

A new species of *Lyelliceras* (Ammonoidea, Lyelliceratidae) from the Albian (Lower Cretaceous) of France*

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Abstract

A new lyelliceratid, *Lyelliceras escragnollensis* sp. nov., is described from the condensed Albian of Escragnolles (Var) and La Balme de Rencurel (Isère), as well as from the upper Lower or lower Upper Albian of Maurepaire (Aube), in France. The new species is precisely dated on the basis of a previous record from the lower Middle Albian *Lyelliceras lyelli* Subzone of the *Hoplites dentatus* Zone at Courcelles (Aube). It is regarded as a short-lived descendant of *Lyelliceras pseudolyelli*, and is characterised as a compressed species of the genus in which the inner ventrolateral tubercles are weak and apparently absent on the early phragmocone whorls, the outer ventrolateral clavi feeble, offset to opposite across the venter, the siphonal clavi being more numerous than the outer ventrolateral.

Keywords: Ammonoidea, Lyelliceratidae, *Lyelliceras*, Albian, Lower Cretaceous, France

Introduction

Ammonites of the family Lyelliceratidae are key biostratigraphic indicators in the upper Lower and basal Middle Albian, with a cosmopolitan distribution. The group was reviewed by Latil (1995) and Kennedy & Klinger (2008). The latter authors re-examined the type material in the d'Orbigny Collection, housed at the Muséum national d'Histoire naturelle (Paris), and recognised a distinctive form, referred to as *Lyelliceras?* sp. nov. (Kennedy & Klinger, 2008, p. 87, fig. 31A-D). Additional specimens of this form are present in the collections of The Natural History Museum, London, and of the Institut Dolomieu, Grenoble. Taken together they provide the basis for the description of a previously unnamed species of *Lyelliceras*, interpreted as a short-lived descendant of *Lyelliceras pseudolyelli* (Parona & Bonarelli, 1897).

Repositories of specimens

The following abbreviations are used to indicate the repositories of specimens mentioned in the text: BMNH, The Natural History Museum (formerly British Museum (Natural History)),

London; ID, Institut Dolomieu, Grenoble; MNHN, Muséum national d'Histoire naturelle, Paris.

Conventions

Dimensions are given in millimetres; D = diameter; Wb = whorl breadth; Wh = whorl height; U = umbilicus. The suture terminology is that of Korn et al. (2003): E = external lobe; A = adventive lobe (= lateral lobe [L] of Kullmann & Wiedmann, 1970); U = umbilical lobe; I = internal lobe.

Systematic palaeontology

Family Lyelliceratidae Spath, 1921

Genus *Lyelliceras* Spath, 1921

Type species

Ammonites lyelli d'Orbigny, 1841, p. 255, pl. 74, figs 1, 2, by the original designation of Spath (1921, p. 222, footnote).

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Lyelliceras escagnollensis sp. nov.

Figs 1A, C-N, R-X, 2, 3.

1979 *Lyelliceras* aff. *cotteri* Spath; Destombes, p. 110, pl. 4-24, fig. 1.

2008 *Lyelliceras?* sp. nov.; Kennedy & Klinger, p. 87, fig. 31A-D.

Types

The holotype is BMNH 73722b (Fig. 1F-H, U); paratypes are BMNH 37629 (Fig. 1D, I-K), 73722c (Fig. 1C, R-T) and 37625d (Fig. 1A, L-M), from the condensed Albian of Escagnolles (Var, France); MNHN d'Orbigny Collection 5792a-3 (Fig. 1E, V-X), from the upper Lower, or lower Middle, Albian of Maurepaire (Aube, France); ID 2066, from the condensed Albian of La Balme de Rencurel (Isère, France; see Fig. 2).

Costal dimensions

	D	Wb	Wh	Wb:Wh	U
BMNH 37625d	19.3 (100)	7.9 (40.9)	9.2 (47.7)	0.86	5.4 (28.0)
BMNH 73722c	22.9 (100)	8.4 (36.7)	10.8 (47.2)	0.78	4.8 (21.0)
BMNH 37629	24.2 (100)	9.4 (38.8)	10.7 (44.2)	0.88	6.8 (28.1)
MNHN 5792a-3	27.3 (100)	9.6 (35.2)	12.0 (44.0)	0.80	7.5 (21.5)
BMNH 73722b	42.1 (100)	13.0 (30.9)	16.5 (39.2)	0.79	14.0 (33.2)

Diagnosis

A compressed species of *Lyelliceras* in which the inner ventrolateral tubercles are weak and apparently absent on the early phragmocone whorls, the outer ventrolateral clavi feeble, offset to opposite across the venter, the siphonal clavi more numerous than the outer ventrolateral.

