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33. Data Report: Radiolarians in Sediments from Palmer Deep, Antarctica, Leg 178, Site 1098[1]

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INTRODUCTION

Palmer Deep is a series of three glacially overdeepened basins on the Antarctic Peninsula shelf, ~20 km southwest of Anvers Island. Site 1098 (64°51.72′S, 64°12.48′W) was drilled in the shallowest basin, Basin I, at 1012 m water depth. The sediment recovered was primarily laminated, siliceous, biogenic, pelagic muds alternating with siliciclastic hemipelagic sediments (Barker, Camerlenghi, Acton, et al., 1999). Sedimentation rates of 0.1725 cm/yr in the upper 25 m and 0.7–0.80 cm/yr in the lower 25 m of the core have been estimated from ^{14}C (Domack et al., 2001). The oldest datable sediments have an age of ~13 ka and were underlain by diamicton sediments of the last glacial maximum (Domack et al., 2001).

The large-scale water-mass distribution and circulation in the vicinity of Palmer Deep is dominated by Circumpolar Deep Water (CDW) below 200 m (Hofmann et al., 1996). Palmer Deep is too far from the coast to be influenced by glacial meltwater and cold-tongue generation associated with it (Domack and Williams, 1990; Dixon and Domack, 1991). Circulation patterns in the Palmer Deep area are not well understood, but evidence suggests southward flow across Palmer Deep from Anvers Island to Renaud Island (Kock and Stein, 1978). The water south of Anvers Island is nearly open with loose pack ice from February through May. The area is covered with sea ice beginning in June (Gloersen et al., 1992; Leventer et al., 1996).

Micropaleontologic data from the work of Leventer et al. (1996) on a 9-m piston core has revealed circulation and climate patterns for the past 3700 yr in the Palmer Deep. The benthic foraminifer assemblage is

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dominated by two taxa, *Bulimina aculeata* and *Bolivina pseudopunctata,* which are inversely related. High relative abundances of *B. aculeata* occur cyclically over a period of ~230 yr. The assemblage associated with high abundance of *B. aculeata* in Palmer Deep resembles that from the Bellingshausen shelf, which is associated with CDW. In addition to the faunal evidence, hydrographic data indicate incursions of CDW into Palmer Deep (Leventer et al., 1996). A distinctive diatom assemblage dominated by a single genus was associated with peaks in *B. aculeata,* whereas a few different assemblages were associated with lows in *B. aculeata.* Leventer et al. (1996) interpreted the variability in diatom assemblages as an indication of changes in productivity associated with changes in water column stability.

Abelmann and Gowing (1997) studied the horizontal and vertical distributions of radiolarians in the Atlantic sector of the Southern Ocean. They show that the spatial distribution of radiolarian assemblages reflects hydrographic boundaries. In a transect from the subtropical Atlantic to polar Antarctic zones, radiolarians in the upper 1000 m of the water column occurred in distinct surface and deep-living assemblages related to water depth, temperature, salinity, and nutrient content. Living assemblages resembled those preserved in underlying surface sediments (Abelmann and Gowing, 1997).

Circumantarctic coastal sediments from neritic environments contained a distinctive assemblage dominated by the *Phormacantha hystrix*/*Plectacantha oikiskos* group and *Rhizoplegma boreale* (Nishimura et al., 1997). Low diversity and species compositions distinguished the coastal sediments from the typical pelagic Antarctic assemblages. Factors that controlled the assemblages were water depth, proximity to the coast, occurrence of sea ice, and steepness of topography, rather than temperature and salinity. Nishimura et al. (1997) found a gradient of sorts from deep-water sites containing diverse assemblages typical of pelagic environments to coastal sites with low diversity assemblages dominated by *P. hystrix*/*P. oikiskos* group and *R. boreale*. In general, sites between these two extremes had increased proportions of the coastal assemblage with decreasing water depth (Nishimura et al., 1997). At a site near Hole 1098 (GC905), they showed that the relative abundance of the coastal assemblage increased downcore (Nishimura et al., 1997). The purpose of the research presented here was to make a cursory investigation into the radiolarian assemblages as possible paleoenvironmental indicators.

