

CRETACEOUS FAUNAS FROM ZULULAND AND NATAL,  
SOUTH AFRICA  
A *JAUBERTICERAS* FROM THE MZINENE FORMATION (ALBIAN)

By

WILLIAM JAMES KENNEDY

*Geological Collections, University Museum, Oxford*

&

HERBERT CHRISTIAN KLINGER

*South African Museum, Cape Town*

(With 6 figures)

[MS. accepted 28 April 1977]

ABSTRACT

The ammonite subfamily Gabbioceratinae Breistroffer, 1953, is represented in the Cretaceous of southern Africa by a unique specimen of *Jauberticeras collignoni* Murphy from the Albian Mzinene Formation exposed along the Mzinene River, Zululand. The specimen shows details of suture, lirae and constrictions not previously known in the species, until now based on the unique Madagascan holotype alone, allowing a fuller diagnosis, description and comparison with other species. The holotype and the types of the closely related species *J. jaubertianum* (d'Orbigny) and *J. villoutreysi* Murphy are reillustrated for comparative purposes.

CONTENTS

	PAGE
Introduction . . . . .	1
Systematic palaeontology . . . . .	2
Acknowledgements . . . . .	11
References . . . . .	11

INTRODUCTION

In two previous papers (Kennedy & Klinger 1977, and in press) the authors have documented the representatives of the great majority of the ammonite superfamily Tetraxonitaceae Hyatt, 1900 known from the Cretaceous sediments of Zululand and Natal. In the course of examining the collections of the late Dr E. C. N. van Hoepen, recently transferred to the South African Museum from the National Museum Bloemfontein, one of the authors (H. C. K.) recognized a further representative of this superfamily, in the form of a *Jauberticeras* Jacob, 1907, from the Upper Albian Mzinene Formation of Zululand.

*Jauberticeras* is one of the two genera referred to the subfamily Gabbioceratinae Breistroffer, 1953 (the other is the genus *Gabbioceras* Hyatt, 1900); the specimen represents not only the first record of the genus from southern Africa, but also the first record of the subfamily from the region.

## SYSTEMATIC PALAEOLOGY

Class CEPHALOPODA Cuvier, 1797

Order AMMONOIDEA Zittel, 1884

Suborder LYTOCERATINA Hyatt, 1889

Superfamily TETRAGONITACEAE Hyatt, 1900

Family **Tetragonitidae** Hyatt, 1900

Subfamily Gabbioceratinae Breistroffer, 1953

The subfamily Gabbioceratinae has been the subject of two exhaustive accounts in recent years (Wiedmann 1962; Murphy 1967), and there is a divergence of opinion over which species should be referred to *Gabbioceras* versus *Jauberticeras*, as well as over the systematic position of a number of species regarded by Wiedmann as *Gabbioceras* and by Murphy as *Eotetragonites*. More serious is the disputation of the position of *Parajaubertella* Matsumoto, 1943, regarded by Wiedmann as a synonym of *Gabbioceras* and by Murphy as an independent homoeomorphous offshoot of the *Eogaudryceras* stock. There is, however, agreement that the subfamily has its origin in the group of *Eogaudryceras* (*Eogaudryceras*) *numidum* (Coquand). From this the line of descent runs to *Gabbioceras*, with *G. lamberti* (Breistroffer) as the earliest known member of that genus giving rise to *Jauberticeras* via *J. jaubertianum* during early late, or late early Aptian time. *Jauberticeras* is confined to the late Aptian and Albian; *Gabbioceras* extends to the Cenomanian.

Genus *Jauberticeras* Jacob, 1907*Type species*

*Ammonites jaubertianus* d'Orbigny (1850: 200, figs 9–10) by original designation (see Howarth 1974 for clarification of the date and place of publication of *Jauberticeras* and of *Ammonites jaubertianus* as type species).

*Diagnosis*

Relatively small cadicones with a funnel-shaped umbilicus, no flank and a marked angulation demarcating umbilicus from the broad, flattened venter. Shell surface lirate with constrictions (sometimes only visible on the mould). Suture with three umbilical lobes.

*Discussion*

The authors take this opportunity to illustrate (Fig. 1A–G) a plaster cast of the lectotype of *J. jaubertianum*, the original of which is from the Aptian of Hyèges, Basses Alpes, France. When compared with *Gabbioceras* (a typical example of which is shown in Fig. 2A–G), the two genera are best distinguished on whorl section (following Murphy 1967: 604): in *Gabbioceras* the venter is strongly curved (Fig. 2A, C, D, G): in *Jauberticeras* it is flat (Fig. 1A–B, D–F).

The angulation is commonly sharper in *Jauberticeras* when compared with early *Gabbioceras* (Murphy 1967, fig. 1).

*Occurrence*

Late Aptian to mid Albian of southern France, Spain, the Caucasus, north Africa, Madagascar and Zululand.

