

New Coleoidea from the Lower Jurassic of Southwest Germany

By Wolfgang Riegraf, Tübingen

With 2 figures in the text

RIEGRAF, W. (1982): New Coleoidea from the Lower Jurassic of Southwest Germany. – N. Jb. Geol. Paläont. Mh., 1982 (2): 91–97; Stuttgart.

Abstract: Rare specimens of ?*Phragmoteuthis* sp. (Lower Hettangian), *Phragmoteuthis* sp. cf. *Phragmoteuthis montefiorei* (BUCKMANN 1880) (Lower Sinemurian) and *Chondroteuthis wunnenbergi* BODE 1933 (Lower Toarcian) are described from Southwest Germany for the first time. It is shown that *Chondroteuthis wunnenbergi* BODE had an ink sac.

Key words: Discoveries, Belemnoida (Coleoidea), Lower Liassic, Toarcian, anatomy (ink sac); South-West German Hills (Tübingen, Dormettingen), Baden-Württemberg.

Zusammenfassung: Aus dem südwestdeutschen Lias werden erstmalig *Phragmoteuthis* sp. (Unteres Hettangium), *Phragmoteuthis* sp. cf. *montefiorei* (BUCKMANN 1880) (Unteres Sinemurium) und *Chondroteuthis wunnenbergi* BODE 1933 (Unteres Toarcium) als seltene Funde beschrieben. Für *Chondroteuthis wunnenbergi* BODE wird der Besitz eines Tintenbeutels nachgewiesen.

Introduction

Faunistic relationships observed between the Lower Toarcian of Southwest Germany and that of Northern Germany and England (RIEGRAF, WERNER & LÖRCHER, in preparation) similarly existed in the Hettangian and Sinemurian. These relationships are further emphasized by the new discoveries described in this paper. *Phragmoteuthis*-specimens of Jurassic age were so far known in Southern Germany from the Lower Toarcian (QUENSTEDT 1845–49: 529, 550, pl. 36, figs. 6, 8, 14; RIEGRAF & REITNER 1979: 297, figs. 1–3), from England (JELETZKY 1966: 78, pl. 13, fig. 3; DONOVAN 1977: 22, fig. 3; RIETSCHER 1977: 124, fig. 3) and Northern Italy (PINNA 1972) from the Sinemurian. *Chondroteuthis wunnenbergi* BODE was previously discovered only in England and Northern Germany (see following synonymy). The *Phragmoteuthis*-phragmocones from the Lower Jurassic of Southern Germany had wrongly been interpreted as belemnite phragmocones.

The author thanks Mr. W. WETZEL for taking the photographs, J. GHIOLD for help in translation, Th. ENGESER and J. REITNER (all in Tübingen) for supplying rare publications.

The specimens published here are deposited in the Institute and Museum of Geology and Palaeontology, University of Tübingen (GPIT), Southern Germany, catalogue-number 1555/1-4.

Specimen descriptions

Genus: *Phragmoteuthis* MOJSISOVICS 1882

Type species: *Belemnoteuthis bisinuata* BRONN 1859

?*Phragmoteuthis* sp.

(Fig. 1a, 2a)

Material: A nearly complete phragmocone without apex from the Vogelbrunnen between Tübingen and Bebenhausen, Southwest Germany (GPIT 1555/1).

Stratigraphic position: Base of the lowermost "Pilonotenbank" = Hettangian, *planorbis*-zone, *planorbis*-subzone.

Description: The slightly compressed phragmocone shows over a length of 20 mm about 16 camerae filled with calcite. The first few camerae are broken off. The last one is filled with sediment and is possibly the body chamber. The phragmocone angle is about 40° and the diameter of the last camera is about 22 mm. A thin conotheca wall is observed sporadically. The siphuncle is not well preserved.

