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Cainozoic Foraminifera from boreholes in the Anton Dohrn Seamount to Hatton-Rockall Basin area

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Cainozoic Foraminifera from boreholes in the Anton Dohrn Seamount to Hatton-Rockall Basin area

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Summary

This report describes the calcareous microfaunas recovered from boreholes in the Rockall area. Biostratigraphical and, where possible, palaeoecological data are presented.

Borehole 57-12/41DR: Cold water Pleistocene faunas were identified.

Borehole 57-17/05DR: Pleistocene at 0.14-0.16m

Borehole 57-17/08DR: Pleistocene at 0.05-0.08m

No older than mid Miocene at 0.56-0.57m

Mid-late Eocene at 0.62-0.68m

Barren at 0.78-0.80m

1 Introduction

Samples from three boreholes from the Anton Dohrn Seamount (Boreholes 57-12/41) and Hatton-Rockall Basin (boreholes 57-17/05DR and 57-17/08DR) were examined for calcareous microfaunas. Foraminifera were present in the majority of samples, but Ostracoda were not observed. The assemblages proved to be of Eocene, Miocene and Pleistocene in age.

2 Sample details and faunal list

2.1 BOREHOLE 57-12/41DR (ANTON DOHRN SEAMOUNT)

Depth 0.00-0.10m MPA50844

Benthonic:

Bulimina marginata	vr	
Cibicides lobatulus	f	
Cibicides refulgens	vr	
Gyroidina sp	vr	
Karreriella bradyi	vr	
Oridorsalis umbonata		r
Paromalina crassa	f	
Planularia ariminensis	vr	
Quinqueloculina sp	vr	

Planktonic:

Globigerina bulloides	f	
Globorotalia inflata	f	
Globorotalia truncatulinoides	vr	
Neogloboquadrina pachyderma (sinistral)		a

Note: N. *pachyderma* abundant on the 125micron sieve.

Depth 0.76-0.88m MPA50845

Benthonic:

Cibicides lobatulus	vr	
Oridorsalis umbonata		vr
Planularia ariminensis?	vr	

Planktonic:

None seen.

Note: Very rare, very poorly preserved.

2.2 BOREHOLE 57-17/05DR (HATTON-ROCKALL BASIN)

Depth 0.14-0.16m MPA50846

Benthonic:

None seen.

Planktonic:

"*Globigerina* spp"

Globigerina sp cf *bulloides*

Globorotalia crassaformis

Globorotalia sp cf. *inflata*

Globorotalia sp cf. *scitula*

Globorotalia truncatulinoides

Neogloboquadrina pachyderma

Orbulina universa

Note: Indurated. A thin section was examined.

2.3 BOREHOLE 57-17/08DR (HATTON-ROCKALL BASIN)

Depth 0.05-0.08m MPA50847

Benthonic:

Cassidulina teretis	vr
*Cibicidoide*s sp (frag) (?reworked)	r
Heterolepa mexicana (reworked from Oligocene)	vr

Planktonic:

Globigerina bulloides	r
Globigerina quinqueloba	vr
Globigerinita bradyi	vr
Globorotalia crassaformis	r
Globorotalia inflata	c
Globorotalia scitula	r
Neogloboquadrina pachyderma (sinistral)	a

Note: Very rich in foraminifera- almost a sandy foraminiferal limestone. Slightly indurated.

Depth 0.56-0.57m MPA50848

Benthonic:

Eponides sp

Quinqueloculina sp

Planktonic:

"*Globigerina* spp"

Globigerinoides ruber cf *seigliei*

Globorotalites cf *inflata*

Orbulina universa

Note: Indurated limestone. Indeterminate "*Globigerina* spp" dominate.

Depth 0.62-0.68m MPA50849

Benthonic:

Bulimina sp cf *marginata*

Planktonic:

"*Globigerina* spp"

Globigerina sp cf *yegauensis*

Globigerinatheka index

Orbulina?? (possible fragmentary chambers of "*Globigerina* spp")

Pseudohastigerina cf. *wilcoxensis*

Note: Foraminifera are very rare in this indurated limestone.

