

FORAMINIFERA FROM THE  
CRETACEOUS OF SOUTH-LIMBURG, HOLLAND.

by J. HOFKER

II. *Pseudoparrella alata* (Marsson).*PSEUDOPARRELLA ALATA* (Marsson)

*Discorbis alata* Marsson, 1878, Mitt. nat. Vereins Neu-Vorpommerns und Rügens, Jahrb. 10, p. 165, pl. 4, fig. 33.

*Pseudoparrella alata* (Marsson), cf., Cushman, 1931, Journ. Pal., vol. 5, p. 311, pl. 36, fig. 5. (?).

*Pseudoparrella minisae* Visser, 1950, Thesis, Leyden, p. 279, pl. 7, fig. 8.

Test rounded in dorsal view, ventral side in most cases slightly more convex than the dorsal side. At the dorsal side only the chambers of the last formed whorl clearly visible, those of the former whorls indistinct by thickening of the wall. At the ventral side no umbilicus but a rounded central part smooth with the surface and poreless. Periphery acute to keeled, sometimes lobate in the last formed chambers.

Chambers at the dorsal side in well-preserved specimens and in clarifying oil distinct up to the first coils, 5—8 in a whorl, two or three whorls, gradually increasing in size, with smooth, rounded and strongly oblique sutures, bending backward. At the ventral side only the chambers of the last formed whorl visible, the sutures extending towards the centre, but for a poreless central area. The sutures at the ventral side are rounded backward, so that they form a fluent line with the periphery of each chamber. The wall always is very smooth, with fine but distinct pores, with very narrow spaces between the pores.

The aperture is formed by a narrow slit riding on the ventral suture of the last formed chamber, and oblique to that suture, always running with its top towards the margin of the test. Around this aperture distinct but small chalk knobs are clearly seen.

On transverse section the walls are porous at both sides, and only an area around the aper-

ture is poreless. The septa foramina formed by the former apertures are somewhat loop-shaped slits obliquely to the axis of coiling. The dorsal wall is very thick at the centre, and the umbilical filling is poreless. The margin of the test is porous.

Diameter from 0,3—0,8 mm; thickness 0,20—0,50 mm.

This species was described by Marsson from the upper white chalk of Rügen, the *Pseudotextularia*-zone. It was found rarely in the uppermost part of the Cr 4, especially in the white chalk in the Southern part of the area south of Maestricht and at Hallambaye in Belgium, in the top-layers of that outcrop. In the Mb it is missing totally, but reappears in the basal conglomerate of the Mc, and is abundant in the upper Mc and the lower Md; in the upper part of the Md, the *Lockhartia*-zone, it becomes more rare.

From these data it is clear that this species is a warmwater form. The *Pseudotextularia*-zone with its typical tropical species and the Mc-Md are warm water zones, whereas the Mb must have been sedimented in a much colder sea; the upper part of the Md seems gradually becoming colder again, and then the species disappears once again.

Whether Cushman's *Pseudoparrella* cf. *alata* (Marsson) is the same species, is not yet certain; it was found in the Taylor, a geologically older part of the Cretaceous; may be that this species from the Taylor is a forefather of *P. alata*.

Comparison with the specimens from the Mc-Md with those from the *Pseudotextularia*-zone reveals, that it must be the same species; so Visser's *P. minisae* is a synonym of *Pseudoparrella alata* (Marsson).

Visser points to *Pseudoparrella navaroana* Cushman as a related species; but the highly developed keel and the much larger number of chambers (9-10) together with the other shape of the whole test, in specimens from the type-locality, clearly prove the difference with our species. It is, however, a remarkable fact that in the Navarro a species appears which is so closely related to *Pseudoparrella alata*.

