

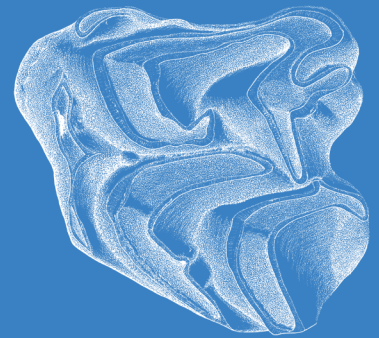
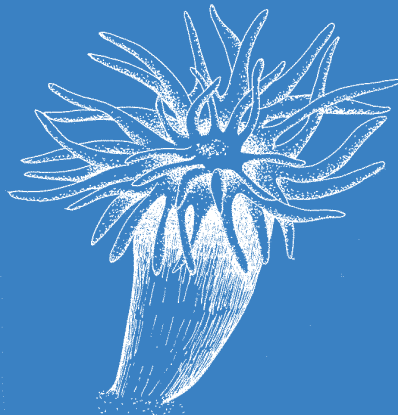
Zitteliana

An International Journal
of Palaeontology and Geobiology

Series A / Reihe A
Mitteilungen der Bayerischen Staatssammlung
für Paläontologie und Geologie

50

Jubilee Volume



München 2010

Zitteliana

An International Journal of Palaeontology and Geobiology

Series A/Reihe A

Mitteilungen der Bayerischen Staatssammlung für Paläontologie und Geologie

50

CONTENTS/INHALT

BABA SENOWBARI-DARYAN & MICHAELA BERNECKER <i>Amblysiphonella agabensis</i> nov. sp., and <i>Musandamia omanica</i> nov. gen., nov. sp. (Porifera) from the Upper Triassic of Oman	3
ALEXANDER NÜTZEL A review of the Triassic gastropod genus <i>Kittliconcha</i> BONARELLI, 1927 – implications for the phylogeny of Caenogastropoda	9
ANDRZEJ KAIM & MARIA ALESSANDRA CONTI A problematic zygopleuroid gastropod <i>Acanthostrophia</i> revisited	21
GERNOT ARP Ammonitenfauna und Stratigraphie des Grenzbereichs Jurensismergel/Opalinuston- Formation bei Neumarkt i.d. Opf. (oberstes Toarcium, Fränkische Alb)	25
VOLKER DIETZE Über <i>Ammonites Humphriesianus umbilicus</i> QUENSTEDT, 1886 an seiner Typus-Lokalität (östliche Schwäbische Alb, Südwestdeutschland)	55
VOLKER DIETZE, GÜNTER SCHWEIGERT, GERD DIETL, WOLFGANG AUER, WOLFGANG DANGELMAIER, ROGER FURZE, STEFAN GRÄBENSTEIN, MICHAEL KUTZ, ELMAR NEISSER, ERICH SCHNEIDER & DIETMAR SCHREIBER Rare Middle Jurassic ammonites of the families Erycitidae, Otoitidae and Stephanoceratidae from southern Germany	71
WOLFGANG WITT Late Miocene non-marine ostracods from the Lake Küçükçekmece region, Thrace (Turkey)	89
JÉRÔME PRIETO Note on the morphological variability of <i>Keramidomys thaleri</i> (Eomyidae, Mammalia) from Puttenhausen (North Alpine Foreland Basin, Germany)	103
MARTIN PICKFORD Additions to the DEHM collection of Siwalik hominoids, Pakistan: descriptions and interpretations	111
MICHAEL KRINGS, NORA DOTZLER, THOMAS N. TAYLOR & JEAN GALTIER Microfungi from the upper Visean (Mississippian) of central France: Structure and development of the sporocarp <i>Mycocarpon cinctum</i> nov. sp.	127
ZLATKO KVAČEK & JOSEF BOGNER <i>Aracistrobus</i> , an enigmatic non-araceous fossil from the Eurasian Oligocene and Miocene	137
Instructions for authors/Hinweise für Autoren	143

