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PALYNOLOGY OF PETROFINA ARCHER-1, GIPPSLAND BASIN, AUSTRALIA

BY

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for PETROFINA EXPLORATION AUSTRALIA SA JULY 1990

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CONTENTS

I SUMMARY

2400m (cutts)-2550m (cutts) : lean P. tuberculatus Zone : Oligocene : offshore marine : immature

2560m (cutts) : extremely lean probably upper N. asperus Zone : late Eocene : marine : immature

2580m (cutts)-2630m (cutts) : lower N. asperus Zone (2580-2600m D. heterophlycta Dinoflagellate Zone, 2630m W. echinosuturata Dinoflagellate Zone) : Middle Eocene : offshore marine : immature

2640m (cutts)-2700m (cutts) : lean but apparently all L. balmei Zone (2700m apparently E. crassitabulata Dinoflagellate Zone but contains a single M. druggii specimen presumed reworked) : Paleocene : marine : immature

2715m (cutts)-2730m (cutts) : upper T. longus Zone (M. druggii Dinoflagellate Zone) : Maastrichtian : nearshore marine : immature

2785m (cutts)-3085m (cutts) ; lower T. longus Zone : Maastrichtian : non-marine : immature

3120m (cutts)-3260m (cutts) : upper T. lilliei Zone (non-marine part) : early Maastrichtian - late Campanian : non-marine : immature

3280m (cutts)-3519m (swc) : lower T. lilliei Zone (I. korojonense Dinoflagellate Zone) : Campanian : nearshore to marginal marine : immature

3595m (swc)-3869m (swc) : upper N. senectus Zone (less marine part) : Campanian : marginally marine to non-marine : marginally mature for oil, immature for gas/condensate

3897m (swc)-4035m (swc) : lower N. senectus Zone (3897-3962 N. aceras Zone) : Campanian : marginally marine to offshore marine : marginally mature for oil, immature for gas/condensate

II INTRODUCTION

Fifty six samples were submitted by Nick Grollmann of Petrofina for palynology. Raw data is presented in Appendix I.

The palynostratigraphic framework for the Cretaceous is most recently reviewed by Helby, Morgan and Partridge (1987). In the Tertiary, the zonal scheme was most recently published by Partridge (1976), but significant new data exists in privately circulated studies, in Harris (1985), Morgan (1988), and in Marshall and Partridge (1988). The zonal scheme used here is shown in Fig. 1 and is a combination of Helby, Morgan and Partridge (1987) and Partridge (1976). The data is easily discussed against this framework.

Organic maturity data was generated in the form of the Spore Colour Index and plotted on Fig. 2. The oil and gas windows follow the general consensus of geochemical literature. The oil window corresponds to spore colours of light-mid brown (2.7) to dark brown (3.6). This would correspond to Vitrinite Reflectance values of 0.6% to 1.3%. However, factors such as detailed kerogen type, basin type, basin history and heating curves all affect precise interpretation, and analytical machine-based maturity parameters are probably more reliable.

	AGE	SPORE - POLLEN ZONES	DINOFLAGELLATE ZONES
Early Tertiary	Early Oligocene	P. tuberculatus	
	Late Eocene	upper N. asperus	P. comatum
		middle N. asperus	V. extensa
	Middle Eocene	lower N. asperus	D. heterophlycta
			W. echinosuturata
	Early Eocene	P. asperopolus	W. edwardsii
			W. thompsonae
		upper M. diversus	W. ornata
			W. waipawaensis
		middle M. diversus	
		lower M. diversus	W. hyperacantha
	Paleocene	upper L. balmei	A. homomorpha
		lower L. balmei	E. crassitabulata
			T. evittii
Late Cretaceous	Maastrichtian	T. longus	M. druggii
	Campanian	T. lillei	I.korojonense
		N. senectus	X. australis
	Santonian	T. pachyexinus	N. aceras
			I. cretaceum
			O. porifera
	Coniacian	C. triplex	
	Turonian		C. striatoconus
			P. infusorioides
	Cenomanian	A. distocarinatus	
Early Cretaceous	Albian Late	P. pannosus	
	Albian Middle	upper C. paradoxa	
	Albian Early	lower C. paradoxa	
		C. striatus	
	Aptian	upper C. hughesi	
		lower C. hughesi	
	Barremian	F. wonthaggiensis	
	Hauterivian		
	Valanginian	upper C. australiensis	
	Berriasian	lower C. australiensis	
Juras.	Tithonian	R. watherooensis	

