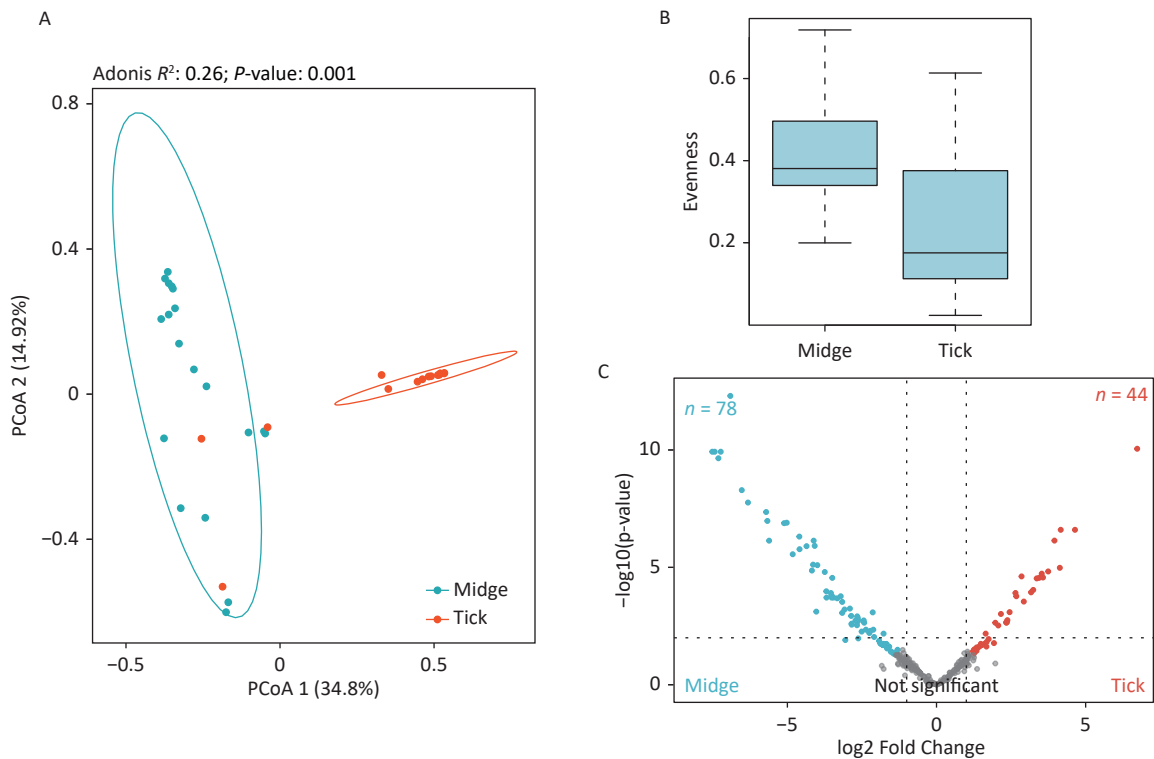
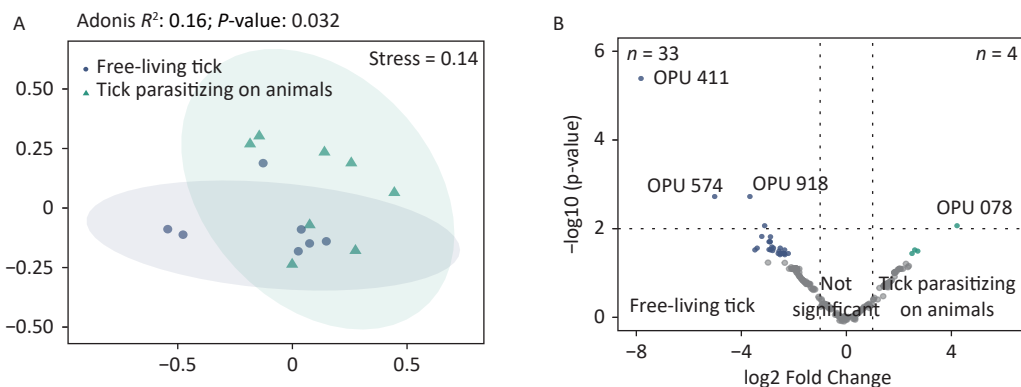


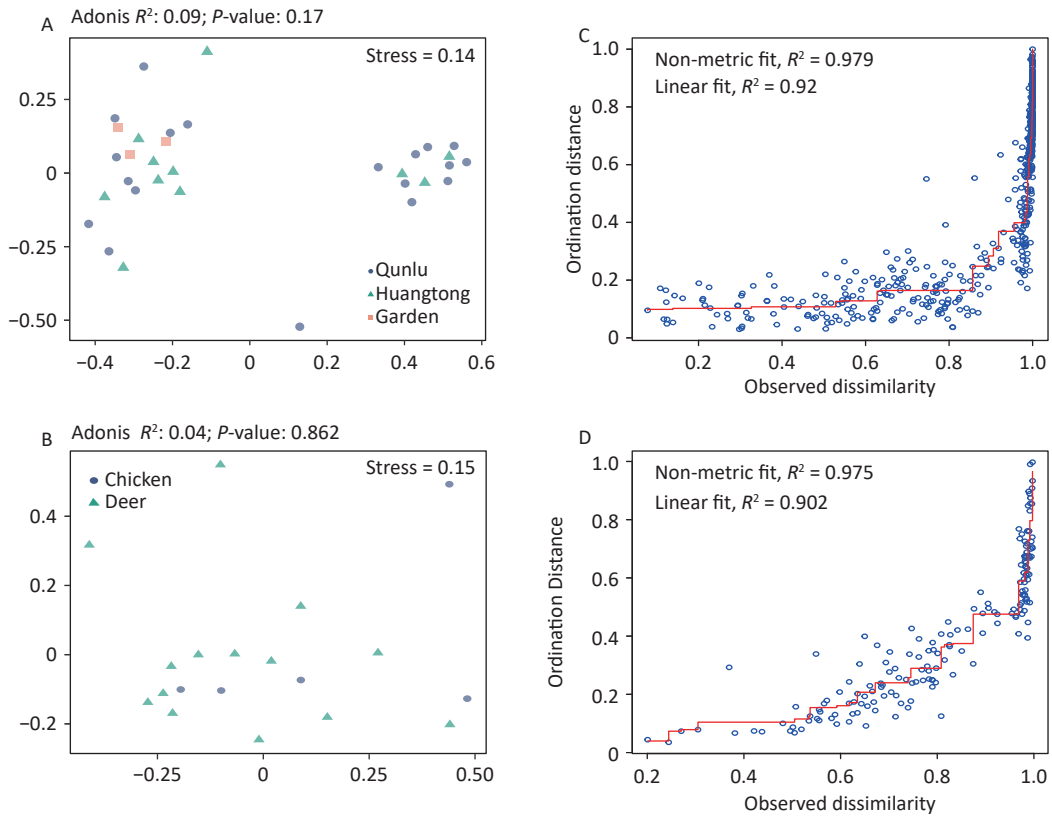
Supplementary Figure S1. Rarefaction curves for 16S rRNA gene sequences of (A) all samples and (B) both vectors. Each line represents an independent sample.



Supplementary Figure S2. Assessment of microbial diversity in midge and tick groups. (A) Principal coordinate analysis (PCoA) of midge and tick bacterial communities. Each dot represents a collective sample. All samples found inside the circle constitute biological replicates at a confidence level of 99.95%. The samples presented two distinct clusters, as indicated by Adonis test ($R^2 = 0.24$, $P = 0.001$). (B) Boxplots representing the OPU (Operational phylogenetic Unit) evenness by vector type. (C) Volcano plot for identifying differentially expressed OPUs using a negative binomial generalized linear model. Midges and ticks were differentially enriched for 78 and 44 OPUs, respectively, at a threshold of $\alpha < 0.05$.



Supplementary Figure S3. Comparisons of bacterial microbiota among ticks. (A) Non-metric multidimensional scaling ordination—NMDS—of the bacterial communities of free-living ticks and ticks parasitizing on animals. The samples presented two distinct clusters, as indicated by Adonis test ($R^2 = 0.16$, $P = 0.032$). (B) Volcano plot for identifying differentially expressed OPUs between free-living ticks and ticks parasitizing on animals using a negative binomial generalized linear model. Free-living ticks and ticks parasitizing on animals were differentially enriched for 33 and 4 OPUs, respectively, at a threshold of $\alpha < 0.05$.



Supplementary Figure S4. Non-metric multidimensional scaling ordination—NMDS—of the bacterial communities of all OPUs with respect to (A) geography and (B) hosts of midges. There was no significant difference in the bacterial community structure between geography (Adonis, $R^2 = 0.09$, $P = 0.17$) and hosts of midges (Adonis, $R^2 = 0.04$, $P = 0.86$). Shepard stress diagrams for all OPUs with respect to (C) geography and (D) hosts of midges.

Supplementary Material

Supplementary Tables

Table S1. Collected information of midge and tick samples in Jiangxi Province, China.

Species	Sample No.	No. of pools	Type of samples	Sources	Location (above m. s. l, latitude/longitude, County)
Midges	M01	50	<i>Culicoides arakawae</i> Arakawa*	Sheep	Qunlu Practice Base (52.6m, 29°48' N/116°39' E, Pengze)
	M02	50			
	M03	50			
	M04	50			
	M05	50			
	M06	50			
	M07*	50			
	M08	300			
	M09	300			
	M10	300			
	M11	300			
	M12	300			
	M13	300			
	M14	300			
	M15	300			
	M16	300			
	M17	300			
	M18*	300			
Ticks	T01	20	<i>Haemaphysalis longicornis</i> Neumann (Free-living ticks)	Natural environment	Qunlu Practice Base (52.6m, 29°48' N/116°39' E, Pengze)
	T02	20			
	T03	20			
	T04	20			
	T05	20			
	T06	20			
	T07	20			
	T08	10			
	T09	20			
	T10	20			
	T11	7			
	T12	8			
	T13	10			
	T14	10			
	T15	10			

Sample No.: the number of samples.

No. of pools: the number of individuals in each sample.

Free-living ticks: ticks collected from the natural environment.

Ticks parasitizing on animals: ticks collected from animal hosts.

*All midge samples were species of *Culicoides arakawae*, except for sample M07, which was *Culicoides nipponensis*, and sample M18, which was *Culicoides punctatus*.

Table S2. List of primers used in this study.

Target Gene	Primer Name	Sequence (5'-3')	PCR Type	Fragment Size (bp)
<i>cox2</i>	COIF20	ATGGCAACTTGAGGAMATAT	Single	601
	COIR612	CGCAGATTTCTGAACATTG		
<i>cytb</i>	CytbF373	ATAGGAACTGCTTTTATAGG	Single	526
	CytbR944	CAATAGATATGACTAAAGCGATTACT		
<i>COI</i>	LCO1490	GGTCAACAAATCATAAAGATATTGG	Single	710
	HCO2198	TAAACTTCAGGGTGACCAAAAAATCA		
<i>Pantoea atpD</i>	atpD-F	GAGGGTAACGACTTCTACCAC	Single	330
	atpD-R	CTGTACGGAGGTGATTGAAC		
<i>Coxiella groEL</i>	Cox-GrF1	TTTGAAAAATGGGCGCKCAAATGGT	1st PCR	655
	Cox-GrR2	CGRTCRCCTCAARCCAGGTGC	2nd PCR	619
	Cox-GrF2	GAAGTGGCTTCGCRTACWTCAGACG		
	Cox-GrR1	CCAAARCCAGGTGCTTTYAC		

Table S3. Quality estimation of the 16S rRNA sequencing by PacBio.

Sample	Raw reads	Final reads	Length(bp)	Q20(%)	Q30(%)	GC%	Number of OPUs
M01	8886	7495	1470	99.68	99.32	48.24	53
M02	7394	6048	1479	99.74	99.41	53.83	76
M03	9827	8302	1479	99.73	99.41	53.94	126
M04	10171	8501	1465	99.75	99.44	54.05	116
M05	6761	4232	1472	99.67	99.32	55.42	17
M06	11298	8999	1477	99.71	99.38	55.35	63
M07	11658	9668	1474	99.71	99.39	53	53
M08	5379	3553	1469	99.64	99.29	55.59	43
M09	11599	9024	1479	99.73	99.4	53.54	89
M10	8567	5309	1480	99.63	99.25	53.85	123
M11	10131	7948	1469	99.71	99.37	51.83	99
M12	6881	4801	1481	99.67	99.33	53.89	103
M13	6970	4891	1481	99.63	99.26	52.15	53
M14	9419	5606	1478	99.61	99.22	53.72	41
M15	10956	7992	1478	99.66	99.3	54.7	53
M16	3307	2347	1466	99.7	99.39	53.16	147
M17	11705	9436	1480	99.7	99.35	54.25	35
M18	6803	5013	1455	99.69	99.35	52.03	46
Total	157712	119165	-	-	-	-	_a
Average	8761.78	6620.28	1474	-	-	-	-
SD	2350.94	2170.00	7	-	-	-	-

T01	8546	5494	1471	99.67	99.31	52.12	58
T02	5290	3901	1470	99.67	99.31	51.76	126
T03	8593	6965	1479	99.7	99.37	52.77	141
T04	9685	8036	1477	99.71	99.37	52.86	103
T05	8322	6685	1478	99.7	99.36	52.91	75
T06	5766	4661	1481	99.7	99.38	52.64	67
T07	5786	4559	1475	99.7	99.37	53.06	97
T08	3406	2377	1474	99.67	99.33	53.42	49
T09	3112	2490	1481	99.66	99.3	52.69	41
T10	3821	2984	1481	99.68	99.34	52.55	25
T11	1857	1404	1477	99.71	99.37	53.37	59
T12	3329	2601	1475	99.65	99.29	53.91	70
T13	4728	3776	1480	99.69	99.35	52.7	92
T14	3927	2964	1481	99.7	99.37	52.74	38
T15	3412	2681	1477	99.7	99.39	52.86	28
Total	79580	61578	-	-	-	-	_b
Average	5305.33	4105.20	1477	-	-	-	-
SD	2341.97	1872.99	3	-	-	-	-

Final reads: The number of high quality reads for analysis.

^a662 unique OPU were assigned in total.

^b618 unique OPU were assigned in total.

Table S4. List of known species detected in midges.