Depth 0.78-0.80m MPA50850

Benthonic:

None seen.

Planktonic:

None seen.

Note: Sample coralline.

3 Conclusions

3.1 BOREHOLE 57-12/41DR

The planktonic assemblage recovered from the sample at 0.00-0.10m (MPA50844), being dominated by sinistral *N. pachyderma* and frequent *Globigerina bulloides* and *Globorotalia inflata*, is characteristic of the Subarctic faunal province (in the sense of BÉ, 1977) of the Pleistocene to Recent. The abundance of sinistrally coiled *N. pachyderma* suggests Spring water temperatures below 7.2°C and at the latitude of the bore site its incoming is characteristic of the base of the Pleistocene (i.e. c.1.8Ma). Benthonic foraminifera are generally rare or very rare, but there are no species that have been derived from the inner shelf. *Cibicides lobatulus, Paromalina crassa, Oridorsalis umbonata* and *Planularia ariminensis* are often found on the continental slope of north western Europe (MURRAY, 1991). *Planularia ariminensis* for example is particularly found in water depths between about 300 and 500m although it has been recorded down to c.800m. *Paromalina crassa* is generally found in water depths in excess of about 600m. It is found living in the Porcupine Seabight between 800 and 950m and between 880 and 1400m in the Western Approaches where it appears to be associated with the Mediterranean Water mass.

The sample from a depth of 0.76-0.88m (MPA50845) yielded only very rare, poorly preserved foraminifera. Although no biostratigraphical or palaeoenvironmental conclusions can be made, those taxa found (listed above) are the same as those for the overlying sample.

3.2 BOREHOLE 57-17/05DR

Only a single sample, from a depth of 0.14-0.16m, was examined from this borehole (MPA50846). As the sample was indurated, a thin section was cut. Benthonic taxa were not found, but planktonic species were more common. Whereas the presence of *G. crassaformis* and *G inflata* first appeared during the Pliocene, the first up sequence occurrence of *Globorotalia truncatulinoides* is indicative of N22 and N23 (Pleistocene) (BOLLI & SAUNDERS, 1985).

3.3 BOREHOLE 57-17/08DR

The slightly indurated sample from a depth 0.05-0.08m (MPA50847) was found to be very rich in foraminifera, although benthonic species were very rare and apparently mainly reworked. Although *C. teretis* is often a good marker of the Pleistocene, the red-stained specimens of *H. mexicana* is probably reworked from the Oligocene and the fragment of *Cibicidoides* resembles species in the Eocene. However, the abundant sinistrally coiled, cold water morph, of *N. pachyderma* suggests that the assemblage is of Pleistocene age and *Globorotalia crassaformis* and *Globorotalia inflata* indicates that the assemblage is no older than Pliocene.

A thin section of indurated limestone at a depth of 0.56-0.57m (MPA50848) contains frequent planktonic foraminifera, although dominated by indeterminate "*Globigerina* spp" and the remainder are rare. The occurrence of *Orbulina universa* is important as the species first appeared in the 'mid' Miocene (foraminiferal Zone N9) and ranges through to the Recent (BOLLI & SAUNDERS, 1985). *Globorotalites cf inflata*, if correctly identified, implies an age no older than the late Pliocene, but the cut of the slide makes identification uncertain.

The thin section of the indurated limestone at a depth of 0.62-0.68m (MPA50849) is the only sample to contain Palaeogene foraminifera. Foraminifera are rare, but include *Globigerinatheka index,* which is restricted to the mid and late Eocene (P11-P17), *Pseudohastigerina* cf. *wilcoxensis* (early and mid Eocene) and *Globigerina* sp cf *yegauensis* (mid Eocene to mid Oligocene) (TOUMARKINE & LUTERBACHER, 1985). A mid (?to late) Eocene age is suggested. Unfortunately the stratigraphically lowest sample examined, a coralline limestone from a depth of 0.78-0.80m (MPA50850), was devoid of foraminifera so that biostratigraphical conclusions are not possible.

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