

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

REPT BK NO. 91/21

PALYNOLOGY OF SELECTED SAMPLES
FROM THE WESTERN CARPENTARIA
BASIN, NORTHERN TERRITORY

by

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BIOSTRATIGRAPHY BRANCH

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TITLE: Palynology of selected samples from the Western
Carpentaria Basin, Northern Territory.

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LOCALITY: BAUHINIA DOWNS, ROPER RIVER and WALLHALLOW 1:250 000
mapsheets, Western Carpentaria Basin, Northern
Territory.

SAMPLE DATA:

Submitter: A. Krassay and L.A. Frakes, Department of Geology, The
University of Adelaide.

Borehole/ Location No.	Branch No.	RS No.	Depth	Sample Type	Lithology
AL3-34	S 6876	5965-1	outcrop	grab	black mudstone
AL4-1	S 6877	6063-1	outcrop	grab	dark grey silty mudstone
AL4-7	S 6878	6069-1	outcrop	grab	light grey clayey siltstone
DRW-16	S 6879	6069-2	outcrop	grab	greenish grey clayey siltstone
DRW-25	S 6880	6069-3	29.04m	core	dark grey clayey siltstone
DRW-27	S 6881	6069-4	27.23m	core	dark grey clayey siltstone.

LOCATION:

S 6876 6.5km NNW of Bauhinia Station
 S 6877 25km SSW of Top Springs Homestead
 S 6878 32.5km SSE of Top Springs Homestead
 S 6879 15km NE of Rose River Mission
 S 6880 24km NE of Rose River Mission
 S 6881 23km NE of Rose River Mission

STRATIGRAPHIC INFORMATION:Stratigraphic Unit:

S 6876 ?Mullamen Beds
 S 6877 ?Wallumbilla Formation
 S 6878 ?Wallumbilla Formation
 S 6879 Skwarko Unit 2
 S 6880 Skwarko Unit 2
 S 6881 Skwarko Unit 2

Geological Province:

All samples are from the Carpentaria Basin.

ANALYTICAL DATA:Laboratory technique:

Standard processing technique with the addition of 10 um and 129 um sieve steps.

Microscope used:

Zeiss Photomicroscope III.

Palynomorphs counted:

None counted because preservation is generally poor.

RESULTSMain components of microfossil assemblage:

Only two samples (DRW-16 and DRW-25) produced microfossils; the remainder contained abundant vitrinite; several samples, including DRW-16, contained a minor amount of modern pollen contamination.

The palynofloral correlations made below are with the zonal scheme of Helby et al. (1987) (Fig. 1).

Zonation:

S 6879 (DRW-16) Due to the very poor preservation of the palynoflora it is difficult to assign spore-pollen and microplankton zonations.

However, based on the presence of *Foraminisporis asymmetricus* the palynoflora can be no older than *Cyclosporites hughesii* spore-pollen Zone. Although the younger zonal spores *Crybelosporites striatus* and *Coptospora paradoxa* were not found in the assemblage their absence may be due to the poor preservation.

The microplankton assemblage contains *Pseudoceratium turneri* and thus can be no older than *Diconodinium davidii* microplankton Zone. If the absence of *D. davidii*, *Muderongia tetracantha* and *Pseudoceratium ludbrookiae* is real, then the assemblage is correlative with *Canninginopsis denticulata* microplankton Zone.

The spore-pollen zonation indicates an Aptian or younger age whereas the microplankton suggest an age range from Late Aptian to Middle Albian, probably the latter. In terms of local stratigraphy the sample probably came from the upper part of the Wallumbilla Formation (Bulldog Shale equivalent).

S 6880 (DRW-25) The preservation of microfossils in the sample is fair and the yield good.

Coptospora paradoxa is present and *Phimopollenites pannosus* is absent, thus the spore-pollen assemblage is correlated with the *Coptospora paradoxa* Zone.

Within the microplankton assemblage, *Pseudoceratium turneri* is present and *Diconodinium davidii*, *Muderongia tetracantha* and *Pseudoceratium ludbrookiae* are absent. This indicates that the assemblage is correlative with the *Canninginopsis denticulata* Zone, which is consistent with the spore-pollen determination.

Palynofloras correlative with these zonations are of Middle Albian age.

The stratigraphic unit from which the sample came would be upper Wallumbilla Formation (Bulldog Shale equivalent).

Palaeoenvironment:

The high frequency and relatively high diversity of dinoflagellates in the two samples suggests reasonably deepwater marine conditions, whereas the presence of abundant and diverse pollen and spores along with other plant matter indicate that the shoreline was not too far distant.

Other Comments:

A complete record of taxa encountered in the samples is available from the Biostratigraphy Branch, S.A. Department of Mines and Energy.

REFERENCES:

Helby, R., Morgan, R. and Partridge, A.D., 1987. A palynological zonation for the Australian Mesozoic. *Association of Australasian Paleontologists, Memoir 4*, 1-94.

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