

# The Upper Cretaceous ammonite *Grandidiericeras* Collignon, 1961 (Puzosiinae), from the St Lucia Formation of KwaZulu-Natal, South Africa

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(with 3 figures)

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The ammonite genus *Grandidiericeras* Collignon, 1961 was previously known from two species, based on six described specimens, three of which, referred to *Grandidiericeras grandidierorum* Collignon, 1961, are from the Middle Campanian of Madagascar, and three, referred to *Grandidiericeras nagaoui* Matsumoto & Saito, 1987, from the Coniacian of Japan. A single specimen from the Upper Santonian to Lower Campanian of Lake St Lucia in KwaZulu-Natal represents a new species, *Grandidiericeras corrugatum*.

**Key words:** ammonites, *Grandidiericeras*, Santonian, Campanian, Cretaceous, KwaZulu-Natal, South Africa.

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## INTRODUCTION

The puzosiine genus *Grandidiericeras*, with *Grandidiericeras grandidierorum* as type species, was introduced by Collignon in 1961 (pp. 17, 47, pl. 17, fig. 1), [erroneously dated 1960 on p. 47] based on two individuals. The holotype, no. 3915 in the Collections of the Muséum National d'Histoire Naturelle, Paris, has a maximum preserved diameter of 160 mm approximately, and is illustrated here as Fig. 3A–B. Collignon's second specimen, MNHP 3914, was not figured, but the diameter was given as 134 mm. They are from Collignon's locality 157, Ankilizato (Belo sur Tsiribihina), Madagascar, and referred by him to the 'Campanien moyen à *Eupachydiscus levyi* et *Delawarella subdelawarensis*.' In 1970, Collignon illustrated a fragmentary specimen (p. 19, pl. 614, fig. 2297), consisting of a nucleus and a 120° sector of phragmocone with a maximum preserved whorl height of 45 mm. It is figured here as Fig. 2B. This specimen came from locality 156 of his Ankilizato (Belo sur Tsiribihina) section, and was referred to his Campanien moyen, 'Zone à *Subdelawarella subdelawarensis* et *Australiella australis*' (it should be noted that *subdelawarensis* is referred to *Delawarella* elsewhere in Collignon's works, and that *Subdelawarella* is a *nomen nudum*). The associated fauna from this locality and zone given in Collignon (1970) indicate an equivalence, in

KwaZulu-Natal, to Campanian II of Kennedy & Klinger (1975).

Matsumoto & Saito (1987, p. 1, figs 1–4) described three specimens (and mention several other large individuals left in the field) of a second species, *Grandidiericeras nagaoui* from the Coniacian of Japan, the largest of which reaches a diameter of at least 500 mm (Matsumoto & Saito 1987, fig. 2). The present specimen, from the Upper Santonian to Lower Campanian of Lake St Lucia in northern KwaZulu-Natal provides a stratigraphic link between these Coniacian and Middle Campanian species.

## SYSTEMATIC PALAEOLOGY

Suborder **AMMONITINA** Hyatt, 1889  
Superfamily **DESMOCERATOIDEA** Zittel, 1895  
Family **DESMOCERATIDAE** Zittel, 1895  
Subfamily **PUZOSIINAE** Spath, 1922

Genus *Grandidiericeras* Collignon, 1961

Type species

*Grandidiericeras grandidierorum* Collignon, 1961, p. 47, pl. 17, fig. 1, from the Middle Campanian of Collignon's locality 157, Ankilizato (Belo sur Tsiribihina), Madagascar.

***Grandidierceras corrugatum* sp. nov.**

Figs 1A–B, 2A

## Derivation of name

*corrugatus* (Latin): wrinkled, referring to the ventral ornament.

## Type

The holotype is SAM-PCZ022402 from the Upper Santonian to Lower Campanian St Lucia Formation at locality 105 of Kennedy & Klinger (1975, p. 296).

## Diagnosis

A *Grandidierceras* with well-developed concave, elongate umbilical bullae.

## Description

The holotype (Figs 1A–B, 2A) is a fragmentary internal cast of a phragmocone in sparry calcite with an estimated maximum diameter of 130–140 mm, and a maximum preserved whorl height of 50 mm. It retains traces of calcite spar-replaced shell. Coiling is relatively involute, the umbilicus comprising an estimated 25% of the diameter, shallow, with a low, convex wall and narrowly rounded umbilical shoulder. The flanks are flattened, subparallel, with rounded ventrolateral shoulders and a very feebly convex venter. The whorl breadth to height ratio is 0.64, the greatest breadth well below mid-flank. Twenty-eight ribs arise at the umbilical seam, sweep back across the umbilical wall, then forwards across the umbilical shoulder, where they strengthen into a sharp, concave umbilical bulla. Each bulla gives rise to a single rib, straight and feebly prorsiradiate on the inner flank, flexed slightly back and feebly convex at mid-flank, straight on the outer flank, broadening, and passing straight across the venter, where they are at their greatest breadth and strength, flattened and ribbon-like, with steep adapical and adapertural faces, and separated by subequal interspaces. Four interspaces on the outer whorl are slightly deepened into incipient constrictions. The poorly exposed suture is deeply incised and puzosiine.