Zitteliana	A 50	143 Seiten	München, 30.06.2010	ISSN 1612-412X
------------	------	------------	---------------------	----------------

Editors-in-Chief/Herausgeber: Gert Wörheide, Michael Krings
Production and Layout/Bildbearbeitung und Layout: Martine Focke, Manuela Schellenberger
Bayerische Staatssammlung für Paläontologie und Geologie

Editorial Board

A. Altenbach, München
B.J. Axsmith, Mobile, AL
F.T. Fürsich, Erlangen
K. Heißig, München
H. Kerp, Münster
J. Kriwet, Stuttgart
J.H. Lipps, Berkeley, CA
T. Litt, Bonn
A. Nützel, München
O.W.M. Rauhut, München
B. Reichenbacher, München
J.W. Schopf, Los Angeles, CA
G. Schweigert, Stuttgart
F. Steininger, Eggenburg

Bayerische Staatssammlung für Paläontologie und Geologie
Richard-Wagner-Str. 10, D-80333 München, Deutschland
<http://www.palmuc.de>
email: zitteliana@lrz.uni-muenchen.de

Für den Inhalt der Arbeiten sind die Autoren allein verantwortlich.
Authors are solely responsible for the contents of their articles.

Copyright © 2010 Bayerische Staatssammlung für Paläontologie und Geologie, München

Die in der Zitteliana veröffentlichten Arbeiten sind urheberrechtlich geschützt.
Nachdruck, Vervielfältigungen auf photomechanischem, elektronischem oder anderem Wege
sowie die Anfertigung von Übersetzungen oder die Nutzung in Vorträgen, für Funk und Fernsehen
oder im Internet bleiben – auch auszugsweise – vorbehalten und bedürfen der schriftlichen Genehmigung
durch die Bayerische Staatssammlung für Paläontologie und Geologie, München.

ISSN 1612-412X

Druck: Gebr. Geiselberger GmbH, Altötting

Cover illustrations: (from left to right) Shell of the gastropod *Loxonema regium* DE KONINCK from the Carboniferous of Belgium (redrawn from DE KONINCK 1881); Solitary coral *Caninia* sp. from the Carboniferous of England (redrawn from RAMSBOTTOM in MCKERROW 1978); Tooth of the rare ruminant *Orygotherium escheri* VON MEYER from the Miocene of Germany (after RÖSSNER & MÖRS 2001). **Back cover:** Atrium of the Munich Palaeontological Museum, view from the main entrance.

Umschlagbilder: (von links nach rechts) Gehäuse der Schnecke *Loxonema regium* DE KONINCK aus dem Karbon von Belgien (neu gezeichnet nach DE KONINCK 1881); Solitärkoralle *Caninia* sp. aus dem Karbon von England (neu gezeichnet nach RAMSBOTTOM in MCKERROW 1978); Zahn des seltenen Wiederkäuers *Orygotherium escheri* VON MEYER aus dem Miozän von Deutschland (nach RÖSSNER & MÖRS 2001). **Rückseite:** Lichthof des Paläontologischen Museums München, Blick vom Haupteingang.

Zitteliana	A50	21 - 24	2 Figs	München, 30.06.2010	ISSN 1612 - 412X
------------	-----	---------	--------	---------------------	------------------

*This paper is dedicated to
Jean-Claude Fischer (1930 – 2009)*

A problematic zygopleuroid gastropod *Acanthostrophia* revisited

By
Andrzej Kaim^{1,2*} & Maria Alessandra Conti³

¹*Bayerische Staatssammlung für Paläontologie und Geologie, Richard-Wagner-Strasse 10,
580333 München, Germany*

²*Instytut Paleobiologii PAN, ul. Twarda 51/55, 00-818 Warszawa, Poland*

³*Dipartimento di Scienze della Terra, Università “la Sapienza”, Piazzale Aldo Moro 5, 00185 Roma, Italy*

