Detailed palynological analysis of Gurnard Formation in Patricia–1, Gippsland Basin.

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Biostrata Report 2000/20

22nd November 2000

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INTERPRETATIVE DATA

Summary

Sixteen samples, comprising 13 core samples, two cuttings and one sidewall core sample, are analysed over a ~200 metre interval from 692 to 800m in Patricia–1. The study confirms the presence of non-marine Early Eocene assemblages at the top of the coarse clastics part of the Latrobe Group, nearshore marine Middle to Late Eocene assemblages through the Gurnard Formation, and an open-marine Early Oligocene assemblage from the base of the Seaspray Group as tabulated below:

Table 1: Palynological Summary for Patricia–1.

AGE	UNIT/FACIES	SPORE-POLLEN ZONES (MICROPLANKTON ZONES)	DEPTHS mKB
RECENT to Early MIOCENE	GIPPSLAND LIMESTONE Seafloor to 655m	No palynology dating.	
Early MIOCENE to OLIGOCENE	LAKE ENTRANCE FORMATION 655 to ?695m	Upper *P. tuberculatus* Lower *P. tuberculatus* (*Operculodinium* Sz.)	672m† 683 to 692m (672 to 692m)
Basal OLIGOCENE	"Early Oligocene Wedge" ?695 to 700m	(*F. leos*)	Caved in cuttings at 700–703m
Late to Middle EOCENE	LATROBE GROUP Gurnard Formation 700 to 744m	Middle *N. asperus* (*S. kakanuiensis*) Lower *N. asperus* (*D. heterophlycta*) and (*E. partridgei*)	700 to 703m (700 to 703m) 703.2 to 742.3m (703.2 to 730.7m) (737.5 to 742.3m)
Early EOCENE	LATROBE GROUP Undiff. coarse clastics 744 to ?764m	*P. asperopolus*	Out–of–place core–3 samples 743.5 to 743.7m
PALEOCENE?	LATROBE GROUP Undiff. coarse clastics ?764m to 800m	No palynology dating	
LATE ALBIAN	STRZELECKI GROUP 800 to 900mTD	*P. pannosus*	821 to 880m†

† Zone picks after Dettmann (1987).

Introduction

The collection and preparation of eleven new palynological samples and re–examination of existing palynological slides from an additional five samples from Patricia–1 were undertaken as part of a larger review project for Basin Oil Pty Ltd, revising the age dating and correlation of the Gurnard Formation in the wells Baleen–1, Flathead–1, Judith–1, Sperm Whale–1 and Whale–1, which are located on the Northern Strzelecki Terrace in the offshore Gippsland Basin. The samples were collected by the author from the Victorian Department of Natural Resources & Environment (DNR&E) on 13th September 2000, and submitted to Laola Pty Ltd in Perth for palynological processing. The prepared palynological slides were returned during the next two week and Provisional Reports on the analyses of samples from Patricia–1 were submitted on the 25th and 28th September.

The new palynological analyses have been made on nine core and two cuttings, and four core and one sidewall core originally reported on by Dettmann (1987). Details of zone assignments, confidence ratings and key comments are given in Table 2, with lithologies and quantities of the new samples processed provided in Table 3. Visual residues yields, palynomorph preservation, and recorded species diversity for all samples are provided in Table 4. Results of the assemblage counts are provided in Table 5, and the distribution list for all known spore-pollen and microplankton identified are provided in Table 6. Author citations for spore-pollen species can mostly be sourced from Stover & Partridge (1973, 1982) and Dettmann (1963), and for the microplankton species from the indexes of Williams *et al.* (1998) and Fensome *et al.* (1990). Species names followed by “ms” or “†” are unpublished manuscript names.

Geological Discussion

The sequence penetrated in Patricia–1 consists of a moderate thickness of Gippsland Limestone (604 metres), overlying a thin Lakes Entrance Formation (45 metres), which are assigned to the Seaspray Group. These unconformably overlie a significant thickness of Gurnard Formation (44 metres), and a thin section of coarse siliciclastic facies assigned to the Latrobe Group (66 metres). The latter, in turn, unconformably overlies about 100 metres of Early Cretaceous Strzelecki Group extending to T.D.

The main focus of this palynological study of Patricia–1 has been the Gurnard Formation, which in most respects represents a nearly complete section through what could be considered an idealised section of the formation. Demonstrating this is helped by the recovery of ~40 metres of conventional core representing 91% of the thickness of the Gurnard Formation. The availability of the cores allowed the collection of large than normal quantities of rock for the palynological processing (average 19.2 grams per sample) which has overcome the perennial problem of extremely low palynological yields from the glauconitic-rich lithologies. Although the organic residue yields from the cores were still only moderate, the concentration of palynomorphs in the residues, and on the palynological slides, was extremely high, enabling almost the full diversity of the assemblages to be recorded. For example, the spore-pollen assemblages averaged 71 species per core sample (range 52 to 100 species per sample), with a total diversity in excess of 120 species, while the microplankton diversity averaged 16 species per core sample (range 10 to 27 species per sample), with a total diversity in excess of 35 species. The relatively moderate diversity of microplankton reflects the low abundance of the microplankton relative to the spore-pollen (average 7% of combined SP + MP count), a consequence of the depositional setting of the Gurnard Formation in Patricia–1. The latter is estimated to have been no more than 10 to 20 km from the palaeoshoreline during the Middle Eocene based on palaeogeographic reconstructions (Partridge, 1999). Overall the results from the core samples from the Gurnard Formation can be considered exceptional as the other sample analysed in Patricia-1 have less than half the species diversity (Table 4). The latter are nevertheless fairly typical of the results from the vast bulk of the palynological analyses in the Gippsland Basin.

The palynological sequence through the 44 metre thick Gurnard Formation in Patricia–1 extends through the Middle and Late Eocene, with most of the section (>63%) belonging to the late Middle Eocene *D. heterophlycta* microplankton Zone. The bottom 6.5 to 13 metres represents the oldest known Gurnard Formation assigned to the *E. partridgei* microplankton Zone (formerly the informal *A. australicum* Zone) of early Middle Eocene age, while no more than three metres at the top of the formation can be assigned to the Late Eocene *C. incompositum* and *S. kakanuiensis* microplankton Zones. It is not certain whether both of the latter zones are represented in the cuttings sample from 700–703m, but it seems likely that the basal Oligocene *P. comatum* Acme Zone and the associated Upper *N. asperus* Zone are missing at the boundary between the Gurnard and Lakes

Entrance Formations. Depending on the location in the basin the *P. comatum* Acme Zone can occur at either the top of the Gurnard Formation or in non-glauconitic medium to dark grey calcareous claystones at the base of the Lakes Entrance Formation. A well in which the *P. comatum* Acme Zone straddles the boundary between these two units is Blenny–1 (Partridge, 1992).

