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Environmental and biological controls on Na / Ca ratios in scleractinian cold-water corals

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Samplename	Location	Coordinates	Waterdepth [m]	Temperature [°C]	Salinity [PSU]	pH	Reference
A1 - A4	Traenadjupet, Norwegian Sea	66°58.400'N 11°06.529'E	300	7.2	35.2	8.02	Dullo et al. (2008), Rüggeberg et al. (2011)
B1 - B2	Whittard Canyon, Celtic Sea	48°46.79'N 10°34.20'W	835	9.79	35.5	7.99	Raddatz et al. (2013)
C1 - C2	Stjernsund Fjord, Norwegian Sea	70°16.04'N 22°27.37'E	295	5.9	35	8.20	Rüggeberg et al. (2011)
D1 – D4	Little Galway Mound, Belgica Mound Province	51°26.51'N 11°45.43'W	881	8.96	35.53	7.99	Dullo et al. (2008), Rüggeberg et al. (2011)
E1 - E3	Santa Maria di Leuca, Ionic Sea	39°125.00'N 18°127.00'E	560–750	13.66	38.66	8.08	Flögel et al. (2014)
F1 – F4	Guilvinec Canyon, Bay of Biscay	46°56.20'N 5°21.60'W	800	10.29	35.6	8.08	Raddatz et al. (2013)
G1 – G4	Sotbakken, Norwegian Sea	70°45.35'N 18°40.04'E	265	6.6	35.2	8.06	Raddatz et al. (2013)
H1 – H3	Galway Mound, Belgica Mound Province	51°26.94'N 11°45.16'E	837	9.54	35.53	7.99	Dullo et al. (2008), Rüggeberg et al. (2011)
I1 – I3	Urania Bank, Strait of Sicily	36°50.32'N 13°09.35'E	559	13.5	38.8	8.11	Raddatz et al. (2013), López Correa et al. (2010)
J1 – J2	Meknes Carbonate Mound Provinence, Gulf of Cadiz	34.59.98'N 7°04.51'W	738	10.28	35.7	7.76	Raddatz et al. (2013)
K1 – K5	Trondheimfjord, Norwegian Sea	63°28.61'N 9°59.72'E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)
LO1	Bari Canyon, Adriatic Sea	41°18.00'N 17°12.00'E	315–650	13.49	38.62	8.08	Flögel et al. (2014)
MSS1	Santa Maria di Leuca, Ionic Sea	39°25.00'N 18°27.00'E	560–750	13.66	38.66	8.08	Flögel et al. (2014)

MA1	Bari Canyon, Adriatic Sea	41°18.00′N 17°12.00′E	315–650	13.49	38.62	8.08	Flögel et al. (2014)
MSM1	Campeche Bank,Gulf of Mexico	23°50.121'N 87°10.484'W	565	10.59	35.24	7.94	WOA 2013(Locarnini et al., 2013; Zweng et al., 2013)
MSM2	Great Bahama Bank Mound E, Northwest Atlantic	24°35.623'N 79°16.808'W	579	9.24	35.084	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
MSM3	Great Bahama Bank Mound B, Northwest Atlantic	24°33.848'N 79°19.811'W	616	9.27	35.1	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
MSM4	Southwest Florida, Gulf of Mexico	24°58.164'N 84°17.973'W	483	8.29	35.17	7.85	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
ALB1	El Idrissi Bank, Alboran Sea	36°06.31′N 3°29.33′W	647	12.98	38.464	8.06	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS1	Northeastern Red Sea	27°42.306'N 35°09.046'E	954	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS2	Northeastern Red Sea	22°17.857'N 38°53.648'E	580	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS3	Northeastern Red Sea	27°42.306'N 35°09.046'E	954	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS4	Northeastern Red Sea	27°42.306'N 35°09.046'E	954	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS5	Northeastern Red Sea	22°46.149'N 38°02.944'E	625	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)

L10-1	Tautra Reef, Norwegian Sea	63°35.36'N 10°31.23'E	39	6	30.1	7.99	Neulinger (2008)
L2-1 – L2-2	Lopphavet, Norwegian Sea	70°26.80'N 21°10.38'E	230	6.5	35.1	8.06	Raddatz et al. (2013)
L3-1 – L3-2	Lopphavet,Norwegian Sea	70°26.80'N 21°10.38'E	230	6.5	35.1	8.06	Raddatz et al. (2013)
L5-1 – L5-2	Stjernsund Fjord, Norwegian Sea	70°16.04'N 22°27.37'E	295	5.9	35	8.20	Rüggeberg et al. (2011)
L6-1 – L6-2	Sula Reef, Norwegian Sea	64°05.93'N 8°05.47'E	286	7.6	35.3	8.08	Raddatz et al. (2013)
L7-1 – L7-2	Sula Reef, Norwegian Sea	64°05.93'N 8°05.47'E	286	7.6	35.3	8.08	Raddatz et al. (2013)
L8-1 – L8-2	Nordleksa, Norwegian Sea	63°36.43'N 9°22.66'E	155	7.8	35	8.03	Form et al. (2014)
LR1 – LR6	Lopphavet, Norwegian Sea	70°26.59'N 21°10.00'E	230	6.5	35.1	8.05	Raddatz et al. (2013)
LW1 – LW5	Lopphavet, Norwegian Sea	70°26.59'N 21°10.00'E	230	6.5	35.1	8.05	Raddatz et al. (2013)
NL-1 – NL6	Nordleksa, Norwegian Sea	63°36.43'N 9°22.66'E	155	7.8	35	8.03	Form et al. (2014)
OS1 – OS6	Oslo Fjord, North Sea	59°04.01'N 10°44.31'E	115	8.2	35.2	7.98	Raddatz et al. (2013)
P391-1 – P391-3	Lopphavet, Norwegian Sea	70°26.59'N 21°10.00'E	230	6.5	35.1	8.05	Raddatz et al. (2013)
RL1-1 – RL1-4	Trondheimfjord, Norwegian Sea	63°28.61'N 9°59.72'E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)
RL4-1 – RL4-4	Trondheimfjord, Norwegian Sea	63°28.61'N 9°59.72'E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)

