

GASTROPODA FROM THE LOWER CRETACEOUS SEDIMENTS OF SOUTH-EASTERN ALEXANDER ISLAND

By M. R. A. THOMSON

ABSTRACT. Twelve species of Gastropoda are described from the Lower Cretaceous of south-eastern Alexander Island. The fauna appears to be essentially Antarctic and only one species, *Anchura* (?) *antarctica* (Cox), has been described previously. Two species, *Turritella alexandra* and *Procerithium* (*Rhabdocolpus*) *alexandri*, are well enough preserved to be described as new.

THE Gastropoda described here were collected from ten localities between Succession Cliffs and Keystone Cliffs on the south-eastern coast of Alexander Island (Fig. 1). The sedimentary rocks which are exposed there consist of a variety of mudstones and sandy mudstones interbedded with beds of sandstone and conglomerate, sometimes more than 30 m. thick. The sedimentology, fauna and flora of these sediments indicate that they were deposited in a relatively shallow-water environment close to land (Taylor, 1967, p. 2; Horne, 1969). These sediments have a total thickness of about 3,000 m. and range in age from Upper Neocomian at Keystone Cliffs (and probably at least part of Succession Cliffs (locality B)) to uppermost Aptian at Waitabit Cliffs. The gentle south-westerly dip of the sediments suggests that the younger beds should occur in the southern part of this area but the presence of the Upper Neocomian at Keystone Cliffs is due to the occurrence of a large thrust. Whereas the sandstones are generally unfossiliferous, the mudstones frequently contain a rich and varied fauna dominated by bivalves, but numbers of other fossils belonging to many other classes and phyla and including gastropods are also present. Gastropods, especially *Anchura* (?), occur sporadically throughout the sedimentary sequence and they sometimes occur abundantly at certain horizons. At Keystone Cliffs, where the fauna is often poor and unvaried, the occurrence of isolated gastropods in turbidite beds indicates they have presumably been transported from elsewhere.

Twelve species from ten genera are described here, but field observations and indeterminate specimens in the present collections indicate that several other species are present in the total fauna.

SYSTEMATIC DESCRIPTIONS

FAMILY NODODELPHINULIDAE COX

Genus *Amphitrochus* Cossmann 1907

Amphitrochus sp.

Fig. 2j

Material

One internal mould (KG.4.3) with some of the test still adhering; locality U.

Description

The specimen is small, trochiform, comprises four whorls only, and the apical ones are absent. In cross-section the whorls are trapezoidal and, although the test is corroded, a row of strong tubercles can be seen on each side of the sutures. Due to corrosion, the test has been removed from the whorl ramps and they have been reduced to smooth internal moulds. The base of the last whorl is almost flat and pierced by a moderately wide umbilicus which is now plugged with calcite. The outline of the aperture is almost square, except for the truncated angle corresponding to the basal margin of the last whorl.

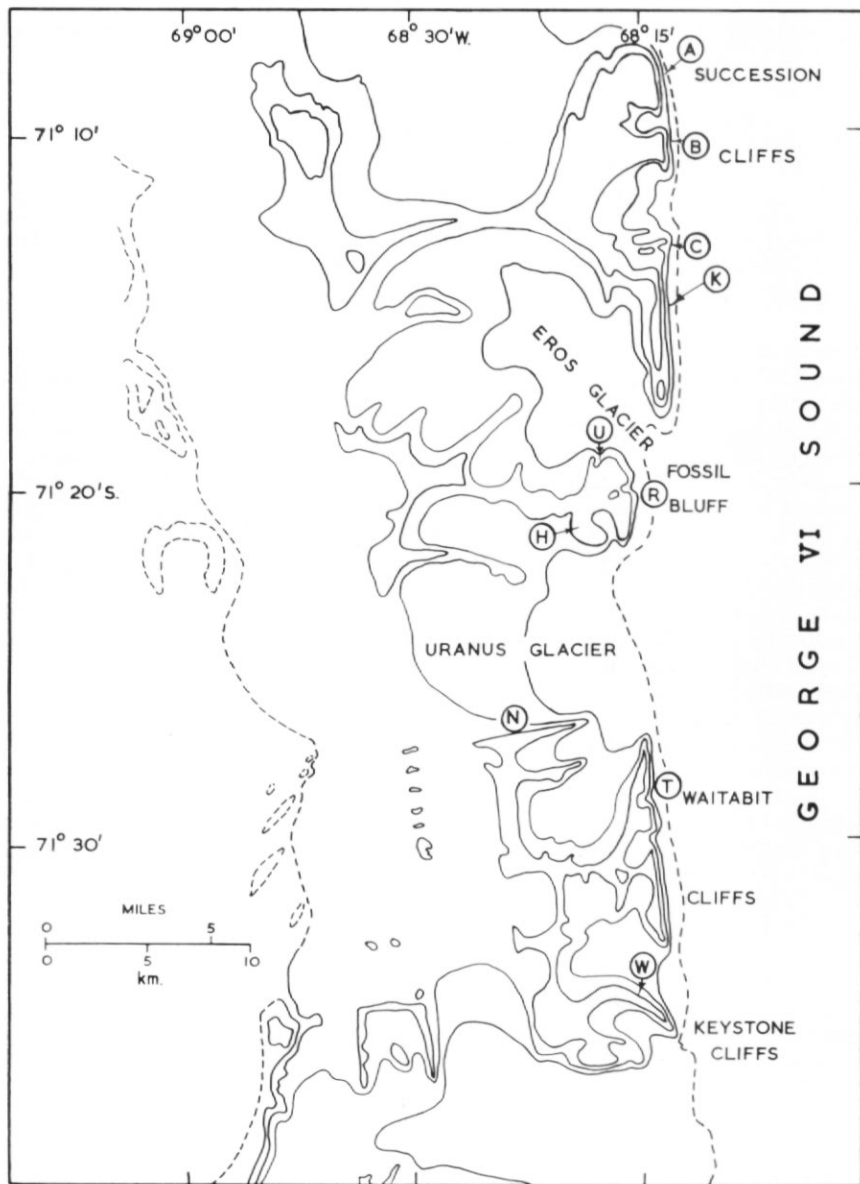


Fig. 1. Sketch map of part of south-eastern Alexander Island showing the localities from which the Gastropoda were collected.