## Discussion

*Grandidierceras corrugatum* sp. nov. is distinguished from *G. grandidierorum* (compare Figs 2A and 2B) by its well-developed umbilical bullae and much coarser ribs, which are reduced to mere striae on the early whorls and on

the umbilical shoulder of *G. grandidierorum* at a diameter equivalent to that of the holotype of *G. corrugatum*. The figured specimens of *Grandidierceras nagaoi* (Matsumoto & Saito 1987, figs 1–4) are much larger, but are immediately distinguished by the lack of bullae, and very weak inner flank ribs, the ribs narrower, finer and more numerous, with more numerous long and short intercalatories on the middle and outer flank.

## Occurrence

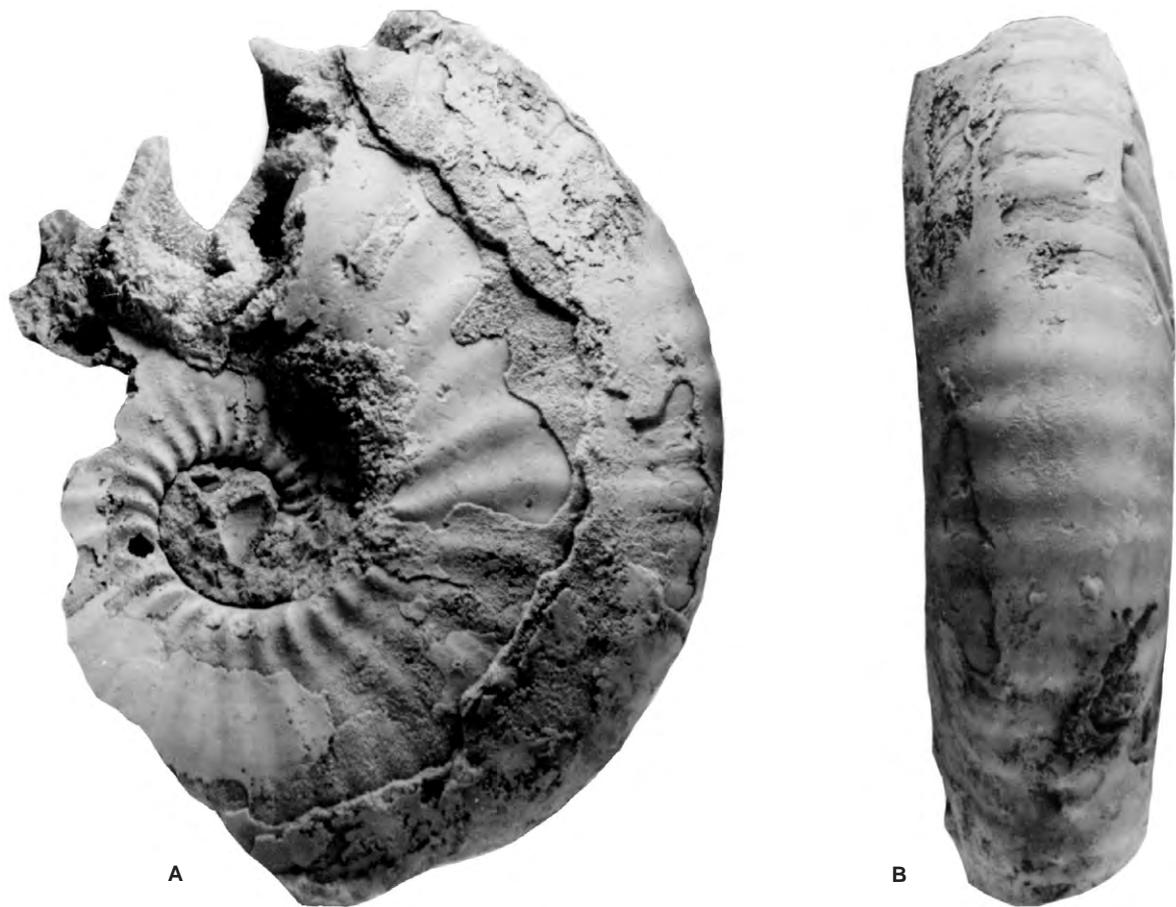
The St Lucia Formation at locality 105 is exposed in a 2–3 metre cliff and ca. 100 m foreshore exposure that spans the boundary between Santonian III and Campanian I of Kennedy & Klinger (1975); see detailed log in Klinger & Kennedy (1980, fig. 130). The precise level of occurrence of the specimen is not recorded.