METHODS

All the samples used for this research were obtained by scraping along the entire length of every 1.5-m section of each core taken from Hole 1098B. The sediments were treated with a solution of 10% hydrogen peroxide neutralized with sodium pyrophosphate (Sanfilippo et al., 1985; Boltovskoy, 1999). Successive treatments were conducted until the radiolarian skeletons were clean. The carbonate fraction was removed with hydrochloric acid. Sediments were sieved over a 45-µm screen, and strewn slides of the >45-µm fraction were mounted with Canada balsam. Analyses of the slides were made using a Zeiss Photomicroscope I at 100×. All skeletons (one slide per sample) were identified to the lowest taxonomic level possible and counted. Qualitative estimates of total radiolarian abundance were made as relative percent of skeletons of total grains on a slide. This approach was used because the sediment was sieved and radiolarian abundance was “few” (100–500 skeletons per slide) in all samples. Fifty-two taxa were counted. Preservation was estimated using the following criteria:

G = good; no sign of dissolution and only minor fragmentation.
M = moderate; dissolution and obvious fragmentation.

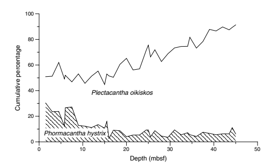
RESULTS AND DISCUSSION

Most of the >45-µm fraction consisted of sediment grains, diatom frustules, and sponge spicules. The radiolarian fraction was comprised of <1–10% of the >45–µm particles, and preservation was good for the majority of samples (Table T1). The assemblage was dominated by *P. oikiskos* and *P. hystrix* (Fig. F1). Their cumulative percentage increased downcore, whereas the percentage of *P. hystrix* decreased. Diversity (Margalef, 1958) (Fig. F2) ranged between 1% and 5% and decreased downcore. For comparison, diversity of radiolarians in sediment-trap samples collected from Santa Barbara Basin, California, ranged from 10% to 20% (Lange et al., 1997). The dominance by the *P. oikiskos* and *P. hystrix* and low diversity reflect the coastal setting (Nishimura et al., 1997) and diminished open-ocean influence downcore. Estimating the diversity for a coastal, neritic, and shallow neritic site in Nishimura et al. (1997) using Margalef (1958), we arrive at 12.1, 8.4, and 4.6, respectively. These estimates were derived using the number of species in assemblages from the deep plain north of the South Shetland Trench (GC903; 70 species), Bransfield Strait (GC901; 49 species), and South Orkney Islands (GC808; 27 species) out of 300 specimens counted (Nishimura et al., 1997). Results from this study indicate that Site 1098 contains a more extreme coastal assemblage than those reported by Nishimura et al. (1997). This conclusion is further supported by the relative abundance of the coastal assemblage found at Site 1098, which reached over 90% at the bottom of Hole 1098B.

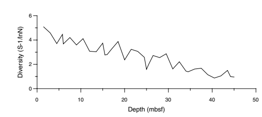
Although a gradient in the relative abundance of the coastal assemblages seems to exist and is confirmed by results presented here, the distribution of this assemblage around Antarctica exhibits important exceptions. Nishimura et al. (1997) did not find the assemblages in the Ross Sea, and in Prydz Bay it was diluted by *Antarctissa* species.

T1. Abundance of radiolarian skeletons in scrape samples, Hole 1098B, p. 13.

F1. Cumulative percentage of *Phormacantha hystrix* and *Plectacantha oikiskos,* p. 11.



F2. Radiolarians from scrape samples, p. 12.



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APPENDIX

Radiolarian species list for Hole 1098B. Species are arranged alphabetically within the Spumellarian and Nassellarian groups. The number preceding each species is the same as in Table **T1**.

Spumellarians

32. *Acanthosphaera corloca* (Popofsky)
Boltovskoy and Riedel, 1980, p. 107 (fig. 2; pl. 1, fig. 20); Abelmann and Gowing, 1997, p. 22 (pl. I, fig. 5).

33. *Actinomma* spp.
Abelmann and Gowing, 1997, (pl. I, figs. 2, 3).
Remarks: Specimens of this species group resemble the juvenile stages of *Actinomma antarctica* and *Actimomma medianum*
35. *Actinomma* sp. cf. *A. leptodermum* (Jørgensen)
Abelmann and Gowing, 1997, p. 22 (pl. I, fig. 4); *Actinomma* spp. 1, Morley, 1977, p. 253 (pl. 3, figs. 1–3 [with description and synonymy]).

