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a South Atlantic Eocene Core

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Pyrgopyxis, a New Genus of Diatoms from a South Atlantic Eocene Core

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In a recent study of some material from a core taken in the South Atlantic Ocean, many siliceous organisms usually referred to the genus *Pyxilla* were found. The age of the material is Eocene. The core is one of a series taken by personnel of the R. V. *Vema* on a survey organized and directed by Dr. Maurice Ewing, Director, Lamont Geological Observatory of Columbia University.

The pertinent locality information follows:

Cruise	Core	Depth Meters	Latitude	Longitude	Length of Core	CAS Number
V 18	112	2429	51°40'S.	48°29'W.	260 cm.	41054

The lower portion of the core, 96–260 cm. was described as follows: “Yellowish-gray (5Y7/2) moderately sorted, diatomaceous, slightly silty lutite mixed with about 5–7 percent minerals and rock fragments. The lutite contains diatoms and sponge spicules, as the major constituents and a minor amount of Radiolaria.”

The genus *Pyxilla* was established by Greville (1865) with the following description: “*Pyxilla*, n. gen. Grev. Frustules free, oblong, transversely bivalved, box-like, minutely cellulate; each valve terminating in a short, thick apiculus.” Two species were described, *Pyxilla johnsoniana* and *Pyxilla barbadensis* Greville (1865, p. 2), and illustrated on plate 1, figures 6 and 5.

Greville's type specimens are now in the British Museum, *P. johnsoniana* B.M. 2771 and *P. barbadensis* B.M. 3037 and an examination of them showed that they are complete cells exactly as illustrated by Greville and that his comment that “the globose valve with its contracted base and terminal apiculus resembles the bulbous dome which crowns the minaret of an eastern mosque” is a reasonably accurate description. *Pyxilla* Greville is therefore seen to be sym-

metrical upon the apical axis consisting of two parts *each* furnished with a central projection. In the following remarks the two elements of which the cell is composed will be referred to as "parts" not valves, as the latter term has a specific meaning with reference to diatoms. Greville's material came from the Cambridge estate Barbados. The type slide B.M. 2771 has only one specimen of *P. johnsoniana*; fortunately it is a whole cell and no other fragments of *Pyxilla* are present, though the preparation is a "strewn" slide and contains a large number of other species. The same remarks apply also to slide B.M. 3037.

The specimens found in core V18-112 are of a totally different structure. The South Atlantic core contains a large number of specimens like those referred to *Pyxilla* by Forti (1909) as *P. johnsoniana* and *P. gracilis*. Forti's interpretation of *Pyxilla* has been followed by all authors who have described similar specimens. For convenience the bipartite specimens from core V18-112 are considered to consist of a short cylindrical cuplike element that will be referred to as the lower part and a funnel or trumpet-shaped component that will be referred to as the upper part. The upper part serves as a lid to the cuplike lower element, it is circular in the transapical plane with a convex surface and has its center drawn out to form the hornlike projection that resembles the stem of the funnel. This hornlike projection, usually curved, often increases in width shortly after leaving the surface of the upper part, but narrows again towards the top which is furnished with one or two small apiculi. On the side of the hornlike extension of the upper part is a notch or spur which is the point of attachment of the adjacent cell. The whole cell is punctate-areolate; the upper part being more coarsely marked. The circular face of the lower part is often slightly recessed around the margin and the areolae are larger towards the margin decreasing in size as they reach the center. In the center the areolae may cover the entire area or may break down to form a few scattered puncta, one or two of which might appear to be more prominent than the others. The puncta are arranged in radiating lines, though in some cells the lower face may show two centers which tend to complicate the radial arrangement. There is no structure present that corresponds to a girdle in the normal diatom, but often there is a slight constriction showing a hyaline line where the two parts join.

