

# Redescription of two specimens previously recorded as fossil teuthids (Coleoidea, Cephalopoda)

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## Synopsis

The two specimens *Teudopsis brodiei* Carruthers, 1871, from the Purbeck Beds of southern England, and *Teuthis* sp. Moore, 1870, of uncertain age (?Middle Jurassic to early Cretaceous) from Queensland, Australia, are redescribed and figured. They are interpreted as the remains of an indeterminate plant, and as a possible bivalve fragment, respectively. Recognition that these specimens are not teuthids affects the recorded geographical distribution and stratigraphical range of teuthids. There are at present no genuine records of fossil teuthids from Australia. The stratigraphically youngest fossil teuthid known from Britain is *Trachyteuthis latipinnis* (Owen, 1855), of Lower Kimmeridgian age.

## Introduction

The Order Teuthida Naef, 1916 includes those coleoid cephalopods having a slightly curved internal shell or gladius, and typically lacking a chambered phragmocone but having a conus ventrally at the posterior end. The gladius of Recent forms is purely conchiolinic, but the fossil forms show evidence of having been mainly aragonitic.

The order includes the Suborders Loligosepiina Jeletzky, 1965, Prototeuthina Naef, 1921 and Mesoteuthina Naef, 1921 which are known only from the fossil record; also the Suborder Oegopseina d'Orbigny, 1839 known from Tertiary and Recent records, and the Suborders Myopseina d'Orbigny, 1839 and Vampyromorphina Robson, 1929 known only from the Recent (see Jeletzky, 1966). The classification of Recent and fossil teuthids is currently under review and is not discussed here.

A number of non-cephalopod and non-teuthid specimens doubtfully or incorrectly recorded as teuthids, and of teuthids recorded as non-cephalopod taxa, have been recognized by previous authors. Several similar records, some apparently forgotten or rarely cited in the literature, remain to be corrected or reinvestigated. Two specimens in the collections of the BM(NH), London, previously recorded as teuthids, are discussed below.

## Descriptions

### ? Indeterminate bivalve fragment

Figs 1–3

1870 ?*Teuthis* sp.; Moore: 258; pl. 16, fig. 8.

1892 ?*Teuthis* sp. indet.; Jack & Etheridge: 487; pl. 35, fig. 21.