12. *Cromyechinus antarctica* (Dreyer)
Petrushevskaya, 1967, pp. 22–27 (figs. 13, 14); *Prunopyle antarctica* Dreyer, Nigrini and Moore, 1979, p. S127 (pl. 16, fig. 4).

14. *Larcopyle butschlii* (Dreyer)
Dreyer, 1889, p. 124 (pl. 10, fig. 70); Benson, 1966, p. 280 (pl. 19, figs. 3–5); Nigrini and Moore, 1979, p. S131 (pl. 17, fig. 1a, 1b).

30. *Lithelius minor* (Jørgensen)
Jørgensen, 1899, p. 65 (pl. 5, fig. 24); Benson, 1966, p. 262 (pl. 17, figs. 9, 10); Nigrini and Moore, 1979, p. S135 (pl. 17, figs. 3–4b); Abelmann, 1992, p. 380 (pl. 2, fig. 13).

23. *Lithelius nautiloides* (Popofsky)
Nigrini and Moore, 1979, p. S137 (pl. 17, fig. 5).

46. *Lithelius* sp. 1
Abelmann and Gowing, 1997, p. 25 (pl. I, fig. 9).

40. *Octopyle stenozona* (Haeckel)
Haeckel, 1887, p. 652 (pl. 9, fig. 11); Benson, 1966, p. 251 (pl. 16, figs. 3, 4); Nigrini and Moore, 1979, p. S123 (pl. 16, fig. 2a, 2b); Abelmann, 1992, p. 380 (pl. 1, fig. 9).

13. *Phorticium clevei* (Haeckel)
Petrushevskaya, 1967, p. 58 (pl. 32, figs. I, II; pl. 34, figs. I–V); Abelmann and Gowing, 1997, p. 25.

39. *Porodiscus* sp.
Nigrini and Moore, 1979, p. S107 (pl. 14, figs. 1–2b).

8. *Rhizoplegma boreale* (Cleve)
Jørgensen, 1899, p. 61 (pl. 9, fig. 38); Jørgensen, 1905, p. 118 (pl. 10, figs. 38e, 38f); Abelmann, 1992, p. 382 (pl. 1, fig. 13); Abelmann and Gowing, 1997, p. 25. *Hexadoras borealis* Cleve, 1899, p. 30 (pl. 2, figs. 2f, 4a–c).

7. *Spongodiscid* sp.
Spongotrochus. sp. 1, Abelmann and Gowing, 1997, p. 25 (pl. II, fig. 4).

16. *Spongopyle osculosa* Dreyer
Dreyer, 1889, p. 42 (pl. 11, figs. 99, 100); Nigrini and Moore, 1979, pp. S115 and S116 (pl. 15, fig. 1 [with synonymy]); Abelmann, 1992, p. 382.

19. *Spongotrochus glacialis* (Popofsky group)
Spongotrochus glacialis Popofsky, 1908, p. 228 (pl. 26, fig. 8; pl. 27, fig. 1; pl. 28, fig. 2); Petrushevskaya, 1975, p. 575 (pl. 5, fig. 8; pl. 35, figs. 1–6); Nigrini

and Moore, 1979, pp. S117 and S118 (pl. 15, fig. 2a, 2d [with synonymy]); Abelmann, 1992, p. 382.

29. *Spongotrochus* sp. (?) cf. *S. venustum* (Bailey)
Nigrini and Moore, 1979, p. S119 (pl. 15, fig. 3a, 3b); Abelmann and Gowing, 1997, p. 25 (pl. II, figs. 1–3).

25. *Spongurus pylomaticus* (Riedel)
Spongurus pylomaticus Riedel, 1958, p. 226 (pl. 1, figs. 10, 11); Nigrini and Moore, 1979, p. S65 (pl. 8, fig. 3a, 3b [with synonymy]); Abelmann, 1992, p. 382 (pl. 1, fig. 11).

26. *Spongurus* sp.
Abelmann, 1992 (pl. 1, fig. 12).

49. *Stylochlamydium asteriscus* (Haeckel)
Nigrini and Moore, 1979, p. S113 (pl. 14, fig. 5).

21. *Sylodictya multispina* (Haeckel)
Boltovskoy and Riedel, 1980, p. 118 (pl. 4, fig. 4a, 4b).

