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Size fractionation, chemotaxonomic groups and bio-optical properties of phytoplankton along a transect from the Mediterranean Sea to the Atlantic Ocean

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Supplementary material

Table S1. – Province allocation, position and sampling date and time of the TransPEGASO stations.

Biogeographical provinces	Station number	Date	Longitude [º W]	Latitude [º N]	Local time	GMT time
MEDI	1	10/21/2014	-5.21	36.02	9:00 AM	8:00 AM
NAST	2	10/21/2014	-6.51	35.30	4:00 PM	3:00 PM
NAST	3	10/22/2014	-9.23	33.23	9:00 AM	8:00 AM
NAST	4	10/23/2014	-12.40	30.32	9:00 AM	8:00 AM
NAST	5	10/23/2014	-13.28	29.49	4:00 PM	3:00 PM
NAST	6	10/24/2014	-15.17	27.38	4:00 PM	4:00 PM
CNRY	7	10/25/2014	-16.52	24.22	9:00 AM	9:00 AM
CNRY	8	10/25/2014	-17.30	23.30	4:00 PM	4:00 PM
CNRY	9	10/26/2014	-19.02	20.33	9:00 AM	8:00 AM
CNRY	10	10/26/2014	-19.39	19.20	4:00 PM	3:00 PM
NATR	11	10/27/2014	-21.23	16.23	9:00 AM	8:00 AM
NATR	12	10/27/2014	-21.44	15.11	4:00 PM	3:00 PM
NATR	13	10/28/2014	-23.18	12.01	9:00 AM	8:00 AM
WTRA	14	10/28/2014	-23.57	10.43	4:00 PM	3:00 PM
WTRA	15	10/29/2014	-25.34	7.24	9:00 AM	8:00 AM
WTRA	16	10/29/2014	-26.12	6.05	4:00 PM	3:00 PM
WTRA	17	10/30/2014	-27.40	3.03	9:00 AM	9:00 AM
WTRA	18	10/30/2014	-28.16	-1.48	4:00 PM	4:00 PM
WTRA	19	10/31/2014	-29.47	-1.21	9:00 AM	9:00 AM
WTRA	20	10/31/2014	-30.28	-2.45	4:00 PM	4:00 PM
SATL	21	11/1/14	-32.02	-6.02	9:00 AM	9:00 AM
SATL	22	11/2/14	-31.56	-10.06	9:00 AM	9:00 AM
SATL	23	11/2/14	-32.23	-10.39	4:00 PM	5:00 PM
SATL	24	11/3/14	-33.54	-14.57	9:00 AM	10:00 AM
SATL	25	11/3/14	-34.20	-14.57	4:00 PM	5:00 PM
SATL	26	11/4/14	-35.32	-15.60	9:00 AM	10:00 AM
SATL	27	11/4/14	-36.05	-18.51	4:00 PM	5:00 PM
SATL	28	11/5/14	-37.12	-20.12	9:00 AM	10:00 AM
SATL	29	11/5/14	-38.22	-23.41	4:00 PM	5:00 PM
SATL	30	11/6/14	-41.26	-24.43	9:00 AM	10:00 AM
SATL	31	11/6/14	-42.29	-26.51	4:00 PM	5:00 PM
SATL	32	11/7/14	-45.15	-29.30	9:00 AM	11:00 AM
SWAS	33	11/17/2014	-56.27	-38.45	9:00 AM	12:00 PM
SWAS	34	11/17/2014	-57.19	-39.56	4:00 PM	7:00 PM
SWAS	35	11/18/2014	-59.27	-42.35	9:00 AM	12:00 PM
SWAS	36	11/18/2014	-60.22	-43.43	4:00 PM	7:00 PM
SWAS	37	11/19/2014	-62.36	-46.26	9:00 AM	12:00 PM
SWAS	38	11/19/2014	-63.25	-47.19	4:00 PM	7:00 PM
SWAS	39	11/20/2014	-64.54	-48.59	9:00 AM	12:00 PM
SWAS	40	11/20/2014	-65.33	-49.42	4:00 PM	7:00 PM
SWAS	41	11/21/2014	-67.05	-51.20	8:00 AM	11:00 AM
SWAS	42	11/21/2014	-67.41	-51.52	3:00 PM	6:00 PM

Table S2. – Pigment ratios used for the runs of the different CHEMTAX clusters (cluster 1 includes MEFI and SWAS; cluster 2, the other provinces). The numbers indicate the amount of pigment per unit of Chl *a*. See Table 1 for pigment name abbreviations.

	Chl *c*2	Per	19'But	Fuco	Neo	Pras	Viol	19'Hex	Allo	Zea	Chl *b*	DV-Chl *a*	Chl *c*2-MGDG [14/14]
PRASINOPHYTES													
pico<3													
Cluster 1	-	-	-	-	0.11	0.28	0.07	-	-	0.13	0.74	-	-
Cluster2	-	-	-	-	0.07	0.20	0.10	-	-	0.10	0.68	-	-
n+m>3													
Cluster 1	-	-	-	-	0.13	0.21	0.08	-	-	0.13	0.80	-	-
Cluster2	-	-	-	-	0.05	0.07	0.03	-	-	0.08	0.20	-	-
Total													
Cluster 1	-	-	-	-	0.12	0.27	0.08	-	-	0.13	0.69	-	-
Cluster2	-	-	-	-	0.08	0.19	0.07	-	-	0.11	1.46	-	-
CHLOROPHYTES													
pico<3													
Cluster 1	-	-	-	-	0.24	0.00	0.07	-	-	0.13	0.31	-	-
Cluster2	-	-	-	-	0.21	0.00	0.07	-	-	0.13	0.35	-	-
n+m>3													
Cluster 1	-	-	-	-	0.19	0.00	0.08	-	-	0.13	0.31	-	-
Cluster2	-	-	-	-	0.05	0.00	0.04	-	-	0.07	0.20	-	-
Total													
Cluster 1	-	-	-	-	0.23	0.00	0.07	-	-	0.12	0.30	-	-
Cluster2	-	-	-	-	0.23	0.00	0.08	-	-	0.13	0.33	-	-
DINOFLAGELLATES													
pico<3													
Cluster 1	0.13	0.61	-	-	-	-	-	-	-	-	-	-	-
Cluster2	0.13	0.66	-	-	-	-	-	-	-	-	-	-	-
n+m>3													
Cluster 1	0.12	0.63	-	-	-	-	-	-	-	-	-	-	-
Cluster2	0.06	0.37	-	-	-	-	-	-	-	-	-	-	-
Total													
Cluster 1	0.13	0.67	-	-	-	-	-	-	-	-	-	-	-
Cluster2	0.12	0.56	-	-	-	-	-	-	-	-	-	-	-
CRYPTOPHYTES													
pico<3													
Cluster 1	0.18	-	-	-	-	-	-	-	0.54	-	-	-	-
Cluster2	0.18	-	-	-	-	-	-	-	0.56	-	-	-	-
n+m>3													
Cluster 1	0.18	-	-	-	-	-	-	-	0.56	-	-	-	-
Cluster2	0.09	-	-	-	-	-	-	-	0.41	-	-	-	-
Total													
Cluster 1	0.18	-	-	-	-	-	-	-	0.61	-	-	-	-
Cluster2	0.18	-	-	-	-	-	-	-	0.61	-	-	-	-
HAPTOPHYTES													
n+m>3													
Cluster 1	0.14	-	0.24	0.14	-	-	-	0.66	-	-	-	-	0.13
Cluster2	0.08	-	0.19	0.12	-	-	-	0.92	-	-	-	-	0.05
P_n+m													
Cluster 1	0.14	-	0.10	0.14	-	-	-	0.61	-	-	-	-	0.14
Cluster2	0.08	-	0.09	0.08	-	-	-	0.04	-	-	-	-	0.04
Total													
Cluster 1	0.13	-	0.17	0.13	-	-	-	0.63	-	-	-	-	0.11
Cluster2	0.15	-	0.11	0.13	-	-	-	0.74	-	-	-	-	0.06
PELAGOPHYTES													
pico<3													
Cluster 1	0.51	-	0.65	0.26	-	-	-	-	-	-	-	-	-
Cluster2	0.45	-	0.61	0.27	-	-	-	-	-	-	-	-	-
n+m>3													
Cluster 1	0.51	-	0.65	0.27	-	-	-	-	-	-	-	-	-
Cluster2	0.17	-	0.30	0.13	-	-	-	-	-	-	-	-	-
Total													
Cluster 1	0.42	-	0.65	0.27	-	-	-	-	-	-	-	-	-
Cluster2	0.38	-	0.68	0.25	-	-	-	-	-	-	-	-	-
DIATOMS													
pico<3													
Cluster 1	0.26	-	0.00	0.70	-	-	-	-	-	-	-	-	-
Cluster2	0.12	-	0.00	0.46	-	-	-	-	-	-	-	-	-
n+m>3													
Cluster 1	0.12	-	0.00	0.53	-	-	-	-	-	-	-	-	-
Cluster2	0.06	-	0.00	0.34	-	-	-	-	-	-	-	-	-
Total													
Cluster 1	0.17	-	0.00	0.70	-	-	-	-	-	-	-	-	-
Cluster2	0.12	-	0.00	0.41	-	-	-	-	-	-	-	-	-
Synecococcus													
pico<3													
Cluster 1	-	-	-	-	-	-	-	-	-	1.05	-	-	-
Cluster2	-	-	-	-	-	-	-	-	-	0.64	-	-	-
Total													
Cluster 1	-	-	-	-	-	-	-	-	-	0.74	-	-	-
Cluster2	-	-	-	-	-	-	-	-	-	0.66	-	-	-
Phroclorococcus													
pico<3													
Cluster 1	-	-	-	-	-	-	-	-	-	0.71	0.20	1.00	-
Total													
Cluster 1	-	-	-	-	-	-	-	-	-	0.80	0.28	1.00	-

Table S3. – Range (minimum: Min and maximum: Max), mean and standard deviation (SD) of pigment concentrations (ng L^{-1}) and pigment ratios in the ≥3 μM size fraction of surface seawater for the seven study provinces. LHC, light-harvesting pigments (19'But + 19'Hex + Fuco + Per). For province names, see the explanation in Figure 1.

