38. RADIOLARIA FROM LEG 27 OF THE DEEP SEA DRILLING PROJECT

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CONTENTS

1. INTRODUCTION

Radiolarians were recovered in Quaternary deposits at all sites (259-263) and in Cretaceous deposits at all sites except Site 262. The drilling sites are all located in the eastern Indian Ocean (Figure 1).

The occurrence of a very well-preserved sequence of Cretaceous radiolarians consisting of three new assemblages is by far the most interesting and significant aspect of this material. The major portion of this paper will be devoted to this sequence. Although zones have been established for the lower part of the Quaternary in the equatorial Pacific (Nigrini, 1971), the Quaternary samples in this study have been treated as a whole. Those species comprising the assemblages are defined and their abundances noted.

Due to the lack of an established zonation for Cretaceous radiolarians and to the generally poor preservation of samples, range charts for the Cretaceous species encountered in Leg 27 material will not be presented. Since only the one sequence at Site 261, Cores 9-23, appears to be of any biostratigraphic significance, a synchronopticon will be used as a substitute, and perhaps better, method, for presenting and studying the ranges of species in these assemblages.

2. RADIOLARIANS AT EACH SITE

Tables 1-8 show the occurrences of radiolarians in the material recovered from Leg 27. The notations of "A,a"; "C,c"; "F,f"; and "R,r" indicate that a species is abundant, common, few, or rare with respect to the total number of radiolarians in a sample. The same letters are used to describe the total assemblage. "+" is used to indicate presence where abundance could not be tabulated; "-" indicates the species has been searched for and not found. Assemblage preservation is indicated by "G" (good) where even delicate features are preserved, "M" (moderate) where the more robust characteristics are preserved despite breakage and partial dissolution or recrystallization, and "P" (poor) where nearly all specimens are destroyed or dissolved.

a. Site 259 (Wharton Basin; 29°37'S, 112°42'E; water depth 4706 m)

Quaternary Radiolaria range from common to absent in Core 1. Preservation is moderately good but deteriorates rapidly with depth in the core.

There was no recovery of Core 2.

Cores 3 through 30 contain Radiolaria in fluctuating abundances. Preservation is so pobr that few specimens can be identified and none can be used for age determination. Some specimens from Core 8 and lower, however, can be classified on the family or even generic level indicating that the material is Cretaceous, i.e., *Dicolocapsa* spp., *Dictyomitra* spp., and several Spongodiscidae.

TABLE 1
Cretaceous Radiolarians at Site 259

Samples	Abundance	Preservation	*Amphipyndax (?) pyrgodes*	*?Cyrtocalpis operosa*	*?Cyrtocapsa grutterinki* var. α	*Dicolocapsa verbeeki*	*Dictyomitra browneri* var. α	*Dictyomitra browneri* var. γ	*Dictyomitra excellens*	*Dictyomitra pseudoscalaris*	*Eucyrtis columbarius*	*?Eucyrtis molengraaffi*	*?Hemicryptocapsa pseudopilula*	*Lithomitra pseudopinguis*	*Lophophaena* sp.	*?Stichocapsa rutteni*	*Stichomitra asymbatos*	*?Theocapsa elata*	*Theocorys* sp. aff. *T. antiqua*	*?Triplocapsa parvipora*	*Xiphosphaera umbilicata*
259-11-3, 70-72	A	P			+	+							+					+			+
259-11-CC	C	P					+								+			+			
259-12-1, 70-72	A	P				+		+	+			+	+					+	+		
259-12-2, 70-72	A	P														+		+			
259-12-3, 70-72	A	P			+										+			+			
259-12-4, 70-72	A	P				+	+	+	+	+		+	+	+	+	+	+	+	+	+	
259-12-5, 70-72	A	P				+									+			+			
259-12-6, 118-120	A	P		+		+												+			
259-12-CC	F	P						+													
259-13-1, 70-72	A	P																+			
259-15-CC	F	P						+										+			
259-19-1, 63-65	R	P							+												
259-21-2, 70-72	F	P	+																		
259-25-1, 55-57	C	P	+																		
259-25-2, 63-65	C	P	+							+											
259-25-3, 57-59	F	P																		+	
259-25-CC	C	P										+									

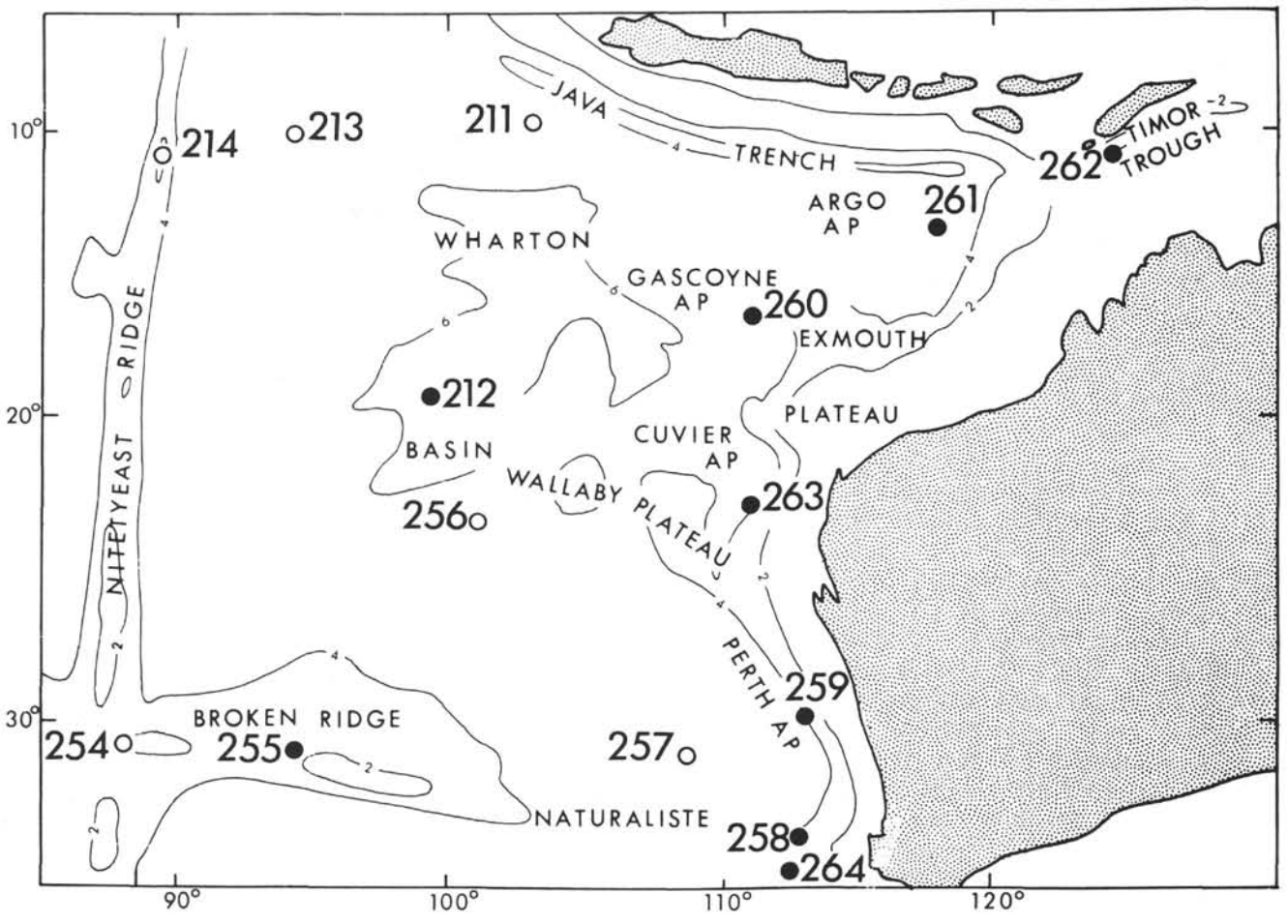

Figure 1. *DSDP Leg 27 drilling sites (solid dots) and previous sites (open circles).*

TABLE 2
Quaternary Radiolarians at Site 259

Samples \ Species	Abundance	Preservation	*Amphirhopalum ypsilon*	*Anthocyrtidium ophirense*	*Anthocyrtidium sanguebaricum*	*Artostrobium auritum* group	*Artostrobium miralestense*	*Botryocyrtis quinaria*	*Botryocyrtis* spp.	*Botryopyle dictyocephalus*	*Carpocanistrum* spp.	*Centrobotrys thermophila*	*Cinclopyramis infundibulum*	*Clathrocanium* spp.	*Collosphaera polygona*	*Cornutella profunda* var. A	*?Dendrospyris* sp. aff. *D. stabilis*	*Dictyocoryne profunda*	*Disolenia quadrata*	*Euchitonia muller*i	*Eucyrtidium anomalum*	*Eucyrtidium hexagonatum*	*Eucyrtidium hexastichum*	*Giraffospyris angulata*	*Giraffospyris laterispina*	*Heliodiscus asteriscus*	*Hexaloncha* sp.	*Lamprocyclas maritalis*	*Lamprocyrtis heteroporus*	*Liriospyris reticulata*	*Lithocampe* sp.	*Lithopera bacca*	*Lophophaena cylindrica*	*Lophophaenoma* sp. aff. *L. witjazi*	*Ommatartus tetrathalamus*	*Peromelissa phalacra*	*Polysolenia* spp.
259-1-3, 50-52	C	M	F	R	R		F		R	R	F		R	R	R	R	R	R	R	F	R	F	R	R	R	R	F	R	R	R	R	F	R	R	C	R	F
259-1-3, 140-142	F	M	R	R		R		R			F	R								R				R	R	R						R			F		F
259-1-4, 96-98	R	M		R							R														R			R								R
259-1-5, 51-53	R	M																																			R

TABLE 2 – *Continued*

Samples \ Species	Abundance	Preservation	*Pterocanium praetextum*	*Pterocanium trilobum*	*Pyloniidae* family group	*Rhopalastrum* sp. 1	*Rhopalastrum* sp. 2	*Saturnalis circularis*	*Siphonosphaera polysiphonia*	*Spirocyrtis* sp. aff. *S. scalaris*	*Spongaster tetras*	*Spongolena* sp.	*Stylatractus universus*	*Stylodictya* sp. aff. *S. multispina*	*Stylosphaera* sp.	*Theocalyptra* sp.	*Theoconus junonis*	*Theocorythium trachelium*	*Tholospyris* sp.	*Zygocircus capulosus*	*Zygocircus* sp. cf. *Z. pisciaudatus*
259-1-3, 50-52	C	M	R	R	C	R	R		F	R	R	R		C	R	R	R	F	R	R	F
259-1-3, 140-142	F	M			F		R					R		F			R	R			
259-1-4, 96-98	R	M			R			R						R				R			
259-1-5, 51-53	R	M			R								R	R							R

b. Site 260 (Wharton Basin near Exmouth Plateau; 16°09′S, 110°18′E; water depth 5709 m)

A typical Quaternary radiolarian assemblage, in which species diversity is high (number of species >100) and specimens are abundant and well preserved, occurs in Core 1 and disappears in Core 2 Section 3. Some of the species represented are (in order of decreasing abundance): *Ommatartus tetrathalamus,* Pyloniidae group, *Dictyocoryne profunda, Euchitonia mulleri, Spongaster tetras, Pterocanium praetexium, P. trilobum, Botryocyrtis* spp. and *Carpocanistrum* spp. There appears to be slight admixture of older Cenozoic sediments.

Sample 2, CC through Core 4, Section 6 are barren.

Sparse and poorly preserved, unidentifiable Radiolaria are present in Sample 4, CC through Core 7, Section 3.

Sample 7, CC contains a poorly preserved but abundant Cretaceous assemblage. The number of specimens declines and their occurrence becomes patchy through Core 11, Section 1.

Sample 11, CC through Core 13, Section 1 contain an abundant, moderate to poorly preserved Cretaceous assemblage quite similar to that found at Site 261, Core 12, and is therefore assumed to be of the same age (Senonian to Aptian). The same distinctive species are present: *Amphipyndax pyrgodes, Dictyomitra lilyae, D. pseudoscalaris, D. brouweri, Eucyrtis hanni, E. bulbosus, Lithocampe chenodes,* and *Eucyrtis columbarius.*

From Sample 13, CC to the basalt contact there is a wide fluctuation in abundance, but the preservation remains extremely poor. Very abundant assemblages occur at Core 15, Section 3 to Core 15, Section 4; Core 16, Section 2, 8-10 cm; Core 17, Section 1, 70-72 cm; Core 18, Section 2; and Sample 18, CC. No age determination is possible.

c. Site 261 (Argo Abyssal Plain; 12°57′S, 117°54′E; water depth 5667 m)

Samples of the top two cores contain a very well-preserved assemblage of Quaternary radiolarians in which species diversity is high (number of species >100) and specimens are abundant. Typical species are, in order of decreasing abundance: *Ommatartus tetrathalamus,* Pyloniidae group, *Stylodictya* sp. aff. *S. multispina, Euchitonia mulleri, Dictyocoryne profunda, Spongaster tetras, Spongotrochus multispinus, Pterocanium praetextum, P. trilobum, Lamprocyclas maritalis, Lithopera bacca, Carpocanistrum* spp., and *Centrobotrys thermophila.*

Radiolaria are generally absent in samples from Cores 3 to 8, although an abundant assemblage appears in Core 8, Sections 3-5. The preservation of these specimens is extremely poor, however, making an age determination impossible.

Core 9 contains a distinct Cretaceous assemblage including *Bathropyramis timorensis, Eucyrtidium* (?) *boodes,* and *Theocapsa elata.* Specimens are poorly preserved.

The material recovered in Core 11 is a chert containing Radiolaria. This was not processed.

Core 12 contains a very abundant and extremely well-preserved assemblage of Cretaceous (Senonian to Aptian). Radiolaria including the distinctive species *Amphipyndax pyrgodes, Dictyomitra lilyae, D. pseudoscalaris, D. brouweri, Eucyrtis hanni, E. bulbosus, E. columbarius, Lithocampe chenodes,* and *Dictyophimus gracilis,* some of which first appear in Core 10. This assemblage continues through Core 23 but adds three new species in Core 15. Abundance fluctuates and preservation declines markedly.

Samples from Cores 24 through 35 (except 25, 26, 33, and 34, where the material is lithified) generally contain

TABLE 3
Cretaceous Radiolarians at Site 260

SAMPLES	ABUNDANCE	PRESERVATION	*Amphibrachium (?) hastatum*	*Amphibrachium* sp. cf. *A. concentricum*	*Amphipyndax (?) epiplatys*	*Amphipyndax mediocris*	*Amphipyndax (?) pyrgodes*	*Artocapsa bicornis*	*?Artocapsa ultima*	*Bathropyramis timorensis*	*?Conosphaera tuberosa*	*Crucella espartoensis*	*?Cyrtocalpis operosa*	*?Cyrtocapsa grutterinki* var. α	*Dicolocapsa verbeeki*	*Dictyomitra browni* var. α	*Dictyomitra browni* var. γ	*Dictyomitra excellens*	*Dictyomitra lilyae*	*Dictyomitra pseudoscalaris*	*Eucyrtidium* sp. cf. *E. thiensis*	*Eucyrtis bulbosus*	*Eucyrtis columbarius*	*Eucyrtis hanni*	*?Eucyrtis molengraaffi*	*Hagiastrid* 1 gen. & sp. indet.	*Hagiastrid* 2 gen. & sp. indet.
260-9-1, 138-140	F	M	R		R		—			R				R		R	F	F	—	F	R						
260-9-CC	R	P								—						—	+										
260-10-1, 50-52	F	M								—								—	—	+		—	—	—			
260-10-CC	R	M				—				—			—					+	—	+	—	—	—	—			
260-11-1, 113-115	C	M			F	—	—			—			—	R	F			C	—	C	—	—	—	—		—	
260-11-CC	A	P			+	—	+			—			—		+	—	+	—	+	+	—	—	—	—	+	—	
260-12-1, 131-133	A	M	+		—	+	+			—		+	—		+	+	+	+	+	+	—	—	+	+	+	—	
260-12-2, 44-46	F	M	+	+		+				—			—			—	+	—	+	+	—	—			+	—	
260-12-2, 130-132	A	M	F		—	R	A	F	F	—	R	F	R	F	F	A	A	—	C	A	F	F	F		A	R	
260-12-CC	A	P				—				—			—								—					—	
260-13-1, 110-112	A	M		F	—	R	R	—	R	—			—			F	—				R					—	
260-16-2, 8-10	A	P													+												
260-17-1, 70-72	A	P													+												
260-18-2, 77.5-79.5	A	P									+				+								+		+		+
260-18-2, 100-102	A	P									+				+										+		

SAMPLES	*?Halesium quadratum*	*?Hemicryptocapsa pseudopilula*	*Lithocampe chenodes*	*Lithomitra pseudopinguis*	*Patulibracchium petroleumensis*	*Porodiscus delicatulus*	*Rhopalodictyum* sp.	*Sphaerostylus lanceola*	*Spongocyclia lanigera*	*Spongocyclia trachodes*	*Spongodiscid* 1 gen. & sp. indet.	*?Spongolonche grandis*	*Spongolonche* sp. aff. *S. grandis*	*Spongoprunum diversispina*	*Spongoprunum* sp. aff. *Cyphantus probus*	*Spongopyle ecleptos*	*Spongopyle stauromorphos*	*Spongosaturnalis* sp. aff. *saturnalis lateralis*	*Spongotripus* sp. cf. *tripodictya triacuminata*	*Staurostylus italicus*	*?Stichocapsa rutteni*	*?Stichocapsa* sp. aff. *S. rutteni*	*Stichomitra asymbatos*	*?Stichomitra campi*	*?Stylotrochus antiquus*	*Theocorys* sp. aff. *T. antiqua*	*?Tricolocapsa parvipora*	*Xiphosphaera umbilicata*
260-9-1, 138-140		R																										
260-9-CC																												
260-10-1, 50-52			—																									
260-10-CC			—																									
260-11-1, 113-115			—						—	—								R							F		R	
260-11-CC			—						—	—	+										+				+			
260-12-1, 131-133	+		—		+		+	+	—	—			+	+	+				+	+	+					+	+	+
260-12-2, 44-46		+	—						—	—					+										+			
260-12-2, 130-132		F	R	F	F	C		F	R	R	F	R		R	F		R		F		F	R	R	F	C		F	F
260-12-CC					+						+																	
260-13-1, 110-112						A										F									A			
260-16-2, 8-10					+																							
260-17-1, 70-72					+																							
260-18-2, 77.5-79.5					+	+																						
260-18-2, 100-102				+		+																						

TABLE 4
Quaternary Radiolarians at Site 260

Samples	Abundance	Preservation	*Actinomma arcadophorum*	*Actinomid* 1 gen. and sp. indet.	*Actinomid* 2 gen. and sp. indet.	*Actinomid* 3 gen. and sp. indet.	*?Amphiplecta acrostoma*	*Amphirhopalum ypsilon*	*Anthocyrtidium ophirense*	*Anthocyrtidium sanguebaricum*	*Archipilium* sp. aff. *A. macropus*	*Artopilium undulatum*	*Artopilium* sp. aff. *A. elegans*	*Artostrobium auritum* group	*Artostrobium miralestense*	*Bathropyramis ramosa*	*Bathropyramis* sp.	*Botryocyrtis quinaria*	*Botryocyrtis* spp.	*Botryopyle dictyocephalus*	*Callimitra* spp.	*Calocyclas monumentum*	*Canthaospyris platyhursa*	*Carposanarium papillosum*	*Carposanistrum* spp.	*Centrobotrys thermophila*	*Centrocubus octostylus*	*Ceratospyris* spp.	*Ceratospyris* sp. aff. *C.* sp. A	*Cinclopyramis infundibulum*	*?Cladococcus abietinus*	*Cladococcus scoparius*	*Clathrocanium* spp.	*Clathrocorys* sp.	*Clathrocyclas semeles*	*Collosphaera polygona*	*Cornutella profunda* var. A
260-1-1, 17-19	A	G	F	R			R	F	F	R	R	R			F	R	R						R		C	R	R	F				F	R	R	F	F
260-1-2, 54-56	A	G	R					F	F	R		R			F	F			F		R	F	R		F	R	R	R				F	R	R	R	R
260-1-3, 25-27	A	G	R		R			F	F	R		R	R	F	R		R		F		R	F		R	F	R	R	R				R		R	R	R
260-1-4, 90-92	C	G	R				F	F	F	R		R		F	R		R		F		R	F			F	R		R				R	R	R	R	R
260-1-CC	A	G	F			R		C	C	R	R	R	R	R	R		R		F	R	F				F		R	R				F		R	R	R
260-2-2, 20-22	R	G						R	R															R												

Samples	Abundance	Preservation	*Cornutella profunda* var. B	*Corocalyptra cervus*	*Corocalyptra kellmari*	*?Cylampterium neatum*	*Cyrtopera* sp. aff. *C. languncula*	*Dendrospyris* sp. aff. *D. binapertonis*	*?Dendrospyris* sp. aff. *D. stabilis*	*Dictyoceras virchowii*	*Dictyocoryne profunda*	*Dictyophimus crisiae*	*Dictyophimus tetracanthus*	*Dictyophimus* (?) sp. indet.	*Disolenia quadrata*	*Disolenia sanguebarica*	*Elatomma* sp.	*Euchitonia mulleri*	Eucyrtid 1 gen. and sp. indet.	*Eucyrtidium acuminatum*	*Eucyrtidium anomalum*	*Eucyrtidium hexagonatum*	*Eucyrtidium hexastichum*	*?Eusyringium siphonostoma*	*Giraffospyris angulata*	*Giraffospyris lateristpina*	*Haliomma erinaceum*	*Haliomma* sp. cf. *H. glisifra*	*Heliodiscus asteriscus*	*Hexalonche* sp.	*Hexapyle dodecantha*	*Lamprocyclas maritalis*	*Lamprocyrtis haysi*	***Lamprocyrtis heteroporus***	*Lamprocyrtis parabolica*	*Lamprospyris hookeri*	*Lamprotripus hutschlii*
260-1-1, 17-19	A	G	F	R				R	F	R	A	R			F	F		A			R	F	R	R	F	R		F	C	F	R	R	R	R	R	R
260-1-2, 54-56	A	G	F	R	R				R	F	C	F	R		R	F	R	A		R		F	R		F	R	R	F	F	C	R	F	R	R		R
260-1-3, 25-27	A	G	R	F			R		F		A	F		R	R	R		A		R	R	F	R		F	R		F	F	C	R	F	R	R	R	R
260-1-4, 90-92	C	G		R			F					C			R			C		R	R	F	R		R	R		F	F	C		F			R	R
260-1-CC	A	G	R	R		R		R	F	R	C	F			R			A	R	R	R	F	R		F			F	F	F		C	R	R		R
260-2-2, 20-22	R	G																R					R		R												

TABLE 4 – *Continued*

Samples \ Species	Abundance	Preservation	*Larcospira quadrangula*	*Liriospyris costata*	*Liriospyris reticulata*	*Liriospyris* sp. 2	*Litharachnium tentorium*	*Lithocampe* sp.	*Lithomelissa monoceras*	*Lithomitra lineata* group	*Lithopera bacca*	*Lithopilium sphaerocephalum*	*Lithostrobus hexagonalis*	*Lophophaena cylindrica*	*Lophophaenoma* sp. aff. *L. witjasi*	*Nephrospyris renilla*	*Ommatartus tetrathalamus*	*Otosphaera polymorpha*	*Peromelissa phalacra*	*Polysolenia* spp.	*Porodiscus microporus*	*Petalomelissa calvata*	*Pterocanium bicorne*	*Pterocanium ornatum*	*Pterocanium praetextum*	*Pterocanium trilobum*	*?Pteropilium stratiotes*	*Pseudodictyophimus gracilipes tetracanthus*	Pylonilidae family group	*Rhopalastrum* sp. 1	*Rhopalastrum* sp. 2	*Saturnalis circularis*	*Sethophormis pentalaatis*	*Sethophormis* sp.	*Siphocampe corbula*	*Siphonosphaera polyphonia*	*Siphonosphaera* sp. A
260-1-1, 17-19	A	G	C		F		R	F	R	R	F		R	R	R	R	A	R	R	C	F	R	R						A	A	A	F	R		F	F	R
260-1-2, 54-56	A	G	C	R	F		R	F	R	F	F		R	F	R	F	C	R	R	C	F	R			C				A	C	A	R	F		F	R	R
260-1-3, 25-27	A	G	C		F			F	F			F	R	R	F	R	A		R	C	F	R			C				A	C	C	R	F		F	R	R
260-1-4, 90-92	C	G	F		F	R		F	R		C		R		R	R	C	R		F	R				F				R	C	C	F	R			R	R
260-1-CC	A	G	C	R	F	R	R	F	F	R	C	R	R	R	F	R	C	R		F	F		R	C	C		R		R	C	C	C	R	R	F	R	R
260-2-2, 20-22	R	G	R					R									R									R				R		R				R	

Samples \ Species	Abundance	Preservation	*Siphonosphaera* sp. B	*Spirocyrtis scalaris*	*Spirocyrtis* sp. aff. *S. scalaris*	*Spongaster tetras*	*Spongobrachium* sp. aff. *S. elliptieum*	*Spongocore diplocylindrica*	*Spongodiscus* sp. 3	*Spongolena* sp.	*Spongosphaera streptacantha*	*Spongotrochus multispinus*	*Stichopilium bicorne*	*Stylatractus universus*	*Stylochlamydium* sp. aff. *S. venustum*	*Stylodictya* sp. aff. *S. multispina*	*Stylosphaera* sp.	*Styptosphaera spongiacea*	*Tessarastrum strausii*	*Theocalyptra* sp.	*Theocorys hertwigi*	*Theocorys jimonis*	*Theocorys veneris*	*Theocorythium trachelium*	*Theophormis callipilium*	*Theopilium pyramidale*	*Tholospyris scaphipes*	*Tholospyris tripodiscus*	*Tholospyris* sp.	*Tympanidium foliosum*	*Udan undulata*	*Verticillata hexacantha*	*Xiphosphaera tesseractis*	*Zygocircus capulosus*	*Zygocircus* sp. cf. *Z. pisciaudatus*	*Zygocircus* sp. 2 aff. *Z. capulosus*
260-1-1, 17-19	A	G	R	R	R	C		C	C	F	R	C	R	F	R	A		R	F	F	F	F		C			R							R		
260-1-2, 54-56	A	G		R	R	C	R	F	C	F	R	C	R	F		A		R	R	F	F	F		F	R		R							R		
260-1-3, 25-27	A	G		R	R	C		F	C	F	R	C	R	R	R	A	R	F		F	F	F	R	F	R									R		
260-1-4, 90-92	C	G			R	F		R	F	R	R	F		R	C			R		F	R	R		R										R		
260-1-CC	A	G		R	R	C	F	F	F	F	R	C	R	R	R	A		R		F	R	F	R	F		R	R							R		
260-2-2, 20-22	R	G				R						R				R																		R		

sparse, recrystallized, and badly corroded Radiolaria. Age is indeterminate.

d. Site 262 (Timor Trough; 10°52′S, 123°51′E; water depth 2315 m)

Samples from Cores 1 to 25 contain a moderately abundant assemblage of Quaternary radiolarians in which the preservation is good to moderate. Species diversity is high and includes, in order of decreasing abundance: *Dictyocoryne profunda, Euchitonia mulleri, Ommatartus tetrathalamus,* Pyloniidae group, *Pterocanium praetextum,* and *P. trilobum.*

Most samples show slight contamination with reworked Cretaceous material including the species *Amphipyndax epiplatys* and *Dictyomitra brouweri.*

In samples from Cores 26 to 28, the same assemblage of Quaternary radiolarians decreases rapidly in abundance and is absent in Core 29. Many specimens are broken.

e. Site 263 (Cuvier Abyssal Plain; 23°20′S, 110°58′E; water depth 5065 m)

Radiolaria are very rare or completely lacking in Site 263 material. Samples from the top three cores contain sparse Quaternary specimens.

Cretaceous radiolarians are present, though patchy and rare, from Core 4 to Core 18. Preservation is extremely poor, making any age determination beyond Cretaceous and any identification beyond radiolarian impossible.

3. CRETACEOUS STRATIGRAPHY

The Cretaceous radiolarians in samples recovered from Sites 259, 260, 261, and 263 are, in general, badly corroded, recrystallized, or filled with iron oxides or consolidated sediment. This restricted most tabulations of their occurrence to presence and absence. However, at Site 261 in the interval between Cores 9 and 23 there are three assemblages of particular interest. In this interval radiolarians are most abundant and diverse and show the best preservation in Cores 12 through 16. Since little is known of the stratigraphic sequence of Radiolaria in this part of the geologic column, it seems useful to describe the three assemblages and events (highest and lowest occurrences of species) associated with Site 261, Cores 9-23. These assemblages are in order from youngest to oldest:

1) *Bathropyramis timorensis* Assemblage. It is characterized by the presence of *Eucyrtidium*(?) *boodes, Theocapsa elata,* and *Bathropyramis timorensis* and is based on four samples from Core 9. All three species have their lowest occurrence in Sample 9, CC.

2) *Eucyrtis columbarius* Assemblage. Associated species are *Eucyrtis hanni, E. bulbosus, E. columbarius, Lithocampe chenodes, Dictyophimus gracilis, Crucella espartoensis, Spongocyclia trachodes, ?Tripodictya elegantissima, Stylosphaera pusilla, Eucyrtidium vermiculatum* with several species of *Spongopyle* and *Dictyomitra.* The assemblage has its highest occurrence in Core 12 and its earliest in Core 23. Most of the 10 species mentioned above reach the top of their ranges in Core 12, a few in Core 10 (Core 11 is a chert).

3) *Spongocyclia lanigera* Assemblage. Characteristic species include Hagiastrid 1 gen. and sp. indet., *Lithocyclia* (?) sp. A. and *Spongocyclia lanigera.* These three species reach the top of their range in Core 15 and co-occur with the species of the *E. columbarius* Assemblage through Core 23.

All three assemblages have these interesting aspects: (1) a complete absence of the family Artostrobiidae, (2) a complete absence of the family Pseudoaulophacidae, (3) a paucity of species in the families Willieriedellidae (1) and Amphipyndacidae (3).

In attempting to assign an age to these assemblages, three different approaches were used in the hope that the results would agree and a firm conclusion could be reached. Unfortunately, this was not the case.

The simplest approach is to relate the age determination given for other microfossils in the same material. Foraminifera from Core 8 have been dated as Senonian (?) or younger and dinoflagellates from Cores 15 to 25 as lower Albian to Aptian.

The second method was to compare stratigraphically important species in the Site 261 sequence with the ranges and zones for these species outlined by Moor (1973) for the northwest Pacific (Leg 17). The comparison was made for *Sphaerostylus lanceola, Cyrtocapsa grutterinki* α, *Eucyrtis kruizingai, Stichocapsa procera, Eucyrtis hanni, Stichomitra asymbatos, Dictyomitra brouweri,* and *Patulibracchium petroleumensis.* These species all co-occurred in the Albian-Cenomanian stages.

The last method, although similar to the comparison with Moore's ranges, is farther reaching and more broadly based. Through the work of Riedel and Sanfilippo, six different Cretaceous assemblages were described according to their stratigraphically most important species. These samples are land based (from Western Australia, Spain, and Italy) and marine (from DSDP Legs 11 and 25). Without any prior knowledge of the ages, these assemblages were compared for presence and absence, and, in as objective a manner as possible, arranged in logical stratigraphic order. After the sequence was established, the assemblages from Site 261 were compared and placed at the most appropriate level. When dates were attached to the different samples, Site 261 was bracketed by a Coniacian sample and an Albian sample.

Combining all three methods of age determination, in as conservative a manner as possible, then places Site 261, Cores 9-23, somewhere in the Senonian to Aptian.

Although no age is available, radiolarian assemblages in topotypic material from the Island of Rotti, which neighbors Timor, were studied for comparison. Of the four samples available from the collection of W. R. Riedel, only Rotti Site 149 showed any similarity. Species in common include *Dictyomitra brouweri, Amphipyndax mediocris, A. epiplatys, Cornutella californica, Cyrtocalpis operosa, Eucyrtis* sp. cf. *E. thiensis, Hemicryptocapsa pseudopilula,* and *Eucyrtis hanni.* Several specimens of the Artostrobiidae are present, which, according to method three discussed above, places Site 149, Rotti above (younger) the sequence of Site 261.