51. *Tetrapyle octacantha* (Mòller)
Nigrini and Moore, 1979, p. S125 (pl. 16, fig. 3a, 3b); Abelmann and Gowing, 1997, p. 25, (pl. II, fig. 9).

Nassellarians

47. *Amphiplecta* sp.
Petrushevskaya, 1971 (pl. 54, figs. II, V).

5. *Antarctissa denticulata* (Ehrenberg)
Abelmann, 1992, p. 378 (pl. 3, figs. 17, 18); Antarctissa denticulata (Ehrenberg) Petrushevskaya, 1967, p. 87 (pl. 49, figs. I–IV); Lithobotrys denticulata Ehrenberg, 1844, p. 203; Lithopera denticulata (Ehr.) Ehrenberg, 1873 (pl. 12, fig. 4).

4. *Antarctissa strelkovi* (Petrushevskaya)
Petrushevskaya, 1967, p. 89 (pl. 51, figs. III–VI).

28. *Arachnocorallium calvata* group (Petrushevskaya)
Petrushevskaya, 1971, p. 136 (pl. 70, figs. I–VIII); Boltovskoy and Riedel, 1987, (pl. III, fig. 24).

24. *Botryostrobus auritus/australis* (Ehrenberg) group Nigrini
Abelmann, 1992, p. 378 (pl. 5, figs. 1–12).
Remarks: Includes forms similar to *Lithamphora furcaspiculata* and *Phormostichoartus corbula*.
20. *Cycladophora bicornis* (Popofsky) Lombari and Lazarus
Lombari and Lazarus, 1988, p. 106 (pl. 5, figs. 9–12).

34. *Cycladophora davisiana* (Ehrenberg)
Ehrenberg, 1861, p. 297; Petrushevskaya, 1967, p. 122 (pl. 69, figs. I–VII).

48. *Cycladophora* sp.
Skeletons that fit the genus concept in Lombari and Lazarus (1988), but not *C. bicornis* or *C. davisiana*.

52. *Cyrtolagena laguncula* Haeckel
Haeckel, 1887, p. 1451 (pl. 75, fig. 10); Petrushevskaya, 1971, p. 171 (pl. 89, figs. I–III).

9. *Dictyophimus gracilipes* Bailey
Petrushevskaya, 1967, pp. 65–67 (figs. 38, 39 [with synonymy]); Abelmann and Gowing, 1997, p. 22.

45. *Dictyophimus* sp.
Includes *Dictyophimus* sp. 4 in Abelmann, 1992, p. 380 (pl. 4, fig. 6).

31. *Druppatractus irregularis* Popofsky

Boltovskoy and Riedel, 1987, (pl. I, fig. 21).

44. *Eucecryphalus* sp. cf. *E. histricosus* Hòlsemann
Hòlsemann, 1963, p. 26 (figs. 16–17); Abelmann, 1992, p. 380 (pl. 4, fig. 13, pl. 5, fig. 14); Artostrobus joergenseni Petrushevskaya, 1967, p. 99 (pl. 57, figs I–X).

41. *Eucyrtidium hexastichum* (Haeckel)
Petrushevskaya, 1971, p. 221 (fig. 99); Renz, 1976, p. 132 (pl. 5, fig. 9).

43. *Eucyrtidium* sp. cf. *E. teuscheri*
Abelmann and Gowing, 1997, p. 22 (pl. II, fig. 14); *Eucyrtidium teuscheri teuscheri* (Haeckel) Caulet, 1986, p. 851 (pl. 5, figs. 5–8).

10. *Helotholus histricosa*
Jørgensen, 1905, p. 137 (pl. 16, figs. 86–88); Kling, 1977 (pl. 1, fig. 6).

50. *Lithomelissa brevispicula* Popofsky
Petrushevskaya, 1967, pp. 78 and 79 (fig. 44).

3. *Lithomelissa setosa* (Jørgensen)
Jørgensen, 1899, pp. 81–83 (pl. 4, figs. 21, 22); Bjørklund, 1974, pp. 24–26 (fig. 8 [with synonymy]); Abelmann, 1992, p. 380 (pl. 3, fig. 14); *Lithomelissa* (?) sp. *A,* Petruashevskaya, 1967, p. 79 (pl. 45, figs. I–VIII; pl. 46, figs. I–III).