	MEDI	NAST - E				CNRY				NATR				WTRA				SATL				SWAS			
		Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
19'But	3.74	0.50	1.99	0.68	0.12	0.32	1.99	1.08	0.61	1.17	1.72	1.38	0.25	0.31	1.31	0.83	0.31	0.30	1.16	0.49	0.23	1.61	70.12	19.60	18.53
19'Hex	25.94	2.58	10.50	3.67	0.71	2.23	10.50	5.75	3.20	3.55	6.03	4.62	0.86	1.87	6.03	4.58	1.31	1.90	6.17	2.79	1.18	1.28	139.37	67.99	53.65
α-Car	1.41	0.12	0.51	0.20	0.07	0.10	0.34	0.26	0.10	0.32	0.51	0.40	0.08	0.10	0.70	0.32	0.18	0.09	0.32	0.12	0.06	0.14	2.46	1.07	0.58
Allo	1.11	0.11	2.03	0.40	0.22	0.11	1.57	0.64	0.56	0.56	2.03	1.19	0.62	0.09	3.09	0.77	0.97	0.03	0.78	0.30	0.21	1.47	29.43	10.66	8.59
β-Car	6.50	0.24	11.33	0.89	0.45	0.21	10.11	3.49	3.88	3.68	11.33	8.28	3.31	0.20	7.20	2.13	2.31	0.30	1.25	0.61	0.28	1.23	45.99	12.37	12.14
Chl *c*2-MGDG [14/14]	2.47	0.25	6.02	0.33	0.05	0.37	6.02	2.03	2.32	1.01	3.46	1.50	0.46	0.42	6.91	2.91	2.06	0.24	17.81	1.99	4.80	0.34	75.95	26.31	24.16
Chl *c*2-MGDG [14/18]	4.12	0.38	2.31	0.86	0.40	0.28	1.51	1.09	0.48	0.47	2.31	0.77	0.21	0.25	2.64	1.18	0.86	0.26	5.69	0.85	1.47	0.45	6.21	3.41	1.66
Chl *c*1	11.54	0.34	3.55	0.54	0.19	0.28	3.55	1.48	1.25	0.62	1.12	0.84	0.21	0.24	1.36	0.70	0.35	0.18	1.91	0.57	0.47	1.49	73.23	18.99	21.66
Chl *c*2	32.53	0.79	9.79	2.07	1.08	0.95	9.79	4.09	3.40	3.04	3.74	3.39	0.29	0.41	3.28	1.54	0.97	0.59	3.16	1.12	0.68	3.43	149.67	44.59	40.44
Chl *c*3	19.31	0.40	4.32	0.62	0.17	0.36	4.32	1.59	1.59	0.68	1.15	0.91	0.19	0.36	5.80	1.43	1.80	0.21	3.80	0.58	0.97	0.94	140.33	36.93	42.42
MV-Chl *a*-epimer	2.17	0.08	7.16	0.19	0.13	0.32	7.16	2.23	2.86	1.80	6.96	4.44	2.11	0.06	2.80	0.84	0.91	0.05	0.81	0.24	0.20	1.62	33.34	12.30	8.59
Chl *b*	9.92	0.92	5.07	1.43	0.31	0.26	5.07	2.70	1.75	2.25	2.60	2.40	0.15	0.74	2.60	1.89	0.60	0.45	1.61	0.95	0.33	1.79	134.02	29.36	36.43
cis-fuco	3.01	0.12	1.06	0.18	0.06	0.09	1.06	0.53	0.37	0.33	0.66	0.46	0.14	0.14	0.42	0.30	0.09	0.10	0.35	0.19	0.08	0.15	12.42	6.76	3.97
cis-hex	1.09	0.08	0.57	0.16	0.08	0.11	0.57	0.29	0.18	0.16	0.45	0.30	0.10	0.04	0.45	0.27	0.12	0.10	0.19	0.14	0.03	0.19	10.95	3.28	2.83
Ddx	10.75	1.53	8.33	2.28	0.65	1.39	8.33	3.98	2.65	2.40	4.02	2.94	0.76	1.01	3.87	2.03	0.90	1.17	2.84	1.75	0.51	5.32	151.73	52.36	37.69
DV-Chl *a*	0.51	0.08	1.23	0.22	0.12	0.12	0.59	0.39	0.17	0.26	1.23	0.38	0.09	0.09	1.23	0.31	0.38	0.06	0.36	0.15	0.09	0.00	0.00	0.00	0.00
DV-Chl *a*-allomer1	2.57	0.06	3.97	0.20	0.19	0.20	3.97	1.22	1.59	0.45	1.59	0.89	0.50	0.15	0.67	0.37	0.19	0.05	0.46	0.14	0.12	0.44	34.93	9.08	9.95
DV-Chl *a*-allomer2	0.21	0.05	0.24	0.10	0.06	0.00	0.24	0.06	0.11	0.00	0.10	0.05	0.04	0.00	0.60	0.09	0.21	0.00	0.15	0.04	0.05	0.00	8.50	1.41	2.49
DV-Chlide *a*	2.06	0.06	1.49	0.41	0.54	0.20	1.03	0.49	0.32	0.40	1.03	0.74	0.26	0.19	0.68	0.42	0.19	0.03	0.38	0.16	0.11	0.74	26.69	9.39	8.71
Fuco	61.83	0.70	18.08	3.37	4.54	2.76	18.08	7.65	6.17	3.57	5.00	4.28	0.58	0.19	2.35	1.24	0.75	0.28	2.26	0.88	0.60	15.02	524.80	156.45	150.71
M-car	0.56	0.09	0.81	0.19	0.14	0.12	0.53	0.27	0.16	0.32	0.81	0.54	0.20	0.06	0.48	0.18	0.14	0.05	0.15	0.08	0.03	0.10	3.53	1.06	0.93
Micr	0.12	0.19	2.99	0.35	0.12	0.14	0.26	0.21	0.04	1.16	2.99	2.13	0.75	0.08	1.37	0.38	0.41	0.05	0.10	0.08	0.01	0.32	5.46	2.00	1.38
MV-Chl *a*-allomer1	3.55	0.11	7.27	0.25	0.21	0.19	7.27	2.11	2.98	0.62	2.71	1.44	0.91	0.19	1.10	0.49	0.32	0.06	0.52	0.18	0.12	0.73	51.01	11.96	14.27
MV-Chl *a*-allomer2	2.36	0.06	0.41	0.13	0.11	0.00	0.41	0.17	0.15	0.23	0.34	0.29	0.04	0.04	0.19	0.11	0.05	0.00	0.46	0.10	0.12	0.28	15.05	5.27	5.13
MV-Chl *c*3	3.73	0.18	1.46	0.32	0.10	0.12	1.46	0.62	0.52	0.27	0.42	0.34	0.06	0.11	0.46	0.31	0.11	0.03	0.60	0.15	0.17	0.21	47.43	11.84	14.50
MV-Chl *a*	212.17	5.62	80.09	14.97	7.83	5.36	80.09	34.11	27.82	30.92	60.10	48.81	12.79	2.87	41.21	18.40	13.53	4.66	18.21	8.18	3.86	50.13	1042.81	411.62	290.09
MV-Chlide *a*	0.53	0.03	0.75	0.21	0.26	0.06	0.75	0.27	0.28	0.07	0.26	0.16	0.07	0.05	0.26	0.16	0.08	0.03	0.16	0.08	0.03	0.15	9.78	3.87	3.17
Neo	0.32	0.11	0.47	0.14	0.02	0.17	0.41	0.25	0.10	0.16	0.47	0.19	0.03	0.11	0.47	0.24	0.11	0.10	0.24	0.14	0.03	0.51	10.50	3.07	3.20
Per	15.18	0.33	6.63	1.23	0.55	0.14	6.63	2.69	2.41	3.08	3.68	3.17	0.07	0.26	3.68	1.90	1.33	0.37	1.43	0.84	0.31	0.13	23.90	7.90	8.71
Pras	0.52	0.08	0.25	0.11	0.02	0.09	0.25	0.15	0.06	0.09	0.24	0.10	0.01	0.10	0.24	0.16	0.05	0.08	0.23	0.11	0.04	0.96	32.78	10.77	10.63
Uri	0.41	0.10	0.40	0.19	0.11	0.10	0.40	0.20	0.12	0.09	0.35	0.11	0.02	0.20	0.47	0.36	0.09	0.10	0.23	0.15	0.04	0.26	7.95	2.38	2.11
Viol	0.86	0.16	0.50	0.23	0.04	0.11	0.50	0.29	0.14	0.23	0.45	0.29	0.05	0.13	0.45	0.27	0.11	0.09	0.30	0.17	0.06	0.21	9.70	2.58	2.65
Zea	0.66	0.11	4.72	0.39	0.24	0.16	3.78	1.38	1.42	0.10	4.72	2.39	1.88	0.08	2.74	1.07	0.90	0.07	0.70	0.21	0.16	0.84	37.81	5.76	10.74
Zea-der	0.41	0.05	4.22	0.08	0.02	0.07	0.14	0.11	0.02	0.18	4.22	1.54	1.89	0.07	0.33	0.17	0.09	0.01	0.38	0.10	0.09	0.11	1.70	0.60	0.44
Phaeob	7.51	0.46	4.73	0.73	0.31	0.18	4.73	1.67	1.79	1.33	3.32	2.55	0.87	0.41	2.59	1.33	0.72	0.41	1.11	0.62	0.17	1.05	48.32	12.85	12.86
Phaeop	28.79	1.21	31.61	3.33	2.70	1.79	31.61	11.20	11.90	9.42	21.61	14.00	5.44	1.09	9.94	5.33	2.84	0.56	4.41	2.43	0.88	7.75	184.51	74.02	68.28
Chl *a*_pico<3	226.13	6.75	101.39	16.68	9.17	6.89	101.39	41.06	35.93	34.81	73.47	57.21	16.37	4.26	47.79	21.20	15.13	5.45	20.34	9.27	4.16	54.09	1155.08	464.91	329.15

