Early life exposure to environmental contaminants (BDE-47, TBBPA, and BPS) produced persistent alterations in fecal microbiome in adult male mice

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Supplemental Figure Legends

Figure S1. Composition and diversity of CD-1 mice that were maternally exposed to vehicle vs. mice that were not maternally exposed to vehicle or any other chemicals (NT). **A)** Alpha diversity of NT and vehicle-exposed groups via chao1 index (asterisks represent statistically significant differences between NT and vehicle-exposed groups). **B)** Beta diversity of NT and vehicle-exposed groups. **C)** Composition of bacteria (L7) in NT and vehicle-exposed groups. The top 15 most abundant taxa are shown (the remaining taxa are summed and shown in the "Other" category). Asterisks represent statically significant changes as compared to NT group (Student's t-test, $p < 0.05$).

Figure S2. Microbial biomarkers associated with each exposure group using Lefse.

Figure S3. Two-way hierarchical clustering dendrograms showing differentally regulated taxa by early life vehicle-exposure as compared to NT.

Figure S4. Pearson's correlation analyses between differentially regulated taxa and BAs **(A)** and short/medium chain fatty acids **(B)**.

Figure S5-S15. Individual microbial pathways predicted by Fishtaco in vehicle- and BDE-47 exposure groups.

Figure S16-S39. Individual microbial pathways predicted by Fishtaco in vehicle- and TBBPA exposure groups.

Supplemental Tables

Supplemental Table 1. Joined reads per sample (16S rDNA Sequencing)	
Sample Name	**Number of Reads**
No Treatment 1	112,745
No Treatment 2	145,071
No Treatment 3	139,687
No Treatment 4	88,144
No Treatment 5	135,336
No Treatment 6	206,800
No Treatment 7	201,923
No Treatment 8	199,547
No Treatment 9	182,291
No Treatment 10	152,520
No Treatment 11	121,927
No Treatment 12	157,246
No Treatment 13	173,285
No Treatment 14	157,325
No Treatment 15	146,591
No Treatment 16	97,279
No Treatment 17	202,013
No Treatment 18	197,967
No Treatment 19	201,732
Vehicle 1	212,663
Vehicle 2	192,999
Vehicle 3	157,380
Vehicle 4	118,261
Vehicle 5	148,384
Vehicle 6	176,899
Vehicle 7	165,180
Vehicle 8	165,363
Vehicle 9	107,253
Vehicle 10	204,988
Vehicle 11	210,909
Vehicle 12	200,861
Vehicle 13	202,090
Vehicle 14	145,106
Vehicle 15	129,645
Vehicle 16	104,676
Vehicle 17	121,548
Vehicle 18	137,707
BDE47 -1	146,132
BDE47 -2	132,719
BDE47 -3	81,039
BDE47 -4	162,219
BDE-5	N/A
BDE47 -6	3,682
BDE47 -7	213,768
BDE47 -8	211,818
BDE47 -9	181,340
BDE47 -10	121,229
BDE47 -11	126,654

BDE47 -12	164,619
BDE47 -13	144,856
BDE47 -14	169,764
BDE47 -15	129,872
BDE47 -16	105,679
BDE47 -17	177,815
BDE47 -18	209,106
BDE47 -19	214,197
BDE47 -20	196,158
BDE47 -21	198,859
BDE47 -22	204,357
BDE47 -23	200,738
BDE47 -24	213,415
TBBPA 1	201,625
TBBPA 2	202,847
TBBPA 3	203,431
TBBPA 4	201,085
TBBPA 5	50,977
TBBPA 6	205,831
TBBPA 7	3,734
TBBPA 8	136,343
TBBPA 9	201,831
TBBPA 10	165,147
TBBPA 11	177,554
TBBPA 12	210,776
TBBPA 13	195,559
TBBPA 14	201,791
TBBPA 15	186,937
TBBPA 16	141,132
TBBPA 17	211,239
BPS 1	212,935
BPS 2	203,707
BPS 3	207,845
BPS 4	197,791
BPS 5	164,835
BPS 6	182,942
BPS 7	196,858
BPS 8	200,686
BPS 9	205,908
BPS 10	195,259
BPS 11	146,606
BPS 12	206,627
BPS 13	213,364
BPS 14	209,023
BPS 15	203,630

Supplemental Table 2		
Exposure	**Ko ID**	**Pathways**
BDE-47	Ko00120	Primary Bile Acid Biosynthesis
	Ko00121	Secondary bile acid biosynthesis
	Ko03060	Protein Export
	Ko00471	D-Glutamine and D-glutamate metabolism
	Ko00740	Riboflavin metabolism
	Ko04964	Proximal tubule bicarbonate reclamation
	Ko04070	Phosphatidylinositol signaling system
	Ko03010	Ribosome
	Ko00312	Beta-Lactam resistance
	Ko00311	Penicillin and cephalosporin biosynthesis
	Ko00900	Terpenoid backbone biosynthesis
TBBPA	Ko00945	Stilbenoid, diarylheptanoid and gingerol biosynthesis
	Ko00281	Geraniol degradation
	Ko00740	Riboflavin metabolism
	Ko00531	Glycosaminoglycan metabolism
	Ko03010	Ribosome
	Ko00623	Toluene degradation
	Ko00780	Biotin metabolism
	Ko00190	Oxidative Phosphorylation
	Ko00785	Lipoic acid metabolism
	Ko03070	Bacterial Secretion system
	Ko00604	Glycosphingolipid metabolism
	Ko00130	Ubiquinone and other terpenoid-quinone biosynthesis
	Ko00670	One carbon pool by folate
	Ko04146	Peroxisome
	Ko00511	Other glycan degradation
	Ko00910	Nitrogen metabolism
	Ko00523	Polyketide sugar unit biosynthesis
	Ko00540	Lipopolysaccharide biosynthesis
	Ko03018	RNA degradation
	Ko00790	Folate biosynthesis
	Ko03060	Protein export
	Ko00521	Streptomycin biosynthesis
	Ko04070	Phosphatidylinositol signaling system
BPS	Ko00364	Fluorobenzoate degradation
	Ko00900	Terpenoid backbone synthesis

Supplemental Table 3.

Primers	Sequences
IL-2 Forward	GAGTCAGCAACTGTGGTGGA
IL-2 Reverse	AGGGCTTGTTGAGATGATGC
IL-4 Forward	TCAACCCCCAGCTAGTTGTC
IL-4 Reverse	GGTGTTCTTCGTTGCTGTGA
IL-12p40 Forward	CACACTGGACCAAAGGGACT
IL-12p40 Reverse	ATTTATTCTGCTGCCGTGCT
IL-12p35 Forward	CTCCTGTGGGAGAAGCAGAC
IL12p35 Reverse	CAGATAGCCCATCACCCTGT
Cyp7a1 Forward	CAACGGGTTGATTCCATACC
Cyp7a1 Reverse	ATTTCCCCATCAGTTTGCAG
Gapdh Forward	GGCAAATTCAACGGCACAGT
Gapdh Reverse	GTCTCGCTCCTGGAAGATGG
Nqo1 Forward	TCTGCAGCTTCCAGCTTCTTG
Nqo1 Reverse	TCTGCAGCTTCCAGCTTCTTG
Gapdx Forward	AGTGGGTGAACCCTCACAAG
Gapdx Reverse	AGCTGGGTTTACTGGTGGTG

Figure S1

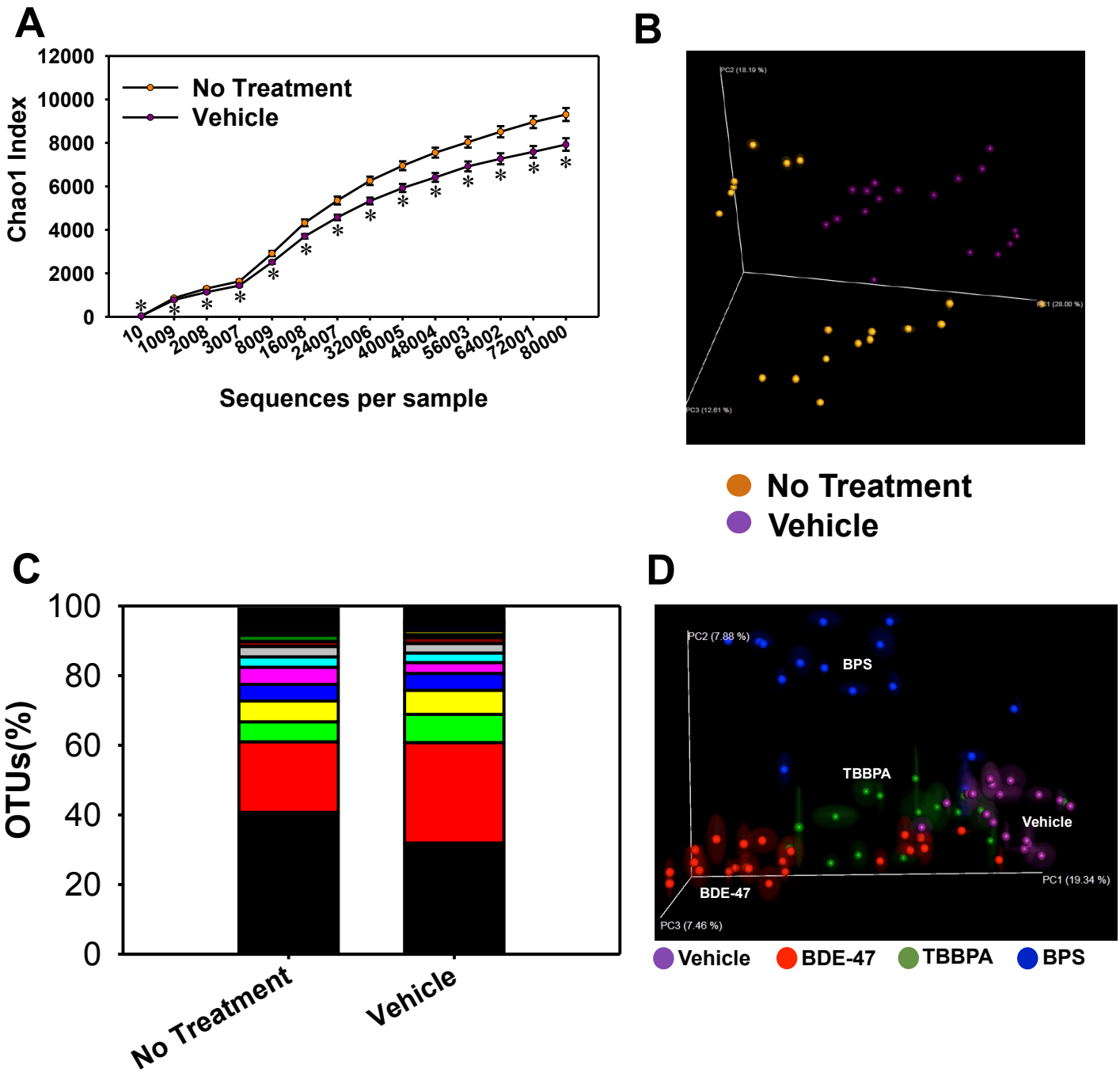

A
12000
10000
8000
6000
4000
2000
0
Chao1 Index
No Treatment
Vehicle
10
1009
2008
3007
8009
16008
24007
32006
40005
48004
56003
64002
72001
80000
Sequences per sample
B
PC2 (18.19 %)
PC1 (28.00 %)
PC3 (12.61 %)
No Treatment
Vehicle
C
100
80
60
40
20
0
OTUs(%)
No Treatment
Vehicle
D
PC2 (7.88 %)
BPS
TBBPA
Vehicle
PC1 (19.34 %)
BDE-47
PC3 (7.46 %)
Vehicle
BDE-47
TBBPA
BPS
p__Bacteroidetes;c__Bacteroidia;o__Bacteroidales;f__S24-7;g__;s__
p__Firmicutes;c__Clostridia;o__Clostridiales;f__;g__;s__
p__Firmicutes;c__Clostridia;o__Clostridiales;f__Lachnospiraceae;g__;s__
p__Bacteroidetes;c__Bacteroidia;o__Bacteroidales;f__Rikenellaceae;g__;s__
p__Firmicutes;c__Clostridia;o__Clostridiales;f__Ruminococcaceae;g__Oscillospira;s__
p__Firmicutes;c__Bacilli;o__Lactobacillales;f__Lactobacillaceae;g__Lactobacillus;s__
p__Firmicutes;c__Clostridia;o__Clostridiales;f__Ruminococcaceae;g__;s__
p__Firmicutes;c__Clostridia;o__Clostridiales;f__Ruminococcaceae;g__;s__
p__Firmicutes;c__Clostridia;o__Clostridiales;f__Ruminococcaceae;g__Ruminococcus;s__
p__Bacteroidetes;c__Bacteroidia;o__Bacteroidales;f__Bacteroidaceae;g__Bacteroides;s__
p__Bacteroidetes;c__Bacteroidia;o__Bacteroidales;f__[Odoribacteraceae];g__Odoribacter;s__
p__Firmicutes;c__Clostridia;o__Clostridiales;f__Lachnospiraceae;g__[Ruminococcus];s__gnavus
p__Bacteroidetes;c__Bacteroidia;o__Bacteroidales;f__Prevotellaceae;g__Prevotella;s__
p__Tenericutes;c__Mollicutes;o__RF39;f__;g__;s__
p__Bacteroidetes;c__Bacteroidia;o__Bacteroidales;f__Bacteroidaceae;g__Bacteroides;s__acidifaciens
Other

Figure S2

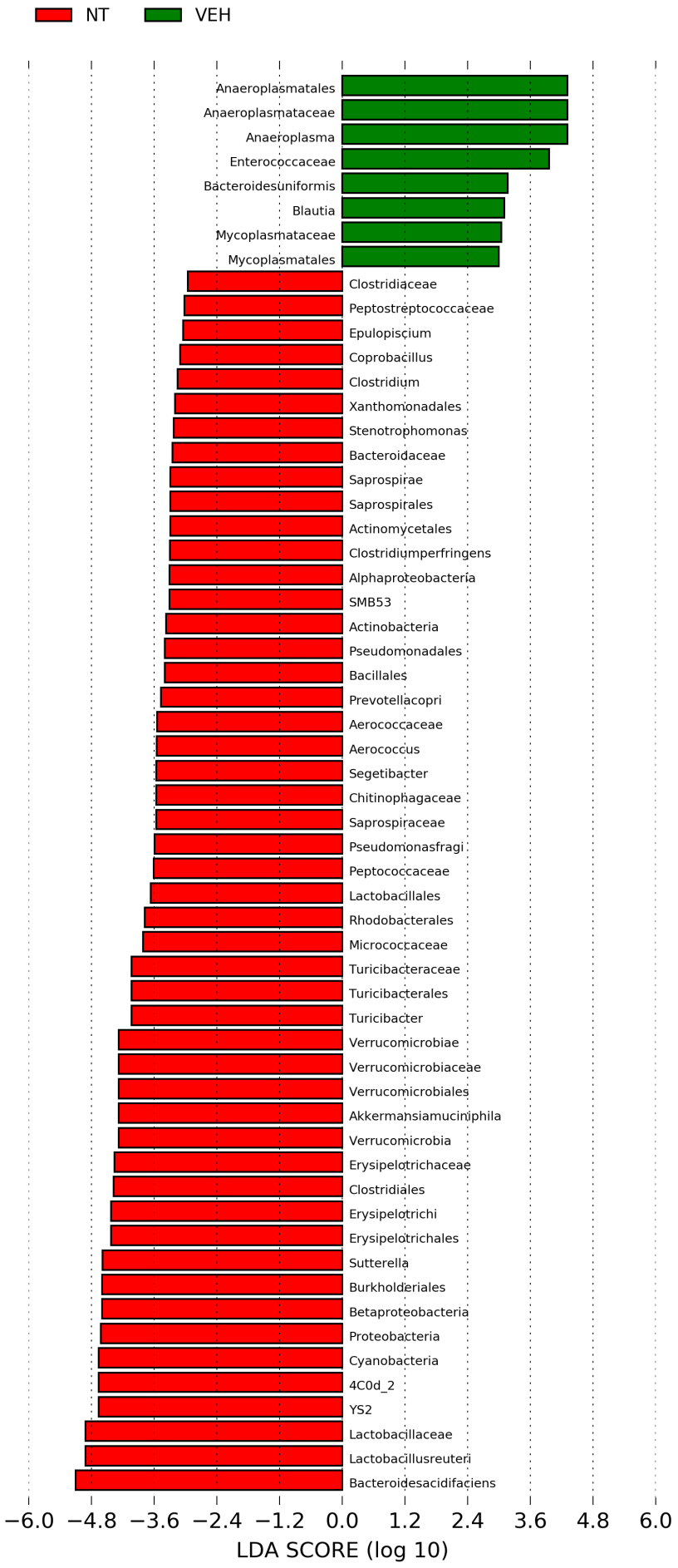
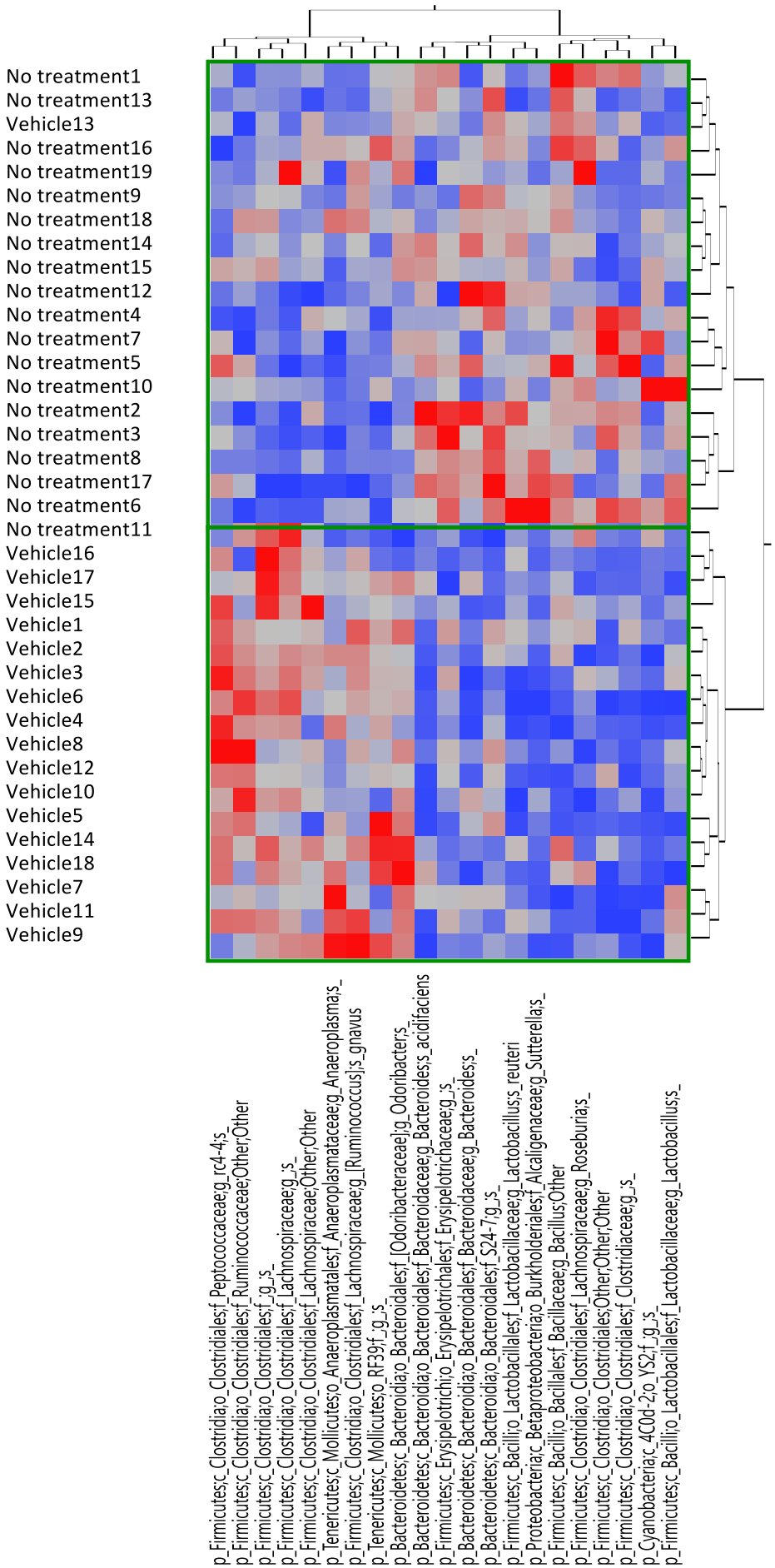

NT
VEH
Anaeroplasmatales
Anaeroplasmataceae
Anaeroplasma
Enterococcaceae
Bacteroidesuniformis
Blautia
Mycoplasmataceae
Mycoplasmatales
Clostridiaceae
Peptostreptococcaceae
Epulopiscium
Coprobacillus
Clostridium
Xanthomonadales
Stenotrophomonas
Bacteroidaceae
Saprospirae
Saprospirales
Actinomycetales
Clostridiumperfringens
Alphaproteobacteria
SMB53
Actinobacteria
Pseudomonadales
Bacillales
Prevotellacopri
Aerococcaceae
Aerococcus
Segetibacter
Chitinophagaceae
Saprospiraceae
Pseudomonasfragi
Peptococcaceae
Lactobacillales
Rhodobacterales
Micrococcaceae
Turicibacteraceae
Turicibacterales
Turicibacter
Verrucomicrobiae
Verrucomicrobiaceae
Verrucomicrobiales
Akkermansiamuciniphila
Verrucomicrobia
Erysipelotrichaceae
Clostridiales
Erysipelotrichi
Erysipelotrichales
Sutterella
Burkholderiales
Betaproteobacteria
Proteobacteria
Cyanobacteria
4C0d_2
YS2
Lactobacillaceae
Lactobacillusreuteri
Bacteroidesacidifaciens
−6.0 −4.8 −3.6 −2.4 −1.2 0.0 1.2 2.4 3.6 4.8 6.0
LDA SCORE (log 10)

