J.micropalaeontol., **5** (2): 65–69, December 1986

Globofissurella and *Cerebrina*, two new foraminiferal genera in the Family Lagenidae

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ABSTRACT — *Globofissurella*, a new genus of Oolininae, differs from other genera of the subfamily by its costate test and fissurine aperture. The type species *Globofissurella scotti* sp. nov., and an additional species, *Globofissurella bulabrum* sp. nov. are also described. *Cerebrina* gen. nov., type species *Cerebrina perplexa* sp. nov. differs from other genera of the subfamily Oolininae by its reticulate surface sculpture and fissurine aperture.

INTRODUCTION

Although highly variable and diverse, unilocular foraminifera are perhaps the least understood members of the group. Part of this long-standing problem has been the inadequate number of taxonomic divisions recognised within the group, although this problem has been largely addressed by recent major taxonomic revisions (Jones, 1984; Patterson & Richardson, in press).

Patterson & Richardson (in press) largely based their revision on wall structure, porosity, test shape, aperturral configuration, carinal development and surface sculpture. Differentiation of the present genera is primarily based on sculpture.

METHODS

Specimens were studied with transmitted and reflected light, to determine morphological variation and the presence or absence of an entosolenian tube. Photographs were taken with a Leitz Ortholux Microscope and Orthomat camera attachment, using Ilford Pan F, 35mm film. Scanning electron micrographs were taken with an ISI Super-111A S.E.M. and Polaroid NP 55 film.

MATERIALS

Materials used for this study were from five core levels of DSDP Site 357 (Leg 39) on the Rio Grande Rise, southwest Atlantic Ocean; lat. 30°00.25′S, long. 35°33.59′W. The core levels were:

1. Pliocene; core 1, section 6, 80-86cm.
2. Pliocene; core 1, core catcher.
3. Pliocene; core 2, section 1, 80-86cm.
4. Pliocene; core 2, section 2, 79-85cm.
5. Pliocene; core 2, section 6, 82-88cm.

TYPE SPECIMENS

The holotypes, figured paratypes and unfigured paratypes are deposited in the U.S. National Museum of Natural History, Washington D.C.

SYSTEMATIC DESCRIPTIONS

Suborder Lagenina Delage and Hérouard, 1896
Superfamily Nodosariacea Ehrenberg, 1838
Family Lagenidae Reuss, 1862
Subfamily Oolininae Loeblich & Tappan, 1961

Cerebrina gen. nov.

Type species. *Cerebrina perplexa* sp. nov.
Derivation of name. From the Latin, *cerebrum* (brain) + *-ina* (diminutive), with reference to the reticulate sculpture on each test face. Gender feminine.
Diagnosis. A genus of Oolininae with variously complex raised reticulate sculpture on each test face.
Range. Cretaceous to Recent.
Description. Test free, unilocular, pyriform, compressed; wall calcareous, hyaline to translucent, non-porous; each test face sculpted with variously complex raised reticulate patterns; periphery may have single or multiple carinae; aperture fissurine or a slightly compressed oval; entosolenian tube present.
Remarks. *Cerebrina* differs from *Fissurina* Reuss and *Globofissurella* gen. nov. in having a complex surface reticulation as opposed to a smooth surface in *Fissurina* and longitudinal costae in *Globofissurella*. *Cerebrina* differs from *Cursina* Patterson & Richardson in the fissurine or oval terminal aperture, rather than a broad slit within an apical carina.

Several species previously placed in *Fissurina* and *Lagena* are herein transferred to *Cerebrina*. These include: *Lagena sulcata* Walker & Jacob var. *marginata* (Montagu) subvar. *squamosomarginata* Parker & Jones, 1865, now *Cerebrina squamosomarginata* (Parker & Jones); *L. terrilli* Parr, 1938, now *C. terrilli* (Parr); *L. tricincta* Gumbel, 1868, now *C. tricincta* (Gumbel); *L. lacunata* Burrows & Holland, 1895, now *C. lacunata* (Burrows & Holland); *L. laqueata* Matthes, 1939, now *C. laqueata* (Matthes); *L. laureata* Heron-Allen & Earland, 1932, now *C. laureata* (Heron-Allen & Earland); *L. orbignyana* (Seguenza) var. *curvicosta-*

