



**PALYNOLOGICAL ZONATION AND CORRELATION
OF THE PEACE RIVER COALFIELD
NORTHEASTERN BRITISH COLUMBIA
AN UPDATE***

**By Jane Broatch
Department of Geological Sciences
The University of British Columbia**

As outlined in a previous paper (Broatch, 1986), a good palynozonation has been established for seven sections south of the Burnt River, ranging from the Minnes to Hulcross Formations. Since that time, 52 additional samples of Minnes and Gething have been collected from the Sukunka (26) and Goodrich (26) areas to the north. A total of 264 samples has been processed, of which 220 have been examined microscopically for palynomorphs. The zonation for the Gething through Gates Formations at Bullmoose Mountain in the north has been established and correlated with the sections to the south (Broatch, 1986). Good assemblages have been obtained from the Minnes samples examined, but it is still too early to give a zonation within the northern Minnes, or to correlate to the Jurassic and Lower Cretaceous sections of Minnes to the south. The establishment of this northern zonation is critical because the top of the Minnes is bevelled. Also, the final results should allow for a better estimate of the extent of the hiatus between the upper Minnes and the overlying Cadomin Formation.

The presence of both dinocysts and spore/pollen assemblages has allowed recognition of the facies changes from marine to terrestrial (Figure 5-7-1). Significantly, it has shown a marine unit at the base of the Gething that persists from the northwest to southeast and that splits into an upper and lower tongue in the south, near the Triad Creek area. Two other marine tongues occur in the Gething: one about half way up section that pinches out south of Monkman Pass, and a second that extends just south of Wolverine River. The Gething is separated from the overlying Moosebar Formation by a barren zone interpreted to be largely reworked near-shore terrestrial strata.

The overlying marine Moosebar contains a large assemblage of dinocysts, and thins slightly to the southeast. It is separated from the overlying Gates Formation by a "Transition Unit" (the Torrens Member) that is barren of palynomorphs. The Gates Formation has a thick basal unit that is open-marine at Bullmoose Mountain and that changes rapidly to intertonguing restricted-marine and nonmarine conditions between Bullmoose Mountain and Wolverine River. Above this unit is a middle terrestrial followed by a middle marine interval, both of which are thin. The uppermost section of the Gates contains another terrestrial unit overlain by a marine unit.

In addition to recognizing the main facies, the presence of several restricted species in each formation, and in each member of the Gates (Figure 5-7-2), provides an ideal tool for correlation and dating of separate sections within the coalfield. It is now quite evident that outlying sections both to the north and south will be correlatable with zones in the central area. This is also the case with the Minnes Formation, as shown previously by Broatch (1986), although more work needs to be done to refine the zonation.

REFERENCE

Broatch, J. (1986): Palynological Zonation and Correlation of the Peace River Coalfield, Northeastern British Columbia, *B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork*, 1985, Paper 1986-1, pages 321-326.

* This project is a contribution to the Canada/British Columbia Mineral Development Agreement. British Columbia Ministry of Energy, Mines and Petroleum Resources.

