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Discovery of the original specimen of *Ammonites nodosa* BRUGUIÈRE 1789, type species of *Ceratites* DE HAAN 1825 (Ammonoidea, Triassic)

By HANS RIEBER¹⁾ and EDWARD TIMOTHY TOZER²⁾

ZUSAMMENFASSUNG

Ammonites nodosa BRUGUIÈRE 1789, die Typusart zu *Ceratites* DE HAAN 1825, wurde in der im Paläontologischen Institut und Museum der Universität Zürich aufbewahrten Sammlung von J. J. Scheuchzer wiedergefunden. Das Stück, das Scheuchzer 1718 beschrieben und abgebildet hatte, sowie die beiden anderen Formen, die er in der Beschreibung erwähnt hatte, galten als verschollen. Alle drei konnten jedoch wiedergefunden werden. Eines derselben bildet die Grundlage der Abbildung bei Scheuchzer. Es wird vorgeschlagen, dieses Stück als Lectotyp für *Ammonites nodosa* zu nehmen. Dazu ist jedoch ein Entscheid der Internationalen Kommission für Zoologische Nomenklatur nötig, da 1934 für *Ammonites nodosa* ein Neotyp vorgeschlagen wurde. Über den Verbleib des Neotyps ist allerdings nichts bekannt.

Abstract

Ammonites nodosa BRUGUIÈRE 1789, type species of *Ceratites* DE HAAN 1825, is founded on material in the collection of J. J. Scheuchzer, which he described and illustrated in 1718. Scheuchzer referred to three specimens. Generally assumed to have been lost, all three have now been found in the Scheuchzer collection at the Paleontological Museum of the University of Zürich. One specimen formed the basis for Scheuchzer's illustration. It is suggested that this specimen should be regarded as the lectotype for *Ammonites nodosa*. A decision by the International Commission on Zoological Nomenclature will be necessary concerning this choice because a neotype for *Ammonites nodosa* was proposed in 1934. The whereabouts of the neotype is unknown.

Introduction

When BRUGUIÈRE (1792, p.43) defined the species *Ammonites nodosa* he did not provide illustrations, nor did he describe any actual specimens. For the interpretation of the species he referred to illustrations in two earlier works. One was by BAIER (1708), the other in 'Traité de Pétrifications' (B***, 1742), a work attributed to LOUIS BOURGUET. The illustration in the 'Traité' (no. 262 on Pl. 39) was copied (with acknowledgment) from an earlier work by J. J. SCHEUCHZER (1718, Fig. 25). Scheuchzer illustrated two views: the side and the venter. Bourguet reproduced (redrawn) only the side view.

The works of Baier, Scheuchzer and Bourguet employ pre-Linnaean nomenclature. SCHEUCHZER (1718, p.257) classified his specimens as 'Cornu Ammonis non spinatum

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striatum, striis simplicibus, seu singularibus.' BOURGUET (1742, p. 70) used the designation 'corne d'Ammon a doubles tubercules'.

The illustrations in the works of Baier and Scheuchzer, although not very good, are nevertheless good enough to leave no doubt that the ammonoids illustrated by each of these authors are distinctly different from one another, according to modern taxonomic standards. Facsimile reprints of Baier's and Scheuchzer's illustrations have been published recently (TOZER 1984, p. 18, 19). F. A. QUENSTEDT (1849, p. 193; 1858, p. 4) identified the ammonite in Baier's book as *Ammonites perarmatus* J. Sowerby. This is a Jurassic ammonite, type species of *Euaspidoceras* Spath (Arkell et al. 1957, p. L 338). Nobody has seriously suggested that Baier's ammonite should be regarded as the type for *Ammonites nodosa* so it may be dismissed from this discussion.