Figure S3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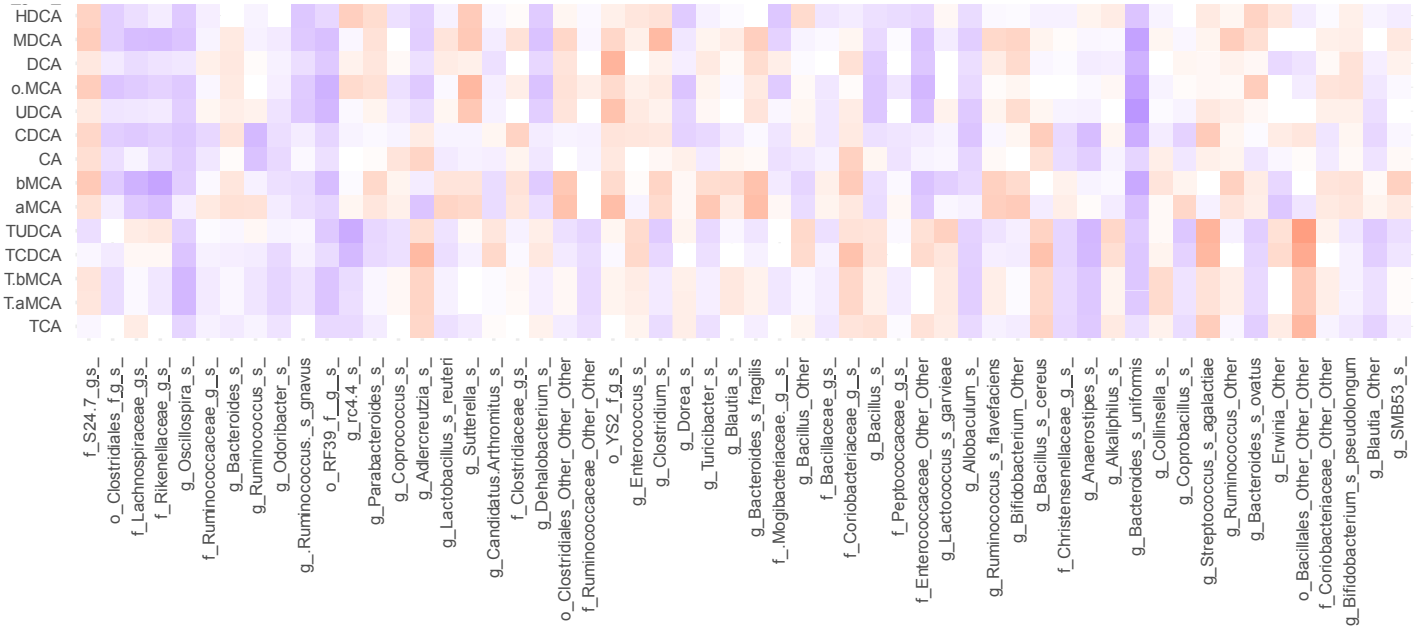
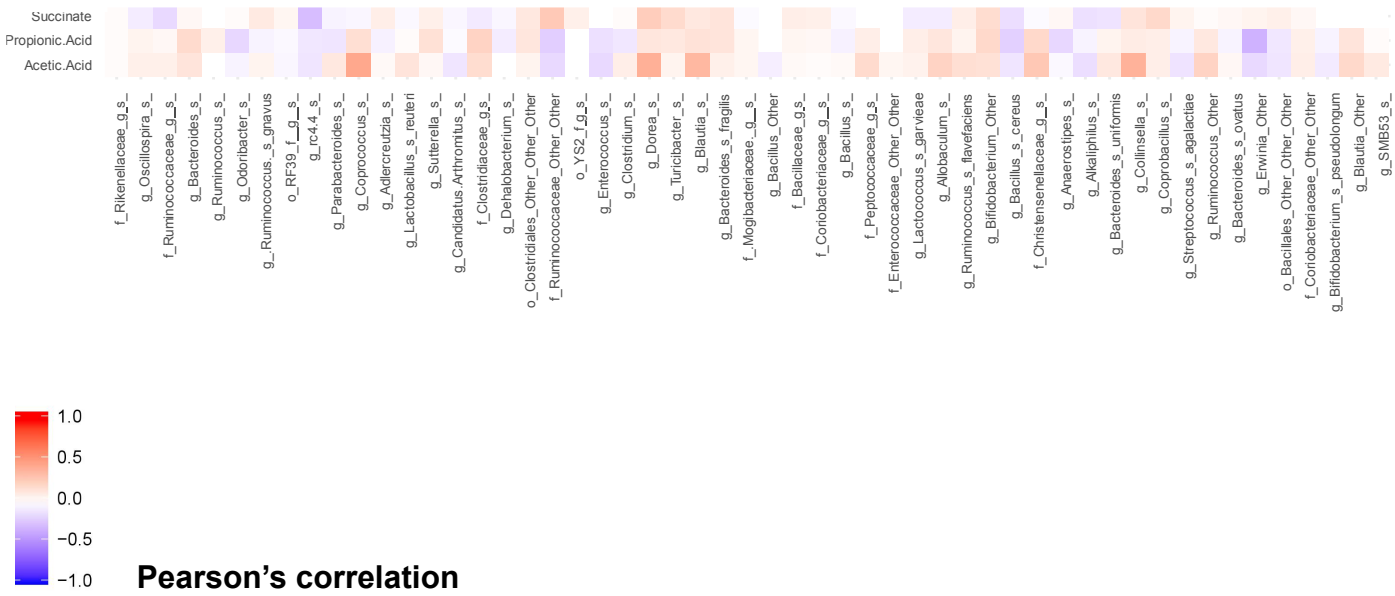
No treatment13
Vehicle13
No treatment16
No treatment19
No treatment9
No treatment18
No treatment14
No treatment15
No treatment12
No treatment4
No treatment7
No treatment5
No treatment10
No treatment2
No treatment3
No treatment8
No treatment17
No treatment6
No treatment11
Vehicle16
Vehicle17
Vehicle15
Vehicle1
Vehicle2
Vehicle3
Vehicle6
Vehicle4
Vehicle8
Vehicle12
Vehicle10
Vehicle5
Vehicle14
Vehicle18
Vehicle7
Vehicle11
Vehicle9
p_Firmicutes;c_Clostridia;o_Clostridiales;f_Peptococcaceae;g_rc4-4;s_
p_Firmicutes;c_Clostridia;o_Clostridiales;f_Ruminococcaceae;Other;Other
p_Firmicutes;c_Clostridia;o_Clostridiales;f_;g_;s_
p_Firmicutes;c_Clostridia;o_Clostridiales;f_Lachnospiraceae;g_;s_
p_Firmicutes;c_Clostridia;o_Clostridiales;f_Lachnospiraceae;Other;Other
p_Tenericutes;c_Mollicutes;o_Anaeroplasmatales;f_Anaeroplasmataceae;g_Anaeroplasma;s_
p_Firmicutes;c_Clostridia;o_Clostridiales;f_Lachnospiraceae;g_[Ruminococcus];s_gnavus
p_Tenericutes;c_Mollicutes;o_RF39;f_;g_;s_
p_Bacteroidetes;c_Bacteroidia;o_Bacteroidales;f_[Odoribacteraceae];g_Odoribacter;s_
p_Bacteroidetes;c_Bacteroidia;o_Bacteroidales;f_Bacteroidaceae;g_Bacteroides;s_acidifaciens
p_Firmicutes;c_Erysipelotrichi;o_Erysipelotrichales;f_Erysipelotrichaceae;g_;s_
p_Bacteroidetes;c_Bacteroidia;o_Bacteroidales;f_Bacteroidaceae;g_Bacteroides;s_
p_Bacteroidetes;c_Bacteroidia;o_Bacteroidales;f_S24-7;g_;s_
p_Firmicutes;c_Bacilli;o_Lactobacillales;f_Lactobacillaceae;g_Lactobacillus;s_reuteri
p_Proteobacteria;c_Betaproteobacteria;o_Burkholderiales;f_Alcaligenaceae;g_Sutterella;s_
p_Firmicutes;c_Bacilli;o_Bacillales;f_Bacillaceae;g_Bacillus;Other
p_Firmicutes;c_Clostridia;o_Clostridiales;f_Lachnospiraceae;g_Roseburia;s_
p_Firmicutes;c_Clostridia;o_Clostridiales;Other;Other;Other
p_Firmicutes;c_Clostridia;o_Clostridiales;f_Clostridiaceae;g_;s_
p_Cyanobacteria;c_4C0d-2;o_YS2;f_;g_;s_
p_Firmicutes;c_Bacilli;o_Lactobacillales;f_Lactobacillaceae;g_Lactobacillus;s_

Figure S4

A


HDCA
MDCA
DCA
o.MCA
UDCA
CDCA
CA
bMCA
aMCA
TUDCA
TCDCA
T.bMCA
T.aMCA
TCA
f_S24.7_g:s_
o_Clostridiales_f:g:s_
f_Lachnospiraceae_g:s_
f_Rikenellaceae_g:s_
g_Oscillospira_s_
f_Ruminococcaceae_g__s_
g_Bacteroides_s_
g_Ruminococcus_s_
g_Odoribacter_s_
g_.Ruminococcus._s_gnavus
o_RF39_f__g__s_
g_rc4.4_s_
g_Parabacteroides_s_
g_Coprococcus_s_
g_Adlercreutzia_s_
g_Lactobacillus_s_reuteri
g_Sutterella_s_
g_Candidatus.Arthromitus_s_
f_Clostridiaceae_g:s_
g_Dehalobacterium_s_
o_Clostridiales_Other_Other_Other
f_Ruminococcaceae_Other_Other
o_YS2_f:g:s_
g_Enterococcus_s_
g_Clostridium_s_
g_Dorea_s_
g_Turicibacter_s_
g_Blautia_s_
g_Bacteroides_s_fragilis
f_.Mogibacteriaceae_g__s_
g_Bacillus_Other
f_Bacillaceae_g:s_
f_Coriobacteriaceae_g__s_
g_Bacillus_s_
f_Peptococcaceae_g:s_
f_Enterococcaceae_Other_Other
g_Lactococcus_s_garvieae
g_Allobaculum_s_
g_Ruminococcus_s_flavefaciens
g_Bifidobacterium_Other
g_Bacillus_s_cereus
f_Christensenellaceae_g__s_
g_Anaerostipes_s_
g_Alkaliphilus_s_
g_Bacteroides_s_uniformis
g_Collinsella_s_
g_Coprobacillus_s_
g_Streptococcus_s_agalactiae
g_Ruminococcus_Other
g_Bacteroides_s_ovatus
g_Erwinia_Other
o_Bacillales_Other_Other_Other
f_Coriobacteriaceae_Other_Other
g_Bifidobacterium_s_pseudolongum
g_Blautia_Other
g_SMB53_s_

B


Succinate
Propionic.Acid
Acetic.Acid
f_Rikenellaceae_g:s_
g_Oscillospira_s_
f_Ruminococcaceae_g:s_
g_Bacteroides_s_
g_Ruminococcus_s_
g_Odoribacter_s_
g_Ruminococcus._s_gnavus
o_RF39_f__g__s_
g_rc4.4_s_
g_Parabacteroides_s_
g_Coprococcus_s_
g_Adlercreutzia_s_
g_Lactobacillus_s_reuteri
g_Sutterella_s_
g_Candidatus.Arthromitus_s_
f_Clostridiaceae_g:s_
g_Dehalobacterium_s_
o_Clostridiales_Other_Other_Other
f_Ruminococcaceae_Other_Other
o_YS2_f:g:s_
g_Enterococcus_s_
g_Clostridium_s_
g_Dorea_s_
g_Turicibacter_s_
g_Blautia_s_
g_Bacteroides_s_fragilis
f_.Mogibacteriaceae_g__s_
g_Bacillus_Other
f_Bacillaceae_g:s_
f_Coriobacteriaceae_g__s_
g_Bacillus_s_
f_Peptococcaceae_g:s_
f_Enterococcaceae_Other_Other
g_Lactococcus_s_garvieae
g_Allobaculum_s_
g_Ruminococcus_s_flavefaciens
g_Bifidobacterium_Other
g_Bacillus_s_cereus
f_Christensenellaceae_g__s_
g_Anaerostipes_s_
g_Alkaliphilus_s_
g_Bacteroides_s_uniformis
g_Collinsella_s_
g_Coprobacillus_s_
g_Streptococcus_s_agalactiae
g_Ruminococcus_Other
g_Bacteroides_s_ovatus
g_Erwinia_Other
o_Bacillales_Other_Other_Other
f_Coriobacteriaceae_Other_Other
g_Bifidobacterium_s_pseudolongum
g_Blautia_Other
g_SMB53_s_
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0.5
0.0
−0.5
−1.0
Pearson's correlation

Figure S5

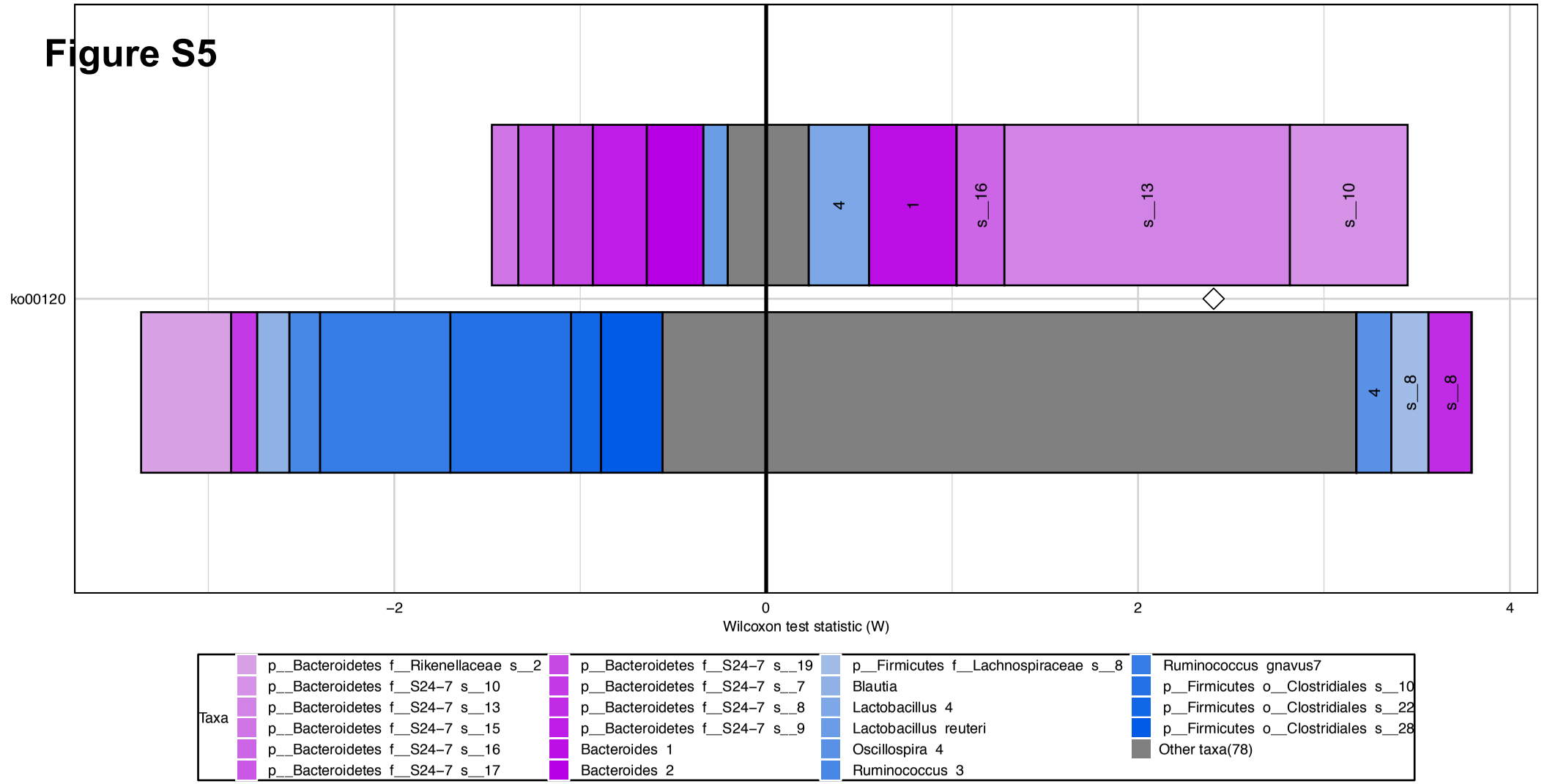

ko00120
4
1
s__16
s__13
s__10
4
s__8
s__8
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__8
Blautia
Lactobacillus 4
Lactobacillus reuteri
Oscillospira 4
Ruminococcus 3
Ruminococcus gnavus7
p__Firmicutes o__Clostridiales s__10
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__28
Other taxa(78)

Figure S6

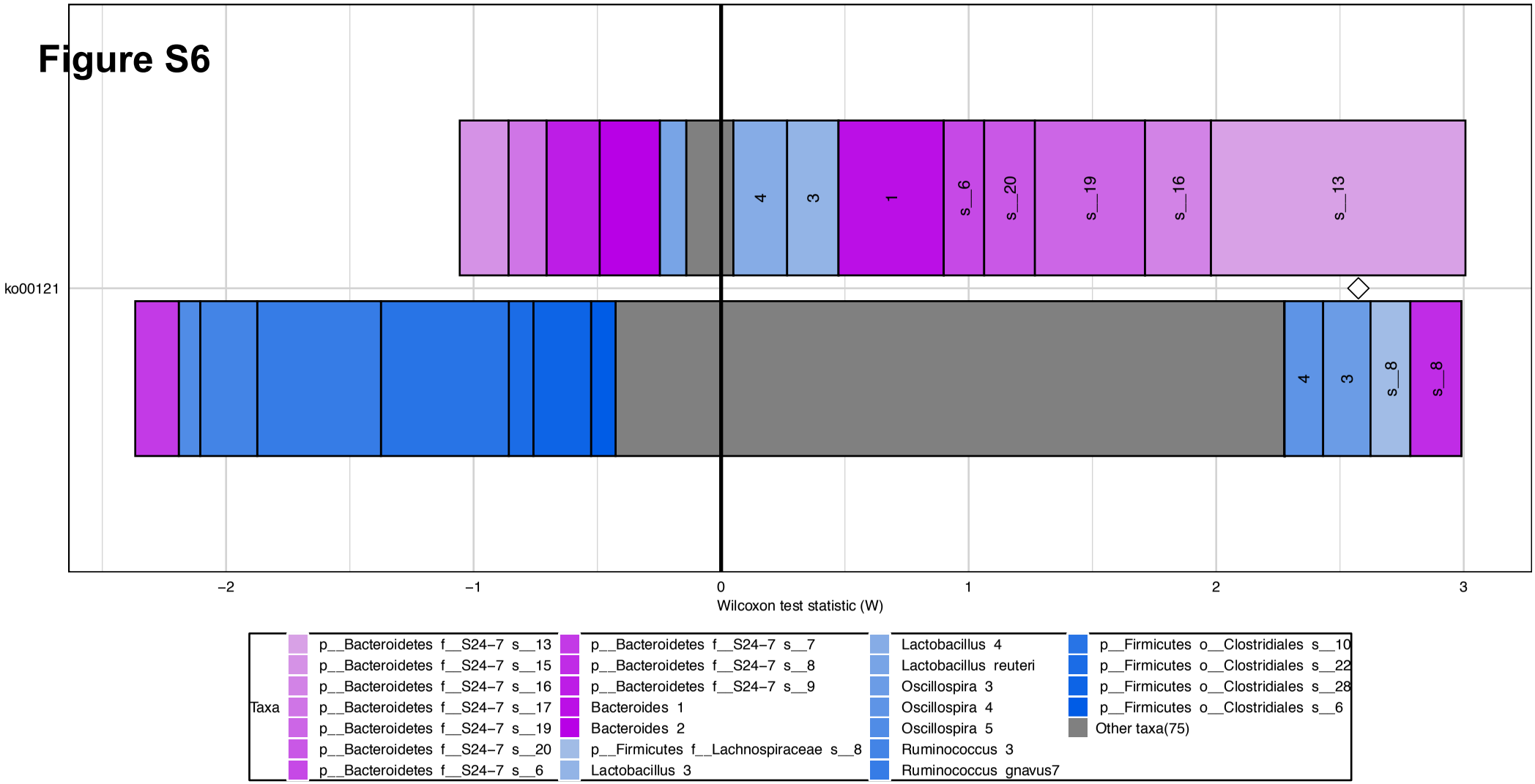

ko00121
4
3
1
s__6
s__20
s__19
s__16
s__13
4
3
s__8
s__8
−2
−1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__8
Lactobacillus 3
Lactobacillus 4
Lactobacillus reuteri
Oscillospira 3
Oscillospira 4
Oscillospira 5
Ruminococcus 3
Ruminococcus gnavus7
p__Firmicutes o__Clostridiales s__10
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__28
p__Firmicutes o__Clostridiales s__6
Other taxa(75)

