



Supplementary Materials:

4 (Shannon H)

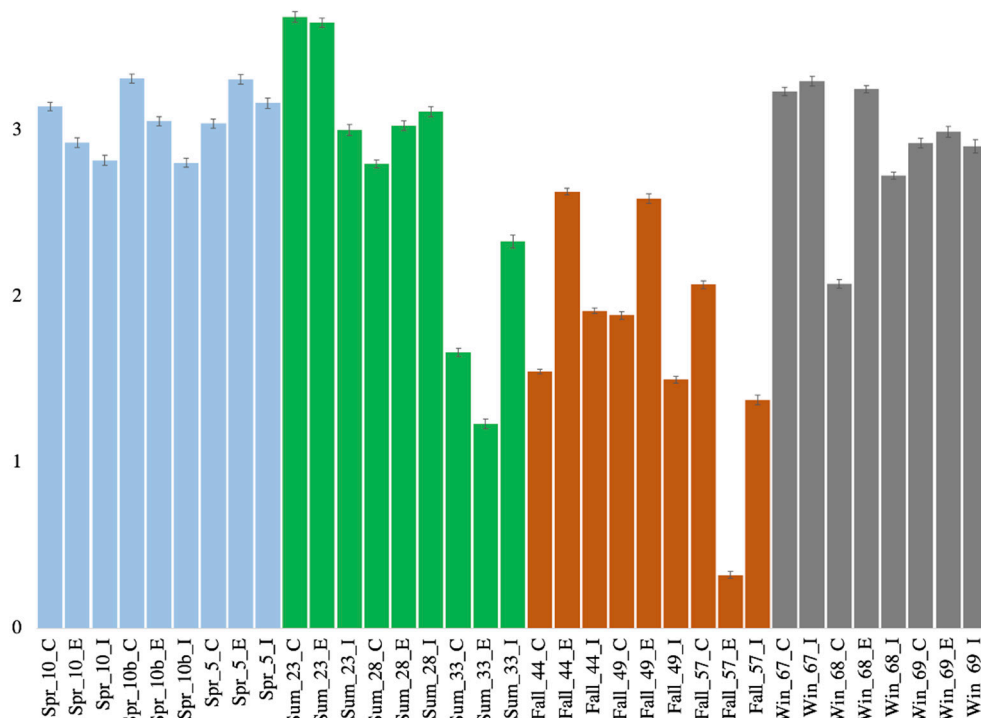


Figure S1. Bacterial Shannon diversity indices for all gut microbiome sections and seasons. S, stomach; C, cecum; I, intestine; Spr, spring; Sum, summer; Win, winter.

Table S1. Wilcoxon and Kruskal-Wallis test comparisons between Shannon diversity indices, computed in R.

Comparison	p-value
Fall-Spring	0.001397486
Fall-Summer	0.039951967
Spring-Summer	0.808642914
Fall-Winter	0.016705635
Spring-Winter	1.000000000
Summer-Winter	0.663453369
Cecum-Stomach	0.7945872
Cecum-Intestine	1.0000000
Stomach-Intestine	1.0000000
Male-Female	0.8812

Table S2. Analysis of molecular variance (amova) testing significance of clusters C1, C2, C3 and C4 observed in the PCoA plot.

C1-C2-C3-C4	Among	Within	Total
SS	5.18423	8.14293	13.3272
dF	3	31	34
MS	1.72808	0.262675	
Fs: 6.57876, p-value: <0.001			
C1-C3	Among	Within	Total

SS	2.80539	4.71236	7.51776
dF	1	20	21
MS	2.80539	0.235618	
Fs: 11.9065, <i>p</i> -value: <0.001			
C1-C4	Among	Within	Total
SS	1.45837	4.24808	5.70646
dF	1	13	14
MS	1.45837	0.326776	
Fs: 4.46291, <i>p</i> -value: 0.001			
C1-C2	Among	Within	Total
SS	1.44708	4.47224	5.91932
dF	1	14	15
MS	1.44708	0.319446	
Fs: 4.52998, <i>p</i> -value: < 0.001			
SS	1.03306	3.67069	4.70376
C3-C4	Among	Within	Total
dF	1	17	18
MS	1.03306	0.215923	
Fs: 4.78441, <i>p</i> -value: < 0.001			
C2-C3	Among	Within	Total
SS	2.09949	3.89485	5.99433
dF	1	18	19
MS	2.09949	0.21638	
Fs: 9.70276, <i>p</i> -value: < 0.001			
C2-C4	Among	Within	Total
SS	1.00634	3.43057	4.43691
dF	1	11	12
MS	1.00634	0.31187	
Fs: 3.22681, <i>p</i> -value: 0.004			

Table S3. Homogeneity of molecular variance (homova) testing significance of variance between clusters C1, C2, C3 and C4 observed in the PCoA plot.

	BValue	P-value	SSwithin/(Ni-1) values
C1-C2-C3-C4	1.25997	0.001	0.33061 - 0.17229 - 0.320641 - 0.30456
C1-C2	0.0107119	0.572	0.33061 - 0.30456
C1-C3	0.994095	<0.001	0.33061 - 0.17229
C1-C4	0.00132864	0.84	0.33061 - 0.320641
C3-C4	0.680924	0.027	0.17229 - 0.320641
C3-C2	0.641697	0.02	0.17229 - 0.30456
C2-C4	0.00331122	0.631	0.320641 - 0.30456

Table S4. List of the shared taxa between samples from all 4 seasons, and list of unique taxa found within samples from each season. Taxa are presented in decreasing relative abundance in the samples.

