

Public-data File 91-21b

**PALEONTOLOGY DATA
FROM 29 OUTCROP SAMPLES OF
LATE CRETACEOUS TO JURASSIC AGE,
SAGAVANIRKTOK QUADRANGLE,
NORTHEASTERN BROOKS RANGE, ALASKA**

by

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Quadrangle, northeastern Brooks Range, Alaska**

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Introduction

Field work was during 1990 and 1989 from a helicopter-supported base camp at Slope Mountain. Results of this report are part of a joint project between DGGs Energy Section and the Alaska Division of Oil and Gas.

Microfossil paleontology analyses (palynology and foraminifera) is by Micropaleo Consultants, Inc. Megafossil paleontology analyses is by William P. Elder, U.S. Geological Survey

The DGGs Public-data File 91-21 "series" (91-21a, b, c, and so forth) will address geology of the northeastern Brooks Range and adjacent North Slope:

Public-data File 91-21a, "Surficial geologic maps of the Sagavanirktok A-1, A-2, and B-2 Quadrangles, northeastern Brooks Range, Alaska", by C.F. Waythomas consists of three 1:63,360-scale maps with unit descriptions.

Foraminifera and palynomorph Summary

A total of 25 outcrop samples were processed and examined for Foraminifera and palynomorphs at Micropaleo Consultants Inc. in San Diego, California. Outcrop samples are from the northeastern North Slope, Alaska.

Foraminiferal sample preparations were by standard procedures. This process involved boiling the rock material in Quaternary-Q and washing over 20 and 200 mesh screens. A representative fauna and washed lithology were then picked into slides for examination.

Palynological preparations were made using hydrochloric, hydrofluoric, and nitric acid treatments. The resultant residues were further concentrated by a heavy liquid separation and a sieving/panning technique. For samples with adequate organic recoveries, two permanent slide mounts were made. Each slide contained different size fractions. One slide had particles larger than 20 microns, and the other had particles between 10 and 20 microns. For samples with small recoveries, only one slide with particles larger than 10 microns were mounted.

The interpretations for the age, zone, and environment of deposition are given for each discipline. A list of the recovered microfossils is listed for each sample. Foraminiferal analysis also includes the washed lithology description. The palynological analysis also includes percentages for the dominant kerogen materials

FORAMINIFERA RESULTS

The abundances reported in this section represent the following quantiles: VR = very rare (single specimen), R = rare (2-10 specimens), F = frequent (11-32 specimens), C = common (33-99 specimens), and A = abundant (100+ specimens).

<u>01) 90AMu 14-1</u>	Ivishak River
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera
<u>Washed lith.</u>	Dark brownish-gray shale.
<u>02) 90AMu 15-3</u>	Gilead Creek
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera
<u>Washed lith.</u>	Dark brownish-gray silty shale
<u>03) 90AMu 22-1</u>	Echooka River tributary
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera
<u>Washed lith.</u>	Dark gray to black well-indurated shale
<u>04) 90AMu 22-2</u>	Echooka River tributary
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera
	Tar? residue (F)
<u>Washed lith.</u>	Dark gray to black well-indurated shale

