G.S.C. O.F. 1873 PALYNOLOGICAL ANALYSIS OF THE INTERVAL 980-4505M, LINNET E-63, GRAND BANKS

This document was produced by scanning the original publication.

Ce document est le produit d'une numérisation par balayage de la publication originale.

BUJAK DAVIES GROUP

PALYNOLOGICAL ANALYSIS OF THE INTERVAL 980-4505M, LINNET E-~~36~~ 83, GRAND BANKS

REPORT No. 86-0066

February, 1988

CALGARY, ALBERTA

OPEN FILE
DOSSIER PUBLIC
1873
GEOLOGICAL SURVEY
COMMISSION GEOLOGIQUE
OTTAWA

BIOSTRATIGRAPHIC SUMMARY

980-1110m:	*Deflandrea heterophlycta* Zone (early Oligocene)
1130-1650m:	*Diphyes colligerum* Zone (late Eocene)
1670-2110m:	*Adnatosphaeridium reticulense* Zone (middle Eocene)
2130-2470m:	*Areoligera senonensis* Zone (early Eocene)
2490-2500m:	*Ceratiopsis speciosa* Zone (late Paleocene)
2520-2530m:	*Palaeoperidinium pyrophorum* Zone (early Paleocene)
2550-2650m:	*Dinogymnium euclaense* Zone (Maastrichtian)
2670-2710m:	*Odontochitina operculata* Zone (Campanian)
2730-2770m:	Zone not differentiated (Coniacian to Santonian)
2790-2800m:	*Surculosphaeridium longifurcatum* Peak Zone (Turonian)
2820-3130m:	*Kiokansium polypes* Zone (Cenomanian)
3150-3220m:	*Chichaouadinium vestitum* Zone (Albian)
3240-3760m:	*Parvisaccites amplus* Zone (early Albian)
3780-4120m:	*Subtilisphaera perlucida* Zone (Aptian)

4140-4240m: Possible Rubospora Zone (possible Mississippian)

4260-4505m: Zone not assigned (Ordovician to Silurian)

SELECTED PALYNOMORPHS

Listings show highest occurrences unless otherwise specified.

(+) indicates marker species.

980-1110m: Deflandrea heterophlycta Zone (early Oligocene)

980-990m	Caryapollenites simplex Corylus #LA Dapsilidinium pastielsii Momipites coryloides (+) Operculodinium centrocarpum Paralecaniella indentata Phthanoperidinium #LG (+) Quercoidites #LA
1010-1020m	Areosphaeridium #LL (+) Chiropteridium mespilanum Cordosphaeridium? parvum (+) Cyclonephelium sp. A, Will. & Brid. 1975 (+) Glaphyrocysta sp. indet. (+) Lentinia serrata (+) Tiliaepollenites vescipites
1070-1080m	Deflandrea phosphoritica Wetzeliella articulata (+)
1100-1110m	Cribroperidinium giuseppei

1130-1650m: Diphyes colligerum Zone (late Eocene)

1130-1140m	Areoligera undulata (+) Cordosphaeridium cantharellum Glaphyrocysta intricata (small form) Glaphyrocysta microfenestrata Glaphyrocysta semitecta (+) Phthanoperidinium comatum Phthanoperidinium levimurum Thalassiphora pelagica
1160-1170m	Dinopterygium cladoides
1190-1200m	Glaphyrocysta laciniiforme (+) Rouseisporites #LA
1220-1230m	Trinovantedinium boreale
1340-1350m	Azolla spp.
1400-1410m	Jusseaia sp., Piel 1971
1520-1530m	Quadrina pallida
1580-1590m	Dapsilidinium simplex Palaeocystodinium golzowense
1640-1650m	Areosphaeridium multicornutum (small) (+) Cicatricosisporites dorogensis Gochtodinium simplex

1670-2110m: Adnatosphaeridium reticulense Zone (middle Eocene)

1670-1680m	Areoligera senonensis (+) Phthanoperidinium multispinosum
1700-1710m	Araneosphaera araneosa Areosphaeridium fenestratum Systematophora placacantha
1730-1740m	Cordosphaeridium minumum
1760-1770m	Glaphyrocysta vicina Hystrichokolpoma salacium
1790-1800m	Adnatosphaeridium multispinosum Glaphyrocysta spineta (+) Hystrichokolpoma unispinum (+) Phthanoperidinium alectrolophum
1850-1860m	Cordosphaeridium inodes inodes
1880-1890m	Areoligera senonensis (+) Cordosphaeridium gracile Deflandrea eocenica (+) Hystrichokolpoma cinctum

Comment: Extremely low recovery at 1920m, 1980, 2070m.

