Macroscaphites Meek, 1876, a heteromorph ammonite from the Lower Aptian of southern Mozambique and northern KwaZulu-Natal

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(with 3 figures)

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Macroscaphites soaresi (Da Silva 1962) is described from the Lower Aptian of southern Mozambique and northern KwaZulu. *Macroscaphites* and *Costidiscus* are regarded as a dimorphic pair. Apart from dubious records from Antarctica, these are the only records of *Macroscaphites*/*Costidiscus* from the southern hemisphere.

Key words: *Macroscaphites*, Lower Aptian, Mozambique, KwaZulu-Natal.

CONTENTS

INTRODUCTION

The genus *Macroscaphites* Meek, 1876 (type species *Scaphites yvani* Puzos, 1832, p. 355, pl. 2, by subsequent designation of Roman 1938, p. 380), based on a microconch, and its synonym, *Costidiscus* Uhlig, 1882 (type species *Ammonites recticostatus* d'Orbigny, 1841, p. 134, pl. 40, figs 3, 4, by original designation), based on a macroconch, display one of the most striking cases of dimorphism shown by Cretaceous ammonites. The former has an initial evolute planispire, succeeded by a crozier-shaped uncoiled portion. The latter is planispiral throughout ontogeny, and reaches maturity at a much greater diameter than the spiral portion of the corresponding microconch (Kilian 1910; Avram 1976, 1978, 1984; Delanoy *et al.* 1995; Wright 1996; Kakabadze 2004; but see Vermeulen 2000; Vašíček *et al.* 2004, p. 49; Busnardo *in* Gauthier 2006, p. 153, and Vašíček 2008, p. 409).

Macroscaphites/*Costidiscus* are best known from the Barremian–Aptian of southern and central Europe, Georgia, north Africa, the Sinai Peninsula and Mexico (Wright 1996), with further records from Venezuela (Renz 1982) and Colombia (Kakabadze & Thieuloy 1991). Thomson (1974, p. 11, pl. 2d and p. 12, pl. 2g) recorded doubtful specimens of *Costidiscus* and *Macroscaphites* from Alexander Island in the Antarctic Peninsula, but we are uncertain of these identifications. The present specimens from southernmost Mozambique and northern KwaZulu are the first unambiguous records from the southern hemisphere of this dimorphic pair.

CONVENTIONS

Dimensions are given in millimetres: D = diameter; Wb = whorl breadth; Wh = whorl height; U = umbilicus; c = costal dimension; ic = intercostal dimension. Figures in brackets 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 & Wiedmann 1970); U = umbilical lobe; I = internal lobe.

SYSTEMATIC PALAEONTOLOGY

Family **MACROSCAPHITIDAE** Hyatt, 1900

Genus ***Macroscaphites*** Meek, 1876

Type species

Scaphites yvani Puzos, 1832, p. 355, pl. 2, by subsequent designation of Roman 1938, p. 380 = *Costidiscus* Uhlig,

