

1 **Fig. S1.** Illustration of the methane-fed rearing system. The concentration of dissolved oxygen in
2 seawater was controlled by a dissolved oxygen electrode (A), dissolved oxygen meter (B), and air
3 pump (C). The concentration of dissolved methane in seawater was controlled by a methane gas
4 cylinder (D), pressure regulator (E), water pump (F), pre-filter (G), and hollow fiber module (H).
5 White arrows indicate the direction of gas flow. Black arrows indicate the direction of water flow.

6

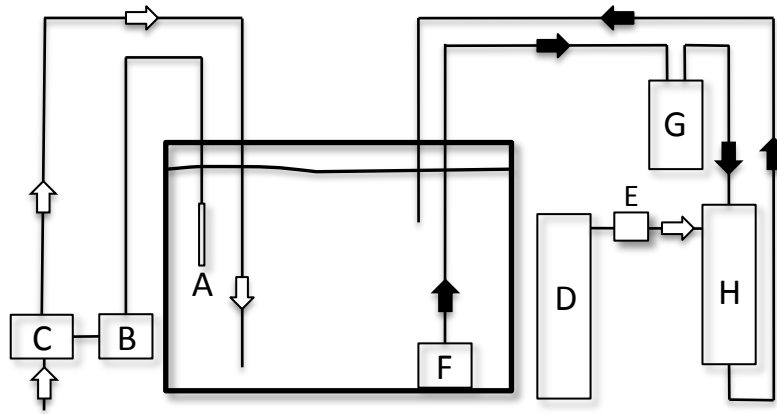
7 **Fig. S2.** Phylogenetic tree based on epibiotic 16S rRNA gene sequences. The sequence of the 16S
8 rRNA gene from *Aquifex aeolicus* was defined as an outgroup. Representative sequences obtained
9 from the *S. crosnieri* epibiotic community in this study are shown in blue. Sequences of the bacterial
10 strains isolated from the *S. crosnieri* epibiotic community after rearing for 12 months are shown in red.
11 A bootstrap analysis was performed with 1,000 resampled data sets. Bootstrap values >50% are shown
12 at branch points. The scale bar indicates 0.09 substitutions per site.