The material described by Scheuchzer must be regarded as the foundation for *Ammonites nodosa*. This was the interpretation of PHILIPPI (1901, p. 409), SPATH (1934, p. 476) and WENGER (1957, p. 91). These and other authors who have dealt with *Ammonites nodosa* make no reference to Scheuchzer's actual specimens and it seems to have been the general conclusion that the whereabouts of his material was unknown. In consequence SPATH (ibid.) proposed that a specimen illustrated by PHILIPPI (1901, Pl. 46, Fig. 1, 1a, b) should be regarded as the neotype. WENGER (1957, p. 91) followed the same procedure. Neither Spath nor Wenger indicated that they had ever seen or knew the present whereabouts of this neotype. According to PHILIPPI (op. cit.) the specimen came from Ballbronn and was in the collection of the Geologische Landesuntersuchung von Elsass-Lothringen. We have not made a search for this specimen.

Some authors (e.g. PHILIPPI 1901, p. 409; RIEDEL 1918, p. 461; SCHMIDT 1928, p. 303) considered that a specimen illustrated by SCHLOTHEIM (1823, Pl. 21, Fig. 1, fide SPATH 1934, p. 477) may be regarded as typical and the species is accordingly cited as '*Ceratites nodosus* (BRUGUIÈRE) SCHLOTHEIM'. This is without legal justification. Nor is there practical justification because the whereabouts of Schlotheim's specimen also seems to be unknown.

The foundation of the species *Ammonites nodosa* has thus been very shaky, because none of the specimens that have been regarded as typical, i.e. those of Scheuchzer, Schlotheim and Philippi, could be traced. The species is important, having been designated type species of *Ceratites* DE HAAN (1825, p. 39) by HYATT and SMITH (1905, p. 168). Further up the taxonomic scale *Ceratites* forms the basis for taxa all the way to a Suborder: the Ceratitina, a taxonomic entity with more than 500 genus group taxa.

The discovery of Scheuchzer's original specimens

Scheuchzer's specimens have now been located. His collection is now in the Paleontological Museum of the University of Zürich. The collection has been moved several times since Scheuchzer's time. According to STEIGER (1933, p. 36) Scheuchzer, between 1717 and 1723 attempted to sell his collection for 30,000 French pounds, but his efforts were in vain. At some stage the collection came into the hands of Dr. Karl Weber-Sulzer of Winterthur, who, in 1902 donated it to the Botanical Garden of the University of Zürich. Around 1944 it was moved to the Zoological Museum and in 1956 to its present location in the Paleontological Institute and Museum.

In March 1985 Tozer was visiting Rieber at the Paleontological Museum. The subject of the Scheuchzer collection came up in conversation. Rieber remarked that the collection is in the Museum. We immediately went to the cabinets and within minutes had located a specimen (fig. 1a, b), which although without a label giving a name and locality, clearly bore a distinct resemblance to Scheuchzer's side view (SCHEUCHZER 1718, Fig. 25), a copy of which has been recently published (TOZER 1984, p. 19).

