Divaricella juttingae nov. spec.

from the Older Pleistocene of Western Europe

by

G. SPAINK

Geological Survey, Haarlem, Holland

Divaricella divaricata (Linné) is a typical southern species, living from the British Channel South to the Mediterranean, where it is common. It is always supposed that this species has, in Western Europe, a wide stratigraphic range from the Pliocene (in which it is thought to occur scarcely) up to the Older Pleistocene, notably the "Marine Icenian" (in which it is fairly common) and to the Younger Pleistocene, notably the Dutch, German and Danish Eemian-deposits, in which it is very common. After the Eemian it disappears from Central Western Europe.

The specimens from the Eemian-deposits agree perfectly with the recent specimens of *Divaricella divaricata* from the Mediterranean in all the features, but on comparing the Older Pleistocene specimens with the authentic *Divaricella divaricata,* many important differences in adult and juvenile shells appear to be present, so that it must be considered an independent species. I propose to name it in honour of Mrs. W. S. S. VAN DER FEEN-VAN BENTHEM JUTTING.

Divaricella **juttingae** nov. spec.

Fig. 1, 2.

Loripes divaricata [non] Linnaeus, S. V. Wood, 1850, p. 137, Pl. 12 fig. 4.
Divaricella divaricata [non] (Linné, 1758), J. Heering, 1950, p. 103, Pl. 7 fig. 11-14.

TYPE-MATERIAL

GEOLOGICAL SURVEY AT HAARLEM

Holotype - Dubbeldam near Dordrecht, boring G.D. 44B/3 (old nr. 546/266); depth: 118.40-123.00 m. "Marine Icenian". Left valve. Width: 8.3 mm, Height: 8.0 mm.

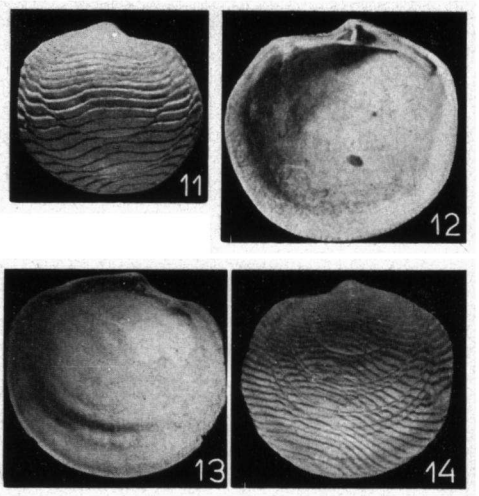

Fig. 1. *Divaricella juttingae* nov. spec. (after Heering, 1950, pl. 7). No. 11, 12: paratype, right valve, width 5.2, height 4.9 mm, from Seppe near Roosendaal, boring G. D. 49F/31 (old no. 622/51), depth 84.00-85.00 m, "Marine Icenian". No. 13, 14: holotype, left valve, width 8.3, height 8.0 mm.

Paratypes - 135 specimens from the Icenian from the localities, mentioned by J. HEERING, 1950, pag. 104, with exception of Biggekerke, Zoutelande and Vlissingen.

RIJKSMUSEUM VAN NATUURLIJKE HISTORIE AT LEIDEN

Domburg, washed ashore: 1 right valve, Coll. B. HUBERT, Juli 1925; 1 left and 1 right valve, Filiaal No. 3795, Coll. J. H. DRENTH, 1942; 1 left valve, Filiaal No. 3796, Coll. H. VAN HAREN.

BRITISH MUSEUM (NATURAL HISTORY) AT LONDON

Red Crag deposits: Sutton, Suffolk, LL 23527-8, 1 left and 1 right valve, Coll. S. V. WOOD, idem, LL 23533-4, 22 right valves, Coll. R. BELL; Butley, Suffolk, LL 23535, 2 left valves, Coll. R. BELL.

Norwich Crag deposits: Bramerton, Norfolk, LL 33255-9, 3 left and 2 right valves, Coll. F. W. HARMER; Postwick near Norwich, LL 23530-1, 2 left valves, Coll. S. WOODWARD; Thorpe, Norfolk, LL 33928-9, 2 left valves, Coll. F. W. HARMER.

BOTANY SCHOOL, UNIVERSITY OF CAMBRIDGE

Ludham borehole, N.E. of Norwich, 1 juvenile right valve, depth: 57'6-61'00 feet, Antian Pollen Zone (derived?).

Bramerton Common Section, 1 defect right valve, depth: 12.20 m, Foraminiferal Zone B I, Thurnian-Antian (derived?).

