

Table S1 Origin, year of isolation, number of isolates of *S. enterica* serovar Typhimurium and its monophasic variant used in this study

Serovar	Country	Origin	Year of isolation	No. of isolates	
Typhimurium	Japan	Cattle	1977–2016	624	
		Swine	1972–2015	106	
		Birds	1992–1999	4	
		Meats		0	
		Environmental water		0	
		Humans		0	
		Subtotal		734	
	Italy	Cattle	2010	1	
		Swine	2009–2012	3	
		Birds	2011	2	
		Meats	2009–2011	4	
		Subtotal		10	
	4,[5],12:i:- ^a	Japan	Cattle	2001–2017	200
			Swine	2001–2017	46
Birds			2000–2014	8	
Meats			2003–2008	4	
Environmental water			2007	2	
Humans			2002–2008	9	
Subtotal				269	
Italy		Cattle	2011	1	
		Swine	2011	1	
		Birds	2011–2012	3	
		Meats	2010–2011	7	
		Environmental water	2012	2	
Subtotal			14		
Total				1027	

^aMonophasic variant of *S. enterica* serovar Typhimurium

Table S2 Origin and characteristics of *S. enterica* serovar Typhimurium and its monophasic variant subjected to whole genome sequencing

Isolate	Serotype or antigenic formula	hierBAPS cluster	Clade	Country	Source	Year	Phage type ^a	Sequence type	SG11 ^b	SG13 ^c	Transposon ^d	pYTI ^e	Antimicrobial resistance pattern ^f
L-3843	4,[5],12:i:-	1	1	Japan	Human	2002	UT	19	-	-	-	-	AMP, SUL, TET, SXT, GEN
L-4122	Typhimurium	1	1	Japan	Cattle	1993	DT104	19	+	-	-	-	AMP, STR, SUL, CHL
L-4014	Typhimurium	1	1	Japan	Cattle	2007	DT104	19	+	-	-	-	AMP, STR, SUL, CHL, NAL
L-4123	Typhimurium	1	1	Japan	Cattle	1994	DT104	19	+	-	-	-	AMP, STR, SUL, CHL
L-4230	Typhimurium	1	1	Japan	Swine	2011	DT104	19	+	-	-	-	AMP, STR, SUL, CHL
L-3039	Typhimurium	1	1	Japan	Crow	1998	DT104	19	+	-	-	-	AMP, STR, SUL, TET, CHL
LB-18	Typhimurium	1	1	Italy	Swine	2010	DT120	19	+	-	-	NA	AMP, STR, TET, CHL
LB-26	Typhimurium	1	1	Italy	Cattle	2010	U302	19	+	-	-	NA	AMP, STR, SUL, TET, CHL
LB-25	Typhimurium	1	1	Italy	Swine	2011	U302	19	+	-	-	NA	AMP, STR, SUL, TET, CHL
L-4131	Typhimurium	1	2	Japan	Cattle	2002	DT12	2297	-	-	-	NA	Susceptible
LB-8	Typhimurium	1	2	Italy	Swine	2010	DT193	19	-	-	-	NA	AMP
L-4133	Typhimurium	1	2	Japan	Cattle	1990	RDNC	19	-	-	-	NA	Susceptible
L-4132	Typhimurium	1	2	Japan	Cattle	1985	RDNC	19	-	-	-	-	AMP, STR, TET, CHL, KAN, NAL, GEN
L-4128	Typhimurium	1	2	Japan	Cattle	1992	RDNC	328	-	-	-	-	SUL, TET
L-4129	Typhimurium	1	2	Japan	Cattle	1987	RDNC	328	-	-	-	-	Susceptible