FIGURE 1 ZONATION FRAMEWORK

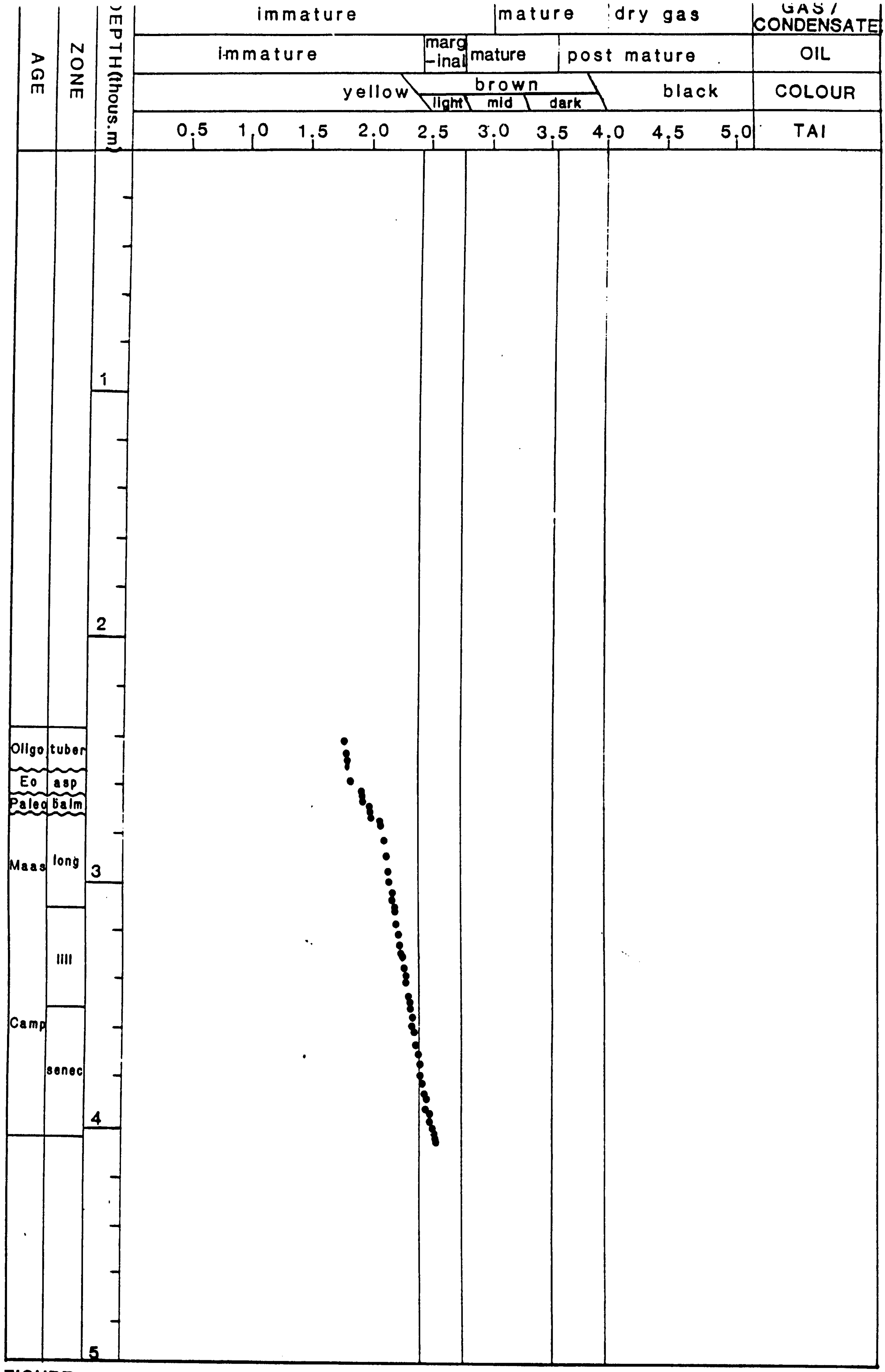

FIGURE 2 MATURITY PROFILE ARCHER 1

III PALYNOSTRATIGRAPHY

A 2400m (cutts)-2550m (cutts) : P. tuberculatus Zone

Assignment to the Proteacidites tuberculatus Zone is indicated by the consistent presence of Cyatheacidites annulatus without younger indicators. Yields are generally poor but C. annulatus, Falcisporites, Nothofagidites and Proteacidites are frequent amongst the subordinate spores and pollen.

Dinoflagellates dominate (60 to 95% of palynomorphs) and are moderately diverse given the poor yields. Common components are Spiniferites spp and Operculodinium spp., indicating the dinoflagellate correlatives of the P. tubeculatus Zone.

Offshore marine environments are indicated by the dominant and diverse dinoflagellates.

Colourless palynomorphs indicate immaturity for hydrocarbons.

B. 2560m (cutts) : lean -? upper N. asperus Zone

This sample was extremely lean and is strictly speaking indeterminate. However, Nothofagidites spp. are common and the Oligocene indicators are absent. Dinoflagellates were too rare to be diagnostic. Assignment to the middle or upper N. asperus Zone is indicated by exclusion from the zonal assignments above and below, and the middle N. asperus Zone is usually quite distinctive. The upper N. asperus Zone is therefore most likely.

The presence of subordinate dinoflagellates indicates nearshore marine environments.

Colourless palynomorphs indicate immaturity for hydrocarbons.

C. 2580m (cutts)-2630m (cutts) : lower N. asperus Zone

Assignment to the lower Nothofagidites asperus Zone is indicated by the dinoflagellates, as the spore pollen are subordinate (5-10% of palynomorphs), of low diversity , and not zone diagnostic. Common forms include Proteacidites, Cyathidites and Haloragacidites. Rare forms include Proteacidites pachypolus, Kuylisporites waterbolkii, Banksieacidites elongatus and Malvacipollis diversus, confirming the zonal assignments.

The dinoflagellates are common, diverse and distinctive. At 2580m (cutts) Deflandra heterophlycta, Kisselovia coleothrypta and Tritonites tricornis indicate the D. heterophlycta dinoflagellate Zone in an Operculodinium dominated assemblage. At 2600m (cutts), D. heterophlycta, Rhombodinium glabrum, Achilleodinium biformoides and abundant Homotriblium tasmaniense indicate the D. heterophlycta zone in a H. tasmaniense and Areoligera senonensis dominated assemblage. At 2630m (cutts) common Areosphaeridium multicornutum and H. tasmaniense indicate the W. echinosuturata dinoflagellate zone.

Offshore marine environments are indicated by the common and diverse dinoflagellates, rare spores and pollen, and common amorphous sapropel (particularly at the base of the interval).

Colourless palynomrphs indicate immaturity for hydrocarbon generation.

D. 2640m (cutts)-2700m (cutts) : L. balmei Zone

These samples are all extremely lean of in situ palynomorphs, with significant Oligocene and Eocene caving. Amongst the in situ palynomorphs, the presence of Lygistepollenites balmei and Gambierina rudata without younger or older markers indicates the L. balmei zone. Oldest Proteacidites incurvatus at 2650m (cutts) may indicate the base of the upper L. balmei Zone, but could also be caved. At 2700m, youngest Tricolpites longus occurs, (suggesting penetration of the Cretaceous) but it is considered reworked.

Dinoflagellates include significant caving, but Deflandrea speciosus and D. medcalfii indicate generally Paleocene ages. At 2700m, Eisenackia crassitabulata and frequent Glaphyrocysta retiintexta indicate the mid Paleocene E. crassitabulata dinoflagellate zone, but could be caved a short distance, and actually exist in the interval 2680-2700m. A single specimen of Manumiella druggii was also recorde3d at 2700m (suggesting penetration of the Cretaceous) but is considered reworked. Clearly it is possible that the Cretaceous occurs in this interval but cuttings confuse the issue.

Environments are marine because of the in situ dinoflagellates, but the lean Paleocene and extent of caving precludes accurate extimates of content and diversity.

Colourless to light yellow spore colours indicate immaturity for hydrocarbon generation.

E. 2715m (cutts)-2730m (cutts) : upper T. longus Zone

These samples are extremely lean and contain 80% caved Paleocene and Eocene. The rare spore pollen include G. rudata and Tricolpites longus indicating the T. longus zone.

