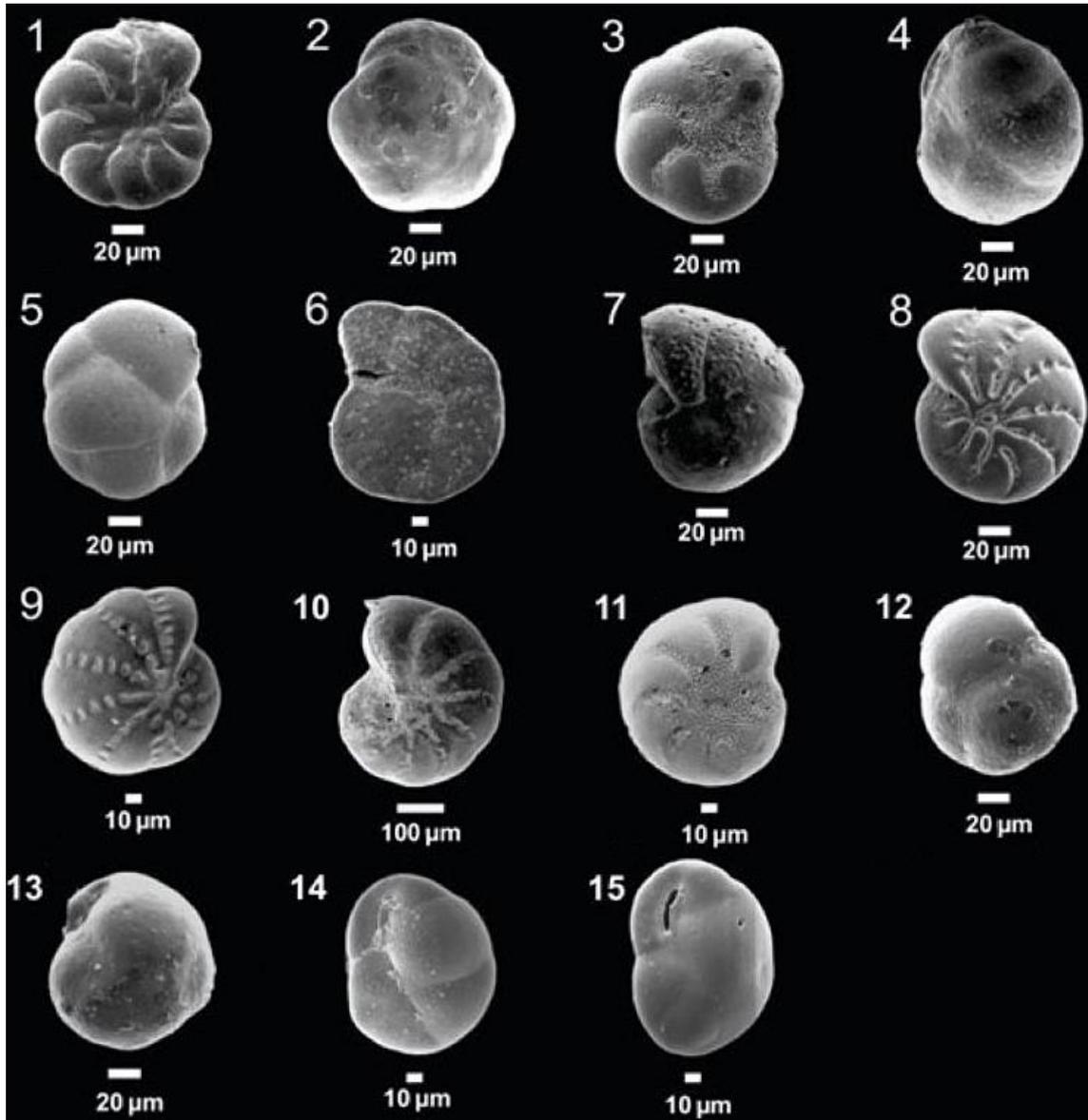
