



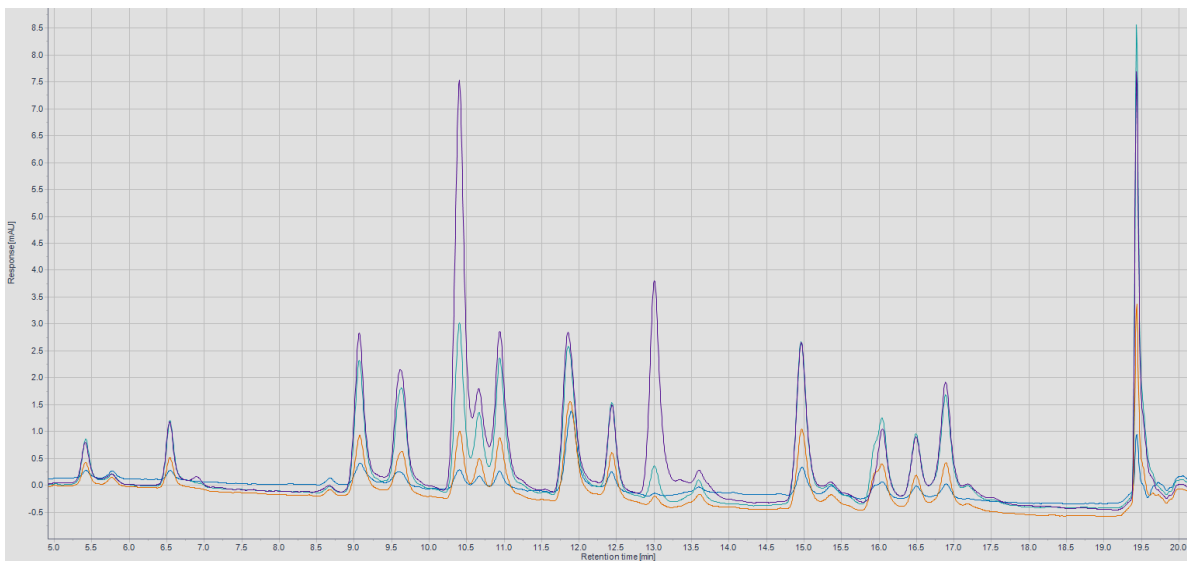
Supplement of

Macroalgal influence on particulate organic matter sources and early transformation in an Arctic fjord

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43 **Figure S1:** Amino acid standard (sequentially: Aspartate, Glutamate, Serine, Histidine,
44 Glycine, Threonine, Arginine, Alanine, Tyrosine, Cysteine, Valine, Methionine,
45 Phenylalanine, Isoleucine, Leucine, Lysine) calibration at 25 pmol (blue line), 100 pmol
46 (orange line), 250 pmol (sky blue line) and 1 nmol (Purple line) concentration.

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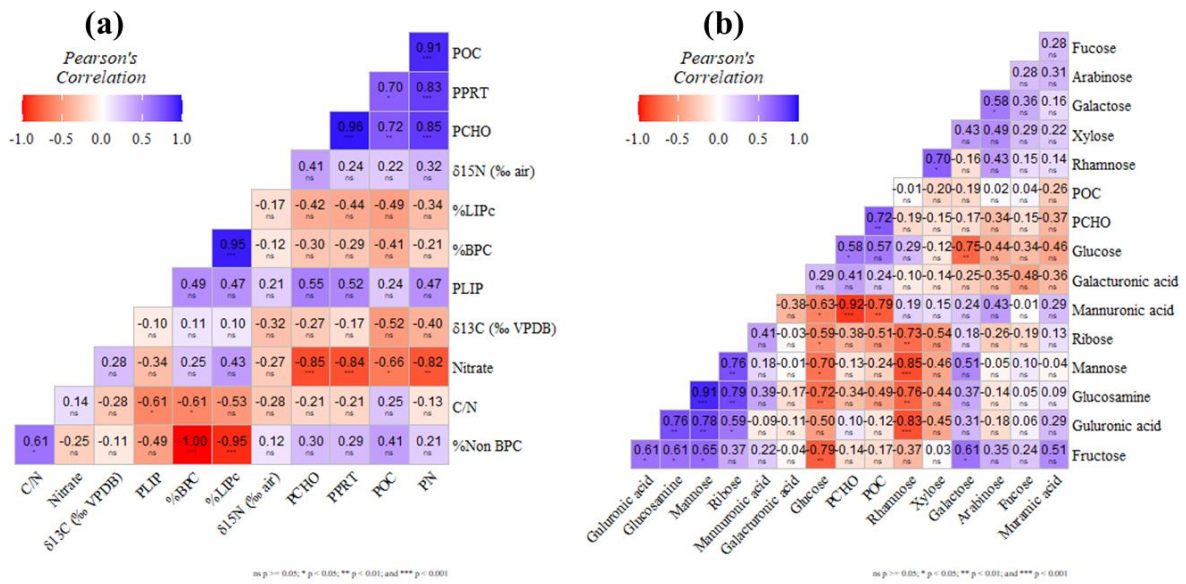
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 64 **Figure S2:** Heatmap of Pearson's correlation matrix of biochemical parameters, stable
 65 isotopes, and nutrient concentrations (a) and biochemical parameters with monosaccharide
 66 compositions. The heatmap displays correlation coefficients (r) from -1.0 (red) to 1.0 (blue),
 67 with significance levels indicated as: *ns* ($p \geq 0.05$), * ($p < 0.05$), ** ($p < 0.01$), and *** ($p < 0.001$).