Manuscript received April 07, 2010; revised manuscript accepted April 25, 2010

Abstract

SEM examination of the type series of *Acanthostrophia acanthica* CONTI & FISCHER, 1984 from Middle Jurassic of Italy has shown that this gastropod most likely belongs to the family Protorculidae as previously suggested by NÜTZEL (1998). It is also similar to some Jurassic species of Polygyrinidae, which might also be related to Protorculidae. The supposition of KAIM et al. (2008) that *Acanthostrophia* is an early member of Abysochrysidae could not be confirmed.

Key words: Gastropoda, Zygopleuroidea, Abysochrysoidea, *Acanthostrophia*, taxonomy, Jurassic, Italy.

Zusammenfassung

Rasterelektronenmikroskopische Studien der Typuserie von *Acanthostrophia acanthica* CONTI & FISCHER, 1984 aus dem mittleren Jura Italiens ergaben, dass dieser Gastropode höchstwahrscheinlich der Familie Protorculidae angehört, wie dies schon von NÜTZEL (1998) vorgeschlagen wurde. Die Art ähnelt auch Vertretern der Familie Polygyrinidae, welche ihrerseits den Protorculidae nahe stehen könnte. Die Annahme KAIMS et al. (2008), *Acanthostrophia* sei ein früher Vertreter der Abysochrysidae, konnte nicht bestätigt werden.

Schlüsselwörter: Gastropoda, Zygopleuroidea, Abysochrysoidea, *Acanthostrophia*, Taxonomie, Jura, Italien.

1. Introduction

Acanthostrophia is a monotypic genus described by CONTI

& FISCHER (1984) from Middle Jurassic of Italy. Originally it was placed in family Zygopleuridae, which was a “dust bin taxon” at the time. Based on the original illustration which is of rather modest quality, KAIM et al. (2008) assumed that this genus may represent a basal abysochrysid. Abysochrysidae encompass modern deep sea caenogastropods. To substantiate or reject this hypothesis, we decided to examine the type series of *Acanthostrophia* under the SEM. The present paper presents the result of these investigations.

2. Material and repository

The specimens of *Acanthostrophia acanthica* have been recovered from locality Case Canepine (Fig. 1) in Umbria, Italy (CONTI & FISCHER 1981, 1984). According to Conti & Fisher (1984), the gastropods are from the *Stephanoceras humphriesianum* Zone (Lower Bajocian, Middle Jurassic). It is likely that the gastropod-bearing layer has been deposited in a neptunian dyke (CONTI & FISCHER 1984). The examined material consists of 8 specimens included in the type series by CONTI & FISCHER (1984). The holotype and 6 paratypes are illustrated herein (Fig. 2). The seventh paratype is a barely recognisable shell fragment. All specimens are housed in the Museum of Palaeontology, Department of Earth Sciences, University „La Sapienza“, Rome, Italy, collection N.S 8/MAC. The specimens are finely re-crystallised with calcite. The holotype is still partially embedded in a calcareous matrix while the paratypes are fully recovered from the host rock.

3. Methods

The specimens of the type series have been studied with

*Author for correspondence and reprint requests; E-mail: a.kaim@lrz.uni-muenchen.de

the SEM without coating. Preliminary observations have been made with a Philips XL-20 SEM at the Institute of Palaeobiology, Polish Academy of Sciences, Warsaw, Poland using a backscattered electron detector (BSE) and then on Philips XL-30 ESEM at the Faculty of Earth Sciences, University of Silesia, Sosnowiec, Poland using secondary electron (SE) and Centaurus (CEN) detectors.

