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Biostratigraphy of a suite of samples from the Devizes area

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Biostratigraphy of a suite of samples from the Devizes area

Ian P. Wilkinson

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British Geological Survey offices

Keyworth, Nottingham NG12 5GG

☎ 0115-936 3241 Fax 0115-936 3488
e-mail: sales@bgs.ac.uk
www.bgs.ac.uk
Shop online at: www.geologyshop.com

Murchison House, West Mains Road, Edinburgh EH9 3LA

☎ 0131-667 1000 Fax 0131-668 2683
e-mail: scotsales@bgs.ac.uk

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☎ 020-7589 4090 Fax 020-7584 8270
☎ 020-7942 5344/45 email: bgs_london@bgs.ac.uk

Forde House, Park Five Business Centre, Harrier Way, Sowton, Exeter, Devon EX2 7HU

☎ 01392-445271 Fax 01392-445371

Geological Survey of Northern Ireland, Colby House, Stranmillis Court, Belfast BT9 5BF

☎ 028-9038 8462 Fax 028-9038 8461

Maclean Building, Crowmarsh Gifford, Wallingford, Oxfordshire OX10 8BB

☎ 01491-838800 Fax 01491-692345

Columbus House, Greenmeadow Springs, Tongwynlais, Cardiff, CF15 7NE

☎ 029-2052 1962 Fax 029-2052 1963

Parent Body

Natural Environment Research Council, Polaris House, North Star Avenue, Swindon, Wiltshire SN2 1EU

☎ 01793-411500 Fax 01793-411501
www.nerc.ac.uk

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Summary

This report summarises the palaeontological results obtained from Kimmeridgian to Mid Cretaceous deposits of the region around Devizes. Biostratigraphical conclusions are based principally on the foraminifera recorded.

1 Introduction

A suite of 36 samples from the Kimmeridge Clay through to the Chalk was examined for calcareous microfaunas in order to place them into a biostratigraphical context. Conclusions given below are based predominantly on the foraminiferal content.

2 Faunal details and conclusions

MPA54166 WMD10591 SU 01345 58127

Rare fish debris was observed, but the sample was barren of calcareous microfossils. No biostratigraphical conclusions can be drawn.

MPA54167 WMD11063 SU 17314 63343

Plectina cenomana

Praeglobotruncana stephani

Rotalipora sp cf *R. cushmani*

?*Lingulogavelinella globosa*

Foraminifera indicate a position no lower than BGS4ii (*costatus* Subzone). If the single poorly preserved specimen tentatively assigned to *Lingulogavelinella globosa* is correctly identified, then BGS6 (*guerangeri* macrofaunal zone) is indicated.

MPA54169 WMD11065 ST98263 57431

Hedbergella delrioensis (very rare)

Lenticulina muensteri

Haplophragmoides hauesleri

The sample contained much flint/chert and a few chalk chips but the main lithology was sandstone. A moderately rich fauna was recovered, but very low in diversity. The fragment of *Hedbergella delrioensis* (mid-late Cretaceous) was probably contamination. *Lenticulina muensteri* is a long-ranging Jurassic species that becomes extinct in Preplicomphalas Zone. *Haplophragmoides hauesleri* goes into extinction in the Fittoni Zone. A late Kimmeridgian age is indicated.

MPA54176 WMD11072 SU05818 60407

This glauconite-rich sample was barren of foraminifera, probably due to decalcification. No biostratigraphical conclusions can be drawn.

MPA54181 KRB218 SU40117 15774

Tritaxia pyramidata (becomes extinct at the top of the *dispar* macrofaunal zone)

Arenobulimina praefrankei (ranges from the top of the *inflatum* zone to mid *dispar* Zone)

Arenobulimina chapmani (goes into extinction at the top of the *dispar* zone)

Haplophragmoides nonionoides (becomes extinct at the top of the *auritus* subzone)

Cribrostomoides nonionoides angulosa (disappears at the top of the *auritus* subzone)

Arenobulimina cf *obliqua* (ranges from the top of the *inflatum* Zone into the Cenomanian)

This is a difficult fauna to interpret. The fauna is probably mixed (reworking or contamination) with one part being indicative of the Upper Albian no higher than *auritus* Subzone and the other part suggesting top *inflatum* zone.

MPA54184 KRB221 SU 40048 15770

Only a single fragment of *Arenobulimina* sp was found. This is probably Albian in age, but its provenance is questionable.

