

CRETACEOUS FAUNAS FROM ZULULAND AND NATAL, SOUTH AFRICA. A *KOLOCERAS* (CEPHALOPODA, AMMONOIDEA) FROM THE MZINENE FORMATION (ALBIAN)

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(With 2 figures)

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ABSTRACT

The monospecific, micromorphic ammonite genus *Koloceras* (of the subfamily Aconecerasinae), thus far only known from the Upper Albian of Estancia La Vega in Santa Cruz Province, Argentina, is recorded for the first time from the Upper Albian of Zululand.

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INTRODUCTION

On three separate occasions, micromorph, platyconic ammonites have been recorded from the Upper Albian of the Southern Hemisphere as *Borissiakoceras*—a genus generally regarded as being of Middle Cenomanian to Turoonian age, but which may occur as early as the Lower Cenomanian and persist up to the Coniacian (see e.g. Kennedy & Klinger 1979: 115–116). These records are:

1. *Borissiakoceras* sp. Nullo *et al.*, 1981 (pl. 2 (fig. 9a–c)) from Patagonia, Argentina.

2. *Falciferella breadeni* Brunnschweiler, 1959 (p. 15, pl. 1 (figs 5–6)) and *Falciferella reymonti* Brunnschweiler, 1959 (p. 16, pl. 1 (figs 7–8)), both referred to *Borissiakoceras* by Cooper & Kennedy (1979: 297) from South Australia.

3. *Borissiakoceras* sp. nov. ? aff. *reymonti* Cooper & Kennedy (1979: 297, fig. 31H–I) from Porto Amboim, Angola.



Cooper & Kennedy (1979: 296–7) regarded the Angolan and Australian material as bridging the phylogenetic gap in the family Binneyitidae between the last appearance of the genus *Falciferella* Casey, 1954 (type species *F. milbournei* Casey, 1954: 271, pl. 7 (figs 1–5), text-fig. 3), in the Middle Albian and the first occurrence of *Borissiakoceras* in the Middle Cenomanian. Recent data suggest that this view seems to be too simplistic.

The Australian material was recently (McNamara 1985) referred to a new genus *Naramoceras* (type species *Falciferella breadeni* Brunnenschweiler, 1959: 15, pl. 1 (figs 5–6)) in the subfamily Aconeceratinae. The Patagonian material was also referred to a new genus (Riccardi *et al.* 1987: 167), *Koloceras* (type species *Koloceras talenkanum* Riccardi *et al.*, 1987: 169, pl. 14 (figs 1–17b), text-figs 42–46), also of the subfamily Aconeceratinae.

Both *Koloceras* and *Naramoceras* have distinctive, little-incised suture lines with a trifid lateral lobe (L), which clearly separate them from *Borissiakoceras*. *Koloceras* in turn differs from *Naramoceras* in having a trifid second lateral ( $U_2$ ) lobe, rather than bifid as in the latter.

The erection of these two (apparently endemic) genera casts doubt on the identity of the Angolan specimen. Is it indeed the only true Upper Albian *Borissiakoceras*, or might it belong to *Koloceras* or *Naramoceras*? Unfortunately, we have not seen the suture lines of the Angolan specimen to be able to comment further on this matter.

In Patagonia and South Australia, *Koloceras* and *Naramoceras* respectively occur in association with a diverse and distinct heteromorph ammonite fauna belonging to the subfamily Labeceratinae (see e.g. Whitehouse 1926; McNamara 1978; Aguirre Urreta & Riccardi 1988). The subfamily Labeceratinae has a typically South Gondwanid distribution, and is locally very common in Zululand and southern Mozambique (see Spath 1925; Klinger 1976; Klinger 1989). When *Naramoceras* and *Koloceras* were first described, our immediate reaction was to see if we had any representatives of either genus in our collections from *Labecerat*-bearing localities. We did not find any.

Recently, in the course of routine curation of the Van Hoepen collection, housed in the South African Museum, a small ammonite was brought to the attention of one of us (H. C. Klinger), who identified it as belonging to the genus *Koloceras*; later a second specimen was found, which is tentatively referred to that genus.

We here describe the first record of the genus *Koloceras* from South Africa. We cannot be certain whether this is only a fortuitous discovery of a post-mortem drifted occurrence of this apparently endemic, monospecific Patagonian genus, or whether it indeed represents part of a population as yet not localized. Its discovery should encourage the search for further material of both *Koloceras* and *Naramoceras* in the Southern Hemisphere, to clarify the interrelationship between these two genera and *Borissiakoceras* of the subfamily Binneyitinae.