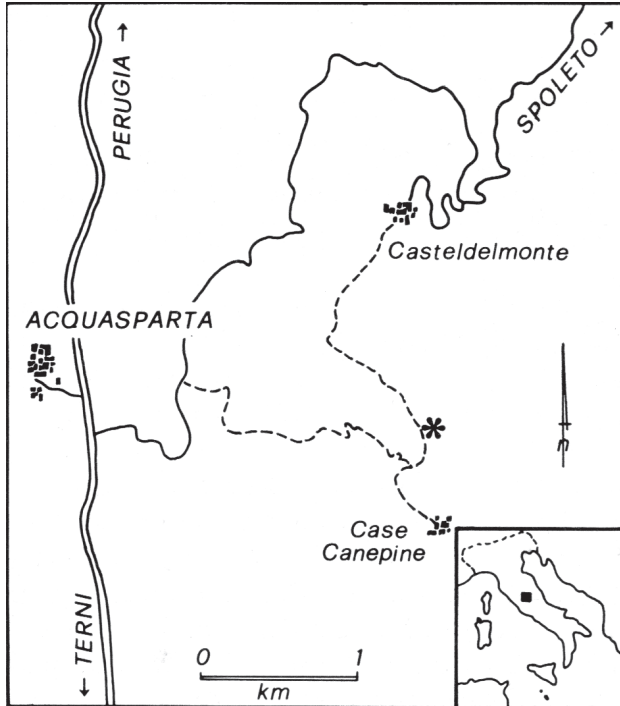


Figure 1: Geographical setting of the *Acanthostrophia acanthica* type locality (from CONTI & FISCHER 1981).

4. Systematic Palaeontology

Class Gastropoda CUVIER, 1797
 Order Caenogastropoda COX, 1959
 Superfamily Zygopleuroidea WENZ, 1938
 Family Protorculidae BANDEL, 1991

Genus *Acanthostrophia* CONTI & FISCHER, 1984

Type species: *Acanthostrophia acanthica* CONTI & FISCHER, 1984, by monotypy.

Original diagnosis: Coquille très élancée. Protoconque conique à tours nombreux, bombés et costulés. Tours de spire très nombreux, portant une rangée de fortes épines à leur partie inférieure. Aucune ornementation spirale. Base carénée à la périphérie, lisse, imperforée. Ouverture petite, holostome; bord columellaire mince, faiblement excavé, formant une courbe assez brusque à son point de raccordement avec le labre.

Translated diagnosis: Shell very elongated. Protoconch conical with many convex and ribbed whorls. Teleoconch with

numerous whorls having a line of strong spines in their lower part. No spiral ornamentation present. Base angulate at the periphery, smooth, anomphalous. Aperture small and holostomatous; columellar edge thin, slightly excavated, forming a rather abrupt curve at the connection point with the lip.

Acanthostrophia acanthica CONTI & FISCHER, 1984

Material: 8 specimens. Holotype (MAC 6.1) is an incomplete adolescent shell consisting of nine whorls (Fig. 2.2) and missing protoconch. Paratype MAC 6.2 is a juvenile shell (Fig. 2.1) with protoconch lacking the first whorl and one side of the shell worn. Remaining paratypes (MAC 6.3-7) are teleoconch fragments (Figs. 2.3-7).

Dimensions: Holotype (MAC 6.1): height 11.5 mm, width 4.5 mm, reconstructed height of complete specimen 23.2 mm. Paratype MAC 6.2: height 3.3 mm, width 0.9 mm; protoconch height 1.0 mm, width 0.4 mm.

Description: Protoconch long and slender, consisting of 5 whorls (first whorl missing). The protoconch is densely ornamented by slightly opisthocyrt axial ribs. The ribs are stronger at the whorl periphery and faint in the vicinity of the suture. Protoconch whorls with a slight subsutural bulge. Last protoconch whorl wider than the first whorl of the teleoconch. Demarcation between protoconch and teleoconch not preserved. Teleoconch starts with two rows of blunt nodes at upper and lower suture. The nodes from both rows are connected in pairs by a weak opisthocline shell elevations. The lateral flanks are slightly concave on the juvenile whorls. The nodes of both rows correspond closely each other at the suture forming together a single row of nodes with the suture crossing the nodes. Later in ontogeny, the abapical row of nodes becomes stronger than the other and moves slightly in an abapical direction; its nodes become more pointed. The adapical row of nodes disappears on the adult specimens and the shell outline becomes convex with the shell periphery located in the abapical portion of the shell flank. The aperture is poorly preserved on the examined specimens; it seems to be squareish and holostomatous.