OPU num	Species name	Positive samples	Positive Ratio(%)	Reads	Abundance(%)	Ref
OPU542	<i>Aeromonas hydrophila</i> /rivipollensis	4	22.22	3452	2.8968	
OPU530	<i>Providencia rettgeri</i>	5	27.78	3272	2.7458	
OPU1082	<i>Asaia siamensis</i> /spathodeae/krungthepensis/ lannensis	13	72.22	3031	2.5435	Future Microbiol. 2016;11(1):23-9.
OPU753	<i>Acinetobacter calcoaceticus</i> /pituiti/seifertii	5	27.78	3014	2.5293	
OPU1115	<i>Rickettsia bellii</i>	4	22.22	3000	2.5175	Vector Borne Zoonotic Dis. 2021 Apr;21(4):232-241.
OPU689	<i>Pseudomonas koreensis</i> /moraviensis	8	44.44	2222	1.8646	
OPU1092	<i>Gluconobacter japonicus</i> /fratewrii/thailandicus/cerinus	4	22.22	1804	1.5139	
OPU470	<i>Pantoea agglomerans</i>	13	72.22	1588	1.3326	
OPU758	<i>Acinetobacter nectaris</i>	6	33.33	977	0.8199	
OPU465	<i>Enterobacter ludwigii</i>	8	44.44	879	0.7376	Environ Pollut. 2011 Oct;159(10):2675-83.
OPU315	<i>Staphylococcus equorum</i>	13	72.22	819	0.6873	Med Mal Infect. 2013 Jun;43(6):255-7.
OPU515	<i>Serratia symbiotica</i>	8	44.44	724	0.6076	mBio. 2021 Apr 20;12(2):e00359-21.
OPU519	<i>Klebsiella oxytoca</i>	5	27.78	439	0.3684	
OPU407	<i>Lactococcus lactis</i>	11	61.11	389	0.3264	
OPU702	<i>Pseudomonas paraflava</i>	10	55.56	370	0.3105	
OPU313	<i>Staphylococcus sciuri</i>	7	38.89	297	0.2492	Vet Microbiol. 2017 Feb;199:79-84.
OPU1196	<i>Staphylococcus succinus</i>	6	33.33	284	0.2383	
OPU856	<i>Stenotrophomonas maltophilia</i> /pavanii	4	22.22	272	0.2283	
OPU739	<i>Acinetobacter soli</i>	2	11.11	253	0.2123	J Clin Microbiol. 2011 Jun;49(6):2283-5.
OPU562	<i>Chryseobacterium anthropi</i>	1	5.56	227	0.1905	
OPU421	<i>Leuconostoc mesenteroides</i>	3	16.67	202	0.1695	a case report. BMC Infect Dis. 2018 Nov 3;18(1):547.
OPU385	<i>Enterococcus faecalis</i>	5	27.78	199	0.1670	
OPU505	<i>Lonsdalea quercina</i>	9	50.00	195	0.1636	J Basic Microbiol. 2014 Oct;54(10):1126-35.
OPU733	<i>Zymobacter palmae</i>	3	16.67	172	0.1443	
OPU472	<i>Pantoea eucalypti</i>	10	55.56	164	0.1376	
OPU795	<i>Delftia tsuruhatensis</i>	2	11.11	158	0.1326	Emerg Infect Dis. 2018 Mar;24(3):594-596.
OPU233	<i>Nocardioidei listeri</i>	5	27.78	151	0.1267	
OPU975	<i>Paracoccus sphaerophysae</i>	1	5.56	119	0.0999	
OPU526	<i>Klebsiella pneumoniae</i>	5	27.78	115	0.0965	
OPU008	<i>Microbacterium lacticum</i>	1	5.56	114	0.0957	
OPU310	<i>Staphylococcus epidermidis</i>	2	11.11	99	0.0831	Methods Mol Biol. 2014;1106:17-31.
OPU492	<i>Escherichia Shigella group</i>	6	33.33	80	0.0671	
OPU078	<i>Glutamicibacter nicotianae</i>	5	27.78	66	0.0554	
OPU536	<i>Orbus sasakiae</i>	1	5.56	47	0.0394	
OPU231	<i>Kribbella alba</i>	8	44.44	46	0.0386	
OPU164	<i>Corynebacterium stationis</i>	4	22.22	45	0.0378	
OPU786	<i>Acidovorax oryzae</i> /cattleyae/avenae/ citruilli	3	16.67	45	0.0378	Mol Plant Pathol. 2020 Jan;21(1):17-37.
OPU279	<i>Bacillus cereus</i> /toyonensis/ thuringiensis	4	22.22	44	0.0369	
OPU1096	<i>Acetobacter orleanensis</i>	1	5.56	41	0.0344	
OPU1064	<i>Sphingomonas abaci</i>	3	16.67	39	0.0327	
OPU745	<i>Acinetobacter dispersus</i>	3	16.67	38	0.0319	
OPU071	<i>Brevibacterium epidermidis</i>	3	16.67	36	0.0302	Am J Med Sci. 2011 Sep;342(3):257-8.
OPU741	<i>Acinetobacter guillouiae</i> /bereziniae	5	27.78	33	0.0277	
OPU342	<i>Anaerococcus nagysae</i>	2	11.11	29	0.0243	
OPU443	<i>Tatumella ptyseos</i>	2	11.11	28	0.0235	
OPU500	<i>Serratia fonticola</i>	4	22.22	28	0.0235	
OPU777	<i>Ignatzschineria larvae</i> /ureiclastica	3	16.67	27	0.0227	
OPU998	<i>Brevundimonas intermedia</i> /nasdae/ vesicularis	6	33.33	24	0.0201	J Microbiol Immunol Infect. 2012 Dec;45(6):448-52.
OPU378	<i>Enterococcus avium</i>	4	22.22	23	0.0193	Gut Pathog. 2019 Apr 24;11:16.
OPU556	<i>Chryseobacterium hagamense</i>	4	22.22	23	0.0193	
OPU844	<i>Oligella ureolytica</i>	4	5.56	23	0.0193	Indian J Pathol Microbiol. 2014 Jan-Mar;57(1):141-3.
OPU1204	<i>Aerococcus urinaequi</i> /viridans	3	16.67	22	0.0185	
OPU379	<i>Enterococcus casseliflavus</i> /galinarum	1	5.56	18	0.0151	
OPU898	<i>Methylobacterium phyllosphaerae</i>	3	16.67	17	0.0143	
OPU737	<i>Acinetobacter junii</i>	4	22.22	16	0.0134	
OPU303	<i>Kurthia populi</i>	3	16.67	16	0.0134	
OPU490	<i>Phytobacter diazotrophicus</i>	1	5.56	15	0.0126	
OPU185	<i>Corynebacterium faecale</i>	5	27.78	14	0.0117	
OPU1025	<i>Sphingomonas aerophila</i>	1	5.56	14	0.0117	
OPU191	<i>Dietzia aerolata</i> /aurantiaca	1	5.56	12	0.0101	
OPU170	<i>Corynebacterium variabile</i>	1	5.56	10	0.0084	
OPU442	<i>Tatumella saanichensis</i>	1	5.56	10	0.0084	
OPU004	<i>Microbacterium testa</i>	4	22.22	8	0.0067	
OPU316	<i>Jeotgaliococcus psychrophilus</i>	4	22.22	8	0.0067	
OPU380	<i>Enterococcus faecium</i>	2	11.11	8	0.0067	
OPU532	<i>Morganella morganii</i>	2	11.11	8	0.0067	J Microbiol Immunol Infect. 2017 Sep 6.
OPU860	<i>Stenotrophomonas rhizophila</i>	1	5.56	8	0.0067	
OPU163	<i>Corynebacterium minutissimum</i> /singulare	1	5.56	7	0.0059	
OPU088	<i>Arthrobacter gendavensis</i>	3	16.67	6	0.0050	
OPU1108	<i>Belnapia soli</i>	2	11.11	6	0.0050	
OPU489	<i>Kosakonia cowanii</i>	3	16.67	6	0.0050	Braz J Microbiol. 2018 Jan-Mar;49(1):16-17.
OPU744	<i>Acinetobacter johnsonii</i>	1	5.56	6	0.0050	
OPU790	<i>Comamonas aquatica</i>	2	11.11	6	0.0050	
OPU896	<i>Methylobacterium tardum</i>	3	16.67	6	0.0050	
OPU181	<i>Corynebacterium maris</i>	3	16.67	5	0.0042	
OPU118	<i>Streptomyces ecfoliatus</i> /violascens/daghestanicus/albidoflavus	3	16.67	5	0.0042	
OPU236	<i>Friedmanniella ikinavensis</i>	1	5.56	5	0.0042	
OPU666	<i>Siccationidurans occlusans</i>	1	5.56	5	0.0042	
OPU981	<i>Paracoccus alcaliphilus</i>	3	16.67	5	0.0042	
OPU746	<i>Acinetobacter gandensis</i>	1	5.56	4	0.0034	
OPU023	<i>Curtobacterium flaccumfaciens</i>	3	16.67	4	0.0034	
OPU153	<i>Rhodococcus enclensis</i> /kroppenstedtii	2	11.11	4	0.0034	
OPU187	<i>Dietzia alimentaria</i>	3	16.67	4	0.0034	
OPU384	<i>Enterococcus termintis</i>	3	16.67	4	0.0034	
OPU415	<i>Lactobacillus crispatus</i>	3	16.67	4	0.0034	
OPU554	<i>Flavobacterium profundum</i> /odoratimumus	1	5.56	4	0.0034	
OPU581	<i>Dysgonomonas termittidis</i>	2	11.11	4	0.0034	
OPU778	<i>Ignatzschineria indica</i>	2	11.11	4	0.0034	IDCases. 2020 Feb 15;19:e00723.
OPU041	<i>Brachyobacterium paraconglomeratum</i> /conglomeratum	3	16.67	3	0.0025	
OPU1004	<i>Brevundimonas terrae</i>	1	5.56	3	0.0025	
OPU092	<i>Kocuria atrinae</i>	2	11.11	3	0.0025	
OPU171	<i>Corynebacterium glyciniphilum</i>	2	11.11	3	0.0025	
OPU232	<i>Nocardioopsis valliformis</i>	2	11.11	3	0.0025	
OPU304	<i>Kurthia huakuii</i>	1	5.56	3	0.0025	
OPU423	<i>Weissella confusa</i>	3	16.67	3	0.0025	
OPU461	<i>Enterobacter asburiae</i>	3	16.67	3	0.0025	
OPU504	<i>Gibbsiella dentisarsi</i>	2	11.11	3	0.0025	
OPU521	<i>Yokenella regensburgei</i>	2	11.11	3	0.0025	Vet Pathol. 2022 Jan 8;3009858211069165.
OPU555	<i>Chryseobacterium nepalense</i>	1	5.56	3	0.0025	
OPU561	<i>Chryseobacterium scophthalmum</i>	1	5.56	3	0.0025	
OPU606	<i>Pedobacter swonensis</i>	1	5.56	3	0.0025	
OPU716	<i>Pseudomonas psychrotolerans</i>	3	16.67	3	0.0025	
OPU82	<i>Glutamicibacter soli</i>	3	16.67	3	0.0025	
OPU826	<i>Herbaspirillum huttiense</i> /aquaticum	2	11.11	3	0.0025	

OPU899	Methylobacterium mesophilicum	1	5.56	3	0.0025	Clin Infect Dis. 2000 Jun;30(6):936-8.
OPU1031	<i>Sphingomonas astaxanthinifaciens</i>	1	5.56	2	0.0017	
OPU030	Sanguibacter suarezii	1	5.56	2	0.0017	
OPU042	<i>Brachybacterium faecium</i>	1	5.56	2	0.0017	
OPU058	<i>Janibacter cremeus</i>	2	11.11	2	0.0017	
OPU1023	Sphingomonas paucimobilis	2	11.11	2	0.0017	
OPU1047	<i>Sphingomonas aquatilis/melonis</i>	2	11.11	2	0.0017	
OPU1067	<i>Porphyrobacter colymbi</i>	1	5.56	2	0.0017	
OPU115	<i>Streptomyces albolongus/cavourensis</i>	2	11.11	2	0.0017	
OPU192	<i>Dietzia timorensis</i>	2	11.11	2	0.0017	
OPU200	<i>Pseudonocardia ammonixydans</i>	2	11.11	2	0.0017	
OPU300	<i>Rummelibacillus stabekisii</i>	1	5.56	2	0.0017	
OPU314	Staphylococcus vitulinus/lentus	1	5.56	2	0.0017	Perit Dial Int. 2014 Jun;34(4):469-70.
OPU318	<i>Jeotgaliococcus halotolerans</i>	2	5.56	2	0.0017	
OPU464	<i>Serratia ureilytica</i>	1	11.11	2	0.0017	
OPU520	Klebsiella michiganensis	2	11.11	2	0.0017	
OPU524	Klebsiella aerogenes	2	11.11	2	0.0017	J Craniofac Surg. 2021 Aug 27.
OPU600	<i>Mucilaginibacter ginsengisoli</i>	1	5.56	2	0.0017	
OPU621	<i>Sphingobacterium mizutaii</i>	2	11.11	2	0.0017	
OPU709	<i>Pseudomonas meridiana/antarctica</i>	2	11.11	2	0.0017	
OPU752	Acinetobacter lwoffii	2	11.11	2	0.0017	Infect Disord Drug Targets. 2015;15(3):184-8.
OPU787	<i>Acidovorax wautersii</i>	2	11.11	2	0.0017	
OPU858	<i>Stenotrophomonas chelatiphaga/tumulicola</i>	1	5.56	2	0.0017	
OPU918	<i>Methylobacterium goeingense</i>	2	11.11	2	0.0017	
OPU977	<i>Paracoccus acridae</i>	1	5.56	1	0.0008	
OPU1040	<i>Sphingomonas fonticola</i>	1	5.56	1	0.0008	
OPU612	<i>Sphingobacterium alimentarium</i>	1	5.56	1	0.0008	
OPU219	<i>Nocardioides daphniae</i>	1	5.56	1	0.0008	
OPU006	<i>Microbacterium tumbae</i>	1	5.56	1	0.0008	
OPU018	<i>Pseudoaerobacter endophyticus</i>	1	5.56	1	0.0008	
OPU049	<i>Dermabacter vaginalis</i>	1	5.56	1	0.0008	
OPU067	<i>Brevibacterium antiqum</i>	1	5.56	1	0.0008	
OPU072	<i>Brevibacterium iodinum</i>	1	5.56	1	0.0008	
OPU076	<i>Bifidobacterium longum</i>	1	5.56	1	0.0008	
OPU077	<i>Bifidobacterium pseudolongum</i>	1	5.56	1	0.0008	
OPU095	<i>Kocuria halotolerans</i>	1	5.56	1	0.0008	
OPU1021	<i>Sphingomonas pseudosanguinis</i>	1	5.56	1	0.0008	
OPU1044	<i>Sphingomonas prati</i>	1	5.56	1	0.0008	
OPU1057	<i>Sphingomonas phyllosphaerae</i>	1	5.56	1	0.0008	
OPU1059	<i>Sphingomonas yunnanensis</i>	1	5.56	1	0.0008	
OPU1066	<i>Erythrobacter vulgaris</i>	1	5.56	1	0.0008	
OPU1076	<i>Novosphingobium fluoreni</i>	1	5.56	1	0.0008	
OPU1097	<i>Acetobacter orientalis</i>	1	5.56	1	0.0008	
OPU114	<i>Streptomyces fulvoroebus/microflavus</i>	1	5.56	1	0.0008	
OPU116	<i>Streptomyces acidiscabies</i>	1	5.56	1	0.0008	
OPU1165	<i>Thermus scotoductus</i>	1	5.56	1	0.0008	
OPU122	<i>Streptomyces lonarensis</i>	1	5.56	1	0.0008	
OPU146	<i>Gordonia malaquae</i>	1	5.56	1	0.0008	
OPU147	<i>Gordonia caeni</i>	1	5.56	1	0.0008	
OPU149	<i>Williamsia serinedens</i>	1	5.56	1	0.0008	
OPU155	<i>Rhodococcus artemisiae</i>	1	5.56	1	0.0008	
OPU158	<i>Rhodococcus degradans</i>	1	5.56	1	0.0008	
OPU161	Rhodococcus fascians	1	5.56	1	0.0008	Pathogens. 2021 Feb 20;10(2):241.
OPU194	<i>Nocardia grenadensis</i>	1	5.56	1	0.0008	BMJ Case Rep. 2018 Jun 4;2018:bcr2018225441.
OPU198	<i>Pseudonocardia sediminis</i>	1	5.56	1	0.0008	
OPU204	<i>Actinomycetospora rishriensis</i>	1	5.56	1	0.0008	
OPU206	<i>Prauserella alba</i>	1	5.56	1	0.0008	
OPU209	<i>Stackebrandtia endophytica</i>	1	5.56	1	0.0008	
OPU291	<i>Sporosarcina soli</i>	1	5.56	1	0.0008	
OPU307	Staphylococcus petrasii	1	5.56	1	0.0008	Int J Med Microbiol. 2019 Dec;309(8):151355.
OPU308	Staphylococcus warneri	1	5.56	1	0.0008	Front Microbiol. 2021 Jul 29;12:691087.
OPU324	<i>Paenibacillus silagei</i>	1	5.56	1	0.0008	
OPU395	<i>Pisciglobus halotolerans</i>	1	5.56	1	0.0008	
OPU401	Streptococcus gallolyticus	1	5.56	1	0.0008	
OPU410	<i>Lactobacillus vaccinosatercus</i>	1	5.56	1	0.0008	
OPU411	<i>Lactobacillus curvatus</i>	1	5.56	1	0.0008	
OPU416	<i>Lactobacillus amylovorus</i>	1	5.56	1	0.0008	
OPU417	<i>Lactobacillus gallinarum</i>	1	5.56	1	0.0008	
OPU422	<i>Leuconostoc holzapfelii</i>	1	5.56	1	0.0008	
OPU424	<i>Weissella cibaria</i>	1	5.56	1	0.0008	
OPU426	<i>Weissella minor</i>	1	5.56	1	0.0008	
OPU459	Cedecea neteri	1	5.56	1	0.0008	
OPU462	<i>Enterobacter muelleri/tabaci</i>	1	5.56	1	0.0008	
OPU474	<i>Pantoea brenneri</i>	1	5.56	1	0.0008	
OPU534	Proteus terrae/penneri/vulgaris/cibarius	1	5.56	1	0.0008	
OPU657	<i>Hymenobacter rigui</i>	1	5.56	1	0.0008	
OPU659	<i>Hymenobacter psychrotolerans</i>	1	5.56	1	0.0008	
OPU671	<i>Rufibacter quinquiliarum/ruber</i>	1	5.56	1	0.0008	
OPU693	<i>Pseudomonas coleopterorum/rhizopherae</i>	1	5.56	1	0.0008	
OPU738	Acinetobacter vivianii/courvalinii	1	5.56	1	0.0008	Microb Pathog. 2020 Dec;149:104287.
OPU742	<i>Acinetobacter indicus</i>	1	5.56	1	0.0008	
OPU761	<i>Acinetobacter apis</i>	1	5.56	1	0.0008	
OPU807	Cupriavidus gilardii	1	5.56	1	0.0008	mSphere. 2019 Oct 2;4(5):e00631-19.
OPU841	Alcaligenes faecalis	1	5.56	1	0.0008	
OPU848	Burkholderia metallica/seminalis/terrortii/cepacia	1	5.56	1	0.0008	
OPU885	<i>Bradyrhizobium neotropicale</i>	1	5.56	1	0.0008	
OPU910	Methylobacterium extorquens/aminovorans	1	5.56	1	0.0008	J Clin Microbiol. 2011 Sep;49(9):3329-31.
OPU936	<i>Pelagibacterium luteolum</i>	1	5.56	1	0.0008	
OPU943	<i>Rhizobium soli</i>	1	5.56	1	0.0008	
OPU949	Agrobacterium larrymoorei	1	5.56	1	0.0008	Int J Syst Evol Microbiol. 2001 May;51(Pt 3):1023-1026.
OPU952	Ochrobactrum pseudogrignonense	1	5.56	1	0.0008	

