

Supplementary material

Characteristics of aerobic methane-oxidising bacterial community at the sea-floor surface of the Nankai Trough

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Table S1. Blast analysis results of clones obtained from pmof1–pmor primer set

Clone name	Blast search closest relative	Accession number	Identities	Isolation source
S1s-pmo01	Uncultured bacterium clone: 3_B28	LC377920	92/95 (96%)	Japan: Okinawa Trough, Iheya North
S1s-pmo02	Uncultured bacterium clone NZ_45_pmoA_19	KC751348	87/90 (96%)	Marine methane seep; SO191/2_45
S1s-pmo05	Uncultured bacterium clone NZ_315_pmoA_82	KC751410	89/91 (97%)	Marine methane seep; SO191/2_315
S1s-pmo09	Uncultured bacterium clone NZ_45_pmoA_19	KC751348	94/95 (98%)	Marine methane seep; SO191/2_45
S1s-pmo51	Uncultured bacterium clone NZ_315_pmoA_82	KC751410	87/95 (91%)	Marine methane seep; SO191/2_315
S1s-pmo52	Uncultured bacterium clone BR1pmoA35	EU982990	95/95 (100%)	Escarpment cold seep site
S1s-pmo55	Uncultured bacterium clone: Kuro-pmoA-18	AB176933	94/95 (98%)	Methane seep marine sediment
S1s-pmo56	Uncultured gamma proteobacterium clone LC13_OTU_1–2	KP868875	91/95 (95%)	Lake Cadagno freshwater
S1s-pmo57	Uncultured bacterium clone FE2pmoA07	EU983001	91/91 (100%)	Escarpment cold seep site
S1s-pmo58	Uncultured bacterium clone FE2pmoA07	EU983001	95/95 (100%)	Escarpment cold seep site
S1s-pmo59	Uncultured bacterium clone methane SIP pmo-6	GU584245	94/95 (98%)	Marine hydrocarbon seep sediment
S1s-pmo60	Uncultured bacterium clone PmV1t8	FM165450	94/95 (98%)	Tube of Lamellibrachia sp. from cold seeps
S1k-pmo11	Uncultured bacterium clone Clamsed_4F	EU444868	94/95 (98%)	Above methane seep along the North American continental margin
S1k-pmo12	Uncultured bacterium clone Clamsed_8E	EU444874	93/95 (97%)	Above methane seep along the North American continental margin
S1k-pmo16	Uncultured bacterium clone: Kuro-pmoA-18	AB176933	94/94 (100%)	Methane seep marine sediment
S1k-pmo17	Uncultured bacterium clone: YS18pmoA06	AB451507	68/68 (100%)	PCR-derived sequence from hydrothermal deposits
S1k-pmo18	Uncultured bacterium clone GC234_C04	DQ518573	88/88 (100%)	Gulf of Mexico
S1k-pmo61	Uncultured bacterium clone NZ_45_pmoA_69	KC751371	93/95 (97%)	Marine methane seep; SO191/2_45
S1k-pmo65	Uncultured bacterium clone BR1pmoA11	EU983006	92/95 (96%)	Escarpment cold seep site
S1k-pmo70	Uncultured bacterium clone NZ_45_pmoA_69	KC751371	93/95 (97%)	Marine methane seep; SO191/2_45

Table S2. Blast analysis results of clones obtained from A189–mb661 primer set

Clone name	Blast search closest relative	Accession number	Identities	Isolation source
S1s-P2-01	Uncultured bacterium clone TS-S P-66	EU417487	145/156 (92%)	Hydrocarbon seep sediment in Timor Sea, Australia
S1s-P2-02	Uncultured bacterium clone t0 pmo-30	GU584271	157/157 (100%)	Marine hydrocarbon seep sediment
S1s-P2-03	Uncultured bacterium clone FE2pmoA07	EU983001	157/157 (100%)	Escarpment cold seep site
S1s-P2-05	Uncultured bacterium clone Clamsed_11C	EU444863	156/157 (99%)	Above methane seep along the North American continental margin
S1s-P2-15	Uncultured bacterium clone PMO-G	AY354045	156/157 (99%)	Rainbow vent field on the Mid-Atlantic Ridge
S1s-P2-20	Uncultured bacterium clone FE2pmoA07	EU983001	156/157 (99%)	Escarpment cold seep site
S1s-P2-24	Uncultured bacterium clone NZ_45_pmoA_19	KC751348	152/157 (96%)	Marine methane seep; SO191/2_45
S1k-P2-01	Uncultured bacterium clone FE2pmoA07	EU983001	131/131 (100%)	Escarpment cold seep site
S1k-P2-03	Uncultured bacterium clone TS-S P-66	EU417487	145/156 (92%)	Hydrocarbon seep sediment in Timor Sea, Australia
S1k-P2-04	Uncultured bacterium clone methane SIP pmo-6	GU584245	132/134 (98%)	Marine hydrocarbon seep sediment