Table S4. – Range (minimum: Min and maximum: Max), mean and standard deviation (SD) of pigment concentrations (ng L^{-1}) and pigment ratios in the <3 μM size fraction of surface seawater for the seven study provinces. LHC, light-harvesting pigments (19'But + 19'Hex + Fuco + Per). For province names, see the explanation of Figure 1.

	MEDI	NAST - E				CNRY				NATR				WTRA				SATL				SWAS			
		Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
19'But	35.69	3.11	7.19	5.11	1.55	1.56	7.19	4.99	2.35	3.64	6.33	4.78	0.97	2.68	6.33	4.59	1.29	1.82	5.65	3.02	1.04	8.90	170.08	59.96	56.49
19'Hex	81.00	6.57	27.16	10.68	3.83	11.73	27.16	16.85	6.10	13.75	25.56	14.90	0.97	7.17	25.56	14.22	6.45	4.18	12.05	6.36	2.17	8.43	1235.18	210.54	350.58
α-Car	14.71	5.26	13.88	6.01	0.70	0.40	11.10	4.32	4.29	7.56	12.64	8.38	0.69	5.67	13.88	10.10	2.82	0.22	5.69	3.22	1.54	1.24	11.02	4.20	3.11
Allo	10.86	0.13	2.03	0.64	0.40	0.15	2.03	1.15	0.75	0.16	0.83	0.40	0.31	0.17	0.75	0.42	0.21	0.09	1.38	0.33	0.36	2.24	49.40	11.95	13.42
β-Car	14.42	1.74	20.11	2.27	0.29	2.35	20.11	7.94	7.15	4.60	9.60	6.90	2.06	0.39	6.94	2.59	2.14	0.39	2.66	1.27	0.66	9.54	47.73	26.72	13.26
Chl *c*2-MGDG [14/18]	5.87	0.27	8.39	2.78	1.89	1.17	7.48	3.93	2.80	0.39	7.34	0.45	0.08	0.43	8.39	3.05	3.13	0.35	3.81	1.94	1.13	0.41	105.94	35.61	38.29
Chl *c*2-MGDG [14/14]	12.87	0.42	5.13	1.45	0.98	2.15	5.13	3.27	1.14	0.90	4.94	2.01	0.94	0.71	4.94	2.33	1.44	0.71	2.29	1.24	0.43	1.58	44.93	11.32	12.64
Chl *c*1	4.79	0.43	2.07	0.54	0.10	0.56	2.07	1.22	0.63	0.48	0.80	0.54	0.04	0.33	0.80	0.48	0.15	0.21	1.83	0.66	0.41	1.32	31.42	10.30	8.92
Chl *c*2	40.66	1.04	14.61	2.72	1.14	3.47	14.61	8.67	4.94	3.45	4.37	3.66	0.22	1.22	5.43	3.14	1.39	0.79	4.33	1.96	0.89	6.31	182.68	68.51	56.20
Chl *c*3	28.92	0.96	15.71	4.35	5.70	1.94	5.92	3.60	1.47	2.01	2.77	2.46	0.32	1.31	2.55	1.76	0.44	0.24	2.47	0.84	0.57	2.88	200.37	57.41	70.53
MV-Chl *a*-epimer	4.91	0.19	6.91	0.25	0.04	0.31	6.91	2.28	2.69	0.77	1.24	1.06	0.21	0.31	1.75	0.61	0.47	0.18	0.67	0.33	0.15	6.32	38.05	17.13	10.51
Chl *b*	96.63	4.07	15.48	4.84	0.64	2.71	9.05	6.64	2.52	8.21	15.48	10.37	1.52	8.41	18.35	11.98	3.49	0.75	5.83	2.67	1.59	6.60	317.62	106.94	96.11
cis-fuco	3.80	0.25	1.94	0.57	0.31	0.32	1.94	1.08	0.61	0.88	1.85	1.01	0.11	0.46	1.85	1.04	0.53	0.17	0.88	0.36	0.18	1.05	111.47	25.39	34.61
cis-hex	7.29	0.24	0.72	0.32	0.11	0.25	0.72	0.50	0.17	0.22	0.41	0.29	0.09	0.14	0.45	0.27	0.12	0.11	0.66	0.23	0.15	1.01	23.00	6.37	6.13
Ddx	12.01	2.31	10.77	4.33	1.45	2.54	10.77	7.95	3.26	2.04	6.47	3.54	2.08	1.32	5.69	3.50	1.55	1.38	4.73	2.51	1.01	17.48	363.10	105.98	98.32
DV-Chl *a*	46.24	23.46	54.93	28.60	2.76	0.08	43.43	17.29	17.46	30.59	51.55	37.13	4.92	32.50	54.93	44.41	8.46	4.47	29.19	15.93	6.68	0.00	0.00	0.00	0.00
DV-Chl *a*-allomer1	3.69	0.17	4.99	0.30	0.17	0.34	4.99	1.81	1.86	0.32	1.09	0.51	0.18	0.15	1.09	0.59	0.29	0.04	1.01	0.25	0.26	1.90	36.59	13.85	10.32
DV-Chl *a*-allomer2	1.00	0.20	0.56	0.29	0.08	0.06	0.42	0.19	0.14	0.34	0.56	0.47	0.10	0.08	0.49	0.25	0.13	0.04	0.93	0.20	0.24	0.29	3.47	1.68	0.97
DV-Chlide a	3.92	0.30	7.22	0.70	0.33	0.47	7.22	2.95	2.61	0.38	1.64	0.99	0.51	0.22	1.10	0.66	0.30	0.09	0.72	0.38	0.15	4.73	25.67	14.40	7.97
Fuco	44.30	3.50	25.37	4.47	0.86	4.91	25.37	14.56	8.39	1.80	3.35	2.69	0.66	0.74	3.86	1.94	0.97	0.86	6.08	2.31	1.51	23.83	379.91	189.80	120.86
M-car	1.05	0.19	1.00	0.25	0.04	0.35	1.00	0.64	0.26	0.36	0.58	0.47	0.09	0.24	0.50	0.37	0.09	0.07	0.29	0.17	0.06	1.11	3.47	1.90	0.76
Micr	4.32	0.09	3.87	0.14	0.04	0.13	3.87	1.08	1.61	0.12	0.30	0.19	0.08	0.07	0.41	0.15	0.11	0.06	0.12	0.10	0.02	0.37	18.97	6.33	5.30
MV-Chl *a*-allomer1	3.03	0.06	7.69	0.17	0.10	0.07	7.69	2.38	3.10	0.44	0.65	0.57	0.10	0.08	3.21	0.69	1.03	0.09	0.98	0.27	0.22	1.87	46.31	14.96	12.94
MV-Chl *a*-allomer2	4.29	0.09	1.17	0.18	0.06	0.09	0.57	0.35	0.17	0.19	1.17	0.31	0.09	0.13	1.38	0.63	0.43	0.06	0.51	0.18	0.12	1.47	10.69	4.85	2.69
MV-Chl *c*3	3.48	0.36	1.01	0.67	0.16	0.35	1.01	0.76	0.25	0.68	0.90	0.81	0.10	0.46	0.88	0.65	0.14	0.13	1.37	0.47	0.34	0.57	16.69	7.58	6.17
MV-Chl *a*	363.31	18.10	124.08	27.16	7.16	28.03	124.08	62.15	36.83	31.64	60.39	45.58	11.75	13.37	58.04	29.12	15.03	8.42	33.06	16.21	6.41	328.23	1434.55	783.64	351.03
MV-Chlide a	1.02	0.06	1.04	0.20	0.08	0.09	1.04	0.51	0.37	0.08	0.62	0.28	0.22	0.10	0.62	0.25	0.17	0.10	0.35	0.17	0.07	0.74	6.57	3.51	2.00
Neo	4.80	0.14	0.93	0.19	0.05	0.19	0.58	0.41	0.15	0.33	0.51	0.42	0.07	0.15	0.93	0.38	0.25	0.11	0.24	0.16	0.03	3.49	17.55	8.40	4.69
Per	2.88	0.11	3.60	0.41	0.42	0.07	3.60	1.47	1.48	0.05	0.98	0.12	0.06	0.11	1.84	0.51	0.61	0.11	0.28	0.18	0.06	0.19	71.31	14.17	20.00
Pras	13.53	0.09	0.71	0.11	0.02	0.13	0.71	0.38	0.21	0.13	0.31	0.18	0.04	0.09	0.31	0.17	0.07	0.07	0.26	0.11	0.05	0.51	64.37	29.44	18.25
Uri	6.41	0.11	0.31	0.13	0.03	0.06	0.27	0.13	0.08	0.10	0.19	0.15	0.04	0.13	0.43	0.22	0.10	0.09	0.18	0.13	0.03	2.25	28.95	12.12	8.38
Viol	5.63	0.29	1.08	0.46	0.10	0.33	1.08	0.56	0.30	0.35	0.41	0.39	0.03	0.10	0.55	0.31	0.13	0.17	0.60	0.31	0.12	3.21	39.64	17.50	13.86
Zea	24.57	26.04	59.60	30.21	3.84	3.88	36.78	25.01	13.33	37.24	59.60	46.15	9.68	26.83	54.95	39.45	11.09	9.30	24.62	19.23	4.44	2.61	64.86	21.23	19.30
Zea-der	0.42	0.04	0.52	0.08	0.04	0.09	0.52	0.25	0.16	0.07	0.16	0.09	0.02	0.04	0.25	0.12	0.06	0.07	0.97	0.20	0.25	0.25	4.71	1.61	1.45
Phaeob	8.24	0.51	5.14	0.90	0.48	0.96	5.14	2.26	1.70	0.83	1.48	1.11	0.27	0.08	1.98	0.84	0.61	0.21	1.05	0.50	0.25	3.06	36.40	16.52	9.36
Phaeop	15.37	2.52	78.16	3.27	0.63	2.91	78.16	30.92	31.11	4.15	8.11	5.12	0.95	0.68	9.05	4.35	3.26	0.66	3.98	1.92	0.98	7.33	81.47	37.30	21.42
Chl *a*_+m>3	431.41	50.56	151.06	57.86	6.59	55.62	151.06	89.90	36.35	78.91	98.60	86.91	6.47	48.24	117.56	77.21	22.68	13.78	64.76	33.93	13.19	349.55	1508.16	854.02	377.59