30238 25.3749

*, Bacteria in bold are potential pathogens

Table S5. List of potential new species detected in midges.

OPUUnum	Species name	Positive samples	Positive Ratio(%)	Reads	Abundance(%)
OPU467	<i>Pantoea sp7</i>	14	77.78	44236	37.1216
OPU766	<i>Acinetobacter sp13</i>	9	50.00	3666	3.0764
OPU446	<i>Pantoea sp1</i>	10	55.56	952	0.7989
OPU405	<i>Lactococcus sp2</i>	5	27.78	598	0.5018
OPU513	<i>Serratia sp1</i>	6	33.33	530	0.4448
OPU306	<i>Staphylococcus sp4</i>	9	50.00	354	0.2971
OPU1198	<i>Staphylococcus sp8</i>	4	22.22	284	0.2383
OPU546	<i>Flavobacterium sp3</i>	1	5.56	242	0.2031
OPU544	<i>Aeromonas sp2</i>	2	11.11	199	0.1670
OPU178	<i>Corynebacterium sp14</i>	1	5.56	189	0.1586
OPU1193	<i>Staphylococcus sp5</i>	4	22.22	157	0.1318
OPU748	<i>Acinetobacter sp16</i>	1	5.56	142	0.1192
OPU698	<i>Pseudomonas sp7</i>	5	27.78	130	0.1091
OPU323	<i>Exiguobacterium sp1</i>	9	50.00	123	0.1032
OPU734	<i>Zymobacter sp1</i>	1	5.56	103	0.0864
OPU182	<i>Corynebacterium sp15</i>	5	27.78	99	0.0831
OPU576	<i>Dysgonomonas sp1</i>	3	16.67	95	0.0797
OPU484	<i>Pantoea sp21</i>	6	33.33	91	0.0764
OPU457	<i>Cedecea sp1</i>	12	66.67	86	0.0722
OPU628	<i>Algoriella sp1</i>	1	5.56	79	0.0663
OPU755	<i>Acinetobacter sp5</i>	3	16.67	74	0.0621
OPU391	<i>Vagococcus sp5</i>	1	5.56	51	0.0428
OPU516	<i>Lelliottia sp2</i>	1	5.56	50	0.0420
OPU594	<i>Bacteroides sp1</i>	1	5.56	47	0.0394
OPU749	<i>Acinetobacter sp3</i>	1	5.56	47	0.0394
OPU560	<i>Chryseobacterium sp1</i>	5	27.78	46	0.0386
OPU518	<i>Lelliottia sp3</i>	4	22.22	38	0.0319
OPU386	<i>Vagococcus sp7</i>	1	5.56	36	0.0302
OPU729	<i>Halomonas sp3</i>	3	16.67	31	0.0260
OPU177	<i>Corynebacterium sp13</i>	2	11.11	30	0.0252
OPU527	<i>Pluralibacter sp1</i>	3	16.67	29	0.0243
OPU197	<i>Pseudonocardia sp1</i>	7	38.89	28	0.0235
OPU870	<i>Luteimonas sp5</i>	6	33.33	26	0.0218
OPU762	<i>Acinetobacter sp9</i>	1	5.56	25	0.0210
OPU978	<i>Paracoccus sp2</i>	1	5.56	25	0.0210
OPU1089	<i>Asaia sp8</i>	3	16.67	23	0.0193
OPU805	<i>Kinneretia sp1</i>	1	5.56	18	0.0151
OPU1095	<i>Tanticharoenia sp1</i>	1	5.56	17	0.0143
OPU320	<i>Salinicoccus sp2</i>	7	38.89	17	0.0143
OPU382	<i>Enterococcus sp3</i>	1	5.56	17	0.0143
OPU404	<i>Lactococcus sp1</i>	3	16.67	17	0.0143
OPU243	<i>Cutibacterium sp3</i>	3	16.67	16	0.0134
OPU325	<i>Paenibacillus sp1</i>	1	5.56	15	0.0126
OPU383	<i>Enterococcus sp4</i>	4	22.22	15	0.0126
OPU661	<i>Siccationidurans sp1</i>	1	5.56	15	0.0126
OPU1116	<i>Rickettsia sp2</i>	2	11.11	14	0.0117
OPU455	<i>Enterobacter sp2</i>	5	27.78	14	0.0117
OPU482	<i>Pantoea sp19</i>	5	27.78	14	0.0117
OPU486	<i>Pantoea sp23</i>	1	5.56	13	0.0109
OPU570	<i>Moheibacter sp1</i>	1	5.56	13	0.0109
OPU759	<i>Acinetobacter sp7</i>	1	5.56	13	0.0109
OPU189	<i>Dietzia sp3</i>	3	16.67	12	0.0101
OPU545	<i>Aliidiomarina sp1</i>	1	5.56	12	0.0101
OPU779	<i>Ignatzschineria sp2</i>	2	11.11	12	0.0101
OPU433	<i>Spiroplasma sp1</i>	1	5.56	11	0.0092
OPU373	<i>Sporomusa sp1</i>	2	11.11	11	0.0092

OPU460	<i>Cedecea sp3</i>	3	16.67	11	0.0092
OPU468	<i>Pantoea sp8</i>	1	5.56	11	0.0092
OPU873	<i>Pseudofulvimonas sp1</i>	1	5.56	11	0.0092
OPU1062	<i>Sphingomonas sp25</i>	1	5.56	10	0.0084
OPU1087	<i>Asaia sp6</i>	1	5.56	10	0.0084
OPU183	<i>Corynebacterium sp8</i>	4	22.22	10	0.0084
OPU448	<i>Pantoea sp3</i>	2	11.11	10	0.0084
OPU449	<i>Pantoea sp4</i>	6	33.33	10	0.0084
OPU473	<i>Pantoea sp11</i>	3	16.67	10	0.0084
OPU517	<i>Lelliottia sp1</i>	1	5.56	10	0.0084
OPU637	<i>Spirosoma sp7</i>	2	11.11	10	0.0084
OPU005	<i>Microbacterium sp3</i>	2	11.11	9	0.0076
OPU1085	<i>Asaia sp4</i>	2	11.11	9	0.0076
OPU1090	<i>Swaminathania sp1</i>	4	22.22	9	0.0076
OPU692	<i>Pseudomonas sp3</i>	2	11.11	9	0.0076
OPU1032	<i>Sphingomonas sp30</i>	2	11.11	8	0.0067
OPU331	<i>Romboutsia sp2</i>	7	38.89	8	0.0067
OPU330	<i>Romboutsia sp1</i>	3	16.67	8	0.0067
OPU340	<i>Peptoniphilus sp1</i>	1	5.56	8	0.0067
OPU364	<i>Sporobacter sp1</i>	3	16.67	8	0.0067
OPU479	<i>Pantoea sp16</i>	3	16.67	8	0.0067
OPU571	<i>Ornithobacterium sp1</i>	3	16.67	8	0.0067
OPU696	<i>Pseudomonas sp5</i>	4	22.22	8	0.0067
OPU723	<i>Thiopseudomonas sp1</i>	1	5.56	8	0.0067
OPU901	<i>Methylobacterium sp10</i>	1	5.56	8	0.0067
OPU987	<i>Paracoccus sp1</i>	2	11.11	8	0.0067
OPU1042	<i>Sphingomonas sp32</i>	2	11.11	7	0.0059
OPU1022	<i>Sphingomonas sp28</i>	2	11.11	7	0.0059
OPU1088	<i>Asaia sp7</i>	2	11.11	7	0.0059
OPU1151	<i>Prostheco bacter sp1</i>	1	5.56	7	0.0059
OPU301	<i>Kurthia sp2</i>	4	22.22	7	0.0059
OPU663	<i>Siccationidurans sp2</i>	1	5.56	7	0.0059
OPU760	<i>Acinetobacter sp8</i>	1	5.56	7	0.0059
OPU447	<i>Pantoea sp2</i>	4	22.22	6	0.0050
OPU017	<i>Amnibacterium sp1</i>	2	11.11	6	0.0050
OPU075	<i>Brevibacterium sp6</i>	5	27.78	6	0.0050
OPU087	<i>Garicola sp1</i>	3	16.67	6	0.0050
OPU326	<i>Paenibacillus sp2</i>	2	11.11	6	0.0050
OPU408	<i>Lactococcus sp4</i>	3	16.67	6	0.0050
OPU429	<i>Atopostipes sp1</i>	5	27.78	6	0.0050
OPU629	<i>Spirosoma sp5</i>	1	5.56	6	0.0050
OPU676	<i>Terrimonas sp1</i>	1	5.56	6	0.0050
OPU691	<i>Pseudomonas sp2</i>	2	11.11	6	0.0050
OPU720	<i>Pseudomonas sp27</i>	2	11.11	6	0.0050
OPU730	<i>Halomonas sp1</i>	1	5.56	6	0.0050
OPU843	<i>Paenalcaligenes sp2</i>	1	5.56	6	0.0050
OPU1039	<i>Sphingomonas sp13</i>	1	5.56	5	0.0042
OPU044	<i>Brachybacterium sp3</i>	2	11.11	5	0.0042
OPU099	<i>Enteractinococcus sp1</i>	3	16.67	5	0.0042
OPU1134	<i>Singulisphaera sp1</i>	1	5.56	5	0.0042
OPU1169	<i>Treponema sp1</i>	1	5.56	5	0.0042
OPU1174	<i>Terriglobus sp1</i>	1	5.56	5	0.0042
OPU1195	<i>Staphylococcus sp6</i>	3	16.67	5	0.0042
OPU203	<i>Pseudonocardia sp1</i>	3	16.67	5	0.0042
OPU354	<i>Clostridium sp2</i>	1	5.56	5	0.0042
OPU419	<i>Lactobacillus sp4</i>	3	16.67	5	0.0042
OPU478	<i>Pantoea sp15</i>	3	16.67	5	0.0042
OPU638	<i>Spirosoma sp8</i>	2	11.11	5	0.0042

OPU768	<i>Acinetobacter sp15</i>	1	5.56	5	0.0042
OPU451	<i>Pantoea sp6</i>	3	16.67	4	0.0034
OPU1098	<i>Acetobacter sp1</i>	1	5.56	4	0.0034
OPU1117	<i>Rickettsia sp3</i>	2	11.11	4	0.0034
OPU144	<i>Gordonia sp4</i>	1	5.56	4	0.0034
OPU305	<i>Oceanobacillus sp1</i>	1	5.56	4	0.0034
OPU332	<i>Romboutsia sp3</i>	3	16.67	4	0.0034
OPU333	<i>Intestinibacter sp1</i>	3	16.67	4	0.0034
OPU344	<i>Clostridium sp1</i>	2	11.11	4	0.0034
OPU358	<i>Clostridium sp9</i>	2	11.11	4	0.0034
OPU413	<i>Lactobacillus sp1</i>	1	5.56	4	0.0034
OPU450	<i>Pantoea sp5</i>	2	11.11	4	0.0034
OPU454	<i>Enterobacter sp4</i>	2	11.11	4	0.0034
OPU456	<i>Enterobacter sp3</i>	2	11.11	4	0.0034
OPU458	<i>Cedecea sp2</i>	1	5.56	4	0.0034
OPU481	<i>Pantoea sp18</i>	3	16.67	4	0.0034
OPU591	<i>Alistipes sp1</i>	1	5.56	4	0.0034
OPU662	<i>Siccationidurans sp3</i>	1	5.56	4	0.0034
OPU904	<i>Methylobacterium sp4</i>	1	5.56	4	0.0034
OPU967	<i>Aquamicrobium sp1</i>	1	5.56	4	0.0034
OPU990	<i>Gemmobacter sp4</i>	3	16.67	4	0.0034
OPU1037	<i>Sphingomonas sp11</i>	3	16.67	3	0.0025
OPU184	<i>Corynebacterium sp9</i>	3	16.67	3	0.0025
OPU1113	<i>Rubritepida sp1</i>	1	5.56	3	0.0025
OPU013	<i>Agrococcus sp1</i>	1	5.56	3	0.0025
OPU024	<i>Leucobacter sp1</i>	1	5.56	3	0.0025
OPU045	<i>Brachybacterium sp1</i>	2	11.11	3	0.0025
OPU097	<i>Yaniella sp2</i>	2	11.11	3	0.0025
OPU100	<i>Enteractinococcus sp2</i>	1	5.56	3	0.0025
OPU1086	<i>Asaia sp5</i>	2	11.11	3	0.0025
OPU1120	<i>Anaplasma sp1</i>	2	11.11	3	0.0025
OPU1152	<i>Verrucomicrobium sp1</i>	1	5.56	3	0.0025
OPU119	<i>Streptomyces sp4</i>	1	5.56	3	0.0025
OPU180	<i>Corynebacterium sp7</i>	1	5.56	3	0.0025
OPU237	<i>Friedmanniella sp1</i>	1	5.56	3	0.0025
OPU312	<i>Staphylococcus sp3</i>	3	16.67	3	0.0025
OPU392	<i>Vagococcus sp6</i>	3	16.67	3	0.0025
OPU430	<i>Turicibacter sp1</i>	3	16.67	3	0.0025
OPU463	<i>Serratia sp1</i>	2	11.11	3	0.0025
OPU471	<i>Pantoea sp10</i>	2	11.11	3	0.0025
OPU475	<i>Pantoea sp12</i>	1	5.56	3	0.0025
OPU476	<i>Pantoea sp13</i>	2	11.11	3	0.0025
OPU480	<i>Pantoea sp17</i>	2	11.11	3	0.0025
OPU487	<i>Pantoea sp24</i>	2	11.11	3	0.0025
OPU498	<i>Pseudocitrobacter sp1</i>	2	11.11	3	0.0025
OPU523	<i>Raoultella sp1</i>	2	11.11	3	0.0025
OPU543	<i>Aeromonas sp1</i>	1	5.56	3	0.0025
OPU585	<i>Parabacteroides sp1</i>	1	5.56	3	0.0025
OPU613	<i>Sphingobacterium sp1</i>	1	5.56	3	0.0025
OPU617	<i>Sphingobacterium sp2</i>	2	11.11	3	0.0025
OPU623	<i>Sphingobacterium sp9</i>	2	11.11	3	0.0025
OPU639	<i>Spirosoma sp4</i>	1	5.56	3	0.0025
OPU646	<i>Leadbetterella sp1</i>	2	11.11	3	0.0025
OPU665	<i>Siccationidurans sp4</i>	1	5.56	3	0.0025
OPU719	<i>Pseudomonas sp24</i>	2	11.11	3	0.0025
OPU751	<i>Acinetobacter sp19</i>	2	11.11	3	0.0025
OPU763	<i>Acinetobacter sp10</i>	2	11.11	3	0.0025
OPU780	<i>Ignatzschineria sp3</i>	1	5.56	3	0.0025