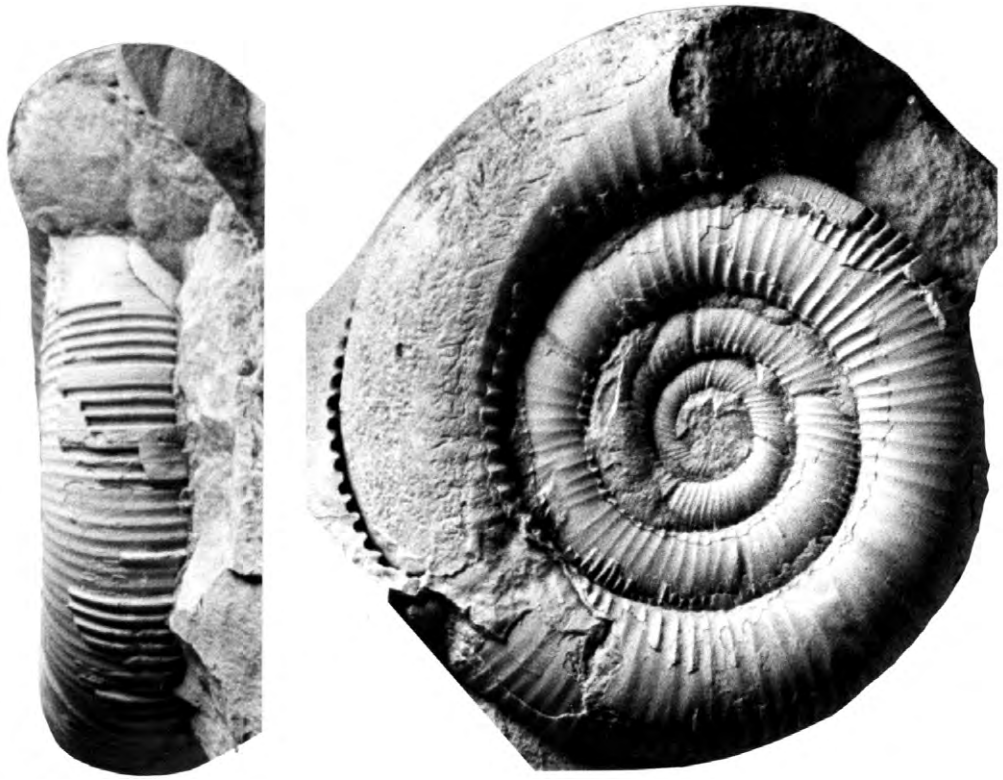

Fig. 1. *Macroscaphites soaresi* (Da Silva, 1962). SAM-PCM22286 from the Lower Aptian on the Rio Maputo, 6.5 km west of Catuane, southernmost Mozambique. Figures are ×2.

1882, p. 87, type species *Ammonites recticostatus* d'Orbigny, 1841, p. 134, pl. 40, figs 3, 4, by original designation.

Macroscaphites soaresi (Da Silva, 1962)

Figs 1–3

1962 *Neosilesites soaresi* Da Silva, p. 19, pl. 8, figs 1–3; text-fig. 4.

1999 *Neosilesites soaresi*; MacRae, p. 226.

Types

The holotype is the original of Da Silva (1962, p. 189, pl. 8, figs 1–3; text-fig. 14), specimen no. 436/57; the paratype is specimen no. 467/57, both in the collections of the Museu de Laboratório Mineralógico e Geológico of the University of Coimbra (Portugal) and from the Lower Aptian on the Rio Maputo, 6.5 km west of Catuane, southernmost Mozambique.

Material

SAM-PCM5396 and SAM-PCM22286, from the same horizon and locality as the types. SAM-PCZ13419 and PCZ20147 (both formerly LJE113), from the Lower Aptian of locality 170, Makatini Formation, northern KwaZulu-Natal.

Description

SAM-PCM22286 (Figs 1, 2A, 3A) is a wholly septate individual with a maximum preserved diameter of 51.6 mm. The adapertural end of the specimen is damaged, and there are indications of a further 90° sector of outer whorl, seemingly body chamber. This specimen retains extensive areas of original shell material. Coiling is very evolute, the umbilicus broad and shallow, comprising 55.8% of the diameter. The whorl section is depressed oval, with an estimated whorl breadth to height ratio of 1.41 (the specimen is partially embedded in matrix). There are approximately 70 primary ribs on the outer whorl. They arise at the umbilical seam, and are very narrow and wiry where the shell is preserved. They are feebly concave across the umbilical wall and shoulder, straight and prorsiradiate across the flanks, and straight to very feebly convex across the venter. Most of the ribs bifurcate either low or high on the flanks; occasional ribs trifurcate. As a result, there are many more ribs on the ventrolateral shoulders and venter than at the umbilical shoulder. The ribs are much more subdued on the internal mould and where the shell is partially exfoliated. Two constrictions are present on the outer whorl, and four on the penultimate whorl. The constrictions are narrow, prorsiradiate, and follow a course parallel to the ribs.

	D	Wb	Wh	Wb:Wh	U
SAM-PCM22286	49.3 (100)	~18.2 (~36.9)	13.0 (26.4)	~1.41	27.5 (55.8)
SAM-PCM5396 at	71.0 (100)	22.5 (31.7)	21.3 (30.0)	1.06	38.3 (53.9)
SAM-PCM5396 at	82.3 (100)	23.2 (28.3)	23.2 (28.2)	1.0	43.6 (53.0)
SAM-PCZ13419	– (–)	20.2 (–)	16.6 (–)	1.25	–(–)