Table S5. – Abundance, in cells L^{-1} of selected frequent phytoplankton taxa (the 10 most frequent in the case of dinoflagellates, diatoms and coccolithophores) and total values for major groups.

Sample date	21.10 A	21.10 B	22.10 A	23.10 A	23.10 B	24.10 B	25.10 A	25.10 B	26.10 A	26.10 B	27.10 A	28.10 A	28.10 B	29.10 A	29.10 B	30.10 A	30.10 B	31.10 A	1.11 A
Station	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18	19	21
Dinoflagellates																			
Gonyaulax spp.	10	0	0	0	0	0	30	0	20	10	0	60	10	30	10	20	30	20	30
Gymnodinium elongatum	20	50	10	20	20	10	90	10	10	20	20	0	10	30	30	10	0	0	0
Oxytoxum minutum	10	40	70	0	0	20	40	10	0	0	10	10	10	20	60	80	20	70	70
Oxytoxum spp.		0	20	30	20	0	10	0	0	10	0	0	30	0	30	0	0	10	10
Oxytoxum variabile	30	80	20	0	10	20	959	0	0	10	0	40	20	0	20	70	50	10	90
Pronoctiluca acuta		0		20	30	20	40	10	110	0	30	40	10	10	10	0	0	0	0
Protoperidinium spp. (Large)	40	0	0	0	0	0	0	30	100	50	10	10	10	10	0	0	10	10	10
Scrippsiella spp.		90	10	30	100	80	0	890	50	170	80	10	370	110	190	20	140	20	40
Unidentified large dinoflagellates	180	450	320	340	330	420	540	780	1880	970	210	440	290	360	220	90	180	160	70
Unnidentified small dinoflagellates (<20 µm)	6850	4247	2192	1507	3699	1781	4384	4384	4932	3425	3973	4384	4247	4247	5206	3288	3151	1233	1096
Diatoms																			
Chaetoceros spp. Large (>20 µm)	0	0	0	0	0	160	80	0	50	0	20	0	0	20	0	0	0	40	0
Chaetoceros spp. Small (<20 µm)	0	0	0	10	0	1918	430	70	25345	250	130	274	20	0	10	0	0	0	0
Hemiaulus hauckii		0	10	0	10	0	0	0	0	0	10	0	10	180	50	0	0	0	0
Proboscia alata	90	0	0	0	0	0	0	0	40	50	210	30	80	0	50	0	30	0	10
Pseudo-nitzschia spp. (Thin)	30	60	0	0	0	0	0	10	10823	822	40	20	10	30	0	0	0	0	0
Pseudo-nitzschia spp. (Wide)	160	40	10	0	0	0	10	70	2329	120	10	10	0	0	0	0	20	0	0
Thalassiosira spp. Small (<20 µm)	411	0	0	0	0	0	137	0	1918	137	0	137	0	0	0	0	0	0	0
Thalassiosira/Porosira spp. (>20 µm)	0	0	0	0	0	0	0	10	0	20	0	10	0	20	0	10	110	10	10
Unidentified centric diatoms	10	0	0	0	0	10	0	0	80	60	20	0	0	20	0	0	30	0	0
Unidentified pennate diatoms	10	0	0	0	0	50	0	40	10	90	210	20	30	40	70	30	60	20	20
Coccolithophores																			
Unidentified small coccolithophores (<10 µm)	15344	4521	5617	1233	2603	2192	5343	14796	2055	21509	7946	4795	5206	4932	4932	3151	4658	5069	6165
Unidentified large coccolithohores	822	510	274	130	850	590	280	430	60	50	80	190	200	240	110	460	150	750	260
Discosphaera tubifera	60	230	220	110	360	110	500	360	0	0	10	30	260	390	340	190	40	560	870
Calcidiscus leptoporus	110	300	490	150	120	70	130	0	30	10	10	20	0	10	0	20	150	290	320
Umbellosphaera irregularis		274	685	137	137	130	137	685	137	0	20	0	150	274	70	20	10	50	685
Syracosphaera pulchra HET	260	170	160	30	20	20	30	80	20	20	10	0	0	10	20	0	20	0	0
Rhabdosphaera clavigera	822	160	548	80	60	40	130	250	20	0	0	0	0	10	0	0	0	0	90
S. pulchra HOL	0	50	710	30	0	20	0	10	0	0	20	0	0	40	0	0	0	0	0
Syracosphaera spp.	50	0	30	0	0	20	70	0	0	0	0	20	0	30	0	20	0	10	0
Helicosphaera carteri	20	10	40	0	0	0	0	0	0	0	0	0	20	20	0	50	50	60	0
Other groups																			
Criptophytes	1370	137	548	0	137	0	137	0	822	685	548	137	137	274	411	0	0	0	0
Nanoflagellates (3-20 µm)	86520	14933	35020	63860	18906	12467	16480	19454	23564	16440	23701	15618	7261	42196	21509	7398	26304	4384	8494
Group totals																			
Dinoflagellates	7260	5217	2872	2237	4339	2541	6884	6611	7996	5035	4483	5291	5207	5234	5886	3805	3858	1623	1496
Diatoms	13969	952	200	621	648	2635	1097	550	43594	8692	2648	2418	1463	3511	3351	1988	2258	1714	2379
Coccolithophores	17498	6245	8794	1900	4150	3202	6640	16631	2342	21649	8116	5055	5836	5976	5472	3921	5148	6999	8580
Criptophytes	1370	137	548	0	137	0	137	0	822	685	548	137	137	274	411	0	0	0	0
Others	86660	14953	35030	63900	18926	12467	16510	19494	23574	16460	23711	15648	7291	42226	21539	7428	26334	4394	8504

Table S5 (Cont.). – Abundance, in cells L^{-1} of selected frequent phytoplankton taxa (the 10 most frequent in the case of dinoflagellates, diatoms and coccolithophores) and total values for major groups.

