THE PALYNOLOGY OF MORAY-1

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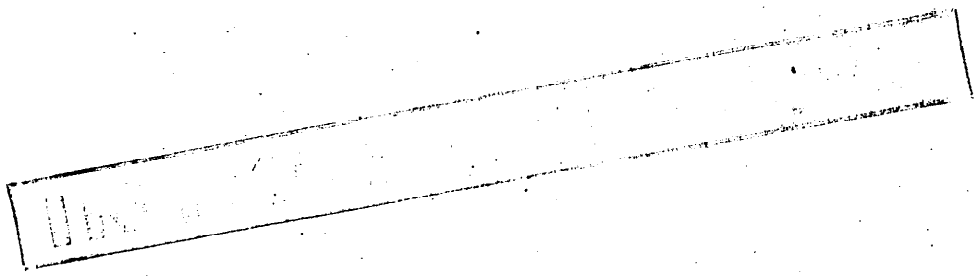

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SUMMARY

The following spore-pollen zones are identified in Moray-1:

Zone	Depth in Feet & Rating
Lower *Nothofagidites asperus*	5490 (1)
Lower *Malvacipollis diversus*	5540 (2) - 5559 (2)
Lygistepollenites balmei	5584 (1) - 6006 (1)
Tricolpites longus	6054 (1)
Tricolporites lilliei	6226 (1)
Cicatricosisporites distocarinatus	6322 (2) - 6399(2)
Zone indeterminant	6464 - 8531

COMMENTS

The palynology indicates that there are probably four breaks in the sequence in this well. These are:

(1) A disconformity between the Lower *N. asperus* Zone at 5490 feet and the Lower *M. diversus* Zone at 5540 feet.

(2) A probable hiatus between 6006 to 6064 feet representing some of the lower part of the *L. balmei* Zone.

(3) A disconformity between the *T. lilliei* Zone at 6226 feet and the *C. distocarinatus* Zone at 6322 feet.

(4) A probable disconformity below the *C. distocarinatus* Zone, between 6399 and 6464 feet.

There is no suggestion of breaks within the *L. balmei* to Lower *M. diversus* sequen or the *T. lilliei* to *T. longus* sequence based on the spore-pollen assemblages.

Dinoflagellates were found in all sidewall cores from the Lower *N. asperus* Zone at 5490 feet to the base of the *L. balmei* Zone at 6006 feet, suggesting a

continuous marginal marine environment. The section below the L. balmei Zone contains only non-marine assemblages.

ZONES

The section from 6464 feet to T.D. (Total Depth) can only be given a general age of Late Jurassic to Cretaceous. The section which is of unfavourable lithology for palynology contains only spre-pollen assemblages of low diversity without any diagnostic species.

The C. distocarinatus Zone identified at 6322 and 6399 feet is found elsewhere in the Gippsland Basin in the following wells: Golden Beach-1 (C. triplex to C. distocarinatus Zone from cuttings between 6000 and 6770 feet); Golden Beach West-1 (6380-90 feet); Merriman-1 (5070-81 feet) and Tuna-1 (11,940 feet). All these samples are of poor quality, containing only spore-pollen assemblages of low diversity. The assemblage most similar to that from Moray-1 at 6322 feet is from Tuna-1. The age of the Moray-1 samples, given as C. distocarinatus Zone, is based on the occurrence of the species Amosopollis cruciformis, Kraeuselisporites majus, Phyllocladidites mawsonii and the lack of angiosperm pollen. The samples could be slightly younger, perhaps equivalent to the Clavifera triplex Zone or the Tricolpites pachyexinus Zone. However, this is not favoured as the Moray-1 samples are distinct, in their lack of angiosperm pollen, from other samples referred to these latter zone in the Gippsland Basin. The presence of larger assemblages containing a few key species is the only difference between the samples referred to in the C. distocarinatus Zone and the samples from the underlying section.

The T. lilliei Zone assemblages at 6226 feet is from near the top of the zone and is closely related in character and therefore age to the T. longus Zone assemblage at 6054 feet. Both assemblages are non-marine.

The L. balmei Zone contains more abundant and slightly more diverse assemblages of dinoflagellates than have been seen elsewhere in this zone in the Gippsland Basin. The environment is therefore probably more marine than elsewhere. The similarity of the dinoflagellates to those recorded in Mackerel-1, 2 and 3 suggest that only the upper part of the L. balmei Zone is represented. This similarity and the distinct change from marine to non-marine in the underlying T. longus Zone is the reason for suggesting a hiatus between the zones.