The cuttings sample at 700–703m also contain the caved index species of the *F. leos* microplankton Zone. This zone is interpreted to lie in the unsampled interval from 695 to 700m as *Fromea leos* ms was not recorded from the sidewall core at 692m, which instead contains the next younger *P. simplex* microplankton Zone. Further resolution of this very condensed section through the top three metres of the Gurnard Formation into the basal eight metres of the Lakes Entrance Formation could be achieved if the sidewall cores shot at 699.5m, 700.3m 701.5m and 702.5m could be found and sampled for palynological analysis. This condensed interval may represent as much as 7 million years (32 to 39 Ma on the timescale of Haq *et al.*, 1987), and is represented by over 200 metres of lower coastal plain coal measures deposition in the onshore Seaspray Depression, in the western part of the basin.

The two deepest core samples at 743.5m and 743.7m, although supposedly above the obvious base on the Gurnard Formation picked on the electric logs at 744m, clearly cannot belong to that formation as they contain diverse non-marine assemblages belonging to the Early Eocene *P. asperopolus* spore-pollen Zone. Instead they are interpreted to most likely come from the first shaly section in the underlying coarse clastics, represented on the gamma ray log between 748 and 752m. The depth anomaly undoubtedly relates to the poor recovery of conventional core–3. Although 18 metres were cut from 740 to 758m, only 21% or 3.8 metres were recovered. Inspection of the portion of core–3 held by the DNR&E revealed a rather broken-up sequence of bioturbated and glauconitic argillaceous sandstone identified as typical Gurnard Formation, overlying loose quartz sand to cobbles (>6cm) mixed with loose fragments of medium-grey carbonaceous mudstone. These latter lithologies are interpreted to come from the coarse clastic facies of the Latrobe Group underlying the Gurnard Formation. It would appear that recovery of core–3 declined once the top of the coarse clastic was penetrated at 744m, most likely because of the presence of a conglomeritic section immediately below the Gurnard Formation.

The deepest sample examined in Patricia–1 was a small amount (<0.5g) of carbonaceous shaly material picked from a composite cuttings sample between 790 and 800m. This sample was analysed because a small amount of picked cuttings from a similar stratigraphic position in Baleen–2 gave a good Paleocene *L. balmei* Zone assemblage (Partridge, 2000). Unfortunately the same success was not achieved in Patricia–1 as the shale picked from the cuttings at 790–800m gave an extremely low yield assemblage (<100 specimens), dominated by *Nothofagidites* pollen that is interpreted to be entirely caved from the *N. asperus* or younger Zones, and does not reflect the age of the interval.

In the original palynological report by Dettmann (1987) the Gurnard Formation was more evenly subdivided between the Lower and Middle *N. asperus* Zones, principally based on the identification of *Gippslandica extensa* (recorded as *Lentonia extensa* in the original report) at 705m. Upon re-examination of the palynological slides for this study *G. extensa* could not be found and it is interpreted that the original record is a misidentification of the superficially similar species *Spinidinium macmurdoense* that was recorded.

Discussion of Assemblages

Lower to Upper *Proteacidites tuberculatus* spore-pollen Zone
and *Operculodinium* microplankton Superzone.
Interval: 672 to 692 metres.
Age: Early Oligocene to Early Miocene.

Three sidewall cores were analysed from the Seaspray Group in the original study by Dettmann (1987), but only the deepest was re-examined for this report. This assemblage was dominated by *Nothofagidites* pollen (58% of SP count) and dinocysts belonging to *Spiniferites* (17% of combined SP & MP count). Unusual for a marine sample the assemblage also contained abundant fungal remains (22% of total count). Although the spore-pollen assemblage is rather non-descript and lacking in key index species assignment to the Lower *P. tuberculatus* Zone is preferred rather than the next older Upper *N. asperus* Zone originally specified by Dettmann (1987). This choice is influenced by the associated microplankton assemblage which contains the important manuscript species *Protoellipsodinium simplex* and *Pyxidinopsis pontus*, but lacks the acme of *Phthanoperidinium comatum* that is usually associated with the Upper *N. asperus* Zone. The sample also lacks *Fromea leos* which is diagnostic of the intervening *F. leos* microplankton Zone.

The assemblage recorded by Dettmann (1987) from the sidewall core at 683m is similarly rather non-descript, while the shallowest sidewall core at 672m contains *Acaciapollenites myriosporites* which is diagnostic of the Upper *P. tuberculatus* Zone.

Middle *Nothofagidites asperus* spore-pollen Zone and
***Stoveracysta kakanuiensis* microplankton Zone.**
Cuttings sample at: 700–703 metres.
Age: Latest Eocene.

The shallowest cuttings sample collected from the top of the glauconitic section in Patricia–1 contains a distinctive assemblage with a mixture of key dinocyst index species for the latest Eocene and earliest Oligocene. The co-occurrence of the index dinoflagellate species *Stoveracysta kakanuiensis*, *Corrudinium incompositum* and *Gippslandica extensa* confirms the definite presence of the youngest Eocene microplankton zone (and possibly the underlying *G. extensa/ C. incompositum* Zone interval), while the presence of the distinctive pollen *Triorites magnificus* indicates an age no younger than the Middle *N. asperus* Zone (= *T. magnificus* Subzone).

In addition, the presence in the cuttings of the manuscript acritarch species *Fromea leos* (which is not known to overlap in range with *S. kakanuiensis*, *C. incompositum* or *G. extensa*) is interpreted to indicate the presence in Patricia–1 of the *F. leos* Zone in the 8 to 10 metre interval between the sidewall core at 692m and the interval of the cuttings. At the same time the lack of any significant abundance of the dinocyst *Phthanoperidinium comatum* in the cuttings is interpreted to indicate that the *P. comatum* Acme Zone and associated Upper *N. asperus* Zone are probably missing in Patricia–1. This means that the very basal Oligocene is missing in Patricia–1 and this break lies at the base of the Seaspray Group.

Overall the spore-pollen assemblage is dominated by *Nothofagidites* pollen (57%), which is consistent with a Late Eocene to Early Oligocene age, while the microplankton assemblage is dominated by *Spiniferites* species (50%) and *Operculodinium centrocarpum* (14%). Such dominance of these latter species is interpreted to mean that a significant proportion of the microplankton assemblage is caved, and a similar interpretation probably applies to many of the spore-pollen in the sample.

Lower *Nothofagidites asperus* spore-pollen Zone.

Interval: 703.2 to 742.3 metres.

Age: Middle Eocene.

Eight new core samples and three of the original 4 core samples analysed by Dettmann (1987) were examined over this interval. Although the recovered organic residue yields from the samples was only low to moderate the concentration of the palynomorphs on the slides was typically high and most assemblages are well preserved. Spore-pollen diversity was high to very high (average diversity 71+ species per sample), while microplankton diversity was moderate (average 16 species per sample). Overall the assemblages are dominated by angiosperm pollen (average 71%), mostly *Nothofagidites* spp. (average 41%), *Haloragacidites harrisii* (average 6.5%) and *Proteacidites* spp. (average 5%), with secondary gymnosperm pollen (average 21%) and only minor spores (average 8%).