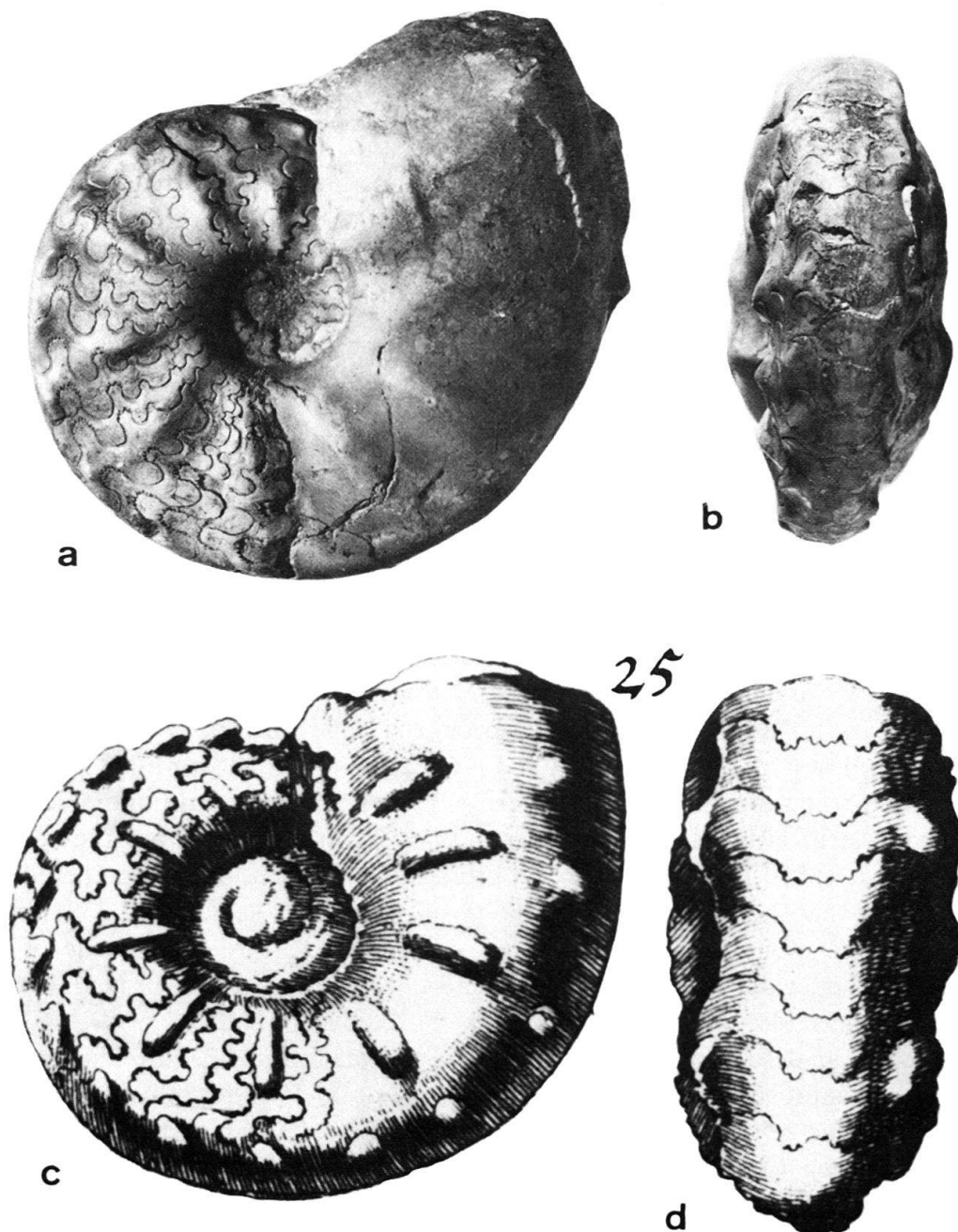


Fig. 1. *Ceratites nodosus* BRUGUIÈRE.

a, b: proposed lectotype, probably from Muschelkalk near Wolfenbüttel. – J.J. Scheuchzer collection, most probably no. 90, Paläontologisches Institut und Museum der Universität Zürich (PIMUZ), no. L/1651.
 c, d: Illustrations of 'Cornu Ammonis non spinatum striatum, striis simplicibus, seu singularibus'; enlarged about one half (SCHEUCHZER 1718, p. 159, Fig. 25).

Scheuchzer gives no indication of scale. It now seems that his illustration is at a reduced scale, about two thirds the natural size. As shown by the illustration accompanying this article (fig. 1c, d) having made adjustment for scale, there is fairly close correspondence between the specimen and Scheuchzer's side view. For the phragmocone the resemblance in the ribbing and tuberculation is particularly close, although somewhat exaggerated in the drawing. The spacing and form of the septa are fairly accurately portrayed except that most of the saddles are shown to be indented, an inaccuracy commented upon by PHILIPPI (1901, p. 410). For the body chamber the correspondence is not exact, marginal tuberculation on Scheuchzer's illustration being more pronounced than on the specimen. A possible explanation for this anomaly will be offered below.