DESCRIPTION

Shell moderately convex, solid, a little inequilateral and circular to slightly oblique, nearly as high as broad. Umbo in the middle of the shell, prosogyral, a little protruding. Before the apex lies a rather deep small lunula. Posterior side often more or less straight, anterior side sometimes slightly angulated in the middle. Dorsal side broad, straight to slightly convex behind the top and concave in front of it. These parts make an angle of about 140°. The transitions to the anterior and posterior sides are subangular. A very weak depression runs from the apex to the posterior-ventral side. Exterior softly lustrous, with numerous distinct growth-lines and a set of coarse, broad, strongly elevated, flat ribs. These ribs mostly cross over the growth-lines. The upper border of them is sharp and distincly raised, the lower border declines to the usually sharply limited interspaces or fades into them. These interspaces often occupy 1/6 to 1/4 of the width of the ribs. In the interspaces fine, somewhat irregular short lines may be seen, parallel to the growth-lines. In weathered shells generally a fine set of radiating lines belonging to the inner layer is visible. Interior with a distinct pallial line and muscle-scars. The anterior adductor-scar rather long, pointed above, the hinder part, which is rounded, is lying free for a half or for a third part of its length inside the pallial line. The posterior scar as large as the anterior, but broader. A small pedal muscle-scar can be observed against the innerside of the anterior-lateral tooth near the top of the adductor-scar. A similar scar can also be observed at the posterior scar, but here the pedal scar is half fused with the adductor-scar. Hinge with distinct cardinal and lateral teeth and a deep oblique resiliophore. Lateral teeth short. Inner margin of the shell usually indistinctly crenulated, due to weathering of the margin, but if intact, a regular fine crenulation can be observed. An indistinct set of irregular radiating lines is often visible.

Dimensions of the largest Dutch specimen: Width 10.0 mm, Height 9.8 mm.

Divaricella juttingae can easily be distinguished from *Divaricella divaricata* by the following points: The sculpture is much coarser, the flat ribs decline and are more strongly elevated. The interspaces between the ribs are missing, or hardly visible, in *Divaricella divaricata. Divaricella juttingae* carries about 30 to 40 ribs, *Divaricella divaricata* about 55 to 70 (counted on adult specimens). The general form of *Divaricella juttingae* is circular to a little inequilateral with

the apex in the middle. *Divaricella divaricata* is, however, more strongly inequilateral with the apex behind the middle. The umbo of *Divaricella divaricata* is more protruding and strongly vaulted, so that the exterior is strongly bowed and there is often a weakly raised zone, running from the top over the highest parts of the lifted ribs. *Divaricella juttingae* has usually a less and regularly bowed surface. In *Divaricella divaricata* the cardinal teeth are more developed, especially the cardinal tooth of the right valve, which is triangular. The inner border of the hinge plate is bent outwards under the cardinal teeth. In *Divaricella juttingae* the cardinal tooth of the right valve is hardly triangular and the hingeplate is not bent outwards.

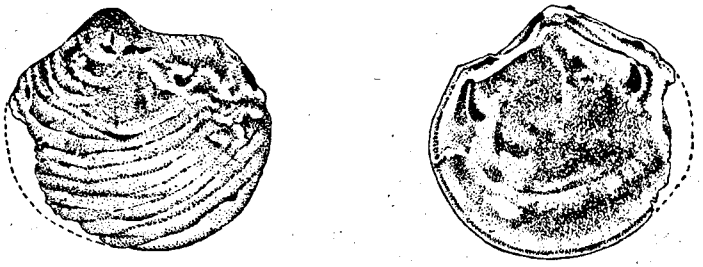

Fig. 2. *Divaricella juttingae* nov. spec., right valve, juvenile, width nearly 2.1, height 2.05 mm, from Ludham borehole near Norwich, depth: 57'6-61'00 ft., "Antian Pollen Zone".

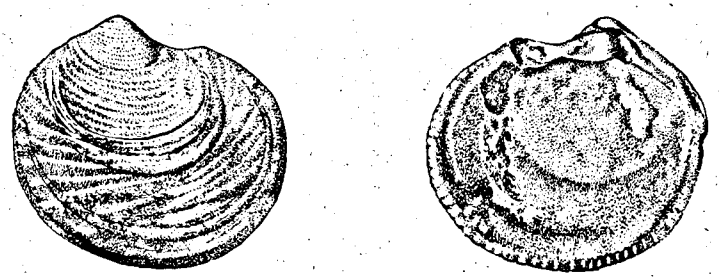

Fig. 3. *Divaricella divaricata* (Linné), right valve, juvenile, width 2.25, height 2.15 mm, from Amersfoort, boring I, G. D. 32B/119 (old no. 428/107), depth: 22.50-23.50 m, type locality of the Eemian.