The base of the Lower *N. asperus* Zone in Patricia–1 is identified at 742.3m by the increase in abundance of *Nothofagidites* pollen (to >40%) and the key FADs (First Appearance Datums) of *Nothofagidites falcatus, N. vansteenisii* and *Tricolpites simatus*, supported by the FADs of *Anisotricolporites triplaxis, Proteacidites reflexus* and *Matonisporites ornamentalis* in the immediately overlying sample at 739.8m. The suite of core samples are considered to be no younger than the Lower *N. asperus* Zone based on the consistent presence of *Proteacidites pachypolus* and successive LADs of *Diporites delicatus* ms (at 739.8m), *Proteacidites asperopolus* (at 730.7m), and *Proteacidites reflexus* (at 708.8m), based on the ranges in Stover & Partridge (1973, 1982). With the exception of single specimens of *Triorites magnificus* (at 717m) and *Proteacidites reticulatus* (at 708.8m) the samples lack the consistent occurrence of spore-pollen species considered diagnostic of the overlying Middle *N. asperus* Zone. Most conspicuous by their absence are *Aglaoreidia qualumis*, *Anacolosidites sectus*, *Proteacidites rectomarginis* and *Verrucosisporites cristatus*.

Subdivision of the Lower *N. asperus* Zone into the new lower *P. crescentis* Subzone and an upper *A. luteoides* Subzone is difficult in Patricia–1 due to the rarity of the key index species. The *P. crescentis* Subzone extends no shallower than 730.7m based on presence of the eponymous species *Plicodiporites crescentis* ms in this sample where it is associated with the LAD of *Proteacidites asperopolus*. By default the interval 703.2 to 725.8m is assigned to the younger *A. luteoides* Subzone, even though the eponymous species *Anacolosidites luteoides* is only recorded at 739.8m. The designation of the top of the *P. crescentis* Subzone within the basal sample of the *D. heterophlycta* Zone is marginally high than previously recorded.

The Middle Eocene age for the bulk of the Gurnard Formation derived from the spore-pollen assemblages is supported by the associated microplankton in the samples, with both the *D. heterophlycta* and *E. partridgei* Zones identified.

***Deflandrea heterophlycta* microplankton Zone.**
Interval: 703.2 to 730.7 metres.
Age: Middle Eocene.
The *D. heterophlycta* Zone is recorded from eight core samples over a 27 metre interval. The base of the zone is identified by the first reliable occurrence of the eponymous species *Deflandrea heterophlycta* and the FAD of the acritarch *Paucilobimorpha inaequalis* (= *Tritonites inaequalis* Marshall & Partridge, 1988), while the top of the zone is picked at 703.2m based on the LADs of *Enneadocysta partridgei, Paucilobimorpha inaequalis, Spinidinium macmurdoense* and *Vozzennikovia apertura/rotunda*. Unexpectedly *D. heterophlycta* was only reliably recorded from the basal half of the interval. Questionable identifications of the eponymous species at 705m and 739.8m are based on fragmented specimens. The occurrence of rare specimens of *Corrudinium incompositum* at 720m and 725.8m is anomalously stratigraphically low, but has to be interpreted as a extension of range of the species as the overall aspect of the assemblages is of Middle rather than Late Eocene in age. Supporting this extension of range is the fact that *C. incompositum* is known to extend into the Middle Eocene in the Northern Hemisphere (Stover *et al.*, 1996).

Another unusual occurrence was the presence of *Diphyes colligerum* at 725.8m but not in other samples. As this species was recorded at only 772m in Baleen–2 it may be worth checking whether these occurrences confirm an electric logs correlation between the two wells.

Abundance of microplankton in the samples is only moderate (~8% of combined SP + MP count), with most samples dominated by the shallow water algal cyst *Paralecaniella indentata* (average ~30% of MP count). With the exception of the sample from the top of core–2 at 725.8m (which may be contaminated) abundance of species of *Spiniferites* in the microplankton assemblages is relatively low (average 8% of MP count) in contrast to abundances of >50% in the Seaspray

Group. This marked difference is used in other wells in the study to estimate the amount of cavings in cuttings samples.

Enneadocysta partridgei **microplankton Zone.**
Interval: 737.5 to 742.3 metres.
Age: Middle Eocene.

The *E. partridgei* Zone is recorded from three core samples over a 5 to 13 metre interval at the base of the Gurnard Formation. The zone has previously been recorded in palynological reports and on stratigraphic tables from the Gippsland Basin as the informal *Areosphaeridium australicum* Zone. The name change is necessary as *Areosphaeridium australicum* was a manuscript species that has recently been described as *Enneadocysta partridgei* by Stover & Williams (1995).

The base of the zone is picked at 742.3m on the FADs of the eponymous species *Enneadocysta partridgei* and the acritarch *Paucilobimorpha tripus* de Coninck 1986 (= *Tritonites tricornus* Marshall & Partridge, 1988), while the top of the zone is picked at 737.5m on the LAD of *Paucilobimorpha pandus* (= *Tritonites pandus* Marshall & Partridge, 1988). Each of the three samples show discrete assemblages, perhaps hinting that the sequence in relatively condensed. The bottom sample is dominated by *Eocladopyxis peniculata* (58% of MP count). The middle sample at 739.8m with the low microplankton abundance of 2% is dominated by *Paralecaniella indentata* (29% of MP count), while the top sample is dominated by the *Vozzhennikovia apertura* and *V. rotunda* species complex (46% of MP count). This latter sample also has an unusually young stratigraphic occurrence of *Palaeocysodinium golzowense*.

Proteacidites asperopolus **spore-pollen Zone.**
Sample depths: 743.5 and 743.7 metres.
Age: Early Eocene.

Two samples from the bottom of core–3 contain non-marine spore-pollen assemblages that can be confidently assigned to the *P. asperopolus* Zone. The sample depths suggest they are from the base of the Gurnard Formation, but as both assemblages are inconsistent with the other samples from that formation it is considered that the samples are from the underlying coarse clastics portion of the Latrobe Group.

The presence of the eponymous species *Proteacidites asperopolus* together with *Sapotaceoidaepollenites rotundus*, *Clavastephanocolporites meleosus* and

Crassiretitriletes vanraadshoovenii in the deeper sample confirm an age no older than the zone, while the occurrence of *Intratriporopollenites notabilis* in the shallower sample confirms an age no younger than the zone. Both assemblages are characterised by abundant *Proteacidites* pollen (>20%) and only moderate amounts of *Nothofagidites* pollen (average <15%). Spores are also uncommon (average <20%) while gymnosperm pollen are infrequent (<5%). The non-marine nature of the assemblages is emphasised by abundant (>60% of total count) fungal remains (spores, hyphae, fruiting bodies and germlins) in both samples.

Indeterminate interval.

Below the bottom of core-3 at 758m to the top of the Strzelecki Group at 800m there is no palynological dating as the sidewall cores at 769m and 786.5m were reported as barren by Dettmann (1987). In an attempt to rectify this situation a composite cuttings sample was collected over the interval 790–800m and a small amount of carbonaceous shale was picked from the dominantly sandstone lithology. The extremely small palynological residue recovered was sufficient to make only one slide with a quarter coverslip, which contained <100 specimens. The recorded assemblage was comprised exclusively of long ranging species that were not age diagnostic, but the dominance of *Nothofagidites* pollen (>27%) suggests the picked shale is caved from the Lower *N. asperus* or younger Zones.