Discussion: This specimen shows camerae with distribution narrower than those of the one described below. It seems likely that it is a species of *Phragmoteuthis* different from the Sinemurian one. The specimen figured by DIEBEL (1940: 176, 186, pl. 22, fig. 9) is of the same age and belongs probably also to *Phragmoteuthis*. HOFFMANN (1965: 696) described *Atractites* ex gr. *convergens* MOJSISOVICS from the Hettangian of Northern Germany, but did not figure the specimen. It is possible that the specimen described here is the phragmocone of an *Atractites*-species. For example phragmocones of *Atractites meneghinii* SALOMON (SALOMON 1895: 195, pl. 8, figs. 7-9) and of *Atractites* (?) indet. (MOJSISOVICS 1882: 302, pl. 92, fig. 15) resemble the Tübingen specimen. The question can not be decided upon without better preserved material.

Originally such Hettangian phragmocones have been determined as belemnite phragmocones (for example RIEGRAF 1980: 146, table 1), because true belemnite rostra had been discovered in the *planorbis*-zone (TERQUEM & PIETTE 1865: 140; SCHWEGLER 1939; 1962; RIEGRAF 1980: 141) and true belemnite phragmocones came from the *angulata*-zone of Oldentrup near Bielefeld, Northern Germany (BUDWILL collection, GPIT 1555/4). PFEFFER (1942: 83), ROSENKRANZ (1967: 25), SCHLOZ (1972: 150) and HÖLDER (1973: 63) published uncertain "belemnite" remains of Hettangian age that possibly include *Phragmoteuthis*-specimens.

Phragmoteuthis sp. cf. *Phragmoteuthis montefiorei* (BUCKMANN 1880)

(Fig. 1b, 2b)

Material: A phragmocone fragment from the fields NE of the village Waldhausen, urban area of Tübingen, Southwest Germany (GPIT 1555/2).

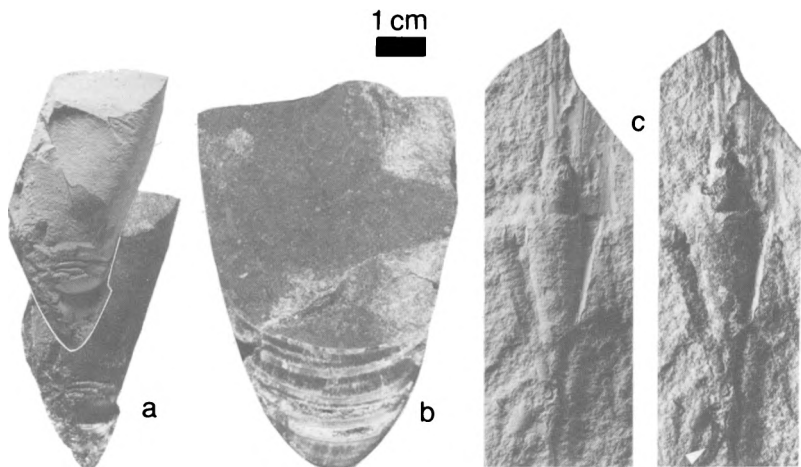


Fig. 1a: *?Phragmoteuthis* sp., Hettangian, *planorbis*-zone, *planorbis*-subzone, Bebenhausen near Tübingen. GPIT 1555/1. Nearly complete phragmocone without apex. Coated with ammonium chloride (above) and uncoated (below). – b: *Phragmoteuthis* sp. cf. *Phragmoteuthis montefiorei* (BUCKMAN), Sinemurian, *bucklandi*-zone, *conybeari*-subzone, Tübingen. GPIT 1555/2. Oblique longitudinal section, polished. – c: *Chondroteuthis wunnenbergi* BODE, Lower Toarcian, *falciferum*-zone, upper *exaratum*-subzone, Dormettingen near Balingen. GPIT 1555/3. The proostracum is incomplete, the phragmocone crushed. Above the phragmocone is the inc sac (black), on the left transversely-wrinkled muscular tissue (see also Fig. 2). Coated with ammonium chloride (on the left) and uncoated (on the right).