1950-1960m	Diphyes colligerum Distatodinium paradoxum Rhombodinium draco
2040-2050m	Hafniasphaera septata Thalassiphora patula

2130-2470m: Areoligera senonensis Zone (early Eocene)

2130-2140m	Systematophora #LC (+)
2220-2230m	Areoligera senonensis (Common)
2250-2260m	Achomosphaera alcicornu Apectodinium homomorphum Apectodinium hyperacanthum Lentinia wetzelii Wetzeliella meckelfeldensis (+)
2280-2290m	Apectodinium homomorphum (+) (Common) Eocladopyxis peniculatum
2310-2320m	Hafniasphaera cryptovesiculata (+) Homotryblium pallidum
2340-2350m	Areosphaeridium sp. A, Will. Dracodinium solidum (+) Lanternosphaeridium radiatum Polysphaeridium subtile Spiniferites cornutus Systematophora #LE (+)

Turbiosphaera filosa (+)

2370-2380m
Adnatosphaeridium vittatum
Cordosphaeridium fibrospinosum
Dracodinium condylos (+)
Kisselovia coleothrypta

2400-2410m
Apectodinium homomorphum (+) (Abundant)
Apectodinium hyperacanthum (+) (Abundant)
Areoligera senonensis (+) (Abundant)
Hystrichokolpoma #LP (+)

2430-2440m
Cordosphaeridium inodes longipes

2460-2470m
Cordosphaeridium tiara
Homotryblium abbreviatum
Membranilarnacia ursulae
Senegalinium #LA (+)

2490-2500m: Ceratiopsis speciosa Zone (late Paleocene)

2490-2500m
Camarozonosporites #LB
Ceratiopsis speciosa glabra (+)
Ceratiopsis speciosa speciosa (+)
Deflandrea oebisfeldensis (+)

2520-2530m: Palaeoperidinium pyrophorum Zone (early Paleocene)

2520-2530m
Ceratiopsis diebelii (+)
Ceratiopsis pannucea

Palaeocystodinium australinum (+)
Palaeocystodinium gabonense
Palaeoperidinium pyrophorum (+)

2550-2650m: Dinogymnium euclaense Zone (Maastrichtian)

2550-2560m Alterbia minor
Isabelidinium cretaceum (+)
Oligosphaeridium complex

2610-2620m Phelodinium magnificum

2640-2650m Isabelidinium belfastense (+)

2670-2710m: Odontochitina operculata Zone (Campanian)

2670-2680m Chatangiella tripartita (+)

2730-2770m: zone not differentiated (Coniacian to Santonian)

Comment: mostly Eocene cavings.

2730-2740m Cyclonephelium distinctum
Surculosphaeridium longifurcatum (+)

2760-2770m Palaeohystrichophora infusorioides
Triprojectus magnus

2790-2800m: Surculosphaeridium longifurcatum Peak Zone (Turonian)

2790-2800m	Cyclonephelium vannophorum (+) Rugubivesiculites rugosus Senoniasphaera reticulata (+) Surculosphaeridium longifurcatum (+) (Present)

2820-3130m: Kiokansium polypes Zone (Cenomanian)

2820-2830m	Abiespollenites microreticulatus (+) Biretisporites potoniae (+) Chichaouadinium #EB (+) Odontochitina operculata Rugubivesiculites reductus
2850-2860m	Costatoperforosporites markovae (+) Silicisphaera buspina (Present)
2880-2890m	Aptea polymorpha (Present) Cyclonephelium brevispinum Podocarpidites potomacensis
2910-2920m	Parvisaccites radiatus Rugubivesiculites minimus Rugubivesiculites rugosus (Rare)
2970-2980m	Kiokansium polypes (+)