<u>05) 90AMu 22-3</u>	Echooka River tributary, Canning Fm, turbidites
<u>Age.</u>	Late Cretaceous
	Probable Senonian
<u>Zone.</u>	F-5
<u>Environment.</u>	Marginal Marine
<u>Fauna.</u>	<i>Trochammina ribstonensis</i> (R) <i>Trochammina whittingtoni</i> (VR)
<u>Washed lith.</u>	Dark brownish-gray sandy shale
<u>06) 90AMu 22-4</u>	Echooka River tributary, Canning Fm, turbidites
<u>Age.</u>	Late Cretaceous
	Probable Senonian
<u>Zone.</u>	F-5
<u>Environment.</u>	Marginal Marine
<u>Fauna.</u>	<i>Bathysiphon cf. vitta</i> (VR) <i>Trochammina whittingtoni</i> (VR)
<u>Washed lith.</u>	Dark brownish-gray sandy shale
<u>07) 90AMu 25</u>	West of Echooka River
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera
<u>Washed lith.</u>	Black well-indurated thinly-laminated shale
<u>08) 90AMu 27-2</u>	Echooka River, pebble shale, overlies Kemik Sandstone
<u>Age.</u>	Probable Early Cretaceous
	Possible Barremian
<u>Zone.</u>	F-12?
<u>Environment.</u>	Marine (Undifferentiated)
<u>Fauna.</u>	<i>Trochammina squamata</i> (R) Paper shale (F) Rounded frosted quartz floaters (F)
<u>Washed lith.</u>	Dark brownish-gray sandy shale
<u>09) 90AMu 27-3</u>	Echooka River downstream from Kemik Sandstone/Hue Shale interval
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera Paper shale (A)
<u>Washed lith.</u>	Black paper shale
<u>10) 90AMu 27-4</u>	As above; Hue Shale, gray shale
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera Paper shale (C) Tar? (R)
<u>Washed lith.</u>	Black paper shale

- 11) 90AMu 27-5
Age.
Environment.
Fauna.
Washed lith.
- As above; Hue Shale, bentonitic shale
Indeterminate
Indeterminate
Barren of Foraminifera
Paper shale (C)
Black paper shale
- 12) 90AMu 27-6
Age.
Environment.
Fauna.
Washed lith.
- As above; Hue Shale, with bentonitic seems
Indeterminate
Indeterminate
Barren of Foraminifera
Paper shale (F)
Dark brownish-gray to black thinly-laminated shale.
- 13) 90AMu 27-8
Age.
Environment.
Fauna.
Washed lith.
- Echooka River, Canning Formation
Indeterminate
Indeterminate
Barren of Foraminifera
Paper shale (F)
Brownish-gray thinly-laminated shale.
- 14) 90AMu 28-2
Age.
Environment.
Fauna.
Washed lith.
- Gilead Creek, west bank
Indeterminate
Indeterminate
Barren of Foraminifera
Paper shale (A)
Light & dark brownish-gray paper shale.
- 15) 90AMu 28-4
Age.
Environment.
Fauna.
Washed lith.
- Gilead Creek, west bank
Indeterminate
Indeterminate
Barren of Foraminifera
Megaspores (R)
Tar? residue (F)
Paper shale (A)
Dark brow paper shale.
- 16) 90AMu 28-4A
Age.
Environment.
Fauna.
Washed lith.
- Gilead Creek, west bank
Indeterminate
Indeterminate
Barren of Foraminifera
Paper shale (A)
Light & dark brownish-gray paper shale.
- 17) 90AMu 28-7
Age.
Environment.
Fauna.
Washed lith.
- Gilead Creek, west bank
Indeterminate
Indeterminate
Barren of Foraminifera
Dark brownish-gray well-indurated siltstone or silty shale.

- 18) 90AMu 35
Age.
Environment.
Fauna.
Washed lith.
- Ivishak River, Schrader Bluff Formation
Indeterminate
Indeterminate
Barren of Foraminifera
Dark brownish-gray siltstone or silty shale.
- 19) 90AMu 35-1
Age.
Environment.
Fauna.
Washed lith.
- Ivishak River, Schrader Bluff Formation
Indeterminate
Indeterminate
Barren of Foraminifera
Buff tan bentonitic? or tuffaceous? siltstone.
- 20) 90AMu 35-2
Age.
Environment.
Fauna.
Washed lith.
- Ivishak River, Schrader Bluff Formation
Indeterminate
Indeterminate
Barren of Foraminifera
Light brownish-gray bentonitic? or tuffaceous? siltstone.
- 21) 90AMu 35-4
Age.
Environment.
Fauna.
Washed lith.
- Ivishak River, Schrader Bluff Formation
Indeterminate
Indeterminate
Barren of Foraminifera
Black well-indurated thinly-laminated shale.
- 22) 90AMu 35-5
Age.
Environment.
Fauna.

