

Table S1 (major OTUs)

Phylum	Class	Order	Family	Genus/ species	OTU IDs	Sample 1	Sample 2	Sample 3	Blast_Identifi- cation	BLAST % identity	Source	Ref	RDP
<i>Acidobacteria</i>	<i>[Chloracidobacteria]</i>	RB41	Ellin6075	NA	denovo1963	0.093	0.745	2.22	Acidobacteria; Blastocatellia; Blastocatellales; Blastocatellaceae_ NA	--	--	--	Bacteria; Acidobacteria; Acidobacteria_Gp4
				NA	denovo1096	0.467	1.397	0.905	Acidobacteria; Blastocatellia; Blastocatellales; Blastocatellaceae_ NA	--	--	--	Bacteria; Acidobacteria; Acidobacteria_Gp4
<i>Actinobacteria</i>	<i>Acidimicrobiia</i>	<i>Acidimicrobiales</i>	C111	NA	denovo4002	2.056	0.279	0	Actinobacteria; Acidimicrobiia; Acidimicrobiales; Acidimicrobiaceae; Ilumatobacter flumins	97	sediment of an estuary	(Matsumoto et al., 2009)	Bacteria; Actinobacteria; Actinobacteria; Acidimicrobiidae; Acidimicrobiales; Acidimicrobineae; Acidimicrobiaceae genus Ilumatobacter

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<i>Actinobacteria</i>	<i>Acidimicrobiia</i>	<i>Acidimicrobiales</i>	NA	NA	denovo223	0.561	0.838	0.164	Bacteria; Actinobacteria; Acidothermales; Acidothermaceae; Acidothermus cellulosolicus	97	subglacial Lake Sediment	(Pearse et al., 2013)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales
			<i>Intrasporangiaceae</i>	NA	denovo2925	0.561	2.98	19.079	Actinobacteria; Micrococcales; Intrasporangiaceae ; Janibacter hoylei	98	cryotubes at elevation of 21 to 41 km	(Shivaji et al., 2009)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Micrococcineae; Intrasporangiaceae
			<i>Microbacteriaceae</i>	NA	denovo395	1.215	0	0.658	Actinobacteria; Micrococcales; Microbacteriaceae ; Marisediminicola antarctica	100	antarctic sandy intertidal sediments	(Li et al., 2010)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Micrococcineae; Microbacteriaceae

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<i>Actinobacteria</i>	<i>Acidimicrobiia</i>	<i>Acidimicrobiales</i>	<i>Micrococcaceae</i>	NA	denovo3122	2.336	1.304	0.576	Actinobacteria; Micrococcales; Micrococcaceae; Arthrobacter flavus	99	pond in McMurdo Dry Valley, Antarctica	(Reddy et al., 2000)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Micrococcineae; Microbacteriaceae;unclassified _Microbacteriaceae
			<i>Nocardiodaceae</i>	NA	denovo3556				Actinobacteria; Micrococcales; Nocardiodaceae; Nocardioides glacieisoli	98	ice tongue surface of the Hailuogou glacier in Szechwan Province, PR China	(Liu et al., 2015)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Propionibacterineae; Nocardiodaceae; Nocardioides
				<i>Nocardioides</i>	denovo3875	1.215	0.372	0.082	Actinobacteria; Micrococcales; Nocardiodaceae; Nocardioides szechwanensis	98	Hailuogou glacier in Szechwan province, PR China	(Liu et al., 2013)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Micrococcineae; Micrococcaceae; Arthrobacter

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Actinobacteria	Thermoleophilia	Gaiellales	<i>Sporichthyaceae</i>	NA	denovo2123	1.308	0.559	0.164	Actinobacteria; Geodermatophilal es; Geodermatophilac eae_NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Micrococcineae; Micrococcaceae
			<i>Gaiellaceae</i>	NA	denovo3689	0.093	4.842	0	Actinobacteria; Thermoloephilia; Gaiellales; Gaiellaceae_NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae
				NA	denovo2010	2.523	0.652	0	Actinobacteria; Thermoloephilia; Gaiellales; Gaiellaceae_NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; Gaiellales; Gaiellaceae; Gaiella

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<i>Actinobacteria</i>	<i>Thermoleo-philia</i>	<i>Gaiellales</i>	<i>Gaiellaceae</i>	NA	denovo1087	0.374	1.304	0	Actinobacteria; Thermoloephilia; Gaiellales; Gaiellaceae_NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; Gaiellales; Gaiellaceae; Gaiella
<i>Actinobacteria</i>	<i>Thermoleophilia</i>	<i>Solirubrobacterales</i>	NA	NA	denovo1281	0.093	1.304	0	Actinobacteria; Thermoloephilia; Gaiellales; Gaiellaceae_NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; Gaiellales; Gaiellaceae; Gaiella
			NA	NA	denovo586	0	3.538	0	Actinobacteria; Thermoloephilia; Solirubrobacterale s_NA	--	--	--	Bacteria; Actinobacteria; unclassified_Actinobacteria

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<i>Bacteroidetes</i>	<i>[Saprospirae]</i>	<i>[Saprospirales]</i>	<i>Chitinophagaceae</i>	NA	denovo2829	0.841	14.432	1.974	Bacteroidetes; Chitinophagia; Chitinophagales; Chitinophagaceae_ NA	--	--	--	Bacteria; Bacteroidetes; Sphingobacteriia; Sphingobacteriales; Chitinophagaceae; unclassified_Chitinophagaceae
				NA	denovo819	0.561	0.279	1.809	Bacteroidetes; Chitinophagia; Chitinophagales; Chitinophagaceae_ NA	--	--	--	Bacteria; Bacteroidetes; Sphingobacteriia; Sphingobacteriales; Chitinophagaceae; unclassified_Chitinophagaceae
				<i>Flavisolibacter</i>	denovo3	1.176	0.366	0.344	Bacteria; Proteobacteria; Betaproteobacteri a; Burkholderiales; Oxalobacteraceae_ NA	--	--	--	Bacteria; Proteobacteria; Betaproteobacteria; unclassified_Betaproteobacteri a

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<i>Bacteroidetes</i>	<i>[Saprospirae]</i>	<i>[Saprospirales]</i>	<i>Chitinophagaceae</i>	<i>Sediminibacterium</i>	denovo4	0.197	0.924	0.156	Bacteria; Proteobacteria; Deltaproteobacteri a; Syntrophobacteral es; Syntrophaceae_NA	--	--	--	Bacteria; unclassified_Bacteria
				<i>Segetibacter</i>	denovo5	0.692	0.796	0.248	Bacteria; Proteobacteria; Gammaproteobact eria; Oceanospirillales_ NA	--	--	--	Bacteria; unclassified_Bacteria
	<i>Sphingobacteriia</i>	<i>Sphingobacteriales</i>	<i>Sphingobacteriaceae</i>	NA	denovo3996	5.701	0	0.247	Bacteroidetes; Sphingobacteriia; Sphingobacteriales ; Sphingobacteriace ae; Pedobacter ruber	99	soil	(Margesin & Zhang 2013)	Bacteria; Bacteroidetes; Sphingobacteriia; Sphingobacteriales; Sphingobacteriaceae; Pedobacter

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<i>Chloroflexi</i>	<i>Ellin6529</i>	NA	NA	NA	denovo1831	0.935	0.559	0.247	Firmicutes; Bacilli; Bacillales_NA	--	--	--	Bacteria; Acidobacteria; Acidobacteria_Gp16; Gp16
<i>Cyanobacteria</i>	<i>Nostocophycideae</i>	<i>Nostocales</i>	<i>Nostocaceae</i>	NA	denovo872	0	0.093	2.138	Cyanobacteria; Nostocales; Nostocaceae; Anabaena cylindrica	98	--	--	Bacteria; Cyanobacteria/Chloroplast; Cyanobacteria; Family I; GpI
				<i>Nostoc</i>	denovo741	0	0	15.049	Cyanobacteria; Nostocales; Nostocaceae; Nostoc punctiforme	99	--	--	Bacteria; Cyanobacteria/Chloroplast; Cyanobacteria; Family I; GpI

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<i>Cyanobacteria</i>	<i>Oscillatoriothyriceae</i>	<i>Oscillatoriales</i>	<i>Phormidiaceae</i>	<i>Phormidium</i>	denovo310	3.271	2.235	0	Cyanobacteria; Oscillatoriothyriceae; Oscillatoriales; Phormidiaceae; Phormidium autumnale	100	Antarctica : James Ross Island, Lake Phormidui m, sediment	(Strunecký et al., 2012)	Bacteria; Cyanobacteria/Chloroplast; Cyanobacteria
<i>Gemmatimonadetes</i>	<i>Gemmatimonadetes</i>	<i>N1423WL</i>	NA	NA	denovo1054				Gemmatimonadetes; Gemmatimonadales_NA	--	--	--	Bacteria; unclassified_Bacteria
<i>Proteobacteria</i>	<i>Alphaproteobacteria</i>	<i>Caulobacterales</i>	<i>Caulobacteraceae</i>	NA	denovo432				Proteobacteria; Alphaproteobacteria; Caulobacterales; Caulobacteraceae; Brevundimonas vesicularis	100	antarctic soils	(Matvieieva et al., 2017)	Bacteria; Proteobacteria; Alphaproteobacteria; Caulobacterales; Caulobacteraceae; Brevundimonas

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<i>Proteobacteria</i>	<i>Alphaproteobacteria</i>	<i>Rhodobacterales</i>	<i>Rhodobacteraceae</i>	NA	denovo2067	0.748	0	0.576	Proteobacteria; Alphaproteobacter ia; Rhodobacterales; Rhodobacteraceae ; Rhodobacter sediminis	100	lagoon sediments	(Subhash et al., 2017)	Bacteria; Proteobacteria; Alphaproteobacteria; Rhodobacterales; Rhodobacteraceae; unclassified_Rhodobacteraceae
		<i>Sphingomonadales</i>	<i>Sphingomonadaceae</i>	NA	denovo1395	2.804	0.745	0.987	Proteobacteria; Alphaproteobacter ia; Sphingomonadales ; Sphingomonadace ae; Novosphingobium stygium	99	freshewat er, sediments	(Li et al., 2012)	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; unclassified_Sphingomonadace ae
				<i>Kaistobacter</i>	denovo3743	7.196	0.931	1.316	Bacteria; Proteobacteria; Alphaproteobacter ia; Sphingomonadales ; Sphingomonadace ae; Sphingomonas flava	100	road soil	(Du et al., 2015)	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; Sphingomonas