42. *Lithomelissa thoracites* Haeckel
Popofsky, 1913, p. 337 (figs. 44–47); Abelmann and Gowing, 1997, p. 25.

6. *Lithomelissa* spp.
Includes *Lithomelissa* sp. 1, Abelmann and Gowing, 1997, p. 25 (pl. II, figs. 11–13).

15. *Peridium spinipes* (Haeckel)
Boltovskoy and Riedel, 1980, p. 122 (pl. 5, fig. 2).

2. *Phormacantha hystrix* (Jørgensen)
Peridium hystrix Jørgensen, 1899, p. 76; *Phormacantha hystrix* Jørgensen, 1905, p. 132 (pl. 14, figs. 59–63); Bøjrklund, 1976, p. 1124 (pl. 6, figs. 12–18); Abelmann, 1992, pp. 380 and 381 (pl. 3, fig. 4).

11. *Phormostichoartus corbula* (Harting)
Lithocampe corbula Harting, 1863, p. 12 (pl. 1, fig. 21); *Siphocampe corbula* (Harting) Nigrini, 1967, p. 85 (pl. 8, fig. 5; pl. 9, fig. 3); *Phormostichoartus corbula* (Harting) Nigrini, 1977, p. 252 (pl. 1, fig. 10); Nigrini and Moore, 1979, p. N103 (pl. 27, fig. 3).

1. *Plectacantha oikiskos* (Jørgensen)
Jørgensen, 1905, p. 131 (pl. 13, figs. 50–57); Bjørklund, 1976, p. 1124, (pl. 6, figs. 8–10); Abelmann, 1992, p. 382, (pl. 3, figs. 1, 2).

36. *Plectacantha* sp.
Skeletons that fit the genus concept for *Plectacantha* Jørgensen in Petrushevskaya, 1971, p. 139.

18. *Saccospyris antarctica* Haecker
Petrushevskaya, 1967, p. 151 (pl. 85, fig. II); Abelmann, 1992, p. 382 (pl. 3, fig. 11).

22. *Sethoconus tabulatus* (Ehrenberg)
Petrushevskaya, 1971 (pl. 92, figs. X, XI); Boltovskoy and Riedel, 1987 (pl. V, fig. 16).

27. *Siphocampe arachnea* (Ehrenberg) group
Nigrini, 1977, p. 255 (pl. 3, figs. 7, 8 [with synonymy]); Abelmann, 1992, p. 382 (pl. 5, fig. 15).

17. Spyrid group
Includes *Amphispyris* spp., *Lophospyris* spp., and *Phormospyris* spp.

37. *Theocalyptra bicornis* (Popofsky)

Pterocorys bicornis Popofsky, 1908, p. 288 (pl. 34, figs. 7, 8); *Theocalyptra bicornis* (Popofsky) Riedel, 1958, p. 240 (pl. 4, fig. 4).

38. *Tricerospyris antarctica* Haecker

Riedel, 1958, p. 230, (figs. 3–5; pl. 2, figs. 6, 7); Abelmann, 1992, p. 382 (pl. 3, fig. 12); *Phormospyris stabilis* (Goll) *antarctica* (Haecker); Nigrini and Moore, 1979, p. N17 and N18 (pl. 20, fig. 1a–d [with synonymy]).

Figure F1. Cumulative percentage of *Phormacantha hystrix* (shaded) and *Plectacantha oikiskos* in Hole 1098B.