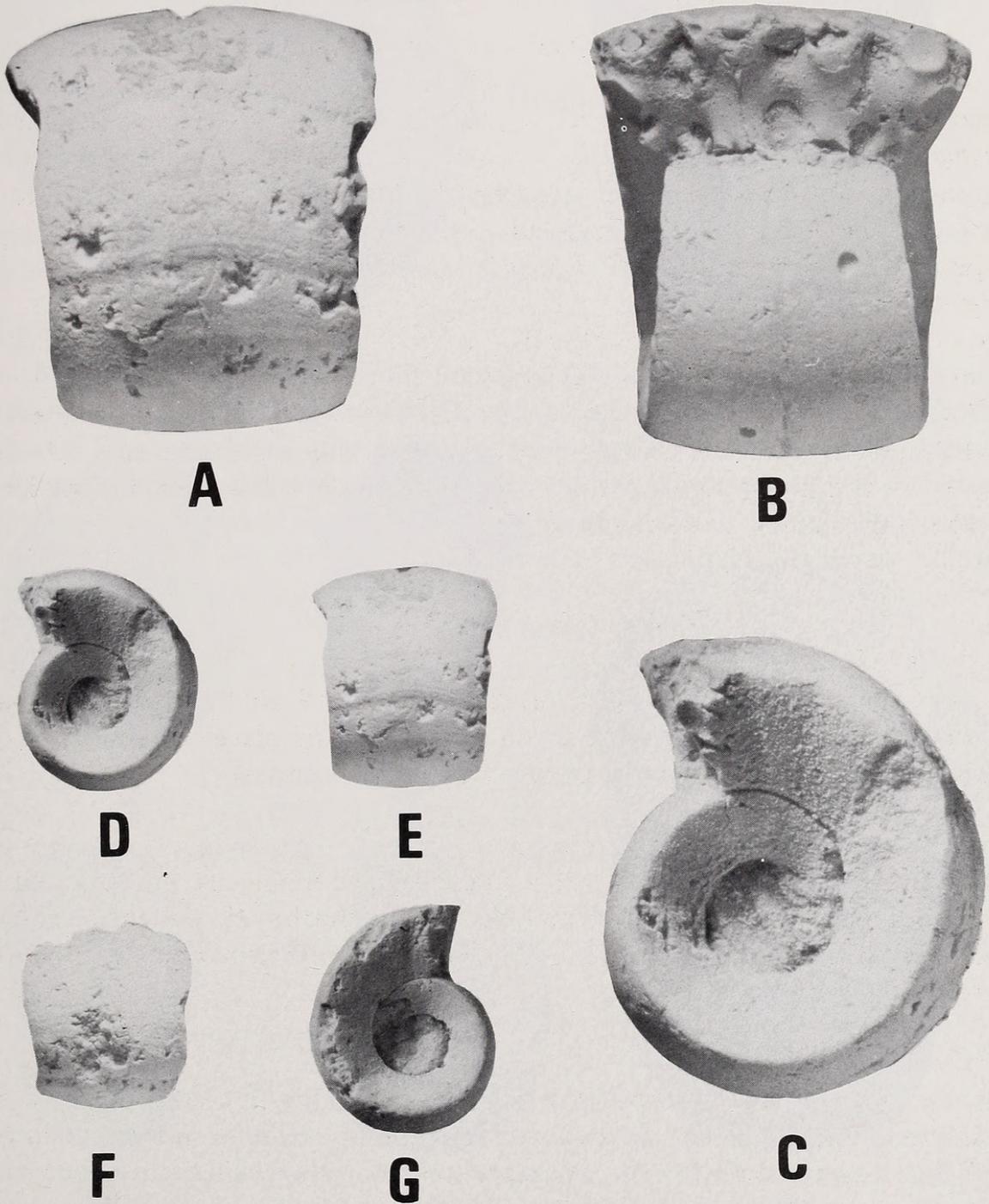


Fig. 1. *Jauberticeras jaubertianum* (d'Orbigny). The lectotype from the Aptian of Hyèges, Basses Alpes, France (Petielerc Collection, Sorbonne, Paris). A-C  $\times 2$ ; D-G  $\times 1$ .

