

PALYNOLOGICAL ANALYSIS OF
WEST HALIBUT-1, GIPPSLAND BASIN

by

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Esso Australia Ltd
Paleontology Report 1979/3

March 28, 1979.

WEST HALIBUT-1

I N T R O D U C T I O N

Twenty-one sidewall cores, eleven core samples and one cuttings sample were processed and examined for palynology. Yield varied from very good to very poor, however, age determinations could be made in most cases.

Formation and zone subdivisions from the basal part of the Lakes Entrance Formation to the bottom of the well are summarized below. Table 1 lists all of the samples examined and summarises the findings, while individual fossil occurrence is noted on the accompanying distribution charts.

S U M M A R Y

<u>UNIT/FACIES</u>	<u>ZONE</u>	<u>DEPTH (in metres)</u>
Lakes Entrance Formation	<u>P. tuberculatus</u>	2372
<hr/>		
	UNCONFORMITY	
Latrobe Group (Coarse clastics)	Middle <u>M. diversus</u>	2374-2403.7
	Lower <u>M. diversus</u>	2411-2510.5
	Upper <u>L. balmei</u>	2515-2577
		T.D. 2577

G E O L O G I C A L C O M M E N T S

1. Most of the samples from the Latrobe Group showed some evidence of marine influence by the presence of at least a few dinoflagellates in the residues.
2. In contrast to the adjacent Fortescue-1 well where the Middle M. diversus Zone sediments were predominantly of non-marine character the highest Eocene (of the Middle M. diversus Zone) samples in West Halibut-1 at 2374m and 2377.5m contain almost entirely dinoflagellate assemblages with very few non-marine (i.e. spores and pollen) specimens present. This difference is probably a function of the more distal or seaward position of West Halibut-1 compared to Fortescue-1.

Even though the highest Eocene assemblage in West Halibut-1 contains predominantly dinoflagellates, the actual species composition makes it clearly distinct from the sample from the immediately overlying and much younger Lakes Entrance Formation.

3. The top of the Latrobe at West Halibut-1 is stratigraphically lower (Middle M. diversus) than the top of the section encountered at Fortescue-1 (Upper M. diversus).
4. The Wetzeliella hyperacantha Zone, which was noted in Fortescue-1 to straddle the boundary between the Upper L. balmei and Lower M. diversus Zones, was found to do the same thing in this well. It extends from 2510.5 to 2522 metres.
5. The separation between the Lower and Middle M. diversus Zones is based on the rare occurrence of Proteacidites tuberculiformis at 2403.7 metres. Since no other species, whose first appearances are diagnostic of the Middle M. diversus Zone were found, the separation between the Lower and Middle subzones should be considered tentative at this time.

DISCUSSION OF ZONES

The presence and distribution of all identified species are marked on the distribution sheets. The basis for separation this well section into stratigraphic zones is given below:

Upper Lygistepollenites balmei Zone: 2515-2577 metres.

The top of this zone is picked on the highest "in place" occurrence of L. balmei and A. obscurus and below the first occurrence of such Early Eocene species as Spinizonocolpites prominatus and Polypodiaceoisporites varus. The presence of such species as Proteacidites grandis, Cyathidites gigantis and Wetzeliella homomorpha, which occur throughout this section demonstrate that only Upper L. balmei sediments were penetrated.

Wetzeliella hyperacantha Zone: 2510.5 - 2522 metres.

As noted in the Geological Comments, Wetzeliella hyperacantha occurs in the samples on each side of the boundary between the Upper L. balmei and Lower M. diversus Zones. A similar occurrence was noted in Fortescue-1. The only occurrence of Kenleyia fimbriata, at 2515 metres, is also in this zone.

Lower Malvacipollis diversus Zone: 2411 - 2510.5 metres.

The base of the Lower M. diversus Zone is placed in West Halibut-1 at 2510.5 metres which contains the first appearances of Spinizonocolpites prominatus (frequent), Crassoretitriletes vanraadshoovenii and Polypodiaceoidsporites varus, while the top is taken at the sample below the first occurrence of Proteacidites tuberculiformis. Supporting the assignment of this section to the Lower part of the Middle subdivision is the frequent occurrence of Tetracolporites multistrixis which ranges up into only the lower part of the Middle subdivision.

Overall the samples in the Lower M. diversus Zone can be characterised by the common occurrence of Proteacidites grandis. In this aspect the samples can be readily distinguished from the underlying Upper L. balmei Zone, for although P. grandis may be common in this latter zone it is invariably associated with abundant pollen of Lygistepollenites balmei.

Middle Malvacipollis diversus Zone: 2374 - 2403.5 metres.