Dinoflagellates include frequent M. druggii at 2715m (rare at 2730m) and indicate the M. druggii dinoflagellate zone, correlative with the upper T. longus spore pollen zone. It is possible that the middle T. longus zone also exists in this interval, masked by lean yields and caving in these cuttings.

Nearshore marine environments are indicated by the low diversity in situ dinoflagellates.

Light yellow spore colours indicate immaturity for hydrocarbon generation.

F. 2785m (cutts)-3085m (cutts) : lower T. longus Zone

Assignment is indicated at the top by youngest Tricolpites confessus, T. waiparaensis, Tricolporites lillei, Triporopollenites sectilis and the dominance of Nothofagidites endurus over Gambierina rudata. At the base, oldest consistent Tetracolporites verrucosus (below this point it is inconsistent and considered caved), indicates the assignment. Plant debris dominate all residues with cuticle fragments and amorphous sapropel diluting the scarce spores and pollen. N. endurus and Proteacidites are common, with frequent T. confessus at 2865-2910 and 3005m. T. longus is rare in this well, and T. verrucosus is more consistent.

Non-marine environments are indicated by the abundant plant debris, common and diverse spores and pollen, and absence of dinoflagellates (other than trace caved Tertiary taxa).

Yellow spore colours indicate immaturity for hydrocarbon generation.

G. 3120m (cutts)-3260m (cutts) : upper T. lillei Zone

Assignment is indicated at the top by the absence of consistent T. verrucosus above, and at the base by diverse dinoflagellates. Residues are swamped by plant debris, with consistent and diverse spores and pollen. Nothofagidites and Proteacidites are consistently common, with consistent T. confessus, T. sectilis and T. lillei.

Non-marine environments are indicated by the abundant plant debris, diverse spores and pollen, and probably lack of in situ dinoflagellates. The few dinoflagellate seen are probably all caved.

H. 3280m (cutts)-3519m (swc) : lower T. lillei Zone

Assignment is indicated at the top on youngest diverse dinoflagellates particularly Isabelidinium cretaceum, and at the base on oldest T. lillei and T. waiparaensis and supported by oldest T. sectilis at 2497m. In the interval, Proteacidites and Nothofagidites are consistently common, with P. mawsonii and T. gillii intermittently frequent.

Dinoflagellates include youngest I. cretaceum and I. pellucidum (greenense) at the top, and oldest I. pellucidum and I. pellucidum (greenense) at the base, and indicate the Isabelidinium korojonense dinoflagellate zone. Within the interval, very rare dinoflagellates occur (3285-3315m) and include I. cretaceum. Dinoflagellates comprise 3% of palynomorphs 3350 (cutts)-3380m (swc), dominated by I. pellucidum (greenense). Dinoflagellates are absent 3400m (swc)-3470m (swc), but again comprise 2% of palynomorphs with common I. pellucidum (greenense) at 3497m (swc). At 3519m, Cyclopsiella is abundant with frequent I. pellucidum (greenense) in a diverse microplankton assemblage comprising 20% of palynomorphs.

Nearshore to marginal marine environments are indicated by the frequent and diverse dinoflagellates at the base becoming less frequent and less diverse upwards.

Yellow to light brown spore colours indicate immaturity for hydrocarbons.

I. 3595m (swc)-3869m (swc) : upper N. senectus Zone

Assignment is indicated at the top on the absence of the T. lillei zone markers listed above, and at the base on youngest Nelsoniella spp. Within the interval, Cyathidites, Nothofagidites and Proteacidites dominate, in relative low diversity assemblages. Many samples are lean, and the interval 3610-3732m is especially so.

Dinoflagellates lack formal zone indicators. At the top (3576-95m) they are frequent with Cyclopsiella, Trithyrodinium suspectum, T. "marshallii" and Exochosphaeridium phragmites frequent. Dinoflagellates are rare or absent in the almost barren samples 3610-3732m. Dinoflagellates are absent from the average yielding samples 3762-3810m which are considered non-marine. Dinoflagellates comprise 5% of palynomorphs at the base with Cyclopsiella and Isabelidinium variable frequent at 3841.5m, and T. suspectum frequent at 3869m.

Marginally marine to non-marine environments are indicated by the low content and diversity of the dinoflagellates and their absence respectively.

Light brown spore colours indicate marginal maturity for oil, but immaturity for gas/condensate.

J. 3897m (swc)-4035m (swc) : lower N. senectus Zone

Assignment is indicated at the top by youngest Nelsoniella spp. and at the base by oldest Nothofagidites senectus. Within the interval, Proteacidites, Falcisporites and Cyathidites are the most common. T. confessus occurs down to 4002m, and N. endurus and T. sabulosus to 4035m.

Dinoflagellates include Nelsoniella spp in the interval 3897-3962m, indicating the N. aceras dinoflagellate zone. In this interval, dinoflagellates are common and diverse, with Chatangiella victoriensis, Isabelidinium variabile and T. suspectum common. Nelsoniella semireticulata occurs in the interval 3911-3962m while N. aceras occurs in the interval 3940-3962m. Below this, C. victoriensis and I. variabile dominate at 3969m while I. variabile is the most common dinoflagellate in a meagre assemblage at 3977-4002m. At 4035m, only a single dinoflagellate was seen.

Environments show a progressive deepening from marginally marine at 4002-4035m to nearshore marine 3969-77m and offshore marine 3897-3962m.

Light brown spore colours indicate marginal maturity for oil, but immaturity for gas/condensate.