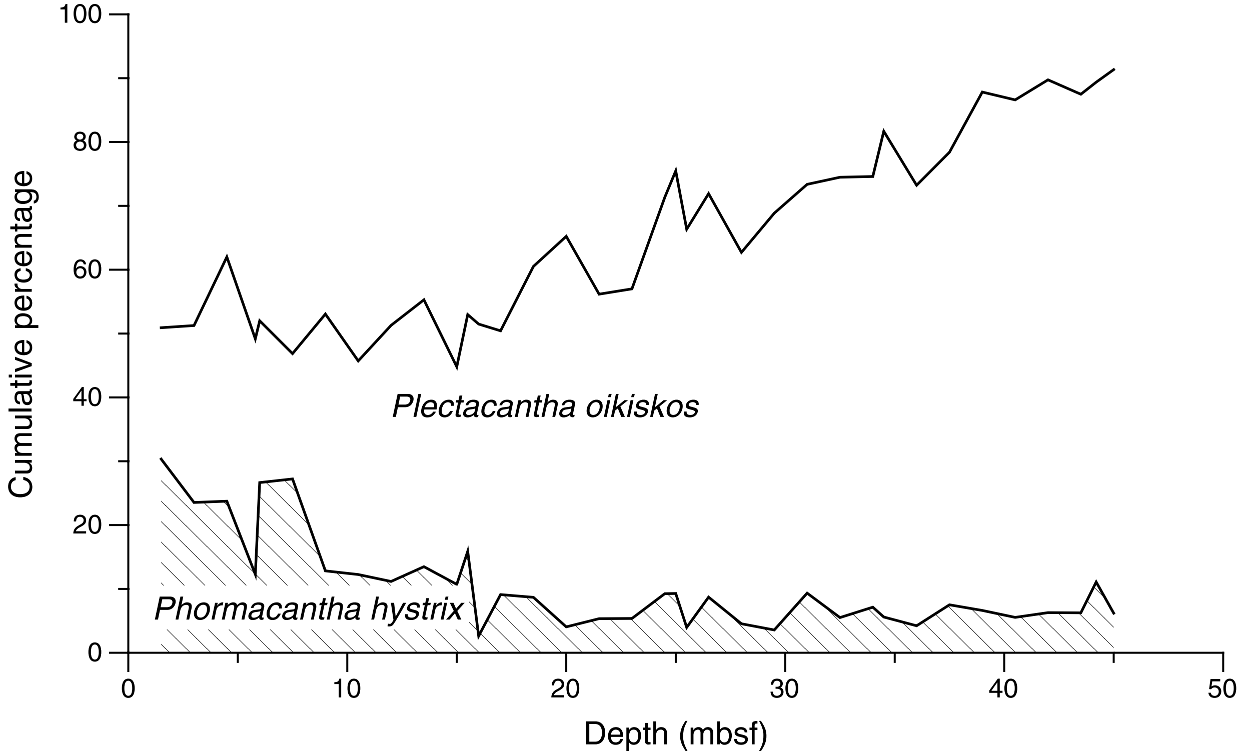

Figure F2. Diversity of radiolarians from scrape samples from Hole 1098B. Diversity is calculated as (S-1)/lnN, where *S* = number of taxa and *N* = number of skeletons (Margalef, 1958).

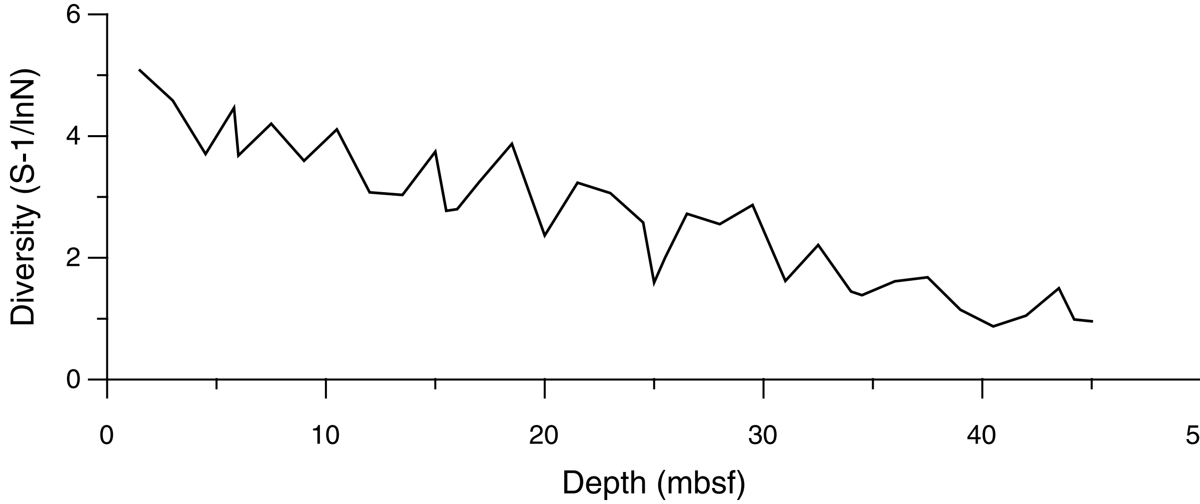

Table T1. Abundance of radiolarian skeletons in scrape samples, Hole 1098B.