Differences are also found in the very juvenile shells. Mr. P. E. P. NORTON of the University of Cambridge has sent me a slightly worn valve of 2 mm from the Ludham-borehole near Norwich. From *Divaricella divaricata* I have plenty of very juvenile valves from the type-locality of the Eemian near Amersfoort. Both are represented in fig.

2 and 3. In the juvenile *Divaricella juttingae* also the shell is slightly inequilateral. The top is less prosogyral and placed in the middle. *Divaricella divaricata* is strongly inequilateral, often even somewhat comma-shaped when smaller than 2 mm. The sculpture starts, in *Divaricella juttingae,* with strong ribs, already distinctly separated. In *Divaricella divaricata* numerous, weak, hardly visible ribs are present in the same area.

I have observed that in *Divaricella juttingae* the juvenile valve and with this the oldest growth-lines are often more equilateral than the younger ones, so that adult specimens are mostly more inequilateral than the juvenile specimens, while in *Divaricella divaricata* the reverse occurs, the juvenile valves being very inequilateral and the adults often less inequilateral, so that the extremes of both may come close together. But in that case it is still easy to identify both.

Mr. C. P. CASTELL of the British Museum (Natural History) was so kind as to send me a good number of specimens from the Older Pleistocene of East Anglia from the Crag-deposits. The adult specimens are mainly larger than the Dutch fossils and nearly as large as adult specimens of *Divaricella divaricata.* But they agree well with the Dutch fossils. Most of the Dutch fossils are not adult.

STRATIGRAPHY

Although *Divaricella juttingae* is reported from the Dutch Pliocene and from the "Marine Icenian" by J. HEERING (1950, pag. 104, as *D. divaricata*), it has appeared from recent investigations that all specimens have been found exclusively in the deposits of the Dutch "Marine Icenian". *Divaricella juttingae* is found from the base to the top of these deposits and it is absent in the Amstelian or Merxemian, on which the "Marine Icenian" rests. So it is clear why in Belgium, where the "Marine Icenian" is wanting, no specimens of *Divaricella juttingae* have been encountered.

In England *Divaricella juttingae* is found in the Older Pleistocene, more exactly in the Norwich-Crag and in the Red-Crag. It seems, that in England *Divaricella juttingae* has a larger stratigraphic range. Mr. P. E. P. NORTON has found the species in younger deposits, in the Ludham borehole N.E. from Norwich in the Antian-pollenzone (a juvenile valve, here figured) and a worn, defect specimen from the Bramerton Common Section, Foraminiferal Zone B I, both to be correlated with the Dutch Eburonian and Waalian, but both specimens seem to be derived from older deposits. The correlation between the Dutch and English Older Pleistocene is very difficult and still not completely clear. The Dutch "Marine Icenian" does not corres-

pond exactly with HARMER's Icenian of East Anglia and seems to be older.

I don't know specimens of *Divaricella divaricata* from the Older Pleistocene of Western Europe.

REMARKS

Divaricella divaricata (Linné) var. *rotundoparva* Sacco (SACCO, 1901, pag. 99, Pl. 29 fig. 14 and 15) from the Tortonian to the Astian of Italy agrees with *Divaricella juttingae* in several points. The specimens, I have seen from Italy, however, are more inequilateral, more convex, the umbo is more protruding and not placed in the middle of the shell. The sculpture, although more distinct than in recent specimens, is that of *Divaricella divaricata* with hardly visible interspaces and not so strongly lifted up ribs and finally, the juvenile shell is very inequilateral, so that var. *rotundoparva* is a real variety of *Divaricella divaricata.*

I thank Dr. C. O. VAN REGTEREN ALTENA of the Rijksmuseum van Natuurlijke Historie at Leiden, Mr. C. P. CASTELL of the British Museum (Natural History) in London, Dr. M. GLIBERT of the Institut Royal des Sciences Naturelles de Belgique in Brussels and Mr. P. E. P. NORTON of the Botany School of the University of Cambridge for their kind help and informations, Mr. NORTON also for his linguistic assistance and Mr. G. A. PEETERS from Rotterdam for his excellent drawings, here published.

LITERATURE

WOOD, S. V., 1850. A Monograph of the Crag Mollusca, Part II, Bivalves. Palaeontographical Society, London.

SACCO, F., 1900. I Molluschi dei Terreni Terziarii del Piemonte e della Liguria, parte 28. Torino.

HEERING, J. 1950. Pelecypoda (and Scaphopoda) of the Pliocene and Older-Plistocene deposits of the Netherlands. Mededelingen van de Geologische Stichting, Serie C-IV-1-No. 9, Maastricht.