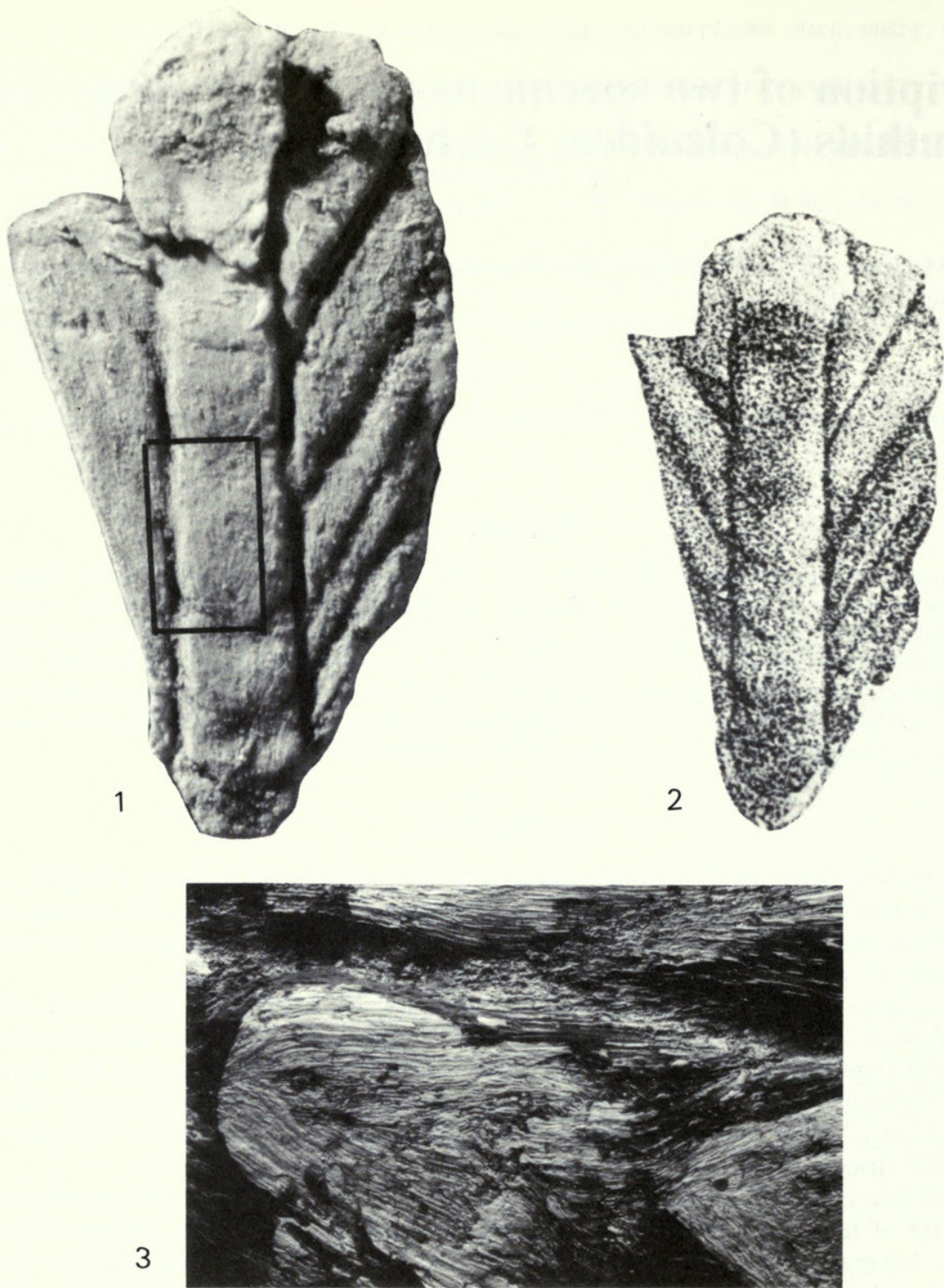
1920 *Teuthis* sp. indet.; Bulow-Trummer: 268.

1982 ?*Teuthis* sp. (fragment of bivalve?); Phillips: 73.

DEPOSITORY. British Museum (Natural History), London. Register no. C46831.

LOCALITY. Wollumbilla, Queensland, Australia.





