Metatranscriptomic analyses of plant cell wall polysaccharide degradation by microorganisms in cow rumen

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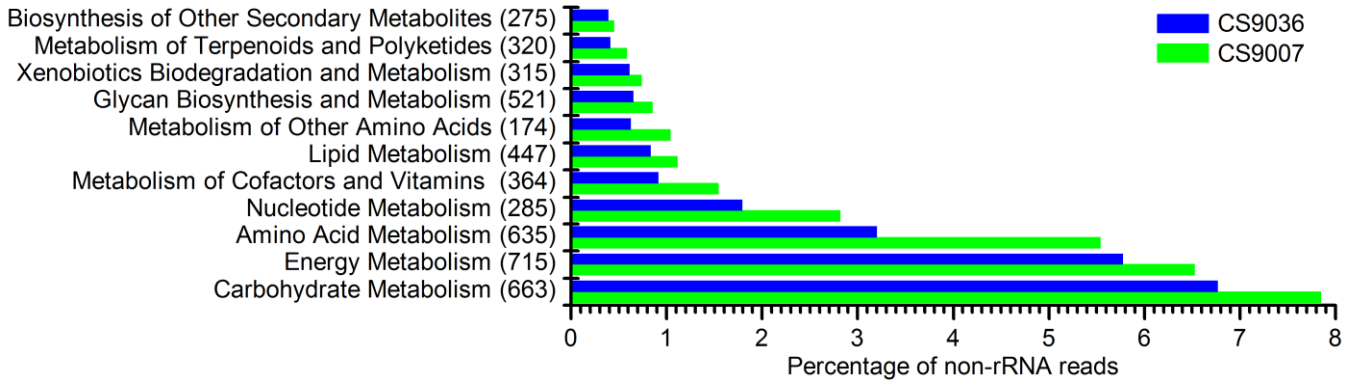

Fig S1. The profiling of KEGG metabolic pathways in the two rumen metatranscriptomes. The number inside parenthesis is the total number of KEGG Ortholog (KO) in the pathway in KEGG database.

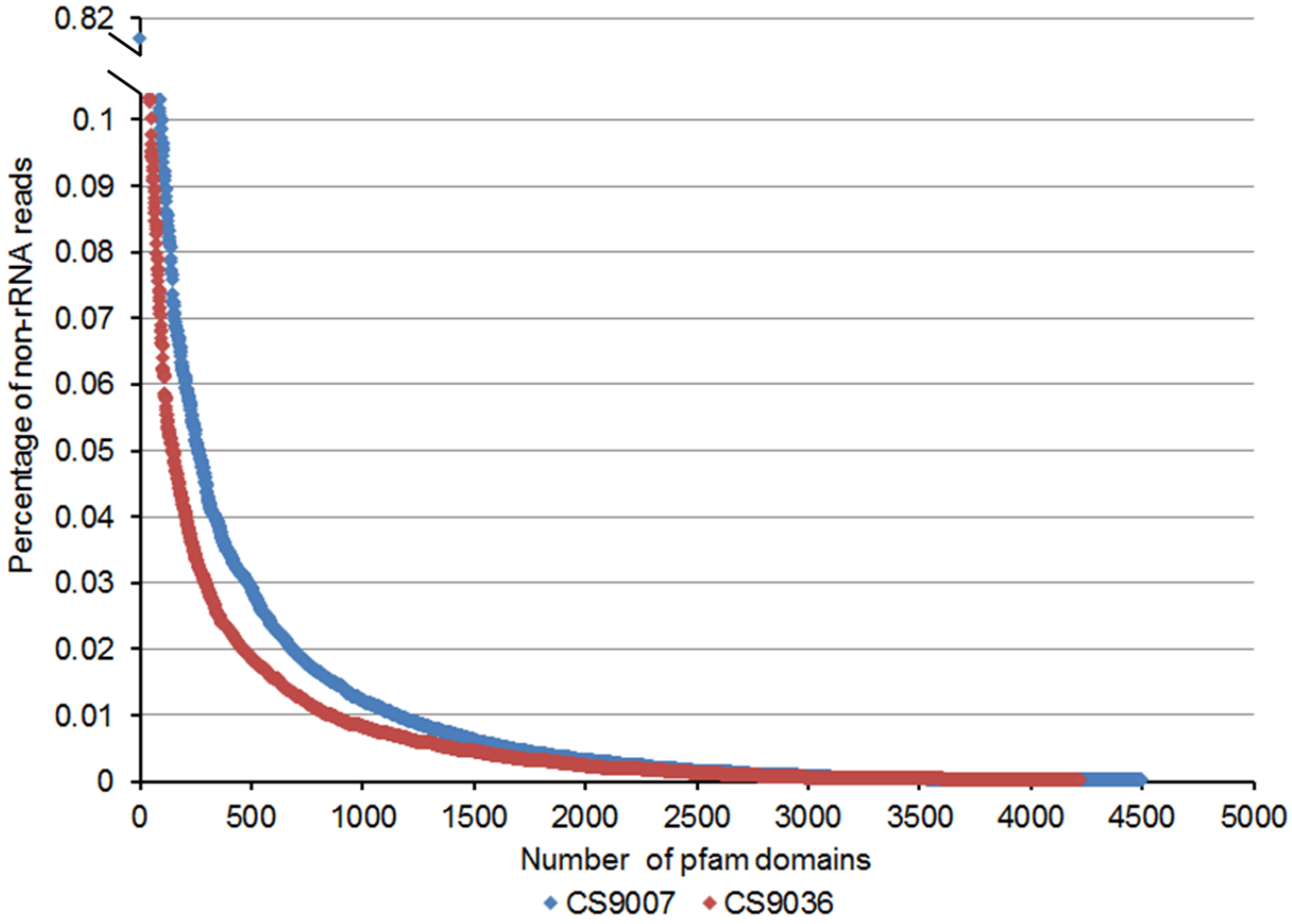

Fig S2. The expression abundance of the detected protein domains based on Pfam.

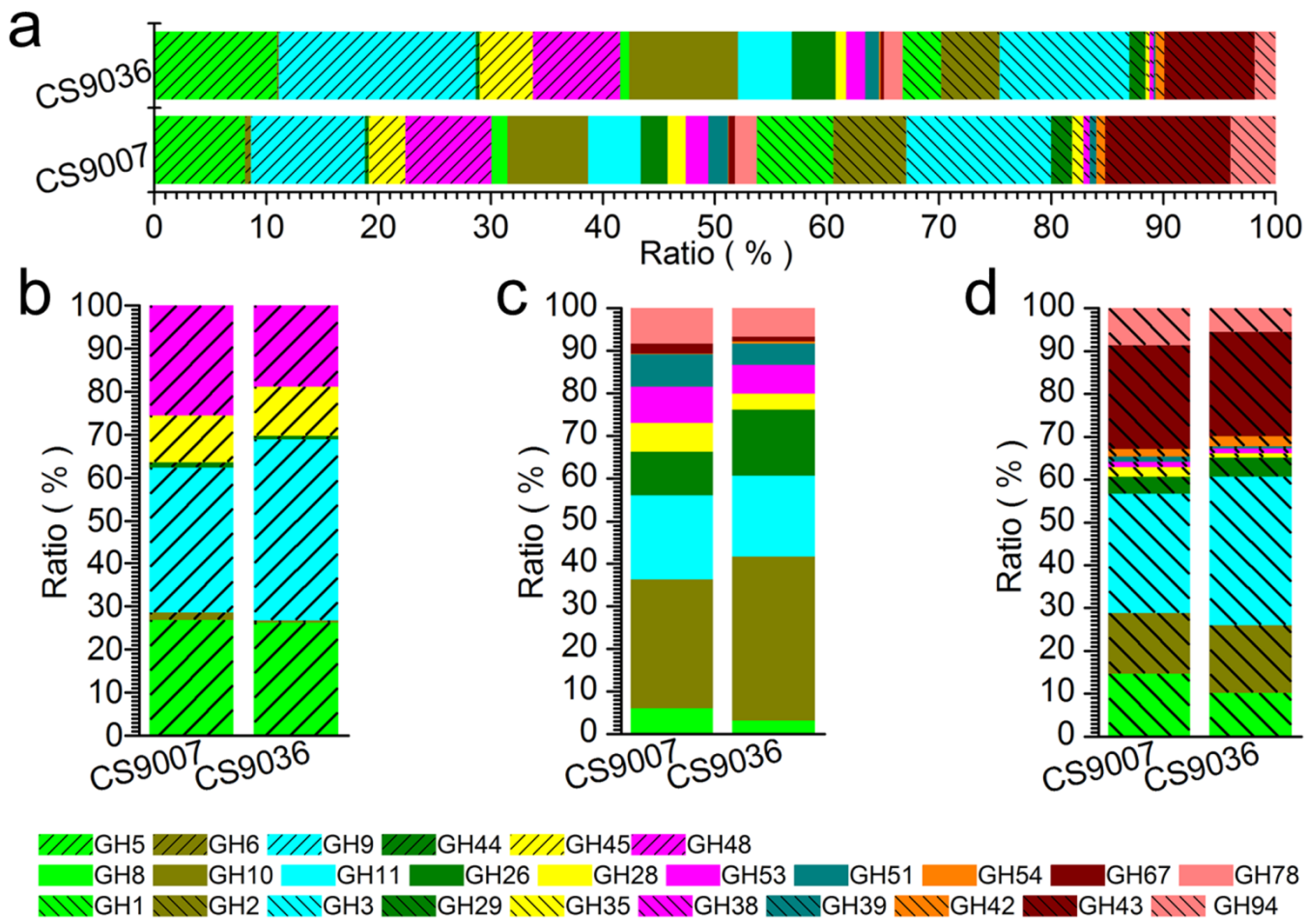

Fig S3. Average relative ratio (%) of PCWP-degradation related GHs from CS9007 and CS9036. a: GHs targeted to PCWP-degrading; b: GHs targeted to cellulose-degrading; c: GHs targeted to hemicellulose-degrading; d: GHs targeted to oligosaccharide-degrading.

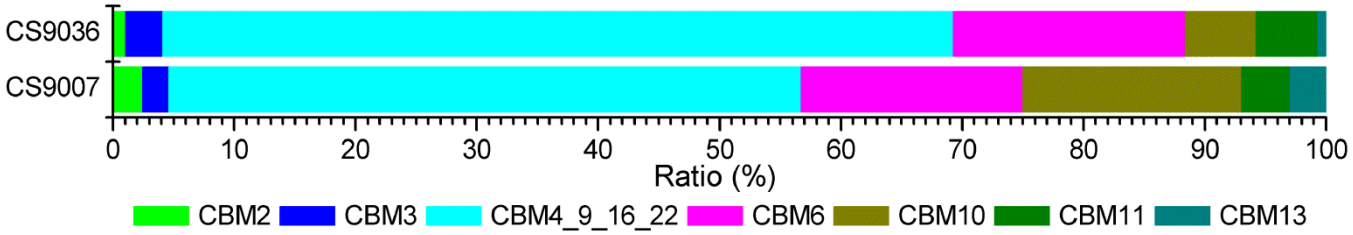

Fig S4. Average relative ratio (%) of PCWP-degradation related CBMs from CS9007 and CS9036.

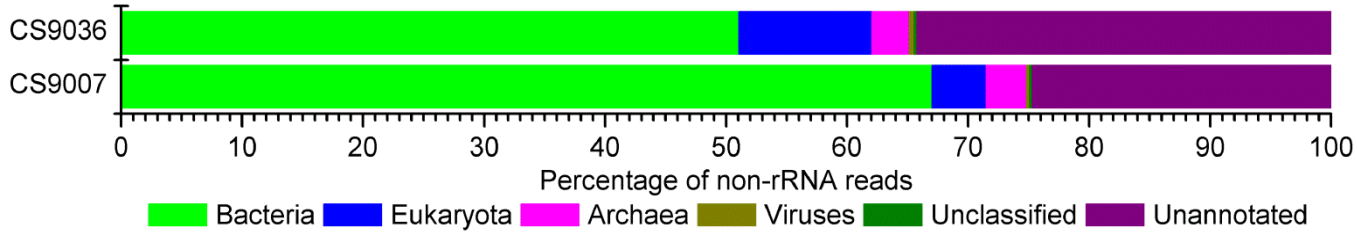

Fig S5. Taxonomic distribution, at domain level, of the non-rRNA reads derived from the cow rumen metatranscriptomes.

