

The ammonite genus *Prionocycloceras* Spath, 1926, from the Coniacian of KwaZulu-Natal, South Africa

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ABSTRACT:

Klinger, H.C. and Kennedy, W.J. 2015. The ammonite genus *Prionocycloceras* Spath, 1926, from the Coniacian of KwaZulu-Natal, South Africa. *Acta Geologica Polonica*, **66** (4), 663–669. Warszawa.

Subprionocyclus latiumblicatus Van Hoepen, 1968, and *Subprionocyclus obesus* Van Hoepen, 1968, are revised, and referred to *Prionocycloceras* Spath, 1926, a genus not previously recognised from the South African Cretaceous. The material comes from the Middle and Upper Coniacian St Lucia Formation of northern KwaZulu-Natal.

Keywords: Cretaceous; Coniacian; Ammonite; *Prionocycloceras*; KwaZulu-Natal; South Africa.

INTRODUCTION

This note continues the revision of the Cretaceous ammonite faunas from Eastern Cape Province and KwaZulu-Natal, the publication of which we began forty years ago (Kennedy and Klinger 1975). Here we revise two of the species assigned to the genus *Subprionocyclus* Shimizu, 1932, by Van Hoepen (1968), and refer them to *Prionocycloceras* Spath, 1926. The third species, *Subprionocyclus cyni* Van Hoepen, 1968 (p. 183, pl. 1) is a Coniacian *Protexanites* (*Protexanites*) (Klinger & Kennedy 1980, p. 9, figs 2–4). The Madagascar *Schloenbachia* (*Gauthiericeras*) *bajuvarica* of Boule, Lemoine and Thévenin (1908, p. 22 (42) pl. 5 (12), fig. 1) is shown to be a synonym of *Prionocyclus latiumblicatus*.

CONVENTIONS

SAM: The South African Museum, Cape Town.

Dimensions are given in millimetres: D = diameter; Wb = whorl breadth; Wh = whorl height; U = umbilicus. Figures in parentheses are dimensions as a percentage of diameter.

The suture terminology is that of Korn *et al.* (2003): E = external lobe; A = adventive lobe (= lateral lobe, L, of Kullmann and Wiedmann 1970); U = umbilical lobe; I = internal lobe.

SYSTEMATIC PALAEOLOGY

Superfamily Acanthoceratoidea de Grossouvre, 1894
Family Collignoniceratidae Wright & Wright, 1951

Subfamily Collignoniceratinae Wright & Wright, 1951
Genus *Prionocycloceras* Spath, 1926
(=*Donjuaniceras* Basse, 1950)

TYPE SPECIES: *Prionocyclus guyabanus* Gerhardt, 1897, p. 197, pl. 5, fig. 22, by the original designation of Spath 1926, p. 197.

DIAGNOSIS: "Evolute: whorl section more or less rectangular, with angular to sharply rounded shoulders; keel mainly distinct with grooves on either side but may weaken on outer whorls; keel with crenulations more numerous than ribs; ribs generally simple but may be intercalated, typically distant, rursiradiate at shoulder, strongly projected on venter, crossing keel as riblets; ventrolateral tubercles may be double, but inner ones dominant and enlarging into a septate horn." (Wright 1996, p. 187).

DISCUSSION: Wright's diagnosis is based on the detailed account of Matsumoto (1965, p. 38). Species of *Prionocycloceras* may reach a large size: Young (1963, p. 67, pl. 23, figs 5, 6; pl. 27, figs 2, 3; text-figs 12a, 14a, 33d) figured fragments with whorl heights of up to 100mm. The crenulated keel, with crenulations more numerous than the ribs, is weak to obsolete on internal moulds, whilst not all species develop massive ventrolateral horns, as is the case with the species described below, and *Prionocycloceras mediotuberculatus* (Gerhardt, 1897) (p. 198, pl. 5, fig. 23).

OCCURRENCE: Coniacian, Spain, Armenia, Algeria, Madagascar, KwaZulu-Natal, South Africa, Brazil, Venezuela, Colombia, Peru, Texas.

Prionocycloceras latiumbilicatus (Van Hoepen, 1968)
(Text-figs 1, 2)

1907. *Schloenbachia* (*Gauthiericeras*) *bajuvarica* Redtenbacher; Boule, Lemoine and Thévenin, p. 22 (42), pl. 5 (12), fig. 1.