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Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	<i>Novosphingobium</i>	denovo6	1.055	0.239	0.371	Bacteria; Proteobacteria; Alphaproteobacter ia; Sphingomonadales ; Sphingomonadace ae_NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; unclassified_Actinobacteria
				<i>Sphingomonas</i>	denovo3521	0.093	0.093	1.809	Bacteria; Proteobacteria; Alphaproteobacter ia; Sphingomonadales ; Sphingomonadace ae; Sphingomonas echinoides	99	seawater	(Kim et al., 2006)	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; Sphingomonas
	<i>Betaproteo-bacteria</i>	<i>Burkholderiales</i>	<i>Comamonadaceae</i>	NA	denovo3901	4.112	1.49	4.03	Proteobacteria; Betaproteobacteri a; Burkholderiales; Comamonadaceae ; Polaromonas jejuensis	99	--	(Weon et al., 2008)	Bacteria; Proteobacteria; Betaproteobacteria; Burkholderiales; Comamonadaceae; unclassified_Comamonadaceae

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<i>Proteobacteria</i>	<i>Betaproteobacteria</i>	<i>Burkholderiales</i>	<i>Comamonadaceae</i>	NA	denovo3486	1.028	1.117	0.987	Proteobacteria; Betaproteobacteri a; Burkholderiales;Co mamonadaceae;Ac idovorax konjaci	100	--	--	Bacteria; Proteobacteria; Betaproteobacteria; Burkholderiales; Comamonadaceae; unclassified_Comamonadaceae
		<i>Methylophilales</i>	<i>Methylophilaceae</i>	<i>Methyloteneramobilis</i>	denovo744	6.168	0	0	Bacteria; Proteobacteria; Betaproteobacteri a; Nitrosomonadales; Methylophilaceae; Methylotenera versatilis	99	--	(Martineau et al., 2010)	Bacteria; Proteobacteria; Betaproteobacteria; Methylophilales; Methylophilaceae; unclassified_Methylophilaceae
		<i>SC-I-84</i>	NA	NA	denovo3372	0.561	0.931	0.411	Proteobacteria; Betaproteobacteri a; Burkholderiales_N A	--	--	--	Bacteria; Proteobacteria; unclassified_Proteobacteria

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<i>Proteobacteria</i>	<i>Gammaproteobacteria</i>	<i>Xanthomonadales</i>	<i>Xanthomonadaceae</i>	NA	denovo3578	2.15	0.838	0.082	Proteobacteria; Gammaproteobact eria; Xanthomonadales; Xanthomonadacea e; Arenimonas daechungensis	97	eutrophic reseorvior	(Huy et al., 2013)	Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; unclassified_Xanthomonadacea e
				NA	denovo836	1.589	0.372	0.411	Proteobacteria; Gammaproteobact eria; Xanthomonadales; Xanthomonadacea e; Pseudomonas gengulata	99	--	--	Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; Stenotrophomonas
				NA	denovo4056	0.561	0.559	0.082	Proteobacteria; Gammaproteobact eria; Xanthomonadales; Xanthomonadacea e; Arenimonas; Arenimonas subflava	100	drinking water network	(Nemes-Barnás et al., 2015)	Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; Arenimonas

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<i>Proteobacteria</i>	<i>Gammaproteobacteria</i>	Xanthomonadales	Xanthomonadaceae	<i>Dokdonella</i>	denovo8	0.107	0.382	1.375	Bacteria; Proteobacteria; Gammaproteobact eria; Xanthomonadales; Rhodanobacterace ae_NA	--	--	--	Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; unclassified_Xanthomonadacea e
				<i>Thermomonas</i>	denovo1783				Bacteria; Proteobacteria; Gammaproteobact eria; Xanthomonadales; Xanthomonadaceae; Thermomonas carbonis	99	soil of a coal mine	(Wang et al., 2014)	Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; unclassified_Xanthomonadacea e
<i>Verrucomicrobia</i>	<i>[Spartobacteria]</i>	<i>[Chthoniobacterales]</i>	<i>[Chthoniobacteraceae]</i>	<i>Chthoniobacter</i>	denovo3390				Bacteria; Verrucomicrobia; Spartobacteria; Chthoniobacterale s; Chthoniobacterace ae_NA	--	--	--	Bacteria; Verrucomicrobia; Spartobacteria; Spartobacteria_genera_incerta e_sedis

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<i>Verrucomicrobia</i>	[Spartobacteria]	[Chthoniobacterales]	[Chthoniobacteraceae]	DA101	denovo1008	0	2.142	0.247	Bacteria; Verrucomicrobia; Spartobacteria; Chthoniobacterale s; Chthoniobacterace ae_NA	--	--	--	Bacteria; Verrucomicrobia; Spartobacteria; Spartobacteria_genera_incerta e_sedis
					denovo995	0	1.397	0	Bacteria; Verrucomicrobia; Spartobacteria; Chthoniobacterale s; Chthoniobacterace ae_NA	--	--	--	Bacteria; Verrucomicrobia; Spartobacteria; Spartobacteria_genera_incerta e_sedis
	<i>Verrucomicrobiae</i>	<i>Verrucomicrobiales</i>	<i>Verrucomicrobiaceae</i>	<i>Luteolibacter</i>	denovo2716	1.495	0.931	0	Bacteria; Verrucomicrobia; Verrucomicrobiae; Verrucomicrobiale s; Verrucomicrobiace ae; Luteolibacter luojiensis	99	arctic tundra soil	(Jiang et al., 2012)	Bacteria; Verrucomicrobia; Verrucomicrobiae; Verrucomicrobiales; Verrucomicrobiaceae; Luteolibacter

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<i>Verrucomicrobia</i>	<i>Verrucomicrobiae</i>	<i>Verrucomicrobiales</i>	<i>Verrucomicrobiaceae</i>	<i>Luteolibacter</i>	denovo901	0.748	0.838	0	Bacteria; Verrucomicrobia; Verrucomicrobiae; Verrucomicrobiales; Verrucomicrobiaceae; Luteolibacter luojiensis	99	arctic tundra soil	(Jiang et al., 2012)	Bacteria; Verrucomicrobia; Verrucomicrobiae; Verrucomicrobiales; Verrucomicrobiaceae; Luteolibacter

Table S1 (sequences of major representative OTUs)

OTU ID	Rep_Sequence
denovo1963	TACGTAGGGACCAAGCGTTGTTCCGATTTACTGGGCGTAAAGGGCGCGTAGGCGGCGTGACAAGTCACTTGTGAAATCTCCGGGCTTAACTCGG AACGGTCAAGTGATACTGTTGTGCTAGAGTACAGAAGGGGCAATCGGAATTCCTGGTGTAGCGGTGAAATGCGTAGATATCAAGAGGAACACCA GAGGCGAAGGCGGATTGCTAGGCTGATACTGACGCTGAGGCGCGAAAGCTAGGGTAGCAAACGGG
denovo1096	TACGTAGGGACCAAGCGTTGTTCCGATTTACTGGGCGTAAAGGGCGCGTAGGCGGCTTGACAAGTCACTTGTGAAATCTCTGGGCTTAACCCAGA ACGGCCAAGTGAAACTGTCATGCTAGAGTGCAGAAGGGGCAATCGGAATTCCTGGTGTAGCGGTGAAATGCGTAGATATCAAGAGGAACACCTG AGGTGAAGACGGGTTGCTGGGCTGACACTGACGCTGAGGCGCGAAAGCCAGGGGAGCAAACGGG
denovo4002	CACGTAGGCACCAAGCGTTATCCGGATTTATTGGGCGTAAAGAGCTCGTAGGCGGTTTGGTAAGTCGGGTGTGAAAATCTGGGCTCAACCCAGA GAGGCCACTCGATACTGCTATGACTAGAGTACGGTAGGGGAGCGGGGAATTCATGGTGTAGCGGTGAAATGCGCAGATATCATGAGGAACACCA GCGGCGAAGGCGCCGCTCTGGGCCGTAAGTACGCTGAGGAGCGAAAGCATGGGTAGCAAACAGG
denovo223	TACGTAGGGTGCAAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCTCGTAGGCGGCTGTGCGGTCGGATGTGAAAATCCAGGGCTCAACCCTG GACCTGCATTCGATACGGGCAGACTAGAGTTCGGTAGGGGAGACTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCG GTGGCGAAGGCGGGTCTCTGGGCCGAAACTGACGCTGAGGAGCGAAAGCGTGGGGAGCAAACAGG
denovo2925	TACGTAGGGTGCAAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCTGTAGGCGGTTTGTGCGCTCTGCTGTGAAATTCGGGGCTCAACCCCGA ACTTGCAAGTGGGTACGGGCAGACTAGAGTGTGGTAGGGGAGACTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCG ATGGCGAAGGCAGGTCTCTGGGCCACTACTGACGCTGAGAAGCGAAAGCATGGGGAGCGAACAGG
denovo395	TACGTAGGGTGCAAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCTCGTAGGCGGTTTGTGCGCTCTGCTGTGAAATCCGGAGGCTCAACCTCCG GCCTGCAGTGGGTACGGGCAGACTAGAGTGCAGTAGGGGAGATTGGAATTCCTGGTGTAGCGGTGGAATGCGCAGATATCAGGAGGAACACCA ATGGCGAAGGCAGATCTCTGGGCCGTAAGTACGCTGAGGAGCGAAAGCATGGGGAGCGAACAGG
denovo3122	TACGTAGGGCGCAAGCGTTATCCGGAATTATTGGGCGTAAAGAGCTCGTAGGCGGTTTGTGCGCTCTGCCGTGAAAGTCCGGGGCTTAACCCCGG ATCTGCGGTGGGTACGGGCAGACTTGAGTGATGTAGGGGAGACTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCG ATGGCGAAGGCAGGTCTCTGGGCATTAAGTACGCTGAGGAGCGAAAGCATGGGGAGCGAACAGG
denovo3556	TACGTAGGGTGCGAGCGTTGTCCGGAATTATTGGGCGTAAAGGGCTCGTAGGCGGTTTGTGCGCTCGGGAGTGAAAACCATGAGCTTAACTCAT GGCTTGCTTTGATACGGGCAGACTAGAGGTATGCAGGGGAGAACGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACC GGTGCGAAGGCGGTTCTCTGGGCATTACCTGACGCTGAGGAGCGAAAGTGTGGGGAGCGAACAGG
denovo3875	TACGTAGGGTGCGAGCGTTGTCCGGAATTATTGGGCGTAAAGGGCTCGTAGGCGGTTTGTGCGCTCGGGAGTGAAAACACCGGGCTTAACTCGG TGCTGGCTTCGATACGGGCAGACTAGAGGTATCAGGGGAGAACGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCG GTGGCGAAGGCGGTTCTCTGGGAATTACCTGACGCTGAGGAGCGAAAGTGTGGGGAGCGAACAGG
denovo2123	TACGTAGGGTGCAAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCTCGTAGGCGGTTTGTGCGCTCGGCTGTGAAATCTCGGGGCTCAACCCCGA GCCTGCAGTCGATACGGGCAGACTAGAGTGCTGTAGGGGAGACTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCG GTGGCGAAGGCGGGTCTCTGGGCAGTAAGTACGCTGAGGAGCGAAAGCGTGGGGAGCGAACAGG