Figure S7

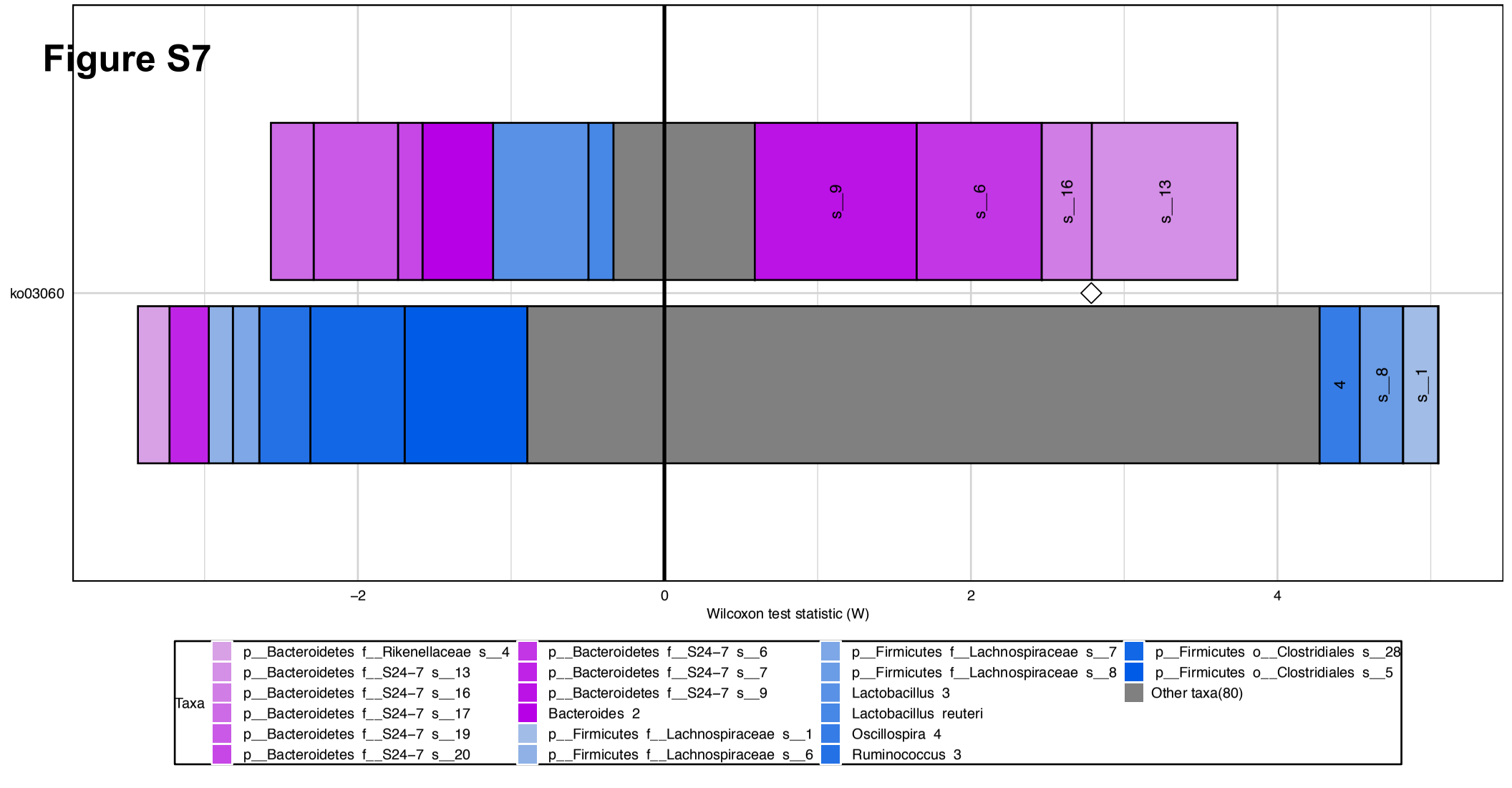

ko03060
s__9
s__6
s__16
s__13
4
s__8
s__1
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__9
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__7
p__Firmicutes f__Lachnospiraceae s__8
Lactobacillus 3
Lactobacillus reuteri
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__28
p__Firmicutes o__Clostridiales s__5
Other taxa(80)

Figure S8

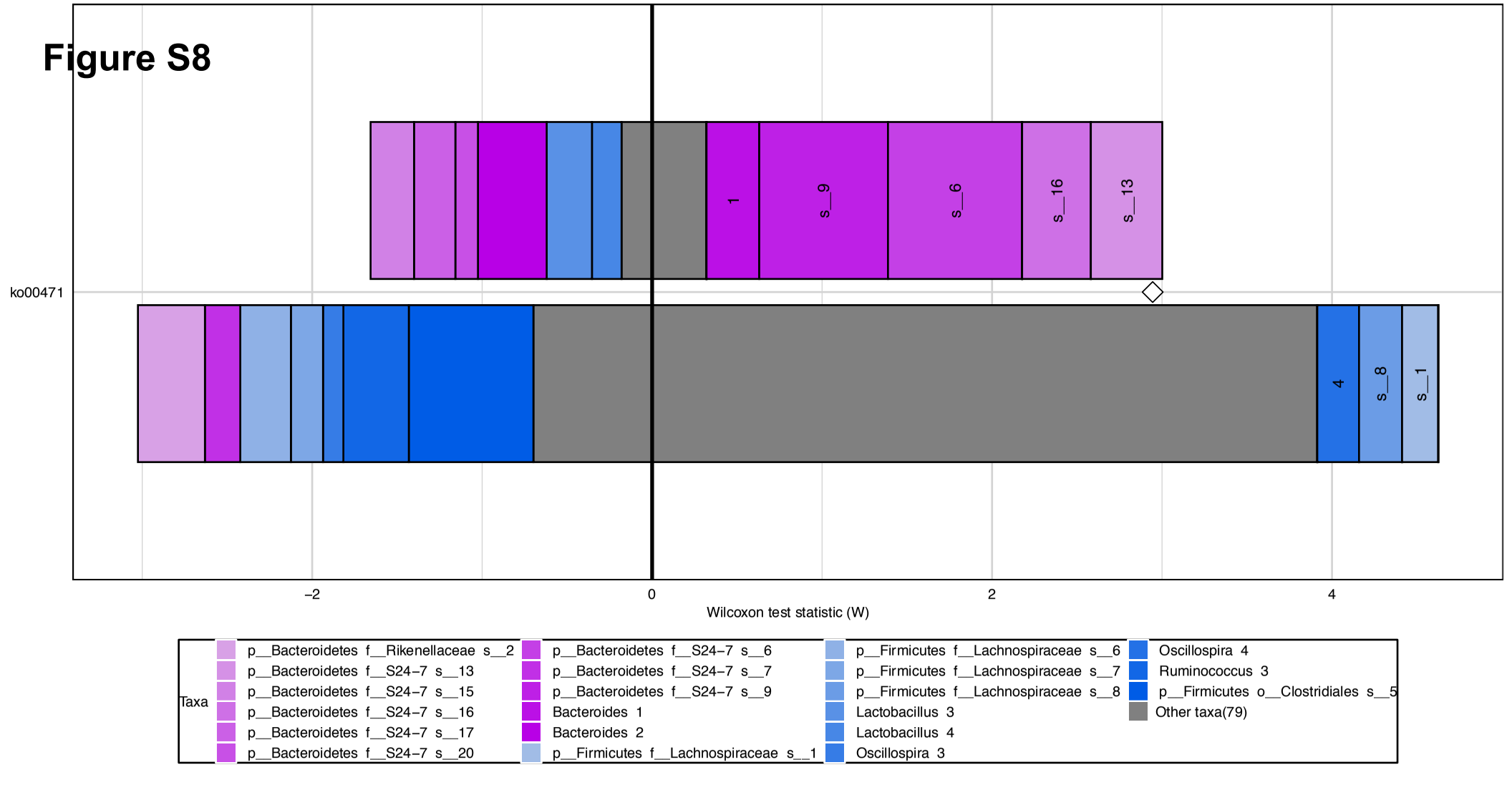

ko00471
1
s__9
s__6
s__16
s__13
4
s__8
s__1
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__7
p__Firmicutes f__Lachnospiraceae s__8
Lactobacillus 3
Lactobacillus 4
Oscillospira 3
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__5
Other taxa(79)

Figure S9

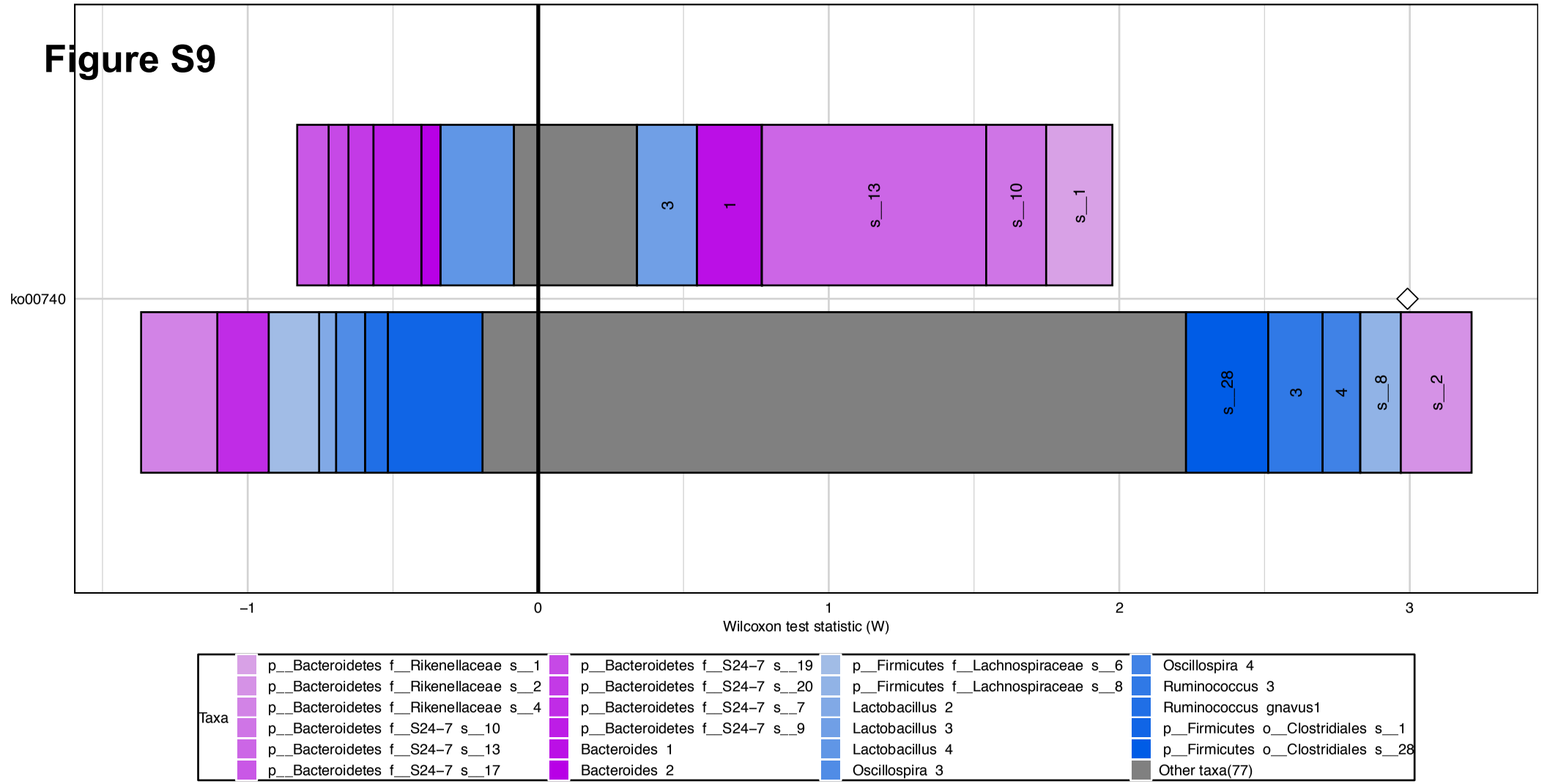

ko00740
s__13
s__10
s__1
3
1
s__28
3
4
s__8
s__2
−1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__8
Lactobacillus 2
Lactobacillus 3
Lactobacillus 4
Oscillospira 3
Oscillospira 4
Ruminococcus 3
Ruminococcus gnavus1
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__28
Other taxa(77)

Figure S10

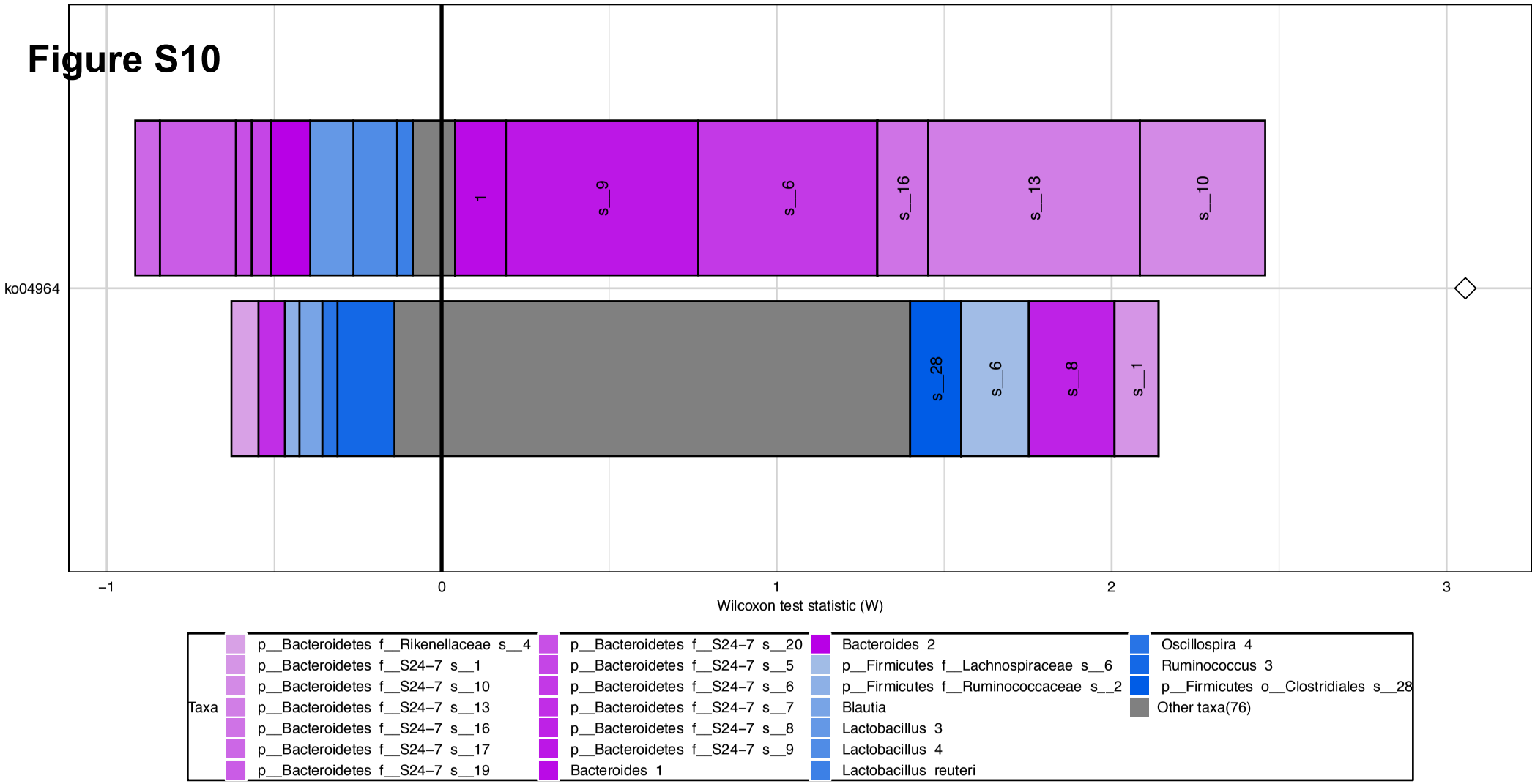

ko04964
1
s__9
s__6
s__16
s__13
s__10
s__28
s__6
s__8
s__1
−1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__5
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Ruminococcaceae s__2
Blautia
Lactobacillus 3
Lactobacillus 4
Lactobacillus reuteri
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__28
Other taxa(76)

Figure S11

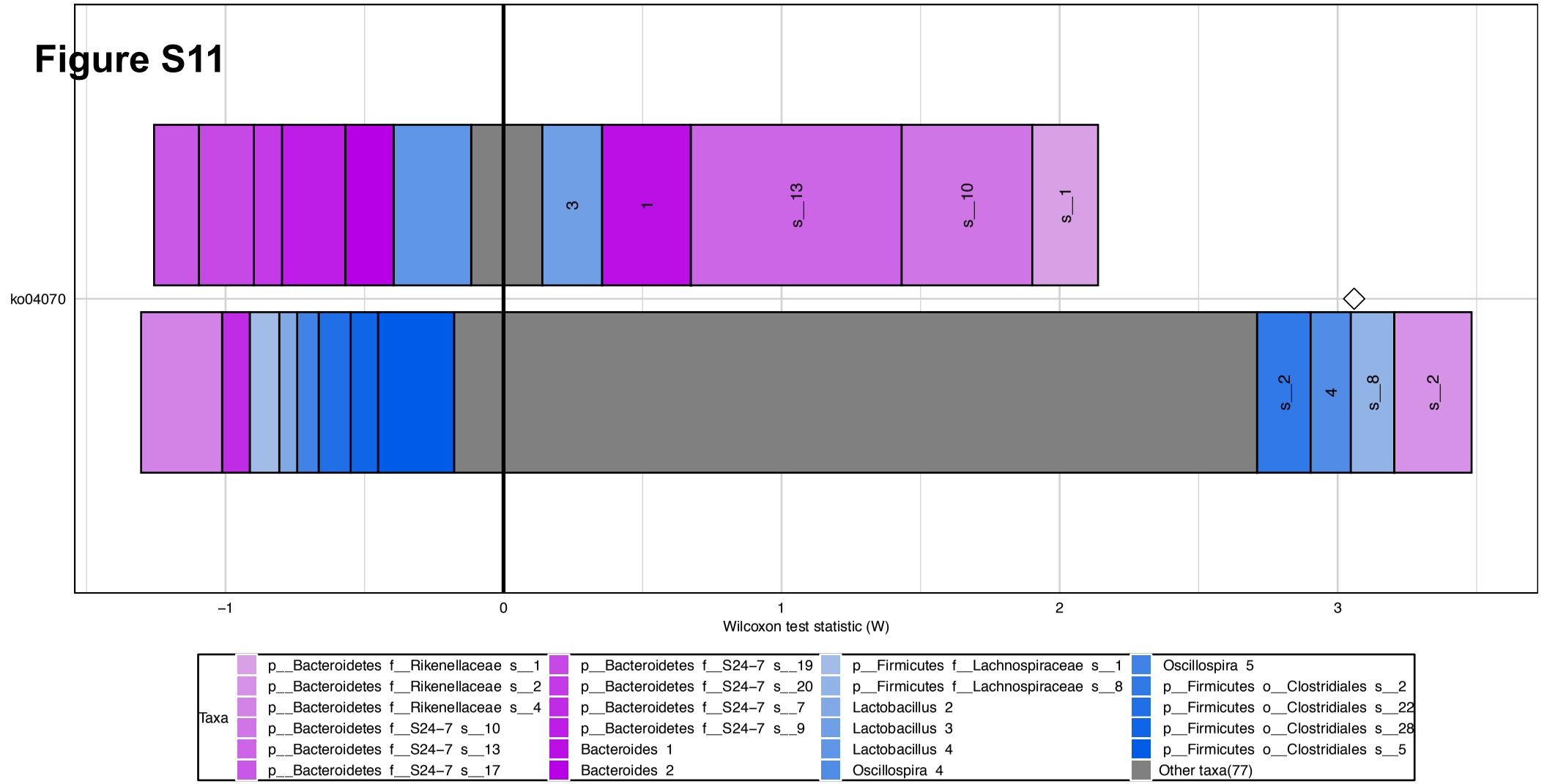

ko04070
3
1
s__13
s__10
s__1
s__2
4
s__8
s__2
−1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__1
p__Firmicutes f__Lachnospiraceae s__8
Lactobacillus 2
Lactobacillus 3
Lactobacillus 4
Oscillospira 4
Oscillospira 5
p__Firmicutes o__Clostridiales s__2
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__28
p__Firmicutes o__Clostridiales s__5
Other taxa(77)

Figure S12

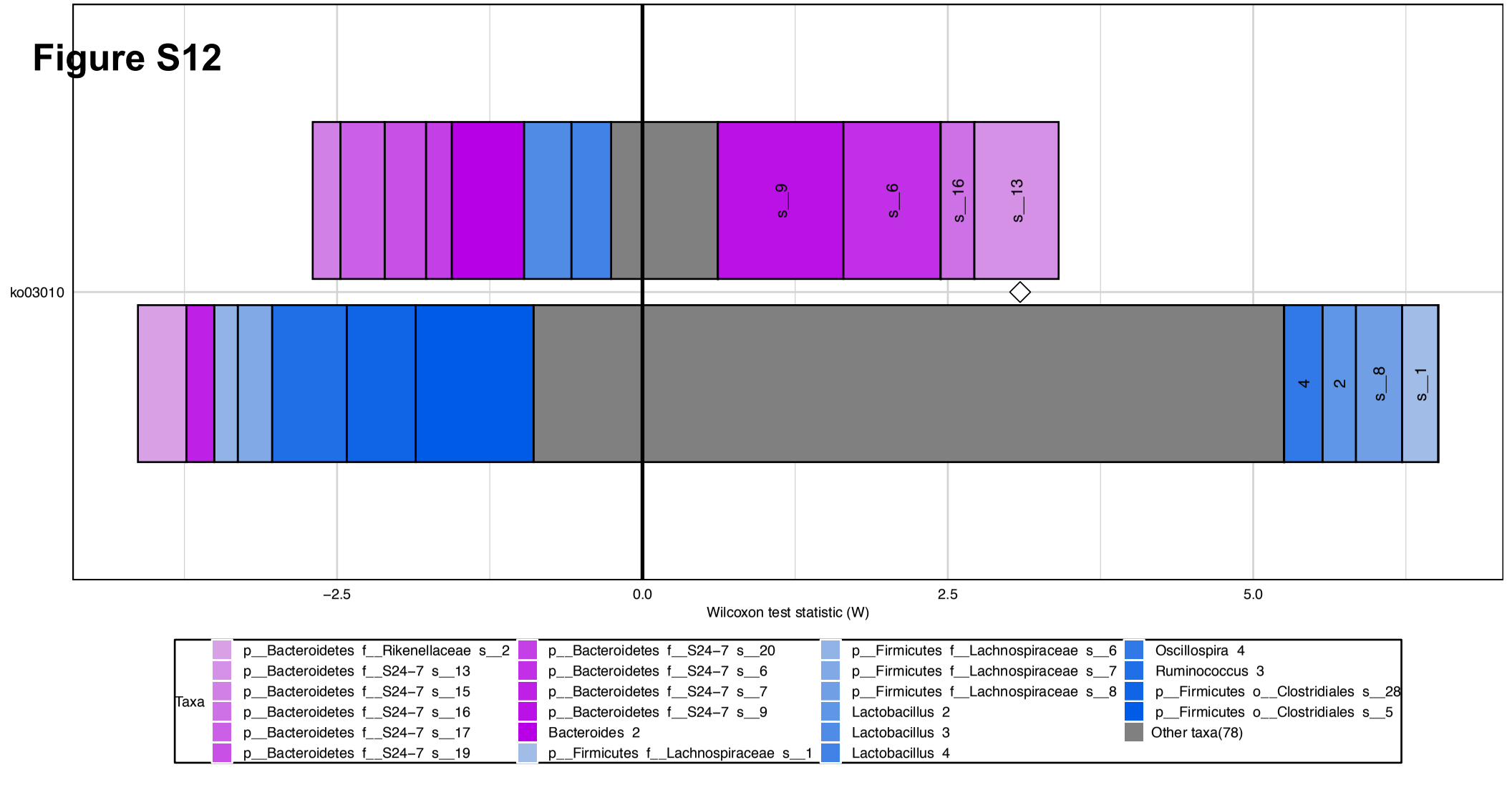

ko03010
s__9
s__6
s__16
s__13
4
2
s__8
s__1
−2.5
0.0
2.5
5.0
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__9
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__7
p__Firmicutes f__Lachnospiraceae s__8
Lactobacillus 2
Lactobacillus 3
Lactobacillus 4
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__28
p__Firmicutes o__Clostridiales s__5
Other taxa(78)