TABLE 5
Cretaceous Radiolarians at Site 261

SAMPLES	ABUNDANCE	PRESERVATION	*Actinomid 4* gen. & sp. indet.	*Amphibrachium* (?) *haastatum*	*Amphibrachium* sp. cf. *A. concentricum*	*Amphipyndax* (?) *epiplatys*	*Amphipyndax mediocris*	*Amphipyndax* (?) *pyrgodes*	*Artocapsa biacmis*	*?Artocapsa altima*	*Bathropyramis timorensis*	*?Conosphaera tuberosa*	*?Cornutella californica* var. *A*	*?Cornutella californica* var. *B*	*Cruecella espartoensis*	*?Cyrtocalpis operosa*	*?Cyrtocapsa grutterinki* var. *a*	*Diacanthocapsa* sp. *B*	*Dicolocapsa* sp.	*Dicolocapsa verbeeki*	*Dictyomitra browneri* var. *a*	*Dictyomitra browneri* var. *Y*	*Dictomitra excelsa*	*Dictyomitra lilyae*	*?Dictyomitra matleola*	*Dictyomitra pseudoscalaris*	*Dictyophimus gracilis*	*Dictyophimus obliquum*	*Eucyrtidium* (?) *boodes*	*Eucyrtidium* sp. cf. *E. thiensis*	*Eucyrtidium vermiculatum*	*Eucyrtis bulbosus*	*Eucyrtis aclambarius*	*Eucyrtis hanni*	*Eucyrtis kruizingai*	*?Eucyrtis molengraaffi*	*Hagiastrid 1* gen. & sp. indet.	*Hagiastrid 2* gen. & sp. indet.	*?Halesium quadratum*	*Halicomma minor*	*?Hemicryptocapsa pseudoplicula*	*inserti aedis*	*Lithocampe chemodes*	*?Lithocampe pseudoharpagata* var. *a*	*Lithocyclia ? sp. A*	*Lithomitra pseudopinguis*	*?Lithostrobus erectus*
261-9-2, 110-112	C	M		+		+		—		+							+																									
261-9-3, 90-92	C	M		R	R	R	R	—	R	R	R	R								A	C	R	R			C																	
261-9-4, 50-52	A	M		R	R	R	R	—	R	R	R	R								A	C	R	R			A			R													
261-9-4, 110-112	A	M	R	R	R	R	R	—	R	R	R	R								C	C	A	R			C																	
261-9-CC	A	M		F		C	R	R	R	F	C	R					C		F	A	C	A	F			A													C				R
261-10-1, 10-12	C	M		F		F	R	—			—	R					R		—	C	—	F	—	F		C																R	R
261-10-CC	C	P		+		—	R	+			—				+		+		—	+			—	+		+							+										
261-12-2, top	A	G	R	A		C	R	A			—	R			F	—	C	R	—	A	F	F	R	C	C	C		R					C	C	F	C			R				
261-12-2, 11-12	A	G	R	F	C	R	F	C			—	F	R		F	—	R		—	A	F	F	—	F		F		F	R				F	A		C			F	F	R	C		
261-12-CC	A	G		C		F	F	A			—	F	R	R	F	—	F		—	C	F	F	F	C									C			C			F	F		F		R
261-13-CC	C	M		F	F	—	F	R			—					—			—	C	F	F	F	R			R						C	F		C			R			F	R
261-14-1, 45-46	F	P		+	+		R				—			R	+	—			—	+	+	—	—			+							+			+							
261-14-CC	F						+				—					—			—	+	+	—	—			+																	
261-15-1, 9-11	A	G		F	F	R	+	—	R		—	F			F	—			—	C	C	C	R			F					R			F		C			R			C		
261-15-CC	C	M			+		R				—	+			+	—	+		—	+	+	+	+	\		—							+			+			+	+				
261-16-1, 101-103	A	M		R	R	R	R	F			—		R	F					—		R	F	F	R	F	E	R					F	F	F		A			C	A	F	A		
261-16-CC	C	P					F																			+										+						+	F	
261-17-CC	C	P					+												—		+																							
261-18-CC	C	P					+												—		+					+																	
261-19-3, 100-102	R	P					+												—		+																				+			
261-19-4, 117-119	R	P																	—		+																							
261-19-5, 120-122	C	P					+												—		+					+																	
261-19-CC	F	P																	—		+					+																	
261-21-2, 73-75	R	P					+												—		+					+	+																
261-21-3, 29-31	C	P																	—		+																						
261-21-CC	A	P					+												—		+																						
261-22-1, 70-72	A	P																	—		+																						
261-22-2, 78-80	F	P																				+				+																	
261-22-3, 133-135	F	P																				+																					
261-22-4, 55-57	A	P								+	+		+	+					—		+	+					+	+				+											
261-22-5, 31-33	C	P					+	—											—		+					+																	
261-22-CC	A	P			+														—		+					+					+											
261-23-1, 142-143	C	P				+	+	—											—		+					+			+													
261-23-2, 80-82	R	P					+	—											—		+																						
261-23-3, 100-102	C	P				+		—											—		+						+																
261-23-CC	A	P		+	+			—		+		—							—		+					+					+											
261-24-2, 93-94	R	P																	—		+					+																	
261-24-CC	C	P																			+																						
261-25-3, 125-127	R	P																			+																						
261-26-2, 63-65	C	P																	—		+																						
261-27-1, 50-52	F	P																	—		+					+																	
261-27-2, 105-107	C	P																	—		+																						
261-27-CC	F	P																			+																						
261-28-1, 76-78	R	P																			+																						
261-28-2, 48-50	A	P																	—		+																						
261-28-2, 135-137	A	P	+																		+																						
261-28-3, 46-48	C	P																			+																						
261-28-CC	C	P																	—		+																						
261-29-2, 90-91	C	P																	—		+																						
261-29-3, 41-43	A	P																+	—		+																						
261-29-3, 142-144	A	P																	—		+																						
261-29-CC	C	P																	—		+																						
261-30-1, 132-134	F	P																																									
261-30-3, 137-139	C	P																	—		+																						

TABLE 5 – *Continued*

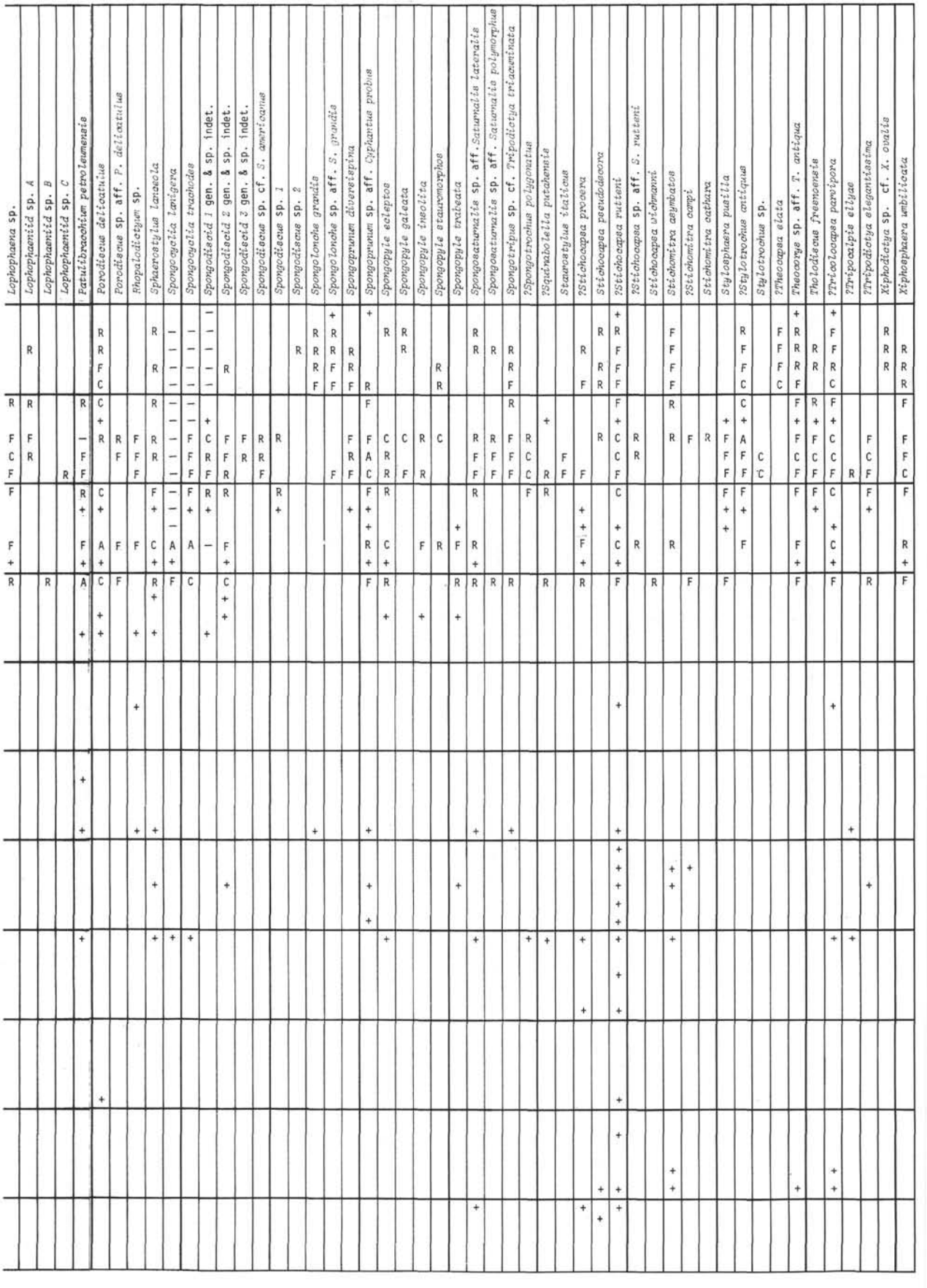

TABLE 6
Quaternary Radiolarians at Site 261

Samples	Abundance	Preservation	*Actinomma arcadophorum*	Actinommid 3 gen. and sp. indet.	*?Amphiplecta acrostoma*	*Amphirhopalum ypsilon*	*Anthocyrtidium ophirense*	*Anthocyrtidium sanguebaricum*	*Archiphilium* sp. aff. *A. macropus*	*Artopilium undulatum*	*Artopilium* sp. aff. *A. elegans*	*Artostrobium auritum* group	*Artostrobium miralestense*	*Bathropyramis* sp.	*Botryocyrtis* spp.	*Botryopyle dictyocephalus*	*Calocyclas monumentum*	*Carpocanarium papillosum*	*Carpocanistrum* spp.	*Centrocubus octostylus*	*Centrobotrys thermophila*	*Ceratospyris* sp. aff. *C.* sp. A	*Ceratospyris* spp.	*Cinclopyramis infundibulum*	*?Cladococcus abietinus*	*Clathrocanium* spp.	*Clathrocorys* sp.	*Clathrocyclas semeles*	*Collosphaera polygona*	*Collosphaera tuberosa*	*Cormutella profunda* var. A	*Cormutella profunda* var. B	*Cormutella* sp. aff. *C. longisetta*	*Corocalyptra cervus*	*Cyrtopera* sp. aff. *C. langunula*	*Dendrospyris* sp. aff. *D. binapertonis*	*?Dendrospyris* sp. aff. *D. stabilis*
261-1-CC	A	G	F			F	F	R		R		F	R			R	F	R	F	R	R	R	F	R	R	F		R		R	R	R	R	R	R	R
261-2-CC	A	G	R	R	R	F	F	F	R	R	R	F	F	R	R		R	R	C				F	R	R	F	R			R	R		R		R	C

Samples	Abundance	Preservation	*Dictyocaeras virchowii*	*Dictyocoryne profunda*	*Dictyophimus crisiae*	*Disolenia quadrata*	*Disolenia sanguebarica*	*Euchitonia mulleri*	Eucyrtid 1 gen. and sp. indet.	*Eucyrtidium acuminatum*	*Eucyrtidium anomalum*	*Eucyrtidium hexagonatum*	*Eucyrtidium hexastichum*	*Giraffospyris angulata*	*Giraffospyris laterispina*	*Haliomma* sp. cf. *H. glisifra*	*Heliodiscus asteriscus*	*Hexaconche* sp.	*Hexapyle dodecantha*	*Lamprocyclas maritalis*	*Lamprocyrtis hayasi*	*Lamprocyrtis heteroporus*	*Lamprocyrtis parabolica*	*Lamprospyris hookeri*	*Lamprotripus hutschlii*	*Larcospira quadrangula*	*Liriospyris costata*	*Liriospyris reticulata*	*Litharachnium tentorium*	*Lithocampe* sp.	*Lithomelissa monoceras*	*Lithopera bacca*	*Lithopilium sphaerocephalum*	*Lithostrobus hexagonalis*	*Lophophaena cylindrica*	*Lophophaenoma* sp. aff. *L. witjazii*	*Nephrospyris renilla*
261-1-CC	A	G	R	C	F	F	R	C	R	R	R	R	R	C		F	F	F	R	F	R	R	R	R	F	C	R	F		R	F	R	R	F	R	R
261-2-CC	A	G	R	C	F		R	C	R	R	R	R	R	F	R	F	F	R	F	F	R	F			R	F		F	R	F	F	F	F		R	F	R

TABLE 6 – *Continued*

Samples \ Species	Abundance	Preservation	*Ommatartus tetrathalamus*	*Otosphaera polymorpha*	*Polysolenia* spp.	*Porodiscus micropora*	*Psilomelissa calvata*	*Pteracanium praetextum*	*Pteracanium trilobum*	*?Pteropilium stratiotes*	Pylonidae family group	*Rhopalastrum* sp. 1	*Rhopalastrum* sp. 2	*Saturnalis circularis*	*Sethophormis* sp.	*Siphocampe corbula*	*Siphonosphaera polyiphonia*	*Siphonosphaera* sp. A	*Spirocyrtis scalaris*	*Spirocyrtis* sp. aff. *S. scalaris*	*Spongaster tetras*	*Spongocore diplocylindrica*	*Spongodiscus* sp. 3	*Spongolena* sp.	*Spongosphaera streptacantha*	*Spongotrochus multispinus*	*Stichopilium bicorne*	*Stylatractus universus*	*Stylochlamydium* sp. aff. *S. venustum*	*Stylodictya* sp. aff. *S. multispina*	*Stylosphaera* sp.	*Styptosphaera spongiacea*
261-1-CC	A	G	A	R	F	F	R	C	C	R	A	C	C	R	R	F	R		R	F	C	F	F	F	R	C	R	F		A	R	R
261-2-CC	A	G	A	R	C	F	R	C	C		A	C	C	R	R	F	R	R	R	R	F	F		R		F		F	R	C	R	R

Samples \ Species	Abundance	Preservation	*Tessarastrum straussii*	*Theocalyptra* sp.	*Theoconus hertwigi*	*Theoconus junonis*	*Theocorys veneris*	*Theocorythium trachelium*	*Theopilium pyramidale*	*Tholospyris scaphipes*	*Tholospyris tripodiscus*	*Tholospyris* sp.	*Tympanidium foliosum*	*Verticillata hexacantha*	*Zygocircus capulosus*	*Zygocircus* sp. 2 aff. *Z. capulosus*	*Zygocircus* sp. cf. *Z. pisicaudatus*
261-1-CC	A	G	R	F	R	F	R	F	R	R		R		R	R	R	F
261-2-CC	A	G		F	R	F	R	F			R	R	R	R	R	R	R

TABLE 7
Quaternary Radiolarians at Site 262

SAMPLES / SPECIES	ABUNDANCE	PRESERVATION	*Acrobotrys* sp.	*Actinomma arcadophorum*	*Actinommid 2* gen. & sp. indet.	*?Amphipleeta acrostoma*	*Amphirhopalum ypsilon*	*Anthocyrtidium ophirense*	*Anthocyrtidium zanguebaricum*	*Artopilium* sp. aff. *A. elegans*	*Artopilium undulatum*	*Artostrobium aurtum* group	*Artostrobium minalestense*	*Astrosphaera hexagonalis*	*Bathropyramis ramosa*	*Botryocyrtis quinaria*	*Botryocyrtis* spp.	*Botropyle dictyocephalus*	*Callimitra* spp.	*Calocyclas monumentum*	*Cantarospyris platybursa*	*Carpocanarium papillosum*	*Carpocanistrum* spp.	*Centrobotrys thermophila*	*Centrocubus octostylus*	*Ceratospyris* sp. aff. *C.* sp. *A*	*Ceratospyris* spp.	*Cinclopyramis infundibulum*	*?Cladococcus abietinus*	*?Cladococcus pinetum*	*Cladococcus scoparius*	*Cladococcus* sp.
262-1-2, 31-33	C	G		F	R			F				R	R				F						F		R		F		F		
262-1-2, 89-91	C	G	R	R		R		F	R	R		R	R	R		R	F	R	R	R	R		R	R	R		F		R		R
262-1-4, 39-41	C	G		F	R		R		R			R	R				F		R	R			R			R	F		F		R
262-1-CC	C	G		F			R	F	R			R	R			R	F			R			F	R			F		R		
262-2-2, 94-96	C	G					R	R	R		R	F	R			R	F			R				R			F		R		R
262-2-CC	A	G		F		R	F	F				F	F		R	R	C		R	R	R		F	R	R	R	F		F	R	R
262-3-2, 84-86	C	G		F			F	F	R		R	C	F			R	F	R	R	R	R	R	F	F			F	R	R		R
262-3-CC	A	G		R			F	F	F			F	F		R	F	F	F		R			R			R	R	R	R		
262-4-CC	A	G		R	R		F	R	R	R		F	R			R	C		R	R			F	R			F		R		
262-5-CC	F	G						F			R	F	R				F	R					R				R	R	R		
262-6-CC	C	G		R			F	R	R		R	F	F			R	F			F			R				R			R	R
262-7-CC	C	G		F			F	F	R		R	F	F		R	R	F	R	R		R		F	R			F	R		R	R
262-8-CC	F	G		R			R	F	R		R	F	F				F			R			F			R	R		R	F	
262-9-CC	C	G					R	R	R		R	F	F			R	F			R							F				
262-10-CC	C	G		R			F	F	R			F	R			R	F			R			F				F		R		
262-14-CC	C	G		R			F	R	R		R	R	R		R		R			R			R				R		R	R	
262-18-CC	C	M					F	R	R				R				R						R				R		R	R	
262-22-CC	C	G					R	R				R	R				R						R					R			
262-26-CC	C	G					F					R	F			R	R						F						R		
262-27-CC	F	G										R	R				R												R		
262-28-CC	R	G					R																R					R			
262-29-CC	R	G																													

TABLE 7 – *Continued*

Clathrocanium spp.	*Clathrocorys* sp.	*Clathrocyclas semeles*	*Collosphaera polygona*	*Collosphaera tuberosa*	*Conocalyptra cervus*	*Conocalyptra killmari*	*Conocalyptra kruegeri*	*Conocalyptra* sp. aff. *C. kruegeri*	*Cornutella profunda* var. *A*	*Cornutella profunda* var. *B*	*Cyrtopera* sp. aff. *C. languncula*	*Dendrospyris* sp. aff. *D. binapertonis*	?*Dendrospyris* sp. aff. *D. stabilis*	*Dictyoceras virchowii*	*Dictyocodon palladius*	*Dictyocoryne profunda*	*Dictyophimus crisiae*	*Dictyophimus* (?) sp. indet.	*Dictyophimus tetracanthus*	*Disolenia quadrata*	*Disolenia zanguebarica*	*Elatomma* sp.	*Euchitonia mulleri*	*Eucyrtid 2* gen. & sp. indet.	*Eucyrtid 3* gen. & sp. indet.	*Eucyrtidium acuminatum*	*Eucyrtidium anomalum*	*Eucyrtidium hexagonatum*	*Eucyrtidium hexastichum*	?*Eusyringium siphonostoma*	*Giraffospyris angulata*	*Giraffospyris laterispina*	*Haliomma erinaceum*	*Haliomma* sp. cf. *H. glisifra*
R				R	F								R			F				F			C				R	F	R	R	F	R	R	C
F	R			F	F	R	R				R		R	R	R	R	R		R	F	R		F		R	R	F	F	R	R	F	R	R	C
R				R	R						R					F	R			R			C				F	F			F	R		C
R		R		F											R	F	R			F	R		F				R	F	R		F			F
	R			F	F					R						F					R		F				R	F	R		F	R	R	F
F	R	R		F	F				R				R	R		F	R			F	F		C				F	F	F	R	F		R	F
F		R		F	F				R			R	R		R	F	R	R		F	F	R	F				F	F	F		F	R	R	F
F	R			F	F				R		R		R	R	R	C	R			R	F		A				F	C			C		R	F
F		R		F	F											F	R		R	F	F		C				R	F	R		F	R	R	F
		R		F	R					R				R		F				R			F				R	R			F			R
F	R	R		F	R					R		R	R	R		F	R			R	R		C			R	R	F	R		F	R	R	F
				F	F			R	R	R			R	R		R	R			F	R		C	R			R	F	R		F	R		F
			R	R				R					R			F	R			F	R		F				R	F			F	R	R	F
			R	F	R			R								F	R	R		F	R		C				R	F	F		F	R		F
			R	F									R	R		F	R			F	R		C					F	R		F			F
R			F	R	R								R	R		C	R						C			R	R	F		R	F			C
						R						R				C	R						C				R	R			F			F
																F	R						F								F			
																R	R						C				R			R	R	R		R
																F							R											
																R		R																

TABLE 7 – *Continued*

SAMPLES \ SPECIES	ABUNDANCE	PRESERVATION	*Heliodiscus asteriscus*	*Heliodiscus echiniscus*	*Hexalonche* sp.	*Lamprocyclas maritalis*	*Lamprocyrtis haysi*	*Lamprocyrtis heteroporus*	*Lampromitra parabolica*	*Lamprospyris hookeri*	*Lamprotripus bütschlii*	*Larcospira quadrangula*	*Liriospyris costata*	*Liriospyris reticulata*	*Liriospyris* sp. 1	*Liriospyris* sp. 2	*Litharachnium tentorium*	*Lithomelissa monoceras*	*Lithomitra lineata* group	*Lithopera bacca*	*Lithopilium sphaerocephalum*	*Lithostrobus hexagonalis*	*Lophophaena cylindrica*	*Lophophaenoma* sp. aff. *L. witjazi*	*Myelastrinae* subfamily group	*Nassellarian* gen. and sp. indet.	*Nephrospyris renilla*	*Ommatartus tetrathalamus*	*Otosphaera polymorpha*	*Peromelissa phalacra*	*Polysolenia* spp.	*Porodiscus microporus*
262-1-2, 31-33	C	G	F			F	F							F														R			F	
262-1-2, 89-91	C	G	R			F	R	R	R	R	F	R	R	F	R		R	R		R		R	R	F	R	R	R	F	R	R	F	
262-1-4, 39-41	C	G	R	R		R					R	R						R		R				R				F		R	F	R
262-1-CC	C	G	F		R	F					F	F	R	R	R	R	R	R		R			R	F			R	C	R	R	R	
262-2-2, 94-96	C	G	R		F	F	R				R	F	R	F				R		R			R	F			R	F			F	R
262-2-CC	A	G	F	R	F	F	R				R	F		F	R	R	R	F		R			F	C			F	C	F	R	F	F
262-3-2, 84-86	C	G	F		F	C	R		R	R	F	F	R	F	R		F	F	R	R		R	F	F	R		R	C	F	F	F	R
262-3-CC	A	G	R		F	F	F	F			R	C	R	F			F	R		R			F	F			F	C	F	R	R	R
262-4-CC	A	G	F	R	F	F	R	R	R	R	R	C	R	F				R		R		R	R	F			R	A	F		F	R
262-5-CC	F	G	F		F	F					R	F		R				R				R	R	R			R	F	R	R	F	R
262-6-CC	C	G	F			F	R		R	R	F	C	R	R			R	R		R		R	F	F			R	C	R	R	F	R
262-7-CC	C	G	F		F	F	F	R	R		R	C		F	R		R	F		R	R	R	F	F			R	C			F	R
262-8-CC	F	G	R		F	F					F	R	R	R				R		R	R		R	R			R	F			R	
262-9-CC	C	G	F		F	F		F			R	C		F		R		R		R		R	F				R	C	R		F	R
262-10-CC	C	G	F		F	F		R			R	C		F		R		R		R		R	F	R			R	C	R		F	R
262-14-CC	C	G	F		F	R	R	R			F	F		R						R		R	R	R			R	F			C	F
262-18-CC	C	M	F		F	F	R	F			R	F											R					F	R		F	R
262-22-CC	C	G	R		F	R		R				F																F			F	R
262-26-CC	C	G	F		F	F						R		R						R		R	R	R				C			F	
262-27-CC	F	G	R		F	R	R					R								R								F			R	R
262-28-CC	R	G	R			R																						R				R
262-29-CC	R	G																													R	

TABLE 7 – *Continued*

Pseudodictyophimus gracilipes tetracanthus	R	R	R	R
Psilomelissa calvata		R	R	R
Pterocanium bicorne	R			
Pterocanium praetextum	F C F F C	C C F F F	F C C C F	C F F F R
Pterocanium trilobum	F F F F F	F F F F F	F C C C F	F F F F F
?Pteropilium stratiotes	R	R	R	
Pylonidae family group	C C C C C	C C C C C	C F F F F	C F F F F
Rhopalastrum sp. *1*	F F R R R	F F F F F	F F F F F	F F R F F
Rhopalastrum sp. *2*	F F R R R	F F F F F	F F F F F	F F F R F
Saturnalis circularis	R			
Sethoconus myxobrachia	R			
Sethophormis pentalactis	F F R R R	F R F R R	F R R R R	C C C C C
Sethophormis rotula	R			
Sethophormis sp.	R F R R R	R F R R R	R F R R R	C R R R R
Sethophormis sp. aff. *S. pentalactis*	R	R	R	R
Siphocampe corbula	R R R R R	R R R R R	R F F F F	C F F F F
Siphonosphaera polysiphonia	F F F F R	F F F F R	F R F F R	C F F F F
Siphonosphaera sp. *A*	R R R	R R R	R R R	C R F F F
Siphonosphaera sp. *B*	R R R	R R R	R R R	C R F F F
Spinocyrtis scalaris	F F F R R	F F F F F	F F F F F	C F C A F
Spinocyrtis sp. aff. *S. scalaris*	R R R R R	R R R R R	R F F F F	C C C C C
Spongaster tetras	R R R R R	R R R R R	R F F F F	C R R R R
Spongobrachium sp. aff. *S. elliptium*	R	R	R	R
Spongocore diplocylindrica	R R R R R	R R R R R	R F F F F	C F C A F
Spongodiscus sp. *3*	R F F F F	R F F F F	R F F F F	C F C A F
Spongolena sp.	R R R R R	R R R R R	R R R R R	F F F F F
Spongoliva ellipsoides	R R R R R	R R R R R	F F F F F	C C C C C
Spongosphaera streptacantha	R F F F F	R F F F F	F F F F F	C C C C C
Spongotrochus multispinus	F F F F F	F F F F F	F F F F F	F F F F F
Stichocampe bironea	R	R	R	R
Stichopilium bicorne	F R R R R	F R R R R	R R R R R	F F F F F
Stylatractus universus	R R R R R	R R R R R	R R R R R	F F F F F
Stylochlamydium sp. aff. *S. venustum*	R R R R R	R R R R R	F F F F F	F F F F F
Stylodictya sp. aff. *S. multispina*	C C C C C	C C C C C	C C C C C	C C C C C
Stylosphaera sp.	R R R R R	R R R R R	R R R R R	R R R R R
Stuptosphaera spongiacea	R R R R R	R R R R R	R R R R R	R R R R R
Tetraconetha tetracanetha	R	R	R	R

TABLE 7 – *Continued*

SAMPLES \ SPECIES	ABUNDANCE	PRESERVATION	*Theocalyptra* sp.	*Theoconus hertwigi*	*Theoconus junonis*	*Theocorys veneris*	*Theocorythium trachelium*	*Theophormis callipilium*	*Theopilium pyramidale*	*Tholospyris scaphipes*	*Tholospyris* sp.	*Tholospyris tripodiscus*	*Tympanidium foliosum*	*Verticillata hexacantha*	*Xiphosphaera teseractis*	*Zygocircus capulosus*	*Zygocircus* sp. aff. *Z. capulosus*	*Zygocircus* sp. aff. *Z. pisicaudatus*	*Zygocircus* sp. cf. *Z. pisicaudatus*
262-1-2, 31-33	C	G	F	F	C					R			R	R		F	R	R	F
262-1-2, 89-91	C	G	C	F	C	R	R		F	R	R	R	F	R		F			F
262-1-4, 39-41	C	G	F	R	F	R				R			R			F			F
262-1-CC	C	G	F		F	R	R		R				R			F			
262-2-2, 94-96	C	G	R	R	F		R			R	R			R		R			
262-2-CC	A	G	F	F	C		F		R	R						F			F
262-3-2, 84-86	C	G	F	F	F	R	F		F	R		R		R		F	R		
262-3-CC	A	G	F	R	C	R	R		F	R		R		F		C			
262-4-CC	A	G	F	R	F	R	R			R	R			R		F	R		R
262-5-CC	F	G	F		F			R		R			R	R		R			R
262-6-CC	C	G	R	R	F				R				R	R		F	R		R
262-7-CC	C	G	F	R	F	R	R	R	R		R		F			R	R	R	
262-8-CC	F	G	R		F		R				R				R		R		R
262-9-CC	C	G	F		F		R									R			R
262-10-CC	C	G	R		C		R		R	R						R			R
262-14-CC	C	G	R	R	F		R	R		R	R		R			R	R		
262-18-CC	C	M	R	R	F		R								R				
262-22-CC	C	G			R	R										R			R
262-26-CC	C	G			R		R								R				R
262-27-CC	F	G																	F
262-28-CC	R	G																	R
262-29-CC	R	G																	R

TABLE 8
Quaternary Radiolarians at Site 263

Samples \ Species	Abundance	Preservation	*Amphirhopalum ypsilon*	*Anthocyrtidium ophirense*	*Artostrobium auritum* group	*Cinclopyramis infundibulum*	*Dictyocoryne profunda*	*Disolenia zanguebarica*	*Euchitonia mulleri*	*Eucyrtidium hexastichum*	*Giraffospyris angulata*	*Giraffospyris laterispina*	*Haliomma* sp. cf. *H. glisifra*	*Heliodiscus asteriscus*	*Hexapyle dodecantha*	*Lamprocyclas maritalis*	*Larcospira quadrangula*	*Lithocampe* sp.	*Ommatartus tetrathalamus*	*Otosphaera polymorpha*	*Polysolenia* spp.	*Porodiscus microporus*	*Pterocanium praetextum*	*Pterocanium trilobum*	*Pylonitidae* family group	*Rhopalastrum* sp. 1	*Rhopalastrum* sp. 2	*Siphocampe corbula*	*Siphonosphaera polysiphonia*	*Spongaster tetras*	*Spongolena* sp.	*Spongotrochus multispinus*	*Stylatractus universus*	*Stylodictya* sp. aff. *S. multispina*	*Theocorys jimonis*	*Theocorythium trachelium*	*Zygocircus* sp. cf. *Z. piscicaudatus*
263-1-1, 110-112	R	G		R				R				R		R		R			R		R			R	R			R				R	R		R	R
263-1-2, 92-94	R	G																															R				
263-1-CC	R	G	R		R					R	R			R		R		R		R	R		R		R	R				R		R	R	R	R	R
263-2-4, 46-48	F	M	R				R						R	R		R			R		R	R			F	R	R	R		R		R		R		R	R
263-2-CC	R	M				R			R					R	R		R								R								R	R		R	R

After having studied the sequence of Cores 12-16, Site 261, the other poorly preserved cores above and below it, along with cores from other sites, were examined in an attempt to recognize any assemblage similarities. The *Bathropyramis timorensis* Assemblage was defined in Core 9, and the *Eucyrtis columbarius* and *Spongocyclia lanigera* assemblages were followed and last recognized in Core 23. In other sites, the *E. columbarius* Assemblage alone was found at Site 260, Core 12.

4. SYSTEMATICS

Following is an outline of species classification. The precedures listed next were used in this presentation:

1) Spumellaria were subdivided according to the suprageneric classification of Riedel (1971) with the exception that the Porodiscidae were split from the Spongodiscidae (Petrushevskaya and Kozlova, 1972) and the Hagiastridae were elevated to the family level (Pessagno, 1971).

2) Nassellaria were subdivided according to the suprageneric classification of Petrushevskaya (1971a).

3) Specific identification followed Haeckel (1887), except for new species described by later investigators.

Following the outline is an alphabetical listing of individual species encountered in this study. The reference following the plate and figure number in this chapter designates the concept of the species adopted by the author. This may not necessarily conform completely with the original description. Locations of reference to each species are noted after "This chapter" by special designations for each of the topics within the chapter. This replaces the traditional index. The final notation of Quaternary or Cretaceous refers to the age of the material in which the species was found.

