

CR/17/087

Last modified: 2018/05/01 10:17



**British  
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

# Palynology of Faroe-Shetland Basin well 205/20-2 between 2958.81 and 2999.78 m

Energy Systems and Basin Analysis Programme

Commissioned Report CR/17/087



BRITISH GEOLOGICAL SURVEY

ENERGY SYSTEMS AND BASIN ANALYSIS PROGRAMME  
COMMISSIONED REPORT CR/17/087

# Palynology of Faroe-Shetland Basin well 205/20-2 between 2958.81 and 2999.78 m

J B Riding

The National Grid and other  
Ordnance Survey data © Crown  
Copyright and database rights  
2018. Ordnance Survey Licence  
No. 100021290 EUL.

## *Keywords*

Palynology, Late Jurassic, Early  
Cretaceous, Faroe-Shetland  
Basin, biostratigraphy.

## *Bibliographical reference*

RIDING, J.B. 2018. Palynology  
of Faroe-Shetland Basin well  
205/20-2 between 2958.81 and  
2999.78 m. British Geological  
Survey Commissioned Report,  
CR/17/087. 9pp.

Copyright in materials derived  
from the British Geological  
Survey's work is owned by the  
Natural Environment Research  
Council (NERC) and/or the  
authority that commissioned the  
work. You may not copy or adapt  
this publication without first  
obtaining permission. Contact the  
BGS Intellectual Property Rights  
Section, British Geological  
Survey, Keyworth,  
e-mail [ipr@bgs.ac.uk](mailto:ipr@bgs.ac.uk). You may  
quote extracts of a reasonable  
length without prior permission,  
provided a full acknowledgement  
is given of the source of the  
extract.

Maps and diagrams in this book  
use topography based on  
Ordnance Survey mapping.

## BRITISH GEOLOGICAL SURVEY

The full range of our publications is available from BGS shops at Nottingham, Edinburgh, London and Cardiff (Welsh publications only) see contact details below or shop online at [www.geologyshop.com](http://www.geologyshop.com)

The London Information Office also maintains a reference collection of BGS publications, including maps, for consultation.

We publish an annual catalogue of our maps and other publications; this catalogue is available online or from any of the BGS shops.

*The British Geological Survey carries out the geological survey of Great Britain and Northern Ireland (the latter as an agency service for the government of Northern Ireland), and of the surrounding continental shelf, as well as basic research projects. It also undertakes programmes of technical aid in geology in developing countries.*

*The British Geological Survey is a component body of the Natural Environment Research Council.*

*British Geological Survey offices*

### **BGS Central Enquiries Desk**

Tel 0115 936 3143 Fax 0115 936 3276  
email [enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)

### **Environmental Science Centre, Keyworth, Nottingham NG12 5GG**

Tel 0115 936 3241 Fax 0115 936 3488  
email [sales@bgs.ac.uk](mailto:sales@bgs.ac.uk)

### **The Lyell Centre, Research Avenue South, Edinburgh EH14 4AP**

Tel 0131 667 1000 Fax 0131 668 2683  
email [scotsales@bgs.ac.uk](mailto:scotsales@bgs.ac.uk)

### **Natural History Museum, Cromwell Road, London SW7 5BD**

Tel 020 7589 4090 Fax 020 7584 8270  
Tel 020 7942 5344/45 email [bgs-london@bgs.ac.uk](mailto:bgs-london@bgs.ac.uk)

### **Cardiff University, Main Building, Park Place, Cardiff CF10 3AT**

Tel 029 2167 4280 Fax 029 2052 1963

### **Maclean Building, Crowmarsh Gifford, Wallingford OX10 8BB**

Tel 01491 838800 Fax 01491 692345

### **Geological Survey of Northern Ireland, Department of Enterprise, Trade & Investment, Dundonald House, Upper Newtownards Road, Ballymiscaw, Belfast, BT4 3SB**

Tel 028 9038 8462 Fax 028 9038 8461  
[www.bgs.ac.uk/gsni/](http://www.bgs.ac.uk/gsni/)

### *Parent Body*

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

Tel 01793 411500 Fax 01793 411501  
[www.nerc.ac.uk](http://www.nerc.ac.uk)

Website [www.bgs.ac.uk](http://www.bgs.ac.uk)

Shop online at [www.geologyshop.com](http://www.geologyshop.com)

# Contents

<b>Summary .....</b>	<b>ii</b>
<b>1 Introduction .....</b>	<b>2</b>
<b>2 Palynology .....</b>	<b>2</b>
<b>3 Conclusions .....</b>	<b>3</b>

# Summary

As part of Phase 3 of the BGS Faroe-Shetland Consortium project on the Jurassic of the UK sector of the Faroe-Shetland Basin, detailed logging of core from well 205/20-2 was undertaken. Thirteen core samples were taken for palynology between 2958.81 and 2999.78 m in order to provide age determinations and additional facies information.

Samples 5 to 13 (2970.35 to 2999.78 m) all proved barren of, or very sparse in, identifiable palynomorphs, and hence no age assessments are possible in this succession. By contrast, the uppermost interval (samples 1 to 4; 2958.81 to 2968.08 m) is interpreted as being of Kimmeridgian to Middle Volgian age (Eudoxus to Anguiformis zones) based largely on sparse dinoflagellate cysts.

## 1 Introduction

As part of detailed sedimentological logging of conventional core from offshore well 205/20-2, thirteen samples between 2958.81 and 2999.78 m were collected for palynological analysis in order to provide biostratigraphical ages and palaeoecological information. The samples were all prepared using standard acid-based techniques. The samples, aqueous residues and microscope slides are held in the BGS collections at Keyworth, Nottingham. The sample details are listed in Appendix 1. The zones referred to are standard ammonite zones.

