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Supplement of

Benthic foraminifera as tracers of brine production in the Storfjorden “sea ice factory”

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Station	Depth (m)	Sedimentation rate (mm yr ⁻¹)	Grain size characteristics				
			Layer (cm)	% SAND	% SILT	Mean (µm)	Mode (µm)
MC1	108	3.1 ± 2.5	0.0-0.5	4.0	87.3	8.7	10.5
			0.5-1.0	3.5	87.4	8.1	9.3
MC2	117	3.9 ± 0.3	0.0-0.5	4.8	87.0	9.3	9.3
			0.5-1.0	5.9	82.6	7.6	7.2
MC4	191.5	3.2 ± 0.5	0.0-0.5	7.3	86.2	10.9	12.0
			0.5-1.0	6.7	85.1	9.1	9.3
MC5	171	2.6 ± 0.9	0.0-0.5	9.0	83.8	10.8	10.5
			0.5-1.0	8.2	85.1	10.8	10.5
MC6	157	5.0 ± 3.2	0.0-0.5	10.4	84.8	14.2	13.6
			0.5-1.0	4.3	88.9	10.0	12.0
MC7	321	1.3 ± 0.6	0.0-0.5	6.8	88.2	14.3	19.9
			0.5-1.0	6.2	88.9	14.1	19.9

Table S1: Sedimentation rate and sediment grain size characteristics (percentage of sand and silt, distribution mean and mode) of the topmost centimetre of sediment (0.0-0.5 and 0.5-1.0 cm sediment layers separately) for each sampling station (data are not available for station MC3).

Stations	PRT mg g ⁻¹		CHO mg g ⁻¹		LIP mg g ⁻¹		PRT %		CHO %		LIP %	
	avg	sd	avg	sd	avg	sd	avg	sd	avg	sd	avg	sd
MC1	5.39	0.74	2.75	0.32	2.33	0.01	47.95	2.41	20.03	0.53	32.03	2.94
MC2	5.85	0.76	3.64	0.28	3.72	0.44	40.23	0.62	20.52	0.80	39.24	0.18
MC4	5.06	1.01	6.47	0.31	3.47	0.08	32.12	4.42	33.79	1.71	34.09	3.00
MC5	4.33	0.92	6.21	0.84	3.01	0.45	30.75	4.58	36.08	2.52	33.16	7.11
MC6	6.01	0.26	4.07	0.57	3.75	0.09	39.91	1.69	22.02	2.77	38.07	1.15
MC7	3.62	0.50	2.91	0.06	2.36	0.40	37.76	5.76	24.71	0.35	37.53	5.87
Stations	BPC mgC g ⁻¹		Chl-a µg g ⁻¹		Phaeo µg g ⁻¹		CPE µg g ⁻¹		C-CPE mgC g ⁻¹		C-CPE/BPC %	
	avg	sd	avg	sd	avg	sd	avg	sd	avg	sd	avg	sd
MC1	5.49	0.49	4.08	0.19	19.96	3.50	24.04	3.69	0.72	0.11	13.09	0.87
MC2	7.12	0.82	6.08	0.47	35.12	9.15	41.19	9.62	1.24	0.29	17.21	2.10
MC4	7.67	0.51	5.27	0.33	28.35	5.30	33.62	5.63	1.01	0.17	13.10	1.37
MC5	6.86	0.45	6.41	0.44	30.45	7.13	36.86	7.58	1.11	0.23	16.02	2.27
MC6	7.38	0.21	6.82	0.76	27.78	2.46	34.60	3.22	1.04	0.10	14.06	1.20
MC7	4.71	0.07	0.02	0.04	6.40	0.48	6.43	0.45	0.19	0.01	4.09	0.33

Table S2: For each sampling station (data are not available for station MC3), biochemical parameters are reported as average ± sd (n = 3). Starting from left: total amount of proteins (PRT), carbohydrates (CHO), lipids (LIP), relative contribution of PRT, CHO and LIP to the BPC, the biopolymeric carbon contents (BPC), chlorophyll-a (Chl-a) and phaeopigment (Phaeo) contents, the chloroplast pigment equivalent (CPE), the autotrophic Carbon (C-CPE) and the algal fraction of BPC (C-CPE/BPC).