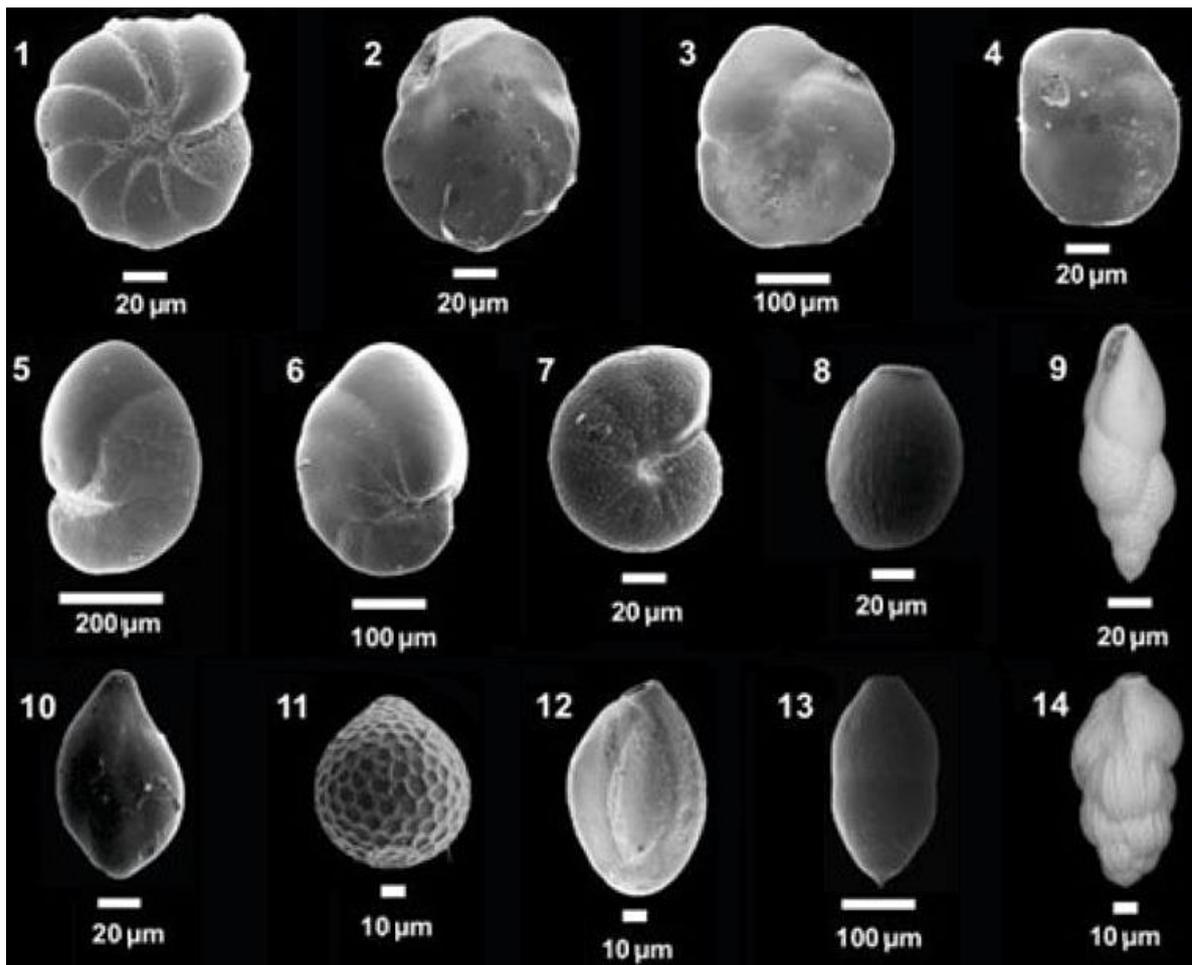


