Table S1. OTUs and diversity indices from fecal samples from wild and captive rock ptarmigans

Sampling site	Sample	Reads*	Total $OTUs_{0.02}$	Good's coverage	Simpson's diversity (1/D)	Shannon's diversity index
Wild	WL4	279,976	23,096	0.74	47.9	10.0
	WL5	45,683	12,701	0.76	63.0	9.4
	WL7	87,347	20,477	0.77	50.9	9.7
	WL8	61,717	16,981	0.76	49.2	9.6
Zoo	YL1	28,270	6,249	0.77	56.8	9.0
	YL2	53,186	11,480	0.82	65.6	9.2
	YL3	140,087	14,701	0.84	50.3	9.1
	YL4	75,765	16,038	0.83	47.5	9.3
	YL5	114,682	16,230	0.82	88.8	9.6

* reads obtained after a series of cleaning steps

WL, Wild Japanese rock ptarmigans living in Tateyama Mountains.

YL, Captive bred Svalbard rock ptarmigans at the Preservation and Research Center, The City of Yokohama.

Details, see text.

Table S2. Major OTUs (top 20 of the sequence reads) in fecal samples from the cecum of wild Japanese and captive Svalbard rock ptarmigan

OTU No.	Closest GenBank relative Closest GenBank cultured relative Closest GenBank identified relative	Accession Number	% similarity	Reported source	Bacterial group
	Uncultured bacterium	FP077861	99	Human fecal sample	
WL-OTU-0	*Olsenella* sp. 1183	AB739700	99		Actinobacteria
	Olsenella uli strain DSM 7084	NR_074414	96	Gingival crevice	
	Uncultured bacterium clone TuCw58	DQ071541	99	Ceca of Capercaillie (*Tetrao urogallus*)	
WL-OTU-1	-				Actinobacteria
	Actinomyces cardiffensis strain CCUG 44997	NR_025521	95	Human clinical sources	
	Uncultured bacterium clone TuCw37	DQ071470	96		
WL-OTU-2	-				Synergistetes
	Cloacibacillus porcorum strain CL-84	NR_109636	92	Pig cecal mucosa	
	Uncultured bacterium clone T2WK098	HQ716462	90	Pig feces	
WL-OTU-3					Bacteroidetes
	Bacteroides salanitronis strain DSM 18170	NR_074616	88	Cecum	
	Uncultured bacterium clone TuCw17	DQ071445	98	Ceca of Capercaillie (*Tetrao urogallus*)	
WL-OTU-4					Firmicutes
	Megasphaera cerevisiae strain: JCM 6129	AB971803	93		
	Uncultured bacterium clone Mol-108	FJ031932	96	Feline feces	
WL-OTU-5					Actinobacteria
	Bifidobacterium pullorum strain KCTC 3274	GU361830	96		
	Uncultured bacterium clone TuCw25	DQ071461	93		
WL-OTU-6					Actinobacteria
	Slackia equolifaciens strain DZE	NR_116295	93	Human intestine	
	Uncultured bacterium clone FS2_LC_059	KC804749	99	Gut of flying squirrels	
WL-OTU-7					Firmicutes
	Sporobacter termitidis strain SYR	NR_044972	93	Digestive tract of the wood-feeding termite	
	Uncultured bacterium clone SG_B552	KF843208	89	Pooled stool from school going group	
WL-OTU-8					Tenericutes
	Asteroleplasma anaerobium strain 161	NR_044657	82		
	Uncultured bacterium clone TuCw57	DQ071540	99	Ceca of Capercaillie (*Tetrao urogallus*)	
WL-OTU-9					Firmicutes
	Roseburia hominis strain A2-183	NR_074809	95		
	Uncultured bacterium clone AP15K.105	AM406047	97	Human faecal sample	
WL-OTU-10					Firmicutes
	Dialister propionicifaciens strain ADV 1053.03	NR_043231	93		
	Uncultured bacterium clone WTB_B48	EU009802	90	Turkey cecum	
WL-OTU-11					Bacteroidetes
	Bacteroides helcogenes strain: A4-47	AB219934	86	Pig feces	
	Uncultured bacterium clone TuCw83	DQ071514	97	Ceca of Capercaillie (*Tetrao urogallus*)	
WL-OTU-12					Bacteroidetes
	Prevotella buccae strain SEQ181	JN867257	88	Human clinical isolate	
	Uncultured bacterium clone cc_164	GQ175467	99	Ceca content of chicken gut	
WL-OTU-13					Firmicutes
	Defluviitalea saccharophila strain LIND6LT2	NR_117912	86		
	Uncultured bacterium clone TuCc8	DQ071485	99	Ceca of Capercaillie (*Tetrao urogallus*)	
WL-OTU-14	*Ruminococcus* sp. ID1	AY960569	96		Firmicutes
	Syntrophococcus sucromutans strain S195	NR_036869	95		
WL-OTU-15					Bacteroidetes
	Bacteroides acidifaciens strain A40	NR_028607	89		
WL-OTU-16					Bacteroidetes
	Prevotella buccae strain SEQ207	JN867282	82	Human clinical isolate	