Description

Juveniles between 18 and 27 mm in diameter are moderately involute, with an umbilicus that comprises 21-28 per cent of the diameter, shallow, with a low, feebly convex wall and umbilical shoulder. The costal whorl section is compressed polygonal, with a whorl breadth to height ratio of 0.78-0.88, the greatest breadth just outside the umbilical shoulder. The early phragmocone whorls have no, or very weak flank ribs, as seen on the inner whorls of specimens such as MNHN 5792a-3 (Fig. 1E, V-X). From an estimated diameter of 11 mm, there are 19-28 ribs per whorl. Primary ribs arise at the umbilical seam, strengthen across the umbilical wall and shoulder, and develop into weak umbilicolateral bullae. Other ribs are weak to incipient on the umbilical wall and shoulder, not developing into a bulla. Yet other ribs are narrow, feebly prorsiradiate, straight to feebly convex on the inner to middle flank and projecting feebly forwards on the outer flank, where they strengthen and broaden. Well-developed outer ventrolateral clavi are present on all ribs, and are near-opposite, as in BMNH 37629 (Fig. 1D, I-K), to feebly offset, as in BMNH 73722c (Fig. 1C, R-T) and MNHN 5792a-3 (Fig. 1E, V-X). Inner ventrolateral

bullae appear at a late stage, and are absent on the phragmocone whorls to diameters of up to 25 mm, as in MNHN 5792a-3 (Fig. 1E, V-X). They are always weak and bullate in these specimens. Larger specimens such as ID 2066 (Fig. 2), 35.5 mm in diameter, are densely ribbed, the ribs straight and rectiradiate, rather than feebly flexed, and develop a distinct siphonal ridge that links the siphonal clavi. The outer ventrolateral clavi are slightly offset on the adapical part of the outer whorl of this specimen, and opposite on the adapertural part.

The holotype, BMNH 73722b (Fig. 1F-H, U), has 24 primary ribs out of a total of 26 ribs at the ventrolateral shoulder of the outer whorl. The primary ribs arise at the umbilical seam, and sweep forwards and strengthen across the umbilical wall and ventrolateral shoulder. They are very prorsiradiate and very feebly flexed across the flanks: feebly convex on the inner to middle flanks and feebly concave on the outer flanks. The umbilicolateral bullae, initially feeble, strengthen progressively, and migrate outwards to an inner lateral position. The inner ventrolateral bullae are very feeble to incipient on the apical half of the outer whorl, thereafter strengthening progressively, and becoming prominent on the adapertural 90° sector of the outer whorl. The outer ventrolateral clavi are well developed and prominent around the outer whorl, and are only very slightly offset across the venter. The siphonal clavi are smaller and more numerous than the outer ventrolateral, and are borne on a distinct siphonal ridge.

The juvenile suture is well seen in BMNH 37629 (Fig. 3), and is moderately incised, with broad, bifid E/A, narrow A, and smaller, little-incised A/U₂ and U₂/U₃.

Discussion

The compressed whorls, style of flank ribbing, late appearance of inner ventrolateral tubercles and siphonal clavi more numerous than the outer ventrolateral separate *Lyelliceras escagnollensis* sp. nov. from *L. lyelli* (d'Orbigny, 1841) and *L. pseudolyelli* (see revisions in Kennedy & Klinger, 2008). *Lyelliceras lyelli* has equal numbers of outer ventrolateral and siphonal clavi that are opposite rather than offset in typical members of the species, with well-developed inner ventrolateral clavi from an earlier ontogenetic stage. In *L. pseudolyelli* the ventrolateral clavi are distinctly offset, and linked by a zigzag ridge, the inner ventrolateral tubercles well developed from an early ontogenetic stage. The present species thus shows some characters of both *L. lyelli* and *pseudolyelli*. The material from southeast France comes from condensed sequences, and is imprecisely dated. The material from Maurepaire (MNHN 5792a-3, d'Orbigny Collection) comes from an expanded sequence that spans the Lower-Middle Albian boundary (Latil, 1995). The *Lyelliceras* aff. *cotteri* Spath of Destombes (1979, p. 110, pl. 4-24, fig. 1) from the expanded basal Middle Albian *lyelli* Subzone of Courcelles (Aube) is another specimen of *Lyelliceras escagnollensis* sp. nov., and provides a precise dating of the