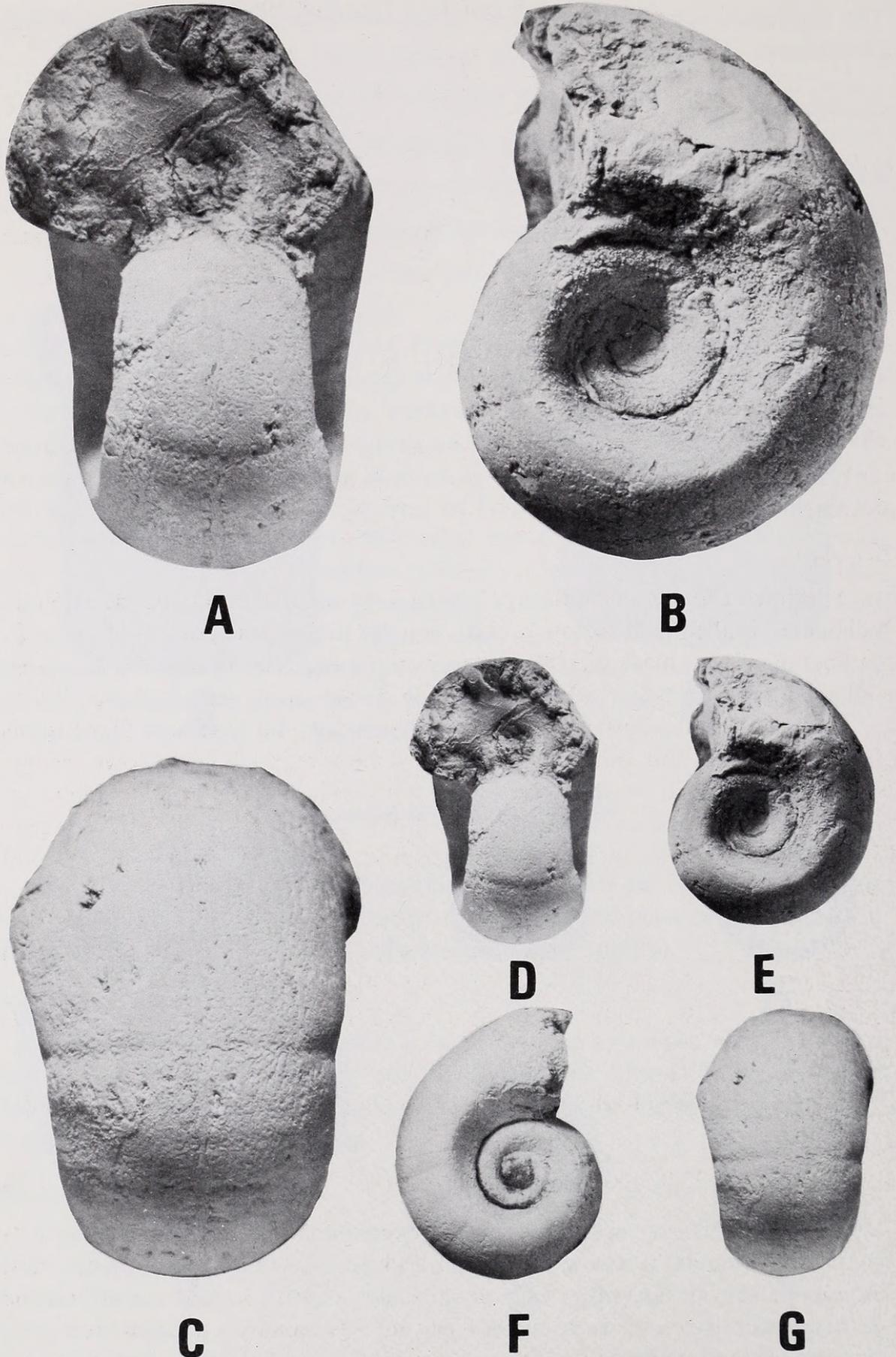


Fig. 2. *Gabbioceras lamberti* (Breistroffer). BMNH C10780, from the Aptian of Castellane, Basses Alpes, France. A-C  $\times 2$ ; D-G  $\times 1$ .

*Jauberticeras collignoni* Murphy, 1967

Figs 3–5

*Jauberticeras latecarinatum* Collignon non Anthula, 1963: 28, pl. 251 (fig. 1080).*Jauberticeras collignoni* Murphy, 1967: 606, pl. 64 (fig. 16).*Holotype*

M. Collignon Collection no. 435, the original of Collignon (1963: 28, pl. 251 (fig. 1080)) by monotypy. Reproduced here as Fig. 3A–H. From the Albian *sensu lato* of Betioky, Madagascar.

*Material*

Specimen D293 in the E. C. N. van Hoepen Collection.

*Emended diagnosis*

A *Jauberticeras* with a blunt lateral angle, moderately expanding whorls, weak lirae and irregularly spaced prorsiradiate convex constrictions and a prominent second saddle on the internal suture.

*Description*

Specimen D293 is a beautifully preserved mould of a phragmocone 21,5 mm in diameter, infilled with sparry calcite, and retaining a short portion of the body chamber filled with black quartzose glauconitic sandstone. Traces of the original shell material with delicate external ornament are preserved on the umbilical wall, but on the outer surface the shell is partially or wholly absent. Dimensions of the specimen, and others with which it is compared, are shown below. (D = diameter; Wb = whorl breadth; Wh = whorl height; U = umbilical diameter from seam to seam; K = umbilical diameter from keel to keel. Figures in parentheses are dimensions expressed as percentages of the total diameter.)

	D	Wb	Wh	Wb:Wh	U	K
<i>J. collignoni</i>	22,4 (100)	16,3 (74)	6,9 (31)	2,36	9,8 (44)	18,7 (84)
D293	18,2 (100)	13,3 (73)	5,5 (30)	2,41	7,4 (41)	14,2 (78)
MC435	19,3 (100)	13,2 (68)	5,2 (27)	2,54	8,1 (42)	14,9 (77)

*J. villoutreysi*

BMNH C68145	27,8 (100)	18,5 (67)	8,8 (32)	2,13	12,0 (43)	22,5 (81)
-------------	------------	-----------	----------	------	-----------	-----------

*J. jaubertianum*

lectotype	32,0 (100)	21,0 (82)	10,5 (32)	2,48	10,8 (33)	— (—)
-----------	------------	-----------	-----------	------	-----------	-------

The coiling is very evolute, so that the angulation of the successive whorls is exposed in the umbilicus, giving it terraced, rather than evenly sloping sides. The umbilical wall is gently convex, whilst the angulation between it and the venter is abruptly rounded and blunt. The venter is broadly and evenly rounded, the distance between angulations comprising 84 per cent of the maximum diameter. The whorls expand quite slowly, so that there is a distinct tapering

of the whorls towards the apex in both dorsal and ventral views. The mould bears low, faint, irregular folds and interspaces, which are markedly prorsiradiate on the flanks and sweep across the venter with a broad and shallow convex curvature. Two of these folds are strengthened into broad collars, one at the beginning of the body chamber, the other at a diameter of just over 20 mm. These are succeeded by distinct if shallow constrictions.