Sample date	2.11 A	2.11 B	3.11 A	3.11 B	4.11 A	4.11 B	5.11 A	5.11 B	6.11 B	7.11 A	17.11 A	17.11 B	18.11 A	18.11 B	19.11 B	20.11 A	20.11 B	21.11 A	21.11 B
Station	22	23	24	25	26	27	28	29	31	32	33	34	35	36	38	39	40	41	42
Dinoflagellates																			
Gonyaulax spp.	0	0	20	0	0	10	10	0	0	10	0	0	0	0	0	0	0	0	0
Gymnodinium elongatum	30	20	20	60	50	70	60	0	80	50	0	0	170	210	0	0	0	0	0
Oxytoxum minutum	50	10	50	10	30	0	60	10	10	60	0	0	60	0	0	0	0	0	0
Oxytoxum spp.	0	20	10	30	20	10	20	10	130	20		0		0	0		0		0
Oxytoxum variabile	40	0	0	10	60	10	70	40	30	0		0	3425	0	0	0	0	0	0
Pronoctiluca acuta	30	0	0	10	10	20	10	10	20	10		0		0	0		0		0
Protoperidinium spp. (Large)	0	0	10	0	10	20	0	20	0	0	0	0	140	60	0	0	0	0	70
Scrippsiella spp.	0	60	20	10	10	10	40	110	80	40		0		30	0		0		0
Unidentified large dinoflagellates	370	200	90	80	170	230	230	260	430	240	30	20	6302	13426	270	60	40	20	50
Unnidentified small dinoflagellates (<20 µm)	2329	1918	548	1096	3151	2329	2466	3836	3014	2466	685	274	50416	22331	1918	0	20	30	685
Diatoms																			
Chaetoceros spp. Large (>20 µm)	20	0	0	0	0	10	70	10	0	0	0	0	2466	5891	20	0	0	80	0
Chaetoceros spp. Small (<20 µm)	0	30	0	20	0	0	80	0	30	0	0	0	685	3425	40	0	70	40	0
Hemiaulus hauckii	0	0	20	0	0	20	60	80	30	0		0		0	0		0		0
Proboscia alata	0	0	0	0	0	0	30	0	0	30	0	0	0	0	0	0	0	0	0
Pseudo-nitzschia spp. (Thin)	0	0	0	0	0	0	0	0	0	0	0	0	959	4521	10	20	0	20	0
Pseudo-nitzschia spp. (Wide)	0	0	0	10	0	0	0	0	0	0	0	0	3425	11371	0	20	0	0	0
Thalassiosira spp. Small (<20 µm)	0	10	0	0	0	0	0	0	0	0	0	0	0	411	5206	50	548	1233	0
Thalassiosira/Porosira spp. (>20 µm)	20	50	30	30	10	10	0	0	0	0	0	0	20	20	0	0	0	0	0
Unidentified centric diatoms	0	0	0	10	0	0	10	10	0	0	0	0	50	3151	10	10	0	20	0
Unidentified pennate diatoms	30	20	0	40	30	20	0	20	0	0	0	10	0	90	0	10	10	10	0
Coccolithophores																			
Unidentified small coccolithophores (<10 µm)	2740	3288	3425	3973	3562	2877	3836	3288	3836	7672	29866	1507	2192	599716	3425	69	274	2466	3014
Unidentified large coccolithohores	430	690	480	980	190	320	200	570	990	170	0	0	10	20	0	0	0	0	0
Discosphaera tubifera	170	150	620	140	110	160	320	390	880	590		0		0	0		10		0
Calcidiscus leptoporus	70	80	70	60	60	20	0	10	30	20		0		10	0		0		0
Umbellosphaera irregularis	2740	2192	274	137	548	0	411	137	137	1644		0		0	0		0		0
Syracosphaera pulchra HET	40	30	40	70	20	20	0	30	40	40		0		0	0		0		0
Rhabdosphaera clavigera	10	60	10	0	0	0	10	30	40	50		0		0	0		0		0
S. pulchra HOL	10	80	60	100	10	100	120	30	60	50		0		0	0		0		0
Syracosphaera spp.	10	20	90	10	0	10	0	0	0	0		0		0	0		0		0
Helicosphaera carteri	0	30	10	0	10	10	0	0	0	0		0		0	0		0		0
Other groups																			
Criptophytes	0	0	0	137	137	0	0	0	137	0	1644	274	0	0	685	0	0	0	274
Nanoflagellates (3-20 µm)	8631	3562	4795	6576	13152	10960	13837	12878		9316	8768	407880	588183	1656240	1418559	184528	3014	3288	24934
Group totals																			
Dinoflagellates	3069	2338	938	1356	3748	2829	3036	4386	3994	3163	1694	304	75249	47976	3735	80	220	15668	1510
Diatoms	2018	942	1283	414	1694	561	1650	1647	290	1313	548	421	8400	58121	5556	110	638	1553	2653
Coccolithophores	6270	6640	5079	5480	4530	3537	4897	4485	6023	10256	29866	1507	2212	599746	3425	69	284	2466	3014
Criptophytes	0	0	0	137	137	0	0	0	137	0	1644	274	0	0	685	0	0	0	274
Others	8631	3572	4805	6576	13172	10960	13887	12888	9366	8818	418150	588203	1662269	1419579	184528	3014	3288	24934	165222