L-1945	Typhimurium	1	3	Japan	Society finch	1992	DT193	159	-	-	-	-	TET
LB-17	Typhimurium	1	3	Italy	Swine	2009	DT120	19	-	-	-	-	AMP, TET, CHL
L-4156	Typhimurium	1	3	Japan	Cattle	1986	DT193	19	-	-	-	NA	AMP, STR, SUL, TET, CHL, KAN, CFZ
L-3792	4,[5],12:i:-	1	3	Japan	Swine	2009	DT27	19	-	-	-	-	AMP, STR, SUL, TET, SXT
LB-24	Typhimurium	1	3	Italy	Swine	2010	U302	19	-	-	-	NA	AMP, SUL, CHL, NAL
L-4256	Typhimurium	1	3	Japan	Swine	2011	DT195	19	-	-	-	-	Susceptible
L-4228	Typhimurium	1	3	Japan	Swine	2008	UT	19	-	-	-	-	STR, SUL, TET, SXT
L-4204	Typhimurium	1	3	Japan	Swine	2008	DT195	19	-	-	-	-	STR, SUL, TET
L-4227	Typhimurium	1	3	Japan	Swine	2007	RDNC	19	-	-	-	-	STR, SUL, TET
L-4209	Typhimurium	1	3	Japan	Swine	2013	DT12	19	-	-	-	-	Susceptible
L-4211	Typhimurium	1	3	Japan	Cattle	2014	DT12	19	-	-	-	NA	Susceptible
L-3783	4,[5],12:i:-	2	4	Japan	Crow	2000	RDNC	99	-	-	-	-	Susceptible
L-3785	4,[5],12:i:-	2	4	Japan	Parrot	2005	RDNC	99	-	-	-	-	Susceptible
L-3635	4,[5],12:i:-	2	4	Japan	Cattle	2007	RDNC	99	-	-	-	-	Susceptible
L-3836	4,[5],12:i:-	2	4	Japan	Penguin	2009	RDNC	99	-	-	-	-	Susceptible
LB-5	4,[5],12:i:-	2	4	Italy	Sea water	2012	NT	99	-	-	-	NA	Susceptible
LB-4	4,[5],12:i:-	2	4	Italy	Heron	2012	RDNC	99	-	-	-	NA	Susceptible
LB-3	4,[5],12:i:-	2	4	Italy	Water	2012	DT41	99	-	-	-	NA	Susceptible
L-3823	4,[5],12:i:-	2	4	Japan	Human	2003	DT193	99	-	-	-	NA	Susceptible
L-3828	4,[5],12:i:-	2	4	Japan	River water	2007	DT26	99	-	-	-	-	Susceptible
L-4232	4,[5],12:i:-	3	5	Japan	Domestic duck	2014	DT8	19	-	-	-	-	Susceptible
L-3130	Typhimurium	3	5	Japan	Domestic duck	1999	DT8	19	-	-	-	-	Susceptible
L-4153	Typhimurium	3	5	Japan	Cattle	2007	DT193	313	-	-	-	-	Susceptible
LB-16	Typhimurium	3	5	Italy	Swine	2009	DT120	19	-	-	-	NA	Susceptible
LB-9	Typhimurium	3	5	Italy	Aves	2011	DT193	19	-	-	-	NA	Susceptible
L-2929	Typhimurium	3	5	Japan	Domestic pigeon	1998	DT193	19	-	-	-	-	Susceptible
L-4125	Typhimurium	3	6	Japan	Cattle	2006	DT40	19	-	-	-	-	Susceptible
L-4124	Typhimurium	3	6	Japan	Cattle	2001	RDNC	19	-	-	-	-	Susceptible
L-4149	Typhimurium	3	6	Japan	Cattle	2003	DT41	19	-	-	-	-	TET
L-4154	Typhimurium	3	6	Japan	Cattle	1980	DT193	19	-	-	-	-	STR, SUL, TET, NAL
L-4130	Typhimurium	3	6	Japan	Cattle	1985	RDNC	19	-	-	-	NA	AMP, NAL
L-4155	Typhimurium	3	6	Japan	Cattle	1984	DT193	19	-	-	-	-	NAL