Often the cells are found joined together in pairs and from the mode of attachment of similar ends, that is, funnel end to funnel end, it is usually accepted that the cell is a resting spore of a diatom. It is not known for certain which species of diatom produces a particular type of bipartite cell, but frequently cells are seen with "fragments" of a thin tubular investment attached which is finely punctate and probably belongs to a *Rhizosolenia* species.

It is not known whether *Pyxilla* Greville formed pairs as the type slide shows only a solitary specimen, but it is likely that it did not, as no notch or scar of attachment is visible on the short extension of the upper part of the type speci-

men. In the South Atlantic material many whole cells were found though most occurred as separated parts.

It is clear that as the lower part of the South Atlantic specimen does not possess an apiculus or extension, and the upper part with its long hornlike extension, usually curved, and bearing a marginal spur (attachment scar), is so unlike Greville's species, the V18-112 cells cannot be referred to *Pyxilla*, as Greville's description excludes them. It is proposed therefore that the new genus *Pyrgupyxis* be established to accommodate the specimens from the core together with similar species which, until now, have been erroneously placed in *Pyxilla*.

Pyrgupyxis Hendey, new genus

Cellula cylindricalis, parté supra infundibuliformis et apiculis terminalibus instructa. Pars infera, brevis cylindricalis, cupulata. Superficies valvarum areolata. Cellulae in paribus extremis similibus conjunctae.

Cell cylindrical, with the upper part shaped like a funnel and furnished with terminal spines. Lower part short, cylindrical, cuplike. Surface of the parts areolate. Cells united in pairs by similar ends.

Pyrgus—a tower, *pyxis*—a box.

Pyrgupyxis eocena Hendey, new species.

(Figures 1-4)

Cellula cylindricalis, in daubus partibus formata. Pars supra ad instar infundibuli et apiculis terminalibus instructa. Pars infera brevis cylindricalis, cupulata. Superfies partium areolata, areolae in parte infera in striis radiantibus dispositae.

Mensura cellularum: Long. 70-80 microns; lat. 35-40 microns. Hab. In medio ex solo maris in Oceano Atlantico.

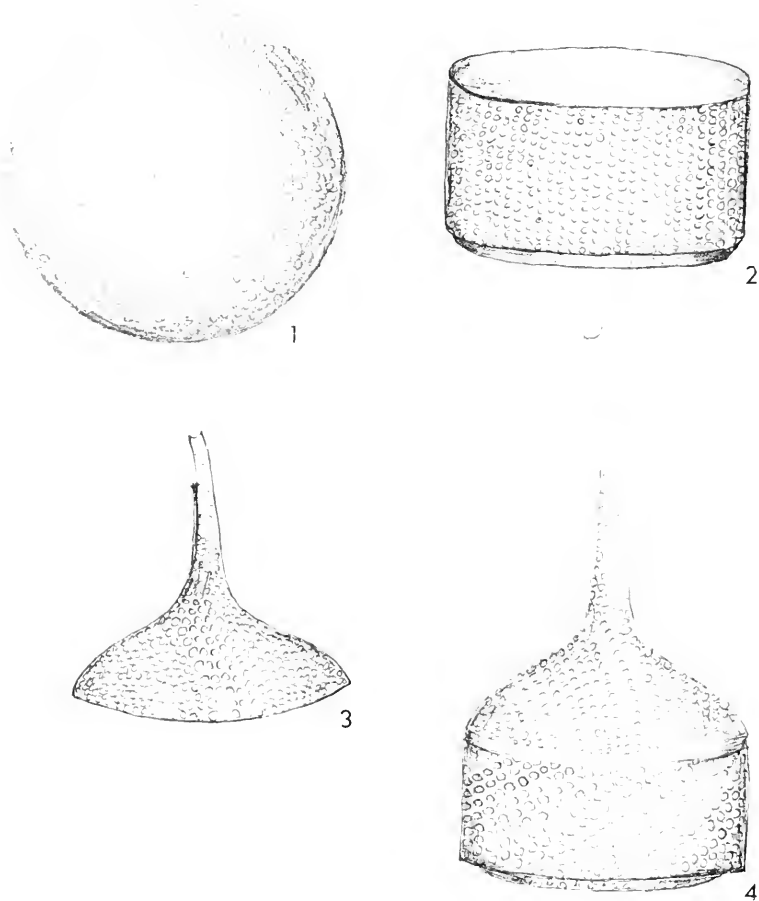
Cell cylindrical. Formed in two parts. Upper part in the form of a funnel and furnished with terminal spines. Lower part short cylindrical, cuplike. Surface of the parts areolate, areolae on the lower part arranged in radiating striae.