Fifteen new species are introduced. Type specimens will be deposited in the United States National Museum.

a. Classification Outline

Subclass Radiolaria
- Superorder Polycystina Ehrenberg, 1838, emend. Riedel, 1967a
  - Order Spumellaria Ehrenberg, 1875
    - Family Collosphaeridae Müller 1858, emend. Riedel, 1971
      - *Collosphaera polygona* Haeckel, 1887
      - *Collosphaera tuberosa* Haeckel, 1887
      - *Disolenia quadrata* (Ehrenberg, 1872a)
      - *Disolenia zanguebarica* (Ehrenberg, 1872a)
      - *Otosphaera polymorpha* Haeckel, 1887
      - *Polysolenia* spp.
      - *Siphonosphaera polysiphonia* Haeckel, 1887
      - *Siphonosphaera* sp. A
      - *Siphonosphaera* sp. B
    - Family Litheliidae Haeckel, 1862
      - *Larcospira quadrangula* Haeckel, 1887
    - Family Phacodiscidae Haeckel, 1881
      - *Heliodiscus asteriscus* Haeckel, 1887
      - *Heliodiscus echiniscus* Haeckel, 1887
    - Family Pylodiscidae Haeckel, 1887
      - *Hexapyle dodecantha* Haeckel, 1887
    - Family Pyloniidae Haeckel, 1881
      - Pyloniidae family group
    - Family Liosphaeridae Haeckel, 1881
      - *Styptosphaera spongiacea* Haeckel 1887
    - Family Actinommidae Haeckel, 1862, emend. Riedel, 1971
      - *Actinomma arcadophrum* Haeckel, 1887
      - Actinommid 1 gen. and sp. indet.
      - Actinommid 2 gen. and sp. indet.
      - Actinommid 3 gen. and sp. indet.
      - Actinommid 4 gen. and sp. indet.
      - *Astrosphaera hexagonalis* Haeckel, 1887
      - *Centrocubus octostylus* Haeckel, 1887
      - *?Cladococcus abietinus* Haeckel, 1887
      - *?Cladococcus pinetum* Haeckel, 1887
      - *Cladococcus scoparius* Haeckel, 1887
      - *Cladococcus* sp.
      - *?Conosphaera tuberosa* Tan Sin Hok, 1927
      - *Elatomma* sp.
      - *Haliomma erinaceum* Haeckel, 1862
      - *Haliomma minor* Campbell and Clark, 1944b
      - *Haliomma* sp. aff. *H. glisifra* Renz, in press
      - *Hexalonche* sp.
      - *Sphaerostylus lanceola* (Parona, 1890)
      - *Spongosphaera streptacantha* Haeckel, 1862
      - *Staurostylus italicus* Rüst, 1898
      - *Stylatractus universus* Hays, 1970
      - *Stylosphaera pusilla* Campbell and Clark, 1944b
      - *Stylosphaera* sp.
      - *Xiphosphaera tesseractis* Dreyer, 1913
      - *Xiphosphaera umbilicata* Rüst, 1898

Subfamily Saturnalinae Deflandre, 1953
Saturnalis circularis Haeckel, 1887
Spongosaturnalis sp. aff. *Saturnalis lateralis* group Campbell and Clark, 1944b
Spongosaturnalis sp. aff. *Saturnalis polymorphus* Squinabol, 1914
Subfamily Artiscinae Haeckel, 1881, emend. Riedel, 1971
Ommatartus tetrathalamus (Haeckel, 1887)
Spongoliva ellipsoides Popofsky, 1912
Family Porodiscidae Haeckel, 1881, emend. Petrushevskaya and Kozlova, 1972
Amphirhopalum ypsilon Haeckel, 1887
Porodiscus delicatulus (Lipman, 1952)
Porodiscus microporous (Stöhr, 1880)
Porodiscus sp. aff. *P. delicatulus* (Lipman, 1952)
Stylodictya sp. aff. *S. multispina* Haeckel, 1862
Stylochlamydium sp. aff. *S. venustum* (Bailey, 1856)
Tessarastrum straussii Haeckel, 1887
Tholodiscus fresnoensis (Foreman, 1968)
Tripodictya elegantissima Vinassa, 1899
Xiphodictya sp. cf. *X. ovalis* Rüst, 1898
Family Hagiastridae Riedel, 1971, emend. Pessagno, 1971
Amphibrachium (?) *hastatum* n. sp.
Crucella espartoensis Pessagno, 1971
Hagiastrid 1 gen. and sp. indet.
Hagiastrid 2 gen. and sp. indet.
?*Halesium quadratum* Pessagno, 1971
Patulibracchium petroleumensis Pessagno, 1971
Family Spongodiscidae Haeckel, 1862, emend. Petrushevskaya and Kozlova, 1972
Amphibrachium sp. cf. *A. concentricum* Lipman, 1960
Dictyocoryne profunda Ehrenberg, 1872b
Euchitonia mulleri Haeckel, 1862
Lithocyclia? sp. A
Rhopalastrum sp. 1
Rhopalastrum sp. 2
Rhopalodictyum sp.
Spongaster tetras Ehrenberg, 1860
Spongobrachium sp. aff. *S. ellipticum* Haeckel, 1862
Spongocore diplocylindrica Haeckel, 1887
Spongocyclia lanigera n. sp.
Spongocyclia trachodes n. sp.
Spongodiscid 1 gen. and sp. indet.
Spongodiscid 2 gen. and sp. indet.
Spongodiscid 3 gen. and sp. indet.
Spongodiscus sp. cf. *S. americanus* Kozlova and Gorbovets, 1966
Spongodiscus sp. 1
Spongodiscus sp. 2
Spongodiscus sp. 3
Spongolena sp.
?*Spongoloncheg grandis* Campbell and Clark, 1944b
Spongolonche sp. aff. *S. grandis* Campbell and Clark, 1944b
Spongoprunum diversispina Squinabol, 1904
Spongoprunum sp. aff. *Cyphantus probus* Rüst, 1888
Spongopyle ecleptos n. sp.
Spongopyle galeata n. sp.
Spongopyle insolita Kozlova and Gorbovets, 1966
Spongopyle stauromorphos n. sp.
Spongopyle trabeata n. sp.
Spongotripus sp. cf. *Tripodictya triacuminata* Lipman, 1952
Spongotrochus multispinus Haeckel, 1887
?*Spongotrochus polygonatus* Campbell and Clark, 1944b
?*Stylotrochus antiquus* Campbell and Clark, 1944a
Stylotrochus sp.
Subfamily Myelastrinae Riedel, 1971
Myelastrinae subfamily group
Order Nassellaria Ehrenberg, 1875
Nassellarian gen. and sp. indet.
Suborder Cyrtida Haeckel, 1862, emend. Petrushevskaya, 1971a
Superfamily Eucyrtidioidea Ehrenberg, 1847, emend. Petrushevskaya, 1971a
Family Eucyrtidiidae Ehrenberg, 1847, emend. Petrushevskaya, 1971a
Archipilium sp. aff. *A. macropus* (Haeckel, 1887)
Artocapsa bicornis Tan Sin Hok, 1927
?*Artocapsa ultima* Tan Sin Hok, 1927
Artopilium undulatum Popofsky, 1913
Artopilium sp. aff. *A. elegans* Haeckel, 1887
Calocyclas monumentum Haeckel, 1887
Clathrocyclas semeles Haeckel, 1887
Coroclayptra cervus (Ehrenberg, 1872b)
Corocalyptra killmari Renz, in press
Corocalyptra kruegeri Popofsky, 1908
Corocalyptra sp. aff. *C. kruegeri* Popofsky, 1908
?*Cyclampterium neatum* Sanfilippo and Riedel, 1970
?*Cyrtocapsa grutterinki* var. α Tan Sin Hok, 1927
Cyrtopera sp. aff. *C. languncula* Haeckel, 1887
Diacanthocapsa sp. B
Dicolocapsa verbeeki Tan Sin Hok, 1927
Dicolocapsa sp.
Dictyoceras virchowii Haeckel, 1862
Dictyocodon palladius Haeckel, 1887
Dictyomitra brouweri var. α (Tan Sin Hok, 1927)
Dictyomitra brouweri var. γ (Tan Sin Hok, 1927)
Dictyomitra excellens (Tan Sin Hok, 1927)
Dictyomitra lilyae (Tan Sin Hok, 1927)
?*Dictyomitra malleola* Aliev, 1961
Dictyomitra pseudoscalaris (Tan Sin Hok, 1927)
Dictyophimus crisiae Ehrenberg, 1854
Dictyophimus gracilis Tan Sin Hok, 1927
Dictyophimus obliquum (Hinde, 1900)
Dictyophimus(?) sp. indet.
Eucyrtid 1 gen. and sp. indet.
Eucyrtid 2 gen. and sp. indet.
Eucyrtid 3 gen. and sp. indet.
Eucyrtidium acuminatum (Ehrenberg, 1844)
Eucyrtidium anomatum Haeckel, 1862
Eucyrtidium (?) *boodes* n. sp.
Eucyrtidium hexastichum (Haeckel, 1887)
Eucyrtidium hexagonatum Haeckel, 1887
Eucyrtidium vermiculatum n. sp.
Eucyrtidium sp. cf. *E. thiensis* Tan Sin Hok, 1927
Eucyrtis bulbosus n. sp.
Eucyrtis columbarius n. sp.
Eucyrtis hanni (Tan Sin Hok, 1927)
Eucyrtis kruizingai (Tan Sin Hok, 1927)
?*Eucyrtis molengraaffi* (Tan Sin Hok, 1927)
?*Eusyringium siphonostoma* Haeckel, 1887
Lampromitra parabolica Popofsky, 1913
Lithocampe chenodes n. sp.
?*Lithocampe pseudochrysalis* var. α Tan Sin Hok, 1927
Lithocampe sp.
Lithomitra pseudopinguis Tan Sin Hok, 1927
Lithopera bacca Ehrenberg, 1872a
Lithopilium sphaerocephalum Popofsky, 1913
Lithostrobus erectus Tan Sin Hok, 1927
Lithostrobus hexagonalis Haeckel, 1887
Pterocanium bicorne Haeckel, 1887
Pterocanium orcinum Haeckel, 1887
Pterocanium praetextum (Ehrenberg, 1872a)
Pterocanium trilobum (Haeckel, 1860)
Sethoconus myxobrachia Strelkov and Reshetnyak, 1959
?*Squinabolella putahensis* Pessagno, 1969
Stichocampe bironec Renz, in press
?*Stichocapsa procera* Hinde, 1908
Stichocapsa pseudodecora Tan Sin Hok, 1927
?*Stichocapsa* sp. aff. *S. rutteni* Tan Sin Hok, 1927
?*Stichocapsa rutteni* Tan Sin Hok, 1927
Stichocapsa wichmanni Tan Sin Hok, 1927
Stichomitra asymbatos Foreman, 1968
?*Stichomitra campi* (Campbell and Clark, 1944a) emend. Foreman, 1968
Stichomitra cathara Foreman, 1968
Stichopilium bicorne Haeckel, 1887
Theocalyptra sp.
?*Theocapsa elata* Tan Sin Hok, 1927
Theocorys veneris Haeckel, 1887
Theocorys sp. aff. *T. antiqua* Squinabol, 1903
Theopilium pyramidale Popofsky, 1913

?*Tricolocapsa parvipora* Tan Sin Hok, 1927
?*Tripocalpis ellyae* Tan Sin Hok, 1927
Udan undulata Renz, in press
Subfamily Artostrobiinae Riedel, 1967b
Artostrobium auritum group (Ehrenberg, 1844)
Artostrobium miralestense (Campbell and Clark, 1944a)
Carpocanarium papillosum (Ehrenberg, 1872a)
Lithomitra lineata group (Ehrenberg, 1838)
Siphocampe corbula (Harting, 1863)
Spirocyrtis scalaris Haeckel, 1887
Spirocyrtis sp. aff. *S. scalaris* Haeckel, 1887
Subfamily Plectopyramidinae Haeckel, 1908, emend. Petrushevskaya, 1971a
Bathropyramis ramosa Haeckel, 1887
Bathropyramis timorensis n. sp.
Bathropyramis sp.
Cinclopyramis infundibulum Haeckel, 1887
?*Cornutella californica* var. A Campbell and Clark, 1944b, emend. Foreman, 1968
?*Cornutella californica* var. B Campbell and Clark, 1944b, emend. Foreman, 1968
Cornutella profunda Ehrenberg 1854
Cornutella sp. aff. *C. longisetta* Ehrenberg, 1872a
?*Cyrtocalpis operosa* Tan Sin Hok, 1927
Litharachnium tentorium Haeckel, 1862
Subfamily Pterocorydinae Haeckel, 1881, emend. Riedel, 1967a
Anthocyrtidium ophirense (Ehrenberg, 1872a)
Anthocyrtidium zanguebaricum (Ehrenberg, 1872a)
Lamprocyclas maritalis Haeckel, 1887
Lamprocyrtis haysi Kling, 1973
Lamprocyrtis heteroporus (Hays, 1965)
Tetracorethra tetracorethra (Haeckel, 1887) emend. Petrushevskaya, 1971b
Theoconus hertwigii (Haeckel, 1887)
Theoconus junonis Haeckel, 1887
Theocorythium trachelium (Ehrenberg, 1872a)
Subfamily Amphipyndacinae Riedel, 1967b, emend. Petrushevskaya, 1971a
Amphipyndax (?) *epiplatys* n. sp.
Amphipyndax mediocris (Tan Sin Hok, 1927)
Amphipyndax (?) *pyrgodes* n. sp.
Family Williriedellidae Dumitrica, 1970
?*Hemicryptocapsa pseudopilula* Tan Sin Hok, 1927
Family Carpocaniidae Haeckel, 1881, emend. Riedel, 1967a
Carpocanistrum spp.
Superfamily Cannobotryoidea Haeckel, 1881, emend. Riedel, 1967a
Family Cannobotryidae Haeckel, 1881, emend. Riedel, 1967a
Acrobotrys sp.
Botryocyrtis quinaria Ehrenberg, 1872a
Botryocyrtis spp.
Botryopyle dictyocephalus Haeckel, 1887
Centrobotrys thermophila Petrushevskaya, 1965
Superfamily Plagiacanthoidea Hertwig, 1879, emend. Petrushevskaya, 1971a
Family Sethophormididae Haeckel, 1881, emend. Petrushevskaya, 1971a
Sethophormis pentalactis Haeckel, 1887
Sethophormis rotula Haeckel, 1887
Sethophormis sp. aff. *S. pentalactis* Haeckel, 1887
Sethophormis sp.
Family Plagiacanthidae Hertwig, 1879, emend. Petrushevskaya, 1971a
Subfamily Lophophaeninae Haeckel, 1881, emend. Petrushevskaya, 1971a
Amphiplecta acrostoma Haeckel, 1887
Dictyophimus tetracanthus Popofsky, 1913
Lamprotripus butschlii (Haeckel, 1887)
Lithomelissa monoceras Popofsky, 1913
Lophophaena cylindrica (Cleve, 1900)
Lophophaena sp.
Lophophaeniid sp. A
Lophophaeniid sp. B
Lophophaeniid sp. C
Lophophaenoma sp. aff. *L. witjazii* Petrushevskaya, 1971b
Peromelissa phalacra (Haeckel, 1887) emend. Petrushevskaya, 1971b
Pseudodictyophimus gracilipes (Bailey 1856) *tetracanthus* (Popofsky, 1913)
Psilomelissa calvata Haeckel, 1887
Verticillata hexacantha Popofsky, 1913
Subfamily Sethoperinae Haeckel, 1881, emend. Petrushevskaya, 1971a
Callimitra spp.
Clathrocanium spp.
Clathrocorys sp.
?*Pteropilium stratiotes* Haeckel, 1887
Suborder Spyrida Ehrenberg, 1847, emend. Petrushevskaya, 1971a
Family Triospyrididae Haeckel, 1881, emend. Petrushevskaya, 1971a
Cantharospyris platybursa Haeckel, 1887
Ceratospyris sp. aff. *C.* sp. A
Ceratospyris spp.
Dendrospyris sp. aff. *D. binapertonis* Goll, 1968
?*Dendrospyris* sp. aff. D. stabilis Goll, 1968
Giraffospyris laterispina Goll, 1969
Lamprospyris hookeri Haeckel, 1887
Nephrospyris renilla Haeckel, 1887
Tholospyris scaphipes (Haeckel, 1887)
Tholospyris tripodiscus Haeckel, 1887
Tholospyris sp.
Family Acanthodesmiidae Haeckel, 1862, emend. Riedel, 1971
Giraffospyris angulata (Haeckel, 1887)
Liriospyris costata (Haeckel, 1887)
Liriospyris reticulata (Ehrenberg, 1872a)
Liriospyris sp. 1
Liriospyris sp. 2
Tympanidium foliosum Haeckel, 1887
Zygocircus capulosus Popofsky, 1913
Zygocircus sp. 1 cf. *Z. capulosus* Popofsky, 1913
Zygocircus sp. 2 aff. *Z. capulosus* Popofsky, 1913
Zygocircus sp. aff. *Z. piscicaudatus* Popofsky, 1913

b. Taxonomic Listing

(If a dimension represents the mean of the measurements taken, it is indicated by a bar above the number, as 63.)

Acrobotrys sp.
Riedel and Sanfilippo, 1971, pl. 1J, fig. 17, 18.
This chapter: Plate 18, Figure 9; Table 7.
Quaternary.

Actinomma arcadophorum Haeckel, 1887
Renz, in press.
This chapter: Plate 14, Figure 1-; Tables 4, 6, 7.
Quaternary.

Actinommid 1 gen. and sp. indet.
Dimensions: (2 specimens) diameter medullary shell $\overline{63}\mu$; diameter cortical shell $\overline{570}\mu$; external primary spine $\overline{87}\mu$; external secondary spine 30μ.
This chapter: Plate 14, Figure 9; Tables 4, 6.
Quaternary.
This chapter: Plate 13, Figure 20; Table 4.
Quaternary.

Actinommid 2 gen. and sp. indet.
Dimensions: (2 specimens) shell diameter $\overline{69}\mu$, spine length $\overline{140}\mu$; number of arms 12.
This chapter: Plate 14, Figure 2; Tables 4, 7.
Quaternary.

Actinommid 3 gen. and sp. indet.
Dimensions: (2 specimens) diameter medullary shell $\overline{36}\mu$; diameter cortical shell $\overline{120}\mu$; large spine $\overline{141}\mu$; other spines 45μ.
This chapter: Plate 14, Figure 9; Tables 4, 6.
Quaternary.

Actinommid 4 gen. and sp. indet.
Description: Spherical shell with internal medullary shell from which primary spines arise: these connect to and extend beyond the cortical shell; their three-bladed nature appears only in the extensions and arises when the spines are formed over the margins of pores on the cortical shell; these pores are very large and irregular.

Dimensions: (2 specimens) diameter medullary shell 47μ; diameter cortical shell 144-156μ; extended spine 45μ.

This chapter: Plate 9, Figure 16; Table 5.

Cretaceous.

Amphibrachium (?) hastatum, n. sp.

Description: Hagiastrid with two arms, broad in the central area and tapering into stout three-bladed spines; four parallel rows of pores run the length of the shell.

Dimensions: (6 specimens) shell length 354-397μ; shell width 120-126μ; spine 105-216μ.

Remarks: Specimens are more often found broken in half. Although the genus *Amphibrachium* in recent usage has been included in the Spongodiscidae, the type species *A. diminutum* Rüst, 1885, may have been a Hagiastrid. Pessagno, 1971, revised its familial assignment to the Hagiastridae in which it is the only genus for two-rayed species. If this revision proves correct, the genus should be redefined to include species with tapering tips and terminal spines. The specific name is Latin for spear-bearing.

Type locality: 12°56.83'S, 117°53.56'E; DSDP Leg 27, Sample 261-12, CC.

This chapter: Plate 1, Figures 1-6; Plate 9, Figure 1; Tables 3, 5.

Cretaceous.

Amphibrachium sp. cf. A. concentricum Lipman, 1960

Riedel and Sanfilippo, 1970, p. 504, pl. 1, fig. 7.

Dimensions: (2 specimens) long axis 114μ; short axis 75μ.

This chapter: Plate 9, Figure 11; Tables 3, 5.

Cretaceous.

Amphiplecta acrostoma Haeckel, 1887

Petrushevskaya, 1971b, p. 103, pl. 54, fig. II-IV.

Note: Petrushevskaya does not describe or discuss the complete thorax with a row of double spines which was characteristic of most specimens examined here.

This chapter: Plate 18, Figure 12; Tables 4, 6, 7.

Quaternary.

Amphipyndax (?) epiplatys n. sp.

Description: Elevated spherical cephalis enveloped in a short pointed apical horn; variable number of segments (8-12); shell conical; pores rounded, slightly irregular, arranged approximately in a checkerboard pattern with two or three rows per segment; pore wall usually thickened around the first two abdominal segments forming "shoulders."

Dimensions: (2 specimens) total height 276μ(8 segments)->420μ (12 segments); maximum width 144-180μ; apical spine 6-15μ.

Remarks: Although this species possesses the characteristic knob-like cephalis and neck of *Amphipyndax*, the ring dividing the cephalis was obscured and is only assumed to be present. Specimens were found in Site 149 material from Rotti, but Tan Sin Hok, 1927, does not describe the species. *A. epiplatys* differs from *A. enesseffi* and *A. mediocris* by possessing a stout apical horn which envelopes the cephalis and a pore wall thickening around the first two abdominal segments. The specific name is Greek for "broad-topped."

Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-9-4, 110-112 cm.

This chapter: Plate 5, Figures 1-3; Plate 12, Figure 2; Tables 3, 5; Sections 2 and 3.

Cretaceous.

Amphipyndax mediocris (Tan Sin Hok, 1927)

1927 *Dictyomitra mediocris* Tan Sin Hok, p. 55, pl. 10, fig. 82.

1968 *Amphipyndax stocki* (Campbell and Clark, 1944b) emend. Foreman, p. 78, pl. 8, fig. 12a-c.

Remarks: Material from Site 149, Rotti, was examined to determine the real similarity between the Tan Sin Hok species and the Foreman, 1968, species. The only difference is that specimens from DSDP Leg 27, Site 261 and Rotti, Site 149, tend to have fewer segments (5-7).

This chapter: Plate 5, Figures 7-9; Plate 12, Figures 3; Tables 3, 5; Section 3.

Cretaceous.

Amphipyndax (?) pyrgodes n. sp.

Description: Elevated spherical cephalis enveloped in a short pointed apical horn; variable number of segments (13-17); shell conical; segments with slight thickenings at the constrictions have a scalloped appearance; pores rounded in two-three rows per segment.

Dimensions: (3 specimens) total height 399μ (13 segments) to 540μ (17 segments); maximum width 153-219μ; apical spine 10μ.

Remarks: As in *A. epiplatys*, the neck area was obscured so that the typical Amphipyndacid ring was not observed.

This species is similar to *A. epiplatys*, but differs from it by usually possessing more segments, by displaying a thickening of the pore wall at each constriction, and by lacking the "shoulders" or general thickening of the pore wall in the upper segments. This species was not found in material from Site 149, Rotti. The specific name is Greek for tower-like.

Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-12-2, top.

This chapter: Plate 5, Figures 4-6; Plate 12, Figure 1; Tables 1, 3, 5; Section 2b, c.

Cretaceous.

Amphirhopalum ypsilon Haeckel, 1887

Nigrini, 1967, p. 35, pl. 3, fig. 3a-d.

This chapter: Plate 15, Figure 14; Tables 2, 4, 6, 7, 8.

Quaternary.

Anthocyrtidium ophirense (Ehrenberg, 1872a)

Renz, in press.

This chapter: Plate 19, Figure 22; Tables 2, 4, 6, 7, 8.

Quaternary.

Anthocyrtidium zanguebaricum (Ehrenberg, 1872a)

Renz, in press.

This chapter: Plate 19, Figure 17; Tables 2, 4, 6, 7.

Quaternary.

Artocapsa bicornis Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 74, pl. 16, fig. 142.

?*Stichomitra livermorensis* (Campbell and Clark, 1944b) in Foreman, 1968, p. 76, pl. 8, fig. 2a only.

Description: Cephalis rounded but irregular with stout apical spine; shell conical with six segments rounded at the bottom with a stout three-bladed terminal spine; pore wall relatively thick with spiny protuberances; pores hexagonally rounded.

Dimensions: (2 specimens) total height 234μ; maximum width 105μ; terminal spine 48-66μ; apical spine 18μ; pore wall 14μ.

Remarks: This species was not found at Site 149, Rotti.

This chapter: Plate 6, Figures 21-23; Plate 11, Figures 12 a, b; Tables 3, 5.

Cretaceous.

Artocapsa ultima Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 74, pl. 16, fig. 143.

?*Stichomitra livermorensis* (Campbell and Clark, 1944b) in Foreman, 1968, p. 76, pl. 8, fig. 2b only.

Description: Cephalis irregular with stout apical spine and several secondary spines; shell conical with six segments, rounded at the bottom with a stout three-bladed terminal spine; pores large, rounded, arranged in rows in checkerboard fashion.

Dimensions: (2 specimens) total height 342μ; maximum width 156μ; pore wall 18μ; apical spine 45μ.

Remarks: This species differs from the concept of Tan Sin Hok in the fact that there are six rather than seven segments and the last is the broadest rather than the fifth; the pores are also larger and more regular. This species was not found in the material from Site 149, Rotti.

This chapter: Plate 6, Figure 24; Plate 11, Figure 13; Tables 3, 5.

Cretaceous.

Archipilium sp. aff. A. macropus (Haeckel, 1887)

Petrushevskaya and Kozlova, 1972, p. 553, pl. 29, fig. 13, 14.

Remarks: Although Petrushevskaya and Kozlova, 1972, found similar specimens in Miocene-Pliocene material, the specimens observed here are believed to be much younger.

This chapter: Plate 17, Figures 11a, b; Tables 4, 6.

?Quaternary-Pleistocene.

Artopilium sp. aff. A. elegans Haeckel, 1887

Haeckel, 1887, p. 1440, pl. 75, fig. 1.

Remarks: The species has a more spherical cephalis with a single apical horn and feet which turn convexly inward; spines usually occur only on the thoracic portion of the feet.

This chapter: Plate 17, Figure 4; Tables 4, 6, 7.

Quaternary.

Artopilium undulatum Popofsky, 1913

Renz, in press.

Remarks: Most specimens have four-six segments.

This chapter: Plate 16, Figure 13; Tables 4, 6, 7.

Quaternary.

Artostrobium auritum group (Ehrenberg, 1844)

Renz, in press.

This chapter: Plate 17, Figure 13; Tables 2, 4, 6, 7, 8.

Quaternary.

Artostrobium miralestense (Campbell and Clark, 1944a).
Renz, in press.
This chapter: Plate 17, Figure 22; Tables 2, 4, 6, 7.
Quaternary.

Astrosphaera hexagonalis Haeckel, 1887
Renz, in press.
This chapter: Plate 14, Figure 1; Table 7.
Quaternary.

Bathropyramis ramosa Haeckel, 1887
Haeckel, 1887, p. 1161, pl. 54, fig. 4.
Dimensions: (2 specimens) length 480-495μ; width 186-213μ; rib width 9-15μ; cephalis 12-15μ.
This chapter: Plate 17, Figure 27; Tables 4, 7.
Quaternary.

Bathropyramis timorensis n. sp.
Description: Plectopyramid with nine very thick, wing-like ribs which in cross-section appear as points on a star; these flare in the upper portion as "shoulders"; pores between ribs are single and elliptical in the upper portion becoming rounded when double or triple; cephalis simple, difficult to see, encased in stout apical spine.
Dimensions: (6 specimens) total length 279-345μ; maximum width 117-231μ; maximum width between ribs 45-75μ; rib thickness $\overline{32}\mu$; apical spine $\overline{66}\mu$; rib thickness at "shoulder" $\overline{27}\mu$.
Remarks: This species differs from other species of *Bathropyramis* in its very characteristic wing-like ribs which possess an upper thoracic thickening or shoulders. This species is named for the Island of Timor near which it was discovered.
Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-9-4, 110-112 cm.
This chapter: Plate 4, Figures 8, 9; Plate 12, Figure 4 a-c; Tables 3, 5; Sections 2c, 3, 4.
Cretaceous.

Bathropyramis sp.
Similar to Renz, in press.
Remarks: apical horns never observed unbroken.
This chapter: Plate 17, Figure 26; Tables 4, 6.
Quaternary.

Botryocyrtis quinaria Ehrenberg, 1872a
Petrushevskaya and Kozlova, 1972, p. 554, pl. 39, fig. 7; Section 2b.
This chapter: Plate 18, Figure 19; Tables 2, 4, 7.
Quaternary.

Botryocyrtis spp.
Renz, in press.
This chapter: Plate 18, Figure 15; Tables 2, 4, 6, 7.
Quaternary.

Botryopyle dictyocephalus Haeckel, 1887
Petrushevskaya, 1971b, p. 161, pl. 83, fig. I-V.
This chapter: Plate 18, Figures 10, 20; Tables 2, 4, 6, 7.
Quaternary.

Callimitra spp.
Renz, in press.
This chapter: Plate 18, Figure 5; Tables 4, 7.
Quaternary.

Calocyclas *monumentum* Haeckel, 1887
Renz, in press.
This chapter: Plate 16, Figure 25; Tables 4, 6, 7.
Quaternary.

Cantharospyris platybursa Haeckel, 1887
Renz, in press.
This chapter: Plate 19, Figures 19a, b; Tables 4, 7.
Quaternary.

Carpocanarium papillosum (Ehrenberg, 1872a)
Riedel and Sanfilippo, 1971, p. 132, pl. 11, fig. 24.
This chapter: Plate 17, Figure 21; Tables 4, 6, 7; Sections 2b, c.
Quaternary.

Carpocanistrum spp.
Renz, in press.
This chapter: Plate 17, Figure 17; Tables 2, 4, 6, 7.
Quaternary.

Centrobotrys thermophila Petrushevskaya, 1965
Nigrini, 1967, p. 49, pl. 5, fig. 7.
This chapter: Plate 18, Figure 16; Tables 2, 4, 6, 7; Section 2c.
Quaternary.

Centrocubus octostylus Haeckel, 1887
Haeckel, 1887, p. 278, pl. 18, fig. 1.
This chapter: Plate 14, Figure 14; Tables 4, 6, 7.
Quaternary.

Ceratospyris sp. aff. C. sp. A
Renz, in press.
Remarks: The polygonal pores with meshwork at the lateral extremes of the bilocular cephalis are not as bulbous in these specimens.
This chapter: Plate 19, Figure 8; Tables 4, 6, 7.
Quaternary.

Ceratospyris spp.
Renz, in press.
This chapter: Plate 19, Figure 9; Tables 4, 6, 7.
Quaternary.

Cinclopyramis infundibulum Haeckel, 1887
Renz, in press.
This chapter: Plate 17, Figure 23; Tables 2, 4, 6, 7, 8.
Quaternary.

?Cladococcus abietinus Haeckel, 1887
Haeckel, 1887, p. 226, pl. 27, fig. 3.
Remarks: This species differs from Haeckel's description in possessing spines dentated only toward the tips.
This chapter: Plate 13, Figure 18; Tables 4, 6, 7.
Quaternary.

?Cladococcus pinetum Haeckel, 1887
Haeckel, 1887, p. 226, pl. 27, fig. 1.
Dimensions: (2 specimens) diameter of sphere $\overline{99}\mu$; spine $\overline{240}\mu$.
Remarks: The assignment of this species is tentative because the branching of the spines is less dramatic than described by Haeckel.
This chapter: Plate 13, Figure 19; Table 7.
Quaternary.

Cladococcus scoparius Haeckel, 1887
Haeckel, 1887, p. 225, pl. 27, fig. 2.
Dimensions: (2 specimens) diameter medullary shell $\overline{60}\mu$; spine 120μ; number of spines >22.
This chapter: Plate 13, Figure 17; Tables 4, 7.
Quaternary.

Cladococcus sp.
Dimensions: (3 specimens) shell diameter $\overline{75}\mu$; spine length $\overline{51}\mu$; number of arms >18.
This chapter: Plate 14, Figure 4; Table 7.
Quaternary.

Clathrocanium spp.
Renz, in press.
This chapter: Plate 18, Figure 3; Tables 2, 4, 6, 7.
Quaternary.

Clathrocyclas semeles Haeckel, 1887
Haeckel, 1887, p. 1388, pl. 58, fig. 5.
This chapter: Plate 16, Figure 16; Tables 4, 6, 7.
Quaternary.

Clathrocorys sp.
Renz, in press.
This chapter: Plate 18, Figure 4; Tables 4, 6, 7.
Quaternary.

Collosphaera polygona Haeckel, 1887
Renz, in press.
This chapter: Plate 13, Figure 14; Tables 2, 4, 6, 7.
Quaternary.

Collosphaera tuberosa Haeckel, 1887
Nigrini, 1971, p. 445, pl. 34.1, fig. 1.
This chapter: Plate 13, Figure 6; Tables 6, 7.
Quaternary.

?Conosphaera tuberosa Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 36, pl. 6, fig. 10.
Dimensions: (2 specimens) radius $\overline{90}\mu$; radius of medullary shell 24μ.
Remarks: This species is similar to that described by Tan Sin Hok but smaller. It was found at Site 149, Rotti.
This chapter: Plate 2, Figures 6-8; Plate 9, Figure 17; Tables 3, 5.
Cretaceous.

?Cornutella californica var. A Campbell and Clark, 1944b, emend. Foreman, 1968
Foreman, 1968, p. 21, pl. 3, fig. 1c.
Dimensions: (2 specimens) length without horn 108μ; maximum width 90μ; apical horn 153μ.
Remarks: This species is similar to that figured by Foreman but tends to have a shorter broader thorax. No similar species was described by Tan Sin Hok, 1927.
This chapter: Plate 4, Figure 10; Plate 12, Figure 6; Table 5.
Cretaceous.

?Cornutella californica var. B Campbell and Clark, 1944a, emend. Foreman, 1968

Foreman, 1968, p. 21, pl. 3, fig. 1b.

Dimensions: (2 specimens) total length 240μ; maximum width 45μ; apical horn 84μ.

Remarks: Two similar *Cornutella* species occur at Site 149, Rotti and were described by Tan Sin Hok, 1927, as *C. apicata* and *C. facilis*. In both, the characteristics of the pores and the pore wall differ sufficiently from this species to justify another name. Although *C. californica* has been described as Maestrichtian from the eastern Pacific, it is at least more superficially similar to this species than the others.

This chapter: Plate 4, Figure 11;Plate 12, Figure 7; Table 5.

Cretaceous.

Cornutella profunda Ehrenberg 1854a

Nigrini, 1967, p. 60, pl. 6, fig. 5a-c, fig. 5a = var. B, 5c = var. A.

Remarks: Nigrini regarded both thin- and thick-walled forms as conspecific. These have been separated for abundance estimates into two varieties, due to the fact that no transitional forms were observed.

This chapter: Plate 17, Figures 24, 25; Tables 2, 4, 6, 7 (var A); Tables 4, 6, 7 (var B).

Quaternary.

Cornutella sp. aff. C. longisetta Ehrenberg, 1872a

Petrushevskaya and Kozlova, 1972, p. 551, pl. 30, fig. 8.

Remarks: Specimens in Leg 27 material have a thicker shell wall and hexagonal pores.

This chapter: Plate 17, Figure 20; Table 6.

Quaternary.

Corocalyptra cervus (Ehrenberg, 1872b)

Renz, in press.

This chapter: Plate 16, Figure 22; Tables 4, 6, 7.

Quaternary.

Corocalyptra killmari Renz, in press

Renz, in press.

This chapter: Plate 17, Figure 10; Tables 4, 7.

Quaternary.

Corocalyptra kruegeri Popofsky, 1908

Renz, in press.

This chapter: Plate 16, Figure 10; Table 7.

Quaternary.

Corocalyptra sp. aff. C. kruegeri Popofsky, 1908

Renz, in press.

Remarks: Specimens of this type differ from the original species description by forming postabdominal segments of an undulating form rather than by true constrictions.

This chapter: Plate 16, Figure 11; Table 7.

Quaternary.

Crucella espartoensis Pessagno, 1971

Pessagno, 1971, p. 54, pl. 18, fig. 1-4.

Remarks: Usually without a patagium.

This chapter: Plate 1, Figures 11, 12; Plate 9, Figure 4; Tables 3, 5; Section 3.

?Cyclampterium neatum Sanfilippo and Riedel, 1970

Riedel and Sanfilippo, 1971, p. 106, pl. 1E, fig. 4-6.

This chapter: Plate 16, Figure 29; Table 4.

Quaternary.

?Cyrtocapsa grutterinki var. α Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 65, pl. 13, fig. 111.

Dimensions: (2 specimens) total height without apical or terminal spines 193-231μ; thorax length 27μ; abdomen length 142μ; maximum width 179μ; terminal spine 36-75μ.

Remarks: Cephalis may have three or more short apical spines or one stout three-bladed spine. This species differs from that of Tan Sin Hok by possessing only one abdominal segment.

This chapter: Plate 6, Figures 1-3; Plate 11, Figure 7; Tables 1, 3, 5; Section 3.

?Cyrtocalpis operosa Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 40, pl. 7, fig. 27.

Description: Appearing to be a "pseudo cornutella" with a tapering thorax, spherical cephalis with small apical horn; pores rounded in alternating vertical rows and moderately close set.

Dimensions: (2 specimens) total height 123-210μ; maximum width 66μ; apical spine 6μ; pore wall 9-12μ.

Remarks: This species differs from the concept of Tan Sin Hok in being taller and having a thinner pore wall.

This chapter: Plate 4, Figures 15, 16; Plate 12, Figure 8; Tables 1, 3, 5; Section 3.

Cretaceous.

Cyrtopera sp. aff. C. languncula Haeckel, 1887

Renz, in press.

Remarks: All specimens are broken.

This chapter: Plate 16, Figure 2; Tables 4, 6, 7.

Quaternary.

Dendrospyris sp. aff. D. binapertonis Goll, 1968

Goll, 1972, p. 963, pl. 49, fig. 1, 2.

Dimensions: (4 specimens) height 60μ; width 87μ; "feet" 36μ.

This chapter: Plate 19, Figure 11; Tables 4, 6, 7.

Quaternary.

?Dendrospyris sp. aff. D. stabilis Goll, 1968

Renz, in press.

This chapter: Plate 19, Figure 14; Tables 2, 4, 6, 7.

Quaternary.

Diacanthocapsa sp. B

Petrushevskaya and Kozlova, 1972, p. 536, pl. 7, fig. 4, 5.

Dimensions: (2 specimens) height 141μ; maximum width 96μ; abdominal wall thickness 18μ.

This chapter: Plate 11, Figure 18; Table 5.

Cretaceous.

Dicolocapsa verbeeki Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 44, pl. 8, fig. 40.

1968? *Solenotryma* sp. Foreman, p. 33, pl. 4, fig. 6.

Dimensions: (4 specimens) height 104μ; maximum width 93μ; pore wall 9μ.

Remarks: It appears that species in the *Tricolocapsa parvipora* group are related to *D. verbeeki* since both show a tendency to grow septa (internal constrictions) indiscriminately in the thorax. A terminal tube as described by Foreman was never observed.

This chapter: Plate 6, Figures 13-18; Plate 11, Figure 9; Tables 1, 3, 5.