## SYSTEMATIC DESCRIPTION

Superfamily HAPLOCERATACEAE Zittel, 1884

Family **Oppelidae** Bonarelli, 1894

Subfamily Aconeceratinae Spath, 1923

Genus *Koloceras* Riccardi, Aguirre Urreta & Medina, 1987*Koloceras talenkanum* Riccardi, Aguirre Urreta & Medina, 1987

Figs 1–2

*Borissiakoceras* sp. Nullo *et al.*, 1981: 200, pl. 2 (fig. 9a–c).? *Falciferella* sp. Medina & Rinaldi, 1986: 16, pl. 2 (figs 3–5), pl. 4 (figs 6–9).*Koloceras talenkanum* Riccardi *et al.*, 1987: 169, pl. 14 (figs 1–17b), text-figs 42–46.*Type*

Holotype is the specimen (MLP 19981) figured by Riccardi *et al.* (1987, pl. 14 (fig. 15a–b)), an adult macroconch from the upper part of the Río Mayer Formation, Estancia La Vega, Santa Cruz Province, Argentina, housed in the collections of the Museo de Ciencias Naturales, La Plata.

*Material*

NMB D380 (Van Hoepen Collection) from locality 51 and NMB D872 (Van Hoepen Collection) from locality 55, both from the Mzinene Formation, Albian IV–V, Zululand. (For precise locality data see Kennedy & Klinger 1975.)

*Dimensions*

Dimensions of specimens are in millimetres; abbreviations are as follows: D = diameter, Wb = whorl breadth, Wh = whorl height, U = umbilical diameter. Figures in parentheses are dimensions as a percentage of total diameter.

<i>Specimen</i>	<i>D</i>	<i>Wb</i>	<i>Wh</i>	<i>Wb/Wh</i>	<i>U</i>
D380	8,6	1,8 (20,9)	4,55 (52,9)	0,4	1,65 (19,2)
D872	7,99	1,85 (23,1)	3,6 (45,1)	0,51	1,35 (16,9)

*Description*

D380 (Figs 1E–F, 2A) is a microconch; the phragmocone is preserved in clear calcite and the body chamber is preserved in grey glauconitic silt and occupies half of the outer whorl. The umbilicus is partially occluded with matrix but it seems to have steep umbilical walls. The flanks are flat and parallel, and the venter rounded.

The small size, platycone shell shape, lack of ornament and simplified sutures (Fig. 2A) with a trifid lateral (L) lobe clearly identify it with Patagonian *Koloceras talenkanum*.

D872 (Fig. 1G) is part of a phragmocone preserved in sparry calcite. The sutures are not preserved well enough to permit a definite identification. The small size and shell shape suggest that it might be a macroconch of *Koloceras talenkanum*.