MPA54185 KRB222 SU 40395 15781

Arenobulimina chapmani (becomes extinct at the top of the *dispar* zone)

Haplophragmoides nonionoides cf *angulosa* (goes into extinction at the top of the *auritus* Subzone)

Arenobulimina cf *obliqua* (Extends from upper *inflatum* zone into the Cenomanian)

Arenobulimina sabulosa

Arenobulimina frankei

Arenobulimina postchapmani/advena

The fauna listed above is indicative of the highest Albian and the upper *dispar* macrofaunal Zone is inferred.

MPA54186 KRB223 SU 40385 15750

Arenobulimina postchapmani (restricted to the *dispar* macrofaunal Zone) and a fragment of *Vaginulina sp cf mediocarinata* suggests the Upper Albian, and probably the *dispar* zone

MPA54191 ARF15 ST9448 547062

Lenticulina subalata (becomes extinct in Pallasioides macrofauna zone)

Marginulina undulata (goes into extinction in the fittoni Zone)

Citharina serratocostata (disappears from the record in the in the Okusensis Zone)

Marginulina 'fragraria'

The fauna is indicative of the late Kimmeridgian, no higher than Pallasioides Zone.

MPA54192 ARF1563 ST 9603 5515

Ammobaculites agglutinans

Haplophragmoides hauesleri

Only agglutinated foraminifer are present, possibly due to decalcification, however the Upper Kimmeridgian—Rotunda-Fittoni macrofaunal zone can be suggested.

MPA54194 ARF1565 ST 9697 5885

Barren and possibly decalcified. No biostratigraphical conclusions are possible.

MPA54196 ARF1567 ST 9671 5990

Barren and possible decalcified. No biostratigraphical conclusions are possible.

MPA54197 ARF1568 ST 9730 5816

Arenobulimina cf obliqua

A. praefrankei

A. chapmani

Fish debris

Arenobulimina cf obliqua ranges from the upper *inflatum* Zone to Cenomanian and *A. praefrankei* ranges from the *auritus* Subzone to basal Cenomanian The assemblage is placed within the *auritus* macrofaunal Subzone to top *dispar* zones (Upper Albian)

MPA54198 ARF1569 ST 9743 5544

Barren. This ferruginous sample contains a large amount of modern plant debris, possibly causing decalcification. No biostratigraphical conclusions can be drawn.

MPA54200 ARF1571 ST 9718 5752

Arenobulimina chapmani

Arenobulimina cf obliqua

Abundant fish debris

Rare echinoid spines

Macrodentina fragments

Mid-late Albian on the evidence of the foraminifera, but with a single ?reworked Kimmeridgian-Portlandian ostracod fragment of *Macrodentina*

MPA54201 ARF1572 ST 8774 5584

Barren: a large amount of plant material is present possibly causing decalcification. No biostratigraphical conclusions can be drawn.

MPA54202 ARF1573 ST 9779 5786

Arenobulimina chapmani

Cribrostomoides nonionoides

Tritaxia pyramidata

The age is considered to be Mid to Late Albian, but below than the *dispar* zone.

MPA54203 ARF1574 ST 9779 5524

Dentalina cf pseudocommunis

Textularia jurassica

Praeconocaryomma (sp 1 and cf hexagona)

Fish debris, mould of gastropod, small bivalves

The foraminifera and radiolaria suggest a position within the Upper Kimmeridgian—probably no higher than Pallasioides Zone at which level *Dentalina pseudocommunis* disappears from the record. *Textularia jurassica* goes into extinction in the ‘mid’ Fittoni Zone.

MPA54204 ARF 1575 ST 9782 5487

Cribrostomoides nonionoides

Glomospira gaultina

The sample is considered to of mid to late Albian age and below the *dispar* zone.

MPA54206 ARF 1577 ST 9788 5810

Arenobulimina chapmani

Tritaxia pyramidata

Arenobulimina cf obliqua

Fish frags

The foraminifera in this glauconite rich sample are long ranging, and only a general mid to late Albian age can be assigned to it.

MPA54208 ARF1579 ST 9801 5874

Arenobulimina chapmani

Cribrostomoides nonionoides

Arenobulimina cf obliqua

Weakly glauconitic

As for MPA54202 (ARF1573)

MPA54210 ARF1581 ST 9937 5752

Arenobulimina praefrankei

A. cf obliqua

A. chapmani

Cribrostomoides nonionoides

The concurrent range of *Arenobulimina praefrankei* (no lower than *auritus* subzone) and *Cribrostomoides nonionoides* (no higher than *auritus* subzone) places the fauna in the late Albian *auritus* subzone

MPA54212 ARF1583 ST 9879 5759

Arenobulimina chapmani

A. cf obliqua

The low diversity, fauna comprises long-ranging taxa so that only a general age determination of mid to late Albian can be assigned to it.