On the venter, patches of partially exfoliated shell appear smooth, save for the low folds already mentioned; a few tiny areas preserve fine, dense lirae, invisible to the naked eye. In contrast, areas of umbilical wall where shell is well preserved show distinct if fine prorsiradiate lirae, concave close to the umbilical seam, but weakly flexed so as to be gently convex across the angulation. So far as can be discerned the whole of the shell was finely lirate, lirae paralleling the folds and constrictions visible on the mould.

The external suture is well exposed (Fig. 4) and is deeply and intricately subdivided, as is characteristic of other species of the genus. The median saddle of the external lobe is prolonged into a series of narrow, tapering processes which strongly recall the siphonal band of certain tetragonitids (Kennedy & Klinger 1977).

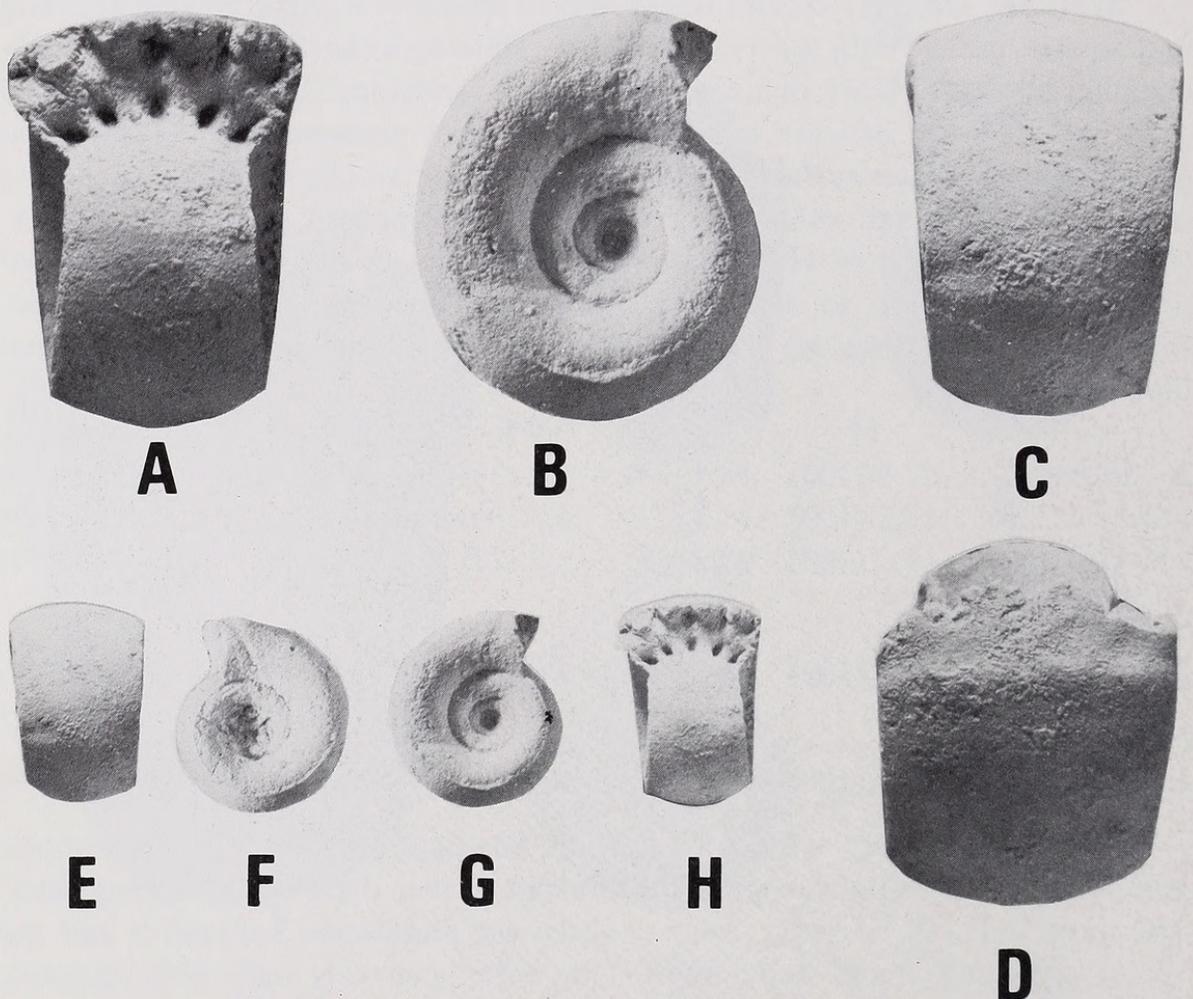


Fig. 3. *Jauberticeras collignoni* Murphy. Holotype, M. Collignon Collection no. 435, from the Albian *sensu lato* of Betioky, Madagascar. A-D  $\times 2$ ; E-H  $\times 1$ .

