

Public-data File 90-25

**1990 PALYNOLOGY REPORT OF OUTCROP SAMPLES FROM
NORTH SLOPE, ALASKA
(PRELIMINARY)**

by

DGGS Energy Section Staff

Alaska Division of
Geological and Geophysical Surveys

September 1990

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STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
PALYNOLOGY REPORT
OF
OUTCROP SAMPLES FROM NORTH SLOPE, ALASKA



July 24, 1990

TO: R. Reifentuhl
State of Alaska, Dept. of Natural Resources
Division of Geological & Geophysical Surveys
3700 Airport Way
Fairbanks, AK 99709-4609

SUBJECT: Palynology Report - Outcrop samples from North Slope, Alaska.
Twenty samples received July 5 and 11, 1990.

Introductory Summary

A total of 20 outcrop samples were processed and examined for palynomorphs. The samples were sent directly from the field to our laboratory in two shipments. The present study, by M.C.I., was conducted under the "rapid analysis" format which does not provide a detailed record of all palynomorphs observed.

Standard processing techniques were used in preparing the palynological samples for examination. This process included the use of hydrochloric and hydrofluoric acids. The resultant residues were further concentrated by heavy liquid separation and a sieving/panning process.

The samples yielded adequate organic material, but palynomorph recoveries were very poor in the nine samples which comprised the first shipment.

We also processed and examined the samples for foraminiferal analysis. The results are included in this report and illustrate the advantage of multidiscipline study. The added analyses are included at no charge.

Results

The age, zone, environment of deposition, and the key palynomorph taxa are given for each sample.

From the palynological preparations, an interpretation of the depositional environment is stated as nonmarine, marginal marine, or marine. These designations are simply categories based on the absence, or presence and diversity of microplankton. Some of the samples in this shipment recovered no palynomorphs, which precluded any interpretation regarding the environment of deposition.

Many of the samples are assigned tentatively to the P-M18 zone. These are based on negative evidence. If the same assemblage contained the more age restrictive dinocysts, as seen in two of the samples, a middle to late Albian, P-M17 zone, assignment would be appropriate.

01) 90RR-2D

<u>Age.</u>	Cretaceous Possible Early Cretaceous (Poss. Aptian - Albian)
<u>Zone.</u>	Possible P-M17 or P-M18
<u>Environment.</u>	Marine.
<u>Palynomorphs.</u>	Undifferentiated bisaccates (abundant) <i>Imbatodinium jaegeri</i> (single) <i>?Palaeoperidinium cretaceum</i> (rare)
<u>Remarks.</u>	Organics corroded, very poor preservation of palynomorphs.

02) 90RR-6A

<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate. No evidence of marine.
<u>Palynomorphs.</u>	Indeterminate spore(?) fragments (rare)

03) 90RR-7A

<u>Age.</u>	Indeterminate
<u>Environment.</u>	Nonmarine. No evidence of marine.

03) 90RR-7A (Cont.)

Palynomorphs. Undifferentiated bisaccates (frequent)
? *Classopollis* sp. (rare)
Indet. spore & spore fragments (abundant)

FORAMINIFERA

Age. Late Jurassic - Early Cretaceous
Oxfordian - Valanginian
(Possible Berriasian - Valanginian)

Zone. F-13 to F-16

Environment. Marine (undifferentiated)

04) 90RR-15A

Age. Indeterminate

Environment. Nonmarine. No evidence of marine.

Palynomorphs. Undifferentiated bisaccates (frequent)
Indet. spore & spore fragments (common)

05) 90RR-15B

Age. Indeterminate

Environment. Indeterminate

Palynomorphs. Essentially barren of palynomorphs.

06) 90RR-16B

Age. Indeterminate

Environment. Indeterminate

Palynomorphs. Barren of palynomorphs.

07) 90RR-16C

<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Palynomorphs.</u>	Barren of palynomorphs.