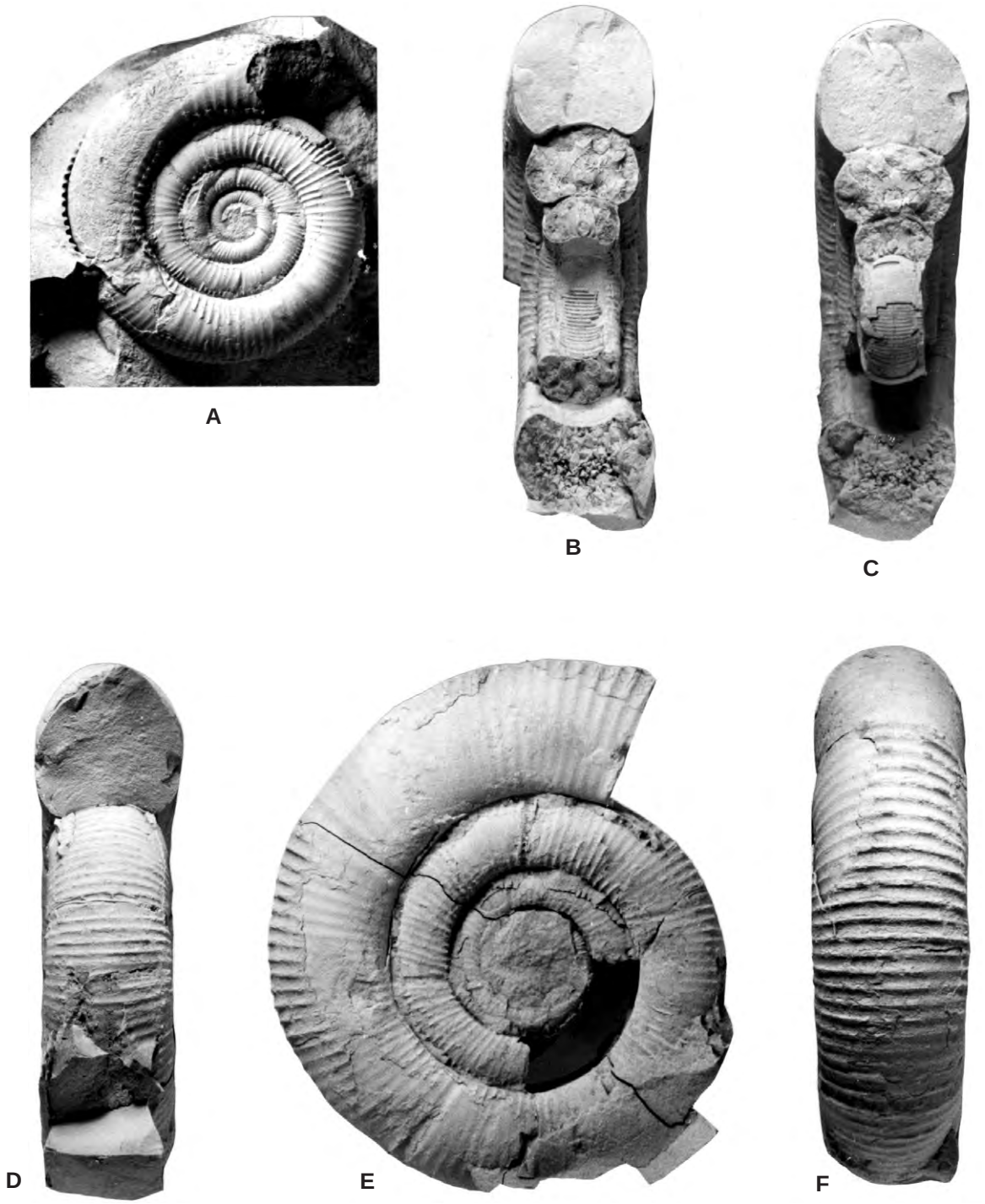

Fig. 2. *Macroscaphites soaresi* (Da Silva, 1962). **A**, SAM-PCM22286; **B–F**, SAM-PCM 5396. Both specimens are from the Lower Aptian on the Rio Maputo, 6.5 km west of Catuane, southernmost Mozambique. All figures are ×1.

SAM-PCM5396 (Fig. 2B–F) is a larger individual. The position of the final septum is unclear, but the adapertural 90° sector, and perhaps the adapertural 180° sector of the outer whorl is body chamber. The umbilicus comprises up to 53.9% of the diameter. The whorl section is depressed oval with a whorl breadth to height ratio of 1.38 on the penultimate whorl, becoming oval with a whorl breadth to height ratio of around 1 on the outer whorl. The dorsal impressed zone is broad and shallow. The ribs on the penultimate whorl show the same branching pattern as in the previous specimen. On the outer whorl the ribs are predominantly single, and do not branch. There are three constrictions on the outer whorl.

SAM-PCZ13419 is a 60° sector of phragmocone only, with a maximum preserved whorl height of 16.6 mm and a depressed oval whorl section with a whorl breadth to height ratio of 1.4. SAM-PCZ20147 is a fragmentary 90° segment, mainly of the venter and part of one flank, clearly showing the fine ribbing.