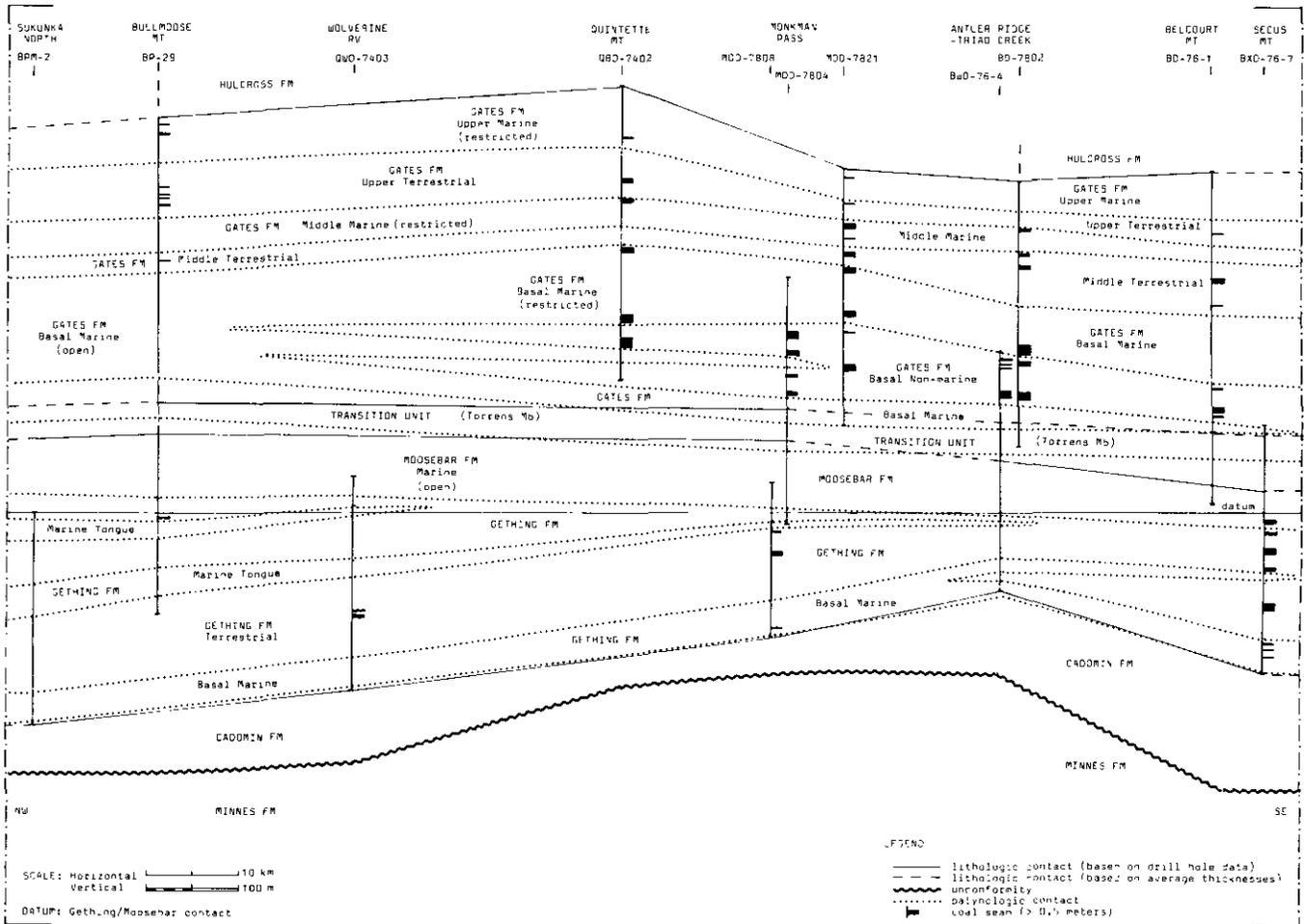


Figure 5-7-1. Zonation and correlation of the Peace River Coalfield based on total palynomorph assemblage.

EXPLANATION:

Zonation established on the basis of type(s) of palynomorphs present (spores/pollen, dinocysts/acritarchs, algal cysts/fungal spores) and relative abundance and diversity of species. Terrestrial facies are characterized by an absence of marine dinocyst/acritarch species, abundant and/or diverse spore species and moderate numbers of algal and fungal material. Restricted marine facies are characterized by a mixed assemblage of spores, pollen, dinocysts/acritarchs, algal cysts and fungal spores in abundances reflecting proximity to terrestrial or open-marine facies. Open-marine facies are characterized by an abundant and diverse dinocyst/acritarch assemblage.

Much of the terrestrial Gething facies and the entire "Transition Unit" are barren of indigenous palynomorphs suggesting rapid facies changes and reworking of sediments during deposition.

Coal seams greater than 0.5 metre are plotted for reference. Coal depths are based on drill hole logs as are lithologic contacts. Palynologic contacts do not rely on coal seam location but have been placed to emphasize probable concurrent episodes of coal development without compromising palynologic data.