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Table S2 – Continued

Isolate	Serotype or antigenic formula	hierBAPS cluster	Clade	Country	Source	Year	Phage type ^a	Sequence type	SG11 ^b	SG13 ^c	Transposon ^d	pY11 ^e	Antimicrobial resistance pattern ^f
L-4135	Typhimurium	3	7	Japan	Cattle	2003	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4136	Typhimurium	3	7	Japan	Cattle	2006	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4137	Typhimurium	3	7	Japan	Cattle	2006	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4138	Typhimurium	3	7	Japan	Cattle	2007	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4134	Typhimurium	3	7	Japan	Cattle	2006	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4148	Typhimurium	3	7	Japan	Cattle	2007	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4147	Typhimurium	3	7	Japan	Cattle	2007	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4239	Typhimurium	3	7	Japan	Cattle	2010	UT	19	–	–	–	+	AMP, STR, SUL, TET
L-4235	Typhimurium	3	7	Japan	Cattle	2013	DT193	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4150	Typhimurium	3	7	Japan	Cattle	2004	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4238	Typhimurium	3	7	Japan	Cattle	2012	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4139	Typhimurium	3	7	Japan	Cattle	2007	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4152	Typhimurium	3	7	Japan	Cattle	2006	UT	19	–	–	–	+	AMP, STR, SUL, TET, CHL, SXT, KAN, CFZ, CTX
L-4140	Typhimurium	3	7	Japan	Cattle	2007	UT	19	–	–	–	+	AMP, STR, SUL, TET, CHL, SXT, KAN, CFZ, CTX
L-4151	Typhimurium	3	7	Japan	Cattle	2003	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4141	Typhimurium	3	7	Japan	Cattle	2000	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4144	Typhimurium	3	7	Japan	Cattle	2002	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4145	Typhimurium	3	7	Japan	Cattle	2002	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4146	Typhimurium	3	7	Japan	Cattle	2005	UT	19	–	–	–	+	AMP, TET, KAN
L-4142	Typhimurium	3	7	Japan	Cattle	2002	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4143	Typhimurium	3	7	Japan	Cattle	2003	UT	19	–	–	–	+	AMP, STR, SUL, TET, KAN
L-4260	Typhimurium	3	8	Japan	Cattle	2013	RDNC	19	–	–	–	–	Susceptible
L-4258	Typhimurium	3	8	Japan	Cattle	2013	RDNC	19	–	–	–	–	Susceptible
L-4231	4[5],12:i:-	3	8	Japan	Swine	2013	120	19	–	–	–	–	Susceptible
L-4229	4[5],12:i:-	3	8	Japan	Swine	2008	120	19	–	–	–	–	Susceptible
L-3760	4[5],12:i:-	3	8	Japan	Cattle	2005	DT120	19	–	–	–	–	Susceptible
L-3764	4[5],12:i:-	3	8	Japan	Human	2006	DT193	19	–	–	–	–	Susceptible
L-3765	4[5],12:i:-	3	8	Japan	Human	2007	DT193	19	–	–	–	–	Susceptible
L-3284	4[5],12:i:-	3	8	Japan	Poultry	2001	RDNC	19	–	–	–	–	Susceptible
L-4218	4[5],12:i:-	3	8	Japan	Poultry	2002	DT3	19	–	–	–	NA	Susceptible
L-3761	4[5],12:i:-	3	8	Japan	Human	2004	RDNC	19	–	–	–	NA	Susceptible
L-3834	4[5],12:i:-	3	8	Japan	Human	2004	RDNC	19	–	–	–	NA	SUL
L-4205	4[5],12:i:-	3	8	Japan	Poultry	2008	RDNC	19	–	–	–	–	Susceptible
L-3840	4[5],12:i:-	3	8	Japan	Cattle	2007	RDNC	19	–	–	–	–	AMP
L-3833	4[5],12:i:-	3	8	Japan	Swine	2007	RDNC	19	–	–	–	–	Susceptible
L-3750	4[5],12:i:-	3	8	Japan	Cattle	2003	RDNC	19	–	–	–	–	Susceptible
L-3751	4[5],12:i:-	3	8	Japan	Cattle	2008	RDNC	19	–	–	–	–	Susceptible
L-4210	4[5],12:i:-	3	8	Japan	Cattle	2013	U291	19	–	–	–	–	AMP, CFZ, CTX, FOX
L-3822	4[5],12:i:-	3	8	Japan	Human	2008	RDNC	19	–	–	–	–	Susceptible
L-3825	4[5],12:i:-	3	8	Japan	Cattle	2006	RDNC	19	–	–	–	–	STR
L-4208	4[5],12:i:-	3	8	Japan	Swine	2013	U291	19	–	–	–	–	Susceptible
L-3824	4[5],12:i:-	3	8	Japan	Swine	2005	RDNC	19	–	–	–	–	Susceptible
L-3829	4[5],12:i:-	3	8	Japan	River water	2007	RDNC	19	–	–	–	–	AMP, SUL, SXT
L-3826	4[5],12:i:-	3	8	Japan	Human	2007	DT26	19	–	–	–	–	Susceptible
L-4234	4[5],12:i:-	4	9	Japan	Swine	2014	RDNC	34	–	+	–	NA	AMP, STR, SUL, TET
L-4233	4[5],12:i:-	4	9	Japan	Cattle	2014	RDNC	34	–	+	–	–	AMP, STR, SUL, TET