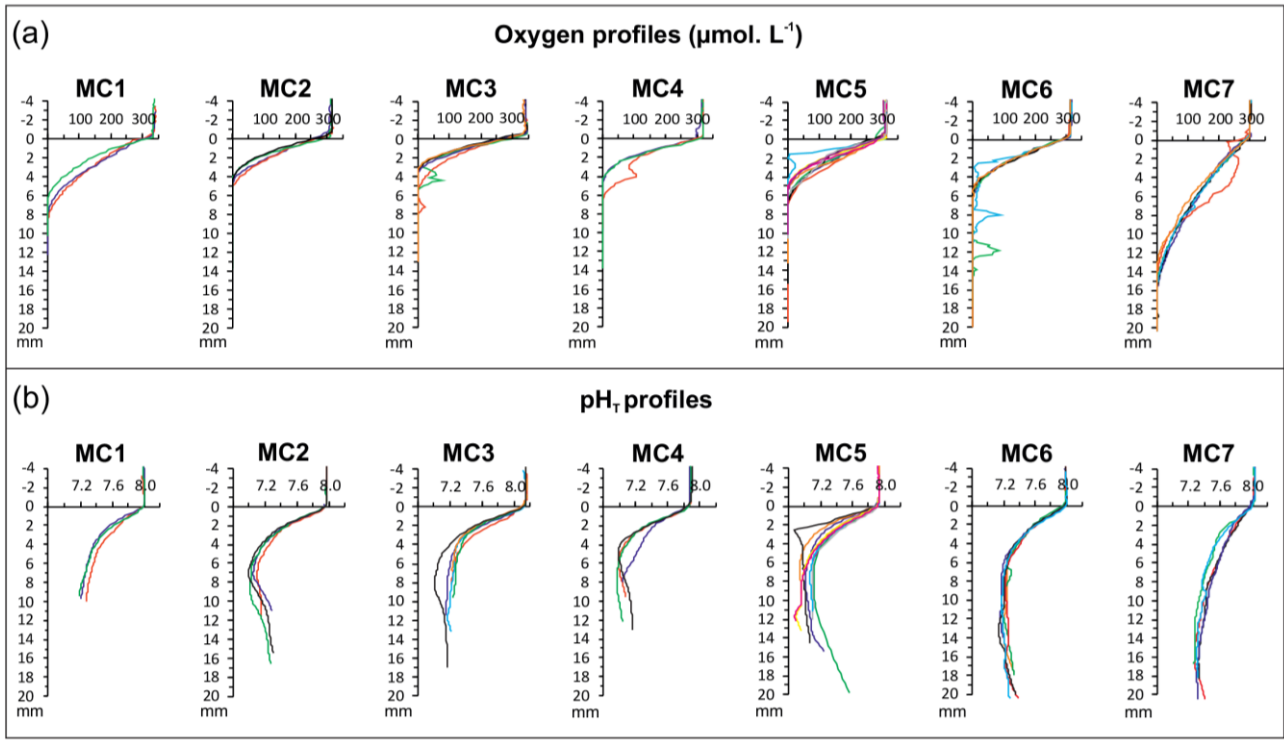


Figure S1: Replicated measurements of sediment oxygen (a) and pH_T microprofiles (b) in interface cores sampled at each station. Level 0 is the position of the sediment-water interface. Different colours represent different replicates of profiles.