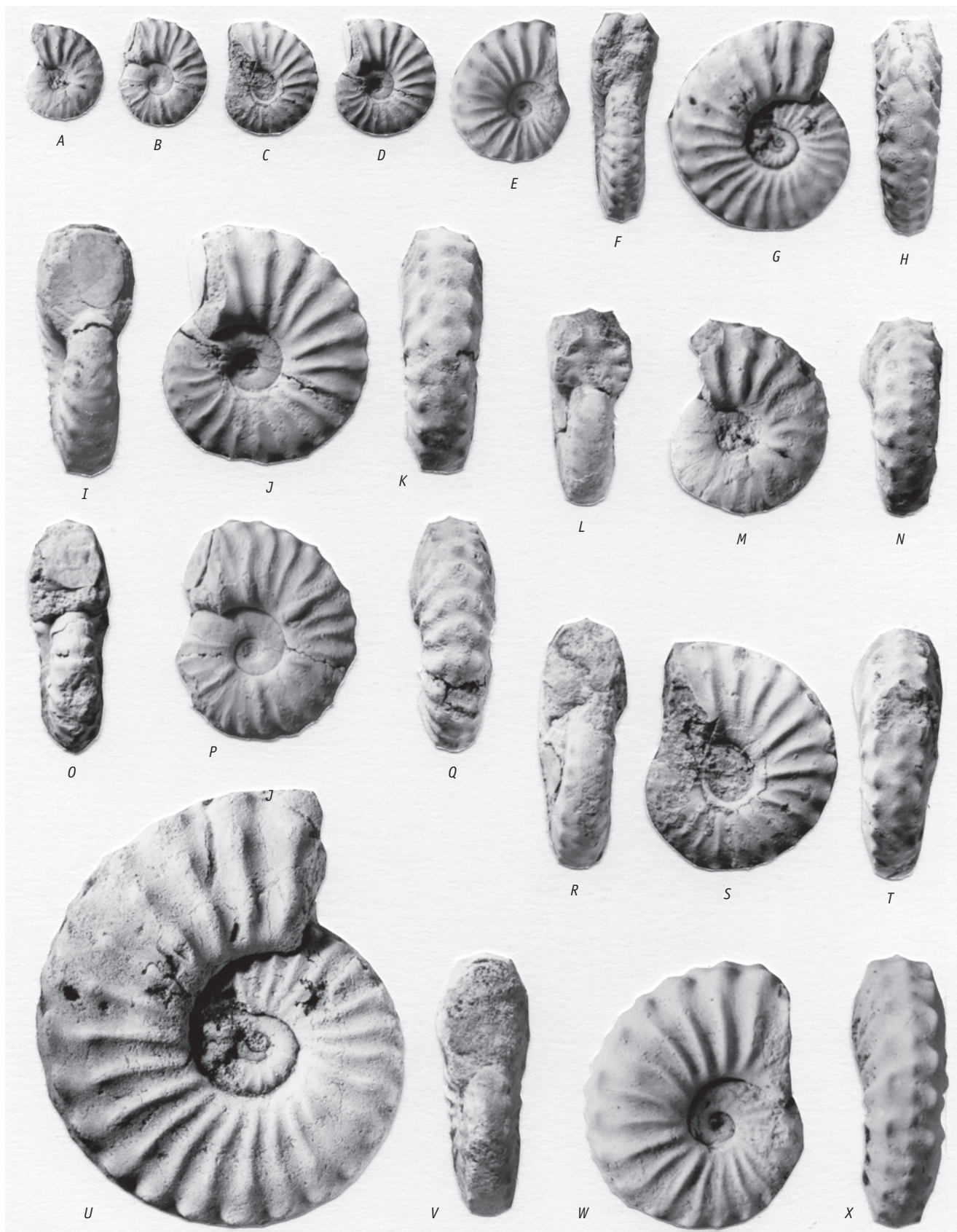


Fig. 1A, C-N, R-X. *Lyellicerias escragnollensis* sp. nov.; A, L-N. paratype, BMNH 37625d. C, R-T. paratype, BMNH 73722c; D, I-K, paratype, BMNH 37629; E, V-X, paratype, MNHN d'Orbigny Collection 5792a-3; F-H, U. holotype, BMNH 72722b. B, O-Q, *Lyellicerias* aff. *escragnollensis* sp. nov., BMNH 37628. The originals of A-D and F-U are from the condensed Albian of Escragnolles (Var), that of E, V-X is from the upper Lower, or lower Middle, Albian of Maurepaire (Aube). A-H are natural size; I-X are $\times 2$.