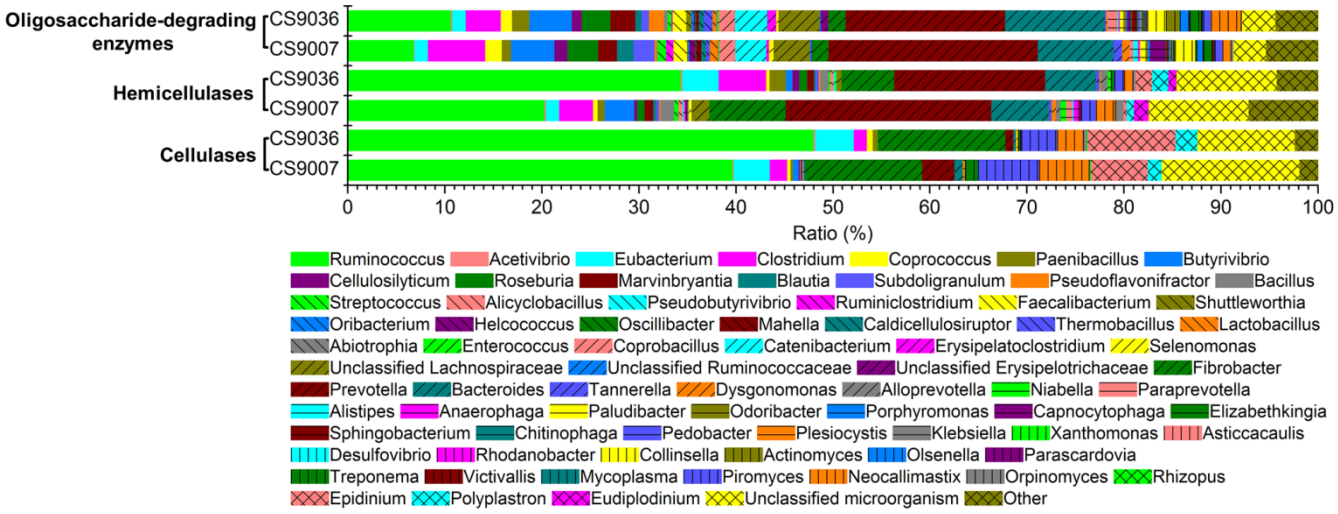

Fig S6. Relative ratio (%) of PCWP degradation related genera from CS9007 and CS9036. The relative ratio is defined as the proportion of the number of sequence reads for a given genus to that for the total genera encoding cellulase-, hemicellulase- and oligosaccharide-degrading enzymes, respectively. "Other" represents the genera only detected in CS9007 or CS9036.

Table S1. Summary of non-rRNAs assigned to NR, KEGG, Pfam and CAZy databases.

Characteristics	CS9007	CS9036
No. of non-rRNA reads match against	627,883	479,200
NR ($\leq 1e^{-5}$)	472,771 (75.30%)	315,139 (65.76%)
Identity $\geq$ 30%	462,413 (97.81%)	307,375 (97.54%)
Identity < 30%	10,358 (2.19%)	7,764 (2.46%)
KEGG ($\leq 1e^{-5}$)	431,183 (68.67%)	263,099 (54.90%)
Pfam ($\leq 1e^{-5}$)	359,231(57.21%)	189727(39.59%)
Pfam ($\leq 1e^{-5}$)-CAZy	**9744 (1.55%)**	**7338 (1.53%)**

Table S2. The CAZy families [glycoside hydrolases (GHs), carbohydrate esterases (CEs), pectate lyases (PLs), Glycosyl Transferases (GTs), carbohydrate-binding modules (CBMs)] and other domains associated with PCWP-degrading and their abundance[1] detected in two metatranscriptomes

CAZy Family	Pfam Accession	Pfam HMM Name	Number of reads		Abundance[1] (%)		
			CS9007	CS9036	CS9007	CS9036	Average
Glycoside hydrolases							
GH1	**PF00232**	**Glyco_hydro_1**	**190**	**80**	**0.0303**	**0.0167**	**0.0235**
GH2	**PF02836**	**Glyco_hydro_2_C**	**182**	**123**	**0.029**	**0.0257**	**0.0273**
GH3	**PF00933**	**Glyco_hydro_3**	**360**	**271**	**0.0573**	**0.0566**	**0.0569**
GH4	PF02056	Glyco_hydro_4	30	18	0.0048	0.0038	0.0043
GH5	**PF00150**	**Cellulase**	**226**	**257**	**0.036**	**0.0536**	**0.0448**
GH6	**PF01341**	**Glyco_hydro_6**	**15**	**4**	**0.0024**	**0.0008**	**0.0016**
GH7	**PF00840**	**Glyco_hydro_7**	**0**	**0**	**0**	**0**	**0**
GH8	**PF01270**	**Glyco_hydro_8**	**40**	**19**	**0.0064**	**0.004**	**0.0052**
GH9	**PF00759**	**Glyco_hydro_9**	**283**	**412**	**0.0451**	**0.086**	**0.0655**
GH10	**PF00331**	**Glyco_hydro_10**	**200**	**228**	**0.0319**	**0.0476**	**0.0397**
GH11	**PF00457**	**Glyco_hydro_11**	**131**	**112**	**0.0209**	**0.0234**	**0.0221**
GH12	**PF01670**	**Glyco_hydro_12**	**0**	**0**	**0**	**0**	**0**
GH13	PF00128	Alpha-amylase	1321	1146	0.2104	0.2391	0.2248
GH14	PF01373	Glyco_hydro_14	1	3	0.0002	0.0006	0.0004
GH15	PF00723	Glyco_hydro_15	1	0	0.0002	0	0.0001
GH16	PF00722	Glyco_hydro_16	59	48	0.0094	0.01	0.0097
GH17	PF00332	Glyco_hydro_17	2	0	0.0003	0	0.0002
GH18	PF00704	Glyco_hydro_18	42	28	0.0067	0.0058	0.0063
GH19	PF00182	Glyco_hydro_19	0	0	0	0	0
GH20	PF00728	Glyco_hydro_20	63	29	0.01	0.0061	0.008
GH22	PF00062	Lys	0	0	0	0	0
GH23	PF01464	SLT	117	31	0.0186	0.0065	0.0126
GH24/GH104	PF00959	Phage_lysozyme	12	10	0.0019	0.0021	0.002
GH25	PF01183	Glyco_hydro_25	120	92	0.0191	0.0192	0.0192
GH26	**PF02156**	**Glyco_hydro_26**	**67**	**92**	**0.0107**	**0.0192**	**0.0149**
GH27	PF02065	Melibiase	223	112	0.0355	0.0234	0.0294
GH28	**PF00295**	**Glyco_hydro_28**	**45**	**22**	**0.0072**	**0.0046**	**0.0059**
GH29	**PF01120**	**Alpha_L_fucos**	**52**	**34**	**0.0083**	**0.0071**	**0.0077**
GH30	PF02055	Glyco_hydro_30	11	16	0.0018	0.0033	0.0025
GH31	PF01055	Glyco_hydro_31	171	185	0.0272	0.0386	0.0329
GH32	PF00251	Glyco_hydro_32N	184	113	0.0293	0.0236	0.0264
GH33	PF02973	Sialidase	0	0	0	0	0

GH34	PF00064	Neur	0	0	0	0	0
GH35	**PF01301**	**Glyco_hydro_35**	**28**	**8**	**0.0045**	**0.0017**	**0.0031**
GH36	PF05691	Raffinose_syn	5	0	0.0008	0	0.0004
GH37	PF01204	Trehalase	2	1	0.0003	0.0002	0.0003
GH38	**PF01074**	**Glyco_hydro_38**	**16**	**9**	**0.0025**	**0.0019**	**0.0022**
GH39	**PF01229**	**Glyco_hydro_39**	**16**	**4**	**0.0025**	**0.0008**	**0.0017**
GH42	**PF02449**	**Glyco_hydro_42**	**22**	**18**	**0.0035**	**0.0038**	**0.0036**
GH43	**PF04616**	**Glyco_hydro_43**	**312**	**189**	**0.0497**	**0.0394**	**0.0446**
GH44	**PF12891**	**Glyco_hydro_44**	**10**	**8**	**0.0016**	**0.0017**	**0.0016**
GH45	**PF02015**	**Glyco_hydro_45**	**91**	**111**	**0.0145**	**0.0232**	**0.0188**
GH46	PF01374	Glyco_hydro_46	0	0	0	0	0
GH47	PF01532	Glyco_hydro_47	0	0	0	0	0
GH48	**PF02011**	**Glyco_hydro_48**	**214**	**183**	**0.0341**	**0.0382**	**0.0361**
GH49	PF03718	Glyco_hydro_49	0	0	0	0	0
GH51	**PF06964**	**Alpha-L-arabinofuranosidase C-terminus**	**50**	**29**	**0.008**	**0.0061**	**0.007**
GH52	**PF03512**	**Glyco_hydro_52**	**0**	**0**	**0**	**0**	**0**
GH53	**PF07745**	**Glyco_hydro_53**	**56**	**40**	**0.0089**	**0.0083**	**0.0086**
GH54	**PF09206**	**ArabFuran-catal**	**1**	**3**	**0.0002**	**0.0006**	**0.0004**
GH56	PF01630	Glyco_hydro_56	0	0	0	0	0
GH57	PF03065	Glyco_hydro_57	54	39	0.0086	0.0081	0.0084
GH59	PF02057	Glyco_hydro_59	1	1	0.0002	0.0002	0.0002
GH61	PF03443	Glyco_hydro_61	0	0	0	0	0
GH62	**PF03664**	**Glyco_hydro_62**	**0**	**0**	**0**	**0**	**0**
GH63	PF03200	Glyco_hydro_63	4	1	0.0006	0.0002	0.0004
GH65	PF03632	Glyco_hydro_65m	5	13	0.0008	0.0027	0.0018
GH66	PF13199	Glyco_hydro_66	2	3	0.0003	0.0006	0.0005
GH67	**PF07488**	**Glyco_hydro_67M**	**16**	**7**	**0.0025**	**0.0015**	**0.002**
GH68	PF02435	Glyco_hydro_68	0	1	0	0.0002	0.0001
GH70/GT70	PF02324	Glyco_hydro_70	2	2	0.0003	0.0004	0.0004
GH71	PF03659	Glyco_hydro_71	0	0	0	0	0
GH72	PF03198	Glyco_hydro_72	0	0	0	0	0
GH73	PF01832	Glucosaminidase	56	45	0.0089	0.0094	0.0092
GH75	PF07335	Chitosanase	0	0	0	0	0
GH76	PF03663	Glyco_hydro_76	5	1	0.0008	0.0002	0.0005
GH77	PF02446	Glyco_hydro_77	594	406	0.0946	0.0847	0.0897
GH78	**PF05592**	**Bac_rhamnosid**	**54**	**39**	**0.0086**	**0.0081**	**0.0084**
GH79	PF03662	Glyco_hydro_79	0	0	0	0	0
GH81	PF03639	Glyco_hydro_81	0	0	0	0	0
GH83	PF00423	HN	0	0	0	0	0

GH84	PF07555	NAGidase	9	6	0.0014	0.0013	0.0013
GH85	PF03644	Glyco_hydro_85	3	0	0.0005	0	0.0002
GH88/GH105	PF07470	Glyco_hydro_88	55	33	0.0088	0.0069	0.0078
GH89	PF05089	NAGLU	11	14	0.0018	0.0029	0.0023
GH90	PF09251	Salmonella phage P22 tail-spike	0	0	0	0	0
GH92	PF07971	Glyco_hydro_92	36	52	0.0057	0.0109	0.0083
GH94/GT36	**PF06165**	**Glyco_transf_36**	**111**	**43**	**0.0177**	**0.009**	**0.0133**
GH97	PF10566	Glyco_hydro_97	109	75	0.0174	0.0157	0.0165
GH98	PF08306	Glyco_hydro_98M	14	4	0.0022	0.0008	0.0015
GH100	PF12899	Glyco_hydro_100	0	0	0	0	0
GH101	PF12905	Glyco_hydro_101	0	0	0	0	0
GH102	PF03562	MltA	0	0	0	0	0
GH108	PF05838	DUF847	1	1	0.0002	0.0002	0.0002
GH109	PF01408	Oxidoreductase family, NAD-binding Rossmann fold	253	131	0.0403	0.0273	0.0338
GH112	PF09508	Lacto-N-biose phosphorylase	7	7	0.0011	0.0015	0.0013
GH114	PF03537	Glyco_hydro_114	22	4	0.0035	0.0008	0.0022
GH116	PF12215	beta-Glucocerebrosidase 2 N terminal	1	1	0.0002	0.0002	0.0002
Total CHO-GHs			**2788**	**2345**	**0.4443**	**0.4896**	**0.4665**
Total GHs			6396	5017	1.0187	1.047	1.0328
Carbohydrate Esterases							
CE1	PF00756	Putative esterase	167	118	0.0266	0.0246	0.0256
CE4	PF01522	Polysacc_deac_1	170	78	0.0271	0.0163	0.0217
CE5	PF01083	Cutinase	0	0	0	0	0
CE6	PF03629	Domain of unknown function (DUF303)	84	60	0.0134	0.0125	0.0129
CE7	PF05448	Acetyl xylan esterase (AXE1)	21	6	0.0033	0.0013	0.0023
CE8	PF01095	Pectinesterase	90	43	0.0143	0.009	0.0117
CE9	PF01979	Amidohydrolase family	154	74	0.0245	0.0154	0.02
CE10	PF00135	Carboxylesterase family	160	125	0.0255	0.0261	0.0258
CE11	PF03331	LpxC	67	40	0.0107	0.0083	0.0095
CE13	PF03283	PAE	3	0	0.0005	0	0.0002
CE14	PF02585	PIG-L	33	12	0.0053	0.0025	0.0039
Total CEs			949	556	0.1511	0.116	0.1336
Polysaccharide Lyases							