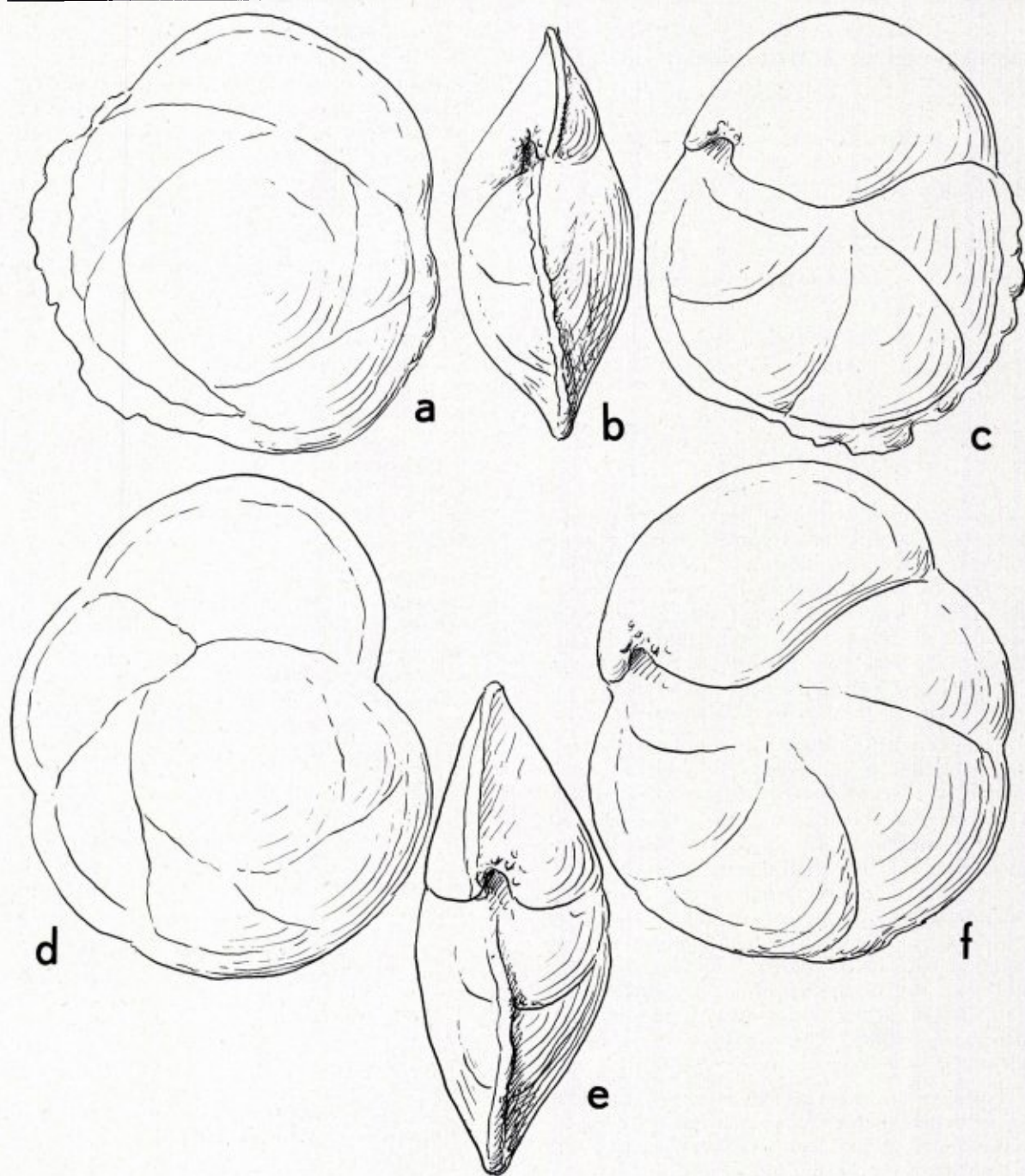


Fig. 1. *PSEUDOPARRELLA ALATA* (Marsson).

a, dorsal side; b, apertural face; c, ventral side of specimen from the top-layer of the outcrop at Hallambaye;  $\times 60$ ; Upper part of Cr 4. d, dorsal side; e, apertural face; f, ventral side of specimen from the quarry Nelissen at Rooth; middle Mc;  $\times 60$ .