Phimopollenites panosus **spore-pollen Zone.**

Interval: 821 to 880 metres.

Age: Late Albian.

The sidewall cores from the basal 100 metres penetrated in the well were assigned to the *P. pannosus* Zone by Dettmann (1987) based on the presence of the eponymous species in association with *Coptospora paradoxa*. The assigned zone is consistent with the recorded assemblage but neither sample was re-examined in this study.

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***Confidence Ratings used in STRATDAT database and applied to Table 2.**

Alpha codes: Linked to sample		**Numeric codes:** Linked to fossil assemblage		
A	Core	**1**	**Excellent confidence:**	High diversity assemblage recorded with key zone species.
B	Sidewall core	**2**	**Good confidence:**	Moderately diverse assemblage recorded with key zone species.
C	Coal cuttings	**3**	**Fair confidence:**	Low diversity assemblage recorded with key zone species.
D	Ditch cuttings	**4**	**Poor confidence:**	Moderate to high diversity assemblage recorded without key zone species.
E	Junk basket	**5**	**Very low confidence:**	Low diversity assemblage recorded without key zone species.

Table 2: Interpretative data for Patricia–1 well.

Sample	Depth	Spore-Pollen Zone (Microplankton Zone)	CR*	Comments and Key Species Present
SWC	692m	*P. tuberculatus* (*P. simplex*)	B4 B2	MP 29% with *Spiniferites* spp. 59% of MP count. Age based on FADs of *Proteacidites tuberculatus* & *Protoellipsodinium simplex*†.
Cuttings	700–703m	Middle *N. asperus* (*S. kakanuiensis*)	D3 D2	MP 32% with ~20% of assemblage caved. Assemblage dominated by *Nothofagidites* 57% and contains LADs of *Stoveracysta kakanuiensis* and *Triorites magnificus* mixed with FAD of *Fromea leos*.
Core–1	703.2m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP 3% and *Nothofagidites* 55%. LADs of *Paucilobimorpha inaequalis* and *Enneadocysta partridgei.*
Core–1	705m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP 2% and *Nothofagidites* 56%. LAD of *Deflandrea cygniformis*.
Core–1	708.8m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP 8% and *Nothofagidites* 56%. LAD of *Proteacidites reflexus*.
Core–1	713.2m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP 19% and *Nothofagidites* 46%. LAD of *Dryptopollenites semilunatus*.
Core–1	717m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP 6% and *Nothofagidites* 34%. LAD of *Deflandrea heterophlycta*.
Core–1	720m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP 4% and *Nothofagidites* 24%. Abundant *Myrtaceidites* pollen 21%.
Core–2	725.8m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP 18% and *Nothofagidites* 28%. Key MP FAD of *Rhombodinium glabrum*.
Core–2	730.7m	Lower *N. asperus* (*D. heterophlycta*)	A1 A2	MP <2% and *Nothofagidites* 42%. FADs of *Paucilobimorpha inaequalis* and *Deflandrea heterophlycta*
Core–2	737.5m	Lower *N. asperus* (*E. partridgei*)	A1 A2	MP 8.5% and *Nothofagidites* 39%. LAD of *Paucilobimorpha pandus*.
Core–2	739.8m	Lower *N. asperus* (*E. partridgei*)	A1 A2	MP <2% and *Nothofagidites* 29%. FAD of *Paucilobimorpha pandus*.
Core–3	742.3m	Lower *N. asperus* (*E. partridgei*)	A1 A2	MP ~4% and *Nothofagidites* 42%. FAD of *Paucilobimorpha tripus*
Core–3	743.5m	*P. asperopolus*	A1	LAD of *Intratriporopollenites notabilis* Fungal spores & hyphae 60% of total count. *Nothofagidites* 17% and *Proteacidites* 20%.
Core–3	743.7m	*P. asperopolus*	A1	FADs of *Proteacidites asperopolus*, *Clavastephanocolporites meleosus*, and *Sapotaceoidaepollenites rotundus* in assemblage with abundant fungal spores & hyphae >60% of total count. *Nothofagidites* 11% and *Proteacidites* 25%.
Picked Cuttings	790–800m	Caved assemblage of Lower *N. asperus*		Very small amount of hand-picked carbonaceous shale gave an entirely caved assemblage.

MP %= microplankton expressed as % of combined SP & MP count.
Nothofagidites % = abundance expressed as % of SP count only.
FAD & LAD = First & Last Appearance Datums.

BASIC DATA

Table 3: Basic sample data on new samples processed from Patricia–1.

Sample Type	Depth metres	Lithology	Weight (grams)
Cuttings	700-703m	Unconsolidated green–black glauconitic? sand with <10% caved marl.	15.2
Core 1	703.1m	Brown-grey sandy micaceous mudstone (loose pieces)	22.1
Core 1	708.8m	Bioturbated green-grey sandy micaceous mudstone (loose pieces)	21.5
Core 1	713.2m	Bioturbated medium grey argillaceous sandstone (loose pieces)	16.0
Core 1	717m	Bioturbated brown grey argillaceous sandstone (loose pieces)	20.9
Core 2	725.8m	Bioturbated brn-grey sandy argillaceous sandstone (loose pieces)	15.3
Core 2	730.7m	Bioturbated brown-grey argillaceous sandstone (loose pieces)	20.3
Core 2	737.5m	Bioturbated brown-grey argillaceous sandstone (loose pieces)	15.5
Core 3	742.3m	Green-brown glauconitic argillaceous sandstone (loose pieces)	19.7
Core 3	743.7m	Medium grey carbonaceous mudstone with carbonaceous plant flecks	21.0
Composite picked cuttings	790-800m	Picked trace of carbonaceous shale from composite cuttings.	0.5

Average: 17.1

BASIC DATA

Table 4: Basic assemblage data on samples examined in Patricia–1.