3000-3010m *Vesperopsis* #EA

3090-3100m *Cleistosphaeridium aciculare*

3150-3220m: Chichaouadinium vestitum Zone (Albian)

3150-3160m
Ischyosporites estherae (+)
Leiotriletes equiexinus
Leptolepidites bossus
Podocarpidites potomacensis

3180-3190m
Abiespollenites microreticulatus
Acritosporites excavatus (+)
Chichaouadinium vestitum (+)
Cicatricosisporites undatus
Contignisporites glebulentus
Exochosphaeridium striolatum
Plicatella bilateralis

3210-3220m
Biretisporites potoniae
Parvisaccites amplus (Questionably present)
Phyllocladites microreticulatus
Plicatella pseudomacrorhyza
Rugubivesiculites rugosus (Common)

3240-3760m: Parvisaccites amplus Zone (early Albian)

3240-3250m
Cedripites canadensis
Cicatricosisporites augustus
Crybelosporites pannuceus
Parvisaccites amplus (+)

3270-3280m	Cicatricosisporites #ECD Parvisaccites radiatus
3300-3310m	Distaltriangulisporites costatus
3330-3340m	Balmeisporites holodictyus Costatoperforosporites robustus Phyllocladites inchoatus
3360-3370m	Laevigatosporites mesozoicus
3540-3550m	Cicatricosisporites nankingensis (+) Plicatella bifurcata
3630-3640m	Oligosphaeridium asterigerum (+)
3660-3670m	Kleithriasphaeridium loffrense
3690-3700m	*Permian reworking Cicatricosisporites apicanalis Vitreisporites pallidus
3720-3730m	Podocarpidites epistriatus
3750-3760m	Foraminisporis asymmetrica Oligosphaeridium totum (+)

3780-4120m: Subtilisphaera perlucida Zone (Aptian)

3780-3790m	Densoisporites microrugulatus Ovoidinium scabrosum Subtilisphaera perlucida
3870-3880m	Aptea polymorpha Canningia ringnesiorum Cicatricosisporites #EAL (Questionably present) Plicatella potomacensis Taurocusporites spackmanii
3900-3910m	Astrocysta cretacea Plicatella cristata Plicatella tricornitata
3930-3940m	Callialasporites monoalasporus
3960-3970m	Parvisaccites amplus (Common)

4140-4240m: possible Rugospora Zone (possible Mississippian)

Comment: Mostly middle Cretaceous cavins and lignitic mud additives. High TAI.

4140-4150m	Leiotriletes spp.
4170-4180m	Rugospora sp. indet.

4260-4505m: Zone not assigned (Ordovician to Silurian)

Comment: Highly thermally altered with ghosts of palynomorphs.

4260-4270m	*Cymatiosphaera* sp. indet. *Micrhystridium* sp. indet.
4290-4300m	*Protoleiosphaeridium diaphanium* (+) (Rare)
4320-4330m	*Electoriskos* sp. indet. (+) *Micrhystridium stellatum* *Protoleiosphaeridium diaphanium* (Common)
4405-4415m	*Polyancystrodorus* sp. indet. (+)
4435-4445m	*Barakella/Acanthodiacrodium* sp. indet. (+) *Multiplicisphaeridium* sp. indet. (+)
4465-4475m	*Actipilion* sp. indet. (+)

APPENDIX A

Alphabetical Listing of Species Shown on Occurrence Chart: Marine Dinoflagellates

