

*ARCOSCALPELLUM COMPTUM* (WITHERS),  
A SPECIES OF CIRRIPEDE NEW TO THE GAULT

by J. S. H. COLLINS

ABSTRACT. A species of cirripede, *Arcoscalpellum comptum* (Withers), hitherto known only from terga and carinae from the Lower Greensand, is here recorded from the Gault. Further valves are attributed to this species and the present known vertical and geographical distribution is tabulated.

WITHERS (1910) founded his species *Scalpellum comptum* on two terga (I 13403—holotype, and I 13404—paratype, in the collection of the British Museum (Natural History)) from the Lower Greensand of Sevenoaks, Kent. In 1935 he referred it to the genus *Arcoscalpellum* Hoek, and in 1945 described further terga and two carinae (C. W. and E. V. Wright Coll.) from the 'Crackers' of Atherfield, Isle of Wight.

A comparison of these specimens with valves from the Gault collected by the author reveals that they belong to the same species. Although there are distinct differences between the terga (the commonest valves found) of *A. comptum* and those of *A. arcuatum* (Darwin), a well-known Gault species, their superficial similarity is undoubtedly the reason why the presence of *A. comptum* in the Gault has been overlooked until now.

The scutum and upper latus, here described, are sufficiently distinct from the corresponding valves of *A. arcuatum* and any other known Gault species, yet so resemble in structure and ornament the terga and carinae of *A. comptum* that they may with certainty be included within that species.

DESCRIPTION

1910 *Scalpellum comptum* Withers, p. 153, fig. 5.

1935 *Scalpellum (Arcoscalpellum) comptum* Withers, p. 202, pl. xxiii, figs. 7, 8.

1945 *Arcoscalpellum comptum* (Withers), p. 552, pl. ii, figs. 1, 2.

*Terga*. (Plate 90, figs. 1–5.) All the terga examined from the Gault agree closely with the types and have, as Withers (1935) states, a prominent ridge extending from the apex to the middle of the scutal margin, on either side of which the valve is almost smooth or with only weakly developed longitudinal ridges. The number of these ridges on the carinal side and on the extreme occludent side of the valves varies slightly among individuals. The length of the valve slightly exceeds twice its width.

The terga closely resemble those of *A. arcuatum* (Darwin), but may at once be distinguished by the smaller number of longitudinal ridges. Moreover, while in *A. arcuatum* these ridges are sometimes bifurcated, and shorter finer ridges which do not extend to the apex are always intercalated, the holotype of *A. comptum* (I 13403) and all the terga examined from the Gault have uninterrupted ridges that pass continuously from the apex to the margin of the valve. In the paratype of *A. comptum* (I 13404), however, two of the ridges on the carinal side are bifurcated.

The terga of both species have the same size range and the inner side is similar.

*Carina* (Plate 90, figs. 6a, b, 7). The specimens figured by Withers from the 'Crackers' of Atherfield are embedded in matrix and Withers was of the opinion (1945) that the intraparietes, which are hidden, were inflected at right angles, causing the upper part of the valve to be solid. A further small carina (21512, C. W. Wright Coll.) from the 'Crackers' of Atherfield, and the author's specimens from the Gault show that this is not so. In these a weakly developed ridge separates the parietes from the intraparietes, which are narrow, being at their widest part equal in width to the parietes. They are short and sometimes faintly longitudinally striated, and are inflected inwards to about 45°, the valve remaining open almost to the apex. The inner margin is thickened.

The Gault specimens examined are larger than those recorded from the 'Crackers' and range in length from 9 to 13 mm., and are about four times longer than wide.

The carina is distinguished from that of *A. arcuatum* by the rounded tectum, the laterally visible intraparietes and the general absence of ridges.