Sample Type	Depth metres	Visual Yield	Palynomorph Concentration	Preservation	No. SP Species	No. MP Species
SWC	692	Moderate	High	Fair	32+	10+
Cuttings	700–703	Low	High	Poor-good	33+	21+
Core–1	703.2	Moderate	Very high	Poor-good	73+	17+
Core–1	705	High	High	Poor-good	57+	10+
Core–1	708.8	Moderate	High	Poor-good	65+	14+
Core–1	713.2	Moderate	High	Poor-good	52+	12+
Core–1	717	Low	High	Poor-good	71+	27+
Core–1	720	High	High	Poor-good	72+	20+
Core–2	725.8	Low	High	Good	67+	18+
Core–2	730.7	Moderate	High	Good	100+	20+
Core–2	737.5	Moderate	High	Fair-good	60+	12+
Core–2	739.8	High	High	Good	88+	15+
Core–3	742.3	Moderate	High	Good	80+	14+
Core–3	743.5	High	High	Fair	39+	
Core–3	743.7	High	High	Good	37+	
Composite picked cuttings	790-800	Very low	Low	Fair	24+	3+
				Averages:	**59+**	**13+**

Table 5. Patricia–1	**BASIC DATA on abundance of palynomorphs.**							
Sample Type	**SWC**	**Cutts**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**
Depth (m)	**692**	**700-703**	**703.2**	**705**	**708.8**	**713.2**	**717**	**720**
SPORE-POLLEN SPECIES								
Baculatisporites spp.	0.8%				0.6%	2.3%		
Cyathidites spp. large >40µm						0.6%		
Cyathidites spp. small <40µm	3.2%	4.9%	2.0%	1.6%	3.2%	3.4%	1.9%	1.3%
Dictyophyllidites spp.	0.8%							
Gleicheniidites spp.				0.8%		1.1%		
Laevigatosporites spp.		0.8%	1.0%		1.9%	2.3%	1.3%	3.2%
Monolete spores undiff:		2.5%	0.5%			0.6%	1.3%	
Stereisporites spp.	0.8%	0.8%		0.8%		0.6%		
Trilete spores undiff.	0.8%	0.8%	1.5%	1.6%		0.6%	1.3%	
Tripunctisporis maastrichtiensis								
TOTAL SPORES:	**6%**	**10%**	**5%**	**5%**	**6%**	**11%**	**6%**	**4%**
GYMNOSPERMS								
Araucariacites australis	2.4%	4.9%	1.5%	1.6%	0.6%	2.3%	1.3%	
Cupressacites sp.			1.0%	0.8%		1.1%		1.3%
Dacrycarpites australiensis			0.5%		0.6%			
Dilwynites spp.	8.1%	6.6%	1.5%	1.6%	1.3%	3.4%	1.3%	3.8%
Lygistepollenites florinii	0.8%	2.5%	2.5%		1.3%	5.1%	6.5%	1.3%
Microcachyridites antarticus	1.6%	0.8%	2.0%		0.6%	1.1%		
Phyllocladidites mawsonii	4.0%	4.9%	10.4%	7.0%	9.5%	8.6%	14.2%	3.2%
Podocarpidites spp.	0.8%	2.5%	6.0%	6.2%	3.2%	6.3%	4.5%	2.6%
Trichotomosulcites subgranulatus			2.5%		0.6%	0.6%	0.6%	
TOTAL GYMNOSPERM POLLEN:	**18%**	**22%**	**28%**	**17%**	**18%**	**29%**	**28%**	**12%**
ANGIOSPERM pollen undiff.	0.8%	1.6%	2.5%		0.6%	1.7%	4.5%	2.6%
Anacolosidites acutullus								
Banksieacidites arcuatus								0.6%
Beaupreaidites trigonalis†			0.5%				0.6%	
Cupanieidites orthoteichus				0.8%	1.3%			0.6%
Dicotetradites clavatus		0.8%			0.6%	0.6%		
Haloragacidites harrisii	5.6%	3.3%	2.0%	3.1%	10.1%	3.4%	16.8%	9.0%
Ilexpollenites spp.	0.8%				0.6%			
Liliacidites spp.								
Malvacipollis spp.	0.8%	0.8%	1.0%			0.6%		1.3%
Milfordia spp.					0.6%			1.3%
Myrtaceidites mesonesus/parvus	1.6%		0.5%	5.4%		0.6%		20.5%
Nothofagidites asperus	1.6%	0.8%	0.5%		0.6%	0.6%	0.6%	0.6%
Nothofagidites brachyspinulosus	0.8%	2.5%	2.5%		1.3%	2.3%	1.3%	
Nothofagidites deminutus	0.8%	3.3%	3.5%	1.6%	3.2%	2.9%	5.2%	2.6%
Nothofagidites emarcidus/heterus	49.2%	40.2%	39.8%	49.6%	46.2%	37.1%	22.6%	19.2%
Nothofagidites flemingii		3.3%	2.5%	1.6%	0.6%	0.6%	3.2%	0.6%
Nothofagidites goniatus		0.8%	1.0%	0.8%	0.6%	1.7%		0.6%
Nothofagidites vansteenisii	7.3%	6.6%	5.0%	2.3%	3.2%	1.1%	1.3%	1.3%
Periporopollenites spp.			0.5%				0.6%	0.6%
Proteacidites obscurus								
Proteacidites annularis	0.8%							0.6%
Proteacidites asperopolus								
Proteacidites pachypolus								0.6%
Proteacidites spp.	3.2%	3.3%	3.5%	4.7%	3.2%	3.4%	3.2%	4.5%
Santalumidites cainozoicus								
Tricolpites simatus				0.8%			0.6%	
Tricolporites paenestriatus								
Tricolp(or)ates spp.	0.8%	0.8%	2.0%	7.8%	3.8%	3.4%	5.2%	14.7%
Triporopollenites spp.	1.6%							1.3%
TOTAL ANGIOSPERM POLLEN:	**76%**	**68%**	**67%**	**78%**	**77%**	**60%**	**66%**	**83%**
TOTAL SPORE-POLLEN COUNT:	**124**	**122**	**201**	**129**	**158**	**175**	**155**	**156**
Initial MICROPLANKTON COUNT:	**51**	**58**	**7**	**3**	**13**	**40**	**10**	**7**
TOTAL initial SP & MP COUNT:	175	180	208	132	171	215	165	163
Microplankton as % SP + MP:	29%	32%	3%	2%	8%	19%	6%	4%

Table 5. Patricia–1	**BASIC DATA on abundance of palynomorphs.**							
Sample Type	**SWC**	**Cutts**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**
Depth (m)	**692**	**700-703**	**703.2**	**705**	**708.8**	**713.2**	**717**	**720**
MICROPLANKTON								
Dinoflagellates undiff:	6%	12%	11%	4%	30%	21%	13%	25%
Achomosphaera spp.			1%	1%		5%		
Deflandrea spp.			15%	42%	1%		6%	6%
Corrudinium incompositum								1%
Cyclopsiella vieta	2%							
Enneadocysta partridgei			4%	6%	10%		1%	1%
Eocladopyxis peniculata								
Fromea leos†		5%						
Fromea spp.	14%	7%	5%		3%	5%	2%	4%
Heteraulacysta paxilla†				1%		1%		2%
Histiocysta variata†								15%
Impagidinium spp.	4%	3%			8%			1%
Lingulodinium machaerophorum	4%	3%					1%	
Operculodinium centrocarpum	4%	14%	9%	5%	3%	3%	3%	
Palaeocystodinium golzowense								
Paralecaniella indentata		5%	20%	32%	3%	51%	67%	33%
Paucilobimorpha spp.			1%		1%			1%
Phthanoperidinium spp.			13%	4%	18%		2%	2%
Rhombodinium glabrum								2%
Spinidinium/Vozzhennikovia spp.			17%	4%	13%	1%		3%
Spiniferites spp.	59%	50%	5%		11%	13%	6%	3%
Tectatodinium spp.	8%							
Extra MICROPLANKTON COUNT:	**51**	**58**	**103**	**78**	**103**	**104**	**102**	**97**
OTHER PALYNOMORPHS								
Fungal germlins	0.4%			1.1%			0.6%	1.6%
Fungal spores & hyphae	21.2%	3.2%	1.9%	23.4%	6.0%	4.4%	3.5%	11.7%
Reworked spore-pollen	0.9%							
TOTAL OTHER PALYNOMORPHS:	**51**	**6**	**4**	**43**	**11**	**10**	**7**	**25**
TOTAL initial COUNT:	**226**	**186**	**212**	**175**	**182**	**225**	**172**	**188**
Additional abundance categories								
Total Nothofagidites spp.	60%	57%	55%	56%	56%	46%	34%	25%
Total Proteacidites spp.	4%	3%	3%	5%	3%	3%	3%	6%
† Manuscript names								