Figure S13

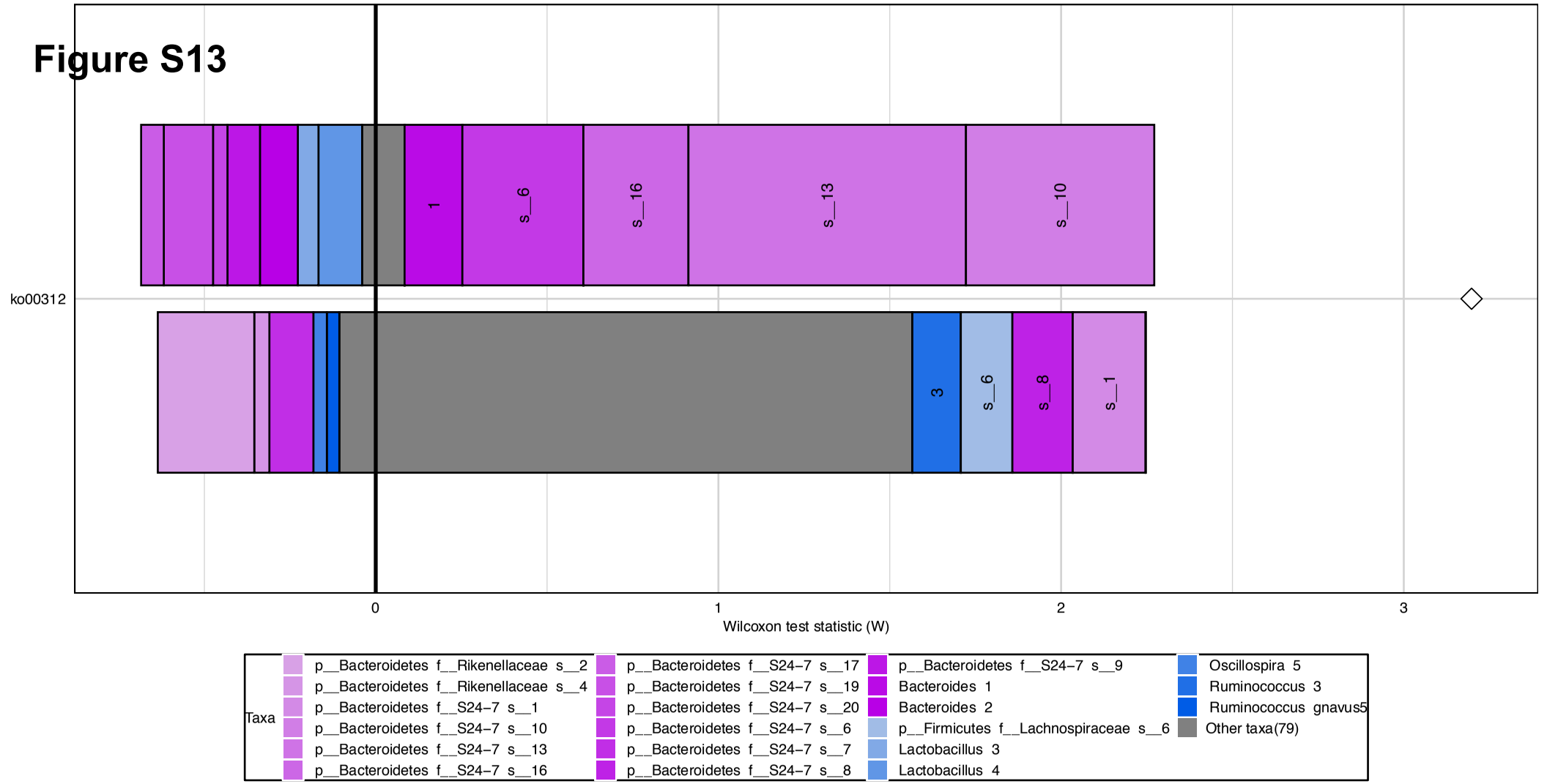

ko00312
1
s__6
s__16
s__13
s__10
3
s__6
s__8
s__1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__6
Lactobacillus 3
Lactobacillus 4
Oscillospira 5
Ruminococcus 3
Ruminococcus gnavus5
Other taxa(79)

Figure S14

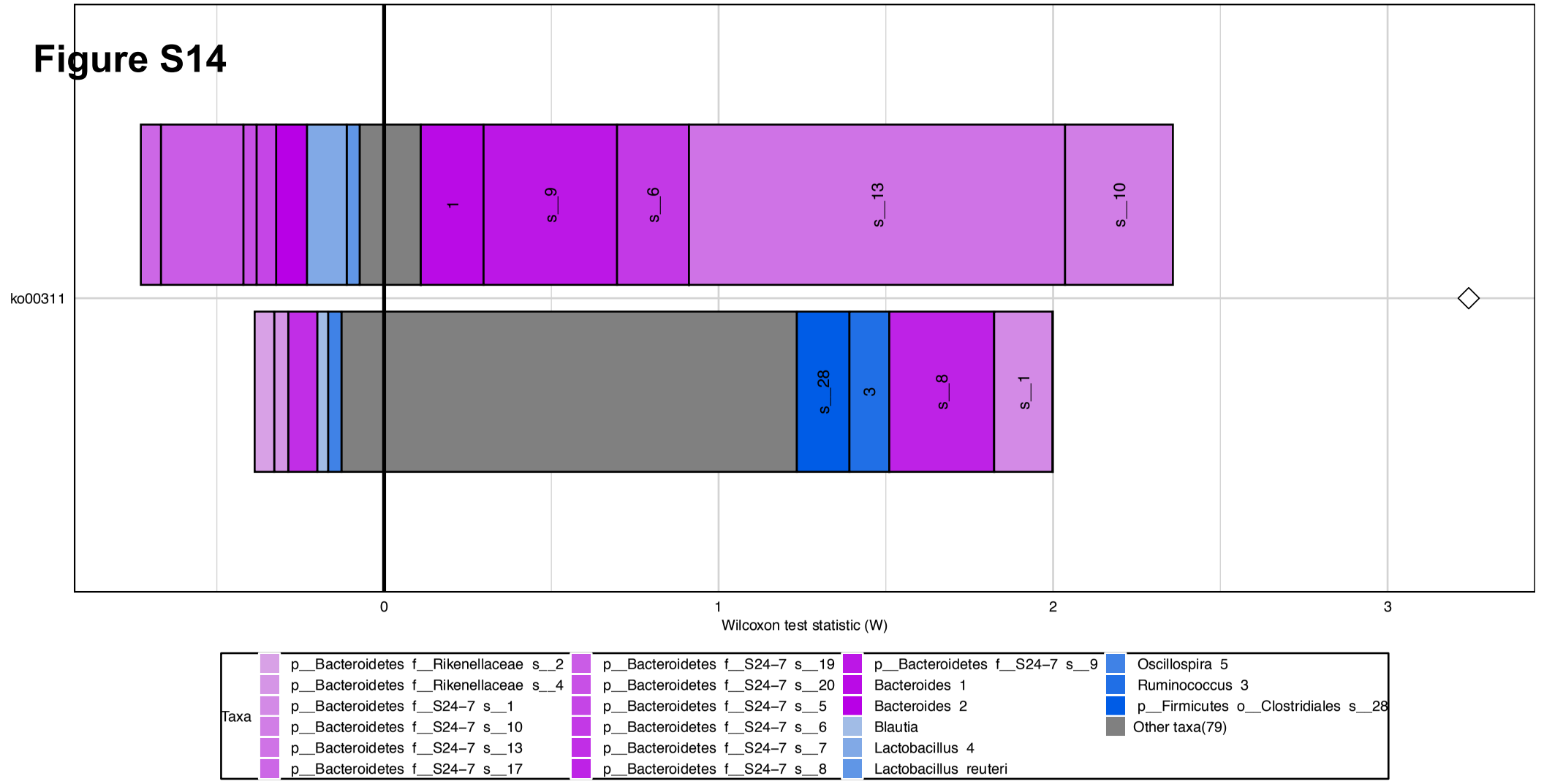

ko00311
1
s__9
s__6
s__13
s__10
s__28
3
s__8
s__1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__5
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
Blautia
Lactobacillus 4
Lactobacillus reuteri
Oscillospira 5
Ruminococcus 3
p__Firmicutes o__Clostridiales s__28
Other taxa(79)

Figure S15

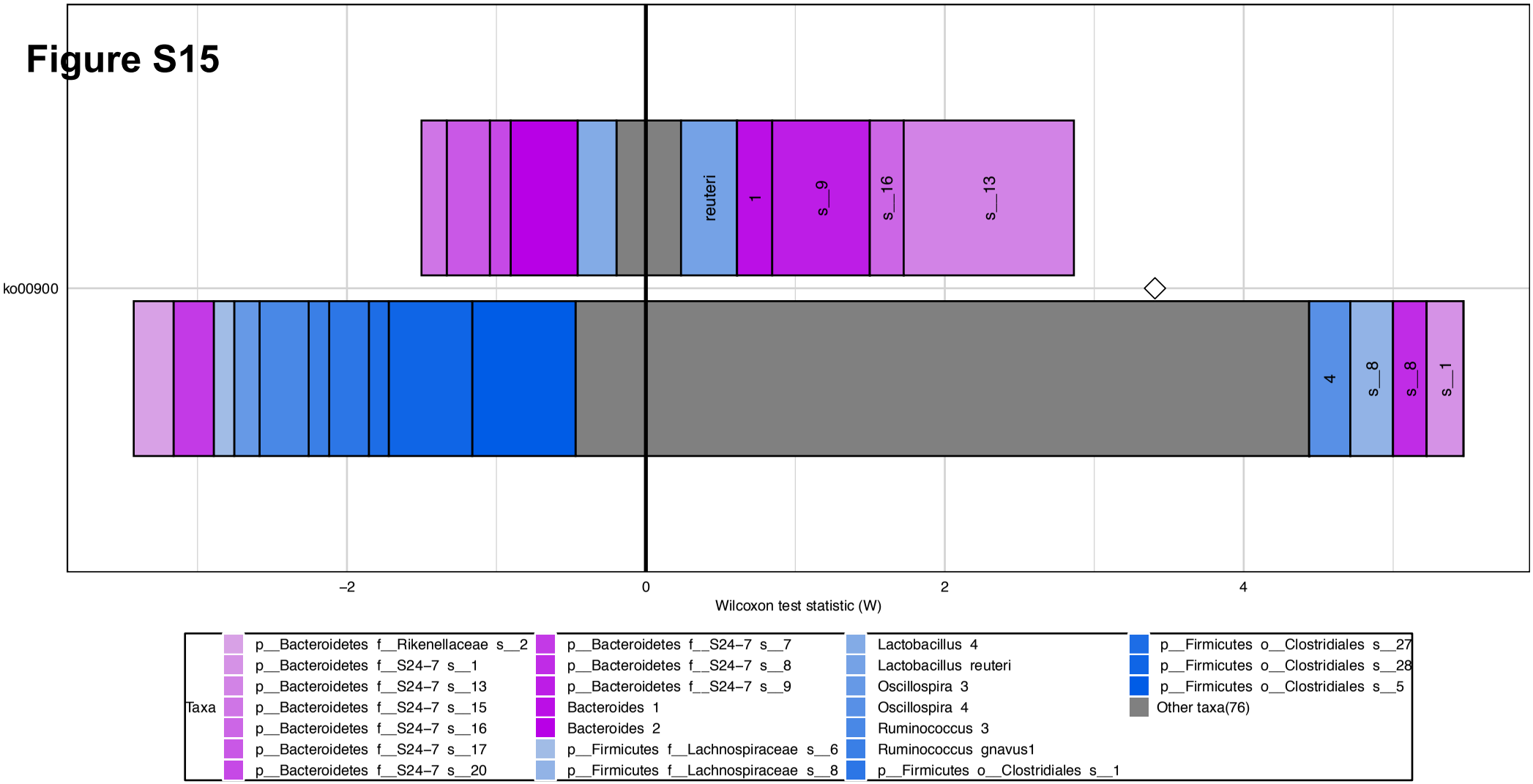

ko00900
reuteri
1
s__9
s__16
s__13
4
s__8
s__8
s__1
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__16
p__Bacteroidetes f__S24−7 s__17
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides 1
Bacteroides 2
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__8
Lactobacillus 4
Lactobacillus reuteri
Oscillospira 3
Oscillospira 4
Ruminococcus 3
Ruminococcus gnavus1
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__28
p__Firmicutes o__Clostridiales s__5
Other taxa(76)

Figure S16

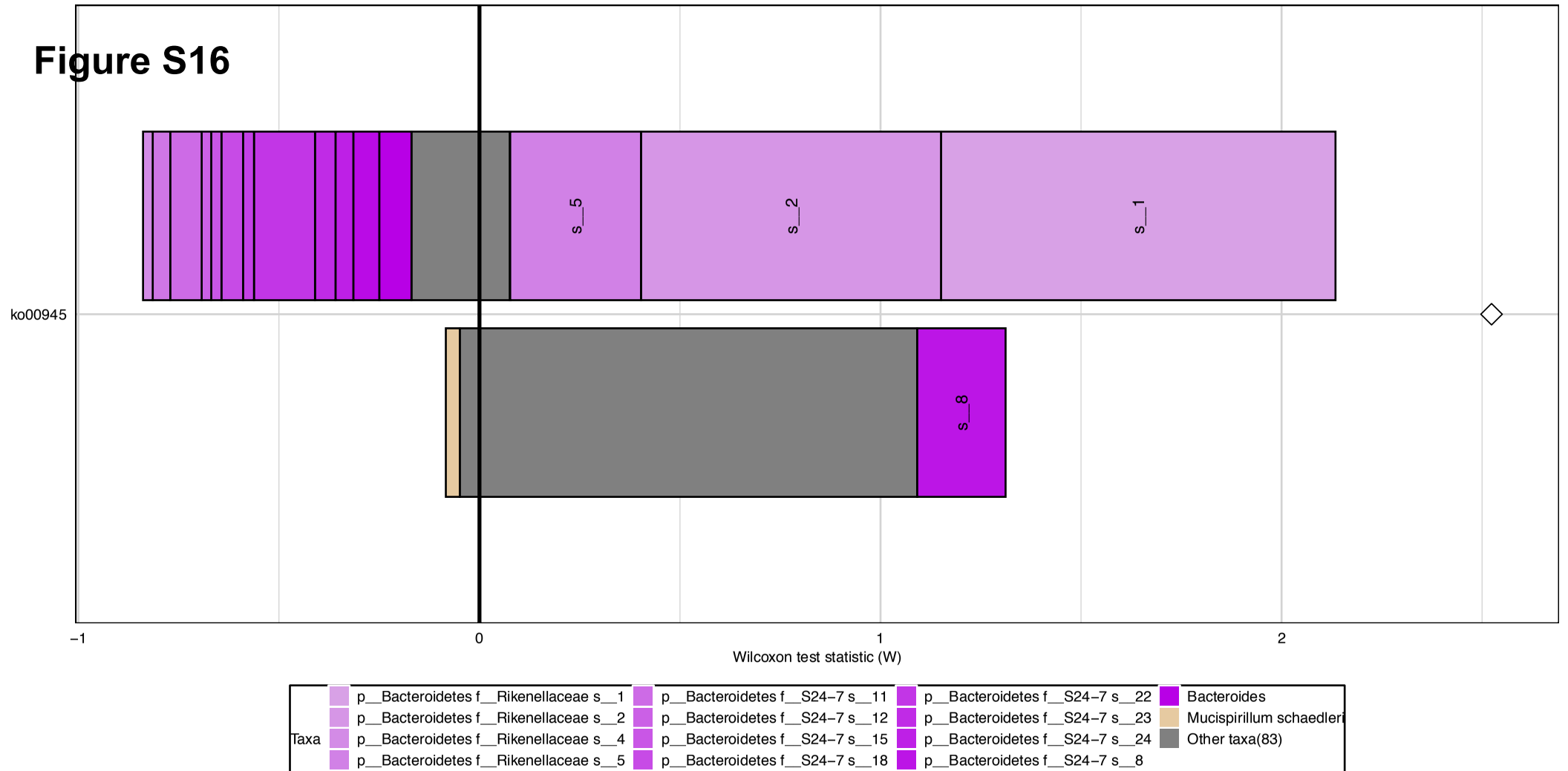

s__5
s__2
s__1
s__8
ko00945
−1
0
1
2
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__Rikenellaceae s__5
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Mucispirillum schaedleri
Other taxa(83)

Figure S17

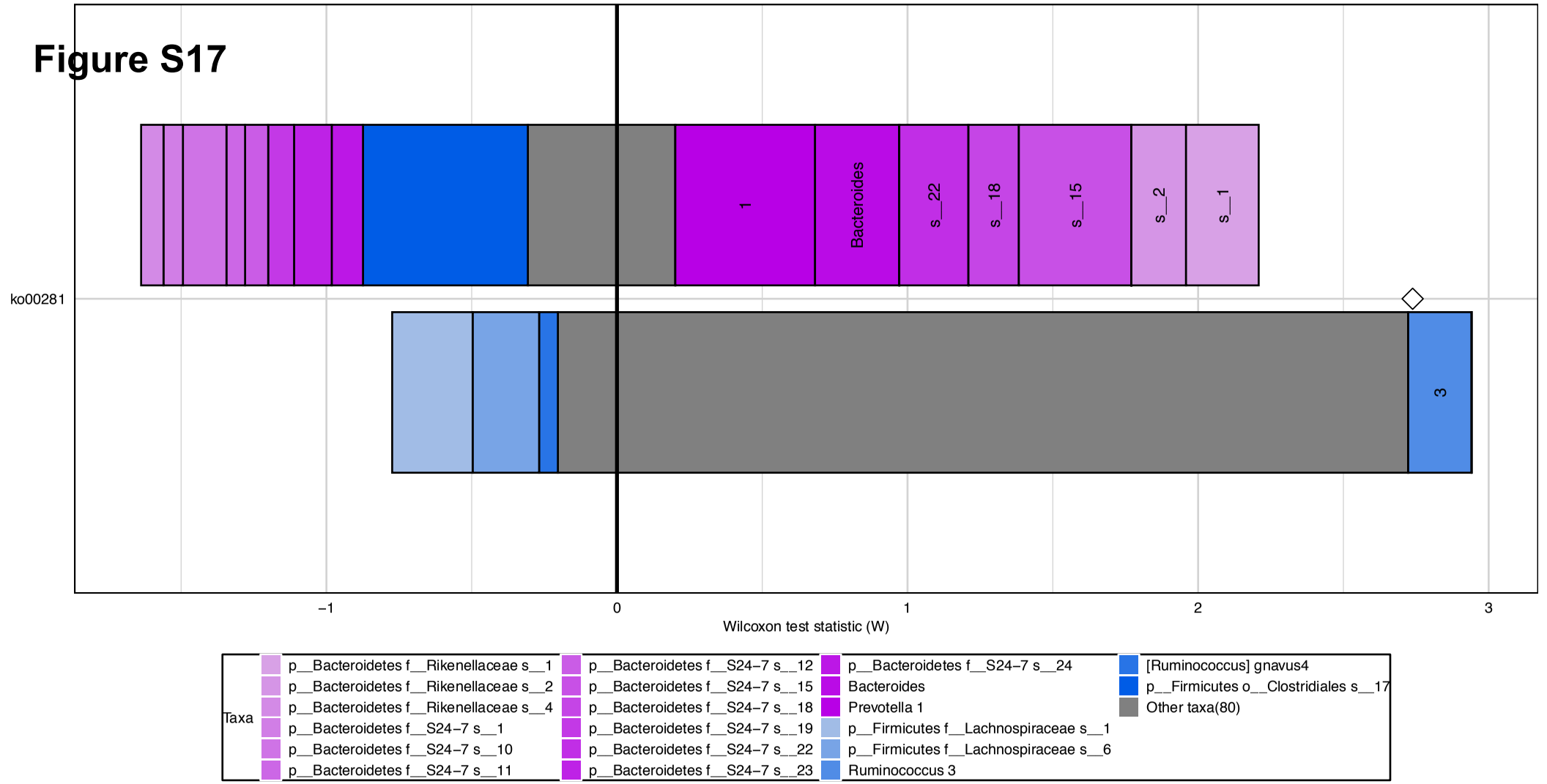

ko00281
1
Bacteroides
s__22
s__18
s__15
s__2
s__1
3
−1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__1
p__Firmicutes f__Lachnospiraceae s__6
Ruminococcus 3
[Ruminococcus] gnavus4
p__Firmicutes o__Clostridiales s__17
Other taxa(80)