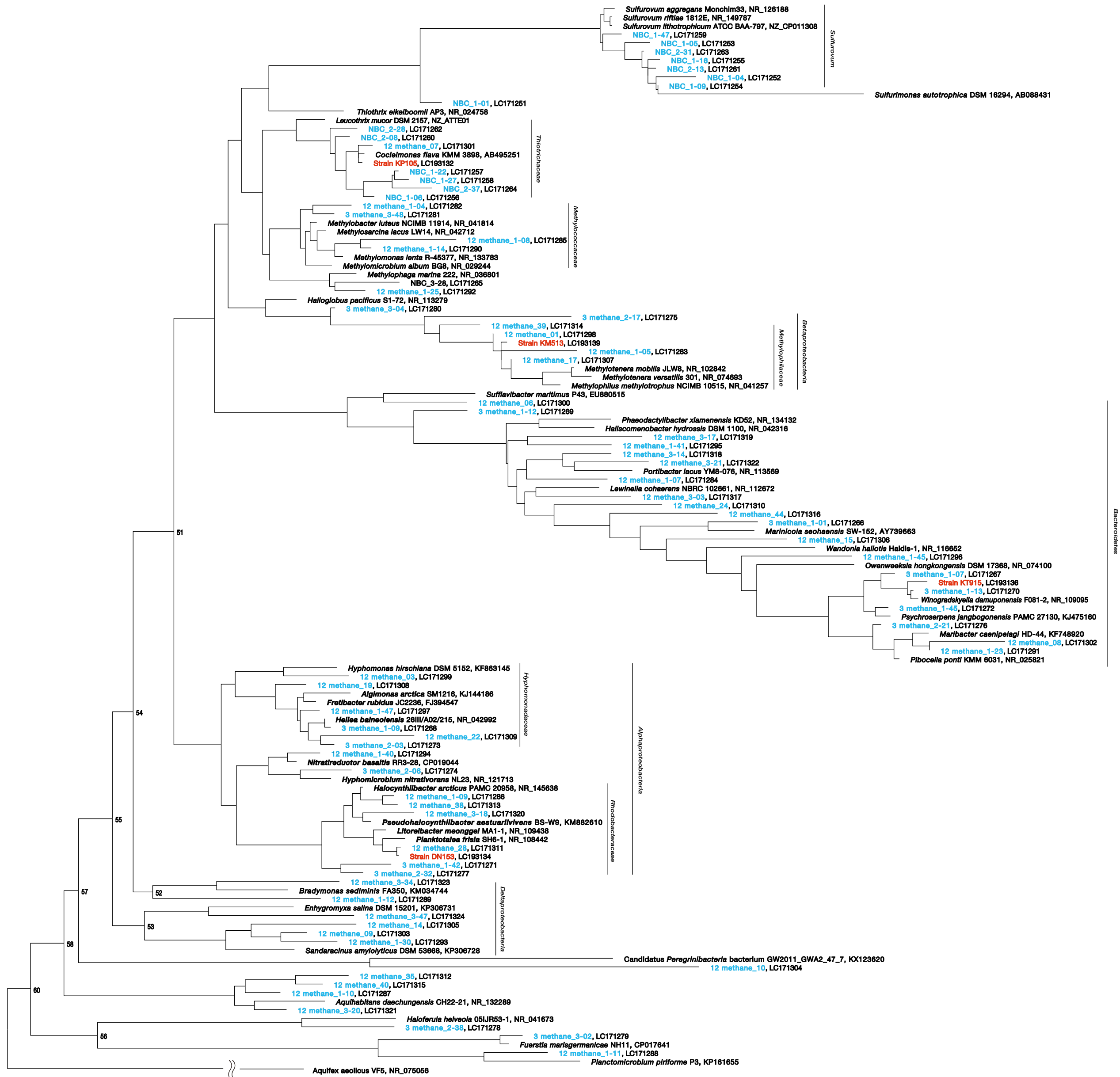
13

14 **Fig. S3.** Electron micrographs of setae of *S. crosnieri* individuals during methane-fed rearing.
15 Scanning electron micrographs (A and B) and a transmission electron micrograph (C) of setae
16 dissected from *S. crosnieri* after rearing for 12 months are shown. Scale bars indicate 20 μm (A), 5 μm
17 (B), and 200 nm (C).

Dissolved oxygen
controlling device

Dissolved methane
controlling device





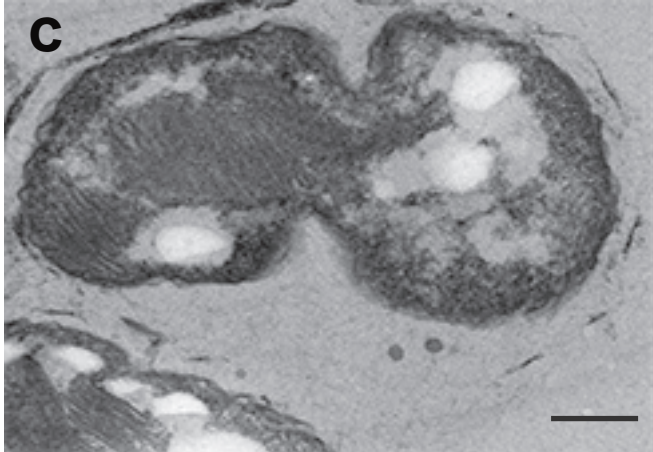
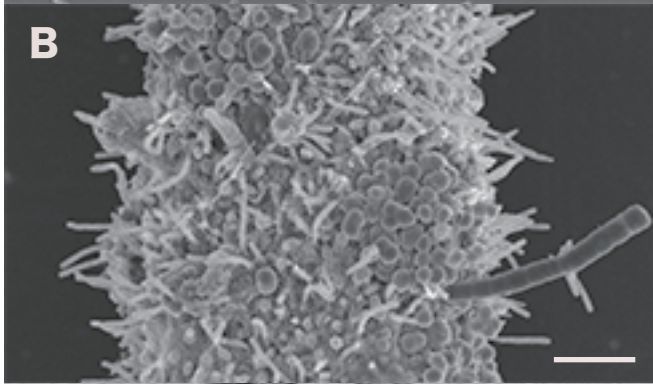
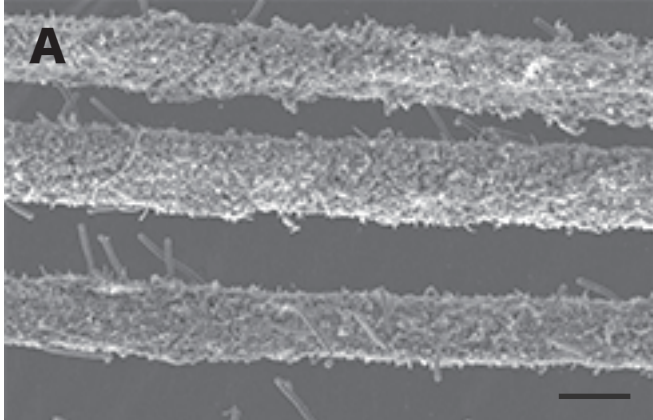


Table S1: Sequence similarity and compositions of bacterial phylotypes obtained from *S. crosnieri* epibiotic community.