The occurrence of Proteacidites tuberculiformis at 2403.7 metres confirms the presence of the Middle M. diversus Zone at this depth. Unfortunately other indicator species (e.g. Proteacidites ornatus, P. xestiformis, P. plemmelus and Diporites delicatus) whose first appearance can be used to recognise the base of this zone are absent from this well, and consequently the differentiation of the zone in this well is very poor. Two of the samples from the upper part of this zone (e.g. 2374m and 2377.5m) contained an almost entirely dinoflagellate flora. Compared to Fortescue-1 this suggests that the West Halibut-1 location is in a more distal or seaward location during the Middle M. diversus Zone time.

Proteacidites tuberculatus Zone: 2372 metres.

The sample from 2372 yielded Cyatheacidites annulata, Dinospherea simplex and other species from the P. tuberculatus Zone. The one sidewall core above this depth (1825), that was processed for palynology, was barren.

REFERENCES

- Stacy, H.E., and Partridge, A.D., 1978, Palynological Analysis of Fortescue-1, Gippsland Basin, ESOA Paleo. Report 1978/19.

TABLE 1 : SUMMARY OF PALEONTOLOGICAL ANALYSES, WEST HALIBUT-1, GIPPSLAND BASIN

Sample	Depth (m)	Depth (ft)	Zone	Age	Confidence Rating	Yield	Diversity	Comments
SWC111	1825	5986	Indeterminate	-	-	Barren	Barren	
SWC 58	2372	7782	<u>P. tuberculatus</u>	Oligocene	0	Good	Moderate	
SWC 57	2374	7789	Middle <u>M. diversus</u>	Early Eocene	2	Fair	Low	Early Eocene dinoflagellate flora
SWC 55	2376	7795	Middle <u>M. diversus</u>	Early Eocene	1	Poor	Low	Highest occurrence of <u>P. grandis</u>
SWC 84	2377.5	7800	Middle <u>M. diversus</u>	Early Eocene	2	Poor	Low	
SWC 112	2381	7812	Middle <u>M. diversus</u>	Early Eocene	1	Poor	Low	
SWC 82	2385	7825	Middle <u>M. diversus</u>	Early Eocene	2	Poor	Low	
Core-1	2387.7	7834	Indeterminate	-	-	V. Poor	V. Low	Almost barren
Core-1	2389.9	7841.	Indeterminate	-	-	Barren	Barren	
Core-1	2399.3	7872	Middle <u>M. diversus</u>	Early Eocene	2	Fair	Moderate	
Core-2	2403.7	7886	Middle <u>M. diversus</u>	Early Eocene	1	Good	High	Lowest <u>P. tuberculiformis</u> , Highest <u>T. multistriatus</u>
SWC 52	2411	7910	Lower <u>M. diversus</u>	Early Eocene	2	Poor	Moderate	
Core-4	2427.2	7963	Lower <u>M. diversus</u>	Early Eocene	2	V. Poor	V. Low	
Core-5	2437.2	7996	Lower <u>M. diversus</u>	Early Eocene	2	Poor	Low	
Core-5	2438.6	8001	Lower <u>M. diversus</u>	Early Eocene	1	Very Good	High	
Core-6	2440	8005	Lower <u>M. diversus</u>	Early Eocene	1	Good	Moderate	
Core-6	2444.8	8021	Lower <u>M. diversus</u>	Early Eocene	2	Poor	Low	Coal sample
Core-6	2447.7	8031	Lower <u>M. diversus</u>	Early Eocene	2	Fair	Moderate	
Core-6	2453.5	8050	Lower <u>M. diversus</u>	Early Eocene	1	Good	High	
SWC 45	2472.5	8112	Lower <u>M. diversus</u>	Early Eocene	1	Good	High	
SWC 44	2479	8133	Lower <u>M. diversus</u>	Early Eocene	1	Good	High	
SWC 41	2507.5	8227	Lower <u>M. diversus</u>	Early Eocene	2	Fair	Moderate	Mud contamination (<u>P. tuberculatus</u> fl <u>S. prominatus</u>)
SWC 40	2510.5	8237	Lower <u>M. diversus</u>	Early Eocene	0	Good	High	Several reworked? <u>L. balmei</u>
SWC 39	2515	8251	Upper <u>L. balmei</u>	Paleocene	0	V. Good	Very High	
SWC 38	2518	8261	Upper <u>L. balmei</u>	Paleocene	1	Good	High	
SWC 37	2522	8274	Upper <u>L. balmei</u>	Paleocene	1	Good	High	
SWC 36	2537	8323	Upper <u>L. balmei</u>	Paleocene	1	Good	High	
SWC 35	2541	8337	Upper <u>L. balmei</u>	Paleocene	0	V. Good	Very High	
SWC 34	2545	8350	Upper <u>L. balmei</u>	Paleocene	0	V. Good	Very High	
SWC 33	2549	8363	Upper <u>L. balmei</u>	Paleocene	0	Good	High	
SWC 32	2553.5	8378	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	
SWC 31	2565	8415	Upper <u>L. balmei</u>	Paleocene	1	Good	High	Abundant <u>W. homomorpha</u>
Cuttings	2577	8455	Upper <u>L. balmei</u>	Paleocene	3	Good	High	Abundant <u>W. homomorpha</u>