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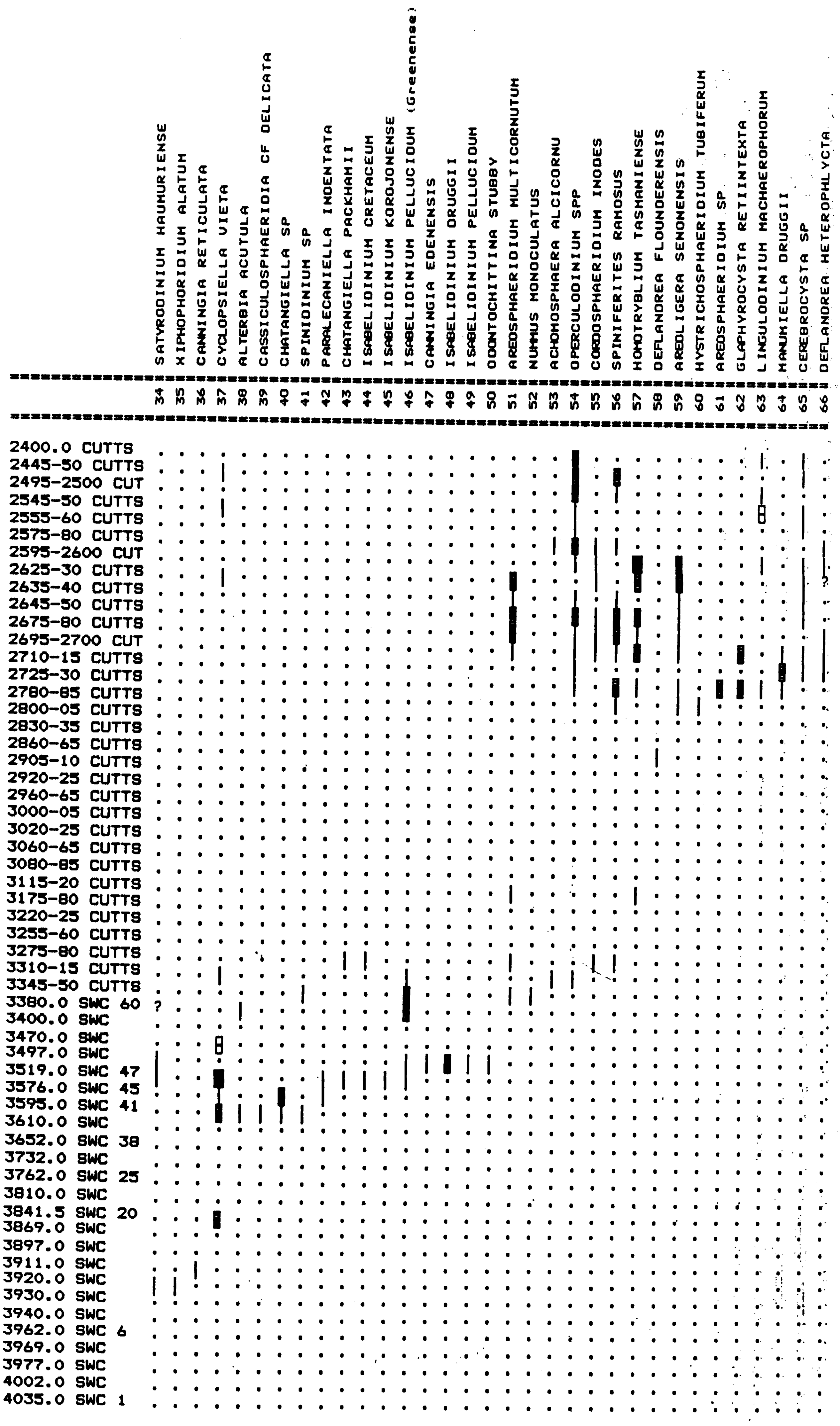
CLIENT: ______________________________
WELL: ARCHER #1
FIELD/AREA: ______________________________
SECTION: ________ TOWNSHIP: ________ RANGE: ________
COUNTY: ________________ STATE: ________________
KB ELEVATION: ____________ TOTAL DEPTH: ____________
ANALYST: ROGER MORGAN DATE: JULY 1990
NOTES: ALL DEPTHS IN METRES

RANGE CHART OF GRAPHIC ABUNDANCES BY LOWEST APPEARANCE (by group)

Key to Symbols

= Very Rare
= Rare
= Few
= Common
= Abundant
? = Questionably Present
. = Not Present


34 SATYRODINIUM HAUMURIENSE
35 XIPHOPHORIDIUM ALATUM
36 CANNINGIA RETICULATA
37 CYCLOPSIELLA VIETA
38 ALTERBIA ACUTULA
39 CASSICULOSPHAERIDIA CF DELICATA
40 CHATANGIELLA SP
41 SPINIDINIUM SP
42 PARALECANIELLA INDENTATA
43 CHATANGIELLA PACKHAMII
44 ISABELIDINIUM CRETACEUM
45 ISABELIDINIUM KOROJONENSE
46 ISABELIDINIUM PELLUCIDUM (Greenense)
47 CANNINGIA EDENENSIS
48 ISABELIDINIUM DRUGGII
49 ISABELIDINIUM PELLUCIDUM
50 ODONTOCHITTINA STUBBY
51 AREOSPHAERIDIUM MULTICORNUTUM
52 NUMMUS MONOCULATUS
53 ACHOMOSPHAERA ALCICORNU
54 OPERCULODINIUM SPP
55 CORDOSPHAERIDIUM INODES
56 SPINIFERITES RAMOSUS
57 HOMOTRYBLIUM TASMANIENSE
58 DEFLANDREA FLOUNDERENSIS
59 AREOLIGERA SENONENSIS
60 HYSTRICHOSPHAERIDIUM TUBIFERUM
61 AREOSPHAERIDIUM SP
62 GLAPHYROCYSTA RETIINTEXTA
63 LINGULODINIUM MACHAEROPHORUM
64 MANUMIELLA DRUGGII
65 CEREBROCYSTA SP
66 DEFLANDREA HETEROPHLYCTA
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3652.0 SWC 38
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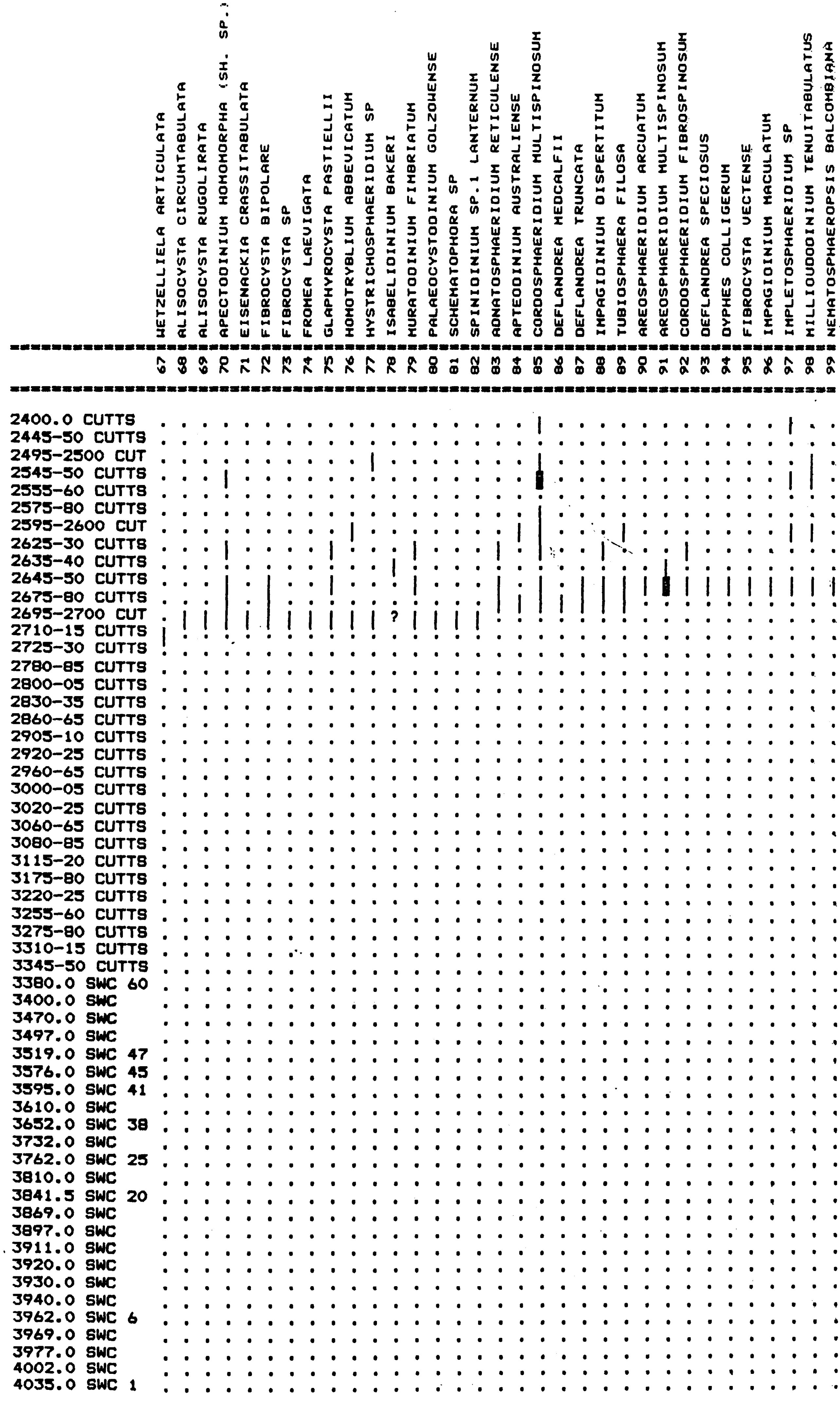