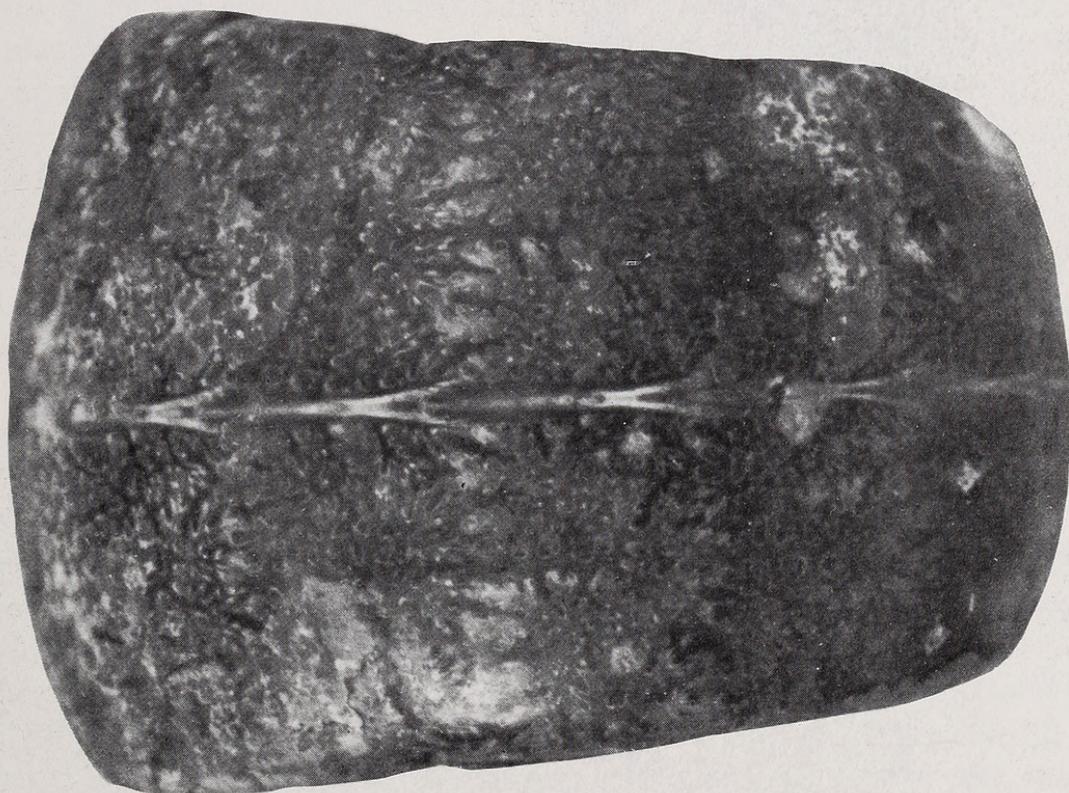
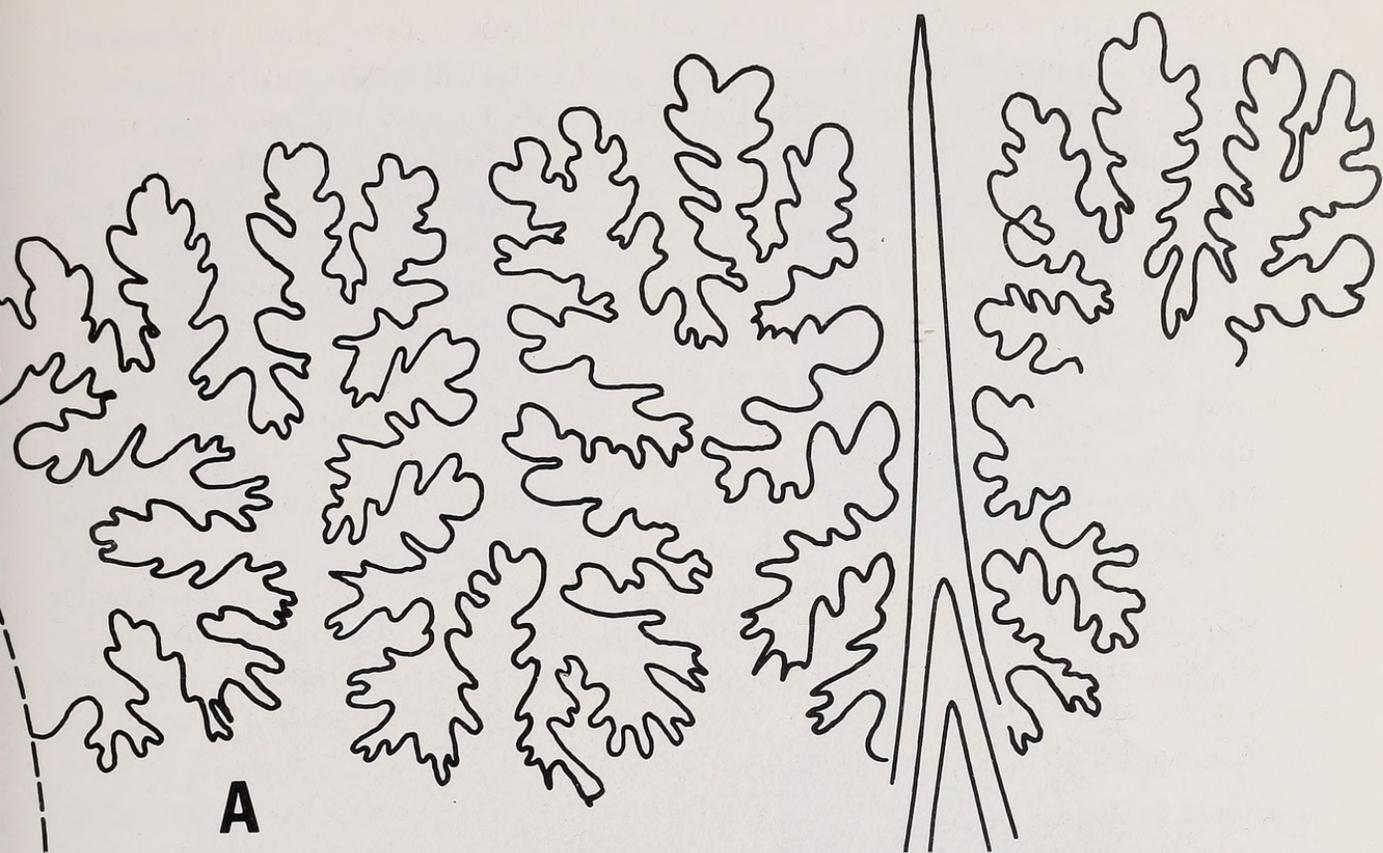
**B**