ta Sidebottom, 1912, now *C. curvicostata* (Sidebottom); *L. orbignyana* (Seguenza) var. *stellata* Sidebottom, 1912, now *C. stellata* (Sidebottom); *L. pirellii* Buchner, 1940, now *C. pirellii* (Buchner); *L. pseudoorbignyana* Buchner var. *tumulosa* Buchner, 1940, now *C. tumulosa* (Buchner); *L. pulchella* Brady var. *hexagona* Heron-Allen & Earland, 1916, now *C. hexagona* (Heron-Allen & Earland; *L. scarenaensis* Hantken, 1883, now *C. scarenaensis* (Hantken); *L. scarenaensis* Hantken var. *depressula* Selli, 1946, now *C. depressula* (Selli); *L. schulzeana* Brady, now *C. schulzeana* (Brady); *Fissurina akpatii* Sliter, 1968, now *Cerebrina akpatii* (Sliter); *F. contusa* Parr, 1945, now *C. contusa* (Parr).

Cerebrina perplexa sp. nov.
(Pl. 1, figs. 8-10)

Derivation of name. From the Latin, *perplexus* (tangled, involved, intricate) with reference to the test surface.
Diagnosis. A species of *Cerebrina* with complex reticulations confined to a circular area on each test face.
Types and occurrence. Pliocene. Holotype (U.S.N.M. no. 383529) and figured paratypes (U.S.N.M. no. 383530) from Core 2, Section 6, 82-88cm.
Description. Test free, unilocular, compressed; wall calcareous, hyaline, appearing somewhat hispid between the raised costae and reticulations, non porous; a complex system of raised reticulations is confined to a circular area on each test face, a lateral carina extends from the base to the aperture and is bracketed by two pairs of subordinate carina or costae which anastomose near the base and aperture, short longitudinal costae radiate from the apertural region; aperture compressed; entosolenian tube free, short and straight.
Dimensions. Maximum length = 700μm; maximum width = 550μm.
Remarks. The reticulate surface pattern on the test face is similar to that of *Lagena horquetensis* Bermúdez, but the latter has an elongate neck, phialine lip, and lacks the anastomosing longitudinal costae of *Cerebrina perplexa*.

Globofissurella gen. nov.

