

Figure S1: Nutrient contents of the cover crops. Boxplot displaying variation in TC content (a), TN content (b), and TP content (c) between different cover crops (*, $p < 0.05$).

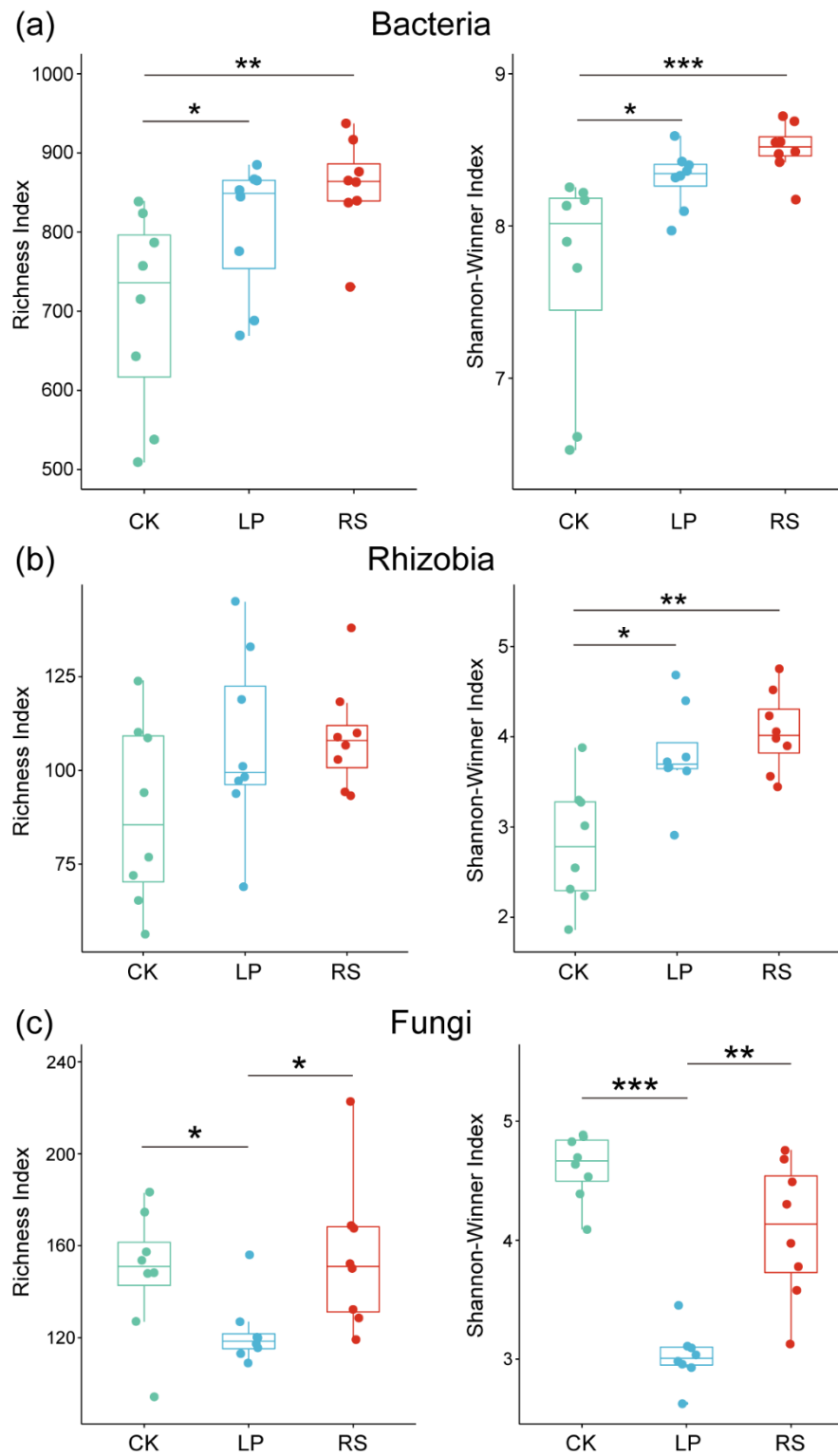
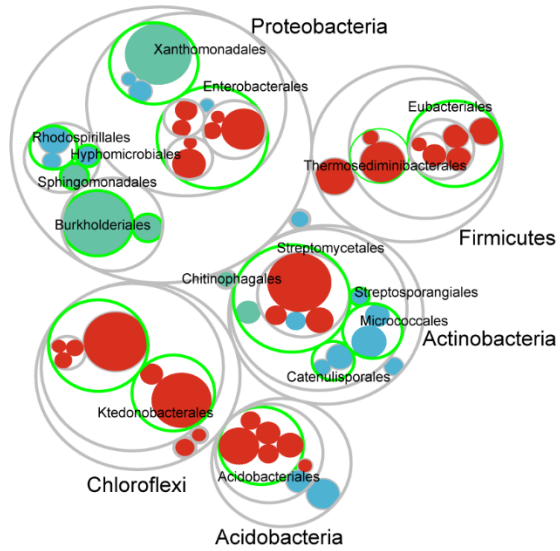


