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The microstratigraphy of the cretaceous system of Zululand

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PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

L. simplex is known from the Campanian to the Danian of Poland (Pozaryska, 1957).

FIGURED SPECIMEN: Bh. A., 310'; P. C. Slide No. 27b.

LAGENA ACUTICOSTA Reuss 1862

Pl. IV Fig. 9

DESCRIPTION

The test is subspherical to slightly elongated. The aperture is very small on a very thin transparent neck that looks almost like a spine. The wall is ornamented with sharp longitudinal costellae.

COMPARISON

The Zululand specimens are more delicate than the ones represented by Reuss.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype of L. acuticosta is from the Cretaceous System, Kreidetuff (Maestrichtian) Stage, Europe.

FIGURED SPECIMEN: Bh. A., 282'; P. C. Slide No. 27c.

LAGENA APICULATA (Reuss) 1851

Pl. IV Fig. 10

DESCRIPTION

The test is elongated, the wall smooth and shiny, the aperture is on a short neck and is non-radiate. The neck is not clearly

separated from the chamber. At the aboral end of the test a blunt spine is present.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

L. apiculata is known from the Upper Cretaceous of Europe, America and Australia (Pozaryska, 1957).

FIGURED SPECIMEN: Bh. A., 292'; P. C. Slide No. 27d.

LAGENA HISPIDA Reuss 1863

Pl. IV Fig. 11

DESCRIPTION

The test is slightly elongated. The aperture is rounded on a slender, very distinct neck. The wall is ornamented with numerous small nodes. At the aboral end the test is perforate, probably due to a hollow spine or a tubular projection which was broken off.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

This species is known from the Jurassic to the Oligocene and has been reported from Europe, North America and Australia)Pozaryska, 1957).

FIGURED SPECIMEN: Bh. A., 310'; P. C. Slide No.27e.

LAGENA sp. A_1

Pl. IV Fig. 12

DESCRIPTION

The test consists of a spherical chamber with a very long thin

neck about 1½ times the height of the chamber, with a broad lip of irregular shape. At the apical end there is a tubular projection that has never been observed intact. The tubular projection and the neck are not on a straight line. The test is very delicate. The wall is thin, perforated and bears spines that may be short or long and very thin. The neck is less heavily sculptured than the rest of the test and the broad lip is smooth and so is an area approximately the same size as the lip, at the aboral end around the tubular projection. This might suggest that this "Lagena" is actually a fragment from a multilocular genus.

FIGURED SPECIMEN: Bh. A., 282'; P. C. Slide No. 27a.

VARIATIONS

Morphotype A_2

Pl. IV Fig. 13

Morphotype A_2 differs in its much thicker and smooth wall. The only sculpture present is confined to the long neck and consists of strong longitudinal striae.

FIGURED SPECIMEN: Bh. A., 786'; P. C. Slide No. $27a_2$.

Genus LENTICULINA Lamarck 1804

LENTICULINA (ROBULUS) ALEXANDERI (Sandidge) 1932

Pl. IV Fig. 14

DESCRIPTION

The coiling is planispiral involute with a rather big, sub-elliptical and compressed test in which the equatorial periphery

is uninterrupted. The axial periphery is sharply to bluntly angled. The early three to four chambers of the last whorl show a thickened periphery but a true keel is not developed. There are eight to nine chambers in the last whorl which increase slowly in height and rapidly in width. This gives the test its subelliptical shape. The umbilical plug is a rounded body of clear calcite and at its centre the proloculum is visible.

The sutures are flush, gently curved backwards and are generally thin, although at first they are thicker. The wall is smooth and thick. The aperture at the peripheral angle is radiate, with one of the slits more developed than the others and extending down the apertural face. The aperture is visible between the chambers.

FIGURED SPECIMEN: Bh. A., 1222'; P. C. Slide No. 1a.

VARIATIONS

Morphotype CA_2A.

Pl. IV Fig. 15

This morphotype differs in the shape of the test, which is subcircular, caused by the slower rate of increase of the chamber widths. Seven to ten chambers are present or more rarely six. The bigger specimens appear to have a smaller and less clear umbilical plug.

COMPARISON

The distinctive features of this species are the thickened periphery and sutures of the early chambers of the last whorl, and the flattened test.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype is from the Cretaceous, Ripley Formation, Western Alabama.

FIGURED SPECIMEN: Bh. A., 282[1]; P. C. Slide No. $1a_2$.

LENTICULINA (CRISTELLARIA) HOFFMANI (Ehrenberg) 1854

Pl. V Fig. 1

DESCRIPTION

The coiling is evolute, planispiral and formed of only one whorl. The test is subelliptical and is strongly flattened. The two sides are parallel and the proloculum protrudes on either side. The test has a very strongly developed keel. There are eleven chambers which increase very rapidly in width but remain almost of constant height. An umbonal plug is not developed. The sutures are flush, very thin and almost straight. The aperture is on the apertural face, near to the apical angle and is visible between the chambers.

COMPARISON

The Zululand specimens differ from the holotype of C. hoffmani in their thinner sutures. It is differentiated from the other Zululand species by its strongly flattened test and parallel sides.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype is from the Cretaceous, Weisser Kalkstein (Europe).