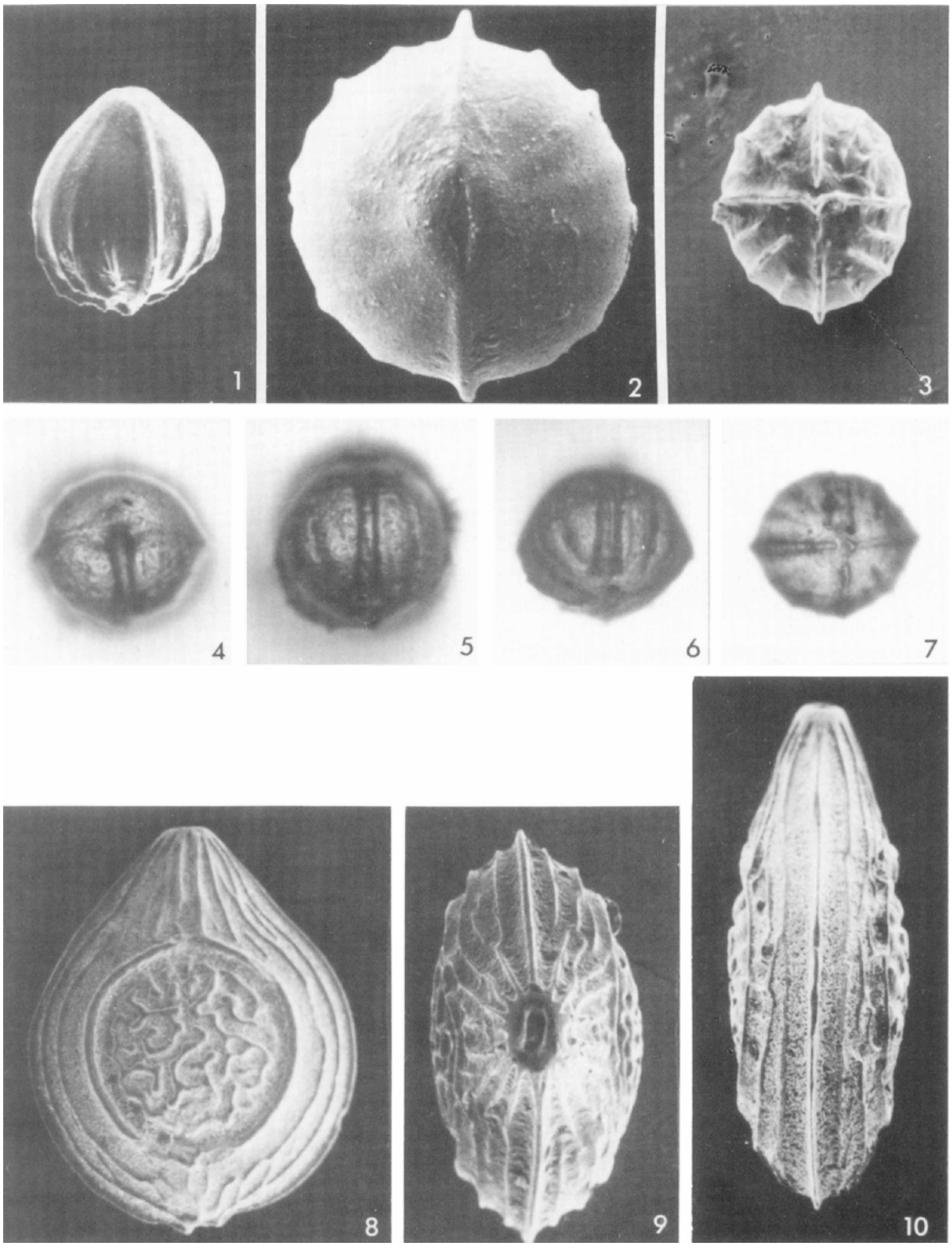
Type species. *Globofissurella scotti* sp. nov.
Derivation of name. From the Latin, *globus* (ball, sphere) + *fissura* (crack, cleft, chink) + *-ella* (diminutive), with reference to the aperture of the globular test. Gender feminine.
Diagnosis. A genus of *Oolininae* with a costate globular test and a fissurine aperture.
Range. Oligocene to Recent.
Description. Test free, unilocular, calcareous, subspherical, slightly compressed; wall smooth, hyaline, pores may or may not penetrate the outer wall surface; variable number of longitudinal costae; small circular opening at center of fissurine aperture; entosolenian tube present.
Remarks. *Globofissurella* differs from *Fissurina* Reuss and from *Pseudoolina* Jones in having a costate test, and from *Vasicostella* Patterson & Pettis in having a fissurine aperture and in lacking a neck and complex carina.

Several species formerly referred to *Lagena* and *Fissurina* are transferred to this genus. These include *Fissurina bouei* Karrer, now *Globofissurella bouei* (Karrer), *F. basistriata* de Klasz, Le Calvez & Rerat, now *G. basistriata* (de Klasz, Le Calvez & Rerat), *F. insigera* Poag, now *G. insigera* (Poag), *F. multicosta* Karrer, now *G. multicosta* (Karrer), *F. multicostula* McCulloch, now *G. multicostula* (McCulloch), *F. obscurocostata* Galloway & Wissler, now *G. obscurocostata* (Galloway & Wissler, *Lagena byramensis* Cushman, now *G. byramensis* (Cushman), *L. cornubiensis* Millett, now *G. cornubiensis* (Millett), *L. costifera* Terquem & Terquem, now *G. costifera* (Terquem & Terquem), *L. laureata* Heron-Allen & Earland, now *G. laureata* (Heron-Allen & Earland), and *Lagena marginata* (Walker & Boys) {recognised Montagu} *incomposita* Matthes, now *G. incomposita* (Matthes).

Explanation of Plate 1

Figs. 1-7. *Globofissurella scotti* sp. nov., holotype U.S.N.M. no. 383433. Fig. 1, edge view showing slightly compressed test and concentration of costae near base (×200); fig. 2, apertural view showing fissurine aperture (×350); fig. 3, basal view showing radiating costae (×200); fig. 4, apertural view showing entosolenian tube becoming attached to one wall (×140); fig. 5, side view showing longitudinally attached entosolenian tube (×140); fig. 6, oblique basal view showing flaring entosolenian tube that terminates near the test base (×140); fig. 7, basal view showing termination of entosolenian tube relative to base (×140).

