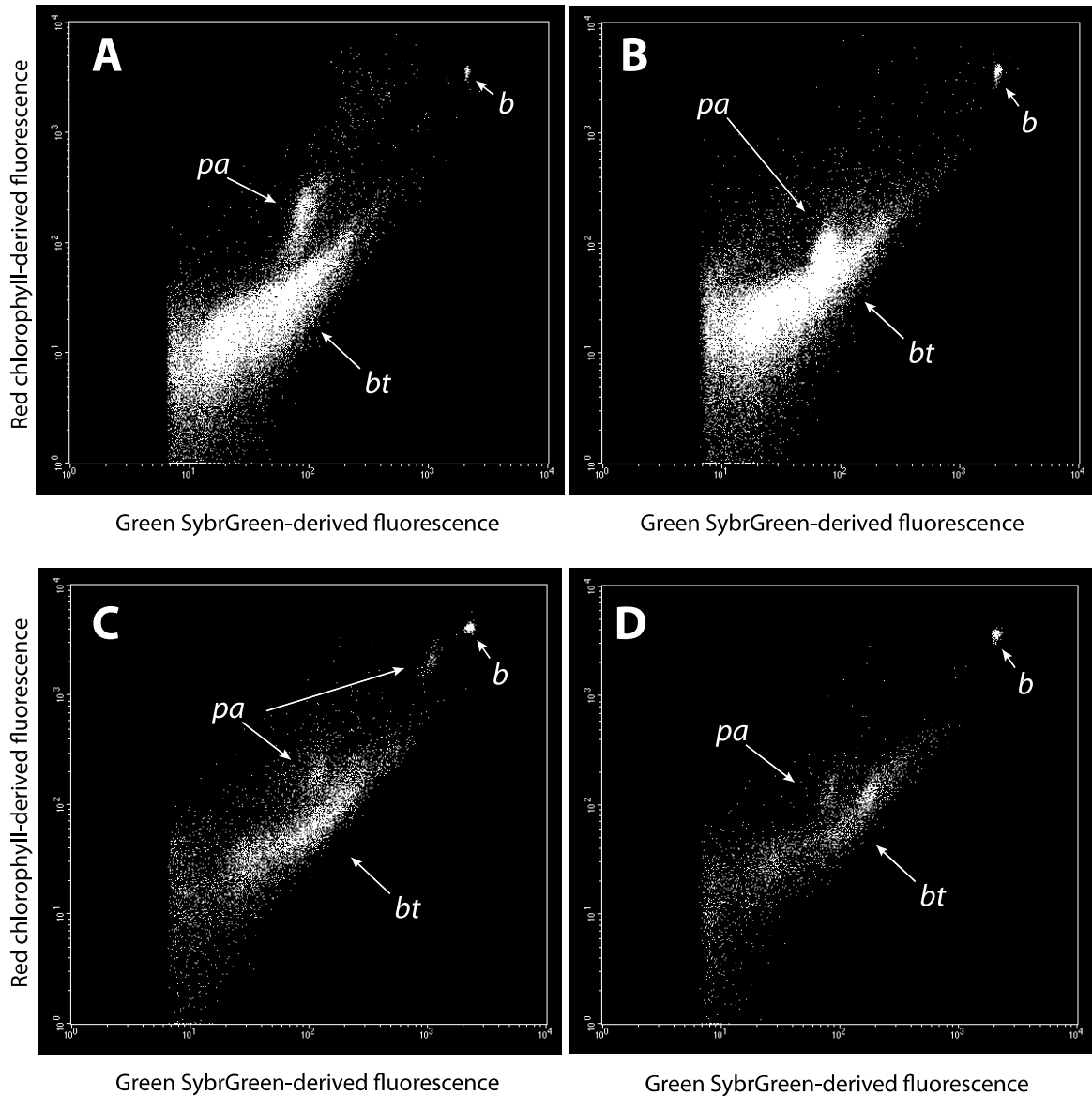
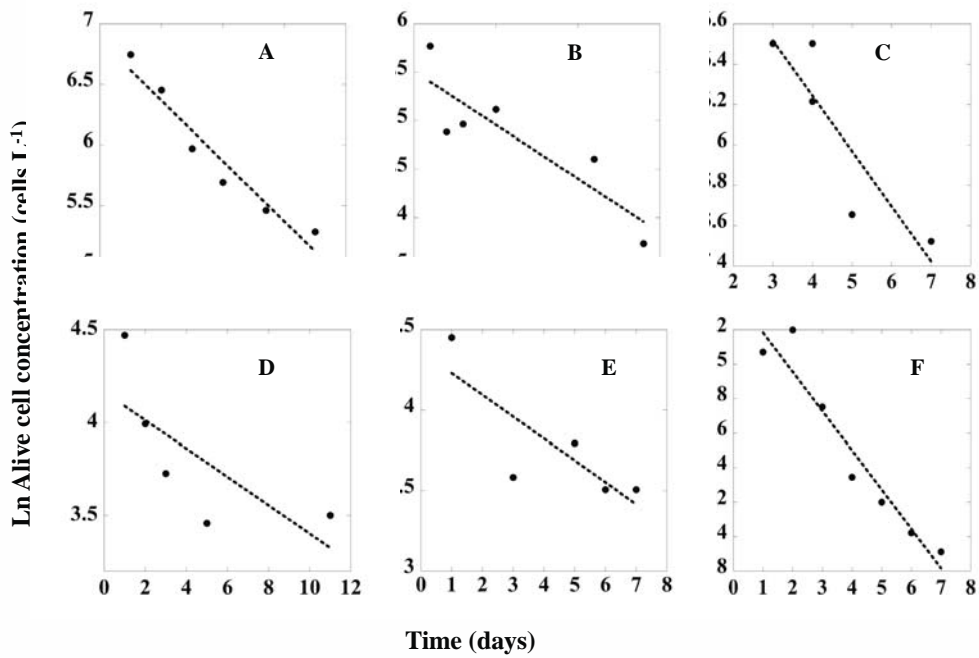