67 WETZELLIELA ARTICULATA
68 ALISOCYSTA CIRCUMTABULATA
69 ALISOCYSTA RUGOLIRATA
70 APECTODINIUM HOMOMORPHA (SH. SP.)
71 EISENACKIA CRASSITABULATA
72 FIBROCYSTA BIPOLARE
73 FIBROCYSTA SP
74 FROMEA LAEVIGATA
75 GLAPHYROCYSTA PASTIELLII
76 HOMOTRYBLIUM ABBEVICATUM
77 HYSTRICHOSPHAERIDIUM SP
78 ISABELIDINIUM BAKERI
79 MURATODINIUM FIMBRIATUM
80 PALAEOCYSTODINIUM GOLZOWENSE
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82 SPINIDINIUM SP.1 LANTERNUM
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84 APTEODINIUM AUSTRALIENSE
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87 DEFLANDREA TRUNCATA
88 IMPAGIDINIUM DISPERTITUM
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94 DYPHES COLLIGERUM
95 FIBROCYSTA VECTENSE
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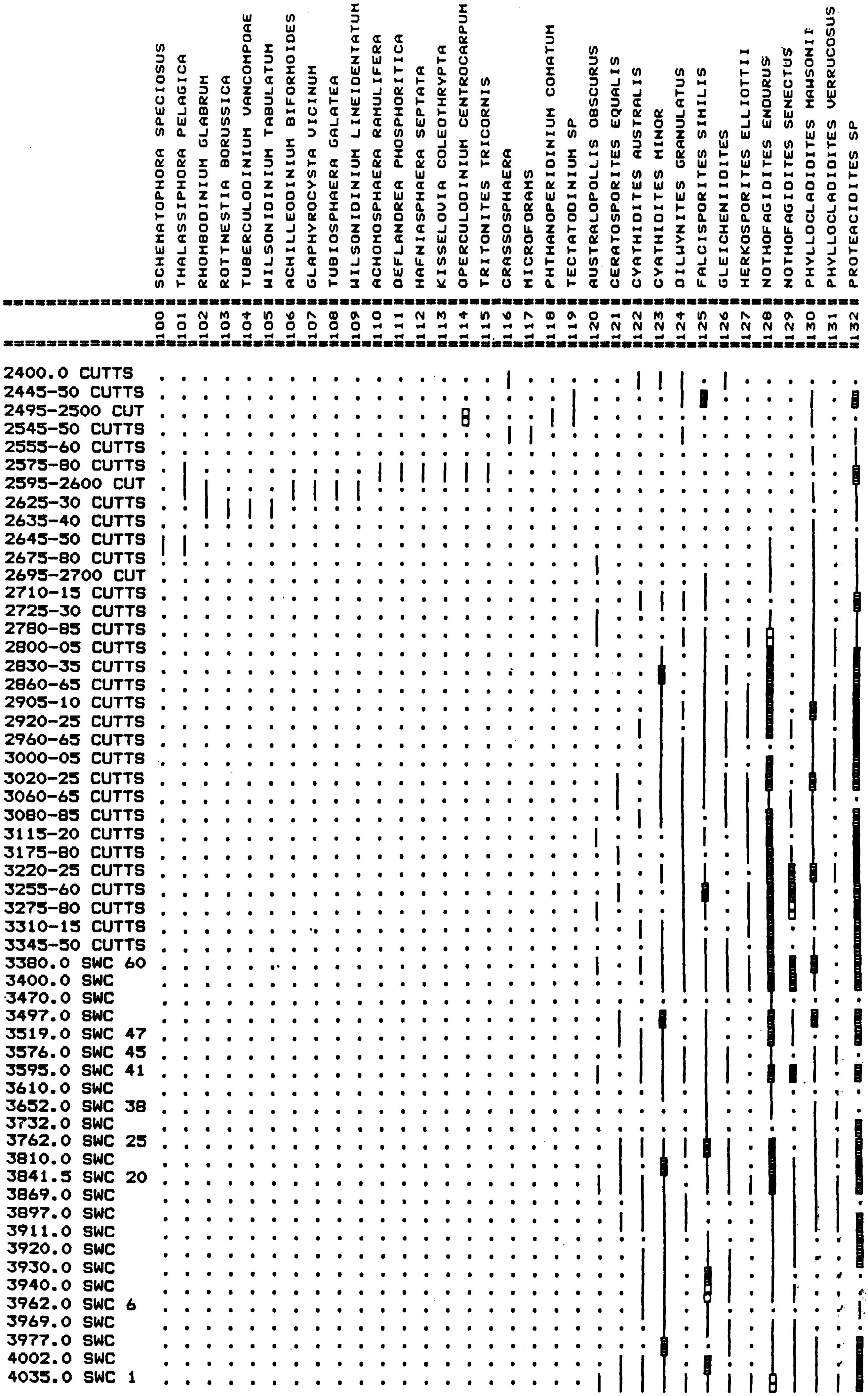
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115 TRITONITES TRICORNIS
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117 MICROFORAMS
118 PHTHANOPERIDINIUM COMATUM
119 TECTATODINIUM SP
120 AUSTRALOPOLLIS OBSCURUS
121 CERATOSPORITES EQUALIS
122 CYATHIDITES AUSTRALIS
123 CYATHIDITES MINOR
124 DILWYNITES GRANULATUS
125 FALCISPORITES SIMILIS
126 GLEICHENIIDITES
127 HERKOSPORITES ELLIOTTII
128 NOTHOFAGIDITES ENDURUS
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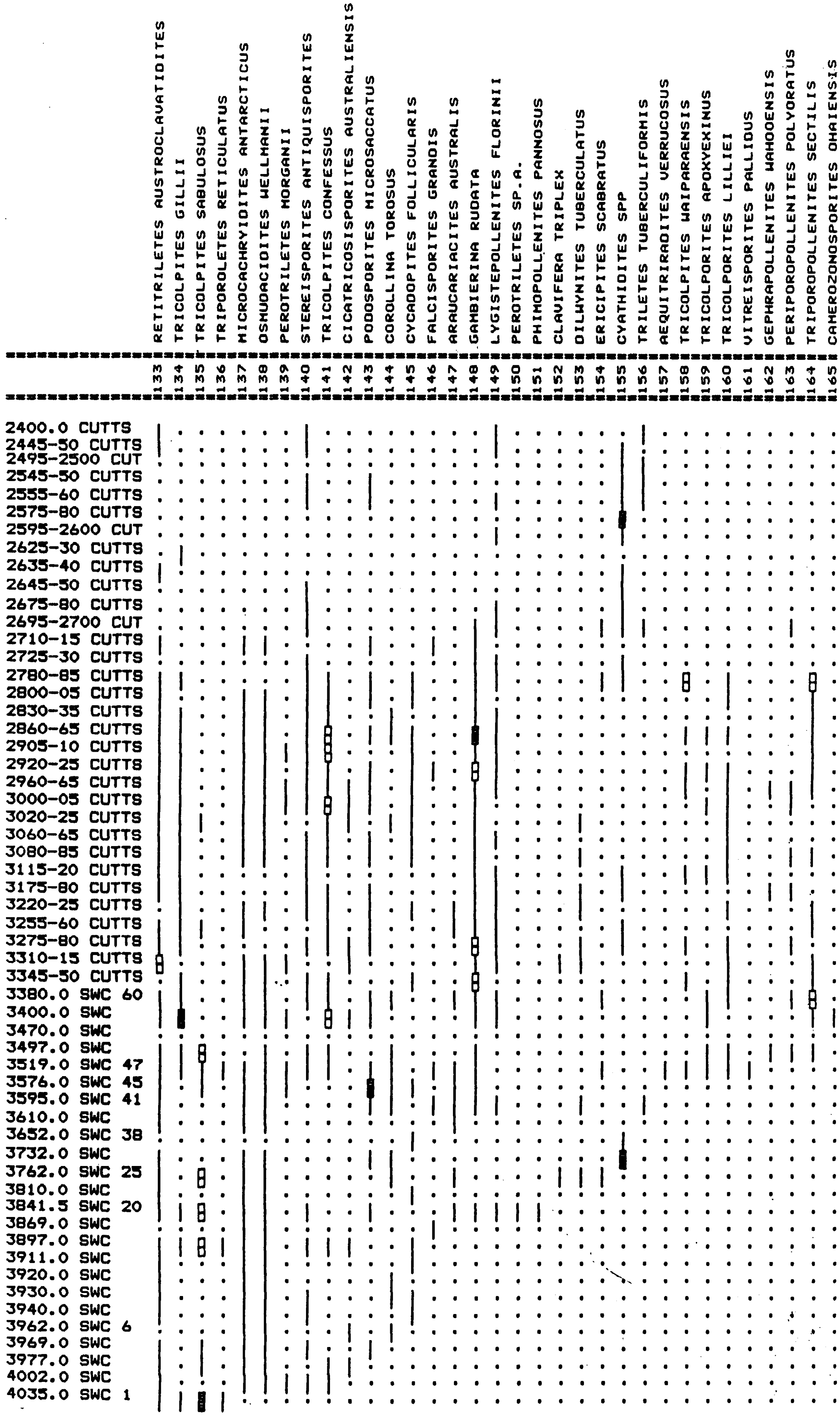