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denovo3689	TACGTAGGGGGCAAGCGTTGTCCGATTTATTGGGCGTAAAGAGCGTGTAGGCGGCTAGATAGGTCCGTTGTGAAAACCTCGAGGCTCAACCTCG AGACGTCGATGGAAACCATCTGGCTAGAGTCCGGAAGAGGAGAGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACCC GTGGCGAAGGCGGCTCTCTGGTACGTGACTGACGCTGAGACGCGAAAGCGTGGGGAGCAAACAGG
denovo2010	TACGTAGGGGGCAAGCGTTGTCCGATTTATTGGGCGTAAAGAGCGTGTAGGCGGCCGCACAGGTCCGTTGTGAAAACCTGGAGGCTTAACCTTC AGACGTCGATGGAAACCGTGCGGCTAGAGTCCGGAAGAGGAGAATGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACC CGTGGCTAAGGCGGTTCTCTAGTACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCAAACAGG
denovo1087	TACGTAGGGGGCAAGCGTTGTCCGATTTACTGGGCGTAAAGAGCGTGTAGGCGGCAAAGCAGGTCTGTTGTGAAAACCTGGAGGCTCAACCTCC AGACGTCGACAGAAACCGCTTGGCTAGAGTCCGGAAGAGGAGAGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACC AATGGCGAAGGCAGCTCTCTGGGACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG
denovo1281	TACGTAGGGGGCAAGCGTTGTCCGATTTATTGGGCGTAAAGCGCGTGTAGGCGGCCAGATAAGTCCGCTGTGAAAACCTCGAAGCTCAACTTCG AGCTGTCGGTGGAAACTATTTGGCTAGAGTCCGGAAGAGGAGAGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACCC GTGGCGAAGGCGGCTCTCTGGTACGGAACGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG
denovo586	TACGTAGGGGGCAAGCGTTGTCCGGAATCATTGGGCGTAAAGCGCGCTAGGCGGCCCGGTAAGTCCGCTGTAAAAGTCAAAGGCTCAACCTTT GAATGCCGGTGGATACTGTCCGGCTAGAGTCCGGAAGAGGCGAGTGGAATTCCTGGTGTAGCGGTGGAATGCGCAGATATCAGGAGGAACACC AATAGCGAAGGCAGCTCGCTGGGACGGTACTGACGCTAAGGCGCGAAAGCGTGGGGAGCAAACAGG
denovo2829	TACGGAGGGTGCAAGCGTTATCCGGAATCACTGGGTTTAAAGGGTGCGTAGGCGGGCAGGTAAGTCCGTGGTGAAATCTCTGAGCTTAACTCAG AAACTGCCATGGATACTATTTGTCTTGAATATTGTGGAGGTAAGCGGAATATGTCATGTAGCGGTGAAATGCTTAGATATGACATAGAACACCAAT TGCGAAGGCAGCTTACTACACAGTTATTGACGCTGAGGCACGAAAGCGTGGGGATCAAACAGG
denovo819	TACGGAGGGTGCAAGCGTTATCCGGAATTAAGGGTGCGTAGGTGGGTAGGTAAGTCAGTGGTGAAATCTTCAAGCTTAACTTGGA AACTGCCATTGATACTATTTATCTTGAATACTTTGGAGGTAAGCGGAATATGTCATGTAGCGGTGAAATGCTTAGATATGACATAGAACACCAATT GCGAAGGCAGCTTACTACACAGTTATTGACACTGAGGCACGAAAGCGTGGGGATCAAACAGG
denovo3	TACGTAGGGTGCGAGCGTTAATCGGAATTACTGGGCGTAAAGCGTACGCAGGCGGCTTTGCAAGACAGGTGTGAAATCCCCGGGCCTAACCTGG GAACTGCATTTGTGACTGCATGGCTAGAGTTTGTGAGAGGGGGTGGAATTCACGTGTAGCAGTGAAATGCGTAGATATGTGGAGGAACACCG ATGGCGAAGGCAGCCCCCTGGGATGTGACTGACGCTCATGTACGAAAGCGTGGGGAGCAAACAGG
denovo4	TACGTAGGGTGCAAGCGTTGCTCGGAATCATTGGGCGTAAAGAGCGTGTGGGTGGCTAGATAAGTCGGATGTGAAATCCCTCGGCTCAACCGAG GAAGTGCATTCGAAACTATCTAGCTCGAGGATGGCAGAGGAAGGTGGAATTCCTAGTGTAGAGGTGAAATTCGTAGATATTAGGAGGAATACCG GTGGCGAAGGCGGCCTTCTGGACCATTCCTGACACTGAGACGCGAAAGCGTGGGTAGCAAACAGG
denovo5	TACGTAGGGTGCAAGCGTTGTCCGGAATTACTGGGCGTAAAGAGTGCGTAGGTGGTTTAATAAGTCAGATGTGAAATCCCCGGGCTCAACCTGG GAACTGCATTTGAAACTGTAAAGCTAGAGTACGGTAGAGGGAAGTGGAATTCCTGGTGTAGCGGTGAAATGCGTAGATATCGGAAGGAACATCA GTGGCGAAGGCGACTTCCTGGACCGCAACTGACACTGAGGCACGAAAGCGTGGGGAGCAAACAGG

OTU ID	Rep_Sequence
denovo3996	TACGGAGGATCCAAGCGTTATCCGGATTTATTGGGTTTAAAGGGTGCGTAGGCCGGCCTATTAAGTCAGGGGTGAAAGACGGTGGCTCAACCATC GCAGTGCCTTTGATACTGATAGGCTTGATTACACTTGAGGTAGGCGGAATGTGACAAAGTAGCGGTGAAATGCATAGATATGTCACAGAACACCAA TTGCGAAGGCAGCTTACTAAGGTGTTAATGACGCTGAGGCACGAAAGCGTGGGGATCAAACAGG
denovo1831	TACGTAGGTGGCAAGCGTTGTCCGGATTTACTGGGCGTAAAGAGCGCGCAGGCGGTCTTCAAGTCGCGTGTGAAAGCCCCGGCTCAACTGGG GAGGGTCACGCGATACTGATCGACTCGAAGGCAGGAGAGGGTAGTGGAATTCCCGGTGTAGTGGTGAAATGCGTAGATATCGGGAGGAACACC AGTGGCGAAGGCGACTACCTGGCCTGTTCTTGACGCTGAGGCGCGAAAGCTAGGGGAGCAAACGGG
denovo872	TACGGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGGGTCCGCAGGTGGCAATGTAAGTCTGCTGTAAAGAGTCATGCTTAACATGAT AAGAGCAGTGGAACTACATAGCTAGAGTACGTTCCGGGGCAGAGGGAATTCCTGGTGTAGCGGTGAAATGCGTAGATATCAGGAAGAACACCG GTGGCGAAAGCGCTCTGCTAGGCCGTAAGTACACTGAGGGACGAAAGCTAGGGGAGCGAATGGG
denovo741	TACGGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGCGTCCGCAGGTGGCAATGTAAGTCTGCTGTAAAGAGTCTAGCTCAACTAGAT AAGAGCAGTGGAACTACATAGCTAGAGTACGTTCCGGGGCAGAGGGAATTCCTGGTGTAGCGGTGAAATGCGTAGAGATCAGGAAGAACACCA GTGGCGAAGGCGCTCTGCTAGGCCGTAAGTACACTGAGGGACGAAAGCTAGGGGAGCGAATGGG
denovo310	GACGGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGCGTCCGCAGGTGGCAGTTCAAGTCTGCTGTCAAAGACCGGGGCTTAACCTCG GAAAGGCAGTGGAACTGAACAGCTAGAGTATGGTAGGGGCAGAGGGAATTCCTGGTGTAGCGGTGAAATGCGTAGAGATCAGGAAGAACATC GGTGGCGAAGGCGCTCTGCTGGACCATAACTGACACTCAGGGACGAAAGCTAGGGGAGCGAATGGG
denovo1054	TACGGGGGTGCGAGCGTTGTCCGGAATCACTGGGCGTAAAGGGCGCGTAGGTGGTCTGATAAGGGTGTGGTGAAAGTCCGGGGCTCAACCCCG GATCTGCCGTGCCGACTGTCAGACTCGAGGACTGTAGAGGCAGGCGGAATTCGGGTGTAGCGGTGGAATGCGTAGAGATCCGGAGGAAGACC GGTGGCGAAGGCGGCCTGCTGGGCAGTTACTGACACTGAGGCGCGACAGCGTGGGGAGCAAACAGG
denovo432	TACGAAGGGGGCTAGCGTTGCTCGGAATTACTGGGCGTAAAGGGAGCGTAGGCGGACATTTAAGTCAGGGGTGAAATCCCGGGGCTCAACCTCG GAATTGCCTTTGATACTGGGTGTCTTGAGTATGAGAGAGGTGTGTGGAAGTCCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCAG TGGCGAAGGCGACACACTGGCTCATTACTGACGCTGAGGCTCGAAAGCGTGGGGAGCAAACAGG
denovo2067	TACGGAGGGGGCTAGCGTTGTTCCGGAATTACTGGGCGTAAAGCGCACGTAGGCGGATCAGAAAGTCAGAGGTGAAATCCCAGGGCTCAACCTTG GAACTGCCTTTGAAACTCCTGGTCTTGAGGTGAGAGAGGTGAGTGGAAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAGGAACACCA GTGGCGAAGGCGGCTCACTGGCTCGATACTGACGCTGAGGTGCGAAAGCGTGGGGAGCAAACAGG
denovo1395	TACGGAGGGAGCTAGCGTTGTTCCGGAATTACTGGGCGTAAAGCGTACGTAGGCGGTTATTCAAGTCAGAGGTGAAAGCCCCGGGGCTCAACCCCG GAACGGCCTTTGAAACTAGGTAGCTAGAGTCTTGAGAGAGGTAGTGGAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCA GTGGCGAAGGCGACTAACTGGACAAGTACTGACGCTGAGGTACGAAAGCGTGGGGAGCAAACAGG
denovo3743	TACGGAGGGGGCTAGCGTTGTTCCGGAATTACTGGGCGTAAAGCGCGCGTAGGCGGCTTTGTAAGTTAGAGGTGAAAGCCCCGGAGCTCAACTCCG GAATTGCCTTTAAGACTGCATCGCTAGAATCATGGAGAGGTGAGTGGAAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCAG TGGCGAAGGCGACTCACTGGACATGTATTGACGCTGAGGTGCGAAAGCGTGGGGAGCAAACAGG