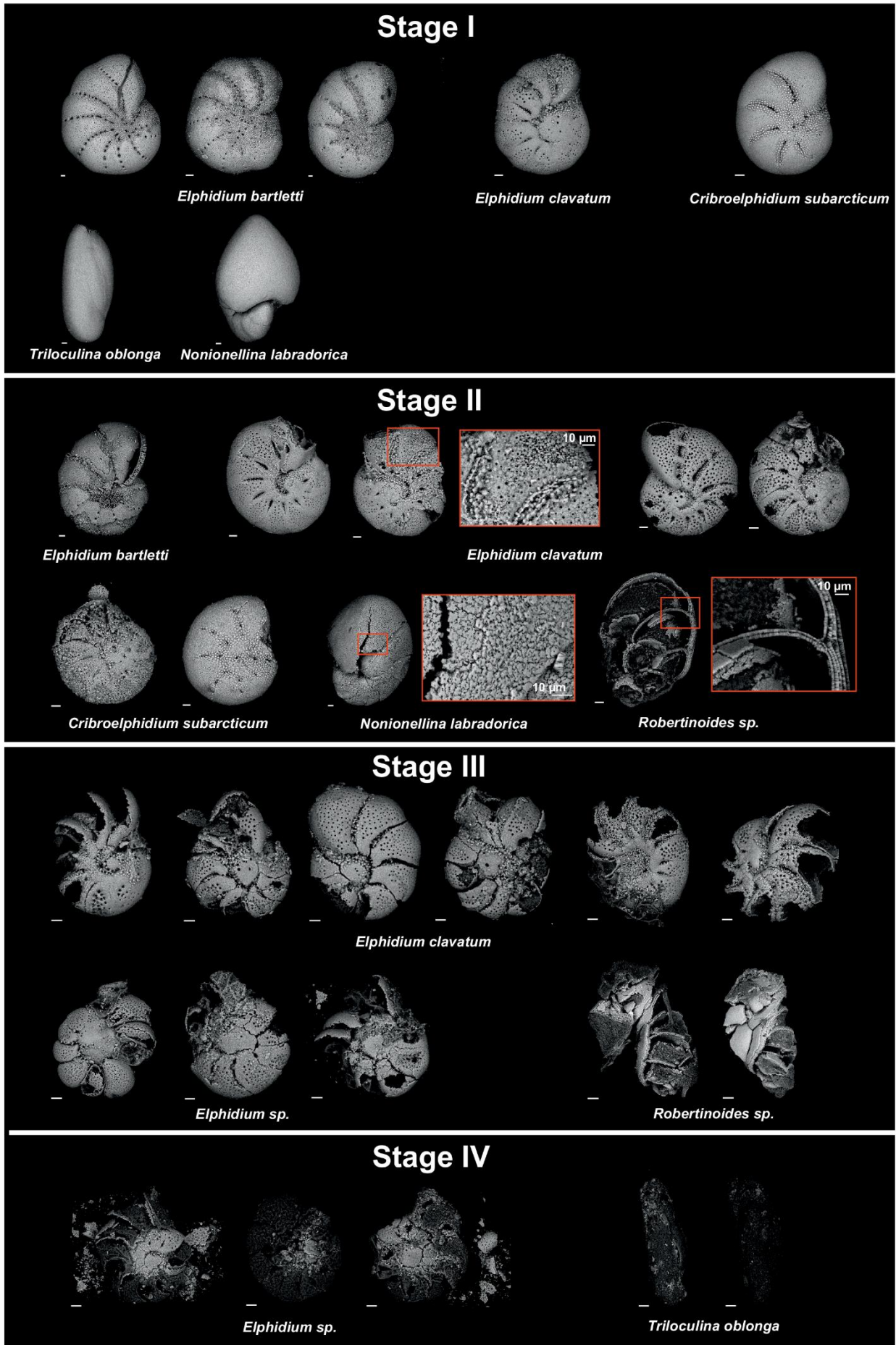


Figure S2: High-resolution SEM images of specimens (from the >150 µm size fraction) classified into four dissolution stages from weak (stage I) to severe (stage IV) following the classification of Gonzales et al. (2017). Scale bars 20 µm.