OPU827	<i>Herbaspirillum sp1</i>	1	5.56	3	0.0025
OPU838	<i>Pusillimonas sp1</i>	1	5.56	3	0.0025
OPU852	<i>Azovibrio sp1</i>	1	5.56	3	0.0025
OPU246	<i>lamia sp1</i>	2	11.11	2	0.0017
OPU1077	<i>Altererythrobacter sp4</i>	1	5.56	2	0.0017
OPU717	<i>Pseudomonas sp26</i>	1	5.56	2	0.0017
OPU483	<i>Pantoea sp20</i>	1	5.56	2	0.0017
OPU603	<i>Mucilaginibacter sp2</i>	1	5.56	2	0.0017
OPU287	<i>Planomicrobium sp1</i>	2	11.11	2	0.0017
OPU396	<i>Jeotgalibaca sp1</i>	2	11.11	2	0.0017
OPU002	<i>Microbacterium sp1</i>	1	5.56	2	0.0017
OPU007	<i>Microbacterium sp4</i>	2	11.11	2	0.0017
OPU022	<i>Curtobacterium sp1</i>	2	11.11	2	0.0017
OPU034	<i>Promicromonospora sp1</i>	1	5.56	2	0.0017
OPU035	<i>Demequina sp1</i>	1	5.56	2	0.0017
OPU040	<i>Actinotalea sp1</i>	1	5.56	2	0.0017
OPU080	<i>Glutamicibacter sp2</i>	2	11.11	2	0.0017
OPU090	<i>Arthrobacter sp3</i>	1	5.56	2	0.0017
OPU1028	<i>Sphingomonas sp5</i>	2	11.11	2	0.0017
OPU1192	<i>Mycobacterium sp10</i>	2	11.11	2	0.0017
OPU1197	<i>Staphylococcus sp7</i>	2	11.11	2	0.0017
OPU120	<i>Streptomyces sp5</i>	1	5.56	2	0.0017
OPU121	<i>Streptomyces sp6</i>	1	5.56	2	0.0017
OPU126	<i>Mycobacterium sp2</i>	1	5.56	2	0.0017
OPU136	<i>Mycobacterium sp9</i>	2	11.11	2	0.0017
OPU148	<i>Williamsia sp1</i>	2	11.11	2	0.0017
OPU193	<i>Dietzia sp6</i>	1	5.56	2	0.0017
OPU230	<i>Aeromicrobium sp1</i>	2	11.11	2	0.0017
OPU238	<i>Friedmanniella sp2</i>	1	5.56	2	0.0017
OPU343	<i>Tissierella sp1</i>	1	5.56	2	0.0017
OPU347	<i>Robinsoniella sp1</i>	2	11.11	2	0.0017
OPU387	<i>Vagococcus sp1</i>	1	5.56	2	0.0017
OPU388	<i>Vagococcus sp2</i>	1	5.56	2	0.0017
OPU389	<i>Vagococcus sp3</i>	1	5.56	2	0.0017
OPU406	<i>Lactococcus sp3</i>	2	11.11	2	0.0017
OPU409	<i>Pilibacter sp1</i>	1	5.56	2	0.0017
OPU414	<i>Lactobacillus sp3</i>	1	5.56	2	0.0017
OPU444	<i>Tatumella sp1</i>	1	5.56	2	0.0017
OPU452	<i>Enterobacter sp1</i>	2	11.11	2	0.0017
OPU466	<i>Enterobacter sp6</i>	2	11.11	2	0.0017
OPU502	<i>Serratia sp4</i>	1	5.56	2	0.0017
OPU507	<i>Lonsdalea sp3</i>	2	11.11	2	0.0017
OPU508	<i>Lonsdalea sp1</i>	2	11.11	2	0.0017
OPU522	<i>Citrobacter sp1</i>	1	5.56	2	0.0017
OPU525	<i>Enterobacter sp1</i>	2	11.11	2	0.0017
OPU531	<i>Providencia sp1</i>	2	11.11	2	0.0017
OPU547	<i>Flavobacterium sp1</i>	1	5.56	2	0.0017
OPU583	<i>Dysgonomonas sp5</i>	1	5.56	2	0.0017
OPU589	<i>Fermentimonas sp2</i>	1	5.56	2	0.0017
OPU597	<i>Prevotella sp2</i>	1	5.56	2	0.0017
OPU624	<i>Sphingobacterium sp3</i>	2	11.11	2	0.0017
OPU705	<i>Pseudomonas sp14</i>	2	11.11	2	0.0017
OPU725	<i>Marinimicrobium sp1</i>	1	5.56	2	0.0017
OPU735	<i>Zymobacter sp2</i>	1	5.56	2	0.0017
OPU754	<i>Acinetobacter sp4</i>	2	11.11	2	0.0017
OPU764	<i>Acinetobacter sp11</i>	1	5.56	2	0.0017
OPU765	<i>Acinetobacter sp12</i>	1	5.56	2	0.0017
OPU767	<i>Acinetobacter sp14</i>	1	5.56	2	0.0017

OPU796	<i>Polaromonas sp1</i>	2	11.11	2	0.0017
OPU835	<i>Verticiella sp1</i>	1	5.56	2	0.0017
OPU916	<i>Methylobacterium sp13</i>	1	5.56	2	0.0017
OPU947	<i>Agrobacterium sp1</i>	2	11.11	2	0.0017
OPU1207	<i>Acinetobacter sp20</i>	1	5.56	2	0.0017
OPU1179	<i>Stenotrophobacter sp1</i>	1	5.56	1	0.0008
OPU1068	<i>Altererythrobacter sp1</i>	1	5.56	1	0.0008
OPU050	<i>Tetrasphaera sp2</i>	1	5.56	1	0.0008
OPU1065	<i>Altererythrobacter sp4</i>	1	5.56	1	0.0008
OPU1188	<i>Fimbriimonas sp1</i>	1	5.56	1	0.0008
OPU1017	<i>Sphingomonas sp2</i>	1	5.56	1	0.0008
OPU1041	<i>Sphingoaurantiacus sp1</i>	1	5.56	1	0.0008
OPU063	<i>Ornithinimicrobium sp2</i>	1	5.56	1	0.0008
OPU286	<i>Planomicrobium sp3</i>	1	5.56	1	0.0008
OPU675	<i>Segetibacter sp1</i>	1	5.56	1	0.0008
OPU867	<i>Luteimonas sp2</i>	1	5.56	1	0.0008
OPU065	<i>Serinicoccus sp1</i>	1	5.56	1	0.0008
OPU113	<i>Antricoccus sp1</i>	1	5.56	1	0.0008
OPU1182	<i>Stenotrophobacter sp2</i>	1	5.56	1	0.0008
OPU247	<i>Aquihabitans sp1</i>	1	5.56	1	0.0008
OPU298	<i>Bacillus sp3</i>	1	5.56	1	0.0008
OPU963	<i>Mesorhizobium sp1</i>	1	5.56	1	0.0008
OPU1029	<i>Sphingomonas sp6</i>	1	5.56	1	0.0008
OPU728	<i>Pseudohongiella sp1</i>	1	5.56	1	0.0008
OPU809	<i>Lautropia sp1</i>	1	5.56	1	0.0008
OPU868	<i>Luteimonas sp3</i>	1	5.56	1	0.0008
OPU931	<i>Devosia sp1</i>	1	5.56	1	0.0008
OPU934	<i>Devosia sp3</i>	1	5.56	1	0.0008
OPU980	<i>Paracoccus sp5</i>	1	5.56	1	0.0008
OPU010	<i>Leifsonia sp1</i>	1	5.56	1	0.0008
OPU011	<i>Homoserinibacter sp1</i>	1	5.56	1	0.0008
OPU014	<i>Agrococcus sp2</i>	1	5.56	1	0.0008
OPU025	<i>Leucobacter sp2</i>	1	5.56	1	0.0008
OPU026	<i>Canibacter sp1</i>	1	5.56	1	0.0008
OPU027	<i>Leucobacter sp3</i>	1	5.56	1	0.0008
OPU047	<i>Brachybacterium sp4</i>	1	5.56	1	0.0008
OPU064	<i>Ornithinimicrobium sp1</i>	1	5.56	1	0.0008
OPU1045	<i>Sphingomonas sp14</i>	1	5.56	1	0.0008
OPU1051	<i>Sphingomonas sp19</i>	1	5.56	1	0.0008
OPU1052	<i>Sphingomonas sp34</i>	1	5.56	1	0.0008
OPU1053	<i>Sphingomonas sp20</i>	1	5.56	1	0.0008
OPU106	<i>Kineosporia sp1</i>	1	5.56	1	0.0008
OPU1072	<i>Novosphingobium sp1</i>	1	5.56	1	0.0008
OPU1093	<i>Gluconobacter sp1</i>	1	5.56	1	0.0008
OPU110	<i>Acidothermus sp1</i>	1	5.56	1	0.0008
OPU1125	<i>Labilithrix sp1</i>	1	5.56	1	0.0008
OPU1138	<i>Pirellula sp1</i>	1	5.56	1	0.0008
OPU1140	<i>Roseimaritima sp1</i>	1	5.56	1	0.0008
OPU1141	<i>Blastopirellula sp1</i>	1	5.56	1	0.0008
OPU1164	<i>Truepera sp1</i>	1	5.56	1	0.0008
OPU134	<i>Mycobacterium sp3</i>	1	5.56	1	0.0008
OPU169	<i>Corynebacterium sp10</i>	1	5.56	1	0.0008
OPU179	<i>Corynebacterium sp6</i>	1	5.56	1	0.0008
OPU205	<i>Saccharopolyspora sp1</i>	1	5.56	1	0.0008
OPU208	<i>Glycomyces sp1</i>	1	5.56	1	0.0008
OPU210	<i>Nocardioides sp8</i>	1	5.56	1	0.0008
OPU211	<i>Nocardioides sp9</i>	1	5.56	1	0.0008
OPU223	<i>Nocardioides sp6</i>	1	5.56	1	0.0008

OPU234	<i>Actinomadura sp1</i>	1	5.56	1	0.0008
OPU242	<i>Naumannella sp1</i>	1	5.56	1	0.0008
OPU258	<i>Gaiella sp1</i>	1	5.56	1	0.0008
OPU280	<i>Bacillus sp4</i>	1	5.56	1	0.0008
OPU288	<i>Planococcus sp1</i>	1	5.56	1	0.0008
OPU292	<i>Sporosarcina sp3</i>	1	5.56	1	0.0008
OPU293	<i>Savagea sp1</i>	1	5.56	1	0.0008
OPU296	<i>Solibacillus sp1</i>	1	5.56	1	0.0008
OPU297	<i>Bacillus sp2</i>	1	5.56	1	0.0008
OPU302	<i>Kurthia sp1</i>	1	5.56	1	0.0008
OPU309	<i>Staphylococcus sp1</i>	1	5.56	1	0.0008
OPU319	<i>Jeotgalicoccus sp2</i>	1	5.56	1	0.0008
OPU334	<i>Terrisporobacter sp1</i>	1	5.56	1	0.0008
OPU339	<i>Anaerovorax sp1</i>	1	5.56	1	0.0008
OPU345	<i>Blautia sp1</i>	1	5.56	1	0.0008
OPU346	<i>Ruminococcus sp1</i>	1	5.56	1	0.0008
OPU355	<i>Clostridium sp3</i>	1	5.56	1	0.0008
OPU359	<i>Clostridium sp3</i>	1	5.56	1	0.0008
OPU367	<i>Eubacterium sp3</i>	1	5.56	1	0.0008
OPU368	<i>Clostridium sp6</i>	1	5.56	1	0.0008
OPU369	<i>Ruminococcus sp3</i>	1	5.56	1	0.0008
OPU376	<i>Phascolarctobacterium sp1</i>	1	5.56	1	0.0008
OPU377	<i>Veillonella sp1</i>	1	5.56	1	0.0008
OPU390	<i>Vagococcus sp4</i>	1	5.56	1	0.0008
OPU402	<i>Streptococcus sp2</i>	1	5.56	1	0.0008
OPU403	<i>Streptococcus sp3</i>	1	5.56	1	0.0008
OPU412	<i>Lactobacillus sp2</i>	1	5.56	1	0.0008
OPU420	<i>Lactobacillus sp5</i>	1	5.56	1	0.0008
OPU427	<i>Alkalibacterium sp1</i>	1	5.56	1	0.0008
OPU432	<i>Mesoplasma sp1</i>	1	5.56	1	0.0008
OPU437	<i>Acholeplasma sp1</i>	1	5.56	1	0.0008
OPU445	<i>Tatumella sp2</i>	1	5.56	1	0.0008
OPU469	<i>Pantoea sp9</i>	1	5.56	1	0.0008
OPU491	<i>Enterobacter sp1</i>	1	5.56	1	0.0008
OPU501	<i>Serratia sp3</i>	1	5.56	1	0.0008
OPU503	<i>Rahnella sp1</i>	1	5.56	1	0.0008
OPU509	<i>Pragia sp1</i>	1	5.56	1	0.0008
OPU514	<i>Buttiauxella sp1</i>	1	5.56	1	0.0008
OPU548	<i>Flavobacterium sp4</i>	1	5.56	1	0.0008
OPU563	<i>Chryseobacterium sp3</i>	1	5.56	1	0.0008
OPU566	<i>Chryseobacterium sp6</i>	1	5.56	1	0.0008
OPU572	<i>Apibacter sp1</i>	1	5.56	1	0.0008
OPU573	<i>Fluviicola sp1</i>	1	5.56	1	0.0008
OPU607	<i>Pedobacter sp1</i>	1	5.56	1	0.0008
OPU610	<i>Pedobacter sp2</i>	1	5.56	1	0.0008
OPU614	<i>Sphingobacterium sp4</i>	1	5.56	1	0.0008
OPU615	<i>Sphingobacterium sp5</i>	1	5.56	1	0.0008
OPU619	<i>Sphingobacterium sp7</i>	1	5.56	1	0.0008
OPU620	<i>Sphingobacterium sp8</i>	1	5.56	1	0.0008
OPU625	<i>Sphingobacterium sp10</i>	1	5.56	1	0.0008
OPU626	<i>Empedobacter sp1</i>	1	5.56	1	0.0008
OPU653	<i>Hymenobacter sp1</i>	1	5.56	1	0.0008
OPU660	<i>Hymenobacter sp3</i>	1	5.56	1	0.0008
OPU685	<i>Taibaiella sp1</i>	1	5.56	1	0.0008
OPU687	<i>Lewinella sp1</i>	1	5.56	1	0.0008
OPU704	<i>Pseudomonas sp13</i>	1	5.56	1	0.0008
OPU711	<i>Pseudomonas sp19</i>	1	5.56	1	0.0008
OPU715	<i>Pseudomonas sp25</i>	1	5.56	1	0.0008

OPU727	<i>Cellvibrio sp2</i>	1	5.56	1	0.0008
OPU731	<i>Halomonas sp2</i>	1	5.56	1	0.0008
OPU740	<i>Acinetobacter sp1</i>	1	5.56	1	0.0008
OPU757	<i>Alkanindiges sp1</i>	1	5.56	1	0.0008
OPU793	<i>Brachymonas sp1</i>	1	5.56	1	0.0008
OPU801	<i>Ideonella sp1</i>	1	5.56	1	0.0008
OPU828	<i>Collimonas sp1</i>	1	5.56	1	0.0008
OPU834	<i>Bordetella sp1</i>	1	5.56	1	0.0008
OPU842	<i>Paenalcaligenes sp1</i>	1	5.56	1	0.0008
OPU850	<i>Propionivibrio sp1</i>	1	5.56	1	0.0008
OPU851	<i>Azonexus sp1</i>	1	5.56	1	0.0008
OPU854	<i>Nitrosospira sp1</i>	1	5.56	1	0.0008
OPU871	<i>Rhodanobacter sp1</i>	1	5.56	1	0.0008
OPU875	<i>Algiphilus sp1</i>	1	5.56	1	0.0008
OPU883	<i>Wenzhouxiangella sp1</i>	1	5.56	1	0.0008
OPU889	<i>Pseudolabrys sp1</i>	1	5.56	1	0.0008
OPU894	<i>Methyloceanibacter sp1</i>	1	5.56	1	0.0008
OPU919	<i>Methylobacterium sp8</i>	1	5.56	1	0.0008
OPU925	<i>Microvirga sp3</i>	1	5.56	1	0.0008
OPU951	<i>Ochrobactrum sp1</i>	1	5.56	1	0.0008
OPU962	<i>Mesorhizobium sp4</i>	1	5.56	1	0.0008
OPU969	<i>Nitratireductor sp1</i>	1	5.56	1	0.0008
OPU979	<i>Paracoccus sp3</i>	1	5.56	1	0.0008
OPU984	<i>Paracoccus sp8</i>	1	5.56	1	0.0008
OPU986	<i>Paracoccus sp9</i>	1	5.56	1	0.0008
OPU995	<i>Roseibaca sp1</i>	1	5.56	1	0.0008
OPU1038	<i>Ignatzschineria sp1</i>	1	5.56	1	0.0008

54134 45.4278

Table S6. List of known species detected in ticks.