OTU ID	Rep_Sequence
denovo6	CACGTAGGGGGCGAGCGTTGTCCGATTATTGGGCGTAAAGAGCTCGTAGGCGGTTCCGTCAGTCGGGTGTGAAAACCTCTGGGCTCAACCCAG AGACGCCACCCGATACTGCGGTGACTAGAGTCCGGTAGGGGAGTGCGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACC AACGGCGAAGGCAGCACTCTGGGCCGGTACTGACGCTGAGGAGCGAAAGCGTGGGGAGCGAACAGGATTAGATAGCCGTGTAGT
denovo3521	TACGGAGGGAGCTAGCGTTATTCGGAATTACTGGGCGTAAAGCGCACGTAGGCGGCTTTGTAAGTTAGAGGTGAAAGCCTGGAGCTCAACTCCA GAACTGCCTTTAAGACTGCATCGCTTGAATCCAGGAGAGGTGAGTGGAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCAG TGGCGAAGGCGGCTCACTGGACTGGTATTGACGCTGAGGTGCGAAAGCGTGGGGAGCAAACAGG
denovo3901	TACGTAGGGTGCGAGCGTTAATCGGAATTACTGGGCGTAAAGCGTGCAGGCGGTTATATAAGACAGTTGTGAAATCCCCGGGCTCAACCTGG GAATTGCATCTGTGACTGTATAGCTAGAGTACGGTAGAGGGGGATGGAATTCGCGTGTAGCAGTGAAATGCGTAGATATGCGGAGGAACACCG ATGGCGAAGGCAATCCCCTGGACCTGTACTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGG
denovo3486	TACGTAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGTGCAGGCGGTGATGTAAGACAGATGTGAAATCCCCGGGCTCAACCTGG GAACTGCATTTGTGACTGCATCGCTGGAGTGCGGCAGAGGGGGATGGAATTCGCGTGTAGCAGTGAAATGCGTAGATATGCGGAGGAACACCG ATGGCGAAGGCAATCCCCTGGGCCTGCACTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGG
denovo744	TACGTAGGGTGCGAGCGTTAATCGGAATTACTGGGCGTAAAGCGTGCAGGCGGTTTTGTAAGTCAGATGTGAAATCCCCGAGCTCAACTTGG GAACTGCGTTTGAAACTACAAGACTAGAATAGGTCAGAGGGGGGTAGAATTCACGTGTAGCAGTGAAATGCGTAGAGATGTGGAGGAATATCA ATGGCGAAGGCAGCCCCCTGGGATCATATTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGG
denovo3372	TACGTAGGGTGCGAGCGTTAATCGGAATTACTGGGCGTAAAGCGTGCAGGCGGTTTGTTAAGTCTGATGTGAAAGCCCCGGGCTCAACCTGG GAATGGCATTGGAACTGGCAAGCTTGAGTATGGCAGAGGGGGGTGGAATTCGCGTGTAGCAGTGAAATGCGTAGAGATGCGGAGGAACACC GATGGCGAAGGCAGCCCCCTGGGCCAATACTGACGCTCAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo3578	TACGAAGGGTGCAAGCGTTACTCGGAATTACTGGGCGTAAAGCGTGCAGGCGGTTTGTTAAGTCTGTCGTGAAAGCCCCGGGCTCAACCTGG GAATGGCGATGGAACTGGCGAGCTAGAGTACGGTAGAGGAGAGTGGAATTCCTGGTGTAGCAGTGAAATGCGTAGAGATCGGGAGGAACATC AGTTGCGAAGGCGGCTCTCTGGACCACTACTGACGCTGAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo836	TACGAAGGGTGCAAGCGTTACTCGGAATTACTGGGCGTAAAGCGTGCAGGCGGTTTGTTAAGTCCGTTGTGAAAGCCCTGGGCTCAACCTGG GAACTGCAGTGGATACTGGGCGACTAGAGTGTGGTAGAGGGTAGCGGAATTCCTGGTGTAGCAGTGAAATGCGTAGAGATCAGGAGGAACATC CATGGCGAAGGCAGCTACCTGGACCAACACTGACACTGAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo4056	TACGAAGGGTGCAAGCGTTACTCGGAATTACTGGGCGTAAAGCGTGCAGGCGGTTTGTTAAGTCTGTCGTGAAATCCCCGGGCTCAACCTGG GAATGGCGATGGATACTGGCGCGCTAGAGTGAAGTAGAGGAGAGTGGAATTCCTGGTGTAGCAGTGAAATGCGTAGAGATCGGGAGGAACATC AGTTGCGAAGGCGGCTCTCTGGACCATCACTGACACTGAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo8	TACAGGGGGGCAAGCGTTGTTGGAATTACTGGGCGTAAAGGGCTCGTAGGCGGCCAACTAAGTCCGACGTGAAATCCCAAAGCTTAACCTTGG AACTGCGTCGGATACTGGATGGCTTGAATTCGGGAGAGGGATGCAGAATTCAGGTGTAGCGGTGAAATGCGTAGATATCTGGAGGAATACCGG TGGCGAAGGCGGCATCCTGGACCGACATTGACGCTGAGGAGCGAAAGCTAGGGGAGCAAACGGG

OTU ID	Rep_Sequence
denovo1783	TACGAAGGGTGCAAGCGTTACTCGGAATTACTGGGCGTAAAGCGTGCCTAGGTGGTTTGTTAAGTCTGATGTGAAAGCCCTGGGCTCAACCTGG GAATGGCATTGGATACTGGCGAGCTAGAGTGCGGTAGAGGGTAGTGGAATCCCGGTGTAGCAGTGAAATGCGTAGAGATCGGGAGGAACATC TGTGGCGAAGGCGACTACCTGGACCAGCACTGACACTGAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo3390	TACAGAGGTCTCAAGCGTTGTTTCGGATTCAATTGGGCGTAAAGGGTGCCTAGGTGGCGGGGTAAGTCTGGTGTGAAATCTCGGGGCTCAACCCCG AAACTGCACTGGATACTGCCTTGCTTGAGTACTGGAGAGGAGATTGGAATTTACGGTGTAGCAGTGAAATGCGTAGATATCGTAAGGAAGACCA GTGGCGAAGGCGAATCTCTGGACAGTTACTGACACTGAGGCACGAAGGCCAGGGGAGCAAACGGG
denovo1008	TACAGAGGTCCCAAGCGTTGTTTCGGATTCAATTGGGCGTAAAGGGTGCCTAGGTGGCGTGGTAAGTCGGGTGTGAAATTTTCGGAGCTTAACCTCCG AAACTGCATTCGATACTGCCGTGCTTGAGGACTGGAGAGGAGACTGGAATTTACGGTGTAGCAGTGAAATGCGTAGAGATCGTAAGGAAGACCA GTGGCGAAGGCGGGTCTCTGGACAGTTCCTGACACTGAGGCACGAAGGCTAGGGGAGCAAACGGG
denovo995	TACAGAGGTCCCAAGCGTTGTTTCGGATTCAATTGGGCGTAAAGGGTGCCTAGGTGGCGCCGTAAAGTGGGGTGTGAAATTTTCGGAGCTTAACCTCCG AAACTGCATTCCATACTGCGGTGCTTGAGGACTGGAGAGGAGACTGGAATTCATGGTGTAGCAGTGAAATGCGTAGAGATCATGAGGAAGACCA GTGGCGAAGGCGGGTCTCTGGACAGTTCCTGACACTGAGGCACGAAGGCCAGGGGAGCAAACGGG
denovo2716	TACGAAGGTCCCAAGCGTTGTTTCGGAATCACTGGGCGTAAAGGGAGCGTAGGCGGCGTGGTAAGTCAGATGTGAAATCCCGGGGCTCAACCCCG GAACTGCATCCGATACTGCCATGCTAGAGGATTGGAGAGGTAGCTGGAATTCTTGGTGTAGCAGTGAAATGCGTAGAGATCAAGAGGAACACTC GTGGCGAAAGCGAGCTACTGGACAATTCCTGACGCTGAGGCTCGAAGGCTAGGGTAGCGAAAGGG
denovo901	TACGAAGGTCCCAAGCGTTGTTTCGGAATCACTGGGCGTAAAGGGAGCGTAGGCGGCGCGGTAAGTCGGATGTGAAATCCCGGGGCTCAACCCCG GAACTGCATCTGATACTGCCGTGCTTGAGTAATGGAGGGGTAGCTGGAATTCTCGGTGTAGCAGTGAAATGCGTAGATATCGAGAGGAACACTC GTGGCGAAAGCGAGCTACTGGACATTTACTGACGCTGAGGCTCGAAGGCTAGGGGAGCGAAAGGG

Table S1 (minor OTUs)