Remarks: The holotype is an adult or adolescent shell displaying only the adult type of ornamentation described above. Very similar is also paratype MAC 6.5 (Fig. 2.5) while the best preserved juvenile paratype MAC 6.2 (Fig. 2.1) consisting of protoconch and 6 teleoconch whorls displays only the juvenile type of teleoconch ornamentation. Perhaps the paratype MAC 6.3 is an intermediate form; nevertheless it is possible that the type series belongs to two different species. To substantiate this suggestion, however, more topotypic material would be needed. Provisionally, we consider that the holotype and the paratypes are conspecific.

5. Discussion

Acanthostrophia acanthica has been originally placed in the family Zygopleuridae by CONTI & FISCHER (1984) This family was a dust bin taxon for high spired caenogastropods at the

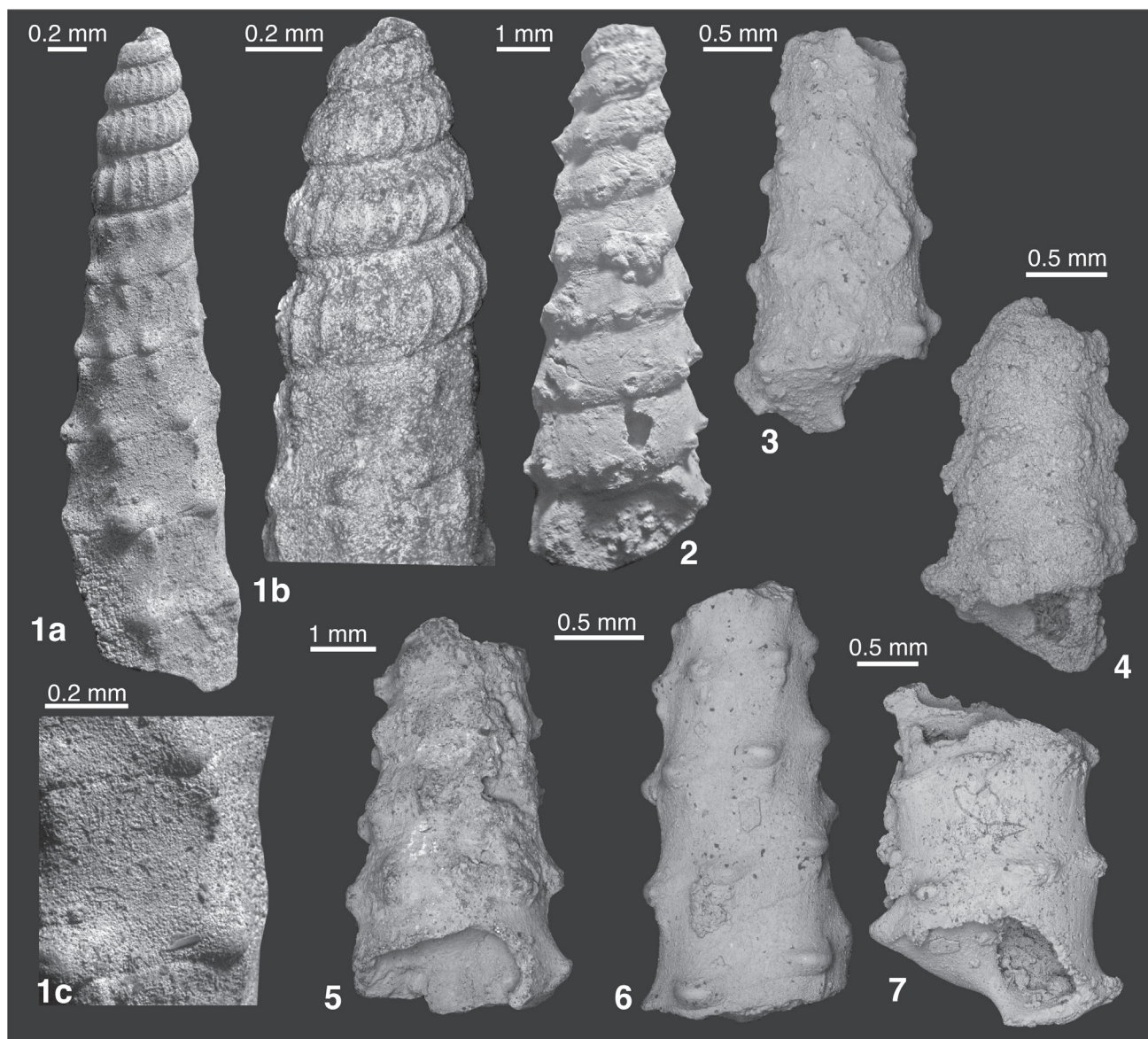


Figure 2: *Acanthostrophia acanthica* CONTI & FISCHER, 1984 from Lower Bajocian (Middle Jurassic) of Case Canepine, Umbria, Italy. 1. Paratype MAC 6.2, entire specimen (1a), close up of the protoconch (1b) and close up of the teleoconch sculpture (1c). 2. Holotype MAC 6.1. 3. Paratype MAC 6.3. 4. Paratype MAC 6.4. 5. Paratype MAC 6.5. 6. Paratype MAC 6.6. 7. Paratype MAC 6.7. 1a, 1c, and 2 performed on SE detector, all the others performed on CEN detector.

time. A major re-evaluation of this group became possible by SEM investigations of gastropod larval shells. The investigations of ‘zygopleurid’ protoconchs has been initiated by BANDEL (1991) and followed by NÜTZEL (1998) who subdivided ‘zygopleuroids’ into several families and