OPU num	Species name	Positive samples	Positive Ratio(%)	Reads	Abundance(%)	Ref
OPU689	<i>Pseudomonas koreensis/moraviensis</i>	4	26.67	835	1.3560	
OPU702	<i>Pseudomonas paraflava</i>	6	40.00	774	1.2569	
OPU752	Acinetobacter lwoffii	5	33.33	399	0.6480	Infect Disord Drug Targets. 2015;15(3):184-8.
OPU442	<i>Tatumella saanichensis</i>	1	6.67	387	0.6285	
OPU152	<i>Williamsia herbiopolensis</i>	6	40.00	254	0.4125	
OPU313	Staphylococcus sciuri	2	13.33	202	0.3280	Vet Microbiol. 2017 Feb;199:79-84.
OPU991	<i>Gemmobacter intermedius</i>	1	6.67	186	0.3021	
OPU769	Psychrobacter pulmonis	2	13.33	158	0.2566	
OPU872	<i>Frateuria aurantia</i>	1	6.67	120	0.1949	
OPU078	<i>Glutamicibacter nicotianae</i>	3	20.00	113	0.1835	
OPU858	<i>Stenotrophomonas chelatiphaga/tumulicola</i>	1	6.67	111	0.1803	
OPU023	Cartobacterium flaccumfaciens	6	40.00	101	0.1640	
OPU472	<i>Pantoea eucalypti</i>	1	6.67	83	0.1348	
OPU151	<i>Williamsia maris</i>	5	33.33	79	0.1283	
OPU315	Staphylococcus equorum	6	40.00	77	0.1250	Med Mal Infect. 2013 Jun;43(6):255-7.
OPU1004	<i>Brevundimonas terrae</i>	1	6.67	77	0.1250	
OPU898	<i>Methylobacterium phyllosphaerae</i>	10	66.67	76	0.1234	
OPU171	<i>Corynebacterium glyciniphilum</i>	1	6.67	73	0.1185	
OPU1021	<i>Sphingomonas pseudosanguinis</i>	1	6.67	67	0.1088	
OPU998	Brevundimonas intermedia/nasdae/vesicularis	4	26.67	57	0.0926	J Microbiol Immunol Infect. 2012 Dec;45(6):448-52.
OPU1049	<i>Sphingomonas kyungheensis</i>	5	33.33	52	0.0844	
OPU918	<i>Methylobacterium goesingense</i>	4	26.67	50	0.0812	
OPU470	Pantoea agglomerans	6	40.00	47	0.0763	
OPU1064	<i>Sphingomonas abaci</i>	5	33.33	43	0.0698	
OPU465	Enterobacter ludwigii	5	33.33	40	0.0650	Environ Pollut. 2011 Oct;159(10):2675-83.
OPU693	<i>Pseudomonas coleopterorum/rhizopherae</i>	2	13.33	38	0.0617	
OPU753	Acinetobacter calcoaceticus/pittii/seifertii	3	20.00	34	0.0552	
OPU162	<i>Rhodococcus yunnanensis</i>	5	33.33	32	0.0520	
OPU170	<i>Corynebacterium variabile</i>	2	13.33	32	0.0520	
OPU716	<i>Pseudomonas psychrotolerans</i>	4	26.67	31	0.0503	
OPU844	Oligella ureolytica	2	13.33	29	0.0471	Indian J Pathol Microbiol. 2014 Jan-Mar;57(1):141-3.
OPU694	<i>Pseudomonas abietaniphila</i>	2	13.33	28	0.0455	
OPU1196	Staphylococcus succinus	2	13.33	27	0.0438	
OPU540	Vibrio metschnikovii	1	6.67	21	0.0341	
OPU896	<i>Methylobacterium tardum</i>	4	26.67	20	0.0325	
OPU1047	<i>Sphingomonas aquatilis/melonis</i>	6	40.00	19	0.0309	
OPU666	<i>Siccationidurans oculans</i>	2	13.33	19	0.0309	
OPU204	<i>Actinomycetospora rishriensis</i>	5	33.33	18	0.0292	
OPU149	<i>Williamsia serinedens</i>	3	20.00	18	0.0292	
OPU072	<i>Brevibacterium iodinum</i>	2	13.33	18	0.0292	
OPU856	Stenotrophomonas maltophilia/pavonii	3	20.00	17	0.0276	
OPU695	<i>Pseudomonas graminis/lutea</i>	2	13.33	15	0.0244	
OPU1059	<i>Sphingomonas yunnanensis</i>	5	33.33	14	0.0227	
OPU82	<i>Glutamicibacter soli</i>	3	20.00	14	0.0227	
OPU316	<i>Jeotgalicoccus psychrophilus</i>	2	13.33	14	0.0227	
OPU906	<i>Methylobacterium komagatae</i>	4	26.67	13	0.0211	
OPU091	<i>Kocuria gwangalliensis</i>	4	26.67	12	0.0195	
OPU736	<i>Carnimonas nigrificans</i>	2	13.33	11	0.0179	
OPU089	<i>Arthrobacter koreensis/luteolus</i>	1	6.67	11	0.0179	
OPU1175	<i>Terriglobus aquaticus</i>	1	6.67	11	0.0179	
OPU907	<i>Methylobacterium aerolatium</i>	4	26.67	10	0.0162	
OPU141	Gordonia terrae/lacunae/hongkongensis	3	20.00	10	0.0162	
OPU052	<i>Lapillicoccus jejuensis</i>	4	26.67	9	0.0146	
OPU164	<i>Corynebacterium stationis</i>	3	20.00	9	0.0146	
OPU271	<i>Bacillus megaterium</i>	3	20.00	9	0.0146	
OPU633	<i>Spirosoma rigui</i>	2	13.33	9	0.0146	
OPU739	Acinetobacter soli	1	6.67	9	0.0146	J Clin Microbiol. 2011 Jun;49(6):2283-5.
OPU1094	<i>Gluconobacter albidus/cerevisiae</i>	1	6.67	9	0.0146	
OPU186	Corynebacterium efficiens	3	20.00	8	0.0130	BMC Genomics. 2005 Jun 7;6:86.
OPU004	<i>Microbacterium testa</i>	2	13.33	8	0.0130	
OPU1108	<i>Belnapia soli</i>	2	13.33	8	0.0130	
OPU385	Enterococcus faecalis	1	6.67	8	0.0130	
OPU453	Enterobacter hormaechi	1	6.67	8	0.0130	
OPU127	<i>Mycobacterium hodleri</i>	4	26.67	7	0.0114	
OPU181	<i>Corynebacterium maris</i>	3	20.00	7	0.0114	
OPU795	Defftia tsurhatensis	2	13.33	7	0.0114	Emerg Infect Dis. 2018 Mar;24(3):594-596.
OPU071	Brevibacterium epidermidis	1	6.67	7	0.0114	Am J Med Sci. 2011 Sep;342(3):257-8.
OPU318	<i>Jeotgalicoccus halotolerans</i>	1	6.67	7	0.0114	
OPU1006	<i>Brevundimonas naejangsaniensis</i>	1	6.67	7	0.0114	
OPU165	<i>Corynebacterium casei</i>	1	6.67	7	0.0114	
OPU130	<i>Mycobacterium madagascariense</i>	3	20.00	6	0.0097	
OPU279	Bacillus cereus/toyonensis/thuringiensis	2	13.33	6	0.0097	
OPU088	<i>Arthrobacter gendavensis</i>	2	13.33	6	0.0097	
OPU029	<i>Cellulosimicrobium aquatile</i>	2	13.33	6	0.0097	
OPU216	<i>Nocardioideis kribbensis</i>	2	13.33	6	0.0097	
OPU160	Rhodococcus hoagii	2	13.33	6	0.0097	
OPU1082	<i>Asaia siamensis/spathodeae/krungthepensis/lannensis</i>	2	13.33	5	0.0081	Future Microbiol. 2016;11(1):23-9.
OPU161	Rhodococcus fascians	2	13.33	5	0.0081	Pathogens. 2021 Feb 20;10(2):241.
OPU1057	<i>Sphingomonas phyllosphaerae</i>	2	13.33	5	0.0081	
OPU860	<i>Stenotrophomonas rhizophila</i>	2	13.33	5	0.0081	
OPU636	<i>Spirosoma aerophilum</i>	2	13.33	5	0.0081	
OPU899	Methylobacterium mesophilicum	3	20.00	4	0.0065	Clin Infect Dis. 2000 Jun;30(6):936-8.
OPU895	<i>Methylobacterium fujiisawaense</i>	3	20.00	4	0.0065	
OPU067	<i>Brevibacterium antiquum</i>	2	13.33	4	0.0065	
OPU236	<i>Friedmanniella ikinawensis</i>	2	13.33	4	0.0065	
OPU821	<i>Massilia arvi</i>	2	13.33	4	0.0065	
OPU1020	<i>Sphingomonas roseiflava</i>	2	13.33	4	0.0065	
OPU407	<i>Lactococcus lactis</i>	1	6.67	4	0.0065	
OPU190	<i>Dietzia lutea</i>	1	6.67	4	0.0065	
OPU074	<i>Brevibacterium oceani</i>	1	6.67	4	0.0065	
OPU911	<i>Methylobacterium salsuginis</i>	1	6.67	4	0.0065	
OPU910	Methylobacterium extorquens/aminovorans	3	20.00	3	0.0049	J Clin Microbiol. 2011 Sep;49(9):3329-31.
OPU274	<i>Bacillus niacini</i>	3	20.00	3	0.0049	
OPU492	Escherichia Shigella group	2	13.33	3	0.0049	
OPU153	<i>Rhodococcus enclensis/kroppenstedtii</i>	2	13.33	3	0.0049	
OPU146	<i>Gordonia malaquae</i>	2	13.33	3	0.0049	
OPU272	<i>Bacillus psychrosaccharolyticus</i>	2	13.33	3	0.0049	
OPU917	<i>Methylobacterium adhaesivum/gossipiicola</i>	2	13.33	3	0.0049	
OPU201	<i>Pseudonocardia tropica</i>	2	13.33	3	0.0049	
OPU1110	<i>Roseomonas aquatica</i>	2	13.33	3	0.0049	
OPU622	<i>Sphingobacterium hotanense</i>	2	13.33	3	0.0049	
OPU1060	<i>Sphingomonas jinjuensis</i>	2	13.33	3	0.0049	
OPU041	Brachybacterium paraconglomeratum /conglomeratum	1	6.67	3	0.0049	
OPU556	<i>Chryseobacterium hagamense</i>	1	6.67	3	0.0049	
OPU1092	<i>Gluconobacter japonicus/frateurii/thailandicus/cerinus</i>	1	6.67	3	0.0049	
OPU621	<i>Sphingobacterium mizutaii</i>	1	6.67	3	0.0049	