Washed lith.
- Ivishak River, Schrader Bluff Formation
Indeterminate
Indeterminate
Barren of Foraminifera
Pyrite (R)
Oil staining (R)
Dark brownish-gray silty shale.
- 23) 90AMu 39
Age.
Environment.
Fauna.
Washed lith.
- North side Savlukviayak River, Torok-Tuktu
Indeterminate
Indeterminate
Barren of Foraminifera
Dark gray shale.
- 24) 90AMu 41
Age.
Environment.
Fauna.
Washed lith.
- Near VABM Inter
Indeterminate
Indeterminate
Barren of Foraminifera
Dark gray to black micaceous siltstone or silty shale.
- 25) 90AMu 44
Age.
Environment.
Fauna.
Washed lith.
- North of Lupine anticline
Indeterminate
Indeterminate
Barren of Foraminifera
Dark gray to black iron-stained thinly-laminated shale.

PALYNOLOGY RESULTS

The abundances for the palynomorphs represent the following quantities: VR = very rare (single specimen), R = rare (2-5 specimens), F = frequent (6-15 specimens), C = common (16-30 specimens), and A = abundant (greater than 30 specimens).

<u>01) 90AMu 14-1</u>	Ivishak River
<u>Age.</u>	Senonian
<u>Environment.</u>	Undifferentiated
<u>Palynomorphs.</u>	Marine Undifferentiated bisaccates (F) <i>Gleicheniidites senonicus</i> (F) <i>Chatangiella</i> cf. <i>C. blapertura</i> (F) <i>Laciniadinium biconiculum</i> (R)
<u>Kerogen.</u>	40% herbaceous; 60% woody-fusinitic
<u>02) 90AMu 15-3</u>	Gilead Creek
<u>Age.</u>	Campanian
<u>Zone.</u>	P-T12
<u>Environment.</u>	Nonmarine
<u>Palynomorphs.</u>	Undifferentiated bisaccates (F) <i>Aquilapollenites trialatus</i> (R)
<u>Kerogen.</u>	30% herbaceous; 70% woody-fusinitic
<u>03) 90AMu 22-1</u>	Echooka River tributary, Hue Shale, interbedded with tuff
<u>Age.</u>	Indeterminate
<u>Environment.</u>	No evidence of marine
<u>Palynomorphs.</u>	Tasmanaceae (VR)
<u>Kerogen.</u>	95% woody-fusinitic
<u>04) 90AMu 22-2</u>	Echooka River tributary, Hue Shale, interbedded with tuff
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Marginal marine?
<u>Palynomorphs.</u>	? <i>Deflandrea</i> sp. (VR)
<u>Kerogen.</u>	95% woody-fusinitic
<u>05) 90AMu 22-3</u>	As above, Canning Formation
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Nonmarine?
<u>Palynomorphs.</u>	Barren of palynomorphs
<u>Kerogen.</u>	95% woody-fusinitic
<u>06) 90AMu 22-4</u>	As above, Canning Formation
<u>Age.</u>	Senonian
<u>Environment.</u>	Undifferentiated
<u>Palynomorphs.</u>	Marginal marine <i>Deltoidospora</i> spp. (R) <i>Gleicheniidites senonicus</i> (VR) <i>Chatangiella</i> spp. fragments (R)
<u>Kerogen.</u>	95% woody-fusinitic