Figure S18

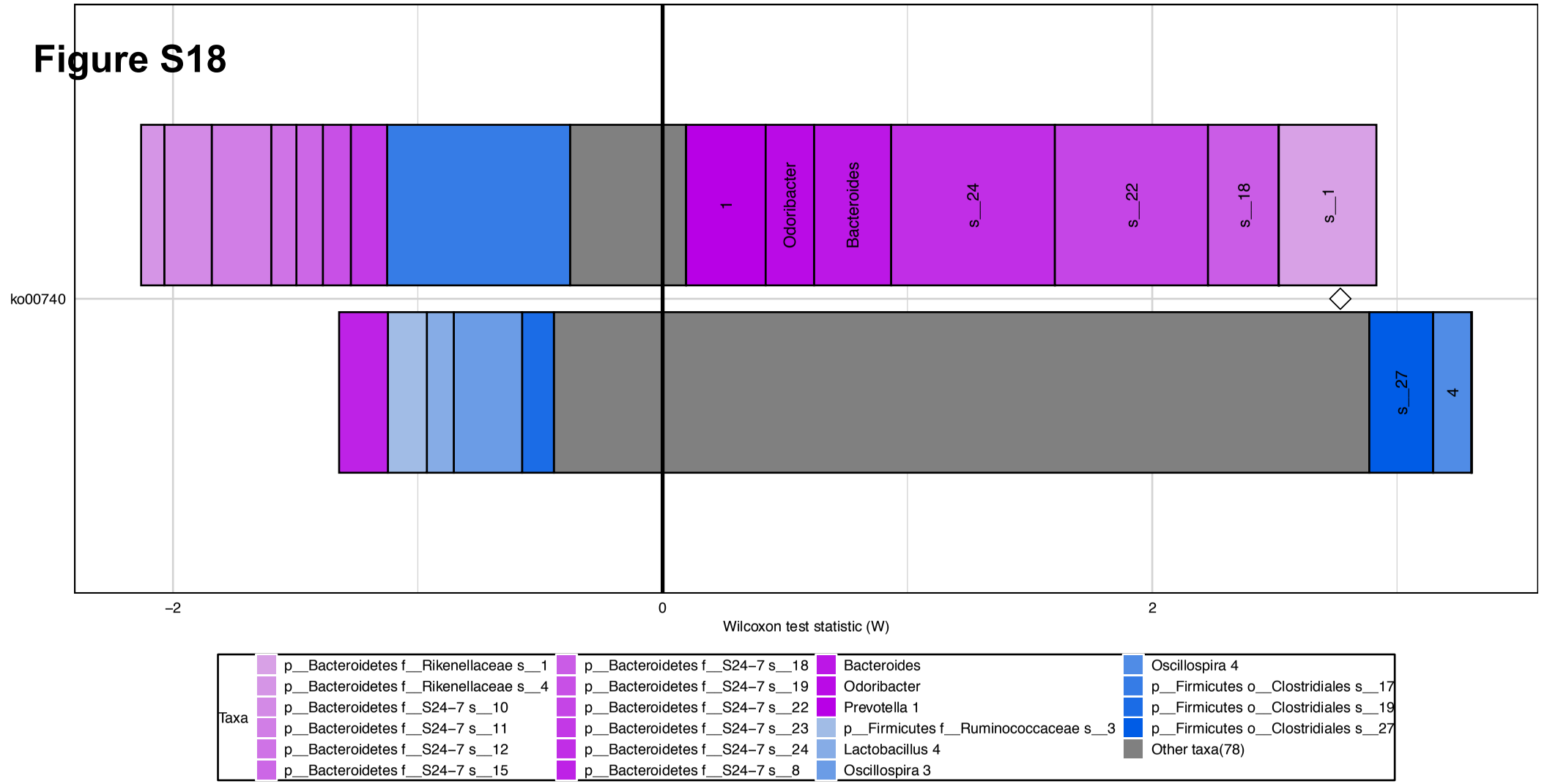

ko00740
1
Odoribacter
Bacteroides
s__24
s__22
s__18
s__1
s__27
4
−2
0
2
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__8
Bacteroides
Odoribacter
Prevotella 1
p__Firmicutes f__Ruminococcaceae s__3
Lactobacillus 4
Oscillospira 3
Oscillospira 4
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__27
Other taxa(78)

Figure S19

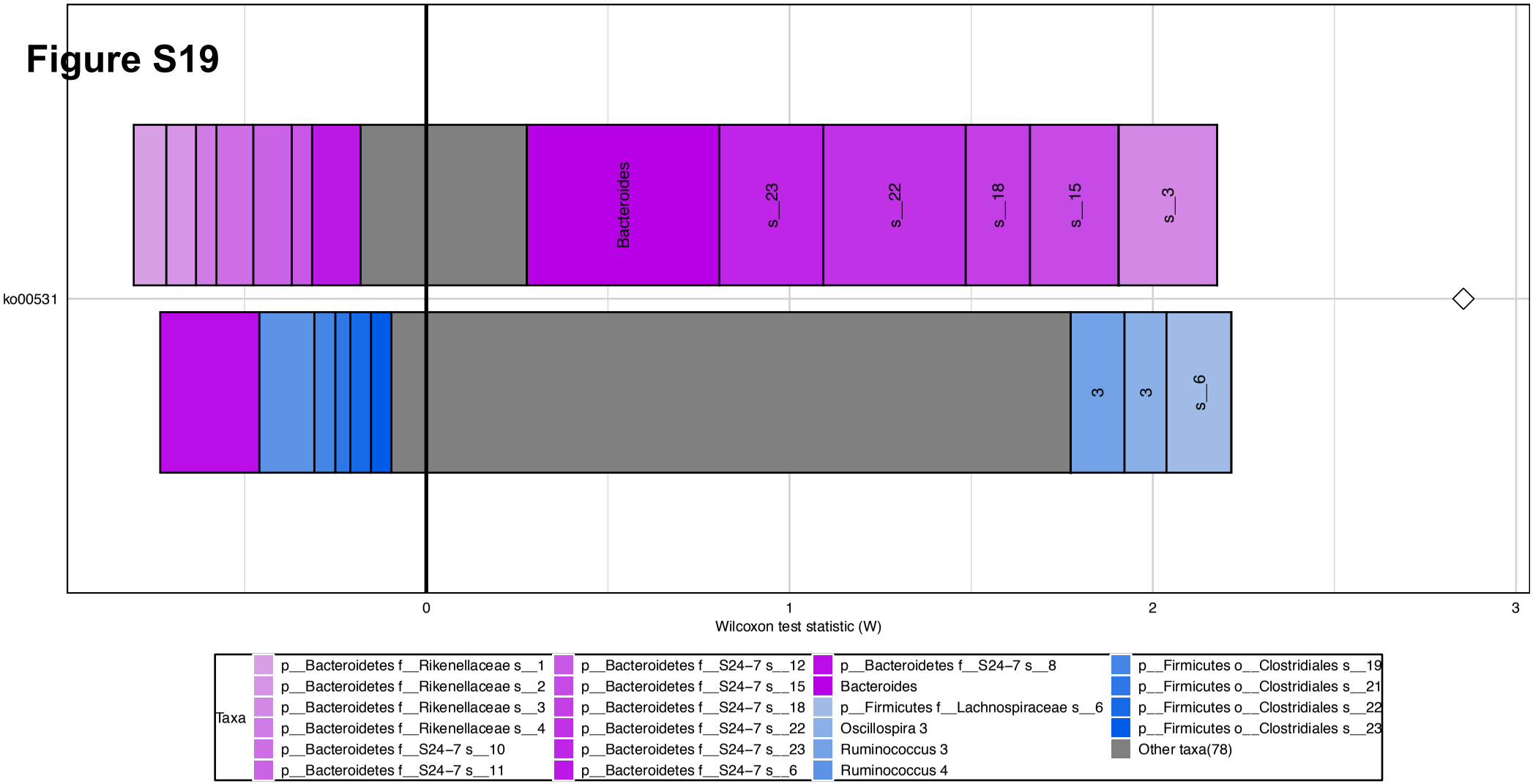

ko00531
Bacteroides
s__23
s__22
s__18
s__15
s__3
3
3
s__6
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__3
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__8
Bacteroides
p__Firmicutes f__Lachnospiraceae s__6
Oscillospira 3
Ruminococcus 3
Ruminococcus 4
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__21
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__23
Other taxa(78)

Figure S20

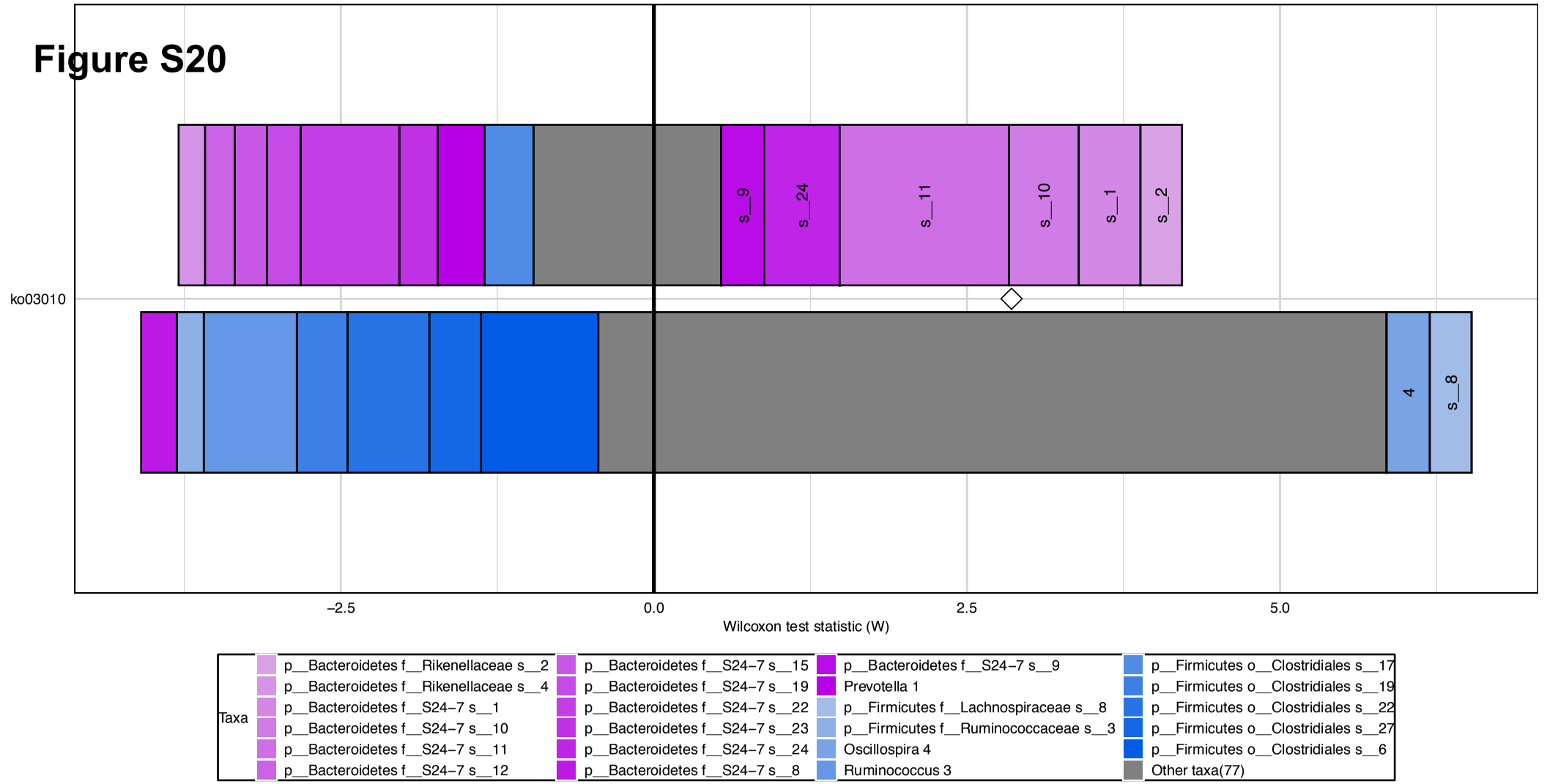
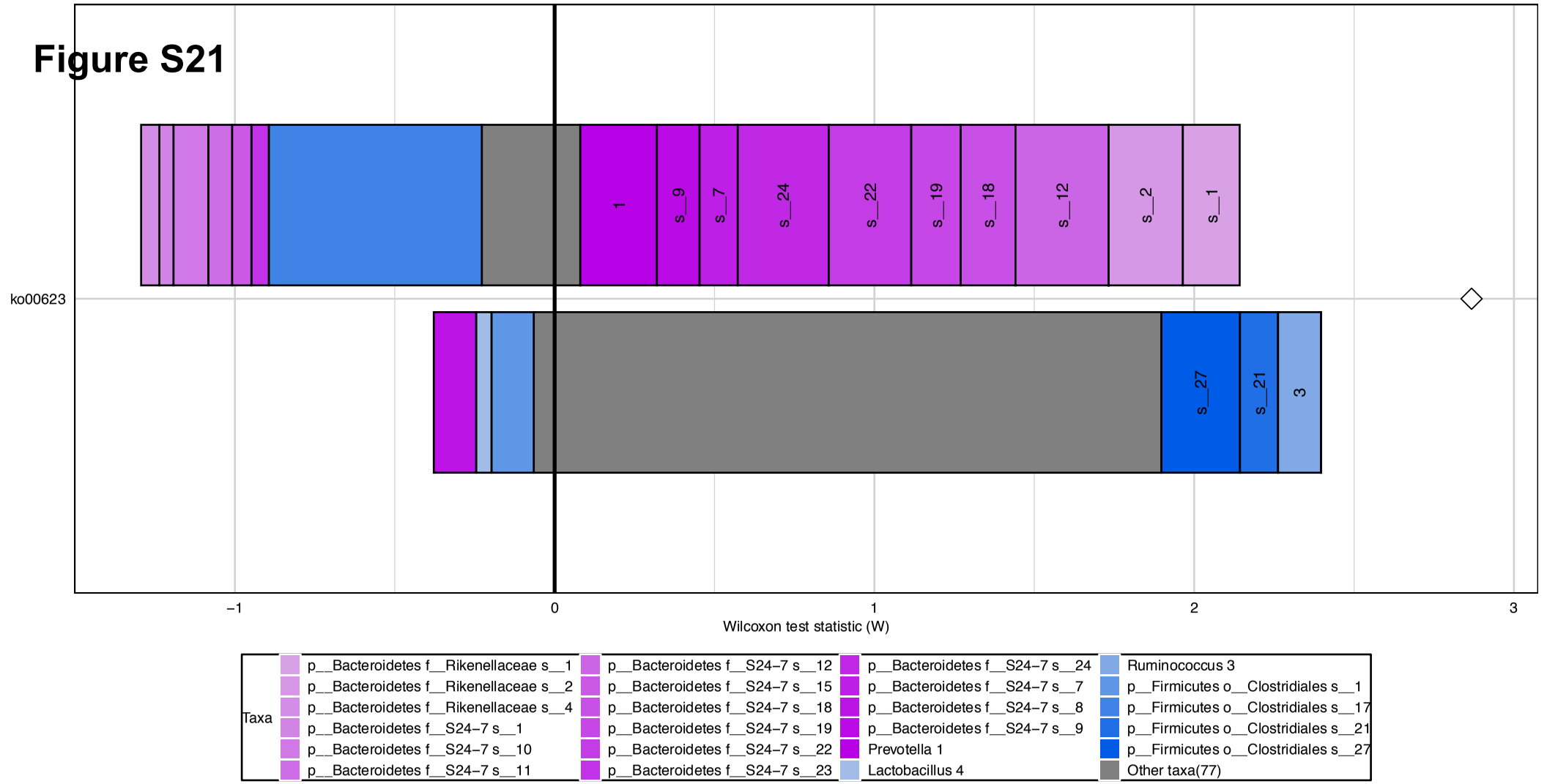

ko03010
s__9
s__24
s__11
s__10
s__1
s__2
4
s__8
−2.5
0.0
2.5
5.0
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__8
p__Firmicutes f__Ruminococcaceae s__3
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(77)

Figure S21


ko00623
1
s__9
s__7
s__24
s__22
s__19
s__18
s__12
s__2
s__1
s__27
s__21
3
−1
0
1
2
3
Wilcoxon test statistic (W)

Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__7
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Prevotella 1
Lactobacillus 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__21
p__Firmicutes o__Clostridiales s__27
Other taxa(77)

Figure S22

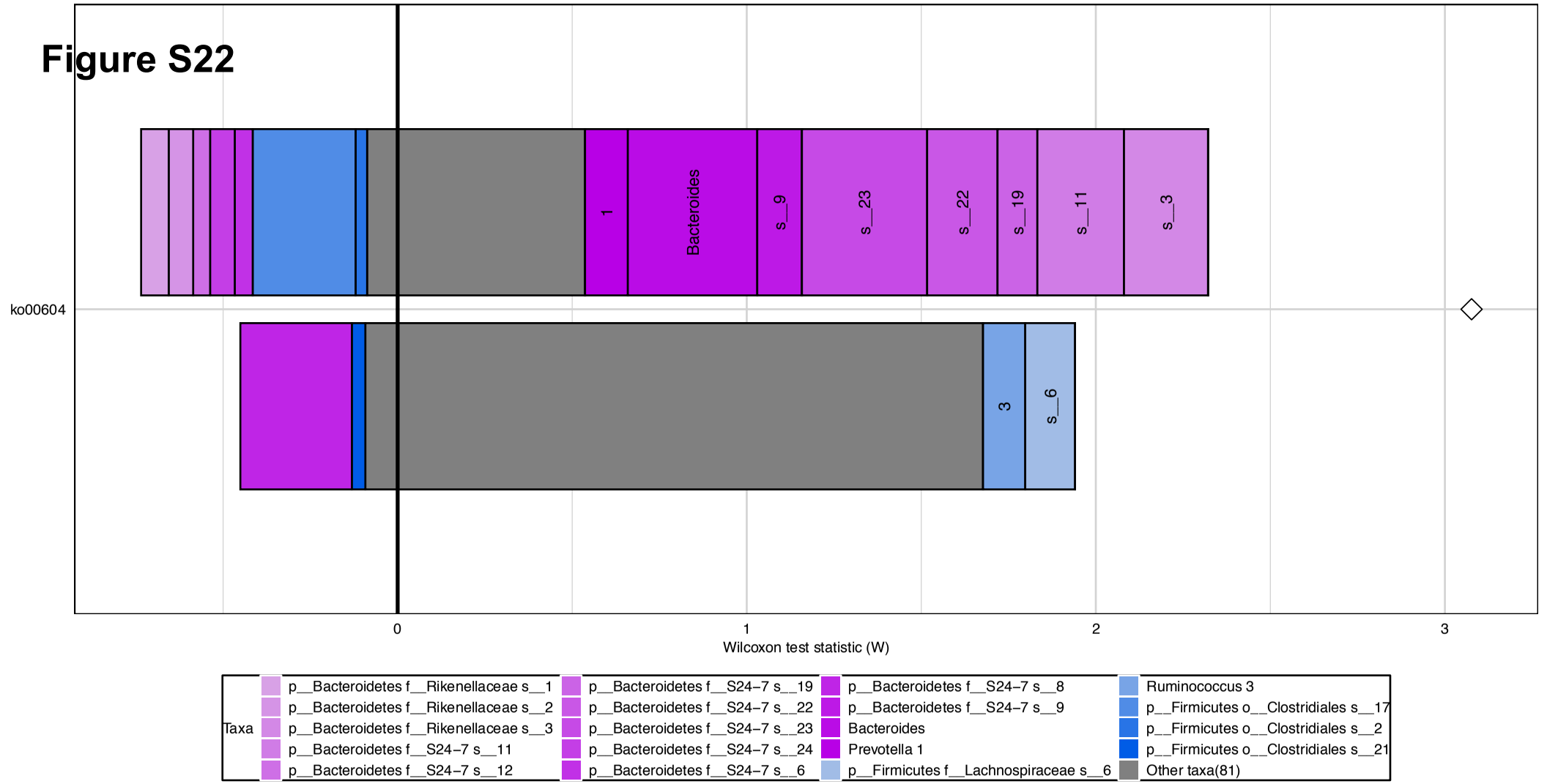

ko00604
1
Bacteroides
s__9
s__23
s__22
s__19
s__11
s__3
3
s__6
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__3
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__2
p__Firmicutes o__Clostridiales s__21
Other taxa(81)

Figure S23

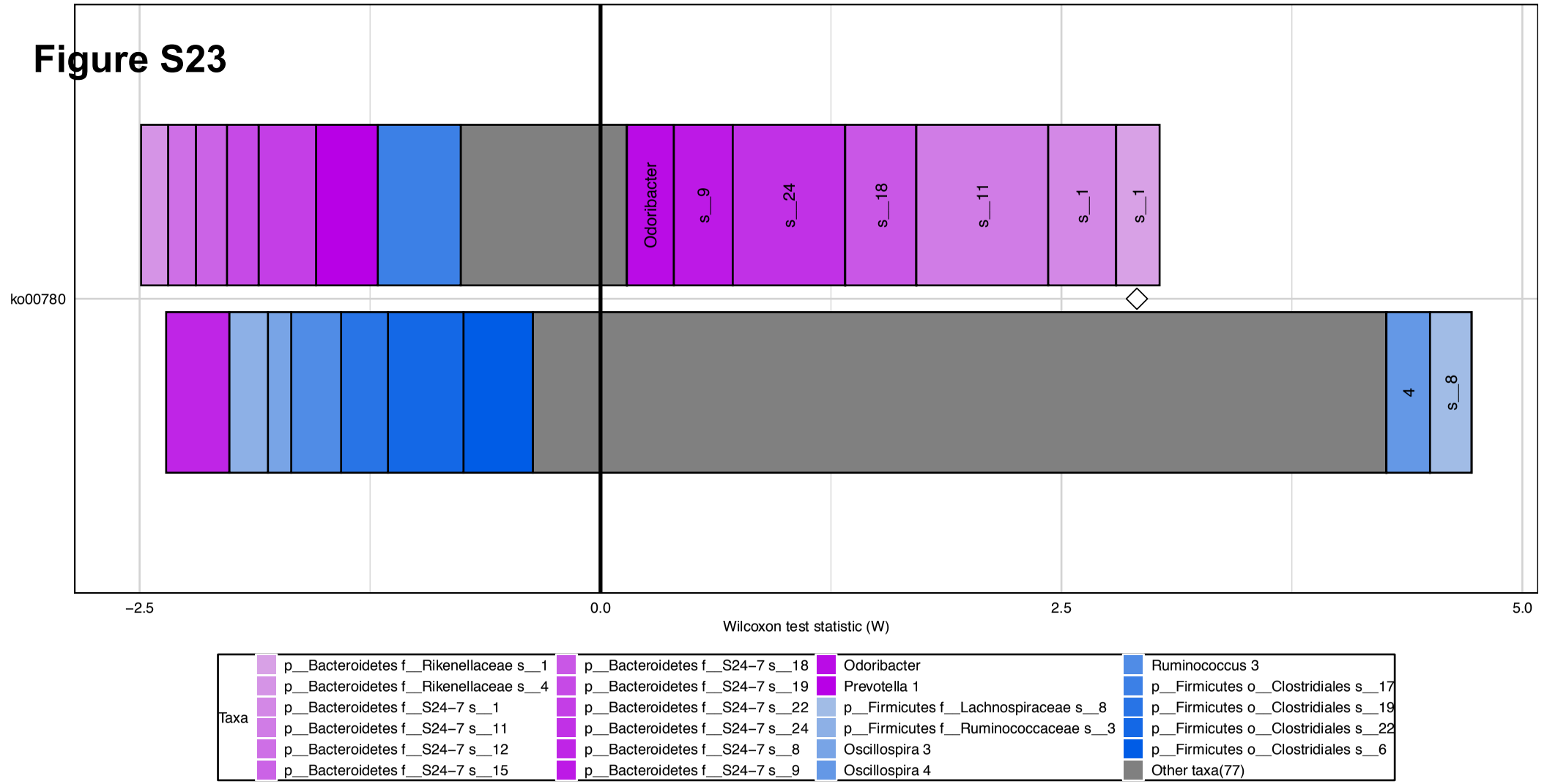

Odoribacter
s__9
s__24
s__18
s__11
s__1
s__1
ko00780
4
s__8
−2.5
0.0
2.5
5.0
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Odoribacter
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__8
p__Firmicutes f__Ruminococcaceae s__3
Oscillospira 3
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__6
Other taxa(77)