Measurements

The shell measures 15 mm. from umbilicus to apex but, due to crushing, the mean spire angle cannot be measured with any accuracy.

Remarks

This specimen shows the main features of the genus *Amphitrochus* but it differs from the type species in its narrower mean spire angle; further comparison is prevented because details

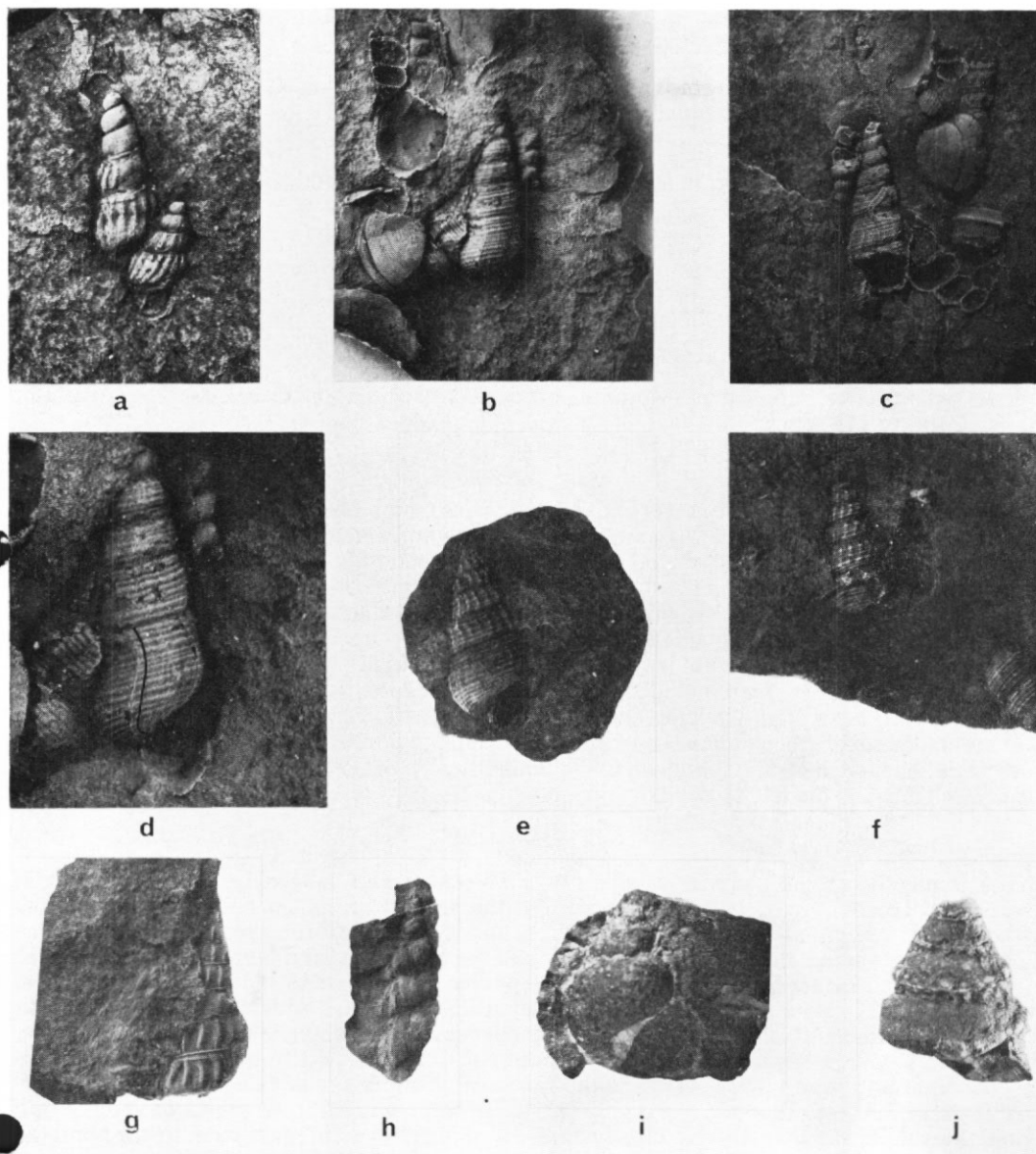


Fig. 2. a. *Rissoina* sp. A latex cast from a part external mould, part internal cast; locality T; $\times 3$; coated. (KG.103.90)
 b. *Turritella alexandra* sp. nov. Latex cast from the holotype showing the aperture; locality H; $\times 3$; coated. (KG.2.217)
 c. *T. alexandra* sp. nov. A latex cast from the counterpart of the holotype showing the abapertural view; locality H; $\times 3$; coated. (KG.2.223)
 d. *T. alexandra* sp. nov. An enlargement of Fig. 2b to show the ornament and form of the growth lines (black line); locality H; $\times 6$; coated. (KG.2.217)
 e. *Procerithium (Rhabdocolpus) alexandri* sp. nov. Latex cast from the holotype; locality K; $\times 3$; coated. (KG.18.19)
 f. *P. (R.) alexandri* sp. nov. Latex cast from internal and external moulds; locality H; $\times 3$; coated. (KG.2.225)
 g. *Turriscala (Claviscala)* sp. A latex cast from a natural external mould; locality H; $\times 1$; coated. (KG.2.185)
 h. *Proscala* (?) sp. Latex cast from a poorly preserved external mould; locality W; $\times 1$; coated. (KG.106.44)
 i. *Vanikoropsis* (?) sp. Internal mould with some of the test adhering; locality R; $\times 2$. (KG.1.696)
 j. *Amphitrochus* sp. An internal mould from locality U; $\times 2$. (KG.4.3)