Shared taxa between samples from all four seasons
Stenotrophomonas; Xanthomonadaceae; Xanthomonadales; Gammaproteobacteria; Proteobacteria
Macrococcus; Staphylococcaceae; Staphylococcales; Bacilli; Firmicutes
Pseudomonas; Pseudomonadaceae; Pseudomonadales; Gammaproteobacteria; Proteobacteria
Clostridiaceae_unclassified; Clostridiaceae; Clostridiales; Clostridia; Firmicutes
Enterobacteriaceae_unclassified; Enterobacteriaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Lelliottia; Enterobacteriaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria

Acinetobacter; Moraxellaceae; Pseudomonadales; Gammaproteobacteria; Proteobacteria
Staphylococcus; Staphylococcaceae; Staphylococcales; Bacilli; Firmicutes
Delftia; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Brevundimonas; Caulobacteraceae; Caulobacterales; Alphaproteobacteria; Proteobacteria
Mycoplasma; Mycoplasmataceae; Mycoplasmatales; Bacilli; Firmicutes
Clostridium_sensu_stricto_1; Clostridiaceae; Clostridiales; Clostridia; Firmicutes
Corynebacterium; Corynebacteriaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Bacteria_unclassified; Bacteria_unclassified; Bacteria_unclassified; Bacteria_unclassified; Bacteria_unclassified
Allorhizobium-Neorhizobium-Pararhizobium-Rhizobium; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Streptococcus; Streptococcaceae; Lactobacillales; Bacilli; Firmicutes
Flavobacterium; Flavobacteriaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Enterobacterales_unclassified; Enterobacterales_unclassified; Enterobacterales; Gammaproteobacteria; Proteobacteria
Sphingomonas; Sphingomonadaceae; Sphingomonadales; Alphaproteobacteria; Proteobacteria
Rhodococcus; Nocardiaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Methylobacterium-Methylorubrum; Beijerinckiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Anaerococcus; Peptostreptococcales-Tissierellales_fa; Peptostreptococcales-Tissierellales; Clostridia; Firmicutes
Roseomonas; Acetobacteraceae; Acetobacterales; Alphaproteobacteria; Proteobacteria
Enhydrobacter; Moraxellaceae; Pseudomonadales; Gammaproteobacteria; Proteobacteria
Gammaproteobacteria_unclassified; Gammaproteobacteria_unclassified; Gammaproteobacteria_unclassified; Gammaproteobacteria; Proteobacteria
Lactobacillus; Lactobacillaceae; Lactobacillales; Bacilli; Firmicutes
Sphingomonadaceae_unclassified; Sphingomonadaceae; Sphingomonadales; Alphaproteobacteria; Proteobacteria
Xanthomonadaceae_unclassified; Xanthomonadaceae; Xanthomonadales; Gammaproteobacteria; Proteobacteria
Nocardioides; Nocardiodaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
Micrococcaceae_unclassified; Micrococcaceae; Micrococcales; Actinobacteria; Actinobacteriota
Cutibacterium; Propionibacteriaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
Pseudarthrobacter; Micrococcaceae; Micrococcales; Actinobacteria; Actinobacteriota
Pseudomonadaceae_unclassified; Pseudomonadaceae; Pseudomonadales; Gammaproteobacteria; Proteobacteria
Comamonadaceae_unclassified; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Rhizobiaceae_unclassified; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Bacilli_unclassified; Bacilli_unclassified; Bacilli_unclassified; Bacilli; Firmicutes
Oxalobacteraceae_unclassified; Oxalobacteraceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Xanthomonadales_unclassified; Xanthomonadales_unclassified; Xanthomonadales; Gammaproteobacteria; Proteobacteria
Burkholderiales_unclassified; Burkholderiales_unclassified; Burkholderiales; Gammaproteobacteria; Proteobacteria
Moraxellaceae_unclassified; Moraxellaceae; Pseudomonadales; Gammaproteobacteria; Proteobacteria
Novosphingobium; Sphingomonadaceae; Sphingomonadales; Alphaproteobacteria; Proteobacteria
Caulobacteraceae_unclassified; Caulobacteraceae; Caulobacterales; Alphaproteobacteria; Proteobacteria
Dechloromonas; Rhodocyclaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Enterobacter; Enterobacteriaceae; Enterobacteriales; Gammaproteobacteria; Proteobacteria
Unique taxa in the spring samples
Microvirga; Beijerinckiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Polyangiales_unclassified; Polyangiales_unclassified; Polyangiales; Polyangia; Myxococcota
Phenylobacterium; Caulobacteraceae; Caulobacterales; Alphaproteobacteria; Proteobacteria
Brevibacterium; Brevibacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Capnocytophaga; Flavobacteriaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Isoptricola; Promicromonosporaceae; Micrococcales; Actinobacteria; Actinobacteriota
Turicella; Corynebacteriaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Peptoniphilus; Peptostreptococcales-Tissierellales_fa; Peptostreptococcales-Tissierellales; Clostridia; Firmicutes