PL1	PF00544	Pec_lyase_C	38	47	0.0061	0.0098	0.0079
PL2	PF06917	Periplasmic pectate lyase	0	0	0	0	0
PL3	PF03211	Pectate_lyase	11	23	0.0018	0.0048	0.0033
PL5	PF05426	Alginate_lyase	1	1	0.0002	0.0002	0.0002
PL7/PL18	PF08787	Alginate lyase	1	0	0.0002	0	0.0001
PL8	PF02278	Lyase_8	1	1	0.0002	0.0002	0.0002
PL10	PF09492	Pectic acid lyase	11	10	0.0018	0.0021	0.0019
PL12/PL15/ PL17/PL21	PF07940	Heparinase II/III-like protein	3	4	0.0005	0.0008	0.0007
PL16	PF07212	Hyaluronidase protein (HylP)	0	0	0	0	0
Total PLs			66	86	0.0105	0.0179	0.0142
Glycosyl Transferases							
GT1	PF00201	UDPGT	8	6	0.0013	0.0013	0.0013
GT5	PF00862	Sucrose_synth	0	0	0	0	0
GT6	PF03414	Glyco_transf_6	2	0	0.0003	0	0.0002
GT7	PF02709	Glyco_transf_7C	0	0	0	0	0
GT8	PF01501	Glyco_transf_8	50	17	0.008	0.0035	0.0058
GT9	PF01075	Glyco_transf_9	9	7	0.0014	0.0015	0.0014
GT10	PF00852	Glyco_transf_10	1	4	0.0002	0.0008	0.0005
GT11	PF01531	Glyco_transf_11	9	2	0.0014	0.0004	0.0009
GT13	PF03071	GNT-I	0	0	0	0	0
GT15	PF01793	Glyco_transf_15	0	0	0	0	0
GT16	PF05060	MGAT2	0	0	0	0	0
GT17	PF04724	Glyco_transf_17	0	1	0	0.0002	0.0001
GT18	PF15024	Glyco_transf_18	0	0	0	0	0
GT19	PF02684	LpxB	24	11	0.0038	0.0023	0.0031
GT20	PF00982	Glyco_transf_20	0	7	0	0.0015	0.0007
GT21	PF13506	Glyco_transf_21	0	0	0	0	0
GT22	PF03901	Glyco_transf_22	0	0	0	0	0
GT25	PF01755	Glyco_transf_25	4	0	0.0006	0	0.0003
GT26	PF03808	Glyco_tran_WecB	27	8	0.0043	0.0017	0.003
GT28	PF04101	Glyco_transf_28	73	48	0.0116	0.01	0.0108
GT29	PF00777	Glyco_transf_29	0	0	0	0	0
GT31	PF01762	Galactosyl_T	0	2	0	0.0004	0.0002
GT34	PF05637	Glyco_transf_34	0	1	0	0.0002	0.0001
GT35	PF00343	Phosphorylase	983	793	0.1566	0.1655	0.161
GT37	PF03254	XG_FTase	0	0	0	0	0
GT39	PF02366	PMT	0	0	0	0	0
GT41	PF13844	Glyco_transf_41	0	1	0	0.0002	0.0001
GT43	PF03360	Glyco_transf_43	0	0	0	0	0

GT47	PF03016	Exostosin	0	0	0	0	0
GT48	PF02364	Glucan_synthase	0	0	0	0	0
GT49	PF13896	Glyco_transf_49	0	0	0	0	0
GT50	PF05007	Mannosyl_trans	0	0	0	0	0
GT51	PF00912	Transgly	194	71	0.0309	0.0148	0.0229
GT52	PF07922	Glyco_transf_52	0	0	0	0	0
GT53	PF04602	Arabinose_trans	0	0	0	0	0
GT54	PF04666	Glyco_transf_54	0	0	0	0	0
GT56	PF07429	Glyco_transf_56	0	1	0	0.0002	0.0001
GT57	PF03155	Alg6_Alg8	1	0	0.0002	0	0.0001
GT58	PF05208	ALG3	0	0	0	0	0
GT59	PF04922	DIE2_ALG10	0	0	0	0	0
GT62	PF03452	Anp1	0	0	0	0	0
GT64	PF09258	Glyco_transf_64	0	0	0	0	0
GT66	PF02516	STT3	58	43	0.0092	0.009	0.0091
GT90	PF05686	Glyco_transf_90	2	4	0.0003	0.0008	0.0006
GT92	PF01697	Glyco_transf_92	2	7	0.0003	0.0015	0.0009
Total GTs			1447	1034	0.2305	0.2158	0.2231
Carbohydrate-Binding Modules							
CBM1	PF00734	CBM_1	0	0	0	0	0
CBM2	PF00553	CBM_2	9	2	0.0014	0.0004	0.0009
CBM3	PF00942	CBM_3	8	8	0.0013	0.0017	0.0015
CBM4/CBM9/ CBM16/CBM22	PF02018	CBM_4_9	194	181	0.0309	0.0378	0.0343
CBM5/CBM12	PF02839	CBM_5_12	1	3	0.0002	0.0006	0.0004
CBM6	PF03422	CBM_6	68	56	0.0108	0.0117	0.0113
CBM10	PF02013	CBM_10	67	17	0.0107	0.0035	0.0071
CBM11	PF03425	CBM_11	15	15	0.0024	0.0031	0.0028
CBM13	PF00652	Ricin_B_lectin	11	2	0.0018	0.0004	0.0011
CBM14	PF01607	CBM_14	0	0	0	0	0
CBM15	PF03426	CBM_15	0	0	0	0	0
CBM17/CBM28	PF03424	CBM_17_28	0	0	0	0	0
CBM18	PF00187	Chitin_bind_1	8	2	0.0013	0.0004	0.0008
CBM19	PF03427	CBM_19	0	0	0	0	0
CBM20	PF00686	CBM_20	26	30	0.0041	0.0063	0.0052
CBM21	PF03370	CBM_21	18	0	0.0029	0	0.0014
CBM25	PF03423	CBM_25	15	9	0.0024	0.0019	0.0021
CBM27	PF09212	CBM27	0	0	0	0	0
CBM31	PF11606	AlcCBM31	0	0	0	0	0
CBM32/CBM47	PF00754	F5_F8_type_C	48	28	0.0076	0.0058	0.0067
CBM33	PF03067	Chitin_bind_3	0	0	0	0	0

CBM34/GH13N	PF02903	Alpha amylase, N-terminal ig-like domain	46	23	0.0073	0.0048	0.0061
CBM40	PF02973	Sialidase	0	0	0	0	0
CBM41	PF03714	Bacterial pullanase-associated domain	5	11	0.0008	0.0023	0.0015
CBM42	PF05270	AbfB	1	5	0.0002	0.001	0.0006
CBM43	PF07983	X8	0	0	0	0	0
CBM46	PF03442	Carbohydrate binding domain X2	10	3	0.0016	0.0006	0.0011
CBM48	PF02922	CBM_48	220	160	0.035	0.0334	0.0342
CBM49	PF09478	CBM49	0	0	0	0	0
CBM50	PF01476	LysM	106	76	0.0169	0.0159	0.0164
CBM51	PF08305	NPCBM	1	5	0.0002	0.001	0.0006
CBM52	PF10645	Carbohydrate binding	0	0	0	0	0
CBM57	PF11721	Di-glucose binding within endoplasmic reticulum	9	9	0.0014	0.0019	0.0017
Total CHO-CBMs			**372**	**281**	**0.0593**	**0.0586**	**0.059**
Total CBMs			886	645	0.1411	0.1346	0.1379
Total CAZymes			9744	7338	1.5519	1.5313	1.5416
Other domains associated with PCWP-degrading							
Dockerin_1	PF00404	Dockerin type I repeat	28	27	0.0045	0.0056	0.0051
Cohesin	PF00963	Cohesin	171	196	0.0272	0.0409	0.0341
Polysaccharide utilization loci							
SusC	PF00593	TonB dependent receptor	415	321	0.0661	0.067	0.0666
SusD	PF07980	SusD family	393	317	0.0626	0.0662	0.0644
SusD-like	PF12741	Susd and RagB outer membrane lipoprotein	29	21	0.0046	0.0044	0.0045
SusD-like_2	PF12771	Starch-binding associating with outer membrane	34	27	0.0054	0.0056	0.0055
SusD-like_3	PF14322	Starch-binding associating with outer membrane	365	209	0.0581	0.0436	0.0509
Total PULs			1236	895	0.1969	0.1868	0.1919

[1]Abundance is the percentage that the number of assigned reads for a given CAZy family to that for the non-rRNA reads in each metatranscriptomic samples.

* PCWP-degradation related GHs (CHO-GHs) and CBMs (CHO-CBMs) were in bold.

Table S3. Summary of the phyla detected in this study.

Phylum	Number of reads		Abundance[1] (%)		
	CS9007	CS9036	CS9007	CS9036	Average
Bacteria					
Firmicutes	**267717**	**147467**	**42.6380**	**30.7736**	**36.7058**
Bacteroidetes	**98649**	**57600**	**15.7114**	**12.0200**	**13.8657**
Spirochaetes	**13489**	**9492**	**2.1483**	**1.9808**	**2.0646**
Proteobacteria	**13069**	**10033**	**2.0814**	**2.0937**	**2.0876**
Actinobacteria	**10764**	**8550**	**1.7143**	**1.7842**	**1.7493**
Fibrobacteres	**5958**	**3883**	**0.9489**	**0.8103**	**0.8796**
Synergistetes	**1601**	**796**	**0.2550**	**0.1661**	**0.2105**
Fusobacteria	**1160**	**770**	**0.1847**	**0.1607**	**0.1727**
Chloroflexi	**974**	**575**	**0.1551**	**0.1200**	**0.1376**
Lentisphaerae	645	413	0.1027	0.0862	0.0945
Verrucomicrobia	628	414	0.1000	0.0864	0.0932
Cyanobacteria	613	539	0.0976	0.1125	0.1051
Thermotogae	529	340	0.0843	0.0710	0.0776
Tenericutes	479	363	0.0763	0.0758	0.0760
Planctomycetes	466	463	0.0742	0.0966	0.0854
Elusimicrobia	266	112	0.0424	0.0234	0.0329
Chlorobi	233	181	0.0371	0.0378	0.0374
Aquificae	197	182	0.0314	0.0380	0.0347
Acidobacteria	192	172	0.0306	0.0359	0.0332
Deferribacteres	162	139	0.0258	0.0290	0.0274
Saccharibacteria	161	67	0.0256	0.0140	0.0198
Ignavibacteriae	146	210	0.0233	0.0438	0.0335
Deinococcus-Thermus	132	132	0.0210	0.0275	0.0243
Dictyoglomi	70	64	0.0111	0.0134	0.0123
Nitrospirae	63	36	0.0100	0.0075	0.0088
Caldiserica	56	50	0.0089	0.0104	0.0097
Chlamydiae	33	19	0.0053	0.0040	0.0046
Thermodesulfobacteria	32	23	0.0051	0.0048	0.0049
Chrysiogenetes	22	19	0.0035	0.0040	0.0037
Gemmatimonadetes	14	25	0.0022	0.0052	0.0037
Poribacteria	10	2	0.0016	0.0004	0.0010
Archaea					
Euryarchaeota	**20703**	**14684**	**3.2973**	**3.0643**	**3.1808**
Crenarchaeota	89	37	0.0142	0.0077	0.0109
Thaumarchaeota	17	18	0.0027	0.0038	0.0032
Korarchaeota	4	2	0.0006	0.0004	0.0005
Nanohaloarchaeota	2	1	0.0003	0.0002	0.0003
Parvarchaeota	2	2	0.0003	0.0004	0.0004
Eukaryota					
Protozoa	**15827**	**30566**	**2.5207**	**6.3785**	**4.4496**
Fungi	**3477**	**4872**	**0.5538**	**1.0167**	**0.7852**

Total	**458651**	**293313**	**73.0472**	**61.2089**	**67.1280**

[1]Abundance is the percentage that the number of assigned reads for a given taxon to that for the non-rRNA reads in each metatranscriptomic samples.

*Taxa with abundance >0.1% were in bold.

Table S4. Panorama of the genera detected in present study.

Genus	Number of reads		Abundance[1] (%)		
	CS9007	CS9036	CS9007	CS9036	Average
Bacteria					
Ruminococcus	**44192**	**31837**	**7.0383**	**6.6438**	**6.8410**
Prevotella	**52555**	**26860**	**8.3702**	**5.6052**	**6.9877**
Clostridium	**42994**	**23160**	**6.8475**	**4.8331**	**5.8403**
Eubacterium	**18339**	**10724**	**2.9208**	**2.2379**	**2.5793**
Bacteroides	**16151**	**10650**	**2.5723**	**2.2225**	**2.3974**
Butyrivibrio	**22126**	**9370**	**3.5239**	**1.9553**	**2.7396**
Treponema	**11452**	**8137**	**1.8239**	**1.6980**	**1.7610**
Blautia	**12151**	**4825**	**1.9352**	**1.0069**	**1.4711**
Roseburia	**8334**	**4236**	**1.3273**	**0.8840**	**1.1056**
Fibrobacter	**5958**	**3883**	**0.9489**	**0.8103**	**0.8796**
Coprococcus	**7117**	**3521**	**1.1335**	**0.7348**	**0.9341**
Tannerella	**4080**	**2417**	**0.6498**	**0.5044**	**0.5771**
Marvinbryantia	**4626**	**2105**	**0.7368**	**0.4393**	**0.5880**
Oscillibacter	**4225**	**1930**	**0.6729**	**0.4028**	**0.5378**
Subdoligranulum	**3238**	**1844**	**0.5157**	**0.3848**	**0.4503**
Alistipes	**3131**	**1684**	**0.4987**	**0.3514**	**0.4250**
Pseudoflavonifractor	**3639**	**1681**	**0.5796**	**0.3508**	**0.4652**
Streptococcus	**2379**	**1602**	**0.3789**	**0.3343**	**0.3566**
Faecalibacterium	**3325**	**1573**	**0.5296**	**0.3283**	**0.4289**
Paenibacillus	**1733**	**1470**	**0.2760**	**0.3068**	**0.2914**
Anaerophaga	**1993**	**1466**	**0.3174**	**0.3059**	**0.3117**
Selenomonas	**2515**	**1440**	**0.4006**	**0.3005**	**0.3505**
Bacillus	**1994**	**1440**	**0.3176**	**0.3005**	**0.3090**
Dorea	**3121**	**1333**	**0.4971**	**0.2782**	**0.3876**
Oribacterium	**2929**	**1327**	**0.4665**	**0.2769**	**0.3717**
Odoribacter	**2100**	**1272**	**0.3345**	**0.2654**	**0.2999**
Capnocytophaga	**2026**	**1205**	**0.3227**	**0.2515**	**0.2871**
Parabacteroides	**2004**	**1146**	**0.3192**	**0.2391**	**0.2792**
Porphyromonas	**1373**	**1054**	**0.2187**	**0.2199**	**0.2193**
Slackia	**2078**	**1011**	**0.3310**	**0.2110**	**0.2710**
Stomatobaculum	**2489**	**980**	**0.3964**	**0.2045**	**0.3005**
Lactobacillus	**1296**	**915**	**0.2064**	**0.1909**	**0.1987**
Phascolarctobacterium	**1576**	**906**	**0.2510**	**0.1891**	**0.2200**
Paludibacter	**1309**	**867**	**0.2085**	**0.1809**	**0.1947**