of the ornament on the whorl ramps and on the basal disc are lacking. It is too poorly preserved to attempt a specific identification.

FAMILY RISSOIDAE FORBES AND HANLEY

Genus *Rissoina* d'Orbigny 1840

Rissoina sp.

Fig. 2a

Material

Two part-external moulds, part-internal casts on a rock slab (KG.103.90) from Waitabit Cliffs; Locality T.

Description

The larger of the two gastropods (Fig. 2a) is 7.5 mm. high and consists of five whorls in a moderately acute spire which has an angle of 21° . The whorls have gently convex sides and fine impressed sutures. Internal casts of early whorls are smooth but on later whorls strong opisthocline costae, which stop short of the smooth basal part of the shell, are present. On the larger specimen, traces of fine growth lines can be seen on the last whorl. Neither specimen has any concentric ornament. The small ribbon-like structures associated with the sutures are the external moulds of shell on what is otherwise an internal cast.

The aperture, which is preserved on the smaller specimen, is sub-ovate and pinched out posteriorly into a small gutter lying against the body whorl. The outer lip is thickened and a thin inductura covers the columellar lip and the parietal region. Anteriorly, the columellar and outer lips meet at a small spout which is diametrically opposite the posterior gutter and directed slightly to the left of the axis.

Remarks

The family Rissoidae includes a wide range of genera and subgenera which range from Jurassic to Recent (Wenz, 1938-44, p. 606), but the present specimens compare most closely with *Rissoina s.s.*, a Palaeocene to Recent subgenus. The form of the aperture is the same as that in the type species *Rissoina inca* d'Orbigny and the only essential difference in the ornament of the two is the reduction in strength of the axial ribs on the base of the present species. The lack of ribs on the base of the Alexander Island species, together with the paucity of growth lines, makes it impossible to demonstrate either the presence or absence of a siphonal fasciole, which Sohl (1960, p. 86) noted as being present in *Rissoina s.s.* and some closely related subgenera. Although Wenz (1938-44) gave the range of *Rissoina s.l.* as Cenomanian to Recent, Cox (Cox and Arkell, 1948-50, p. 68), by including three species from the Great Oolite and Forest Marble of the British Isles, clearly regarded this genus as ranging back to the Jurassic. It has not been possible to identify the present specimens with any previously described species but their incomplete preservation prevents a formal designation as a new species.

FAMILY TURRITELLIDAE WOODWARD

Genus *Turritella* Lamarck 1799

Turritella alexandra sp. nov.

Fig. 2b-d

Material

About six internal and external moulds from locality H. Other indeterminate moulds from the same locality may belong to this species. Specimen KG.2.217 is designated as the holotype.

Diagnosis

Shell small, slender turriculate with rounded whorls having a spiral ornament; growth lines opisthocyrt, reflected on base, tending to be rugate; aperture projecting strongly from base.

Description

The shell (Fig. 2b and c) is small, moderately slender and consists of about six whorls with gently convex sides. The whorls are separated by impressed sutures and are ornamented with numerous spiral threads of varying strength. These spiral threads are crossed by fine opisthocyrt growth lines, which are often somewhat rugate so that small granules are produced where the two intersect (Fig. 2d). On the base of the last whorl the growth lines are reflected to curve gently in the opposite direction. The aperture is preserved on specimen KG.2.217 (Fig. 2d). It projects strongly forward from the base of the shell and has columellar and outer lips which are parallel to each other; the anterior margin is angularly rounded.

Measurements

The holotype (KG.2.217), which has a broken apex, is 8.5 mm. high and has a mean spire angle of about 20°.

Remarks

This species is distinguished by its small size, the varying sizes of the spiral threads and the projecting aperture. It differs from *T. ekelöfi* Wilckens (1910, pl. 4, fig. 1), from the Lower to Middle Campanian of Snow Hill Island, in possessing a projecting aperture and somewhat rugose growth lines. It differs from *Turritella* (*Turritella*) *unicarinata* (Woodward) 1833 in having fewer spiral threads and a differently shaped aperture. Many genera or subgenera have been recognized within the Turritellidae by various authors and the form of the growth lines has been held as a useful criterion in classification, especially as the apical whorls and the aperture are frequently absent in fossil specimens. Abbass (1962) used the form of the growth lines between the sutures and Marwick (1957) also considered that part of the growth line on the base of the shell. Using these two systems with the present specimens, it is possible to suggest several different generic and subgeneric affinities. The exact generic or subgeneric position of the present specimens is therefore uncertain.

FAMILY PROCERITHIIDAE

Genus *Procerithium* Cossmann 1902

Subgenus *Rhabdocolpus* Cossmann 1906

Procerithium (*Rhabdocolpus*) *alexandri* sp. nov.

Fig. 2e, f

Material

About ten internal and external moulds from localities C, H, K and U. The best specimen is KG.18.19 from locality K and this is designated as the holotype.