	Uncultured bacterium clone TuCc14	DQ071477	99	Ceca of Capercaillie (*Tetrao urogallus*)	
WL-OTU-17					Deltaproteobacteri
	Desulfovibrio fairfieldensis	U42221	90		
WL-OTU-18					Actinobacteria
	Olsenella profusa strain CCUG 45372	FN178467	88		
	Uncultured bacterium clone FS1_SO_330	KC804349	99	Gut of flying squirrels	
WL-OTU-19	*Clostridiales* bacterium CIEAF 013	AB702935	98	Feces of mouse	Firmicutes
	Pseudoflavonifractor capillosus strain ATCC 29799	NR_025670	98	Feces of mouse	
	Uncultured bacterium clone B5_F31	EF025268	100	Intestine	
YL-OTU-0	Bacterium ic1311	DQ057463	98	Ileum; cecum	Firmicutes
	Ruminococcus torques	AB910746	97		
YL-OTU-1					Actinobacteria
	Bifidobacterium pullorum strain KCTC 3274	GU361830	99		
	Uncultured bacterium clone cc_11	GQ175372	99	Ceca content of chicken gut	
YL-OTU-2					Firmicutes
	Faecalibacterium prausnitzii strain 78_10294632078__070	KJ957877	97		
	Uncultured bacterium clone 13AC_H08	HM575014	100	Cecal luminal content from chick reared	
YL-OTU-3	Bacterium ic1297	DQ057460	98	Ileum; cecum	Firmicutes
	Ruminococcus torques	AB910746	97		
	Uncultured bacterium clone 01b04	GQ137202	100	Swine waste feed for ASBR reactor	
YL-OTU-4					Firmicutes
	Gemmiger formicilis strain X2-56	NR_104846	99		
	Uncultured bacterium clone 10_C3_18	JN001301	100	Mouse colon	
YL-OTU-5					Verrucomicrobia
	Akkermansia muciniphila strain ATCC BAA-835	NR_074436	100		
	Uncultured bacterium clone G12_084	JX889732	100	Rabbit feces	
YL-OTU-6	Bacterium P1A4	KM043745	100	Fecal sample	Bacteroidetes
	Bacteroides dorei strain Z5	KJ145327	100	Fecal sample	
	Uncultured organism clone ELU0090-T14-S-NI_000372	HQ780914	99	Gastrointestinal specimens	
YL-OTU-7	Clostridium sp. SL-2013-71	HG326494	94		Firmicutes
	Candidatus Soleaferrea massiliensis AP7	JX101688	92	Human stool	
	Uncultured bacterium clone BY12	DQ394300	100	Broiler intestine	
YL-OTU-8					Firmicutes
	Butyricicoccus pullicaecorum strain 25-3	NR_044490	98	Cecal content of a broiler chicken	
	Uncultured organism clone ELU0112-T277-S-NI_000316	HQ788332	100	Gastrointestinal specimens	
YL-OTU-9					Bacteroidetes
	Odoribacter laneus strain JCM 16069	NR_113074	99		
	Uncultured bacterium clone cc_28	GQ175385	100	Ceca content of chicken gut	
YL-OTU-10					Firmicutes
	Clostridium hylemonae	AB910737	97		
	Uncultured bacterium clone 1613Q1	KM100395	100	Fecal sample, Weddell seal (*Leptonychotes weddellii*)	
YL-OTU-11					Gammaproteobact
	Escherichia coli FAP1	CP009578	100	Feces	
	Uncultured bacterium clone 21AC_G04	HM575157	100	Fresh pine shaving broiler litter	
YL-OTU-12					Firmicutes
	Ruminococcus obeum	NR_119185	99		
	Uncultured bacterium clone: R-C-H10.	AB506364	100	Feces of breeding pig fed	
YL-OTU-13					Firmicutes
	Sporobacter termitidis strain SYR	NR_044972	94	Wood-feeding termite	
	Uncultured organism clone ELU0160-T347-S-NIPCRAMgANa_000167	HQ807920	100	Gastrointestinal specimens	
YL-OTU-14	Bacterium P2G6	KM043766	100	Fecal sample	Firmicutes
	Intestinimonas butyriciproducens strain SRB-521-5-I	NR_118554	95		
	Uncultured bacterium clone V-22	JQ248114	99	Feces	
YL-OTU-15					Firmicutes
	Clostridium colinum strain DSM 6011	NR_026151	94		
	Uncultured bacterium clone RL246_aai76h08	DQ793763	100	Human feces	
YL-OTU-16					Firmicutes
	Anaerostipes butyraticus strain JCM 17466	NR_113319	98		
	Uncultured bacterium clone 06AWH1A	KJ422637	100		
YL-OTU-17					Firmicutes
	Clostridium perfringens strain ATCC 13124	NR_121697	100		
	Uncultured bacterium clone AP07K.83.	AM275478	99	Human faecal sample	
YL-OTU-18	Bacterium MRG-1	HQ687764	96	Intestine of Korean female	Firmicutes
	Candidatus Stoquefichus massiliensis AP9	JX101690	93	Human stool	
	Uncultured bacterium clone 5AC_C05	HM574804	100	Ileal mucosa from chick reared on fresh pine shavings	
YL-OTU-19					Firmicutes
	Ruminococcus lactaris strain ATCC 29176	NR_027579	97		