08) 90RR-16-23O

<u>Age.</u>	Indeterminate
<u>Environment.</u>	Nonmarine. No evidence of marine.
<u>Palynomorphs.</u>	Indet. spore fragments (rare)

09) 90RR-20A

<u>Age.</u>	Indeterminate
<u>Environment.</u>	Nonmarine. No evidence of marine.
<u>Palynomorphs.</u>	Indet. spore fragments (rare)

10) 90RR-16-173

<u>Age.</u>	Indeterminate
<u>Environment.</u>	Nonmarine. No evidence of marine.
<u>Palynomorphs.</u>	Indet. spore(?) fragments (rare) Undifferentiated bisaccates (rare)

11) 90RR-26

<u>Age.</u>	Possible Early Cretaceous Undifferentiated
<u>Environment.</u>	Probably marginal marine.

11) 90RR-26 (Cont.)

Palynomorphs. Indet. spores and fragments (rare)
Undifferentiated bisaccates (rare)
Gleicheniidites senonicus (single)
?Cyclonephelium sp. (single)
Dinocyst fragments? (rare)

Remarks. The poorly preserved, and questionably identified dinocyst pieces hint of an early Cretaceous age.

FORAMINIFERA

Age. Possible Early Cretaceous
Possible Albian

Environment. Marine (undifferentiated)

12) 90TJR-013

Age. Cretaceous
Possible Early Cretaceous
Undifferentiated

Environment. Probably marginal marine.

Palynomorphs. Undifferentiated bisaccates (common)
Cicatricosisporites sp. (single)
?Hystrichosphaeridium sp. (single)
Odontochitina or *Pseudoceratium* sp. (single)

Remarks. If the poorly preserved dinocyst specimen noted as possibly *Pseudoceratium* is correct, then an early Cretaceous age is appropriate.

13) 90MM-2-4

Age. Early Cretaceous
Probable Middle - Late Albian

Zone. Probable P-M17

13) 90MM-2-4 (Cont.)

<u>Environment.</u>	Marginal marine.
<u>Palynomorphs.</u>	Undifferentiated bisaccates (common) <i>Classopollis classoides</i> (rare) <i>Lundbladispota</i> sp. (reworked) (single) <i>Taeniaesporites</i> sp. (reworked) (single) Tasmanaceae (single) <i>Muderongia asymmetrica</i> (rare) <i>Palaeoperidinium cretaceum</i> (single)

FORAMINIFERA

<u>Age.</u>	Early Cretaceous Probable Middle - Late Albian
<u>Zone.</u>	F-9
<u>Environment.</u>	Inner - Middle Neritic (turbid)

14) 90MM-2-7

<u>Age.</u>	Early Cretaceous Aptian - Albian
<u>Zone.</u>	Possible P-M18
<u>Environment.</u>	Marginal marine.
<u>Palynomorphs.</u>	Undifferentiated bisaccates (frequent) <i>Cicatricosisporites</i> sp. (rare) <i>Gleicheniidites senonicus</i> (rare) <i>?Vittatina</i> sp. (reworked) (single) <i>Hymenozonotriletes lepidophytus</i> (reworked) (single) <i>Cyclonephelium distinctum</i> (rare) <i>Odontochitina operculata</i> (single) <i>Oligosphaeridium complex</i> (rare) <i>Palaeoperidinium cretaceum</i> (single) <i>Pseudoceratium retusum</i> (single)

14) 90MM-2-7 (Cont.)

FORAMINIFERA

Age. Early Cretaceous
Probable Middle - Late Albian

Zone. F-9

Environment. Inner - Middle Neritic (turbid)

15) 90MM-2-10

Age. Early Cretaceous
Middle - Late Albian

Zone. P-M17

Environment. Marginal marine.

Palynomorphs. Undifferentiated bisaccates (common)
Gleicheniidites senonicus (rare)
Taxodiaceae (frequent)
Cribopteridinium edwardsi (single)
Oligosphaeridium complex (single)
Palaeopteridinium cretaceum (rare)
Pseudoceratium retusum (single)
Spinidinium vestitum (rare)

Remarks. The key form in this sample is *S. vestitum*. This species is usually not present below the middle Albian.

FORAMINIFERA

Age. Early Cretaceous
Probable Middle - Late Albian

Zone. F-9

Environment. Inner - Middle Neritic (turbid)

16) 90MM-2-16

Age. Indeterminate

Environment. Nonmarine?

Palynomorphs. Barren of palynomorphs.
Recovered only woody-fusinitic organics.