Diagnosis

Shell small, turriculate; mean spire angle fairly large for genus; whorls with axial costae and spiral threads, the former disappearing on the last whorl in adult specimens; aperture sub-oval with anterior gutter or notch against the columella.

Description

The shell (Fig. 2e and f) is small (up to 9 mm. high) and turriculate with a mean spire angle of about 25–30°. Generally six or seven whorls are present; these have gently convex sides and are separated by grooved sutures. Near the apex the whorls bear about eight strong, gently curved axial costae which are crossed by about four major spiral threads and several minor

ones. Abapically, the number of axial costae increases but each is successively reduced in prominence until they disappear and only the spiral ornament remains. Adapically, the costae encroach onto a small ramp below the suture but abapically they terminate against the lowest major spiral thread. The body whorl is non-umbilicate and it has a rounded base ornamented with spiral threads only.

On specimen KG.18.19 (Fig. 2e) there are the remains of a sub-oval aperture with a thin outer lip and a smooth, thickened columellar lip. Posteriorly, the aperture is somewhat angular and, although the anterior end is damaged, it appears to have been almost spade-shaped with a small gutter or spout against the columellar lip.

Remarks

This species is morphologically similar to *Procerithium* (*Rhabdocolpus*) *lorieri* (Hébert and Deslongchamps) from the Callovian of France. Specimen KG.18.19 resembles a specimen of the above species illustrated by Cossmann (1913, pl. IV, figs. 42 and 43) but it differs from the latter in the more rounded form of the aperture and the greater reduction in axial ornament. A similar reduction in axial ornament with increase in size also occurs in "*Cerithium*" *leckhamptonensis* Hudleston (1887-96, p. 157, pl. IX, fig. 2) from the Inferior Oolite of England. Cossmann's (1913, p. 77) description of the Jurassic species of France is confused in parts; the citation of the illustration numbers at the head of his description is incorrect and, although the "angle apical" of 25-20° quoted in the text agrees with that of the specimen in his illustration, the measurements quoted ("longueur probable: 29 mm.; diametre basal: 7 ou 6 mm.") suggest a mean spire angle considerably less than 20°. The reduction in the strength of the axial ribs on the body whorl is not mentioned by Cossmann but it can be seen in his illustration.

FAMILY SCALIDAE BRODERIP

Genus *Turriscala* de Boury 1909

Subgenus *Claviscala* de Boury 1909

Turriscala (*Claviscala*) sp.

Fig. 2g

Material

One fragmentary external mould (KG.2.185) from locality H showing typical scalid ornament. The mould occurs in a fine-grained muddy sandstone which also contains fragments of *Anchura* (?) *antarctica* (Cox).

Description

The specimen (Fig. 2g) comprises seven whorls of a long, narrow turriculate gastropod which has the most apical whorls and the aperture missing. The whorls are moderately high with feebly convex sides and are separated by narrowly grooved sutures. The suture is bordered by two carinae: the adapical one is the stronger and encircles the periphery of the basal disc of the preceding whorl, while the abapical one is less well developed and best seen on the largest whorl. Ornament consists of strong, widely spaced costae which terminate a little short of the suture or against the carinae where these are present. The costae, of which there are about 12 on the largest whorl and perhaps three or four on the smallest, are straight or slightly opisthocyrte and they are crossed by a series of numerous fine spiral threads. Where the mould is more perfectly preserved, very faint growth lines can be seen on the costae and the interspaces between them.

Remarks

Despite the incompleteness of this specimen, the sculpture of the whorls is distinctive enough to allow an identification with the subgenus *Claviscala* de Boury. The genotype is *C. richardi* Dautzenberg and de Boury. However, as only one imperfectly preserved specimen of this Recent species is known, Cossmann (1912, p. 9) considered that a more appropriate genotype

would have been *C. clementina* (Michelin), of which numerous specimens have been collected and described from the Albian of Europe. At first sight, the present specimen compares fairly closely with *C. clementina* but differs from it in having more axial costae per whorl and, even allowing for crushing, it also has a somewhat larger mean spire angle. It differs from *C. ischyra* Gardner (1876, p. 108, pl. III, fig. 7) in having straighter axial costae which are also fractionally narrower in the present specimen, thus giving them a more isolated appearance. Because of these differences and the geographical isolation of the Alexander Island specimen from its European relatives, it is considered that it belongs to a new species. Because of the fragmentary preservation of this single specimen, a formal description as a new species is not given here.

Genus *Proscala* Cossmann 1912

Proscala (?) sp.

Fig. 2h

One fragmentary and poorly preserved external mould (Fig. 2h) from Keystone Cliffs (locality W) shows morphological features which are perhaps best referred to this genus. The spire has a mean angle of about 20° and is composed of moderately high, gently convex whorls bearing fine, widely separated axial ribs. The largest of the five and a half whorls preserved has numerous fine striae about $20\ \mu\text{m}$. apart on its surface, and these probably represent part of the internal structure of the test revealed by corrosion before fossilization. Both the apex and the aperture are absent.

FAMILY VANIKORIDAE

Genus *Vanikoropsis* Meek 1876

Vanikoropsis (?) sp.

Fig. 2i

Material

Two internal moulds with some of the test still adhering (KG.1.696, 697); from a coarse pebbly sandstone at Fossil Bluff; locality R.

Description

The shell is small and turbate with a moderately elevated spire which has a mean spire angle of about 60° . About four-fifths of the total shell are occupied by the large globose body whorl and the spire consists of four rounded whorls separated by impressed sutures. The aperture is ovate to semi-circular, the inner lip being nearly straight and the outer lip broadly rounded. Fragments of test adhering to specimen KG.1.697 carry an ornament of numerous spiral ribbons but nothing can be seen of any growth lines.