Aggregatibacter; Pasteurellaceae; Pasteurellales; Gammaproteobacteria; Proteobacteria
Candidatus_Rhabdochlamydia; Simkaniaceae; Chlamydiales; Chlamydiae; Verrucomicrobiota
Gaiella; Gaiellaceae; Gaiellales; Thermoleophilia; Actinobacteriota
Niveispirillum; Azospirillaceae; Azospirillales; Alphaproteobacteria; Proteobacteria
Chryseolinea; Microscillaceae; Cytophagales; Bacteroidia; Bacteroidota
Iamia; Iamiaceae; Microtrichales; Acidimicrobiia; Actinobacteriota
Thermoactinomyces; Thermoactinomycetaceae; Thermoactinomycetales; Bacilli; Firmicutes
Xanthobacter; Xanthobacteraceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Tepidimonas; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Atopobium; Atopobiaceae; Coriobacteriales; Coriobacteriia; Actinobacteriota
uncultured_ge; uncultured_fa; uncultured; Acidimicrobiia; Actinobacteriota
Conexibacter; Solirubrobacteraceae; Solirubrobacterales; Thermoleophilia; Actinobacteriota
Vermiphilaceae_ge; Vermiphilaceae; Babeliales; Babeliae; Dependientiae
Thermoactinomycetaceae_unclassified; Thermoactinomycetaceae; Thermoactinomycetales; Bacilli; Firmicutes
uncultured; Hungateiclostridiaceae; Clostridia_or; Clostridia; Firmicutes
Hyphomicrobiaceae_unclassified; Hyphomicrobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Cereibacter; Rhodobacteraceae; Rhodobacterales; Alphaproteobacteria; Proteobacteria
Cupriavidus; Burkholderiaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Rickettsiella; Diplorickettsiaceae; Diplorickettsiales; Gammaproteobacteria; Proteobacteria
uncultured; Diplorickettsiaceae; Diplorickettsiales; Gammaproteobacteria; Proteobacteria
Pectobacteriaceae_unclassified; Pectobacteriaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Unique taxa in the summer samples
Yersinia; Yersiniaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Bacteroidales_unclassified; Bacteroidales_unclassified; Bacteroidales; Bacteroidia; Bacteroidota
Leucobacter; Microbacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Ruminococcaceae_unclassified; Ruminococcaceae; Oscillospirales; Clostridia; Firmicutes
Neisseriaceae_unclassified; Neisseriaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Vagococcus; Vagococcaceae; Lactobacillales; Bacilli; Firmicutes
uncultured; Ruminococcaceae; Oscillospirales; Clostridia; Firmicutes
uncultured; Rhizobiales_Incertae_Sedis; Rhizobiales; Alphaproteobacteria; Proteobacteria
Dietzia; Dietziaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Kurthia; Planococcaceae; Bacillales; Bacilli; Firmicutes
Gemella; Gemellaceae; Staphylococcales; Bacilli; Firmicutes
Hyphomicrobium; Hyphomicrobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Mesorhizobium; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Gallicola; Peptostreptococcales-Tissierellales_fa; Peptostreptococcales-Tissierellales; Clostridia; Firmicutes
Saccharopolyspora; Pseudonocardaceae; Pseudonocardiales; Actinobacteria; Actinobacteriota
Longimicrobium; Longimicrobiaceae; Longimicrobiales; Longimicrobia; Gemmatimonadota
Plesiomonas; Enterobacteriaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Dermacoccus; Dermacoccaceae; Micrococcales; Actinobacteria; Actinobacteriota
Ruminococcus; Ruminococcaceae; Oscillospirales; Clostridia; Firmicutes
Pannonibacter; Stappiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
uncultured; Desulfovibrionaceae; Desulfovibrionales; Desulfovibrionia; Desulfobacterota
Anaerostipes; Lachnospiraceae; Lachnospirales; Clostridia; Firmicutes
Larkinella; Spirosomaceae; Cytophagales; Bacteroidia; Bacteroidota
Lactococcus; Streptococcaceae; Lactobacillales; Bacilli; Firmicutes
Rubellimicrobium; Rhodobacteraceae; Rhodobacterales; Alphaproteobacteria; Proteobacteria
Clostridium_sensu_stricto_13; Clostridiaceae; Clostridiales; Clostridia; Firmicutes
Marmoricola; Nocardiodaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
Blastococcus; Geodermatophilaceae; Frankiales; Actinobacteria; Actinobacteriota

