

## **Supplementary material**

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

Ashok S Jagtap<sup>1</sup>, Archana Singh<sup>1</sup>, Anand Jain<sup>1</sup>, Nandini Raj<sup>2</sup>, Manish Tiwari<sup>1</sup>

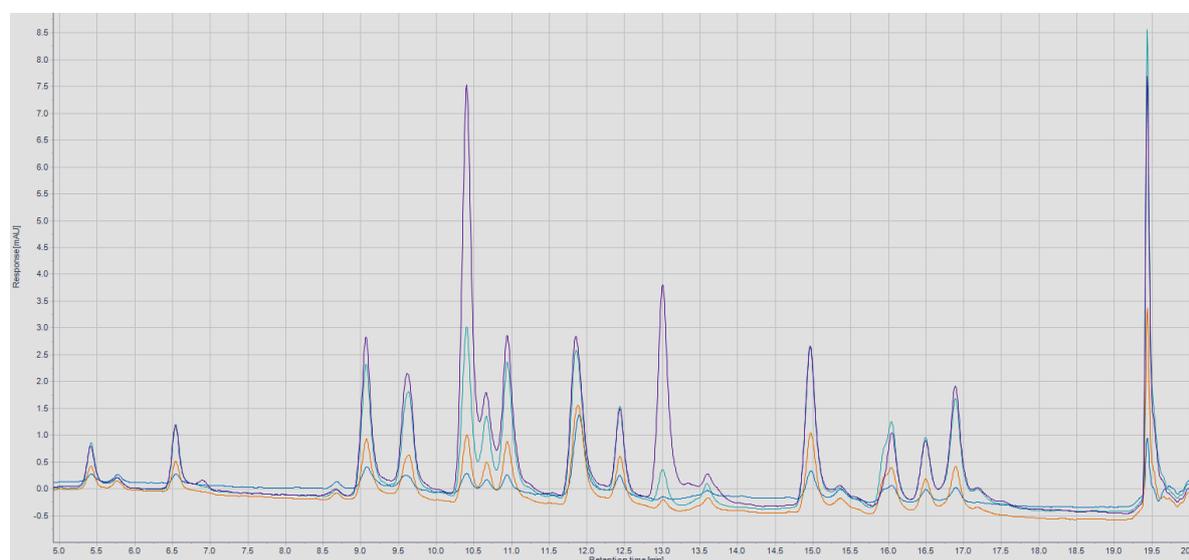
<sup>1</sup>National Centre for Polar and Ocean Research, Ministry of Earth Sciences, Vasco-da-Gama,

Goa 403804, India

<sup>2</sup>Amity Institute of Biotechnology, Amity University, Uttar Pradesh 201313, India

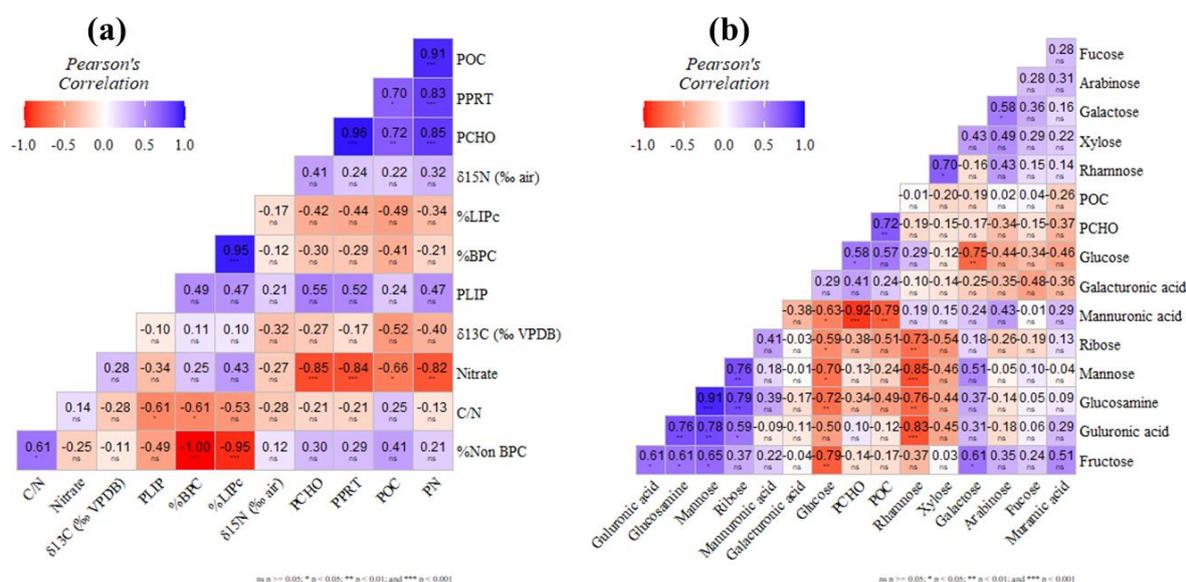
**Table S1.** Concentration of major photosynthetic pigments (ng/L) in particulate organic matter across various sampling stations (NA, BD, KN, HN) and depths (MDS, 500m, 1500m).

Sample ID	Chl-C2	Peridinin	Fuco xanthin	19-Hex fucoxanthin	Diadin oxanthin	Chl-b	DV chl-a	Chl-a	Phaeophytina
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



**Figure S1:** Amino acid standard (sequentially: Aspartate, Glutamate, Serine, Histidine, Glycine, Threonine, Arginine, Alanine, Tyrosine, Cysteine, Valine, Methionine,

Phenylalanine, Isoleucine, Leucine, Lysine) calibration at 25 pmol (blue line), 100 pmol (orange line), 250 pmol (sky blue line) and 1 nmol (Purple line) concentration.



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

**Table S2:** ANOVA of particulate organic matter (POM) composition, including major biochemical classes (BPC, PCHO, PPRT, PLIP), stable isotopes ( $\delta^{15}\text{N}$ ,  $\delta^{13}\text{C}$ ), and individual monomers (monosaccharides and amino acids).

Source of Variation	SS	df	MS	F	P-value	F crit
Between MDS and Adj-W	1333.8	1	1333.8	0.51	0.47	3.96

Within MDS and Adj-W	213277.5	82	2600.9			
Total	214611.3	83				

**Table S3:** Average amino acid concentration (ug/L) in macroalgal dominant sites and 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