Figure S2: Diversity indices of peanut rhizosphere soil microbes as affected by cover crops. Boxplot displaying variation in bacterial diversity (a), rhizobial diversity (b), and fungal diversity (c) among different cover crop treatments (*, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$).

(a) Bacteria



(b) Rhizobia



(c) Fungi

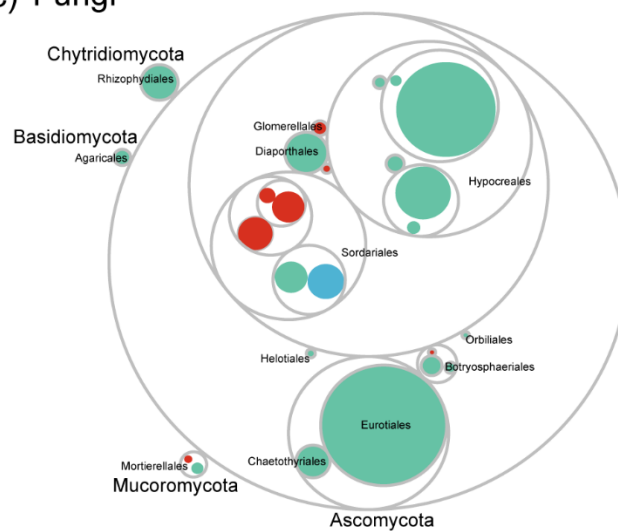


Figure S3: Composition of bacterial (a), rhizobial (b), and fungal (c) indicator species.

Table S1: PCR information.

	Primers	Reaction system	Cycling parameters
Bacteria	515F (5'-GTGCCAGCMGCCGCGGTAA-3')/907R (5'-CCGTCAATTCCTTTGAGTTT-3')	A 25 µl reaction containing 12.5 µl SYBR®Premix Ex Taq (Takara), 0.5 µl PCR forward and reverse primer (both 10 µM), 2 µl DNA template, and 9.5 µl double distilled water (ddH ₂ O)	Pre-denaturation at 95 °C for 3 min, with 27 cycles of 95 °C for 30 s, 55 °C for 30 s, and 72 °C for 45 s, and extension at 72 °C for 10 min
Rhizobia	<i>rpoB</i> 1479F (5'-GATCGAAACGCCGGAAGG-3')/ <i>rpoB</i> 1831R (5'-TGCATG TTCGAG CCCAT-3')		Pre-denaturation at 95 °C for 5 min, with 30 cycles of 94 °C for 30 s, 60 °C for 45 s, and 72 °C for 1 min, and extension at 72 °C for 10 min
Fungi	ITS1F (5'-CTTGGTCATTTAGAGGAAGTAA-3')/ITS2R (5'-GCTGCGTTCTTCATCGATGC-3')		Pre-denaturation at 95 °C for 3 min, with 35 cycles of 95 °C for 30 s, 55 °C for 30 s, and 72 °C for 45 s, and extension at 72 °C for 10 min

Table S2: Effect of different cover crops on peanut biomass, nitrogen content, and nitrogen uptake.

Treatment	Biomass of peanut straw	Biomass of peanut pod	N content of peanut straw	N content of peanut pod	N uptake of peanut
	(g plant ⁻¹)		(mg g ⁻¹)		(mg plant ⁻¹)
CK	16.67±3.13a	11.80±1.18b	16.28±1.89a	28.38±1.67b	605.23±52.41c
LP	16.36±2.77a	12.64±1.31ab	17.01±1.57a	32.04±2.25a	681.39±40.58b
RS	17.73±1.10a	13.57±0.65a	16.92±2.05a	34.08±1.22a	762.03±58.55a

Table S3: Core rhizosphere taxa.

Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
Bacteria	1	Bacteria	Bacteroidetes	Chitinophagia	Chitinophagales	Chitinophagaceae	<i>Sediminibacterium</i>
	3	Bacteria	Proteobacteria	Gammaproteobacteria	Xanthomonadales	Rhodanobacteraceae	<i>Metallibacterium</i>
	6	Bacteria	Proteobacteria	Gammaproteobacteria	Xanthomonadales	Rhodanobacteraceae	<i>Metallibacterium</i>
	7	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
	8	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	9	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	10	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
	11	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Tengunoibacter</i>
	12	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia</i>

	13	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	14	Bacteria	Actinobacteria	Actinomycetia	Streptosporangiales	Thermomonosporaceae	<i>Actinocorallia</i>
	16	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	17	Bacteria	Actinobacteria	Actinomycetia	Micrococcales	Micrococcaceae	<i>Sinomonas</i>
	18	Bacteria	Firmicutes	Clostridia	Thermosediminibacterales	Tepidanaerobacteraceae	<i>Tepidanaerobacter</i>
	20	Bacteria	Actinobacteria	Actinomycetia	Micrococcales	Micrococcaceae	<i>Sinomonas</i>
	21	Bacteria	Proteobacteria	Gammaproteobacteria	Xanthomonadales	Rhodanobacteraceae	<i>Rhodanobacter</i>
	22	Bacteria	Proteobacteria	Alphaproteobacteria	Hyphomicrobiales	Beijerinckiaceae	<i>Methylovirgula</i>
	24	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	25	Bacteria	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	<i>Sphingomonas</i>
	27	Bacteria	Actinobacteria	Actinomycetia	Micrococcales	Microbacteriaceae	<i>Cnuibacter</i>

28	Bacteria	Proteobacteria	Gammaproteobacteria	Xanthomonadales	Rhodanobacteraceae	<i>Metallibacterium</i>
29	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>
30	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Salmonella</i>
31	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Salmonella</i>
32	Bacteria	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	<i>Sphingomicrobium</i>
33	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Kitasatospora</i>
36	Bacteria	Actinobacteria	Thermoleophilia	Solirubrobacterales	Conexibacteraceae	<i>Conexibacter</i>
37	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
38	Bacteria	Actinobacteria	Actinomycetia	Corynebacteriales	Mycobacteriaceae	<i>Mycobacterium</i>
39	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
40	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
41	Bacteria	Acidobacteria	Acidobacteriia	Bryobacterales	Bryobacteraceae	<i>Bryobacter</i>

	42	Bacteria	Actinobacteria	Actinomycetia	Catenulisporales	Actinospicaceae	<i>Actinospica</i>
	43	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	44	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	45	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia</i>
	47	Bacteria	Candidatus Saccharibacteria	Unassigned	Unassigned	Unassigned	<i>Candidatus Saccharimonas</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	48	Bacteria	Firmicutes	Bacilli	Bacillales	Bacillaceae	<i>Geobacillus</i>
	49	Bacteria	Proteobacteria	Gammaproteobacteria	Xanthomonadales	Rhodanobacteraceae	<i>Dyella</i>
	50	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
	52	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	53	Bacteria	Proteobacteria	Alphaproteobacteria	Hyphomicrobiales	Hyphomicrobiaceae	<i>Rhodoplanes</i>
	55	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia</i>

57	Bacteria	Actinobacteria	Actinomycetia	Pseudonocardiales	Pseudonocardiaceae	<i>Crossiella</i>
59	Bacteria	Candidatus Saccharibacteria	Unassigned	Unassigned	Unassigned	<i>Candidatus Saccharimonas</i>
61	Bacteria	Proteobacteria	Deltaproteobacteria	Syntrophorhabdales	Syntrophorhabdaceae	<i>Syntrophorhabdus</i>
62	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
63	Bacteria	Proteobacteria	Alphaproteobacteria	Rhodospirillales	Azospirillaceae	<i>Skermanella</i>
64	Bacteria	Proteobacteria	Alphaproteobacteria	Rhodospirillales	Azospirillaceae	<i>Azospirillum</i>
65	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
66	Bacteria	Firmicutes	Unassigned	Unassigned	Unassigned	Unassigned
67	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
68	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Candidatus Desulforudis</i>
69	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Granulicella</i>
70	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Klebsiella</i>