1968. *Subprionocyclus latiumbilicatus* Van Hoepen, 1968, p. 183, pl. 2.

TYPES: The holotype is SAM-PCZ20717 (formerly Z713); there are nine paratypes, (Z69, Z73, Z630, Z655, Z660, Z661, Z662, Z695, Z843), all from the Middle Coniacian part of the St Lucia Formation of locality 24 of Van Hoepen (1968) on the lower reaches of the Hluhluwe River, 7.5 km ESE of Hluhluwe, in northern KwaZulu-Natal, South Africa.

DESCRIPTION: The holotype (Text-fig. 1) is a near-complete adult retaining a 120° sector of body chamber, with an estimated maximum diameter of 85 mm. There are extensive areas of partially exfoliated aragonitic shell. Coiling is evolute, with 40% of the previous whorl covered, the umbilicus shallow, comprising 32% of the diameter, with a low flat vertical wall and narrowly rounded umbilical shoulder. The whorl section is compressed trapezoidal, with a costal whorl breadth to height ratio of 0.68, the greatest breadth at the umbilical bullae in costal section, and just outside the umbilical shoulder in intercostal section. The ventrolateral shoulder is obtusely angular in costal section, and broadly rounded in intercostal section, the venter obtusely fastigiate, with a strong siphonal keel, flanked by shallow grooves. On the phragmocone, 16 small umbilical bullae per whorl perch on the umbilical shoulder. They give rise to pairs of low, relatively wide, straight prorsiradiate ribs on the inner and middle flank. These flex forwards and are very feebly concave on the ventrolateral shoulder, and strengthen into a well-developed inner ventrolateral bulla, from which a low, broad rib sweeps forwards to a low ventrolateral clavus, separated from the siphonal keel by a smooth zone. Comparable ornament extends onto the adapical part of the body chamber, accompanied by prominent growth lines and lirae. On the adaperural 90° sector of the body chamber, bullate primary ribs are separated by long intercalated ribs, some feebly linked to the umbilical bulla. The ribs link to well-developed ventrolateral clavi. These give rise to an initially broad prorsiradiate rib that narrows as it sweeps forwards to form an obtuse ventral chevron, interrupted and separated from the siphonal keel by a shallow groove. The rib terminations adjacent to the grooves form discontinuous undulose keels. The suture (Text-fig. 2) is only moderately incised, with a broad bifid E/A and A/U₂, separated by a narrow A.

DISCUSSION: *Prionocycloceras latiumbilicatus* differs from *Prionocycloceras obesus* (Van Hoepen, 1968), described below (Text-fig. 4) in its more compressed whorl section, the ribs single bullate primaries and long intercalated ribs, rather than some arising in pairs. Of the Madagascan species, small individuals and fragments referred to *Prionocycloceras guyabanum* (Besairie 1936, p. 203, pl. 24, figs 19, 20; Collignon 1965, p. 45, pl. 433, figs 1792, 1793) have strong inner ventrolateral horns. *Prionocyclus pseudobravaisi* Collignon, 1965 (p. 44, pl. 432, figs 1789–1791) is based on pyritic nuclei up to 26 mm in diameter, with crowded flexuous primary and intercalated ribs, the former lacking umbilical bullae. *Prionocyclus multicostatum* Collignon, 1965 (p. 65, pl. 433, figs 1794–1795; Text-fig. 5) is very evolute,

with a much broader whorl section. The ribs are predominantly primaries and long intercalatories, the former lacking umbilical bullae, with prominent inner ventrolateral spines on the penultimate whorl.

The original of *Schloenbachia* (*Gauthiericeras*) *bajuvarica* Redtenbacher of Boule, Lemoine & Thévenin

(1907, p. 22 (42), pl. 5 (13), fig. 1), from the Montagne des Française, Madagascar, is a feebly ornamented variant of the present species. It is illustrated here as Text-fig. 2.

OCCURRENCE: Middle Coniacian of northern KwaZulu-Natal, South Africa. Coniacian of Madagascar.



