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Notes on the topotype and deep-sea specimens of the planktonic foraminifer *Cassigerinelloita amekiensis* Stolk

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ABSTRACT – Specimens of *Cassigerinelloita amekiensis* Stolk from the type collections and DSDP/ODP holes are found to possess a microperforate and pustulate wall and a triserial, pseudoplanispiral coiling mode. These characters prompt its affinity with the contemporaneous *Guembelitria triseriata* (Terquem). An amended description of *Cassigerinelloita amekiensis* is given, and the peculiar coiling mode discussed. *J. Micropalaeontol.* **13**(2): 157–159, December 1994.

INTRODUCTION

The planktonic foraminiferal species *Cassigerinelloita amekiensis* was first described by Stolk (1965) from the latest early Eocene to early middle Eocene of Nigeria. As implied by the generic name, Stolk believed that his *Cassigerinelloita* was closely related to *Cassigerinella* Pokorny. Subsequent work on this taxon was scarce, so that its taxonomic position remains unsettled in the conventional classification schemes. Blow (1979), for example, regarded it as a variant of *Globigerinita*, whereas Loeblich & Tappan (1987) placed it with the catapsydracids. None of these authors agreed with Stolk in considering its affinity with *Cassigerinella*.

In this study, we encountered a large number of specimens referable to *C. amekiensis* from several DSDP/ODP holes. The material was later compared with two topotypes obtained from the type collections. We concluded that *Cassigerinelloita amekiensis* is neither a cassigerinelline nor a captapsydracine, on the evidence that it possesses a microperforate wall (Li & Radford, 1992). This is summarized and re-asserted further below with illustrations of the topotypes.

SYSTEMATIC PALAEONTOLOGY

Superfamily **Heterohelicacea** Cushman, 1927
Family **Guembelitriidae** Montanaro Gallitelli, 1957
Genus **Cassigerinelloita** Stolk, 1965

Type species. *Cassigerinelloita amekiensis* Stolk, 1965, p. 264. pl. 1, figs. 1a–d.

Amended description. Test small, 70–120 μm, subspherical to polygonal, without a distinct periphery, chambers inflated, spherical, alternately pseudoplanispiral and triserial, surface pustulate and microperforate, aperture small, arched, with or without a lip, secondary apertures developed on the final stage of some individuals.

Remarks. The most distinct character of *C. amekiensis* is having two simultaneous axes of coiling, i.e. its chambers are arranged triserially in a very low trochospire, or pseudoplanispire, so that a polygonal to subspherical test is formed (Pl. 1, fig. 8). Viewed from their outer margin, or from the side opposite to the aperture, any three successive chambers always constitute a unique trigonal pattern, with the last-formed chamber situated across the suture of the previous two, in the shape of an isosceles triangle (Pl. 1, figs 3–5, 9, 10). For every consecutive chamber, only a single alternation of coiling direction occurs through ontogeny, and this planispirality may produce a false impression that the chambers are coiled in pairs as in *Cassigerinella*. Species of the biserial *Cassigerinella*, however, always possess laterally flat tests with pseudoumbilici (of Banner, 1982) and a distinct periphery, to which the aperture is directed (Li, 1986). Any three successive chambers in these flattened cassigerinellids never form an isosceles triangle, a basic unit in the polygonal *Cassigerinelloita amekiensis*. The term 'triserial pseudoplanispiral coiling' is then introduced to define this peculiar mode that characterizes *C. amekiensis*.

Similar to other Cenozoic microperforate planktonic taxa, *C. amekiensis* possesses a typical microperforate, pustulate wall (Pl. 1, fig. 11; see also Li, 1991; Li & Radford, 1992). The pustules on the topotypes (Pl. 1, figs 1, 2) are so well developed that the micropores have been obscured and the surface has a rough appearance. This pattern may be mistaken for the cancellate wall type under light microscopes, as seen in Stolk's type illustrations.

In addition to the primary aperture, which is semicircular or low arched (Pl. 1, figs 1–4, 7), some individuals of *C. amekiensis* may have one or more sutural openings between the last few chambers (Pl. 1, fig. 10). The shape and coiling of the last few chambers may vary, and the additional chambers, or 'bullae' of Stolk, may add to the test along or beyond the basic triserial pseudoplanispiral mode (Pl. 1, fig. 6).

Affinity. As *C. amekiensis* possesses a microperforate, pustulate wall and a triserial, pseudoplanispiral coiling mode and occurs together with the similarly small, microperforate but triserial *Guembelitria triseriata* (Terquem), it was regarded as being derived from the latter taxon (Li & Radford, 1992).

Stratigraphic range. Uppermost lower Eocene to lower middle Eocene (Zones P9–P11 of Blow, 1979).

