INTRODUCTION

Site 634, drilled during ODP Leg 101, was essentially a reoccupation of Site 98, drilled during DSDP Leg 11 (Hollister, Ewing, et al., 1972; Table 1, Fig. 1). At Site 634, the upper 144 m of sediment was washed in an attempt to reach the Upper Cretaceous target horizon in the time remaining for the cruise (Austin, Schlager, et al., 1986). Figure 2 illustrates the spatial relationship of Site 98 (2750 m water depth) and Site 634 (2835 m water depth), 0.2 nmi to the northwest. Radiolarians were observed in Site 98 samples from 100 to 240 meters below seafloor (mbsf) during Leg 11, but no detailed biostratigraphic analyses were conducted. Thus, Site 98 presented us an opportunity to sample material correlating with the washed section at Site 634.

Samples were taken from Cores 101-634A-2R through 101-634A-4R to study radiolarians, but all proved barren, nor were radiolarians observed in shipboard smear slides. A correlation between Sites 98 and 634 (Fig. 2) suggests that these cores represent the same interval as that recovered in Cores 11-98-10 and 11-98-11, which were also barren. These results are presented separately from other Leg 101 radiolarian studies (Palmer, this volume) because the Site 98 fauna was predominantly Eocene, while other radiolarian assemblages studied were Oligocene and Miocene.

METHODS OF INVESTIGATION

Samples (10 cm³) were selected from the same intervals in which siliceous microfossils were reported by Hollister, Ewing, et al. (1972). Conventional radiolarian preparation procedures were followed (Riedel and Sanfilippo, 1977), including disaggregation of the sample in hydrogen peroxide solution, treatment with hydrochloric acid to remove calcium carbonate, and sieving through a 63-μm mesh screen. Strained walls of the residue were made for each sample and were scanned at 250 x for diagnostic taxa. Zones were identified using the standard low-latitude radiolarian zonation of Riedel and Sanfilippo (1977), including the same interval as that recovered in Cores 11-98-10 and 11-98-11, which were also barren. Biostratigraphically important species are listed in the Appendix (Table 1).

RESULTS

Fourteen of the samples obtained from Site 98 contain radiolarians (Table 1). The first appearance of Stichocorys delmontensis (in Sample 11-98-5-1, 116–118 cm) and the last appearance of Thyrsocystis annosa (in Sample 11-98-5-2, 118–120 cm) suggest that the boundary between the Cyrtocapsella tetrapera and Stichocorys delmontensis zones (early Miocene age) may occur between the samples (Table 1). Unfortunately, no other biostratigraphically important species are present.

Core 11-98-6 contains species that indicate the Calocyclas bandyca and Carposiminstra axy zones (late Eocene age). Core 11-98-7 contains fragments of tan chert, but no radiolarians. Cores 11-98-8 through 11-98-9 contain radiolarians from the Bekoma bidartensis Zone (early Eocene to late Paleocene age; Table 1).

SUMMARY

Recovery from the Cenozoic section in the Northwest Providence Channel, Bahamas, was poor because of spot coring and washing. Nevertheless, radiolarians were found in 14 samples from Site 98; two samples were Miocene in age, and the remaining 12 were Eocene (or latest Paleocene, in some cases). This suggests a long record of Paleogene and lower Neogene biosiliceous sedimentation at the location of Sites 98 and 634; such a record was noted in numerous studies of the Caribbean region. Continuous coring of the Northwest Providence Channel section would allow further study of this depositional episode.

ACKNOWLEDGMENTS

I appreciate the assistance of the ODP curatorial staff and the East Coast Repository in obtaining samples from DSDP Site 98. Peggy Myre (ODP) helped with sample preparation and photography; Frank Rack (ODP) also prepared samples. Artwork was drafted by Karen Benson and staff (ODP). I appreciate the thoughtful reviews by J. A. Austin, Jr., D. A. Dunn, F. M. Mauarrasse, and W. Schlager.

REFERENCES


Brandt, R., 1935. In Wetzel, O. Die Mikropalaenctologie des Hiitten­


Mikrogeologie: Leipzig (Leopold Voss).