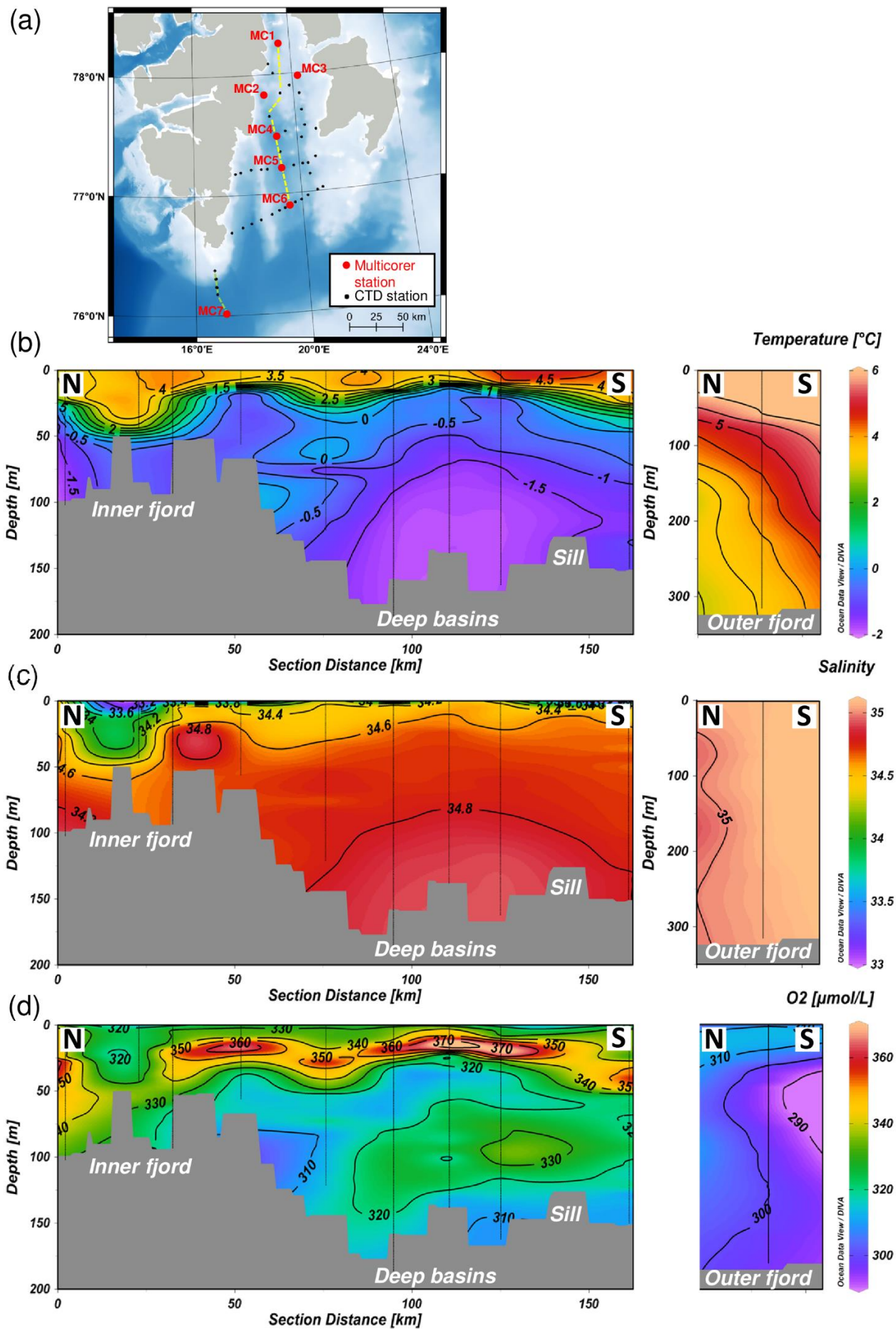


Figure S3: (a) Map with the location of all CTD stations from the STeP cruise (black dots) and of the interface multicorer stations analysed in the present study (red dots). The dashed yellow line is the N-S transect used for the ODV interpolations shown on the left panels and the dashed green line the one shown on the right panels. Bathymetry obtained from EMODnet (<http://portal.emodnet-bathymetry.eu>) and map elaborated with QGIS (made with Natural Earth). Ocean Data View interpolation for temperature (b) salinity (c) and oxygen (d) of CTD profiles.