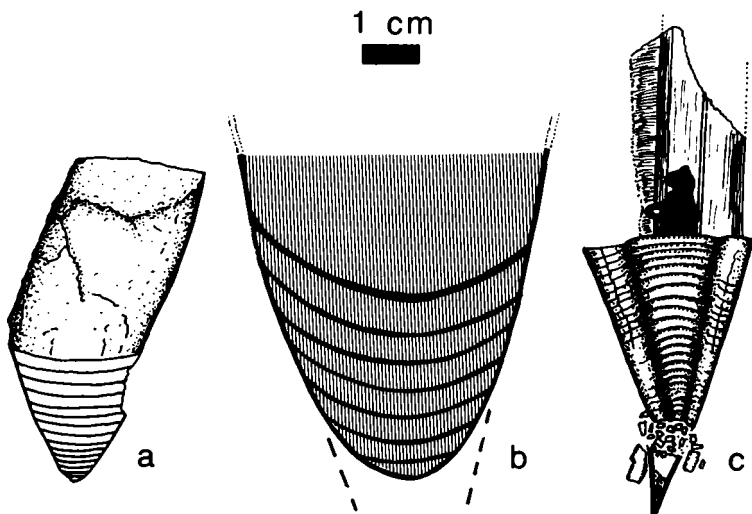


Fig. 2 a–c: Same specimens of Fig. 1 a–c, drawn diagrammatically.

Stratigraphic position: Oolithic "Kupferfelsbank" with *Vermiceras spiratissimum* (QUENSTEDT) and *Vermiceras longidomus* (QUENSTEDT) (= *V. conybeari* (Sowerby) ?) = Sinemurian, *bucklandi*-zone, *conybeari*-subzone.

Description: The obliquely broken phragmocone with a maximum diameter of 52 mm and a phragmocone angle (constructed) of 32–34° is covered by a 1 mm thick conotheca. The apex is lacking. The largest camera may be the body chamber. For a total length of 40 mm one can see 10 camerae, i. e. fewer than in the specimen described above.

Discussion: The author suspects that the "Belemnitenalveolen" (belemnite alveoli) mentioned by ENGEL (1896: 139) also belong to *Phragmoteuthis*, because they came from the same stratigraphic level, in which belemnite rostra are completely unknown in Southern Germany. In contrast, the English *Phragmoteuthis*-specimens are preserved in bituminous shales with their soft-parts and arm-crowns with hooks attached, but flattened.

Genus: *Chondroteuthis* BODE 1933

Type species: *Chondroteuthis wunnenbergi* BODE 1933

Chondroteuthis wunnenbergi BODE 1933

(Fig. 1c, 2c)

1887 *Belemnites pyramidalis* MÜNSTER. – DENCKMANN: 81, pl. 9, fig. 4

1922 problematischer Phragmokon. – NAEF: 171, fig. 64c

1927 kleiner Belemnit mit Phragmokonus. – WUNNENBERG: 66, text-fig. 7

*1933 *Chondroteuthis wunnenbergi* BODE: 55, pls. 9–11, figs. 1–13

1966 *Chondroteuthis wunnenbergi* BÖDE. – JELETZKY: 147, pl. 20, figs. 3–4

Material: An incomplete, bitten and broken specimen from Dormettingen near Balingen, Southwest Germany (GPIT 1555/3).

Stratigraphic position: "Unterer Stein", ϵII_5 = Lower Toarcian, *falciferum*-zone, *exaratum*-subzone. The species is reported from Northern Germany mostly in the "boreale-Geodenlagen" corresponding to the upper part of the *elegantulum*-subzone of WEITSCHAT (1973: 16), i. e. earlier than in Southwest Germany.

Description: The rostrum is 8 mm long and has a sharp, well preserved apex. Since it is broken in its full length one can see the thin conotheca wall of the phragmocone. Rostrum and phragmocone have a total length of 46 mm. The phragmocone angle is 15°, but the phragmocone itself is compressed and broadened by compaction. It was crushed and fragmented in its mid section by the bite of a carnivorous vertebrate (cf. HÖLDER 1955; RIEGRAF in KELLER 1977: 123–124, text-fig. 4). BODE (1933: 39) wrote that *Chondroteuthis wunnenbergi* BODE is commonly broken by rapacious animals and is represented in their coprolithes. The phragmocone shows a fine, longitudinal striation and, on one side, the originally strong curvature. The broken-off proostracum is 36 mm in length. It shows, however, the typical longitudinal striation and the "Mittelrippe" (median rib) (BODE

1933: 49). The proostracum consists of a brownish and horny material. The ink sac occurs near the end of the phragmocone. This structure is unknown in specimens from Northern Germany (BODE 1933: pls. 9–11). The ink sac continues laterally into a thin loop. At the side of the proostracum transversely wrinkled remains of muscular tissue appear.