Figs. 8-10. *Cerebrina perplexa* sp. nov., holotype U.S.N.M. no. 383529, paratype U.S.N.M. no. 383530. Fig. 8, side view of holotype showing complex reticulation (×100); fig. 9, apertural view of paratype showing compressed oval aperture (×130); fig. 10, edge view of paratype showing lateral carina (×120).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Globofissurella scotti sp. nov.
(Pl. 1, figs. 1-7; Pl. 2, fig. 6)

Derivation of name. Patronymic for D. B. Scott, Centre for Marine Geology, Dalhousie University, in recognition of his excellent work on foraminifera.
Diagnosis. A species of *Globofissurella* with an entosolenian tube attached to the inner wall and terminating at the base of the test.
Types and occurrence. Pliocene. Holotype (U.S.N.M. no. 383433) from Core 2, Section 1, 80-86cm.
Description. Test free, unilocular, globular; wall calcareous, hyaline, smooth, numerous fine pores in wall and costae penetrate outer surface; four equidistant prominent costae arise at base and terminate at aperture, 2-3 shorter costae lie between the major costae, originating at the base and terminating halfway up the test; aperture small and round in center of a fissurine cleft; entosolenian tube originating at aperture and becoming attached to one wall and terminating in a flared opening at the base.
Dimensions. Maximum length = 195μm; maximum diameter = 190μm.
Remarks. *Globofissurella scotti* sp. nov. differs from *G. bulabrum* sp. nov. in having an attached entosolenian tube that terminates at the base of the test, rather than the short twisted attached entosolenian tube of the latter. Costae are also fewer and generally shorter in *G. scotti* sp. nov. than in *G. bulabrum* sp. nov.

Globofissurella bulabrum sp. nov.
(Pl. 2, figs. 1-5)

Derivation of name. From the Latin, *bu-*, prefix meaning large, huge, great, + *labrum* (lip, brim), with reference to the pronounced apertural lips.
Diagnosis. A species of *Globofissurella* with pronounced apertural lips and an attached twisted entosolenian tube terminating in the upper part of the test.
Types and occurrence. Holotype (U.S.N.M. no. 383412) and unfigured paratype (U.S.N.M. no. 383413) from Core 2, Section 1, 80-86cm. Unfigured paratypes from Core 1, Core Catcher (U.S.N.M. no. 383414) and from Core 2, Section 2, 79-85cm (U.S.N.M. no. 383437).
Description. Test free, unilocular, globular; wall calcareous, hyaline, smooth, numerous fine pores in walls and costae do not penetrate surface; 15-18 costae originate at the base although several bifurcate near the base; aperture small and round at center of a narrow slit with a short attached and twisted entosolenian tube terminating in the upper part of the test.
Dimensions. Maximum length = 270μm; Maximum diameter = 230μm.
Remarks. *Globofissurella bulabrum* differs from *Fissurina multicostula* McCulloch in having pronounced apertural lips, and in the short, attached and twisted entosolenian tube, rather than an attached entosolenian tube terminating at the test base. The distinctive apertural lips of the present species are similar to those of *G. bouei* Karrer but the latter has fewer costae, and these terminate half way up the test.

ACKNOWLEDGEMENTS

This research was supported by a Canadian Natural Sciences and Engineering Research Council Postgraduate Scholarship and by support as an American Chemical Society Fellow, under ACS PRF grant 16479-A2 to Helen Tappan Loeblich and Alfred R. Loeblich Jr. Student research grants from the Cushman Foundation for Foraminiferal Research and the Department of Earth and Space Sciences, University of California, Los Angeles, provided the Polaroid film. Core samples from the Deep Sea Drilling Project were supplied through the assistance of the National Science Foundation. National Science Foundation Grant EAR-8306170 to Alfred R. Loeblich, Jr. and Helen Tappan provided additional support and use of the scanning electron microscope. I would also like to thank A.R.L. and H.T. for the many consultations and for critically reviewing the manuscript.