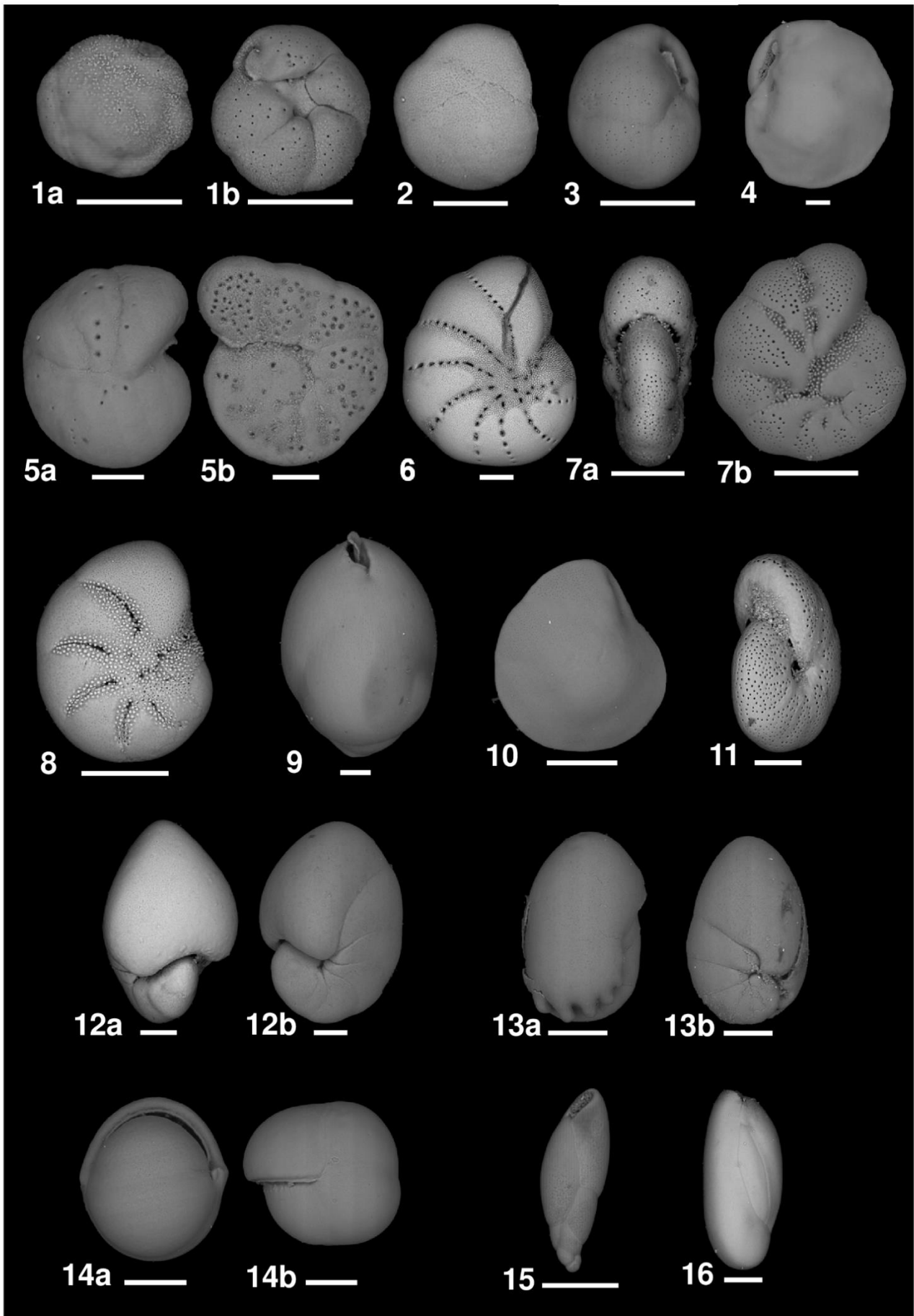


Figure S4: Scanning electron micrographs of the most relevant calcareous benthic species from Storfjorden (scale bars = 100 μm). 1a, 1b. *Alabaminella weddellensis* (Earland, 1936). 2. *Buccella frigida* (Cushman, 1922). 3. *Cassidulina reniforme* Nørvang, 1945. 4. *Cassidulina teretis* Tappan, 1951. 5a, 5b *Cibicidoides lobatulus* (Walker & Jacob, 1798). 6. *Elphidium bartletti* Cushman, 1933. 7a, 7b. *Elphidium clavatum* Cushman, 1930. 8. *Criboelphidium subarcticum* (Cushman, 1944). 9. *Globobulimina auriculata* (Bailey, 1894). 10. *Islandiella norcrossi* (Cushman, 1933). 11. *Melonis barleeanus* (Williamson, 1858). 12a, 12b. *Nonionellina labradorica* (Dawson, 1860). 13a, 13b. *Nonionella digitata* Nørvang, 1945. 14a, 14b. *Pullenia bulloides* (d'Orbigny, 1846). 15. *Stainforthia feylingi* Knudsen & Seidenkrantz, 1994. 16. *Triloculina oblonga* (Montagu, 1803).