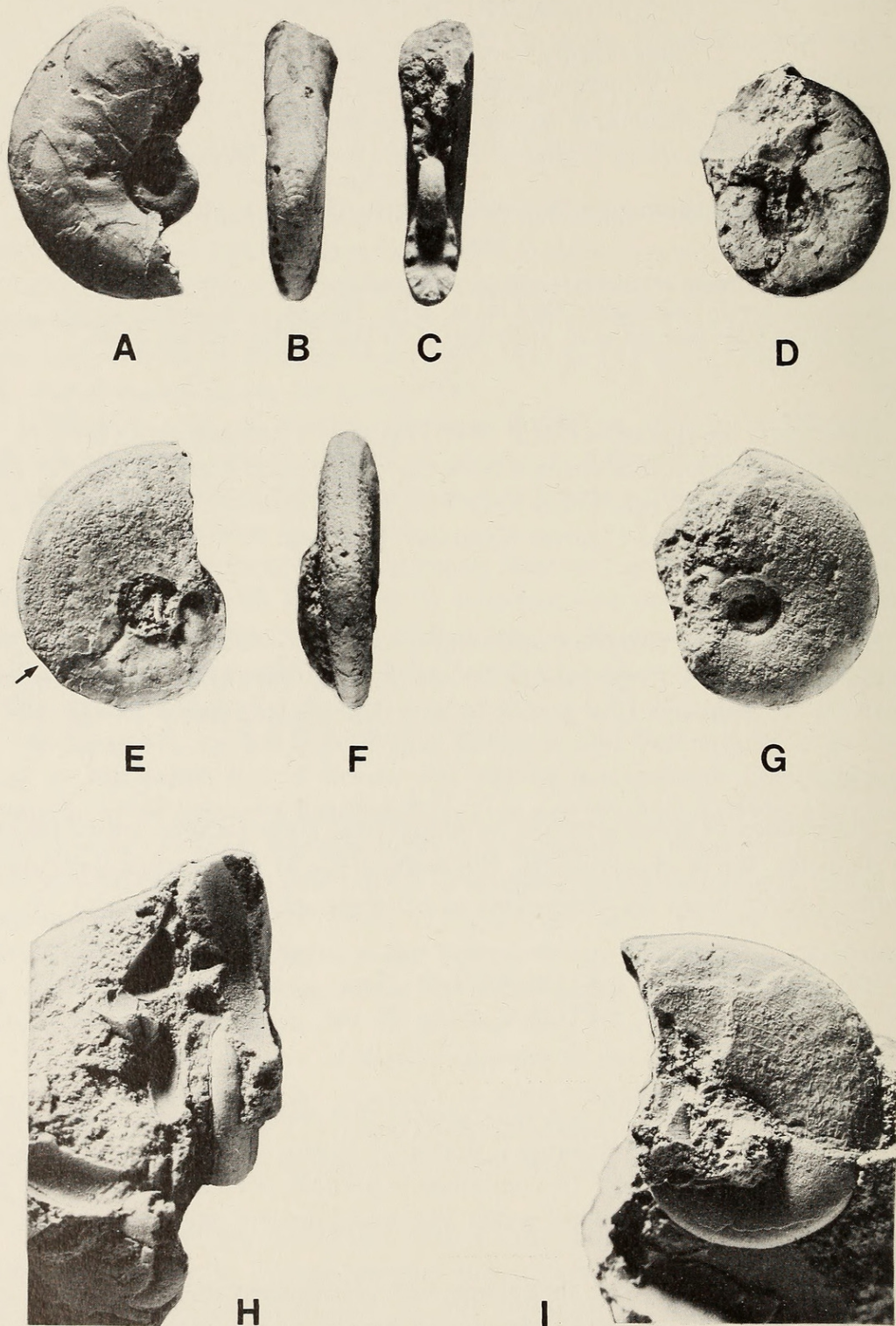


Fig. 1. *Koloceras talenkanum* Riccardi *et al.*, 1987. A-C. SAM-PC8394. D. SAM-PC8393. E-F. NMB D380. G. NMB D872. H-I. SAM-PC8392. A-D, H-I. From Estancia La Vega, Santa Cruz Province, Argentina, upper part of the Río Mayer Formation, Late Albian. E-F. From locality 51, Zululand, Mzinene Formation, Albian IV-V. G. From locality 55, Zululand, Mzinene Formation, Albian V. All  $\times 4$ .



