Supplementary Materials

1. BIOMASS ESTIMATE

For microplankton (≥20 μm and ≤200 μm), cell dimensions of at least 10 specimens of each taxon identified were measured for biomass estimation using a Zeiss Axiovert 100 inverted microscope. Cell biovolume (V) was calculated by assigning standard geometric shapes to each cell type identified (Hillebrand et al., 1999). Then, mean cell-specific biovolume was transformed into carbon content using different conversion factors for each group: pg C cell^{-1} = 0.288 V0.811 for diatoms (DIAT), pg C cell^{-1} = 0.216 V0.939 for other algal groups (dinoflagellates, DINO; Menden-Deuer and Lessard, 2000), pg C cell^{-1} = (lorica volume) × 0.553 + 444.5 for loricate ciliates (Verity and Langdon, 1984), and pg C cell^{-1} = 0.19 V μm^{3} for aloricate ciliates (CIL; Putt and Stoecker, 1989).

The carbon content of cells counted by flow cytometry was calculated using different conversion factors and considering cells as spheres: 220 fg C m^{-3} for nano-phytoplakton (Tarran et al., 2006), 1.5 pg C cell^{-1} for Pico-EUK, 12 fg C cell^{-1} for H-BACT (Zubkov et al., 2000), 226 fg C cell^{-1} for Pico-CYAN. For nanophytoplankton biomass calculation, forward scatter (FS) values were transformed into cell diameters using the equation of the regression from Belzile and Gosselin (2015) for a culture of *Coccomyxa* sp. Based on this equation, we used FS values of our community to calculate an average diameter for cells at each station. Then, we calculated the biovolume (considering the cells as spheres) and multiplied it by a carbon conversion factor of 220 fg C as in Tarran et al. (2006). In this way, we obtained a carbon per cell factor. Finally, this factor was used to convert the total abundances of nanoplanktonic cells to biomass. The limitation here was that we were assuming that the gulf community had the same diameter vs FS rate as the monoculture of *Coccomyxa* sp. Therefore, it is possible that we underestimated cell diameters and, consequently, the biomass estimate was low. Because this is a methodological limitation, we did not include these results in the analyses.

2. STATISTICAL ANALYSIS

Relations between the microbial community and environmental variables were evaluated with a canonical transformation-based redundancy analysis (tb-RDA) in RStudio© 2015 (Oksanen et al., 2017). The Hellinger transformation was used to normalize the biomass matrix (Legendre and Legendre, 1998). The linearity and colinearity of the environmental matrix were assessed with transformation (log x + 1) and according to Zuur et al. (2010), respectively. The final matrix included N2, Ri, temperature, salinity, oxygen, nitrate+nitrites and ΔN/Δz. A forward selection of the significant environmental variables suggested that temperature (associated to stratification or N2), nutrient availability, and dynamic stability (Ri) were the main factors controlling the community (tb-RDA results $p = 0.002$, Figure 6).