Measurements

Specimen KG.1.696 has the following dimensions: height, 11.6 mm.; width of body whorl, 9.2 mm.; height of body whorl, 9.0 mm.

Remarks

While these specimens show most of the features of the genus *Vanikoropsis* Meek, their assignment to this genus is doubtful because the exact nature of the base of the shell is not known. Meek (1876) originally proposed this genus for non-umbilicate shells, but Sohl (1967, p. B22) has pointed out that the holotype possesses a narrow umbilical chink. The umbilicus in specimen KG.1.696 (Fig. 2i) is plugged with calcite which is probably recrystallized; the shell is also missing from the base, so that if a small chink was originally present it could well have come off with the missing test.

Apart from the uncertainty of the exact form of the base of the present specimens, they may

be compared to *V. nebrascensis* (Meek and Hayden) (cf. Sohl, 1967, pl. 5, figs. 14 and 17) except that they have a narrower mean spire angle than the Upper Cretaceous species of North America. Wilckens (1910, pl. 4, fig. 18) illustrated a specimen from the Lower to Middle Campanian of Snow Hill Island, and this he thought was merely a variety of his species *Eunaticina* (?) *arktowskiana*; it has the same general proportions as the present specimens. However, the aperture of Wilckens's specimen is not illustrated so that it is not possible to make a very close comparison.

FAMILY APORRHAIIDAE PHILLIPI

The systematic position of the aporrhaid gastropods from Alexander Island is uncertain because they do not fit satisfactorily into any of the known genera of this family. Cox (1953, p. 6) described some of these aporrhoids under the genus *Tessarolax* because, in addition to the doubly digitate outer lip, there appeared to be an indication of a digitation adhering to the spire. On one specimen (E.151.11; British Museum (Nat. Hist.) No. G.69801) examined by him the adapical margin of the outer lip is turned up against the penultimate whorl of the spire but this feature is common in many aporrhoids which do not have a posterior digitation against the spire. None of the other specimens from the collection examined by Cox nor from the present collections shows any further indications of a digitation adhering to the spire and therefore they are no longer considered here as belonging to this genus.

The doubly digitate outer lip of the present specimens recalls that of the genus *Dicroloma* Gabb 1868, but the ornament on the spire in species of this Jurassic* genus is confined to spiral threads and simple carinae, while on the present specimens the carinae are distinctly tuberculate. The present specimens, especially those belonging to *Anchura* (?) sp. β , with its two digitations on the outer lip trending parallel to the axis of the spire, are similar to *Anchura carinata* (Mantell) from the Gault of England. The wing-like extension of the outer lip in *Anchura carinata* is very narrow and extended so that the digitations are distant from the spire. Allowing for flattening in specimens of *Anchura* (?) *antarctica* (Cox), the wing in this species is also moderately narrow, although not as extended as in *A. carinata*. Sohl (1960, p. 104-05) has discussed the validity of grouping *A. carinata* with Upper Cretaceous species of *Anchura*, which compare more closely with the type species *A. abrupta* Conrad and differ from the former in having only a feebly developed anterior digitation on the outer lip and rounded whorls with an ornament of closely spaced axial ribs and strong concentric threads. Sohl (1960) has suggested that *A. carinata* is more closely related to *Drepanocheilus* Meek. Sohl's discussion of the various species which have been assigned to the genus *Anchura* clearly indicates that a careful revision of the Aporrhaidae is required. The author is not in a position to carry out this work, but when it is undertaken the present specimens, perhaps together with *A. carinata*, should be considered for inclusion within a new genus. For the present the Alexander Island specimens are assigned doubtfully to the genus *Anchura* s.l.

Anchura (?) *antarctica* (Cox) 1953

Fig. 3a-d

Material

About 12 internal and external moulds, all of which are more or less incomplete; from localities H, N, R and T.

Description

Cox (1953, p. 6) has already described the main features of this species but the present material shows the form of the body whorl and its digitate outer lip much better. The body whorl bears two prominent rounded carinae which pass into two elongate digitations supporting the small wing-like extension of the outer lip. These two digitations diverge at an angle of

* Specimens from the Lower Cretaceous of west-central Argentina, described by Weaver (1931, p. 386-87) as *Dicroloma*, have since been included by Camacho (1953) in his new genus *Protohemichenopus*, which bears strong resemblances to the genus *Tessarolax* Gabb 1864 and may even be synonymous with it.