OPU030	<i>Sanguibacter suarezii</i>	1	6.67	3	0.0049	
OPU557	<i>Chryseobacterium endophyticum</i>	1	6.67	3	0.0049	
OPU081	<i>Glutamicibacter protophormiae</i>	1	6.67	3	0.0049	
OPU664	<i>Siccationidurans metalli</i>	1	6.67	3	0.0049	
OPU1018	<i>Sphingomonas trueperi/azotifigens/pituitosa</i>	1	6.67	3	0.0049	
OPU541	<i>Vibrio cincinnatiensis</i>	1	6.67	3	0.0049	Acta Med Croatica. 2000;54(3):107-11.
OPU526	<i>Klebsiella pneumoniae</i>	2	13.33	2	0.0032	
OPU1076	<i>Novosphingobium fluoreni</i>	2	13.33	2	0.0032	
OPU158	<i>Rhodococcus degradans</i>	2	13.33	2	0.0032	
OPU114	<i>Streptomyces fulvorobeus/microflavus</i>	2	13.33	2	0.0032	
OPU1165	<i>Thermus scotoductus</i>	2	13.33	2	0.0032	
OPU847	<i>Caballeronia terrestris/humi</i>	2	13.33	2	0.0032	
OPU176	<i>Corynebacterium xerosis</i>	2	13.33	2	0.0032	
OPU105	<i>Kineosporia endophyticus</i>	2	13.33	2	0.0032	
OPU900	<i>Methylobacterium marchantiae/bullatum</i>	2	13.33	2	0.0032	
OPU016	<i>Mycetocola manganoxydans</i>	2	13.33	2	0.0032	
OPU941	<i>Rhizobium yangtingense</i>	2	13.33	2	0.0032	
OPU157	<i>Rhodococcus aerolatus</i>	2	13.33	2	0.0032	
OPU1019	<i>Sphingomonas yangtingensis</i>	2	13.33	2	0.0032	
OPU056	<i>Terrabacter tumescens</i>	2	13.33	2	0.0032	
OPU515	<i>Serratia symbiotica</i>	1	6.67	2	0.0032	mBio. 2021 Apr 20;12(2):e00359-21.
OPU118	<i>Streptomyces ecfoliatus/violascens/daghestanicus/albidoflavu.</i>	1	6.67	2	0.0032	
OPU949	<i>Agrobacterium larrymoorei</i>	1	6.67	2	0.0032	Int J Syst Evol Microbiol. 2001 May;51(Pt 3):1023-1026.
OPU1025	<i>Sphingomonas aerophila</i>	1	6.67	2	0.0032	
OPU1044	<i>Sphingomonas prati</i>	1	6.67	2	0.0032	
OPU381	<i>Enterococcus camelliae</i>	1	6.67	2	0.0032	
OPU057	<i>Humibacillus xanthopallidus</i>	1	6.67	2	0.0032	
OPU060	<i>Janibacter limosus</i>	1	6.67	2	0.0032	
OPU093	<i>Kocuria palustris</i>	1	6.67	2	0.0032	Microbiol Clin (Engl Ed). 2019 Jun-Jul;37(6):422-423.
OPU818	<i>Massilia haematophila</i>	1	6.67	2	0.0032	
OPU001	<i>Microbacterium oxyda</i>	1	6.67	2	0.0032	
OPU241	<i>Microclunatus aurantiacus</i>	1	6.67	2	0.0032	
OPU1054	<i>Sphingomonas desiccabilis</i>	1	6.67	2	0.0032	
OPU195	<i>Williamsia faeni</i>	1	6.67	2	0.0032	
OPU096	<i>Yaniella halotolerans</i>	1	6.67	2	0.0032	
OPU185	<i>Corynebacterium faecale</i>	1	6.67	1	0.0016	
OPU741	<i>Acinetobacter guillouiae/berезинiae</i>	1	6.67	1	0.0016	
OPU1204	<i>Aerococcus urinaeequi/viridans</i>	1	6.67	1	0.0016	
OPU187	<i>Dietzia alimentaria</i>	1	6.67	1	0.0016	
OPU746	<i>Acinetobacter gandensis</i>	1	6.67	1	0.0016	
OPU380	<i>Enterococcus faecium</i>	1	6.67	1	0.0016	
OPU058	<i>Jamibacter cremeus</i>	1	6.67	1	0.0016	
OPU092	<i>Kocuria atrinae</i>	1	6.67	1	0.0016	
OPU709	<i>Pseudomonas meridiana/antarctica</i>	1	6.67	1	0.0016	
OPU1031	<i>Sphingomonas astaxanthinifaciens</i>	1	6.67	1	0.0016	
OPU115	<i>Streptomyces albolongus/cavourensis</i>	1	6.67	1	0.0016	
OPU012	<i>Agrococcus jenensis</i>	1	6.67	1	0.0016	
OPU1003	<i>Brevundimonas staleyii/bullata</i>	1	6.67	1	0.0016	
OPU657	<i>Hymenobacter rigui</i>	1	6.67	1	0.0016	
OPU008	<i>Microbacterium lacticum</i>	1	6.67	1	0.0016	
OPU123	<i>Mycobacterium gilvum</i>	1	6.67	1	0.0016	
OPU337	<i>Acetoanaerobium pronyense</i>	1	6.67	1	0.0016	
OPU743	<i>Acinetobacter radioresistens</i>	1	6.67	1	0.0016	
OPU021	<i>Agromyces indicus</i>	1	6.67	1	0.0016	
OPU802	<i>Aquicola tertiaricarbonis</i>	1	6.67	1	0.0016	
OPU957	<i>Aureimonas altamirensis</i>	1	6.67	1	0.0016	FEMS Microbiol Lett. 2015 Mar;362(6):fmv016.
OPU277	<i>Bacillus circulans</i>	1	6.67	1	0.0016	IDCases. 2021 Jan 26;23:e01058
OPU275	<i>Bacillus drentensis</i>	1	6.67	1	0.0016	
OPU273	<i>Bacillus endoradicis</i>	1	6.67	1	0.0016	
OPU046	<i>Brachybacterium fresconis</i>	1	6.67	1	0.0016	
OPU558	<i>Chryseobacterium arachidis</i>	1	6.67	1	0.0016	
OPU791	<i>Comamonas thiooxydans/testosteroni</i>	1	6.67	1	0.0016	Case Rep Med. 2014;2014:578127.
OPU1109	<i>Dankookia rubra</i>	1	6.67	1	0.0016	
OPU240	<i>Friedmanniella endophytica</i>	1	6.67	1	0.0016	
OPU239	<i>Friedmanniella lacustris</i>	1	6.67	1	0.0016	
OPU015	<i>Frigoribacterium salinisoli/faeni/endophyticum</i>	1	6.67	1	0.0016	
OPU019	<i>Gulosibacter molinativorax</i>	1	6.67	1	0.0016	
OPU732	<i>Halomonas alkaliantarctica/neptunia.bolivienensis/olivaria</i>	1	6.67	1	0.0016	
OPU059	<i>Jamibacter melonis</i>	1	6.67	1	0.0016	
OPU053	<i>Knoellia aerolata</i>	1	6.67	1	0.0016	
OPU094	<i>Kocuria korensis</i>	1	6.67	1	0.0016	
OPU418	<i>Lactobacillus salivarius</i>	1	6.67	1	0.0016	
OPU225	<i>Marmoricola korecus</i>	1	6.67	1	0.0016	
OPU224	<i>Marmoricola scoriae</i>	1	6.67	1	0.0016	
OPU819	<i>Massilia oculi</i>	1	6.67	1	0.0016	
OPU908	<i>Methylobacterium haplocladii/thuringiense</i>	1	6.67	1	0.0016	
OPU897	<i>Methylobacterium longum/phyllotavhyos</i>	1	6.67	1	0.0016	
OPU009	<i>Microbacterium lemovicicum</i>	1	6.67	1	0.0016	
OPU604	<i>Mucilaginibacter myungsuensis</i>	1	6.67	1	0.0016	
OPU124	<i>Mycobacterium mageritense</i>	1	6.67	1	0.0016	Indian J Microbiol. 2018 Mar;58(1):28-32.
OPU128	<i>Mycobacterium sedminis</i>	1	6.67	1	0.0016	
OPU132	<i>Mycobacterium vaccae</i>	1	6.67	1	0.0016	
OPU108	<i>Nakamurella flavida</i>	1	6.67	1	0.0016	
OPU109	<i>Nakamurella lactea</i>	1	6.67	1	0.0016	
OPU218	<i>Nocardioides plantarum</i>	1	6.67	1	0.0016	
OPU954	<i>Ochrobactrum gallinifacis</i>	1	6.67	1	0.0016	
OPU033	<i>Oerskovia jenensis/paurometabola</i>	1	6.67	1	0.0016	
OPU985	<i>Paracoccus harundaensis/marullii/carotinidaaciens</i>	1	6.67	1	0.0016	
OPU939	<i>Pararhizobium giardinii</i>	1	6.67	1	0.0016	
OPU254	<i>Patulibacter minatonensis</i>	1	6.67	1	0.0016	
OPU1008	<i>Phenylobacterium haematophilum</i>	1	6.67	1	0.0016	
OPU054	<i>Phycoccus aerophilus</i>	1	6.67	1	0.0016	
OPU102	<i>Pseudarthrobacter sulfonivorans</i>	1	6.67	1	0.0016	
OPU714	<i>Pseudomonas guangdongensis</i>	1	6.67	1	0.0016	
OPU199	<i>Pseudonocardia endophytica</i>	1	6.67	1	0.0016	
OPU937	<i>Rhizobium metallidurans</i>	1	6.67	1	0.0016	
OPU159	<i>Rhodococcus globerrulus</i>	1	6.67	1	0.0016	
OPU156	<i>Rhodococcus rhodochrous</i>	1	6.67	1	0.0016	IET Nanobiotechnol. 2018 Jun;12(4):505-508.
OPU1105	<i>Roseomonas aerilata</i>	1	6.67	1	0.0016	
OPU1104	<i>Roseomonas vinacea</i>	1	6.67	1	0.0016	
OPU259	<i>Rubrobacter bracarensis</i>	1	6.67	1	0.0016	
OPU031	<i>Sanguibacter antarcticus</i>	1	6.67	1	0.0016	
OPU616	<i>Sphingobacterium caeni</i>	1	6.67	1	0.0016	
OPU311	<i>Staphylococcus agnetis/hyicus</i>	1	6.67	1	0.0016	
OPU1199	<i>Staphylococcus kloosii</i>	1	6.67	1	0.0016	Genome Announc. 2018 May 17;6(20):e00404-18.
OPU117	<i>Streptomyces intermedius</i>	1	6.67	1	0.0016	Ann Agric Environ Med. 2019 Dec 19;26(4):555-565.
OPU055	<i>Terrabacter koreensis</i>	1	6.67	1	0.0016	
OPU139	<i>Tsukamurella tyrosinosolvans</i>	1	6.67	1	0.0016	
OPU890	<i>Variibacter gotjawalensis</i>	1	6.67	1	0.0016	

OPU782	<i>Variovorax soli/caeni</i>	1	6.67	1	0.0016
OPU196	<i>Williamsia limnetica</i>	1	6.67	1	0.0016
				5438	8.8311

*, Bacteria in bold are potential pathogens

Table S7. List of potential new species detected in ticks.

OPU num	Species name	Positive samples	Positive Ratio(%)	Reads	Abundance(%)
OPU878	<i>Coxiella sp1</i>	12	80.00	43792	71.1163
OPU699	<i>Pseudomonas sp8</i>	4	26.67	1575	2.5577
OPU467	<i>Pantoea sp7</i>	1	6.67	671	1.0897
OPU148	<i>Williamsia sp1</i>	6	40.00	242	0.3930
OPU1120	<i>Anaplasma sp1</i>	4	26.67	173	0.2809
OPU766	<i>Acinetobacter sp13</i>	1	6.67	163	0.2647
OPU584	<i>Dysgonomonas sp2</i>	1	6.67	163	0.2647
OPU1051	<i>Sphingomonas sp19</i>	4	26.67	147	0.2387
OPU166	<i>Corynebacterium sp3</i>	1	6.67	127	0.2062
OPU904	<i>Methylobacterium sp4</i>	8	53.33	116	0.1884
OPU698	<i>Pseudomonas sp7</i>	2	13.33	78	0.1267
OPU990	<i>Gemmobacter sp4</i>	1	6.67	78	0.1267
OPU283	<i>Fictibacillus sp1</i>	2	13.33	67	0.1088
OPU188	<i>Dietzia sp2</i>	2	13.33	48	0.0779
OPU022	<i>Curtobacterium sp1</i>	4	26.67	32	0.0520
OPU323	<i>Exiguobacterium sp1</i>	2	13.33	31	0.0503
OPU446	<i>Pantoea sp1</i>	2	13.33	29	0.0471
OPU692	<i>Pseudomonas sp3</i>	2	13.33	29	0.0471
OPU661	<i>Siccationidurans sp1</i>	4	26.67	26	0.0422
OPU845	<i>Oligella sp1</i>	2	13.33	26	0.0422
OPU1134	<i>Singulisphaera sp1</i>	8	53.33	24	0.0390
OPU135	<i>Mycobacterium sp5</i>	2	13.33	24	0.0390
OPU537	<i>Gilliamella sp1</i>	1	6.67	23	0.0374
OPU824	<i>Massilia sp12</i>	4	26.67	23	0.0374
OPU576	<i>Dysgonomonas sp1</i>	1	6.67	22	0.0357
OPU1055	<i>Sphingomonas sp21</i>	5	33.33	21	0.0341
OPU173	<i>Corynebacterium sp4</i>	3	20.00	21	0.0341
OPU285	<i>Planomicrobium sp2</i>	3	20.00	17	0.0276
OPU638	<i>Spirosoma sp8</i>	3	20.00	16	0.0260
OPU1048	<i>Sphingomonas sp16</i>	6	40.00	15	0.0244
OPU814	<i>Massilia sp3</i>	1	6.67	15	0.0244
OPU136	<i>Mycobacterium sp9</i>	5	33.33	14	0.0227
OPU107	<i>Geodermatophilus sp1</i>	4	26.67	14	0.0227
OPU359	<i>Clostridium sp3</i>	3	20.00	14	0.0227
OPU711	<i>Pseudomonas sp19</i>	3	20.00	14	0.0227
OPU312	<i>Staphylococcus sp3</i>	2	13.33	14	0.0227
OPU635	<i>Spirosoma sp6</i>	1	6.67	13	0.0211
OPU629	<i>Spirosoma sp5</i>	4	26.67	12	0.0195
OPU813	<i>Massilia sp2</i>	2	13.33	12	0.0195
OPU017	<i>Amnibacterium sp1</i>	4	26.67	11	0.0179
OPU374	<i>Anaeromusa sp1</i>	1	6.67	11	0.0179
OPU045	<i>Brachybacterium sp1</i>	3	20.00	10	0.0162
OPU637	<i>Spirosoma sp7</i>	2	13.33	10	0.0162
OPU330	<i>Romboutsia sp1</i>	5	33.33	9	0.0146
OPU513	<i>Serratia sp1</i>	3	20.00	9	0.0146
OPU663	<i>Siccationidurans sp2</i>	3	20.00	9	0.0146
OPU284	<i>Fictibacillus sp2</i>	2	13.33	9	0.0146
OPU703	<i>Pseudomonas sp12</i>	2	13.33	9	0.0146
OPU286	<i>Planomicrobium sp3</i>	1	6.67	9	0.0146
OPU788	<i>Xylophilus sp1</i>	1	6.67	9	0.0146
OPU1042	<i>Sphingomonas sp32</i>	4	26.67	8	0.0130
OPU080	<i>Glutamicibacter sp2</i>	2	13.33	8	0.0130
OPU582	<i>Dysgonomonas sp4</i>	1	6.67	8	0.0130
OPU103	<i>Quadrisphaera sp1</i>	4	26.67	7	0.0114
OPU306	<i>Staphylococcus sp4</i>	3	20.00	7	0.0114
OPU1052	<i>Sphingomonas sp34</i>	3	20.00	7	0.0114

OPU712	<i>Pseudomonas sp20</i>	1	6.67	7	0.0114
OPU084	<i>Citricoccus sp1</i>	4	26.67	6	0.0097
OPU1053	<i>Sphingomonas sp20</i>	4	26.67	6	0.0097
OPU276	<i>Bacillus sp3</i>	3	20.00	6	0.0097
OPU829	<i>Noviherbaspirillum sp1</i>	3	20.00	6	0.0097
OPU287	<i>Planomicrobium sp1</i>	2	13.33	6	0.0097
OPU043	<i>Brachybacterium sp2</i>	2	13.33	6	0.0097
OPU068	<i>Brevibacterium sp2</i>	2	13.33	6	0.0097
OPU718	<i>Pseudomonas sp23</i>	2	13.33	6	0.0097
OPU1080	<i>Skermanella sp1</i>	2	13.33	6	0.0097
OPU1195	<i>Staphylococcus sp6</i>	1	6.67	6	0.0097
OPU593	<i>Bacteroides sp3</i>	1	6.67	6	0.0097
OPU048	<i>Brachybacterium sp5</i>	1	6.67	6	0.0097
OPU837	<i>Candidimonas sp1</i>	1	6.67	6	0.0097
OPU1061	<i>Sphingomonas sp24</i>	1	6.67	6	0.0097
OPU859	<i>Stenotrophomonas sp2</i>	1	6.67	6	0.0097
OPU1174	<i>Terriglobus sp1</i>	4	26.67	5	0.0081
OPU947	<i>Agrobacterium sp1</i>	3	20.00	5	0.0081
OPU1085	<i>Asaia sp4</i>	3	20.00	5	0.0081
OPU394	<i>Desemzia sp1</i>	3	20.00	5	0.0081
OPU1050	<i>Sphingomonas sp18</i>	3	20.00	5	0.0081
OPU673	<i>Pseudoflavitalea sp1</i>	2	13.33	5	0.0081
OPU662	<i>Siccationidurans sp3</i>	2	13.33	5	0.0081
OPU914	<i>Methylobacterium sp7</i>	2	13.33	5	0.0081
OPU003	<i>Microbacterium sp2</i>	2	13.33	5	0.0081
OPU1172	<i>Bryocella sp1</i>	1	6.67	5	0.0081
OPU174	<i>Corynebacterium sp12</i>	1	6.67	5	0.0081
OPU609	<i>Pedobacter sp3</i>	1	6.67	5	0.0081
OPU901	<i>Methylobacterium sp10</i>	3	20.00	4	0.0065
OPU912	<i>Methylobacterium sp6</i>	3	20.00	4	0.0065
OPU150	<i>Williamsia sp2</i>	3	20.00	4	0.0065
OPU691	<i>Pseudomonas sp2</i>	2	13.33	4	0.0065
OPU720	<i>Pseudomonas sp27</i>	2	13.33	4	0.0065
OPU282	<i>Bacillus sp2</i>	2	13.33	4	0.0065
OPU816	<i>Massilia sp5</i>	2	13.33	4	0.0065
OPU172	<i>Corynebacterium sp11</i>	2	13.33	4	0.0065
OPU640	<i>Larkinella sp1</i>	2	13.33	4	0.0065
OPU946	<i>Rhizobium sp7</i>	2	13.33	4	0.0065
OPU457	<i>Cedecea sp1</i>	1	6.67	4	0.0065
OPU320	<i>Salinicoccus sp2</i>	1	6.67	4	0.0065
OPU429	<i>Atopostipes sp1</i>	1	6.67	4	0.0065
OPU843	<i>Paenalcaligenes sp2</i>	1	6.67	4	0.0065
OPU620	<i>Sphingobacterium sp8</i>	1	6.67	4	0.0065
OPU756	<i>Acinetobacter sp6</i>	1	6.67	4	0.0065
OPU1171	<i>Edaphobacter sp1</i>	1	6.67	4	0.0065
OPU568	<i>Elizabethkingia sp1</i>	1	6.67	4	0.0065
OPU133	<i>Mycobacterium sp8</i>	1	6.67	4	0.0065
OPU708	<i>Pseudomonas sp17</i>	1	6.67	4	0.0065
OPU630	<i>Spirosoma sp1</i>	1	6.67	4	0.0065
OPU140	<i>Tsukamurella sp2</i>	1	6.67	4	0.0065
OPU333	<i>Intestinibacter sp1</i>	3	20.00	3	0.0049
OPU332	<i>Romboutsia sp3</i>	3	20.00	3	0.0049
OPU237	<i>Friedmanniella sp1</i>	3	20.00	3	0.0049
OPU665	<i>Siccationidurans sp4</i>	3	20.00	3	0.0049
OPU902	<i>Methylobacterium sp3/OP</i>	3	20.00	3	0.0049
OPU1046	<i>Sphingomonas sp15</i>	3	20.00	3	0.0049
OPU331	<i>Romboutsia sp2</i>	2	13.33	3	0.0049
OPU729	<i>Halomonas sp3</i>	2	13.33	3	0.0049

