

A NOTE ON THE TAXONOMIC POSITION OF  
**LENTICULINA (MARGINULINOPSIS) RADIATA (TERQUEM)**

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ABSTRACT. — *Lenticulina (Marginulinopsis) radiata* (Terquem) has been the centre of controversy as regards its taxonomic position, due to wrong illustration by Terquem, as pointed out by Bizon (1960). The present study is an attempt to resolve this controversy in the light of variations shown by this species from the Lower Lias rocks of Warwickshire, England.

INTRODUCTION

While studying the Lower Lias foraminifera from Warwickshire, England, the author came across a number of controversies as regards the taxonomic position of many Lower Lias foraminifera, but much detailed studies could not be achieved for many reasons. However, in the case of *Lenticulina (Marginulinopsis) radiata* (Terquem) some good material was available to study its variation in the Lower Lias of Warwickshire and hence to evaluate the taxonomic position of this species. This work constitutes a part of the thesis submitted for a doctorate degree at Birmingham University, England.

SYSTEMATICS

Family **LAGENIDAE**

Genus **Lenticulina** Lamarck 1804.

There have been many attempts to separate the coiled forms of the family *Lagenidae* into several genera on the basis of their morphological characters. However, there are so many intermediate stages between these genera that it seems more helpful to group these genera into a single genus *Lenticulina* with several sub-genera, as has been suggested by Bartenstein (1948).

**Lenticulina (Marginulinopsis) radiata** Terquem

Text - figures I & II

- ? 1791 *Nautilus costatus* Batsch; pl. I, fig. 1a-g.
- 1863 *Marginulina radiata* Terquem; p. 200, pl. ix, fig. 10a,b.
- 1866b *Marginulina radiata* Terquem; p. 505, pl. xxi, fig. 16.
- ? 1876 *Marginulina picta* Terquem;-Blake, p. 462, pl. xix, fig. 6, 6a,b.
- ? 1903 *Marginulina (Nodosaria) costata* (Batsch); Shick, p. 137, pl. iv, fig. 17,18.

- 1908 *Marginulina costata* (Batsch); Issler, p. 68, fig. 177-184.
- 1936 *Vaginulina radiata* (Terquem); Franke, p. 84, pl. 8, fig. 33, 40.
- 1936 *Cristellaria (Astacolus) radiata* (Terquem); Franke, p. 107, pl. 11, fig- 3.
- ? 1937 *Cristellaria (Astacolus) radiata* (Terquem); Bartenstein & Brand, p. 172, many figures.
- 1952 *Lenticulina (Astacolus) radiata* (Terquem); Usbeck, p. 398, pl. 17, fig. 51.
- 1953 *Lenticulina (Astacolus) homoradiata* Seibold & Seibold, p. 57, text fig. 5 vii.
- 1957 *Marginulina radiata* Terquem; Norvang, p. 264, fig. 94, 95,
- ? 1957 *Marginulinopsis radiata* (Franke not Terquem); Norvang, p. 371, fig. 105, 107.
- 1959 *Lenticulina (Astacolus) neoradiata* Neuweiler, p. 430, text fig. 1 i-v.
- 1960 *Marginulinopsis radiata* (Terquem); Bizon, p. 7, pl. 2, fig. 3a,b; pl. 4, fig. 17a, b.

Test elongate, slightly compressed, almost of constant width; sides somewhat parallel to one another. Initial portion spirally coiled, comprising up to four chambers; later part rectilinear. The coil is not visible in ordinary light arrangements but can be observed in thin sections only. The proloculum is somewhat globular followed by three triangular chambers; later chambers uncoiling and rectangular in shape, up to nine in number, broader than high. The test is ornamented with coarse, longitudinal ribs up to seven in number on each side of the test. These ribs are slightly oblique and increase in number with the growth of the test. Sutures indistinct, at least in the early part of the test, later becoming distinct and constricted. In cross-section the test is ovate to rectangular with rounded corners. Aperture terminal situated at the peripheral angle, radiate, occasionally round.

#### VARIATIONS

Text-fig. 1 (a) illustrates the histograms showing the distribution of this species with the increase in the number of ribs. Most common are the specimens with 4-5 ribs on each side of the test. Text-fig. 1 (b) depicts the graphs showing the relationship of length to the number of ribs, and though a smaller specimen with more ribs may be found occasionally, in general, the number of ribs increases with the length of the test. Younger specimens of this species (Text-fig. 2 i, ii.) appear to be transitional between *Lenticulina (Lenticulina)* and *Lenticulina (Marginulinopsis)* but can be distinguished one from the other by the shape of the test and the arrangement and type of the ornamentation.