*Scutum* (Plate 90, figs. 10, 11). The scutum, which is trapezoidal in outline, is about twice as long as wide. It is moderately convex transversely, the convexity being slightly accentuated towards the occludent margin. The apex is acute and somewhat produced. The apico-basal ridge is moderately developed and becomes splayed out a little towards the base; its margins are rounded throughout its length and it is slightly produced at the basi-lateral angle. The basal margin may be either convex or slightly concave, and at right angles to the lower part of the occludent and lateral margins. The rostral angle is very slightly produced downwards. The occludent margin is regularly convex and there is a shallow depression parallel to its edge. The tergal margin, which is short, may be either slightly convex or concave and the edge is slightly arched. The tergo-lateral angle is barely produced and is inclined with the lateral margin at about 40°. (In *A. arcuatum* this angle averages 36°.) There is a lateral depression parallel to the tergal margin. The lateral margin is regularly convex, except close to both the tergo-lateral and basi-lateral angles, where it is slightly excavated.

Generally there are longitudinal ridges on the lateral side and a few on the extreme part of the occludent side of the valve. Other valves may be almost smooth, although there is a tendency for the ridges on the extreme lateral side to remain. None of the valves examined shows intercalated or bifurcated ridges.

---

EXPLANATION OF PLATE 90

All specimens, except Fig. 11, are from the Upper Albian, *H. orbigny* subzone (between Beds 50 and 64 of Milbourne 1963), Rugby Portland Cement Co., Ford Place, Wrotham, Kent. Fig. 11 is from the Middle Albian, *D. cristatum* subzone, of the same locality. All photographed specimens  $\times 3$ . Specimens deposited in Palaeontological Department, British Museum (Natural History).

Figs. 1-11, 18. *Arcoscalpellum comptum* (Withers). 1, Tergum, left, In64248. 2, Tergum, right, In64249. 3, 4, 5, Terga, left, In64250-2. 6a, b, Carina, outer and side views, In64253. 7, Carina, outer view, In64254. 8, Upper latus, left, In64255. 9, Upper latus, right, In64256. 10, Scutum, left, In64257. 11, Scutum, right, In64258. 18, Carina, transverse section  $\times 5$ , 8 mm. from apex, just below maximum development of the intraparietes, In64265.

Figs. 12-17, 19. *Arcoscalpellum arcuatum* (Darwin). 12, Tergum, left, bifurcated and intercalated longitudinal striae clearly seen on occludent side of valve, In64259. 13a, b, Carina, outer and side views, In64260. 14, Upper latus, left, In64261. 15, Upper latus, right, In64262. 16, Scutum, left, In64263. 17, Scutum, right, In64264. 19, Carina, transverse section  $\times 5$ , 7.5 mm. from apex, In64266.

---

On the inner surface a prominent pit, inclined towards the occludent margin, extends above the adductor muscle pit to the apex. As growth advances a pit, bounded by a sharp ridge extending along the tergal margin, is developed.

*Upper latus* (Plate 90, figs. 8, 9). The valve is thin and subtriangular in outline. It is slightly inclined towards the scutum, almost flat transversely, and slightly convex longitudinally. The umbo is slightly produced with a thickened ledge, which is more pronounced on the scutal side, and which thins out towards the lateral angles. The tergal margin is slightly convex and is shorter than the scutal margin, which is moderately concave. The angle enclosed by two lines drawn from the apex to the lateral angles is approximately 65°. The basal margin is boldly convex; the portion occupying the distance from a poorly developed apico-basal ridge to the sharp basi-tergal angle, is almost straight. The basi-scutal angle is bluntly rounded. The portion of the valve on the tergal side of the apico-basal ridge is slightly raised and a pronounced ridge extends parallel to the scutal margin. A few very fine uninterrupted ridges complete the surface ornament. The growth-lines are distinct and present a slightly overlapping appearance. On the thickened edges of the scutal and tergal margins the growth-lines are upturned, forming fine longitudinal ridges.

CONCLUSIONS

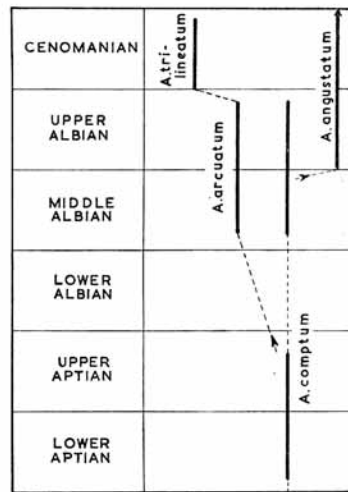
Withers (1910) compared the terga of *A. comptum* with those of *A. arcuatum* and *A. fossula* (Darwin) and, with knowledge of the carina, further implied (1945) that *A. comptum* was the ancestor of *A. arcuatum*. With better preserved specimens from the Gault, it is possible to advance these opinions further.