Scheuchzer had three specimens that eventually provided the definition of *Ceratites nodosus*. In the catalogue of his collection they are listed as numbers 89, 90 and 90a (SCHEUCHZER 1716, p.28). The three specimens are also referred to in the more definitive account, which is accompanied by illustrations (SCHEUCHZER 1718, p.259, Fig.25). A facsimile reprint and translation of SCHEUCHZER'S (1718, p.259) delightful description is given in Figure 2. In the catalogue the specimens are listed with localities as follows:

89, ex Querfurtensi; 90, ex Ducatu Guelferbyitano; 90a, von Kindel bey Eisenach. 'Guelferbyitano' refers to the Duchy of Brunswick-Wolfenbüttel. It will be recalled that in about 1559 two branches of the ancient house of Guelph diverged, one became known as Brunswick-Wolfenbüttel, the other as Brunswick-Lunenburg. George Ludwig (1660-1727) was a Duke of Brunswick-Lunenburg and in 1714 became George I, King of England.

In 1985 the authors were unaware that Scheuchzer had been dealing with three specimens. We thought that the whole matter was resolved by the discovery of one specimen that resembled Scheuchzer's illustration. In 1986 Rieber made another search and discovered specimens numbered 89 and 90a with handwritten labels. The specimen found in 1985 was accompanied by a handwritten label numbered 139. The actual specimen bears no number. The three specimens have now been given registration numbers as follows: 89 = L/1650; '139' = L/1651; 90a = L/1652 (see Fig. 1, and 3).

No 139, in SCHEUCHZER'S work (1716, p. 33; 1718, p. 273) is an ammonoid described in the category 'striis bifurcatis'. Scheuchzer did not illustrate no. 139 but the description does not fit L/1651. There seems to be little doubt that the label numbered 139, is misplaced and that the specimen is actually no. 90. SCHEUCHZER (1718, p. 259) notes that one of his three specimens contains bivalves. This is a feature of one side of L/1651 providing further evidence that it is one of Scheuchzer's three specimens (Fig. 3d). No. 89 and 90a have been identified, L/1651 would be no. 90 by elimination.

Scheuchzer, in describing 89, 90 and 90a (Fig. 2), clearly indicated that he regarded all three as representatives of the same kind of fossil but he does not indicate which of the three is illustrated or whether the drawing was composite, deriving features from more than one specimen. Comparison of '139' with Scheuchzer's illustration leaves little doubt that it formed the principal basis for his figure (see Fig. 1), the only major discrepancy being that the marginal nodes are more pronounced on the figure than on the specimen. No. 89 (L/1650,) has marginal nodes on the body chamber that are more distinct than on L/1651 (see Fig. 1, and 3c). This perhaps influenced the artist responsible for Scheuchzer's figure 25 when it came to portraying the characters of the body chamber. However No. 89 (L/1650, fig. 3c) is much more evolute than L/1651 and clearly did not form the principal

M. D. n. 89. 90. 90. a. Cornu Ammonis non spinatum, striis rectè ad marginem usque excurrentibus, & plerunque in binos tuberculorum ordines elevatis, futuris verò serpentino ductu spiram & ambitum extimum trajicientibus. Ein Ammons-Horn / ohne Ruglgrat / mit geraden gegen dem Bort auslauffenden / meistens in zwey Reigen erhobener Bücklein erhöhten Streimen / zwischen welchen viel Nätze Schlangenweise hin/und durch den Rugken streichen. Fig. 25. Dergleichen habe von Quersfurt / Wolfenbüttel / und Kindel bey Eisenach. Wir finden sie in der Schweiz nicht. Vermuthlich ist in dasiger Gegend / wo gar viel Überbleibseln der Sündfluth gefunden werden / vor dieser allgemeinen Überschwemmung ein Meer gewesen / in welchem dergleichen von den unsrigen ganz verschiedene Schnecken gelebet haben. Sie sind überaus schön / weiß / oder gelblecht an der Farb / und sind die Nätze / welche die Merkmale so vieler Gelenken oder Kammeren sind / hin und wieder gezählet : die Materi ist Marmorhart / und lasset sich wirklich polieren ; Woraus im vorbeygehen zuersehen / daß aller Marmor zur Zeit der Sündfluth gewesen eine flüssige letzte Materi / so hernach verhartet. Ich habe einen solchen Schnecken / der von aufferer Gewalt zusammengetruckt worden ; einen anderen / auf deme steinerne Muschelen sitzen ; wiederum zwey Beweisthümer / daß diese Steine ehemaligen lebendige Schnecken gewesen.