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Table S2—Continued

Isolate	Serotype or antigenic formula	hierBAPS cluster	Clade	Country	Source	Year	Phage type ^a	Sequence type	SGI1 ^b	SGI3 ^c	Transposon ^d	pYTI ^e	Antimicrobial resistance pattern ^f
L-4261	4[5],12:i:-	4	9	Japan	Cattle	2014	DT195	34	—	+	+	—	AMP, STR, SUL, TET, KAN
L-4259	4[5],12:i:-	4	9	Japan	Cattle	2013	RDNC	34	—	+	+	NA	AMP, STR, SUL, TET
L-4257	4[5],12:i:-	4	9	Japan	Cattle	2013	RDNC	34	—	+	+	NA	AMP, STR, SUL, TET
L-3841	4[5],12:i:-	4	9	Japan	Swine	2009	UT	34	—	+	—	NA	AMP, STR, SUL
L-3838	4[5],12:i:-	4	9	Japan	Swine	2008	UT	34	—	+	+	NA	AMP, STR, SUL, TET
L-3837	4[5],12:i:-	4	9	Japan	Cattle	2008	UT	34	—	+	+	NA	AMP, STR, SUL, TET
L-4071	4[5],12:i:-	4	9	Japan	Cattle	2013	DT193	34	—	+	+	NA	AMP, STR, SUL, TET, CFZ, CTX, FEP
LB-7	4[5],12:i:-	4	9	Italy	Poultry	2010	DT193	34	—	+	+	NA	AMP, STR, SUL, TET
LB-6	4[5],12:i:-	4	9	Italy	Swine	2011	DT193	34	—	+	+	NA	AMP, STR, TET
LB-19	4[5],12:i:-	4	9	Italy	Swine	2011	DT120	34	—	+	+	NA	AMP, STR, SUL, TET
L-3844	4[5],12:i:-	4	9	Japan	Swine	2002	RDNC	34	—	+	—	NA	STR, SUL
L-3835	4[5],12:i:-	4	9	Japan	Human	2007	DT193	34	—	+	+	NA	STR, SUL, TET
L-3846	4[5],12:i:-	4	9	Japan	Swine	2008	DT193	34	—	+	+	NA	STR, SUL, TET
L-4126	Typhimurium	4	9	Japan	Cattle	1998	RDNC	34	—	+	+	NA	AMP, STR, SUL, TET
L-4127	Typhimurium	4	9	Japan	Cattle	1998	RDNC	34	—	+	+	NA	AMP, STR, SUL, TET
LB-10	4[5],12:i:-	4	9	Italy	Swine	2011	U311	34	—	+	+	NA	TET
LB-22	4[5],12:i:-	4	9	Italy	Swine	2011	U302	34	—	+	+	NA	AMP, STR
LB-13	4[5],12:i:-	4	9	Italy	Swine	2011	U311	34	—	+	+	NA	AMP, STR, SUL, TET
LB-20	4[5],12:i:-	4	9	Italy	Poultry	2011	U311	34	—	+	+	NA	AMP, STR, SUL, TET
LB-23	4[5],12:i:-	4	9	Italy	Cattle	2011	U302	34	—	+	+	NA	AMP, STR, SUL, TET, NAL
LB-14	Typhimurium	4	9	Italy	Poultry	2011	U311	34	—	+	+	NA	AMP, STR
LB-21	4[5],12:i:-	4	9	Italy	Poultry	2012	DT120	34	—	+	+	NA	AMP, STR
LB-15	Typhimurium	4	9	Italy	Swine	2012	U311	34	—	+	+	NA	SUL, TET
LB-12	4[5],12:i:-	4	9	Italy	Cattle	2011	U311	34	—	+	+	NA	AMP, STR, SUL, TET
LB-11	4[5],12:i:-	4	9	Italy	Swine	2011	U311	34	—	+	—	NA	Susceptible

^aUT, untypable; RDNC, reacted but did not confirm.

^bSGI1, *Salmonella* genomic island 1; +, presence; —, absence.

^cSGI-3, *Salmonella* genomic island 3; +, presence; —, absence.

^dChromosomal composite transposon; +, presence; —, absence.