Index number	Taxon names
93	Achomosphaera #LF
56	Achomosphaera alcicornu
4	Achomosphaera ramulifera
42	Adnatosphaeridium multispinosum
71	Adnatosphaeridium vittatum
89	Alterbia minor
57	Apectodinium homomorphum
58	Apectodinium hyperacanthum
118	Aptea anaphrissa
108	Aptea polymorpha
36	Araneosphaera araneosa
34	Areoligera senonensis
17	Areoligera undulata
5	Areosphaeridium #LL
37	Areosphaeridium fenestratum
32	Areosphaeridium multicornutum (small)
64	Areosphaeridium sp. A, Will. & Bujak '77
126	Astrocysta cretacea
124	Canningia ringnesiorum
125	Canningia sp. indet.
84	Ceratiopsis diebelii
85	Ceratiopsis pannucea
81	Ceratiopsis speciosa glabra
82	Ceratiopsis speciosa speciosa
95	Chatangiella tripartita
103	Chichaouadinium #EB
115	Chichaouadinium vestitum
6	Chiropteridium mespilanum
127	Chlamydophorella nyei
113	Cleistosphaeridium aciculare
128	Cleistosphaeridium spp.
18	Cordosphaeridium cantharellum
72	Cordosphaeridium fibrospinosum
47	Cordosphaeridium gracile
46	Cordosphaeridium inodes inodes
76	Cordosphaeridium inodes longipes
39	Cordosphaeridium minumum
77	Cordosphaeridium tiara
7	Cordosphaeridium? parvum
16	Cribroperidinium giuseppei
114	Cribroperidinium sp. indet.
109	Cyclonephelium brevispinum
97	Cyclonephelium distinctum
110	Cyclonephelium paucispinum
8	Cyclonephelium sp. A, Will. & Brid. 1975
100	Cyclonephelium vannophorum
1	Dapsilidinium pastielsii
30	Dapsilidinium simplex
48	Deflandrea eocenica
83	Deflandrea oebisfeldensis
14	Deflandrea phosphoritica
121	dinoflagellate indeterminate
25	Dinopterygium cladoides
50	Diphyes colligerum
51	Distatodinium paradoxum
73	Dracodinium condylos
65	Dracodinium solidum
61	Eocladopyxis peniculatum
116	Exochosphaeridium striolatum
19	Glaphyrocysta intricata (small form)
27	Glaphyrocysta laciniiforme
20	Glaphyrocysta microfenstrata
21	Glaphyrocysta semitecta
9	Glaphyrocysta sp. indet.
43	Glaphyrocysta spineta
40	Glaphyrocysta vicina
33	Gochtodinium simplex
62	Hafniasphaera cryptovesiculata
53	Hafniasphaera septata
78	Homotryblium abbreviatum
63	Homotryblium pallidum
75	Hystrichokolpoma #LP
49	Hystrichokolpoma cinctum
26	Hystrichokolpoma rigaudiae
41	Hystrichokolpoma salacium
44	Hystrichokolpoma unispinum
101	Hystrichosphaeridium cooksoniae
94	Isabelidinium belfastense
90	Isabelidinium cretaceum
111	Kiokansium polypes
74	Kisselovia coleothrypta
120	Kleithriasphaeridium loffrense
106	Kleithriasphaeridium readii
66	Lanternosphaeridium radiatum
10	Lentinia serrata
59	Lentinia wetzelii
11	Lingulodinium machaerophorum
79	Membranilarnacia ursulae
104	Odontochitina operculata
119	Oligosphaeridium asterigerum
91	Oligosphaeridium complex
122	Oligosphaeridium totum
2	Operculodinium centrocarpum
86	Palaeocystodinium australinum
87	Palaeocystodinium gabonense
31	Palaeocystodinium golzowense
98	Palaeohystrichophora infusorioides
88	Palaeoperidinium pyrophorum
92	Phelodinium magnificum
3	Phthanoperidinium #LG
45	Phthanoperidinium alectrolophum
22	Phthanoperidinium comatum
23	Phthanoperidinium levimurum
35	Phthanoperidinium multispinosum

Marine Dinoflagellates: cont'd

105	Plicatella spp.
67	Polysphaeridium subtile
52	Rhombodinium draco
80	Senegalinium #LA
102	Senoniasphaera reticulata
107	Silicisphaera buspina
68	Spiniferites cornutus
28	Spiniferites pseudofurcatus
12	Spiniferites ramosus ramosus
123	Subtilisphaera perlucida
96	Surculosphaeridium longifurcatum
55	Systematophora #LC
69	Systematophora #LE
13	Systematophora ancyrea
38	Systematophora placacantha
117	Systematophora spp.
54	Thalassiphora patula
24	Thalassiphora pelagica
29	Trinovantedinium boreale
99	Triprojectus magnus
70	Turbiosphaera filosa
112	Vesperopsis #EA
15	Wetzeliella articulata
60	Wetzeliella meckelfeldensis