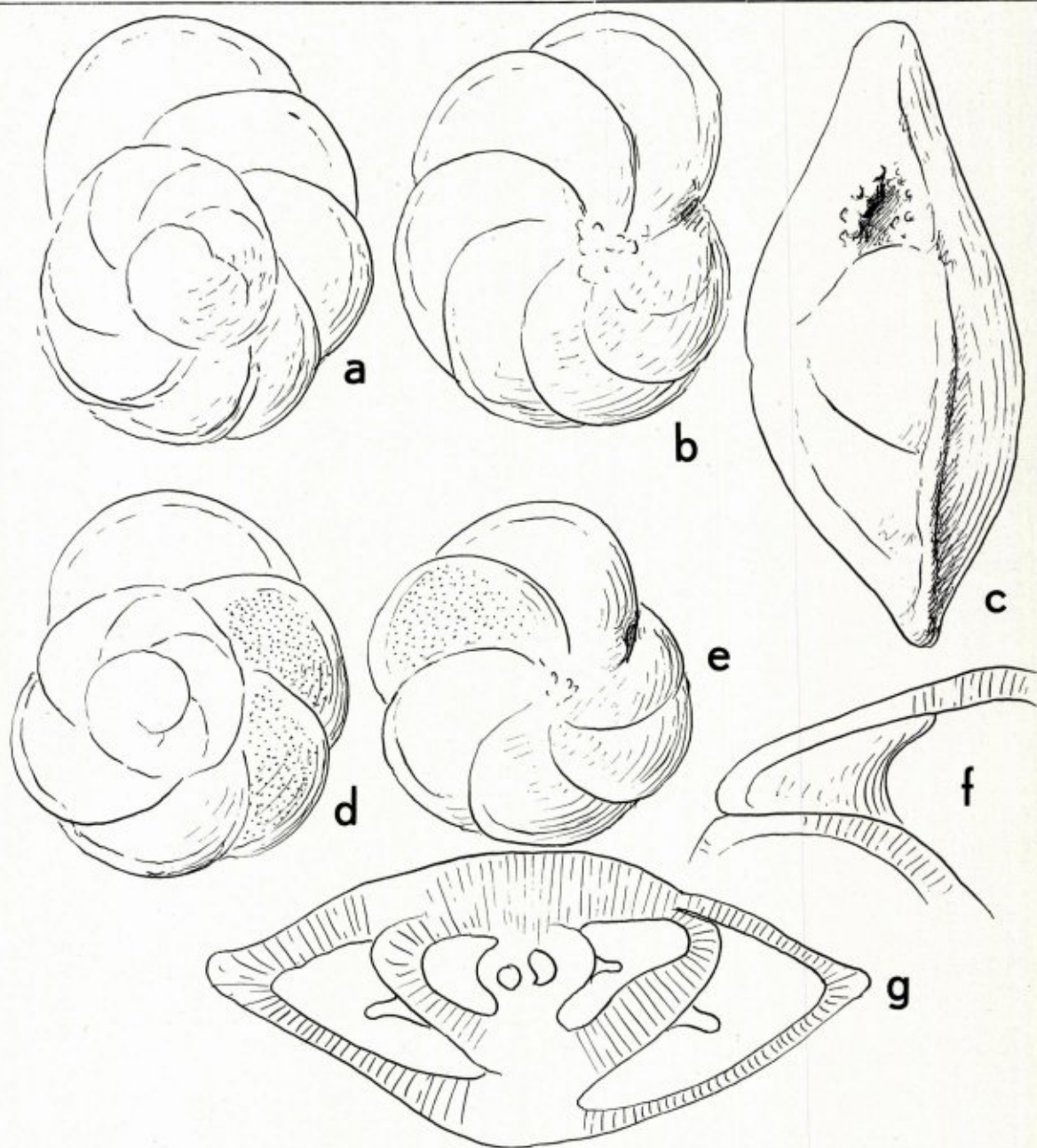


Fig. 2. *PSEUDOPARRELLA ALATA* (Marsson).

a, dorsal side; b, ventral side of specimen from quarry Nelissen, Rooth; seen in clarifyer;  $\times 60$ . c. apertural face of same specimen, enlarged  $\times 135$ ; d, dorsal side; e, ventral side of specimen from outcrop near Rooth, seen in clarifyer, with some of the chamberwalls showing the fine pores, typical for *Pseudoparrella*;  $\times 60$ ; f, part of section through specimen from Rooth, horizontal section, showing the apertural area with the typical tooth-plate;  $\times 360$ . g, transverse section of a specimen from Rooth, showing the septal foramina and the thick dorsal wall in the centre;  $\times 135$ .