17) 90MM-2-20

Age. Early Cretaceous
Aptian - Albian

Zone. Possible P-M18

Environment. Marginal marine.

Palynomorphs. Undifferentiated bisaccates (common)
Gleicheniidites senonicus (rare)
Taxodiaceae (frequent)
Cyclonephelium distinctum (frequent)
Imbatodinium jaegeri (long apical)(rare)
Palaeoperidinium cretaceum (abundant)

18) 90MM-2-21

Age. Early Cretaceous
Aptian - Albian

Zone. Possible P-M18

Environment. Marginal marine.

Palynomorphs. Undifferentiated bisaccates (common)
Classopollis classoides (rare)
Gleicheniidites senonicus (frequent)
Taxodiaceae (frequent)
Cyclonephelium distinctum (frequent)
Imbatodinium jaegeri (long apical)(rare)
Palaeoperidinium cretaceum (abundant)

19) 90MM-2-24

<u>Age.</u>	Early Cretaceous Aptian - Albian
<u>Zone.</u>	Possible P-M18
<u>Environment.</u>	Marginal marine.
<u>Palynomorphs.</u>	Undifferentiated bisaccates (frequent) <i>Deltoidospora</i> sp. (rare) <i>Gleicheniidites senonicus</i> (frequent) <i>Lycopodiumsporites</i> sp. (rare) <i>Cribopteridinium edwardsi</i> (frequent) <i>Gardodinium trabeculosum</i> (single) <i>Imbatodinium jaegeri</i> (long apical)(rare) <i>Muderongia</i> sp. (single) <i>Palaeopteridinium cretaceum</i> (abundant)

FORAMINIFERA

<u>Age.</u>	Early Cretaceous Probable Middle - Late Albian
<u>Zone.</u>	F-9
<u>Environment.</u>	Inner - Middle Neritic (turbid)

20) 90MM-2-25

<u>Age.</u>	Early Cretaceous Aptian - Albian
<u>Zone.</u>	Possible P-M18
<u>Environment.</u>	Marginal marine.
<u>Palynomorphs.</u>	Undifferentiated bisaccates (frequent) <i>Densosporites</i> sp. (reworked) (rare) <i>Deltoidospora</i> sp. (rare) Taxodiaceae (rare) <i>Trilobosporites perverulentus</i> (rare)

20) 90MM-2-25 (Cont.)

Cyclonephelium distinctum (rare)
Odontochitina operculata (single)
Oligosphaeridium complex (rare)
Palaeoperidinium cretaceum (rare)

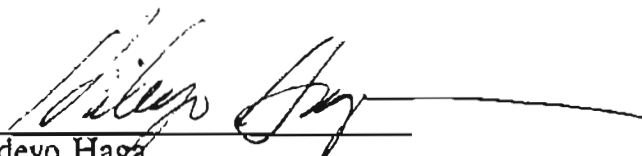

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TABLE 1: SAMPLE LOCATIONS AND ROCK UNITS

sample #	lat/long	quadrangle	rock unit
90RR02D	69° 05' 40"N, 148° 46' 47"W	Sagavanirktok A-4	Nanushuk Group
90RR06A	69° 09' 09"N, 147° 46' 23"W	Sagavanirktok A-2	Gilead Creek sandstone(?)
90RR07A	69° 09' 04"N, 147° 46' 21"W	Sagavanirktok A-2	Kingak Shale
90RR15A,B	69° 02' 00"N, 148° 04' 36"W	Sagavanirktok A-2	Torok Formation(?)
90RR16B,C,230,173 (measured section)	69° 06' 19"N, 148° 02' 17"W	Sagavanirktok A-2	Gilead Creek sandstone
90RR20A	69° 09' 26"N, 147° 46' 12"W	Sagavanirktok A-2	Gilead Creek sandstone
90RR26	69° 06' 53"N, 148° 03' 56"W	Sagavanirktok A-2	Gilead Creek sandstone
90TJR013	69° 07' 57"N, 148° 05' 15"W	Sagavanirktok A-2	Gilead Creek sandstone(?)
90MM02 (measured section)	68° 39' 21"N, 150° 35' 42"W	Chandler Lake C-1	Nanushuk Group