suggested their phylogenetic relationships to the Recent families of the Ptenoglossa. NÜTZEL (1998) noted a striking similarity of the protoconch of *A. acanthica* to the protoconch of the Late Triassic *Protorcula subpunctata* (MÜNSTER, 1841) and included the former species into the family Protorculidae. KAIM et al. (2008) suggested that *A. acanthica* might be a basal abyssochrysoid. Indeed *A. acanthica* has a strongly elongated teleoconch with squareish holostomatous aperture and multispiral, axially ribbed protoconch; characters occurring also in abyssochrysoids (e.g. *Hokkaidoconcha*). However, *A.*

acanthica, has no trace of spiral ornamentation on the protoconch and a different pattern of ornamentation on the early whorls of the teleoconch. The teleoconch ornament resembles that of *Protorcula subpunctata* (BANDEL 1991; NÜTZEL 1998). It supports the suggestion of NÜTZEL (1998) that Protorculidae is a better place for *Acanthostrophia*. Another group of zygopleuroids to which *Acanthostrophia* is similar is the small Triassic-Jurassic family Polygyrinidae. Some species of the Jurassic polygyrinid *Teutonica*, e.g. *T. calloviana* GRÜNDEL, 2001 and *T. jakubowskii* KAIM, 2004 possess a multispiral axially ribbed protoconch and a teleoconch ornamentation which is similar to that of *Acanthostrophia acanthica*. Polygyrinidae are of uncertain position among ‘zygopleuroids’ (NÜTZEL 1998; GRÜNDEL 2001; KAIM 2004), a link to *Acanthostrophia* may suggest they stand close to Protorculidae. Polygyrinidae

differ from Protorculidae in having a somewhat flattened upper part of the protoconch..