Pajaroellobacter; Polyangiaceae; Polyangiales; Polyangia; Myxococcota
MBNT15_ge; MBNT15_fa; MBNT15_or; MBNT15_cl; MBNT15
Lachnoclostridium; Lachnospiraceae; Lachnospirales; Clostridia; Firmicutes
Nibribacter; Hymenobacteraceae; Cytophagales; Bacteroidia; Bacteroidota
Skermanella; Azospirillaceae; Azospirillales; Alphaproteobacteria; Proteobacteria
Subgroup_11_ge; Subgroup_11_fa; Subgroup_11_or; Subgroup_11; Acidobacteriota
UBA12409_ge; UBA12409; Babeliales; Babeliae; Dependientiae
Amb-16S-1323_ge; Amb-16S-1323; Rhizobiales; Alphaproteobacteria; Proteobacteria
Acetoanaerobium; Peptostreptococcaceae; Peptostreptococcales-Tissierellales; Clostridia; Firmicutes
Haliangium; Haliangiaceae; Haliangiales; Polyangia; Myxococcota
Belnapia; Acetobacteraceae; Acetobacterales; Alphaproteobacteria; Proteobacteria
Exiguobacterium; Exiguobacteraceae; Exiguobacteriales; Bacilli; Firmicutes
Oscillospirales_unclassified; Oscillospirales_unclassified; Oscillospirales; Clostridia; Firmicutes
Panacagrimonas; Solimonadaceae; Salinisphaerales; Gammaproteobacteria; Proteobacteria
NB1-j_ge; NB1-j_fa; NB1-j_or; NB1-j_cl; NB1-j
Desulfovibrionaceae_unclassified; Desulfovibrionaceae; Desulfovibrionales; Desulfovibrionia; Desulfobacterota
Dermatophilaceae_unclassified; Dermatophilaceae; Micrococcales; Actinobacteria; Actinobacteriota
Desulfobacca; Desulfobaccaceae; Desulfobaccales; Desulfobaccia; Desulfobacterota
Parabacteroides; Tannerellaceae; Bacteroidales; Bacteroidia; Bacteroidota
Nocardiodaceae_unclassified; Nocardiodaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
PMMR1; Caulobacteraceae; Caulobacterales; Alphaproteobacteria; Proteobacteria
MB-A2-108_ge; MB-A2-108_fa; MB-A2-108_or; MB-A2-108; Actinobacteriota
Bergeyella; Weeksellaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Bacillales_unclassified; Bacillales_unclassified; Bacillales; Bacilli; Firmicutes
Simonsiella; Neisseriaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Candidatus_Paracaedibacter; Paracaedibacteraceae; Paracaedibacteriales; Alphaproteobacteria; Proteobacteria
Chlamydiaceae_unclassified; Chlamydiaceae; Chlamydiales; Chlamydiae; Verrucomicrobiota
Tannerella; Tannerellaceae; Bacteroidales; Bacteroidia; Bacteroidota
Fusobacterium; Fusobacteriaceae; Fusobacteriales; Fusobacteriia; Fusobacteriota
TM7a; Saccharimonadaceae; Saccharimonadales; Saccharimonadia; Patescibacteria
Halomonadaceae_ge; Halomonadaceae; Oceanospirillales; Gammaproteobacteria; Proteobacteria
Treponema; Spirochaetaceae; Spirochaetales; Spirochaetia; Spirochaetota
Candidatus_Planktoluna; Microbacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Rufibacter; Hymenobacteraceae; Cytophagales; Bacteroidia; Bacteroidota
Staphylococcales_unclassified; Staphylococcales_unclassified; Staphylococcales; Bacilli; Firmicutes
Clostridium; Caloramatoraceae; Clostridiales; Clostridia; Firmicutes
Defluviitaleaceae_UCG-011; Defluviitaleaceae; Lachnospirales; Clostridia; Firmicutes
Geodermatophilaceae_unclassified; Geodermatophilaceae; Frankiales; Actinobacteria; Actinobacteriota
Dermacoccaceae_unclassified; Dermacoccaceae; Micrococcales; Actinobacteria; Actinobacteriota
Candidatus_Aquiluna; Microbacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Sanguibacter; Sanguibacteraceae; Micrococcales; Actinobacteria; Actinobacteriota
Micromonosporaceae_unclassified; Micromonosporaceae; Micromonosporales; Actinobacteria; Actinobacteriota
Allokutzneria; Pseudonocardiaceae; Pseudonocardiales; Actinobacteria; Actinobacteriota
Paludibacteraceae_unclassified; Paludibacteraceae; Bacteroidales; Bacteroidia; Bacteroidota
Algoriphagus; Cyclobacteriaceae; Cytophagales; Bacteroidia; Bacteroidota
Adhaeribacter; Hymenobacteraceae; Cytophagales; Bacteroidia; Bacteroidota
Pseudarcicella; Spirosomaceae; Cytophagales; Bacteroidia; Bacteroidota
Fluviicola; Crocinitomicaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Weeksellaceae_ge; Weeksellaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Babeliales_unclassified; Babeliales_unclassified; Babeliales; Babeliae; Dependientiae

