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THE PALYNOLOGY OF NANNYGAI-1

SUMMARY

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

<u>Zone</u>	<u>Depth in Feet & Rating</u>	<u>Age</u>
<u>Proteacidites tuberculatus</u>	7070 (1) - 7110 (1)	Oligocene
Lower <u>Nothofagidites asperus</u>		
Subdivision indeterminant	7210 (2) - 7230 (2)	Middle-Late Eocene
A. Subdivision	7250 (0) - 7286 (1)	Middle Eocene
<u>Proteacidites asperopolus</u>	7294 (2) - 7385 (1)	Early Eocene
Upper <u>Malvacipollis diversus</u>	7486 (1) - 7607 (1)	Early Eocene
Lower <u>Malvacipollis diversus</u>	7788 (1) - 8272 (1)	Early Eocene
<u>Lygistipollenites balmei</u>	8365 (1) - 9857 (2)	Paleocene

COMMENTS

The palynology indicates that there are time breaks associated with the lithological breaks near the top of the Latrobe Group. These are, firstly a distinct environmental change but probably only a short time break between 7286 feet and 7294 feet and two less clearly defined breaks between 7250 feet and 7210 feet, and 7210 feet and 7190 feet.

The L. balmei Zone (8365. to 9857 feet) is non-marine except for the incursion of marine dinoflagellates at the base of the section penetrated and near the top of the zone, where Wetzeliella homomorpha is present at 8437 feet. The samples contain good to poor spore-pollen assemblages. There is no T. longus zone assemblage present in this well in contrast to Gurnard-1 where a good T. longus Zone assemblage is present at 9657 feet.

In the Lower M. diversus Zone (7788 to 8272 feet) dinoflagellate are a minor component of most samples, but are most abundant in the lowest sample. Although this zone is identified down to 8272 feet, the sample at 8196 feet contains very rare specimens of the pollen L. balmei. The last occurrence of this species, usually in association with a number of other species, is taken as the top of the

increase in Nothofagidites. In most sections because of sampling gaps and slight disconformities these criteria are in fact the same. In Nannygai-1 what we could, in effect be seeing, in the interval 7294 to 7348 feet, perhaps because of better sampling is a unit younger than the P. asperopolus/P. pachypolus abundance in the Marlin and Tuna areas yet older than the Nothofagidites/H. harrissii reversal. Still, the character of the spore-pollen assemblages in this unit are more similar to the P. asperopolus Zone. For this reason and because there is also a distinct spore-pollen assemblage change between 7294 and 7286 feet the top of the P. asperopolus Zone is taken at 7294 feet. Dinoflagellates are rare in the P. asperopolus Zone, indicating a fairly non-marine environment, with the exception of the sample at 7385 feet which gave a low yield of predominantly dinoflagellates.

The Lower N. asperus Zone (7210 to 7286 feet) contains some very good and well preserved assemblages. However not all the samples can be accurately dated as only limited material is available from individual samples. This is because half of each sidewall core was examined for foraminifera and also because, from previous experience, it is known that the type of lithology present in this interval generally only gives low spore-pollen recoveries per unit volume. The four sidewall cores between 7250 and 7286 feet contain dominantly dinoflagellate assemblages, which on the basis of the occurrence of the key dinoflagellates, Leptodinium maculatum, Deflandrea heterophylcta and Oligosphaeridium dictyoplokus, are correlated with the 'A' subdivision of the Lower N. asperus Zone in Turrum-1 (i.e. 6430-6680 feet). The sample at 7530 feet also may belong to this subzone, although no key forms were observed in the limited spore-pollen residue recovered. The sample at 7210 feet however, contains a very different assemblage which is composed mainly of spore-pollen and also contains a few dinoflagellates which are not found in the underlying section. At present it is not possible to give a more refined age dating than Lower N. asperus to this sample.

Re-examination of Gurnard-1 in light of the better sampling in this well, indicates 1) that the sample at 7272 feet correlates with the interval 7250 and 7286 feet in Nannygai-1, and 2) the sample at 7200 feet, contains some apparent contamination and can only be given a general age range of Lower N. asperus Zone to P. tuberculatus Zone.