Cretaceous.

Dicolocapsa sp.

Description: Cephalis subspherical without apical spine, thorax subspherical, third segment (?) or "skirt" only rudimentary yet always present; pores very small, regular and wide-set.

Dimensions: (3 specimens) height 162μ; width 108μ; "skirt" length 54μ; pore wall 12μ.

This chapter: Plate 6, Figure 19; Plate 11, Figure 2; Table 5.

Cretaceous.

Dictyoceras virchowii Haeckel, 1862

Haeckel, 1862, pl. 8, figs. 6-8.

This chapter: Plate 17, Figure 5; Tables 4, 6, 7.

Quaternary.

Dictyocodon palladius Haeckel, 1887

Haeckel, 1887, p. 1335, pl. 71, fig. 12, 13.

This chapter: Plate 16, Figure 1; Table 7.

Quaternary.

Dictyocoryne profunda Ehrenberg, 1872b

Renz, in press.

This chapter: Plate 15, Figure 7; Tables 2, 4, 6, 7, 8; Sections 2b-d.

Quaternary.

Dictyomitra brouweri var. α (Tan Sin Hok, 1927)

1927 *Eucyrtidium brouweri* var. α Tan Sin Hok, p. 58, pl. 11, fig. 93.

Moore, 1973, pl. 14, fig. 7-9.

Remarks: Genus revised. See *D. brouweri* var. γ. Specimens found at Site 149, Rotti.

This chapter: Plate 8, Figures 14-16; Plate 11, Figure 26; Tables 1, 3, 5; Sections 2b-d, 3.

Cretaceous.

Dictyomitra brouweri var. γ (Tan Sin Hok, 1927)

1927 *Eucyrtidium brouweri* var. γ Tan Sin Hok, p. 58, pl. 11, fig. 91.

Remarks: Specimens do not have the thickened pore walls as illustrated by Tan Sin Hok. The generic assignment has been revised because this species appears to be more closely related to the type species of *Dictyomitra*, i.e., *D. multicostata* Zittel, 1876, than to the type species of *Eucyrtidium*, i.e., *E. acuminatum* Ehrenberg, 1847; specimens found at Site 149, Rotti.

This chapter: Plate 8, Figures 9-13; Plate 11, Figure 27; Tables 1, 3, 5; Sections 2b-d, 3.

Cretaceous.

Dictyomitra excellens (Tan Sin Hok, 1927)
1927 *Lithomitra excellens* Tan Sin Hok, p. 56, pl. 11, fig. 85.
Dimensions: (3 specimens) total length 225-375μ; maximum width 102μ.
Remarks: Number of segments varies from 10 to 13. The generic assignment of this species has been reevaluated because it appears to be more closely related to the type species *Dictyomitra*, i.e., *D. multicostata* Zittel, 1876, than to the type species of *Lithomitra*, i.e., *L. pachyderma* Ehrenberg, 1873, probably an artostrobiid.
This chapter: Plate 8, Figures 7, 8; Plate 11, Figure 35; Tables 1, 3, 5.
Cretaceous.

Dictyomitra lilyae Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 56, pl. 10, fig. 83.
Dimensions: (3 specimens) total length $\overline{207}\mu$; maximum width $\overline{106}\mu$; length largest segment 30μ.
Remarks: Several specimens of *D. lilyae* were found in the material from Sites 149 and 384, Rotti. This species bears a strong resemblance to *D. formosa* Squinabol, 1904, as presented in Moore, 1973, and to *D. haeckelii* (Pantanelli, 1880) as presented in Hinde, 1900.
This chapter: Plate 8, Figures 1-4; Plate 11, Figure 33; Tables 3, 5. Sections 2b, c.
Cretaceous.

?Dictyomitra malleola Aliev, 1961
Aliev, 1965, p. 48, pl. 8, fig. 6.
Dimensions: (3 specimens), height $\overline{357}\mu$, width $\overline{141}\mu$; number of segments 14-15.
Remarks: The swelling of the second abdominal segment is not as great as pictured by Aliev.
This chapter: Plate 8, Figure 20; Plate 11, Figure 28; Table 5.
Cretaceous.

Dictyomitra pseudoscalaris (Tan Sin Hok, 1927)
1927 *Stichomitra pseudoscalaris* Tan Sin Hok, p. 56, pl. 11, fig. 84.
Dimensions: (3 specimens), total length $\overline{251}\mu$; maximum width 110μ; length largest segment $\overline{45}\mu$.
Remarks: Number of segments varies from 6 to 10; a small apical horn may or may not be present. The generic assignment of this species has been reevaluated because it appears from the arrangement of the pores and costae to be more closely related to the type species of *Dictyomitra*, i.e., *D. multicostata* Zittel, 1876, than to the type species of *Stichomitra, S. costata* Cayeux, 1897.
This chapter: Plate 8, Figures 5, 6; Plate 11, Figure 34; Tables 1, 3, 5; Sections 2b, c.
Cretaceous.

Dictyophimus crisiae Ehrenberg, 1854
Nigrini, 1967, p. 66, pl. 6, fig. 7a, b.
This chapter: Plate 17, Figure 2; Tables 4, 6, 7.
Quaternary.

Dictyophimus gracilis Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 42, pl. 7, fig. 33.
Description: Cephalis hemispherical with stout, flared, three-pronged apical spine; thorax hemispherical with three stout, three-bladed legs extending from its edge and curving inward; pores moderately large and irregularly hexagonal.
Dimensions: (3 specimens) length (cephalis and thorax) 63-81μ; apical spine 35-42μ; leg 49-60μ; maximum thorax width 75-78μ.
Remarks: Material from Site 149, Rotti, was examined to insure the similarity between the species described by Tan Sin Hok and the species in DSDP Site 261 material.
This chapter: Plate 5, Figures 14-16; Plate 11, Figure 11; Table 5; Sections 2c, 3.
Cretaceous.

Dictyophimus obliquum (Hinde, 1900)
(1900 *Tripilidium obliquum* Hinde, p. 26, pl. 2, fig. 9.
Description: Eucyrtid with subspherical cephalis and tall, stout, three-bladed apical horn; thorax pear-shaped; from its edge extend three long convex feet with short spines or teeth along the upper inner side.
Dimensions: (2 specimens) apical spine $\overline{66}\mu$; length cephalis + thorax $\overline{84}\mu$; maximum width 84μ; length feet $\overline{135}\mu$.
Remarks: The generic assignment of this species has been shifted because this author feels that specimens are more closely related to the type species of *Dictyophimus*, i.e., *D. crisiae* Ehrenberg, 1854, established in the argument presented by Nigrini, 1968, than to the type species of *Tripilidium*, i.e., *T. nanum* Rüst, 1885. *D. obliquum* is similar to *D. gracilis*, but differs from it by the shape of the thorax and the length of the apical horn and feet.
This chapter: Plate 5, Figure 17; Plate 11, Figure 1; Table 5.
Cretaceous.

Dictyophimus tetracanthus Popofsky, 1913
Renz, in press.
This chapter: Plate 18, Figure 11; Tables 4, 7.
Quaternary.

Dictyophimus? sp. indet.
cf. *Pseudodictyophimus*? sp. indet.
Petrushevskaya and Kozlova, 1972, pl. 37, fig. 22.
This chapter: Plate 17, Figure 18; Tables 4, 7.
Quaternary.

Disolenia quadrata (Ehrenberg, 1872a)
Renz, in press.
This chapter: Plate 13, Figure 8; Tables 2, 4, 6, 7.
Quaternary.

Disolenia zanguebarica (Ehrenberg, 1872a)
Rena, in press.
This chapter: Plate 13, Figure 5; Tables 4, 6, 7, 8.
Quaternary.

Elatomma sp.
Dimensions: (2 specimens) diameter cortical shell $\overline{252}\mu$; diameter medullary shell $\overline{66}\mu$; primary spine length external $\overline{33}\mu$; secondary spine length external $\overline{9}\mu$.
This chapter: Plate 13, Figure 16; Tables 4, 7.
Quaternary.

Euchitonia mulleri Haeckel, 1862
Nigrini, 1967, p. 37, pl. 4, fig. 1a, b.
This chapter: Plate 15, Figure 1; Tables 2, 4, 6, 7, 8; Sections 2b-d.
Quaternary.

Eucyrtid 1 gen. and sp. indet.
Dimensions: (1 specimen) cephalis $\overline{18}\mu$; apical spine $\overline{51}\mu$; thorax length $\overline{105}\mu$; thorax width $\overline{165}\mu$; feet $\overline{30}\mu$ (broken).
This chapter: Plate 16, Figure 15; Tables 4, 6.
Quaternary.

Eucyrtid 2 gen. and sp. indet.
Dimensions: (2 specimens) cephalis $\overline{18}\mu$; apical spines $\overline{45\text{-}54}\mu$; thorax length $\overline{126}\mu$; thorax width $\overline{180}\mu$; foot $\overline{186}\mu$.
This chapter: Plate 17, Figure 1; Table 7.
Quaternary.

Eucyrtid 3 gen. and sp. indet.
This chapter: Plate 16, Figure 23; Table 7.
Quaternary.

Eucyrtidium acuminatum (Ehrenberg, 1844)
Renz, in press.
This chapter: Plate 16, Figure 8; Tables 4, 6, 7.
Quaternary.

Eucyrtidium anomalum Haeckel, 1862
Renz, in press.
This chapter: Plate 16, Figure 20; Tables 2, 4, 6, 7.
Quaternary.

Eucyrtidium (?) boodes n. sp.
Description: Multisegmented Eucyrtid with a large subspherical cephalis enveloped in a stout apical horn; shell concical; pore wall thickened around the upper segments forming "shoulders" pores rounded, regular, moderately large.
Dimensions: (2 specimens) cephalis $\overline{21}\mu$; apical horn $\overline{48}\mu$; total length (8 segments) $\overline{345}\mu$; maximum width $\overline{126}\mu$; "shoulder" width 105μ; pore wall at "shoulders" $\overline{30}\mu$.
Remarks: This species is only tentatively assigned to the genus *Eucyrtidium* since all specimens are broken. It differs from other species in this genus by its characteristic large cephalis and horn and the thickened pore wall around the upper segments. The species name is Greek for ox-like.
Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-9-4, 110-112 cm.
This chapter: Plate 8, Figures 21, 22; Plate 11, Figures 15 a, b; Table 5; Sections 2c, 3.
Cretaceous.

Eucyrtidium hexagonatum Haeckel, 1887
Renz, in press.
This chapter: Plate 16, Figure 3; Tables 2, 4, 6, 7.
Quaternary.

Eucyrtidium hexastichum (Haeckel, 1887)

Renz, in press.

This chapter: Plate 16, Figure 6; Tables 2, 4, 6, 7, 8.

Quaternary.

Eucyrtidium vermiculatum n. sp.

Description: Cephalis small, subspherical with small apical spine; shell slightly conical becoming cylindrical distally. Strong internal septa; pores very irregular with irregular raised ridges running over each segment such that each segment in profile appears to have a bulge or node at its center.

Dimensions: (3 specimens) height 153-219μ; width 78-90μ; number of segments six to nine.

Remarks: This species differs from other Cretaceous species of *Eucyrtidium* by possessing raised irregular ridges which cause intra segmental bulges.

The species name is Latin for worm-like.

Type locality: 12°56.83'S, 117°53.56'E. DSDP Leg 27, Sample 261-12-2, top.

This chapter: Plate 8, Figures 17-19; Plate 11, Figure 22; Table 5; Section 3.

Cretaceous.

Eucyrtidium sp. cf. E. thiensis Tan Sin Hok, 1927

Only as figured by Moore, 1973, pl. 7, fig. 6 not Tan Sin Hok, 1927.

Description: Eucyrtid with six segments; small, spherical cephalis without apical horn; shell conical with bulbous end segment; pores small widely spaced in columns.

Dimensions: (2 specimens) total length $\overline{195}\mu$; maximum width $\overline{111}\mu$.

Remarks: This species has *not* been found in the material from Site 149, Rotti; after studying the material, it appears that Tan Sin Hok was describing a different species, namely *E. thiensis* discussed in this chapter and not the species designated by Moore.

This chapter: Plate 11, Figure 23; Tables 3, 5; Section 3.

Cretaceous.

Eucyrtis bulbosus n. sp.

Description: Cephalis subspherical with short apical spine; thorax and abdomen conical with a bulbous spiny lower segment and a pseudosegmented tapering tail; number of segments vary from six to nine; pores hexagonal, closely spaced in alternating rows.

Dimensions: (3 specimens) total height 192-309μ; maximum width 96-105μ; length of largest segment 78-96μ; length of tail 111μ.

Remarks: This species is quite similar to *E. hanni*, but differs from it by possessing a large bulbous abdominal segment. Many times the tail is broken. The specific name is Latin for bulbous.

Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-12-2, 11-12 cm.

This chapter: Plate 7, Figures 26-29; Plate 12, Figure 15 a, b; Tables 3, 5; Sections 2b, c, 3.

Cretaceous.

Eucyrtis columbarius n. sp.

Description: Cephalis subspherical, sometimes enveloped in a stout apical horn usually offset, at other times simple with no horn; thorax somewhat rounded and hemispherical, abdominal segments, cylindrical or slightly conical with strictures appearing as internal rings; two or more slight lateral, internal ribs on abdomen occur randomly and sometimes protrude at the mouth as a tube; rarely the terminal segment appears bulbous and closed; often the lower segments curve out as if the axis is bent; pores round, regular, close set in rows or columns along the internal ribs; those not located on ribs tend to occur in checkerboard fashion.

Dimensions: (6 specimens) height without apical horn 165-237μ; maximum width 72-105μ; number of segments 6-10.

Remarks: This species is probably related to *Eucyrtidium thiensis* Tan Sin Hok, 1927 (not Moore, 1973), a description based on one specimen. After studying topotypic material from Site 149, Rotti, two specimens plus fragments were found and considered to be *E. thiensis*. These differ from this species in being more conical in shape and in lacking a bent axis. There is also a similarity based on the character of the pores and internal septa with *Cyrtocapsa ovalis* Rüst, 1885. Whether this is conspecific with either of the other species can be decided only when topotypic material is available. The specific name is Latin for dove-like.

Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-12-2, 11-12 cm.

This chapter: Plate 7, Figures 14-20; Plate 12, Figures 13 a-c; Tables 1, 3, 5; Sections 2b, c, 3, 4.

Cretaceous.

Eucyrtis hanni (Tan Sin Hok, 1927)

1927 *Lithocampe hanni* Tan Sin Hok, p. 64, pl. 13, fig. 109.

Dimensions: (4 specimens) total height 189-309μ; length terminal segment 54-87μ; maximum width 66-84μ; apical spine 18-27μ; number of segments 7-11.

Remarks: This species may be conspecific with *E. zhamoidai* Foreman, 1973, and with *Stichocapsa bicacuminata* Rüst, 1885, but until topotypic material can be examined, this cannot be determined. *E. hanni* is present at Site 149, Rotti. The generic assignment has been revised since this species appears to be more closely related to *Eucyrtis conoidea* Rüst, 1885 (type specimen designated by Foreman, 1973) than to *Lithocampe radicula* Ehrenberg, 1838.

This chapter: Plate 7, Figures 21-25; Plate 12, Figures 16a, b; Tables 3, 5; Sections 2b, c, 3.

Cretaceous.

Eucyrtis kruizingai (Tan Sin Hok, 1927)

Tan Sin Hok, 1927, p. 61, pl. 11, fig. 97.

Dimensions: (2 specimens) total height 117-219μ; maximum width 72-99μ; number of segments 4-6.

Remarks: The generic assignment of this species has been revised since it appears to be more closely related to the type species of *Eucyrtis*, i.e., *E. conoidea* Rüst, 1885 (designated by Foreman, 1973) than to the type species of *Eusyringium*, i.e., *E. conosiphon* Haeckel, 1887.

This chapter: Plate 11, Figure 24; Table 5; Section 3.

Cretaceous.

Eucyrtis molengraaffi (Tan Sin Hok, 1927)

1927 *Syringium molengraaffi* Tan Sin Hok, p. 63, pl. 13, fig. 105; pl 11, fig. 32.

Dimensions: (3 specimens) total height 123-219μ; maximum width 69-96μ; number of segments.

Remarks: This species differs from the concept of Tan Sin Hok in the following ways: (1) number of segments varies from five to eight; (2) segments generally have three rows of pores rather than two. Since this species has little in common with *Syringium vinassai* Principi, 1909, from the middle Miocene of Tripoli, the type species of this genus, its generic assignment has been revised to *Eucyrtis*, type species *E. conoidea* Rüst, 1885, designated by Foreman, 1973.

This chapter: Plate 7, Figures 1-4; Plate 11, Figure 32; Tables 1, 3, 5.

Cretaceous.

?Eusyringium siphonostoma Haeckel, 1887

Haeckel, 1887, p. 1499, pl. 80, fig. 14.

Description: Cephalis hemispherical with small apical horn; collar constriction slight; first abdominal segment elongated; pores small, rounded, irregular, and close-set.

Dimensions: (2 specimens) height (5 segments) $\overline{162}\mu$; width $\overline{66}\mu$; thorax $\overline{21}\mu$; first abdominal segment $\overline{54}\mu$; second abdominal segment 39μ.

Remarks: Assignment of this species is tentative because all specimens are incomplete; a terminal tube was never observed.

This chapter: Plate 16, Figure 7; Tables 4, 7.

Quaternary.

Giraffospyris angulata (Haeckel, 1887)

Renz, in press.

This chapter: Plate 19, Figure 10; Tables 2, 4, 6, 7, 8.

Quaternary.

Giraffospyris laterispina Goll, 1969

Goll, 1972, p. 965, pl. 66, fig. 1-4.

Dimensions: (2 specimens) height $\overline{75}\mu$; width $\overline{96}\mu$; feet $\overline{12}\mu$.

This chapter: Plate 19, Figure 7; Tables 2, 4, 6, 7, 8.

Quaternary.

Hagiastrid 1 gen. and sp. indet.

Dimensions: (3 specimens) maximum radius 102-174μ.

Remarks: A similar specimen is pictured in Riedel and Sanfilippo, 1970, pl. 2, fig. 4.

This chapter: Plate 1, Figures 7, 8; Plate 9, Figure 3; Tables 3, 5; Section 3.

Cretaceous.

Hagiastrid 2 gen. and sp. indet.

Dimensions: (2 specimens) arm $\overline{147}\mu$; central disc $\overline{60}\mu$.

This chapter: Plate 1, Figures 9, 10; Plate 9, Figure 6; Tables 3, 5.
Cretaceous.

?Halesium quadratum Pessagno 1971
Pessagno, 1971, p. 23, pl. 3, fig. 1-6; pl. 4, fig. 1, 2.
Remarks: Specimens are smaller than described by Pessagno (ray length 180μ vs. 324μ) and broken so that a brachiopyle was not detected; patagium poorly developed or absent. It is the presence of other specific features (nodes, tabulas, etc.) which warrant the placing of specimens in this species.
This chapter: Plate 9, Figure 12; Tables 3, 5.
Cretaceous.

Haliomma erinaceum Haeckel, 1862
Renz, in press.
This chapter: Plate 14, Figure 11; Tables 4, 7.
Quaternary.

Haliomma minor Campbell and Clark, 1944b
Campbell and Clark, 1944b, p. 11, pl. 4, fig. 3.
Dimensions: (2 specimens) diameter cortical shell 90μ; diameter medullary shell 34μ; spine 48μ.
This chapter: Plate 9, Figure 8; Table 5.
Cretaceous.

Haliomma sp. cf. H. glisifra Renz, in press
Renz, in press.
Remarks: Specimens found in Leg 27 material tend to be more robust with shorter spines than the type species from the central Pacific.
This chapter: Plate 14, Figure 12; Tables 4, 6, 7, 8.
Quaternary.

Heliodiscus asteriscus Haeckel, 1887
Renz, in press.
This chapter: Plate 13, Figure 11; Tables 2, 4, 6, 7, 8.
Quaternary.

Heliodiscus echiniscus Haeckel, 1887
Nigrini, 1967, p. 34, pl. 3, fig. 2a, b.
This chapter: Plate 13, Figure 1; Table 7.
Quaternary.

?Hemicryptocapsa pseudopilula Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 51, pl. 9, fig. 69.
Dimensions: (3 specimens) width abdomen 135-144μ; width thorax 33-45μ; length thorax 18-27μ; width cephalis 15-18μ; pore wall 12-15μ.
Remarks: This species is slightly larger than described by Tan Sin Hok.
This chapter: Plate 5, Figures 10-13; Plate 12, Figure 5; Tables 1, 3, 5; Section 3.
Cretaceous.

Hexalonche sp.
Description: Medullary shell small with regular, hexagonal pores; cortical shell large with large rounded pores of various sizes; six stout primary spines; numerous small secondary spines.
Dimensions: (2 specimens) diameter medullary shell 48μ; diameter cortical shell 171μ; primary spine 120μ; secondary spine 9μ.
This chapter: Plate 14, Figure 13, Tables 2, 4, 6, 7.
Quaternary.

Hexapyle dodecantha Haeckel, 1887
Renz, in press.
This chapter: Plate 13, Figure 7; Tables 4, 6, 8.
Quaternary.

incerti sedis
Dimensions: (2 specimens) width 80μ; height 96μ.
Remarks: Probably a cross-section view of the central area of a disc.
This chapter: Plate 9, Figure 10; Table 5.
Cretaceous.

Lamprocyclas maritalis Haeckel, 1887
Renz, in press.
This chapter: Plate 19, Figure 21; Tables 2, 4, 6, 7, 8; Section 2c.
Quaternary.

Lamprocyrtis haysi Kling, 1973
Kling, 1973, p. 82, pl. 5, fig. 15, 16; pl. 15, fig. 1-3.
This chapter: Plate 19, Figure 25; Tables 2, 4, 6, 7.
Quaternary.

Lamprocyrtis heteroporus (Hays, 1965)
Kling, 1973, p. 83, pl. 5, fig. 19-21; pl. 15, fig. 6.
This chapter: Plate 19, Figure 25; Tables 2, 4, 6, 7.
Quaternary.

Lampromitra parabolica Popofsky, 1913
Renz, in press.
This chapter: Plate 16, Figure 9; Tables 4, 6, 7.
Quaternary.

Lamprospyris hookeri Haeckel, 1887
Renz, in press.
This chapter: Plate 19, Figure 30; Tables 4, 6, 7.
Quaternary.

Lamprotripus butschlii (Haeckel, 1887)
Petrushevskaya, 1971b, fig. 50.1.
Remarks: Rib extensions are much reduced.
This chapter: Plate 18, Figure 23; Tables 4, 6, 7.
Quaternary.

Larcospira quadrangula Haeckel, 1887
Renz, in press.
This chapter: Plate 13, Figure 2; Tables 4, 6, 7, 8.
Quaternary.

Liriospyris costata (Haeckel, 1887)
Nigrini, 1967, p. 45, pl. 5, fig. 4.
Remarks: The generic assignment of this species has been altered to follow the revisions by Goll, 1968.
This chapter: Plate 19, Figure 2; Tables 4, 6, 7.
Quaternary.

Liriospyris reticulata (Ehrenberg, 1872a)
Goll, 1968, p. 1429, pl. 176, fig. 9, 11, 13.
This chapter: Plate 19, Figure 1; Tables 2, 4, 6, 7.
Quaternary.

Liriospyris sp. 1
Dimensions: (2 specimens) height 108μ; width 108μ.
This chapter: Plate 19, Figure 3; Table 7.
Quaternary.

Liriospyris sp. 2
This chapter: Plate 19, Figure 4; Tables 4, 7.
Quaternary.

Litharachnium tentorium Haeckel, 1862
Renz, in press.
Remarks: Specimens broken.
This chapter: Plate 17, Figure 19; Tables 4, 6, 7.
Quaternary.

Lithocampe chenodes n. sp.
Description: Cephalis spherical with large thick offset apical spine or stout corona-shaped spine; thorax and upper abdominal segments cylindrical numbering six to eight; lower abdominal segments becoming broader and forming a bulbous section which tapers toward the end; total number of segments 14-18; numerous stout spines protrude from this section; pores small, rounded and close set between which very irregular interstitial network of ridges can be seen.
Dimensions: (3 specimens) total height 327-372μ; maximum width 150-180μ; apical spine 33-54μ; abdominal spines 45-67μ.
Remarks: This species differs from *L.* sp. aff. *L. mediodilatata* Rüst, 1885, as described by Moore, 1973, in the characteristics of the apical spine and abdominal spines; the greater number of segments; generally small size and proportions; and in the very characteristic irregular network of ridges. The specific name is Greek for goose-like.
Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-12-2, top.
This chapter: Plate 7, Figure 30; Plate 12, Figure 14 a-d; Tables 3, 5; Sections 2b, c, 3.
Cretaceous.

?Lithocampe pseudochrysalis var. α Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 64, pl. 13, fig. 108.
Remarks: The specific features of the pore wall were obscured; all other characteristics agree with Tan Sin Hok's description.
This chapter: Plate 11, Figure 31; Table 5.
Cretaceous.

Lithocampe sp.
Nigrini, 1967, p. 87, pl. 8, fig. 6a, b.
This chapter: Plate 16, Figure 4; Tables 2, 4, 6, 8.
Quaternary.

Lithocyclia? sp. A
Moore, 1973, p. 824, pl. 18, fig. 6.
Dimensions: (2 specimens) diameter central rings 63-75μ; diameter disc 240-255μ.
Remarks: This species appears to be identical with that figured by Moore, 1973, but its assignment to the genus *Lithocyclia* is in error.
This chapter: Plate 4, Figures 6, 7; Plate 10, Figure 16; Table 5; Section 3.
Cretaceous.

Lithomelissa monoceras Popofsky, 1913
Renz, in press.
This chapter: Plate 18, Figure 14; Tables 4, 6, 7.
Quaternary.

Lithomitra lineata group (Ehrenberg, 1838)
Renz, in press.
This chapter: Plate 17, Figure 12a, b; Tables 4, 7.
Quaternary.

Lithomitra pseudopinguis Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 57, pl. 10, fig. 86.
Description: Cephalis subspherical without an apical horn; thoracic and abdominal segments rounded getting progressively larger; segments vary from three to five; pores angular, irregular, closely spaced.
Dimensions: (3 specimens) total height 114-207μ; maximum width 90μ.
Remarks: *Tetracapsa zinckenii* Rüst, 1885, may be conspecific, but the figure is so stylized and the description so brief that no decision is possible until topotypic material is examined. If at that time the species of Tan Sin Hok is found to be a new species, its generic assignment should be revised since it has little in common with the type species *L. pachyderma* Ehrenberg, 1873 (probably an Artostrobiid).
This chapter: Plate 7, Figures 5-7; Plate 11, Figure 30; Tables 1, 3, 5.
Cretaceous.

Lithopera bacca Ehrenberg, 1872a
Renz, in press.
This chapter: Plate 16, Figure 28; Tables 2, 4, 6, 7; Section 2e.
Quaternary.

Lithopilium sphaerocephalum Popofsky, 1913
Renz, in press.
This chapter: Plate 16, Figure 22; Tables 4, 6, 7.
Quaternary.

?Lithostrobus erectus Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 53, pl. 10, fig. 16.
Description: Cephalis subspherical, enveloped in a very stout apical horn; segmentation slight; pores small, very irregular, giving an almost spongy appearance.
Dimensions: (2 specimens) total length 261μ; maximum width 99-135μ; apical spine 69μ.
Remarks: Number of segments varies from five to eight; apical spine is longer than described by Tan Sin Hok (69μ vs. 29μ); but similar specimens were found in the material from Rotti, Site 149.
This chapter: Plate 7, Figures 12, 13; Plate 11, Figures 19a, b; Table 5.
Cretaceous.

Lithostrobus hexagonalis Haeckel, 1887
Renz, in press.
This chapter: Plate 16, Figure 19; Tables 4, 6, 7.
Quaternary.

Lophophaena cylindrica (Cleve, 1900)
Renz, in press.
This chapter: Plate 18, Figure 6; Tables 2, 4, 6, 7.
Quaternary.

Lophophaena sp.
Description: Three-lobed cephalis; collar constriction slight; third segment never complete; pores medium sized, irregularly rounded, moderately close-set.
Dimensions: (6 specimens); length 87-105μ; maximum width 69-75μ; length cephalis 38μ; length third segment 27μ.
This chapter: Plate 12, Figure 9; Tables 1, 5.
Cretaceous.

Lophophaenoma sp. aff. L. witjazii Petrushevskaya, 1971b
Renz, in press.
This chapter: Plate 18; Figure 13; Tables 2, 4, 6, 7.
Quaternary.

Lophophaeniid sp. A
Description: Three-lobed cephalis with three-bladed apical spine; three rather short legs begin at the collar constriction and emerge at the bottom of the thorax, pylome constricted; pores on cephalis and thorax, large, irregular, and close-set.
Dimensions: (1 specimen) total length 108μ; width 78μ; apical spine 15μ; leg 25μ; pylome diameter 33μ.
This chapter: Plate 12, Figure 11; Table 5.
Cretaceous.

Lophophaeniid sp. B
Description: Cephalis divided into four chambers by septa; three short wings originate from collar stricture and extend through the thorax wall; external surface appears rough; pores small, irregular, widely spaced.
Dimensions: (1 specimen) total length 102μ; maximum width 72μ; length cephalis 33μ.
This chapter: Plate 12, Figure 10; Table 5.
Cretaceous.

Lophophaeniid sp. C.
Description: Large, simple cephalis with three to four short apical spines; collar stricture moderately strong; subsequent strictures weak; thorax subconical; abdomen and postabdominal segments cylindrical; pores small, very irregular, close-set, distributed over entire shell.
Dimensions: (1 specimen) length (5 segments) 141μ; width 72μ; cephalis length 45μ; thorax length 30μ; length of abdominal segment 21μ.
This chapter: Plate 12, Figure 12; Table 5.
Cretaceous.

Myelastrinae subfamily group
Renz, in press.
This chapter: Plate 15, Figure 6; Table 7.
Quaternary.

Nassellarian gen. and sp. indet.
Dimensions: (2 specimens) height $\overline{150}\mu$; width $\overline{86}\mu$; spine $\overline{45}\mu$.
This chapter: Plate 16, Figure 26; Table 7.
Quaternary.

Nephrospyris renilla Haeckel, 1887
Renz, in press.
This chapter: Plate 19, Figure 6; Tables 4, 6, 7.
Quaternary.

Ommatartus tetrathalamus (Haeckel, 1887)
Renz, in press.
This chapter: Plate 14, Figure 5; Tables 2, 4, 6, 7, 8; Sections 2b-d.
Quaternary.

Otosphaera polymorpha Haeckel, 1887
Nigrini, 1967, p. 23, pl. 1, fig. 8.
This chapter: Plate 13, Figure 15; Tables 4, 6, 7, 8.
Quaternary.

Patulibracchium petroleumensis Pessagno, 1971
Pessagno, 1971, p. 37, pl. 11, fig. 2-5.
Remarks: The presence of a cylindrical bracchiopyle in these specimens is vague; majority of specimens without patagium.
This chapter: Plate 9, Figure 2; Tables 3, 5; Section 3.
Cretaceous.

Peromelissa phalacra (Haeckel, 1887), emend. Petrushevskaya, 1971b
Petrushevskaya, 1971b, p. 131, pl. 72, fig. XIV-XVII.
This chapter: Plate 18, Figure 7; Tables 2, 4, 7.
Quaternary.

Polysolenia spp.
Nigrini, 1967, p. 13, pl. 1, fig. 1, 2, 3a, b.
Remarks: In this study, the species *P. spinosa, P. flammabunda,* and *P. lappacea* were recognized and treated as a group.
This chapter: Plate 13, Figure 4; Tables 2, 4, 6, 7, 8.
Quaternary.

Porodiscus delicatulus (Lipman, 1952)
Petrushevskaya and Kozlova, 1972, p. 525, pl. 5, fig. 9.
Dimensions: (2 specimens) diameter 174μ; number of spiral whorls 7, length of spines 24-39μ.
Remarks: The rings discussed by Petrushevskaya and Kozlova are joined in spiral whorls in all specimens observed.
This chapter: Plate 9, Figure 14; Tables 3, 5.
Cretaceous.

Porodiscus microporous (Stöhr, 1880)
Renz, in press.
This chapter: Plate 15, Figure 16; Tables 4, 6, 7,8.
Quaternary.

Porodiscus sp. aff. P. delicatulus (Lipman, 1952)
Petrushevskaya and Kozlova, 1972, p. 525, pl. 5, fig. 9.
Dimensions: (2 specimens) diameter $\overline{166}\mu$, number of spiral whorls 6, number of spines 7-8.
Remarks: These specimens differ from *P. delicatulus* in having thicker and generally fewer spiral whorls, and shorter spines.

This chapter: Plate 9, Figure 7; Table 5.
Cretaceous.

Pseudodictyophimus gracilipes (Bailey, 1856) tetracanthus (Popofsky, 1913)
Petrushevskaya, 1971b, p. 95, pl. 49, fig. I-VII.
This chapter: Plate 18, Figure 2; Tables 4, 7.
Quaternary.

Psilomelissa calvata Haeckel, 1887
Renz, in press.
This chapter: Plate 18, Figure 8; Tables 4, 6, 7.
Quaternary.

Pterocanium bicorne Haeckel, 1887
Haeckel, 1887, p. 1332, pl. 73, fig. 15.
This chapter: Plate 17, Figure 6; Tables 4, 7.
Quaternary.

Pterocanium orcinum Haeckel, 1887
Haeckel, 1887, p. 1329, pl. 73, fig. 2.
This chapter: Plate 17, Figure 9; Table 4.
Quaternary.

Pterocanium praetextum (Ehrenberg, 1872a)
Renz, in press.
Remarks: No distinction was made between square- and round-"shouldered" specimens.
This chapter: Plate 17, Figure 8; Tables 2, 4, 6, 7, 8; Sections 2b-d.
Quaternary.

Pterocanium trilobum (Haeckel, 1860)
Renz, in press.
This chapter: Plate 17, Figure 7; Tables 2, 4, 6, 7, 8; Sections 2b-d.
Quaternary.

?Pteropilium stratiotes Haeckel, 1887
Haeckel, 1887, p. 1326, pl. 70, fig. 9.
Remarks: Lattice work never complete between wings and apical horn.
This chapter: Plate 16, Figure 27; Tables 4, 6, 7.
Quaternary.

Pyloniidae family group
Renz, in press.
This chapter: Plate 13, Figures 12, 13; Tables 2, 4, 6, 7, 8; Sections 2b-d.
Quaternary.

Rhopalodictyum sp.
Description: Three-armed Spongodiscid without concentric rings; arms with flared tips and three short terminal spines.
Dimensions: (2 specimens) arm length 135-150μ; width at tip 99-117μ.
This chapter: Plate 3, Figures 10, 11; Plate 10, Figure 2; Tables 3, 5.
Cretaceous.