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137 MICROCACHRYIDITES ANTARCTICUS
138 OSMUNDACIDITES WELLMANII
139 PEROTRILETES MORGANII
140 STEREISPORITES ANTIQUISPORITES
141 TRICOLPITES CONFESSUS
142 CICATRICOSISPORITES AUSTRALIENSIS
143 PODOSPORITES MICROSACCATUS
144 COROLLINA TOROSUS
145 CYCADOPITES FOLLICULARIS
146 FALCISPORITES GRANDIS
147 ARAUCARIACITES AUSTRALIS
148 GAMBIERINA RUDATA
149 LYGISTEPOLLENITES FLORINII
150 PEROTRILETES SP.A.
151 PHIMOPOLLENITES PANNOSUS
152 CLAVIFERA TRIPLEX
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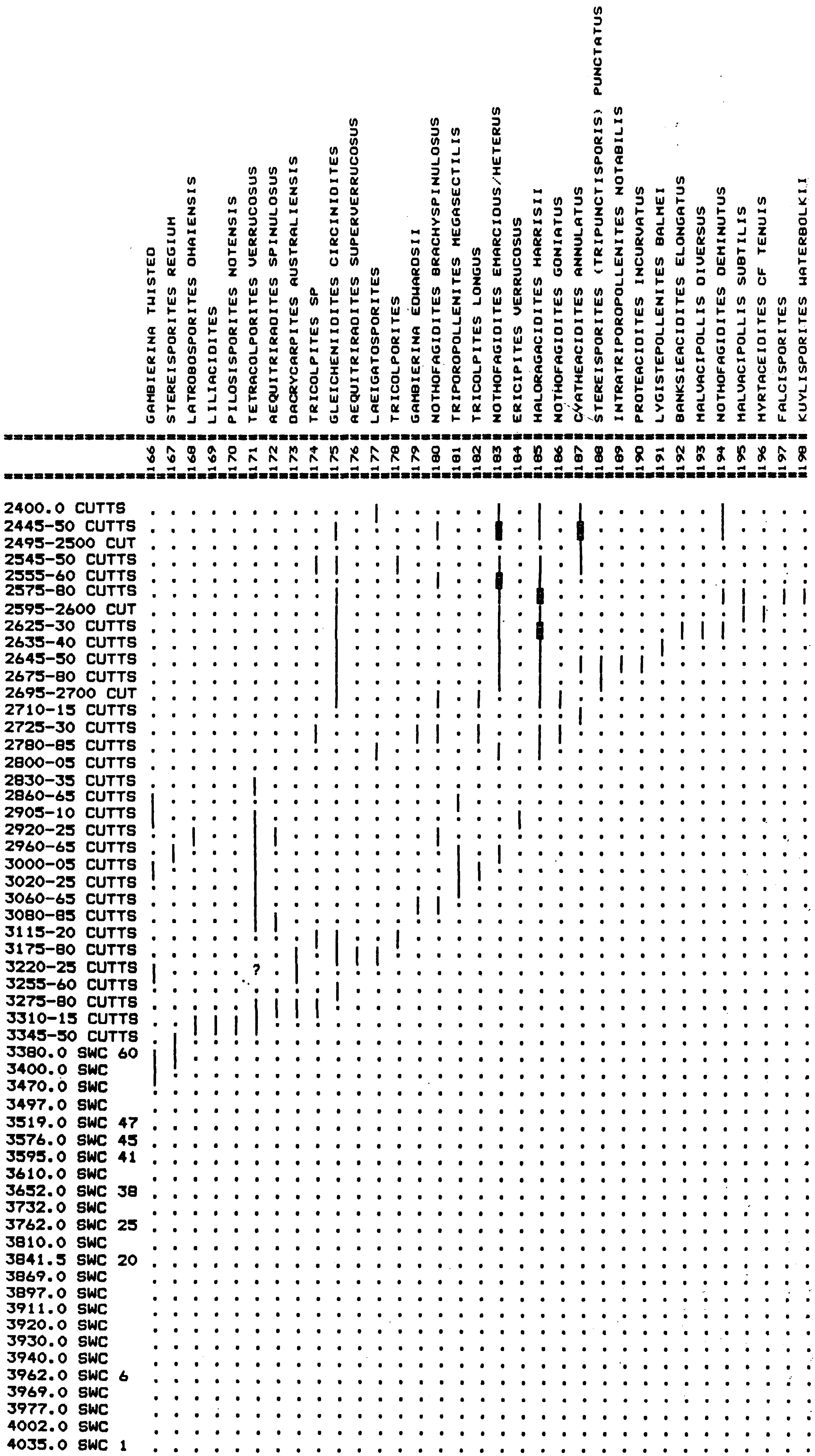
154 ERICIPITES SCABRATUS
155 CYATHIDITES SPP
156 TRILETES TUBERCULIFORMIS
157 AEQUITRIRADITES VERRUCOSUS
158 TRICOLPITES WAIPARAENSIS
159 TRICOLPORITES APOXYEXINUS
160 TRICOLPORITES LILLIEI
161 VITREISPORITES PALLIDUS
162 GEPHRAPOLLENITES WAHOOENSIS
163 PERIPOROPOLLENITES POLYORATUS
164 TRIPOROPOLLENITES SECTILIS
165 CAMEROZONOSPORITES OHAIENSIS
2400.0 CUTTS
2445-50 CUTTS
2495-2500 CUT
2545-50 CUTTS
2555-60 CUTTS
2575-80 CUTTS
2595-2600 CUT
2625-30 CUTTS
2635-40 CUTTS
2645-50 CUTTS
2675-80 CUTTS
2695-2700 CUT
2710-15 CUTTS
2725-30 CUTTS
2780-85 CUTTS
2800-05 CUTTS
2830-35 CUTTS
2860-65 CUTTS
2905-10 CUTTS
2920-25 CUTTS
2960-65 CUTTS
3000-05 CUTTS
3020-25 CUTTS
3060-65 CUTTS
3080-85 CUTTS
3115-20 CUTTS
3175-80 CUTTS
3220-25 CUTTS
3255-60 CUTTS
3275-80 CUTTS
3310-15 CUTTS
3345-50 CUTTS
3380.0 SWC 60
3400.0 SWC
3470.0 SWC
3497.0 SWC
3519.0 SWC 47
3576.0 SWC 45
3595.0 SWC 41
3610.0 SWC
3652.0 SWC 38
3732.0 SWC
3762.0 SWC 25
3810.0 SWC
3841.5 SWC 20
3869.0 SWC
3897.0 SWC
3911.0 SWC
3920.0 SWC
3930.0 SWC
3940.0 SWC
3962.0 SWC 6
3969.0 SWC
3977.0 SWC
4002.0 SWC
4035.0 SWC 1