<p><u>07) 90AMu 25</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>West of Echooka River Indeterminate Nonmarine ? Barren of palynomorphs 99% woody-fusinitic</p>
<p><u>08) 90AMu 27-2</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>Echooka River, pebble shale Indeterminate Nonmarine ? Barren of palynomorphs 95% woody-fusinitic</p>
<p><u>09) 90AMu 27-3</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>As above, Hue Shale Indeterminate Nonmarine ? Barren of palynomorphs 100% woody-fusinitic</p>
<p><u>10) 90AMu 27-4</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>As above, Hue Shale Indeterminate Nonmarine ? Barren of palynomorphs 100% woody-fusinitic</p>
<p><u>11) 90AMu 27-5</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>As above, Hue Shale Indeterminate Nonmarine ? Barren of palynomorphs 100% woody-fusinitic</p>
<p><u>12) 90AMu 27-6</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>As above, Hue Shale Indeterminate Nonmarine ? Barren of palynomorphs 100% woody-fusinitic</p>
<p><u>13) 90AMu 27-8</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>As above, Hue Shale Indeterminate Nonmarine ? ? <i>Deltoidospora</i> sp. (VR) 95% woody-fusinitic</p>
<p><u>14) 90AMu 28-2</u> <u>Age.</u> <u>Environment.</u> <u>Palynomorphs.</u> <u>Kerogen.</u></p>	<p>Gilead Creek, west bank Senonian Undifferentiated Marine Undifferentiated bisaccates (C) <i>Cicatricosisporites</i> spp. (R) <i>Chatangiella</i> cf. <i>C. biapertura</i> (R) <i>Chatangiella</i> spp. (R) 20% amorphous; 70% herbaceous; 10% woody-fusinitic</p>

<u>15) 90AMu 28-4</u>	Gilead Creek, west bank
<u>Age.</u>	Senonian
	Undifferentiated
<u>Environment.</u>	Marine
<u>Palynomorphs.</u>	Undifferentiated bisaccates (F) <i>Chatangiella</i> spp. (F) <i>Laciniadinium biconiculum</i> (R)
<u>Kerogen.</u>	20% amorphous; 70% herbaceous; 10% woody-fusinitic
<u>16) 90AMu 28-4A</u>	Gilead Creek, west bank
<u>Age.</u>	Senonian
	Undifferentiated
<u>Environment.</u>	Marginal marine
<u>Palynomorphs.</u>	Undifferentiated bisaccates (R) <i>Chatangiella</i> spp. (R)
<u>Kerogen.</u>	20% amorphous; 70% herbaceous; 10% woody-fusinitic
<u>17) 90AMu 28-7</u>	Gilead Creek, west bank
<u>Age.</u>	Probable Senonian
	Undifferentiated
<u>Environment.</u>	Marginal marine
<u>Palynomorphs.</u>	<i>Chatangiella</i> spp. (R)
<u>Kerogen.</u>	10% herbaceous; 90% woody-fusinitic
<u>18) 90AMu 35</u>	Ivishak River, Schrader Bluff Formation
<u>Age.</u>	Campanian - Maestrichtian
	Possible Campanian
<u>Zone.</u>	Possible P-T12
<u>Environment.</u>	Marginal marine
<u>Palynomorphs.</u>	<i>Aquilapollenites</i> cf. <i>A. fusiformis</i> (VR) <i>Aquilapollenites</i> spp. (R) Taxodiaceae (R) <i>Chatangiella</i> spp. (R)
<u>Kerogen.</u>	40% herbaceous; 60% woody-fusinitic
<u>19) 90AMu 35-1</u>	Ivishak River, Schrader Bluff Formation
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Nonmarine
<u>Palynomorphs.</u>	Undifferentiated bisaccates (VR) <i>Laevigatosporites</i> sp. (VR)
<u>Kerogen.</u>	10% herbaceous; 90% woody-fusinitic
<u>20) 90AMu 35-2</u>	Ivishak River, Schrader Bluff Formation
<u>Age.</u>	Campanian - Maestrichtian
	Possible Campanian
<u>Zone.</u>	Possible P-T12
<u>Environment.</u>	Nonmarine
<u>Palynomorphs.</u>	<i>Aquilapollenites</i> cf. <i>A. triatatus</i> (VR) <i>Aquilapollenites</i> sp. (VR)
<u>Kerogen.</u>	10% herbaceous; 90% woody-fusinitic