uncultured; Planococcaceae; Bacillales; Bacilli; Firmicutes
Enterococcaceae_unclassified; Enterococcaceae; Lactobacillales; Bacilli; Firmicutes
Clostridia_unclassified; Clostridia_unclassified; Clostridia_unclassified; Clostridia; Firmicutes
Lactonifactor; Lachnospiraceae; Lachnospirales; Clostridia; Firmicutes
Fusobacteriaceae_ge; Fusobacteriaceae; Fusobacteriales; Fusobacteriia; Fusobacteriota
Fusobacteriales_unclassified; Fusobacteriales_unclassified; Fusobacteriales; Fusobacteriia; Fusobacteriota
Saccharimonadaceae_unclassified; Saccharimonadaceae; Saccharimonadales; Saccharimonadia; Patescibacteria
Caulobacter; Caulobacteraceae; Caulobacterales; Alphaproteobacteria; Proteobacteria
Hirschia; Hyphomonadaceae; Caulobacterales; Alphaproteobacteria; Proteobacteria
Paramesorhizobium; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Polymorphum; Stappiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Tardiphaga; Xanthobacteraceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Verticiella; Alcaligenaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Rhodocyclaceae_unclassified; Rhodocyclaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Enterobacterales_ge; Enterobacterales_fa; Enterobacterales; Gammaproteobacteria; Proteobacteria
Pseudoxanthomonas; Xanthomonadaceae; Xanthomonadales; Gammaproteobacteria; Proteobacteria
Unique taxa in the fall samples
Ralstonia; Burkholderiaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Sediminibacterium; Chitinophagaceae; Chitinophagales; Bacteroidia; Bacteroidota
Asinibacterium; Chitinophagaceae; Chitinophagales; Bacteroidia; Bacteroidota
uncultured_ge; uncultured; Frankiales; Actinobacteria; Actinobacteriota
Chloroplast_ge; Chloroplast_fa; Chloroplast; Cyanobacteriia; Cyanobacteria
Klenkia; Geodermatophilaceae; Frankiales; Actinobacteria; Actinobacteriota
Chitinophagaceae_unclassified; Chitinophagaceae; Chitinophagales; Bacteroidia; Bacteroidota
Candidatus_Ovatusbacter; Unknown_Family; Gammaproteobacteria_Incertae_Sedis; Gammaproteobacteria; Proteobacteria
Clostridiales_unclassified; Clostridiales_unclassified; Clostridiales; Clostridia; Firmicutes
Nocardiaceae_unclassified; Nocardiaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Wolinella; Helicobacteraceae; Campylobacterales; Campylobacteria; Campilobacterota
Trabulsiella; Enterobacteriaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Sarcina; Clostridiaceae; Clostridiales; Clostridia; Firmicutes
Rickettsia; Rickettsiaceae; Rickettsiales; Alphaproteobacteria; Proteobacteria
Sphingosaurantiacus; Sphingomonadaceae; Sphingomonadales; Alphaproteobacteria; Proteobacteria
Cellvibrio; Cellvibrionaceae; Cellvibrionales; Gammaproteobacteria; Proteobacteria
Aeromicrobium; Nocardiodaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
Pedobacter; Sphingobacteriaceae; Sphingobacteriales; Bacteroidia; Bacteroidota
Paenibacillaceae_unclassified; Paenibacillaceae; Paenibacillales; Bacilli; Firmicutes
Methylophilaceae_unclassified; Methylophilaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Subgroup_22_ge; Subgroup_22_fa; Subgroup_22_or; Subgroup_22; Acidobacteriota
Acidimicrobiia_unclassified; Acidimicrobiia_unclassified; Acidimicrobiia_unclassified; Acidimicrobiia; Actinobacteriota
CL500-29_marine_group; Ilumatobacteraceae; Microtrichales; Acidimicrobiia; Actinobacteriota
Actinotalea; Cellulomonadaceae; Micrococcales; Actinobacteria; Actinobacteriota
Crossiella; Pseudonocardiaceae; Pseudonocardiales; Actinobacteria; Actinobacteriota
Streptomycetaceae_unclassified; Streptomycetaceae; Streptomycetales; Actinobacteria; Actinobacteriota
H3.93_ge; H3.93_fa; H3.93; Dehalococcoidia; Chloroflexi
Thermus; Thermaceae; Thermales; Deinococci; Deinococcota
Desulfobacterota_unclassified; Desulfobacterota_unclassified; Desulfobacterota_unclassified; Desulfobacterota_unclassified; Desulfobacterota

Desulfovibrionales_unclassified; Desulfovibrionales_unclassified; Desulfovibrionales; Desulfovibrionia; Desulfobacterota
Rhodovarius; Acetobacteraceae; Acetobacterales; Alphaproteobacteria; Proteobacteria
Rhodoplanes; Xanthobacteraceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
uncultured_ge; uncultured_fa; uncultured; Alphaproteobacteria; Proteobacteria
Azomonas; Pseudomonadaceae; Pseudomonadales; Gammaproteobacteria; Proteobacteria
Unique taxa in the winter samples
env.OPS_17_ge; env.OPS_17; Sphingobacteriales; Bacteroidia; Bacteroidota
Anaerovoracaceae_ge; Anaerovoracaceae; Peptostreptococcales-Tissierellales; Clostridia; Firmicutes
Rhodobacter; Rhodobacteraceae; Rhodobacterales; Alphaproteobacteria; Proteobacteria
Modestobacter; Geodermatophilaceae; Frankiales; Actinobacteria; Actinobacteriota
Diaphorobacter; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Frankiales_unclassified; Frankiales_unclassified; Frankiales; Actinobacteria; Actinobacteriota
TRA3-20_ge; TRA3-20; Burkholderiales; Gammaproteobacteria; Proteobacteria
Propionivibrio; Rhodocyclaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Galbitalea; Microbacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Dyadobacter; Spirosomaceae; Cytophagales; Bacteroidia; Bacteroidota
Methylobacter; Methylocomonadaceae; Methylococcales; Gammaproteobacteria; Proteobacteria
DNF00809; Eggerthellaceae; Coriobacteriales; Coriobacteriia; Actinobacteriota
Polaromonas; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
FFCH16263_ge; FFCH16263_fa; FFCH16263; Actinobacteria; Actinobacteriota
KD4-96_ge; KD4-96_fa; KD4-96_or; KD4-96; Chloroflexi
Aminobacter; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
MND1; Nitrosomonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Brevinema; Brevinemataceae; Brevinematales; Brevinematia; Spirochaetota
Sporichthyaceae_ge; Sporichthyaceae; Frankiales; Actinobacteria; Actinobacteriota
Amaricoccus; Rhodobacteraceae; Rhodobacterales; Alphaproteobacteria; Proteobacteria
Rosenbergiella; Erwiniaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Oceanospirillales_unclassified; Oceanospirillales_unclassified; Oceanospirillales; Gammaproteobacteria; Proteobacteria
Mycobacteriaceae_unclassified; Mycobacteriaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Dysgonomonadaceae_unclassified; Dysgonomonadaceae; Bacteroidales; Bacteroidia; Bacteroidota
Prevotellaceae_unclassified; Prevotellaceae; Bacteroidales; Bacteroidia; Bacteroidota
Sphingobacteriaceae_unclassified; Sphingobacteriaceae; Sphingobacteriales; Bacteroidia; Bacteroidota
Sphingobacteriales_unclassified; Sphingobacteriales_unclassified; Sphingobacteriales; Bacteroidia; Bacteroidota
Paraliobacillus; Bacillaceae; Bacillales; Bacilli; Firmicutes
Clostridium_sensu_stricto_2; Clostridiaceae; Clostridiales; Clostridia; Firmicutes
Nitrospira; Nitrospiraceae; Nitrospirales; Nitrospira; Nitrospirota
TM7; S32; Saccharimonadales; Saccharimonadia; Patescibacteria
Pedomicrobium; Hyphomicrobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
KF-JG30-B3_ge; KF-JG30-B3; Rhizobiales; Alphaproteobacteria; Proteobacteria
Aeromonadales_unclassified; Aeromonadales_unclassified; Aeromonadales; Gammaproteobacteria; Proteobacteria
Robbsia; Burkholderiaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Malikia; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Diplorickettsiaceae_unclassified; Diplorickettsiaceae; Diplorickettsiales; Gammaproteobacteria; Proteobacteria
Siccibacter; Erwiniaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Tatumella; Erwiniaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria

Table S5. List of the unique taxa found within samples from each individual. Taxa are presented in decreasing relative abundance in the samples.

Unique taxa in the samples from fish #5
Microvirga; Beijerinckiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Turicella; Corynebacteriaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Iamia; Iamiaceae; Microtrichales; Acidimicrobiia; Actinobacteriota
Thermoactinomyces; Thermoactinomycetaceae; Thermoactinomycetales; Bacilli; Firmicutes
Xanthobacter; Xanthobacteraceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Tepidimonas; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Atopobium; Atopobiaceae; Coriobacteriales; Coriobacteriia; Actinobacteriota
Conexibacter; Solirubrobacteraceae; Solirubrobacteriales; Thermoleophilia; Actinobacteriota
Cereibacter; Rhodobacteraceae; Rhodobacterales; Alphaproteobacteria; Proteobacteria
Rickettsiella; Diplorickettsiaceae; Diplorickettsiales; Gammaproteobacteria; Proteobacteria
uncultured; Diplorickettsiaceae; Diplorickettsiales; Gammaproteobacteria; Proteobacteria
Pectobacteriaceae_unclassified; Pectobacteriaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #23
Bacteroidales_unclassified; Bacteroidales_unclassified; Bacteroidales; Bacteroidia; Bacteroidota
Longimicrobium; Longimicrobiaceae; Longimicrobiales; Longimicrobia; Gemmatimonadota
Plesiomonas; Enterobacteriaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
uncultured; Desulfovibrionaceae; Desulfovibrionales; Desulfovibrionia; Desulfobacterota
Larkinella; Spirosomaceae; Cytophagales; Bacteroidia; Bacteroidota
Rubellimicrobium; Rhodobacteraceae; Rhodobacterales; Alphaproteobacteria; Proteobacteria
Marmoricola; Nocardiodaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
Blastococcus; Geodermatophilaceae; Frankiales; Actinobacteria; Actinobacteriota
Pajaroellobacter; Polyangiaceae; Polyangiales; Polyangia; Myxococcota
Lachnoclostridium; Lachnospiraceae; Lachnospirales; Clostridia; Firmicutes
Nibribacter; Hymenobacteraceae; Cytophagales; Bacteroidia; Bacteroidota
Skermanella; Azospirillaceae; Azospirillales; Alphaproteobacteria; Proteobacteria
Belnapia; Acetobacteraceae; Acetobacterales; Alphaproteobacteria; Proteobacteria
Exiguobacterium; Exiguobacteraceae; Exiguobacterales; Bacilli; Firmicutes
Desulfovibrionaceae_unclassified; Desulfovibrionaceae; Desulfovibrionales; Desulfovibrionia; Desulfobacterota
Parabacteroides; Tannerellaceae; Bacteroidales; Bacteroidia; Bacteroidota
Nocardiodaceae_unclassified; Nocardiodaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
PMMR1; Caulobacteraceae; Caulobacterales; Alphaproteobacteria; Proteobacteria
Simonsiella; Neisseriaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Candidatus_Paracaedibacter; Paracaedibacteraceae; Paracaedibacteriales; Alphaproteobacteria; Proteobacteria
Chlamydiaceae_unclassified; Chlamydiaceae; Chlamydiales; Chlamydiae; Verrucomicrobiota
Fusobacterium; Fusobacteriaceae; Fusobacteriales; Fusobacteriia; Fusobacteriota
Treponema; Spirochaetaceae; Spirochaetales; Spirochaetia; Spirochaetota
Candidatus_Planktoluna; Microbacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Rufibacter; Hymenobacteraceae; Cytophagales; Bacteroidia; Bacteroidota
Clostridium; Caloramatoraceae; Clostridiales; Clostridia; Firmicutes
Geodermatophilaceae_unclassified; Geodermatophilaceae; Frankiales; Actinobacteria; Actinobacteriota
Candidatus_Aquiluna; Microbacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Paludibacteraceae_unclassified; Paludibacteraceae; Bacteroidales; Bacteroidia; Bacteroidota
Adhaeribacter; Hymenobacteraceae; Cytophagales; Bacteroidia; Bacteroidota
Pseudarcicella; Spirosomaceae; Cytophagales; Bacteroidia; Bacteroidota
Fluviicola; Crocinitomicaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Clostridia_unclassified; Clostridia_unclassified; Clostridia_unclassified; Clostridia; Firmicutes
Lactonifactor; Lachnospiraceae; Lachnospirales; Clostridia; Firmicutes