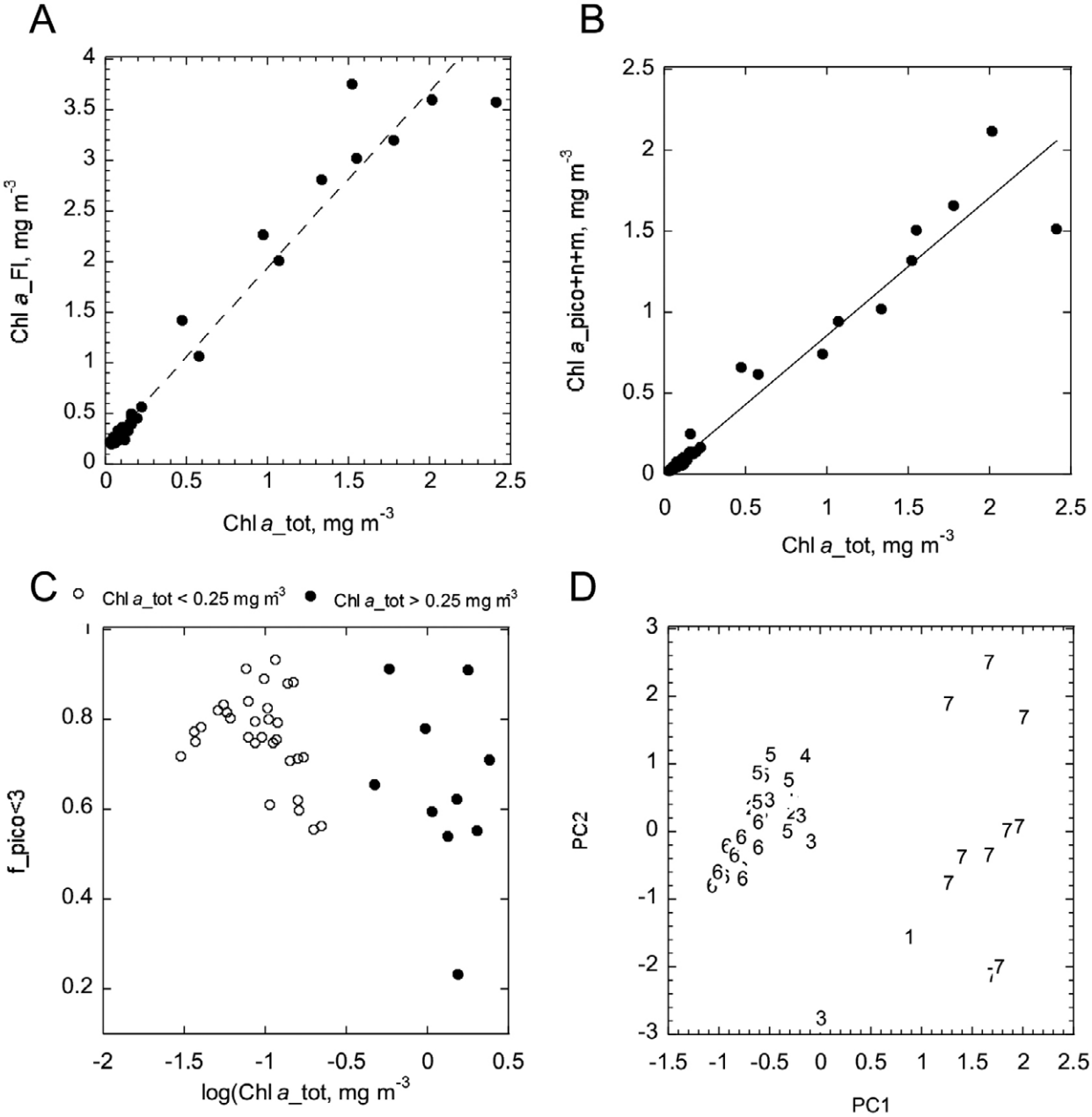

Fig. S1. – A, relationships between regression of Chl *a*_Fl and Chl *a*_tot), Chl *a*_Fl =1.76*Chl *a*_tot + 0.17, n=41, r^2=0.96, p<0.0001 (one Chl *a*_tot outlier for station 41 was excluded); B, between the sum of the <3 (f_pico<3) and the ≥3 (f_n+m≥3) Chl *a* filtration fractions (Chl *a*_pico<3+n+m≥3) and Chl *a*_tot, Chl *a*_pico<3+n+m≥3 = 0.85+ Chl *a*_tot + 0.005; n=41, r^2=0.95, p<0.0001; the same outlier was also excluded); C, between f_pico<3 and log(Chl *a*_tot); D, between PC2 and PC1. The numbers within the graph indicate the provinces (see the explanation of Table S1 for abbreviations). 1, MEDI; 2, NAST-E; 3, CNRY; 4, NATR; 5, WTRA; 6, SATL; 7, SWAS.

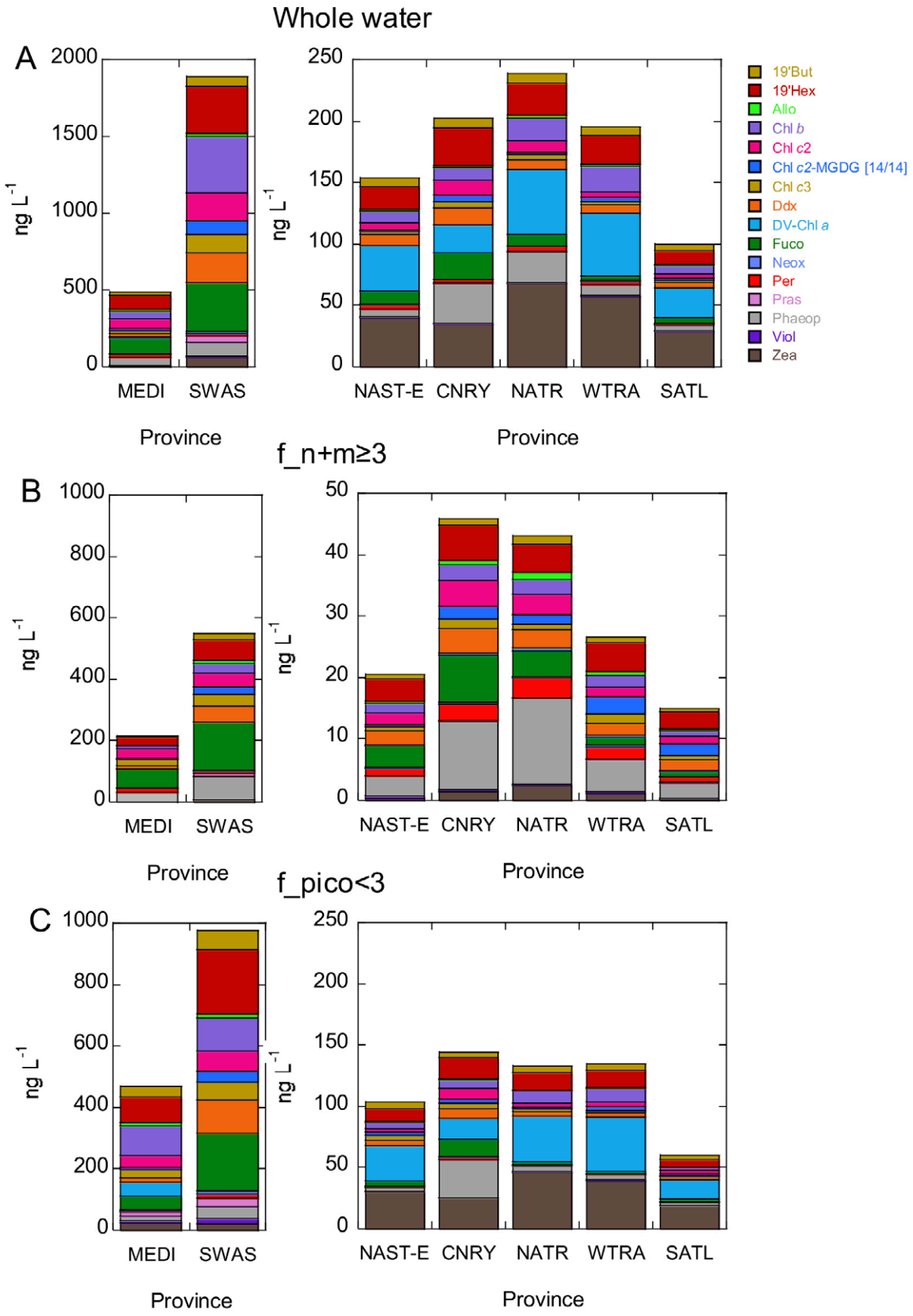

Fig. S2. – Average HPLC-determined concentration of the 11 globally most abundant pigments plus the biomarkers alloxanthin, neoxanthin, peridinin, prasinoxanthin and violaxanthin in the seven provinces for whole water (A), the f_n+m≥3 fraction (B) and the f_pico<3 fraction (C). Province name abbreviations as in Table S1. Pigment abbreviations as in Table 1.

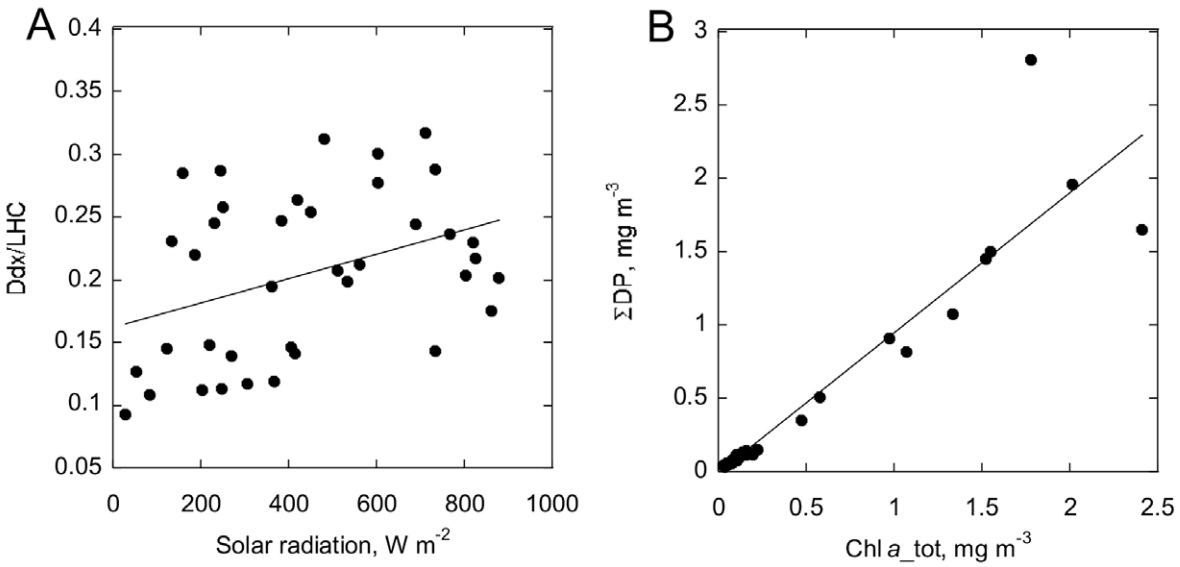

Fig. S3. – A, relationship between Ddx/LSC and solar radiation, $y = 9.72e\text{-}5*x + 0.162$, n=40, $r^2=0.14$, $p<0.05$; B, between SDP and Chl *a*_tot, SDP = 0.96*Chl *a*_tot – 0.01, n=41, $r^2=0.88$, $p<0.0001$.