Mikroseptaria: Leipzig (Leopold Voss).


Dictyoprora urceolus (Haeckel) 118
Dictyoprora mongolfieri
Dorcadospyris simplex (Riedel)
Ehrenberg
Cyrtocapsella cornuta (Haeckel)
Foresman

Date of acceptance: 10 July 1987

APPENDIX

Taxonomic List

Bekoma bidartensis Riedel and Sanfilippo
Bekoma bidartensis Riedel and Sanfilippo, 1978, p. 65, Pl. 3, Fig. 3.
Buryella tetradica Foreman
Buryella tetradica Foreman, 1973, p. 433, Pl. 8, Figs. 4 and 5; Pl. 9, Figs. 13 and 14.
Calocyclas hispida (Ehrenberg)
Antrocyrtis hispida Ehrenberg, 1873, p. 216; 1875, Pl. 8, Fig. 2.
Calocyclas hispida (Ehrenberg) Foreman, 1973, p. 434, Pl. 1, Figs. 12-15; Pl. 9, Fig. 18.
Calocyclas turris Ehrenberg
Calocyclas turris Ehrenberg, 1873, p. 218; 1875, Pl. 18, Fig. 7. Riedel and Sanfilippo, 1978, p. 65, Pl. 3, Figs. 7 and 8.
Calocycla castum (Haeckel)
Calocycla castum (Haeckel), 1887, p. 1384, Pl. 73, Fig. 10.
Calocycla castum (Haeckel) Foreman, 1973, p. 434, Pl. 1, Figs. 7, 9, and 10.
Ceratospyris articulata Ehrenberg
Ceratospyris articulata Ehrenberg, 1873, p. 218. Sanfilippo and Riedel, 1973, p. 526, Pl. 15, Figs. 1-3; Pl. 31, Figs. 8 and 9.
Cyrtopectopula cornuta (Haeckel)
Cyrtopectopula (Cyrtopectopula) cornuta Haeckel, 1887, p. 1513, Pl. 78, Fig. 9.
Dictyopora mongolfieri (Ehrenberg)
Dictyopora mongolfieri Ehrenberg, 1854, Pl. 36, Fig. 18, B lower; 1873, p. 230.
Dictyopora mongolfieri (Ehrenberg) Nigrini, 1977, p. 250, Pl. 4, Fig. 7.
Dictyopora urceolus (Haeckel)
Dictyopora urceolus Haeckel, 1887, p. 1305.
Dictyopora urceolus (Haeckel) Nigrini, 1977, p. 251, Pl. 4, Figs. 9 and 10.
Dorcadospyris simplex (Riedel)
Brachiospyris simplex Riedel, 1959, p. 293, Pl. 1, Fig. 10.
Dorcadospyris simplex (Riedel) Riedel and Sanfilippo, 1970, p. 527, Pl. 8, Figs. 9 and 10.