As stated above, the length of the terga of *A. comptum* slightly exceeds twice the width, a feature approaching the valves of *A. angustatum* (Geinitz) of the *A. fossula* group. The terga of *A. arcuatum* are generally just twice as long as wide. The ridge extending from the apex to the scutal margin is, to a greater or lesser degree, present in both groups (contrary to Withers's statement (1910) that it is never present in *A. arcuatum*).

The presence of small, laterally visible intraparietes in the carina of *A. comptum*, together with the rounded tectum devoid of a median ridge in all but the earliest stage of growth, are both characteristic of the *A. fossula* group. The intraparietes of *A. arcuatum*, which are turned under, are not visible in the lateral view, and the tectum is strongly arched with a median ridge.

The outline of the scutum is similar to that in both groups, but the valve resembles that of *A. angustatum* in being nearly devoid of ridges.

The upper latus is flatter, thinner, and smoother than that of *A. arcuatum* and in this



TEXT-FIG. 1. Evolution of *Arcoscalpellum comptum* (Withers) and allied species.

respect approaches that of *A. angustatum*. The concave scutal margin and broadly rounded basi-scutal angle also suggest that this valve more nearly approaches the *A. angustatum* form than the *A. arcuatum*.

The latest known occurrence of *A. comptum* in the Upper Gault, *H. varicosum* subzone, overlaps the lowest known record of *A. angustatum* (Withers 1935, and specimens in author's collection). The earliest record of *A. arcuatum* is from the *A. intermedius* subzone, from where it continues at least to the *H. varicosum* subzone.

From the evidence thus far available, it would seem that *A. comptum* was more probably the ancestral form of the *A. fossula* group, as originally suggested by Withers (1910) rather than that of the *A. arcuatum* group. Both groups presumably arose from a common ancestor, yet to be found.

TABLE 1. Vertical and geographical distribution of *Arcoscalpellum comptum* (Withers) in the Gault.

Subzones	Ford Place, Kent (Rugby Portland Cement Co.)	Reservoir Pit, Ford Place, Kent	Folkestone, Kent	Greatness Lane, Kent	Small Dole, Sussex
<i>H. varicosum</i>	T				
<i>H. orbigny</i>	CLST	CLST	T	T	
<i>D. cristatum</i>	T	ST		CST	
<i>A. daviesi</i>					
<i>E. nitidus</i>					
<i>D. doris</i>	T				
<i>E. neglectus</i>					
<i>D. niobe</i>	T			CT	
<i>A. intermedius</i>	CT			T	T
<i>H. spathi</i>					

C: carinae, L: latera, S: scuta, T: terga.  
Subzones after Milbourne 1963.

*Range* (Table 1). The earliest valves of *A. comptum* so far recorded from the Gault are terga and a carina collected from the *A. intermedius* subzone of Ford Place, Wrotham, Kent, and it is evident that the upward range extends at least as far as the *H. varicosum* subzone. In some subzones the tergum (the commonest valve found) occurs fairly frequently. For example, from the lower part of the *H. orbigny* subzone (Beds 50-64 of Milbourne 1963) of Ford Place, one tergum of *A. comptum* was collected to about ten of *A. arcuatum*. The greatest development of *A. comptum* appears to have occurred in the *H. orbigny* subzone.

*Acknowledgements.* I wish to thank the Officers of the British Museum (Natural History) for providing access to specimens; Mr. C. W. Wright for the opportunity to examine his specimens and for valuable advice; Mrs. J. I. Collins, Messrs. A. T. Buffery, R. A. Milbourne, and N. Stevens for assistance in the field; and Mr. E. Kentish for preparing the photographs.