Fig. 4. Sutures of *Jauberticeras collignoni* Murphy. Based on specimen D293 (Van Hoepen Collection) from the Mzinene Formation of the Mzinene River, Zululand, and of late middle or early late Albian age. A  $\times 12$ ; B  $\times 6$  to show details of siphonal structures.

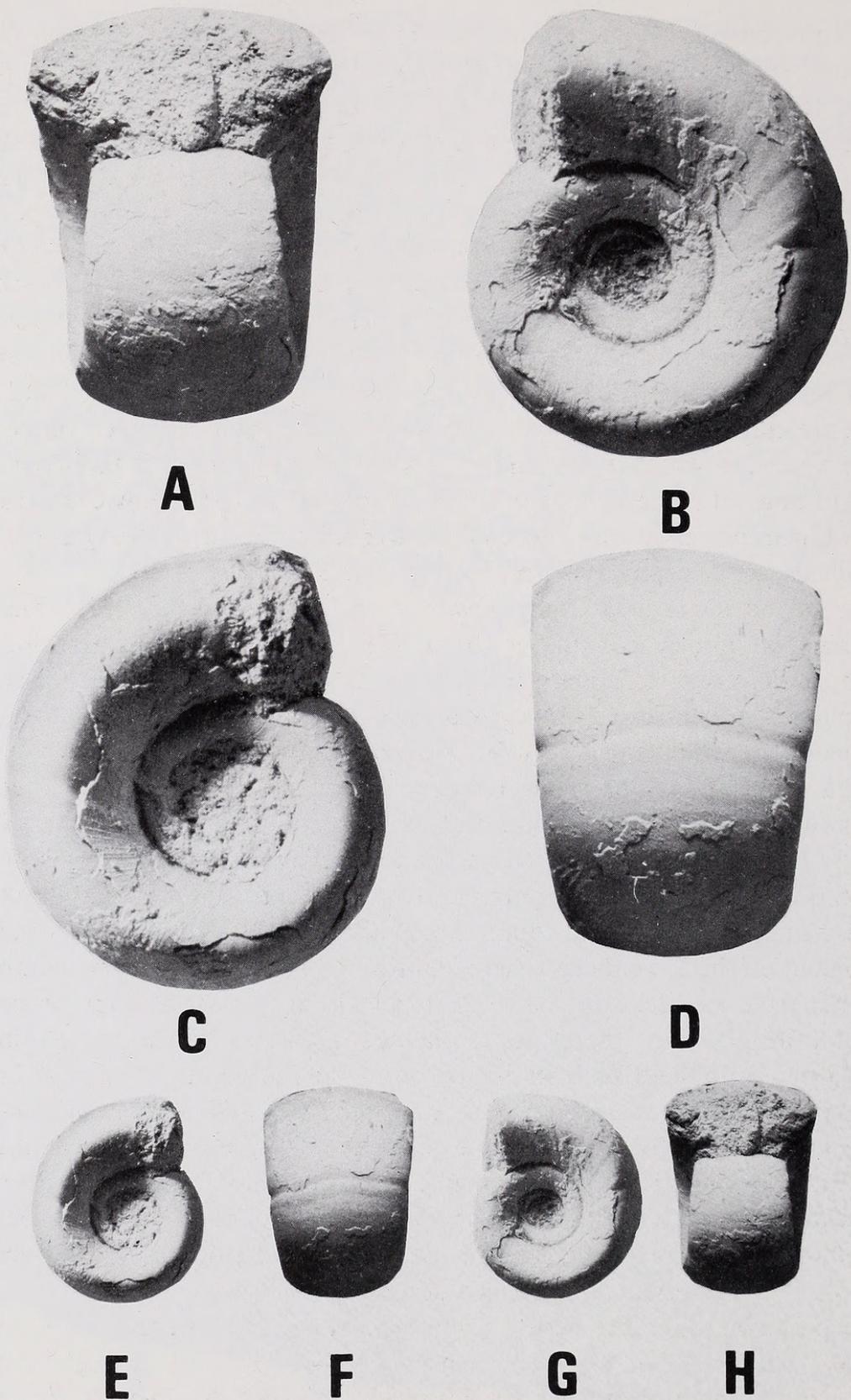


Fig. 5. *Jauberticeras collignoni* Murphy. D293 (Van Hoepen Collection) from the Mzinene Formation of the Mzinene River, Zululand, and of late middle or early late Albian age. A-D  $\times 2$ ; E-H  $\times 1$ .

