

DEPARTMENT OF MINES AND ENERGY

GEOLOGICAL SURVEY

SOUTH AUSTRALIA



REPORT BOOK 96/3

**PALYNOLOGICAL DATING AND CORRELATION OF LATE EOCENE SEDIMENTS  
FROM THE EUCLA BASIN, SOUTH AUSTRALIA.  
DIAMOND VENTURES NL.**

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Biostratigraphy

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Palynological dating and correlation of Late Eocene sediments from the Eucla Basin, South Australia.  
Diamond Ventures NL.

Neville F. Alley

## Summary

A sample from CAR3 No. 1 Well on Eyre Peninsula is Late Eocene in age and correlative with the marginal marine upper part of the Pidinga Formation.

## Introduction

One sample of cuttings from 84-88 m depth in CAR3 No. 1 Well, Eyre Peninsula, was submitted by Diamond Ventures NL, Camberwell, Victoria, for palynological dating.

The laboratory processing was undertaken by Laola Pty. Ltd., Perth, and the microscope analyses and dating by Neville F. Alley, Principal Geologist, Mines and Energy, South Australia.

The data were processed and details presented graphically using Stratabugs 1.2 and CorelDraw 5 software.

## General composition of the palynofloras (Fig. 1)

The sample produced a palynoflora of good yield and preservation.

The palynoflora is dominated by *Nothofagidites* pollen, especially the *Brassospora* group (*N. deminutus/ emarcidus/ falcatus/heterus/incrassatus/vansteenisii* species). Other common taxa are *Haloragacidites harrisii* and the conifers *Microcachryidites antarcticus* and *Podocarpidites ellipticus*. Although the *Proteacidites* group forms only a small percentage of the overall palynoflora, it is reasonably diverse in species.



A relatively small amount of marine microplankton (dinoflagellates) is present with moderate species diversity.

## Dating and correlation

The presence of *Triorites magnificus* indicates a correlation with the largely Late Eocene Middle *Nothofagidites asperus* spore-pollen Zone of Stover and Partridge (1973, 1982; Fig 2). This species makes its oldest appearance at the base of the zone and is largely restricted in its time range to that zone. A marginal marine setting is indicated by the presence of the marine microplankton.

This designation is supported by the presence of the relatively diverse assemblage of the genus *Proteacidites*, in particular the species *P. grandis*, *P. kopiensis* and *P. pachypolus*, which are common associates of *T. magnificus* and are largely extinct by the latest Eocene.

The palynoflora is very similar to those of Late Eocene age in the eastern Eucla Basin (Alley and Benbow, 1989; Alley and Beecroft, 1993). Because of its age and the presence of the marine microplankton the sediment is correlative with the upper part of the Pidinga Formation which is widespread in the Eucla Basin, underlying the Early to Middle Tertiary carbonates and occurring in palaeochannels several hundred kilometres inland from the coast (Fig. 3; Alley and Beecroft, 1993; Benbow *et al.*, 1995). Deposition was undoubtedly related to the Tortachilla Transgression of McGowran (1989) which was a major sea level rise in the Late Eocene leading to deposition of the upper part of the Pidinga Formation (Alley and Beecroft, 1993).

## Conclusions

The sample is Late Eocene in age and correlates with the upper marginal marine part of the Pidinga Formation in the Eucla Basin.



## References

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# DIAMOND VENTURERS

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DIAMOND VENTURERS CAR3 NO. 1

Samples	Tertiary pollen and spores	
84.00m CU	Araucariacites australis	
	Baculatisporites comauensis	
	Baculatisporites disconformis	
	Banksieaidites arcuatus	
	Beaupreaidites elegansiformis	
	Casuarinidites cainozoicus	
	Clavatipollenites glarius	
	Cupanioidites orthoichus	
	Cyathidites australis	
	Cyathidites minor	
	Cyathidites paleospora	
	Dacrycarpites australiensis	
	Dilwynites granulatus	
	Dilwynites tuberculatus	
	Ericipites crasslexinus	
	Gleicheniidites circinidites	
	Haloragacidites harrisi	
	Ilexpollenites anguloclavatus	
	Ischyosporites gremius	
	Liliacidites aviemorensis	
	Liliacidites lanceolatus	
	Lygstepollenites florinii	
	Microcachrydites antarcticus	
	Milfordia homeopunctata	
	Nothofagidites brachyspinulosus	
	Nothofagidites deminutus	
	Nothofagidites emarcidus	
	Nothofagidites falcatus	
	Nothofagidites heterus	
	Nothofagidites incrassatus	
	Nothofagidites vansteenslii	
	Osmundacidites wellmanii	
	Parvisaccites catastus	
	Periporipollenites demarctus	
	Phyllocladidites mawsonii	
	Phyllocladidites ovalis	
	Phyllocladidites reticulosaccatus	
	Podocarpidites ellipticus	
	Podocarpidites magnificus	
	Proteacidites annularis	
	Proteacidites grandis	
	Proteacidites kopiensis	
	Proteacidites obscurus	
	Proteacidites pachypolus	
	Proteacidites pseudomoides	
	Proteacidites rynthius	
	Proteacidites simplex	
	Rhoipites sphaerica	
	Rugulatisporites mallatus	
	Santalumidites cainozoicus	
	Sapotaceoidaeipollenites rotundus	
	Trichotomosulcites subgranulatus	
	Tricolporites adalaidensis	
	Tricolporites leuros	
	Tricolporites prolata	
	Triorites magnificus	
	Verrucatosporites cristatus	
	Verrucatosporites kopukuensis	
	Verrucatosporites speciosus	

Figure 1

Plan No. 1996-0723

TIME M.Y.	Time	Planktonic foraminiferal zones	Spore- pollen zones
15	MIOCENE Middle	N10 — N9	Lower <i>Tripopo- pollenites bellus</i>
		N8	
		N7	
		N6	
20	Early	N5	<i>Proteacidites tuberculatus</i>
		N4	
25	OLIGOCENE Late	P22	
		P21	
30		P20/19	
		P18	
35	EOCENE Late	P17	Upper
		P16	Middle
		P15	
40		P14	Lower <i>Nothofagidites asperus</i>
		P13	
		P12	
		P11	
45		P10	
	Early	P9	<i>Proteacidites asperopolus</i>
50		P8	<i>Malvacipollis diversus</i>
		P7	
		P6 — B — A	<i>Lygistepollenites balmei</i>
55	LATE PALEOCENE	P5	

Figure 2