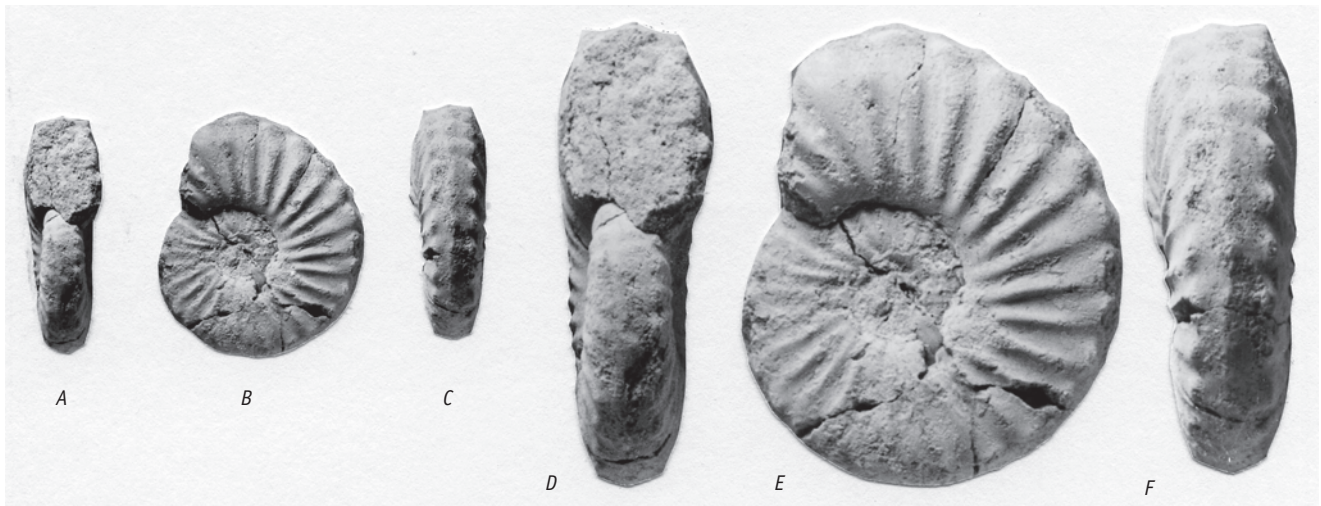


Fig. 2. *Lyelliceras escragnollensis* sp. nov., ID 2066, from the condensed Albian of La Balme de Rencurel (Isère). A-C are natural size; D-F are $\times 2$.

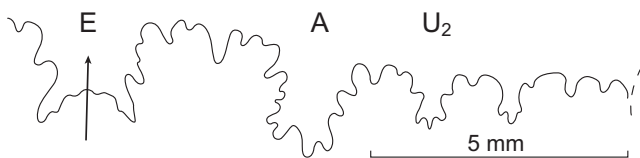


Fig. 3. External suture of *Lyelliceras escragnollensis* sp. nov., BMNH 37629 (see Fig. 1D, I-K).

species. *Lyelliceras escragnollensis* sp. nov. is here regarded as a short-lived descendant of *L. pseudolyelli*.

A distinctive specimen, BMNH 37628 (Fig. 1B, O-Q), is here referred to as *L. aff. escragnollensis* sp. nov. It differs from the type series in having equal numbers of outer ventrolateral and siphonal clavi, as in *L. lyelli*, from which it differs in the compressed whorl section, flexuous ribs, and absence of inner ventrolateral tubercles to a diameter of 22 mm.

Latil (1995, fig. 24 (*pars*), 25 (*pars*), 26 (*pars*)) recognised specimens that were termed 'morphologie *Prolyelliceras*' in collections from Le Gaty (Aube, France), and provided photographs of two individuals (1995, pl. 3, figs 16, 17). These differ from *L. escragnollensis* sp. nov. in several respects. The original of Latil's pl. 3, fig. 16 has a wider umbilicus and more serpentine coiling, the whorl section less, if at all compressed, with outer ventrolateral and siphonal clavi opposite and equal. The original of his pl. 3, fig. 17 has a compressed whorl section, but the outer ventrolateral and siphonal clavi are again opposite and equal. The ribbing style of both specimens is quite distinct from that of *L. escragnollensis* sp. nov.

Occurrence

The new species is currently known from the condensed Albian of Escragnolles (Var) and La Balme de Rencurel (Isère), the upper Lower, or lower Upper, Albian of Maurepaire (Aube) and the lower Middle Albian *Lyelliceras lyelli* Subzone of the *Hoplites dentatus* Zone at Courcelles (Aube), in France.

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