MPA54213 ARF1584 ST 9890 5590

Arenobulimina fragments (cf chapmani)

Globigerinelloides sp cf bentonensis

Ammonite (first two whorls), bivalve, echinoid spine, gastropod mould, fish debris

A very rare fauna fragmentary specimens of Albian (*dispar* zone) age.

MPA54214 ARF1585 ST 9898 5743

Lenticulina subalata (up to *Pallasioides*)

Lenticulina "muensteri"

Lenticulina ponderosa (Hudlestoni-Albani in Russia; Fittoni in Dorset)

Although a small fauna, they indicate a Late Kimmeridgian age, probably no younger than *Pallasioides* Zone.

MPA54215 ARF1586 ST 9905 5703

Lenticulina subalata

Very rare foraminifera Kimmeridgian are no younger than *Pallasioides* zone.

MPA54238 PMH3993 SU 00030 60459

Lenticulina rotula frag

Arenobulimina chapmani

Very rare foraminifera of Mid to late Albian age occur.

MPA54239 PMH3994 SU01873 61593

Gavelinella berthelini

G. baltica

?*G. intermedia*

The rare foraminifera indicate a Cenomanian age, but the absence of key taxa such as *Plectina cretosa*, *P. cenomana*, *Arenobulimina anglica*, *Lingulogavelinella globosa* means that a more detailed date is not possible.

MPA54297 PMH4052 SU00601 64085

Whiteinella archaeocretacea

Dicarinella imbricata

Praeglobotruncana helvetica

Dicarinella canaliculata

Valvulineria lenticularis

Gavelinella tourainensis

The fauna suggests a position no older than BGS10 (within the upper part of the New Pit Chalk), but they occur up to mid BGS12.

MPA54311 LLB58 SU 12850 55872

Arenobulimina anglica

Lenticulina rotula

Gavelinella baltica

The Cenomanian age, no later than BGS4ii, suggests the West Melbury to basal Zigzag chalk formations, no higher than *costatus* macrofaunal subzone.

MPA54312 LLB59 SU 12753 55779

Arenobulimina anglica

Gavelinella cenomanica

Gavelinella intermedia

Arenobulimina anglica becomes extinct in BGS4ii (Cenomanian), no higher than *costatus* macrofaunal subzone. The West Melbury to basal Zigzag chalks are inferred.

MPA54316 LLB63 SU 14635 56848

Tritaxia pyramidata

Hedbergella brittonensis

H. delrioensis

?*Arenobulimina chapmani*? (frag)

Long-ranging Cenomanian foraminifera were encountered, but if the fragment tentatively assigned to *A. chapmani* is correctly identified, the fauna can be placed no higher than basal Zigzag Chalk.

MPA54320 AJN 67 SU 22328 60149

Tritaxia pyramidata

Gavelinella baltica

Pseudotextulariella cretosa

Gavelinella cenomanica

Quinqueloculina antiqua

The concurrent range of *Quinqueloculina antiqua* (up to BGS 2) and *Pseudotextulariella cretosa* (BGS2 to BGS4) indicates BGS2, *saxbii* macrofaunal subzone, of the West Melbury Chalk Formation. Glauconitic.

MPA54323 AJN70 SU21958 60306

Tritaxia pyramidata

Arenobulimina anglica

Gavelinella berthelini

Gavelinella intermedia

Quinqueloculina antiqua

The presence of *Quinqueloculina antiqua* places the fauna no higher than BGS 2 (*saxbii* macrofaunal subzone) but *Pseudotextulariella cretosa*, *M. ozawai* and keeled planktonics were not observed. The West Melbury Chalk is inferred.

MPA54324 AJN71 SU12615 61186

Tritaxia pyramidata

Gavelinella intermedia

G. berthelini

Arenobulimina anglica

radiolaria?

The foraminifera are placed no higher than BGS4ii (no higher than *costatus* macro subzone) of the West Melbury to basal Zigzag chalk.

MPA54591 WMD 11167 ST98283 55259

Rare fragments of siliceous steinkerns of questionable foraminifera and a single specimen of the ostracod ?*Cytherella* sp. No Biostratigraphical conclusions are possible.

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MPA54592

WMD11168

ST97644 55198

Barren.