

Supplement of Biogeosciences Discuss., 11, 18145–18188, 2014
<http://www.biogeosciences-discuss.net/11/18145/2014/>
doi:10.5194/bgd-11-18145-2014-supplement
© Author(s) 2014. CC Attribution 3.0 License.



Supplement of

The trophic and metabolic pathways of foraminifera in the Arabian Sea: evidence from cellular stable isotopes

R. M. Jeffreys et al.

Correspondence to: R. M. Jeffreys (rachel.jeffreys@liv.ac.uk)

Table S1: Station data for deployments from both margins referred to in the Methods and Figure 1. Exact sampling positions, depths, gear type used and the sample fate.

Margin	Discovery #	Latitude (N)	Longitude (E)	Depth (m)	Gear	Sample Type
Oman	55704#2	23° 29.57	59° 14.06	3101	CTD	DO profile
Oman	55708#1	23° 41.47	58° 42.32	1435	CTD	DO profile
Oman	55726#3	23° 19.99	59° 06.81	1935	CTD	DO profile
Oman	55730#1	22° 46.40	59° 57.30	2000	CTD	DO profile
Oman	55786#1	22° 58.01	60° 08.21	3145	CTD	DO profile
Oman	55712#1	23° 23.07	58° 59.03	334	Megacore	Bulk sediment organics
Oman	55717#1	23° 21.18	59° 03.19	1341	Megacore	Bulk sediment organics
Oman	55718#3	23° 21.67	58° 59.30	800	Megacore	Bulk sediment organics
Oman	55725#2	23° 20.31	59° 09.85	2010	Megacore	Bulk sediment organics
Oman	55726#1	23° 19.87	59° 07.34	2075	Megacore	Bulk sediment organics
Oman	55730#2	22° 46.40	59° 57.52	1980	Megacore	Bulk sediment organics
Oman	55753#1	23° 23.47	59° 03.51	1093	Megacore	Bulk sediment organics
Oman	55731#1	22° 41.51	59° 56.01	1414	Megacore	Foraminiferal isotopes
Oman	55754#1	23° 22.98	59° 00.00	504	Megacore	Foraminiferal isotopes
Oman	55763#1	23° 23.02	58° 59.15	363	Megacore	Foraminiferal isotopes
Oman	55765#1	23° 22.76	59° 02.05	789	Megacore	Foraminiferal isotopes
Oman	55766#1	23° 23.52	59° 03.55	1103	Megacore	Foraminiferal isotopes
Oman	55767#1	23° 22.10	59° 05.60	1390	Megacore	Foraminiferal isotopes
Oman	55788#1	23° 01.00	60° 02.98	3185	Megacore	Foraminiferal isotopes
Oman	55789#3	22° 22.49	60° 06.35	2030	Megacore	Foraminiferal isotopes
Pakistan	56001#1	22° 52.34	65° 59.58	1849	CTD	DO profile/POM organics
Pakistan	56011#2	22° 59.99	66° 24.43	1197	CTD	DO profile/POM organics
Pakistan	56020#1	22° 55.82	66° 36.34	930	CTD	DO profile/POM organics
Pakistan	56028#1	23° 12.36	66° 33.98	307	CTD	DO profile/POM organics
Pakistan	56036#3	23° 16.43	66° 42.76	136	CTD	DO profile/POM organics