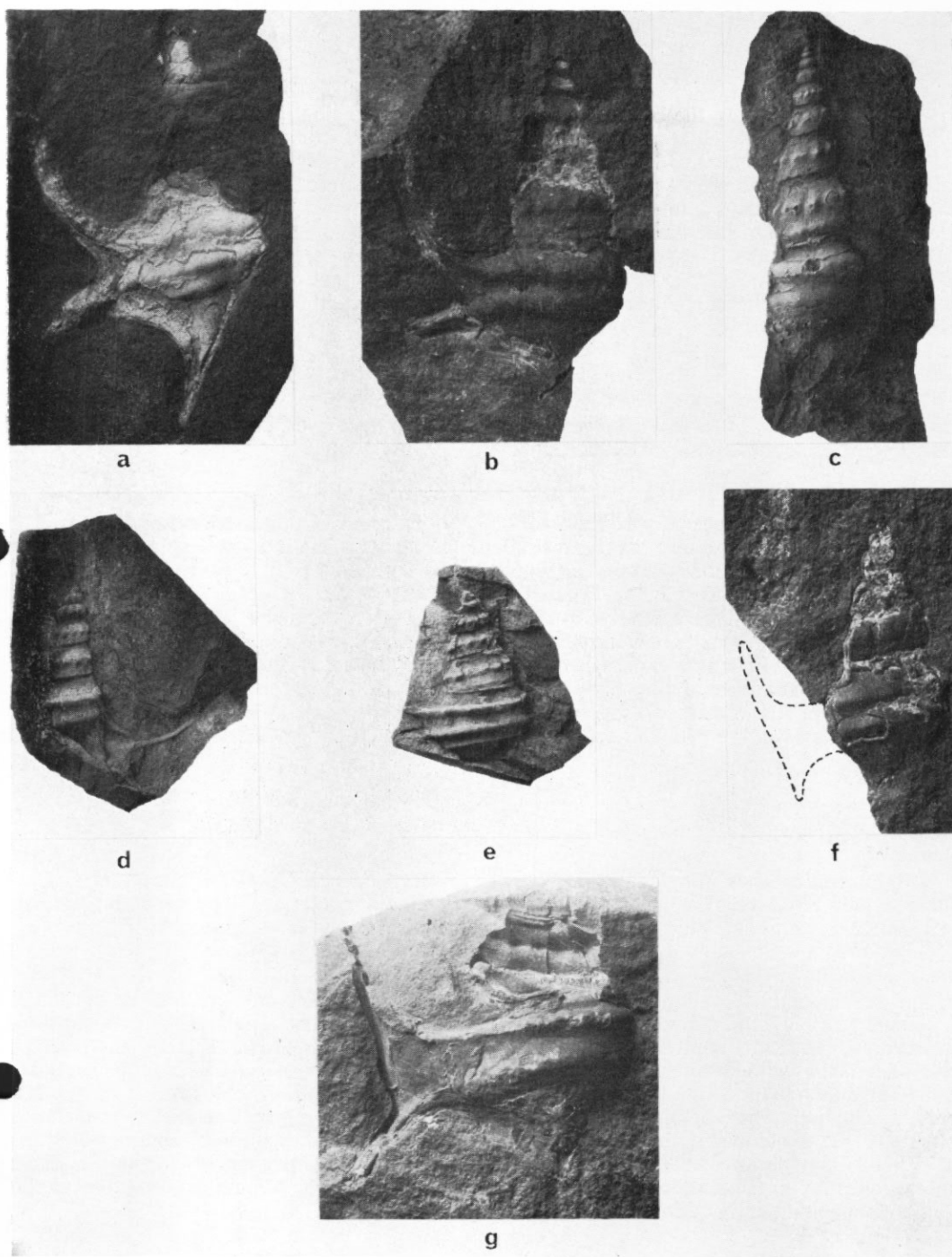


Fig. 3. a. *Anchura* (?) *antarctica* (Cox). Internal mould of an incomplete specimen; locality N; $\times 1$; coated. (KG.11.2)
 b. *A. (?) antarctica* (Cox). Part internal, part external mould; locality H; $\times 1$. (KG.2.205)
 c. *A. (?) antarctica* (Cox). A latex cast from an external mould lacking the outer lip; locality R; $\times 1$; coated. (KG.1.789)
 d. *A. (?) antarctica* (Cox). Plastic cast from the holotype; locality R; $\times 1$; coated. (E.151.11; British Museum (Nat. Hist.) No. G.69799)
 e. *Anchura* (?) sp. α . Plastic cast from the paratype of *Aporrhais* (*Tessarolax*) *antarctica* Cox; locality R; $\times 1$; coated. (E.151.11; British Museum (Nat. Hist.) No. G.69801)
 f. *Anchura* (?) sp. β . The digitate outer lip is present on the joint face perpendicular to the photograph and has been sketched in; locality T; $\times 1$. (KG.103.57)
 g. *Anchura* (?) sp. β . Part internal, part external mould of the last few whorls; locality T; $\times 1$. (KG.103.228)

about 90° after leaving the body whorl, the anterior one being directed forwards and away from the axis of the shell at about 45° and the posterior one curving backwards and trending almost parallel to the axis of the shell. The holotype (Fig. 3d) shows signs of being broken and, although the posterior digitation is directed away from the spire in the fossil, it is likely that it was originally orientated sub-parallel to the spire. The anterior extremity of the body whorl ends in a triangular rostrum, prolonged into a long thin spine which curves gently away from the axis towards the apertural side of the shell. In some large adults (KG.2.205; Fig. 3b) the third less well-developed carina, below the two major ones on the body whorl, produces a slight node on the margin of the outer lip between the anterior rostrum and the major anterior carina.

Measurements

The largest specimen (KG.11.2) is 60 mm. high in comparison with the holotype, which is about 45 mm. high. A crushed juvenile (KG.1.799) without a digitate outer lip, which may belong to this species, is about 24 mm. high.

Remarks

At first sight, the range of specimens (Fig. 3a-d) included in this species may seem a little large. However, the material available is limited and the broader form of the spire in specimens KG.11.2 and 2.205 (Fig. 3a and b) can probably be accounted for by the strong crushing they have undergone. Specimen E.151.11 (British Museum (Nat. Hist.) No. G.69801) (Fig. 3e), which was designated by Cox (1953) as a paratype of his species *Aporrhais* (*Tessarolax*) *antarctica*, has a greater mean spire angle and a much squatter form than the previously described specimens, which cannot be attributed solely to the effects of distortion, and three very prominent carinae on the body whorl. It is therefore regarded as a separate species, *Anchura* (?) sp. a, and a second specimen showing the body whorl of an aporrhaid, with three strong carinae as in the previous specimen, is also assigned to this species.