FIGURED SPECIMEN: Bh. A., 310[1]; P. C. Slide No. 1b.

LENTICULINA (ENANTIOCRISTELLARIA) CAYEUXI (Marie) 1941

Pl. V Fig. 2

DESCRIPTION

The coiling is planispiral involute and the test shape sub-elliptical. The test is quite thick at the umbilicus. Its equatorial periphery is uninterrupted and its axial periphery is angled, although no keel is present. There are five to six chambers in the last whorl. They increase quite rapidly in width. An umbonal plug is not developed, and the proloculum is not visible because the proximal apices of the chambers are in very close contact. The sutures are thin and flush, and strongly curved backwards. The wall is smooth. The aperture is situated at the apical angle and is visible between the chambers.

COMPARISON

This species differs from the other Zululand species in the absence of keel and umbo and in the closely appressed proximal apices of the chambers.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype is from the Upper Cretaceous, Campanian Stage (France).

FIGURED SPECIMEN: Bh. A., 282'; P. C. Slide No. 1c.

LENTICULINA sp. aff. (CRISTELLARIA) TURBINATA (Plummer) 1926

Pl. V Fig. 3

DESCRIPTION

The coiling is planispiral and involute. The test is small and almost perfectly circular in outline. It is rather thick at the

centre. The equatorial periphery has a strong keel that tapers out at the last chamber. There are six or seven chambers in the last whorl, which increase slowly in size. The umbo is relatively big and irregular in shape. The sutures are thin, flush, very strongly curved backwards. The wall is smooth. The aperture is situated at the apical angle, and it is not visible between the chambers.

COMPARISON

This form presents great similarities with L. (Cristellaria) turbinata Plummer, in the type of sutures, keel and general appearance, but has less chambers in the last whorl (six to seven instead of ten).

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype is from the Midway formation (Eocene), Texas. Olsson (1960) reports the presence of Robulus turbinatus in strata equivalent in age to the Paleocene in New Jersey.

FIGURED SPECIMEN: Bh. A., 292'; P. C. Slide No. 1e.

LENTICULINA ROTULATA Lamarck 1804

Pl. V Fig. 4

DESCRIPTION

The coiling is planispiral and involute. The test is subcircular and varies considerably in dimension. It is rather thick at the centre. It has an uninterrupted equatorial periphery and the axial periphery is more or less sharply angled, a very small keel often being present. There are six to eight chambers in the last whorl, which increase very slowly in size. The umbo is large and

rounded and not transparent. The sutures are flush, not thickened and slightly curved backwards. The aperture is located at the peripheral angle and it is visible between the chambers.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

Cushman (1940) found L. rotulata in strata ranging in age from basal Navarro through Taylor into Austin in the Gulf Coast.

FIGURED SPECIMEN: Bh. A., 831'; P. C. Slide No.1f.

LENTICULINA WILLIAMSONI (Reuss) 1862

Pl. V Fig. 5

DESCRIPTION

The coiling is planispiral and involute. The test is sub-elliptical with a depressed umbilicus. The equatorial periphery is uninterrupted and the axial periphery angled with a small keel. There are seven to eight chambers in the last whorl which increase rapidly in size.

No umbo is present and the umbilical area is depressed. The sutures are thin, curved backwards and vary from flush to depressed. The wall is smooth. The aperture is located at the peripheral angle and apertural marks are visible between the chambers. The apertural face has raised edges.

FIGURED SPECIMEN: Bh. A., 552'; P. C. Slide No. 1g.

VARIATIONS

A second morphotype may be recognized within this species. This is referred to as:

Morphotype G_2

Pl. V Fig. 6

Morphotype G_2 differs from the typical form in its last chamber being much smaller than the second last chamber and in not touching the periphery of the previous whorl. Moreover the test is generally thinner.

FIGURED SPECIMEN: Bh. A., 1222'; P. C. Slide No. $1G_2$.

COMPARISON

The Zululand specimens are very close to the figures and description given by Cushman (1946) and by Cushman and Jarvis (1932) but they have more chambers in the last whorl.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

Upper Cretaceous, Trinidad; White chalk, Antigua, (mentioned authors).

LENTICULINA MACRODISCA (Reuss) 1863

Pl. V Fig. 7

DESCRIPTION

The coiling is planispiral and involute. The test is subcircular in outline and thick at the umbilicus. The equatorial periphery is uninterrupted, and the axial periphery angled with a very small keel. There are six chambers in the last whorl, which increase very slowly in size. The umbilical plug is very big and trans-

parent. The proximal apices of the chambers and the proloculum are visible through the umbilical plug. The sutures are flush, thin and curved backwards. The aperture is at the apical angle and is visible between the chambers.

COMPARISON

The Zululand forms are closer to the figures of Trujillo (1960) than to those of Cushman (1946) in having a large umbo.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

L. macrodisca is known from the Coniacian and Santonian of California (Trujillo, loc. cit.) and from the Cretaceous of Trinidad (Cushman, loc. cit.).