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Benthic foraminiferal investigations in Middle to Late Quaternary sections of Kongsfjordhallet, north-west Svalbard. *Polar Research* 42. Correspondence: Debolina Chatterjee, Department of Geological Sciences, Jadavpur University, 188, Raja Subodh Chandra Mallick Road, Jadavpur, Kolkata, West Bengal 700032, India. E-mail: dchatterjee039@gmail.com



Supplementary Fig. S1. Scanning electron microscope photographs of Arctic foraminifera: (1) *Astrononion gallowayi* (U); (2) *Buccella frigida* (Si); (3) *Buccella frigida* (U); (4) *Cassidulina reniforme* (U); (5) *Cassidulina reniforme* (Si); (6) *Cibicides lobatulus* (Si); (7) *Cibicides lobatulus* (U); (8) *Elphidium clavatum* (S); (9) *Criboelphidium williamsoni* (S); (10) *Elphidium subarcticum* (S); (11) *Elphidium albiumbilicatum* (S); (12) *Globocassidulina* sp., (Si); (13) *Globocassidulina* sp. (A); (14), (15) *Cassidulina neoteretis* (A). A: apertural view; U: umbilical view; Si: spiral view; S: side view.



Supplementary Fig. S2. Scanning electron microscope photographs of Arctic foraminifera: (1) *Haynesina orbiculare* (S); (2) *Islandiella helenae* (A); (3) *Islandiella helenae* (Si); (4) *Islandiella norcrossi* (A); (5) *Nonionella auricula* (S); (6) *Nonionella labradorica* (S); (7) *Melonis barleeanus* (Si); (8) *Fissurina* sp. (S); (9) *Stainforthia loeblichii* (S); (10) *Guttulina* sp. (S); (11) *Oolina* sp. (S); (12) *Quinqueloculina* sp. (S); (13) *Glandulina* sp. (S); (14) *Trifarina fluens* (S). A: apertural view; Si: spiral view; S: side view.

Supplementary Table S1. Foraminiferal counts in 1 g (dry weight) samples from unit 3 (subglacial till). Unit 7 (alluvial sediments) contained only four foraminifera specimens. Foraminifera in both units are reworked and are not included in the paleoenvironmental interpretation.

Sample code / unit	KFH14-09 unit 3 low	KFH14-10 unit 3 upper
Specimens counted per 1 g of dry sediments	435	335
Fisher alpha diversity index	2	2
No. of species	7	6

Sample code / unit	KFH14-09 unit 3 low	KFH14-10 unit 3 upper
Benthic foraminifera species	%	%
<i>Astrononion gallowayi</i>	5	9
<i>Buccella frigida</i>	14	16
<i>Cassidulina reniforme</i>	21	19
<i>Cassidulina teretis</i>	12	10
<i>Cibicides lobatulus</i>	29	24
<i>Elphidium clavatum</i>	11	11
<i>Criboelphidium williamsoni</i>	0	1
<i>Elphidium subarcticum</i>	0	0
<i>Elphidium albiumbilicatum</i>	0	0
<i>Fissurina</i> sp.	0	0
<i>Glandulina</i> sp.	0	0
<i>Globocassidulina</i> sp.	0	0
<i>Guttulina</i> sp.	0	0
<i>Haynesina orbiculare</i>	2	1
<i>Islandiella helenae</i>	5	6
<i>Islandiella norcrossi</i>	0	0
<i>Melonis barleeanus</i>	1	0
<i>Nonionella auricula</i>	0	0
<i>Nonionella labradorica</i>	1	1
<i>Oolina</i> sp.	0	0
<i>Quinqueloculina</i> sp.	0	0
<i>Stainforthia loeblichii</i>	0	0
<i>Trifarina fluens</i>	0	0

Supplementary Table S2. Foraminiferal list for Kongsfjordhallet, with the original reference for the species description.

Genus species	References
<i>Astrononion gallowayi</i>	Loeblich & Tappan, 1953
<i>Buccella frigida</i>	Cushman, 1922
<i>Cassidulina reniforme</i>	Nørvang, 1945
<i>Cassidulina neoteretis</i>	Seidenkrantz, 1995
<i>Cibicides lobatulus</i>	Walker & Jacob, 1798
<i>Elphidium clavatum</i>	Cushman, 1930

<i>Criboelphidium williamsoni</i>	Haynes, 1973
<i>Criboelphidium</i> sp.	Loeblich & Tappan, 1964
<i>Elphidium subarcticum</i>	Cushman, 1944
<i>Elphidium albiumbilicatum</i>	Weiss, 1954
<i>Fissurina</i> sp.	Loeblich & Tappan, 1964
<i>Globocassidulina</i> sp.	Loeblich & Tappan, 1964
<i>Glandulina</i> sp.	Loeblich & Tappan, 1964
<i>Guttulina</i> sp.	Loeblich & Tappan, 1964
<i>Haynesina orbiculare</i>	Brady, 1881
<i>Islandiella helenae</i>	Feyling-Hanssen & Buzas, 1976
<i>Islandiella norcrossi</i>	Cushman, 1933
<i>Melonis barleeanus</i>	Williamson, 1858
<i>Nonionella labradorica</i>	Dawson, 1860
<i>Nonionella auricula</i>	Heron-Allen & Earland, 1930
<i>Oolina</i> sp.	Loeblich & Tappan 1964
<i>Quinqueloculina</i> sp.	Loeblich & Tappan 1964
<i>Stainforthia loeblichii</i>	Feyling-Hanssen, 1954
<i>Trifarina fluens</i>	Todd in Cushman & McCulloch, 1948

Supplementary Table S3. Benthic foraminifera species in percentage recorded in 1 g (dry weight) samples from units -1 and 1 from Kongsfjordhallet.

