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# Palynology of the interval 2575.47 to 2610.15 m of well 205/26a-6, Faroe-Shetland Basin

Energy Systems and Basin Analysis Programme

Commissioned Report CR/16/214



BRITISH GEOLOGICAL SURVEY

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# Palynology of the interval 2575.47 to 2610.15 m of well 205/26a-6, Faroe-Shetland Basin

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# 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 205/26a-6 was undertaken and samples were taken for palynology in order to provide additional facies information and age determinations.

The palynological assemblages were very poorly productive with the exception of sample 1 (2575.47m), which contains a dinoflagellate cyst assemblage supporting a Late Jurassic Kimmeridgian or younger age determination. Some samples yielded sufficient residue to allow a count of kerogen types, some samples were almost completely barren.

# 1 Introduction

During detailed logging of core from well 206/26a-6, samples were taken for palynology in order to provide additional facies information and age determinations for the lithofacies analysis.

The samples were prepared for palynology using standard acid maceration techniques. The residues were mounted onto glass slides for microscopic examination. The slides are held in the BGS collections in Keyworth.

Sample details are given in Appendix 1.

## 2 Palynology

Summary descriptions of all 11 samples follow. Detailed palynological data is set out in Appendix 2.

### 2.1 SAMPLE 1 (2575.47 M) – KIMMERIDGIAN TO EARLY CRETACEOUS

This sample is dominated by abundant amorphous organic material (AOM) which partially obscures the palynomorphs even in the oxidised residue. The long-ranging dinoflagellate cysts *Cribroperidinium globatum* and *Cyclonephelium hystrix* are present indicating a Late Jurassic (Kimmeridgian) to Early Cretaceous age (Riding and Thomas, 1992).

Spores present include *Cyathidites minor*, *Gleicheniidites* sp. and *Foveosporites* sp. The pollen assemblage includes undifferentiated bisaccates, *Perinopollenites elatoides*, *Exesipollenites scabratus*, *Cerebropollenites macroverrucosus* and *Araucariacites australis*. These taxa are all long-ranging and typically Mesozoic but with no good age indicators.

The kerogen assemblage is dominated by AOM (85%) with subsidiary amounts of wood, plant material and palynomorphs. The presence of dinoflagellate cysts indicates some marine influence.

### 2.2 SAMPLES 2 TO 4 (2578.7 TO 2584.11 M) – LATE JURASSIC TO EARLY CRETACEOUS

The organic residues from samples 2 and 3 are too sparse to perform a count of the kerogen and palynomorphs are absent. Sample 4 yielded a sparse kerogen assemblage made up of equal proportions of wood, plant material and AOM. Fungal spores are the only palynomorphs present.

### 2.3 SAMPLES 5 AND 6 (2592.93 AND 2593.97 M) – LATE JURASSIC TO EARLY CRETACEOUS

Palynomorphs are very rare in this interval and the kerogen assemblages are dominated by brown wood and plant material with lesser amounts of woody material. The assemblage from sample 5 consists of the spore *Cyathidites*, a fungal spore and a fragment of a chorate dinoflagellate cyst, possibly an opercular plate from the Late Jurassic/ Early Cretaceous genus *Systematophora*. Sample 6 yields undifferentiated bisaccate pollen, *Exesipollenites scabratus* and a fragment of a chorate dinoflagellate cyst, possibly an opercular plate. The dinoflagellate cyst fragments indicate some marine influence.

### 2.4 SAMPLES 7 TO 11 (2596.75 TO 2610.15 M) – INDETERMINATE

Generally the organic residues from this interval are too sparse to perform a count of the kerogen and palynomorphs are absent. However in sample 10, although no palynomorphs were recovered, the kerogen assemblage was good enough to be counted and contains equal proportions of plant material (48%) and wood (48%).

### 3 Conclusions

The palynological assemblages were very poorly productive with the exception of sample 1 (2575.47m). Some samples yielded sufficient residue to allow a count of kerogen types, some samples were almost completely barren.

Sample 1 (2575.47m) contains a dinoflagellate cyst assemblage supporting a Late Jurassic Kimmeridgian or Early Cretaceous age determination. Chorate dinoflagellate fragments indicating Late Jurassic or younger ages were found in samples 5 and 6 (2592.93 and 2593.97 m).

The kerogen assemblages show some variation in the proportions of the different kerogen groups. AOM dominates the uppermost sample with the stronger marine influence. The lower samples are dominated by woody and plant material.

### 4 References

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 - Sample details (measured depths).

<b>INFORMAL No.</b>	<b>BGS MPA No.</b>	<b>DEPTH (m)</b>	<b>SSK No.</b>
1	67523	2575.47	63826
2	67522	2578.7	63825
3	67521	2580.53	63824
4	67520	2584.11	63823
5	67519	2592.93	63822
6	67517	2593.97	63820
7	67516	2596.75	63819
8	67518	2600.65	63821
9	67515	2601.73	63818
10	67514	2606.01	63817
11	67513	2610.15	63816

## Appendix 2 - Palynology data

Well 205/26a-6											
Number	1	2	3	4	5	6	7	8	9	10	11
MPA Number	67523	67522	67521	67520	67519	67517	67516	67518	67515	67514	67513
Depth	2575.47	2578.7	2580.53	2584.11	2592.93	2593.97	2596.75	2600.65	2601.73	2606.01	2610.15
Age interpretation	Kim. to Early Cret.	Late Jurassic to Early Cretaceous					Indeterminate				
Palaeoenvironment	Marine	Indeterminate			?Marine		Indeterminate				
PTERIDOPHYTE SPORES					X						
Cyathidites minor	X										
Foveosporites sp.	X										
Gleicheniidites sp.	X										
GYMNOSPERM POLLEN											
Araucariacites australis	X										
Bisaccate pollen undiff.	X					X					
Cerebropollenites macroverrucosus	X										
Exesipollenites scabratus	X					X					
Perinopollenites elatoides	X										
DINOFLAGELLATE CYSTS					X						
Chorate dinocyst indet	X					X					
Cribroperidinium globatum gp.	X										
Cyclonephelium hystrix	X										
MISCELLANEOUS											
Foraminiferal test lining	X				X						
Fungal spore				X							
Micrhystridium spp.	X										
KEROGEN TYPE PERCENTAGES											
Wood	7			33	18	27				48	
Plant fragments	4			33	57	68				48	
Palynomorphs	4			2	1	1				0	
Amorph. organic material (AOM)	85			32	24	4				4	