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1955
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http://hdl.handle.net10539/14880
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FORAMINIFERA FROM THE UPPER CRETACEOUS BEDS OCCURRING NEAR THE ITONGAZI RIVER, NATAL.

By Yvor H. Smitter

Abstract

A small collection of foraminifera is described from the Upper Cretaceous beds occurring near the Itongazi river, Natal. One of the described species is new. The age of the fauna is demonstrated as Maestrichtian by briefly comparing local forms to similar index forms occurring in Europe and North America where definite age relationships have been established.

Introduction

In 1945, T. W. Gevers and J. de V. Little noted, in a joint paper published in the *Transactions of the Geological Society of South Africa*, a new occurrence of Upper Cretaceous marine beds found along the south coast of Natal. In the present paper, the writer has named and described a small collection of foraminifera obtained from these sediments. With the exception of a single new species, all of the forms have been frequently described in European and American literature, but the fauna is of interest, nonetheless, inasmuch as few, if any, of the species have been recorded in the literature relating to the palaeontology of Southern Africa. Also, the fauna is of further value in assigning a more specific range of age to the beds from which specimens were taken, and faunal evidence based on the foraminifera described in this paper would seem to indicate that the Itongazi beds are middle Maestrichtian in age.

Locality

The strata from which the collection of foraminifera was made occur roughly three miles south of the Umpenyati river mouth, along the coast between the smaller Itongazi and Umkandandhlovu rivers, in Alfred County, Natal. Samples were obtained at a site approximately 150 meters north of Old Beacon Point. Usually, these beds are submerged by the sea and are only exposed at periods of low tide.

Description of Foraminifera

Family MILIOLIDAE

Genus Quinqueloculina d'Orbigny (1826)

Quinqueloculina itongaziana sp. nov.

Figure 38a-c.

Test ovate, not compressed, the apertural end projecting into a very short neck; chambers added in typical quinqueloculine fashion, the last-formed chamber overlapping at the base; angles of immature chambers somewhat projecting; the