APPENDIX A (cont'd)

Alphabetical Listing of Species Shown on Occurrence Chart: Pollen and Spores

Index number	Taxon names
34	Abiespollenites microreticulatus
48	Acritosporites excavatus
29	Alisporites bilateralis
67	Alisporites grandis
1	Alnipollenites verus
31	Araucariacites australis
43	Ascodinium sp.
23	Azolla sp. indet.
65	Balmeisporites holodictyus
2	Betulaceoipollenites betuloides
35	Biretisporites potoniae
90	Callialasporites monoalasporus
26	Camarozonosporites #LB
3	Caryapollenites simplex
54	Cedripites canadensis
60	Chasmatosporites major
84	Cicatricosisporites #EAL
58	Cicatricosisporites #ECD
93	Cicatricosisporites #EM
91	Cicatricosisporites angicanalis
72	Cicatricosisporites apicanalis
55	Cicatricosisporites augustus
25	Cicatricosisporites dorogensis
69	Cicatricosisporites nankingensis
32	Cicatricosisporites sp. indet.
49	Cicatricosisporites undatus
75	Concavissimisporites punctatus
50	Contignisporites glebulentus
4	Corylus #LA
37	Costatoperforatosporites markovae
66	Costatoperforosporites robustus
38	Costatoperforosporites spp.
56	Crybelosporites pannuceus
28	Cyathidites australis
27	Cyathidites minor
5	Cyathidites sp. indet.
44	Deltoidospora hallii
78	Densoisporites microrugulatus
61	Distaltriangulisporites costatus
15	Ericipites antecursorioides
21	Ericipites compactipolleniatus
76	Foraminisporis asymmetrica
82	Gleicheniidites senonicus
45	Ischyosporites estherae
20	Juglanspollenites nigripites
24	Jusseaia sp., Piel 1971
81	Klukisporites foveolatus
85	Kraeuselisporites linearis
68	Laevigatosporites mesozoicus
6	Laevigatosporites ovatus
46	Leiotriletes equiexinus
57	Leiotriletes mecklenburgensis
64	Leiotriletes spp.
47	Leptolepidites bossus
16	Lycopodiumsporites annotinioides
59	Lycopodiumsporites crassus
77	Lycopodiumsporites marginatus
7	Momipites coryloides
8	Osmundacidites claytonites
30	Osmundacidites wellmannii
79	Ovoidinium scabrosum
71	Parvisaccites #EA
42	Parvisaccites amplus
40	Parvisaccites radiatus
83	Parvisaccites spp.
63	Perinopollenites elatoides
62	Phyllocladites inchoatus
52	Phyllocladites microreticulatus
9	Piceaepollenites spp.
10	Pinuspollenites spp.
70	Plicatella bifurcata
51	Plicatella bilateralis
88	Plicatella cristata
86	Plicatella potomacensis
53	Plicatella pseudomacrorhyza
89	Plicatella tricornitata
74	Podocarpidites epistriatus
39	Podocarpidites potomacensis
80	Psilatriletes teter
18	Pterocaryapollenites stellatus
11	Quercoidites #LA
22	Rouseisporites #LA
41	Rugubivesiculites minimus
36	Rugubivesiculites reductus
33	Rugubivesiculites rugosus
92	Ruguspora sp. indet.
94	spore indeterminate
12	Stereisporites antiquasporites
87	Taurocusporites spackmanii
13	Taxodiaceaepollenites hiatus
17	Tiliaepollenites vescipites
14	Tsugaepollenites igniculus
19	Tsugaepollenites viridifluminipites
73	Vitreisporites pallidus

APPENDIX A (cont'd)

Alphabetical Listing of Species Shown on Occurrence Chart: Fungal, Algae and Miscellaneous