Table 5. Patricia–1	**BASIC DATA on abundance of palynomorphs.**							
Sample Type	**Core-2**	**Core-2**	**Core-2**	**Core-2**	**Core-3**	**Core-3**	**Core-3**	**Cutts**
Depth (m)	**725.8**	**730.7**	**737.5**	**739.8**	**742.3**	**743.5**	**743.7**	**790-800**
SPORE-POLLEN SPECIES								
Baculatisporites spp.			1.9%		1.1%		0.8%	
Cyathidites spp. large >40µm	1.3%					2.4%	0.8%	1.2%
Cyathidites spp. small <40µm	5.3%	2.6%	3.1%		2.8%	5.7%	14.3%	3.6%
Dictyophyllidites spp.	0.7%	0.8%			0.6%			
Gleicheniidites spp.		0.3%	1.2%		0.6%			2.4%
Laevigatosporites spp.	4.0%	3.1%	5.0%	3.0%	2.3%	2.4%	5.6%	10.8%
Monolete spores undiff:		0.5%	3.1%	0.6%	1.1%	2.4%		
Stereisporites spp.	0.7%	0.3%			0.6%			3.6%
Trilete spores undiff.	2.0%	1.3%	3.1%	0.6%	0.6%		4.8%	6.0%
Tripunctisporis maastrichtiensis		0.3%			0.6%			
TOTAL SPORES:	**14%**	**9%**	**17%**	**4%**	**10%**	**13%**	**26%**	**28%**
GYMNOSPERMS								
Araucariacites australis	2.0%	0.8%		0.6%	0.6%			1.2%
Cupressacites sp.		1.8%	0.6%					
Dacrycarpites australiensis		0.5%	0.6%					
Dilwynites spp.	9.3%	3.1%	1.9%	3.0%	2.3%			1.2%
Lygistepollenites florinii	2.0%	3.6%	1.9%	3.6%	1.1%			4.8%
Microcachyridites antarticus	0.7%	1.0%	2.5%		0.6%			
Phyllocladidites mawsonii	2.0%	6.3%	8.1%	2.4%	6.3%			8.4%
Podocarpidites spp.	4.6%	8.6%	5.0%	6.5%	4.0%	0.8%	4.0%	10.8%
Trichotomosulcites subgranulatus	0.7%	0.8%			1.1%			1.2%
TOTAL GYMNOSPERM POLLEN:	**21%**	**27%**	**20%**	**16%**	**16%**	**1%**	**4%**	**28%**
ANGIOSPERM pollen undiff.	0.7%	1.6%	1.2%	0.6%	4.0%	5.7%	4.8%	
Anacolosidites acutullus							1.6%	
Banksieacidites arcuatus	0.7%	0.3%						
Beaupreaidites trigonalis†								
Cupanieidites orthoteichus	1.3%	0.3%		3.6%		9.8%	4.0%	
Dicotetradites clavatus	1.3%	0.5%	1.2%					1.2%
Haloragacidites harrisii	11.9%	4.2%	6.2%	2.4%	2.3%	2.4%	6.3%	3.6%
Ilexpollenites spp.			0.6%	0.6%				
Liliacidites spp.	0.7%	0.3%					1.6%	
Malvacipollis spp.		0.3%	0.6%	0.6%	0.6%		0.8%	1.2%
Milfordia spp.	0.7%	0.3%						
Myrtaceidites mesonesus/parvus		1.0%		13.0%	1.1%	3.3%	0.8%	
Nothofagidites asperus		0.3%	0.6%	1.2%				
Nothofagidites brachyspinulosus	1.3%	1.8%	2.5%	0.6%	0.6%			
Nothofagidites deminutus	0.7%	3.9%	1.2%	1.2%	1.7%			1.2%
Nothofagidites emarcidus/heterus	23.2%	29.2%	29.8%	21.9%	36.4%	16.3%	11.1%	21.7%
Nothofagidites flemingii	2.0%	2.6%	2.5%	1.8%	1.1%	0.8%		
Nothofagidites goniatus	0.7%			0.6%	0.6%			2.4%
Nothofagidites vansteenisii	0.7%	3.9%	2.5%	1.8%	1.7%			1.2%
Periporopollenites spp.	0.7%	0.5%	0.6%		1.1%	0.8%		
Proteacidites obscurus	0.7%				1.1%			
Proteacidites annularis					1.1%			
Proteacidites asperopolus							1.6%	
Proteacidites pachypolus				0.6%	0.6%	0.8%	5.6%	2.4%
Proteacidites spp.	7.9%	6.5%	7.5%	10.7%	10.2%	18.7%	18.3%	4.8%
Santalumidites cainozoicus	1.3%	0.5%		1.2%	0.6%		0.8%	
Tricolpites simatus		0.3%		0.6%	0.6%			
Tricolporites paenestriatus		0.3%						
Tricolp(or)ates spp.	8.6%	6.0%	5.0%	15.4%	8.5%	24.4%	11.9%	4.8%
Triporopollenites spp.				1.8%		3.3%	0.8%	
TOTAL ANGIOSPERM POLLEN:	**65%**	**64%**	**62%**	**80%**	**74%**	**86%**	**70%**	**45%**
TOTAL SPORE-POLLEN COUNT:	**151**	**384**	**161**	**169**	**176**	**123**	**126**	**83**
Initial MICROPLANKTON COUNT:	**34**	**11**	**15**	**3**	**7**			**8**
TOTAL initial SP & MP COUNT:	185	395	176	172	183	123	126	91
Microplankton as % SP + MP:	18%	3%	9%	2%	4%			9%