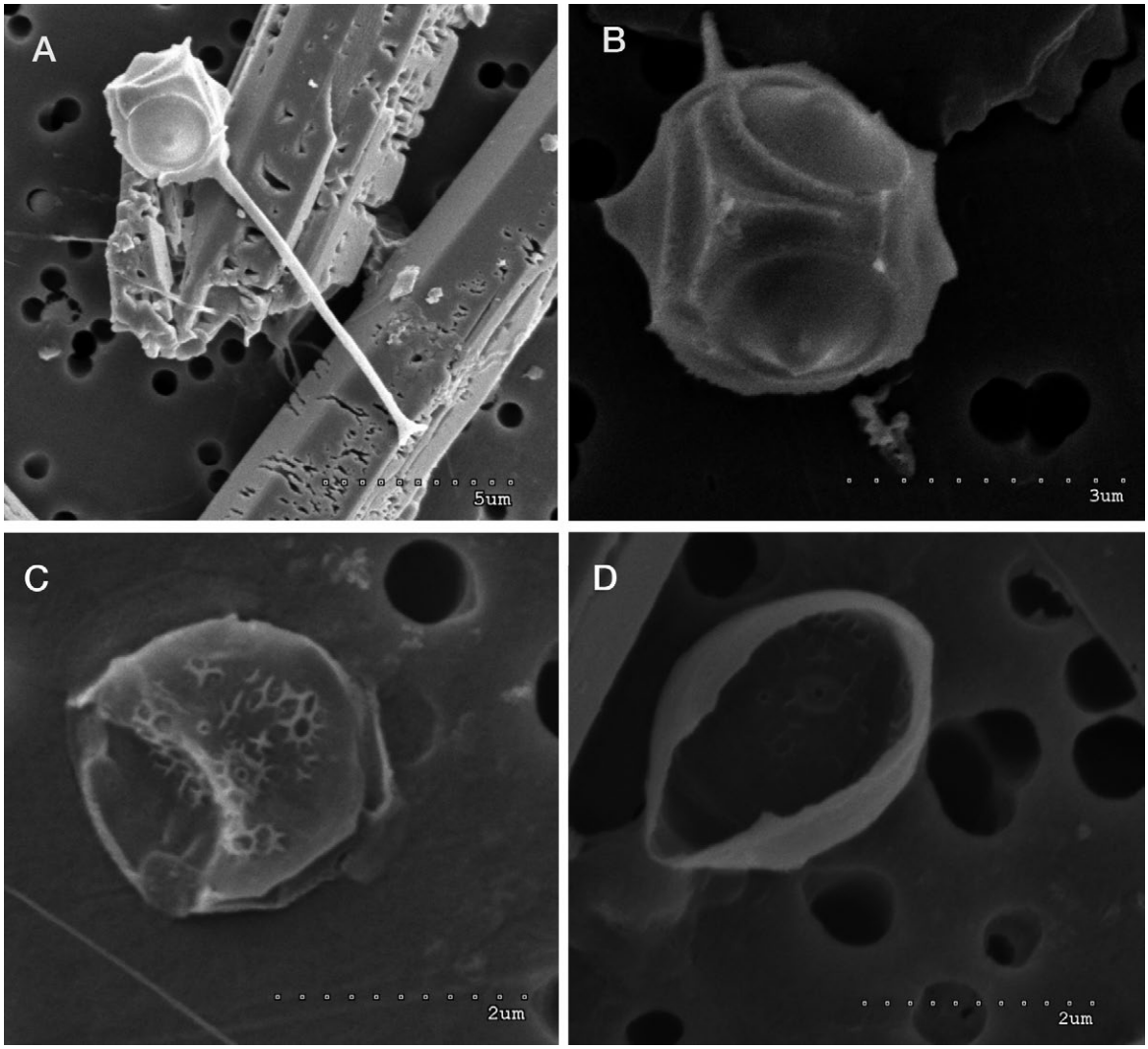

Fig. S4. – Scanning electron micrographs of *Triparma laevis* (Parmales) (A, B) and *Minidiscus* sp. (Bacillariophyceae) (C, D).

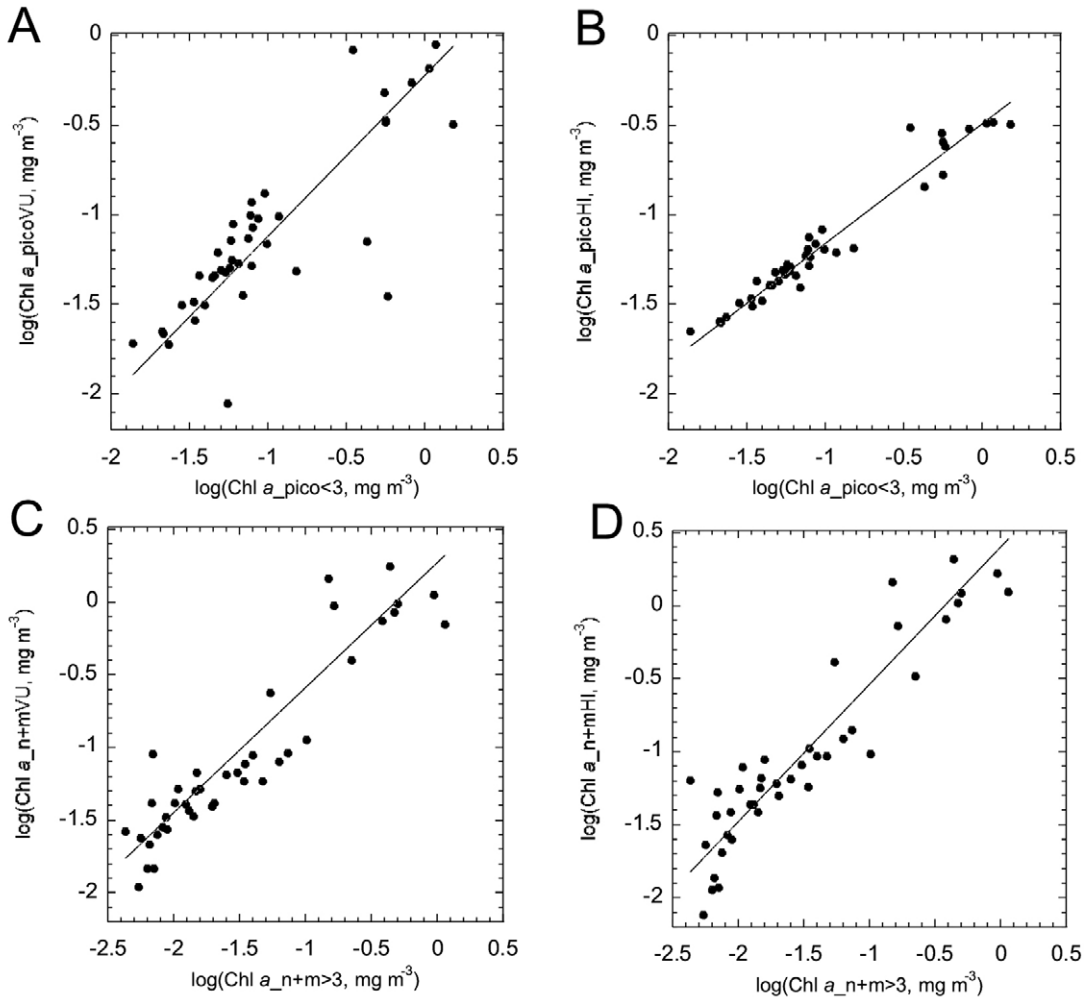

Fig. S5. – A to D, log-log standard major axis regressions of the picoplankton and nano+microphytoplankton contributions to total Chl *a* (in mg m^{-3}) estimated by the methods of Vidussi et al. (2001)-Uitz et al. (2006) (Chl *a*_picoVU and Chl *a*_n+mVU, respectively) and Hirata et al. (2011) (Chl *a*_picoHI and Chl *a*_n+mHI, respectively), with the Chl *a*_pico<3 and Chl *a* n+m≥3 derived from the filtrations. The equations are (A) log(Chl *a*_picoVU) = 0.90*log(Chl *a*_pico<3) – 0.22, n=41, r^2=0.69, p<0.0001; B, log(Chl *a*_picoHI) = 0.67*log(Chl *a*_pico<3) – 0.49, n=41, r^2=0.95, p<0.0001; C, log(Chl *a*_n+mVU) = 0.89*log(Chl *a*_n+m≥3) + 0.27, n=41, r^2=0.86, p<0.0001; D, log(Chl *a*_n+mHI) = 0.94*log(Chl *a*_n+m≥3) + 0.40, n=41, r^2=0.86, p<0.0001. In A, C and D the slopes were not statistically different from 1.