Pakistan	56065#1	22° 52.46	66° 00.02	1847	CTD	DO profile/POM organics
Pakistan	56044#3	22° 59.92	66° 24.06	1211	CTD	DO profile/POM organics
Pakistan	56031#3	23° 16.52	66° 42.40	134	Megacore	Bulk sediment organics
Pakistan	56033#4	23° 16.76	66° 42.64	136	Megacore	Bulk sediment organics
Pakistan	56016#3	23° 16.92	66° 42.74	134	Megacore	Bulk sediment organics
Pakistan	56101#10	23° 16.77	66° 42.71	131	Megacore	Bulk sediment organics
Pakistan	56025#04	23° 12.48	66° 34.02	310	Megacore	Bulk sediment organics
Pakistan	56025#05	23° 12.54	66° 34.03	307	Megacore	Bulk sediment organics
Pakistan	56025#06	23° 12.21	66° 33.88	314	Megacore	Bulk sediment organics
Pakistan	56107#01	23° 12.48	66° 34.00	300.5	Megacore	Bulk sediment organics
Pakistan	56015#02	22° 55.90	66° 36.12	958	Megacore	Bulk sediment organics
Pakistan	56012#03	22° 55.84	66° 36.10	956	Megacore	Bulk sediment organics
Pakistan	56015#03	22° 55.88	66° 36.09	960	Megacore	Bulk sediment organics
Pakistan	56116#03	22° 53.52	66° 36.66	942	Megacore	Bulk sediment organics
Pakistan	56007#02	22° 59.76	66° 24.24	1215	Megacore	Bulk sediment organics
Pakistan	56007#04	22° 59.78	66° 24.49	1203	Megacore	Bulk sediment organics
Pakistan	56007#03	22° 59.91	66° 24.41	1205	Megacore	Bulk sediment organics
Pakistan	56141#02	23° 00.00	66° 24.42	1198	Megacore	Bulk sediment organics
Pakistan	56005#02	22° 52.52	66° 00.11	1860	Megacore	Bulk sediment organics
Pakistan	56005#04	22° 52.26	66° 59.80	1864	Megacore	Bulk sediment organics
Pakistan	56001#04	22° 52.55	66° 59.93	1860	Megacore	Bulk sediment organics
Pakistan	56137#13	22° 52.39	66° 59.94	1853	Megacore	Bulk sediment organics
Pakistan	56101#10	23° 16.77	66° 42.71	132	Megacore	Foraminiferal isotopes
Pakistan	56101#04	23° 16.79	66° 42.70	133	Megacore	Foraminiferal isotopes
Pakistan	56105#05	23° 12.49	66° 34.01	285.4	Megacore	Foraminiferal isotopes
Pakistan	56116#04	22° 53.53	66° 36.64	943	Megacore	Foraminiferal isotopes
Pakistan	56116#06	22° 53.52	66° 36.64	943	Megacore	Foraminiferal isotopes
Pakistan	56137#01	22° 52.39	66° 00.03	1853	Megacore	Foraminiferal isotopes
Pakistan	56137#02	22° 52.41	66° 00.04	1853	Megacore	Foraminiferal isotopes
Pakistan	56139#01	22° 59.99	66° 24.41	1192	Megacore	Foraminiferal isotopes
Pakistan	56139#02	22° 59.98	66° 24.42	1193	Megacore	Foraminiferal isotopes

Table S2: $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ composition of foraminifera given at species level, from both the Oman and Pakistan margins. Depth (m), dissolved oxygen (μm), OMZ zone (see manuscript text) and foraminiferal type are all given. The Tubothalamea marked i and ii and have agglutinated and calcareous walls, respectively.

Margin	Depth (m)	Oxygen (μm)	Zone	Family	Species	$\delta^{13}\text{C}$	$\delta^{15}\text{N}$	Type
Oman	363	14.73	UTZ	Vaginulinidae	<i>Amphicoryna sublineata</i>	n.d.	3.2	Calcareous
Oman	504	5.1	CORE	Vaginulinidae	<i>Lenticulina</i> sp.	n.d.	7.0	Calcareous
Oman	789	6.25	CORE	Buliminidae	<i>Globobulimina turgida</i>	n.d.	6.3	Calcareous
Oman	789	6.25	CORE	Eggerellidae	<i>Karreriella</i> sp.	-20.0	5.3	Textulariid
Oman	789	6.25	CORE	Eggerellidae	<i>Karreriella</i> sp.	-22.3	5.5	Textulariid
Oman	1103	16.51	LB	Foraminifera	unidentified	n.d.	8.8	
Oman	1103	16.51	LB	Nonionidae	<i>Nonionella</i> sp.	-21.6	7.2	Calcareous
Oman	1390	27.2	LB	Hormosinidae	<i>Reophax</i> spp.	n.d.	0.7	Textulariid
Oman	1390	27.2	LB	Ammodiscidae	<i>Ammodiscus</i> sp.	n.d.	2.1	ⁱ Tubothalamea
Oman	1390	27.2	LB	Haplophragmoididae	<i>Veleroninoides scitulus</i>	n.d.	3.5	Textulariid
Oman	1390	27.2	LB	Planulinidae	<i>Hyalina baltica</i>	n.d.	4.7	Calcareous
Oman	1390	27.2	LB	Parrelloididae	<i>Cibicidoides</i> sp.	n.d.	5.3	Calcareous
Oman	1390	27.2	LB	Uvigerinidae	<i>Uvigerina hollicki</i>	-19.0	7.8	Calcareous
Oman	1414	29.9	LB	Chilostomellidae	<i>Chilostomella oolina</i>	n.d.	1.8	Calcareous
Oman	1414	29.9	LB	Parrelloididae	<i>Cibicidoides</i> sp.	n.d.	5.7	Calcareous
Oman	1414	29.9	LB	Planulinidae	<i>Hyalina baltica</i>	-11.5	6.8	Calcareous
Oman	1414	29.9	LB	Uvigerinidae	<i>Uvigerina hollicki</i>	n.d.	8.7	Calcareous
Oman	1390 + 1414	27-30	LB	Buliminidae	<i>Globobulimina</i> sp.	n.d.	3.3	Calcareous
Oman	1390 + 1414	27-30	LB	Hauerinidae	<i>Pyrgo depressa</i>	n.d.	4.2	Calcareous

