

Biostratigraphy Report

Palynology and Micropaleontology

Alaska Outcrop Samples (Set #2): 2006 Field Season

SUMMARY

Ten outcrop samples from the 2006 Field Season were analyzed for palynological and micropaleontological content and age interpretation. All samples were analyzed for both organic-walled palynomorphs and foraminifera. The foraminiferal analysis includes a washed lithology description, and the palynological analysis includes a summary of the principal kerogen components of each sample.

Age interpretation for the sample set based on palynology is late Aptian/Albian; the foraminiferal-based age interpretation is slightly older, Barremian, for all samples. An integrated age pick thus gives the most likely range of Aptian to Barremian for the suite. All samples were deposited in outer neritic to upper bathyal settings based on benthic foraminifera.

The interpretations for the age, zone and environment of deposition are given for each discipline. A list of the recovered microfossils is provided for each sample. The foraminiferal analysis also includes a washed lithology description.

The foraminiferal abundances represent the following quantities: V = very rare (single specimen), R = rare (2 - 5 specimens), F = frequent (6 - 25 specimens), C = common (26 - 100) specimens), A = abundant (101 - 999 specimens) and P = prolific (1000+ specimens).

RESULTS

06DAV003

Palynology

Age: late Aptian/Albian.

Comments: Kerogen mixed dark brown amorphogen and dark brown to black sharp-edged structural material, rare tracheids, other plant fragments. Palynomorphs abundant, dominantly dinoflagellate cysts, but very poorly preserved, many fragmentary, most unidentifiable.

Flora:

Spiniferites sp. - indet.
Chlamydophorella nyei
Pterodinium sp. - indet.
Microdinium opacum
Oligosphaeridium complex - numerous
Tenua hystrix
Impletosphaeridium? sp. - indet.
Gardodinium trabeculosum
Osmundacidites wellmanii
Lycospora pusilla (reworked Mississippian)
Dictyopyxidia imperfecta (?)
Deltoidospora sp. - indet.
bisaccate gymnosperm pollen – indet., very rare

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Dark gray to black slightly sandy somewhat paper shale.

Fauna:

arenaceous spp. (large, coarse) (F)
Gaudryina tailleuri (F)
Gaudryina tappanae (R)
Haplophragmoides coronis (R)
Haplophragmoides duoflatis (F)
Haplophragmoides topagorukensis (R)
Paper shale (C)
Rounded frosted quartz floaters (C)

06DAV027

Palynology

Age: late Aptian/Albian

Comments: Kerogen dominantly dark brown to black amorphogen, lesser sharp-edged mostly elongated black structured grains. Relatively few recognizable palynomorphs. Considerable reworked Mississippian material.

Flora:

Gardodinium trabeculosum
Densosporites spp. - indet. (reworked Mississippian), numerous
Oligosphaeridium complex
bisaccate gymnosperm pollen – indet., very rare
Exesipollenites tumulus
Cycadopites sp. - indet.
Lycospora pusilla (reworked Mississippian), numerous

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Black organic-rich paper shale.

Fauna:

Gaudryina tailleuri (F)
Gaudryina tappanae (A)
Haplophragmoides coronis (F)
Haplophragmoides duoflatis (F)
Haplophragmoides inflatigrandis (R)
Trochammina instowensis (F)
Trochammina squamata (C)
Paper shale (C)
Rounded frosted quartz floaters (F)

06DAV049

Palynology

Age: indeterminate

Comments: Kerogen dominantly black or nearly black amorphogen, lesser sharp-edged ~equant polygonal and elongate dark brown to black structured grains. Nearly barren of identifiable palynomorphs.

Flora:

bisaccate gymnosperm pollen – indet., very rare

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Outer Neritic (Outer Shelf)

Washed Lithology: Dark gray to black organic rich paper shale.

Fauna:

arenaceous spp. (large, coarse) (R)

Haplophragmoides duoflatis (R)

Trochammmina instowensis (R)

Paper shale (C)

Rounded frosted quartz floaters (F)

06DAV081

Palynology

Age: Aptian

Comments: Kerogen mainly brown to dark brown sharp-edged structural material, tracheids, other plant fragments. Palynomorphs abundant, diverse.