Text-fig. 1. The holotype of *Prionocycloceras latiumblicatus* (Van Hoepen, 1968), SAM-PCZ20717 (formerly Z713). Figures are $\times 1$



Text-fig. 2. *Prionocycloceras latiumblicatus* (Van Hoepen, 1968). The original of *Schloenbachia* (*Gauthiericeras*) *bajuvarica* Redtenbacher of Boule, Lemoine and Thévenin (1907, p. 22 (42), pl. 5 (132)), from the Montagne des Française, Madagascar, housed in the collections of the Muséum National d'Histoire Naturelle, Paris.

Figures are $\times 1$

Prionocycloceras obesus (Van Hoepen, 1968)
(Text-figs 3, 4)

1968. *Prionocyclus obesus* Van Hoepen, 1968, p. 184, pl. 3.

TYPES: The holotype is SAM-PCZ19667 (formerly Z1060), from the Middle Coniacian part of the St Lucia Formation at locality 23 of Van Hoepen (1968), Mason's Camp on the western shore of False Bay. The paratype, SAM Z847, is from the same horizon at locality 25 of Van Hoepen (1968), on the lower reaches of the River Hluhluwe, 7 km ESE of Hluhluwe in northern KwaZulu-Natal, South Africa.

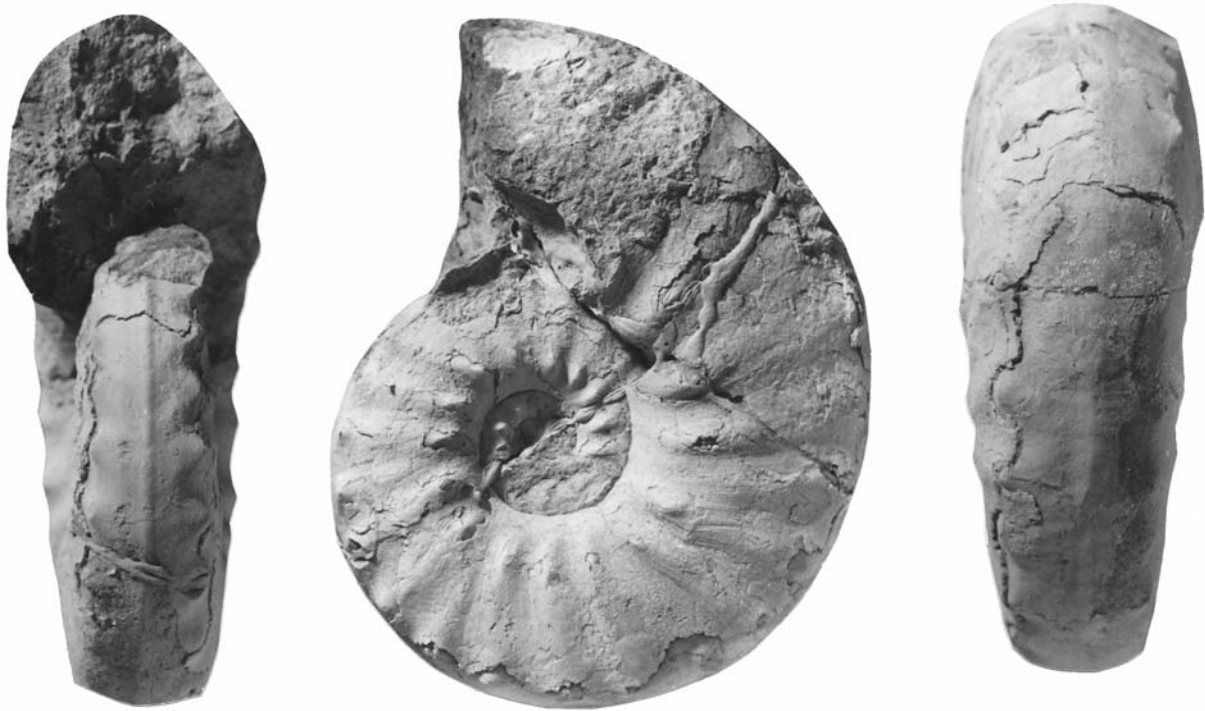
MATERIAL: SAM Z72 and Z190, from the same horizon and locality as the holotype. SAM Z1060, from Mason's Camp. OUM KX 12365, from the Upper Coniacian St Lucia Formation of locality 88 of Kennedy and Klinger (1975, p. 294), loose boulders on the Hluhluwe

floodplain, ESE of Hluhluwe village, 28° 02' 12" S, 32° 21' 55".