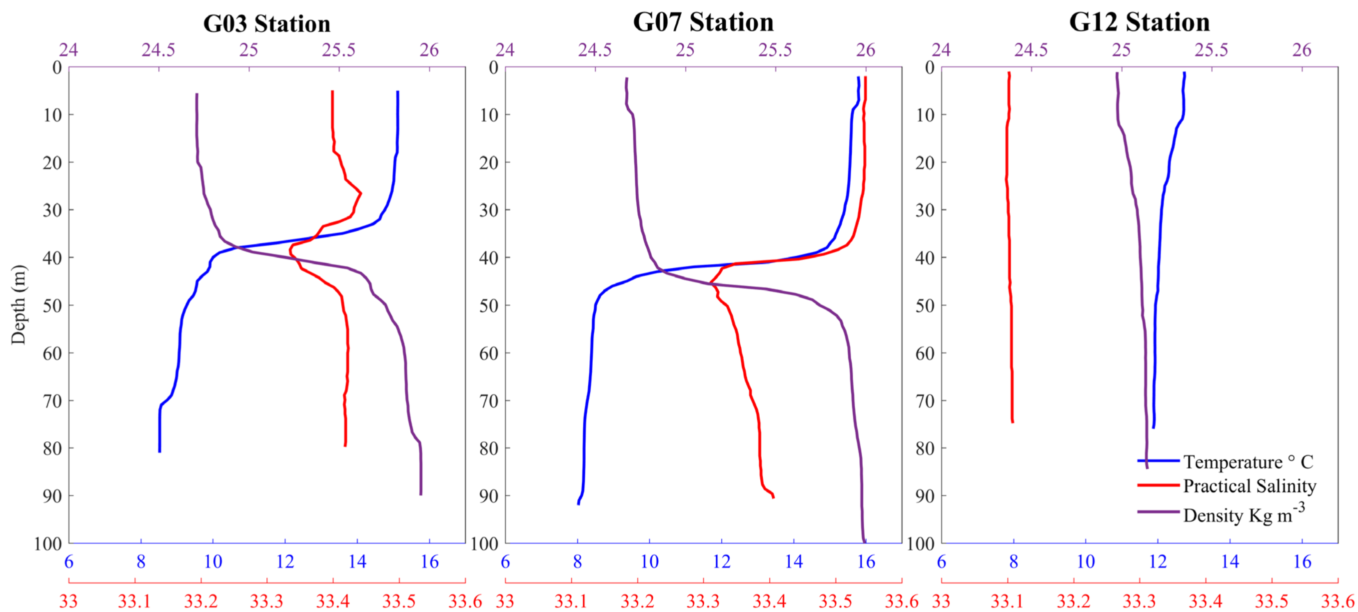

FIGURE S1. Vertical profiles of temperature (°C, blue), practical salinity (red), and density (Kg m^{-3}, violet) at three stations (G03, G07 and G13) in the SJG.

TABLE S1. Particulate organic carbon (POC) and particulate organic nitrogen (PON) mean concentration (nM m^{-2}) and the ratio C:N (POC:PON) for each station in the SJG.

Station	POC (mM m^{-2})	PON (mM m^{-2})	POC/PON
G01	40.51±12.2	14.83±6.28	2.34
G04	11.84±5.89	1.47±0.9	6.86
G06	11±4.21	2.54±0.74	3.71
G07	17.48±0.53	6.77±0.51	2.21
G09	22.03±12.06	5.19±2.62	3.63
G10	30.52±1.69	7.11±2.09	3.68
G11	30.52±3.22	1.44±9.06	18.09
G13	22.83±4.69	3.37±1.99	5.80
G14	22.66±5.33	3.14±0.56	6.18
G15	24.23±4.81	3.93±0.54	5.28
G16	18.96±10.9	2.24±1.46	7.24

TABLE S2. Main groups and fenus/species abundance (Cel L^{-1}) in San Jorge Gulf by sampling station. ND = No data.