Fusobacteriaceae_ge; Fusobacteriaceae; Fusobacteriales; Fusobacteriia; Fusobacteriota
Fusobacteriales_unclassified; Fusobacteriales_unclassified; Fusobacteriales; Fusobacteriia; Fusobacteriota
Tardiphaga; Xanthobacteraceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Verticiella; Alcaligenaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #28
uncultured; Ruminococcaceae; Oscillospirales; Clostridia; Firmicutes
Dietzia; Dietziaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Gemella; Gemellaceae; Staphylococcales; Bacilli; Firmicutes
Mesorhizobium; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Saccharopolyspora; Pseudonocardiaceae; Pseudonocardiales; Actinobacteria; Actinobacteriota
Ruminococcus; Ruminococcaceae; Oscillospirales; Clostridia; Firmicutes
Anaerostipes; Lachnospiraceae; Lachnospirales; Clostridia; Firmicutes
Acetoanaerobium; Peptostreptococcaceae; Peptostreptococcales-Tissierellales; Clostridia; Firmicutes
Haliangium; Haliangiaceae; Haliangiales; Polyangia; Myxococcota
Panacagrimonas; Solimonadaceae; Salinisphaerales; Gammaproteobacteria; Proteobacteria
TM7a; Saccharimonadaceae; Saccharimonadales; Saccharimonadia; Patescibacteria
Halomonadaceae_ge; Halomonadaceae; Oceanospirillales; Gammaproteobacteria; Proteobacteria
Staphylococcales_unclassified; Staphylococcales_unclassified; Staphylococcales; Bacilli; Firmicutes
Defluviitaleaceae_UCG-011; Defluviitaleaceae; Lachnospirales; Clostridia; Firmicutes
Dermacoccaceae_unclassified; Dermacoccaceae; Micrococcales; Actinobacteria; Actinobacteriota
Micromonosporaceae_unclassified; Micromonosporaceae; Micromonosporales; Actinobacteria; Actinobacteriota
Allokutzneria; Pseudonocardiaceae; Pseudonocardiales; Actinobacteria; Actinobacteriota
Algoriphagus; Cyclobacteriaceae; Cytophagales; Bacteroidia; Bacteroidota
Saccharimonadaceae_unclassified; Saccharimonadaceae; Saccharimonadales; Saccharimonadia; Patescibacteria
Caulobacter; Caulobacteraceae; Caulobacteriales; Alphaproteobacteria; Proteobacteria
Rhodocyclaceae_unclassified; Rhodocyclaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Enterobacterales_ge; Enterobacterales_fa; Enterobacterales; Gammaproteobacteria; Proteobacteria
Pseudoxanthomonas; Xanthomonadaceae; Xanthomonadales; Gammaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #33
Pannonibacter; Stappiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Lactococcus; Streptococcaceae; Lactobacillales; Bacilli; Firmicutes
Subgroup_11_ge; Subgroup_11_fa; Subgroup_11_or; Subgroup_11; Acidobacteriota
UBA12409_ge; UBA12409; Babeliales; Babeliae; Dependientiae
Amb-16S-1323_ge; Amb-16S-1323; Rhizobiales; Alphaproteobacteria; Proteobacteria
NB1-j_ge; NB1-j_fa; NB1-j_or; NB1-j_cl; NB1-j
Desulfobacca; Desulfobaccaceae; Desulfobaccales; Desulfobaccia; Desulfobacterota
Bergeyella; Weeksellaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Tannerella; Tannerellaceae; Bacteroidales; Bacteroidia; Bacteroidota
Sanguibacter; Sanguibacteraceae; Micrococcales; Actinobacteria; Actinobacteriota
Weeksellaceae_ge; Weeksellaceae; Flavobacteriales; Bacteroidia; Bacteroidota
Babeliales_unclassified; Babeliales_unclassified; Babeliales; Babeliae; Dependientiae
uncultured; Planococcaceae; Bacillales; Bacilli; Firmicutes
Enterococcaceae_unclassified; Enterococcaceae; Lactobacillales; Bacilli; Firmicutes
Hirschia; Hyphomonadaceae; Caulobacteriales; Alphaproteobacteria; Proteobacteria
Paramesrhizobium; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Polymorphum; Stappiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #44
uncultured_ge; uncultured; Frankiales; Actinobacteria; Actinobacteriota
Chloroplast_ge; Chloroplast_fa; Chloroplast; Cyanobacteriia; Cyanobacteria
Nocardiaceae_unclassified; Nocardiaceae; Corynebacteriales; Actinobacteria; Actinobacteriota