Rhopalastrum sp. 1
Description: Three-armed Spongodiscid; faint concentric rings noticeable in central area (approx. 4); arms thin, becoming bulbous only at tips; usually without patagium.
Dimensions: (3 specimens) diameter of central area $\overline{58}\mu$; arm length 141-207μ; arm width $\overline{30}\mu$; tip width $\overline{93}\mu$.
This chapter: Plate 15, Figure 2; Tables 2, 4, 6, 7, 8.
Quaternary.

Rhopalastrum sp. 2
Description: Three-armed spongodiscid; central area consisting of approximately five faint concentric rings; arms narrow but increasing in width to bulbous tips; patagium usually present, extending between tips but not enclosing them.
Dimensions: (3 specimens) diameter of central area $\overline{90}\mu$; arm length $\overline{167}\mu$; arm tip width $\overline{129}\mu$.
This chapter: Plate 15, Figure 3; Tables 2, 4, 6, 7, 8.
Quaternary.

Saturnalis circularis Haeckel, 1887
Nigrini, 1967, p. 25, pl. 1, fig. 9.
This chapter: Plate 14, Figure 3; Tables 2, 4, 6, 7.
Quaternary.

Sethoconus myxobrachia Strelkov and Reshetnyak, 1959
Renz, in press.
This chapter: Plate 16, Figure 5; Table 7.
Quaternary.

Sethophormis pentalactis Haeckel, 1887
Renz, in press.
This chapter: Plate 18, Figures 18a, b; Tables 4, 7.
Quaternary.

Sethophormis rotula Haeckel, 1887
Renz, in press.
This chapter: Plate 18, Figure 17; Table 7.
Quaternary.

Sethophormis sp. aff. S. pentalactis Haeckel, 1887
Haeckel, 1887, p. 1244, pl. 56, fig. 5.
Remarks: This species has the same structure and dimensions as *S. pentalactis* but differs in the pore structure. Here the pores become progressively larger reaching a maximum at the margin which consists of a row of robust terminal spines.
This chapter: Plate 18, Figure 22; Table 7.
Quaternary.

Sethophormis sp.
Remarks: Only broken specimens observed, no cephalis. Four major radii, 16 interradii.
This chapter: Plate 18, Figure 21; Tables 4, 6, 7.
Quaternary.

Siphocampe corbula (Harting, 1863)
Renz, in press.
This chapter: Plate 17, Figure 14; Tables 4, 6, 7, 8.
Quaternary.

Siphonosphaera polysiphonia Haeckel, 1887
Nigrini, 1967, p. 18, pl. 1, fig. 4a, b.
Remarks: Siphons irregularly curved in most specimens.
This chapter: Plate 13, Figure 9; Tables 2, 4, 6, 7, 8.
Quaternary.

Siphonosphaera sp. A
Riedel, 1971, p. 651, generic definition.
This chapter: Plate 13, Figure 10; Tables 4, 6, 7.
Quaternary.

Siphonosphaera sp. B
Riedel and Sanfilippo, 1971, pl. 1c, fig. 3, 4.
This chapter Plate 13, Figure 3; Tables 4, 7.
Quaternary.

Sphaerostylus lanceola (Parona, 1890)
Foreman, 1973, pl. 1, fig. 7, 11.
Stylaractus ovatus Hinde in Moore, 1973.
This chapter: Plate 2, Figures 13-16; Plate 9, Figure 19; Tables 3, 5; Section 3.
Cretaceous.

Spirocyrtis scalaris Haeckel, 1887
Renz, in press.
This chapter: Plate 17, Figure 16; Tables 4, 6, 7.
Quaternary.

Spirocyrtis sp. aff. S. scalaris Haeckel, 1887
Riedel and Sanfilippo, 1971, pl. 1G, fig. 19.
This chapter: Plate 17, Figure 15; Tables 2, 4, 6, 7.
Quaternary.

Spongaster tetras Ehrenberg, 1860
Nigrini, 1967, p. 41, pl. 5, fig. 1a, b.
This chapter: Plate 15, Figure 8; Tables 2, 4, 6, 7, 8; Sections 2b, c.
Quaternary.

Spongobrachium sp. aff. S. ellipticum Haeckel, 1862
Renz, in press.
This chapter: Plate 15, Figure 10; Tables 4, 7.
Quaternary.

Spongocore diplocylindrica Haeckel, 1887
Renz, in press.
This chapter: Plate 15, Figure 4; Tables 4, 6, 7.
Quaternary.

Spongocyclia lanigera n. sp.
Description: A finely spongy disc with a spiral center; margin without spines.
Dimensions: (3 specimens) diameter spiral 114μ; diameter disc 294μ.
Remarks: This species differs from *S. trachodes* in the fine nature of its spongy shell; it appears quite similar to the Spongodiscid figured by Petrushevskaya and Kozlova, 1972, p. 529, pl. 5, fig. 13. The species name is Latin meaning fleecy.

Type locality: 12°56.85'S, 117°53.56'E, DSDP Leg 27, Sample 261-15, CC.
This chapter: Plate 4, Figure 5; Plate 10, Figures 7a, b; Tables 3, 5; Sections 3, 4.

Cretaceous.

Spongocyclia trachodes n. sp.

Description: A roughly spongy disc with a large spiral central area; margin of disc with short spines.

Dimensions: (2 specimens) diameter of spiral 150μ; diameter disc 210μ.

Remarks: This species differs from *Spongocyclia cycloides* Haeckel, 1860 (type species) by its greater proportion of spongy material around the central spiral and from *S. lanigera* by the rough texture of this spongy material. The species name *trachodes* is Greek for "of a rough nature."

Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-15-1, 9-11 cm.

This chapter: Plate 4, Figures 1-4; Plate 10, Figure 13; Tables 3, 5; Section 3.

Cretaceous.

Spongodiscus sp. cf. S. americanus Kozlova, 1966

Sanfilippo and Riedel, 1973, p. 524, pl. 28, fig. 9.

Dimensions: (3 specimens) diameter 201-255μ; diameter central rings 42-60μ; width spongy girdle 30-60μ; spine 15-21μ.

Remarks: This smaller Cretaceous species is probably only superficially similar to *S. americanus* of Cenozoic deposits.

This chapter: Plate 3, Figure 12; Plate 10, Figure 6; Table 5.

Cretaceous.

Spongodiscus sp. 1

Dimensions: (2 specimens) diameter disc 156-165μ; spine 36μ; number spines 12-15.

This chapter: Plate 10, Figure 17; Table 5.

Cretaceous.

Spongodiscus sp. 2

This chapter: Plate 10, Figure 22; Table 5.

Cretaceous.

Spongodiscus sp. 3

Dimensions: (3 specimens) diameter 255-291μ.

This chapter: Plate 15, Figure 11; Tables 4, 6, 7.

Quaternary.

Spongodiscid 1 gen. and sp. indet.

Description: Four-armed spongodiscid; arms stubby, tipped with stout three-bladed spines.

Dimensions: (3 specimens) shell diameter 180-231μ; spine 60210μ.

This chapter: Plate 3, Figure 9; Plate 10, Figure 4; Tables 3, 5.

Cretaceous.

Spongodiscid 2 gen. and sp. indet.

Description: Large spongy sphere with 17 or more spines projecting from the center into several planes.

Dimensions: (2 specimens) diameter total 330μ; diameter first medullary shell 12μ; second medullary shell 30μ.

This chapter: Plate 10, Figure 23; Table 5.

Cretaceous.

Spongodiscid 3 gen. and sp. indet.

Description: Finely spongy sphere with double medullary shells in the center and 30 or more projecting spines.

Dimensions: (2 specimens) diameter total 330μ; diameter first medullary shell 12μ; second medullary shell 30μ.

This chapter: Plate 10, Figure 23; Table 5.

Cretaceous.

Spongolena sp.

Renz, in press.

This chapter: Plate 15, Figure 5; Tables 2, 4, 6, 7, 8.

Quaternary.

Spongoliva ellipsoides Popofsky, 1912

Renz, in press.

Remarks: Note the similarity between the medullary shell of *S. ellipsoides* and *O. tetrathalamus.*

This chapter: Plate 14, Figure 6; Table 7.

Quaternary.

?Spongolonche grandis Campbell and Clark, 1944b

Campbell and Clark, 1944b, p. 7, pl. 4, fig. 7.

Remarks: This matches the species of Campbell and Clark in all features except it lacks the hooklets at the base of the spines.

This chapter: Plate 10, Figure 12; Tables 3, 5.

Cretaceous.

?Spongolonche sp. aff. S. grandis Campbell and Clark, 1944b

Campbell and Clark, 1944b, p. 7, pl. 4, fig. 7.

Remarks: This species differs from *S. grandis* by possessing terminal spines only half as long.

This chapter: Plate 10, Figure 11; Tables 3, 5.

Cretaceous.

Spongoprunum sp. aff. Cyphantus probus Rüst, 1888

Petrushevskaya and Kozlova, 1972, p. 529, pl. 4, fig. 6.

Remarks: No specimens with the elongated spongy central shell were observed.

This chapter: Plate 2, Figures 19-22; Plate 10, Figure 19; Tables 3, 5.

Cretaceous.

Spongoprunum diversispina Squinabol, 1904

Squinabol, 1904, p. 199, pl. 4, fig. 2.

Description: Spongodiscid with an egg-shaped spongy shell from which protrude two stout three-bladed spines at opposite poles, generally unequal in length.

Dimensions: (2 specimens) long axis of spongy shell 139μ; short axis 110μ; length of spines 75μ, 120μ.

Remarks: This species is similar to *Spongoprunum* sp. aff. *Cyphantus probus* Rüst but larger with a denser spongy shell.

This chapter: Plate 10, Figure 18; Tables 3, 5.

Cretaceous.

Spongopyle ecleptos n. sp.

Description: A fine spongy, rather small, disc with a flared pylome, no internal stricture, short spines surround the margin of the disc with larger spines around the pylome.

Dimensions: (6 specimens) total length (diameter including pylome) 147-165μ; width (diameter of disc) 90-108μ.

Remarks: This species differs from *S. insolita* by possessing short spines around the margin of the disc and by lacking any internal structure. The specific name is Greek for "very fine."

Type locality: 12°56.83'S, 117°53.56'E, DSDP Leg 27, Sample 261-12-2, top.

This chapter: Plate 3, Figures 2-6; Plate 10, Figure 14; Tables 3, 5.

Cretaceous.

Spongopyle galeata n. sp.

Description: A large dense spongy disc with flared pylome; no internal structure; margin of the disc and pylome often with robust spines.

Dimensions: (5 specimens) length (diameter including pylome) 150-195μ; width (diameter of disc) 117-184μ; spines 95-150μ.

Remarks: *S. galeata* is most similar to *S. ecleptos,* but differs from it by possessing a larger dense spongy shell and many times, long stout spines. The specific name *galeata* is Latin for "helmeted."

Type locality: 12°56.83'S, 117°53.56'E; DSDP Leg 27, Sample 261-12-2, top.

This chapter: Plate 10, Figure 8; Table 5.

Cretaceous.

Spongopyle insolita Kozlova, 1966

Riedel and Sanfilippo, 1970, pl. 2, fig. 2.

Petrushevskaya and Kozlova, 1972, pl. 5, fig. 10.

Description: Helmet-shaped spongodiscid with concentric rings or spiral whorls in the "upper" part and a spongy flared pylome in the lower part; generally without spines.

Dimensions: (3 specimens) length 153-186μ; width maximum 102-123μ; diameter of rings or whorls 57-72μ.

Remarks: Specimens generally contain only one flared pylome, but a few individuals have been observed with two, three, and four flares.

This chapter: Plate 3, Figures 7, 8; Plate 10, Figure 10; Table 5.

Cretaceous.

Spongopyle stauromorphos n. sp.

Description: Large spongy disc with a central area of narrow (up to 7) concentric rings from which radiate five stout spines often penetrating the margin; smaller secondary spines are also found on the margin and on the flared pylome.

Dimensions: (4 specimens) total length (diameter with pylome) 210-246μ; width (diameter disc) 158-166μ; primary spines from margin 28-60μ.

Remarks: This species differs from *S. insolita* by having a larger shell with stout spines and many narrow concentric rings. The specific name is Greek for "cross-shaped."

Type locality: 12°56.83'S, 117°53.56'E: DSDP Leg 27, Sample 261-9, CC.

This chapter: Plate 3, Figures 1a, b; Plate 10, Figure 9; Tables 3, 5.

Cretaceous.

Spongopyle trabeata n. sp.

Description: A fine spongy disc with slightly noticeable concentric rings in the central area from which radiate a small number of thin spines; these sometimes penetrate the margin; the most outstanding feature is a large elongated pylome.

Dimensions: (4 specimens) total length (diameter including pylome) 211-243μ; width (diameter disc) 120-132μ.

Remarks: This species differs from other *Spongopyle* species by possessing a vague internal structure with central radiating spines and an extremely long pylome. The specific name *trabeata* is Latin for "robed."

Type locality: 12°56.83'S, 117°53.56'E; DSDP Leg 27, Sample 261-12-2, top.

This chapter: Plate 10, Figure 15; Table 5.

Cretaceous.

Spongosaturnalis sp. aff. Saturnalis lateralis group Campbell and Clark, 1944b

Campbell and Clark, 1944b, p. 6, pl. 1, figs. 7, 10, 11, 13, 15.

Description: Elliptical outer ring with five to seven spines on each half ring; terminal spines strong; shell small, spongy; attached to outer ring by two spines.

Dimensions: (4 specimens) internal ring long axis 225μ, short axis 87μ; ring thickness 12μ; length terminal spines 51-72μ; spongy shell diameter 30μ.

Remarks: Members of this group have similar proportions and spongy shells, but differ in the geometry of the terminal spines. One type is a long simple spine centered between two lesser spines; one tends to be bow-shaped with a simple spine, and one has a solitary fish-hook spine. These characteristics may be species specific, but in the material from Site 261 specimens were so rare that they are treated here as a species group.

This chapter: Plate 2, Figures 1-4; Plate 9, Figure 15; Tables 3, 5.

Cretaceous.

Spongosaturnalis sp. aff. Saturnalis polymorphus Squinabol, 1914

Squinabol, 1914, p. 293, pl. 3, fig. 11, 12; pl. 5, fig. 2-7.

Description: Large, thick outer ring more circular than elliptical; shell small, spongy, attached to outer ring by two strong spines; generally five long spines on each half ring; no terminal spines.

Dimensions: (3 specimens) internal ring diameter 192-201μ; ring thickness 24-39μ; spine length 135μ; spongy shell diameter approximately 30μ.

Remarks: This species is placed in the genus *Spongosaturnalis* because its shell is spongy rather than porous as in *Saturnalis*.

This chapter: Plate 2, Figure 5; Plate 9, Figure 22; Table 5.

Cretaceous.

Spongosphaera streptacantha Haeckel, 1862

Renz, in press.

This chapter: Plate 14, Figure 16; Tables 4, 6, 7.

Quaternary.

Spongotripus sp. cf. Tripodictya triacummata Lipman, 1952

Lipman, 1952, p. 33, pl. 2, fig. 2.

Petrushevskaya and Kozlova, 1972, p. 528, pl. 21, fig. 2.

Dimensions: (2 specimens) diameter 138μ, spine 165μ.

This chapter: Plate 10, Figure 3; Tables 3, 5.

Cretaceous.

Spongotrochus multispinus Haeckel, 1887

Renz, in press.

This chapter: Plate 15, Figure 9; Tables 4, 6, 7, 8.

Quaternary.

?Spongotrochus polygonatus Campbell and Clark, 1944b

Petrushevskaya and Kozlova, 1972, p. 528, pl. 4, fig. 9, 10.

Dimensions: (2 specimens) diameter 150μ; spine 66μ; number of spines 8.

Remarks: Campbell and Clark described a species with only six radial spines, while this species has eight and that of Petrushevskaya and Kozlova probably has more than six.

This chapter: Plate 10, Figure 5; Table 5.

Cretaceous.

?Squinabolella putahensis Pessagno, 1969

Pessagno, 1969, p. 418, pl. 33, fig. 9.

Dimensions: (2 specimens) diameter cephalis 42μ; diameter thorax with skirt 135μ.

Remarks: Some cephalic structure was present but generally specimens were very poorly preserved; specific identification based on characteristics of the thoracic skirt.

This chapter: Plate 11, Figure 14; Table 5.

Cretaceous.

Staurostylus italicus Rüst, 1898

Rüst, 1898, pl. 2, fig. 5.

Description: Rather small sphere with four stout three-bladed spines. Pores irregularly hexagonal, close-set.

Dimensions; (2 specimens) diameter sphere 96μ; spine length 196μ; pore diameter 6μ.

Remarks: All specimens had broken spines.

This chapter: Plate 9, Figure 18; Tables 3, 5.

Cretaceous.

Stichocampe bironec Renz, in press

Renz, in press.

This chapter: Plate 17, Figure 3; Table 7.

Quaternary.

?Stichocapsa procera Hinde, 1908

Hinde, 1908, p. 740, pl. 10, fig. 2.

Description: Cephalis hemispherical often with two short apical horns; segments rounded to oval becoming progressively larger (6-9); constrictions almost total, tending to separate lower segments, no pore structure is detectable; pore wall finely spongy, thick, and smooth showing no signs of segmentation.

Dimensions: (4 specimens) total height 183-255μ; maximum width 123-165μ.

Remarks: This species differs from that described by Hinde in being somewhat smaller and lacking a definite pore structure. The specimens found in Leg 27 material may be later descendants of *S. procera* which was discovered in Jurassic rocks on Rotti.

This chapter: Plate 7, Figures 8-11; Plate 11, Figure 25; Table 5; Section 3.

Cretaceous.

Stichocapsa pseudodecora Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 72, pl. 16, fig. 137.

This chapter: Plate 11, Figure 29; Table 5.

Cretaceous.

?Stichocapsa rutteni Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 71, pl. 15, fig. 133.

Dimensions: (2 specimens) height without apical spine 138-147μ; length thorax 21μ; length of bulbous segment 98μ; apical spine 15μ.

Remarks: This species is quite similar to the concept of Tan Sin Hok, but differs by possessing one smaller abdominal segment rather than two.

This chapter: Plate 11, Figure 5, Tables 1, 3, 5.

Cretaceous.

Stichocapsa wichmanni Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 71, pl. 15, fig. 132.

Dimensions: (2 specimens) total length 186μ; maximum width 138μ.

This chapter: Plate 11, Figure 20; Table 5.

Cretaceous.

?Stichocapsa sp. aff. S. rutteni Tan Sin Hok, 1927

Tan Sin Hok, 1927, p. 71, pl. 15, fig. 133.

Remarks: This rare species is identical with ?*S. rutteni* except for an additional bulbous segment measuring 50-60μ long. These may well be one species.

This chapter: Plate 11, Figure 6; Tables 3, 5.

Cretaceous.

Stichomitra asymbatos Foreman, 1968

Foreman, 1968, p. 73, pl. 8, fig. 10a-c.

Dimensions: (2 specimens) total height 174-270μ; maximum width 111-153μ; apical spine 24μ; number of segments 3-6.

Remarks: A tapering terminal segment was not observed.

This chapter: Plate 11, Figure 21; Tables 1, 3, 5; Section 3.

Cretaceous.

?Stichomitra campi (Campbell and Clark, 1944b), emend. Foreman, 1968

Foreman, 1968, p. 75, pl. 8, fig. 3a-c.

Dimensions: (2 specimens) total height 108μ; maximum width 72μ; number of segments 4-5.

This chapter: Plate 11, Figure 16; Tables 3, 5.

Cretaceous.

Stichomitra cathara Foreman, 1968

Foreman, 1968, p. 73, pl. 8, fig. 9.

Dimensions: (2 specimens) total height 135μ; maximum width 78μ; number of segments 4.

Remarks: No complete specimens were observed.
This chapter: Plate 11, Figure 17; Table 5.
Cretaceous.

Stichopilium bicorne Haeckel, 1887
Renz, in press.
This chapter: Plate 16, Figure 24; Tables 4, 6, 7.
Quaternary.

Stylatractus universus Hays, 1970
Dinkleman, 1973, p. 765, pl. 10, fig. 6, 7.
This chapter: Plate 14, Figure 8; Tables 2, 4, 6, 7, 8.
Quaternary.

Stylochlamydium sp. aff. S. venustum (Bailey, 1856)
Renz, in press.
Remarks: Shell larger and thicker with more rings than pictured by Renz.
This chapter: Plate 15, Figure 17; Tables 4, 6, 7.
Quaternary.

Stylodictya sp. aff. S. multispina Haeckel, 1862
Renz, in press
Remarks: This species differs from that pictured in Renz in that the spines seldom extend beyond the rim of the shell and the outermost - oncentric ring appears incomplete as concave arcs.
This chapter: Plate 15, Figure 12; Tables 2, 4, 6, 7, 8; Section 2c.
Quaternary.

Stylosphaera pusilla Campbell and Clark, 1944b
Campbell and Clark, 1944b, p. 5, pl. 1, fig. 2, 4, 5.
Dimensions: (3 specimens) diameter cortical shell $\overline{77}\mu$; spine 69-135μ.
Remarks: In many specimens the terminal spines may appear rounded rather than three-bladed.
This chapter: Plate 2, Figures 17, 18; Plate 9, Figure 20; Table 5; Section 3.
Cretaceous.

Styptosphaera spongiacea Haeckel, 1887
Renz, in press.
This chapter: Plate 15, Figure 13; Tables 4, 6, 7.
Quaternary.

Stylosphaera sp.
Dimensions: (2 specimens) diameter medullary shell 24-39μ; diameter cortical shell 63-75μ; spine 84-96μ.
This chapter: Plate 14, Figure 7; Tables 2, 4, 6, 7.
Quaternary.

?Stylotrochus antiquus Campbell and Clark, 1944b
Campbell and Clark, 1944b, p. 19, pl. 4, fig. 8, 12.
Dimensions: (4 specimens) diameter 171-320μ; spines 51-74μ.
Remarks: Specimens are generally larger in diameter with longer spines than described by Campbell and Clark.
This chapter: Plate 10, Figure 21; Tables 3, 5.
Cretaceous.

Stylotrochus sp.
Campbell and Clark, 1944b, p. 20, pl. 5, fig. 6.
Description: Lenticular, rather small, spongy shell with six stout three-bladed spines (twisting slightly) protruding at strange angles.
Dimensions: (2 specimens) total height $\overline{108}\mu$; maximum width $\overline{72}\mu$; number of segments 4-5.
This chapter: Plate 10, Figure 1; Table 5.
Cretaceous.

Tessarastrum straussii Haeckel, 1887
Renz, in press.
Remarks: Cross arms rudimentary or completely lacking.
This chapter: Plate 15, Figure 15; Tables 4, 6.
Quaternary.

Tetracorethra tetracorethra (Haeckel, 1887), emend. Petrushevskaya, 1971b
Renz, in press.
Remarks: Apical spine always broken.
This chapter: Plate 19, Figure 18; Table 7.
Quaternary.

Theocalyptra sp.
Renz, in press.
This chapter: Plate 16, Figure 21; Tables 2, 4, 6, 7.
Quaternary.

?Theocapsa elata Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 47, pl. 8, fig. 52.
Dimensions: (3 specimens) total height 177-186μ; maximum width 135-150μ; wall thickness 15μ; thorax length 38μ.
Remarks: This species differs from Tan Sin Hok's description in lacking an apical horn and being generally broader.
This chapter: Plate 6, Figure 20; Plate 11, Figure 8; Tables 1, 5.
Cretaceous.

Theoconus hertwigii (Haeckel, 1887)
Renz, in press.
Remarks: All specimens had ribs.
This chapter: Plate 19, Figure 16; Tables 4, 6, 7.
Quaternary.

Theoconus junonis Haeckel, 1887
Renz, in press.
This chapter: Plate 19, Figure 27; Tables 2, 4, 6, 7, 8.
Quaternary.

Theocorys veneris Haeckel, 1887
Renz, in press.
Remarks: Wings may or may not be present.
This chapter: Plate 16, Figure 18; Tables 4, 6, 7.
Quaternary.

Theocorys sp. aff. T. antiqua Squinabol, 1903
Squinabol, 1903, p. 135, pl. 8, fig. 25.
Dimensions: (5 specimens) height 123-159μ; maximum width 78-108μ.
Remarks: This species, though very similar to the description by Squinabol, differs from it in being wider and longer with pores more closely set.
This chapter: Plate 6, Figures 4-7; Plate 11, Figure 4; Tables 1, 3, 5.
Cretaceous.

Theocorythium trachelium (Ehrenberg, 1872a)
Renz, in press.
This chapter: Plate 19, Figure 28; Tables 2, 4, 6, 7, 8.
Quaternary.

Theophormis callipilium Haeckel, 1887
Haeckel, 1887, p. 1367, pl. 70, fig. 1.
Remarks: Four major radii; 8-12 interradii; none penetrate outer "skirt."
This chapter: Plate 18, Figure 24; Tables 4, 7.
Quaternary.

Theopilium pyramidale Popofsky, 1913
Renz, in press.
This chapter: Plate 16, Figure 17; Tables 4, 6, 7.
Quaternary.

Tholodiscus fresnoensis (Foreman, 1968)
Petrushevskaya and Kozlova, 1972, p. 525, pl. 5, fig. 1.
This chapter: Plate 9, Figure 9; Table 5.
Quaternary.

Tholospyris scaphipes (Haeckel, 1887)
Goll, 1969, p. 328, pl. 58, fig. 1-8, 13, 14.
Dimensions: (3 specimens) height 60μ; width 71μ; feet 48μ.
This chapter: Plate 19, Figure 13; Tables 4, 6, 7.
Quaternary.

Tholospyris tripodiscus Haeckel, 1887
Renz, in press.
This chapter: Plate 19, Figure 29; Tables 4, 6, 7.
Quaternary.

Tholospyris sp.
Renz, in press.
This chapter: Plate 19, Figure 12; Tables 2, 4, 6, 7.
Quaternary.

?Tricolocapsa parvipora Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 48, pl. 9, fig. 59, 60.
1968? *Solenotryma* sp. cf. *S. dacryodes* Foreman, p. 33, pl. 4, fig. 7.
Description: Cephalis subspherical without apical horn; lumbar stricture moderate; position highly variable; later abdominal segments appear to be appendages rather than a fundamental part of the skeleton; pores, small, sparse, irregular.
Dimensions: (4 specimens) total height 96μ (3 segments)—198μ (7 segments); maximum width 75-87μ.
Remarks: Specimens with numerous postabdominal segments are rare. More common are simple three-segmented specimens which have not developed the appendage of segments, as pictured in Tan Sin Hok. In this study, these are treated as one species. *T. parvipora* is similar to *Solenotryma dacryodes* of Foreman in many features, but has consistently lacked a terminal tube.
This chapter: Plate 6, Figures 8-12; Plate 11, Figure 3; Tables 1, 3, 5.
Cretaceous.

?Tripocalpis ellyae Tan Sin Hok, 1927
Tan Sin Hok, 1927, p. 38, pl. 7, fig. 18.

Dimensions: (2 specimens) length without apical horn 165μ; maximum width 102μ; apical horn 66μ; length of feet 75μ.

Remarks: This species differs from that described by Tan Sin Hok, 1927, in having an almost spongy porous network enveloping the cephalis. It also differs from *D. gracilis* in the same manner as well as possessing a distinctively different apical horn which is more spear shaped than crown shaped.

This chapter: Plate 5, Figures 18, 19; Plate 11, Figure 10; Table 5.

Cretaceous.

?Tripodictya elegantissima Vinassa, 1899

Vinassa, 1899, p. 231, pl. 2, fig. 3.

Dimensions: (3 specimens) diameter disc 108μ; spines 165μ.

Remarks: This species is similar to the description of Vinassa, but differs from it by possessing three very long three-bladed spines.

This chapter: Plate 1, Figures 13-15; Plate 9, Figure 5; Table 5.

Cretaceous.

Tympanidium foliosum Haeckel, 1887

Renz, in press.

This chapter: Plate 19, Figure 5; Tables 4, 6, 7.

Quaternary.

Udan undulata Renz, in press.

Renz, in press.

This chapter: Plate 16, Figure 14; Table 4.

Quaternary.

Verticillata hexacantha Popofsky, 1913

Renz, in press.

This chapter: Plate 18, Figure 1; Tables 4, 6, 7.

Quaternary.

Xiphodictya sp. cf. X ovalis Rüst, 1898

Rüst, 1898, p. 23, pl. 7, fig. 6.

Remarks: This species is only superficially similar to the description of Rüst having a central shell with concentric rings and two strong opposing spines and being of like proportions and size.

This chapter: Plate 9, Figure 13; Table 5.

Cretaceous.

Xiphosphaera tesseractis Dreyer, 1913

Renz, in press.

Remarks: Spines always broken.

This chapter: Plate 14, Figure 15; Tables 4, 7.

Quaternary.

Xiphosphaera umbilicata Rüst, 1898

1927 *Xiphosphaera tuberosa* Tan Sin Hok

in press *Acaeniotyle umbilicata* (Rüst) in Foreman

Rüst, 1898, p. 7, pl. 1, fig. 9.

Dimensions: (4 specimens) diameter 120-138μ; spine length 96-135μ; pore wall 12-15μ.

Remarks: As with Foreman, the internal structure is vague. The polar spines are not as long as Rüst described and never curved. No large-shelled specimens were observed.

This chapter: Plate 2, Figures 9-12; Plate 9, Figure 21; Tables 1, 3, 5.

Cretaceous.

Zygocircus capulosus Popofsky, 1913

Petrushevskaya, 1971b, p. 281, pl. 28, figs. VII, VIII.

This chapter: Plate 19, Figure 20; Tables 2, 4, 6, 7.

Quaternary.

Zygocircus sp. 1 aff. Z. capulosus Popofsky, 1913

Popofsky, 1913, p. 287, pl. 28, fig. 3.

This chapter: Plate 19, Figure 15; Table 7.

Quaternary.

Zygocircus sp. 2 aff. Z. capulosus Popofsky, 1913

Renz, in press.

This chapter: Plate 19, Figure 23; Tables 4, 6, 7.

Quaternary.

Zygocircus sp. cf. Z. piscicaudatus Popofsky, 1913

Popofsky, 1913, p. 287, pl. 28, fig. 3.

This chapter: Plate 19, Figure 24; Tables 2, 4, 7, 8.

Quaternary.

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7. PLATES

The plates are of two types. First is a synchronopticon of Site 261, Cores 9-23 (Plates 1-8). Here each plate is divided horizontally into thirds, the top representing the *Bathropyramis timorensis* Assemblage; the middle, the *Eucyrtis columbarius* Assemblage; and the bottom, the *Spongocyclia lanigera* Assemblage. The location of the photo in each third, i.e., top, middle, or bottom, designates the core in which that specimen was found.

The key to these locations is as follows:

top third:	Core 9
middle third:	top—Core 10 middle—Core 12 bottom—Core 13
bottom third:	top—Core 15 middle—Core 16 bottom—Core 23

In those instances when it has not been possible to find a suitable specimen in a sample where its presence has been noted, a "+" has been entered at the appropriate level.

The next group of plates (9-19) is a systematic listing of the species discussed. Cretaceous and Quaternary species are grouped separately. All sample intervals are in centimeters.

a. Synchronopticon
(Plates 1-8)

PLATE 1
(Magnification ×150, unless otherwise indicated)

Figures 1-6 *Amphibrachium* (?) *hastatum* n. sp.
1. 261-9, CC.
2. 261-10-1, 10-12.
3. 261-12, CC.
4. 261-13, CC.
5. 261-15-1, 9-11.
6. 261-23, CC.

Figures 7, 8 Hagiastrid 1 gen. and sp. indet.
7. 261-15-1, 9-11.
8. 261-16-1, 101-103.

Figures 9, 10 Hagiastrid 2 gen. and sp. indet.
9. 261-12, CC.
10. 261-16-1, 101-103.

Figures 11, 12 *Crucella espartoensis* Pessagno.
11. 261-12-2, 11-12, ×50.
12. 261-16-1, 101-103.

Figures 13-15 ?*Tripodictya elegantissima* Vinassa.
13. 261-12-2, 11-12.
14. 261-13, CC.
15. 261-16-1, 101-103.

PLATE 1

Bathropyramis timorensis assemblage


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Eucyrtis columbarius assemblage


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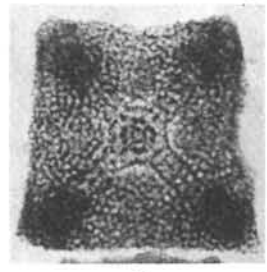
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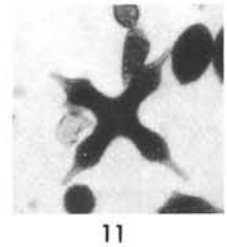
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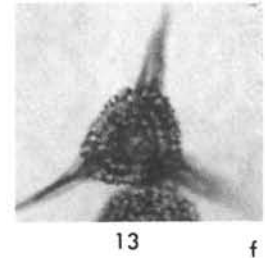
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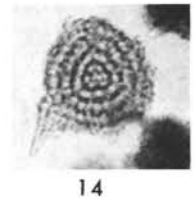
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Spongocyclia lanigera assemblage


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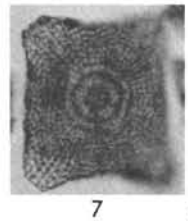
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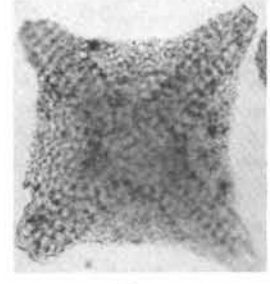
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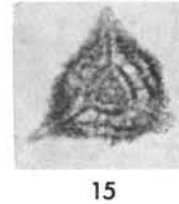
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PLATE 2
(Magnification ×150, unless otherwise indicated)

Figures 1-4 *Spongosaturnalis lateralis* (Campbell and Clark).
1. 261-9-4, 50-52.
2. 261-12, CC, ×135.
3. 261-15-1, 9-11.
4. 261-23, CC.

Figure 5 *Spongosaturnalis polymorphus* (Squinabol); 261-12, CC, ×50.

Figures 6-8 ?*Conosphaera tuberosa* Tan Sin Hok.
6. 261-9-4, 50-52.
7. 261-12, CC, ×135.
8. 261-15-1, 9-11, ×135.

Figures 9-12 *Xiphosphaera umbilicata* Rüst.
9. 261-9, CC.
10. 261-12-2, top.
11. 261-13, CC.
12. 261-16-1, 101-103.

Figures 13-16 *Sphaerostylus lanceola* (Parona).
(?)13. 261-9-4, 110-112.
14. 261-10-1, 10-12.
15. 261-16-1, 101-103.
16. 261-23, CC.

Figures 17, 18 *Stylosphaera pusilla* Campbell and Clark.
17. 261-12-2, top, ×135.
18. 261-16-1, 101-103.

Figures 19-22 *Spongoprunum* sp. aff. *Cyphantus probus* Rüst.
19. 261-9, CC.
20. 261-10-1, 10-12.
21. 261-13, CC.
22. 261-23, CC.