Table 5. Patricia–1	BASIC DATA on abundance of palynomorphs.							
Sample Type	Core-2	Core-2	Core-2	Core-2	Core-3	Core-3	Core-3	Cutts
Depth (m)	725.8	730.7	737.5	739.8	742.3	743.5	743.7	790-800
MICROPLANKTON								
Dinoflagellates undiff:	20%	21%	14%	26%	11%			13%
Achomosphaera spp.								
Deflandrea spp.	1%	16%		9%	9%			
Corrudinium incompositum	2%							
Cyclopsiella vieta								
Enneadocysta partridgei	4%	10%	5%	9%	4%			
Eocladopyxis peniculata					58%			
Fromea leos†								
Fromea spp.								
Heteraulacysta paxilla†	4%							
Histiocysta variata†	1%	11%	2%					
Impagidinium spp.		1%						
Lingulodinium machaerophorum			2%					
Operculodinium centrocarpum		8%	4%					
Palaeocystodinium golzowense			5%					
Paralecaniella indentata	22%	7%	14%	29%	2%			38%
Paucilobimorpha spp.		1%	2%	6%	2%			
Phthanoperidinium spp.	14%			12%	4%			
Rhombodinium glabrum	2%							
Spinidinium/Vozzhennikovia spp.		7%	46%	6%	5%			
Spiniferites spp.	31%	20%	7%	3%	6%			50%
Tectatodinium spp.								
Extra MICROPLANKTON COUNT:	**107**	**92**	**57**	**34**	**102**			**8**
OTHER PALYNOMORPHS								
Fungal germlins				1.3%		0.9%		
Fungal spores & hyphae	12.3%	6.0%	7.4%	22.2%	13.7%	60.4%	60.3%	1.1%
Reworked spore-pollen								
TOTAL OTHER PALYNOMORPHS:	**26**	**25**	**14**	**53**	**29**	**195**	**191**	**1**
TOTAL initial COUNT:	**211**	**420**	**190**	**225**	**212**	**318**	**317**	**92**
Additional abundance categories								
Total Nothofagidites spp.	28%	42%	39%	29%	42%	17%	11%	27%
Total Proteacidites spp.	9%	7%	7%	11%	13%	20%	25%	7%
† Manuscript names								

Table 6. Patricia–1	**BASIC DATA**						**Palynomorph Distribution Chart.**									
Sample Type	**SWC**	**Cutts**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-2**	**Core-2**	**Core-2**	**Core-2**	**Core-3**	**Core-3**	**Core-3**	**Cutts**
Depth (m)	**692**	**700-703**	**703.2**	**705**	**708.8**	**713.2**	**717**	**720**	**725.8**	**730.7**	**737.5**	**739.8**	**742.3**	**743.5**	**743.7**	**790-800**
SPORE-POLLEN SPECIES																
Anacolosidites acutullus														X	X	
Anacolosidites luteoides												X				
Anisotricolporites triplaxis						X	X	X		X		X				
Araucariacites australis	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Baculatisporites spp.	X		X	X	X	X	X		X	X	X	X	X		X	
Banksieacidites arcuatus							X	X	X	X		X	X			
Beaupreaidites elegansiformis		X	X	X									X			
Beaupreaidites trigonalis†			X		X		X	X		X		X				
Beaupreaidites verrucosus					X					X	X					
Bluffopollis scabratus										X						
Bysmapollis emarciatus													X			
Camarozonosporites heskermensis								X				X				
Clavastephanocolporites meleosus															X	
Clavifera triplex										X	X	X				
Concolpites leptos	X		X	X	X			X		X		X		X		
Crassiretitriletes vanraadshoovenii															X	
Cupanieidites orthoteichus				X	X	X	X	X	X	X	X	X	X	X	X	
Cupressacites sp.			X	X	X	X		X		X	X		X			
Cyathidites palaeospora	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cyathidites splendens		X	X	X	X	X			X	X	X	X	X	X	X	X
Dacrycarpites australiensis			X		X	X	X		X	X	X	X	X			
Dicotetradites clavatus		X	X	X	X	X	X	X	X	X	X	X	X			X
Dictyophyllidites arcuatus	X				X	X	X		X	X			X			
Dilwynites granulatus	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Dilwynites tuberculatus			X	X	X		X	X	X	X		X	X			
Diporites delicatus†												X		X	X	
Dryptopollenites semilunatus						X			X		X		X			
Ericipites crassiexinus			X		X		X					X				
Ericipites scabratus			X		X	X			X		X		X			
Foveotriletes balteus			X	X	X		X	X	X	X	X		X			
Gambierina rudata														RW		
Gleicheniidites circinidites		X	X	X		X	X	X	X	X	X	X	X			X
Haloragacidites harrisii	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Haloragacidites trioratus			X		X		X	X	X	X		X	X			
Helciporites astrus													X	X		
Herkosporites elliottii		X	X		X			X					X			
Ilexpollenites spp.	X		X		X	X		X	X		X	X		X		X
Intratriporopollenites notabilis														X		
Ischyosporites gremius			X	X	X		X	X		X		X			X	
Ischyosporites irregularis†	X	X	X		X	X	X	X	X		X	X	X			
Kuylisporites waterbolkii				X		X	X	X	X		X			MD	X	
Laevigatosporites major			X	X	X	X	X	X	X	X		X	X	X		
Laevigatosporites ovatus	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Latrobosporites marginatus			X		X			X			X		X			
Liliacidites spp.								X	X	X		X			X	
Lygistepollenites florinii	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Malvacipollis diversus										X			X	MD		
Malvacipollis robustus†			X	X	X		X	X	X	X		X				
Malvacipollis subtilis	X	X	X		X	X	X	X	X	X	X	X	X		X	X
Matonisporites ornamentalis	X	X	X	X	X	X	X	X		X		X				
Micrantheum spinyspora										X		X				
Microcachyridites antarticus	X	X	X	X	X	X			X	X	X	X	X			
Milfordia homeopunctatus			X		X			X	X	X		X				
Monolites alveolatus			X	X			X	X		X	X	X	X			
Myrtaceidites mesonesus/parvus	X		X	X	X	X		X	X	X		X	X	X	X	
Nothofagidites asperus	X	X	X	X	X	X	X	X		X	X	X	X			
Nothofagidites brachyspinulosus	X	X	X		X	X	X		X	X	X	X	X	MD	X	
Nothofagidites deminutus	X	X	X	X	X	X	X	X	X	X	X	X	X			X