Distribution. Niger Delta (Stolk, 1965; Petters, 1983), southern Atlantic Ocean – DSDP Hole 363 (Li, 1991) and ODP Holes 698A, 699A, 700B, 702 and 703 (Nocchi *et al.*, 1991), Weddell Sea, Antarctica – ODP Hole 689B

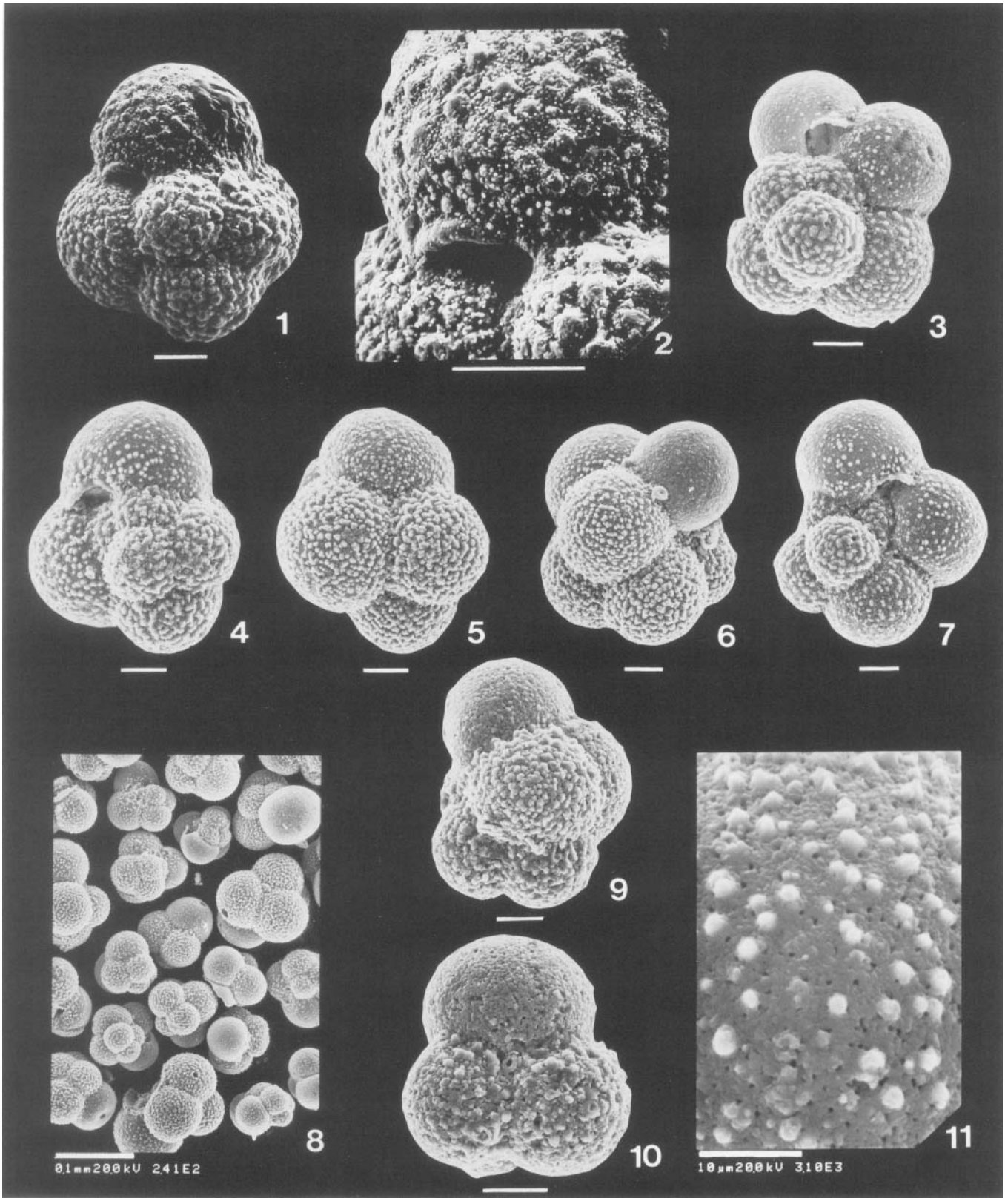

Plate 1

(Stott & Kennett, 1990, as *Globigerina*? sp. B), and Kerguelen Plateau, southern Indian Ocean – ODP Hole 749B (Li, 1991). Like *G. triseriata* (McGowran & Beecroft, 1985), *Cassigerinelloita amekiensis* seems to have flourished in cold or upwelling waters (Li & Radford, 1992).

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Explanation of Plate 1

Figs 1–11: *Cassigerinelloita amekiensis* Stolk. (scale bar = 20 μm; unless otherwise as indicated). **Figs 1, 2.** One of the two topotype specimens from Stolk (1965) type collection (T. P. 521). Note the well developed pustules. **Figs 3–7.** Various specimens from ODP Hole 749B (Sample 749B-11-CC). **Fig. 8.** is part of the population from Sample 749B-11-CC. Note the typical polygonal test with three successive chambers constituting a single unit. **Figs. 9, 10.** Specimens from DSDP Hole 363 (Sample 363-12-3, 49–52 cm). **Fig. 11.** Enlarged view of the test wall on fig. 7, showing the microperforate and pustulate texture.