PLATE 2

Bathropyramis timorensis assemblage


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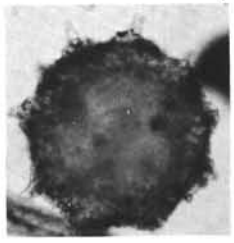
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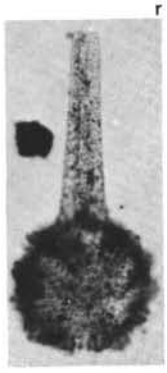
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Eucyrtis columbarius assemblage


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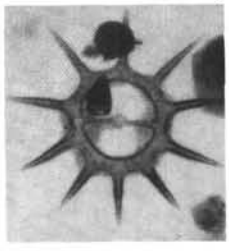
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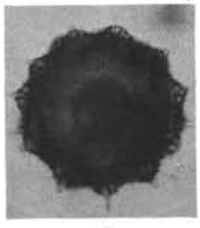
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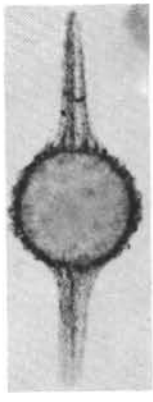
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Spongocyclia lanigera assemblage


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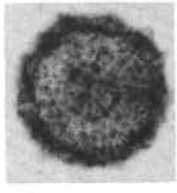
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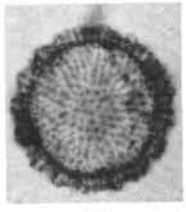
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PLATE 3
(Magnification ×150)

Figures 1a, 1b — *Spongopyle stauromorphos* n. sp. (a) 261-9, CC: (b) 261-12-2, top.

Figures 2-6 — *Spongopyle ecleptos* n. sp.
2. 261-12, CC.
3. 261-13, CC.
4. 261-15-1, 9-11.
5. 261-16-1, 101-103.
6. 261-23, CC.

Figures 7, 8 — *Spongopyle insolita* Kozlova.
7. 261-15-1, 9-11.
8. 261-23, CC.

Figure 9 — Spongodiscid 1 gen. and sp. indet.; 261-12, CC.

Figures 10, 11 — *Rhopalodictyum* sp.
10. 261-12, CC.
11. 261-15-1, 9-11.

Figure 12 — *Spongodiscus* sp. cf. *S. americanus* Kozlova; 261-12-2, 11-12.

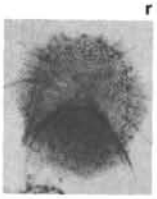
PLATE 3

Bathropyramis timorensis assemblage

1a

Eucyrtis columbarius assemblage

1b



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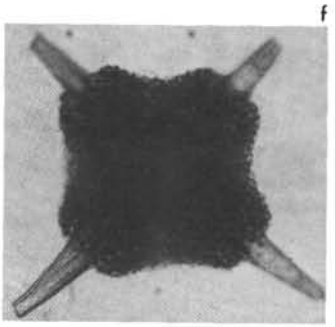

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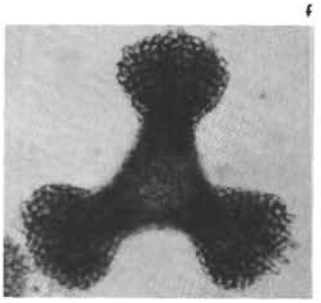

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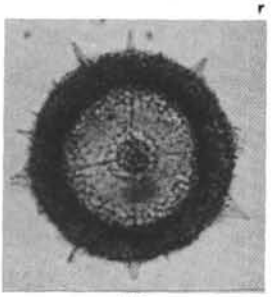

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Spongocyclia lanigera assemblage

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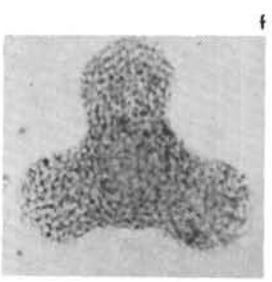

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PLATE 4
(Magnification ×150, unless otherwise indicated)

Figures 1-4 *Spongocyclia trachodes* n. sp.
1. 261-12, CC.
2. 261-13, CC.
3. 261-15-1, 9-11.
4. 261-23, CC.

Figure 5 *Spongocyclia lanigera* n. sp.; 261-15, CC.

Figures 6, 7 *Lithocyclia*? sp. A.
6. 261-15, CC.
7. 261-16-1, 101-103.

Figures 8, 9 *Bathropyramis timorensis* n. sp.
8. 261-9-4, 110-112.
9. 261-9, CC.

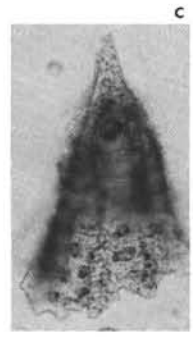
Figures 10-14 *Cornutella* spp.
10. *Cornutella californica* var. A Campbell and Clark; 261-12-2, 11-12.
11. *Cornutella californica* var. B Campbell and Clark; 261-12, CC, ×135.
12. *Cornutella* sp.; 261-16-1, 101-103.
13. *Cornutella* sp.; 261-16-1, 101-103.
14. *Cornutella* sp.; 261-23, CC, ×260.

Figures 15, 16 ?*Cyrtocalpis operosa* Tan Sin Hok.
15. 261-13, CC.
16. 261-16-1, 101-103.

PLATE 4

Bathropyramis timorensis assemblage

8



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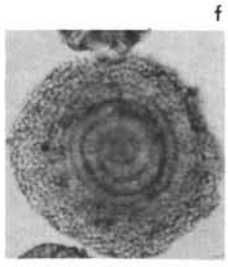
Eucyrtis columbarius assemblage



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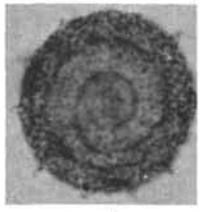

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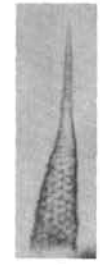
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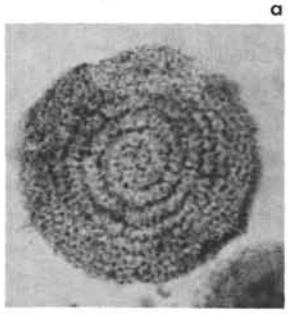
Spongocyclia lanigera assemblage



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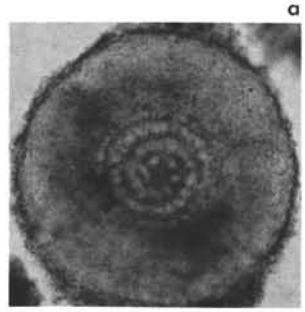

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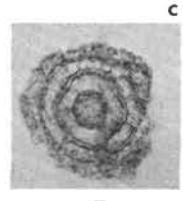

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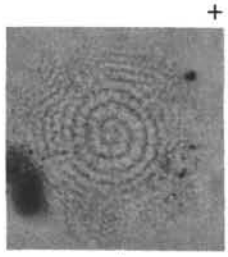

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PLATE 5
(Magnification ×150, unless otherwise indicated)

Figures 1-3 *Amphipyndax* (?) *epiplatys* n. sp.
1. 261-9, CC.
2. 261-12, CC.
3. 261-16-1, 101-103.

Figures 4-6 *Amphipyndax* (?) *pyrgodes* n. sp.
4. 261-9, CC.
5. 261-12, CC.
6. 261-13, CC.

Figures 7-9 *Amphipyndax mediocris* (Tan Sin Hok)
7. 261-12, CC.
8. 261-15-1, 9-11, ×170.
9. 261-23, CC.

Figures 10-13 *Hemicryptocapsa pseudopilula* Tan Sin Hok
10. 261-9, CC.
11. 261-12-2, top:
12. 261-13, CC.
13. 261-23, CC.

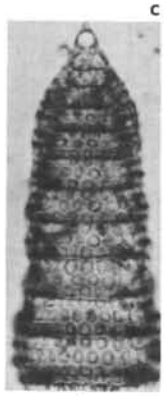
Figures 14-16 *Dictyophimus gracilis* Tan Sin Hok
14. 261-12-2, top, ×135.
15. 261-16-1, 101-103.
16. 261-23, CC.

Figure 17 *Dictyophimus obliquum* (Hinde); 261-12-2, 11-12, ×135.

Figures 18, 19 ?*Tripocalpis ellyae* Tan Sin Hok
18. 261-12, CC.
19. 261-23, CC.

PLATE 5

Bathropyramis timorensis assemblage



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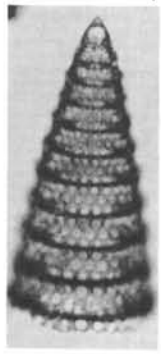

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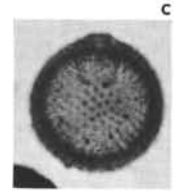

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Eucyrtis columbarius assemblage

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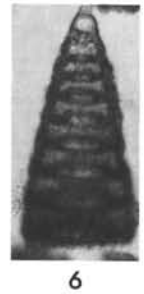

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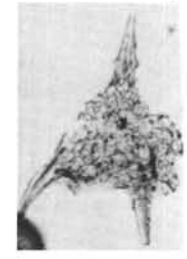

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Spongocyclia lanigera assemblage

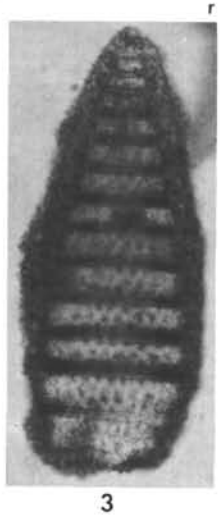

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PLATE 6
(Magnification ×150, unless otherwise indicated)

Figures 1-3 ?*Cyrtocapsa grutterinki* var. α Tan Sin Hok.
1. 261-9-4, 50-52.
2. 261-12, CC, ×135.
3. 261-23, CC.

Figures 4-7 *Theocorys* sp. aff. *T. antiqua* Squinabol.
4. 261-9-4, 110-112.
5. 261-12, CC.
6. 261-13, CC:
7. 261-16-1, 101-103.

Figures 8-12 ?*Tricolocapsa parvipora* Tan Sin Hok.
8. 261-9-3, 90-92.
9. 261-9, CC.
10. 261-10-1, 10-12.
11. 261-12-2, top, ×135.
12. 261-16-1, 101-103.

Figures 13-18 *Dicolocapsa verbeeki* Tan Sin Hok.
13. 261-9-3, 90-92.
14. 261-9-4, 110-112.
15. 261-10-1, 10-12.
16. 261-12-2, 11-12, ×135.
17. 261-13, CC.
18. 261-23, CC.

Figure 19 *Dicolocapsa* sp.; 261-9, CC.

Figure 20 ?*Theocapsa elata* Tan Sin Hok; 261-9, CC.

Figures 21-23 *Artocapsa bicornis* Tan Sin Hok.
21. 261-9, CC.
22. 261-15-1, 9-11.
23. 261-23, CC.

Figure 24 ?*Artocapsa ultima* Tan Sin Hok; 261-9-4, 110-112.

PLATE 6

Bathropyramis timorensis assemblage

Eucyrtis columbarius assemblage

Spongocyclia lanigera assemblage

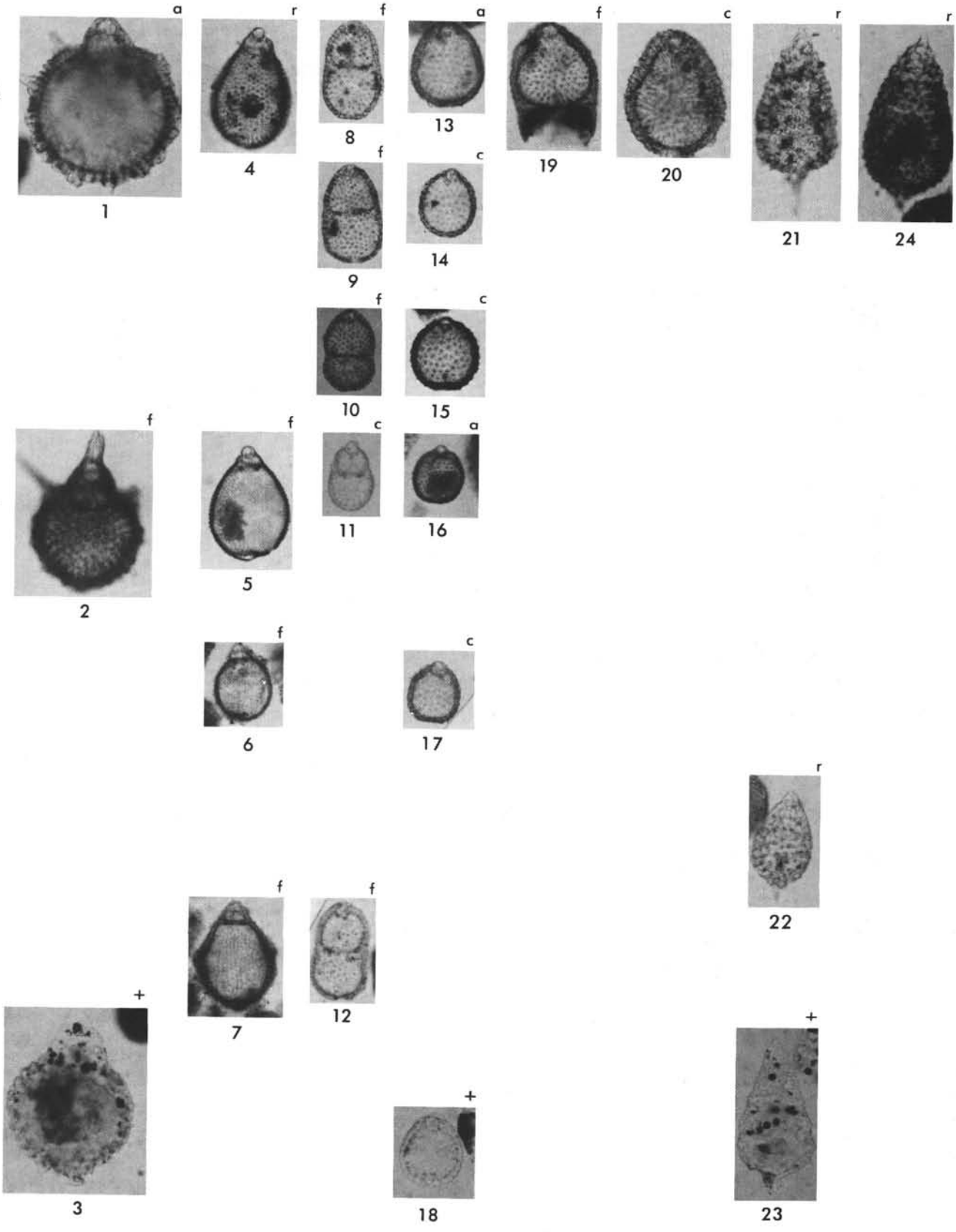


PLATE 7
(Magnification ×150, unless otherwise indicated)

Figures 1-4 ?*Eucyrtis molengraaffi* (Tan Sin Hok).
1. 261-9-4, 50-52.
2. 261-12, CC, ×135.
3. 261-13, CC.
4. 261-16-1, 101-103.

Figures 5-7 *Lithomitra pseudopinquis* Tan Sin Hok.
5. 261-12, CC, ×135.
6. 261-13, CC.
7. 261-23, CC.

Figures 8-11 ?*Stichocapsa procera* Hinde.
8. 261-9, CC.
9. 261-12, CC.
10. 261-15-1, 9-11.
11. 261-23, CC.

Figures 12, 13 *Lithostrobus erectus* Tan Sin Hok.
12. 261-10-1, 10-12.
13. 261-12, CC.

Figures 14-20 *Eucyrtis columbarius* n. sp.
14. 261-10, CC.
15. 261-12-2, top, ×135.
16. 261-12, CC.
17. 261-13, CC.
18. 261-15-1, 9-11.
19. 261-23, CC.
20. 261-23, CC.

Figures 21-25 *Eucyrtis hanni* (Tan Sin Hok).
21. 261-12-2, top, ×135.
22. 261-12-2, 11-12.
23. 261-13, CC.
24. 261-15-1, 9-11.
25. 261-23, CC.

Figures 26-29 *Eucyrtis bulbosus* n. sp.
26. 261-12-2, 11-12.
27. 261-13, CC.
28. 261-15-1, 9-11.
29. 261-16-1, 101-103.

Figure 30 *Lithocampe chenodes* n. sp.; 261-12-2, top, ×135.

PLATE 7

Bathropyramis timorensis assemblage

Eucyrtis columbarius assemblage

Spongocyclia lanigera assemblage

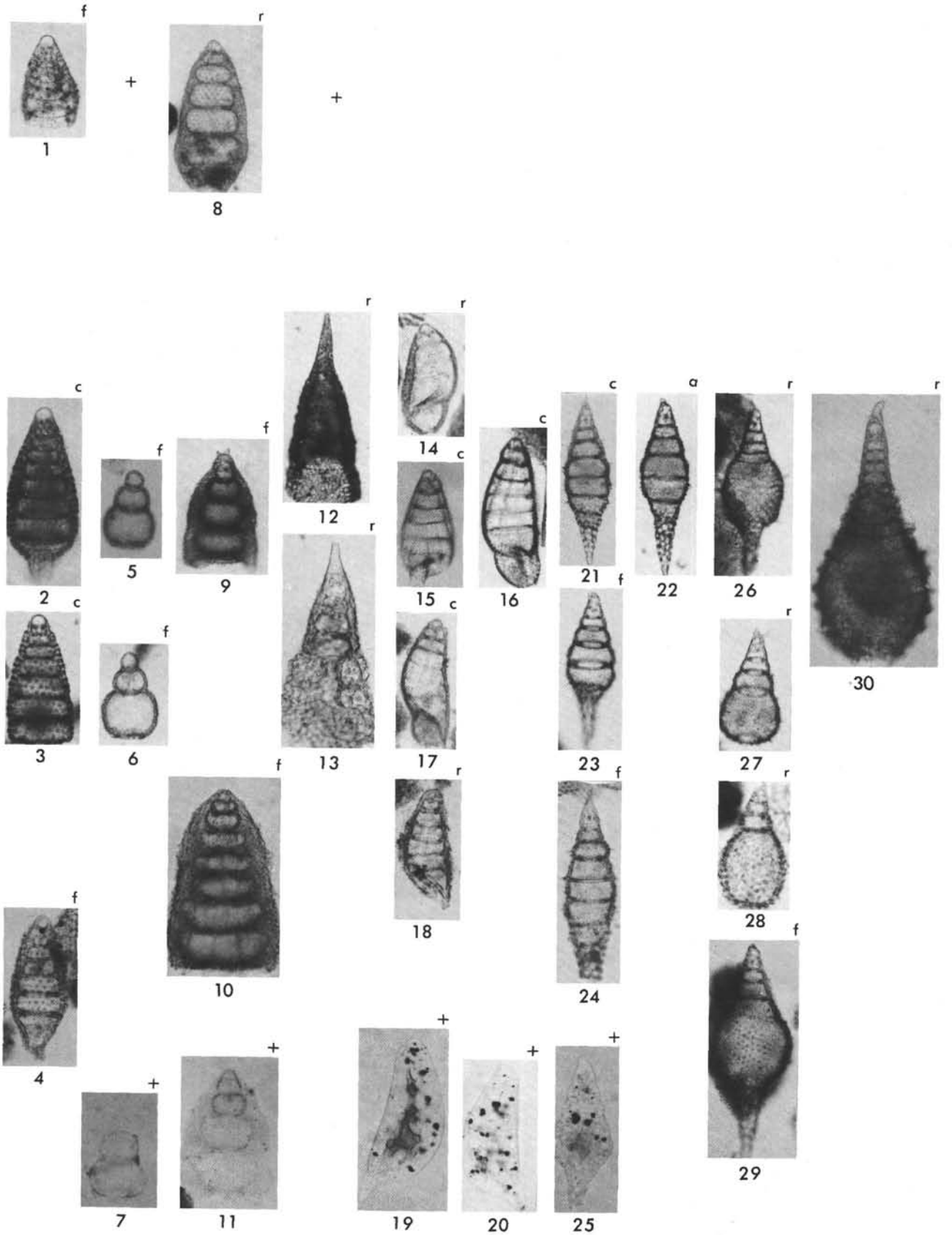


PLATE 8
(Magnification ×150, unless otherwise indicated)

Figures 1-4 *Dictyomitra lilyae* Tan Sin Hok.
1. 261-9-4, 50-52.
2. 261-10-1, 10-12.
3. 261-13, CC, ×135.
4. 261-15-1, 9-11.

Figures 5, 6 *Dictyomitra pseudoscalaris* (Tan Sin Hok).
5. 261-9-4, 110-112.
6. 261-13, CC, ×135.

Figures 7, 8 *Dictyomitra excellens* (Tan Sin Hok).
7. 261-12-2, top, ×135.
8. 261-16-1, 101-103, ×135.

Figures 9-13 *Dictyomitra brouweri* var. γ (Tan Sin Hok).
9. 261-9, CC.
10. 261-12, CC.
11. 261-15-1, 9-11.
12. 261-16-1, 101-103.
13. 261-23, CC.

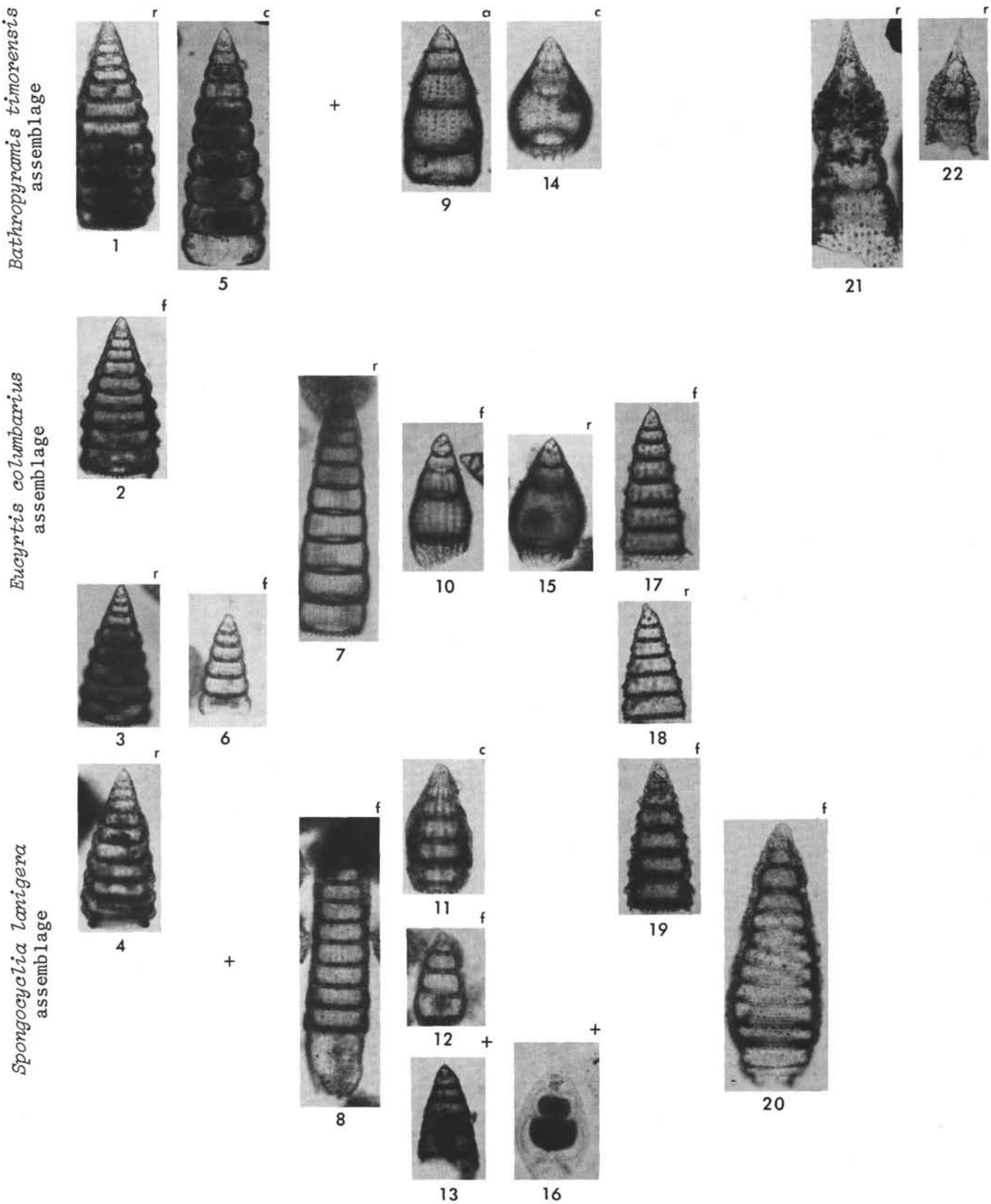
Figures 14-16 *Dictyomitra brouweri* var. α (Tan Sin Hok).
14. 261-9, CC.
15. 261-12-2, 11-12.
16. 261-23, CC.

Figures 17-19 *Eucyrtidium vermiculatum* n. sp.
17. 261-12-2, top.
18. 261-13, CC.
19. 261-15-1, 9-11.

Figure 20 ?*Dictyomitra malleola* Aliev; 261-15-1, 9-11.

Figures 21, 22 *Eucyrtidium* (?) *boodes* n. sp.
21. 261-9-4, 110-112.
22. 261-9-4, 110-112.

PLATE 8


Bathropyramis timorensis assemblage
Eucyrtis columbarius assemblage
Spongocyclia lanigera assemblage
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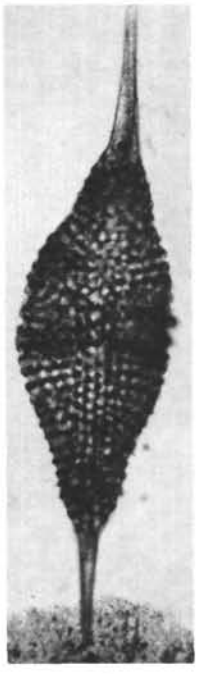
b. PLATE 9
(Magnification ×150, unless otherwise indicated)

Figure 1	*Amphibrachium* (?) *hastatum* n. sp.; holotype, 261-12, CC.
Figure 2	*Patulibracchium petroleumensis* Pessagno; 261-12, CC.
Figure 3	Hagiastrid 1 gen. and sp. indet.; 261-15-1, 9-11.
Figure 4	*Crucella espartoensis* Pessagno; 261-12-2, top.
Figure 5	?*Tripodictya elegantissima* Vinassa; 261-12-2, top.
Figure 6	Hagiastrid 2 gen. and sp. indet., 261-12-2, top.
Figure 7	*Porodiscus* sp. aff. *P. delicatulus* (Lipman); 261-12-2, top.
Figure 8	*Haliomma minor* Campbell and Clark; 261-12-2, 11-12.
Figure 9	*Tholodiscus fresnoensis* (Foreman); 261-12-2, top.
Figure 10	incerti sedis; 261-12-2, top.
Figure 11	*Amphibrachium* sp. cf. *A. concentricum* Lipman; 261-15-1, 9-11.
Figure 12	?*Halesium quadratum* Pessagno; 261-12-2, 11-12.
Figure 13	*Xiphodictya* sp. cf. *X. ovalis* Rüst; 261-9-3, 90-92.
Figure 14	*Porodiscus delicatulus* (Lipman); 261-9, CC.
Figure 15	*Spongosaturnalis* sp. aff. *Saturnalis lateralis* Campbell and Clark; 261-12, CC, ×170.
Figure 16	Actinommid 4 gen. and sp. indet.; 261-12-2, top.
Figure 17	?*Conosphaera tuberosa* Tan Sin Hok; 261-12-2, top.
Figure 18	*Staurostylus italicus* Rüst; 261-12, CC.
Figure 19	*Sphaerostylus lanceola* (Parona); 261-15-1, 9-11.
Figure 20	*Stylosphaera pusilla* Campbell and Clark; 261-12-2, top.
Figure 21	*Xiphosphaera umbilicata* Rüst; 261-12-2, top.
Figure 22	*Spongosaturnalis* sp. aff. *Saturnalis polymorphus* Squinabol; 261-12, CC, ×110.

PLATE 9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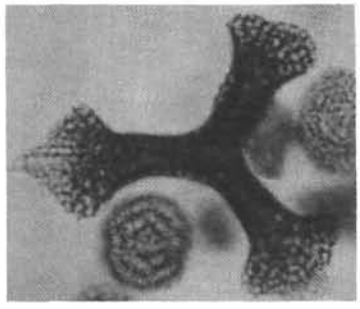
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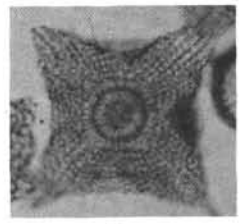
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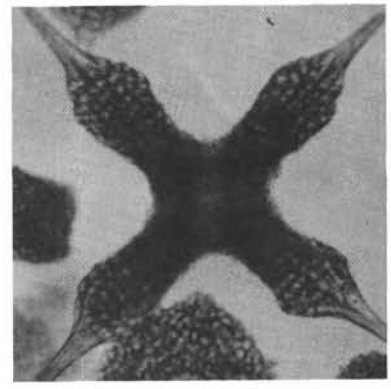
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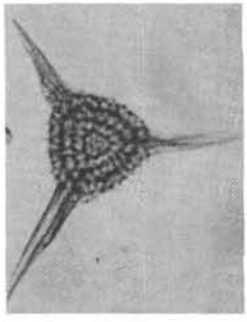
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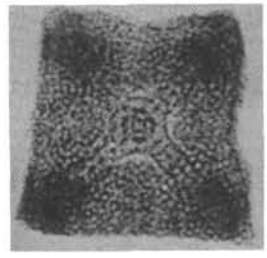
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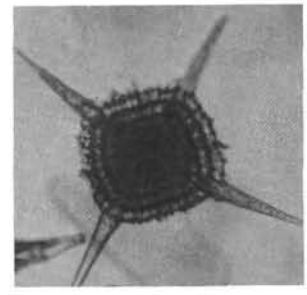
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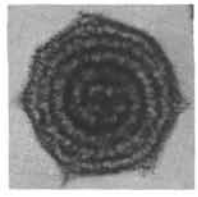
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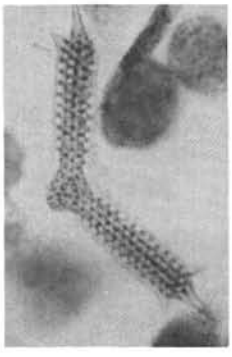
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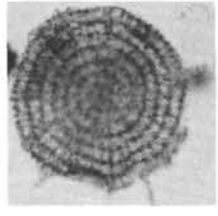
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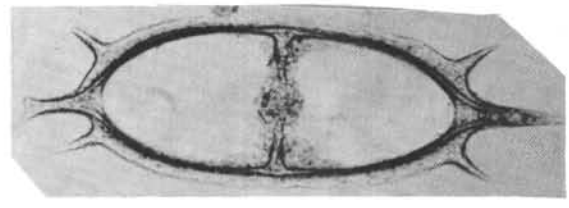
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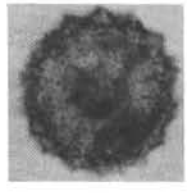
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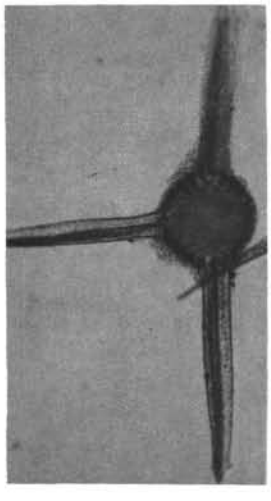
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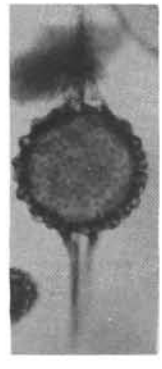
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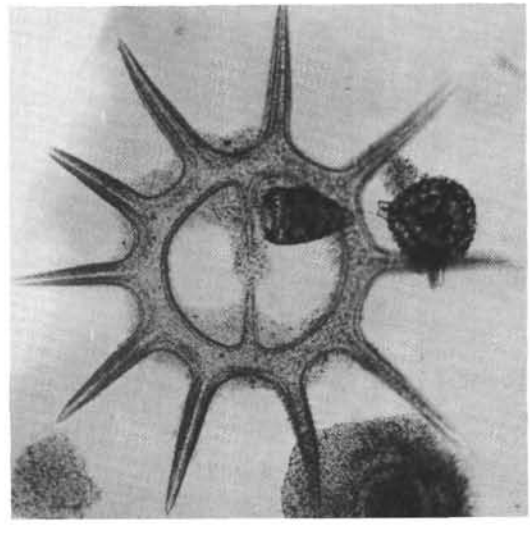
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PLATE 10
(Magnification ×150)

Figure 1 — *Stylotrochus* sp. 261-12-2, 11-12.

Figure 2 — *Rhopalodictyum* sp.; 261-12-2, top.

Figure 3 — *Spongotripus* sp. cf. *Tripodictya triacuminata* Lipman; 261-12-2, top.

Figure 4 — Spongodiscid 1 gen. and sp. indet.; 261-12-2, top.

Figure 5 — ?*Spongotrochus polygonatus* Campbell and Clark; 261-12-2, top.

Figure 6 — *Spongodiscus* sp. cf. *S. americanus* Kozlova; 261-12-2, top.

Figure 7a — *Spongocyclia lanigera* n. sp.; Side view, 261-15, CC.

Figure 7b — *Spongocyclia lanigera* n. sp.; holotype, 261-15, CC.

Figure 8 — *Spongopyle galeata* n. sp.; holotype, 261-12-2, top.

Figure 9 — *Spongopyle stauromorphos* n. sp.; holotype, 261-9, CC.

Figure 10 — *Spongopyle insolita* Kozlova; 261-9, CC.

Figure 11 — *Spongolonche* sp. aff. *S. grandis* Campbell and Clark; 261-9, CC.

Figure 12 — ?*Spongolonche grandis* Campbell and Clark; 261-9-4, 110-112.

Figure 13 — *Spongocyclia trachodes* n. sp.; holotype, 261-15-1, 9-11.

Figure 14 — *Spongopyle ecleptos* n. sp.; holotype, 261-12-2, top.

Figure 15 — *Spongopyle trabeata* n. sp.; holotype, 261-15-1, 9-11.

Figure 16 — *Lithocyclia* ? sp. A; 261-15, CC.

Figure 17 — *Spongodiscus* sp. 1; 261-12-2, top.

Figure 18 — *Spongoprunum diversispina* Squinabol; 261-12-2, top.

Figure 19 — *Spongoprunum* sp. aff. *Cyphantus probus* Rüst; 261-12-2, 11-12.