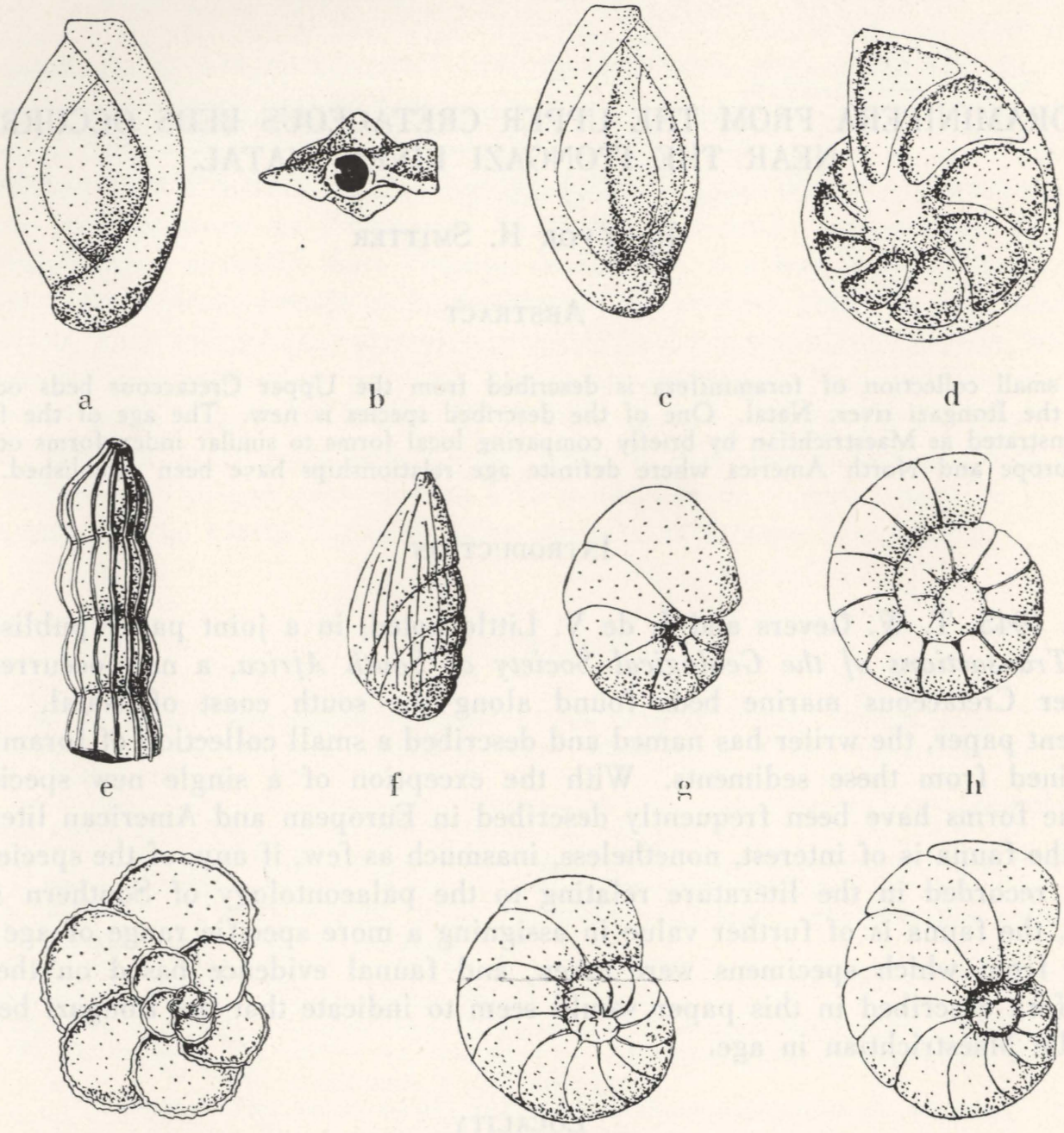

Fig. 38.

(a) *Quinqueloculina itongaziana*. (90x).
(b) *Quinqueloculina itongaziana*. (90x) Apertural view.
(c) *Quinqeuloculina itongaziana*. (90x).
(d) *Lenticulina rotulata*. (70x).
(e) *Nodosaria affinis*. (40x).
(f) *Vaginulina navarroana*. (60x).
(g) *Nonionella robusta*. (110x).
(h) *Gyroidina depressa*. (70x).
(i) *Globotruncana marginata*. (60x).
(j) *Planulina nacatochensis*. (60x).
(k) *Cibicides subcarinatus*. (60x).

last-formed chamber, however, lacks the projecting angle and is conspicuously truncate; sutures not depressed but easily visible; wall smooth, imperforate; aperture rounded, with a very small simple tooth. Length 0.35 mm.; diameter 0.18 mm.

Holotype: Bernard Price Institute for Palaeontological Research, Foraminifera Coll. 2-7.

Remarks: This is a rather unique form characterized in particular by the truncate, and, in some instances, slightly excavated periphery of the last-formed chamber.

Family LAGENIDAE

Genus LENTICULINA Lamarck (1804)

Lenticulina rotulata Lamarck

Figure 38d

Test lenticular, planispiral, involute, slightly keeled; chambers increasing gradually in size as added, 8 to 10 chambers in the adult whorl; sutures distinct, raised, curved back and almost tangential at the periphery, sutures fused at the center to form a prominent raised umbo; wall smooth or very slightly perforate; aperture circular, radiate, at the peripheral angle of the last-formed chamber. Diameter 0.35 to 0.50 mm.; thickness 0.12 to 0.19 mm.

Remarks: This is a common and widely distributed species in the Upper Cretaceous of Europe and America. The upper limit of the range in age of *L. rotulata* has been placed tentatively at middle Maestrichtian although the limits of the age distribution of the species are somewhat uncertain.

Genus NODOSARIA Lamarck (1812)

Nodosaria affinis Reuss

Figure 38e

1845. Reuss, A. E., Verstein. bohm. Kreideformation, pt. 1, p. 26, pl. XIII, fig, 16.
1925. Franke, A., Abh. Geol.-palaeont. Inst., Greifswald Univ., vi. p. 37, pl. 3, fig. 25.
1944. Cushman, J. and Deaderick, W. H., Paleontology, xviii, p. 333, pl. 51, figs. 19-21.

Test elongate, slender, varying considerably in shape in the microspheric and megalospheric forms; the microspheric test is typically many chambered and clearly tapering; the megalospheric form is not tapered and the chambers are uniform in size; chambers distinct, added linearly, inflated; initial end often with a single, short, terminal spine; sutures clearly defined, depressed; wall with 14 to 15 prominent longitudinal costae; aperture slightly projecting, radiate, terminal. Length 0.75 to 1.50 mm.; diameter of largest chambers 0.30 to 0.50 mm.

Remarks: This is a common European and American species occurring throughout the Upper Cretaceous above Turonian age.

Genus VAGINULINA d'Orbigny (1926)

Vaginulina navarroana Cushman

Figure 38f

1936. Cushman, J., *Bull. Geol. Soc. Amer.*, xlvii, p. 416, pl. 1, fig, 3.
1941. Cushman, J. and Hedberg, H. D., *Contr. Foram. Research Cushman Lab.*, xvii, p. 90, pl. 22, fig. 1.
1943. Cushman, J. and Todd, J. V. *Contr. Foram. Research Cushman Lab.*, xix, p. 59, pl. 10, fig. 16.

Test compressed, approximately twice as long as broad; visible chambers 4 to 6 in number, slightly inflated, elongate, overlapping; later chambers distinct but younger chambers not clearly defined; sutures depressed, curved, extending from the adult portion of the dorsal margin to the initial portion of the ventral margin; wall with numerous small longitudinal costae; aperture projecting, radiate. Length 0.30 to 0.60 mm.; breadth 0.18 to 0.30 mm.; thickness 0.05 to 0.08 mm.

Remarks: *V. navarroana* is a distinctive form and an excellent index fossil. The species seems to be restricted to the middle and upper Navarro beds of the American Gulf Coast section and has been recorded also as occurring in sediments of comparable age in Colombia, South America.