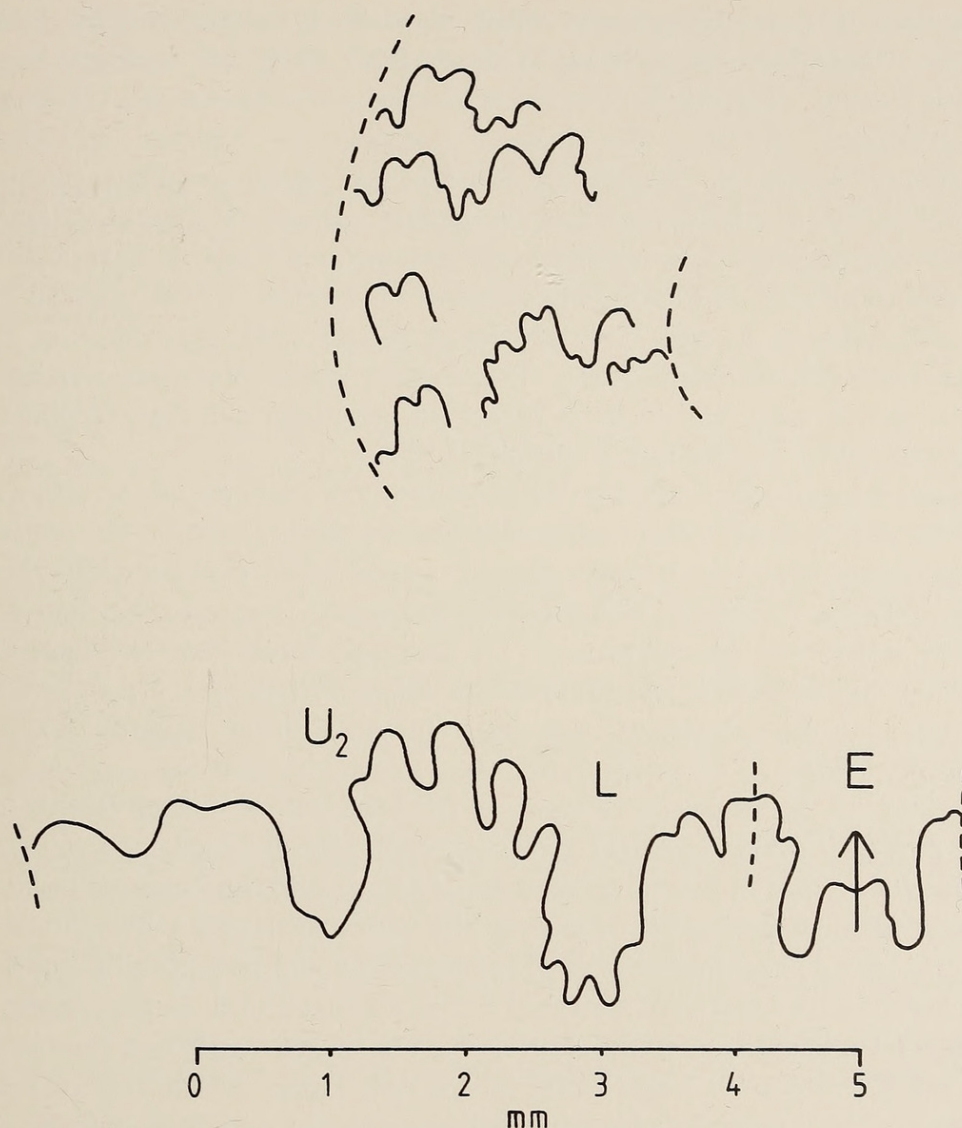


Fig. 2. External suture lines of *Koloceras talenkanum* Riccardi *et al.*, 1987. A. NMB D380. B. SAM-PC8392. Scale bar for size.

### Discussion

These two specimens do not add anything to the extensive descriptions of *Koloceras talenkanum* provided by Riccardi *et al.* (1987), but they do present a palaeobiogeographic enigma.

Thus far, *Koloceras talenkanum*, or the genus *Koloceras* for that matter, were only known from a single locality, 0,7 km to the south-east of the Estancia La Vega, approximately 34 km north-west of the village of Tres Lagos, where about 30–35 metres of sediment referable to the upper part of the Rió Mayer Formation are exposed. According to Riccardi *et al.* (1987: 118), *Koloceras talenkanum* seems to occur throughout the extent of the exposure. The associated ammonite fauna consists of a strange mixture of apparent endemic, South Gondwanid, and



cosmopolitan species respectively, which have been referred to the *Puzosia vegaensis* Assemblage Zone (Riccardi *et al.* 1987: 121), and includes *Puzosia vegaensis* Leanza, *Hypophylloceras lestai* Leanza, *Partschiceras* sp., *Anagaudryceras pulchrum* (Crick), *Eommarshallites espinosum* Medina & Rinaldi, *E. hybridum* Medina & Rinaldi (= '*Parasilesites*' *desmoceratoides* (Stolley)), ?*Umsinenoceras*, *Mortonicerases* (*Neokentrocerases*) *tarense* H. Leanza, *Labeceras singulare* (A. Leanza), *L. crassetuberculatum magnum* Aguirre Urreta & Riccardi, and *Myloceras* (*Calliscaphites*) *andinus* A. Leanza, (cf. A. Leanza 1970; Nullo *et al.* 1981; H. Leanza 1986; Medina & Rinaldi 1986; Riccardi *et al.* 1987; Aguirre Urreta & Riccardi 1988). The bivalve genus *Maccoyella* Etheridge (1892)—thus far only known from Patagonia, Australia and New Zealand—is also common (see Waterhouse & Riccardi 1970).

Detailed synonymies still have to be worked out for some of the above species, but cosmopolitan forms include *Phylloceras* (H.), *Partschiceras* and *Anagaudryceras pulchrum*; the labeceratinae are typical South Gondwanid forms (see Klinger 1989 for a review); and endemic forms are *Eommarshallites* and *Koloceras* (the latter with the exception of the Zululand specimen(s?)). Representatives of the subfamily Mortoniceratinae are conspicuously rare. Up to now only a fragment of *Neokentrocerases* has been recorded from Estancia La Vega (H. Leanza 1985).

Judging by the similarity of some of the labeceratine faunas (see Aguirre Urreta & Riccardi 1988; Klinger 1989), an open marine connection must have existed between part of the Patagonian Austral basin and the Zululand basin. We can think of no single factor to explain the selective barrier between the two basins, permitting free interchange of cosmopolitan and part South Gondwanid faunas but yet restricting interchange of *Eommarshallites* and *Koloceras* on the one side and Mortoniceratinae on the other. On a less negative note, we have to bear in mind that Estancia La Vega is thus far the only Upper Albian locality known in Patagonia. Future exploration may well diminish the apparent endemic character of the Upper Albian ammonoid fauna of Patagonia.

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