Anchura (?) sp. β

Fig. 3f, g

Material

Two internal moulds from locality T, Waitabit Cliffs. Specimen KG.103.57 shows the general form of the shell but the anterior rostrum is not well preserved. The second specimen (KG.103.228) consists of the body and penultimate whorls of a large specimen.

Description

The spire comprises about six moderately high whorls which are crushed in the small specimen (Fig. 3f) and show no features of the surface ornament. The style of preservation, however, is like that of some specimens of *A. (?) antarctica* (cf. KG.2.205; Fig. 3b) and perhaps the form of the two is similar. The penultimate whorl of specimen KG.103.228 (Fig. 3g) bears a median tuberculate carina but it shows no trace of the fine spiral threads found on the last species. The body whorl bears only two carinae, the third less prominent one of *A. (?) antarctica* being absent; the anterior rostrum is triangular but there is no indication of an anterior spine in either of the specimens. The wing-like extension of the outer lip is larger than in the above species and the two digitations diverge strongly, the posterior one trending sub-parallel to the axis without first gently curving.

Measurements

The smaller specimen is 41 mm. high and has a mean spire angle of 33°. Measurements of specimen KG.103.228 show that it is about 30 per cent larger than the other specimen.

Remarks

This species is differentiated from *Anchura* (?) *antarctica* on the form of the digitate outer lip and the number of carinae on the body whorl.

A hitherto undescribed specimen of an aporrhaid gastropod from the Lower to Middle Campanian of a locality near Cape Lamb, Vega Island (D.3126.16; Fig. 4), is probably allied to the three species described above. The shape of the whorls and form of the outer lip are similar but this specimen differs from the Alexander Island species in three respects:

- i. The basic ornament on the shell is augmented by a lattice pattern formed by the intersection of fine spiral striae and growth lines.
- ii. There is a distinct upturning of the posterior margin of the outer lip against the penultimate whorl.
- iii. The anterior rostrum is reflected away from the outer lip and is bifurcate.

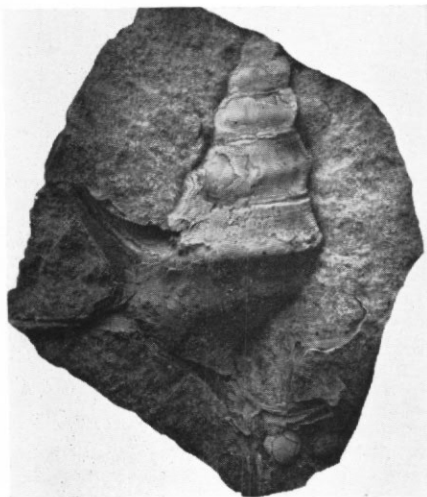


Fig. 4. A latex cast from an external mould of a Lower to Middle Campanian aporrhaid gastropod showing several features in common with the Aptian specimens of *Anchura* (?); near Cape Lamb, Vega Island; $\times 1$; coated. (D.3126.16)

INCERTAE SEDIS

It has not been possible to assign several of the gastropods collected from south-eastern Alexander Island to a systematic position with any degree of confidence. This is partly because of poor preservation, or lack of preservation, of important diagnostic features such as the aperture, and perhaps because they may belong to new genera. Such specimens are described here for completeness and in the hope that better preserved and comparable material may be collected later in Alexander Island or even elsewhere in the Southern Hemisphere.

"Gastropod I"

Fig. 5a

Material

One small internal mould (KG.8.78) with some of the test still adhering; locality B.

Description

The specimen is about 9 mm. high and consists of four angular whorls forming a turbinat shell whose body whorl comprises about half of the total shell. The angle of each whorl is situated at the mid-line and is strongly pronounced so that the sutures are deeply set. No surface ornament of any kind can be seen on the fragmentary, and probably corroded, remains of the test. The aperture is rhomboidal with an angular outer lip which is mirrored by the

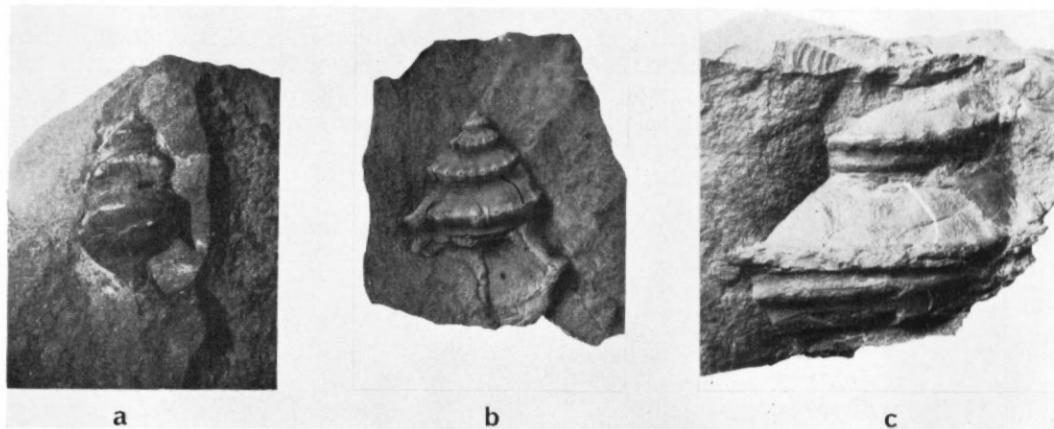


Fig. 5. a. The natural internal mould of "gastropod I"; locality B; $\times 3$. (KG.8.78)
 b. A latex cast from the natural external mould of an almost complete specimen of "gastropod II". The form of the growth lines has been inked in; locality W; $\times 1$; coated. (KG.106.31)
 c. A natural internal mould of the last whorls of a large specimen of "gastropod II". The form of the growth lines has been inked in; locality A; $\times 1$. (KG.10.7)

angular junction between the parietal portion and the stout, smooth columellar lip. Anteriorly, the columellar and outer lips meet at a smooth gutter and the columella projects slightly forward of this to terminate in a sharp point.

