Some heterostrophic gastropods from Triassic St. Cassian Formation with a discussion on the classification of the Allogastropoda

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With 18 figures

Abstract: Fifteen species of Heterostropha are described, 12 of them for the first time. All are newly interpreted with regard to their taxonomic relation to fossil and living gastropods. The Streptacidae with long Paleozoic history are represented in the Late Triassic St. Cassian Formation by several genera that can be differentiated into four families. The Ebalidae are represented by Ebala, with smooth protoconch, Cassianebalidae by Cassianebala and Loxebala with axially ornamented protoconch. The Donaldinidae of St. Cassian are represented by one species of Donaldina and two of Neodonaldina that stand in the continuation of Paleozoic species of Donaldina. Architectonicoidea with shells coiled in a plane and Valvatoidea appear in the St. Cassian fauna without known Paleozoic relation. In the former superfamily the Architectonicidae can be recognized in the genus Rinaldoconchus with two species. Cassianaxidae with Cassianaxis, Amphitomariidae with Amphitomaria, Stuoraxidae with Stuoraxis and Amppezzygrya have a sinistral protoconch and planispirally coiled dextral teleconchs. They all resemble different modern species that have similarly small shells. Modern Hyalogyrinidae have with Alexogyra a new representative from the Triassic. The Valvatoidea are represented with the genera Carboninia and Bandellina. The relation of described species in the system of the Heterostropha is discussed.

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Introduction

The knowledge of the morphology of the protoconch allows to place a number of gastropods from the Upper Triassic St. Cassian Formation into the gastropod subclass Heterostropha. Light is also shed on the evolution of distinct lineages within the subclass. Heterostrophic protoconchs can be recognized on quite a number of species that have been found in the marls of the St. Cassian Formation of the Italian Dolomites near Cortina d’Ampezzo (ZARDINI 1978, 1980, 1985; BANDEL 1988a, b, 1991e, 1992, 1994a, b, 1995).

According to BIZZARINI et al. (1986) and URLICHs (1994) the St. Cassian Formation has been deposited in the time interval between the Late Ladinian and Carnian, with the described here mainly from the Cordevol Member of Early Carnian age. The gastropods lived in shallow water along the edge to deeper basins but were preserved in the sediments of the basins. BLENDINGER & BLENDINGER (1989), FURSICH & WENDT (1977) and WENDT & FÜRSCHE (1980) demonstrated that basins and carbonate platforms existed very close to each other when the area was part of islands and banks at the margin of the tropical Palaeo-Tethys Ocean. Gastropods lived in great numbers within reefs growing on the transition from shallow warm carbonate lagoons to the open ocean. They were preserved in clay-rich, often tuffaceous sediments of the basins, into which they were slumped down more or less steep slopes. Their actual living environment – when preserved in the rock column – provides no further information since it has been transformed into coarse-grained limestone and commonly been dolomitized. During this process all smaller gastropods have disappeared, and larger ones are preserved only as undeterminable internal fills.

The gastropods thus must be collected from basin sediments that have formed alongside with the carbonate platforms, fringing reefs, and low islands. Localities rich in fossils have been described and located in an illustration by ZARDINI (1978). The localities here mentioned are Campo, above Campo di Sopra in Cortina d’Ampezzo in the forest; Dibona or Milieres, exposed slumps below the Rifugio Dibona near the road from Cortina d’Ampezzo to Falzarego pass; Alpe di Specie (Seelandwiesen) above Carbonin (Schluderbach) and close to Rifugio Vallandro (Dürreinstein Hütte); Misurina at the ski lift near the Rifugio Lago di Antorno in the Valle Popena; and Stuores (Störes-Wiesen) consisting of a landslide below the ridge of Pralongia on the way to the Sëttssas above St. Kassian (S. Cassiano). In Alpe di Specie and Misurina fossils can be extracted from marls with slumps of carbonate debris that came down the slopes into the basin. The localities of Dibona and Stuores contain the fossils in graded beds of sorted pebbly carbonate and coarse sand that was emplaced by turbidity currents having their origin on the carbonate platform. In Campo, due to recent and subrecent sliding, the slump mixed up both types of deposits.

Dr. RINALDO ZARDINI and ROLANDO LANCEDELLI from Cortina d’Ampezzo have provided me with samples from their collecting activities of many years in the area of Cortina d’Ampezzo. The late R. ZARDINI also published on the gastropods of St. Cassian Formation and produced three beautifully illustrated guides, in which he named a large number of new species. His material is exhibited at the Community Museum of Cortina d’Ampezzo. These illustrations are a great improvement over the drawings that have been presented by MÜNSTER (1841), LAUBE (1868) and KITTL (1894). The study of the early whorls of many of the species from St. Cassian Formation provided the opportunity to revise the taxonomy of the species (BANDEL 1988a, b, 1991d, e, 1992a, b, c, 1993a, b, c, 1994a, b, 1995) that have been described by MÜNSTER (1841), LAUBE (1868), KITTL (1894) and ZARDINI (1978, 1980, 1985).

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