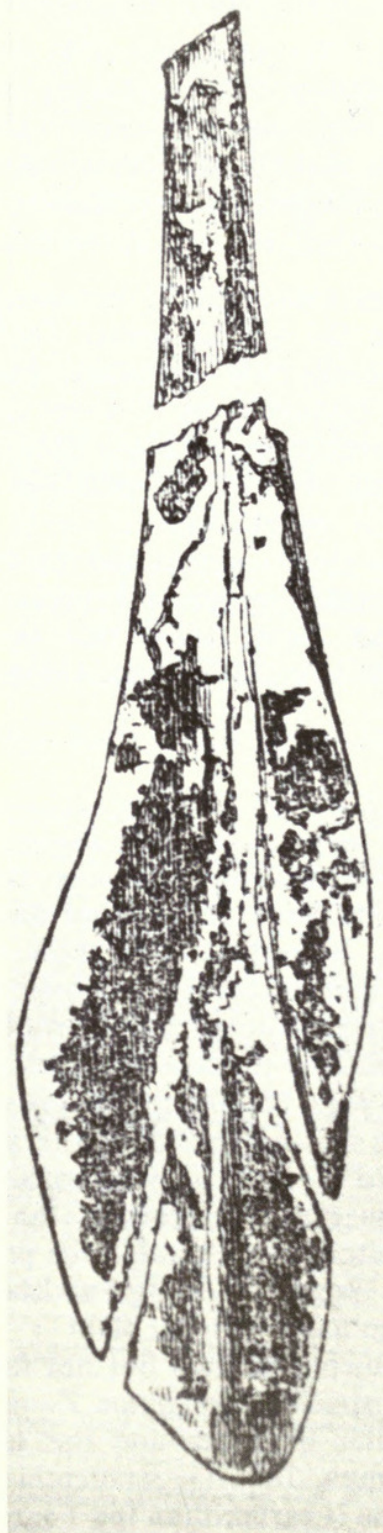
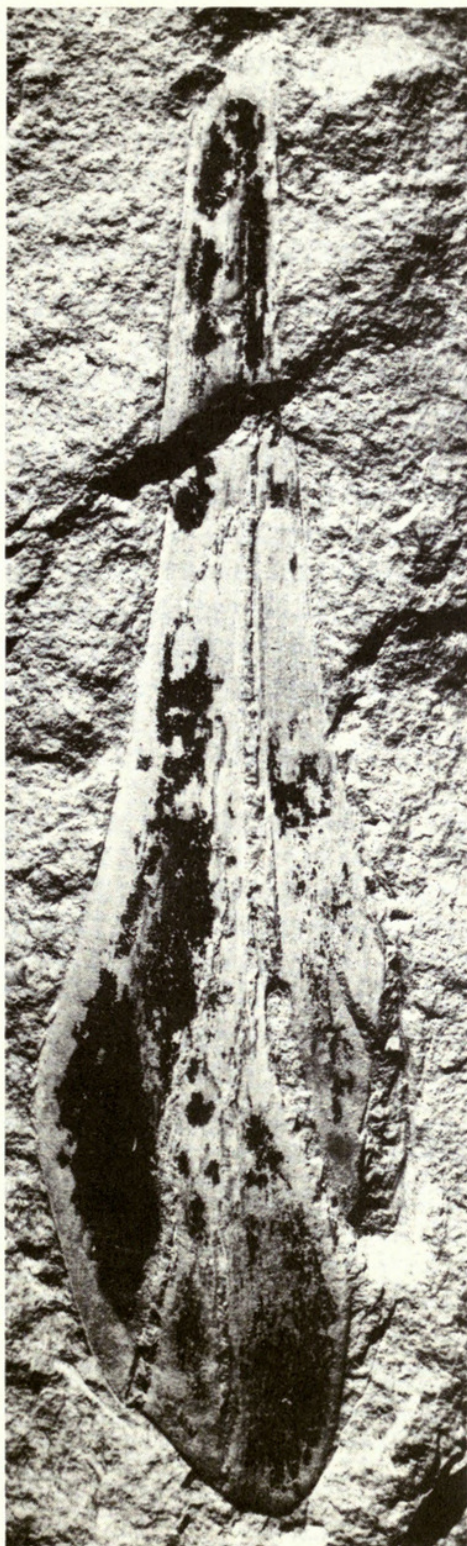
**Figs 1, 2, 3** ?Bivalve fragment from Wollumbilla, Queensland, Australia (= *Teuthis* sp. of Moore, 1870). BM(NH) C46831. Fig. 1, specimen coated with ammonium chloride.  $\times 17$ . Fig. 2, copy of original figure; Moore 1870: pl. 16, fig. 8.  $\times 12$ . Fig. 3, scanning electron micrograph of area boxed in Fig. 1.  $\times 55$ .

**AGE.** Uncertain. ? Middle Jurassic to early Cretaceous (see Moore, 1870: 239).

**DESCRIPTION.** The specimen (Fig. 1) is 6 mm in length, 3 mm wide at the broader end, and has a 'median keel' or axis 1 mm wide, about which the specimen is asymmetrical. The right side of the keeled surface shows 5 or 6 flat ribs; the left side is almost smooth, having only 2 or 3 very flat ribs. The outer margin of the right side appears complete, whereas the left outer margin and the broader end are broken. The shell consists, probably, of primary calcite, as indicated by the relatively well preserved calcite crystals (Fig. 3).



REMARKS. The specimen was originally described by Moore (1870) as a fragment of teuthid shell, and was later included in the family Loliginidae by Jack & Etheridge (1892). Bulow-Trummer (1920) mentioned it under 'Sepioidei indet.' Investigation has shown that the gladius of fossil teuthids consisted originally of aragonite and organic layers. Normally, the aragonite has been replaced by francolite, or has been dissolved completely without any replacement. The Australian specimen lacks characteristic features of a teuthid gladius in symmetry and its shell structure indicates that it is probably a fragment of bivalve shell.