Dimensions of the cells length 70-80 microns, breadth 35-40 microns.

HABITAT. In a core from the sea floor in the Atlantic Ocean.

Holotype no. 3959 (CAS) from Locality 41054, lat. 51°40'S.; long. 48° 29'W.; Lamont Geological Observatory no. R. V. *Vema* Cruise 18, core 112, depth 2429 M. Eocene. The Eocene age has been readily determined by comparison of other species of diatoms and Silicoflagellata associated with this *Pyrgupyxis* at such well known localities as Barbados, West Indies, Oamaru, New Zealand, Mors Denmark, and Kreyenhagen Shale of California.

The lower cuplike portion of the diatom has a deep mantle with straight sides and the areolae are in quinquax.



FIGURES 1-4. *Pyrgopyxis cocena* Hendey, new genus, new species. Approximate magnification, $\times 1000$.

The lower surface is convex and slightly invaginated at the margin. The surface is punctate-areolate, with the areolae larger at the margin than at the center which may be entirely areolate or the areolae may be reduced to a few scattered puncta. The upper part is convex, with no definite mantle at the margin, and the center is drawn out or produced to form a hornlike structure, usually slightly curved, and bearing a notch or spur on one side which is the point of attachment of the contiguous cell. The upper part is like a funnel where the stem of the funnel is about the same length as the diameter of the wider cuplike end. The distal end of the upper part usually carries two small terminal apiculi. The surface of the upper part is areolate with the areolae larger at the broader end and reduced in size as they proceed up the produced or stemlike

portion, at the distal end of which the puncta are few and small. The diameter of the lower cuplike end is greater than the depth of the cup.

Pyrguptyxis cocca was common in the V18-112 material.

Other described species of *Pyrguptyxis* include the following:

Pyrguptyxis johnsoniana = *Pyxilla johnsoniana* in Forti (1909),
non *Pyxilla johnsoniana* Greville (1865).

Pyrguptyxis johnsoniana var. *intermedia* = *Pyxilla johnsoniana* var. *intermedia*
Tempère et Forti in Forti (1909).

Pyrguptyxis gracilis = *Pyxilla gracilis* Tempère et Forti in Forti (1909).

Pyrguptyxis gracilis var. *buccinalis* = *Pyxilla gracilis* var. *buccinalis*
Forti in Forti (1909).

Pyrguptyxis gracilis var. *saratoviana* = *Pyxilla gracilis* var. *saratoviana*
Tempère et Forti in Forti (1909).

Pyrguptyxis caput-avis = *Pyxilla Caput-Avis* J. Brun in Forti (1909).

Pyrguptyxis caput-avis var. *gracilis* = *Pyxilla Caput-Avis* var. *gracilis*
Tempère in Forti (1909).

Pyrguptyxis prolongata (J. Brun) = *Pyxilla prolongata* J. Brun in Forti (1909).

Other species of *Pyrguptyxis* from the V18-112 and other cores are being studied.

REFERENCES

FORTI, A.

1908. Studi per una monografia del genere *Pyxilla* (Diatomee) e dei generi affini.
La Nuova Notarisa, series 20, fasc. 1, pp. 19-38, 2 pls. [issued January, 1909].

GREVILLE, R. K.

1865. Descriptions of new and rare diatoms. Series XIV. Transactions of the Micro-
scopical Society of London, vol. 13, pp. 1-10, pls. 1, 2.



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