DIMENSIONS:

	D	Wb	Wh	Wb;Wh	U
Z1060	103.2(100)	- (-)	46.0 (44.6)	-	28.5 (27.6)
at	91.8 (100)	33.0 (35.9)	40.3 (43.9)	0.82	25.4 (27.7)

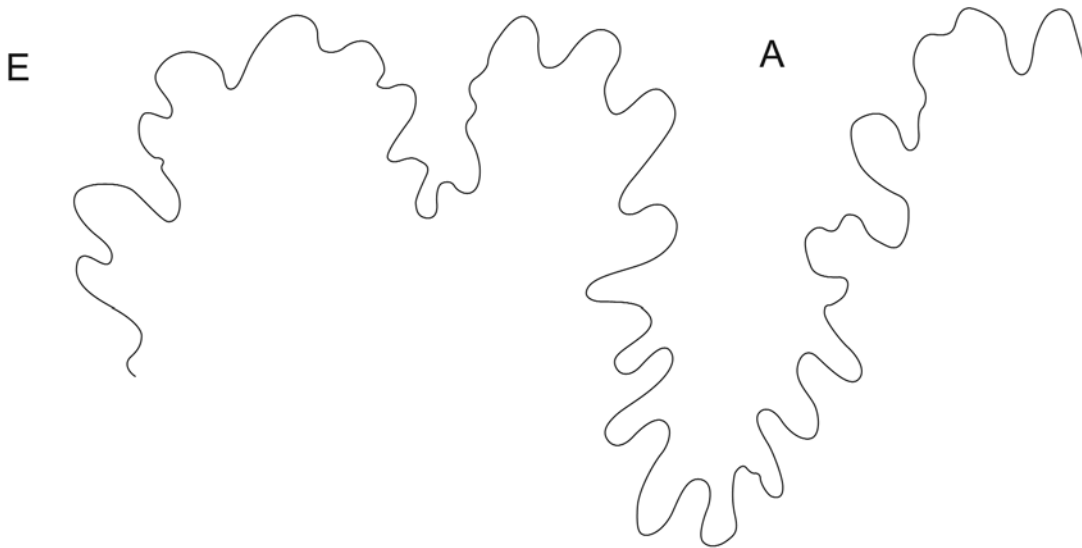
DESCRIPTION: The holotype retains a 120° sector of body chamber, and aragonitic shell on one flank. Coiling is moderately evolute, with 56% of the previous whorl covered. The crater-like umbilicus comprises 28% of the diameter, and has a flattened, outwards-inclined umbilical wall, and a broadly rounded umbilical shoulder. The whorl section is slightly compressed-trapezoidal, with the greatest breadth at the umbilical bullae in costal section and just outside the umbilical shoulder in intercostal section. The inner flanks are feebly convex, the outer flanks flattened and convergent,