RL9-1 – RL9-5	Trondheimfjord, Norwegian Sea	63°28.61'N 9°59.72'E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)
SJ1 – SJ6	Stjernsund Fjord, Norwegian Sea	70°16.04'N 22°27.37'E	295	5.9	35	8.20	Rüggeberg et al. (2011)
SJ2-1 – SJ2-4	Stjernsund Fjord, Norwegian Sea	70°16.04'N 22°27.37'E	295	5.9	35	8.20	Rüggeberg et al. (2011)
TF1 – TF2	Tautra Reef,Norwegian Sea	63°35.36'N 10°31.23'E	39	6	30.1	7.99	Neulinger (2008)
TF2-1 – TF2-6	Trondheimfjord, Norwegian Sea	63°28.61'N 9°59.72'E	240	8.1	31.2	7.99	Dullo et al. (2008), Rüggeberg et al. (2011)
EFC1 – EFC6	Sula Reef, Norwegian Sea	64°05.93'N 8°05.47'E	286	7.6	35.3	8.03	Raddatz et al. (2013)
EFE1 – EFE4	Sula Reef, Norwegian Sea	64°05.93'N 8°05.47'E	286	7.6	35.3	8.08	Raddatz et al. (2013)

Table S1 Sample ident and location Metadata. Sample names such as A1-A4 relate to multiple samples that derive from the same coral specimen/calice.

Samplename	Species	Na/Ca [mmol/mol]	Mg/Ca [mmol/mol]	Sr/Ca [mmol/mol]
A1 - A4	D	29.02	3.83	10.23
B1 - B2	D	24.87	3.17	9.91
C1 - C2	D	29.25	3.97	9.95
D1 – D4	D	27.57	3.94	10.01
E1 - E3	D	24.14	4.03	9.84
F1 – F4	D	24.61	3.56	10.05
G1 – G4	D	31.04	4.25	10.18
H1 – H3	D	23.93	3.62	10.21
I1 – I3	D	23.75	3.99	9.65
J1 – J2	D	21.2	2.45	10.35
K1 – K5	D	28.72	7.84	9.6
LO1	D	26.74	3.94	10
MSS1	D	26.85	5.41	10.03

MA1	M	25.18	3.73	10.47
MSM1	D	66.24	7.71	10.31
MSM2	D	30.17	6.38	10.42
MSM3	M	56.92	9.98	10.62
MSM4	D	25.43	3.04	10.22
ALB1	D	49.9	3.82	10.08
KRS1	C	45.84	4.37	9.94
KRS2	C	22.33	4.47	10.15
KRS3	C	20.91	4.73	9.46
KRS4	C	20.49	2.81	9.78
KRS5	C	20.78	3.49	10.36

L10-1	D	21.12	2.2	10
L2-1 – L2-2	D	24.61	3.04	10.11
L3-1 – L3-2	D	24.58	3.19	10.36
L5-1 – L5-2	D	23.43	3.1	10.39
L6-1 – L6-2	D	23.79	3.68	10.26
L7-1 – L7-2	D	25.45	3.49	10.41
L8-1 – L8-2	D	23.67	3.23	10.21
LR1 – LR6	D	27.18	3.34	10.31
LW1 – LW5	D	26.23	3.79	9.63
NL-1 – NL6	D	28.14	4.67	9.9
OS1 – OS6	D	24.81	5.73	9.7
P391-1 – P391-3	D	24.45	6.26	10.38
RL1-1 – RL1-4	D	21.32	3.03	10.27
RL4-1 – RL4-4	D	24.36	4.72	10.38

RL9-1 – RL9-5	D	22.68	3.41	10.26
SJ1 – SJ6	D	28.64	4.51	10.07
SJ2-1 – SJ2-4	D	29.38	5.37	10.42
TF1 – TF2	D	25.72	6.1	10.13
TF2-1 – TF2-6	D	21.42	3.78	10.2
EFC1 – EFC6	D	26.01	4.31	9.94
EFE1 – EFE4	D	27.1	3.8	10.31

Table S2 Results of the ICP-OES measurements. Red values are identififed as outliers and are not considered for further calculations. Species abreviations stand for D = *Desmophyllum pertusum*, M = *Madrepora oculata* and C = Caryophylliid species. Sample names such as A1-A4 relate to multiple samples that derive from the same coral specimen/calice.

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