Fig. 2. Facsimile reprint of the paragraph in which SCHEUCHZER (1718, p. 259) gives the description of his three specimens of 'Cornu Ammonis ...'. The English translation of it runs as follows:

'An ammonite without keel, with straight ribs, which taper towards the ventral side, and mostly are covered with two rows of tubercles. In between these and across the back run many sutures in a snake-like fashion. Fig. 25. I have this kind (of ammonite) from Quersfurt, Wolfenbüttel, and Kindel near Eisenach. We do not find them in Switzerland. In the former region, where many remains of the Great Flood can be found, a sea probably had existed before this general flooding (i.e. the Great Flood). Snails lived in it which were completely different from today's forms. They are very beautiful and of a white or yellowish color. The sutures, which indicate a certain number of joints or chambers, are serrated occasionally. The material is as hard as marble and takes a true polish. In passing, this shows that all marble was a clayey fluid at the time of the Great Flood and hardened only later. I possess one such snail which is compressed by external forces, and another, on which sit stony clams. They are yet two other proofs, that these stones were originally living snails.'

basis for Scheuchzer's illustration. No. 90a (L/1652, Fig. 3a, b) is poorly preserved and certainly did not contribute to the illustration.

Specimen L/1651 (Fig. 1 and 3d) is evidently the specimen on which *Ammonites nodosa* BRUGUIÈRE (1792, p. 43) was founded. The actual date of publication, according to DODGE (1947, p. 485), was 1789. There can be no doubt that this specimen is the principal source for the illustrations in SCHEUCHZER (1718, No. 25) and B*** (1742, Pl. 39, no 262). The illustration in the latter was referred to by Bruguière in his original definition of the species. Accepting that L/1651 is Scheuchzer's No. 90, its locality is near Wolfenbüttel, 15 km south of Braunschweig, Federal Republic of Germany. This locality, although not precise, is compatible with the specimen having been obtained from the Muschelkalk. The lithology and mode of preservation point to the same conclusion.

L/1651 is a worthy candidate as lectotype for *Ammonites nodosa*. It would be a lectotype, not the holotype, because Scheuchzer has three specimens and it is possible,