Sample code / unit	KFH14-04 unit -1 low	KFH14-05 unit -1 mid	KFH14-06 unit -1 top	Kong base unit 1 base	Kong mid unit 1 mid	Kong top unit 1 top
Specimens counted per 1 g of dry sediments	17	26	18	1746	614	325
Fisher alpha diversity index	0	0	0	2	2	3
No. of species	4	4	4	15	14	9
Benthic foraminifera species	%	%	%	%	%	%
<i>Astrononion gallowayi</i>	0	0	0	0	0	0
<i>Buccella frigida</i>	0	0	0	2	1	1
<i>Cassidulina reniforme</i>	41	42	60	40	35	27
<i>Cassidulina neoteretis</i>	0	0	0	43	43	60
<i>Cibicides lobatulus</i>	0	0	0	1	1	1
<i>Elphidium excavatum</i> f. <i>clavatum</i>	35	34	11	9	11	7
<i>Criboelphidium williamsoni</i>	0	1	1	0	1	0
<i>Elphidium subarcticum</i>	0	0	0	0	0	0
<i>Elphidium albiumbilicatum</i>	0	0	0	0	1	1

Sample code / unit	KFH14-04 unit -1 low	KFH14-05 unit -1 mid	KFH14-06 unit -1 top	Kong base unit 1 base	Kong mid unit 1 mid	Kong top unit 1 top
<i>Fissurina</i> sp.	0	0	0	0	1	0
<i>Glandulina</i> sp.	0	0	0	0	0	1
<i>Globocassidulina</i> sp.	0	0	0	0	1	0
<i>Guttulina</i> sp.	0	0	0	0	0	0
<i>Haynesina orbiculare</i>	6	8	6	0	1	1
<i>Islandiella helenae</i>	18	19	6	2	6	1
<i>Nonionella auricula</i>	0	0	0	0	0	0
<i>Nonionella labradorica</i>	1	0	0	1	1	2
<i>Oolina</i> sp.	0	0	0	0	0	0
<i>Quinqueloculina</i> sp.	0	0	0	0	0	0
<i>Stainforthia loeblichii</i>	0	0	0	0	0	0
<i>Trifarina fluens</i>	0	0	0	0	0	0

Supplementary Table S4. Benthic foraminifera species in percentage recorded in 1 g (dry weight) samples from units 4, 8a and 8b from Kongsfjordhallet.

Sample code / unit	KFH14 -11 unit 4 base	KFH14 -01 unit 4 mid	KFH14 -12 unit 4 top	Kong 8a base unit 8a base	Unit 8a mid	Unit 8a top	Unit 8b base	Unit 8b mid	Unit 8b top
Specimens counted per 1 g of dry sediments	983	828	763	20	25	26	80	42	121
Fisher alpha diversity index	1-2	1	2	0	0	0	0	0	1
No. of species	14	9	13	10	10	9	7	7	8
Benthic foraminifera species	%	%	%	%	%	%	%	%	%
<i>Astrononion gallowayi</i>	5	2	4	5	4	2	1	7	2
<i>Buccella frigida</i>	10	2	8	3	1	2	4	1	3
<i>Cassidulina reniforme</i>	15	47	30	12	20	15	29	29	14
<i>Cassidulina neoteretis</i>	19	12	17	0	0	0	0	0	0
<i>Cibicides lobatulus</i>	33	6	21	42	30	43	5	5	6
<i>Elphidium excavatum</i> f. <i>clavatum</i>	9	21	13	25	32	17	49	43	63
<i>Criboelphidium</i> sp.	0	0	0	0	0	0	0	0	0
<i>Elphidium subarcticum</i>	0	0	0	0	0	0	0	0	0

Sample code / unit	KFH14 -11 unit 4 base	KFH14 -01 unit 4 mid	KFH14 -12 unit 4 top	Kong 8a base unit 8a base	Unit 8a mid	Unit 8a top	Unit 8b base	Unit 8b mid	Unit 8b top
<i>Elphidium albumbilicatum</i>	0	0	0	0	1	0	0	0	0
<i>Fissurina</i> sp.	0	0	0	1	0	0	0	0	0
<i>Glandulina</i> sp.	0	0	0	0	0	0	0	0	0
<i>Globocassidulina</i> sp.	0	0	0	0	0	0	0	0	0
<i>Guttulina</i> sp.	0	0	0	0	0	0	0	0	0
<i>Haynesina orbiculare</i>	2	6	2	5	4	8	6	12	3
<i>Islandiella helenae</i>	3	3	2	6	5	3	5	0	3
<i>Islandiella norcrossi</i>	0	1	0	0	0	0	0	0	0
<i>Melonis barleeanus</i>	0	0	1	0	1	2	0	0	0
<i>Nonionella auricula</i>	0	0	0	0	0	0	0	0	2
<i>Nonionella labradorica</i>	0	0	1	3	0	0	0	5	6
<i>Oolina</i> sp.	0	0	0	1	0		0	0	0
<i>Quinqueloculina</i> sp.	0	0	0	0	0	0	0	0	0