#### DISTRIBUTION

According to Bizon (1960), this species ranges from *semicostatum* zone up to the top of *raricostatum* zone, perhaps higher (?) in Lorraine. Neuweiler (1959) states the range of his form as Lias a3-8. The present specimens were obtained from *bucklandi* zone and *conybeari* subzone.

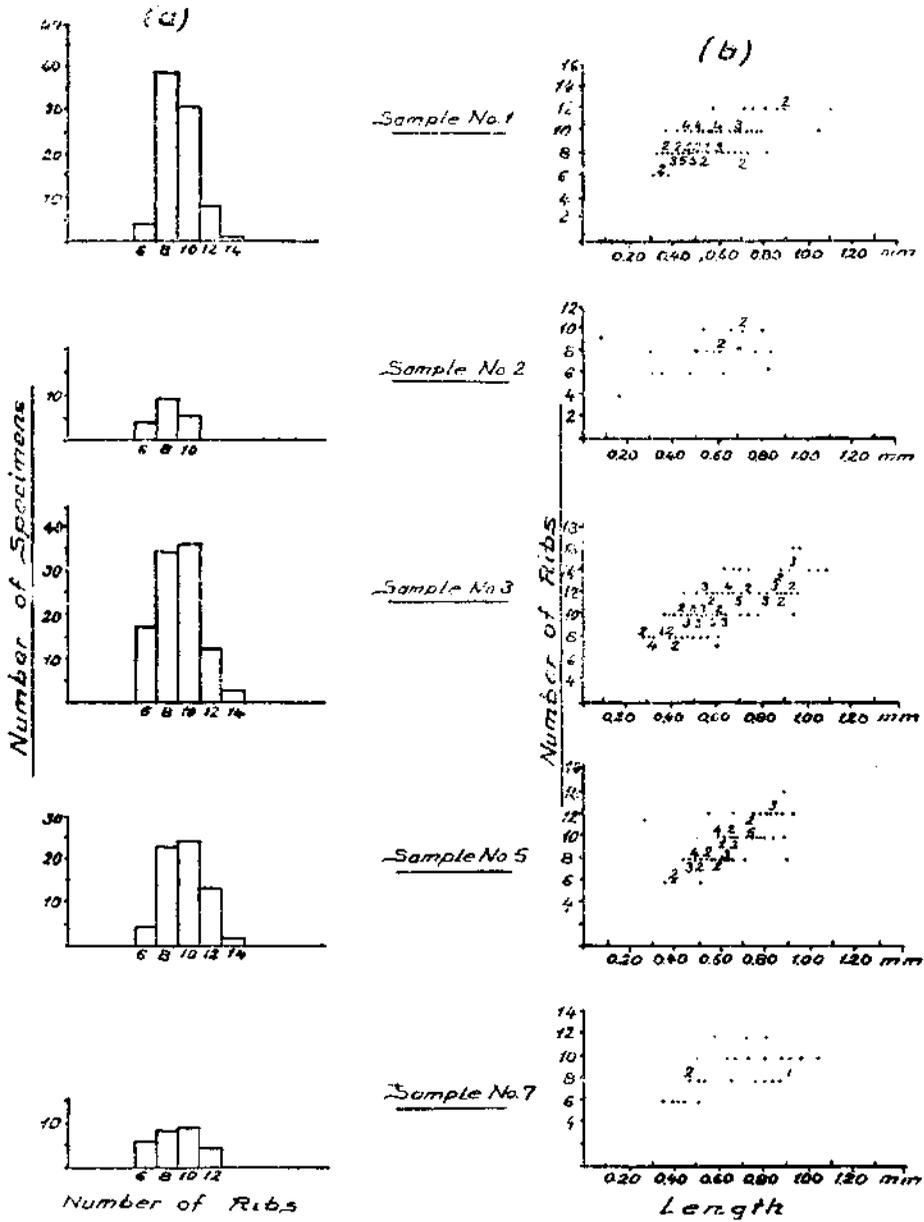


Fig. 1 - *Lenticulina (Marginulinopsis) radiata* (Terquem)

- a) Histograms showing the distribution of *Lenticulina (Marginulinopsis) radiata* (Terquem) from the Lower Lias of Rugby, Warwickshire.
- b) Graphs showing the variations in size with the increase in the number of ribs of *Lenticulina (Marginulinopsis) radiata* (Terquem). The numbers near the point indicate the number of specimens with similar measurements.