The somewhat worn suture of SAM-PCM22286 (Fig. 3A)

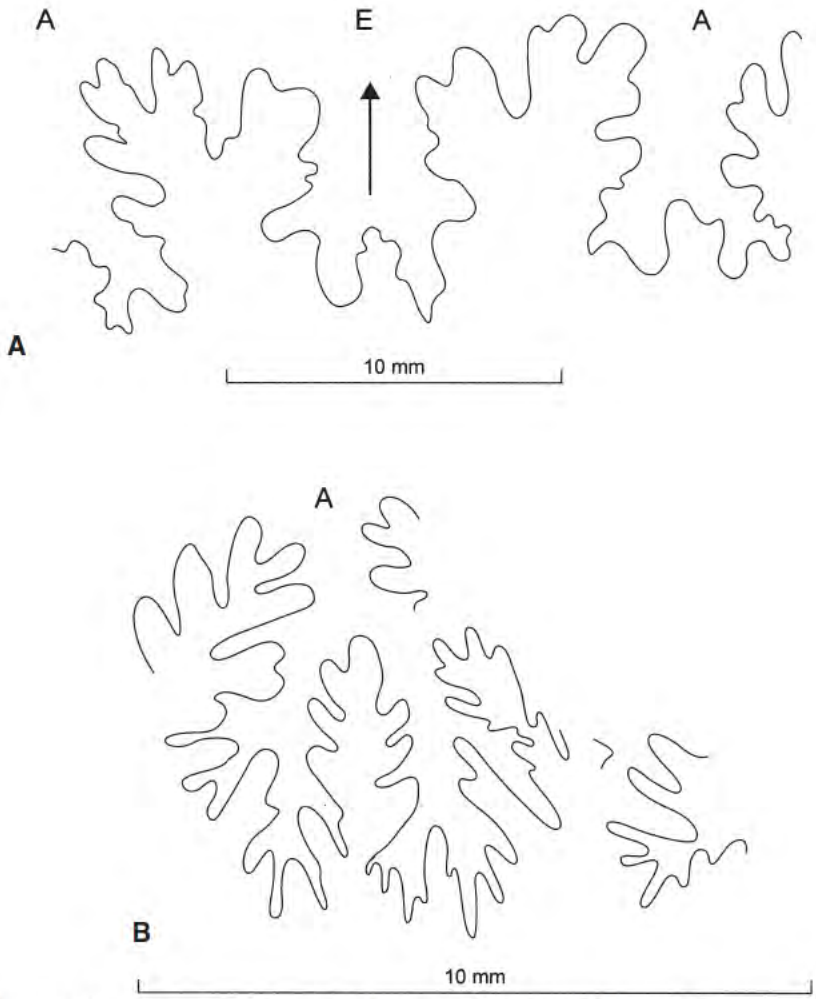

Fig. 3. Partial sutures of *Macroscaphites soaresi* (Da Silva, 1962). **A**, worn suture of SAM-PCM 22286. **B**, unworn suture of SAM-PCZ 13419.

shows a moderately incised bifid E/A and A. The better-preserved suture of SAM-PCZ13419 is visible in fragments only, but is unworn, and accordingly more deeply incised, with parts of A/E and U visible.

Discussion

The present topotype material demonstrates that *Neosilesites soaresi* is a *Macroscaphites*.

Macroscaphites yvani (Puzos, 1832), the holotype of which was recently redescribed by Busnardo *in* Gauthier (2006, p. 152, pl. 29, fig. 2), is based on a microconch. It has predominantly single ribs, lacking the numerous bifurcations on the inner whorls of the present species.

Macroscaphites recticostatus (d'Orbigny, 1841) (p. 134, pl. 40, figs 3, 4), the lectotype of which was designated, illustrated and described by Busnardo *in* Gauthier (2006, p. 43, pl. 23, fig. 1) differs in the presence of only occasional bifurcating ribs, while the ribs of some individuals referred to the species are markedly projected and concave on the ventrolateral shoulder (Busnardo *in* Gauthier 2006, p. 43, pl. 23, fig. 2).

Macroscaphites striatisulcatus (d'Orbigny, 1841, p. 153, pl. 49, figs 4–7, neotype described and figured by Busnardo *in* Gauthier 2006, p. 55, pl. 23, fig. 5) is based on a small individual 20.6 mm in diameter. All of the ribs bifurcate, whereas there are numerous single, and occasional trifurcating ribs in the present species. The constrictions of *striatisulcatus* appear to be much more conspicuous than those of *soaresi*.

There are close similarities to *Macroscaphites microsulcatus* (Simonovitch, Batsevitch and Sorokin, 1875) (p. 167, pl. 4, fig. 1; see revision in Vašíček 1972, p.45, pl. 4, fig. 2), from which the present species differs in having more numerous bifurcating ribs.

The differences between all of these species is slight, and there is as yet no account of intraspecific variation in *Macroscaphites* species. Accordingly, *soaresi* is retained as a separate species at this time.

Occurrence

Lower Aptian, southernmost Mozambique and northern KwaZulu-Natal.

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