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The Foraminifera in the Lower Cretaceous of Trinidad, W. I. Part 5: Maridale Formation, upper Part; *Hedbergella rohri* Zone[1])

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ABSTRACT

Part 5 completes the series "The Foraminifera in the Lower Cretaceous of Trinidad, W.I." (BARTENSTEIN, BETTENSTAEDT & BOLLI 1957, 1966 and BARTENSTEIN & BOLLI 1973, 1977). The age of the investigated fauna in these five parts ranges from Early Barremian to Early Albian, which covers a time span of some 12 million years. In Part 5 are described and figured 136 species or forms in open nomenclature. Of these are new: *Dentalina bonaccordensis, Lenticulina (L.) antillica* and *Lenticulina caribica*. Based on planktic and benthic index forms the fauna is assigned a Late Aptian to earliest Albian age. It originates from a boulder in the Late Eocene Bon Accord boulder bed at Pointe-à-Pierre.

Attached to Part 5 is an index covering all 78 genera, 185 species and subspecies, including 13 new species and subspecies, and 52 forms with open nomenclature dealt with in Parts 1–5.

CONTENTS

Introduction

The Lower Cretaceous foraminifera known from Trinidad range in age from Early Barremian to Early Albian and occur in the Toco, Cuche and Maridale formations. The benthic and some of the planktic faunas have already been published in four parts:

[1]) Part 1: Cuche- und Toco-Formation. Eclogae geol. Helv. *50*/1, 5–67 (1957). – Part 2: Maridale-Formation (Typlokalität). Eclogae geol. Helv. *59*/1, 129–177 (1966). – Part 3: Maridale-Formation (Co-Typlokalität). Eclogae geol. Helv. *66*/2, 389–418 (1973). – Part 4: Cuche-Formation, upper Part; *Leupoldina protuberans* Zone. Eclogae geol. Helv. *70*/2, 543–573 (1977).

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BARTENSTEIN, BETTENSTAEDT & BOLLI (1957, 1966); BARTENSTEIN & BOLLI (1973, 1977). Separate papers on planktic foraminifera were published by BOLLI (1957a, 1959). The planktic foraminifera of Late Albian to Late Maastrichtian age (Gautier, Naparima Hill and Guayaguayare formations) were published by BOLLI (1951, 1957b, 1959) and by BRÖNNIMANN (1952). The benthic foraminifera of these younger formations are now being studied and prepared for publication by J. P. Beckmann.

As has been made clear in earlier publications dealing with foraminifera from the Cretaceous of Trinidad, no continuous sections of significant stratigraphic extent are known. This is particularly true for the Lower Cretaceous. As a consequence, each of the faunas dealt with in Parts 1–4 and also in the present Part 5 originates from isolated outcrops.

A short discussion of the lithology and stratigraphic position of the Maridale Formation, its relation to the Cuche Formation and a historic review were given in Part 2 (p. 130–135). In the following notes the lithologic characters of the Maridale Formation, its known occurrence as slip masses or boulders, its relation to the Cuche Formation as seen today and the distinction and characterisation of its two foraminiferal zones are further elaborated.

Lithologically the Maridale Formation consists of dark grey to blue-grey marls weathering to a yellowish-brown colour. These marls are only known as slip masses or blocks in younger formations. This is shown in Part 1 (Fig. 2, p. 10) on a section through the northern Pointe-à-Pierre area. Here blocks or slipmasses are embedded in the Oligo-Miocene Nariva Formation. The position of the *Hedbergella rohri* Zone of the Maridale Formation dealt with here is shown on that Figure 2 as a slip mass of Maridale Marl (wavy signature), some 100 m southeast of the Bon Accord Marl type locality.

The sample from which the fauna is described here comes from a boulder which was exposed in a trench dug at Pointe-à-Pierre about 100 m east of the Bon Accord Marl type locality. This artificial outcrop is no longer accessible.