	71	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	72	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	73	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	74	Bacteria	Actinobacteria	Actinomycetia	Acidothermales	Acidothermaceae	<i>Acidothermus</i>
	75	Bacteria	Actinobacteria	Actinomycetia	Geodermatophilales	Geodermatophilaceae	<i>Geodermatophilus</i>
	77	Bacteria	Actinobacteria	Thermoleophilia	Solirubrobacterales	Conexibacteraceae	<i>Conexibacter</i>
	78	Bacteria	Firmicutes	Clostridia	Eubacteriales	Unassigned	Unassigned
	80	Bacteria	Actinobacteria	Actinomycetia	Catenulisporales	Catenulisporaceae	<i>Catenulispora</i>
	81	Bacteria	Actinobacteria	Actinomycetia	Catenulisporales	Actinospicaceae	<i>Actinospica</i>
	82	Bacteria	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
	83	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>

	85	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	86	Bacteria	Actinobacteria	Actinomycetia	Catenulisporales	Actinospicaceae	<i>Actinospica</i>
	87	Bacteria	Actinobacteria	Actinomycetia	Acidothermales	Acidothermaceae	<i>Acidothermus</i>
	88	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	89	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
	90	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Tengunoibacter</i>
	92	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	93	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	94	Bacteria	Bacteroidetes	Chitinophagia	Chitinophagales	Chitinophagaceae	<i>Sediminibacterium</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	96	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	98	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Tengunoibacter</i>

100	Bacteria	Actinobacteria	Thermoleophilia	Solirubrobacterales	Conexibacteraceae	<i>Conexibacter</i>
102	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>
103	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>
104	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
107	Bacteria	Proteobacteria	Alphaproteobacteria	Hyphomicrobiales	Reyranellaceae	<i>Reyranella</i>
108	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
110	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
111	Bacteria	Actinobacteria	Thermoleophilia	Solirubrobacterales	Conexibacteraceae	<i>Conexibacter</i>
112	Bacteria	Actinobacteria	Actinomycetia	Catenulisporales	Actinospicaceae	<i>Actinospica</i>
113	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Desulfofundulus</i>
115	Bacteria	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Pseudomonadaceae	<i>Pseudomonas</i>
116	Bacteria	Actinobacteria	Actinomycetia	Acidothermales	Acidothermaceae	<i>Acidothermus</i>

	117	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Occallatibacter</i>
	118	Bacteria	Candidatus Saccharibacteria	Unassigned	Unassigned	Unassigned	<i>Candidatus Saccharimonas</i>
	120	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Pelotomaculum</i>
	121	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Klebsiella</i>
	122	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	123	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Thermosporotrichaceae	<i>Thermosporothrix</i>
	124	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	125	Bacteria	Firmicutes	Clostridia	Thermoanaerobacterales	Thermoanaerobacteraceae	Unassigned
	127	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Tengunoibacter</i>
	128	Bacteria	Actinobacteria	Actinomycetia	Catenulisporales	Catenulisporaceae	<i>Catenulispora</i>
	129	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>

131	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia</i>
132	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Desulfohalotomaculum</i>
133	Bacteria	Candidatus Saccharibacteria	Unassigned	Unassigned	Unassigned	<i>Candidatus Saccharimonas</i>
134	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
135	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
136	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
138	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
140	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
141	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
144	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
148	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Tengunoibacter</i>
149	Bacteria	Actinobacteria	Actinomycetia	Micrococcales	Microbacteriaceae	<i>Leifsonia</i>

	150	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	151	Bacteria	Proteobacteria	Gammaproteobacteria	Unassigned	Unassigned	<i>Acidibacter</i>
	152	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>
	153	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	156	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Thermosporotrichaceae	<i>Thermosporothrix</i>
	160	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Salmonella</i>
	162	Bacteria	Firmicutes	Clostridia	Thermosediminibacterales	Tepidanaerobacteraceae	<i>Biomaiibacter</i>
	172	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	175	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Salmonella</i>
	176	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Granulicella</i>
	179	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>

	180	Bacteria	Proteobacteria	Alphaproteobacteria	Rhodospirillales	Acetobacteraceae	Unassigned
	182	Bacteria	Actinobacteria	Actinomycetia	Frankiales	Frankiaceae	<i>Frankia</i>
	183	Bacteria	Proteobacteria	Betaproteobacteria	Burkholderiales	Burkholderiaceae	<i>Caballeronia</i>
	184	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
	185	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Klebsiella</i>
	186	Bacteria	Proteobacteria	Gammaproteobacteria	Xanthomonadales	Rhodanobacteraceae	<i>Dyella</i>
	191	Bacteria	Actinobacteria	Actinomycetia	Pseudonocardiales	Pseudonocardiaceae	<i>Actinosynnema</i>
	193	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
	195	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Salmonella</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	201	Bacteria	Proteobacteria	Gammaproteobacteria	Xanthomonadales	Rhodanobacteraceae	<i>Dyella</i>
	202	Bacteria	Proteobacteria	Betaproteobacteria	Burkholderiales	Burkholderiaceae	<i>Ralstonia</i>