<u>21) 90AMu 35-4</u>	Ivishak River, Schrader Bluff Formation
<u>Age.</u>	Santonian - Campanian
<u>Zone.</u>	P-M14
<u>Environment.</u>	Marine
<u>Palynomorphs.</u>	Undifferentiated bisaccates (A) <i>Cicatricosisporites</i> sp. (VR) <i>Chatangiella blapertura</i> (R) <i>Chatangiella ditissima</i> (F) <i>Chatangiella granulifera</i> (R) <i>Laciniadinium biconiculum</i> (VR)
<u>Kerogen.</u>	40% amorphous; 60% herbaceous
<u>22) 90AMu 35-5</u>	Ivishak River, Schrader Bluff Formation
<u>Age.</u>	Campanian
<u>Zone.</u>	P-T12
<u>Environment.</u>	Marginal marine
<u>Palynomorphs.</u>	Undifferentiated bisaccates (A) <i>Aquilapollenites trialatus</i> (R) <i>Deltoidospora</i> sp. (R) <i>Densosporites</i> spp. (reworked) (R) <i>Chatangiella</i> sp. (VR) <i>Michrhystridium</i> sp. (VR)
<u>Kerogen.</u>	70% herbaceous; 30% woody-fusinitic
<u>23) 90AMu 39</u>	North side Saviukvlayak River
<u>Age.</u>	Jurassic - Cretaceous
<u>Environment.</u>	Undifferentiated
<u>Palynomorphs.</u>	No evidence of marine <i>Gleichenioidites senonicus</i> (VR)
<u>Kerogen.</u>	99% woody-fusinitic
<u>24) 90AMu 41</u>	Near VABM Inter
<u>Age.</u>	Indeterminate
<u>Environment.</u>	Nonmarine ?
<u>Palynomorphs.</u>	Barren of palynomorphs
<u>Kerogen.</u>	100% woody-fusinitic
<u>25) 90AMu 44</u>	North of Lupine anticline
<u>Age.</u>	Santonian - Campanian
<u>Zone.</u>	P-M14
<u>Environment.</u>	Marine
<u>Palynomorphs.</u>	Undifferentiated bisaccates (A) Taxodiaceae (R) <i>Chatangiella ditissima</i> (F) <i>Chatangiella</i> spp. (C) <i>Laciniadinium biconiculum</i> (A)
<u>Kerogen.</u>	20% amorphous; 70% herbaceous; 10% woody-fusinitic

MACROPALEONTOLOGY

Macropaleontology Summary

Macrofossils were examined by William P. Elder (U.S. Geological Survey, Menlo Park, CA).

90AMu43; USGS Mesozoic Locality: M8675

Age: *

Taxa present:

Bivalves: Protocardia sp., Solecurtus? aff. chapmani Imlay, Tellina sp.
Gastropod: Naticid

Remarks: Bivalves are typical of the Schrader Bluff Formation.

90AMu29-2; USGS Mesozoic Locality: M8676

Age: Probably early Turonian

Taxa present:

Bivalves: Mytiloides mytiloides (Mantell)?

Remarks: This broken inoceramid is probably the above species. Its mode of preservation is similar to what I have seen in some samples from the Seabee Formation.

90AMu36; USGS Mesozoic Locality: M8680

Age: *

Taxa present:

Bivalves: Astarte sp.?, Mytilus sp., Pleuromya sp.,
Protocardia sp. Solecurtus? aff. chapmani Imlay

Remarks: Bivalves are typical of the Schrader Bluff Formation.

90IM17; USGS Mesozoic Locality: M8683

Age: late Albian-Cenomanian

Taxa present:

Bivalves: "Inoceramus" dunveganensis McLean

Remarks: This bivalve is characteristic of the Cenomanian, but some forms may extend into the late Albian.

* The Schrader Bluff Formation ranges from Coniacian to Maestrichtian (ed.).