Oman	2030	90.58	BELOW	Allogromida incertae sedis	unidentified	-20.0	7.1	Monothalamid
Oman	2030	90.58	BELOW	Buliminidae	<i>Globobulimina</i> sp.	n.d.	7.1	Calcareous
Oman	2030	90.58	BELOW	Foraminifera	unidentified	n.d.	10.8	
Oman	2030	90.58	BELOW	Hauerinidae	<i>Quinqueloculina</i> sp.	n.d.	6.6	ⁱⁱ Tubothalamea
Oman	2030	90.58	BELOW	Hormosinidae	<i>Reophax dentaliniformis</i>	-19.4	6.2	Textulariid
Oman	2030	90.58	BELOW	Hormosinidae	<i>Reophax dentaliniformis</i>	n.d.	7.8	Textulariid
Oman	2030	90.58	BELOW	Psammosphaeridae	<i>Psammosphaera</i> fusca with <i>Ammolagena clavata</i>	-20.1	8.3	Monothalamid
Oman	2030	90.58	BELOW	Psammosphaeridae	<i>Psammosphaera</i> fusca with <i>Ammolagena clavata</i>	-20.2	5.4	Monothalamid
Oman	2030	90.58	BELOW	Uvigerinidae	<i>Uvigerina hollicki</i>	-20.1	4.1	Calcareous
Oman	2030	90.58	BELOW	Valvulinidae	<i>Clavulina communis</i> var. sp.	-20.3	9.3	Textulariid
Oman	3185	166	BELOW	Komokiidae	<i>Lana</i> sp.	-21.3	8.5	Monothalamid
Oman	3185	166	BELOW	Buliminidae	<i>Globobulimina</i> sp.	-20.7	3.1	Calcareous
Oman	3185	166	BELOW	Haplophragmoididae	<i>Veloroninoides scitulus</i>	-20.1	9.0	Textulariid
Oman	3185	166	BELOW	Rhabdamminidae	<i>Rhizammina</i> sp.	-21.2	10.0	Monothalamid
Oman	3185	166	BELOW	Rhabdamminidae	<i>Rhizammina</i> sp.	-20.7	-2.6	Monothalamid
Oman	3185	166	BELOW	Uvigerinidae	<i>Uvigerina hollicki</i>	n.d.	-7.8	Calcareous
Pakistan	140	4.9	SHZ	Astrorhizidae	<i>Pelosina</i> sp.	-21.1	9.7	Monothalamid
Pakistan	140	4.9	SHZ	Buliminidae	<i>Globobulimina</i> cf. <i>G. pyrula</i>	-24.5	20.2	Calcareous
Pakistan	140	4.9	SHZ	Allogromida incertae sedis	unidentified	-20.5	11.5	Monothalamid
Pakistan	140	4.9	SHZ	Rhabdamminidae	<i>Bathysiphon</i> sp.	-23.3	-3.9	Monothalamid
Pakistan	140	4.9	SHZ		<i>Bolivina</i> ex. gr. <i>dilatata</i> & <i>Cassidulina laevigata</i>	-20.5	n.d.	Calcareous
Pakistan	140	4.9	SHZ	Bagginidae	<i>Cancris auriculus</i>	-23.2	16.6	Calcareous
Pakistan	140	4.9	SHZ	Bagginidae	<i>Cancris auriculus</i>	-22.5	18.9	Calcareous
Pakistan	140	4.9	SHZ		<i>G. pyrula</i> , <i>Lenticulina</i> sp., <i>C. auriculus</i>	-22.0	1.8	Calcareous
Pakistan	140	4.9	SHZ	Astrorhizidae	<i>Pelosina</i> sp.	-21.5	9.9	Monothalamid