166 GAMBIERINA TWISTED
167 STEREISPORITES REGIUM
168 LATROBOSPORITES OHAIENSIS
169 LILIACIDITES
170 PILOSISPORITES NOTENSIS
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178 TRICOLPORITES
179 GAMBIERINA EDWARDSII
180 NOTHOFAGIDITES BRACHYSPINULOSUS
181 TRIPOROPOLLENITES MEGASECTILIS
182 TRICOLPITES LONGUS
183 NOTHOFAGIDITES EMARCIDUS/HETERUS
184 ERICIPITES VERRUCOSUS
185 HALORAGACIDITES HARRISII
186 NOTHOFAGIDITES GONIATUS
187 CYATHEACIDITES ANNULATUS
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192 BANKSIEACIDITES ELONGATUS
193 MALVACIPOLLIS DIVERSUS
194 NOTHOFAGIDITES DEMINUTUS
195 MALVACIPOLLIS SUBTILIS
196 MYRTACEIDITES CF TENUIS
197 FALCISPORITES
198 KUYLISPORITES WATERBOLKII
2400.0 CUTTS
2445-50 CUTTS
2495-2500 CUT
2545-50 CUTTS
2555-60 CUTTS
2575-80 CUTTS
2595-2600 CUT
2625-30 CUTTS
2635-40 CUTTS
2645-50 CUTTS
2675-80 CUTTS
2695-2700 CUT
2710-15 CUTTS
2725-30 CUTTS
2780-85 CUTTS
2800-05 CUTTS
2830-35 CUTTS
2860-65 CUTTS
2905-10 CUTTS
2920-25 CUTTS
2960-65 CUTTS
3000-05 CUTTS
3020-25 CUTTS
3060-65 CUTTS
3080-85 CUTTS
3115-20 CUTTS
3175-80 CUTTS
3220-25 CUTTS
3255-60 CUTTS
3275-80 CUTTS
3310-15 CUTTS
3345-50 CUTTS
3380.0 SWC 60
3400.0 SWC
3470.0 SWC
3497.0 SWC
3519.0 SWC 47
3576.0 SWC 45
3595.0 SWC 41
3610.0 SWC
3652.0 SWC 38
3732.0 SWC
3762.0 SWC 25
3810.0 SWC
3841.5 SWC 20
3869.0 SWC
3897.0 SWC
3911.0 SWC
3920.0 SWC
3930.0 SWC
3940.0 SWC
3962.0 SWC 6
3969.0 SWC
3977.0 SWC
4002.0 SWC
4035.0 SWC 1
?