Eusyngium fistuligerum (Ehrenberg)
Eusyngium fistuligerum Ehrenberg, 1873, p. 229; 1875, Pl. 9, Fig. 3.
Eusyngium fistuligerum (Ehrenberg) Riedel and Sanfilippo, 1970, p. 527, Pl. 8, Figs. 9 and 10.
Lamponia fabeforme chaunothorax Riedel and Sanfilippo
Lamponia fabeforme chaunothorax Riedel and Sanfilippo, 1970, p. 524, Pl. 5, Figs. 8 and 9.
Lamponia fabeforme fabeforme (Krasheninnikov)
Cycrtocalpis fabeformis Krasheninnikov, 1960, p. 296, Pl. 3, Fig. 11.
Lamponia fabeforme fabeforme (Krasheninnikov) Foreman, 1973, p. 436, Pl. 6, Figs. 6-9.
Lamponia sanfilippiae Foreman
Lamponia sanfilippiae Foreman, 1973, p. 436, Pl. 6, Figs. 15 and 16; Pl. 11, Figs. 16 and 17.
Lychnocanoma amphitrite Foreman
Lychnocanoma amphitrite Foreman, 1973, p. 437, Pl. 11, Fig. 10.
Phormocysria strisia exquisita (Kozlova)
Podocycris exquisita Kozlova in Kozlova and Gorbovets, 1966, p. 106, Pl. 17, Fig. 2.
Phormocysria strisia exquisita (Kozlova) Foreman, 1973, p. 438, Pl. 7, Figs. 1-4, 7 and 8; Pl. 12, Fig. 5.
Phormocysria strisia strisia Brandt
Phormocysria strisia Brandt, 1935, p. 55, Pl. 9, Fig. 12.
Phormocysria strisia strisia Brandt Foreman, 1973, p. 438, Pl. 7, Figs. 5, 6, and 9.
Podocycris (Lampetrium) clarae Riedel and Sanfilippo
Podocycris (Lampetrium) clarae Riedel and Sanfilippo, 1970, p. 355, Pl. 12, Figs. 2 and 3.
Stichocorys delmontensis (Campbell and Clark)
Eucrydulmontense Campbell and Clark, 1944, p. 56, Pl. 7, Figs. 19 and 20.
Stichocorys delmontensis (Campbell and Clark) Sanfilippo and Riedel, 1970, p. 451, Pl. 1, Fig. 9.
Theocytotilla cryptocephala Ehrenberg
Eucrydulmontense Ehrenberg, 1873, p. 227; 1875, Pl. 11, Fig. 11.
Theocytotilla cryptocephala (Ehrenberg) Sanfilippo and Riedel, 1982, p. 178, Pl. 2, Figs. 4-7.
Theocytotilla nigrinae (Riedel and Sanfilippo)
Theocytotilla nigrinae (Riedel and Sanfilippo) Foreman, 1973, p. 441, Pl. 4, Figs. 13 and 15; Pl. 12, Fig. 16.
Theocytotilla alpha Foreman, Sanfilippo and Riedel, 1982, p. 179-180, Pl. 2, Figs. 16 and 17.
Thysycytotilla (Thysycytotilla) bromia Ehrenberg
Thysycytotilla bromia Ehrenberg, 1873, p. 260; 1875, Pl. 12, Fig. 2.
Thysycytotilla (Thysycytotilla) bromia Ehrenberg, 1873, p. 260; 1875, Pl. 12, Fig. 2.

Date of initial receipt: 21 January 1987
Date of acceptance: 10 July 1987
Ms 101B-175
Table 1. Occurrences of radiolarians at Site 98 (25°22.95'N, 77°18.68'W, 2750 m water depth).

<table>
<thead>
<tr>
<th>Sample (cm)</th>
<th>Phormocyrtis striata exquisita</th>
<th>Thyrsocyrtis (Thyrsocyrtis) hirsuta</th>
<th>Theocotylissa alpha</th>
<th>Ceratospyris articulata</th>
<th>Lamptonium sanfilippoae</th>
<th>Dictyoprora urceolus</th>
<th>Dictyoprora mongolfieri</th>
<th>Thyrsocyrtis (Thyrsocyrtis) broma</th>
<th>Lychnocanoma amphitrite</th>
<th>Podocyrtis chalara</th>
<th>Calocyclas hispida</th>
<th>Thyrsocyrtis (Pentalacorys) tetracantha</th>
<th>Dorcadyspyris simplex</th>
<th>Dictyoprora simplex</th>
<th>Theocytis annosa</th>
<th>Cyrtocapsella cornuta</th>
<th>Stichocorys delmontensis</th>
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Note: Relative abundance of individual species: C = common (>100 specimens/slide), F = frequent (11-100/slide), R = rare (3-10/slide), r = very rare (1-2/slide).

Figure 1. Map showing location of Sites 98 and 634.
Figure 2. Correlation of Site 634 with Site 98, based on actual relative position with respect to sea level; the sites are offset 0.2 nmi horizontally and 80 m vertically. Occurrence of radiolarian zones is based on this study; foraminifer ages indicated for the lower part of each section are from Hollister, Ewing, et al. (1972) (Site 98) and Austin, Schlager, et al. (1986) (Site 634). w.d. = water depth.