Like in the BODE specimen (1933: pl. 9, figs. 1–2), in the Dormettingen specimen the proostracum is somewhat displaced laterally relative to the median axis of phragmocone and rostrum. BODE considered this as a compactional phenomenon.

Discussion: BODE recognized the distinctiveness of the genus *Chondroteuthis* and JELETZKY (1966: 146) erected a new family for it. The author believes that *Chondroteuthis* belongs to the group of *Acanthoteuthis* R. WAGNER and *Belemnoteuthis* PEARCE because of the morphology of the rostrum, phragmocone and proostracum. BODE (1933: 52) compared the proostracum of *Chondroteuthis wunnenbergi* BODE to that figured by CRICK (1896: figs. 1–3) which seems, however, to be too broad and too belemnite-like and rather resembles the form described by HÖLDER (1973: text-fig. 10, pl. 2, fig. 7). The Dormettingen specimen contributes to the anatomy of *Chondroteuthis wunnenbergi* BODE, by that it shows clearly the ink sac.

Stratigraphic range: Lower Toarcian, *falciferum*-zone, upper *elegantulum*-to upper *exaratum*-subzone.

Geographic range: England, Northern and Southwest Germany.

Conclusions

1. *Phragmot euthis* MOJSISOVICS occurs in the Triassic of the Alps and Poland, and in the Sinemurian of England, Southwest Germany and Northern Italy. One specimen is described here from the Hettangian of Southwest Germany, another (?) from the Hettangian of Northwest Germany by DIEBEL (1940: 176, 186). Further occurrences of *Phragmot euthis* are in the Lower Toarcian of Southwest Germany.

2. *Chondroteuthis wunnenbergi* BODE is known from England, Northern and Southwest Germany in the *falciferum*-zone of the Lower Toarcian. It possessed an ink sac as shown by the Dormettingen specimen. Like other coleoidea of this level, *Chondroteuthis* was commonly crushed by unknown carnivores (RIEGRAP & REITNER 1979: 301, text-figs. 12–14).