Supplementary Figure 1. Tintinnid ciliates (A, B, C, D) and radiolaria (E, F, G) collected by the bottle net between 2,000-4,000 m.



Supplementary Figure 2. Cytograms of some selected surface and deep ocean samples. The samples were stained with SybrGreen I, a DNA stain that targets nucleic acids and, thus, stain all microbes, phototroph or autotroph. However, those microbes that have red autofluorescence from the chlorophyll a, appear in a different diagonal when plotting red vs. green (SybrGreen) fluorescence. They are indicated as “pa”, while the bacteria and archaea are labelled as “bt”. Reference 1 μ m Yellow-Green Polysciences beads were added as internal standards (labelled “b”). A) A surface sample, Station 40 at 70 m, ratio bt/pa= 11.8; B) Station 110, at 2000 m, ratio bt/pa= 6.1; C) Station 126, at 2200 m ratio bt/pa= 6.2; and D) Stn 113, at 3850 m, ratio bt/pa= 9.1.



Supplementary Figure 3. Mortality of surface phytoplankton cells in the dark. The decline in the number of alive cells of phytoplankton sampled at the surface layer declined with time when maintained in the dark and at cold temperature, conditions encountered during their possible sinking transient from the surface to the deep ocean. (A) *Trichodesmium* sp. ($p < 0.001$); (B) centric diatom ($p < 0.05$); (C) *Ceratium* sp. ($p < 0.01$); (D) *Ceratium* spp. ($p = 0.07$); (E) *Gymnodinium* sp. ($p = 0.09$); (F) Dinoflagellate ($p < 0.001$).



Supplementary Figure 4. The new device Bottle-Net installed in the rosette sampler system amid the Niskin bottles.

Supplementary Table 1. Taxonomic composition of the micro-phytoplankton communities found at the surface (0-200 m depth) and deep (2000-4000 m depth) ocean. The stations were selected to show the variability found at the ocean surface and deep waters in communities across the deep ocean. The cells counted were intact. The symbols are scaled to the relative abundance of the taxon at each station: (x) low abundance, (X) abundant, (XX) dominant, (-) not detected. Pennate diatoms: include *Cylindrotheca* and other genera. Centric diatoms: include a variety of centric genera. *Protoperidinium*, *Gonyaulax*, others: Included cells of those genera and other dinoflagellate genera close morphologically. *Richelia* was found intracellular in *Rhizosolenia*.

