

This report is released as part of AER/AGS Open File Report 2017-08.
See Appendix 5 therein for updated results and interpretations.

**PALYNOLOGICAL ANALYSIS OF
FOUR OUTCROP SAMPLES
FROM THE MCMURRAY
FORMATION
(2005)**

by
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Four outcrop samples were prepared for palynological analysis. Three contained rich assemblages but the fourth contained amorphous material and dead oil only.

The samples come from the Aptian McMurray Formation and come from freshwater to possibly slightly brackish settings. Samples 912 and #3 contain a dinocyst that has not before been recorded in these rocks.

The environments are summarized below and the samples are described in detail in Section 2.

Sample	Environment
912	Restricted; upper estuarine or brackish lake/lagoon
913	Indeterminable
#3	?Flood deposit
#4	Freshwater; swamp

SECTION 2

RESULTS

SAMPLE: 0912 (9th August 04; Daphne West, Organic; 0459679E/8348730N).

Environment: Restricted; upper estuarine or brackish lake/lagoon

Remarks

This assemblage is unusual in that it contains abundant specimens of *Pseudoceratium* aff. *dettmanniae* which I have not recorded before in Alberta. *Sensu stricto* forms are marine and were first described from the Cenomanian Cambridge Greensand. The form seen here is clearly of freshwater or slightly brackish origin and is a new species. Also occurring are small numbers of *Nyktericysta/Vesperopsis* spp. and *N. arachnion* that are characteristic of the fresh to faintly brackish environments in the McMurray. No marine species were recorded.

The preponderance of bisaccate pollen (62%) and relatively small numbers of spores and *Taxodiaceae* (31%) suggests either a high estuarine setting or a large but restricted body of water such as a lagoon or slightly brackish lake.

Significant species

Pseudoceratium aff. *dettmanniae* (A)
N. arachnion (R)
Schizosporis reticulatus

Nyktericysta/vesperopsis spp.
Freshwater cysts indet.
Schizophacus parvus

Bisaccate pollen (VA)
Cicatricosisporites augustus
Taxodiaceapollenites hiatus

Psilatriletes radiatus
Foraminisporis wonthaggiensis

SAMPLE: 0913 (10th August 04)

Environment: Indeterminable

Remarks

The residue consists of amorphous organic matter and dead oil.

SAMPLE: #3

Environment: ?Flood deposit

Remarks

This sample yielded a relatively sparse assemblage of similar composition to 0912. The abundance of inertinite/semi-fusinite laths and the fair to poor sorting of the kerogen (with a tendency to bimodality) suggesting that the assemblage may have come from a flood deposit and the palynomorphs were partially winnowed out.

Significant species

Pseudoceratium aff. *dettmanniae* (R)
Schizophacus *parvus*

Freshwater cysts indet.

Bisaccate pollen (A)
Cicatricosisporites spp.
Foraminisporis *dailyi*
Ischyosporites *pseudoreticulatus*
Pilosporites *trichopapillosus*

Taxodiaceapollenites *hiatus*
C. augustus
F. wonthaggiensis
Kuylisporites *lunaris*

SAMPLE: #4 (North End)

Environment: Freshwater; swamp

Remarks

The freshwater dinocyst *Hurlandsia rugara* is abundant in this sample. The preponderance of small spores and pollen (76%) suggests deposition in a freshwater swamp setting. The low bisaccate numbers (17%) indicate little outside (hinterland) contribution.

Significant species

Hurlandsia rugara (A)
N. arachnion

Nyktericysta/Vesperopis spp.
Freshwater cysts indet.

Taxodiaceapollenites *hiatus* (VA)
Triporeletes *reticulatus*
Foraminisporis *wonthaggiensis*

Osmundacidites spp.
Aequitriradites *spinulosus*
F. asymmetricus