Figure S24

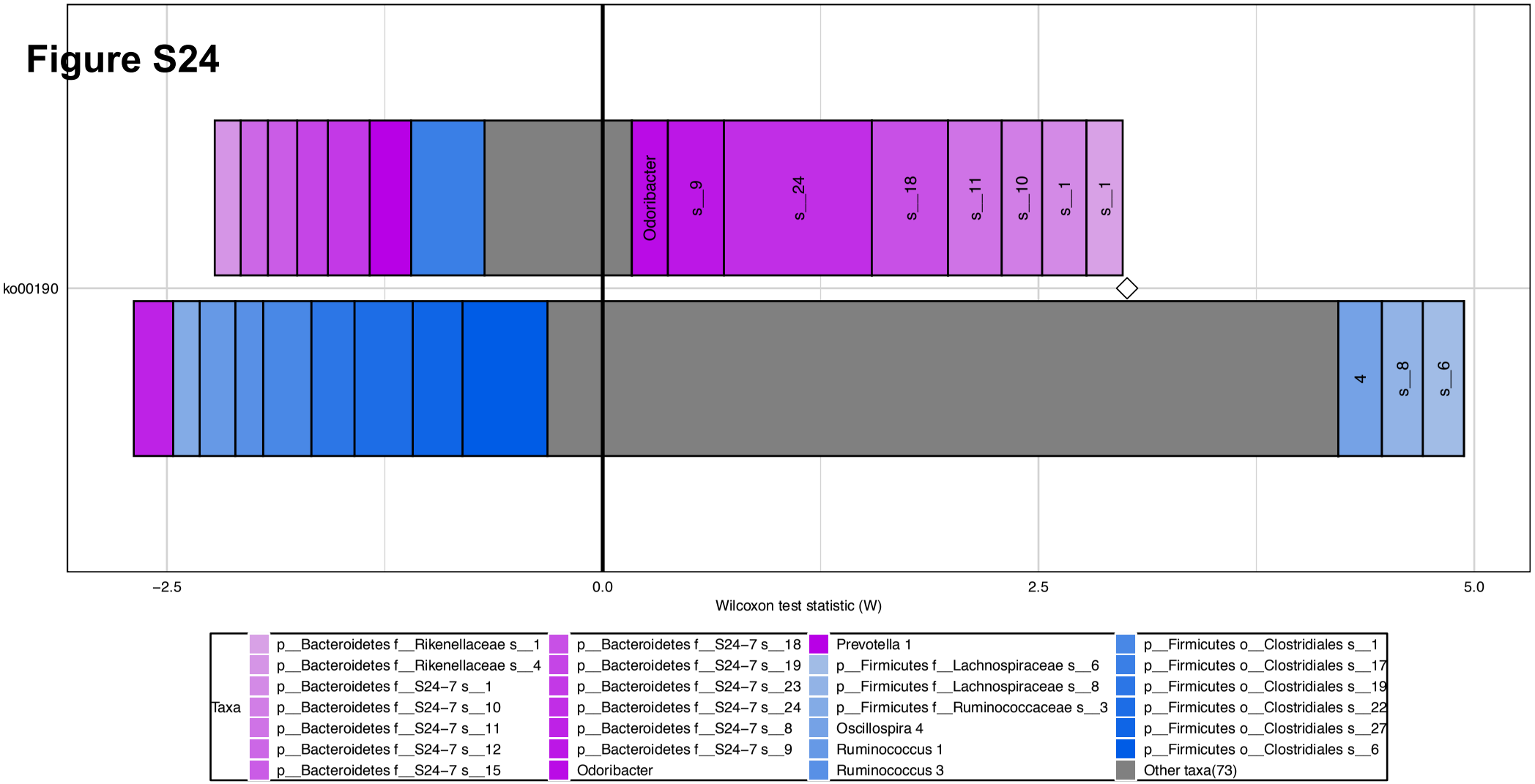
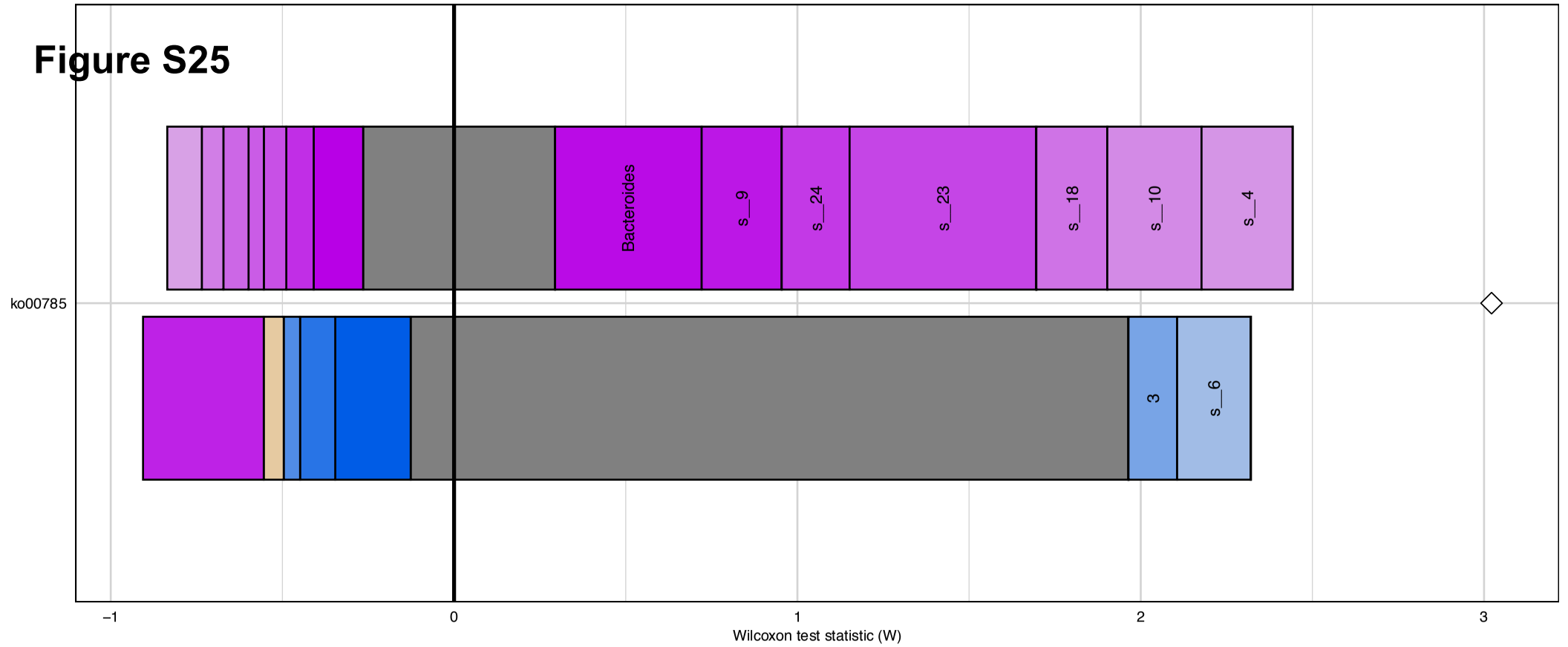

ko00190
Odoribacter
s__9
s__24
s__18
s__11
s__10
s__1
s__1
4
s__8
s__6
−2.5
0.0
2.5
5.0
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Odoribacter
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__8
p__Firmicutes f__Ruminococcaceae s__3
Oscillospira 4
Ruminococcus 1
Ruminococcus 3
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(73)

Figure S25


Bacteroides
s__9
s__24
s__23
s__18
s__10
s__4
3
s__6
ko00785
−1
0
1
2
3
Wilcoxon test statistic (W)

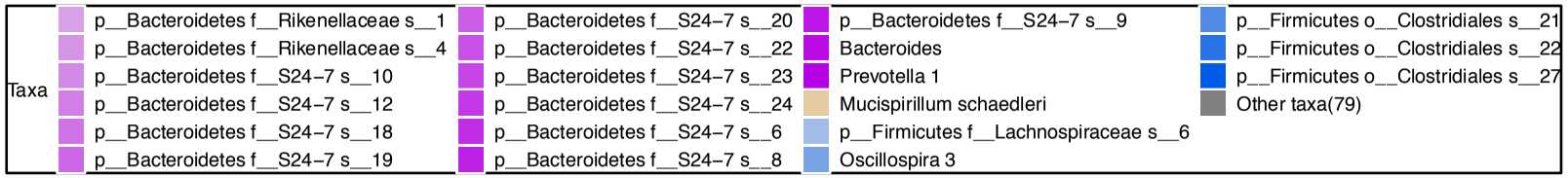

Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Prevotella 1
Mucispirillum schaedleri
p__Firmicutes f__Lachnospiraceae s__6
Oscillospira 3
p__Firmicutes o__Clostridiales s__21
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
Other taxa(79)

Figure S26

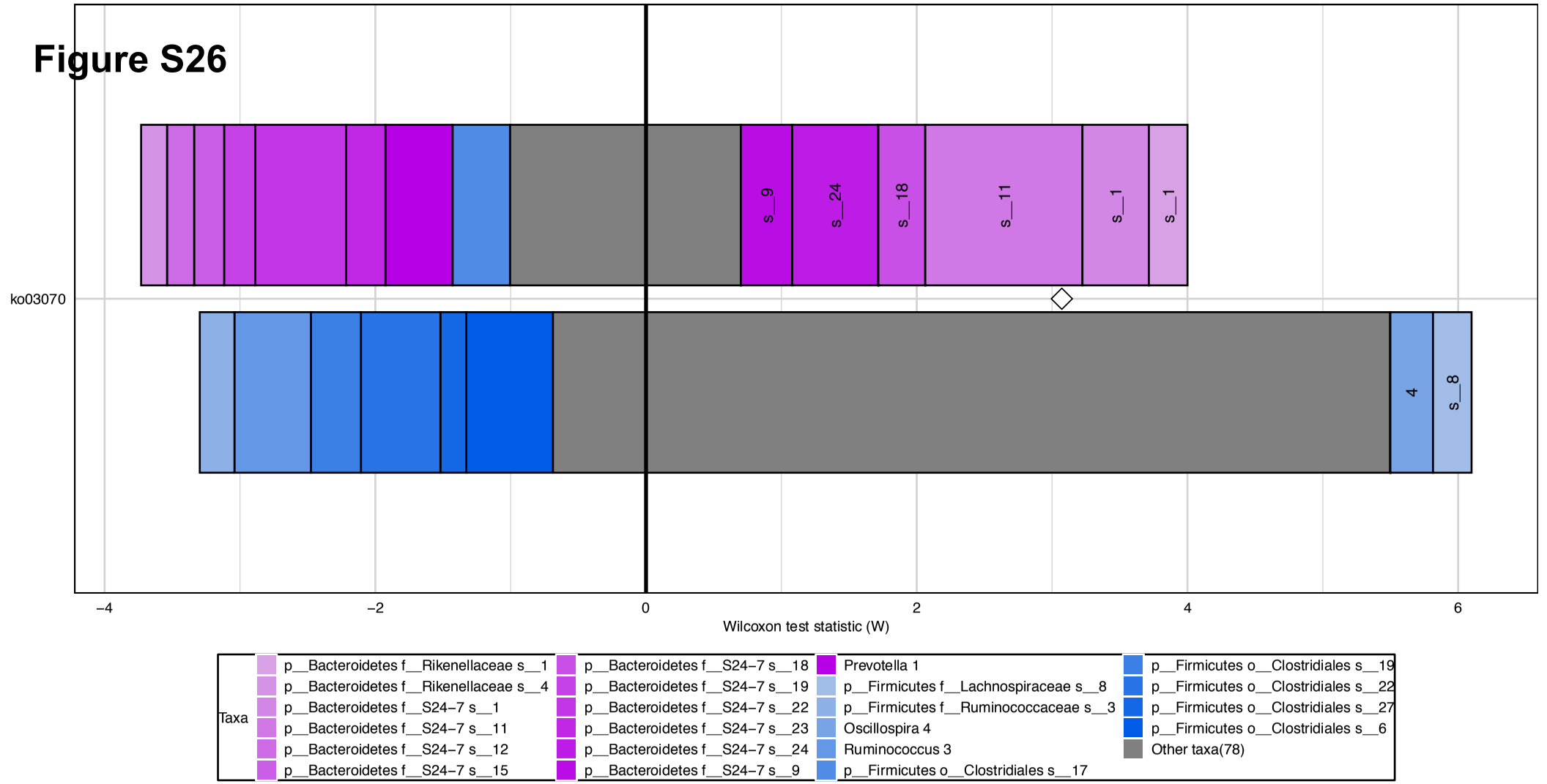

ko03070
s__9
s__24
s__18
s__11
s__1
s__1
4
s__8
−4
−2
0
2
4
6
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__9
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__8
p__Firmicutes f__Ruminococcaceae s__3
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(78)

Figure S27

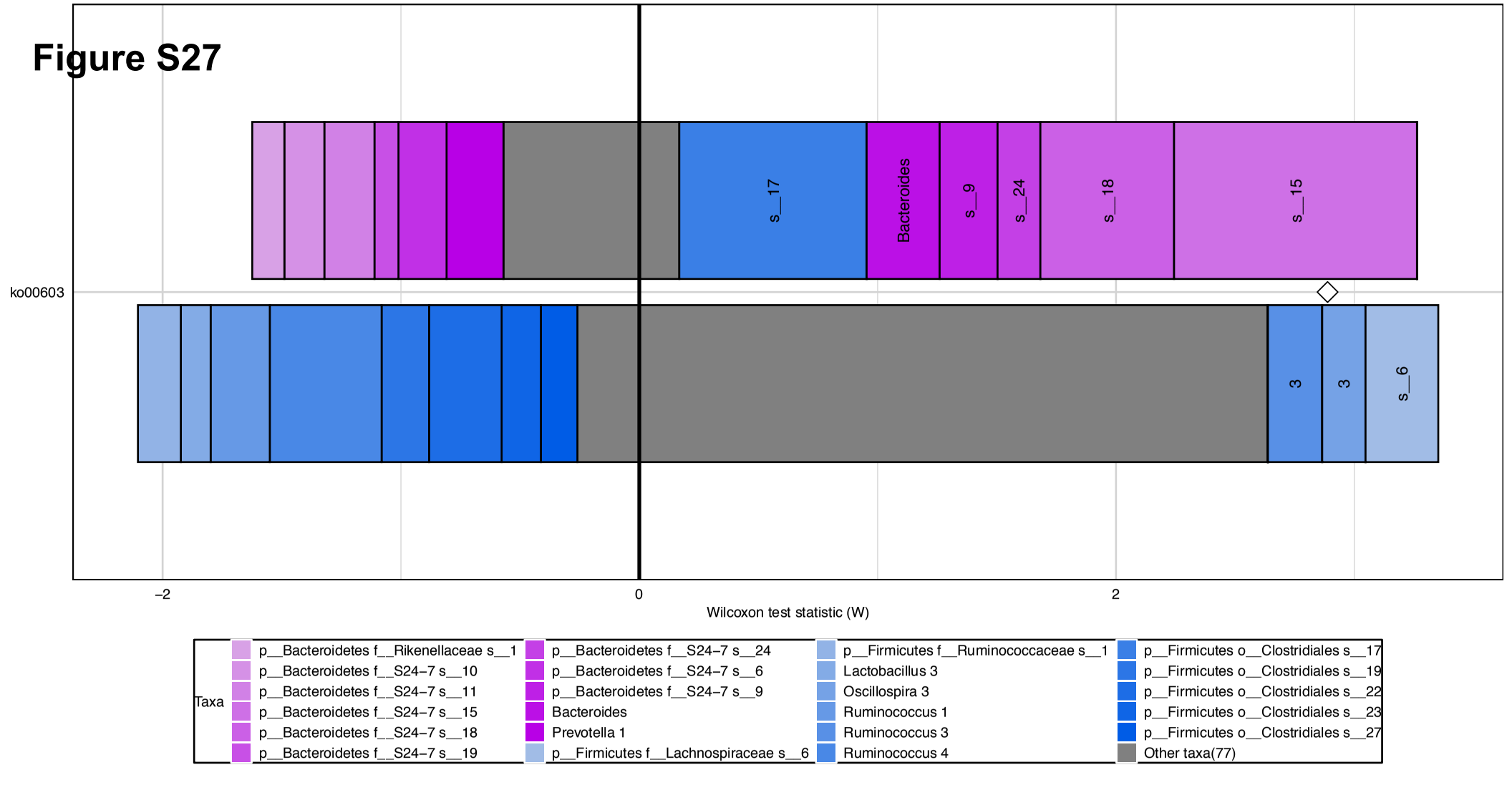

ko00603
s__17
Bacteroides
s__9
s__24
s__18
s__15
3
3
s__6
−2
0
2
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Ruminococcaceae s__1
Lactobacillus 3
Oscillospira 3
Ruminococcus 1
Ruminococcus 3
Ruminococcus 4
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__23
p__Firmicutes o__Clostridiales s__27
Other taxa(77)

Figure S28

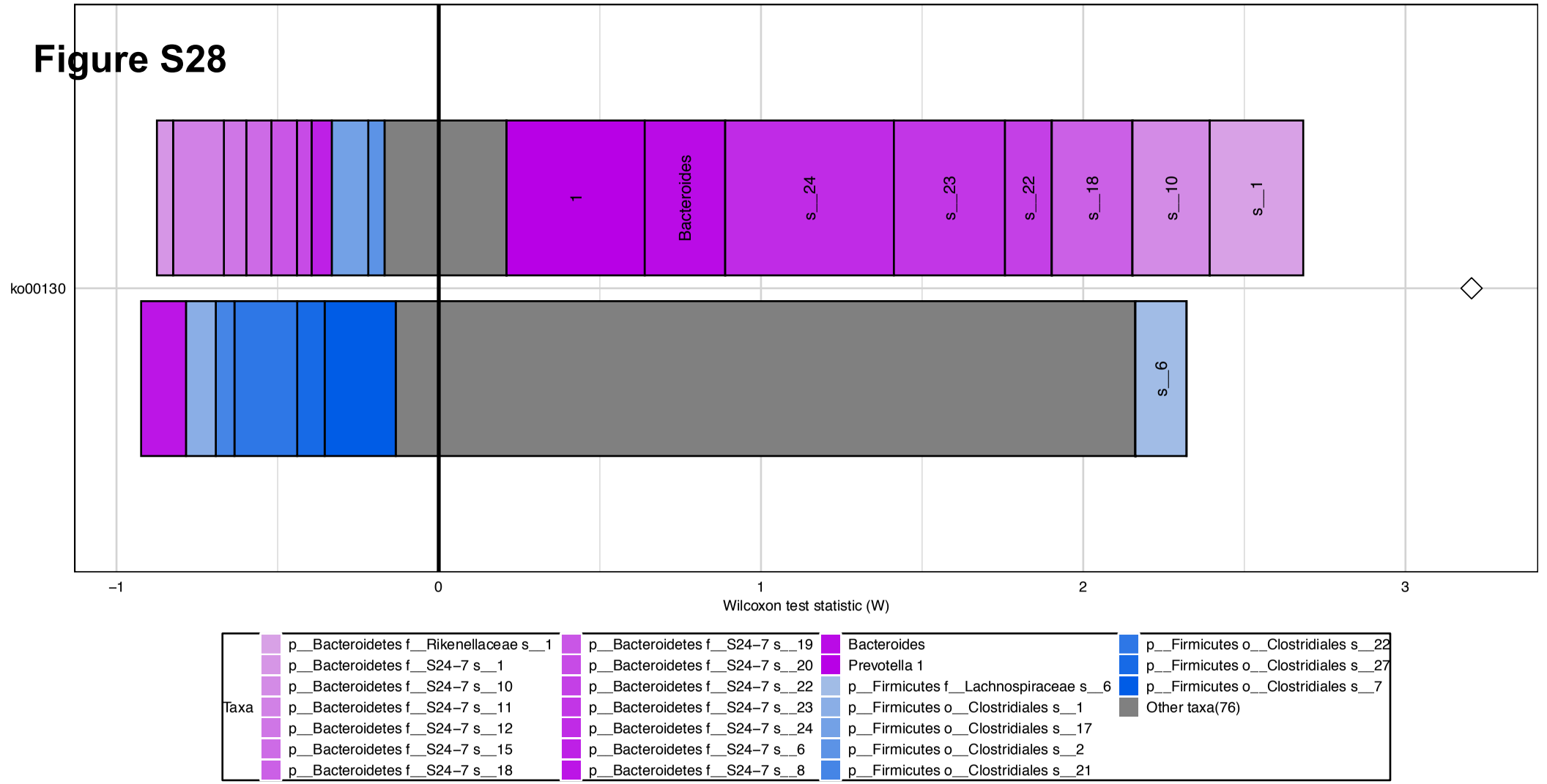

ko00130
1
Bacteroides
s__24
s__23
s__22
s__18
s__10
s__1
s__6
−1
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__8
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__2
p__Firmicutes o__Clostridiales s__21
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__7
Other taxa(76)