GENERALIZED ZONATION	GETTING FM	MOSEBAR FM	TRANSITION UNIT	EATES FM					
				Basal Marine/Non-marine	Middle Terrestrial	Middle Marine	Upper Terrestrial	Upper Marine	
SPORES & POLLEN									
15 Antulsporites distaverrucosus									15
21 Appendicisporites dentimarginatus 'var. grande'									21
39 cf Auritulinasporites deltaformis									39
83 Cicatricosisporites cf tenuis									83
165 Foraminisporis wonthaggiensis									165
199 Ischyosporites 'radiatus'									199
205 Laevigatosporites gracilis									205
213 Lycopodiacidites caperatus									213
221 Lycopodiumsporites eminulus									221
252 Ornamentifera baculata									252
351 Cooksonites 'verrucatus'									351
230 Matonisporites cooksoni									230
323 Tigrisporites scurrandus									323
157 Distaltriangulisporites 'fosaulatus'									157
311 Seatrosporites irregularis									311
74 Cicatricosisporites exilioides									74
227 Lycopodiumsporites sp. B									227
276 Podocarpidites ellipticus									276
333 Trilobosporites trioreticulosus									333
3 Acanthotriletes levidensis									3
301 Rugubivesiculites rugosus									301
53 Callialasporites trilobatus									53
232 Matonisporites 'extendus'									232
331 Trilobosporites purverulentus									331
87 Cingulatisporites distaverrucosus									87
104 Contignisporites cooksonii									104
166 Foveosporites canalis									166
106 Contignisporites multimuratus									106
158 Distaltriangulisporites irregularis									158
280 Podocarpidites potomacensis									280
325 'Tricornisporis concentratus'									325
18 Appendicisporites bilateralis									18
29 Appendicisporites unicus									29
113 Costatoperforosporites foveolatus									113
121 Cyathidites punctatus									121
122 Cyathidites rafaelli									122
148 Dictyophyllidites equiexinoux									148
160 Distaltriangulisporites sp.									160
168 Foveotriletes subtriangularis									168
212 Lycopodiacidites canaliculatus									212
260 Perinopollenites elatoides									260
322 Tigrisporites reticulatus									322
329 Trilobosporites marylandensis									329
114 Couperisporites complexus									114
152 Dictyotosporites speciosus									152
350 Appendicisporites tricornatus									350
20 Appendicisporites dentimarginatus									20
151 Dictyotosporites complex									151
214 Lycopodiacidites cirriidites									214
336 Undulatisporites pannuceus									336
52 Callialasporites segmentatus									52
65 Ceratosporites cf morriniolus									65
85 Cibotiumspora juriensis									85
100 Concavissimisporites minor									100
109 Cooksonites variabilis									109
144 Densosporites microrugulatus									144
200 Januasporites spiniferus									200
281 Psilatricolpites parvulus									281
284 Polycingulatisporites 'tuberculosis'									284
346 Klukisporites pseudoreticulatus									346
269 Pinuspollenites									269
339 Verrucosisporites asymmetricus									339
2 Abietinaepollenites sp.									2
12 Alisporites similis									12
49 Biretisporites spectabilis									49
77 Cicatricosisporites imbricatus									77
161 Eucommidiites troedssonii									161
223 Lycopodiumsporites marginatus									223
266 Phyllocladidites inchoatus									266
327 Trilobosporites applanatus									327
335 Undulatisporites fosaulatus									335
338 Undulatisporites undulapodus									338
345 Vitreisporites pallidus									345
163 Foraminisporis asymmetricus									163
204 Kuylisporites lunaris									204
211 Lycopodiacidites asperatus									211
25 Appendicisporites pschekhaensis									25
202 Klukisporites areolatus									202
274 Podocarpidites biformis									274
304 Schizosporis grandis									304
149 Piceapollenites									149
149 Dictyophyllidites pectinataeformis									149
233 Matonisporites cf excavatus									233
296 Reticulisporites elongatus									296
302 Schizosporis sp.									302
347 Spheripollenites scabratus									347
90 Classopollis chateaunovi									90
131 Cycadoides carpentieri									131
197 Inaperturopollenites dubius									197
239 Podocarpidites ornatus									239
243 Murospora truncata									243
307 Schizosporis rugulatus									307
143 Vitreisporites cf crani									143
70 Cicatricosisporites annulatus									70
93 Clavatipollenites couperii									93
95 Clavatipollenites minutus									95
108 Cooksonites reticulatus									108
112 Coptospora striata									112
174 Ginkgocycadophytus sp.									174
234 Podocarpidites naumovii									234
344 Cicatricosisporites potomacensis									344
348 Reticulisporites semireticulatus									348