Pakistan	140	4.9	SHZ	Astrorhizidae	<i>Pelosina</i> sp.	-20.0	5.1	Monothalamid
Pakistan	140	4.9	SHZ	Hormosinidae	<i>Reophax</i> sp. 1	-23.9	8.1	Textulariid
Pakistan	140	4.9	SHZ	Hormosinidae	<i>Reophax</i> sp. 1	-22.4	19.8	Textulariid
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-23.7	11.4	Calcareous
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-24.0	10.9	Calcareous
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-23.6	11.0	Calcareous
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-23.3	10.5	Calcareous
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-23.4	9.1	Calcareous
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-20.0	5.8	Calcareous
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-23.2	5.8	Calcareous
Pakistan	140	4.9	SHZ	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-23.5	12.1	Calcareous
Pakistan	300	4.9	CORE	Buliminidae	<i>Globobulimina</i> cf. <i>G. pyrula</i>	-22.4	17.3	Calcareous
Pakistan	300	4.9	CORE	Buliminidae	<i>Globobulimina</i> cf. <i>G. pyrula</i>	-21.5	8.7	Calcareous
Pakistan	300	4.9	CORE	Astrorhizidae	<i>Pelosina</i> sp.	-19.8	12.9	Monothalamid
Pakistan	300	4.9	CORE	Rhabdamminidae	<i>Bathysiphon</i> sp.	-22.4	-3.9	Monothalamid
Pakistan	300	4.9	CORE	Mixture	<i>C. laevigata</i> , <i>C. auriculus</i> , <i>Brizalina</i>	-22.2	13.6	
Pakistan	300	4.9	CORE	Mixture	& <i>Cribostomoides</i> , <i>Ammodiscus</i>	-22.2	13.6	
Pakistan	300	4.9	CORE		<i>Nemogullmia</i> , <i>Saccamminid</i> , <i>Allogromiid</i> , <i>Casperammina</i>	-21.8	12.0	Monothalamid
Pakistan	300	4.9	CORE		<i>Saccamminid</i> , <i>Nemogullmia</i> , <i>Allogromiid</i> , <i>Lagenammina</i>	-22.5	n.d.	Monothalamid
Pakistan	300	4.9	CORE	Hormosinidae	<i>Reophax dentaliniformis</i>	-21.8	3.8	Textulariid
Pakistan	300	4.9	CORE	Hormosinidae	<i>Reophax dentaliniformis</i>	-21.0	1.6	Textulariid
Pakistan	300	4.9	CORE	Hormosinidae	<i>Reophax dentaliniformis</i>	-19.8	13.3	Textulariid
Pakistan	300	4.9	CORE	Hormosinidae	<i>Reophax dentaliniformis</i>	-22.5	16.0	Textulariid
Pakistan	300	4.9	CORE	Hormosinidae	<i>Reophax</i> sp. 2	-23.5	13.1	Textulariid
Pakistan	300	4.9	CORE	Hormosinidae	<i>Reophax</i> sp. 2	-22.2	12.1	Textulariid