NÜTZEL (1998) considered Protorculidae as sister group of a clade consisting of Triphoroidea + Cerithiopsoida while Protorculidae + (Triphoroidea + Cerithiopsoida) would form the sister group of Janthinoidea. The position of Abyssochrysidae remained unresolved on his diagram (evolved from Protorculidae, Zygopleuridae, Pseudozygopleuridae, or early Janthinoidea). Recently, KAIM et al. (2008) suggested that abyssochrysid are close relatives of provannids, a group of gastropods typical of chemosynthesis-based communities (hydrothermal vents, hydrocarbon seeps, vertebrate falls and sunken driftwood). Some similarity of abyssochrysid to *Acanthostrophia* and Protorculidae may suggest that the latter family is ancestral to Abyssochrysoidea but such a hypothesis requires more extensive studies of fossil representatives which is beyond the scope of the present paper.

6. Conclusions

The type series of 'zygopleuroid' gastropod *Acanthostrophia acanthica* Conti & Fischer, 1984 has been investigated using SEM techniques. The observations allowed to include this monospecific genus into family Protorculidae as was suggested earlier by NÜTZEL (1998). *Acanthostrophia* resembles also Jurassic species of Polygyrinidae, a family which might be closely related to Protorculidae. The suggestion of KAIM et al. (2008) that *Acanthostrophia* might be an early abyssochrysid could not be confirmed although it seems still to be likely that Abyssochrysoidea (Abyssochrysidae + Hokkaidoconchidae + Provannidae) may have evolved from one of the 'zygopleuroid' families.

Acknowledgements

The visit of AK to Rome and Sosnowiec was financed by Institute of Paleobiology PAS (Warsaw, Poland). The paper has been completed thanks to support from the Alexander von Humboldt Foundation to AK. Mariusz SALAMON, Ewa TEPER, and Michał ZATOŃ (all Silesian University) are thanked for assistance during SEM work in Sosnowiec. Alex NÜTZEL (Munich, Germany) is kindly acknowledged for his detailed review and translation of the abstract into German.

7. References

- BANDEL, K. (1991): Über triassische »Loxonematoidea« und ihre Beziehungen zu rezenten und paläozoischen Schnecken. – *Paläontologische Zeitschrift*, **65**: 239–268.
- CONTI, M. A. & FISCHER, J. C. (1981): Preliminary notes on the Aalenian Gastropods of Case Canepine (Umbria, Italy). – In: A. FARINACCI & S. ELMI (Eds), *Rosso Ammonitico Symposium Proceedings*; Roma (Edizioni Tecnoscienza), 137–147.
- CONTI, M. A. & FISCHER, J. C. (1984): La faune à gastéropodes du Jurassique moyen de Case Capenine (Umbria, Italie), systématique, paléogéographie, paléocologie. – *Geologica Romana*, **21**: 125–183.
- GRÜNDEL, J. (2001): Nerithimorpha und weitere Caenogastropoda (Gastropoda) aus dem Dogger Norddeutschlands und des nordwestlichen Polens. – *Berliner Geowissenschaftliche Abhandlungen, Reihe E*, **36**: 45–99.
- KAIM, A. (2004): The evolution of conch ontogeny in Mesozoic open sea gastropods. – *Palaeontologia Polonica*, **62**: 3–183.
- KAIM, A., JENKINS, R. G. & WARÉN, A. (2008): Provannid and provannid-like gastropods from the Late Cretaceous cold seeps of Hokkaido (Japan) and the fossil record of the Provannidae (Gastropoda: Abyssochrysoidea). – *Zoological Journal of the Linnean Society*, **154**: 421–436.
- NÜTZEL, A. (1998): Über die Stammesgeschichte der Ptenoglossa (Gastropoda). – *Berliner Geowissenschaftliche Abhandlungen, Reihe E*, **26**: 1–229.