Flora:

Circulodinium sp. - indet.

Antulsporites sp. - indet.

Impletosphaeridium? spp. - indet., numerous

Pterodinium sp. - indet.

Cingulizonates bialatus (reworked Mississippian)

Osmundacidites wellmanii

Deltoidospora sp. - indet.

Oligosphaeridium complex

Chlamydophorella sp. - indet.

Chlamydophorella nyei

bisaccate gymnosperm pollen – relatively rare

Densosporites spp. - indet. (reworked Mississippian)

Lycospora pusilla (reworked Mississippian), numerous

Gardodinium trabeculosum

Spiniferites sp. - indet.

Batioladinium micropodium

Lycospora noctuina (reworked Mississippian)

Spelaeotriletes cf. *triangulus* (reworked Mississippian)

Corollina torosa

Diatomozonotriletes saetosus (reworked Mississippian)
Pterodinium verrucosum
Auroraspora sp. - indet. (reworked Mississippian)
Gleicheniidites senonicus
Vitreisporites pallidus
Cicatricosisporites sp. - indet.
Neoraistrickia sp. - indet.
Cribroperidinium edwardsii

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Dark gray to black organic rich paper shale.

Fauna:

Ammodiscus sp. (very small, thin) (F)
Bathysiphon vitta (F)
Gaudryina subcretacea (R)
Gaudryina tailleuri (F)
Gaudryina tappanae (R)
Haplophragmoides coronis (F)
Haplophragmoides duoflatis (F)
Hippocrepina barksdalei (R)
Trochammina instowensis (R)
Paper shale (C)

06DAV083

Palynology

Age: Aptian

Comments: Kerogen virtually identical to 081. Palynomorphs abundant, less diverse.

Flora:

Pterodinium sp. - indet.
Deltoidospora sp. - indet.
Oligosphaeridium complex
Osmundacidites wellmanii

Pterodinium verrucosum
Gardodinium trabeculosum
Densosporites spp. - indet. (reworked Mississippian), numerous
Spelaotriletes cf. *triangulus* (reworked Mississippian)
Crassispora sp. - indet. (reworked Mississippian)
bisaccate gymnosperm pollen – rare
Vitreisporites pallidus
Impletosphaeridium? sp. - indet.
Pterodinium “*spongiosum*”
Lycospora noctuina (reworked Mississippian)
Circulodinium sp. - indet.
Microdinium? sp. - indet.
Pterospermella cf. *australiensis*
Circulodinium distinctum

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Black organic rich paper shale.

Fauna:

Ammobaculites fragmentarius (R)
Gaudryina tailleuri (R)
Gaudryina tappanae (V)
Haplophragmoides coronis (F)
Trochammina conicominita (V)
Trochammina instowensis (R)
Trochammina squamata (R)
Trochamminoides sp. (small, thin) (R)
Paper shale (C)
Rounded frosted quartz floaters (R)

06DAV103

Palynology

Age: Aptian

Comments: Kerogen dominantly dark brown to black amorphogen, lesser sharp-edged ~equant polygonal and elongate dark brown to black structured grains,

similar to 049. Sparse palynomorphs, most fragmentary, unidentifiable.

Flora:

Corollina torosa
Cingulizonates bialatus (reworked Mississippian)
Lycospora pusilla (reworked Mississippian)
Oligosphaeridium complex, numerous
Anapiculatisporites cf. baccatus (reworked Mississippian)
Retitriletes sp. - indet.
Densosporites sp. - indet. (reworked Mississippian)
Chlamydophorella nyei

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Outer Neritic (Outer Shelf)

Washed Lithology: Black heavily iron stained somewhat paper shale.

Fauna:

Ammodiscus sp. (very small, thin) (V)
Trochammina conicominita (V)
Paper shale (F)
Pyrite (F)
Rounded frosted quartz floaters (R)

06DAV135

Palynology

Age: Aptian

Comments: Kerogen mixed dark brown amorphogen and dark brown to black sharp-edged equant polygonal and elongate grains. Sparse palynomorphs.