Hole, core, section	Depth (mbsf)	Abundance	Preservation	1. *Plectacantha oikiskos*	2. *Phormacantha hystrix*	3. *Lithomelissa setosa*	4. *Antarctissa strelkovi*	5. *Antarctissa denticulata*	6. *Lithomelissa* sp.	7. *Spongodiscid* sp.	8. *Rhizoplegma boreale*	9. *Dictyophimus gracilipes*	10. *Helotholus histricosa*	11. *Phormostichoartus corbula*	12. *Cromyechinus antarctica*	13. *Phorticium clevei*	14. *Larcopyle butschlii*	15. *Peridium spinipes*	16. *Spongopyle osculosa*	17. *Spyrid* group	18. *Saccospyris antarctica*	19. *Spongotrochus glacialis* group	20. *Cycladophora bicornis*	21. *Stylodictya multispina*	22. *Sethoconus tabulatus*	23. *Lithelius nautiloides*	24. *Botryostrobus auritus/australis* group	25. *Spongurus pylomaticus*	26. *Spongurus* sp.	27. *Siphocampe arachnea* group	28. *Arachnocorallium calvata* gp.	29. *Spongotrochus* sp. (?) cf. *S.venustum*	30. *Lithelius* minor	31. *Druppatractis irregularis*	32. *Acanthosphaera corloca*	33. *Actinomma* spp.	34. *Cycladophora davisiana*
178-1098B-																																					
1H-1	1.5	5%–10%	G	112	165	125	14	14	10	7	13	1				4	4		1	4		1	1			9	8	3	2		1		2			7	
1H-2	3.0	5%–10%	G	100	85	95	7	9	6	1	12	1			1	1			1	2	1	2	1	5		6	6		2				1			2	
1H-3	4.5	5%–10%	G	145	90	92	6	5	2	1	12	3	1		3	3	1	1				2		1			4		1				1	1		1	
1H-4	5.8	5%–10%	G	156	52	92	8	11	6	2	21	1			3	8	5		2	2	2	2		5		6	9		4				1			5	
1H-CC	6.0	5%–10%	G	76	80	88	2		6	2	5	1			2	2	1	17	1	3			3				1							1		1	
2H-1	7.5	5%–10%	G	59	82	100		1	6	1	11	1	2	1	2	3	8	1		4		1		5		3	2	1									
2H-2	9.0	5%–10%	G	138	44	90		7	8	4	6				3	7	4	8		3		1		2		2	8	1				1					
2H-3	10.5	5%–10%	G	90	33	70		15	9	5	1	1	1		2		4	4	3	3		6		2		5	2	3				2	3			2	
2H-4	12.0	5%–10%	G	140	39	116		6		5	7				4	5	1	4	1	2				3		2	7			1						3	
2H-5	13.5	5%–10%	G	158	51	101		10	4	6	16	2	1			5		1		3		1		2		2	7	1								7	
2H-6	15.0	5%–10%	G	121	38	122		20	2	6	12	1				3		1		3	1	1		4	1	5	7		1						1	4	1
2H-7	15.5	5%–10%	G	119	51	106		5		3	14	2	1				5			3	1	1		1		2	4	1								2	
2H-CC	16.0	<5%	G	148	8	105		2		3	14	4	1				3	2		3		1		4		1	2						1			1	
3H-1	17.0	<5%	G	145	32	107		18		1	7	2	3			7	4		1	3	2	5		7		2	1									1	1
3H-2	18.5	<5%	G	197	33	97	9	6	2	1	9	2	1			2		3	1	2	1	1	1	2		5	1					1	1		1	1	
3H-3	20.0	5%–10%	G	227	15	81	7	16	3		7	3		4		1	2			1				2				1				1					
3H-4	21.5	<5%	G	181	19	97	12	7	1	5	7	3				4	1	1	1	6		4		3		1		1					1	1			
3H-5	23.0	<5%	G	96	10	48	1	7		1	7						1	1	1		1	2		3		2	3			1			1				
3H-6	24.5	<5%	G	208	31	67		8	1	1	6	1		1	2		3	1				1		1			2					1					
3H-7	25.0	<5%	G–M	100	14	27		2						3	2					1		1		1													
3H-CC	25.5	>5%	G	252	16	115		2	3	1	7	1		2		1	2							1		1											
4H-1	26.5	<5%	G	225	31	71	2	1	1		7	5		3	1	1				1	1	2	1	1		2											
4H-2	28.0	<5%	G	64	5	24		3	1	2		2			2		1	1				2				1					2						
4H-3	29.5	<5%	G	346	19	129		8	1	2	3	4	1			5	1		1			1		1		3	2	1	1	1							
4H-4	31.0	<1%	M–G	89	13	25			2		4	2		1				2		1																	
4H-5	32.5	<1%	G	100	8	27			1	1	2					1				1		1	1	1	1												
4H-6	34.0	<1%	G	85	9	18	5	1			6	1			1																						
4H-7	34.5	<1%	G	245	18	46	4				3	1	1	3					1																		
5H-1	36.0	<1%	G	98	6	26		4			3			2					1	1	1																
5H-2	37.5	<1%	M	151	16	26		10	1		5	1		1		1			1																		
5H-3	39.0	<1%	G	367	30	41		6			5					1	1	1																			
5H-4	40.5	<1%	G	248	17	22		13			5				1																						
5H-5	42.0	<5%	G	252	19	13		11		1	4	2																									
5H-6	43.5	<5%	G	169	13	15	5	1			2	1	1	1																							
5H-7	44.2	<5%	G	339	48	23	6	5	1		11																										
5H-CC	45.0	<5%	G	453	33	25	14	5	1	1																											