Figure 5-7-2. Generalized species zonation (chart currently under revision).

GENERALIZED ZONATION	GETTING FM	MOOSEBAR FM	TRANSITION UNIT	GETTING FM					
				Basal Marine/Non-marine	Middle Terrestrial	Middle Marine	Upper Terrestrial	Upper Marine	
DINOFLAGELLATE CYSTS & ACRTARCIS									
32 Apteodinium granulatum									32
139 Deflandrea cf victoriensis									139
156 Diplotesta anglica									156
235 Michrystridium stellatum									235
247 Oligosphaeridium anthophorum									247
255 Palaeoperidinium cretaceum									255
290 Pterodinium sp. A									290
178 Gonyaulacysta archeopyle Type B									178
69 Chytroisphaeria cf pococki									69
31 Apteodinium grande									31
132 Cyclonephellium paucispinum									132
135 Deflandrea cf acuminata									135
180 Gonyaulacysta cretacea									180
248 Oligosphaeridium complex									248
310 Scripiodinium campanula									310
183 Gonyaulacysta orthoceras									183
38 Ascotomocystis maxima									38
170 Fromea amphora									170
179 Gonyaulacysta cf cassidata									179
181 Gonyaulacysta cf episoma									181
186 Hystrichokolpoma 'expansus'									186
201 cf Kalyptea monoceras									201
286 Prolixosphaeridium cf mixtispinosum									286
34 Apteodinium maculatum									34
43 Baltisphaeridium fimbriatum									43
44 Baltisphaeridium sp. A									44
45 Baltisphaeridium sp. B									45
67 Chlamydotheca nyei									67
98 Cleistosphaeridium multispinosum									98
128 Cyclonephellium distinctum									128
188 Hystrichosphaera cingulata									188
192 Hystrichosphaera ramosa var. multibrevis									192
208 Lecaniella foveata									208
245 Odontochitina operculata									245
249 Oligosphaeridium diastema									249
251 Oligosphaeridium pulcherrimum									251
241 Muderongia tetracantha									241
155 Dinopterygium cladoides									155
196 Hystrichosphaeridium stellatum									196
316 Tanyosphaeridium sp. B									316
96 Cleistosphaeridium diversispinosum									96
97 Cleistosphaeridium granulatum									97
134 Cymatosphaera pachytheca									134
137 Deflandrea pellucida									137
145 Diconodinium cf arcticum									145
173 Gardodinium eisenacki									173
187 Hystrichokolpoma ferox									187
195 Hystrichosphaeridium cooksoni									195
257 Pareodinia cf aphelia									257
60 Canningia reticulata									60
129 Cyclonephellium distinctum var. brevispinatum									129
36 Apteodinium sp.									36
154 dino sp. A (nov. sp.)									154
256 Palaeoperidinium sp.									256
ALGAL & FUNGAL SPECIES									
171 fungal body 'Type M'									171
268 Phragmothyrites 'Form D'									268
292 Pterospermopsis australiensis									292
116 Crassosphaera sp. A									116
169 Fractisporonites sp.									169
172 fungal colony (Burden '84)									172
254 Palambages Form A									254
263 Phragmothyrites 'Form A'									263
264 Phragmothyrites 'Form B'									264
309 Scolecosporites									309
319 Tasmanites tardus									319
272 Pluricellaesporites psilatus									272
294 Pterospermopsis sp. B									294
317 Tasmanites newtoni									317
318 Tasmanites suevicus									318

Figure 5-7-2. Generalized species zonation (chart currently under revision) (continued).