Group	Genus/species	Abundance (cel L^{-1})												
		Station												
		G01	G5	G04	G06	G07	G09	G10	G11	G12	G13	G14	G15	G16
Ciliates	*Favella* sp.	0	0	0	0	0	0	0	20	20	0	0	0	0
Ciliates	*Laboea* sp.	0	0	0	0	0	180	0	60	0	0	60	60	0
Ciliates	*Stenosomella* sp.	0	0	0	60	0	0	600	20	20	0	40	740	100
Ciliates	*Strobilidium* sp.	8000	0	5880	320	267.273	160	80	320	0	0	20	200	420
Ciliates	*Strombidium* spp.	0	140	0	560	222.727	760	0	0	0	178.182	500	340	300
Pennate_Diatoms	*Asterionelopsis glacialis*	0	9533	0	0	0	0	0	0	0	0	0	0	3700
Centric_diatoms	*Thalassiosira* sp.2	0	0	0	0	0	0	0	12992.251	40	12992.251	0	0	0
Centric_diatoms	*Chaetoceros* sp.1	0	6325.455	0	0	0	0	0	220	0	0	0	0	1480
Centric_diatoms	*Chaetoceros* sp.2	0	1514.545	0	0	0	0	0	0	0	0	0	0	160
Centric_diatoms	*Chaetoceros* sp.3	0	27529	0	0	0	0	0	0	0	0	0	0	0
Pennate_Diatoms	*Cylindroteca* sp.	0	1336.364	0	0	0	0	20	0	0	0	0	0	1340
Centric_diatoms	*Guinardia* sp.	0	8107.273	0	0	0	0	0	0	0	0	0	0	880
Centric_diatoms	*Leptocylindrus* sp.	0	15858.182	800	60	0	60	0	0	0	0	0	0	1520
Pennate_Diatoms	*Navicula* sp.2	0	267	535	20	0	0	0	0	0	0	0	60	1620
Pennate_Diatoms	*Navicula* sp.3	0	623.636	0	20	0	0	0	100	20	623.636	20	0	0
Centric_diatoms	*Paralia sulcata*	0	0	0	0	0	0	1020	0	0	0	0	0	120
Pennate_Diatoms	*Pleurosigma* sp.	0	0	0	0	0	0	0	20	0	0	0	0	80
Pennate_Diatoms	*Pseudo-nitzschia* sp.1	1600	14165	535	80	0	340	20	20	0	0	0	20	3800
Centric_diatoms	*Rhizosolenia pungens*	0	0	0	0	0	0	40	80	0	0	0	0	40
Centric_diatoms	*Thalassiosira* sp.1	0	1158.182	2000	0	0	0	0	580	0	0	0	0	80
Dinoflagellates	*Alexandrium* sp.	0	0	0	0	0	0	20	740	300	534.545	20	100	0
Dinoflagellates	*Ceratium fusus*	0	0	0	0	89	100	0	0	0	0	0	520	0
Dinoflagellates	*Ceratium lineatum*	1600	267.273	356.364	0	89.091	1260	20	0	0	534.545	2500	240	0
Unarmored dinoflagellates		0	0	0	0	222.727	0	0	860	1080	0	0	0	0
Dinoflagellates	*Dinophysis acuminata*	0	0	0	0	0	0	20	40	100	0	0	40	0
Dinoflagellates	*Prorocentrum micans*	0	0	0	0	846	0	0	0	0	0	40	2540	0
Dinoflagellates	*Protoceratium* sp.	0	0	0	0	133.636	40	220	20	60	178.182	0	220	0
Dinoflagellates	*Protoperidium* sp.1	0	356.364	0	0	0	0	40	440	700	0	60	180	0
Pico-CYAN		$1.25x10^8$	ND	$2.29x10^7$	1.40x107	$5.92x10^7$	$4.14x10^7$	$4.17x10^6$	$1.75x10^7$	ND	$1.78x10^7$	$1.44x10^8$	$2.37x10^7$	$1.47x10^7$
Pico-EUK		$4.29x10^7$	ND	$3.67x10^6$	4.17x106	$9.20x10^6$	$1.51x10^7$	$5.87x10^6$	$2.87x10^7$	ND	$7.23x10^7$	$2.16x10^8$	$7.34x10^6$	$4.87x10^6$
H-BACT		$2.93x10^9$	ND	$7.88x10^8$	6.03x108	$1.57x10^9$	$1.56x10^9$	$1.17x10^9$	$1.72x10^9$	ND	$2.32x10^9$	$2.41x10^9$	$9.09x10^8$	$8.99x10^8$
Nano-CYAN		499412	ND	6557	12247	5271	14045	0	0	ND	333828	234604	176416	75440
Nano-EUK		7885	ND	2459	0	3853	4115	2358	3199	ND	4837	1804	2878	2070