### Discussion

Murphy based this species on the specimen figured by Collignon (1963, pl. 251 (fig. 1080)) which he refigured in dorsal view only (Murphy 1967, pl. 64 (fig. 16), text-fig. 1 (9)). The original description is short, and in it Murphy characterized the species by its low expansion rate, smooth shell, and strong second saddle in the internal suture, lack of lirae and constrictions and similar whorl section to that of the type species. As can be seen from the holotype, here reillustrated (Fig. 3), the specimen does not quite fit Murphy's description in possessing constrictions. There are at least three distinct constrictions on the outer whorl, markedly prorsiradiate on the flank, and feebly convex across the venter, each being preceded by a slight swelling. The whorl section, with a breadth to height ratio of 2,54 at the maximum preserved diameter and 2,08  $360^\circ$  before this, comprises only 68 per cent of the total diameter whereas in *J. jaubertianum*, to which it was said to be similar, the figure is 71 to 94 per cent. The whorl angulation is also significantly blunter. The latter, however, may be partially due to preservation or even of intra-specific value only, being dependent on ontogeny (see Murphy 1967, pl. 64 (fig. 23)).

The second internal saddle is, however, prominently developed, whilst the shell surface is smooth, even under a lens. Close inspection shows that this may be no more than an artefact of preservation; the originally aragonitic shell has been replaced by iron-stained sparry calcite, and the whole of the surface of the umbilicus of the specimen is corroded and pitted. The venter is similarly pitted, and in places the angulation is covered and accentuated by traces of a succeeding whorl, now lost. This preservation and the remaining adherent matrix of fine sandstone suggest the specimen to be from a precisely similar setting to many of the Albian and Cenomanian ammonites from Zululand which the authors have studied, especially those found weathering out along the terraces of the Mzinene and on the Skoenberg, where identically preserved specimens of diverse ammonites have lost delicate growth lines and lirae by post-mortem processes. Lack of liration is not, therefore, a diagnostic feature of the species in the authors' view. With these qualifications in mind, the Zululand specimen, although larger than the Madagascan type, can be referred to *Jauberticeras collignoni* on the basis of similarities of whorl section, bluntness of angulation, relative proportions (which are similar but not identical), expansion rate, form and direction of constrictions, and associated collar-like swellings. Because the present specimen does not show the septal face (retaining as it does part of the body chamber) the nature of the internal suture is not determinable.

The principal difference between *J. collignoni* and the type species, *J. jaubertianum* (of which *J. latecarinatum* (Anthula) (1899: 101, pl. 7 (fig. 2a-c)) is probably a synonym according to Murphy (1967: 605-6)), lies in the more prominent development of the second saddle in the internal suture.

*Jauberticeras villoutreysi* Murphy (1967: 606, pl. 64 (figs 25-29)) (the holotype BMNH C68148 is reproduced here as Fig. 6A-G) has much coarser lirae on the umbilical wall, which give a distinctive appearance to the whorl angulation