**Figs 4, 5** Remains of indeterminate plant from the Purbeck Beds of Dorset (= *Teudopsis brodiei* of Carruthers, 1871). BM(NH) C5251. Fig. 4, photograph of the specimen.  $\times 2.3$ . Fig. 5, copy of original figure; Carruthers 1871: 448, text-fig.



**Indeterminate plant**

Figs 4, 5

- 1871 *Teudopsis brodiei* Carruthers: 448, text-fig.  
 1977 *Teudopsis brodiei* Carruthers; Donovan: 37.  
 1982 *Teudopsis brodiei* Carruthers; Phillips: 73.

DEPOSITORY. British Museum (Natural History), London. Register no. C5251.

LOCALITY. Dorset, England (exact locality unrecorded).

AGE. Purbeck Beds (Upper Jurassic/Lower Cretaceous).

DESCRIPTION. The specimen (Fig. 4) is a lanceolate impression, 6.5 cm long and with a maximum width of 1.7 cm reducing to 0.4 cm at the anterior end (in teuthid terminology). The right half of the specimen shows a longitudinal fracture. The posterior margin is broadly rounded. The rhachis-like anterior end is incomplete. No median keel or axis of symmetry is present. Fine longitudinal striae are present on the posterior extremity. There is no evidence of a gladius-like shell. Parts of the surface are covered with a brown substance resembling lignite.

REMARKS. Carruthers (1871) introduced the specific name *brodiei* for this one specimen and referred it to the teuthid genus *Teudopsis* Deslongchamps, 1835 (Family Teudopseidae van Regteren Altena, 1949; Suborder Mesoteuthina Naef, 1921). The species was subsequently ignored, but Donovan (1977) remarked on its similarity to the genus *Palaeololigo* Naef, 1921 (Family Palaeololiginidae Naef, 1921; Suborder Mesoteuthina Naef, 1921). Apart from a superficial similarity of form, the specimen shows no resemblance to a teuthid gladius, nor evidence of any typical teuthid feature. Dr C. R. Hill, Palaeobotany Section, BM(NH), to whom the specimen was shown, agrees that the specimen is the remains of an indeterminate plant.

The non-teuthid nature of *Teudopsis brodiei* Carruthers, 1871, from the U. Jurassic/L. Cretaceous Purbeck Beds, means that the youngest recorded fossil teuthid from Britain is now *Trachyteuthis latipinnis* (Owen, 1855), from the Lower Kimmeridge Clay (= L-M. Tithonian) of Dorset.

**Discussion**

Some incorrect teuthid references, similar to those above described, have been corrected in subsequent literature. But several doubtful records, partly indicated below, remain in need of investigation, and these may show the need to amend the present record of geographical distribution and stratigraphical range of the Order Teuthida.

*Sepia vetustissima* Costa, 1850 from the Aptian of Petraroia, near Naples, Italy is one of only four fossil teuthids to have been described and figured from the Lower Cretaceous (cf. Reitner & Engeser 1982). The figures of this specimen show no obvious teuthid, sepiid or even coleoid features, and it is not referred to in subsequent literature. Unfortunately the holotype appears to be lost (d'Erasmus 1914). Similarly, *Phylloteuthis incertus* Whiteaves, 1900 (correctly *P. incerta*), from the Cretaceous of the Queen Charlotte Islands, Canada, is not referred to in subsequent literature, although the paper was reviewed by Böhm (1902: 292). Dr J. A. Jeletzky (*in litt.*) has suggested, though without detailed reinvestigation, that the specimen is probably remains of an indeterminate plant.

The specimen described but not figured by Smithe (1877) as *Beloteuthis glevensis*, from the Upper Pliensbachian, *spinatum* Zone of Churchdown, Gloucestershire, England, is not mentioned in later literature and has not yet been traced. If, in fact, it belongs to *Teudopsis* Deslongchamps, 1835 (= *Beloteuthis* Münster, 1843), the first appearance of the Suborder Mesoteuthina is earlier than the Toarcian age accepted at present.

