychia* n. gen. Neritimorpha existed from Ordovician onward first with the Cyrtoneritimorpha and later the still extant Cycloneritimorpha with an overlap in time of occurrence from the Devonian to the Permian.

Neritimorpha stellen eine unabhängige Unterklasse der Gastropoda dar, deren anatomische Merkmale jenen der Archaeogastropoda ähneln, während der Verlauf ihrer Ontognese mehr dem der Caenogastropoda gleicht. Die Ontogenese der Neritimorpha schließt eine Larvalphase ein, in deren Verlauf eine planktotrophe Larve ausgebildet sein kann, die dann eine eigene Larvalschale ausscheidet. Innerhalb der Ordnung Cycloneritimorpha n. ord. wird eine Larvalschale ausgeschieden, die eng gewunden ist und rundliche Gestalt besitzt. Bei den Cyrtoneritimorpha n. ord. ist hingegen der Protoconch offen hakenartig gebogen. So gut bekannte paläozoische Gruppen wie die Platyceratoidea scheinen jeweils beiden Unterklassen zuzufallen. Auf jeden Fall ist die karbonische Gattung *Orthonychia* trotz fast identem Teleoconch nicht mit der triassichen Gattung *Pseudorthonychia* n. gen. zu vereinen, sondern konvergent entstanden. Cyrtoneritimorpha bestehen vom Ordovizium an, vom Devon bis zum Perm lebten sie mit den Cycloneritimorphen gemeinsam, und seit der Trias existieren nur noch die Cycloneritimorpha.

Addresses of the authors: Prof. Dr. Klaus BANDEL, Universität Hamburg, Geologisch-Paläontologisches Institut und Museum, Bundesstraße 55, D-20146 Hamburg, Germany, e-mail: <bandel@geowiss.uni-hamburg.de>. – Jiří FRÝDA, Czech Geological Survey, Klarov 3/131, 118 21 Praha 1, Czech Republic, e-mail: <fryda@cgu.cz>

Introduction

Neritidae have several anatomical characters that distinguish them quite well from other gastropods (see FRETTER & GRAHAM 1962 for data and references). Their radula resembles that of the Archaeogastropoda (TROSCHEL 1856), and they have, therefore, usually been placed close to these or within these to representing one of their families or superfamilies. This was so even though their differences to usual types of archaeogastropods as found among the Trochoidea s.l. and Pleurotomarioidea s.l. had been stated quite early (BOURNE 1908). WENZ (1938) interpreted the Neritacea (= Neritoidea) to represent one of several superfamilies of the order Archaeogastropoda. KNIGHT et al. (1960) considered them to belong to the order Archaeogastropoda and here the superorder Neritopsina with mainly the Neritacea (= Neritoidea).

The taxon Neritimorpha was established by GOLIKOV & STAROBOGATOV (1975) as a new superorder of the subclass Pectinibranchia BLAINVILLE, 1814 of the class Gastropoda. In this frame, the Neritimorpha unite the superfamilies Neritoidea, Hydrocenoidea, Titiscanioidea, and with question mark also Cocculinoidea. This latter group of the cocculinids had already been placed with some reservations next to the Neritacea by THIELE (1931-35), and here it is still found in modern accounts on gastropod classification as that of PONDER & LINDBERG (1997). SALVINI-PLAWEN & HASZPRUNAR (1987) placed the Neritopsina (= Neritimorpha) in the Archaeogastropoda. Later, HASZPRUNAR (1993) again suggested to place the Neritimorpha and the architaenioglossate groups (Cyclophoroidea and Ampullarioidea) to the Archaeogastropoda which he considered to be a paraphyletic taxon.