205	Bacteria	Proteobacteria	Alphaproteobacteria	Hyphomicrobiales	Xanthobacteraceae	<i>Pseudolabrys</i>
207	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
211	Bacteria	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	<i>Sphingomonas</i>
214	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Salmonella</i>
222	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
223	Bacteria	Candidatus Saccharibacteria	Unassigned	Unassigned	Unassigned	<i>Candidatus Saccharimonas</i>
224	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
225	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
226	Bacteria	Proteobacteria	Alphaproteobacteria	Rhodospirillales	Azospirillaceae	<i>Azospirillum</i>
232	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
235	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
236	Bacteria	Candidatus Saccharibacteria	Unassigned	Unassigned	Unassigned	<i>Candidatus Saccharimonas</i>

	243	Bacteria	Actinobacteria	Acidimicrobiia	Acidimicrobiales	Iamiaceae	<i>Iamia</i>
	244	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
	247	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Cronobacter</i>
	248	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	254	Bacteria	Proteobacteria	Gammaproteobacteria	Unassigned	Unassigned	<i>Acidibacter</i>
	256	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	259	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
	260	Bacteria	Proteobacteria	Alphaproteobacteria	Hyphomicrobiales	Xanthobacteraceae	<i>Pseudolabrys</i>
	264	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	271	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Desulfohalotomaculum</i>
	297	Bacteria	Firmicutes	Clostridia	Thermosediminibacterales	Tepidanaerobacteraceae	<i>Tepidanaerobacter</i>

304	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
308	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Thermosporotrichaceae	<i>Thermosporothrix</i>
309	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia</i>
311	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Klebsiella</i>
312	Bacteria	Actinobacteria	Actinomycetia	Micromonosporales	Micromonosporaceae	<i>Actinoplanes</i>
317	Bacteria	Candidatus Saccharibacteria	Unassigned	Unassigned	Unassigned	<i>Candidatus Saccharimonas</i>
323	Bacteria	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
324	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
325	Bacteria	Firmicutes	Unassigned	Unassigned	Unassigned	Unassigned
330	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Desulfohalotomaculum</i>
333	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Occallatibacter</i>
347	Bacteria	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Pseudomonadaceae	<i>Pseudomonas</i>

Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	360	Bacteria	Firmicutes	Negativicutes	Selenomonadales	Sporomusaceae	<i>Thermosinus</i>
	377	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	393	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	395	Bacteria	Proteobacteria	Gamma proteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	401	Bacteria	Chloroflexi	Ktedonobacteria	Unassigned	Unassigned	Unassigned
	429	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	481	Bacteria	Firmicutes	Clostridia	Thermoanaerobacterales	Thermoanaerobacteraceae	<i>Thermacetogenium</i>
	487	Bacteria	Firmicutes	Bacilli	Bacillales	Thermoactinomycetaceae	<i>Staphylospora</i>
Rhizobia	1	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	2	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Phyllobacteriaceae	<i>Mesorhizobium</i>
	13	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Phyllobacteriaceae	<i>Mesorhizobium</i>

	14	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	18	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	21	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	25	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	35	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	39	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	41	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	49	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	56	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	74	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	84	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Phyllobacteriaceae	<i>Mesorhizobium</i>

	89	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	98	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Phyllobacteriaceae	<i>Mesorhizobium</i>
	112	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	114	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	168	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
<hr/>							
Fungi	1	Eukaryota	Ascomycota	Sordariomycetes	Sordariales	Chaetomiaceae	<i>Chaetomium</i>
	3	Eukaryota	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae	<i>Aspergillus</i>
	5	Eukaryota	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae	<i>Penicillium</i>
	6	Eukaryota	Ascomycota	Sordariomycetes	Hypocreales	Nectriaceae	<i>Fusarium</i>
	8	Eukaryota	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae	<i>Aspergillus</i>
	9	Eukaryota	Ascomycota	Sordariomycetes	Hypocreales	Nectriaceae	<i>Fusarium</i>
	10	Eukaryota	Ascomycota	Sordariomycetes	Hypocreales	Bionectriaceae	<i>Clonostachys</i>