Figure S29

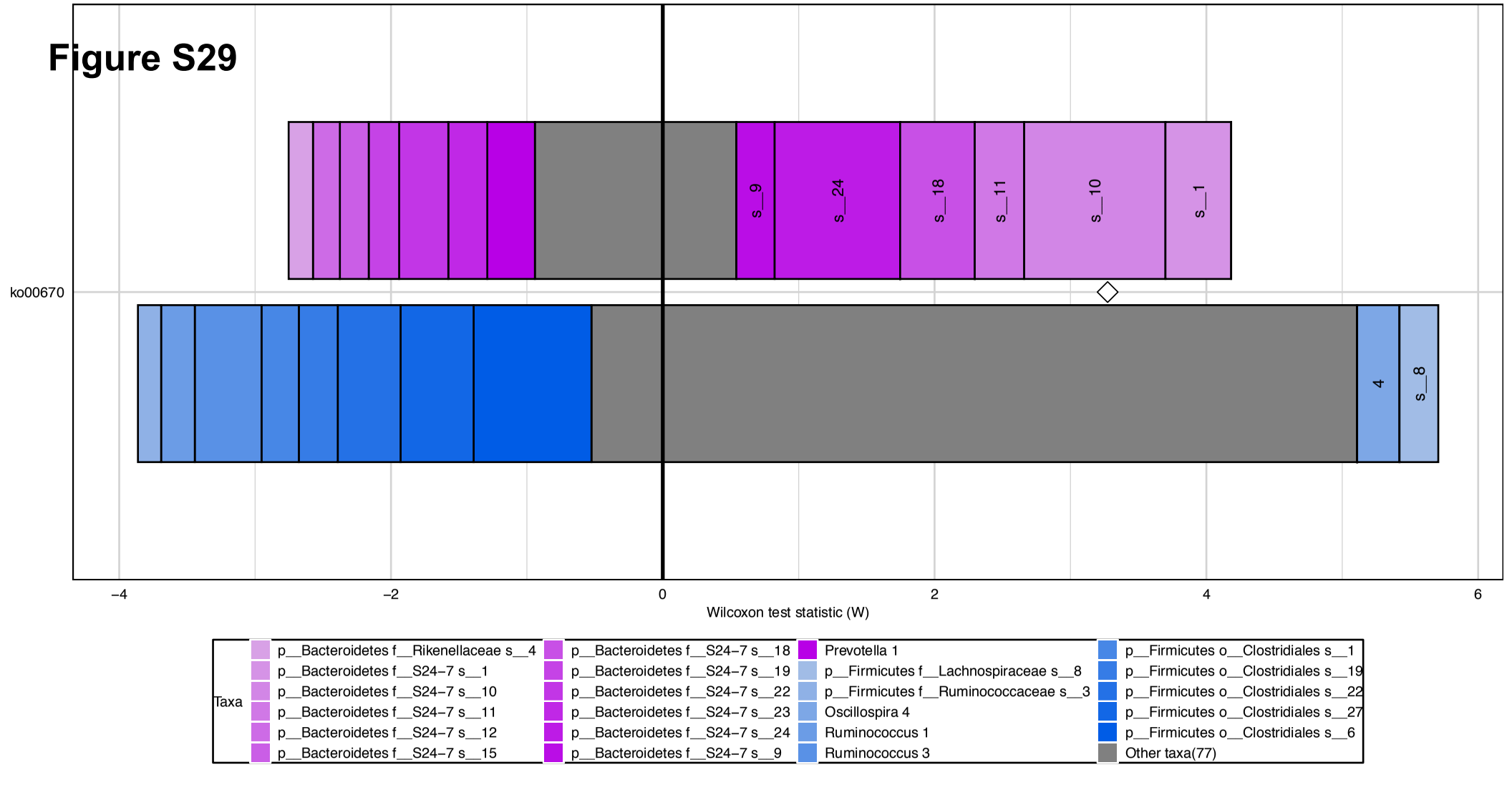

ko00670
s__9
s__24
s__18
s__11
s__10
s__1
4
s__8
−4
−2
0
2
4
6
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__9
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__8
p__Firmicutes f__Ruminococcaceae s__3
Oscillospira 4
Ruminococcus 1
Ruminococcus 3
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(77)

Figure S30

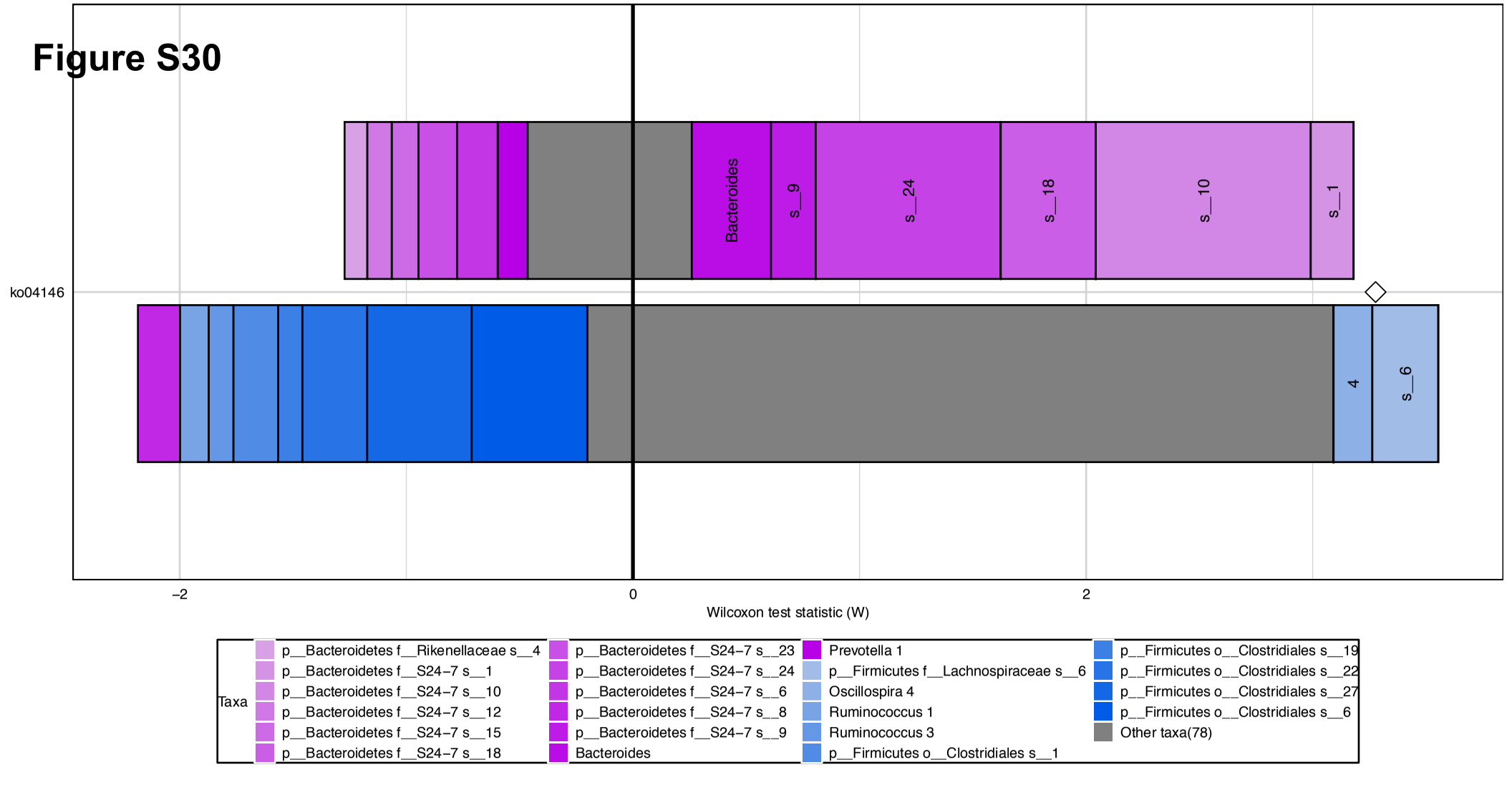

Bacteroides
s__9
s__24
s__18
s__10
s__1
4
s__6
ko04146
−2
0
2
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
Oscillospira 4
Ruminococcus 1
Ruminococcus 3
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(78)

Figure S31

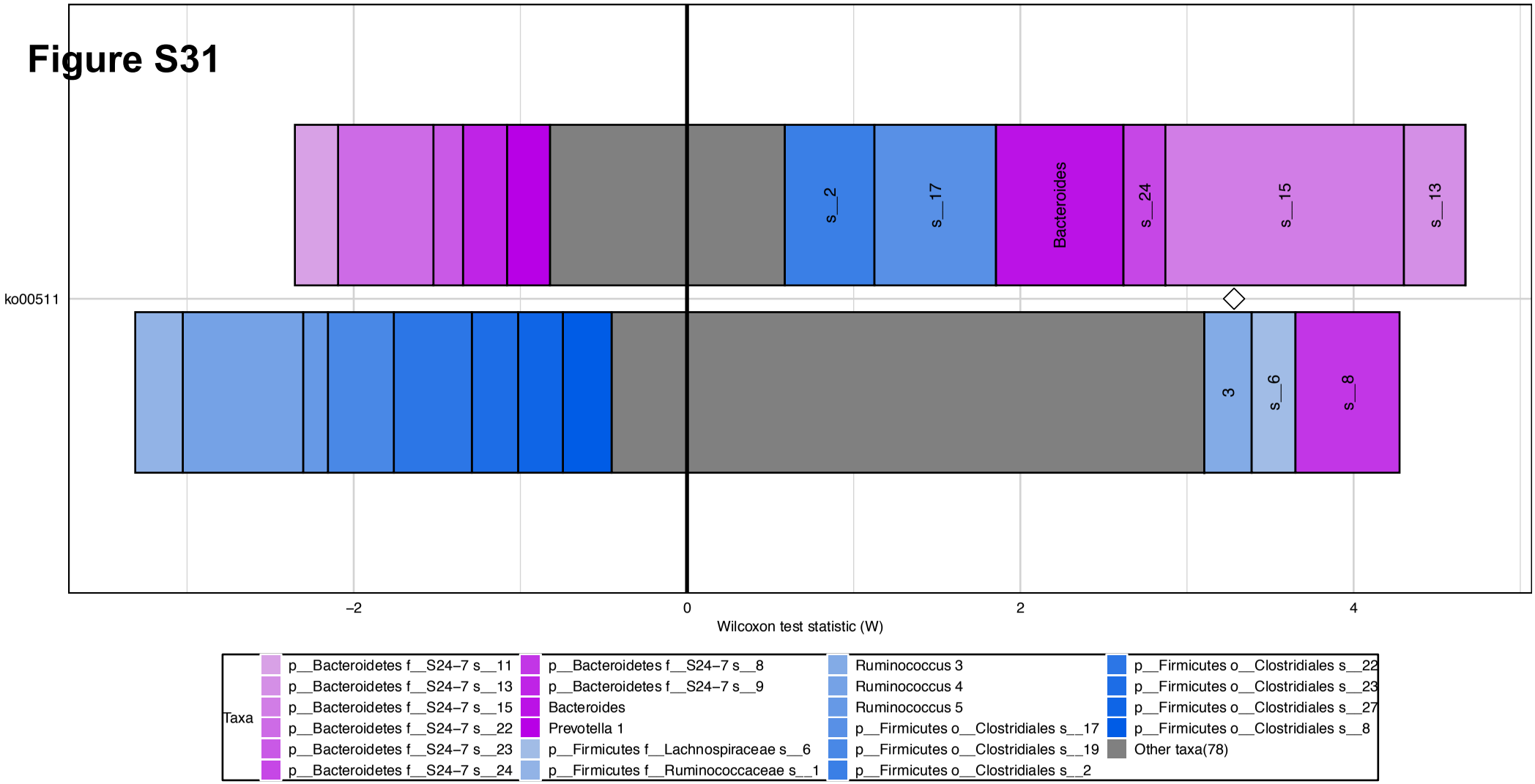

ko00511
s__2
s__17
Bacteroides
s__24
s__15
s__13
3
s__6
s__8
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__13
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Ruminococcaceae s__1
Ruminococcus 3
Ruminococcus 4
Ruminococcus 5
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__2
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__23
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__8
Other taxa(78)

Figure S32

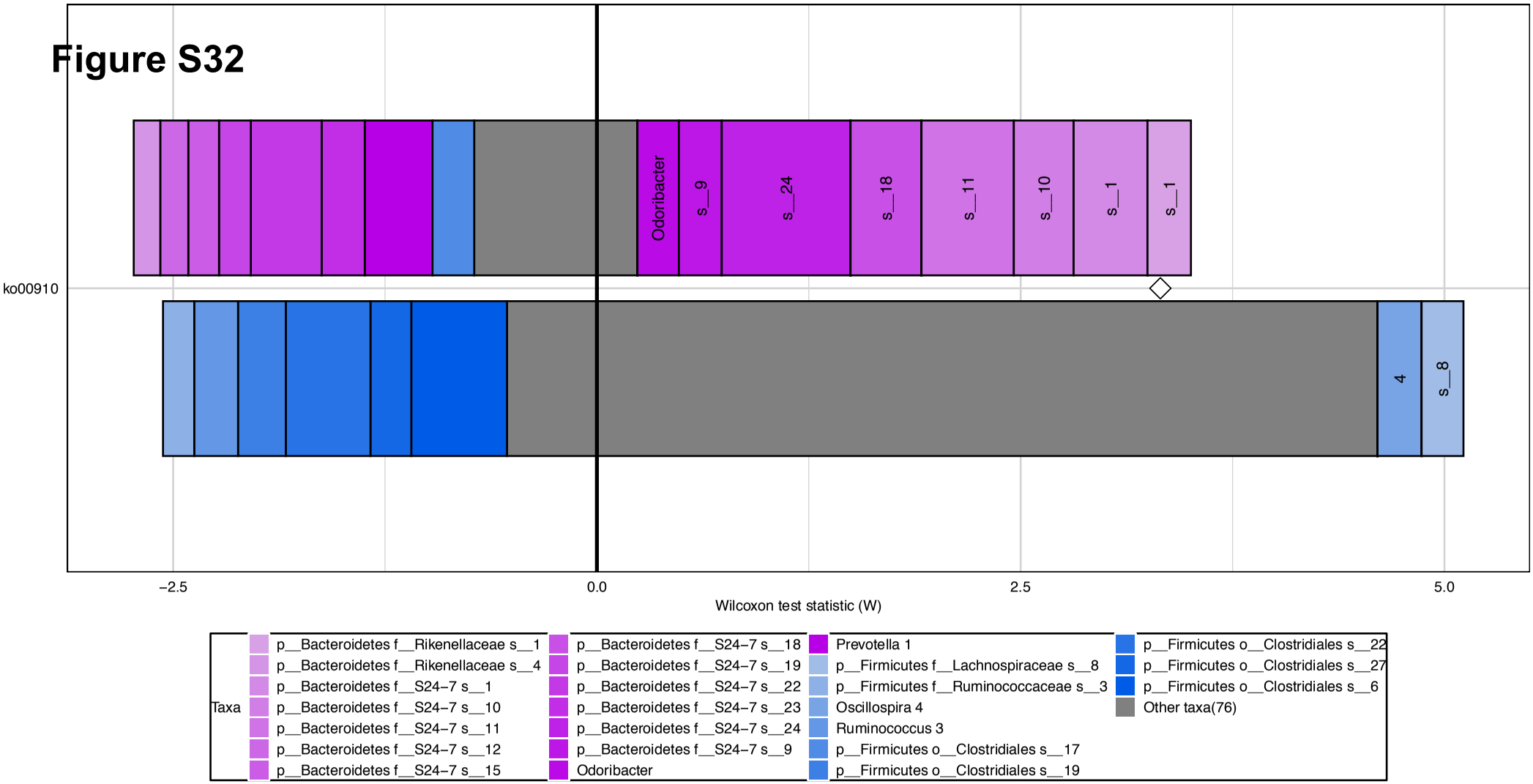

ko00910
Odoribacter
s__9
s__24
s__18
s__11
s__10
s__1
s__1
4
s__8
−2.5
0.0
2.5
5.0
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__9
Odoribacter
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__8
p__Firmicutes f__Ruminococcaceae s__3
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(76)

Figure S33

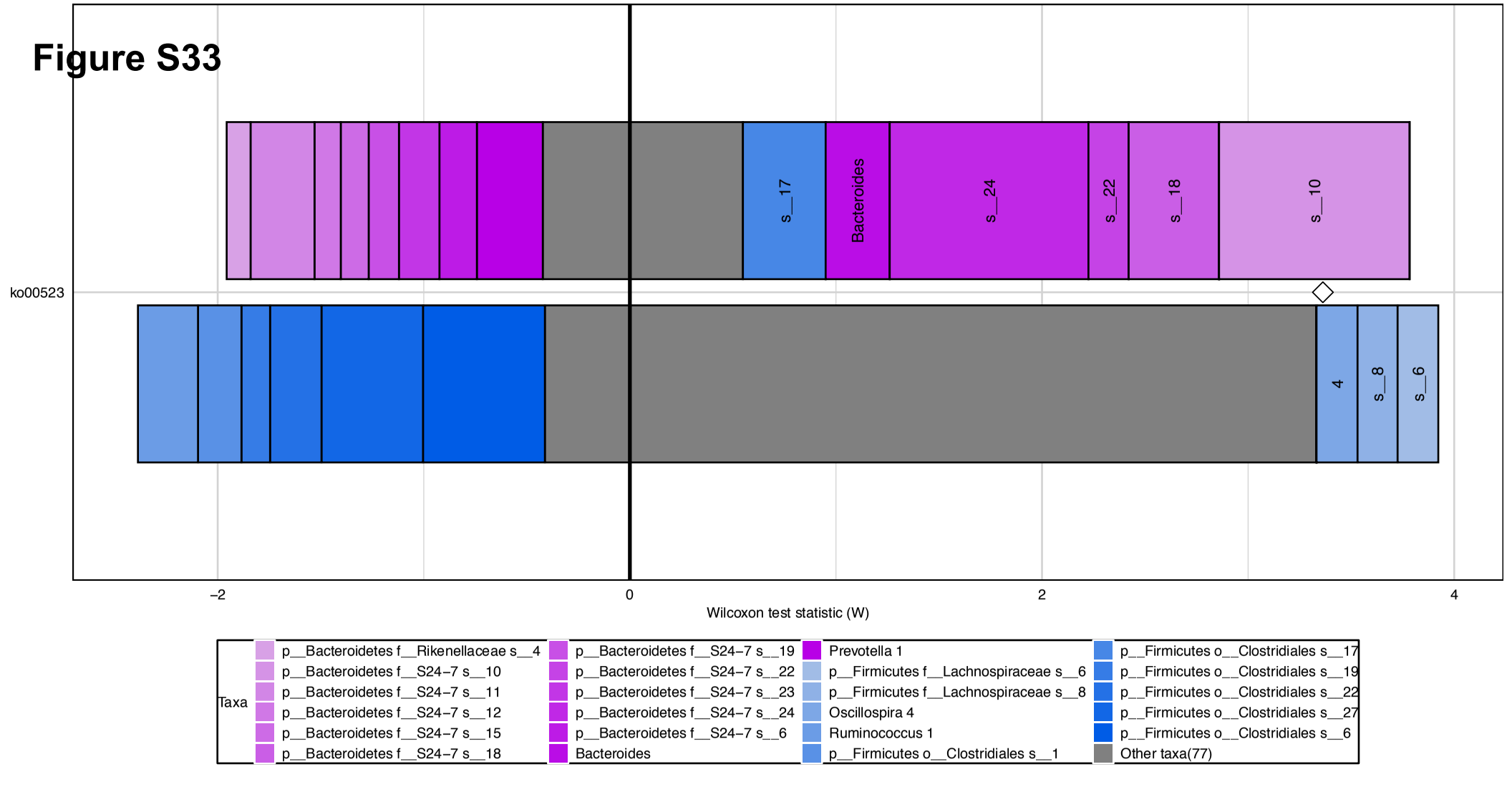

ko00523
s__17
Bacteroides
s__24
s__22
s__18
s__10
4
s__8
s__6
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__8
Oscillospira 4
Ruminococcus 1
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(77)

Figure S34

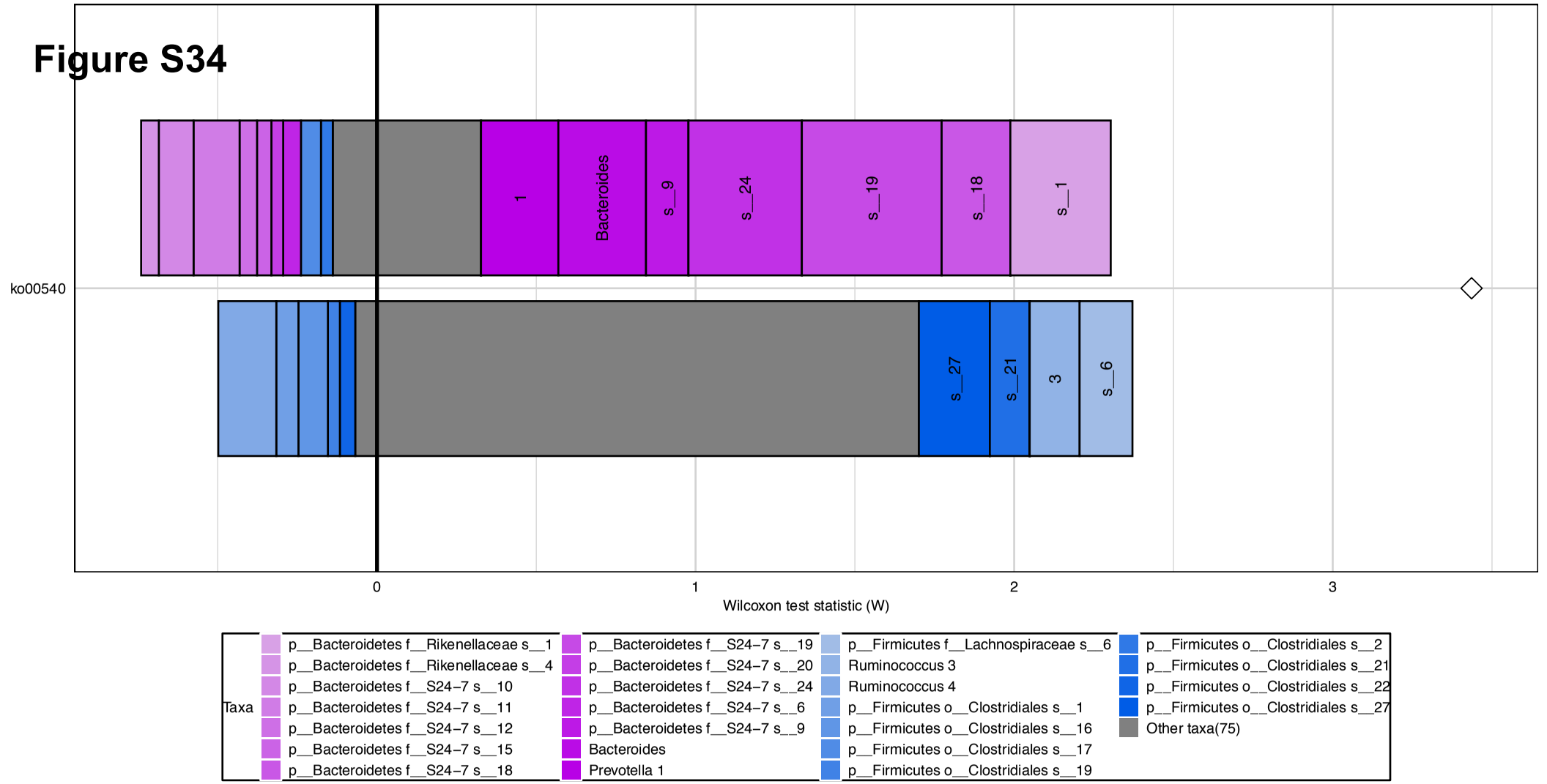

ko00540
1
Bacteroides
s__9
s__24
s__19
s__18
s__1
s__27
s__21
3
s__6
0
1
2
3
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__20
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
Ruminococcus 3
Ruminococcus 4
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__16
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__2
p__Firmicutes o__Clostridiales s__21
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
Other taxa(75)