Sample	199 PROTEACIDITES PACHYPOLUS	200 NOTHOFAGIDITES FALCATUS	201 VERRUCOSISPORITES KOPUKUENSIS	202 DICTOPHYLLIDITES SPP	203 BOTRYOCOCCUS	Sample
2400.0 CUTTS	.	.	|	■	.	2400.0 CUTTS
2445-50 CUTTS	.	|	.	.	.	2445-50 CUTTS
2495-2500 CUT	.	.	|	.	.	2495-2500 CUT
2545-50 CUTTS	.	.	.	.	|	2545-50 CUTTS
2555-60 CUTTS	.	|	.	.	.	2555-60 CUTTS
2575-80 CUTTS	|	.	.	.	.	2575-80 CUTTS
2595-2600 CUT	|	.	.	.	.	2595-2600 CUT
2625-30 CUTTS	.	.	.	.	.	2625-30 CUTTS
2635-40 CUTTS	.	.	.	.	.	2635-40 CUTTS
2645-50 CUTTS	.	.	.	.	.	2645-50 CUTTS
2675-80 CUTTS	.	.	.	.	.	2675-80 CUTTS
2695-2700 CUT	.	.	.	.	.	2695-2700 CUT
2710-15 CUTTS	.	.	.	.	.	2710-15 CUTTS
2725-30 CUTTS	.	.	.	.	.	2725-30 CUTTS
2780-85 CUTTS	.	.	.	.	|	2780-85 CUTTS
2800-05 CUTTS	.	.	.	.	|	2800-05 CUTTS
2830-35 CUTTS	.	.	.	.	.	2830-35 CUTTS
2860-65 CUTTS	.	.	.	.	.	2860-65 CUTTS
2905-10 CUTTS	.	.	.	.	□	2905-10 CUTTS
2920-25 CUTTS	.	.	.	.	|	2920-25 CUTTS
2960-65 CUTTS	.	.	.	.	|	2960-65 CUTTS
3000-05 CUTTS	.	.	.	.	.	3000-05 CUTTS
3020-25 CUTTS	.	.	.	.	.	3020-25 CUTTS
3060-65 CUTTS	.	.	.	.	.	3060-65 CUTTS
3080-85 CUTTS	.	.	.	.	.	3080-85 CUTTS
3115-20 CUTTS	.	.	.	.	.	3115-20 CUTTS
3175-80 CUTTS	.	.	.	.	.	3175-80 CUTTS
3220-25 CUTTS	.	.	.	.	.	3220-25 CUTTS
3255-60 CUTTS	.	.	.	.	.	3255-60 CUTTS
3275-80 CUTTS	.	.	.	.	.	3275-80 CUTTS
3310-15 CUTTS	.	.	.	.	|	3310-15 CUTTS
3345-50 CUTTS	.	.	.	.	.	3345-50 CUTTS
3380.0 SWC 60	.	.	.	.	.	3380.0 SWC 60
3400.0 SWC	.	.	.	.	|	3400.0 SWC
3470.0 SWC	.	.	.	.	|	3470.0 SWC
3497.0 SWC	.	.	.	.	.	3497.0 SWC
3519.0 SWC 47	.	.	.	.	.	3519.0 SWC 47
3576.0 SWC 45	.	.	.	.	.	3576.0 SWC 45
3595.0 SWC 41	.	.	.	.	.	3595.0 SWC 41
3610.0 SWC	.	.	.	.	■	3610.0 SWC
3652.0 SWC 38	.	.	.	.	.	3652.0 SWC 38
3732.0 SWC	.	.	.	.	.	3732.0 SWC
3762.0 SWC 25	.	.	.	.	.	3762.0 SWC 25
3810.0 SWC	.	.	.	.	.	3810.0 SWC
3841.5 SWC 20	.	.	.	.	.	3841.5 SWC 20
3869.0 SWC	.	.	.	.	.	3869.0 SWC
3897.0 SWC	.	.	.	.	.	3897.0 SWC
3911.0 SWC	.	.	.	.	.	3911.0 SWC
3920.0 SWC	.	.	.	.	.	3920.0 SWC
3930.0 SWC	.	.	.	.	.	3930.0 SWC
3940.0 SWC	.	.	.	.	.	3940.0 SWC
3962.0 SWC 6	.	.	.	.	.	3962.0 SWC 6
3969.0 SWC	.	.	.	.	.	3969.0 SWC
3977.0 SWC	.	.	.	.	.	3977.0 SWC
4002.0 SWC	.	.	.	.	.	4002.0 SWC
4035.0 SWC 1	.	.	.	.	.	4035.0 SWC 1

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