#### REFERENCES

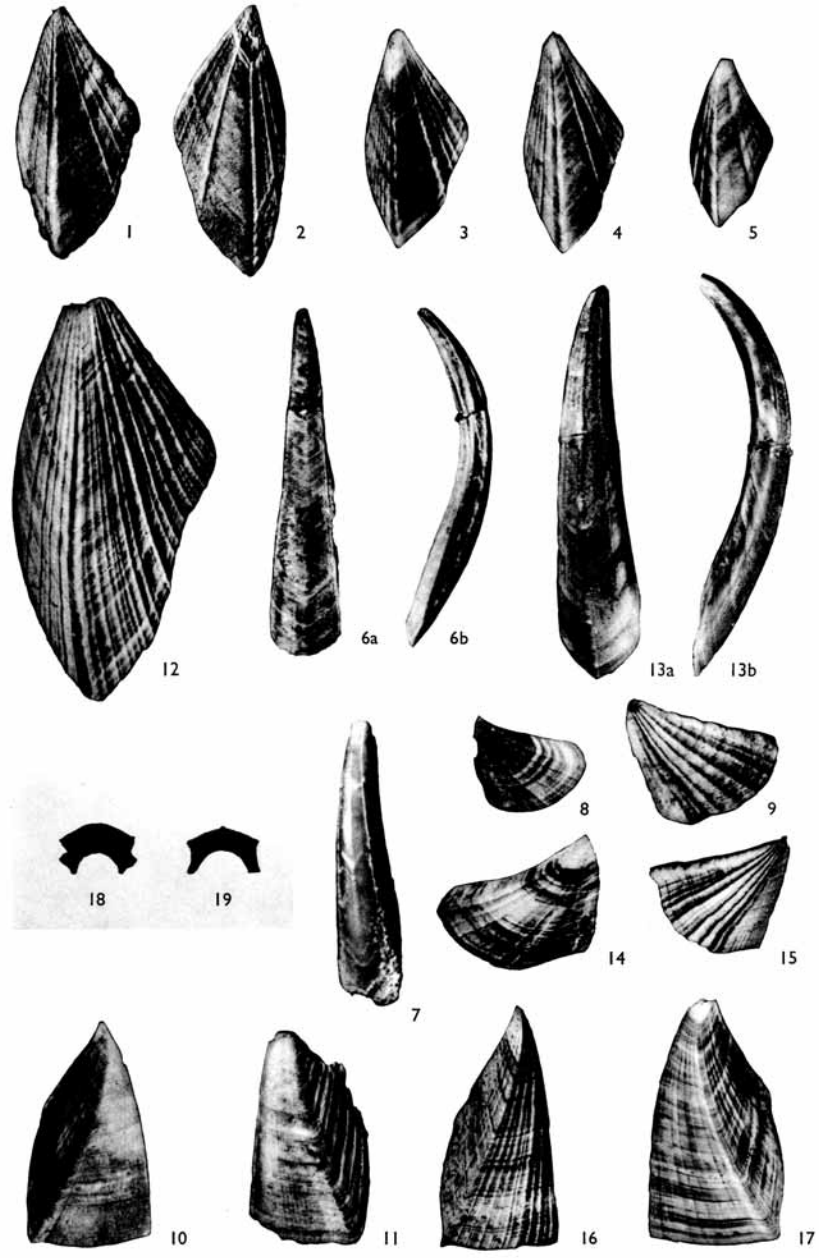
- DARWIN, C. R. 1851. A monograph on the fossil Lepadidae, or pedunculated cirripedes of Great Britain. *Palaeontogr. Soc. (Monogr.)*.  
MILBOURNE, R. A. 1963. The Gault at Ford Place, Wrotham, Kent. *Proc. Geol. Assoc.* **74**, 55-80.

- WITHERS, T. H. 1910. Some new species of the cirripede genus *Scalpellum* from British Cretaceous rocks. *Geol. Mag.* **7**, 151-9.
- 1935. *British Museum Catalogue of Fossil Cirripedia in the Department of Geology*. **2**, Cretaceous, xiii-433, 50 pls. London.
- 1945. New Cretaceous cirripedes and crab. *Ann. Mag. Nat. Hist.* (2) **12**, 552-61, 2 pls.

J. S. H. COLLINS,  
63 Oakhurst Grove,  
East Dulwich,  
London, S.E. 22

Manuscript received 17 October 1964

---



COLLINS, Gault cirripede