WL, Wild Japanese rock ptarmigans living in Tateyama Mountains.
YL, Captive bred Svalbard rock ptarmigans at the Preservcation and Research Center, The City of Yokohama.
Details, see text.

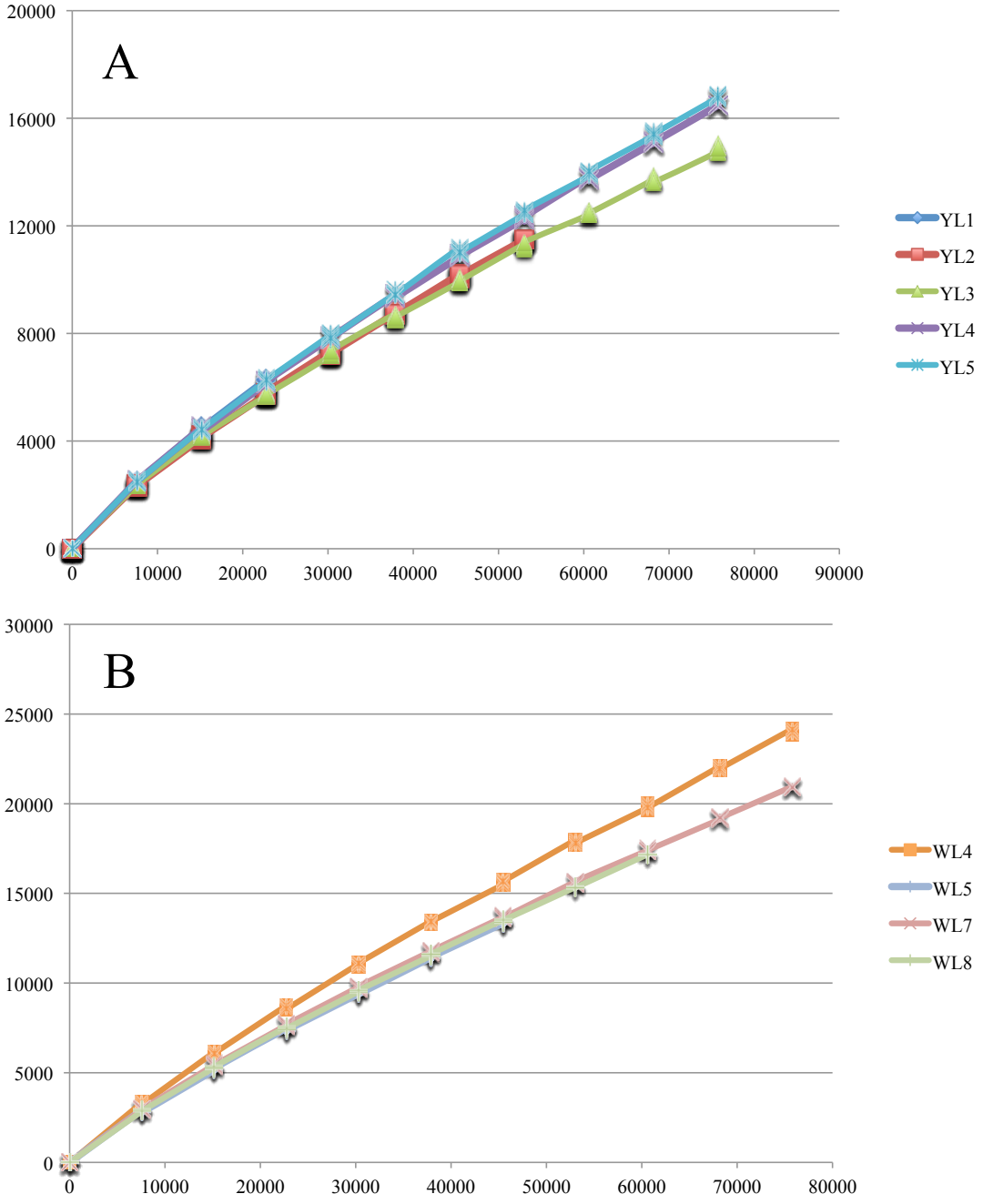

Figure S1. Rarefaction curves of obtained OTUs in each sample.
A) captive Svalbard rock ptarmigans; B) wild Japanese rock ptarmigans.
Details see Fig 1 and text.