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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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-O 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 quantities: 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).

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

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

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

18) 90AMu 35	Ivishak River, Schrader Bluff Formation
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera
Washed lith.	Dark brownish-gray siltstone or silty shale.
19) 90AMu 35-1	Ivishak River, Schrader Bluff Formation
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera
Washed lith.	Buff tan bentonitic? or tuffaceous? siltstone.
20) 90AMu 35-2	Ivishak River, Schrader Bluff Formation
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera
Washed lith.	Light brownish-gray bentonitic? or tuffaceous? siltstone.
21) 90AMu 35-4	Ivishak River, Schrader Bluff Formation
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera
Washed lith.	Black well-indurated thinly-laminated shale.
22) 90AMu 35-5	Ivishak River, Schrader Bluff Formation
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera Pyrite (R) Oil staining (R)
Washed lith.	Dark brownish-gray silty shale.
23) 90AMu 39	North side Saviukviayak River, Torok-Tuktu
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera
Washed lith.	Dark gray shale.
24) 90AMu 41	Near VABM Inter
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera
Washed lith.	Dark gray to black micaceous siltstone or silty shale.
25) 90AMu 44	North of Lupine anticline
Age.	Indeterminate
Environment.	Indeterminate
Fauna.	Barren of Foraminifera
Washed lith.	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).

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

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

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

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