**ACKNOWLEDGEMENTS**

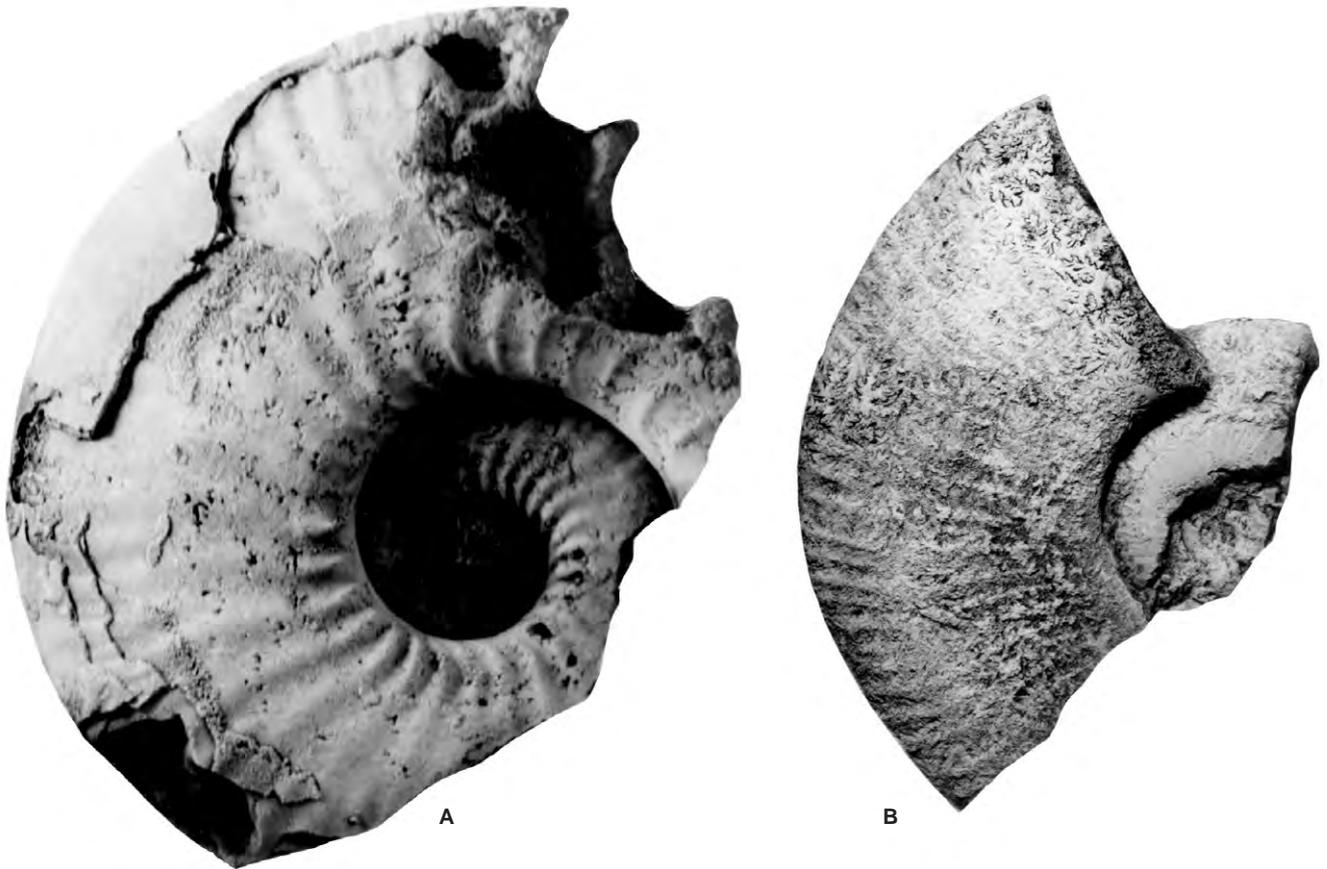
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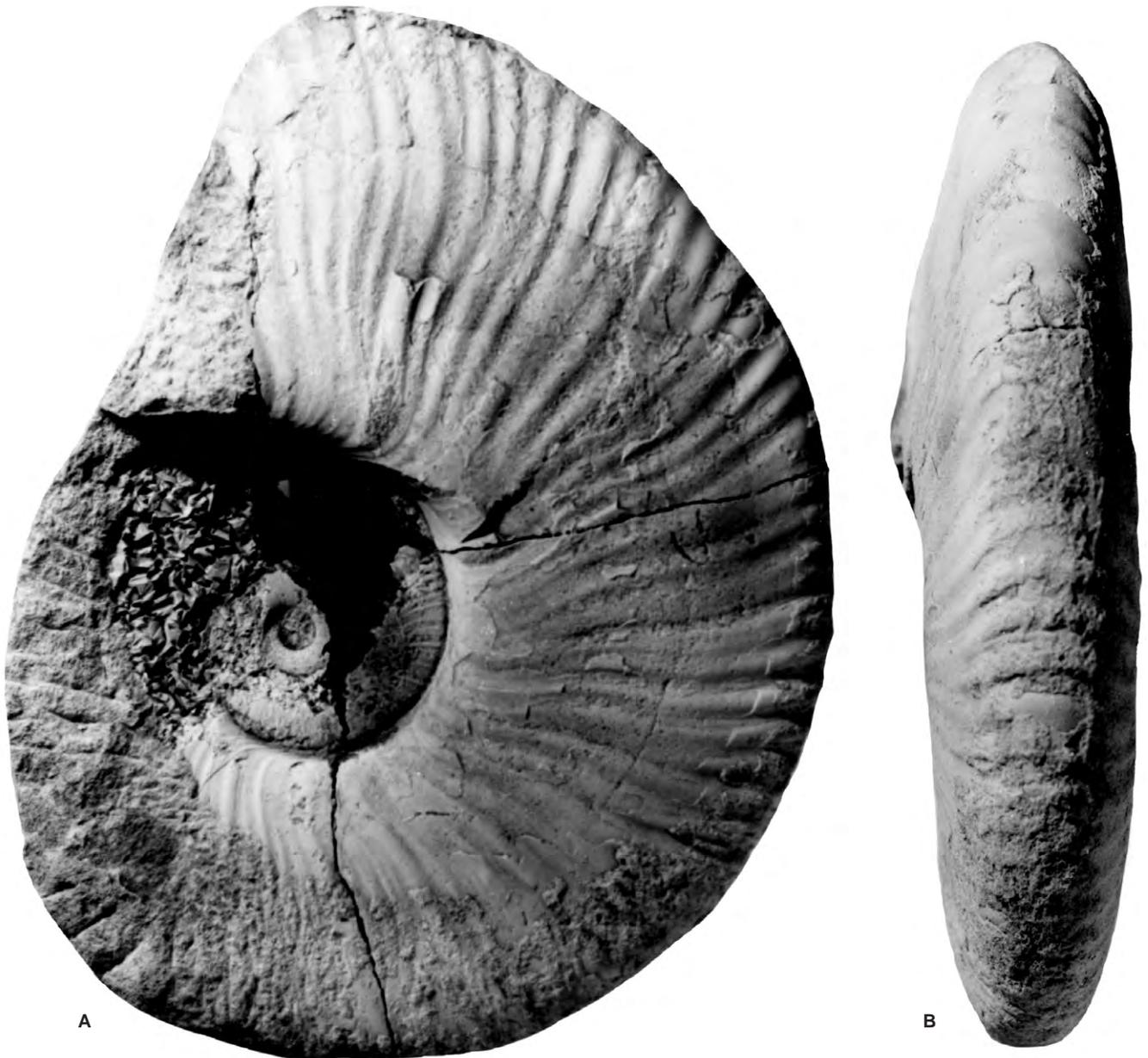
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**Fig. 1.** *Grandidiericeras corrugatum* sp. nov. The holotype, SAM-PCZ022402, from the Upper Santonian to Lower Campanian St Lucia Formation of locality 105 of Kennedy & Klinger (1975). Figures are  $\times 1$ .



**Fig. 2. A**, *Grandidiericeras corrugatum* sp. nov. The holotype, SAM-PCZ022402, from the Upper Santonian to Lower Campanian St Lucia Formation of locality 105 of Kennedy & Klinger (1975). **B**, *Grandidiericeras grandidierorum* Collignon, 1961. The original of Collignon (1970, p. 19, pl. 614, fig. 2297) from the Middle Campanian Zone à *Delawareella subdelawarensis* et *Australiella australis* of locality 156 of his Ankilizato (Belo sur Tsiribihina) section. The original is housed in the collections of the Département des Sciences de la Terre of the Université de Bourgogne, Dijon. Figures are x1.



**Fig. 3.** *Grandidiericeras grandidierorum* Collignon, 1961. The holotype, the original of Collignon (1961, p. 47, pl. 17, fig. 1) no. 3915 in the Collections of the Muséum National d'Histoire Naturelle, Paris. It is from his locality 157, Ankilizato (Belo sur Tsiribihina), Madagascar, and referred to the 'Campanien moyen à *Eupachydiscus levyi* et *Delawarella subdelawarensis*.' Figures are  $\times 1$ .