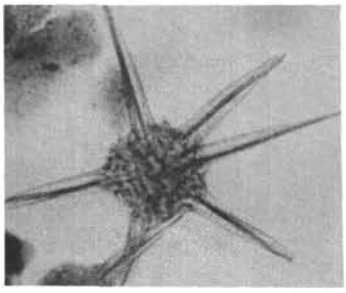
Figure 20 — Spongodiscid 2 gen. and sp. indet.; 261-12-2, top.

Figure 21 — ?*Stylotrochus antiquus* Campbell and Clark; 261-12-2, top.

Figure 22 — *Spongodiscus* sp. 2; 261-15-1, 9-11.

Figure 23 — Spongodiscid 3 gen. and sp. indet.; 261-15, CC.

PLATE 10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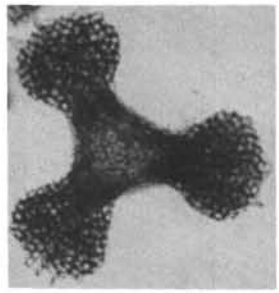
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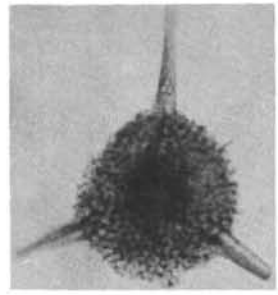
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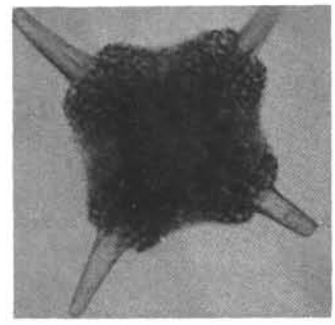
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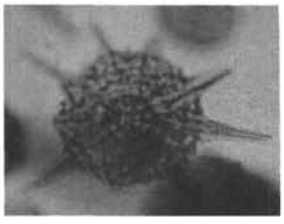
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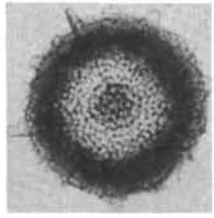
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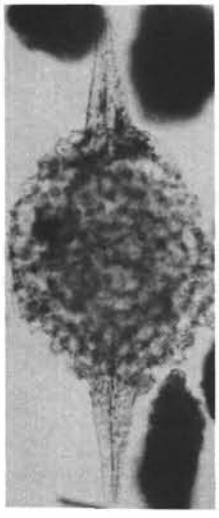
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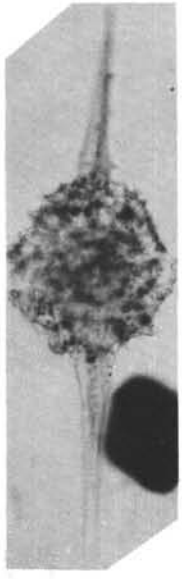
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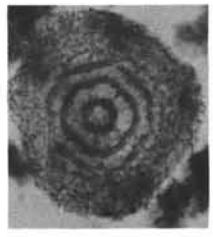
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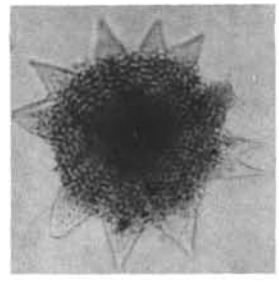
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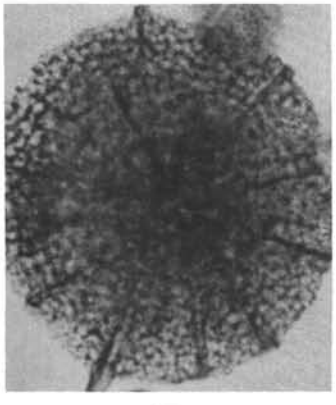
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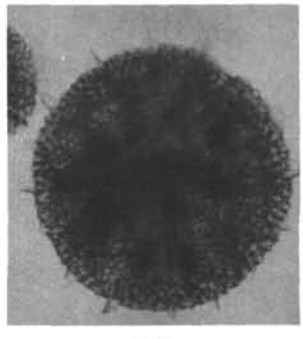
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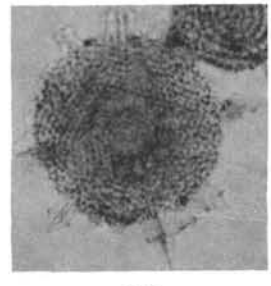
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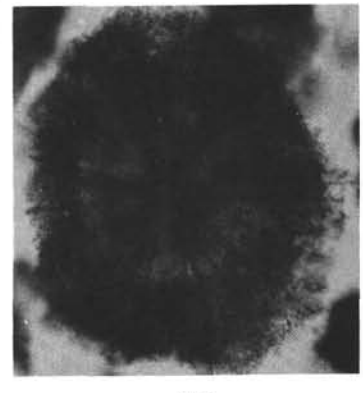
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PLATE 11

Figure 1 *Dictyophimus obliquum* (Hinde); 261-12-2, 11-12, ×70.

Figure 2 *Dicolocapsa* sp; 261-9, CC, ×135.

Figure 3 ?*Tricolocapsa parvipora* Tan Sin Hok; 261-12-2, top, ×135.

Figure 4 *Theocorys* sp. aff. *T. antiqua* Squinabol; 261-9-3, 90-92, ×150.

Figure 5 ?*Stichocapsa rutteni* Tan Sin Hok; 261-9, CC, ×135.

Figure 6 ?*Stichocapsa* sp. aff. *S. rutteni* Tan Sin Hok; 261-12-2, 11-12, ×135.

Figure 7 ?*Cyrtocapsa grutterinki* var. α Tan Sin Hok; 261-12-2, top, ×135.

Figure 8 ?*Theocapsa elata* Tin Sin Hok; 261-9-3, 90-92, ×135.

Figure 9 *Dicolocapsa verbeeki* Tan Sin Hok; 261-13, CC, ×135.

Figure 10 ?*Tripocalpis ellyae* Tan Sin Hok; 261-12, CC, ×150.

Figure 11 *Dictyophimus gracilis* Tan Sin Hok; 261-12-2, top, ×135.

Figure 12a *Artocapsa bicornis* Tan Sin Hok; 261-9-3, 90-92, ×150.

Figure 12b *Artocapsa bicornis* Tan Sin Hok; 261-9, CC, ×150.

Figure 13 ?*Artocapsa ultima* Tan Sin Hok; 261-9, CC, ×135.

Figure 14 ?*Squinabolella putahensis* Pessagno; 261-12, CC, ×150.

Figure 15a *Eucyrtidium* (?) *boodes* n. sp.; holotype, 261-9-4, 110-112, ×135.

Figure 15b *Eucyrtidium* (?) *boodes* n. sp.; 261-9-4, 110-112, ×135.

Figure 16 ?*Stichomitra campi* (Campbell and Clark); 261-12-2, top, ×135.

Figure 17 *Stichomitra cathara* Foreman; 261-12-2, top, ×135.

Figure 18 *Diacanthocapsa* sp. B; 261-12-2, top, ×135.

Figure 19a ?*Lithostrobus erectus* Tan Sin Hok; 261-10-1, 10-12, ×150.

Figure 19b ?*Lithostrobus erectus* Tan Sin Hok; 261-12, CC, ×150.

Figure 20 *Stichocapsa wichmanni* Tan Sin Hok; 261-16-1, 101-103, ×135.

Figure 21 *Stichomitra asymbatos* Foreman; 261-9-4, 110-112, ×135.

Figure 22 *Eucyrtidium vermiculatium* n. sp.; holotype, 261-12-2, top, ×135.

Figure 23 *Eucyrtidium* sp. cf. *E. thiensis* Tan Sin Hok; 261-12-2, top, ×135.

Figure 24 ?*Stichocapsa procera* Hinde; 261-12-2, top, ×135.

Figure 25 ?*Stichocapsa procera* Hinde; 261-12-2, top, ×135.

Figure 26 *Dictyomitra brouweri* var. α (Tan Sin Hok); 261-9, CC, ×135.

Figure 27 *Dictyomitra brouweri* var. γ (Tan Sin Hok); 261-9-4, 50-52, ×135.

Figure 28 ?*Dictyomitra malleola* Aliev; 261-16-1, 101-103, ×135.

Figure 29 *Stichocapsa pseudodecora* Tan Sin Hok; 261-9-3, 90-92, ×135.

Figure 30 *Lithomitra pseudopinguis* Tan Sin Hok; 261-12-2, top, ×135.

Figure 31 ?*Lithocampe pseudochrysalis* var. α Tan Sin Hok; 261-9-4, 50-52, ×135.

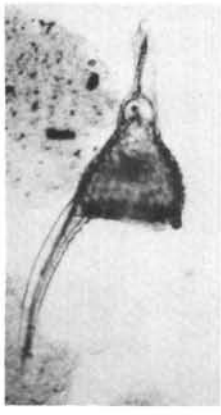
Figure 32 ?*Eucyrtis molengraaffi* (Tan Sin Hok); 261-12-2, 11-12, ×135.

Figure 33 *Dictyomitra lilyae* Tan Sin Hok; 261-9, CC, ×135.

Figure 34 *Dictyomitra pseudoscalaris* (Tan Sin Hok); 261-9, CC, ×135.

Figure 35 *Dictyomitra excellens* (Tan Sin Hok); 261-16-1, 101-103, ×135.

PLATE 11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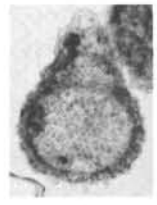
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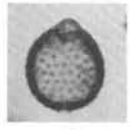
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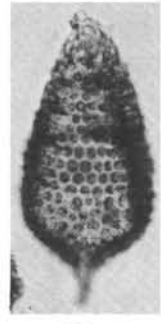
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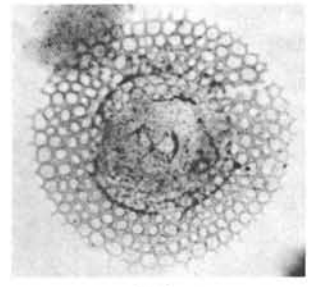
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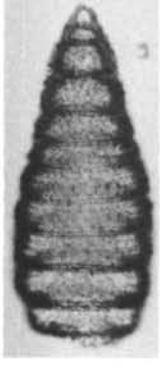
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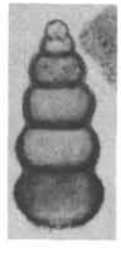
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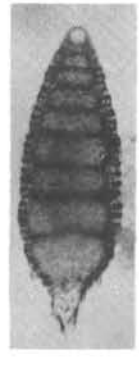
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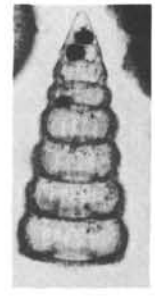
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PLATE 12

Figure 1 — *Amphipyndax* (?) *pyrgodes* n. sp.; holotype, 261-12-2, top, ×150.

Figure 2 — *Amphipyndax* (?) *epiplatys* n. sp.; holotype, 261-9-4, 110-112, ×150.

Figure 3 — *Amphipyndax mediocris* (Tan Sin Hok); 261-12, CC, ×150.

Figures 4 a-c — *Bathropyramis timorensis* n. sp. (a) apical view, 261-9-4, 110-112, ×135. (b) sagittal view, holotype, 261-9-4, 110-112, ×135. (c) sagittal view, 261-9, CC, ×150.

Figure 5 — ?*Hemicryptocapsa pseudopilula* Tan Sin Hok; 261-9-4, 110-112, ×150.

Figure 6 — ?*Cornutella californica* var. A Campbell and Clark, emend. Foreman; 261-12-2, 11-12, ×150.

Figure 7 — ?*Cornutella californica* var. B Campbell and Clark, emend. Foreman; 261-12, CC, ×150.

Figure 8 — ?*Cyrtocalpis operosa* Tan Sin Hok; 261-15, CC, ×150.

Figure 9 — *Lophophaena* sp.; 261-12-2, top, ×135.

Figure 10 — *Lophophaeniid* sp. B; 261-16-1, 101-103, ×150.

Figure 11 — *Lophophaeniid* sp. A; 261-12-2, top, ×150.

Figure 12 — *Lophophaeniid* sp. C; 261-12, CC, ×150.

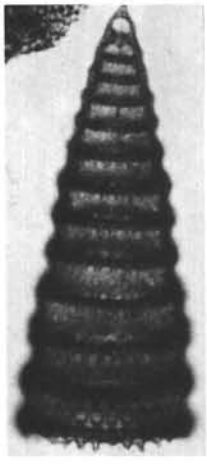
Figures 13 a-c — *Eucyrtis columbarius* n. sp. (a) with bulbous terminal segment, 261-12-2, top, ×260. (b) with apical horn, 261-12, CC, ×150. (c) with terminal spines, holotype, 261-12-2, 11-12, ×150.

Figures 14 a-d — *Lithocampe chenodes* n. sp. (a) 261-12-2, top, ×425. (b) ridges in meshwork, 261-12, CC, ×580. (c) holotype, 261-12, CC, ×135. (d) 261-12, CC, ×260.

Figures 15a, b — *Eucyrtis bulbosus* n. sp. (a) holotype, 261-12-2, 11-12, ×330. (b) 261-12-2, 11-12, ×150.

Figures 16a, b — *Eucyrtis hanni* (Tan Sin Hok), (a) 261-12-2, top, ×150. (b) 261-12-2, top, ×330.

PLATE 12



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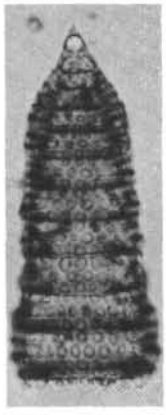

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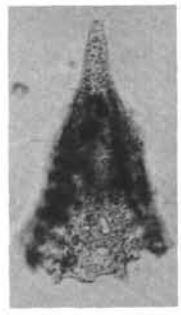

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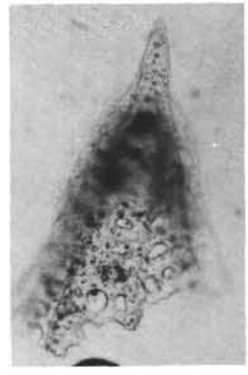

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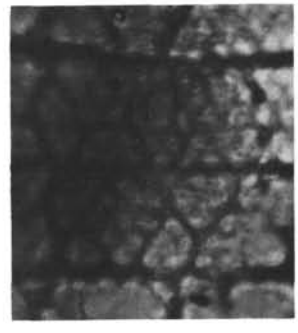

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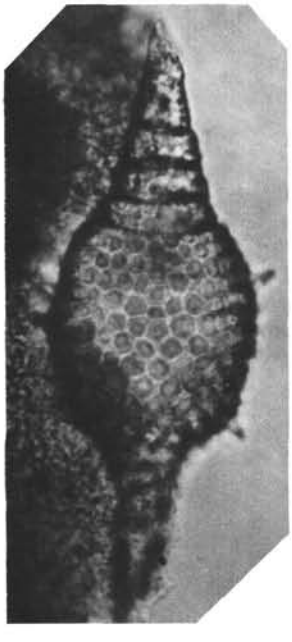

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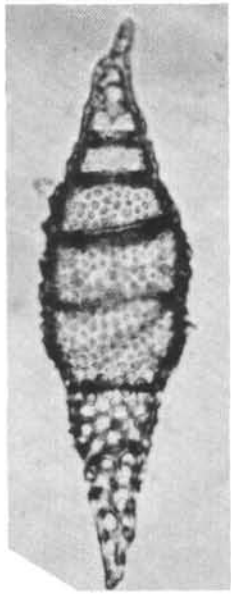

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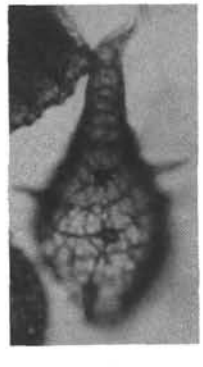

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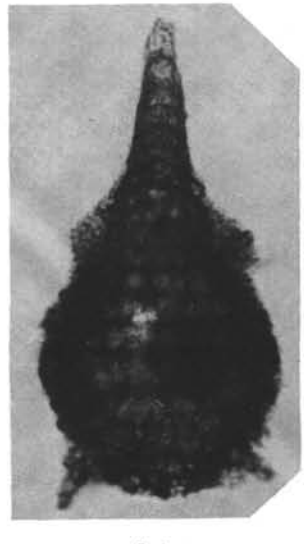


14 d

PLATE 13
(Magnification ×150)

Figure 1 — *Heliodiscus echiniscus* Haeckel; 261-1-4, 39-41.

Figure 2 — *Larcospira quadrangula* Haeckel; 262-1-4, 39-41.

Figure 3 — *Siphonosphaera* sp. B; 261-1-2, 31-33.

Figure 4 — *Polysolenia* sp.; 262-1-2, 31-33.

Figure 5 — *Disolenia zanguebarica* (Ehrenberg); 262-1-2, 89-91.

Figure 6 — *Collosphaera tuberosa* (Haeckel); 261-1-2, 31-33.

Figure 7 — *Hexapyle dodecantha* Haeckel; 260-1-1, 17-19.

Figure 8 — *Disolenia quadrata* (Ehrenberg); 262-1-2, 31-33.

Figure 9 — *Siphonosphaera polysiphonia* Haeckel; 262-1-2, 89-91.

Figure 10 — *Siphonosphaera* sp. A; 262-1-2, 31-33.

Figure 11 — *Heliodiscus asteriscus* Haeckel; 262-1-2, 31-33.

Figure 12 — Pyloniid sp.; 262-1-2, 89-91.

Figure 13 — Pyloniid sp.; 262-1-2, 31-33.

Figure 14 — *Collosphaera polygona* Haeckel; 262-7, CC.

Figure 15 — *Otosphaera polymorpha* Haeckel; 262-1-2, 89-91.

Figure 16 — *Elatomma* sp.; 262-3-2, 84-86.

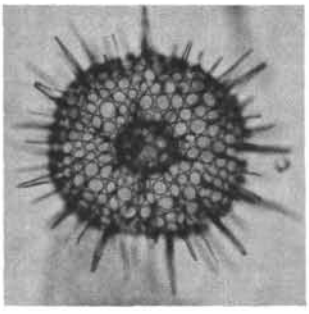
Figure 17 — *Cladococcus scoparius* Haeckel; 262-6, CC.

Figure 18 — ?*Cladococcus abietinus* Haeckel; 262-1-2, 31-33.

Figure 19 — ?*Cladococcus pinetum* Haeckel; 262-2, CC.

Figure 20 — Actinommid 1 gen. and sp. indet.; 260-1-1, 17-19.

PLATE 13



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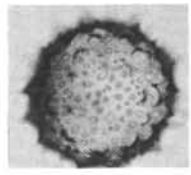

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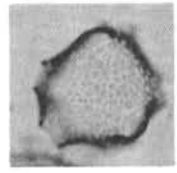

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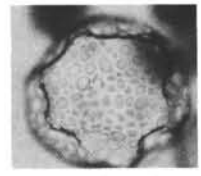

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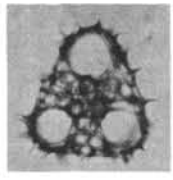

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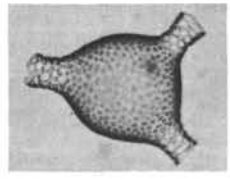

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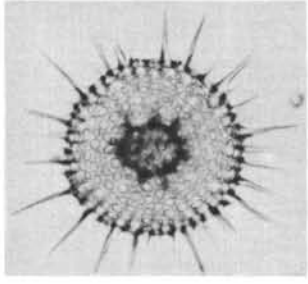

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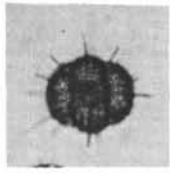

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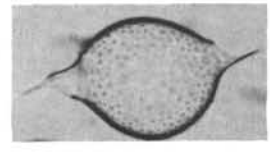

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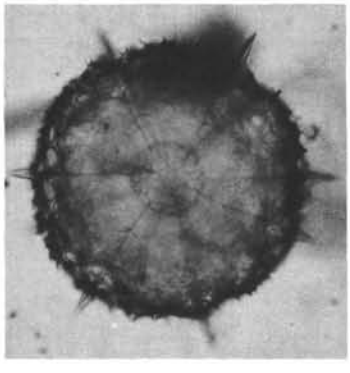

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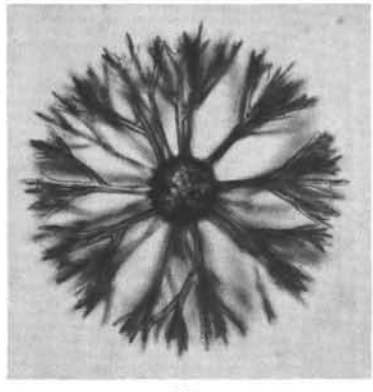

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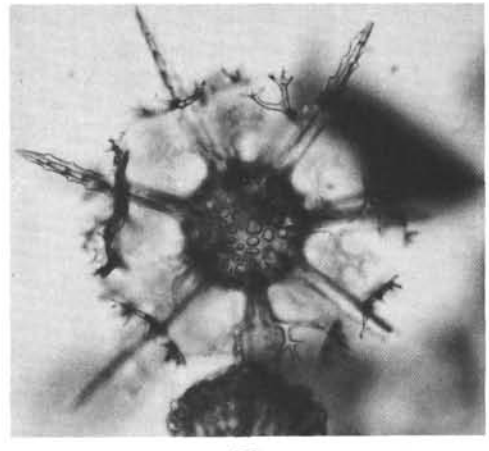

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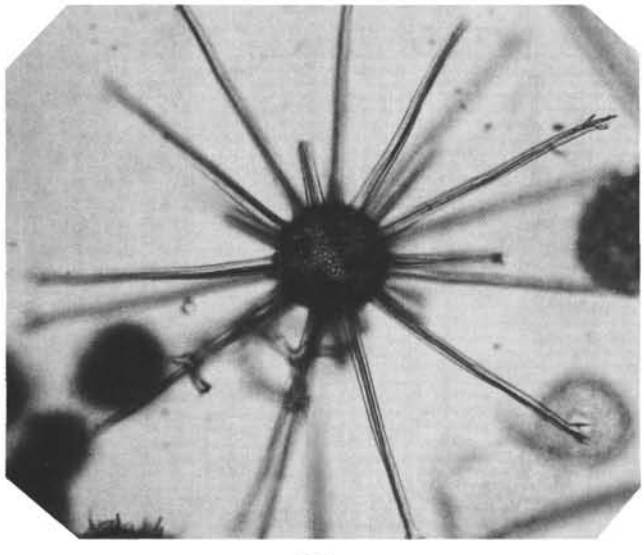

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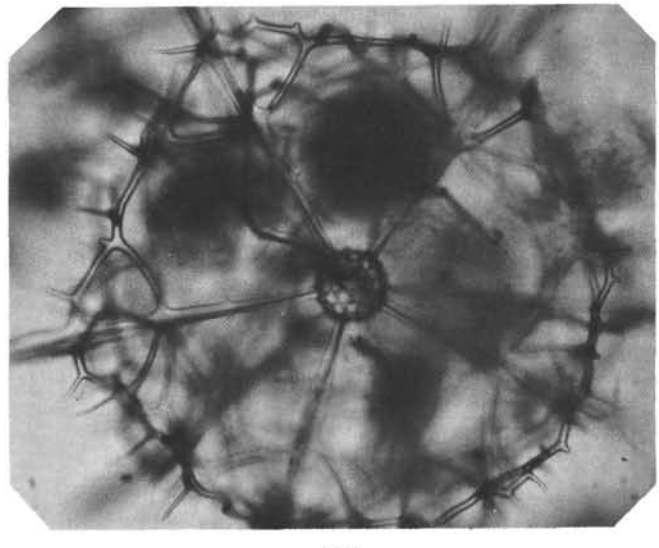

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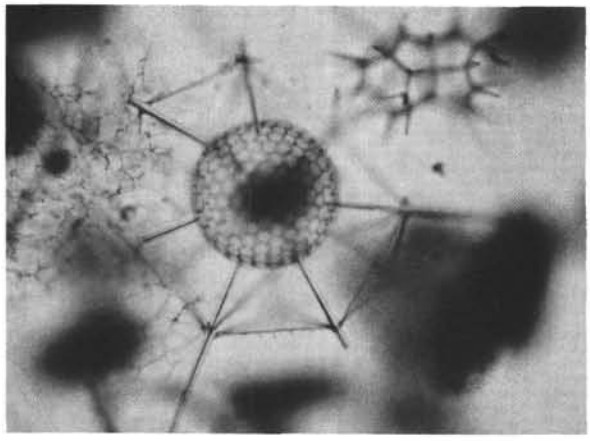
PLATE 14
(Magnification ×150)

Figure 1	*Astrosphaera hexagonalis* Haeckel; 262-1-2, 89-91.
Figure 2	Actinommid 2 gen. and sp. indet.; 262-1-2, 31-33.
Figure 3	*Saturnalis circularis* Haeckel; 262-1-4, 39-41.
Figure 4	*Cladococcus* sp.; 262-1-2, 89-91.
Figure 5	*Ommatartus tetrathalamus* (Haeckel); 262-1-2, 31-33.
Figure 6	*Spongoliva ellipsoides* Popofsky; 262-1-2, 89-91.
Figure 7	*Stylosphaera* sp.; 262-2-2, 94-96.
Figure 8	*Stylatractus universus* Hays; 262-1-2, 31-33.
Figure 9	Actinommid 3 gen. and sp. indet.; 261-1, CC.
Figure 10	*Actinomma arcadophorum* Haeckel; 262-1-2, 31-33.
Figure 11	*Haliomma erinaceum* Haeckel; 262-1-2, 89-91.
Figure 12	*Haliomma* sp. cf. *H. glisifra* Renz; 262-1-2, 31-33.
Figure 13	*Hexalonche* sp.; 262-1, CC.
Figure 14	*Centrocubus octostylus* Haeckel; 262-1-2, 31-33.
Figure 15	*Xiphosphaera tesseractis* Dreyer; 262-7, CC.
Figure 16	*Spongosphaera streptacantha* Haeckel; 262-1-2, 89-91.

PLATE 14



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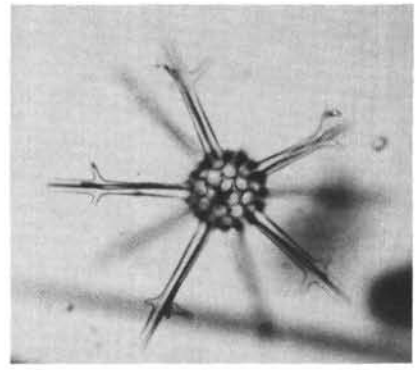

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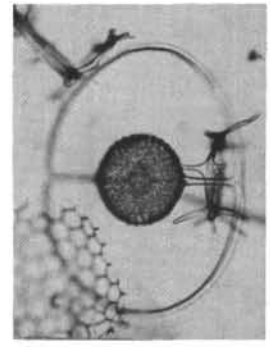

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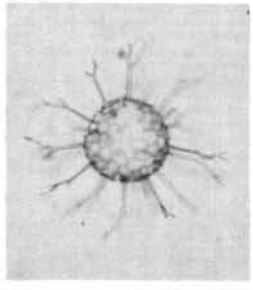

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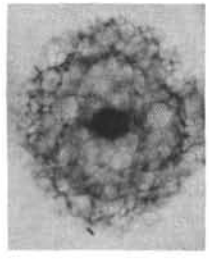

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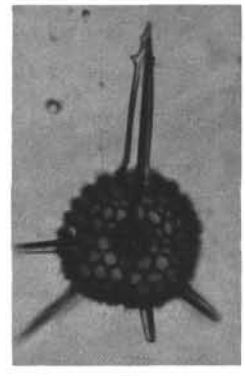

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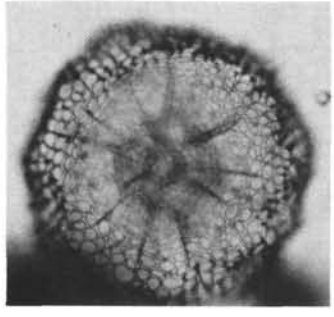

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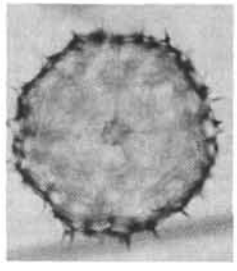

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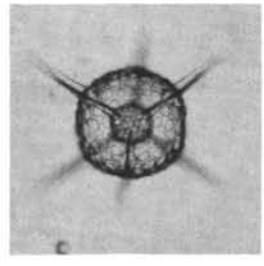

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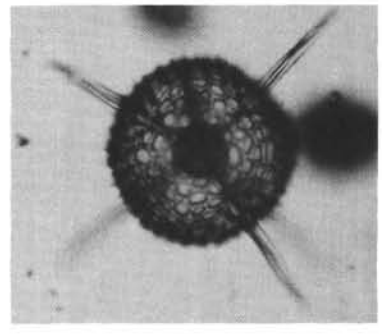

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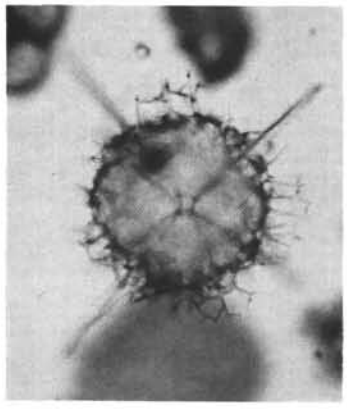

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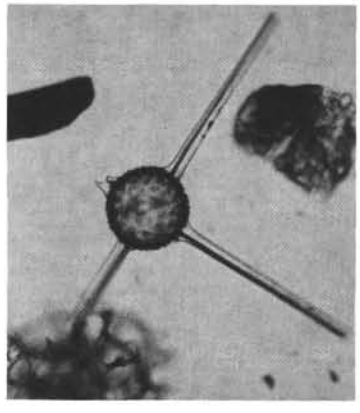

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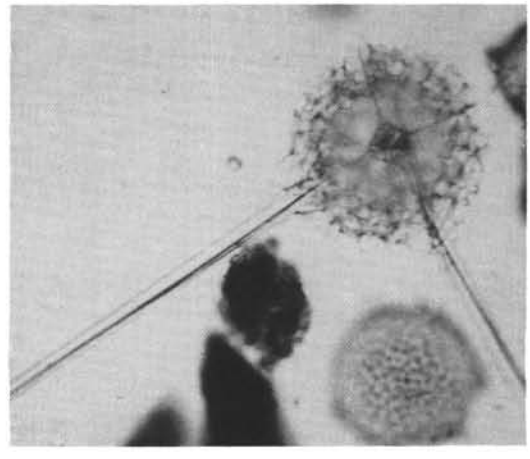

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PLATE 15
(Magnification ×150)

Figure 1 — *Euchitonia mulleri* Haeckel; 262-1-2, 31-33.

Figure 2 — *Rhopalastrum* sp. 1; 262-1-2, 89-91.

Figure 3 — *Rhopalastrum* sp. 2; 262-1-2, 31-33.

Figure 4 — *Spongocore diplocylindrica* Haeckel; 262-1-2, 89-91.

Figure 5 — *Spongolena* sp.; 262-3-2, 84-86.

Figure 6 — Myelastrinae subfamily group; 262-1-2, 89-91.

Figure 7 — *Dictyocoryne profunda* Ehrenberg; 262-1-2, 89-91.

Figure 8 — *Spongaster tetras* Ehrenberg; 262-1-2, 31-33.

Figure 9 — *Spongotrochus multispinus* Haeckel; 262-1-2, 31-33.

Figure 10 — *Spongobrachium* sp. aff. *S. ellipticum* Haeckel; 262-1, CC.

Figure 11 — *Spongodiscus* sp. 3; 262-1-2, 89-91.

Figure 12 — *Stylodictya* sp. aff. *S. multispina* Haeckel; 262-1-2, 31-33.

Figure 13 — *Styptosphaera spongiacea* Haeckel; 262-1-2, 31-33.

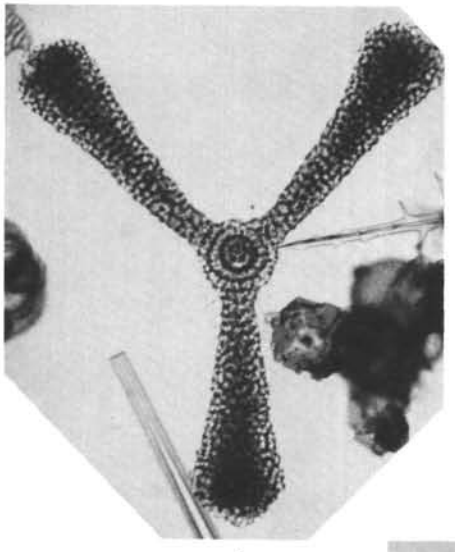
Figure 14 — *Amphirhopalum ypsilon* Haeckel; 262-2-2, 94-96.

Figure 15 — *Tessarastrum straussii* Haeckel; 260-1-1, 17-19.

Figure 16 — *Porodiscus microporus* (Stöhr); 262-1-4, 39-41.

Figure 17 — *Stylochlamydium* sp. aff. *S. venustum* (Bailey); 262-2, CC.