Abiotrophia	**1426**	**856**	**0.2271**	**0.1786**	**0.2029**
Solobacterium	**1696**	**853**	**0.2701**	**0.1780**	**0.2241**
Alloprevotella	**1209**	**842**	**0.1926**	**0.1757**	**0.1841**
Olsenella	**2438**	**763**	**0.3883**	**0.1592**	**0.2738**
Mahella	**1189**	**762**	**0.1894**	**0.1590**	**0.1742**
Dysgonomonas	**1067**	**724**	**0.1699**	**0.1511**	**0.1605**
Paraprevotella	**1155**	**669**	**0.1840**	**0.1396**	**0.1618**
Anaerotruncus	**1379**	**668**	**0.2196**	**0.1394**	**0.1795**
Bifidobacterium	**1183**	**626**	**0.1884**	**0.1306**	**0.1595**
Shuttleworthia	**1294**	**544**	**0.2061**	**0.1135**	**0.1598**
Acetobacterium	**741**	**543**	**0.1180**	**0.1133**	**0.1157**
Spirochaeta	**707**	**518**	**0.1126**	**0.1081**	**0.1103**
Holdemania	**962**	**508**	**0.1532**	**0.1060**	**0.1296**
Desulfovibrio	**723**	**498**	**0.1151**	**0.1039**	**0.1095**
Desulfotomaculum	**810**	**493**	**0.1290**	**0.1029**	**0.1159**
Sphaerochaeta	**1026**	**479**	**0.1634**	**0.1000**	**0.1317**
Acetivibrio	**715**	**478**	**0.1139**	**0.0997**	**0.1068**
Fusobacterium	**770**	**475**	**0.1226**	**0.0991**	**0.1109**
Pseudoramibacter	**1064**	**472**	**0.1695**	**0.0985**	**0.1340**
Coprobacillus	**750**	**458**	**0.1194**	**0.0956**	**0.1075**
Catenibacterium	631	452	0.1005	0.0943	0.0974
Acidaminococcus	663	441	0.1056	0.0920	0.0988
Bacteroidetes oral taxon 274	722	439	0.1150	0.0916	0.1033
Desulfosporosinus	756	436	0.1204	0.0910	0.1057
Desulfitobacterium	759	427	0.1209	0.0891	0.1050
Alkaliphilus	839	410	0.1336	0.0856	0.1096
Eggerthella	974	405	0.1551	0.0845	0.1198
Ethanoligenens	759	392	0.1209	0.0818	0.1013
Anaerostipes	793	390	0.1263	0.0814	0.1038
Mitsuokella	659	388	0.1050	0.0810	0.0930
Erysipelatoclostridium	750	372	0.1194	0.0776	0.0985
Collinsella	628	348	0.1000	0.0726	0.0863
Peptoniphilus	637	340	0.1015	0.0710	0.0862
Atopobium	877	334	0.1397	0.0697	0.1047
Pyramidobacter	752	305	0.1198	0.0636	0.0917
Peptoclostridium	735	216	0.1171	0.0451	0.0811
Cellulosilyticum	626	421	0.0997	0.0879	0.0938
Anaerofustis	615	266	0.0979	0.0555	0.0767
Lachnoanaerobaculum	609	360	0.0970	0.0751	0.0861
Victivallis	570	367	0.0908	0.0766	0.0837
Thermoanaerobacter	566	277	0.0901	0.0578	0.0740
Megasphaera	559	311	0.0890	0.0649	0.0770
Enterococcus	553	406	0.0881	0.0847	0.0864
Caldicellulosiruptor	545	398	0.0868	0.0831	0.0849
Fluviicola	525	423	0.0836	0.0883	0.0859
Owenweeksia	499	322	0.0795	0.0672	0.0733
Sphingobacterium	494	287	0.0787	0.0599	0.0693

Thermoanaerobacterium	480	257	0.0764	0.0536	0.0650
Pedobacter	479	346	0.0763	0.0722	0.0742
Flavobacterium	470	417	0.0749	0.0870	0.0809
Succinatimonas	462	245	0.0736	0.0511	0.0624
Anaerolinea	459	187	0.0731	0.0390	0.0561
Tolumonas	438	259	0.0698	0.0540	0.0619
Aeromonas	434	349	0.0691	0.0728	0.0710
Intestinibacter	406	182	0.0647	0.0380	0.0513
Megamonas	406	152	0.0647	0.0317	0.0482
Vibrio	405	283	0.0645	0.0591	0.0618
Dialister	402	257	0.0640	0.0536	0.0588
Turicibacter	381	193	0.0607	0.0403	0.0505
Gordonibacter	363	193	0.0578	0.0403	0.0490
Johnsonella	349	150	0.0556	0.0313	0.0434
Listeria	344	230	0.0548	0.0480	0.0514
Finegoldia	341	164	0.0543	0.0342	0.0443
Bulleidia	333	180	0.0530	0.0376	0.0453
Caldanaerobacter	327	160	0.0521	0.0334	0.0427
Geobacter	296	194	0.0471	0.0405	0.0438
Anaerococcus	294	229	0.0468	0.0478	0.0473
Geobacillus	294	197	0.0468	0.0411	0.0440
Synergistes	287	132	0.0457	0.0275	0.0366
Haloplasma	277	160	0.0441	0.0334	0.0388
Microscilla	271	249	0.0432	0.0520	0.0476
Acholeplasma	269	158	0.0428	0.0330	0.0379
Thermobacillus	267	138	0.0425	0.0288	0.0357
Corynebacterium	266	123	0.0424	0.0257	0.0340
Solitalea	264	197	0.0420	0.0411	0.0416
Pelotomaculum	262	104	0.0417	0.0217	0.0317
Tepidanaerobacter	251	117	0.0400	0.0244	0.0322
Peptostreptococcus	249	88	0.0397	0.0184	0.0290
Acetonema	242	95	0.0385	0.0198	0.0292
Thermincola	227	93	0.0362	0.0194	0.0278
Thermosediminibacter	224	99	0.0357	0.0207	0.0282
Haliscomenobacter	223	141	0.0355	0.0294	0.0325
Mucilaginibacter	223	199	0.0355	0.0415	0.0385
Staphylococcus	217	145	0.0346	0.0303	0.0324
Fretibacterium	215	83	0.0342	0.0173	0.0258
Epulopiscium	214	130	0.0341	0.0271	0.0306
Thermosinus	206	120	0.0328	0.0250	0.0289
Veillonella	206	137	0.0328	0.0286	0.0307
Syntrophomonas	200	104	0.0319	0.0217	0.0268
Pseudomonas	197	166	0.0314	0.0346	0.0330
Brachyspira	194	177	0.0309	0.0369	0.0339
Leptotrichia	192	136	0.0306	0.0284	0.0295
Myroides	191	158	0.0304	0.0330	0.0317
Escherichia	190	101	0.0303	0.0211	0.0257

Salmonella	190	94	0.0303	0.0196	0.0249
Mogibacterium	187	1777	0.0298	0.3708	0.2003
Chitinophaga	186	125	0.0296	0.0261	0.0279
Parvimonas	186	87	0.0296	0.0182	0.0239
Candidatus Cloacamonas	185	123	0.0295	0.0257	0.0276
Shewanella	181	139	0.0288	0.0290	0.0289
Brevibacillus	173	133	0.0276	0.0278	0.0277
Helcococcus	169	76	0.0269	0.0159	0.0214
Caloramator	166	342	0.0264	0.0714	0.0489
Anaeroglobus	164	52	0.0261	0.0109	0.0185
Mycoplasma	164	151	0.0261	0.0315	0.0288
Streptomyces	161	327	0.0256	0.0682	0.0469
Caldithrix	160	70	0.0255	0.0146	0.0200
Candidatus Arthromitus	160	38	0.0255	0.0079	0.0167
Marivirga	160	131	0.0255	0.0273	0.0264
Niastella	160	125	0.0255	0.0261	0.0258
Azospirillum	158	213	0.0252	0.0444	0.0348
Erysipelothrix	158	68	0.0252	0.0142	0.0197
Mycobacterium	151	2547	0.0240	0.5315	0.2778
Actinomyces	149	157	0.0237	0.0328	0.0282
Spirosoma	149	77	0.0237	0.0161	0.0199
Dyadobacter	147	64	0.0234	0.0134	0.0184
Moorella	147	79	0.0234	0.0165	0.0199
Syntrophobotulus	147	100	0.0234	0.0209	0.0221
Thermotoga	147	101	0.0234	0.0211	0.0222
Leadbetterella	146	74	0.0233	0.0154	0.0193
Filifactor	143	73	0.0228	0.0152	0.0190
Cytophaga	141	120	0.0225	0.0250	0.0237
Campylobacter	140	89	0.0223	0.0186	0.0204
Dethiobacter	140	40	0.0223	0.0083	0.0153
Haemophilus	140	110	0.0223	0.0230	0.0226
Heliobacterium	137	77	0.0218	0.0161	0.0189
Natranaerobius	135	72	0.0215	0.0150	0.0183
Chryseobacterium	133	133	0.0212	0.0278	0.0245
Alicyclobacillus	130	69	0.0207	0.0144	0.0176
Cryptobacterium	130	63	0.0207	0.0131	0.0169
Ignavibacterium	130	109	0.0207	0.0227	0.0217
Runella	126	82	0.0201	0.0171	0.0186
Algoriphagus	124	73	0.0197	0.0152	0.0175
Burkholderia	123	515	0.0196	0.1075	0.0635
Coriobacterium	123	73	0.0196	0.0152	0.0174
Elusimicrobium	121	58	0.0193	0.0121	0.0157
Syntrophothermus	119	43	0.0190	0.0090	0.0140
Exiguobacterium	118	42	0.0188	0.0088	0.0138
Chlorobium	117	69	0.0186	0.0144	0.0165
Polaribacter	117	66	0.0186	0.0138	0.0162
Fervidobacterium	115	45	0.0183	0.0094	0.0139

Centipeda	113	69	0.0180	0.0144	0.0162
Pedosphaera	113	73	0.0180	0.0152	0.0166
Carboxydothermus	112	58	0.0178	0.0121	0.0150
Helicobacter	112	100	0.0178	0.0209	0.0194
Bilophila	111	74	0.0177	0.0154	0.0166
Actinobacillus	109	40	0.0174	0.0083	0.0129
Cyanothece	109	83	0.0174	0.0173	0.0173
Propionibacterium	109	89	0.0174	0.0186	0.0180
Saprospira	109	113	0.0174	0.0236	0.0205
Symbiobacterium	109	38	0.0174	0.0079	0.0126
Lactococcus	105	69	0.0167	0.0144	0.0156
Magnetospirillum	105	69	0.0167	0.0144	0.0156
Desulfobacterium	104	67	0.0166	0.0140	0.0153
Halanaerobium	104	69	0.0166	0.0144	0.0155
Fibrella	103	69	0.0164	0.0144	0.0154
Niabella	100	75	0.0159	0.0157	0.0158
Scardovia	99	89	0.0158	0.0186	0.0172
Acinetobacter	98	72	0.0156	0.0150	0.0153
Sphingomonas	98	108	0.0156	0.0225	0.0191
Cyclobacterium	96	72	0.0153	0.0150	0.0152
Planctomyces	96	95	0.0153	0.0198	0.0176
Sutterella	94	58	0.0150	0.0121	0.0135
Caldilinea	93	59	0.0148	0.0123	0.0136
Caldalkalibacillus	92	46	0.0147	0.0096	0.0121
Aggregatibacter	90	34	0.0143	0.0071	0.0107
Halothermothrix	90	68	0.0143	0.0142	0.0143
Photobacterium	90	88	0.0143	0.0184	0.0163
Oceanimonas	87	54	0.0139	0.0113	0.0126
Sebaldella	87	76	0.0139	0.0159	0.0149
Thermaerobacter	87	36	0.0139	0.0075	0.0107
Cellulophaga	86	57	0.0137	0.0119	0.0128
Deferribacter	86	80	0.0137	0.0167	0.0152
Synechococcus	86	48	0.0137	0.0100	0.0119
Candidatus Saccharibacteria	85	25	0.0135	0.0052	0.0094
Leeuwenhoekiella	85	47	0.0135	0.0098	0.0117
Carnobacterium	84	88	0.0134	0.0184	0.0159
Kordia	84	65	0.0134	0.0136	0.0135
Granulicatella	83	42	0.0132	0.0088	0.0110
Lysinibacillus	83	41	0.0132	0.0086	0.0109
Elizabethkingia	81	49	0.0129	0.0102	0.0116
Marinitoga	81	44	0.0129	0.0092	0.0110
Zunongwangia	81	48	0.0129	0.0100	0.0115
Weeksella	80	56	0.0127	0.0117	0.0122
Chthoniobacter	79	44	0.0126	0.0092	0.0109
Imtechella	79	59	0.0126	0.0123	0.0124
Neisseria	79	62	0.0126	0.0129	0.0128
Sporosarcina	79	32	0.0126	0.0067	0.0096