The two sidewall cores at 7170 and 7190 feet, gave low yield and poorly preserved assemblages which could not be assigned to a zone. Both samples did

However contain reworked L. balmei Zone fossils.

The P. tuberculatus Zone (7070-7110 feet) contains good assemblages, dominated by dinoflagellates, although the preservation is very poor.

TABLE-1

Relative abundance, expressed as a percentage of selective microfossil groups in Nannygai-1.

	Depth in Feet	Spores	Gymnosperms	Angiosperms	Nothofagidites	H. harrisi	P. pachyopolus/ P. asperopolus	Dinoflagellates	
<u>P. asperopolus</u> Zone	7294	12	4	52	13	15	3	0	
	7303	9	9	47	21	10	3	3	
	7317	4	6	53	16	14	3	0	
	7328	8	8	59	14	8	0	3	
	7348	4	2	74	6	6	4	4	
	7385	INSUFFICIENT SPECIMENS TO COUNT							
Upper <u>M. diversus</u> Zone	7486	INSUFFICIENT SPECIMENS TO COUNT							
	7607	3	1	68	13	12	0	3	

SAMPLES EXAMINED

<u>Sample</u>	<u>Depth (in feet)</u>	<u>Zone</u>
Cuttings	7020 - 30*	<u>P. tuberculatus</u>
SWC 55	7070 *	<u>P. tuberculatus</u>
SWC 54	7090 *	<u>P. tuberculatus</u>
SWC 53	7110 *	<u>P. tuberculatus</u>
Cuttings	7100 - 10*	<u>P. tuberculatus</u>
SWC 50	7170 *	Indeterminant
SWC 49	7190 *	Indeterminant
Cuttings	7200 - 10*	Indeterminant
SWC 48	7210 *	Lower <u>N. asperus</u> Subdivision indet.
SWC 47	7230 *	Lower <u>N. asperus</u> Subdivision indet.
SWC 46	7250 *	Lower <u>N. asperus</u> A subdivision
SWC 45	7258 *	Lower <u>N. asperus</u> A subdivision
SWC 44	7268 *	Lower <u>N. asperus</u> A subdivision
SWC 43	7286 *	Lower <u>N. asperus</u> A subdivision
SWC 42	7294	<u>P. asperopolus</u>
Core-1	7303	<u>P. asperopolus</u>
Core-1	7317 *	<u>P. asperopolus</u>
Core-1	7328 *	<u>P. asperopolus</u>
SWC 40	7348 *	<u>P. asperopolus</u>
SWC 39	7372 *	Barren
SWC 38	7385 *	<u>P. asperopolus/W. thompsonae</u>
SWC 36	7486 *	Upper <u>M. diversus</u>
SWC 35	7607 *	Upper <u>M. diversus</u>
Cuttings	7660-80	Indeterminant
SWC 34	7691 *	Indeterminant
SWC 33	7788 *	Lower <u>M. diversus</u>
SWC 32	7935 *	Lower <u>M. diversus</u>
SWC 31	8050	Lower <u>M. diversus</u>
Cuttings	8050 - 60	Lower <u>M. diversus</u>
SWC 24	8196 *	Lower <u>M. diversus</u>
SWC 23	8272 *	Lower <u>M. diversus</u>
SWC 22	8365	<u>L. balmei</u>
SWC 21	8437 *	<u>L. balmei</u>
SWC 20	8537	Barren

<u>Sample</u>	<u>Depth (in feet)</u>	<u>Zone</u>
SWC 19	8629	Barren
SWC 18	8754	<u>L. balmei</u>
SWC 16	8952	<u>L. balmei</u>
SWC 15	9086	<u>L. balmei</u>
SWC 14	9134	<u>L. balmei</u>
SWC 11	9430 *	<u>L. balmei</u>
SWC 10	9507	Indeterminant
SWC 3	9688 *	<u>L. balmei</u>
SWC 1	9857 *	<u>L. balmei</u>

* Dinoflagellates present.