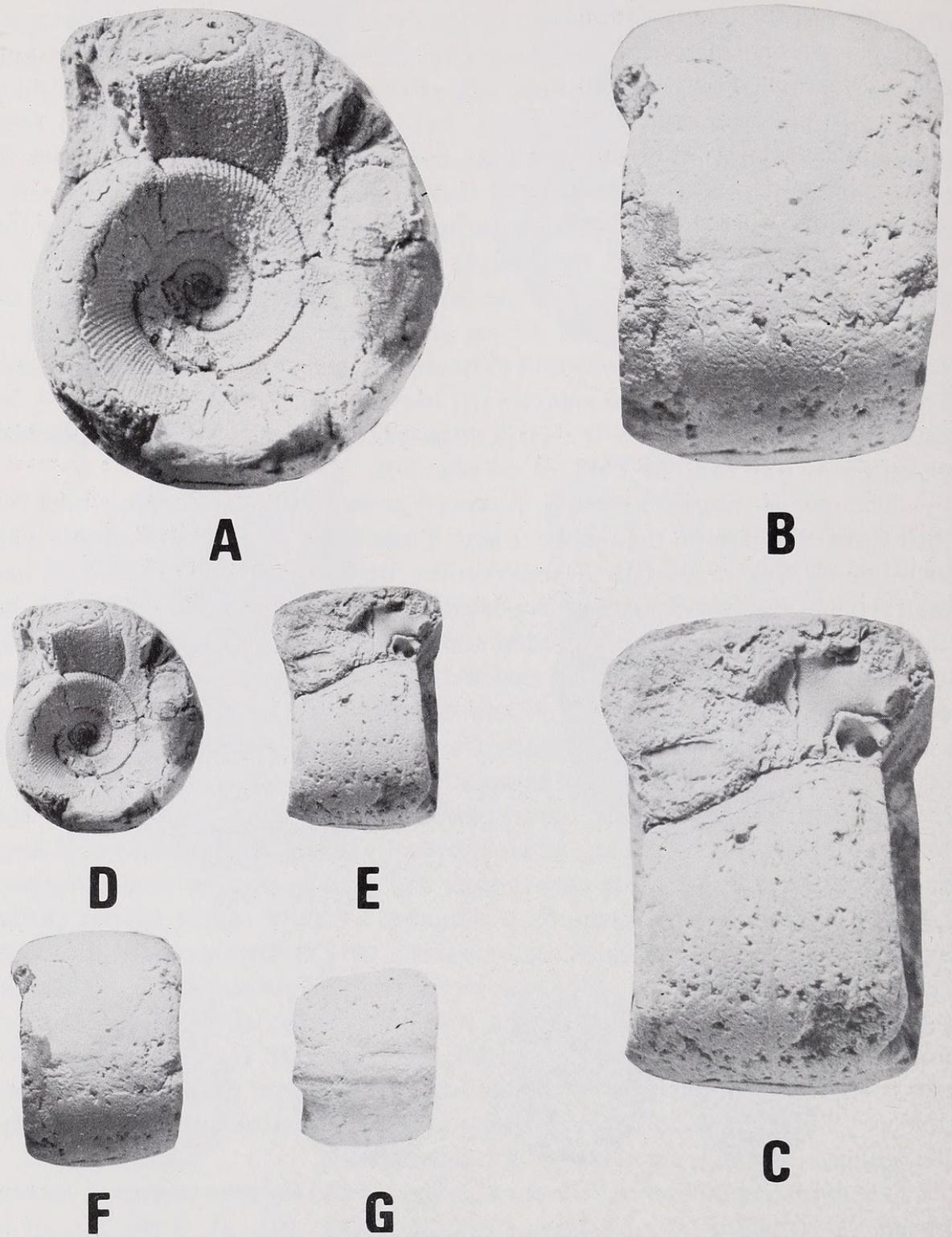


Fig. 6. *Jauberticeras villoutreysi* Murphy. Holotype, BMNH C68148, from the Albian of Clar, Alpes-Maritimes, France (Astier Collection). A-C  $\times 2$ ; D-G  $\times 1$ .

(Fig. 6A). In addition, the expansion rate is such that the last half whorl is almost parallel-sided in profile (Fig. 6B, F), the venter flatter, and constrictions straight across the venter with a broad, band-like collar associated. In addition the saddles in the internal suture are of different sizes (Fig. 6C).

*Jauberticeras lanternoi* Wiedmann (1962: 32, pl. 2 (fig. 2)) has quite different proportions and whorl section, and may possibly be a juvenile *Gabbioceras* (M. A. Murphy pers. comm. 7.3.1977).

*J. subbeticum* Wiedmann (1962: 31, pl. 2 (fig. 3a-c)) has much coarser umbilical liration and a different form of whorl section and constrictions, and again is of dubious generic affinity. According to Murphy (pers. comm. 7.3.1977) it is probably a *Scaphites*.

#### Occurrence

The holotype of *Jauberticeras collignoni* is from the Albian *sensu lato* of Collignon's locality 435, 'Pied Est du Vohimaranitra (Betioky), Madagascar'. The Zululand specimen is from the Albian part of the Mzinene Formation along the Mzinene River near Hluhluwe. Precise locality data are lacking, but preservation suggests it to be from locality 51 of Kennedy & Klinger (1974: 288, fig. 4) where concretions are exposed in the stream bed and bank extending around the broad meander of the river east-north-east of the Sisal Factory at 27°53'43"S, 32°19'22"E. The specimen is thus of late middle or early late Albian age (Albian IV-V).

#### ACKNOWLEDGEMENTS

Our best thanks are due to General M. Collignon of Moirans (Isère), who kindly allowed us to study the holotype of *Jauberticeras collignoni*, and has helped us throughout our work on the Zululand Cretaceous. We are also grateful to Dr M. K. Howarth and Mr D. Phillips (British Museum, Natural History) for allowing us to study the specimens in their care, and Dr J. Sornay of the Muséum Nationale d'Histoire Naturelle, Paris, for help in our study of specimens in the D'Orbigny collection.

#### REFERENCES

- ANTHULA, D. J. 1899. Ueber die Kreide Fossilien des Kaukasus. *Beitr. Paläont. Geol. Öst. Ung.* **12**: 54-159.
- COLLIGNON, M. 1963. *Atlas des Fossiles caractéristiques de Madagascar (Ammonites), Fascicule X (Albien)*. Tananarive: Service Géologique.
- HOWARTH, M. K. 1974. The Lower Cretaceous ammonite genera proposed by C. Jacob in 1907. *Palaeontology* **17**: 727-728.
- KENNEDY, W. J. & KLINGER, H. C. 1974. Cretaceous faunas from Zululand and Natal, South Africa. Introduction, Stratigraphy. *Bull. Br. Mus. nat. Hist. (Geol.)* **25**: 263-315.
- KENNEDY, W. J. & KLINGER, H. C. 1977. Cretaceous faunas from Zululand and Natal, South Africa. The ammonite family Tetragnitidae Hyatt, 1900. *Ann. S. Afr. Mus.* **73**: 149-197.
- KENNEDY, W. J. & KLINGER, H. C. In press. Cretaceous faunas from Zululand and Natal, South Africa. The ammonite family Gaudryceratidae Spath, 1927. *Bull. Br. Mus. nat. Hist. (Geol.)*.

- MURPHY, M. A. 1967. The Ammonoid subfamily Gabbioceratinae Breistroffer. *J. Paleont.* **41**: 595-607.
- ORBIGNY, A. D'. 1850. Note sur quelques nouvelles espèces remarquables des étages Neocomien et Aptien de France. *J. Conchyliol.* **1**: 196-201.
- WIEDMANN, J. 1962. Die Gabbioceratinae Breistroffer. *Neues Jb. Geol. Paläont. Abh.* **115**: 1-43.



Kennedy, W. J. and Klinger, Herbert Christian. 1977. "Cretaceous faunas from Zululand and Natal, South Africa. A Jauberticeras from the Mzinene Formation (Albian)." *Annals of the South African Museum. Annale van die Suid-Afrikaanse Museum* 74, 1–12.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/128445>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/92932>

**Holding Institution**

Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

**Sponsored by**

Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

**Copyright & Reuse**

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.