References

- BODE, A. (1933): *Chondroteuthis wunnenbergi* n. gen. n. sp., eine neue Belemnoidenform, in günstiger Erhaltung. – Jber. niedersächs. geol. Ver., 25: 33–66; Hannover.
- CRICK, G. C. (1896): On the proostracum of a belemnite from the Upper Lias of Alderton, Gloucestershire. – Proc. malac. Soc. London, 2: 117–119; London.
- DENCKMANN, A. (1887): Über die geognostischen Verhältnisse der Umgegend von Dörnten nördl. Goslar, mit besonderer Berücksichtigung der Fauna des oberen Lias. – Abh. geol. Spez.-Karte Preußen, 8: 1–108; Berlin.
- DIEBEL, K. (1940): Ein Ölschiefer im Lias alpha bei Bielefeld. – Jb. Reichsst. Bodenforsch., 60: 155–196; Berlin.
- DONOVAN, D. T. (1977): Evolution of the dibranchiate Cephalopoda. – Symp. zool. Soc. London, 38: 15–48; London.
- ENGEL, Th. (1896): Geognostischer Wegweiser durch Württemberg. – 2. Aufl. Stuttgart (Schweizerbart).
- HÖLDER, H. (1955): Belemniten und Ammoniten als Beutetiere. – Aus der Heimat, 63: 88–92; Öhringen.
- (1973): *Miscellanea cephalopodica*. 5. Ein belemnitisches Proostracum aus dem Unteren Lias. – Münster. Forsch. Geol. Paläont., 29: 63–67; Münster/Westf.
- HOFFMANN, K. (1965): Ein *Atractites* (Dibranchiata, Belemnioidea, Belemnitidae) aus dem nordwestdeutschen Hettangium (Unterlias, *liasicus*-Zone, *laqueolus*-Subzone). Vorläufige Mitteilung. – Geol. Jb., 83: 693–698, Hannover.
- JELETZKY, J. A. (1966): Comparative morphology, phylogeny, and classification of fossil Coleoidea. Mollusca, Art. 7. – Paleont. Contr. Univ. Kansas, 42: 1–162; Lawrence, Kansas.
- MOJSISOVICS, E. v. (1882): Die Cephalopoden der mediterranen Triasprovinz. – Abh. kais. k. geol. Reichsanstalt, 10: 1–322; Wien.
- NAEF, A. (1922): Die fossilen Tintenfische. – Jena (Fischer).
- PFEFFER, E. (1942): Beiträge zur Petrographie der schwäbischen Rhät- und Lias-Sandsteine. – Diss. tech. Hochsch. Stuttgart.
- PINNA, G. (1972): Rinvenimento di un raro cefalopode coleoideo nel giacimento sinemuriano di Osteno in Lombardia. – Atti Soc. ital. Sci. nat. Mus. civ. Storia nat. Milano, 113: 141–149; Mailand.
- QUENSTEDT, F. A. (1845–49): Petrefactenkunde Deutschlands. 1. Abt. 1. Bd. Cephalopoden. – Tübingen (Fues).
- RIEGRAF, W. (1980): Revision der Belemniten des Schwäbischen Jura. Teil 7. – Palaeontographica, (A) 169: 128–206; Stuttgart.
- RIEGRAF, W. & REITNER, J. (1979): Die »Weichteilbelemniten« des Posidonienschiefers (Untertoarcium) von Holzmaden (Baden-Württemberg) sind Fälschungen. – N. Jb. Geol. Paläont. Mh., 1979: 291–304; Stuttgart.
- RIEGRAF, W., WERNER, G. & LÖRCHER, F. (in Vorbereitung): Fauna und Biostratigraphie des südwestdeutschen Untertoarciums. – Stuttgarter Beitr. Natkd., (B).
- RIETSCHEL, S. (1977): Ein Belemnitentier mit Weichteilerhaltung und Rostrum im Senckenberg. – Natur u. Museum, 107: 121–130; Frankfurt/Main.
- ROSENKRANZ, D. (1967): Geologische Kartierung der östlichen Frickenhofer Höhe zwischen Horn, Abtsgmünd und Untergröningen. – Diplomarb. Univ. Tübingen.
- SALOMON, W. (1895): Geologische und palaeontologische Studien über die Marmolata. – Palaeontographica, (A) 42: 1–210; Stuttgart.
- SCHLOZ, W. (1972): Zur Bildungsgeschichte der Oolithenbank (Hettangium) in Baden-Württemberg. – Arb. Inst. Geol. Paläont. Univ. Stuttgart, (n. F.) 67: 101–212; Stuttgart.

- SCHWEGLER, E. (1939): Belemniten aus den Psilonotentonen Schwabens. – Cbl. Mineral. Geol. Paläont., 1939: 200–208; Stuttgart.
- (1962): Revision der Belemniten des Schwäbischen Jura. Teil 2. – Palaeontographica, (A) 118: 1–22; Stuttgart.
- TERQUEM, O & PIETTE, E. (1865): Le lias inférieur de l'est de la France. – Mém. Soc. géol. France, (2) 8: 1–175, Paris.
- WEITSCHAT, W. (1973): Stratigraphie und Ammoniten des höheren Untertoarcium (oberer Lias ϵ) von NW-Deutschland. – Geol. Jb., (A) 8: 1–81; Hannover.
- WUNNENBERG, K. (1927): Beiträge zur Kenntnis des Lias in der Umgebung Braunschweigs. – Jber. Ver. Natwiss. Braunschweig, 20: 56–80; Braunschweig.

Bei der Tübinger Schriftleitung eingegangen am 20. Juli 1981.

Anschrift des Verfassers:

Dipl.-Geol. WOLFGANG RIEGRAF, Universität Tübingen, Institut für Geologie und Paläontologie, Sigwartstr. 10, D-7400 Tübingen 1, W.-Germany.