Wolinella; Helicobacteraceae; Campylobacterales; Campylobacteria; Campilobacterota
Cellvibrio; Cellvibrionaceae; Cellvibrionales; Gammaproteobacteria; Proteobacteria
Subgroup_22_ge; Subgroup_22_fa; Subgroup_22_or; Subgroup_22; Acidobacteriota
CL500-29_marine_group; Ilumatobacteraceae; Microtrichales; Acidimicrobiia; Actinobacteriota
Streptomycetaceae_unclassified; Streptomycetaceae; Streptomycetales; Actinobacteria; Actinobacteriota
Rhodovarius; Acetobacteraceae; Acetobacterales; Alphaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #49
Ralstonia; Burkholderiaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Asinibacterium; Chitinophagaceae; Chitinophagales; Bacteroidia; Bacteroidota
Chitinophagaceae_unclassified; Chitinophagaceae; Chitinophagales; Bacteroidia; Bacteroidota
Candidatus_Ovatusbacter; Unknown_Family; Gammaproteobacteria_Incertae_Sedis; Gammaproteobacteria; Proteobacteria
Trabulsiella; Enterobacteriaceae; Enterobacteriales; Gammaproteobacteria; Proteobacteria
Aeromicrobium; Nocardiodaceae; Propionibacteriales; Actinobacteria; Actinobacteriota
Pedobacter; Sphingobacteriaceae; Sphingobacteriales; Bacteroidia; Bacteroidota
Acidimicrobiia_unclassified; Acidimicrobiia_unclassified; Acidimicrobiia_unclassified; Acidimicrobiia; Actinobacteriota
Crossiella; Pseudonocardaceae; Pseudonocardiales; Actinobacteria; Actinobacteriota
Thermus; Thermaceae; Thermales; Deinococci; Deinococcota
Desulfobacterota_unclassified; Desulfobacterota_unclassified; Desulfobacterota_unclassified; Desulfobacterota_unclassified; Desulfobacterota
Unique taxa in the samples from fish #57
Rickettsia; Rickettsiaceae; Rickettsiales; Alphaproteobacteria; Proteobacteria
Sphingosaurantiacus; Sphingomonadaceae; Sphingomonadales; Alphaproteobacteria; Proteobacteria
Methylophilaceae_unclassified; Methylophilaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Actinotalea; Cellulomonadaceae; Micrococcales; Actinobacteria; Actinobacteriota
H3.93_ge; H3.93_fa; H3.93; Dehalococcoidia; Chloroflexi
Desulfovibrionales_unclassified; Desulfovibrionales_unclassified; Desulfovibrionales; Desulfovibrionia; Desulfobacterota
Rhodoplanes; Xanthobacteraceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
uncultured_ge; uncultured_fa; uncultured; Alphaproteobacteria; Proteobacteria
Azomonas; Pseudomonadaceae; Pseudomonadales; Gammaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #67
Rhodobacter; Rhodobacteraceae; Rhodobacteriales; Alphaproteobacteria; Proteobacteria
Diaphorobacter; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
FFCH16263_ge; FFCH16263_fa; FFCH16263; Actinobacteria; Actinobacteriota
KD4-96_ge; KD4-96_fa; KD4-96_or; KD4-96; Chloroflexi
Sporichthyaceae_ge; Sporichthyaceae; Frankiales; Actinobacteria; Actinobacteriota
Mycobacteriaceae_unclassified; Mycobacteriaceae; Corynebacteriales; Actinobacteria; Actinobacteriota
Dysgonomonadaceae_unclassified; Dysgonomonadaceae; Bacteroidales; Bacteroidia; Bacteroidota
Paraliobacillus; Bacillaceae; Bacillales; Bacilli; Firmicutes
Clostridium_sensu_stricto_2; Clostridiaceae; Clostridiales; Clostridia; Firmicutes
Nitrospira; Nitrospiraceae; Nitrospirales; Nitrospira; Nitrospirota
Pedomicrobium; Hyphomicrobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
KF-JG30-B3_ge; KF-JG30-B3; Rhizobiales; Alphaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #68
Anaerovoracaceae_ge; Anaerovoracaceae; Peptostreptococcales-Tissierellales; Clostridia; Firmicutes
Modestobacter; Geodermatophilaceae; Frankiales; Actinobacteria; Actinobacteriota
Methylobacter; Methylomonadaceae; Methylococcales; Gammaproteobacteria; Proteobacteria
Brevinema; Brevinemataceae; Brevinematales; Brevinematia; Spirochaetota

Amaricoccus; Rhodobacteraceae; Rhodobacterales; Alphaproteobacteria; Proteobacteria
Sphingobacteriales_unclassified; Sphingobacteriales_unclassified; Sphingobacteriales; Bacteroidia; Bacteroidota
TM7; S32; Saccharimonadales; Saccharimonadia; Patescibacteria
Malikia; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Unique taxa in the samples from fish #69
Frankiales_unclassified; Frankiales_unclassified; Frankiales; Actinobacteria; Actinobacteriota
TRA3-20_ge; TRA3-20; Burkholderiales; Gammaproteobacteria; Proteobacteria
Propionivibrio; Rhodocyclaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Galbitalea; Microbacteriaceae; Micrococcales; Actinobacteria; Actinobacteriota
Dyadobacter; Spirosomaceae; Cytophagales; Bacteroidia; Bacteroidota
DNF00809; Eggerthellaceae; Coriobacteriales; Coriobacteriia; Actinobacteriota
Polaromonas; Comamonadaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Aminobacter; Rhizobiaceae; Rhizobiales; Alphaproteobacteria; Proteobacteria
Rosenbergiella; Erwiniaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Oceanospirillales_unclassified; Oceanospirillales_unclassified; Oceanospirillales; Gammaproteobacteria; Proteobacteria
Prevotellaceae_unclassified; Prevotellaceae; Bacteroidales; Bacteroidia; Bacteroidota
Sphingobacteriaceae_unclassified; Sphingobacteriaceae; Sphingobacteriales; Bacteroidia; Bacteroidota
Aeromonadales_unclassified; Aeromonadales_unclassified; Aeromonadales; Gammaproteobacteria; Proteobacteria
Robbsia; Burkholderiaceae; Burkholderiales; Gammaproteobacteria; Proteobacteria
Diplorickettsiaceae_unclassified; Diplorickettsiaceae; Diplorickettsiales; Gammaproteobacteria; Proteobacteria
Siccibacter; Erwiniaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria
Tatumella; Erwiniaceae; Enterobacterales; Gammaproteobacteria; Proteobacteria