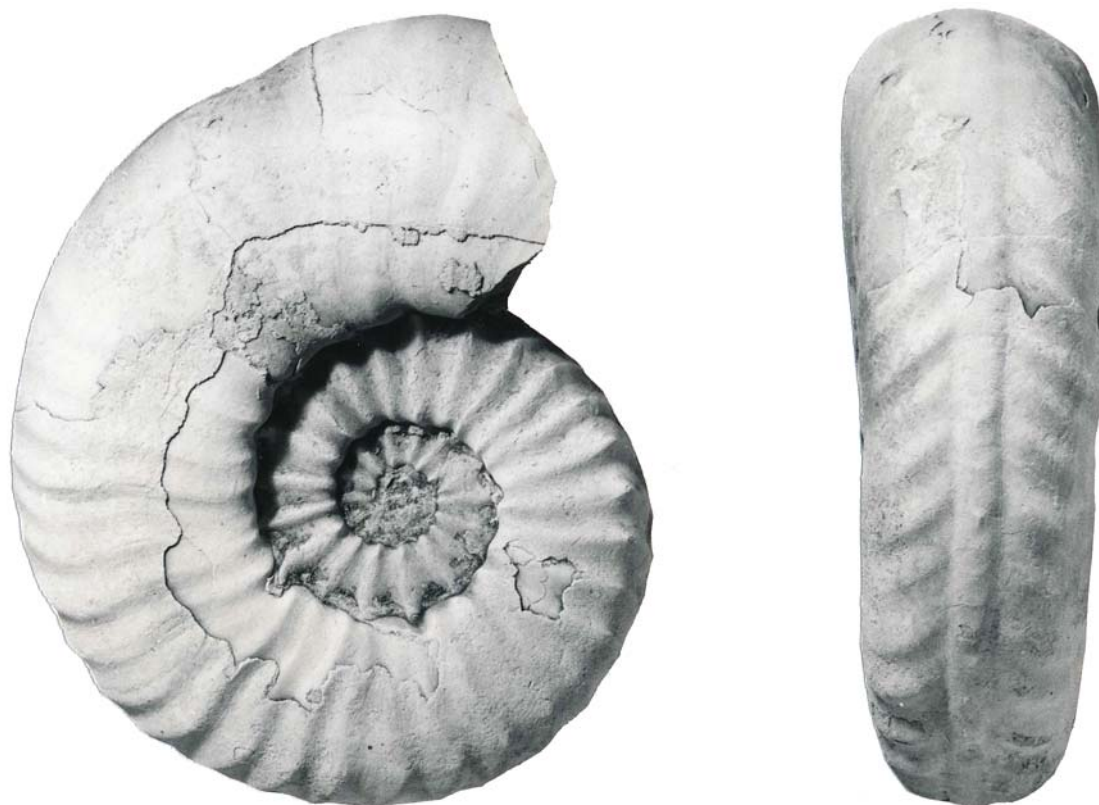
Text-fig. 3. *Prionocycloceras obesum* (Van Hoepen, 1968), the holotype, SAM-PCZ19667. Figures are $\times 1$

the ventrolateral shoulders broadly rounded, the venter very obtusely fastigiate, with a low, blunt siphonal keel. There are 17 umbilical bullae per whorl, perched on the outer margin of the umbilical shoulder. They give rise to one or two low, broad, straight prorsiradiat ribs to give a total of 24 at the ventrolateral shoulder on the outer whorl. The ribs are weakened across the mid-flank region, but strengthen into small, well-differentiated ven-

trolateral clavi that become progressively less conspicuous as size increases. The clavi give rise to low, broad, prorsiradiate ribs that decline cross the venter to form an approximately 90° chevron. The siphonal keel is low and rounded, flanked by faint sulci, and faintly serrated where well-preserved. The incompletely preserved suture is only moderately incised, with a broad bifid E/A and A/U₂, separated by a narrow A (Text-fig. 4).



Text-fig. 4. *Prionocycloceras obesum* (Van Hoepen, 1968), partial external suture of the holotype, SAM-PCZ19667 (formerly Z1060)



Text-fig. 5. *Prionocycloceras multicostatum* Collignon, 1965. The holotype, the original of Collignon, 1965, p. 45, pl. 433, figs 1794, from the lower Upper Coniacian of Satria (Betioky), Madagascar. Figures are $\times 1$

DISCUSSION: Differences from *Prionocycloceras latiumbilicatus* are discussed above. The general form of the shell resembles that of *Prionocyclus multicostatum* Collignon, 1965 (p. 45, pl. 433, figs 1794–1795: Text-fig. 5). The latter has a vertical, rather than outward-inclined umbilical, more numerous, feebly flexuous ribs, without the prominent umbilical bullae of *obesum*, inner ventrolateral spines on the inner whorl, and a coarse serrated siphonal keel.

OCCURRENCE: Middle and lower Upper Coniacian of northern KwaZulu-Natal, South Africa.

Acknowledgements

Kennedy acknowledges the support of the staff of the Geological Collections, Oxford University Museum of Natural History, and the Department of Earth Sciences, Oxford, and the financial assistance of the Oppenheimer Fund (Oxford). We thank Ulrich Kaplan for his critical review of the manuscript.

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Manuscript submitted: 29th December 2015

Revised version accepted: 25th January 2016