PLATE 15



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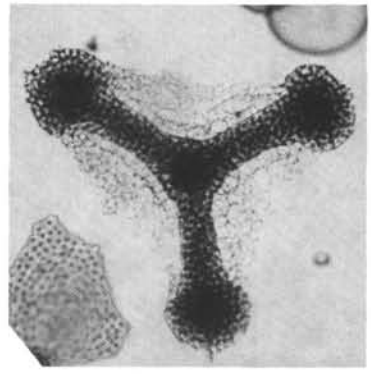

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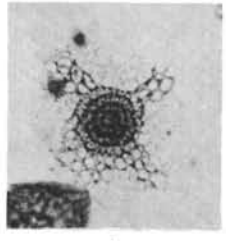

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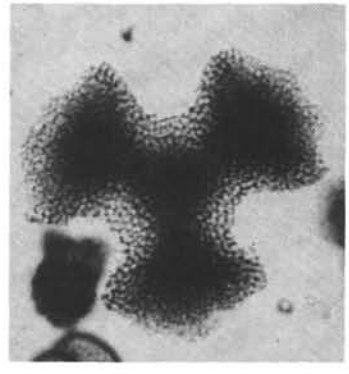

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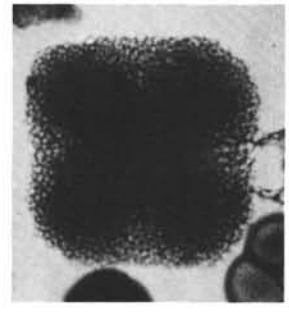

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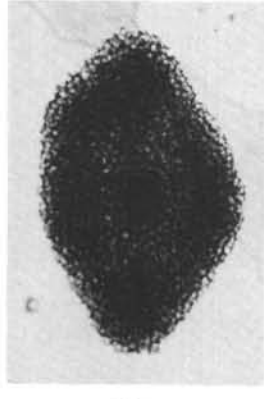

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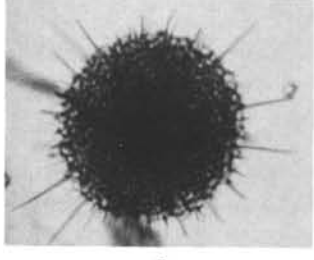

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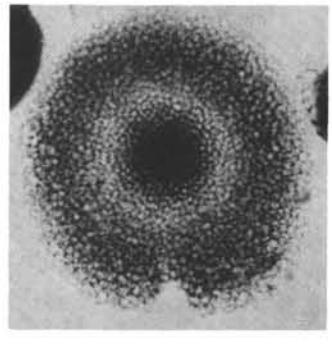

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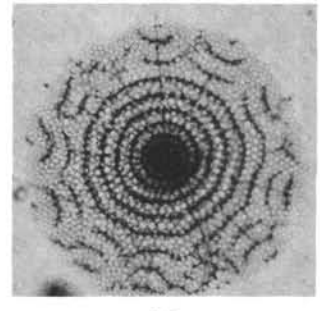

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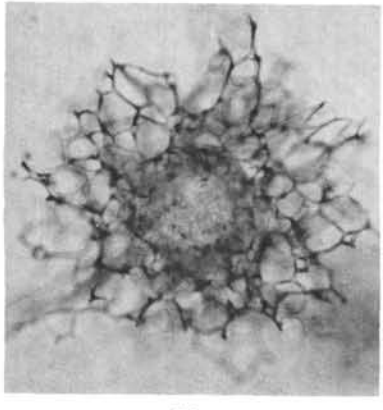

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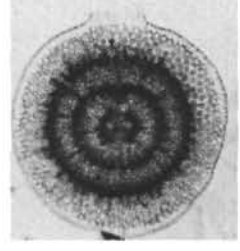

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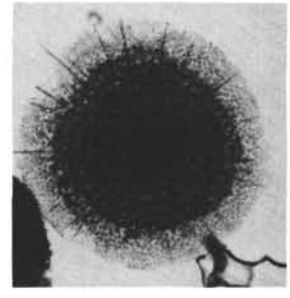

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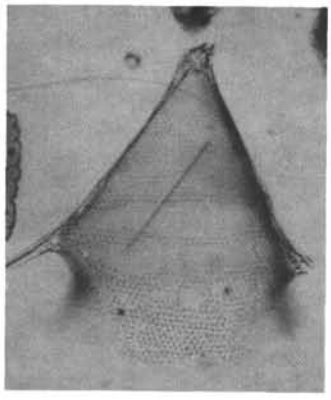
PLATE 16
(Magnification ×150)

Figure 1 *Dictyocodon palladius* Haeckel; 262-1-2, 89-91.
Figure 2 *Cyrtopera* sp. aff. *C. languncula* Haeckel; 262-1-2, 89-91.
Figure 3 *Eucyrtidium hexagonatum* Haeckel; 262-1-2, 89-91.
Figure 4 *Lithocampe* sp.; 260-1-1, 17-19.
Figure 5 *Sethoconus myxobrachia* Strelkov and Reshetnyak; 260-1-1, 60-62.
Figure 6 *Eucyrtidium hexastichum* (Haeckel); 262-1-2, 89-91.
Figure 7 ?*Eusyringium siphonostoma* Haeckel; 262-1-2, 31-33.⅔
Figure 8 *Eucyrtidium acuminatum* (Ehrenberg); 262-1-2, 89-91.
Figure 9 *Lampromitra parabolica* Popofsky; 262-1-2, 89-91.
Figure 10 *Corocalyptra kruegeri* Popofsky; 262-1-2, 89-91.
Figure 11 *Corocalyptra* sp. aff. *C. kruegeri* Popofsky; 262-6, CC.
Figure 12 *Lithopilium sphaerocephalum* Popofsky; 262-6, CC.
Figure 13 *Artopilium undulatum* Popofsky; 262-2-2, 94-96.
Figure 14 *Udan undulata* Renz; 260-1-1, 17-19.
Figure 15 *Eucyrtid* 1 gen. and sp. indet.; 261-1, CC.
Figure 16 *Clathrocyclas semeles* Haeckel; 262-1, CC.
Figure 17 *Theopilium pyramidale* Popofsky; 262-1-2, 89-91.
Figure 18 *Theocorys veneris* Haeckel; 262-1-4, 39-41.
Figure 19 *Lithostrobus hexagonalis* Haeckel; 262-1-2, 89-91.
Figure 20 *Eucyrtidium anomalum* Haeckel; 262-1-2, 89-91.
Figure 21 *Theocalyptra* sp.; 262-1-2, 31-33.
Figure 22 *Corocalyptra cervus* (Ehrenberg); 262-1-2, 89-91.
Figure 23 Eucyrtid 3 gen.and sp. indet.; 262-1-2, 89-91.
Figure 24 *Stichopilium bicorne* Haeckel; 262-1-2, 89-91.
Figure 25 *Calocyclas monumentum* Haeckel; 262-1-2, 89-91.
Figure 26 Nassellarian gen. and sp. indet.; 262-1-2, 89-91.
Figure 27 ?*Pteropilium stratiotes* Haeckel; 262-1-2, 89-91.
Figure 28 *Lithopera bacca* Ehrenberg; 262-1-2, 89-91.
Figure 29 ?*Cyclampterium neatum* Sanfilippo and Riedel; 260-1-3, 25-27.

PLATE 16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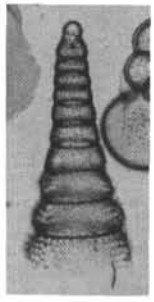
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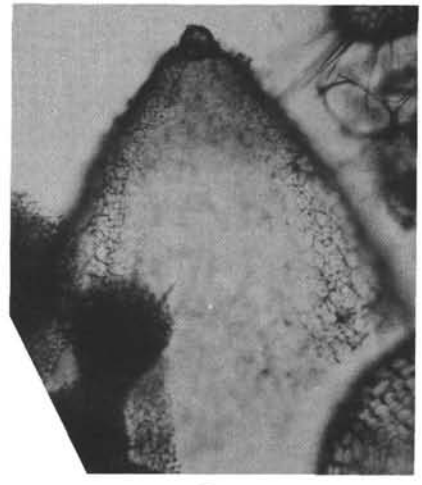
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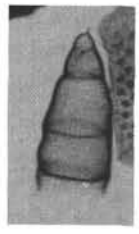
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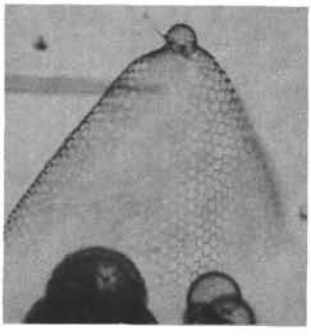
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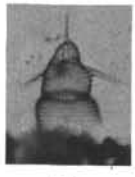
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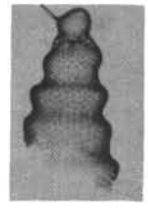
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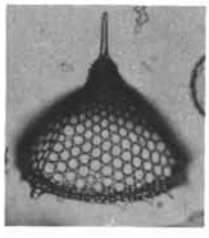
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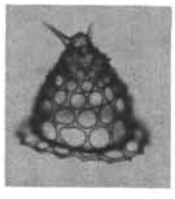
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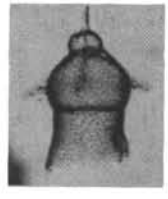
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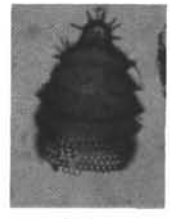
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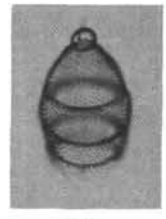
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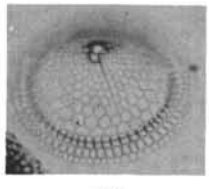
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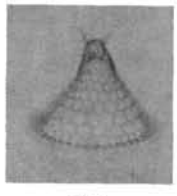
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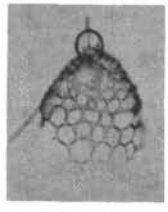
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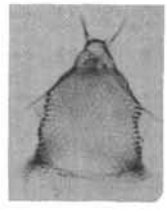
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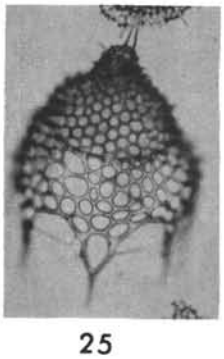
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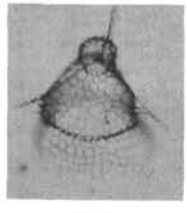
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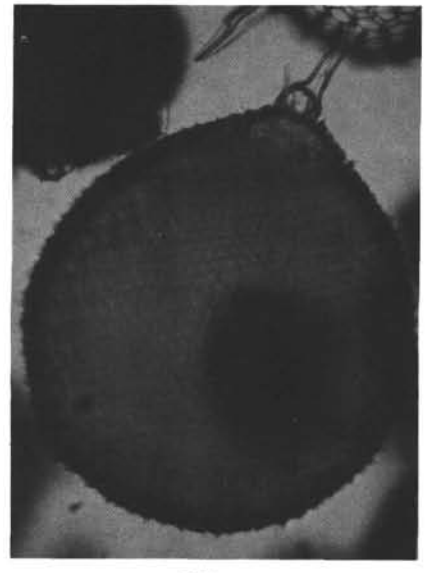
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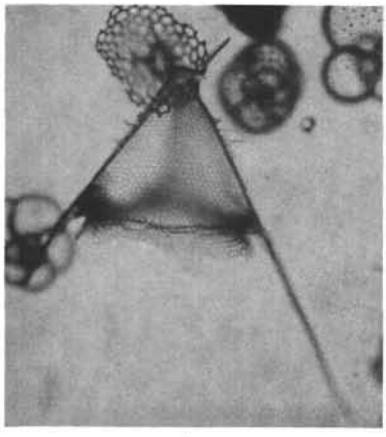
PLATE 17
(Magnification ×150)

Figure 1	Eucyrtid 2 gen. and sp. indet.; 262-6, CC.
Figure 2	*Dictyophimus crisiae* Ehrenberg; 262-1-2, 89-91.
Figure 3	*Stichocampe bironec* Renz; 262-7, CC.
Figure 4	*Artopilium* sp. aff. *A. elegans* Haeckel; 262-1-2, 89-91.
Figure 5	*Dictyoceras virchowii* Haeckel; 262-1-2, 89-91.
Figure 6	*Pterocanium bicorne* Haeckel; 260-1-1, 17-19.
Figure 7	*Pterocanium trilobum* (Haeckel); 262-1-2, 31-33.
Figure 8	*Pterocanium praetextum* (Ehrenberg); 262-1-2, 89-91.
Figure 9	*Pterocanium orcinum* Haeckel; 260-1-3, 25-27.
Figure 10	*Corocalyptra killmari* Renz; 262-14, CC.
Figure 11 a, b	*Archipilium* sp. aff. *A. macropus* (Haeckel), (a) 260-1-1, 17-19. (b) apical view, 260-1-1, 17-19.
Figure 12 a, b	*Lithomitra lineata* (Ehrenberg). (a) 262-2-2, 94-96. (b) 262-2-2, 94-96.
Figure 13	*Artostrobium auritum* (Ehrenberg); 262-1-4, 39-41.
Figure 14	*Siphocampe corbula* (Harting); 262-1-2, 31-33.
Figure 15	*Spirocyrtis* sp. aff. *S. scalaris* Haeckel; 262-1-2, 89-91.
Figure 16	*Spirocyrtis scalaris* Haeckel; 262-1-2, 89-91.
Figure 17	*Carpocanistrum* sp.; 262-1-2, 89-91.
Figure 18	*Dictyophimus* ? sp. indet.; 262-3-2, 84-86.
Figure 19	*Litharachnium tentorium* Haeckel; 262-1-2, 89-91.
Figure 20	*Cornutella* sp. aff. *C. longisetta* Ehrenberg; 261-1, CC.
Figure 21	*Carpocanarium papillosum* (Ehrenberg); 262-3-2, 84-86.
Figure 22	*Artostrobium miralestense* (Campbell and Clark); 262-1-2, 89-91.
Figure 23	*Cinclopyramis infundibulum* Haeckel; 262-3-2, 84-86.
Figure 24	*Cornutella profunda* var. a Ehrenberg; 262-2, CC.
Figure 25	*Cornutella profunda* var. b Ehrenberg; 262-2-2, 94-96.
Figure 26	*Bathropyramis* sp.; 260-1-1, 17-19.
Figure 27	*Bathropyramis ramosa* Haeckel; 262-2, CC.

PLATE 17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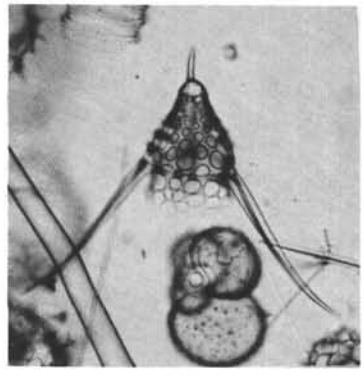
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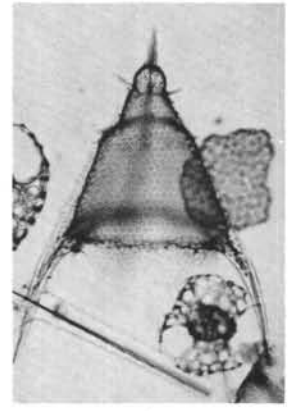
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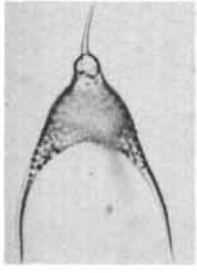
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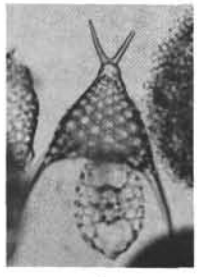
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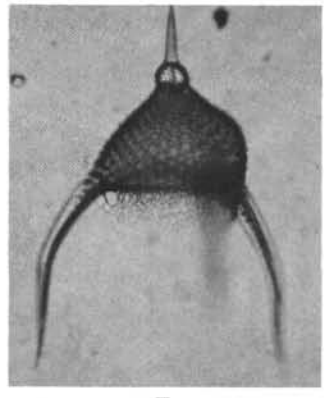
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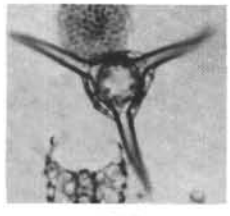
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12a


12b


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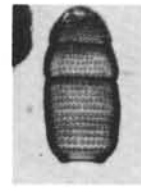
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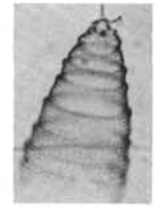
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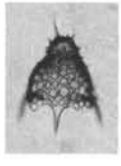
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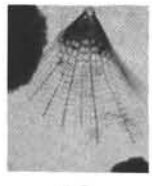
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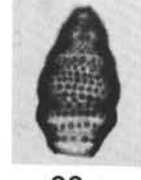
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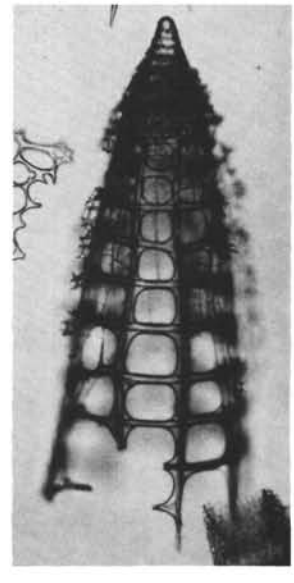
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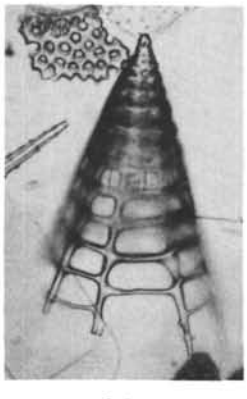
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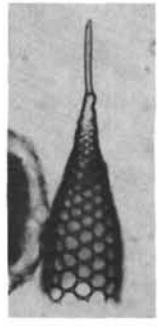
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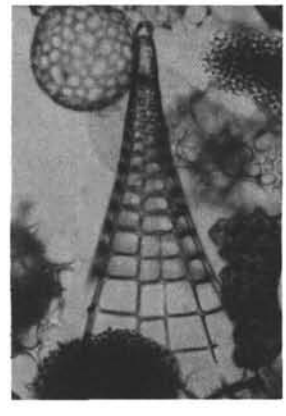
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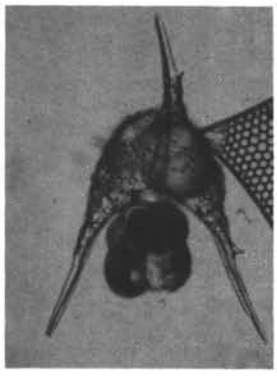
PLATE 18
(Magnification ×150)

Figure 1	*Verticillata hexacantha* Popofsky; 262-2-2, 94-96.
Figure 2	*Pseudodictyophimus gracilipes* (Bailey) *tetracanthus* (Popofsky); 262-1-2, 89-91.
Figure 3	*Clathrocanium* sp.; 262-1-2, 89-91.
Figure 4	*Clathrocorys* sp.; 262-1-2, 89-91.
Figure 5	*Callimitra* sp.; 262-1-4, 39-41.
Figure 6	*Lophophaena cyclindrica* (Cleve); 262-2-2, 94-96.
Figure 7	*Peromelissa phalacra* (Haeckel), emend. Petrushevskaya; 262-1-4, 39-41.
Figure 8	*Psilomelissa calvata* Haeckel; 262-3-2, 84-86.
Figure 9	*Acrobotrys* sp.; 262-1-2, 89-91.
Figure 10	*Botryopyle dictyocephalus* Haeckel; 262-3-2, 84-86.
Figure 11	*Dictyophimus tetracanthus* Popofsky; 262-1-2, 89-91.
Figure 12	?*Amphiplecta acrostoma* Haeckel; 262-1-2, 89-91.
Figure 13	*Lophophaenoma* sp. aff. *L. witjazii* Petrushevskaya; 262-1-2, 31-33.
Figure 14	*Lithomelissa monoceras* Popofsky; 262-1-2, 89-91.
Figure 15	*Botryocyrtis* sp.; 262-1-2, 89-91.
Figure 16	*Centrobotrys thermophila* Petrushevskaya; 262-2-2, 94-96.
Figure 17	*Sethophormis rotula* Haeckel; 262-1-2, 89-91.
Figure 18 a, b	*Sethophormis pentalactis* Haeckel; (a) 262-1-2, 89-91. (b) 262-1, CC.
Figure 19	*Botryocyrtis quinaria* Ehrenberg; 262-2-2, 94-96.
Figure 20	*Botryopyle dictyocephalus* Haeckel; 262-1-2, 89-91.
Figure 21	*Sethophormis* sp.; 262-1-2, 31-33.
Figure 22	*Sethophormis* sp. aff. *S. pentalactis* Haeckel; 262-2-2, 94-96.
Figure 23	*Lamprotripus butschlii* (Haeckel); 262-1-2, 89-91.
Figure 24	*Theophormis callipilium* Haeckel; 262-4, CC.

PLATE 18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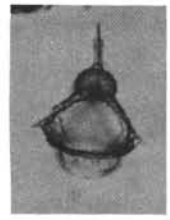
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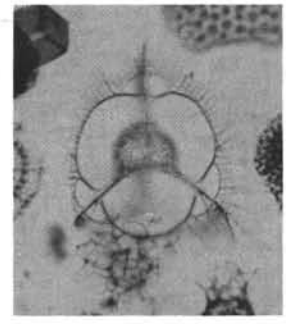
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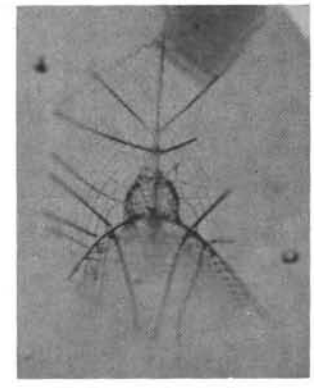
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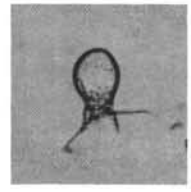
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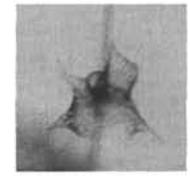
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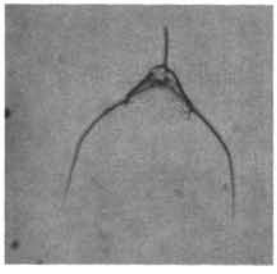
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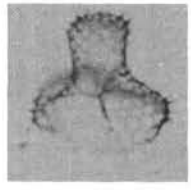
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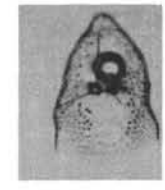
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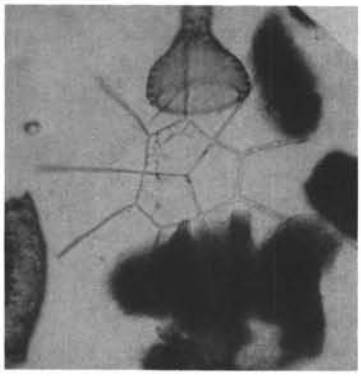
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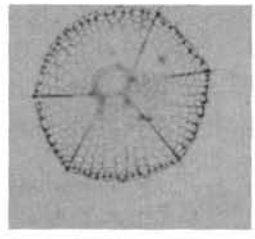
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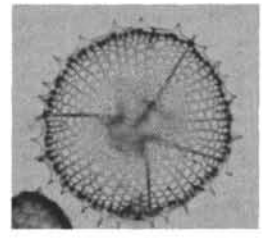
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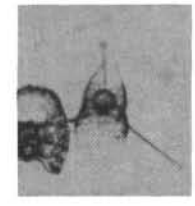
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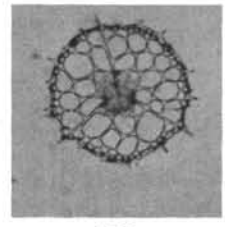
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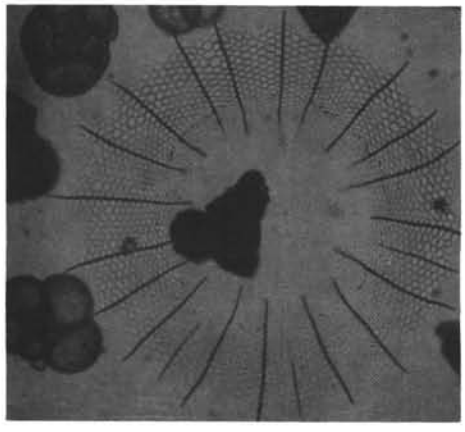
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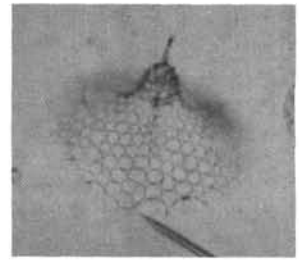
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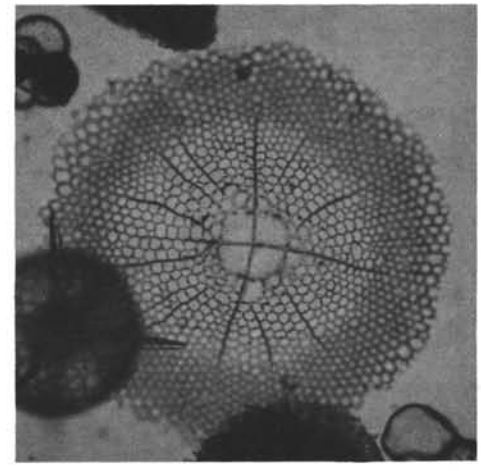
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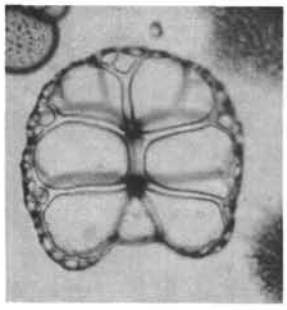
PLATE 19
(Magnification ×150)

Figure 1	*Liriospyris reticulata* (Ehrenberg); 262-1-2, 89-91.
Figure 2	*Liriospyris costata* (Haeckel); 262-2-2, 94-96.
Figure 3	*Liriospyris* sp. 1; 262-1-2, 89-91.
Figure 4	*Liriospyris* sp. 2; 262-1, CC.
Figure 5	*Tympanidium foliosum* Haeckel; 262-1-2, 89-91.
Figure 6	*Nephrospyris renilla* Haeckel; 262-1-2, 89-91.
Figure 7	*Giraffospyris laterispina* Goll; 262-1-2, 89-91.
Figure 8	*Ceratospyris* sp. aff. *C.* sp. A; 262-1-4, 39-41.
Figure 9	*Ceratospyris* sp.; 262-1-2, 89-91.
Figure 10	*Giraffospyris angulata* (Haeckel); 262-1-2, 89-91.
Figure 11	*Dendrospyris* sp. aff. *D. binapertonis* Goll; 262-3-2, 84-86.
Figure 12	*Tholospyris* sp.; 262-1-2, 89-91.
Figure 13	*Tholospyris scaphipes* (Haeckel); 262-1-2, 31-33.
Figure 14	?*Dendrospyris* sp. aff. *D. stabilis* Goll; 262-1-2, 31-33.
Figure 15	*Zygocircus* sp. 1 aff. *Z. capulosus* Popofsky; 262-1-2, 31-33.
Figure 16	*Theoconus hertwigii* (Haeckel); 262-1-2, 31-33.
Figure 17	*Anthocyrtidium zanguebaricum* (Ehrenberg); 262-1-2, 89-91.
Figure 18	*Tetracorethra tetracorethra* (Haeckel), emend. Petrushevskaya; 262-1-2, 31-33.
Figure 19 a, b	*Cantharospyris platybursa* Haeckel; (a) 262-1-2, 89-91. (b) 262-1-2, 31-33.
Figure 20	*Zygocircus capulosus* Popofsky; 262-1-2, 89-91.
Figure 21	*Lamprocyclas maritalis* Haeckel; 262-1-2, 89-91.
Figure 22	*Anthocyrtidium ophirense* (Ehrenberg); 262-1-2, 31-33.
Figure 23	*Zygocircus* sp. 2 aff. *Z. capulosus* Popofsky; 262-1-2, 31-33.
Figure 24	*Zygocircus* sp. cf. *Z. piscicaudatus* Popofsky; 262-1-2, 31-33.
Figure 25	*Lamprocyrtis heteroporus* (Hays); 262-2-2, 94-96.
Figure 26	*Lamprocyrtis haysi* Kling; 262-1-2, 89-91.
Figure 27	*Theoconus junonis* Haeckel; 262-1-2, 89-91.
Figure 28	*Theocorythium trachelium* (Ehrenberg); 262-2-2, 94-96.

PLATE 19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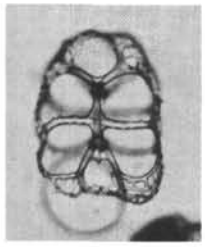
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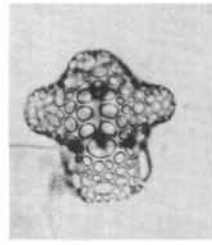
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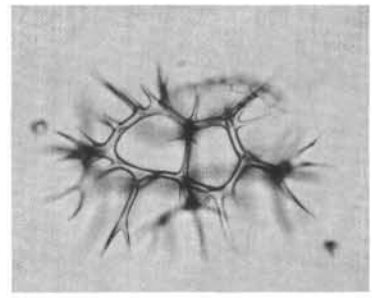
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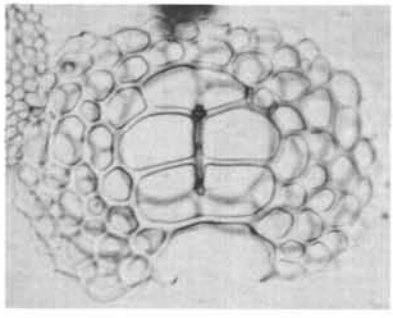
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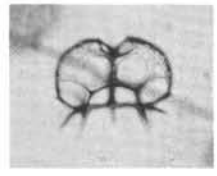
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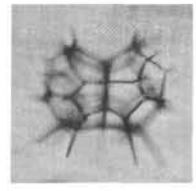
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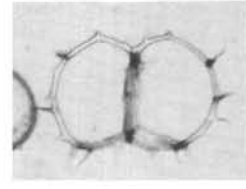
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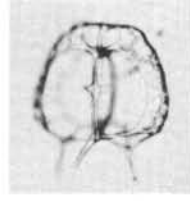
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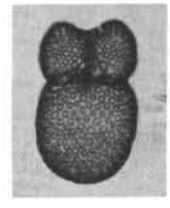
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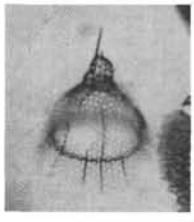
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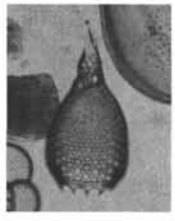
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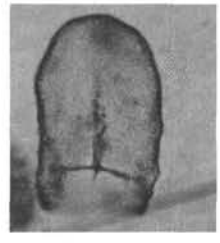
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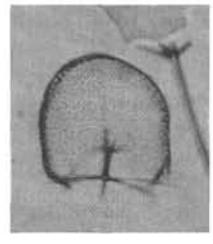
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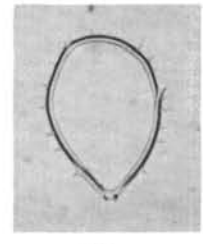
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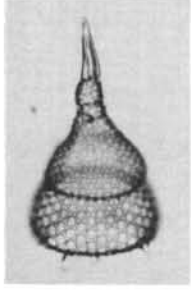
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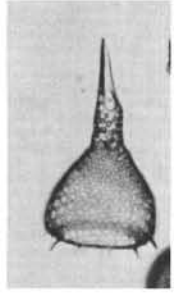
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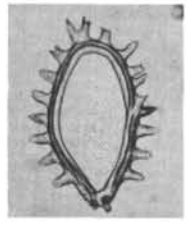
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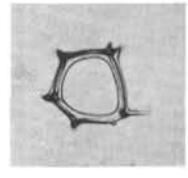
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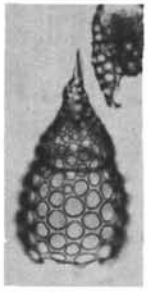
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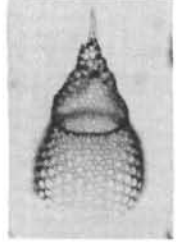
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PLATE 20

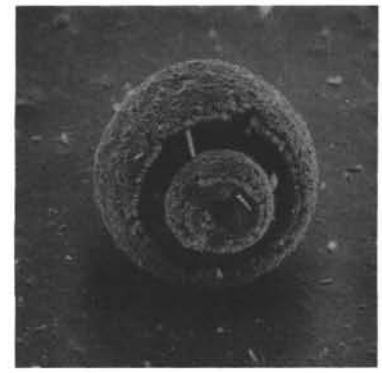
Siliceous Cretaceous Microfossils—Radiolaria?. Scanning electron photomicrographs provided by H. M. Bolli, Swiss Federal Institute of Technology, Zurich. All specimens from Sample 206-15, CC.

Figure 1	×500.
Figure 2	×500.
Figure 3	×500.
Figure 4	×450.
Figure 5	×550.
Figure 6	×500.
Figure 7	×1000.
Figure 8	×500.
Figure 9	×500.
Figure 10	×2500.
Figure 11	×1000.
Figure 12	×2500.

PLATE 20

1

2



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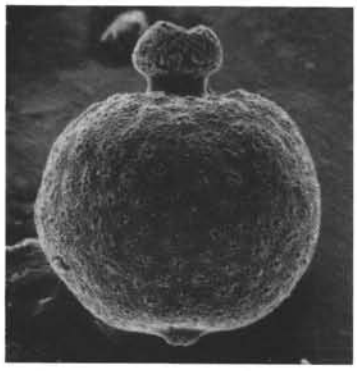

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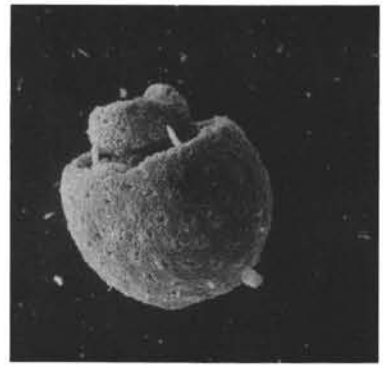

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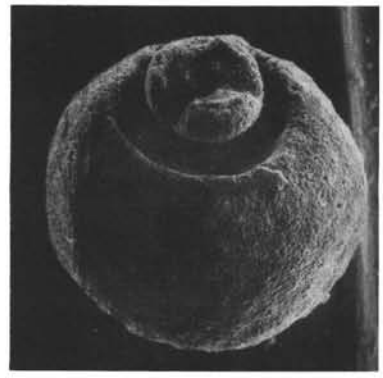

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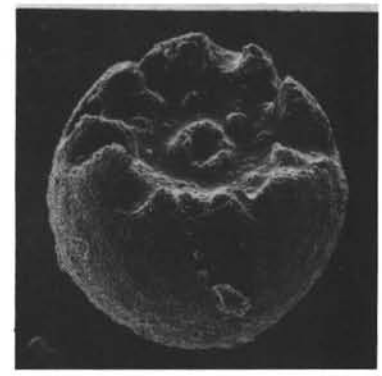

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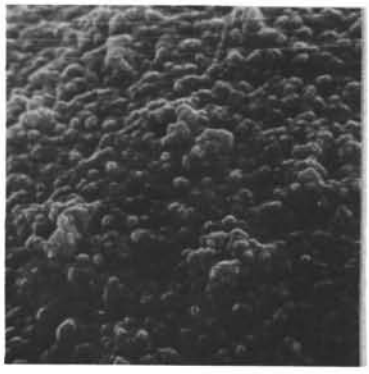

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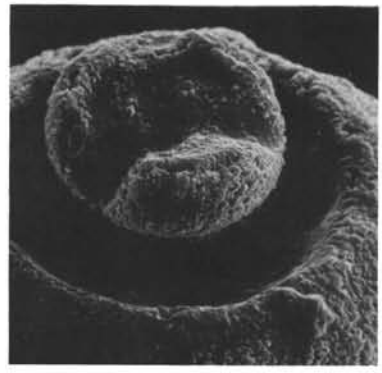

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