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND

ELEVATION: KB: 25 GL: 68

WELL NAME: WEST HALIBUT-1

TOTAL DEPTH: 2577m

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>	2372	0				2372	0			
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>										
	Lower <i>N. asperus</i>										
	<i>P. asperopolus</i>										
	Upper <i>M. diversus</i>										
	Mid <i>M. diversus</i>	2374	2	2376	1		2403.7	1			
	Lower <i>M. diversus</i>	2411	2	2438.6	1		2510.5	0			
	Upper <i>L. balmei</i>	2515	0				2577	3	2565	1	
	Lower <i>L. balmei</i>										
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
EARLY CRET.	<i>A. distocarinatus</i>										
	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
	PRE-CRETACEOUS										

COMMENTS: Wetzeliella hyperacantha Zone: 2510.5 - 2522

- CONFIDENCE RATING:
- 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 spores and pollen or microplankton, or both.
 - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: H.E. STACY DATE: MARCH 1, 1979

DATA REVISED BY: _____ DATE: _____

SAMPLE TYPE *	DEPTHS																			
	S	S	S	S	S	S	C	C	S	C	C	C	C	C	S	S	S	S	S	S
<i>A. qualumis</i>																				
<i>A. acutellus</i>																				
<i>A. luteoides</i>																				
<i>A. oculatus</i>																				
<i>A. sectus</i>																				
<i>A. triplaxis</i>																				
<i>A. obscurus</i>																				
<i>B. disconformis</i>																				
<i>B. arcuatus</i>																				
<i>B. elongatus</i>																				
<i>B. mutabilis</i>																				
<i>B. otwayensis</i>																				
<i>B. elegansiformis</i>																				
<i>B. trigonalis</i>																				
<i>B. verrucosus</i>																				
<i>B. bombaxoides</i>																				
<i>B. emaciatus</i>																				
<i>C. bullatus</i>																				
<i>C. heskermensis</i>																				
<i>C. horrendus</i>																				
<i>C. meleosus</i>																				
<i>C. apiculatus</i>																				
<i>C. leptos</i>																				
<i>C. striatus</i>																				
<i>C. vanraadshoovenii</i>																				
<i>C. orthoteichus/major</i>																				
<i>C. annulatus</i>																				
<i>C. gigantis</i>																				
<i>C. splendens</i>																				
<i>D. australiensis</i>																				
<i>D. granulatus</i>																				
<i>D. tuberculatus</i>																				
<i>D. delicatus</i>																				
<i>D. semilunatus</i>																				
<i>E. notensis</i>																				
<i>E. crassixinus</i>																				
<i>F. balteus</i>																				
<i>F. crater</i>																				
<i>F. lucinosus</i>																				
<i>F. palaequetrus</i>																				
<i>G. edwardsii</i>																				
<i>G. rudata</i>																				
<i>G. divaricatus</i>																				
<i>G. gestus</i>																				
<i>G. catathus</i>																				
<i>G. cranwellae</i>																				
<i>G. wahoensis</i>																				
<i>G. bassensis</i>																				
<i>G. nebulosus</i>																				
<i>H. harrisii</i>																				
<i>H. astrus</i>																				
<i>H. elliotii</i>																				
<i>I. anquoclavatus</i>																				
<i>I. antipodus</i>																				
<i>I. notabilis</i>																				
<i>I. gremius</i>																				
<i>I. irregularis</i>																				
<i>J. peiratus</i>																				
<i>K. waterbolkii</i>																				
<i>L. amplus</i>																				
<i>L. crassus</i>																				
<i>L. ohaiensis</i>																				
<i>L. bainii</i>																				
<i>L. lanceolatus</i>																				
<i>L. balmei</i>																				
<i>L. florinii</i>																				
<i>M. diversus</i>																				
<i>M. duratus</i>																				
<i>M. grandis</i>																				
<i>M. perimagnus</i>																				

*C=core; S=sidewall core; T=cuttings.