The marls in the lower part of the *Planomalina maridalensis* Zone of the Maridale Formation are rich in benthic and planktic foraminifera and radiolaria. Other microfossil remains like ostracodes are scarce. The *Hedbergella rohri* Zone in contrast is characterized by predominantly benthic foraminifera, comparatively few planktic forms and the absence of radiolaria. Planktic index species restricted to one zone are the zonal marker, *Planomalina saundersi* and *Biglobigerinella barri* in the *Planomalina maridalensis* Zone and the zonal marker and *Planomalina cheniourensis* in the younger *Hedbergella rohri* Zone. Based on the strongly different composition of the planktic association of the two neighbouring zones it can be concluded that an appreciable stratigraphic interval divides the samples from which the two faunas originate.

The fauna of the *Hedbergella rohri* Zone (formerly named *Praeglobotruncana rohri* Zone) is the youngest studied in this project. The zone was originally proposed by BOLLI (1959) and at the time considered to be of Middle–Late Albian age. Subsequent investigations on planktic foraminifera led to the conclusion that the *Hedbergella rohri* Zone fauna is rather of Late Aptian to earliest Albian age or, in zonal terms of CARON (1985), approximately equivalent to the *Ticinella bejaouensis* Zone which straddles the Aptian/Albian boundary.

In contrast to Part 1 where planktic foraminifera were not included and Parts 2–4 where only the more significant species were dealt with, all planktic taxa found in the

Hedbergella rohri Zone material are treated in the present final Part. The reason for this is that since publication of Parts 1–4 (1957, 1966, 1973, 1977) and the papers on planktic foraminifera by BOLLI (1957a, 1959) new evidence on Early Cretaceous planktic foraminifera and their stratigraphic significance has become available pointing to a slightly older age assignment of the *Hedbergella rohri* Zone (Late Aptian–earliest Albian against Middle–Late Albian).

Systematic descriptions

AGGLUTINATED FORAMINIFERA

Superfamily Ammodiscacea

Ammodiscus tenuissimus (GUEMBEL 1862)

Pl. 1, Fig. 1–3

1975 *Ammodiscus tenuissimus* (GUEMBEL) – NEAGU, Mem. Inst. Geol. Geophys. (Bucarest) *25*, 21; Pl. 1, Fig. 1–4, 7–13, 25.

Occurrence. – Worldwide from Middle Jurassic to Lower Cretaceous.

Glomospira charoides (JONES & PARKER 1860)

Pl. 1, Fig. 4

1967 *Glomospira charoides* (JONES & PARKER) – MICHAEL, Palaeontographica, Suppl. *12*, 23; Pl. 1, Fig. 8.

Remarks. – The few tests present may also be close to *Glomospira gordialis*, a species of considerable variability.

Glomospira gordialis (JONES & PARKER 1860)

Pl. 1, Fig. 5–6

1973 *Glomospira gordialis* (JONES & PARKER) – BARTENSTEIN & BOLLI, Trinidad *3*, 395; Pl. 2, Fig. 14–17.

Occurrence. – Worldwide from Jurassic to Recent. For further information see remarks in Trinidad *3*, 395 (1973).

Glomospirella gaultina (BERTHELIN 1880)

Pl. 1, Fig. 7–8

1973 *Ammodiscus gaultinus* BERTHELIN – BARTENSTEIN & BOLLI, Trinidad *3*, 394; Pl. 2, Fig. 1–13.

Occurrence. – Worldwide in the Cretaceous, common.

Hippocrepina depressa VASICEK 1947

Pl. 1, Fig. 9–10

1980 *Hippocrepina depressa* VASICEK – SLITER, Init. Rep. Deep Sea Drill. Proj. *50*, Pl. 1, Fig. 2–3.
1984 *Hippocrepina depressa* VASICEK – GEROCH & NOWAK, Benthos *83*, 228; Pl. 1, Fig. 7; Pl. 5, Fig. 4–5.