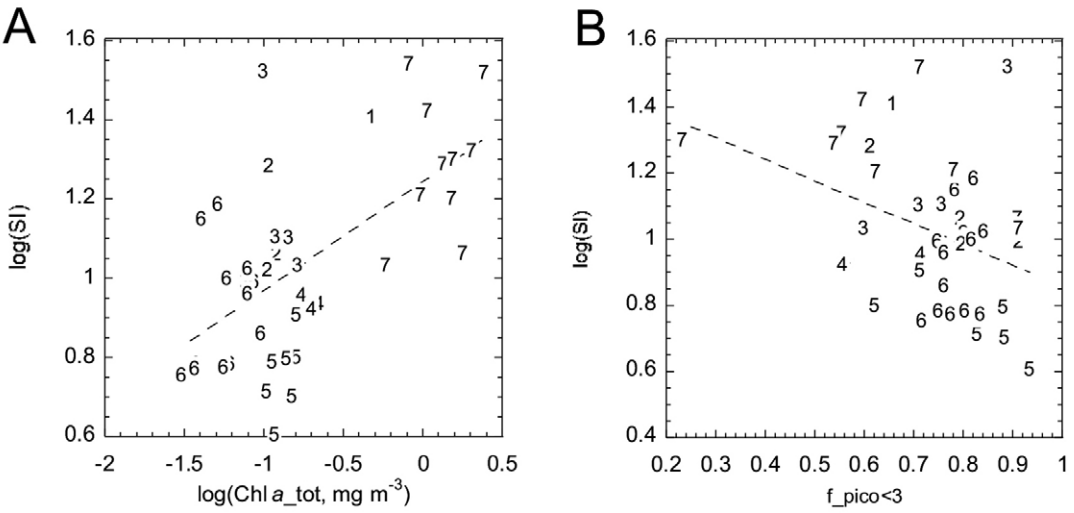

Fig. S6. – A, regression of the logarithm of the size index (SI) on log(Chl *a*_tot) [log(Si) = 0.28*log(Chl *a*_tot) + 1.24, n=41, r^2=0.38, p<0.0001]; and B, of the logarithm of the size index (SI) on f_pico<3 [log(Si) = –0.65*f_pico<3 + 1.50, n=41, r^2=0.14, p<0.05]. The numbers within the graph indicate the provinces (see the explanation of Table S1 for abbreviations). 1, MEDI; 2, NAST-E; 3, CNRY; 4, NATR; 5, WTRA; 6, SATL; 7, SWAS.

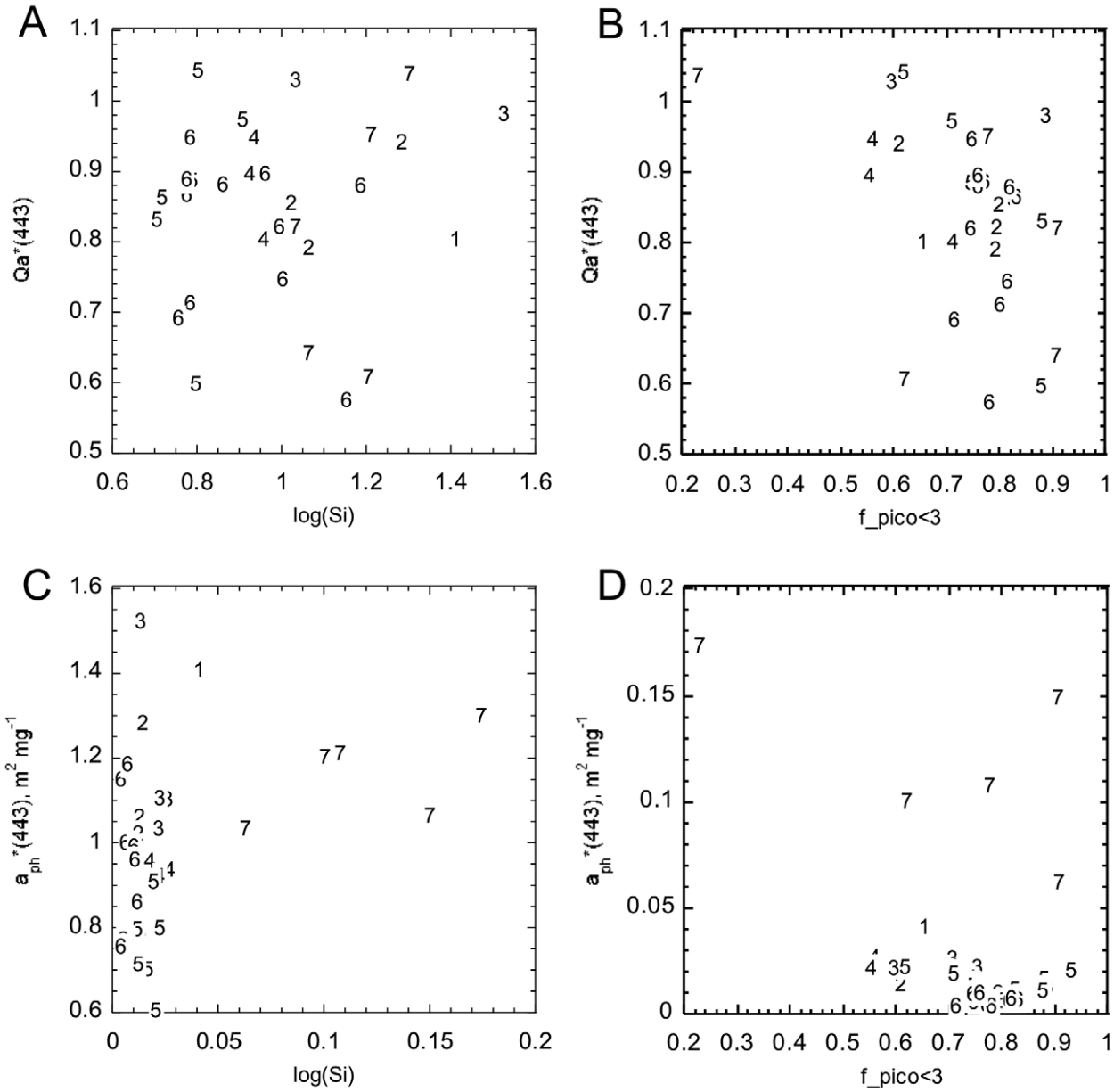

Fig. S7. – A, relationships between Qa*(443) and log(Si); B, between Qa*(443) and the proportion of Chl *a* in the <3 μm fraction of the filtrations (f_pico<3); C, between a_{ph}*(443) and log (Si); and D, between a_{ph}*(443) and f_pico<3. The numbers within the graph indicate the provinces (see the explanation of Table S1 for abbreviations). 1, MEDI; 2, NAST-E; 3, CNRY; 4, NATR; 5, WTRA; 6, SATL; 7, SWAS.

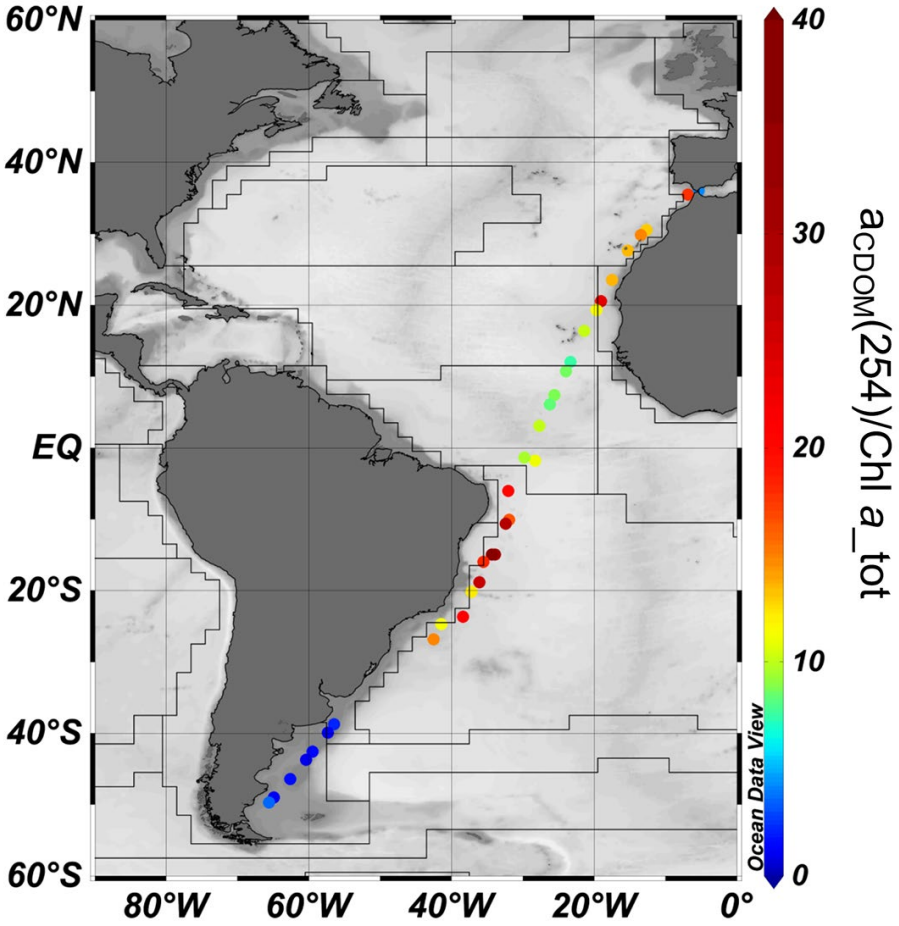

Fig. S8. – Geographic distribution of the ratio $a_{CDOM}(254)$/Chl *a*_tot (units are m^{-1} and mg m^{-3}, respectively). The lines indicate province limits, as in Figure 1.