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84 **Table S1:**

85 Shapiro–Wilk normality tests, Levene's tests for homogeneity of variance and one-way
86 ANOVA examining the variation in biochemical composition (PCHO, PPRT, BPC, glucose
87 and fucose) between macroalgal dominant sites and adjacent waters.

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Variable	Shapiro-Wilk W	Shapiro p-value	Levene's F	Levene p-value	ANOVA F	ANOVA p-value
PCHO	0.9372	0.4627	0.2083	0.6579	1.570	0.239
PPRT	0.9200	0.2860	1.1069	0.3175	2.506	0.145
BPC	0.9302	0.3826	1.0974	0.3195	0.843	0.380
Glucose	0.9540	0.6957	0.5808	0.4636	0.096	0.763
Fucose	0.8985	0.1517	0.1176	0.7387	0.614	0.451

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105 **Table S2.** Concentration of major photosynthetic pigments (ng/L) in particulate organic matter
 106 across various sampling stations (NA, BD, KN, HN) and depths (MDS, 500m, 1500m).

Sample ID	Chl- C2	Peridinin	Fucoxanthin	19-Hex fucoxanthin	Diadinoxanthin	Chl- b	DV chl- a	Chl- a	Phaeophytin a
NA-MDS	17.5	19.3	29.4	15.8	6.7	171.1	10.2	57.5	34.8
NA-500	10.1	5.0	19.6	11.2	3.7	63.5	ND	26.6	ND
NA-1500	18.1	18.2	40.7	9.6	7.0	108.3	11.0	53.2	ND
BD-MDS	23.2	80.2	37.0	51.1	13.0	269.0	12.0	60.6	ND
BD-500	75.7	86.7	98.4	66.7	27.9	418.4	19.2	122.6	34.3
BD-1500	9.6	8.4	20.4	7.1	3.9	81.7	7.0	32.1	ND
KN-MDS	5.3	6.5	14.3	15.1	3.5	83.8	6.7	32.2	ND
KN-500	9.6	6.4	11.5	17.1	3.6	107.0	7.1	38.4	26.0
KN-1500	5.3	6.5	14.3	15.1	3.5	83.8	6.7	32.2	25.5
HN-MDS	5.1	8.3	2.5	7.8	2.8	110.3	6.8	39.4	31.3
HN-500	6.3	8.2	4.4	9.8	2.6	137.5	9.1	40.0	30.0
HN-1500	8.7	8.2	20.1	22.9	3.5	198.2	9.6	58.5	29.3

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113 **Table S3.** Summary of particulate biopolymeric carbon (BPC) and biochemical concentrations
 114 (monosaccharides and amino acids) across sampling stations.

Variable	Range (min. - max.)	Minimum (Station)	Maximum (Station)
BPC (%)	31.7% - 60.0%	NA_MDS	NA_1500
Labile POC (%)	17.8% - 25.7%	NA_MDS	BD_MDS
Total monosaccharide concentration ($\mu\text{g L}^{-1}$)	23.4 - 78.6 $\mu\text{g L}^{-1}$	KN_MDS	BD_MDS
NA station	29.3 - 37.0 $\mu\text{g L}^{-1}$	NA_1500	NA_MDS
BD station	45.6 - 78.6 $\mu\text{g L}^{-1}$	BD_1500	BD_MDS
KN station	23.4 - 34.3 $\mu\text{g L}^{-1}$	KN_MDS	KN_1500
HN station	42.3 - 53.4 $\mu\text{g L}^{-1}$	HN_MDS	HN_1500
Total amino acid concentration ($\mu\text{g L}^{-1}$)	24.4 - 179.8 $\mu\text{g L}^{-1}$	KN_1500	BD_MDS
BD station	179.8 - 74.8 $\mu\text{g L}^{-1}$	BD_MDS	BD_1500
KN station	47.1 - 24.4 $\mu\text{g L}^{-1}$	KN_MDS	KN_1500
NA station	45.1 - 86.7 $\mu\text{g L}^{-1}$	NA_1500	NA_500
HN station	96.1 - 107.6 $\mu\text{g L}^{-1}$	HN_500	HN_1500

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129 **Table S4:** Average amino acid concentration ($\mu\text{g/L}$) in macroalgal dominant sites and
130 adjacent waters

	Asp	Glu	Ser	Gly	Thr	Arg	Ala	Tyr	Cys	Val	Ile	Leu	Lys
MDS	10.8	16.2	5.7	21.0	3.1	16.4	2.3	2.0	0.3	1.2	2.2	8.3	5.3
Adj-W	6.6	9.8	5.4	17.8	2.3	12.6	1.5	0.6	0.1	0.1	0.0	6.4	5.1

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