Anoxybacillus	77	28	0.0123	0.0058	0.0091
Gemella	77	71	0.0123	0.0148	0.0135
Pseudoalteromonas	76	121	0.0121	0.0253	0.0187
Yersinia	76	58	0.0121	0.0121	0.0121
Dethiosulfovibrio	75	40	0.0119	0.0083	0.0101
Kyrpidia	75	28	0.0119	0.0058	0.0089
Lentisphaera	75	46	0.0119	0.0096	0.0108
Anaeromyxobacter	74	66	0.0118	0.0138	0.0128
Ilyobacter	72	61	0.0115	0.0127	0.0121
Rhodothermus	72	45	0.0115	0.0094	0.0104
Blastopirellula	70	57	0.0111	0.0119	0.0115
Dictyoglomus	70	64	0.0111	0.0134	0.0123
Rhodospirillum	70	53	0.0111	0.0111	0.0111
Thermovibrio	70	93	0.0111	0.0194	0.0153
Aerococcus	69	47	0.0110	0.0098	0.0104
Robiginitalea	69	28	0.0110	0.0058	0.0084
Anaerobaculum	68	59	0.0108	0.0123	0.0116
Candidatus Azobacteroides	68	38	0.0108	0.0079	0.0094
Pelobacter	68	51	0.0108	0.0106	0.0107
Acetohalobium	67	31	0.0107	0.0065	0.0086
Stigmatella	66	55	0.0105	0.0115	0.0110
Moraxella	65	24	0.0104	0.0050	0.0077
Pirellula	65	48	0.0104	0.0100	0.0102
Leuconostoc	64	66	0.0102	0.0138	0.0120
Gramella	63	26	0.0100	0.0054	0.0077
Kosmotoga	63	50	0.0100	0.0104	0.0102
Aminobacterium	61	48	0.0097	0.0100	0.0099
Coleofasciculus chthonoplastes	61	36	0.0097	0.0075	0.0086
Chloroflexus	60	80	0.0096	0.0167	0.0131
Verrucomicrobium	60	39	0.0096	0.0081	0.0088
Diplosphaera	59	31	0.0094	0.0065	0.0079
Lacinutrix	59	53	0.0094	0.0111	0.0102
Zobellia	59	32	0.0094	0.0067	0.0080
Roseiflexus	58	40	0.0092	0.0083	0.0088
Alteromonas	57	29	0.0091	0.0061	0.0076
Gemmata	57	91	0.0091	0.0190	0.0140
Haliangium	57	75	0.0091	0.0157	0.0124
Ornithinibacillus	57	31	0.0091	0.0065	0.0078
Caldisericum	56	50	0.0089	0.0104	0.0097
Frankia	56	61	0.0089	0.0127	0.0108
Oceanicola	56	42	0.0089	0.0088	0.0088
Sphingopyxis	56	7	0.0089	0.0015	0.0052
Desmospora	55	32	0.0088	0.0067	0.0077
Desulfobulbus	55	16	0.0088	0.0033	0.0060
Pasteurella	55	35	0.0088	0.0073	0.0080
Bradyrhizobium	54	52	0.0086	0.0109	0.0097
Gordonia	54	102	0.0086	0.0213	0.0149

Phaeospirillum	54	42	0.0086	0.0088	0.0087
Pseudonocardia	54	24	0.0086	0.0050	0.0068
Chloroherpeton	52	41	0.0083	0.0086	0.0084
Ktedonobacter	52	45	0.0083	0.0094	0.0088
Opitutus	52	53	0.0083	0.0111	0.0097
Sphingobium	52	59	0.0083	0.0123	0.0103
Enterobacter	51	39	0.0081	0.0081	0.0081
Rheinheimera	51	48	0.0081	0.0100	0.0091
Klebsiella	50	38	0.0080	0.0079	0.0079
Mesotoga	50	29	0.0080	0.0061	0.0070
Oceanobacillus	50	56	0.0080	0.0117	0.0098
Leptospira	49	59	0.0078	0.0123	0.0101
Maribacter	49	39	0.0078	0.0081	0.0080
Thermanaerovibrio	49	35	0.0078	0.0073	0.0076
Coraliomargarita	48	31	0.0076	0.0065	0.0071
Mesorhizobium	48	81	0.0076	0.0169	0.0123
Moritella	48	34	0.0076	0.0071	0.0074
Rhizobium	48	40	0.0076	0.0083	0.0080
Rhodopirellula	48	38	0.0076	0.0079	0.0078
Dehalococcoides	47	38	0.0075	0.0079	0.0077
Desulfatibacillum	47	54	0.0075	0.0113	0.0094
Singulisphaera	47	54	0.0075	0.0113	0.0094
Sorangium	47	76	0.0075	0.0159	0.0117
Syntrophobacter	47	36	0.0075	0.0075	0.0075
Akkermansia	46	33	0.0073	0.0069	0.0071
Gardnerella	46	88	0.0073	0.0184	0.0128
Psychroflexus	46	19	0.0073	0.0040	0.0056
Mesoflavibacter	45	34	0.0072	0.0071	0.0071
OM60 clade	45	16	0.0072	0.0033	0.0053
Brevundimonas	44	6	0.0070	0.0013	0.0041
Dehalogenimonas	44	10	0.0070	0.0021	0.0045
Eremococcus	44	29	0.0070	0.0061	0.0065
Mobiluncus	44	23	0.0070	0.0048	0.0059
Sporolactobacillus	44	369	0.0070	0.0770	0.0420
Muricauda	43	36	0.0068	0.0075	0.0072
Pediococcus	43	43	0.0068	0.0090	0.0079
Plesiocystis	43	66	0.0068	0.0138	0.0103
Thiorhodovibrio	43	32	0.0068	0.0067	0.0068
Ammonifex	42	32	0.0067	0.0067	0.0067
Deinococcus	42	70	0.0067	0.0146	0.0106
Krokinobacter	42	32	0.0067	0.0067	0.0067
Thermosipho	42	50	0.0067	0.0104	0.0086
Desulfococcus	41	45	0.0065	0.0094	0.0080
Dokdonia	41	23	0.0065	0.0048	0.0057
Idiomarina	41	45	0.0065	0.0094	0.0080
Methylomicrobium	41	39	0.0065	0.0081	0.0073
Arcobacter	40	24	0.0064	0.0050	0.0057

Candidatus Chloracidobacterium	40	18	0.0064	0.0038	0.0051
Pantoea	40	35	0.0064	0.0073	0.0068
Proteus	40	14	0.0064	0.0029	0.0046
Psychromonas	40	18	0.0064	0.0038	0.0051
Brucella	39	7	0.0062	0.0015	0.0038
Corallococcus	39	21	0.0062	0.0044	0.0053
Francisella	39	29	0.0062	0.0061	0.0061
Glaciecola	39	18	0.0062	0.0038	0.0050
Oxalobacter	39	26	0.0062	0.0054	0.0058
Riemerella	39	42	0.0062	0.0088	0.0075
Candidatus Koribacter	38	36	0.0061	0.0075	0.0068
Micavibrio	38	59	0.0061	0.0123	0.0092
Myxococcus	38	21	0.0061	0.0044	0.0052
Nostoc	38	39	0.0061	0.0081	0.0071
Providencia	38	26	0.0061	0.0054	0.0057
Gallibacterium	37	40	0.0059	0.0083	0.0071
Legionella	37	24	0.0059	0.0050	0.0055
Nocardioides	37	18	0.0059	0.0038	0.0048
Novosphingobium	37	43	0.0059	0.0090	0.0074
Planococcus	37	57	0.0059	0.0119	0.0089
Streptobacillus	37	21	0.0059	0.0044	0.0051
Sulfurihydrogenibium	37	24	0.0059	0.0050	0.0055
Acaryochloris	36	24	0.0057	0.0050	0.0054
Bizionia	36	27	0.0057	0.0056	0.0057
Candidatus Amoebophilus	36	37	0.0057	0.0077	0.0067
Halomonas	36	40	0.0057	0.0083	0.0070
Xanthomonas	36	60	0.0057	0.0125	0.0091
Acidovorax	35	20	0.0056	0.0042	0.0049
Cellvibrio	35	29	0.0056	0.0061	0.0058
Gillisia	35	20	0.0056	0.0042	0.0049
Herpetosiphon	35	28	0.0056	0.0058	0.0057
Methylobacterium	35	57	0.0056	0.0119	0.0087
Desulfuromonas	34	40	0.0054	0.0083	0.0069
Ferrimonas	34	13	0.0054	0.0027	0.0041
Leptonema	34	35	0.0054	0.0073	0.0064
Rickettsia	34	23	0.0054	0.0048	0.0051
Sphaerobacter	34	20	0.0054	0.0042	0.0048
Acidithiobacillus	33	16	0.0053	0.0033	0.0043
Aminomonas	33	15	0.0053	0.0031	0.0042
Basfia	33	20	0.0053	0.0042	0.0047
Candidatus Kuenenia	33	17	0.0053	0.0035	0.0044
Cellulomonas	33	27	0.0053	0.0056	0.0054
Dickeya	33	30	0.0053	0.0063	0.0058
Parascardovia	33	21	0.0053	0.0044	0.0048
Truepera	33	25	0.0053	0.0052	0.0052
Crocosphaera	32	14	0.0051	0.0029	0.0040
Jonquetella	32	39	0.0051	0.0081	0.0066

Salinibacter	32	18	0.0051	0.0038	0.0044
Candidatus Solibacter	31	33	0.0049	0.0069	0.0059
Holophaga	31	28	0.0049	0.0058	0.0054
Petrotoga	31	21	0.0049	0.0044	0.0047
Serratia	31	26	0.0049	0.0054	0.0052
Agrobacterium	30	12	0.0048	0.0025	0.0036
Beggiatoa	30	48	0.0048	0.0100	0.0074
Denitrovibrio	30	27	0.0048	0.0056	0.0052
Nitrosomonas	30	10	0.0048	0.0021	0.0034
Oscillochloris	30	17	0.0048	0.0035	0.0042
Ralstonia	30	27	0.0048	0.0056	0.0052
Trichodesmium	30	23	0.0048	0.0048	0.0048
Asticcacaulis	29	22	0.0046	0.0046	0.0046
Croceibacter	29	31	0.0046	0.0065	0.0055
Desulfobacter	29	17	0.0046	0.0035	0.0041
Isosphaera	29	23	0.0046	0.0048	0.0047
Methylacidiphilum	29	11	0.0046	0.0023	0.0035
Microbacterium	29	11	0.0046	0.0023	0.0035
Rhodopseudomonas	29	19	0.0046	0.0040	0.0043
Roseobacter	29	12	0.0046	0.0025	0.0036
Shigella	29	16	0.0046	0.0033	0.0040
Tetragenococcus	29	21	0.0046	0.0044	0.0045
Thermovirga	29	40	0.0046	0.0083	0.0065
Granulicella	28	26	0.0045	0.0054	0.0049
Marinobacter	28	18	0.0045	0.0038	0.0041
Nitrosococcus	28	18	0.0045	0.0038	0.0041
Pelodictyon	28	40	0.0045	0.0083	0.0064
Thermobaculum	28	22	0.0045	0.0046	0.0045
Borrelia	27	80	0.0043	0.0167	0.0105
Candidatus Desulforudis	27	20	0.0043	0.0042	0.0042
Edwardsiella	27	24	0.0043	0.0050	0.0047
Halobacillus	27	27	0.0043	0.0056	0.0050
Psychrobacter	27	24	0.0043	0.0050	0.0047
Saccharomonospora	27	16	0.0043	0.0033	0.0038
Xenorhabdus	27	23	0.0043	0.0048	0.0045
Desulfarculus	26	34	0.0041	0.0071	0.0056
Kingella	26	19	0.0041	0.0040	0.0041
Sinorhizobium	26	17	0.0041	0.0035	0.0038
Thermomicrobium	26	21	0.0041	0.0044	0.0043
Facklamia	25	23	0.0040	0.0048	0.0044
Lentibacillus	25	21	0.0040	0.0044	0.0042
Microcystis	25	54	0.0040	0.0113	0.0076
Arthrobacter	24	45	0.0038	0.0094	0.0066
Calditerrivibrio	24	23	0.0038	0.0048	0.0043
Chlorobaculum	24	21	0.0038	0.0044	0.0041
Cupriavidus	24	18	0.0038	0.0038	0.0038
Hippea	24	21	0.0038	0.0044	0.0041