SAMPLE TYPE *	DEPTHS																												
	S	S	S	S	S	S	C	C	S	C	C	C	C	C	S	S	S	S	S	S									
PALYNOFORMS	2372	2374	2376	2377.5	2381	2385	2399.3	2403.7	2411	2437.2	2438.6	2440	2444.8	2447.7	2453.5	2472.5	2579	2507.5	2510.5	2515	2518	2522	2537	2541	2545	2549	2553.5	2565	
<i>P. rectomarginis</i>																													
<i>P. reflexus</i>																													
<i>P. reticulatus</i>																													
<i>P. reticuloconcavus</i>																													
<i>P. reticuloscabratus</i>																													
<i>P. rugulatus</i>																													
<i>P. scitus</i>																													
<i>P. stipplatus</i>																													
<i>P. tenuixinus</i>																													
<i>P. truncatus</i>																													
<i>P. tuberculatus</i>																													
<i>P. tuberculiformis</i>																													
<i>P. tuberculotumulatus</i>																													
<i>P. xestiformis</i> (Prot.)																													
<i>Q. brossus</i>																													
<i>R. boxatus</i>																													
<i>R. stellatus</i>																													
<i>R. mallatus</i>																													
<i>R. trophus</i>																													
<i>S. cainozoicus</i>																													
<i>S. rotundus</i>																													
<i>S. digitatoides</i>																													
<i>S. marlinensis</i>																													
<i>S. rarus</i>																													
<i>S. meridianus</i>																													
<i>S. prominatus</i>																													
<i>S. uvatus</i>																													
<i>S. punctatus</i>																													
<i>S. regium</i>																													
<i>T. multistrixis</i> (CP4)																													
<i>T. textus</i>																													
<i>T. verrucosus</i>																													
<i>T. securus</i>																													
<i>T. confessus</i> (C3)																													
<i>T. gillii</i>																													
<i>T. incisus</i>																													
<i>T. longus</i>																													
<i>T. phillipsii</i>																													
<i>T. renmarkensis</i>																													
<i>T. sabulosus</i>																													
<i>T. simatus</i>																													
<i>T. thomasii</i>																													
<i>T. waiparaensis</i>																													
<i>T. adalaidensis</i> (CP3)																													
<i>T. angurium</i>																													
<i>T. delicatus</i>																													
<i>T. geraniodes</i>																													
<i>T. leuros</i>																													
<i>T. lilliei</i>																													
<i>T. marginatus</i>																													
<i>T. moultonii</i>																													
<i>T. paenestriatus</i>																													
<i>T. retequetrus</i>																													
<i>T. scabratus</i>																													
<i>T. sphaerica</i>																													
<i>T. magnificus</i> (P3)																													
<i>T. spinosus</i>																													
<i>T. ambiguus</i>																													
<i>T. chnosus</i>																													
<i>T. helosus</i>																													
<i>T. scabratus</i>																													
<i>T. sectilis</i>																													
<i>V. attinatus</i>																													
<i>V. cristatus</i>																													
<i>V. kopukuensis</i>																													

*C=core; S=sidewall core; T=cuttings.

SAMPLE TYPE *	DEPTHS																												
	S	S	S	S	S	S	C	C	C	C	C	C	C	S	S	S	S	S	S	S									
PALYNOFORMS	2372	2374	2376	2377.5	2381	2385	2399.3	2403.7	2411	2437.2	2438.6	2440	2444.8	2447.7	2453.5	2472.5	2479	2507.5	2510.5	2515	2518	2522	2537	2541	2545	2549	2553.5	2565	
<i>Nemat. balcombiana</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Operc. centrocarpum</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Achom. ramulifera</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Spiniferites spp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Dinosphere sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Hyshichokol. rigaudae</i>	/	cf	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Dinosphere simplex</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>D. scabroellipticus</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Systematophora placacantha</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Hystich sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Nemat. divergens</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Leptodinium spp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Ling. machaerophorum</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Defl. dartmooria</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Thal. pelagica</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>P. indentata</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Defl. sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Spinidinium sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Palaeocysto australiense</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Wetz. hyperacantha</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Dyphes colligerun</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Wetz homomorpha</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Adnat sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Tubiosphaera filosa</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Dinosphere pontus</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Histiocysta variata</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Rosnaesph. bifurmoides</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	cf	/	/	/	/	/	/	/	/
<i>Areoligeria sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Kenleyia lophophora</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Spinif. lanceolatus</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Kenleyia fimbriata</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Emmetrocysta sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	?	/	/	/	/	/	/	/	/
<i>Fibrocysta sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Danea sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Delf. medcalfi</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>A. dictyoplokus</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Spiniferites ramulifera</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Thalassiphaera sp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Achomosphaera septata</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
<i>Kenleyia spp.</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

*C= core; S= sidewall core; T= cuttings.