The Lower M. diversus Zone is identified in two samples with very low spore-pollen yields. Although both samples contained key species of this zone, some obvious contamination, and the possibility of some reworking from the underlying L. balmei Zone gives these samples low reliability. The sample at 5055 feet is probably also Lower M. diversus in age but could be considerably younger, equivalent to either the P. asperopolus Zone or the Lower N. asperus Zone A subdivision. The sample contains almost exclusively dinoflagellates; however, the two dominant species have never been recorded before.

The Lower N. asperus Zone at 5490 feet is represented by a sample of low yield and poor preservation, and cannot be assigned to either the A or B subdivision of this zone. Samples above this in the dolomite unit were of unsuitable lithology for obtaining spore-pollen assemblages. Those processed were barren.

SAMPLES EXAMINED

The presence of dinoflagellates in the samples is indicated by an asterisk following the depth.

Sample	Depth (in feet)	Zone
Cuttings	5340 - 400*	P. tuberculatus
Core-1	5407	Barren
Core-1	5410	Barren
SWC 48	5490*	Lower N. asperus
SWC 47	5498	Barren
SWC 46	5505*	Indeterminant
Core-2	5535	Barren
Core-2	5540	Barren
SWC 44	5540	Lower M. diversus
SWC 43	5559*	Lower M. diversus
SWC 41	5584*	L. balmei
Cuttings	5600 -10*	Indeterminant
SWC 87	5618	Barren
SWC 39	5660*	L. balmei
SWC 86	5680*	L. balmei
SWC 37	5806*	L. balmei

MORAY-1

Sample	Depth (in feet)	Zone
Cuttings	5820 - 30	Indeterminant
SWC 111	5871 *	L. balmei
SWC 38	5890 *	L. balmei
SWC 33	5988 *	L. balmei
SWC 32	6006 *	L. balmei
SWC 31	6054	T. longus
Cuttings	6080 - 90	T. longus
SWC 29	6226	T. lilliei
SWC 109	6322	C. distocarinatus
SWC 21	6399	C. distocarinatus
SWC 108	6464	Indeterminant
Cuttings	6460 - 70	Indeterminant
Cuttings	6470 - 80 (Dk. gy.sh.)	Indeterminant
SWC 26	6511	Barren
SWC 24	6720	Barren
Cuttings	6810 - 30	Indeterminant
Cuttings	6880 - 910 (coally frag)	Indeterminant
SWC 106	6917	Barren
SWC 105	7022	Indeterminant
SWC 104	7060	Indeterminant
SWC 101	7318	Barren
Cuttings	7400 - 30	Indeterminant
SWC 16	7704	Barren
SWC 97	7803	Indeterminant
SWC 96	7858	Indeterminant
Cuttings	7860 - 80	Indeterminant
SWC 94	8030	Barren
Cuttings	8050 - 60 (coally frag)	Indeterminant
SWC 93	8126	Barren
SWC 8	8226	Indeterminant
Cuttings	8300 - 10	Indeterminant
Core 3	8531	Indeterminant (no older than Late Jurassic)
SWC 19	8570	Barren
SWC 4	8610	Barren

BASIN GIPPSLAND DATE

WEL NAME MORAY-1 ELEVATION +32 feet

PALYNOLOGIC ZONES	HIGHEST DATA					LOWEST DATA				
	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 ti
P. tuberculatus										
U. N. asperus										
M. N. asperus										
L. N. asperus	5490	1				5490	1			
P. asperopolus										
U. M. diversus	5505	1				5505	1			
M. M. diversus										
L. M. diversus	5540	2				5559	2			
U. L. balmei	5584	1				5680	2			
L. L. balmei	5806	0				6006	0			
T. longus	6054	1				6054	1			
T. lilliei	6226	1				6226	1			
N. senectus										
C. trip./T.pach										
C. distocarin.	6322	1				6322	1			
T. pannosus										

COMMENTS: Dinoflagellate Zones:
Deflandrea heterophylcta 5490 (1)
Wetzeliella homomorpha 5584 (1)
Eisenackia crassitabulata 5806 (1) – 5871 (1)
Trithyrodinium evittii 6006 (1)
Samples below 6322' contain only long ranging species.

RATINGS:
0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.
1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spore and pollen or microplankton, or both.
4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/ microplankton.

NOTE: If a sample cannot be assigned to one particular zone, then no entry should be ma
Also, if an entry is given a 3 or 4 confidence rating, an alternate depth with a better confidence rating should be entered, if possible.

DATA RECORDED BY: ADP DATE July 1972.

DATA REVISED BY: ADP DATE Jan. 1972.