Clone name	Blast search closest relative	Accession number	Identities	Isolation source
S1k-P2-05	Uncultured bacterium clone Bubsed_11G	EU444853	153/157 (97%)	Above methane seep along the North American continental margin
S1k-P2-06	Uncultured bacterium clone NZ_315_pmoA_27	KC751390	156/157 (99%)	Marine methane seep; SO191/2_315
S1k-P2-09	Uncultured bacterium clone 486CT9_pmoA_H11	KY351044	155/157 (98%)	Organic-rich lobe sediments; site F microbial mat
S1k-P2-11	Uncultured bacterium clone: Kuro-pmoA-18	AB176933	157/157 (100%)	Methane seep marine sediment
S1k-P2-16	Uncultured bacterium clone t0 pmo-36	GU584265	156/157 (99%)	Marine hydrocarbon seep sediment
S1k-P2-17	Uncultured bacterium clone: Kuro-pmoA-18	AB176933	156/157 (99%)	Japan: Kuroshima Knoll, southern Ryukyu arc
S1k-P2-19	Uncultured bacterium clone NZ_45_pmoA_76	KC751375	143/143 (100%)	Marine methane seep; SO191/2_45
S1k-P2-21	Uncultured bacterium clone NZ_315_pmoA_62	KC751401	138/142 (97%)	Marine methane seep; SO191/2_315
S1k-P2-24	Uncultured bacterium clone Clamsed_4F	EU444868	155/157 (98%)	Above methane seep along the North American continental margin
S1k-P2-26	Uncultured bacterium clone NZ_45_pmoA_19	KC751348	154/157 (98%)	Marine methane seep; SO191/2_45
S1k-P2-28	Uncultured bacterium clone NZ_315_pmoA_81	KC751409	157/157 (100%)	Marine methane seep; SO191/2_315

Clone name	Blast search closest relative	Accession number	Identities	Isolation source
S1k-P2-29	Uncultured bacterium clone Clamsed_11C	EU444863	155/157 (98%)	Above methane seep along the North American continental margin
S1k-P2-33	Uncultured bacterium clone NZ_315_pmoA_22	KC751389	157/157 (100%)	Marine methane seep; SO191/2_315
S1k-P2-36	Uncultured bacterium clone NZ_315_pmoA_54	KC751396	155/157 (98%)	Marine methane seep; SO191/2_315
S1k-P2-38	Uncultured bacterium clone: Kuro-pmoA-18	AB176933	152/157 (96%)	Methane seep marine sediment
S1k-P2-39	Uncultured bacterium clone Clamsed_11C	EU444863	106/107 (99%)	Above methane seep along the North American continental margin
S1k-P2-43	Uncultured bacterium clone FE2pmoA07	EU983001	157/157 (100%)	Escarpment cold seep site
S1k-P2-51	Uncultured bacterium clone PmV1t1	FM165449	155/157 (98%)	Tube of Lamellibrachia sp. from cold seeps
S1k-P2-53	Uncultured bacterium clone methane SIP pmo-6	GU584245	154/157 (98%)	Marine hydrocarbon seep sediment
S1k-P2-63	Uncultured bacterium clone NZ_45_pmoA_19	KC751348	100/102 (98%)	Marine methane seep; SO191/2_45
S1k-P2-64	Uncultured bacterium clone NZ_45_pmoA_69	KC751371	157/157 (100%)	Marine methane seep; SO191/2_45
S1k-P2-73	Uncultured bacterium clone Clamsed_8E	EU444874	154/157 (98%)	Above methane seep along the North American continental margin