Notes: Meters below seafloor = bottom depth of sample. G = good, M = medium.

Table T1 (continued).

Hole, core, section	Depth (mbsf)	Abundance	Preservation	35. *Actinomma* sp. cf. *A. leptodermum*	36. *Plectacantha* sp.	37. *Theocalyptra bicornis*	38. *Tricerospyris antarctica*	39. *Porodiscus* sp.	40. *Octopyle stenozona*	41. *Eucyrtidium hexastichum*	42. *Lithomelissa thoracites*	43. *Eucyrtidium* cf. *teuscheri*	44. *Eucecryphalus histricosus*	45. *Dictyophimus* sp.	46. *Lithelius* sp. 1	47. *Amphiplecta* sp.	48. *Cycladophora* sp.	49. *Stylochlamidium asteriscus*	50. *Antarctissa brevispina*	51. *Tetrapyle octacantha*	52. *Cyrtolagena laguncula*	Total
178-1098B-																						
1H-1	1.5	5%–10%	G	6	6			2			4		2	5	4			3	2	1	1	544
1H-2	3.0	5%–10%	G	5				1						5	1	1		1				361
1H-3	4.5	5%–10%	G	1													2					379
1H-4	5.8	5%–10%	G	6	1						3			1	5	4						423
1H-CC	6.0	5%–10%	G	2	3			1					2									300
2H-1	7.5	5%–10%	G	1	2	1					3	1										302
2H-2	9.0	5%–10%	G	5		1	1	1														345
2H-3	10.5	5%–10%	G						2	1												269
2H-4	12.0	5%–10%	G					1	2													349
2H-5	13.5	5%–10%	G			1																379
2H-6	15.0	5%–10%	G			2	1															358
2H-7	15.5	5%–10%	G																			321
2H-CC	16.0	<5%	G																			303
3H-1	17.0	<5%	G	2																		351
3H-2	18.5	<5%	G																			380
3H-3	20.0	5%–10%	G																			371
3H-4	21.5	<5%	G																			356
3H-5	23.0	<5%	G																			186
3H-6	24.5	<5%	G																			335
3H-7	25.0	<5%	G–M																			151
3H-CC	25.5	>5%	G																			404
4H-1	26.5	<5%	G																			356
4H-2	28.0	<5%	G																			110
4H-3	29.5	<5%	G																			530
4H-4	31.0	<1%	M–G																			139
4H-5	32.5	<1%	G																			145
4H-6	34.0	<1%	G																			126
4H-7	34.5	<1%	G																			322
5H-1	36.0	<1%	G																			142
5H-2	37.5	<1%	M																			213
5H-3	39.0	<1%	G																			452
5H-4	40.5	<1%	G																			306
5H-5	42.0	<5%	G																			302
5H-6	43.5	<5%	G																			208
5H-7	44.2	<5%	G																			433
5H-CC	45.0	<5%	G																			532