Flora:

Deltoidospora sp. - indet.
Retitriletes sp. - indet.
Kraeuselisporites breviculus
Gardodinium trabeculosum
Cicatricosisporites sp. - indet.
Impletosphaeridium? sp. - indet.

bisaccate gymnosperm pollen – indet., rare
Oligosphaeridium complex, numerous
Osmundacidites wellmanii
Corollina torosa

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Black organic rich paper shale.

Fauna:

Ammobaculites reophacoides (F)
arenaceous spp. (large, coarse) (F)
Gaudryina tappanae (F)
Haplophragmoides coronis (F)
Haplophragmoides duoflatis (C)
Haplophragmoides goodenoughensis (F)
Haplophragmoides inflatigrandis (R)
Pseudobolivina rayi (F)
Trochammina conicominita (F)
Trochammina squamata (F)
Uvigerinammina manitobensis (R)
Paper shale (C)

06DAV149

Palynology

Age: Aptian

Comments: Kerogen very similar to 135, with rare tracheids, other plant material.
Palynomorphs abundant.

Flora:

Chlamydophorella nyei
Densosporites spp. - indet., numerous (reworked Mississippian)
Cicatricosisporites spp. - indet.
Osmundacidites wellmanii
Foraminisporis wonthaggiensis
Deltoidospora spp. - indet., numerous

Corollina torosa
Oligosphaeridium complex
Lycospora pusilla (reworked Mississippian)
bisaccate gymnosperm pollen – indet., rare
Triporoletes reticulatus
Gardodinium trabeculosum
Scriniodinium? sp. - indet.
Microdinium opacum
Apiculiretusispora microseta (reworked Mississippian)
Canningia? sp. - indet.
Retitriletes sp. - indet.
Pterospermella sp. - indet.
Retispora lepidophyta (reworked Late Devonian)
Cassiculosphaeridia? sp. - indet.
Impletosphaeridium? sp. - indet.
Lycospora noctuina (reworked Mississippian)

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Dark grey to black somewhat paper shale.

Fauna:

Ammobaculites fragmentarius (R)
Ammodiscus mackenziensis (R)
Bathysiphon vitta (R)
Gaudryina tailleuri (F)
Gadryina tappanae (R)
Haplophragmoides coronis (F)
Haplophragmoides excavatus (F)
Thuramminoides septagonalis (R)
Trochammina instowensis (F)
Trochammina squamata (R)
Trochamminoides sp. (small- thin) (F)
Paper shale (F)

06DAV164

Palynology

Age: Aptian

Comments: Kerogen very similar to 135. Palynomorphs common, many fragmentary.

Flora:

Oligosphaeridium complex - numerous
Deltoidospora spp. - indet.
Osmundacidites wellmanii
Retitriletes sp. - indet.
Cassiculosphaeridia? sp. - indet.
Densosporites spp. - indet. several (reworked Mississippian)
Aequitriradites? sp. - indet.
Stereigranisporis? sp. - indet.
Pluricellaesporites sp. - indet.

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Dark grey to black iron stained somewhat paper shale.

Fauna:

Ammobaculites fragmentarius (R)
Ammobaculites reophacoides (F)
Gaudryina tailleuri (F)
Gaudryina tappanae (R)
Haplophragmoides coronis (F)
Haplophragmoides duoflatis (F)
Haplophragmoides goodenoughensis (R)
Haplophragmoides inflatigrandis (V)
Trochammina conicominuta (R)
Trochammina squamata (F)
Fish debris (R)
Paper shale (F)
Pyrite (F)

06DAV180

Palynology

Age: probable Aptian

Comments: Kerogen dominantly dark brown to black amorphogen, minor sharp-edged dark brown to black structured material. Palynomorphs very sparse, fragmentary, mostly unidentifiable.

Flora:

Cyclonephelium compactum

Oligosphaeridium complex

Gardodinium trabeculosum

Micropaleontology

Age: Barremian (Zone F-12)

Environment: Upper Bathyal (Upper Slope)

Washed Lithology: Black iron stained somewhat paper shale.

Fauna:

Ammobaculites fragmentarius (R)

Gaudryina tailleuri (F)

Gaudryina tappanae (F)

Haplophragmoides coronis (R)

Haplophragmoides duoflatis (F)

Trochammina conicominita (F)

Gypsum? (F)

Paper shale (F)

Rounded frosted quartz floaters (R)