Clone name	Blast search closest relative	Accession number	Identities	Isolation source
S1k-P2-74	Uncultured bacterium clone NZ_315_pmoA_82	KC751410	138/141 (97%)	Marine methane seep; SO191/2_315
S1k-P2-78	Uncultured bacterium clone t0 pmo-30	GU584271	133/133 (100%)	Marine hydrocarbon seep sediment
S1k-P2-79	Uncultured bacterium clone: 3_B28	LC377920	148/157 (94%)	Japan: Okinawa Trough, Iheya North
S1k-P2-88	Uncultured bacterium clone 4pmP8b15	FN650312	154/157 (98%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
S1k-P2-96	Uncultured bacterium clone methane SIP pmo-16	GU584243	151/157 (96%)	Marine hydrocarbon seep sediment
MC01-P2-02	Uncultured bacterium clone NZ_45_pmoA_46	KC751361	139/156 (89%)	Marine methane seep; SO191/2_45
MC01-P2-03	Uncultured bacterium clone NZ_45_pmoA_31	KC751356	155/157 (98%)	Marine methane seep; SO191/2_45
MC01-P2-04	Uncultured bacterium clone PMO-G	AY354045	156/157 (99%)	Rainbow vent field on the Mid-Atlantic Ridge
MC01-P2-05	Uncultured bacterium clone NZ_45_pmoA_18	KC751347	154/157 (98%)	Marine methane seep; SO191/2_45
MC01-P2-07	Uncultured methanotrophic bacterium clone AT-G04	KJ175619	139/156 (89%)	Deep seawater-brine interface of Red Sea Atlantis II brine pool
MC01-P2-08	Uncultured bacterium clone 4pmP8b15	FN650312	153/157 (97%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow

Clone name	Blast search closest relative	Accession number	Identities	Isolation source
MC01-P2-09	Uncultured bacterium clone 4pmP8b03	FN650309	152/157 (96%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC01-P2-11	Uncultured bacterium clone 4pmP8b03	FN650309	155/157 (98%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC02-P2-03	Uncultured bacterium clone 3pmP8H36	FN650304	157/157 (100%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC02-P2-08	Uncultured bacterium clone NZ_315_pmoA_31	KC751392	155/156 (99%)	Marine methane seep; SO191/2_315
MC03-P2-01	Uncultured bacterium clone: OPU2	AB261622	157/157 (100%)	Sea sediment
MC03-P2-05	Uncultured bacterium clone 3pmP8H36	FN650304	157/157 (100%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC03-P2-07	Uncultured bacterium clone NZ_45_pmoA_52	KC751364	154/157 (98%)	Marine methane seep; SO191/2_45
MC03-P2-08	Uncultured bacterium clone 4pmP8b03	FN650309	156/157 (99%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC03-P2-11	Uncultured bacterium clone 3pmP8H36	FN650304	156/157 (99%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC04-P2-05	Uncultured bacterium clone NZ_45_pmoA_52	KC751364	154/157 (98%)	Marine methane seep; SO191/2_45
MC04-P2-08	Uncultured bacterium clone NZ_315_pmoA_31	KC751392	155/156 (99%)	Marine methane seep; SO191/2_315

Clone name	Blast search closest relative	Accession number	Identities	Isolation source
MC04-P2-19	Uncultured bacterium clone 4pmP8b03	FN650309	154/157 (98%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC05-P2-06	Uncultured bacterium clone 4pmP8b03	FN650309	156/157 (99%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC05-P2-13	Uncultured bacterium clone NZ_45_pmoA_52	KC751364	150/157 (95%)	Marine methane seep; SO191/2_45
MC06-P2-01	Uncultured bacterium clone 4pmP8b03	FN650309	152/157 (96%)	Atlantic Ocean: Mid-Atlantic Ridge, hydrothermal vent site Rainbow
MC06-P2-18	Uncultured bacterium clone NZ_315_pmoA_31	KC751392	155/157 (98%)	Marine methane seep; SO191/2_315
PC11-P2-02	Uncultured bacterium clone NZ_315_pmoA_31	KC751392	155/157 (98%)	Marine methane seep; SO191/2_315