Specimens which were described as *Loligo* sp. by Lepsius (1878: 104), but not figured, were from the Upper Triassic, Rhaetian of South Tyrol. They are recorded in the faunal lists of Bittner (1889) and of Cadrobbi (1940), but not mentioned in subsequent literature. The specimens have not yet been found, neither in Darmstadt, W. Germany, nor in Strasbourg, France,



places where Lepsius was working shortly before and after his publication. Consequently, the only undoubted specimen (and species) of fossil teuthid known from the Triassic is that described by Reitner, 1978 (*Loligosepia niedernachensis*) from the Upper Triassic of the Bavarian Alps.

The doubtful status of what is now the oldest known fossil teuthid—*Glochinomorpha stifeli* from the Permian of Utah, U.S.A., described by Gordon (1971) with new specific, generic, familial and subordinal names—may be resolved by reinvestigation with the aid of scanning electron microscopy and x-ray analysis techniques.

Similarly, *Necroteuthis hungarica* Kretzoi, 1942 from the Oligocene of Budapest, Hungary—the only recorded fossil teuthid gladius from the Tertiary—requires re-examination before its suspected sepiid relationship can be confirmed (cf. *Sepia* (*Parasepia*) *orbignyana* Alvarez & Melendez, 1966 from the Miocene of Andalusia, Spain). Proof of its sepiid nature would strengthen the evidence now indicating that teuthids with calcified gladius (i.e. Prototeuthina and Mesoteuthina) died out in the Cretaceous, and only forms with an organic, non-calcified gladius, as in Recent teuthids (cf. Clarke & Fitch, 1979; Broglio Loriga & Sala Manservigi, 1975) continue beyond the Cretaceous.

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### References

- Alvarez, R. C. & Melendez, B. 1966. Hallazgo de una sepia fosil en el Mioceno de Andalucia. *Boln R. Soc. esp. Hist. nat.*, Madrid, (Geol.) **64**: 199–202, 3 figs.
- Bittner, A. 1881. Ueber die geologischen Aufnahmen in Judicarien und Val Sabbia. *Jb. K.-K. geol. Reichsanst.*, Wien, **31**: 219–370.
- Böhm, J. 1902. [Review of Whiteaves 1900, q.v.]. *Neues Jb. Miner. Geol. Paläont. Jahrg.*, Stuttgart, **1902** (I, 3): 292.
- Broglio Loriga, C. & Sala Manservigi, A. 1975. Minor unpublished fossils of the 'Pesciara' of Bolca (Verona, Italy). In Sorbini, L. et al. (eds), *Miscellanea paleontologica* (1). *Studi e ricerche sui giacimenti terziari di Bolca*, **2**: 157–176, pls 5–8. Verona.
- Bulow-Trummer, E. von 1920. *Cephalopoda dibranchiata*. In Diener, C. (ed.), *Fossilium Cat.*, Berlin, (Animalia) **11**: 1–271.
- Cadrobbi, M. 1940. Su di un nuovo giacimento fossilifero del Retico lungo la strata Gardesana occidentale, in località Gola (Trentino meridionale). *Studi trent. Sci. nat.*, Trento, **21** (3): 165–189.
- Carruthers, W. 1871. On some supposed vegetable fossils. *Q. Jl geol. Soc. Lond.* **27**: 443–448, 1 pl., 1 text-fig.
- Clarke, M. R. & Fitch, J. E. 1979. Statoliths of Cenozoic teuthoid cephalopods from North America. *Palaeontology*, London, **22**: 479–511, pls 53–55.
- Costa, O. G. 1850. *Paleontologia del Regno di Napoli*. 92 pp., 7 pls. Naples.
- Deslongchamps, E. 1835. Memoire sur les Teudopsides, animaux fossiles voisins des Calmars. *Bull. Soc. linn. Normandie*, Caen, **5**: 68–78, pls 2–3.
- Donovan, D. T. 1977. Evolution of the dibranchiate cephalopoda. *Symp. zool. Soc. Lond.*, **18**: 15–48, 15 figs.
- Erasmus, G. d' 1914. La fauna e l'eta dei calcare a ittioliti di Pietraroia (Prov. di Benevento). *Palaeontogr. ital.*, Pisa, **20**: 29–86, pls 4–110, 17 text-figs.
- Gordon, M. 1971. Primitive squid gladii from the Permian of Utah. *Prof. Pap. U.S. geol. Surv.*, Washington, **750-C**: C34–C38, 3 figs.
- Jack, R. L. & Etheridge, R., jr 1892. *The geology and palaeontology of Queensland and New Guinea*. . . (&c.). 2 vols: xxxi + 768 pp., 68 pls, maps. Brisbane & London.
- Jeletzky, J. A. 1965. Taxonomy and phylogeny of fossil Coleoidea (= Dibranchiata). *Geol. Surv. Pap. Can.*, Ottawa, **65-2**: 72–76.
- 1966. Comparative morphology, phylogeny, and classification of fossil Coleoidea. *Paleont. Contr. Univ. Kans.*, Lawrence, (Mollusca) **7** (42): 1–162, 25 pls, 15 text-figs.