Phylum	Class	Order	Family	Genus/ species	OTU IDs	Sample 1	Sample 2	Sample 3	Blast Identifi-cation	BLAST % identi- ty	Source	Ref	RDP
<i>Acidobacteria</i>	<i>[Chloracidobacteria]</i>	RB41	NA	NA	denovo3361	0	0.466	0	Bacteria; Acidobacteria NA	--	--	--	Bacteria; Acidobacteria; Acidobacteria_Gp4; Gp4
<i>Actinobacteria</i>	<i>Acidimicrobiia</i>	<i>Acidimicrobiales</i>	C111	NA	denovo2370	0.654	0	0	Bacteria; Actinobacteria; Acidimicrobiia; Acidimicrobiales; Acidimicrobiaceae; Ilumatobacter nonamiensis	99	seashore sand	(Matsumoto et al. 2013)	Bacteria; Actinobacteria; Actinobacteria; Acidimicrobidae; Acidimicrobiales; Acidimicrobineae; Acidimicrobiaceae; Ilumatobacter
			NA	NA	denovo1095	0	0.745	0.082	Bacteria; Actinobacteria; Kineosporiales; Kineosporiaceae; Angustibacter luteus	100	subarctic forest soil	(Tamura et al. 2010)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Kineosporiineae; Kineosporiaceae

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Actinobacteria</i>	<i>Acidimicrobiia</i>	<i>Acidimicrobiales</i>	<i>Intrasporangiaceae</i>	<i>Phycoccus</i>	denovo713	0.212	0.05	0.491	Actinobacteria; Micrococcales; Intrasporangiaceae; Phycoccus jejuensis	98	seawed	(Yoon et al. 2008)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Micrococcineae; Intrasporangiaceae ; unclassified_Intrasporangiaceae
			<i>Nocardioideaceae</i>	<i>Aeromicrobium</i>	denovo826	0.464	0.185	0.009	Actinobacteria; Propionibacteriales; Nocardioideaceae; Aeromicrobium tamlense	99	dried seaweed	(Lee & Kim 2007)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Propionibacterineae; Nocardioideaceae
				<i>Nocardioides</i>	denovo3875	0.841	0	0	Actinobacteria; Propionibacteriales; Nocardioideaceae; Nocardioides dokdonensis	99	sand sediment of the beach, South Korea	(Park et al. 2008)	Bacteria; Actinobacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Propionibacterineae; Nocardioideaceae; Nocardioides

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Actinobacteria</i>	MB-A2-108	0319-7L14	NA	NA	denovo787	0	0.652	0	Actinobacteria NA	--	--	--	Bacteria; unclassified_Bacteria
			NA	NA	denovo2438	0.187	0.279	0	Actinobacteria NA	--	--	--	Bacteria; unclassified_Bacteria
			NA	NA	denovo2470	0	0.466	0	Actinobacteria NA	--	--	--	Bacteria; unclassified_Bacteria

Phylum	Class	Order	Family	Genus /species	OTU_Ds	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Actinobacteria</i>	<i>Thermoleophilia</i>	<i>Gaiellales</i>	<i>Gaiellaceae</i>	NA	denovo1122	0	0.745	0	Actinobacteria; Thermoleophilia; Gaiellales; Gaiellaceae NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; unclassified_Actinobacteria
				NA	denovo3991	0	0.466	0	Actinobacteria; Thermoleophilia; Gaiellales; Gaiellaceae NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; Gaiellales; Gaiellaceae; Gaiella
				NA	denovo2547	0	0.372	0	Actinobacteria; Thermoleophilia; Gaiellales; Gaiellaceae NA	--	--	--	Bacteria; unclassified_Bacteria

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Actinobacteria</i>	<i>Thermoleophilia</i>	<i>Gaiellales</i>	<i>Gaiellaceae</i>	NA	denovo2728	0	0.186	0	Actinobacteria; Thermoleophilia; Gaiellales; Gaiellaceae NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; Gaiellales; Gaiellaceae; Gaiella
				NA	denovo2610	0	0.186	0	Actinobacteria; Thermoleophilia; Gaiellales; Gaiellaceae NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; Gaiellales; Gaiellaceae; Gaiella
				NA	denovo3934	0.093	0	0	Actinobacteria; Thermoleophilia; Gaiellales; Gaiellaceae NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; unclassified_Rubrobacteridae

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Actinobacteria</i>	<i>Thermoloephilia</i>	<i>Gaiellales</i>	<i>Gaiellaceae</i>	NA	denovo2613	0.093	0	0	Actinobacteria; Thermoloephilia; Gaiellales; Gaiellaceae NA	--	--	--	Bacteria; Actinobacteria; Actinobacteria; Rubrobacteridae; Gaiellales; Gaiellaceae; Gaiella
		<i>Solirubrobacterales</i>	NA	NA	denovo2480	0.093	0.559	0.082	Actinobacteria; Thermoleophila; Solirubrobacterales NA	--	--	--	Bacteria; Actinobacteria; unclassified_Actinobacteria
<i>Bacteroidetes</i>	<i>[Saprospirae]</i>	<i>[Saprospirales]</i>	<i>Chitinophagaceae</i>	NA	denovo1169	0	0.372	0.082	Bacteroidetes; Chitinophagia; Chitinophagales; Chitinophagaceae NA	--	--	--	Bacteria; Bacteroidetes; Sphingobacteriia; Sphingobacteriales; Chitinophagaceae; unclassified_Chitinophagaceae

Phylum	Class	Order	Family	Genus /species	OTU_Ds	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Bacteroidetes</i>	<i>Cytophagia</i>	<i>Cytophagales</i>	<i>Cyclobacteriaceae</i>	NA	denovo628	0.28	0	0	Bacteroidetes; Cytophagia; Cytophagales; Cyclobacteriaceae NA	--	--	--	Bacteria; Bacteroidetes; Cytophagia; Cytophagales; Cyclobacteriaceae; unclassified_Cyclobacteriaceae
			<i>Cytophagaceae</i>	NA	denovo992	0.935	0	0	Bacteroidetes; Cytophagia; Cytophagales; Cytophagaceae NA	--	--	--	Bacteria; Bacteroidetes; Cytophagia; Cytophagales; Ohtaekwangia
				<i>Hymenobacter</i>	denovo401	0	0.279	0.411	Bacteria; Bacteroidetes; Cytophagia; Cytophagales; Hymenobacteraceae; Hymenobacter glaciei	98	antarctic glacier	(Klassen & Foght 2011)	Bacteria; Bacteroidetes; Cytophagia; Cytophagales; Cytophagaceae; Hymenobacter

Phylum	Class	Order	Family	Genus /species	OTU_Ds	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Bacteroidetes</i>	<i>Cytophagia</i>	<i>Cytophagales</i>	<i>Cytophagaceae</i>	<i>Hymenobacter</i>	denovo904	0	0.186	0.164	Bacteria; Bacteroidetes; Cytophagia; Cytophagales; Hymenobacteraceae; Hymenobacter glaciei	98	antarctic glacier	(Klassen & Foght 2011)	Bacteria; Bacteroidetes; Cytophagia; Cytophagales; Cytophagaceae
	<i>Flavobacteriia</i>	<i>Flavobacteriales</i>	<i>Flavobacteriaceae</i>	NA	denovo1366	0.467	0	0	Bacteroidetes; Flavobacteriia; Flavobacteriales; Flavobacteriaceae; Subsaxibacter arcticus	98	Arctic intertidal sand	(Xu et al. 2016)	Bacteria; Bacteroidetes; Flavobacteriia; Flavobacteriales; Flavobacteriaceae; unclassified_Flavobacteriaceae
				<i>Winogradskyella</i>	denovo1071	0.093	0	0	Bacteria; Bacteroidetes; Flavobacteriia; Flavobacteriales; Flavobacteriaceae; Subsaxibacter arcticus	99	Arctic intertidal sand	(Xu et al. 2016)	Bacteria; Bacteroidetes; Flavobacteriia; Flavobacteriales; Flavobacteriaceae; unclassified_Flavobacteriaceae

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Chloroflexi</i>	<i>Gitt-GS-136</i>	NA	NA	NA	denovo273	0.093	0.559	0	Bacteria; Firmicutes; Clostridia; Clostridiales NA	--	--	--	Bacteria; unclassified_Bacteria
<i>Cyanobacteria</i>	<i>Nostocophycideae</i>	<i>Nostocales</i>	<i>Nostocaceae</i>	NA	denovo3812	0	0.186	0	Cyanobacteria; Nostocales; Tolypothrichaceae; Hassallia andreassenii	99	Antarctic aquatic (lacustrine) habitats	--	Bacteria; Cyanobacteria/Chloroplast; Cyanobacteria; Family I; Gpl
<i>Cyanobacteria</i>	<i>Oscillatoriohycideae</i>	<i>Oscillatoriales</i>	<i>Phormidiaceae</i>	<i>Phormidium</i>	denovo2114	0	0.652	0	Cyanobacteria; Oscillatoriohycideae ; Oscillatoriales NA	--	--	--	Bacteria; Cyanobacteria/Chloroplast; Cyanobacteria; unclassified_Cyanobacteria

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	source	Ref	RDP
<i>Gemmatimonadetes</i>	<i>Gemmatimonadetes</i>	<i>Gemmatimonadales</i>	Ellin5301	NA	denovo1668	0	0.652	0	Bacteria; Gemmatimonadetes; Gemmatimonadales NA	--	--	--	Bacteria; unclassified_Bacteria
				NA	denovo2747	0	0.745	0.247	Bacteria; Gemmatimonadetes; Gemmatimonadales NA	--	--	--	Bacteria; Gemmatimonadetes; Gemmatimonadetes; Gemmatimonadales; Gemmatimonadaceae; Gemmatimonas
				NA	denovo1652	0	0.652	0.164	Bacteria; Gemmatimonadetes; Gemmatimonadales NA	--	--	--	Bacteria; Gemmatimonadetes; Gemmatimonadetes; Gemmatimonadales; Gemmatimonadaceae; Gemmatimonas