Table 6. Patricia–1	BASIC DATA						Palynomorph Distribution Chart.									
Sample Type	SWC	Cutts	Core-1	Core-1	Core-1	Core-1	Core-1	Core-1	Core-2	Core-2	Core-2	Core-2	Core-3	Core-3	Core-3	Cutts
Depth (m)	692	700-703	703.2	705	708.8	713.2	717	720	725.8	730.7	737.5	739.8	742.3	743.5	743.7	790-800
Nothofagidites emarcidus/heterus	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nothofagidites falcatus	X		X	X	X	X	X	X	X	X	X	X	X			
Nothofagidites flemingii		X	X	X	X	X	X	X	X	X	X	X	X	X		
Nothofagidites goniatus		X	X	X	X	X	X	X	X	X		X	X			X
Nothofagidites vansteenisii	X	X	X	X	X	X	X	X	X	X	X	X	X			X
Parvisaccites catastus			X		X	X	X	X		X	X	X	X			
Periporopollenites demarcatus	X	X	X		X	X	X	X	X	X		X	X	X		
Periporopollenites polyoratus				X	X		X		X	X	X		X			
Peromonolites densus			X				cf.			X						
Peromonolites vellosus			X	X	X	X	cf.		X	X	X	cf.	X	cf.		
Phyllocladidites mawsonii	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Plicodiporites crescentis†										X						
Podocarpidites spp.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Polycolpites esobalteus							X	X	X	X			X			
Polypodiidites perverrucatus			X	X			X		X				X			
Proteacidites adenanthoides			X	X	X		X		X	X	X	X	X			
Proteacidites alveolatus															X	
Proteacidites annularis	X		X	X	X	X	X	X	X	X		X	X	MD		
Proteacidites asperopolus										X	X	X	X	X	X	
Proteacidites crassus			X		X		X	X	X			X				
Proteacidites kopiensis										X		X	X	X		
Proteacidites latrobensis							X						X	MD	X	
Proteacidites nasus						X		X	X	X		X	X			
Proteacidites obscurus		X	X		X	X	X	X	X		X	X	X			
Proteacidites ornatus		RW														
Proteacidites pachypolus			X	MD		X		X	X	X	X	X	X	X	X	X
Proteacidites pseudomoides								X		X			X		X	
Proteacidites recavus			X	X			X	X	X	X	X	X	X			
Proteacidites reflexus					X					cf.		X				
Proteacidites reticulatus			X													
Proteacidites reticuloscabratus			X	X							X	X			X	
Proteacidites unicus†							X	X								
Proteacidites spp.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Proteacidites stipplatus	X															
Proteacidites tuberculatus	MD	X														
Proteacidites tuberculiformis							X			cf.		X				
Pseudowinterapollis cranwellae			X	X	X				X	X			X			
Retitriletes spp.			X	X	X		X	X	X				X		X	X
Rugulatisporites mallatus					X	X	X		X	X			X	MD		
Rugulatisporites trophus					X					X	X		X			
Santalumidites cainozoicus				X	X	X		X	X	X		X	X	X	X	
Sapotaceoidaepollenites rotundus			X				X	X		X	X		X	MD	X	
Schizocolpus marlinensis								X		X	X			MD		
Schizocolpus rarus†	X									X		X				
Stereisporites antiquisporites	X	X	X	X	X	X	X	X	X	X			X			X
Stereisporites australis			X						X	X	X					
Trichotomosulcites subgranulatus			X	X	X	X	X	X	X	X			X			X
Tricolpites matauraensis								X	X	X		X	X			
Tricolpites simatus				X	X	X	X	X	X	X	X	X	X			
Tricolpites thomasii										cf.	cf.					
Tricolporites adelaidensis	X	X	X	X	X		X	X	X	X		X				
Tricolporites leuros			X							X			X			
Tricolporites moultonii†															X	
Tricolporites paenestriatus					X		X		X	X		X	X	X	X	
Tricolporites sphaerica			X				X	X	X		X					
Tricolp(or)ates spp.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Triorites magnificus		X					cf.									
Triporopollenites ambiguus				X			X							MD		
Triporopollenites heleosus†										X					X	
Triporopollenites simplis										X		X	X		X	
Triporopollenites spp.	X							X		X		X		X	X	
Tripunctisporis maastrichtiensis			X		X	X	X	X	X	X	X	X	X			
Verrucatosporites alienus			X							X		X	X	X	X	
Verrucatosporites attinatus					X	X	X	X		X	X	X				
Verrucosisporites kopukensis		X	X	X	X	X		X	X	X	X	X	X		X	

Table 6. Patricia–1	**BASIC DATA**						**Palynomorph Distribution Chart.**									
Sample Type	**SWC**	**Cutts**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-1**	**Core-2**	**Core-2**	**Core-2**	**Core-2**	**Core-3**	**Core-3**	**Core-3**	**Cutts**
Depth (m)	**692**	**700-703**	**703.2**	**705**	**708.8**	**713.2**	**717**	**720**	**725.8**	**730.7**	**737.5**	**739.8**	**742.3**	**743.5**	**743.7**	**790-800**
MICROPLANKTON																
Achomosphaera spp.			X	X		X			X		X					
Apteodinium australiense		X														
Batiacasphaera amplexus†													X			
Batiacasphaera denticulata†							X			X						
Cleistosphaeridium epacrum†										X						
Cooksonidium capricornum		cf.							cf.		cf.					
Cordosphaeridium inodes									X							
Corrudinium corrudinium†			X													
Corrudinium incompositum		X						X	X							
Cyclopsiella vieta	X		cf.					cf.								
Dapsilidinium pseudocolligerum		CV														
Deflandrea antarctica/flounderensis				X			X	X		X		X	X			
Deflandrea cygniformis				X		X	X			X			X			
Deflandrea heterophlycta	RW			?			X	X	X	X		?				
Deflandrea leptodermata							X									
Deflandrea phosphoriticus		X	X	X	cf.		X	X	X	X			X			
Deflandrea spp.			X	X	X	X	X	X	X	X		X	X			
Dyphes colligerum									X							
Enneadocysta partridgei			X	X	X		X	X	X	X	X	X	X			
Eocladopyxis peniculata												X	X			
Fromea bubbly†	X															
Fromea leos†		X														
Fromea sp. cf. F. chytra		X	X		X	X	X	X								
Gippslandica extensa		X														
Heteraulacacysta paxilia†				X		X	X	X	X			X				
Hystiocysta variata†						X	X	X	X	X	X	X				
Impagidinium spp.	X	X			X	X		X		X	X					
Lingulodinium machaerophorum	X	X					X									
Membranosphaera adnata†			X							X						
Micrhystridium spp.													X			
Operculodinium centrocarpum	X	X	X	X	X	X	X			X	X					
Palaeocystodinium golzowense											X					
Paralecaniella indentata	X	X	X	X	X	X	X	X	X	X	X	X	X			X
Paucilobimorpha inaequalis			X		X	X	X	X		X						
Paucilobimorpha pandus											X	X				
Paucilobimorpha tripus												X	X			
Phthanoperidinium comatum		X	X	X	X	X	X	X	X	X						
Phthanoperidinium delicatum†					X				X			X	X			
Phthanoperidinium eocenicum			X		cf.		X						X			
Protoellipsodinium simplex†	X	CV														
Pyxidinopsis beta†	X															
Pyxidinopsis pontus†		CV														
Rhombodinium glabrum			X				X	X	X							
Samlandia chlamydophora							X									
Senoniasphaera compacta†					X					X		X				
Spinidinium macmurdoense			X	X	X		X			X	X	X				
Spiniferites spp.	X	X	X		X	X	X	X	X	X	X	X	X			
Stoveracysta kakanuiensis		X														
Systematophora placacanthum		X					cf.									
Tectatodinium pellitum	X	CV														
Thalassiphora pelagica							X		X							
Vozzhennikova apertura/rotunda			X		X	X	X	X		X	X		X			X
OTHER PALYNOMORPHS																
Fungal fruiting bodies	X		X	X						X			X	X	X	
Fungal germlins	X			X			X	X	X	X		X		X		
Fungal spores & hyphae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Scolecodonts					X											
† Manuscript Species																
X = Present																
CV = Caved																
RW = Reworked																
cf. = Compare with																
MD = Recorded by Dettmann (1987)																