Index number	Taxon names
15	Acritarch indeterminate
16	Actipilion sp. indet.
13	Barakella/Acanthodiacrodium sp. indet.
7	Cymatiosphaera sp. indet.
10	Electoriskos sp. indet.
6	foraminiferal liners
2	Micrhystridium fragile
8	Micrhystridium sp. indet.
11	Micrhystridium stellatum
14	Multiplicisphaeridium sp. indet.
1	Paralecaniella indentata
4	Pediastrum boryanum
5	Pluricellaesporites spp.
12	Polyancystrodorus sp. indet.
9	Protoleiosphaeridium diaphanium
3	Quadrina pallida

Reworked Palynomorphs

Index number	Taxon names
6	*Achomosphaera neptunii
2	*Chatangiella spp.
7	*Densosporites spp.
3	*Isabelidinium spp.
4	*Odontochitina operculata
5	*Oligosphaeridium spp.
1	*Palaeohystrichophora infusorioides
8	*Permian reworking

APPENDIX B

Examined Samples: Linnet E-36: D215

980.00	Cuttings
1010.00	Cuttings
1040.00	Cuttings
1070.00	Cuttings
1100.00	Cuttings
1130.00	Cuttings
1160.00	Cuttings
1190.00	Cuttings
1220.00	Cuttings
1250.00	Cuttings
1280.00	Cuttings
1310.00	Cuttings
1340.00	Cuttings
1370.00	Cuttings
1400.00	Cuttings
1430.00	Cuttings
1460.00	Cuttings
1490.00	Cuttings
1520.00	Cuttings
1550.00	Cuttings
1580.00	cuttings
1610.00	cuttings
1640.00	cuttings
1670.00	cuttings
1700.00	cuttings
1730.00	cuttings
1760.00	cuttings
1790.00	cuttings
1820.00	cuttings
1850.00	cuttings
1880.00	cuttings
1920.00	cuttings
1950.00	cuttings
1980.00	cuttings
2010.00	cuttings
2040.00	cuttings
2070.00	cuttings
2100.00	cuttings
2130.00	cuttings
2160.00	cuttings
2190.00	cuttings
2220.00	cuttings
2250.00	cuttings
2280.00	cuttings
2310.00	cuttings
2340.00	cuttings
2370.00	cuttings
2400.00	cuttings
2430.00	cuttings
2460.00	cuttings
2490.00	cuttings
2520.00	cuttings
2550.00	cuttings
2580.00	cuttings
2610.00	cuttings
2640.00	cuttings
2670.00	cuttings
2700.00	cuttings
2730.00	cuttings
2760.00	Cuttings
2790.00	Cuttings
2820.00	Cuttings
2850.00	Cuttings
2880.00	Cuttings
2910.00	Cuttings
2940.00	Cuttings
2970.00	Cuttings
3000.00	Cuttings
3030.00	Cuttings
3060.00	Cuttings
3090.00	Cuttings
3120.00	Cuttings
3150.00	Cuttings
3180.00	Cuttings
3210.00	Cuttings
3240.00	Cuttings
3270.00	Cuttings
3300.00	Cuttings
3330.00	Cuttings
3360.00	Cuttings
3390.00	Cuttings
3420.00	Cuttings
3450.00	Cuttings
3480.00	Cuttings
3510.00	Cuttings
3540.00	Cuttings
3570.00	Cuttings
3600.00	Cuttings
3630.00	Cuttings
3660.00	Cuttings
3690.00	Cuttings
3720.00	Cuttings
3750.00	Cuttings
3780.00	Cuttings
3810.00	Cuttings
3840.00	Cuttings
3870.00	Cuttings
3900.00	Cuttings
3930.00	cuttings
3960.00	cuttings
3990.00	cuttings
4020.00	cuttings
4050.00	cuttings
4080.00	cuttings
4110.00	cuttings
4140.00	cuttings
4170.00	cuttings
4200.00	cuttings
4230.00	cuttings
4260.00	cuttings
4290.00	cuttings
4320.00	cuttings
4350.00	cuttings
4375.00	cuttings
4388.10	cuttings
4405.00	cuttings
4435.00	cuttings
4465.00	cuttings
4495.00	cuttings