Group	Accession No.	Clones for the rearing periods (month)			Most similar sequence		
		0	3	12	Source	Accession No.	% sim
<i>Epsilonproteobacteria</i>							
(<i>Sulfurovum</i>)							
NBC_1-05	LC171253	5	0	0	Inactive chimney from East Pacific Rise	JQ287048	97
NBC_1-09	LC171254	25	0	0	<i>S. crosnieri</i> epibiotic community	AB440170	99
NBC_1-47	LC171259	7	0	0	<i>S. crosnieri</i> epibiotic community	AB981871	99
NBC_2-13	LC171261	2	0	0	<i>S. crosnieri</i> epibiotic community	AB981795	99
NBC_2-31	LC171263	2	0	0	<i>K. puravida</i> epibiotic community	JN255991	99
NBC_1-04	LC171252	3	0	0	<i>S. crosnieri</i> epibiotic community	AB981804	98
NBC_1-16	LC171255	11	0	0	<i>S. crosnieri</i> epibiotic community	AB981807	99
<i>Gammaproteobacteria</i>							
(<i>Thiotrichaceae</i>)							
12 methane_07	LC171301	1	7	17	<i>Cocleimonas flava</i> KMM 3898	AB495251	97
NBC_1-06	LC171256	4	0	0	<i>S. crosnieri</i> epibiotic community	EU107481	98
NBC_1-22	LC171257	5	0	0	<i>S. crosnieri</i> epibiotic community	AB476179	99
NBC_2-28	LC171262	1	0	0	<i>S. crosnieri</i> epibiotic community	AB980114	97
NBC_2-37	LC171264	1	0	0	<i>S. crosnieri</i> epibiotic community	AB981870	96
NBC_1-27	LC171258	1	0	0	<i>S. crosnieri</i> epibiotic community	AB981808	99
NBC_2-08	LC171260	3	0	0	<i>S. crosnieri</i> epibiotic community	AB981826	99
(<i>Methylococcaceae</i>)							
12 methane_1-04	LC171282	0	0	3	<i>S. crosnieri</i> epibiotic community	AB980112	99
12 methane_1-14	LC171290	7	21	4	<i>S. crosnieri</i> epibiotic community	AB476240	97
12 methane_1-08	LC171285	0	3	3	<i>S. crosnieri</i> epibiotic community	AB981805	96
3 methane_3-48	LC171281	0	1	0	Carbonates from methane seep	KM356316	99

<i>(Piscirickettsiaceae)</i>							
12 methane_1-25	LC171292	0	6	3	Borehole on Costa Rica Rift flank	GQ903367	98
NBC_3-28	LC171265	1	0	0	<i>S. crosnieri</i> epibiotic community	AB981852	98
<i>(Halieaceae)</i>							
3 methane_3-04	LC171280	0	2	0	Gut of <i>S. crosnieri</i>	AB980096	95
(Unclassified)							
NBC_1-01	LC171251	19	0	0	<i>S. crosnieri</i> epibiotic community	EU107485	97
<i>Alphaproteobacteria</i>							
<i>(Hyphomonadaceae)</i>							
12 methane_19	LC171308	0	0	1	<i>Hyphomonadaceae</i> bacterium JC2234	FJ394548	95
3 methane_1-09	LC171268	0	2	0	<i>Hellea balneolensis</i>	NR_042992	99
12 methane_1-47	LC171297	0	0	1	Marine biofouling	GQ274221	96
3 methane_2-03	LC171273	0	2	0	Marine biofouling	GQ274254	96
12 methane_22	LC171309	0	0	1	Hydrothermal vent biofilm	KP896648	99
12 methane_03	LC171299	0	3	2	Inactive chimney from East Pacific Rise	JQ287328	95
<i>(Hyphomicrobiaceae)</i>							
3 methane_2-06	LC171274	0	1	0	Seafloor lavas from the East Pacific Rise	EU491743	99
<i>(Phyllobacteriaceae)</i>							
12 methane_1-40	LC171294	0	0	1	Inactive chimney from East Pacific Rise	JQ287050	99
<i>(Rhodobacteraceae)</i>							
12 methane_28	LC171311	0	3	4	<i>Planktotalea</i> sp. KHS07	KP172216	99
12 methane_38	LC171313	0	0	1	<i>S. crosnieri</i> epibiotic community	AB981848	98
12 methane_1-09	LC171286	0	2	3	<i>S. crosnieri</i> epibiotic community	AB981848	98
12 methane_3-18	LC171320	0	0	1	Sediment in arctic fjord	KJ566300	98
3 methane_1-42	LC171271	0	3	0	<i>S. crosnieri</i> epibiotic community	AB981886	99
3 methane_2-32	LC171277	0	1	0	Mud volcano sediment in Mediterranean Sea	KF440308	99
<i>Betaproteobacteria</i>							
<i>(Methylophilaceae)</i>							
12 methane_01	LC171298	0	29	29	Gut of ascidian <i>Ciona intestinalis</i>	KF799039	99
12 methane_1-05	LC171283	0	0	2	Gut of ascidian <i>Ciona intestinalis</i>	KF799039	92