	13	Eukaryota	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae	<i>Aspergillus</i>
	23	Eukaryota	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Terramycetaceae	<i>Boothiomyces</i>
	28	Eukaryota	Ascomycota	Sordariomycetes	Sordariales	Chaetomiaceae	<i>Chaetomium</i>
	34	Eukaryota	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	<i>Exophiala</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	35	Eukaryota	Ascomycota	Sordariomycetes	Sordariales	Chaetomiaceae	<i>Chaetomium</i>
	36	Eukaryota	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	<i>Coniosporium</i>
	38	Eukaryota	Ascomycota	Dothideomycetes	Pleosporales	Pleosporaceae	<i>Curvularia</i>
	40	Eukaryota	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae	<i>Aspergillus</i>
	42	Eukaryota	Ascomycota	Dothideomycetes	Pleosporales	Pleosporaceae	<i>Curvularia</i>

Table S4: Ecological cluster 1.

Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
Bacteria	9	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	10	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
	11	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Tengunoibacter</i>
	13	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
	16	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	18	Bacteria	Firmicutes	Clostridia	Thermosediminibacterales	Tepidanaerobacteraceae	<i>Tepidanaerobacter</i>
	25	Bacteria	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	<i>Sphingomonas</i>
	29	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>
	38	Bacteria	Actinobacteria	Actinomycetia	Corynebacterales	Mycobacteriaceae	<i>Mycobacterium</i>
	45	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia</i>

50	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>	
62	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>	
68	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Candidatus Desulforudis</i>	
69	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Granulicella</i>	
72	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>	
73	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>	
78	Bacteria	Firmicutes	Clostridia	Eubacteriales	Unassigned	Unassigned	
81	Bacteria	Actinobacteria	Actinomycetia	Catenulisporales	Actinospicaceae	<i>Actinospica</i>	
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
83	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>	
94	Bacteria	Bacteroidetes	Chitinophagia	Chitinophagales	Chitinophagaceae	<i>Sediminibacterium</i>	
102	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>	

103	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>
110	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>
120	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Pelotomaculum</i>
121	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Klebsiella</i>
122	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
132	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Desulfohalotomaculum</i>
134	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
136	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
140	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
141	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
148	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Tengunoibacter</i>
150	Bacteria	Actinobacteria	Actinomycetia	Streptomycetales	Streptomycetaceae	<i>Streptomyces</i>

	156	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Thermosporotrichaceae	<i>Thermosporothrix</i>
	162	Bacteria	Firmicutes	Clostridia	Thermosediminibacterales	Tepidanaerobacteraceae	<i>Biomaiibacter</i>
	179	Bacteria	Acidobacteria	Acidobacteriia	Acidobacteriales	Acidobacteriaceae	<i>Candidatus Koribacter</i>
	184	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	185	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Klebsiella</i>
	222	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Unassigned
	225	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
	235	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Dictyobacteraceae	<i>Dictyobacter</i>
	244	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
	259	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonosporobacteraceae	<i>Ktedonosporobacter</i>
	304	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>

	323	Bacteria	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
	330	Bacteria	Firmicutes	Clostridia	Eubacteriales	Peptococcaceae	<i>Desulfohalotomaculum</i>
	429	Bacteria	Chloroflexi	Ktedonobacteria	Ktedonobacterales	Ktedonobacteraceae	<i>Ktedonobacter</i>
	487	Bacteria	Firmicutes	Bacilli	Bacillales	Thermoactinomycetaceae	<i>Staphylospora</i>
Rhizobia	2	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Phyllobacteriaceae	<i>Mesorhizobium</i>
	18	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Bradyrhizobiaceae	<i>Bradyrhizobium</i>
	84	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Phyllobacteriaceae	<i>Mesorhizobium</i>
	98	Bacteria	Proteobacteria	Alphaproteobacteria	Rhizobiales	Phyllobacteriaceae	<i>Mesorhizobium</i>
Fungi	3	Eukaryota	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae	<i>Aspergillus</i>
	10	Eukaryota	Ascomycota	Sordariomycetes	Hypocreales	Bionectriaceae	<i>Clonostachys</i>
	23	Eukaryota	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Terramycetaceae	<i>Boothiomycetes</i>
	35	Eukaryota	Ascomycota	Sordariomycetes	Sordariales	Chaetomiaceae	<i>Chaetomium</i>

Taxa	OTU ID	Kingdom	Phylum	Class	Order	Family	Genus
	38	Eukaryota	Ascomycota	Dothideomycetes	Pleosporales	Pleosporaceae	<i>Curvularia</i>