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Proteobacteria</i>	<i>Alphaproteobacteria</i>	<i>Rhizobiales</i>	NA	NA	denovo356	0.187	0.093	0	Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales NA	--	--	--	Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales; Bradyrhizobiaceae; Bosea
		<i>Rhodobacterales</i>	<i>Rhodobacteraceae</i>	<i>Rhodobacter</i>	denovo126	0.28	0.093	0.247	Bacteria; Proteobacteria; Alphaproteobacteria; Rhodobacterales; Rhodobacteraceae NA	--	--	--	Bacteria; Proteobacteria; Alphaproteobacteria; Rhodobacterales; Rhodobacteraceae; unclassified_Rhodobacteraceae
		<i>Sphingomonadales</i>	<i>Sphingomonadaceae</i>	NA	denovo3747	0.187	0	0.576	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; Sphingopyxis wooponensis	98	wetland freshwater	(Baik et al. 2013)	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; Sphingorhabdus

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Proteobacteria</i>	<i>Alphaproteobacteria</i>	<i>Sphingomonadales</i>	<i>Sphingomonadaceae</i>	<i>Kaistobacter</i>	denovo1739	0.467	0	0	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae NA	--	--	--	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; unclassified_Sphingomonadales
					denovo37	0.187	0	0.082	Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae NA	--	--	--	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; unclassified_Sphingomonadaceae
				<i>Zymomonas</i>	denovo2331	0	0.098	0.413	Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; Polymorphobacter fuscus	100	permafrost	(Jia et al. 2015)	Bacteria; Proteobacteria; Alphaproteobacteria; Sphingomonadales; Sphingomonadaceae; Polymorphobacter

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Proteobacteria</i>	<i>Betaproteobacteria</i>	A21b	UD5	NA	denovo3538	0.28	0.466	0.082	Proteobacteria; Betaproteobacteria; Nitrosomonadales; Nitrosomonadaceae NA	--	--	--	Bacteria; Proteobacteria; Betaproteobacteria; unclassified_Betaproteobacteria
		SC-I-84	NA	NA	denovo3252	0	0.559	0	Proteobacteria; Betaproteobacteria; Burkholderiales; Burkholderiaceae NA	--	--	--	Bacteria; Proteobacteria; unclassified_Proteobacteria
<i>Proteobacteria</i>	<i>Gammaproteobacteria</i>	<i>Alteromonadales</i>	Alteromonadaceae	<i>Marinobacter</i>	denovo3013	0.28	0	0	Bacteria; Proteobacteria; Gammaproteobacteria; Alteromonadales; Alteromonadaceae NA	--	--	--	Bacteria; Proteobacteria; Gammaproteobacteria; unclassified_Gammaproteobacteria

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
<i>Proteobacteria</i>	<i>Gammaproteobacteria</i>	<i>Pseudomonadales</i>	Pseudomonadaceae	<i>Pseudomonas</i>	denovo1205	0.187	0	0.082	Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales; Pseudomonadaceae; Pseudomonas psychrophila	100	Arctic fjord Ny-alesund in the Svalbard Archipelago	(Abraham & Thomas 2015)	Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales; Pseudomonadaceae; Pseudomonas
		<i>Xanthomonadales</i>	Xanthomonadaceae	NA	denovo1414	0.187	0.279	0	Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; Luteimonas abyssi	98	deep-sea sediment	(Fan et al. 2014)	Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; Luteimonas
		<i>Xanthomonadales</i>	Xanthomonadaceae	NA	denovo743	0.28	0	0.082	Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae; Luteimonas abyssi	98	deep-sea sediment	(Fan et al. 2014)	Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales; Xanthomonadaceae

Phylum	Class	Order	Family	Genus /species	OTU_Ids	Sample 1	Sample 2	Sample 3	Blast Identification	BLAST % identity	Source	Ref	RDP
Verrucomicrobia	[Spartobacteria]	[Chthoniobacterales]	[Chthoniobacteraceae]	DA101	denovo4041	0	0.372	0.082	Verrucomicrobia; Spartobacteria; Chthoniobacterales; Chthoniobacteraceae NA	--	--	--	Bacteria; Verrucomicrobia; Spartobacteria; Spartobacteria_genera_incertae_sedis
					denovo1537	0	0.186	0	Verrucomicrobia; Spartobacteria; Chthoniobacterales; Chthoniobacteraceae NA	--	--	--	Bacteria; Verrucomicrobia; Spartobacteria; Spartobacteria_genera_incertae_sedis
	Verrucomicrobiae	Verrucomicrobiales	Verrucomicrobiaceae	NA	denovo2975	0	0.186	0	Verrucomicrobia; Verrucomicrobiae; Verrucomicrobiales; Verrucomicrobiaceae NA	--	--	--	Bacteria; Verrucomicrobia; unclassified_Verrucomicrobia

Table S1 (sequences of minor representative OTUs)

OTU_IDs	Rep_Sequence
denovo3361	TACGGGGGGAGCAAGCGTTGTTCCGATTTACTGGGCGTAAAGGGCGCGTAGGCGGCCAGCACAAAGTCAGTTGTGAAATCTCCGAGCTTAACTCGGAAAGGTCAAC TGATACTGTGCGGCTAGAGTGCGGAAGGGGCAACTGGAATTCCTGGTGTAGCGGTGAAATGCGTAGATATCAAGAGGAACACCTGCGGCGAAGGCGGGTTGCTG GGCCGACACTGACGCTGAGGCGCGAAAGCCAGGGGAGCGAACGGG
denovo2370	CACGTAGGCACCAAGCGTTATCCGATTTATTGGGCGTAAAGAGCTCGTAGGCGGTTTCAGTCAGTCGGGTGTGAAAATTGAGGCTTAACCTCAAGAGGTCACTCG ATACTGCTGTGACTAGAGTGCGGTAGGGGAGCGGGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCAAGTGGCGAAGGCGCCGCTCTGG GCCGTAACCTGACGCTGAGGAGCGAAAGCATGGGTAGCAAACAGG
denovo1095	TACGTAGGGTGCAAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCTCGTAGGCGGTTTGTGCGCTCTGGTGTGAAAATCCAGGGCTTAACCTGGACCTGCATCGG GTACGGGCAGACTAGAGTGCGGTAGGGGAGATCGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCGGTGGCGAAGGCGGATCTCTGG GCCGTAACCTGACGCTGAGGAGCGAAAGCATGGGGAGCGAACAGG
denovo713	TACGTAGGGTGCGAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCTTGTAGGTGGTTTGTGCGCTCTGCTGTGAAAATCCGGGGCTCAACCCCGACTTGCAGTG GGTACGGGCAGACTAGAGTGTGGTAGGGGAGACTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCGATGGCGAAGGCAGGTCTCTG GGCCATTACTGACACTGAGAAGCGAAAGCGTGGGGAGCGAACAGG
denovo826	TACGTAGGGTCCGAGCGTTGTCCGGAATTATTGGGCGTAAAGGGCTCGTAGGCGGTTTGTACGTCGGGAGTGAAAATCAGGGCTCAACCTGAGCGTGCTTCC GATACGGGCAGACTAGAGGTATGCAGGGGAGAACGGAATTCCTGGTGTAGCGGTGGAATGCGCAGATATCAGGAGGAACACCGGTGGCGAAGGCGGTTCTCTG GGCATTACCTGACGCTGAGGAGCGAAAGCATGGGGAGCGAACAGG
denovo3875	TACGTAGGGTGCGAGCGTTGTCCGGAATTATTGGGCGTAAAGGGCTCGTAGGCGGTTTGTGCGCTCGGGAGTGAAAACACCGGGCTTAACCTCGGTGCTGGCTTCC GATACGGGCAGACTAGAGGTATTCAGGGGAGAACGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCGGTGGCGAAGGCGGTTCTCTGG GAATTACCTGACGCTGAGGAGCGAAAGTGTGGGGAGCGAACAGG
denovo787	CACGTAGGGGACGAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCGCGTAGGCGGTCGTGCAAGTCGGATGTGAAAATCCCGGGCTCAACCCGGGACCTGCACC CGATACTGCTCGACTCGAGGTAGGTAGGGGAGATCGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCGGTGGCGAAGGCGGATCTCTG GGCCTTACCTGACGCTGAGGCGCGAAAAGCTAGGGGAGCGAACAGG
denovo2438	TACGTAGGGACCGAGCGTTGTCCGATTTATTGGGCGTAAAGCGCGCTAGGCGGCCGATCGCGTCGGATGTGAAAGCTCGGAGCTCAACTCTGAGAGGTCAATC GATACGGGTGCGCTAGAGGCAGGTAGGGGAGATCGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCGGTGGCGAAGGCGGATCTCTG GGCCTGTTCTGACGCTGAGGCGCGAAAAGCTGGGGGAGCAAACAGG
denovo2470	GACGTAGGGGGCGAGCGTTGTCCGATTTATTGGGCGTAAAGCGCGCTAGGCGGCTGCGCAAGTCGGTTGTGAAACCCCGGGGCTCAACCCCGGAAGTGCATCC GATACTGCGTGGCTAGAGGTAGGTAGGGGAGATCGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAGGAACACCGGTGGCGAAGGCGGATCTCTGG GCCTTACCTGACGCTCAGGCGCGAAAAGCTAGGGGAGCGAACAGG
denovo1122	TACGTAGGGGGCAAGCGTTGTCCGATTTATTGGGCGTAAAGAGCGTGTAGGCGGCCGTGTAGGTCTGACGTGAAATCTGGAGGCTCAACCTCCAGCTGTCGTTG GAAACCGCGCGCTAGAGTCCGGAAGAGGAGAGTGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACCTATGGCGAAGGCAGCTCTCTGG GACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG

OTU_IDs	Rep_Sequence
denovo3991	TACGTAGGGGGCTAGCGTTGTCCGGATTTATTGGGCGTAAAGAGCGTGTAGGCGGCCAGATAGGTCTGCTGTGAAAACCTCGAGGCTCAACCTCGAGCTGTCGGCG GAAACCATTCCGGCTAGAGTCCGGAAGAGGAGAGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACCTATGGCGAAGGCAGCTCTCTGG GACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG
denovo2547	TACGTAGGGGGCAAGCGTTGTCCGGATTTATTGGGCGTAAAGAGCGTGTAGGCGGTCAGGTAGGTCCGTTGTGAAAACCAAGGCTCAACCTTGGGACGCCGATG GAAACCATCTGACTAGAGTCCGGAAGAGGAGAATGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACCCGTGGCTAAGGCGGTTCTCTAGT ACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG
denovo2728	TACGTAGGGGGCTAGCGTTGTCCGGATTTATTGGGCGTAAAGCGCGTGTAGGCGGCCAGATAGGTCTGCTGTGAAAACCTCGAGGCTCAACCTCGAGCTGTCGGTGG AAACCATTGGCTAGAGTCCGGAAGAGGAGAGCGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCGGGAAGAACACCCGTGGCGAAGGCGGCTCTCTGGG ACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCAAACAGG
denovo2610	TACGTAGGGGGCAAGCGTTGTCCGGATTTATTGGGCGTAAAGAGCGTGTAGGCGGCCAGACAGGTCCGTTGTGAAAACCTCGAGGCTCAACCTCGAGACGTCGACG GAAACCGTCTGGCTAGAGTCCGGAAGAGGAGTGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACCTATGGCGAAGGCAGCACTCTGG GACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG
denovo3934	TACGTAGGGGGCAAGCGTTGTCCGGATTTATTGGGCGTAAAGAGCGTGTAGGCGGTTAGATAGGTCTGCTGTGAAAACCTCCAGGCTCAACCTGGAGACGTCGGTG GAAACCATCTAGCTAGAGTCCGGAAGAGGAGAGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAACACCCGTGGCGAAGGCGGCTCTCTGG GACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG
denovo2613	TACGTAGGGGGCAAGCGTTGTCCGGATTTATTGGGCGTAAAGCGCGTGTAGGCGGCCAGGTAGGTCCGCTGTGAAAACCTCGAGGCTCAACCTCGAGACGTCGGCG GAAACCATCTGGCTAGAGTCCGGAAGAGGAGAGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCAGGAAGAATATCCGTGGCGAAGGCGGCTCTCTGG GACGGTACTGACGCTGAGACGCGAAAGCGTGGGGAGCGAACAGG
denovo2480	TACGTAGGGGCAAGCGTTGTCCGGAATTATTGGGCGTAAAGAGCGTGTAGGCGGTCCGGTAAGTCGGCTGTGAAAGTCCAGGGCTCAACCCTGGGATGCCGGTC GATACTGCCGACTAGAGTTCGGAAGAGGCGAGTGGAATTCCTGGTGTAGCGGTGAAATGCGCAGATATCGGGAGGAACACCTATGGCGAAGGCAGCTCGCTGG GACGTTACTGACGCTGAGACGCGAAAGCGTGGGGAGCAAACAGG
denovo1169	TACGGAGGGTGCAAGCGTTATCCGGATTTACTGGGTTTAAAGGGTGCGTAGGTGGGTAGGTAAGTCAGTGGTGAAATCTCCGAGCTTAACCTCGGAAACTGCCATT GATACTATTTATCTTGAATATCCTGGAGGTGAGCGGAATATGTCATGTAGCGGTGAAATGCTTAGATATGACATAGAACACCAATTGCGAAGGCAGCTCACTACGG GGTTATTGACACTGAGGCACGAAAGCGTGGGGATCAAACAGG
denovo628	TACGGAGGGTGCAAGCGTTGTCCGGATTTATTGGGTTTAAAGGGTGCGTAGGCGGTTGATTAAGTCAGCGGTGAAAGTTTTGGGCTCAACCCAGAAATTGCCATTG ATACTGGTCGACTTGAGTATTGCAGGGGTACATGGAATTGATGGTGTAGCGGTGAAATGCATAGATACCATCAGGAACACCGATAGCGAAGGCATTGTACTGGGC AACCACTGACGCTGATGCACGAAAGCATGGGGAGCGAACAGG
denovo992	TACGTAGGTGGCAAGCGTTGTCCGGATTTATTGGGTTTAAAGGGTGCGTAGGCGGCCTATTAAGTCAGTGCTGAAATATCCCGGCTTAACCGGGAGGGTGGCATT GATACTGATGGGCTTGAGTAGAGTCGAGGTGGGCGGAATTGACGGTGTAGCGGTGAAATGCTTAGATATCGTCAAGAACACCGATAGTGTAGACAGTTCACTAGG CTCAAACCTGACGCTGAGGCACGAAAGTGTGGGGATCAAACAGG

OTU_IDs	Rep_Sequence
denovo401	TACGGAGGGTGCAAGCGTTGTCCGGATTTATTGGGTTTAAAGGGTGCGTAGGCGGCCGATTAAGTCCGGGGTGAAAGCCCACTGCTCAACAGTGGAAGTGCCTCG GAAACTGGTTGGCTTGAGTACAGACGAGGGCGGCGGAATGGATGCTGTAGCGGTGAAATGCATAGATAGCATCCAGAACACCGATTGCGAAGGCAGCTGCCTAG ACTGTAAGTACGCTGAGGCACGAAAGCGTGGGGAGCGAACAGG
denovo904	TACGGAGGGTGCAAGCGTTGTCCGGATTTATTGGGTTTAAAGGGTGCGTAGGCGGTTCTTTAAGTCCGGGGTGAAAGCCCACTGCTCAACAGTGGAAGTGCCTCG GAAACTGGCGAACTTGAGTACAGACGAGGGTGCGGAATGGATACTGTAGCGGTGAAATGCATAGATAGTATCCAGAACACCGATTGCGAAGGCAGCTGCCTAG ACTGTAAGTACGCTGAGGCACGAAAGCGTGGGGAGCGAACAGG
denovo1366	TACGGAGGATCCAAGCGTTATCCGGAATCATTGGGTTTAAAGGGTCCGTAGGTGGGCCGTTAAGTCAGAGGTGAAATCCTGCAGCTCAACTGTAGAATTGCCTTTG ATACTGGCGGCCTTGAATCGTTGTGAAGTGGTTAGAATATGTGGTGTAGCGGTGAAATGCATAGATATCACATAGAATACCGATTGCGAAGGCAGATCACTAACAG CGCATTGACACTGATGGACGAAAGCGTGGGGAGCGAACAGG
denovo1071	TACGGAGGATCCAAGCGTTATCCGGAATCATTGGGTTTAAAGGGTCCGTAGGTGGACCGTTAAGTCAGAGGTGAAATCCTGCAGCTCAACTGTAGAATTGCCTTTG ATACTGGCGGTCTTGAATCATTGTGAAGTGGTTAGAATATGTAGTGTAGCGGTGAAATGCATAGATATTACATAGAATACCGATTGCGAAGGCAGATCACTAACAA TGTATTGACACTGATGGACGAAAGCGTGGGGAGCGAACAGG
denovo273	TACGTAGGTGGCGAGCGTTGTCCGGAATTAAGTGGGCGTAAAGAGCGCGCAGGCGGCTGACCAAGTCCGATGTGAAAGCTCCCGGCTTAAGTGGGAAATTGCATCG GAAACTGATCGGCTTGAAGGTGGGAGAGGGTAGCGGAATCCCGGTGTAGTGGTGAAATGCGTAGATATCGGGAGGAACACCAAGTGGCGAAGGCGGCTACCTG GCCCATTCTTGACGCTGAGGCGCGAAAGCTAGGGGAGCGAACGGG
denovo3812	TACGGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGCGTCCGCAGGTGGCTGTGTAAGTCTGCTGTTAAATAGTGAGGCTCAACCTCATAAAGGCAGTG GAAACTACACGGCTAGAGTGCCTCGGGGCAGAGGGAATCCTGGTGTAGCGGTGAAATGCGTAGAGATCAGGAAGAACACCGGTGGCGAAAGCGCTCTGCTAG GCCGCAACTGACACTGAGGGACGAAAGCTAGGGGAGCGAATGGG
denovo2114	GACGGAGGATGCAAGCGTTATCCGGAATGATTGGGCGTAAAGCGTCCGCAGGTGGCAATTCAAGTCTGCTGTTAAAGCGCAGGGCTTAAGTCTGTAAAGGCAGTG GAAACTGAATAGCTAGAGTGTGGTAGGGGCAGAGGGAATCCAGTGTAGCGGTGAAATGCGTAGAGATTGGGAAGAATCGGTGGCGAAGGCGCTCTGCTGG ACCATAACTGACACTCACAGGACGAAAGCTAGGGGAGCGAATGGG
denovo1668	TACGGAGGGTGCGAGCGTTGTCCGGAATCACTGGGCGTAAAGGGCGCGTAGGCGGCTCGCGAAGCGTGCGGTGAAAGCCCGGGGCTCAACCCCGGGTCGGCCG TGCGAACTGGCGAGCTCGAGCACAGTAGAGGCAAGTAGAATCCGGGTGTAGCGGTGGAATGCGTAGAGATCCGGAAGAATACCGGTGGCGAAGGCGGCTTGCT GGGCTGTGGCTGACGCTGAGGCGCGACAGCGTGGGGAGCAAACAGG
denovo2747	TACGGAGGGTGCGAGCGTTGTCCGGAATCATTGGGCGTAAAGGGCGCGTAGGTGGCCCGGTCAGCGTGCGGTGAAAGCTCGGGGCTCAACCCCGAGTCGGCCGT GCGAACTGCTGGGCTGGAGCACTGTAGAGGCAGGCGGAATCCGGGTGTAGCGGTGGAATGCGTAGAGATCCGGAAGAACACCGGTGGCGAAGGCGGCCTGCT GGGCAGTTGCTGACACTGAGGCGCGACAGCGTGGGGAGCAAACAGG
denovo1652	TACGGAGGGTGCGAGCGTTGTCCGGAATCATTGGGCGTAAAGGGCGCGTAGGTGGCGGGACAAGCGTGCGGTGAAAGCTCGGGGCTCAACCCCGCGTCGGCCGT GCGAACTGTTTGCTTGAGCACTGTAGAGGCAGGCGGAATCCGGGTGTAGCGGTGGAATGCGTAGAGATCCGGAAGAACACCGGTGGCGAAGGCGGCCTGCTGG GCAGTAGCTGACACTGAGGCGCGACAGCGTGGGGAGCAAACAGG