Leptospirillum	24	6	0.0038	0.0013	0.0025
Mannheimia	24	21	0.0038	0.0044	0.0041
Ochrobactrum	24	28	0.0038	0.0058	0.0048
Rhodococcus	24	31	0.0038	0.0065	0.0051
Thermodesulfovibrio	24	22	0.0038	0.0046	0.0042
Desulfomicrobium	23	15	0.0037	0.0031	0.0034
Hahella	23	12	0.0037	0.0025	0.0031
Methyloversatilis	23	12	0.0037	0.0025	0.0031
Arthrospira	22	26	0.0035	0.0054	0.0045
Desulfurispirillum	22	19	0.0035	0.0040	0.0037
Flexistipes	22	9	0.0035	0.0019	0.0027
Labrenzia	22	23	0.0035	0.0048	0.0042
Marinomonas	22	21	0.0035	0.0044	0.0039
Meiothermus	22	10	0.0035	0.0021	0.0028
Melissococcus	22	18	0.0035	0.0038	0.0036
Micromonospora	22	24	0.0035	0.0050	0.0043
Oscillatoria	22	24	0.0035	0.0050	0.0043
Pectobacterium	22	26	0.0035	0.0054	0.0045
Roseomonas	22	22	0.0035	0.0046	0.0040
Saccharopolyspora	22	23	0.0035	0.0048	0.0042
Thermus	22	16	0.0035	0.0033	0.0034
Acetobacter	21	20	0.0033	0.0042	0.0038
Aquifex	21	11	0.0033	0.0023	0.0028
Citrobacter	21	17	0.0033	0.0035	0.0034
Desulfotalea	21	18	0.0033	0.0038	0.0036
Kineococcus	21	10	0.0033	0.0021	0.0027
Methylomonas	21	9	0.0033	0.0019	0.0026
Oenococcus	21	19	0.0033	0.0040	0.0037
Rhodobacter	21	23	0.0033	0.0048	0.0041
Thiocapsa	21	12	0.0033	0.0025	0.0029
Weissella	21	36	0.0033	0.0075	0.0054
Coprothermobacter	20	9	0.0032	0.0019	0.0025
Desulfurobacterium	20	19	0.0032	0.0040	0.0036
Gluconacetobacter	20	18	0.0032	0.0038	0.0035
Heliobacillus	20	7	0.0032	0.0015	0.0023
Pseudovibrio	20	9	0.0032	0.0019	0.0025
Saccharophagus	20	20	0.0032	0.0042	0.0037
Sulfobacillus	20	15	0.0032	0.0031	0.0032
Thermodesulfatator	20	15	0.0032	0.0031	0.0032
Arcanobacterium	19	8	0.0030	0.0017	0.0023
Brachybacterium	19	19	0.0030	0.0040	0.0035
Fischerella	19	10	0.0030	0.0021	0.0026
Kocuria	19	3	0.0030	0.0006	0.0018
Lyngbya	19	27	0.0030	0.0056	0.0043
Microcoleus	19	38	0.0030	0.0079	0.0055
Moorea	19	12	0.0030	0.0025	0.0028
Ruegeria	19	37	0.0030	0.0077	0.0054

Streptosporangium	19	13	0.0030	0.0027	0.0029
Teredinibacter	19	11	0.0030	0.0023	0.0027
Actinoplanes	18	25	0.0029	0.0052	0.0040
Aliivibrio	18	16	0.0029	0.0033	0.0031
Beutenbergia	18	13	0.0029	0.0027	0.0028
Desulfobacca	18	12	0.0029	0.0025	0.0027
Grimontia	18	17	0.0029	0.0035	0.0032
Hydrogenivirga	18	8	0.0029	0.0017	0.0023
Magnetococcus	18	19	0.0029	0.0040	0.0034
Rhodanobacter	18	32	0.0029	0.0067	0.0048
Simonsiella	18	1	0.0029	0.0002	0.0015
Spiroplasma	18	24	0.0029	0.0050	0.0039
Caulobacter	17	19	0.0027	0.0040	0.0033
Hafnia	17	7	0.0027	0.0015	0.0021
Histophilus	17	6	0.0027	0.0013	0.0020
Octadecabacter	17	10	0.0027	0.0021	0.0024
Syntrophus	17	4	0.0027	0.0008	0.0018
Bacteriovorax	16	19	0.0025	0.0040	0.0033
Candidatus Regiella	16	1	0.0025	0.0002	0.0014
Colwellia	16	11	0.0025	0.0023	0.0024
Limnobacter	16	1	0.0025	0.0002	0.0014
Melioribacter	16	101	0.0025	0.0211	0.0118
Pelagibaca	16	7	0.0025	0.0015	0.0020
SAR92 clade	16	7	0.0025	0.0015	0.0020
Solibacillus	16	26	0.0025	0.0054	0.0040
Aromatoleum	15	4	0.0024	0.0008	0.0016
Bdellovibrio	15	8	0.0024	0.0017	0.0020
Bermanella	15	14	0.0024	0.0029	0.0027
Conexibacter	15	17	0.0024	0.0035	0.0030
Desulfurivibrio	15	5	0.0024	0.0010	0.0017
Dolosigranulum	15	8	0.0024	0.0017	0.0020
Ehrlichia	15	1	0.0024	0.0002	0.0013
Gloeobacter	15	10	0.0024	0.0021	0.0022
Methylophaga	15	19	0.0024	0.0040	0.0032
Nocardiopsis	15	16	0.0024	0.0033	0.0029
Persephonella	15	17	0.0024	0.0035	0.0030
Photorhabdus	15	21	0.0024	0.0044	0.0034
Reinekea blandensis	15	11	0.0024	0.0023	0.0023
Rubrobacter	15	4	0.0024	0.0008	0.0016
Verminephrobacter	15	8	0.0024	0.0017	0.0020
Azoarcus	14	22	0.0022	0.0046	0.0034
Caminibacter	14	4	0.0022	0.0008	0.0015
Desulfohalobium	14	8	0.0022	0.0017	0.0019
Endoriftia	14	1	0.0022	0.0002	0.0012
Methylibium	14	4	0.0022	0.0008	0.0015
Nitrospira	14	6	0.0022	0.0013	0.0017
Pelosinus	14	143	0.0022	0.0298	0.0160

Pontibacter	14	105	0.0022	0.0219	0.0121
Pseudoxanthomonas	14	11	0.0022	0.0023	0.0023
Sulfurimonas	14	19	0.0022	0.0040	0.0031
Thioalkalivibrio	14	14	0.0022	0.0029	0.0026
Achromobacter	13	19	0.0021	0.0040	0.0030
Desulfonatronospira	13	17	0.0021	0.0035	0.0028
Erythrobacter	13	10	0.0021	0.0021	0.0021
Gemmatimonas	13	25	0.0021	0.0052	0.0036
Hyphomonas	13	9	0.0021	0.0019	0.0020
Marinobacterium	13	5	0.0021	0.0010	0.0016
Nitratifractor	13	5	0.0021	0.0010	0.0016
Nitrosospira	13	1	0.0021	0.0002	0.0011
Polaromonas	13	9	0.0021	0.0019	0.0020
Rothia	13	24	0.0021	0.0050	0.0035
Rubrivivax	13	14	0.0021	0.0029	0.0025
Ruminiclostridium	13	2	0.0021	0.0004	0.0012
Sanguibacter	13	12	0.0021	0.0025	0.0023
Stenotrophomonas	13	22	0.0021	0.0046	0.0033
Terriglobus	13	22	0.0021	0.0046	0.0033
Thermobifida	13	8	0.0021	0.0017	0.0019
Trueperella	13	6	0.0021	0.0013	0.0017
Chromobacterium	12	9	0.0019	0.0019	0.0019
Citromicrobium	12	8	0.0019	0.0017	0.0018
Macrococcus	12	16	0.0019	0.0033	0.0026
Parasutterella	12	22	0.0019	0.0046	0.0033
Pelagibacterium	12	11	0.0019	0.0023	0.0021
Phycisphaera	12	6	0.0019	0.0013	0.0016
Taylorella	12	12	0.0019	0.0025	0.0022
Thauera	12	12	0.0019	0.0025	0.0022
Thermodesulfobacterium	12	8	0.0019	0.0017	0.0018
Thiomonas	12	3	0.0019	0.0006	0.0013
Variovorax	12	55	0.0019	0.0115	0.0067
Bartonella	11	13	0.0018	0.0027	0.0022
Brenneria	11	6	0.0018	0.0013	0.0015
Candidatus Methylomirabilis	11	9	0.0018	0.0019	0.0018
Isoptericola	11	10	0.0018	0.0021	0.0019
Methylobacter	11	18	0.0018	0.0038	0.0028
Methylococcus	11	5	0.0018	0.0010	0.0014
Methylovorus	11	10	0.0018	0.0021	0.0019
Microlunatus	11	20	0.0018	0.0042	0.0030
Nitratiruptor	11	5	0.0018	0.0010	0.0014
Parvibaculum	11	7	0.0018	0.0015	0.0016
Prochlorococcus	11	28	0.0018	0.0058	0.0038
Thermodesulfobium	11	3	0.0018	0.0006	0.0012
Thiorhodococcus	11	6	0.0018	0.0013	0.0015
Alishewanella	10	17	0.0016	0.0035	0.0026
Azorhizobium	10	6	0.0016	0.0013	0.0014

Azospira	10	5	0.0016	0.0010	0.0013
Brevibacterium	10	10	0.0016	0.0021	0.0018
Candidatus Phytoplasma	10	21	0.0016	0.0044	0.0030
Catenulispora	10	24	0.0016	0.0050	0.0033
Chelativorans	10	8	0.0016	0.0017	0.0016
Cronobacter	10	14	0.0016	0.0029	0.0023
Erwinia	10	19	0.0016	0.0040	0.0028
Hyphomicrobium	10	4	0.0016	0.0008	0.0012
Intrasporangium	10	6	0.0016	0.0013	0.0014
Kribbella	10	28	0.0016	0.0058	0.0037
Lawsonia	10	8	0.0016	0.0017	0.0016
Mesoplasma	10	6	0.0016	0.0013	0.0014
Neptuniibacter	10	6	0.0016	0.0013	0.0014
Parachlamydia	10	5	0.0016	0.0010	0.0013
Prosthecochloris	10	10	0.0016	0.0021	0.0018
Roseibium	10	10	0.0016	0.0021	0.0018
Simkania	10	1	0.0016	0.0002	0.0009
Sulfuricurvum	10	6	0.0016	0.0013	0.0014
Thiocystis	10	12	0.0016	0.0025	0.0020
Verrucosispora	10	10	0.0016	0.0021	0.0018
Xylanimonas	10	10	0.0016	0.0021	0.0018
Acidiphilium	9	5	0.0014	0.0010	0.0012
Anabaena	9	11	0.0014	0.0023	0.0019
Arsenophonus	9	12	0.0014	0.0025	0.0020
Collimonas	9	4	0.0014	0.0008	0.0011
Delftia	9	5	0.0014	0.0010	0.0012
Herbaspirillum	9	24	0.0014	0.0050	0.0032
Janthinobacterium	9	4	0.0014	0.0008	0.0011
Laribacter	9	10	0.0014	0.0021	0.0018
Methylotenera	9	9	0.0014	0.0019	0.0017
Micrococcus	9	4	0.0014	0.0008	0.0011
Nakamurella	9	10	0.0014	0.0021	0.0018
Nocardia	9	27	0.0014	0.0056	0.0035
Paracoccus	9	36	0.0014	0.0075	0.0045
Patulibacter	9	10	0.0014	0.0021	0.0018
Phenylobacterium	9	8	0.0014	0.0017	0.0016
Pusillimonas	9	2	0.0014	0.0004	0.0009
Raphidiopsis	9	5	0.0014	0.0010	0.0012
Sideroxydans	9	5	0.0014	0.0010	0.0012
Sulfurovum	9	9	0.0014	0.0019	0.0017
Synechocystis	9	4	0.0014	0.0008	0.0011
Thermosynechococcus	9	11	0.0014	0.0023	0.0019
Tistrella	9	33	0.0014	0.0069	0.0042
Wolbachia	9	12	0.0014	0.0025	0.0020
Xanthobacter	9	7	0.0014	0.0015	0.0014
Zymomonas	9	9	0.0014	0.0019	0.0017
Acidobacterium	8	6	0.0013	0.0013	0.0013

Actinosynnema	8	12	0.0013	0.0025	0.0019
Candidatus Pelagibacter	8	9	0.0013	0.0019	0.0016
Citreicella	8	8	0.0013	0.0017	0.0015
Hydrogenobaculum	8	4	0.0013	0.0008	0.0011
Jonesia	8	5	0.0013	0.0010	0.0012
Kitasatospora	8	7	0.0013	0.0015	0.0014
Marichromatium	8	3	0.0013	0.0006	0.0010
Nitrobacter	8	10	0.0013	0.0021	0.0017
Oceanithermus	8	4	0.0013	0.0008	0.0011
Pseudobutyrivibrio	8	4	0.0013	0.0008	0.0011
Ramlibacter	8	4	0.0013	0.0008	0.0011
Stackebrandtia	8	4	0.0013	0.0008	0.0011
Thioalkalimicrobium	8	15	0.0013	0.0031	0.0022
Alkalilimnicola	7	8	0.0011	0.0017	0.0014
Bordetella	7	13	0.0011	0.0027	0.0019
Cardiobacterium	7	22	0.0011	0.0046	0.0029
Comamonas	7	5	0.0011	0.0010	0.0011
Ectothiorhodospira	7	2	0.0011	0.0004	0.0008
Gallionella	7	3	0.0011	0.0006	0.0009
Geodermatophilus	7	14	0.0011	0.0029	0.0020
Hydrogenobacter	7	3	0.0011	0.0006	0.0009
Lautropia	7	5	0.0011	0.0010	0.0011
Mariprofundus	7	2	0.0011	0.0004	0.0008
Orientia	7	9	0.0011	0.0019	0.0015
Pseudogulbenkiania	7	6	0.0011	0.0013	0.0012
Renibacterium	7	3	0.0011	0.0006	0.0009
Sulfurospirillum	7	2	0.0011	0.0004	0.0008
Thermomonospora	7	10	0.0011	0.0021	0.0016
Aeribacillus	6	6	0.0010	0.0013	0.0011
Afipia	6	3	0.0010	0.0006	0.0008
Albidiferax	6	4	0.0010	0.0008	0.0009
Alcanivorax	6	4	0.0010	0.0008	0.0009
Amycolatopsis	6	39	0.0010	0.0081	0.0045
Aneurinibacillus	6	2	0.0010	0.0004	0.0007
Blastococcus	6	15	0.0010	0.0031	0.0020
Candidatus Accumulibacter	6	6	0.0010	0.0013	0.0011
Candidatus Midichloria	6	2	0.0010	0.0004	0.0007
Candidatus Odyssella	6	15	0.0010	0.0031	0.0020
Candidatus Puniceispirillum	6	9	0.0010	0.0019	0.0014
Commensalibacter	6	9	0.0010	0.0019	0.0014
Congregibacter	6	6	0.0010	0.0013	0.0011
Curvibacter	6	1	0.0010	0.0002	0.0006
Dinoroseobacter	6	5	0.0010	0.0010	0.0010
Janibacter	6	8	0.0010	0.0017	0.0013
Kangiella	6	5	0.0010	0.0010	0.0010
Methylobacillus	6	1	0.0010	0.0002	0.0006
Methylocystis	6	10	0.0010	0.0021	0.0015