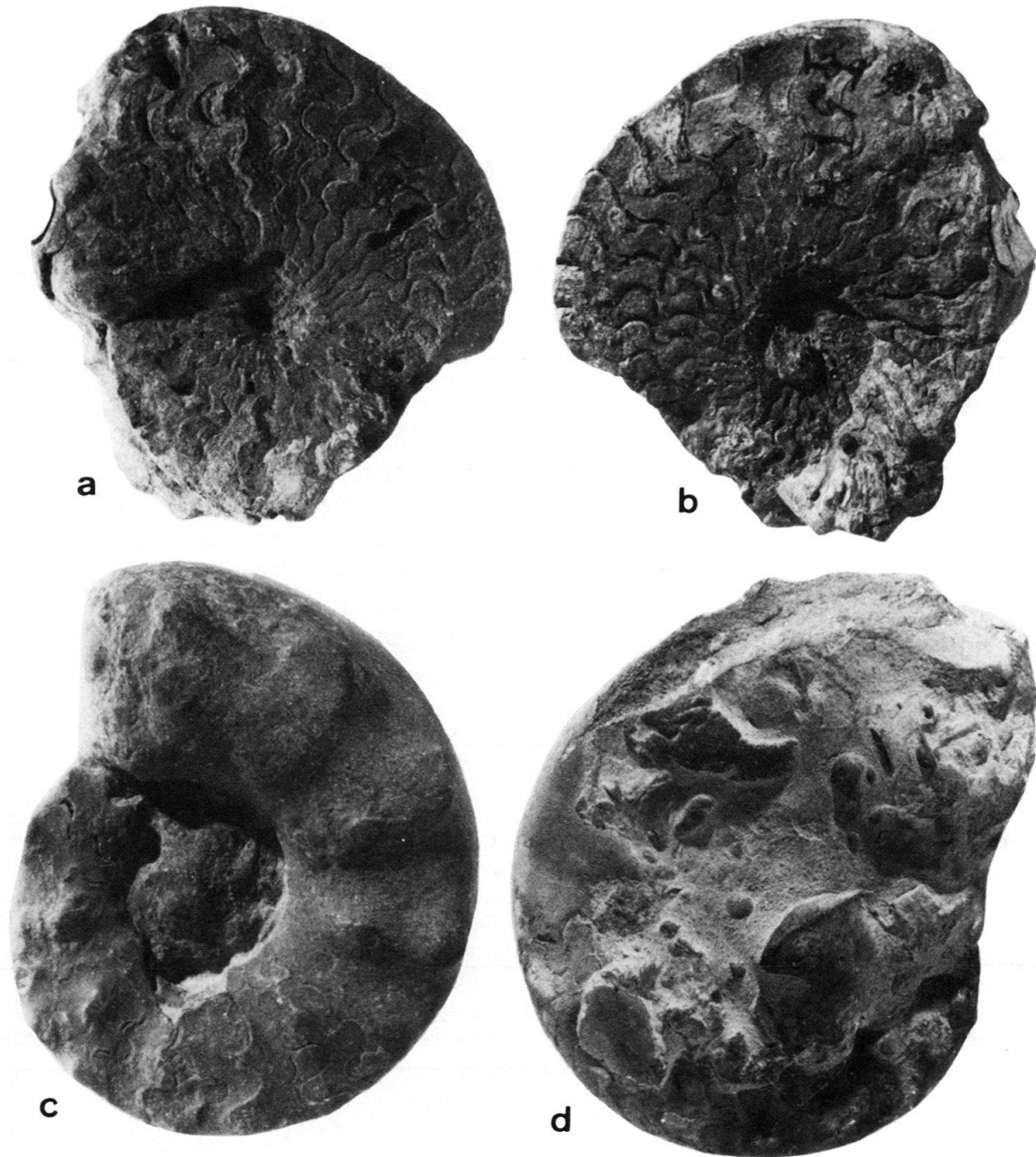


Fig. 3. a, b: Phragmocone of *Ceratites* (*Discoceratites*) sp., both sides natural size, Muschelkalk, near Querfurt. – J. J. Scheuchzer collection, no. 89, PIMUZ no. L/1650.
 c: *Ceratites* (*Acanthoceratites*) *evolutus bispinatus* WENGER, natural size, Muschelkalk, Kindel near Eisenach. – J. J. Scheuchzer collection, no. 90a, PIMUZ, no. L/1652.
 d: *Ceratites nodosus*, proposed lectotype, left side natural size (see Fig. 1a, b). – PIMUZ, no. L/1651.

although unlikely, that his illustrations incorporate data from more than one of them. According to Article 75f of the International Code of Zoological Nomenclature (1961 Edition, p. 83) the status of rediscovered type material, such as Scheuchzer's specimen, requires consideration by the International Commission on Zoological Nomenclature owing to the fact that a neotype was designated by SPATH (1934, p. 477). Whether or not the International Commission judge L/1651 to be the lectotype, there is no doubt that this specimen constitutes the foundation for the species *Ammonites nodosa*.

L/1651 is congeneric but not conspecific with the neotype of *Ceratites nodosus* chosen by SPATH (1934, p. 476) which differs in having strong simple ribs on the body chamber. According to the taxonomy proposed by URLICHS & MUNDLOS (1980, p. 20) L/1651 would be identified as *Ceratites (Doloceratites) robustus robustus* RIEDEL. URLICHS & MUNDLOS (op. cit.) designate *C. (D.) armatus muensteri* PHILIPPI as type species of *Doloceratites*. This taxon has strong marginal tuberculation on the body chamber, unlike L/1651. Acceptance of L/1651 as the type specimen of *Ceratites nodosus* (BRUGUIÈRE) will possibly necessitate taxonomic revisions within the genus *Ceratites* but these questions are not within the scope of this paper.

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