## 2 Palynology

The palynological data in this study are set out in Appendix 2. The samples all proved relatively sparse in palynomorphs. Indeed, samples 8 and 9 and 11 to 13 proved entirely barren, hence no age assessments are possible for these horizons. Dinoflagellate cysts were only observed in samples 1, 2 and 4, however these were poorly-preserved and sparse. These occurrences indicate marine deposition at these horizons. The organic residues in samples 1 to 11 are all dominated by wood fragments, thus implying a single genetic sedimentary succession.

The dinoflagellate cysts in samples 1, 2 and 4 comprise *Cribroperidinium* spp., *?Dichadogonyaulax? pannea*, indeterminate forms, *Systematophora areolata* and *Systematophora* spp. This assemblage is typical of the Late Jurassic (Oxfordian to Volgian). A questionable specimen of *Dichadogonyaulax? pannea* was encountered in sample 2 (2960.77 m). This species is confined to the Kimmeridgian to Middle Volgian interval (Eudoxus to Anguiformis zones) (Riding and Thomas, 1992). The range base of consistent *Systematophora* is Oxfordian, and *Cribroperidinium* is typical of the Kimmeridgian to Volgian. The occurrence of the spore genus *Cicatricosisporites* in samples 1 and 3 is entirely consistent with this assessment.

In summary, the uppermost interval examined (samples 1 to 4; 2958.81 to 2968.08 m) is interpreted as being of Kimmeridgian to Middle Volgian age (?Eudoxus to Anguiformis zones). The remainder of the palynoflora is consistent with this assessment. Reworked Carboniferous spores (*Densoisporites* spp. and *Lycospora pusilla*) were observed in samples 1 and 2. By contrast, samples 5 to 13 (2970.35 to 2999.78 m) cannot be assigned a biostratigraphical age due to the paucity of the palynofloras.

## 3 Conclusions

The uppermost succession (samples 1 to 4; 2958.81 to 2968.08 m) is interpreted as being of Kimmeridgian to Middle Volgian age (?Eudoxus to Anguiformis zones) based largely on sparse dinoflagellate cysts. By contrast, samples 5 to 13 (2970.35 to 2999.78 m) all proved devoid of, or very sparse in, identifiable palynomorphs, and hence no age assessments are possible.

## Reference

RIDING, J B, and THOMAS, J E. 1992. Dinoflagellate cysts of the Jurassic System. 7–97*in. A stratigraphic index of dinoflagellate cysts*. POWELL, A J (editor). (London: Chapman and Hall, British Micropalaeontological Society Publications Series.)

## Appendix 1 - list of samples (measured depths).

<b>Informal No.</b>	<b>BGS Registration No.</b>	<b>Depth (m)</b>
1	MPA 67512	2958.81
2	MPA 67511	2960.77
3	MPA 67510	2964.97
4	MPA 67509	2968.08
5	MPA 67508	2970.35
6	MPA 67507	2973.18
7	MPA 67506	2976.08
8	MPA 67505	2977.30
9	MPA 67504	2980.56
10	MPA 67503	2982.94
11	MPA 67502	2988.30
12	MPA 67501	2994.14
13	MPA 67500	2999.78



## Appendix 2 – palynology data

205/20-2													
Number	1	2	3	4	5	6	7	8	9	10	11	12	13
MPA Number	67512	67511	67510	67509	67508	67507	67506	67505	67504	67503	67502	67501	67500
Depth (m)	2958.8	2960.8	2965	2968.1	2970.4	2973.2	2976.1	2977.3	2980.6	2982.9	2988.3	2994.1	2999.8
Comments	fair	sparse	sparse	sparse	sparse	sparse	sparse	barren	barren	sparse	barren	barren	barren
Age interpretation	Kimmeridgian to Mid Volgian				Indeterminate								
Palaeoenvironment	Marine		Ferr. only	?Marine	Marine	terrestrial taxa only		Indeterminate	Ferr. only	Indeterminate			
PTERIDOPHYTE SPORES:													
Cicatricosisporites spp.	X		X			?							
Concavisporites spp.				X									
Coronatipora valdensis	?												
Cyathidites spp.	X	X	X	X		X	X			X			
Densosporites spp. (reworked)	X												
Duplexisporites spp.			X										
Gleicheniidites senonicus	X			?		X	X			X			
Lycospora pusilla (reworked)	X	X											
Retitrites spp.	X		X	X						X			
Sestrosporites pseudoalveolatus		X		X									
spores - indeterminate	X	X	X	X		X	X			X			
GYMNOSPERM POLLEN:													
bisaccate pollen - undifferentiated	X	X	X	X		X					X		
Callialasporites dampieri	X	X											
Callialasporites spp.	X												
Cerebropollenites macroverrucosus	X	X	X			X				?			
Perinopollenites elatoides						X							
Vitreisporites pallidus		X	X										
pollen - indeterminate										X			
DINOFLAGELLATE CYSTS:													
Cribroperidinium spp.		X		X									
Dichadogonyaulax?pannea		?											
dinoflagellate cysts - indet.		X											
Systematophora areolata	X												
Systematophora spp.	X												
MISCELLANEOUS:													
Botryococcus	X												
foraminiferal test linings	X	X											
Micrhystridium spp.	X												
Tasmanites spp.	X					?							
KEROGEN TYPE (%)													
wood	52	72	73	77	87	78	72	95	98	95	87	...	..
plant fragments	22	13	17	12	10	7	5	5	2	4	5	...	...
palynomorphs	8	8	3	6	...	7	5	...	...	1	...	...	...
amorphous organic material (AOM)	18	7	7	5	3	8	18	...	...	...	8	...	...