OTU_IDs	Rep_Sequence
denovo356	TACGAAGGGGGCTAGCGTTGCTCGGAATCACTGGGCGTAAAGGGCGCGTAGGCGGACTCTTAAGTCGGGGGTGAAAGCCCAGGGCTCAACCCTGGAATTGCCTTC GATACTGAGAGTCTTGAGTTCGGAAGAGGTTGGTGGAAGTGCAGTGTAGAGGTGAAATTCGTAGATATTCGCAAGAACACCACTGGCGAAGGCGGCCAACTGG TCCGATACTGACGCTGAGGCGCGAAAGCGTGGGGAGCAAACAGG
denovo126	TACGGAGGGGCTAGCGTTATTCGGAATTACTGGGCGTAAAGCGCACGTAGGCGGGCTGACAAGTCAGAGGTGAAATCCCAGGGCTCAACCTTGGAAGTGCCTTTG AAACTGTTAGTCTTGAGGTCGTGAGAGGTGAGTGGAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAGGAACACCACTGGCGAAGGCGGCTCACTGGCA CGATACTGACGCTGAGGTGCGAAAGCGTGGGGAGCAAACAGG
denovo3747	TACGGAGGGGAGCTAGCGTTGTTTCGGAATTACTGGGCGTAAAGAGTACGTAGGCGGTGATTCAAGTCAGAGGTGAAAGCCTGGAGCTCAACTCCAGAACTGCCTTT GAAACTAGATCGCTAGAATCATGGAGAGGTGAGTGGAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCACTGGCGAAGGCGACTCACTGG ACATGTATTGACGCTGAGGTACGAAAGCGTGGGGAGCAAACAGG
denovo1739	TACGGAGGGGGCTAGCGTTGTTTCGGAATTACTGGGCGTAAAGCGCGCGTAGGCGGCTTTGTAAGTTAGAGGTGAAAGCCCGGAGCTTAACTCCGGAAGTGCCTT AAAAGTGCATCGCTAGAATTGTGGAGAGGTGAGTGGAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCACTGGCGAAGGCGACTCACTGGA CACATATTGACGCTGAGGTGCGAAAGCTAGGGGAGCAAACGGG
denovo37	TACGGAGGGGGCTAGCGTTGTTTCGGAATTACTGGGCGTAAAGCGCGCGTAGGCGGCTTTGTAAGTTAGAGGTGAAAGCCCGGAGCTCAACTCCGGAAGTGCCTT AAAAGTGCATCGCTAGAATTGTGGAGAGGTGAGTGGAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCACTGGCGAAGGCGACTCACTGGA CACATATTGACGCTCATGCAGAAAGCGTGGGGAGCAAACAGG
denovo2331	TACGGAGGGGAGCTAGCGTTGTTTCGGAATTACTGGGCGTAAAGCGTACGTAGGCGGCTTTGTAAGTCAGAGGTGAAAGCCCACGACTCAATCGTGGAAGTGCCTTT GAGACTGCTTCGCTTGAAGATGGGAGAGGTTAGTGGAATTCGAGTGTAGAGGTGAAATTCGTAGATATTCGGAAGAACACCACTGGCGAAGGCGGCTAACTGG ACCATTCTTGACGCTGAGGTACGAAAGCGTGGGGAGCAAACAGG
denovo3538	TACGTAGGGTGCGAGCGTTAATCGGAATTACTGGGCGTAAAGCGTGCGCAGGCGGTTCTGAAAGTCAGCTGTGAAAGCCCCGGGCTTAACCTGGGAAGTGCGGTT GAAACTACAGGACTAGAATCTGGCAGAGGGGGGTGGAATTCACGTGTAGCAGTGAAATGCGTAGAGATGTGGAGGAACACCGATGGCGAAGGCAGCCCCCTGG GCTGAGATTGACGCTCAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo3252	TACGTAGGGTGCGAGCGTTAATCGGAATTACTGGGCGTAAAGAGTGCGTAGGCGGTTCTGTTATGTCTGTGGTGAAAGCCCTGGGCTCAACCTAGGAATGGCCATG GAAACTGGCGGGCTGGAGTATGGCAGAGGGGGGTGGAATTCGCGTGTAGCAGTGAAATGCGTAGAGATGCGGAGGAACACCGATGGCGAAGGCAGCCCCCTG GGCTAATACTGACGCTGAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo3013	TACGGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGAGCACGTAGGCGGTTGGATAAGTTAGATGTGAAATCCCCGGGCTTAACCTGGGAGCTGCATTT AAAAGTGTCTGGCTAGAGTTCGGTAGAGGGGGGTGGAATTTCCGGTGTAGCGGTGAAATGCGTAGAGATCGGAAGGAACATCAGTGGCGAAGGCGGCCCTGGA CTAGGACTGACGCTGAGGTGCGAAAGCGTGGGGAGCAAACAGG
denovo1205	TACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGGTGGTTTGTTAAGTTGAATGTGAAATCCCCGGGCTCAACCTGGGAAGTGCATCC AAAAGTGGCAAGCTAGAGTATGGTAGAGGGTAGTGGAATTTCTGTGTAGCGGTGAAATGCGTAGATATAGGAAGGAACACCACTGGCGAAGGCGACTACCTGG ACTGATACTGACACTGAGGTGCGAAAGCGTGGGGAGCAAACAGG

OTU_IDs	Rep_Sequence
denovo1414	TACGAAGGGTGCAAGCGTTACTCGGAATTACTGGGCGTAAAGCGTGCGTAGGTGGCCTGTTAAGTCTGATGTGAAAGCCCCGGGCTCAACCTGGGAATTGCATTG GATACTGGCAGGCTAGAGTGCGGTAGAGGGTAGTGGAATCCCGGTGTAGCAGTGAAATGCGTAGAGATCGGGAGGAACACCACTGGCGAAGGCGACTACCTG GACCAGCACTGACACTGAGGCACGAAAGCGTGGGGAGCAAACAGG
denovo743	TACGAAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGGGTGTGTAGGTGGCCTGTTAAGTCTGTCGTGAAAGCCCTGGGCTCAACCTGGGAATGGCGGTG GATACTGGCGGGCTCGAGTACGGTAGAGGGTGGTGGAATCCCGGTGTAGCGGTGAAATGCGTAGAGATCGGGAGGAACATCAGTGGCGAAGGCGGCCACCTG GACCAGTACTGACACTGAGACACGAAAGCGTGGGGAGCAAACAGG
denovo4041	TACAGAGGTCTCAAGCGTTGTTTCGGATTCACTGGGCGTAAAGGGTGCCTAGGTGGCGCCATAAGTCGGGTGTGAAATTCGGAGCTCAACTCCGAAACTGCATTG ATACTGTGGTGCTTGAGGACTGGAGAGGAGACTGGAATTCACGGTGTAGCAGTGAAATGCGTAGAGATCGTGAGGAAGACCACTGGCGAAGGCGGGTCTCTGGA CAGTTCCTGACACTGAGGCACGAAGGCTAGGGGAGCAAACGGG
denovo1537	TACAGAGGTCTCGAGCGTTGTTTCGGATTCACTGGGCGTAAAGGGTGCCTAGGTGGCGGGGTAAGTCAGATGTGAAATTCGGAGCTCAACTCCGAAACTGCATTT GATACTGCCTTGCTTGAGGACTGGAGAGGAGACTGGAATTTACGGTGTAGCAGTGAAATGCGTAGATATCGTAAGGAAGACCACTGGCGAAGGCGGGTCTCTGG ACAGTTCCTGACACTGAGGCACGAAGGCTAGGGGAGCAAACGGG
denovo2975	TACAGAGGTCTCAAGCGTTGTTTCGGAATCACTGGGCGTAAAGGGTGCCTAGGTGCCTGGAAAGTCAGATGTGAAATACGAAGGCTCAACCTTCGAAATGCATCC GATACTACCATGCTAGAGGTCTAAAGGGGAGCTTGGAATTTTCGGTGTAGCAGTGAAATGCGTAGATATCGAAAAGAACACTTGTGGCGAAGGCGAAGCTCTGGT TAGAATCTGACGCTGAGGCACGAAGGCTAGGGTAGCAAACGGG

Figure S1



Phylum	Class	Order	Family	Genus/Species	Sample1	Sample2	Sample3	
Acidobacteria	[Chloracidobacteria]	RB41	Ellin6075	NA				
				NA				
				NA				
Actinobacteria	Acidimicrobiia	Acidimicrobiales	C111	NA				
	Actinobacteria	Actinomycetales	NA	NA				
			NA	NA				
			Intrasporangiaceae	NA				
			Micrococcaceae	NA				
			Nocardiodaceae	NA				
				NA				
				Nocardioides				
			Pseudonocardiaceae	NA				
			Sporichthyaceae	NA				
	Thermoleophilia	Gaiellales	Gaiellaceae	NA				
				NA				
		Solirubrobacterales	NA					
Bacteroidetes	[Saprospirae]	[Saprospirales]	Chitinophagaceae	NA				
				NA				
				NA				
				NA				
				NA				
				Flavisolibacter				
			Segetibacter					
	Saprospiraceae	NA						
	Cytophagia	Cytophagales	Cytophagaceae	NA				
	Hymenobacter							
Sphingobacteriia	Sphingobacteriales	Sphingobacteriaceae	NA					
Chloroflexi	Chloroflexi	[Roseiflexales]	[Kouleothrixaceae]	NA				
	Ellin6529	NA	NA	NA				
	Gitt-GS-136	NA	NA	NA				
Cyanobacteria	Nostocophycideae	Nostocales	Nostocaceae	NA				
	Oscillatoriohphycideae	Oscillatoriales	Phormidiaceae	Phormidium				
Gemmatimonadetes	Gemmatimonadetes	Gemmatimonadales	Ellin5301	NA				
Proteobacteria	Alphaproteobacteria	Caulobacterales	Caulobacteraceae	NA				
		Rhodobacterales	Rhodobacteraceae	NA				
		Sphingomonadales	Sphingomonadaceae	NA				
				Kaistobacter				
				Sphingomonas				
		Betaproteobacteria	A21b	UD5	NA			
	NA							
	Burkholderiales		Comamonadaceae	NA				
				Methylibium				
				NA				
	Oxalobacteraceae		NA					
	Methylophilales		Methylophilaceae	Methylotenera mobili				
	SC-I-84		NA	NA				
	Gammaproteobacteria	Xanthomonadales	Xanthomonadaceae	NA				
				NA				
				NA				
				Dokdonella				
				Thermomonas				
Chthoniobacter								
Verrucomicrobia	[Spartobacteria]	[Chthoniobacterales]	[Chthoniobacteraceae]	DA101				
	Verrucomicrobiae	Verrucomicrobiales	Verrucomicrobiaceae	Luteolibacter				