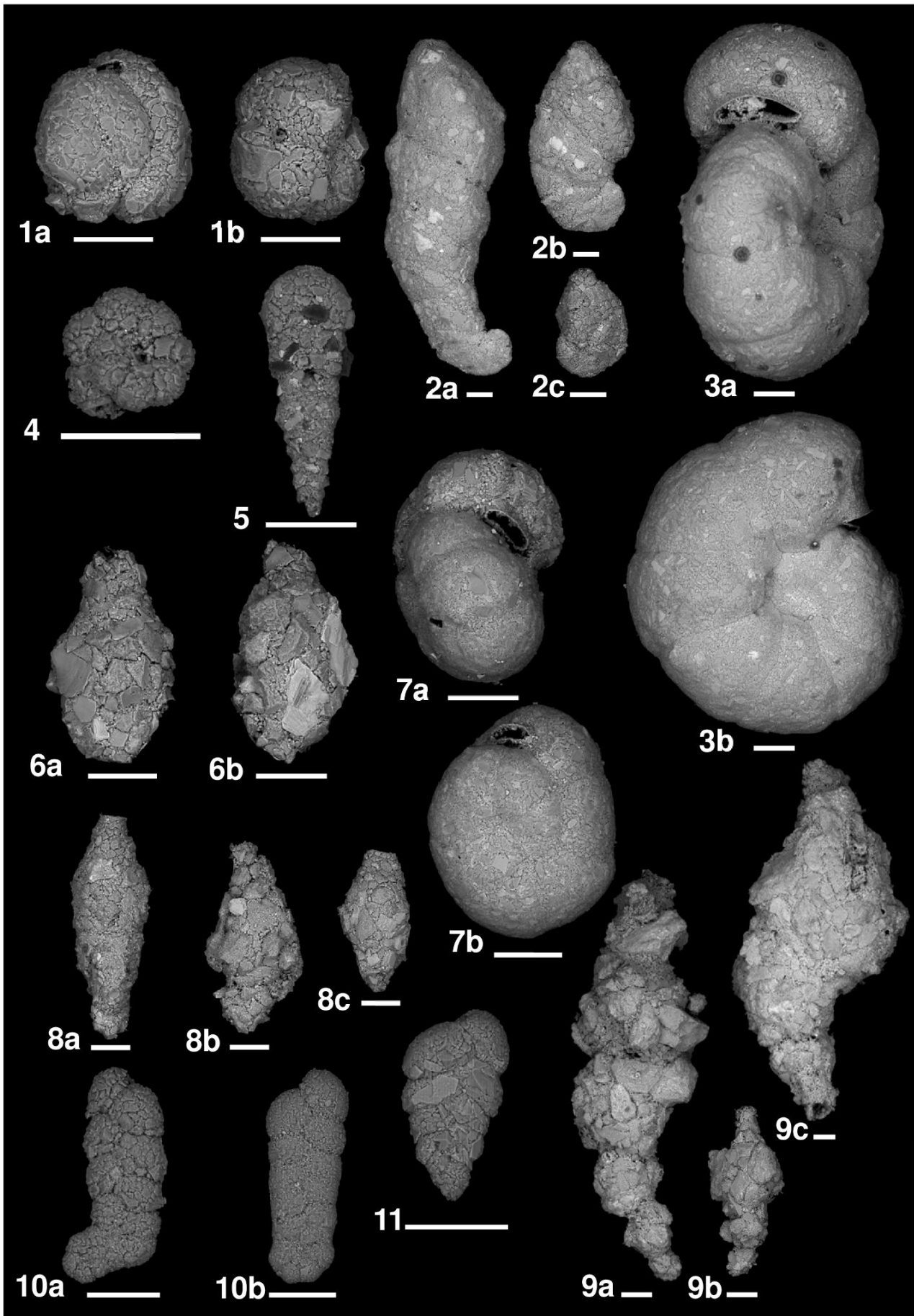


Figure S5: Scanning electron micrographs of the most relevant agglutinated benthic species from Storfjorden (scale bars = 100 μ m). 1a, 1b. *Adercotryma glomeratum* (Brady, 1878). 2a, 2b, 2c. *Ammotium cassis* (Parker, 1870). 3a, 3b. *Labrospira crassimargo* (Norman, 1892). 4. *Cribrostomoides* sp. Cushman, 1910. 5. *Cuneata arctica* (Brady, 1881). 6a, 6b. *Lagenammina difflugiformis* (Brady, 1879). 7a, 7b. *Recurvoides turbinatus* (Brady, 1881). 8a, 8b, 8c. *Reophax fusiformis* (Williamson, 1858). 9a, 9b, 9c. *Reophax scorpiurus* Montfort, 1808. 10a, 10b. *Spiroplectammina biformis* (Parker & Jones, 1865). 11. *Textularia torquata* Parker, 1952.