- Kretzoi, M.** 1942. *Necroteuthis* n.g. (Ceph. Dibr., Necroteuthidae n.f.) aus dem Oligocän von Budapest und das System der Dibranchiata. *Földt. Közl.*, Budapest, **72**: 124–138, pl. 18, 1 text-fig.
- Lepsius, R.** 1878. *Das westliche Süd-tirol geologisch dargestellt*. 375 pp., 10 pls, map. Berlin.
- Moore, C.** 1870. Australasian Mesozoic Geology and Palaeontology. *Q. Jl geol. Soc. Lond.*, **26**: 226–259, pls 10–18.
- Münster, G. Graf zu** 1843. Die schalenlosen Cephalopoden im unteren Jura, den Lias-Schiefen von Franken und Schwaben. *Beiträge zur Petrefacten-kunde*. . . (&c.), **6**: 57–77, pls 5–9, 14. Bayreuth.
- Naef, A.** 1916. Systematische Uebersicht der mediterranen Cephalopoden. *Pubbl. Staz. zool. Napoli*, Naples and Milan, **1**: 11–19.
- 1921. Das System der dibranchiaten Cephalopoden und die mediterranen Arten derselben. *Mitt. zool. Stn. Neapel*, Berlin, **22**: 527–542.
- Owen, R.** 1855. Notice of a new species of an extinct genus of dibranchiate cephalopod (*Coccoteuthis latipinnis*) from the Upper Oolitic Shales at Kimmeridge. *Q. Jl geol. Soc. Lond.*, **11**: 124–125, pl. 7.
- Phillips, D.** 1982. *Catalogue of the Type and Figured Specimens of Fossil Cephalopoda (excluding Mesozoic Ammonoidea) in the British Museum (Natural History)*. 94 pp. London.
- Reitner, J.** 1978. Ein Teuthiden-Rest aus dem Oberrain (Kössener-Schichten) der Lahnewies-Neidernachmulde bei Garmisch-Partenkirchen (Bayern). *Paläont. Z.*, Stuttgart, **52**: 205–212, 6 figs, 1 table.
- & **Engeser, T.** 1982. Teuthiden aus dem Barremie der Insel Maio (Kapverdische Inseln). *Paläont. Z.*, Stuttgart, **56**: 209–216, 3 figs.
- Smithe, F.** 1877. On the Middle Lias of North Gloucestershire. The *spinatus* zone. *Proc. Cotteswold Nat. Fld Club*, London, **6**: 349–405.
- Whiteaves, J. F.** 1900. On some additional or imperfectly understood fossils from the Cretaceous rocks of the Queen Charlotte Islands, with a revised list of the species from these rocks. *Mesozoic Fossils* **1** (4): 263–307, pls 33–39. Ottawa, Geol. Surv. Canada.



Engeser, Theodor and Phillips, David. 1986. "Redescription of two specimens previously recorded as fossil teuthids (Coleoidea, Cephalopoda)." *Bulletin of the British Museum (Natural History) Geology* 40(5), 259–264.

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