Methylosinus	6	2	0.0010	0.0004	0.0007
Mobilicoccus	6	6	0.0010	0.0013	0.0011
Roseovarius	6	17	0.0010	0.0035	0.0023
Starkeya	6	1	0.0010	0.0002	0.0006
Thiobacillus	6	3	0.0010	0.0006	0.0008
Thiorhodospira	6	8	0.0010	0.0017	0.0013
BD1-7 clade	5	4	0.0008	0.0008	0.0008
Buchnera	5	6	0.0008	0.0013	0.0010
Candidatus Protochlamydia	5	5	0.0008	0.0010	0.0009
Chlamydia	5	3	0.0008	0.0006	0.0007
Chromohalobacter	5	7	0.0008	0.0015	0.0011
Dichelobacter	5	7	0.0008	0.0015	0.0011
Halorhodospira	5	4	0.0008	0.0008	0.0008
Leptothrix	5	2	0.0008	0.0004	0.0006
Marinithermus	5	7	0.0008	0.0015	0.0011
Nitrococcus	5	2	0.0008	0.0004	0.0006
Rhodomicrobium	5	5	0.0008	0.0010	0.0009
Salinispora	5	70	0.0008	0.0146	0.0077
Serinicoccus	5	7	0.0008	0.0015	0.0011
Sodalis	5	9	0.0008	0.0019	0.0013
Ureaplasma	5	2	0.0008	0.0004	0.0006
Wolinella	5	3	0.0008	0.0006	0.0007
Acidothermus	4	6	0.0006	0.0013	0.0009
Aeromicrobium	4	4	0.0006	0.0008	0.0007
Azotobacter	4	5	0.0006	0.0010	0.0008
Belliella	4	54	0.0006	0.0113	0.0060
Blattabacterium	4	6	0.0006	0.0013	0.0009
Candidatus Aquiluna	4	3	0.0006	0.0006	0.0006
Cylindrospermopsis	4	5	0.0006	0.0010	0.0008
Dechloromonas	4	7	0.0006	0.0015	0.0010
Enhydrobacter	4	2	0.0006	0.0004	0.0005
Granulibacter	4	7	0.0006	0.0015	0.0010
Halothiobacillus	4	4	0.0006	0.0008	0.0007
Hoeflea	4	3	0.0006	0.0006	0.0006
Hylemonella	4	3	0.0006	0.0006	0.0006
Jannaschia	4	6	0.0006	0.0013	0.0009
Kurthia	4	64	0.0006	0.0134	0.0070
Kytococcus	4	3	0.0006	0.0006	0.0006
Leifsonia	4	7	0.0006	0.0015	0.0010
Maricaulis	4	2	0.0006	0.0004	0.0005
Modestobacter	4	14	0.0006	0.0029	0.0018
Morganella	4	12	0.0006	0.0025	0.0016
Nodularia	4	4	0.0006	0.0008	0.0007
Ornithobacterium	4	78	0.0006	0.0163	0.0085
Parvularcula	4	11	0.0006	0.0023	0.0015
Rahnella	4	11	0.0006	0.0023	0.0015
Salinisphaera	4	6	0.0006	0.0013	0.0009

Sulfitobacter	4	4	0.0006	0.0008	0.0007
Thiomicrospira	4	8	0.0006	0.0017	0.0012
Xylella	4	18	0.0006	0.0038	0.0022
Advenella	3	1	0.0005	0.0002	0.0003
Aequorivita	3	55	0.0005	0.0115	0.0060
Anaeroplasma	3	1	0.0005	0.0002	0.0003
Beijerinckia	3	4	0.0005	0.0008	0.0007
Citricoccus	3	21	0.0005	0.0044	0.0024
Cyanobium	3	2	0.0005	0.0004	0.0004
Dietzia	3	2	0.0005	0.0004	0.0004
Flexibacter	3	123	0.0005	0.0257	0.0131
Fructobacillus	3	5	0.0005	0.0010	0.0008
Indibacter	3	80	0.0005	0.0167	0.0086
Joostella	3	49	0.0005	0.0102	0.0054
Maritimibacter	3	3	0.0005	0.0006	0.0006
Oceanibulbus	3	1	0.0005	0.0002	0.0003
Oceanicaulis	3	2	0.0005	0.0004	0.0004
OM43 clade	3	2	0.0005	0.0004	0.0004
Segniliparus	3	2	0.0005	0.0004	0.0004
Thermobispora	3	18	0.0005	0.0038	0.0021
Tsukamurella	3	6	0.0005	0.0013	0.0009
Wigglesworthia	3	1	0.0005	0.0002	0.0003
Allochromatium	2	5	0.0003	0.0010	0.0007
Aquimarina	2	29	0.0003	0.0061	0.0032
Candidatus Ishikawaella	2	1	0.0003	0.0002	0.0003
Clavibacter	2	15	0.0003	0.0031	0.0017
Emticicia	2	79	0.0003	0.0165	0.0084
Fibrisoma	2	93	0.0003	0.0194	0.0099
Frateuria	2	2	0.0003	0.0004	0.0004
Ketogulonicigenium	2	7	0.0003	0.0015	0.0009
Nautilia	2	4	0.0003	0.0008	0.0006
Nitritalea	2	19	0.0003	0.0040	0.0021
Nitrolancetus	2	17	0.0003	0.0035	0.0019
Phyllobacterium	2	4	0.0003	0.0008	0.0006
Propionigenium	2	1	0.0003	0.0002	0.0003
Sagittula	2	5	0.0003	0.0010	0.0007
Thermoactinomyces	2	1	0.0003	0.0002	0.0003
Thiothrix	2	18	0.0003	0.0038	0.0020
Waddlia	2	3	0.0003	0.0006	0.0005
Acidimicrobium	1	7	0.0002	0.0015	0.0008
Ahrensia	1	3	0.0002	0.0006	0.0004
Anaplasma	1	1	0.0002	0.0002	0.0002
Aurantimonas	1	19	0.0002	0.0040	0.0021
Candidatus Blochmannia	1	2	0.0002	0.0004	0.0003
Candidatus Carsonella	1	3	0.0002	0.0006	0.0004
Candidatus Moranella	1	1	0.0002	0.0002	0.0002
Candidatus Riesia	1	1	0.0002	0.0002	0.0002

Candidatus Ruthia magnifica	1	3	0.0002	0.0006	0.0004
Candidatus Sulcia	1	8	0.0002	0.0017	0.0009
Caryophanon	1	2	0.0002	0.0004	0.0003
Chlamydophila	1	2	0.0002	0.0004	0.0003
Chondromyces	1	13	0.0002	0.0027	0.0014
Cystobacter	1	8	0.0002	0.0017	0.0009
Desulfomonile	1	26	0.0002	0.0054	0.0028
Fulvimarina	1	33	0.0002	0.0069	0.0035
Hydrogenophaga	1	10	0.0002	0.0021	0.0011
Leucobacter	1	12	0.0002	0.0025	0.0013
Loktanella	1	2	0.0002	0.0004	0.0003
Prolixibacter	1	1	0.0002	0.0002	0.0002
Ruminobacter	1	1	0.0002	0.0002	0.0002
Salinibacterium	1	8	0.0002	0.0017	0.0009
Syntrophococcus	1	3	0.0002	0.0006	0.0004
Thalassobium	1	1	0.0002	0.0002	0.0002
Thermocrinis	1	3	0.0002	0.0006	0.0004
Turicella	1	5	0.0002	0.0010	0.0006
Unclassified Clostridiales	**13629**	**5046**	**2.1706**	**1.0530**	**1.6118**
Unclassified Lachnospiraceae	**17402**	**8669**	**2.7715**	**1.8091**	**2.2903**
unclassified Ruminococcaceae	**3285**	**1479**	**0.5232**	**0.3086**	**0.4159**
Unclassified Succinivibrionaceae	**2204**	**886**	**0.3510**	**0.1849**	**0.2680**
Unclassified Erysipelotrichaceae	**1825**	**966**	**0.2907**	**0.2016**	**0.2461**
Unclassified *Peptostreptococcaceae*	**773**	**548**	**0.1231**	**0.1144**	**0.1187**
Archaea					
Methanobrevibacter	**17078**	**12489**	**2.7199**	**2.6062**	**2.6631**
Methanosphaera	**1715**	**875**	**0.2731**	**0.1826**	**0.2279**
Methanobacterium	293	272	0.0467	0.0568	0.0517
Methanosarcina	191	141	0.0304	0.0294	0.0299
Methanothermobacter	173	130	0.0276	0.0271	0.0273
Aciduliprofundum	129	45	0.0205	0.0094	0.0150
Methanocorpusculum	95	30	0.0151	0.0063	0.0107
Methanocella	77	47	0.0123	0.0098	0.0110
Methanococcus	73	39	0.0116	0.0081	0.0099
Thermococcus	73	50	0.0116	0.0104	0.0110
Methanocaldococcus	63	20	0.0100	0.0042	0.0071
Methanoplanus	54	40	0.0086	0.0083	0.0085
Methanosaeta	51	25	0.0081	0.0052	0.0067
Methanosalsum	51	27	0.0081	0.0056	0.0069
Archaeoglobus	48	17	0.0076	0.0035	0.0056
Methanothermus	45	52	0.0072	0.0109	0.0090
Methanopyrus	39	29	0.0062	0.0061	0.0061
Methanospirillum	38	6	0.0061	0.0013	0.0037
Pyrococcus	33	12	0.0053	0.0025	0.0039
Methanococcoides	29	27	0.0046	0.0056	0.0051
Methanohalophilus	24	9	0.0038	0.0019	0.0029
Methanohalobium	22	17	0.0035	0.0035	0.0035

Methanotorris	22	23	0.0035	0.0048	0.0042
Thermoplasma	22	11	0.0035	0.0023	0.0029
Methanosphaerula	21	10	0.0033	0.0021	0.0027
Methanoregula	20	17	0.0032	0.0035	0.0034
Methanoculleus	19	23	0.0030	0.0048	0.0039
Halorhabdus	16	19	0.0025	0.0040	0.0033
Pyrobaculum	16	4	0.0025	0.0008	0.0017
Ferroplasma	12	3	0.0019	0.0006	0.0013
Methanolinea	12	1	0.0019	0.0002	0.0011
Sulfolobus	11	10	0.0018	0.0021	0.0019
Desulfurococcus	9	2	0.0014	0.0004	0.0009
Haloarcula	9	4	0.0014	0.0008	0.0011
Picrophilus	9	6	0.0014	0.0013	0.0013
Thermofilum	9	3	0.0014	0.0006	0.0010
Methanothermococcus	8	12	0.0013	0.0025	0.0019
Ferroglobus	7	6	0.0011	0.0013	0.0012
Haloterrigena	7	3	0.0011	0.0006	0.0009
Thermoproteus	7	2	0.0011	0.0004	0.0008
Candidatus Nitrosoarchaeum	5	5	0.0008	0.0010	0.0009
Halorubrum	5	3	0.0008	0.0006	0.0007
Metallosphaera	5	1	0.0008	0.0002	0.0005
Staphylothermus	5	2	0.0008	0.0004	0.0006
Candidatus Korarchaeum	4	2	0.0006	0.0004	0.0005
Halobiforma	4	6	0.0006	0.0013	0.0009
Haloferax	4	9	0.0006	0.0019	0.0013
Natronobacterium	4	1	0.0006	0.0002	0.0004
Natronomonas	4	1	0.0006	0.0002	0.0004
Nitrosopumilus	4	8	0.0006	0.0017	0.0012
Candidatus Caldiarchaeum	3	2	0.0005	0.0004	0.0004
Haladaptatus	3	2	0.0005	0.0004	0.0004
Halomicrobium	3	2	0.0005	0.0004	0.0004
Haloquadratum	3	11	0.0005	0.0023	0.0014
Natrialba	3	4	0.0005	0.0008	0.0007
Natrinema	3	2	0.0005	0.0004	0.0004
Pyrolobus	3	1	0.0005	0.0002	0.0003
Acidilobus	2	2	0.0003	0.0004	0.0004
Candidatus Parvarchaeum	2	1	0.0003	0.0002	0.0003
Halopiger	2	1	0.0003	0.0002	0.0003
Ignisphaera	2	4	0.0003	0.0008	0.0006
Thermogladius	2	1	0.0003	0.0002	0.0003
Vulcanisaeta	2	1	0.0003	0.0002	0.0003
Halobacterium	1	6	0.0002	0.0013	0.0007
Ignicoccus	1	2	0.0002	0.0004	0.0003
Protozoa					
Paramecium	**2848**	**2922**	**0.4536**	**0.6098**	**0.5317**
Tetrahymena	**2218**	**3204**	**0.3533**	**0.6686**	**0.5109**
Entodinium	**1954**	**2996**	**0.3112**	**0.6252**	**0.4682**