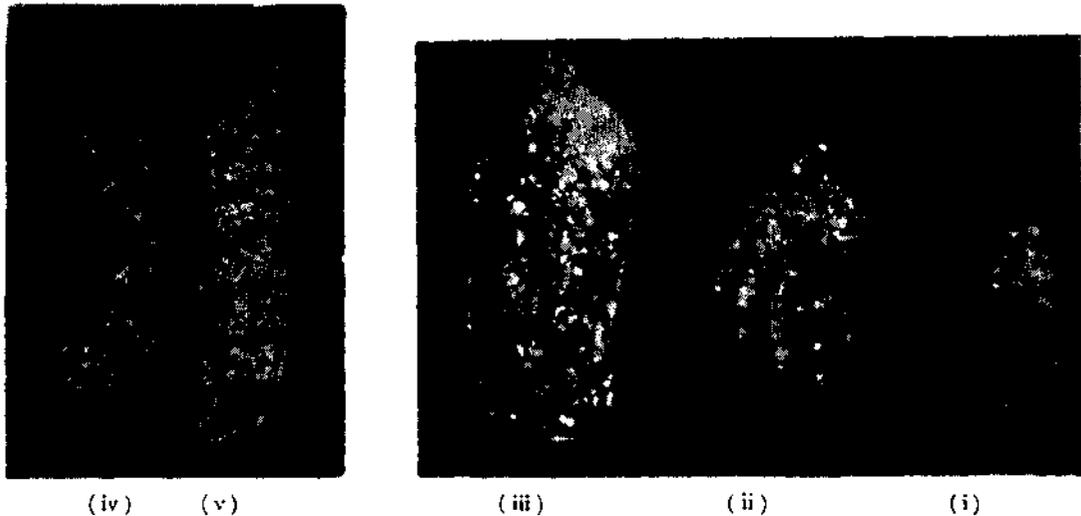


Fig. 2 - *Lenticulina (Marginulinopsis) radiata* (Terquem)

Sample no. 1, Rugby, (i) 6 ribbed form; (ii) and (iii) 8 ribbed forms; (iv) 10 ribbed form; (v) 12 ribbed form. (i-iii X 100) (iv & v X 50)

#### REMARKS AND CONCLUSIONS

There has been a great controversy as regards the taxonomic position of this species which has led the previous workers to confusion. Bizon (1960) in his redescription of Terquem's type, includes this species in *Marginulinopsis*, whereas Cushman (1948) believes *Marginulinopsis* to be synonymous with *Marginulina*. However, according to Glaessner (1945), the name *Marginulinopsis* has been applied to *Marginulina*-like forms with coiled initial portion as in *Lenticulina*.

Batsch (1791) describes his form, «Die Kammern oder Glieder sind walzenrund, kuglig voneinander abgesetzt, und werden durch stark Rippen verbunden...» Shick (1903) and Issler (1908) place their specimens in Batsch's species. Issler (1908), however, places Terquem's (1863) *Marginulina radiata* in his synonymy for *Marginulina costata* (Batsch). Moreover, Issler's illustrations do not appear to have round chambers as stated by Batsch. Therefore, it seems that Batsch's (1791) species is distinctly different from Issler's form, and that Issler's form resembles closely with Terquem's species. Due to inadequate description and illustration by Terquem, this species has been the centre of controversy in the past. Thus, according to Franke (1936), the specimen described and figured by Terquem should be the holotype for his *Cristellaria radiata* and at the same time be a type of *Vaginulina radiata*, a condition which appears impossible to exist. Seibold & Seibold (1953) pointed out this nomenclatural confusion and proposed the new name *Lenticulina (Astacolus) homoradiata* for their form similar to *Lenticulina (Astacolus) radiata* (Terquem) as described and figured by Bartenstein & Brand (1937). Like Seibold & Seibold, Norvang (1957) has pointed out this confusion in his work on Danish Lias. He described Franke's *Cristellaria radiata* as a distinct species *Marginulinopsis radiata* which does not have any relationship with *Marginulina radiata* Terquem. The author considers that probably the two species of Franke are one and not two distinct species as held by Norvang. All this confusion seems to be due to lack of studies of the

variations exhibited by this species like many other species of Lias foraminifera. However, Neuweiler (1959) studied the variations in this species from his Lias material and has pointed out that his form is distinct from the form described by Seibold & Seibold (1953) as *Lenticulina (Astacolus) homoradiata*, but is similar to that described and figured by Franke (1936), Bartenstein & Brand (1937) and Usbeck (1952) and hence proposes a new name *Lenticulina (Astacolus) neoradiata* for his form. To the author, Neuweiler's separation of this species as a new and distinct one rather than one described and illustrated by Terquem (1863) seems to be due to the wrong illustration by Terquem as pointed out by Bizon (1960). Terquem figured (pl. ix, fig. 10b), the cross-section of this species as round whereas Bizon (1960), in his revision of Terquem's types, has pointed out the cross-section of this species' to be an elongate oval. It is, therefore, highly probable that the species described and figured by Neuweiler (1959), Norvang (1957) and other authors is the same as Terquem's *Marginulina radiata* and may, therefore, be placed in the synonymy of *Lenticulina (Marginulinopsis) radiata* (Terquem).

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