Manuscript received January 1986
Manuscript accepted April 1986

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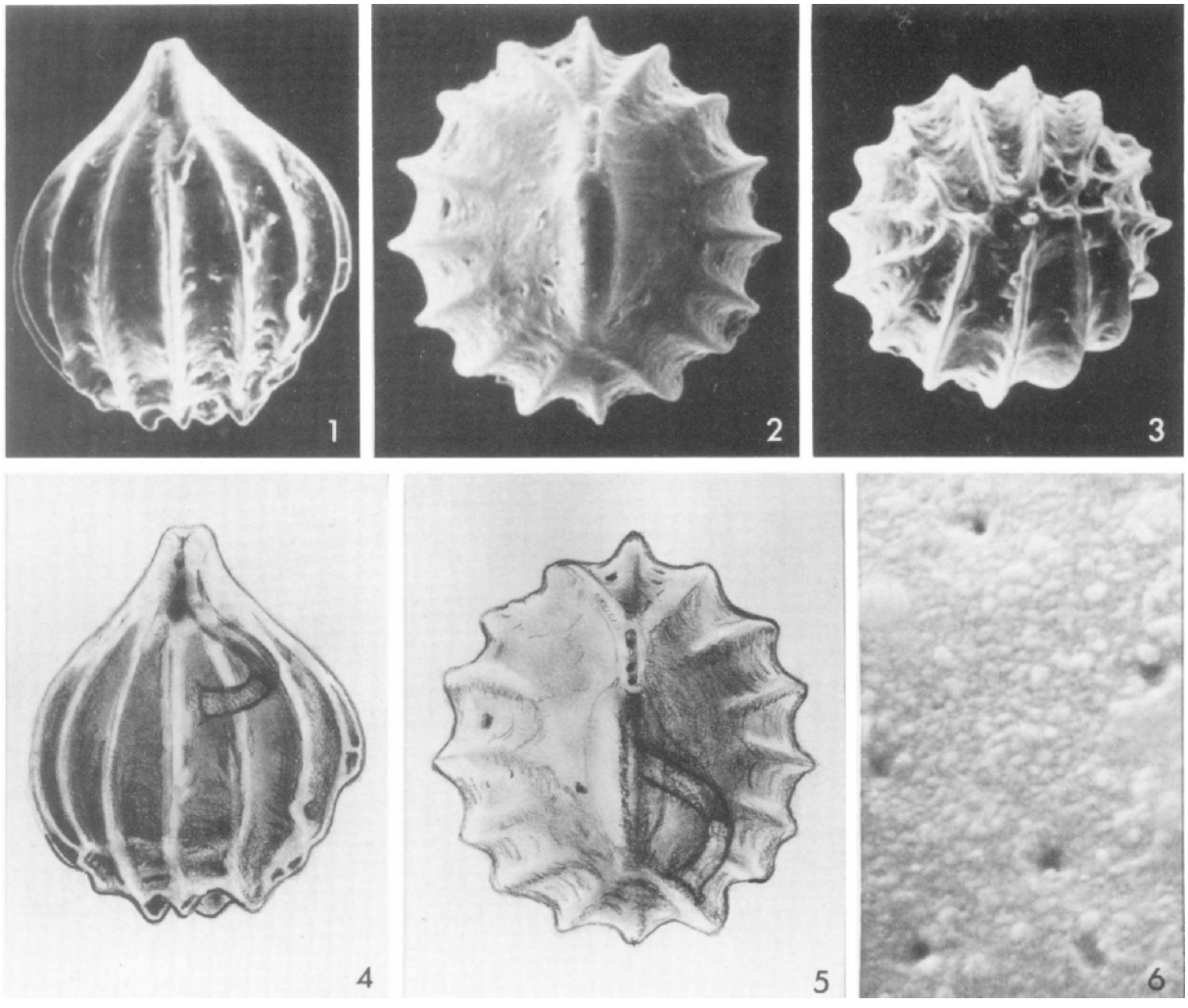

Explanation of Plate 2

Figs. 1-5. *Globofissurella bulabrum* sp. nov., holotype U.S.N.M. no. 383412. Fig. 1, edge view showing subglobular test, pronounced fissurine aperture and numerous longitudinal costae (×200); fig. 2, apertural view showing broad fissurine apertural cleft and slightly compressed test (×240); fig. 3, basal view showing costae (×200); fig. 4, apertural view showing short, attached entosolenian tube (×240); fig. 5, edge view showing attached entosolenian tube terminating in upper part of test (×200).

Fig. 6. *Globofissurella scotti* sp. nov., enlargement of holotype (U.S.N.M. no. 383433) test surface showing pore openings (×5000).