Ichthyophthirius	**1481**	**2054**	**0.2359**	**0.4286**	**0.3323**
Entamoeba	**1216**	**2022**	**0.1937**	**0.4220**	**0.3078**
Trichomonas	**818**	**1116**	**0.1303**	**0.2329**	**0.1816**
Perkinsus	512	449	0.0815	0.0937	0.0876
Plasmodium	512	908	0.0815	0.1895	0.1355
Dictyostelium	487	1639	0.0776	0.3420	0.2098
Naegleria	414	442	0.0659	0.0922	0.0791
Babesia	384	717	0.0612	0.1496	0.1054
Polysphondylium	222	446	0.0354	0.0931	0.0642
Spathidium	185	294	0.0295	0.0614	0.0454
Blastocystis	165	368	0.0263	0.0768	0.0515
Cryptosporidium	163	304	0.0260	0.0634	0.0447
Oxytricha	155	6783	0.0247	1.4155	0.7201
Toxoplasma	153	355	0.0244	0.0741	0.0492
Trypanosoma	152	277	0.0242	0.0578	0.0410
Capsaspora	119	225	0.0190	0.0470	0.0330
Euplotes	103	77	0.0164	0.0161	0.0162
Neospora	102	358	0.0162	0.0747	0.0455
Monosiga	88	322	0.0140	0.0672	0.0406
Giardia	80	76	0.0127	0.0159	0.0143
Plasmodium berghei	80	91	0.0127	0.0190	0.0159
Nyctotherus	78	60	0.0124	0.0125	0.0125
Sterkiella	72	73	0.0115	0.0152	0.0134
Eudiplodinium	68	164	0.0108	0.0342	0.0225
Epidinium	66	168	0.0105	0.0351	0.0228
Leishmania	64	404	0.0102	0.0843	0.0473
Eimeria	64	64	0.0102	0.0134	0.0118
Theileria	64	197	0.0102	0.0411	0.0257
Moneuplotes	63	68	0.0100	0.0142	0.0121
Polyplastron	61	70	0.0097	0.0146	0.0122
Pseudourostyla	58	21	0.0092	0.0044	0.0068
Stylonychia	40	38	0.0064	0.0079	0.0072
Metadinium	38	14	0.0061	0.0029	0.0045
Chilodonella	34	4	0.0054	0.0008	0.0031
Didinium	25	21	0.0040	0.0044	0.0042
Dileptus	25	13	0.0040	0.0027	0.0033
Physarum	24	33	0.0038	0.0069	0.0054
Isotricha	22	17	0.0035	0.0035	0.0035
Karlodinium	21	8	0.0033	0.0017	0.0025
Dasytricha	20	23	0.0032	0.0048	0.0040
Uroleptus	18	22	0.0029	0.0046	0.0037
Mastigamoeba	18	15	0.0029	0.0031	0.0030
Pfiesteria	15	7	0.0024	0.0015	0.0019
Streblomastix	12	29	0.0019	0.0061	0.0040
Arachnula	10	47	0.0016	0.0098	0.0057
Monocercomonoides	9	33	0.0014	0.0069	0.0042
Amphidinium	9	15	0.0014	0.0031	0.0023

Heterocapsa	8	12	0.0013	0.0025	0.0019
Acanthamoeba	8	12	0.0013	0.0025	0.0019
Gymnophrys	7	2	0.0011	0.0004	0.0008
Vermamoeba	7	2	0.0011	0.0004	0.0008
Histomonas	6	13	0.0010	0.0027	0.0018
Anophryoides	5	3	0.0008	0.0006	0.0007
Chromera	5	1	0.0008	0.0002	0.0005
Bodomorpha	5	10	0.0008	0.0021	0.0014
Trichomitus	4	1	0.0006	0.0002	0.0004
Sorogena	4	42	0.0006	0.0088	0.0047
Telotrochidium	4	8	0.0006	0.0017	0.0012
Acytostelium	4	3	0.0006	0.0006	0.0006
Andalucia	4	7	0.0006	0.0015	0.0010
Paulinella	4	4	0.0006	0.0008	0.0007
Protoopalina	4	5	0.0006	0.0010	0.0008
Blepharisma	3	10	0.0005	0.0021	0.0013
Neoceratium	3	1	0.0005	0.0002	0.0003
Uronema	3	4	0.0005	0.0008	0.0007
Reclinomonas	3	2	0.0005	0.0004	0.0004
Planomonas	3	1	0.0005	0.0002	0.0003
Bodo	2	5	0.0003	0.0010	0.0007
Tritrichomonas	2	1	0.0003	0.0002	0.0003
Crypthecodinium	2	3	0.0003	0.0006	0.0005
Eufolliculina	2	7	0.0003	0.0015	0.0009
Miamiensis	2	2	0.0003	0.0004	0.0004
Oxyrrhis	2	4	0.0003	0.0008	0.0006
Prorocentrum	2	5	0.0003	0.0010	0.0007
Symbiodinium	2	1	0.0003	0.0002	0.0003
Arcyria	2	4	0.0003	0.0008	0.0006
Thraustochytrium	2	1	0.0003	0.0002	0.0003
Herpetomonas	1	1	0.0002	0.0002	0.0002
Parabodo	1	1	0.0002	0.0002	0.0002
Pseudocohnilembus	1	1	0.0002	0.0002	0.0002
Allogromia	1	1	0.0002	0.0002	0.0002
Cercomonas	1	4	0.0002	0.0008	0.0005
Collozoum	1	4	0.0002	0.0008	0.0005
Globobulimina	1	3	0.0002	0.0006	0.0004
Gymnochlora	1	6	0.0002	0.0013	0.0007
Rosalina	1	2	0.0002	0.0004	0.0003
Aurantiochytrium	1	1	0.0002	0.0002	0.0002
Fungi					
Batrachochytrium	383	207	0.0610	0.0432	0.0521
Rhizopus	298	235	0.0475	0.0490	0.0483
Neocallimastix	276	148	0.0440	0.0309	0.0374
Piromyces	223	122	0.0355	0.0255	0.0305
Aspergillus	113	116	0.0180	0.0242	0.0211
Schizosaccharomyces	90	117	0.0143	0.0244	0.0194

Candida	79	232	0.0126	0.0484	0.0305
Saccharomyces	77	167	0.0123	0.0348	0.0236
Filobasidiella	62	42	0.0099	0.0088	0.0093
Schizophyllum	57	79	0.0091	0.0165	0.0128
Exophiala	56	52	0.0089	0.0109	0.0099
Chaetomium	54	54	0.0086	0.0113	0.0099
Coprinopsis	54	58	0.0086	0.0121	0.0104
Orpinomyces	50	30	0.0080	0.0063	0.0071
Serpula	47	25	0.0075	0.0052	0.0064
Ogataea	40	70	0.0064	0.0146	0.0105
Pyrenophora	40	16	0.0064	0.0033	0.0049
Fusarium	38	31	0.0061	0.0065	0.0063
Melampsora	37	28	0.0059	0.0058	0.0059
Orbilia	36	83	0.0057	0.0173	0.0115
Nectria	35	31	0.0056	0.0065	0.0060
Sporisorium	35	46	0.0056	0.0096	0.0076
Phaeosphaeria	34	16	0.0054	0.0033	0.0044
Zymoseptoria	33	23	0.0053	0.0048	0.0050
Piriformospora	32	27	0.0051	0.0056	0.0054
Trichoderma	32	104	0.0051	0.0217	0.0134
Enterocytozoon	31	16	0.0049	0.0033	0.0041
Vanderwaltozyma	30	52	0.0048	0.0109	0.0078
Paracoccidioides	28	57	0.0045	0.0119	0.0082
Spathaspora	28	37	0.0045	0.0077	0.0061
Thielavia	28	64	0.0045	0.0134	0.0089
Ajellomyces	27	50	0.0043	0.0104	0.0074
Komagataella	27	72	0.0043	0.0150	0.0097
Neurospora	27	96	0.0043	0.0200	0.0122
Laccaria	26	17	0.0041	0.0035	0.0038
Malassezia	26	55	0.0041	0.0115	0.0078
Postia	25	6	0.0040	0.0013	0.0026
Clavispora	24	62	0.0038	0.0129	0.0084
Moniliophthora	24	5	0.0038	0.0010	0.0024
Puccinia	23	52	0.0037	0.0109	0.0073
Kazachstania	22	81	0.0035	0.0169	0.0102
Debaryomyces	21	10	0.0033	0.0021	0.0027
Kluyveromyces	21	20	0.0033	0.0042	0.0038
Lodderomyces	21	71	0.0033	0.0148	0.0091
Podospora	21	18	0.0033	0.0038	0.0036
Tuber	21	14	0.0033	0.0029	0.0031
Verticillium	20	28	0.0032	0.0058	0.0045
Mixia	20	28	0.0032	0.0058	0.0045
Tetrapisispora	20	118	0.0032	0.0246	0.0139
Millerozyma	19	35	0.0030	0.0073	0.0052
Naumovozyma	19	45	0.0030	0.0094	0.0062
Lachancea	18	29	0.0029	0.0061	0.0045
Eremothecium	17	34	0.0027	0.0071	0.0049

Scheffersomyces	17	41	0.0027	0.0086	0.0056
Yarrowia	17	111	0.0027	0.0232	0.0129
Emericella	16	41	0.0025	0.0086	0.0056
Metarhizium	16	34	0.0025	0.0071	0.0048
Neosartorya	16	24	0.0025	0.0050	0.0038
Botryotinia	15	32	0.0024	0.0067	0.0045
Coccidioides	15	22	0.0024	0.0046	0.0035
Nakaseomyces	15	78	0.0024	0.0163	0.0093
Leptosphaeria	14	60	0.0022	0.0125	0.0074
Meyerozyma	14	41	0.0022	0.0086	0.0054
Ustilago	14	41	0.0022	0.0086	0.0054
Arthroderma	13	34	0.0021	0.0071	0.0046
Penicillium	13	22	0.0021	0.0046	0.0033
Talaromyces	13	49	0.0021	0.0102	0.0061
Colletotrichum	12	22	0.0019	0.0046	0.0033
Nosema	12	15	0.0019	0.0031	0.0025
Rhizophagus	12	1	0.0019	0.0002	0.0011
Rhodotorula	12	23	0.0019	0.0048	0.0034
Sordaria	12	25	0.0019	0.0052	0.0036
Torulaspora	12	22	0.0019	0.0046	0.0033
Sclerotinia	11	19	0.0018	0.0040	0.0029
Alternaria	11	5	0.0018	0.0010	0.0014
Catenaria	11	9	0.0018	0.0019	0.0018
Grosmannia	11	22	0.0018	0.0046	0.0032
Uncinocarpus	11	4	0.0018	0.0008	0.0013
Cordyceps	10	16	0.0016	0.0033	0.0025
Gonapodya	9	8	0.0014	0.0017	0.0016
Zygosaccharomyces	9	27	0.0014	0.0056	0.0035
Magnaporthe	8	23	0.0013	0.0048	0.0030
Myceliophthora	8	25	0.0013	0.0052	0.0032
Glomerella	7	16	0.0011	0.0033	0.0022
Trichophyton	7	35	0.0011	0.0073	0.0042
Glarea	6	5	0.0010	0.0010	0.0010
Blastocladiella	5	6	0.0008	0.0013	0.0010
Edhazardia	5	58	0.0008	0.0121	0.0064
Gigaspora	5	1	0.0008	0.0002	0.0005
Beauveria	4	25	0.0006	0.0052	0.0029
Encephalitozoon	4	15	0.0006	0.0031	0.0019
Nematocida	4	27	0.0006	0.0056	0.0031
Dactylellina	3	3	0.0005	0.0006	0.0006
Dekkera	3	29	0.0005	0.0061	0.0033
Tremella	3	20	0.0005	0.0042	0.0023
Cyberlindnera	2	1	0.0003	0.0002	0.0003
Coniothyrium	2	2	0.0003	0.0004	0.0004
Auricularia	2	35	0.0003	0.0073	0.0038
Fibroporia	2	21	0.0003	0.0044	0.0024
Fomitiporia	2	60	0.0003	0.0125	0.0064

Lasiodiplodia	2	1	0.0003	0.0002	0.0003
Pneumocystis	2	3	0.0003	0.0006	0.0005
Olpidium	1	1	0.0002	0.0002	0.0002
UncRhodotorula	1	1	0.0002	0.0002	0.0002
Allomyces	1	2	0.0002	0.0004	0.0003
Coniophora	1	18	0.0002	0.0038	0.0020
Dichomitus	1	20	0.0002	0.0042	0.0022
Trichosporon	1	21	0.0002	0.0044	0.0023
Wallemia	1	49	0.0002	0.0102	0.0052
Total	457124	291533	72.8040	60.8374	66.8207

[1]Abundance is the percentage that the number of assigned reads for a given taxon to that for the non-rRNA reads in each metatranscriptomic samples.

*Taxa with abundance >0.1% were in bold.