Pakistan	300	4.9	CORE	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-22.2	7.3	Calcareous
Pakistan	300	4.9	CORE	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-22.5	13.0	Calcareous
Pakistan	300	4.9	CORE	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-19.9	12.1	Calcareous
Pakistan	300	4.9	CORE	Uvigerinidae	<i>Uvigerina</i> ex. gr. <i>semiornata</i>	-18.7	12.7	Calcareous
Pakistan	940	7.6	LTZ	Hormosinidae	<i>R. dentaliniformis</i> , <i>R. scorpiurus</i>	-20.6	10.0	Textulariid
Pakistan	940	7.6	LTZ	Chilostomellidae	<i>Chilostomella ovoidea</i>	-21.2	11.2	Calcareous
Pakistan	940	7.6	LTZ	Ammosphaeoidinidae	<i>Cribostomoides</i>	-21.1	10.8	Calcareous
Pakistan	940	7.6	LTZ	Eggerellidae	<i>Dorothia scabra</i>	-25.5	27.3	Textulariid
Pakistan	940	7.6	LTZ	Eggerellidae	<i>Dorothia scabra</i>	-22.5	n.d.	Textulariid
Pakistan	940	7.6	LTZ		<i>Bathysiphon</i> , <i>Hyperammina</i>	-22.0	10.5	Monothalamid
Pakistan	940	7.6	LTZ		<i>Ammodiscus</i> , <i>Cribostomoides</i> , <i>Lenticulina</i>	-20.5	11.4	
Pakistan	940	7.6	LTZ		& <i>Karreriella</i> , <i>Globobulimina</i> , <i>Canceris</i> , <i>Cassidulina</i>	-20.5	11.4	
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.3	9.0	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.0	9.3	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-20.5	10.0	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.0	9.0	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.6	9.2	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.6	9.4	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-20.5	11.2	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-20.3	10.3	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-20.5	11.1	Textulariid
Pakistan	940	7.6	LTZ	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-19.4	15.2	Textulariid
Pakistan	1200	15.6	LB		<i>H. baltica</i> , <i>B. aculeata</i> , <i>C. oolina</i> , <i>C. ovoidea</i>	-22.0	n.d.	Calcareous
Pakistan	1200	15.6	LB		& <i>H. elegans</i> , <i>P. pupoide</i>	-22.0	n.d.	Calcareous
Pakistan	1200	15.6	LB		<i>Nodellum</i> , <i>G. aff. pyrula</i> , <i>Melonis</i> , <i>H. baltica</i>	-21.7	9.1	
Pakistan	1200	15.6	LB		& <i>Ammodiscus</i> , <i>Cribostomoides</i> ,	-21.7	9.1	

Pakistan	1200	15.6	LB		& <i>Saccamminids, Bathysiphon, Allogromiid</i>	-21.7	9.1	
Pakistan	1200	15.6	LB	Hormosinidae	<i>Rheophax scorpiurus</i>	-22.3	16.0	Textulariid
Pakistan	1200	15.6	LB	Hormosinidae	<i>R. bilocularis, R. scorpiurus, R. dentaliniformis</i>	-20.8	0.0	Textulariid
Pakistan	1200	15.6	LB	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-20.8	10.6	Textulariid
Pakistan	1200	15.6	LB	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.6	11.7	Textulariid
Pakistan	1200	15.6	LB	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.0	10.9	Textulariid
Pakistan	1200	15.6	LB	Hormosinidae	<i>Reophax</i> aff. <i>bilocularis</i>	-21.2	11.1	Textulariid
Pakistan	1200	15.6	LB	Hormosinidae	<i>R. bilocularis, R. scorpiurus, R. dentaliniformis</i>	-22.0	8.6	Textulariid
Pakistan	1200	15.6	LB	Astrorhizidae	<i>Pelosina</i> sp.	-23.1	6.9	Monothalamid
Pakistan	1850	73.6	BELOW	Komokiidae	<i>Komoki</i> sp. & <i>Lana</i> sp.	-21.1	2.7	Monothalamid
Pakistan	1850	73.6	BELOW		<i>Allogromiid, Nodellum, Psammospaerid</i>	-20.6	7.2	Monothalamid
Pakistan	1850	73.6	BELOW		<i>H. elegans, B. affinis</i>	-19.8	10.7	
Pakistan	1850	73.6	BELOW		& <i>Cyclamina</i> sp., <i>Cribostomoides</i> sp.	-19.8	10.7	
Pakistan	1850	73.6	BELOW	Astrorhizidae	<i>Pelosina</i> sp.	-20.7	8.7	Monothalamid
Pakistan	1850	73.6	BELOW	Hormosinidae	<i>R. bilocularis, R. scorpiurus, R. dentaliniformis</i>	-20.3	16.1	Textulariid
Pakistan	1850	73.6	BELOW	Rhabdamminidae	<i>Rhizammina</i> sp.	-21.1	6.7	Monothalamid
Pakistan	1850	73.6	BELOW	Rhabdamminidae	<i>Rhizammina</i> sp.	-21.4	7.8	Monothalamid
Pakistan	1850	73.6	BELOW	Rhabdamminidae	<i>Rhizammina</i> sp.	-22.1	7.2	Monothalamid
Pakistan	1850	73.6	BELOW		<i>Nodosium, Bathysiphon, Crithionina</i>	-19.9	9.5	
Pakistan	1850	73.6	BELOW		& <i>Cyclamina, Cribostomoides</i>	-19.9	9.5	