OPU1179	<i>Stenotrophobacter sp1</i>	2	13.33	3	0.0049
OPU026	<i>Canibacter sp1</i>	2	13.33	3	0.0049
OPU546	<i>Flavobacterium sp3</i>	2	13.33	3	0.0049
OPU258	<i>Gaiella sp1</i>	2	13.33	3	0.0049
OPU641	<i>Fibrella sp1</i>	2	13.33	3	0.0049
OPU650	<i>Hymenobacter sp4</i>	2	13.33	3	0.0049
OPU111	<i>Jatrophihabitans sp1</i>	2	13.33	3	0.0049
OPU112	<i>Jatrophihabitans sp2</i>	2	13.33	3	0.0049
OPU810	<i>Massilia sp9</i>	2	13.33	3	0.0049
OPU129	<i>Mycobacterium sp4</i>	2	13.33	3	0.0049
OPU928	<i>Psychroglacielcola sp1</i>	2	13.33	3	0.0049
OPU1027	<i>Sphingomonas sp4</i>	2	13.33	3	0.0049
OPU887	<i>Tardiphaga sp1</i>	2	13.33	3	0.0049
OPU203	<i>Pseudonocardia sp1</i>	1	6.67	3	0.0049
OPU980	<i>Paracoccus sp5</i>	1	6.67	3	0.0049
OPU1007	<i>Brevundimonas sp6</i>	1	6.67	3	0.0049
OPU565	<i>Chryseobacterium sp5</i>	1	6.67	3	0.0049
OPU175	<i>Corynebacterium sp5</i>	1	6.67	3	0.0049
OPU642	<i>Dyadobacter sp1</i>	1	6.67	3	0.0049
OPU643	<i>Dydobacter sp2</i>	1	6.67	3	0.0049
OPU627	<i>Empedobacter sp2</i>	1	6.67	3	0.0049
OPU993	<i>Gemmobacter sp2</i>	1	6.67	3	0.0049
OPU145	<i>Gordonia sp5</i>	1	6.67	3	0.0049
OPU601	<i>Mucilagibacter sp4</i>	1	6.67	3	0.0049
OPU927	<i>Pseudochelaticoccus sp1</i>	1	6.67	3	0.0049
OPU697	<i>Pseudomonas sp6</i>	1	6.67	3	0.0049
OPU098	<i>Yaniella sp3</i>	1	6.67	3	0.0049
OPU086	<i>Arthrobacter sp2</i>	3	20.00	2	0.0032
OPU430	<i>Turicibacter sp1</i>	2	13.33	2	0.0032
OPU1188	<i>Fimbriimonas sp1</i>	2	13.33	2	0.0032
OPU1197	<i>Staphylococcus sp7</i>	2	13.33	2	0.0032
OPU110	<i>Acidothermus sp1</i>	2	13.33	2	0.0032
OPU090	<i>Arthrobacter sp3</i>	2	13.33	2	0.0032
OPU966	<i>Mesorhizobium sp3</i>	2	13.33	2	0.0032
OPU916	<i>Methylobacterium sp13</i>	2	13.33	2	0.0032
OPU1138	<i>Pirellula sp1</i>	2	13.33	2	0.0032
OPU798	<i>Rhizobacter sp2</i>	2	13.33	2	0.0032
OPU1043	<i>Sphingomonas sp33</i>	2	13.33	2	0.0032
OPU958	<i>Aureimonas sp1</i>	2	13.33	2	0.0032
OPU567	<i>Cloacibacterium sp1</i>	2	13.33	2	0.0032
OPU356	<i>Clostridium sp7</i>	2	13.33	2	0.0032
OPU815	<i>Massilia sp4</i>	2	13.33	2	0.0032
OPU825	<i>Massilia sp8</i>	2	13.33	2	0.0032
OPU920	<i>Methylobacterium sp9</i>	2	13.33	2	0.0032
OPU335	<i>Paeniclostridium sp1</i>	2	13.33	2	0.0032
OPU101	<i>Pseudarthrobacter sp5</i>	2	13.33	2	0.0032
OPU706	<i>Pseudomonas sp15</i>	2	13.33	2	0.0032
OPU799	<i>Rhizobacter sp1</i>	2	13.33	2	0.0032
OPU1015	<i>Sphingomonas sp1</i>	2	13.33	2	0.0032
OPU1036	<i>Sphingomonas sp10</i>	2	13.33	2	0.0032
OPU1058	<i>Sphingomonas sp23</i>	2	13.33	2	0.0032
OPU1024	<i>Sphingomonas sp29</i>	2	13.33	2	0.0032
OPU1030	<i>Sphingomonas sp7</i>	2	13.33	2	0.0032
OPU1033	<i>Sphingomonas sp8</i>	2	13.33	2	0.0032
OPU781	<i>Variovorax sp1</i>	2	13.33	2	0.0032
OPU796	<i>Polaromonas sp1</i>	1	6.67	2	0.0032
OPU705	<i>Pseudomonas sp14</i>	1	6.67	2	0.0032
OPU717	<i>Pseudomonas sp26</i>	1	6.67	2	0.0032

OPU1081	<i>Defluviicoccus sp1</i>	1	6.67	2	0.0032
OPU547	<i>Flavobacterium sp1</i>	1	6.67	2	0.0032
OPU653	<i>Hymenobacter sp1</i>	1	6.67	2	0.0032
OPU850	<i>Propionivibrio sp1</i>	1	6.67	2	0.0032
OPU784	<i>Ramlibacter sp1</i>	1	6.67	2	0.0032
OPU402	<i>Streptococcus sp2</i>	1	6.67	2	0.0032
OPU445	<i>Tatumella sp2</i>	1	6.67	2	0.0032
OPU388	<i>Vagococcus sp2</i>	1	6.67	2	0.0032
OPU839	<i>Advenella sp1</i>	1	6.67	2	0.0032
OPU959	<i>Aureimonas sp2</i>	1	6.67	2	0.0032
OPU999	<i>Brevundimonas sp1</i>	1	6.67	2	0.0032
OPU950	<i>Brucella sp1</i>	1	6.67	2	0.0032
OPU434	<i>Erysipelothrix sp1</i>	1	6.67	2	0.0032
OPU1145	<i>Fimbriiglobus sp1</i>	1	6.67	2	0.0032
OPU994	<i>Gemmobacter sp3</i>	1	6.67	2	0.0032
OPU611	<i>Pedobacter sp4</i>	1	6.67	2	0.0032
OPU707	<i>Pseudomonas sp16</i>	1	6.67	2	0.0032
OPU938	<i>Rhizobium sp6</i>	1	6.67	2	0.0032
OPU1106	<i>Roseomonas sp1</i>	1	6.67	2	0.0032
OPU1063	<i>Sphingomonas sp26</i>	1	6.67	2	0.0032
OPU290	<i>Sporosarcina sp2</i>	1	6.67	2	0.0032
OPU425	<i>Weissella sp1</i>	1	6.67	2	0.0032
OPU083	<i>Arthrobacter sp1</i>	1	6.67	1	0.0016
OPU484	<i>Pantoea sp21</i>	1	6.67	1	0.0016
OPU075	<i>Brevibacterium sp6</i>	1	6.67	1	0.0016
OPU560	<i>Chryseobacterium sp1</i>	1	6.67	1	0.0016
OPU755	<i>Acinetobacter sp5</i>	1	6.67	1	0.0016
OPU189	<i>Dietzia sp3</i>	1	6.67	1	0.0016
OPU393	<i>Enterococcus sp4</i>	1	6.67	1	0.0016
OPU696	<i>Pseudomonas sp5</i>	1	6.67	1	0.0016
OPU460	<i>Cedecea sp3</i>	1	6.67	1	0.0016
OPU099	<i>Enteractinococcus sp1</i>	1	6.67	1	0.0016
OPU087	<i>Garicola sp1</i>	1	6.67	1	0.0016
OPU246	<i>Iamia sp1</i>	1	6.67	1	0.0016
OPU481	<i>Pantoea sp18</i>	1	6.67	1	0.0016
OPU754	<i>Acinetobacter sp4</i>	1	6.67	1	0.0016
OPU454	<i>Enterobacter sp4</i>	1	6.67	1	0.0016
OPU106	<i>Kineosporia sp1</i>	1	6.67	1	0.0016
OPU719	<i>Pseudomonas sp24</i>	1	6.67	1	0.0016
OPU675	<i>Segetibacter sp1</i>	1	6.67	1	0.0016
OPU065	<i>Serinicoccus sp1</i>	1	6.67	1	0.0016
OPU1041	<i>Sphingoaurantiacus sp1</i>	1	6.67	1	0.0016
OPU1022	<i>Sphingomonas sp28</i>	1	6.67	1	0.0016
OPU097	<i>Yaniella sp2</i>	1	6.67	1	0.0016
OPU740	<i>Acinetobacter sp1</i>	1	6.67	1	0.0016
OPU572	<i>Apibacter sp1</i>	1	6.67	1	0.0016
OPU281	<i>Bacillus sp5</i>	1	6.67	1	0.0016
OPU834	<i>Bordetella sp1</i>	1	6.67	1	0.0016
OPU1009	<i>Caulobacter sp1</i>	1	6.67	1	0.0016
OPU399	<i>Facklamia sp2</i>	1	6.67	1	0.0016
OPU238	<i>Friedmanniella sp2</i>	1	6.67	1	0.0016
OPU651	<i>Hymenobacter sp3</i>	1	6.67	1	0.0016
OPU652	<i>Hymenobacter sp6</i>	1	6.67	1	0.0016
OPU656	<i>Hymenobacter sp8</i>	1	6.67	1	0.0016
OPU319	<i>Jeotgalicoccus sp2</i>	1	6.67	1	0.0016
OPU805	<i>Kinneretia sp1</i>	1	6.67	1	0.0016
OPU1125	<i>Labilithrix sp1</i>	1	6.67	1	0.0016
OPU027	<i>Leucobacter sp3</i>	1	6.67	1	0.0016

OPU295	<i>Lysinibacillus sp2</i>	1	6.67	1	0.0016
OPU960	<i>Mesorhizobium sp2</i>	1	6.67	1	0.0016
OPU854	<i>Nitrosospira sp1</i>	1	6.67	1	0.0016
OPU217	<i>Nocardioides sp4</i>	1	6.67	1	0.0016
OPU210	<i>Nocardioides sp8</i>	1	6.67	1	0.0016
OPU211	<i>Nocardioides sp9</i>	1	6.67	1	0.0016
OPU1072	<i>Novosphingobium sp1</i>	1	6.67	1	0.0016
OPU842	<i>Paenalcaligenes sp1</i>	1	6.67	1	0.0016
OPU475	<i>Pantoea sp12</i>	1	6.67	1	0.0016
OPU469	<i>Pantoea sp9</i>	1	6.67	1	0.0016
OPU607	<i>Pedobacter sp1</i>	1	6.67	1	0.0016
OPU288	<i>Planococcus sp1</i>	1	6.67	1	0.0016
OPU668	<i>Pontibacter sp3</i>	1	6.67	1	0.0016
OPU252	<i>Solirubrobacter sp1</i>	1	6.67	1	0.0016
OPU1045	<i>Sphingomonas sp14</i>	1	6.67	1	0.0016
OPU1034	<i>Sphingomonas sp31</i>	1	6.67	1	0.0016
OPU1035	<i>Sphingomonas sp9</i>	1	6.67	1	0.0016
OPU1095	<i>Tanticharoenia sp1</i>	1	6.67	1	0.0016
OPU438	<i>Acholeplasma sp2</i>	1	6.67	1	0.0016
OPU1102	<i>Acidisoma sp1</i>	1	6.67	1	0.0016
OPU750	<i>Acinetobacter sp17</i>	1	6.67	1	0.0016
OPU235	<i>Actinomadura sp2</i>	1	6.67	1	0.0016
OPU020	<i>Agromyces sp1</i>	1	6.67	1	0.0016
OPU352	<i>Anaerocolumna sp1</i>	1	6.67	1	0.0016
OPU956	<i>Aurantimonas sp1</i>	1	6.67	1	0.0016
OPU270	<i>Bacillus sp1</i>	1	6.67	1	0.0016
OPU595	<i>Bacteroides sp2</i>	1	6.67	1	0.0016
OPU069	<i>Brevibacterium sp3</i>	1	6.67	1	0.0016
OPU070	<i>Brevibacterium sp4</i>	1	6.67	1	0.0016
OPU073	<i>Brevibacterium sp5</i>	1	6.67	1	0.0016
OPU1183	<i>Bryobacter sp1</i>	1	6.67	1	0.0016
OPU846	<i>Caballeronia sp1</i>	1	6.67	1	0.0016
OPU299	<i>Caryophanon sp1</i>	1	6.67	1	0.0016
OPU559	<i>Chryseobacterium sp2</i>	1	6.67	1	0.0016
OPU361	<i>Clostridium sp10</i>	1	6.67	1	0.0016
OPU362	<i>Clostridium sp4</i>	1	6.67	1	0.0016
OPU363	<i>Clostridium sp5</i>	1	6.67	1	0.0016
OPU357	<i>Clostridium sp8</i>	1	6.67	1	0.0016
OPU792	<i>Comamonas sp1</i>	1	6.67	1	0.0016
OPU167	<i>Corynebacterium sp1</i>	1	6.67	1	0.0016
OPU168	<i>Corynebacterium sp2</i>	1	6.67	1	0.0016
OPU061	<i>Demetria sp1</i>	1	6.67	1	0.0016
OPU436	<i>Dubosiella sp1</i>	1	6.67	1	0.0016
OPU349	<i>Eubacterium sp2</i>	1	6.67	1	0.0016
OPU398	<i>Facklamia sp1</i>	1	6.67	1	0.0016
OPU588	<i>Fermentimonas sp1</i>	1	6.67	1	0.0016
OPU1146	<i>Gemmata sp1</i>	1	6.67	1	0.0016
OPU1158	<i>Gemmatimonas sp1</i>	1	6.67	1	0.0016
OPU079	<i>Glutamicibacter sp1</i>	1	6.67	1	0.0016
OPU143	<i>Gordonia sp3</i>	1	6.67	1	0.0016
OPU655	<i>Hymenobacter sp2</i>	1	6.67	1	0.0016
OPU654	<i>Hymenobacter sp7</i>	1	6.67	1	0.0016
OPU658	<i>Hymenobacter sp9</i>	1	6.67	1	0.0016
OPU929	<i>Hyphomicrobium sp1</i>	1	6.67	1	0.0016
OPU350	<i>Kineothrix sp1</i>	1	6.67	1	0.0016
OPU207	<i>Krasilnikovia sp1</i>	1	6.67	1	0.0016
OPU794	<i>Lampropedia sp1</i>	1	6.67	1	0.0016
OPU1153	<i>Luteolibacter sp1</i>	1	6.67	1	0.0016