12 methane_39	LC171314	0	0	1	Bacterial community in acidification experiment	JN976619	95
12 methane_17	LC171307	0	0	1	Bacterial community co-existing with Pseudo-nitzschia	HM140666	99
(Unclassified)							
3 methane_2-17	LC171275	0	1	0	Marine sponge	EU236422	89
<i>Deltaproteobacteria</i>							
(<i>Bdellovibrionaceae</i>)							
12 methane_1-12	LC171289	0	0	3	Microbial mat in hypersaline pond	JN430263	93
(<i>Bradymonadales</i>)							
12 methane_3-34	LC171323	0	0	1	River sediment	KM823720	90
(<i>Myxococcales</i>)							
12 methane_3-47	LC171324	0	0	1	Marine tidal mat	AY193162	95
12 methane_14	LC171305	0	0	1	Coastal sediment	GU230393	91
12 methane_09	LC171303	0	0	1	Arctic pack ice	AF468246	99
12 methane_1-30	LC171293	0	0	1	Gut of <i>S. crosnieri</i>	AB980107	94
<i>Bacteroidetes</i>							
(<i>Cyclobacteriaceae</i>)							
3 methane_1-01	LC171266	0	1	0	Inactive chimney from East Pacific Rise	JQ287020	99
(<i>Flavobacteriaceae</i>)							
12 methane_1-23	LC171291	0	5	10	<i>Maribacter</i> sp. BSw21903	JQ069963	99
3 methane_2-21	LC171276	0	1	0	<i>Pibocella ponti</i>	NR_025821	97
3 methane_1-45	LC171272	0	2	0	<i>Psychroserpens</i> sp. PAMC 27104	KJ475158	99
12 methane_06	LC171300	0	0	3	methane seep sediments	FM179907	90
3 methane_1-07	LC171267	0	3	0	<i>Arcticiflavibacter luteus</i>	KF711856	99
3 methane_1-13	LC171270	0	4	0	<i>Winogradskyella damuponensis.</i>	NR_109095	98
12 methane_08	LC171302	0	0	1	Seafloor basalt	KT748595	97
(<i>Schleiferiaceae</i>)							
12 methane_1-45	LC171296	0	0	1	Macroalgal surface	GU451471	96
(<i>Saprospiraceae</i>)							
12 methane_3-14	LC171318	0	0	1	Abdominal tuft of <i>Pestarella tyrrhena</i>	DQ890438	97
12 methane_1-41	LC171295	0	0	3	Microbial mat from shallow hydrothermal vent	HQ153931	94

12 methane_24	LC171310	0	0	1	Marine biofilms	JF272143	92
12 methane_3-17	LC171319	0	1	1	Macroalgal surface	GU451380	95
12 methane_3-21	LC171322	0	0	1	Antarctic sea water	GU235293	99
12 methane_1-07	LC171284	0	0	10	Macroalgal surface	GU451530	99
12 methane_3-03	LC171317	0	0	1	Seawater from marineland for shrimp and crab	JN119168	96
3 methane_1-12	LC171269	0	6	0	Atlantic Ocean	FQ032814	94
<i>(Sphingobacteriales)</i>							
12 methane_15	LC171306	0	1	1	Atlantic Ocean	FQ032816	99
12 methane_44	LC171316	0	0	1	Coastal seawater	GQ347704	97
<i>Planctomycetales</i>							
12 methane_1-11	LC171288	0	0	1	<i>S. crosnieri</i> epibiotic community	AB981888	96
3 methane_3-02	LC171279	0	2	0	Microbialites from Alchichica lake	JN825603	96
<i>Verrucomicrobiales</i>							
3 methane_2-38	LC171278	0	1	0	<i>Verrucomicrobia</i> bacterium PAORIC-15	KP030836	99
<i>Gracilibacteria</i>							
12 methane_10	LC171304	0	0	1	Volcanic seamount	FJ497648	94
<i>Acidimicrobiales</i>							
12 methane_1-10	LC171287	0	1	2	Marine bulk water	JX016574	99
12 methane_3-20	LC171321	0	1	1	Marine subsurface sediment	KR825135	99
12 methane_35	LC171312	0	0	1	Marine sediment	FJ716840	97
12 methane_40	LC171315	0	0	1	Surface water from Bering Sea	GQ472798	98
Total		98	116	128			