The American Navarro group, with the exception of the extreme uppermost beds, is equivalent in age to Maestrichtian strata in the European section. The writer has made frequent reference in this paper to the age relationships of the foraminifera of the American Gulf Coast beds where vertical ranges of the various forms have been comprehensively established.

Family NONIOIDAE

Genus NONIONELLA Cushman (1926)

Nonionella robusta Plummer

Figure 38g

1926. Carsey, D.O., (*Nonionina scapha*) *Texas Univ. Bull.*, 2612, p. 49, pl. 1, fig. 2.
1931. Plummer, H. J., *Texas Univ. Bull.*, 3101, p. 175, pl. 14, fig. 12.

Test small, one and one-half times as long as broad, subtrochoid, moderately compressed, biconvex; chambers distinct, 7 to 8 in the adult whorl, later chambers slightly inflated; sutures clearly defined, slightly depressed, gently curved back; wall finely perforate; aperture a narrow slit, along the base of the last-formed chamber. Length 0.20 mm.; breadth 0.15 mm.; thickness 0.12 mm.

Remarks: *N. robusta* is a useful index fossil characteristic of the Navarro age in the American Gulf Coast section. In some respects, this species resembles the European *N.reussana* Cushman, but the test of *N. robusta* is distinctly narrower than the broad test of the European form. From *N. austinana* Cushman the species is distinguished by its greater number of chambers and its convex dorsal surface.

Family ROTALIIDAE

Genus GYROIDINA d'Orbigny (1826)

Gyroidina depressa (Alth)

Figure 38h

1850. Alth, H., (*Rotalina depressa*) *Haidinger's Naturw. Abh.*, iii, p. 266, pl. 13, fig. 21.
1929. Cushman, J. and Church, C. C., *Proc. California Acad.* Sci., 4th ser., xviii, p. 515. pl. 41, figs. 4-6.

Test rather small, distinctly trochoid, ventrally convex, dorsal surface flat; umbilicus open, deep; chambers 11 to 12 in the last-formed whorl; sutures distinct, slightly depressed ventrally, not depressed dorsally, limbate, curved; wall finely punctate; aperture a low opening on the ventral side toward the umbilical area. Diameter 0.30 to 0.40 mm.; thickness 0.12 to 0.18 mm.

Remarks: This is a widely distributed form found throughout all or most of the Upper Cretaceous in Europe and America. The species is particularly abundant in the Itongazi beds.

Family GLOBOROTALIIDAE

Genus GLOBOTRUNCANA Cushman (1927)

Globotruncana marginata (Reuss)

Figure 38i

1845. Reuss, A. E., (*Rosalina marginata*) *Verstein. bohm. Kreideformation*, pt. 1, p. 36, pl. 8, figs. 54, 74; pl. 13, fig. 68.
1934. Thalmann., H. E., *Eclogae geol. Helvetiae*, xxvii, p. 414.
1944. Cushman, J., *Contr. Foram. Research Cushman Lab.*, xx, p. 15, pl. 3, fig. 9.

Test somewhat compressed, trochoid, biconvex; periphery lobate, with a double keel; chambers 5 to 6 in the last-formed whorl, not inflated, arching, increasing regularly in size as added, characteristically overlapping and added obliquely to the general plane of the test; sutures distinct, raised, finely beaded; wall conspicuously perforate; aperture at the base of the lastformed chamber, ventral. Diameter 0.35 to 0.55 mm.; height 0.08 to 0.15 mm.

Remarks: This is a common species in Europe and America, and the age distribution of the form extends from the base of the Upper Cretaceous upward to beds of middle Maestrichtian age.

Family ANOMALINIDAE

Genus PLANULINA d'Orbigny (1826)

Planulina nacatochensis Cushman

Figure 38j.

1938. Cushman, J., *Contr. Foram. Research Cushman Lab.*, xiv, p. 50, pl. 8, fig. 9.

Test compressed, biconvex, evolute; chambers clearly defined, 9 to 10 in last-formed whorl, increasing gradually in size as added, not inflated; sutures distinct, very slightly limbate, curved; wall very finely perforate; aperture a low slit at the periphery. Diameter 0.35 to 0.45 mm.; thickness 0.08 to 0.12 mm.

Remarks: *P. nacatochensis* has a very limited stratigraphical range and evidently is restricted to the middle Navarro beds of the Gulf Coast section in America. The form has also been recorded from the Upper Cretaceous of California.

Genus CIBICIDES Montfort (1808)

Cibicides subcarinatus Cushman and Deaderick

Figure 38k

1944. Cushman, J. and Deaderick, W. H., *Paleontology*, xviii, p. 341.

Test moderately compressed, biconvex, involute; chambers distinct, 10 to 12 in the last-formed whorl, increasing regularly in size as added, slightly inflated; sutures curved back, raised and limbate in the earlier portion of the test, but depressed and not limbate in the more adult portion, wall distinctly perforate; aperture an arched opening at the base of the last chamber, extending toward the umbilical area. Diameter 0.30 to 0.45 mm.

Remarks: This species has been recorded from Senonian and Danian beds, or their age equivalents, in Europe and North and South America.