Figure S35

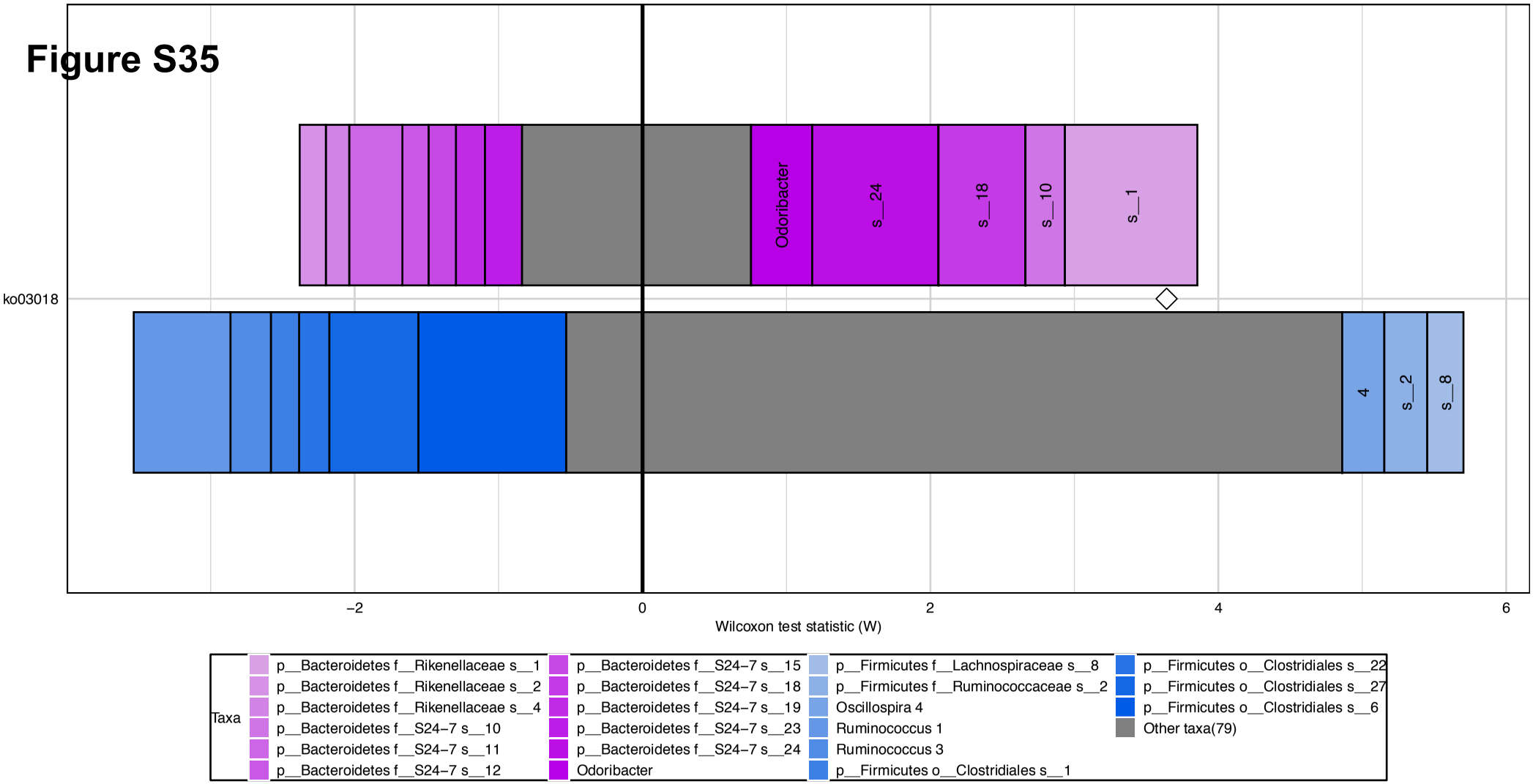

ko03018
Odoribacter
s__24
s__18
s__10
s__1
4
s__2
s__8
−2
0
2
4
6
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__1
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
Odoribacter
p__Firmicutes f__Lachnospiraceae s__8
p__Firmicutes f__Ruminococcaceae s__2
Oscillospira 4
Ruminococcus 1
Ruminococcus 3
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(79)

Figure S36

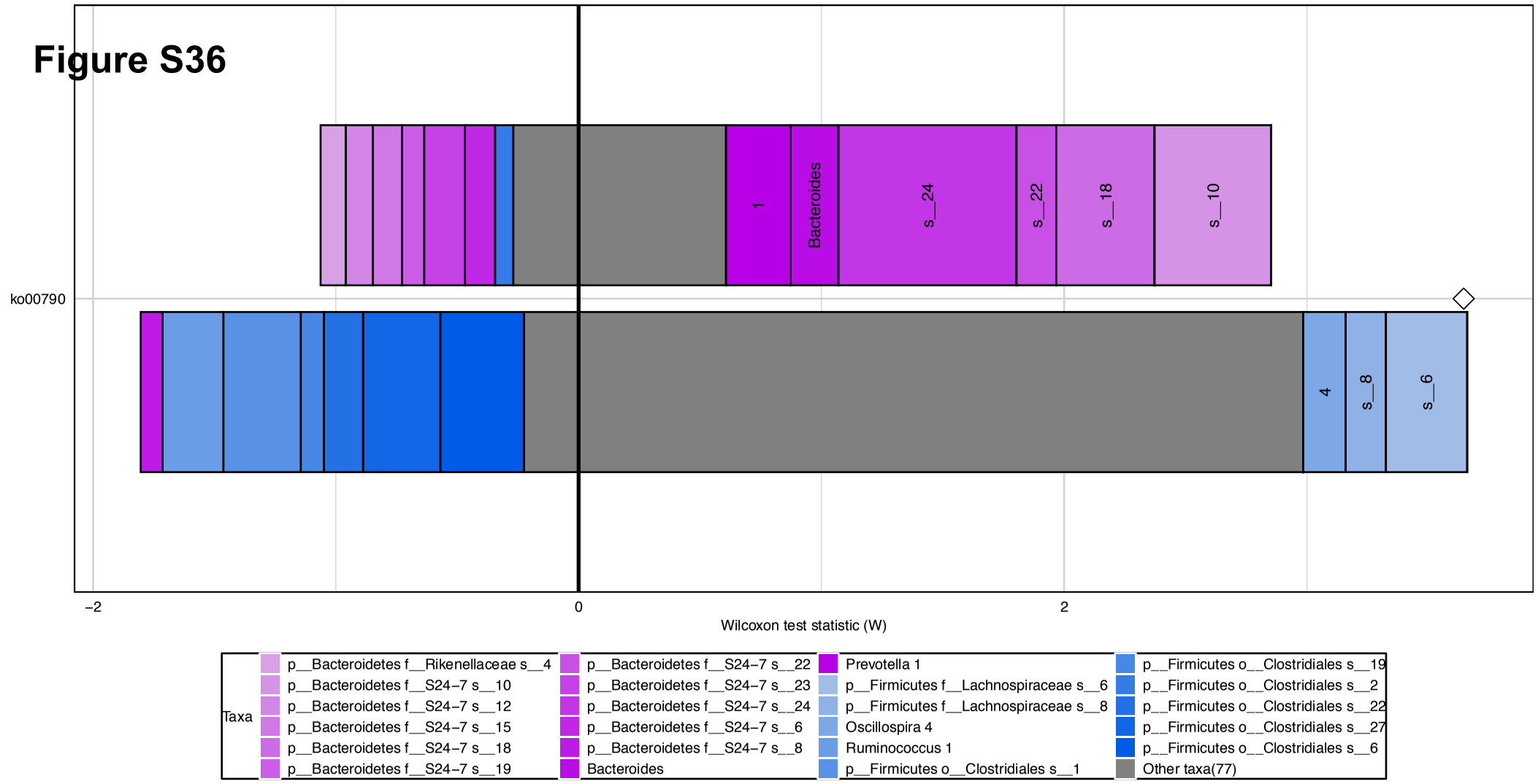

ko00790
1
Bacteroides
s__24
s__22
s__18
s__10
4
s__8
s__6
−2
0
2
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__8
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__8
Oscillospira 4
Ruminococcus 1
p__Firmicutes o__Clostridiales s__1
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__2
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(77)

Figure S37

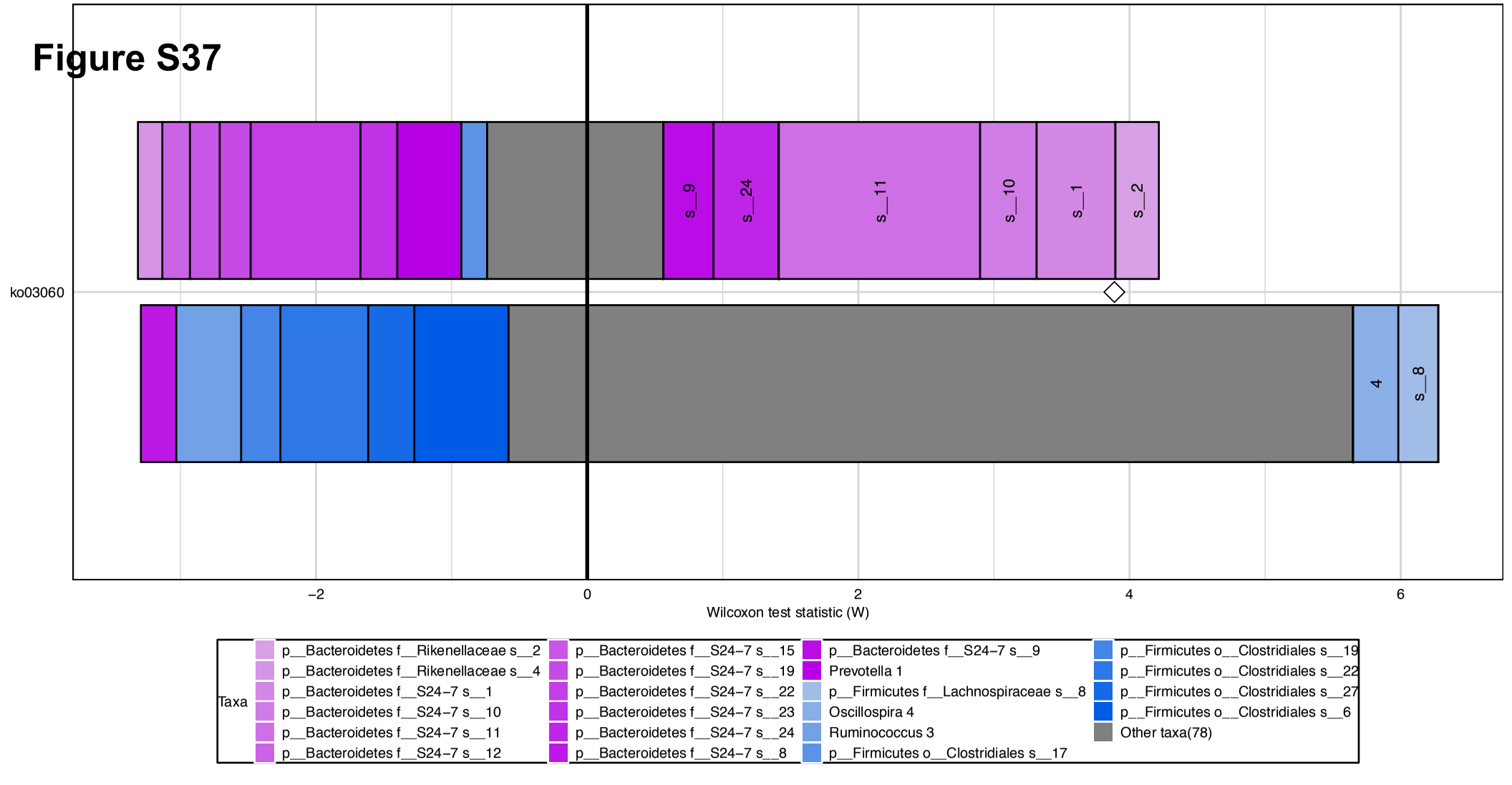

ko03060
s__9
s__24
s__11
s__10
s__1
s__2
4
s__8
−2
0
2
4
6
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__2
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__8
p__Bacteroidetes f__S24−7 s__9
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__8
Oscillospira 4
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(78)

Figure S38

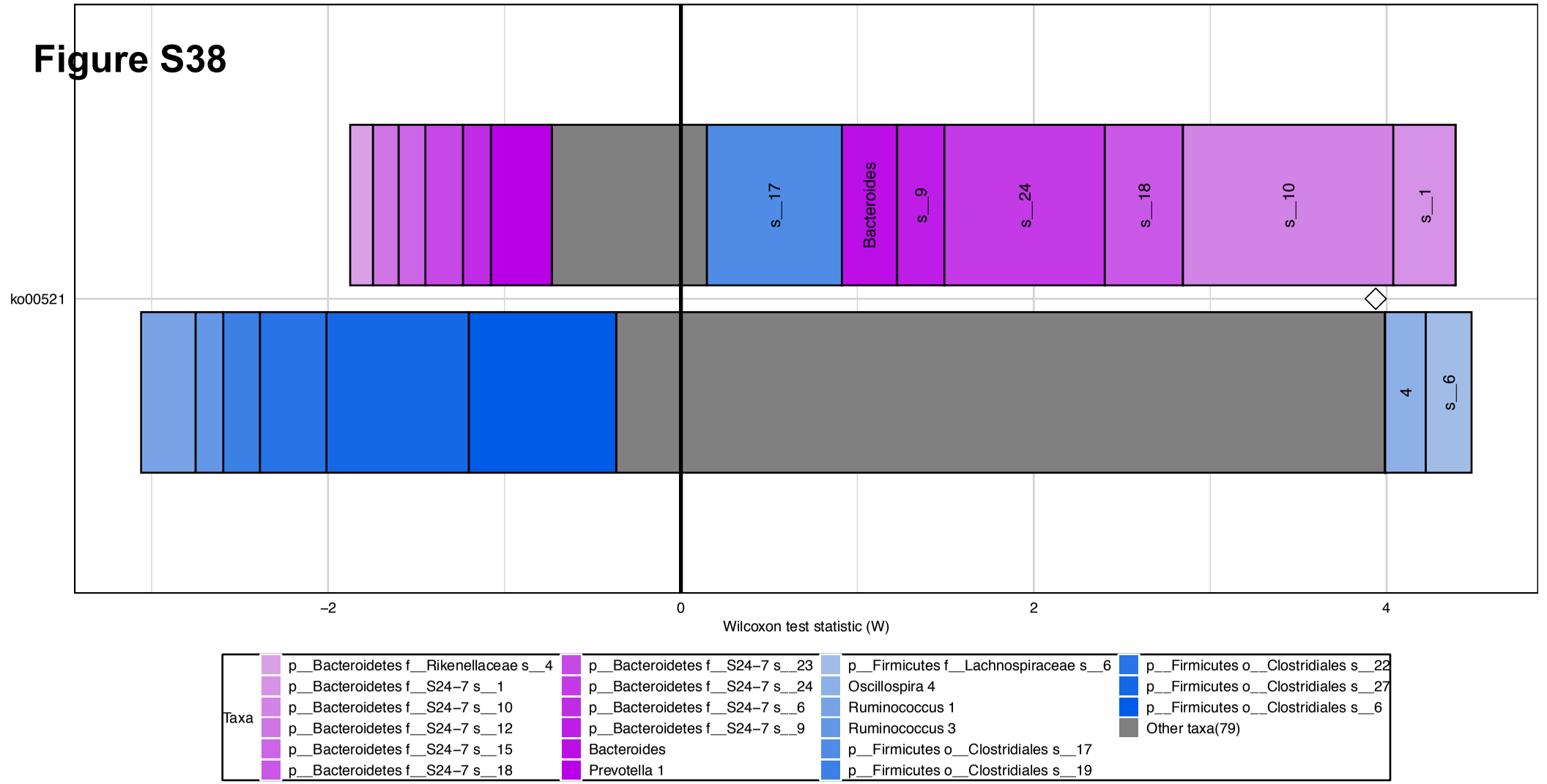
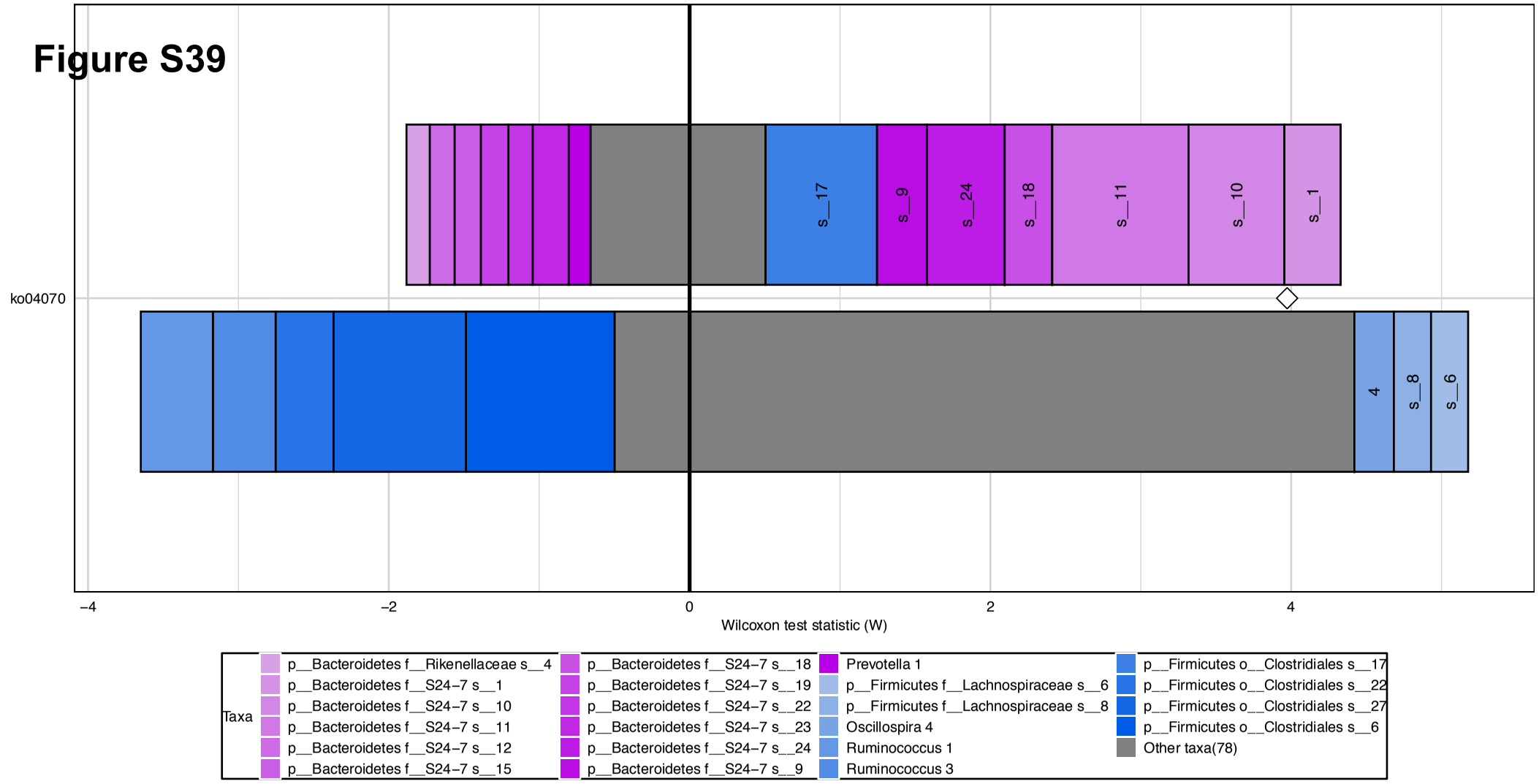

ko00521
s__17
Bacteroides
s__9
s__24
s__18
s__10
s__1
4
s__6
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__6
p__Bacteroidetes f__S24−7 s__9
Bacteroides
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
Oscillospira 4
Ruminococcus 1
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__19
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(79)

Figure S39


ko04070
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s__9
s__24
s__18
s__11
s__10
s__1
4
s__8
s__6
−4
−2
0
2
4
Wilcoxon test statistic (W)
Taxa
p__Bacteroidetes f__Rikenellaceae s__4
p__Bacteroidetes f__S24−7 s__1
p__Bacteroidetes f__S24−7 s__10
p__Bacteroidetes f__S24−7 s__11
p__Bacteroidetes f__S24−7 s__12
p__Bacteroidetes f__S24−7 s__15
p__Bacteroidetes f__S24−7 s__18
p__Bacteroidetes f__S24−7 s__19
p__Bacteroidetes f__S24−7 s__22
p__Bacteroidetes f__S24−7 s__23
p__Bacteroidetes f__S24−7 s__24
p__Bacteroidetes f__S24−7 s__9
Prevotella 1
p__Firmicutes f__Lachnospiraceae s__6
p__Firmicutes f__Lachnospiraceae s__8
Oscillospira 4
Ruminococcus 1
Ruminococcus 3
p__Firmicutes o__Clostridiales s__17
p__Firmicutes o__Clostridiales s__22
p__Firmicutes o__Clostridiales s__27
p__Firmicutes o__Clostridiales s__6
Other taxa(78)