OPU535	<i>Mannheimia sp1</i>	1	6.67	1	0.0016
OPU822	<i>Massilia sp10</i>	1	6.67	1	0.0016
OPU823	<i>Massilia sp11</i>	1	6.67	1	0.0016
OPU817	<i>Massilia sp6</i>	1	6.67	1	0.0016
OPU909	<i>Methylobacterium sp11</i>	1	6.67	1	0.0016
OPU915	<i>Methylobacterium sp12</i>	1	6.67	1	0.0016
OPU922	<i>Methylobacterium sp14</i>	1	6.67	1	0.0016
OPU569	<i>Moheibacter sp2</i>	1	6.67	1	0.0016
OPU602	<i>Mucilagibacter sp1</i>	1	6.67	1	0.0016
OPU125	<i>Mycobacterium sp1</i>	1	6.67	1	0.0016
OPU131	<i>Mycobacterium sp6</i>	1	6.67	1	0.0016
OPU227	<i>Nocardioides sp11</i>	1	6.67	1	0.0016
OPU833	<i>Noviherbaspirillum sp4</i>	1	6.67	1	0.0016
OPU1075	<i>Novosphingobium sp3</i>	1	6.67	1	0.0016
OPU327	<i>Paenibacillus sp3</i>	1	6.67	1	0.0016
OPU341	<i>Peptoniphilus sp2</i>	1	6.67	1	0.0016
OPU669	<i>Pontibacter sp1</i>	1	6.67	1	0.0016
OPU596	<i>Prevotella sp1</i>	1	6.67	1	0.0016
OPU710	<i>Pseudomonas sp18</i>	1	6.67	1	0.0016
OPU783	<i>Pseudorhodoferax sp1</i>	1	6.67	1	0.0016
OPU886	<i>Rhodopseudomonas sp1</i>	1	6.67	1	0.0016
OPU1112	<i>Roseomonas sp3</i>	1	6.67	1	0.0016
OPU1103	<i>Roseomonas sp4</i>	1	6.67	1	0.0016
OPU972	<i>Roseovarius sp1</i>	1	6.67	1	0.0016
OPU366	<i>Ruminococcus sp2</i>	1	6.67	1	0.0016
OPU321	<i>Salinicoccus sp1</i>	1	6.67	1	0.0016
OPU667	<i>Siccationidurans sp5</i>	1	6.67	1	0.0016
OPU618	<i>Sphingobacterium sp6</i>	1	6.67	1	0.0016
OPU1026	<i>Sphingomonas sp3</i>	1	6.67	1	0.0016
OPU632	<i>Spirosoma sp2</i>	1	6.67	1	0.0016
OPU634	<i>Spirosoma sp3</i>	1	6.67	1	0.0016
OPU289	<i>Sporosarcina sp1</i>	1	6.67	1	0.0016
OPU400	<i>Streptococcus sp1</i>	1	6.67	1	0.0016
OPU1449	<i>Terrimicrobium sp1</i>	1	6.67	1	0.0016
OPU051	<i>Tetrasphaera sp1</i>	1	6.67	1	0.0016
OPU138	<i>Tsukamurella sp1</i>	1	6.67	1	0.0016
OPU440	<i>Vampirovibrio sp1</i>	1	6.67	1	0.0016
OPU785	<i>Xenophilus sp1</i>	1	6.67	1	0.0016

48679 79.0526

Table S8. List of potentially higher taxa detected in midges.

OPU num	Species name	Positive samples	Positive Ratio(%)	Reads	Abundance(%)
OPU441	genus Erwinia	17	94.44	14755	12.3820
OPU574	order Flavobacteriales	4	22.22	7074	5.9363
OPU688	uncult class Chitinophagia	17	94.44	6868	5.7634
OPU1091	family Acetobacteraceae	6	33.33	1990	1.6700
OPU1121	class Alphaproteobacteria	2	11.11	1735	1.4560
OPU1118	order Rickettsiales	1	5.56	518	0.4347
OPU1119	family Anaplasmataceae	2	11.11	435	0.3650
OPU776	genus Wohlfahrtiimonas	2	11.11	332	0.2786
OPU510	family Enterobacteriaceae	9	50.00	311	0.2610
OPU970	family Phyllobacteriaceae	3	16.67	97	0.0814
OPU1194	uncult genus Staphylococcus	4	22.22	83	0.0697
OPU1170	family Spirochaetaceae	2	11.11	62	0.0520
OPU365	uncult family Ruminococcaceae	2	11.11	53	0.0445
OPU855	family Neisseriaceae	2	11.11	48	0.0403
OPU512	family Erwiniaceae	9	50.00	44	0.0369
OPU1100	uncult genus Acetobacteraceae	2	11.11	33	0.0277
OPU348	family Lachnospiraceae	2	11.11	31	0.0260
OPU439	phylum Cyanobacteria	8	44.44	27	0.0227
OPU370	uncult family Ruminococcaceae	1	5.56	26	0.0218
OPU1101	uncult family Acetobacteraceae	2	11.11	17	0.0143
OPU864	family Rhodocyclaceae	1	5.56	13	0.0109
OPU1132	uncult phylum Proteobacteria	7	38.89	13	0.0109
OPU884	uncult family Coxiellaceae	4	22.22	12	0.0101
OPU328	family Paenibacillaceae	2	11.11	12	0.0101
OPU892	uncult order Rhizobiales	1	5.56	12	0.0101
OPU878	genus Coxiella	2	11.11	11	0.0092
OPU575	family Porphyromonadaceae	1	5.56	11	0.0092
OPU351	family Lachnospiraceae	2	11.11	9	0.0076
OPU1163	family Trueperaceae	1	5.56	8	0.0067
OPU322	family Staphylococcaceae	5	27.78	8	0.0067
OPU499	family Enterobacteriaceae	3	16.67	8	0.0067
OPU372	uncult order Clostridiales	3	16.67	8	0.0067
OPU1205	family Erysipelotrichaceae	2	11.11	7	0.0059
OPU773	family Pseudomonadaceae	2	11.11	7	0.0059
OPU371	family Ruminococcaceae	3	16.67	5	0.0042
OPU528	family Enterobacteriaceae	2	11.11	5	0.0042
OPU587	order Bacteroidales	1	5.56	5	0.0042
OPU874	class Gammaproteobacteria	1	5.56	5	0.0042
OPU1201	family Ruminococcaceae	2	11.11	4	0.0034
OPU431	class Mollicutes	1	5.56	4	0.0034
OPU1114	uncult family Acetobacteraceae	1	5.56	3	0.0025
OPU774	family Moraxellaceae	1	5.56	3	0.0025
OPU863	family Rhodocyclaceae	1	5.56	3	0.0025
OPU1148	order Verrucomicrobiales	1	5.56	3	0.0025
OPU338	uncult order Clostridiales	1	5.56	3	0.0025
OPU722	order Cellvibrionales	2	11.11	3	0.0025
OPU1190	class Nitrospira	1	5.56	3	0.0025
OPU260	uncult class Thermomicrobia	1	5.56	3	0.0025
OPU882	class Gammaproteobacteria	1	5.56	3	0.0025
OPU1173	uncult genus Edaphobacter	1	5.56	2	0.0017
OPU1447	family Tepidisphaeraceae	1	5.56	2	0.0017
OPU1139	family Planctomycetaceae	1	5.56	2	0.0017
OPU1142	family Planctomycetaceae	1	5.56	2	0.0017
OPU1143	family Planctomycetaceae	2	11.11	2	0.0017
OPU511	family Enterobacteriaceae	1	5.56	2	0.0017
OPU529	family Enterobacteriaceae	2	11.11	2	0.0017
OPU533	family Morganellaceae	1	5.56	2	0.0017
OPU538	family Orbaceae	1	5.56	2	0.0017

OPU598	family Prevotellaceae	2	11.11	2	0.0017
OPU599	family Lentimicrobiaceae	2	11.11	2	0.0017
OPU721	family Pseudomonadaceae	1	5.56	2	0.0017
OPU808	uncult family Burkholderiaceae	1	5.56	2	0.0017
OPU836	uncult family Alcaligenaceae	2	11.11	2	0.0017
OPU1123	class Deltaproteobacteria	1	5.56	2	0.0017
OPU830	uncult genus Paraherbaspirillum	1	5.56	1	0.0008
OPU1200	uncult genus Staphylococcus	1	5.56	1	0.0008
OPU428	uncult genus Marinilactibacillus	1	5.56	1	0.0008
OPU488	uncult genus Pantoea	1	5.56	1	0.0008
OPU631	uncult genus Spirosoma	1	5.56	1	0.0008
OPU1161	family Rubricoccaceae	1	5.56	1	0.0008
OPU1127	family Sandaracinaceae	1	5.56	1	0.0008
OPU248	family Acidimicrobiaceae	1	5.56	1	0.0008
OPU590	family Rikenellaceae	1	5.56	1	0.0008
OPU1130	family Bradymonadaceae	1	5.56	1	0.0008
OPU1144	family Gemmataceae	1	5.56	1	0.0008
OPU1202	family Ruminococcaceae	1	5.56	1	0.0008
OPU353	family Lachnospiraceae	1	5.56	1	0.0008
OPU586	family Porphyromonadaceae	1	5.56	1	0.0008
OPU592	family Porphyromonadaceae	1	5.56	1	0.0008
OPU645	family Cytophagaceae	1	5.56	1	0.0008
OPU724	family Alcanivoracaceae	1	5.56	1	0.0008
OPU849	family Burkholderiaceae	1	5.56	1	0.0008
OPU1206	family Enterobacteriaceae	1	5.56	1	0.0008
OPU251	family Atopobacteriaceae	1	5.56	1	0.0008
OPU268	order Anaerolineales	1	5.56	1	0.0008
OPU269	order Caldilineales	1	5.56	1	0.0008
OPU1133	order Fusobacteriales	1	5.56	1	0.0008
OPU1155	order Verrucomicrobiales	1	5.56	1	0.0008
OPU1124	order Myxococcales	1	5.56	1	0.0008
OPU1154	order Verrucomicrobiales	1	5.56	1	0.0008
OPU1203	order Clostridiales	1	5.56	1	0.0008
OPU1176	class Unclassified Acidobacteriia	1	5.56	1	0.0008
OPU1166	phylum Deinococcus Thermus	1	5.56	1	0.0008
OPU1189	phylum Chloroflexi	1	5.56	1	0.0008

34793

29.19733143

Table S9. List of potentially higher taxa detected in ticks.

OPU Num	Species name	Positive samples	Positive Ratio(%)	Reads	Abundance(%)
OPU441	genus Erwinia	3	20.00	3254	5.2844
OPU574	order Flavobacteriales	2	13.33	1626	2.6406
OPU1119	family Anaplasmataceae	2	13.33	1552	2.5204
OPU688	uncult class Chitinophagia	2	13.33	211	0.3427
OPU1091	family Acetobacteraceae	2	13.33	176	0.2858
OPU439	phylum Cyanobacteria	8	53.33	96	0.1559
OPU575	family Porphyromonadaceae	1	6.67	75	0.1218
OPU372	uncult order Clostridiales	1	6.67	53	0.0861
OPU864	family Rhodocyclaceae	1	6.67	34	0.0552
OPU892	uncult order Rhizobiales	5	33.33	34	0.0552
OPU776	genus Wohlfahrtiimonas	1	6.67	30	0.0487
OPU855	family Neisseriaceae	1	6.67	27	0.0438
OPU154	uncult Rhodococcus spp.	3	20.00	27	0.0438
OPU590	family Rikenellaceae	1	6.67	24	0.0390
OPU1132	uncult phylum Proteobacteria	6	40.00	24	0.0390
OPU1122	family Cystobacteraceae	2	13.33	22	0.0357
OPU1131	class Deltaproteobacteria	3	20.00	22	0.0357
OPU1101	uncult family Acetobacteraceae	5	33.33	20	0.0325
OPU428	uncult genus Marinilactibacillus	2	13.33	17	0.0276
OPU370	uncult family Ruminococcaceae	1	6.67	13	0.0211
OPU371	family Ruminococcaceae	1	6.67	13	0.0211
OPU435	uncult family Erysipelotrichaceae	1	6.67	7	0.0114
OPU891	family Beijerinckiaceae	3	20.00	7	0.0114
OPU1173	uncult genus Edaphobacter	2	13.33	5	0.0081
OPU921	uncult genus Methylobacterium	5	33.33	5	0.0081
OPU1447	family Tepidisphaeraceae	2	13.33	5	0.0081
OPU800	order Burkholderiales	3	20.00	5	0.0081
OPU278	family Bacillaceae	3	20.00	4	0.0065
OPU512	family Erwiniaceae	2	13.33	4	0.0065
OPU1133	order Fusobacteriales	3	20.00	4	0.0065
OPU1148	order Verrucomicrobiales	4	26.67	4	0.0065
OPU1130	family Bradymonadaceae	1	6.67	3	0.0049
OPU840	family Alcaligenaceae	2	13.33	3	0.0049
OPU997	family Rhodobacteraceae	1	6.67	3	0.0049
OPU267	order Dehalococcoidales	2	13.33	3	0.0049
OPU1137	family Isosphaeraceae	1	6.67	2	0.0032
OPU253	family Solirubrobacteraceae	1	6.67	2	0.0032
OPU375	uncult family Selenomonadaceae	1	6.67	2	0.0032
OPU539	family Orbaceae	1	6.67	2	0.0032
OPU682	family Chitinophagaceae	2	13.33	2	0.0032
OPU836	uncult family Alcaligenaceae	1	6.67	2	0.0032
OPU971	family Aurantimonadaceae	2	13.33	2	0.0032
OPU996	family Rhodobacteraceae	1	6.67	2	0.0032
OPU256	order Solirubrobacterales	2	13.33	2	0.0032
OPU1159	uncult genus Gemmatimonas	1	6.67	1	0.0016
OPU631	uncult genus Spirosoma	1	6.67	1	0.0016
OPU1114	uncult family Acetobacteraceae	1	6.67	1	0.0016
OPU1127	family Sandaracinaceae	1	6.67	1	0.0016
OPU1135	family Isosphaeraceae	1	6.67	1	0.0016
OPU1136	family Isosphaeraceae	1	6.67	1	0.0016
OPU1143	family Planctomycetaceae	1	6.67	1	0.0016
OPU1160	family Longimicrobiaceae	1	6.67	1	0.0016
OPU1168	family Deferribacteraceae	1	6.67	1	0.0016
OPU1187	family Chthonomonadaceae	1	6.67	1	0.0016
OPU1202	family Ruminococcaceae	1	6.67	1	0.0016
OPU248	family Acidimicrobiaceae	1	6.67	1	0.0016
OPU249	family Acidimicrobiaceae	1	6.67	1	0.0016
OPU262	family Roseiflexaceae	1	6.67	1	0.0016
OPU265	uncult family Thermosporotrichaceae	1	6.67	1	0.0016

OPU538	family Orbaceae	1	6.67	1	0.0016
OPU684	family Chitinophagaceae	1	6.67	1	0.0016
OPU686	family Saprospiraceae	1	6.67	1	0.0016
OPU721	family Pseudomonadaceae	1	6.67	1	0.0016
OPU774	family Moraxellaceae	1	6.67	1	0.0016
OPU884	uncult family Coxiellaceae	1	6.67	1	0.0016
OPU1128	order Myxococcales	1	6.67	1	0.0016
OPU1156	order Kiritimatiellales	1	6.67	1	0.0016
OPU1191	order Nitrospirales	1	6.67	1	0.0016
OPU1203	order Clostridiales	1	6.67	1	0.0016
OPU263	order Chloroflexales	1	6.67	1	0.0016
OPU1176	class Unclassified Acidobacteria	1	6.67	1	0.0016
OPU1190	class Nitrospira	1	6.67	1	0.0016
OPU431	class Mollicutes	1	6.67	1	0.0016
OPU1166	phylum Deinococcus Thermus	1	6.67	1	0.0016
OPU1167	kingdom Bacteria	1	6.67	1	0.0016
				7461	12.1163