Station number	42		47		68	
	-32.234		-34.44		-31.554	
Latitude (N+,S-)	9.345166667		31.112		113.467	
Longitude (E+,W-)	Surface	Deep	Surface	Deep	Surface	Deep
Dinoflagellates						
<i>Ceratium fusus</i>	X	X	XX	X	-	-
<i>Ceratium</i> spp.	X	X	-	-	X	X
<i>Dinophysis</i> spp.	-	-	-	-	-	-
<i>Prorocentrum</i> spp.	x	-	-	-	-	-
<i>Protoperidinium</i> , <i>Gonyaulax</i> , others	-	x	-	-	x	x
Diatoms & Dictyochaes						
<i>Gymnodinium</i> spp.	X	X	-	-	x	-
Pennate diatoms	X	X	-	-	X	X
<i>Chaetoceros</i> spp., <i>Bacteriastrum</i> spp.	-	-	-	-	x	x
<i>Planktoniella sol</i>	-	-	X	-		
<i>Coscinodiscus</i> spp.	-	-	X	X		
Centric diatoms	X	X	-	-		
<i>Rhizosolenia</i> spp.	-	-	X	X	X	X
<i>Hemiaulus</i> spp.	-	-	-	-		
<i>Dictyocha</i> spp.	-	-	x	-		
Cyanobacteria						
<i>Richelia</i> sp.	-	-	-	-	x	x
<i>Trichodesmium</i> spp.	-	-	X	X	-	-

Table 1. Continued

Station number	74		89		94	
	Surface	Deep	Surface	Deep	Surface	Deep
Latitude	-39.243		-9.474		1.599	
Longitude	135.139		-172.298		-166.85	
Dinoflagellates						
<i>Ceratium fusus</i>	-	-	x	-	-	-
<i>Ceratium</i> spp.	X	X	X	X	x	x
<i>Dinophysis</i> spp.	-	-	x	-	-	-
<i>Prorocentrum</i> spp.	x	-	-	-	-	-
<i>Protoperdinium</i> , <i>Gonyaulax</i> , others	-	-	x	x	-	x
<i>Gymnodinium</i> spp.	-	-	-	-	X	-
Diatoms & Dictyochales						
Pennate diatoms	-	-	-	-	XX	XX
<i>Chaetoceros</i> spp., <i>Bacteriastrum</i> spp.	-	-	-	-	x	-
<i>Planktoniella sol</i>	-	-	x	x	-	-
<i>Coscinodiscus</i> spp.	-	-	-	-	-	-
Centric diatoms	x	x	-	-	x	x
<i>Rhizosolenia</i> spp.	-	-	X	x	X	X
<i>Hemiaulus</i> spp.	-	-	-	-	-	-
<i>Dictyocha</i> spp.	-	-	X	x	-	-
Cyanobacteria						
<i>Richelia</i> sp.	-	-	-	-	-	-
<i>Trichodesmium</i> spp.	-	-	-	-	-	-

Table 1. Continued

Station number	116		129		133	
Latitude	13.205		15.069		18.996	
Longitude	-113.256		-69.295		-55.15	
	Surface	Deep	Surface	Deep	Surface	Deep
Dinoflagellates						
<i>Ceratium fusus</i>	-	-	x	-	x	x
<i>Ceratium</i> spp.	x	x	x	-	X	X
<i>Dinophysis</i> spp.	-	-	-	-	x	-
<i>Prorocentrum</i> spp.	x	x	-	-	-	-
<i>Protoperidinium</i> , <i>Gonyaulax</i> , others	-	-	x	x	x	-
<i>Gymnodinium</i> spp.	x	-	-	-	-	-
Diatoms & Dictyochales						
Pennate diatoms	X	X	x	x	-	-
<i>Chaetoceros</i> spp., <i>Bacteriastrum</i> spp.	XX	XX	-	-	-	-
<i>Planktoniella sol</i>	x	-	-	-	-	-
<i>Coscinodiscus</i> spp.	-	-	-	-	-	-
Centric diatoms	-	-	x	x	-	x
<i>Rhizosolenia</i> spp.	-	-	-	x	x	-
<i>Hemiaulus</i> spp.	-	-	x	-	x	-
<i>Dictyocha</i> spp.	-	-	-	-	-	-
Cyanobacteria						
<i>Richelia</i> spp.	-	-	-	-	-	-
<i>Trichodesmium</i> spp.	-	-	XX	XX	X	X