Remarks

The morphological features of this gastropod may be compared to those of the Middle to Upper Jurassic subgenus of *Purpurina*, *Eucycloidea* Hudleston. In particular, it recalls the species *E. bianor* from the Inferior Oolite (Hudleston, 1887-96, pl. II, fig. 5a-g). The lack of surface ornament in the present specimen may merely be a feature of preservation and the only notable difference between this specimen and other species of *Eucycloidea* appears to be the stronger development of the columellar lip in the former.

"Gastropod II"

Fig. 5b, c

Material

An incomplete internal mould (KG.10.7) of a large specimen from locality A and a small external mould (KG.106.31) from locality W. A third specimen (KG.1.155) from locality R may possibly belong to the same species.

Description

The spire is moderately high and pagodiform (Fig. 5b and c); the smaller, almost complete specimen comprising five whorls in all. Both specimens have whorls which possess a strong tuberculate angulation slightly abapical of the mid-line. Above the angulation is a gently sloping ramp crossed by a series of fine opisthocyrt growth lines and occasional faint axial ribs radiating towards the tubercles; below the angulation the whorl wall slopes very slightly in towards the axis. On the last whorl of the smaller specimen (Fig. 5b) there are two strong angular chords below the angulation and probably three on the larger specimen (Fig. 5c). The most adapical of these chords can also be seen just above the abapical suture on the penultimate whorl of the larger specimen.

The aperture on specimen KG.106.31 (Fig. 5b) is roughly pentagonal in outline, with the columellar lip forming a side which is longer than any of the others. The posterior notch of the aperture is closed but at the anterior end it is incompletely preserved so that the columellar and

outer lips are not seen to meet. It is impossible to determine with any certainty whether the anterior margin of the aperture was entire, or interrupted by a notch or canal.

Remarks

The incomplete form of the aperture precludes identification of this specimen, and it is possible to compare the form and ornament of the spire with a variety of unrelated species. The larger specimen most closely resembles "*Amberleya*" *spinigera* Wilckens from the Lower to Middle Campanian of the north-east Antarctic Peninsula region (Wilckens, 1910, p. 74-75, pl. 3, figs. 25 and 26). The proportions of the two species differ slightly and it is impossible to determine the maximum number of chords below the angulation of the last whorl of the present species. However, the general shape of the two species is the same, both have a similar number of tubercles on the angulation and both occasionally show one of the basal chords just adapically of the abapical suture of the penultimate whorl. The larger specimen is also somewhat similar to an incomplete gastropod from the Upper Cretaceous of Vancouver Island described by Whiteaves (1879, p. 119, pl. 15, fig. 5) as *Serrifusus dakotensis* var. *vancouverensis*. The present specimen lacks the marked axial ribs on the ramp of the latter but it has a stronger third carina on the base of the last whorl. In *Serrifusus* the last whorl is bi- or tricarinate and the Alexander Island specimens have strong chords on the body whorl below the median angulation rather than carinae; also the columella in *Serrifusus* is proportionally stronger (cf. Sohl, 1967, pl. 6, figs. 12, 13, 18-21).

DISCUSSION

The gastropods described here constitute a fauna which appears to be essentially Antarctic in character. Whereas several ammonites and bivalves from the same sediments are conspecific with others from the Lower Cretaceous of Patagonia, there is only one Alexander Island gastropod which may have a close relative in that region. In his recent revision of Feruglio's *Palaeontographia patagonica*, Leanza (1967, p. 157, pl. II, figs. 3, 4) recorded and illustrated two poorly preserved specimens from the mouth of Río Centinela, Lago Argentino, which he thought might be heteromorph ammonites of the family Turritidae. It is suggested by the present author that the ammonite affinities of these specimens are doubtful and that the specimens show a much closer resemblance to the gastropod described here as *Amphitrochus* sp. (p. 45). Allowing for bad preservation and distortion, the smooth whorls with a double row of closely spaced tubercles round the base of each are closely similar in the examples from both localities.

Jaworski (1936, p. 152) has noted that, of the 69 species of Gastropoda recorded at that time from the Lower Cretaceous of South America, only seven were known from Patagonia. Hence there is only a sparse fauna for comparison, even allowing for the few species which have since been added to the gastropod list (Camacho, 1966, p. 351). The apparent sparsity of the Patagonian gastropod faunas could be due to the method of collecting; in this case, future collections might reveal specimens of some of the species described here.

None of the present specimens appears to show any close similarities with species from other Southern Hemisphere Lower Cretaceous faunas, such as those of Madagascar (Malagasy) and Australia.

ACKNOWLEDGEMENTS

I wish to thank Dr. H. W. Ball, Keeper of Palaeontology, British Museum (Nat. Hist.), for allowing me to examine the British Museum's collections of fossil Gastropoda. My thanks are also due to Mr. N. J. Morris and Mr. R. Cleavelly, of the same museum, for their ready assistance and helpful discussion on several occasions.

Most of the specimens described here were collected by Dr. B. J. Taylor. The laboratory facilities in the Department of Geology, University of Birmingham, were kindly provided by Professor F. W. Shotton.

MS. received 13 May 1968

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