FIGURED SPECIMEN: Bh. A., 282'; P. C. Slide No. 1h.

LENTICULINA cf. PAUCISEPTA Reuss 1862

Pl. V Fig. 8

DESCRIPTION

The test is planispiral and involute. It is subelliptical in shape and constricted at the middle. The equatorial periphery is uninterrupted and the axial periphery is rounded and without a keel. There are six chambers in the last whorl, which increase rapidly in size. The apertural face is rounded. An umbilical plug is not present, the umbilical area being depressed. The sutures are flush, thin and slightly curved backwards. The aperture is at the apical angle and is visible between the chambers.

COMPARISON

L. cf. paucisepta is very similar in general appearance to

L. cayeuxi but it differs by having a rounded instead of an angled periphery, by being thin instead of thick at the centre, and by having a rounded apertural face.

The Zululand specimens differ from the holotype in the less inflated last chamber.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype is from the Septarienthone, Germany.

FIGURED SPECIMEN: Bh. A., 292'; P. C. Slide No. 11.

LENTICULINA FUTABAENSIS Asano 1950

Pl. V Fig. 9

DESCRIPTION

The coiling is planispiral and involute. The overall shape of the test is subcircular and rather thick. The equatorial periphery is uninterrupted, and the axial periphery is angled and with a keel. There are seven chambers to the last whorl, which increase slowly in size. No umbonal plug is present. The test is constricted at the centre. The sutures are thickened and elevated near the base of the chambers and anastomose in the middle of the test forming a star-shaped pattern. They are much thinner and only slightly protruding, flush or even depressed near the periphery. The wall is smooth and the aperture is situated at the peripheral angle and is visible between the chambers.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

Trujillo (1960) reports L. futabaensis from the Coniacian and Santonian of California. The holotype is from the Sanonian of Japan.

FIGURED SPECIMEN: Bh. A., 1310¹; P. C. Slide No. 19

LENTICULINA (CRISTELLARIA) WASHITENSIS (Carsey) 1926

Pl. V Fig. 10

DESCRIPTION

The coiling is planispiral and involute. The overall shape is subelliptical. The equatorial periphery is uninterrupted and the axial periphery is sharply angled, but no keel is present. There are nine chambers in the last whorl, which increase slowly in width and rapidly in height. The umbilical plug is not very well developed and the proloculum is not visible. The sutures are very thin, flush and curved backwards. The aperture at the peripheral angle is visible between the chambers.

COMPARISON

This species has some similarities with L. alexanderi in its size and general shape, but it lacks the slight keel at the beginning of the last whorl and the very clear umbilical plug, which are typical characters of L. alexanderi.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype is from the Cretaceous System, Comanchean Series, Del Rio Formation (Texas).

FIGURED SPECIMEN: Bh.A., 4552¹; P.C. Slide No. 1a.

Genus MARGINULINA d'Orbigny 1826

MARGINULINA ELONGATA d'Orbigny 1826

Pl. V Fig. 11

DESCRIPTION

The test is long and quite slender. The axis of the test is slightly curved with a dorsal concavity. There are nine chambers which slowly increase in size, are low and broad with flush sutures at first. They later become inflated and subglobular with constricted sutures. The sutures are slightly inclined to almost horizontal, their highest point being near the aperture at the dorsal edge. The initial stage is not completely enrolled. The wall is smooth. The aperture is at the dorsal angle and is radiate.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype of M. elongata is from the Upper Cretaceous System, Craie Blanche (France).

FIGURED SPECIMEN: Bh. A., 292'; P.C. Slide No. 61a.

MARGINULINA HAMULOIDES Brotzen 1936

Pl. V Fig. 12

DESCRIPTION

The test is short and stout. The axis of the uniserial stage is slightly curved and dorsally convex. The test is formed of six chambers, of which the first three are enrolled, and increase quite rapidly in size. The last chamber is much bigger than the second last, suggesting a strong overlap of the chambers. The sutures are thin and flush, and become more strongly inclined

in later stages. The wall is smooth, and the aperture is radiate, at the dorsal angle.

COMPARISON

This species differs from M. elongata in the stoutness of its test, in its early stage being completely enrolled, in its dorsal edge being slightly convex rather than concave, and in its sutures becoming more inclined instead of less so with growth.

PREVIOUSLY RECORDED STRATIGRAPHIC DISTRIBUTION

The holotype of M. hamuloides is from the Upper Cretaceous System, Sweden.

FIGURED SPECIMEN: Bh. A., 292'; P. C. Slide No. 61b.

MARGINULINA MODESTA Reuss 1860

Pl. V Fig. 13

DESCRIPTION

The test is rather short and thick. The axis is curved, particularly in the early stages. The dorsal side is convex. The early stage is not completely enrolled, and is formed of five chambers which increase slowly in size. The last chamber is much higher than the second last, which suggests some overlap of the chambers. The sutures are thin and flush, the early ones inclined towards the ventral side (due to partial enrolling), the later ones being very slightly inclined. The aperture is at the apical angle. The wall is smooth. The aperture is terminal and rounded and occurs at the dorsal angle, on a thin neck.

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