^eVirulence-resistance plasmid pYTI; +, presence; —, absence; NA, not applicable due to lack of plasmid contigs.

^fAMP, ampicillin; CFZ, ceftazidime; FOX, cefoxitin; CTX, ceftaxime; FEP, cefepime; CHL, chloramphenicol; STR, streptomycin; KAN, Kanamycin; GEN, gentamicin; SUL, sulfonamide;

TET, tetracycline; SXT, trimethoprim-sulfamethoxazole; NAL, nalidixic acid.

Table S3 List of reference genome sequence archives used in this study

Strain	BioSample	Assembly	RefSeq/GenBank IDs
798	SAMN02604223	GCA_000252875.1	chromosome:NC_017046.1/CP003386.1; plasmid p798_93;NC_017054.1/CP003387.1
I4028S	SAMN02604137	GCA_00022165.1	chromosome:NC_016856.1/CP001363.1; plasmid unnamed:NC_016855.1/CP001362.1
CFSAN001921	SAMN01832087	GCA_000430145.3	chromosome:NC_021814.1/CP006048.1; plasmid unnamed:NC_021815.1/CP006050.1; plasmid unnamed3;NC_021816.1/CP006052.1
CVM23701	SAMN02415273	GCA_000170255.1	draft genome:NZ_ABAO00000000/ABAO1000000
D23580	SAMEA2272777	GCA_000027025.1	chromosome:NC_016854.1/FN424405.1
DT104	SAMEA2272504	GCA_000493675.1	chromosome:ENC_022569.1/HE937208.1; plasmid II;NC_022570.1/HE937209.1
DT2	SAMEA2272227	GCA_000493535.2	chromosome:ENC_022344.1/HG326213.1; plasmid pSLT;NZ_LN999012.1/LN999012.1
L-3553	SAMD00002684	GCA_000828595.1	chromosome:NZ_APO14565.1/APO14565.1; plasmid pST3553;NZ_APO14566.1/APO14566.1
L12	SAMN02604315	GCA_000006945.2	chromosome:NC_003197.2/AE006468.2; plasmid pSLT;NC_003277.2/AE006471.2
SLI1344	SAMEA3138382	GCA_000210855.2	chromosome:NC_016810.1/FQ312003.1; plasmid pColIB9_SLJ344;NC_017718.1/HE654725.1; plasmid pRSF1010_SLJ344;NC_017719.1/HE654726.1; plasmid pSLT_SLJ344;NC_017720.1/HE654724.1
ST474	SAMN02602988	GCA_000188735.1	chromosome:NC_016857.1/CP002487.1; plasmid TY474p1;NC_016858.1/CP002488.1; plasmid TY474p2;NC_016765.1/CP002489.1; plasmid TY474p3;NC_016859.1/CP002490.1
T000240	SAMD00000683	GCA_000283735.1	chromosome:NC_016860.1/APO11957.1; plasmid pSTMDT12.L;NC_016861.1/APO11958.1; plasmid pSTMDT12.S;NC_016862.1/APO11959.1
U288	SAMN02604233	GCA_000380325.1	chromosome:NC_021151.1/CP003836.1; plasmid pSTU288-1;NC_021155.1/CP004058.1; plasmid pSTU288-2;NC_021156.1/CP004059.1; plasmid pSTU288-3;NC_021157.1/CP004060.1
UK-1	SAMN02602986	GCA_000213635.1	chromosome:NC_016863.1/CP002614.1; plasmid pSTUK-100;NC_016864.1/CP002615.1

Table S4 List of DDBJ Sequence Read Archives under accession number DRA006240

Isolate	BioSample	Experiment	Replicon
L-3843	SAMD00097407	DRX099907	Chromosome
L-3843	SAMD00097407	DRX099908	Plasmid 1
L-4122	SAMD00097408	DRX099909	Chromosome
L-4014	SAMD00097409	DRX099910	Chromosome
L-4123	SAMD00097410	DRX099911	Chromosome
L-4123	SAMD00097410	DRX099912	Plasmid 1
L-4123	SAMD00097410	DRX099913	Plasmid 2
L-4230	SAMD00097411	DRX099914	Chromosome
L-4230	SAMD00097411	DRX099915	Plasmid 1
L-4230	SAMD00097411	DRX099916	Plasmid 2
L-3039	SAMD00097412	DRX099917	Chromosome
L-3039	SAMD00097412	DRX099918	Plasmid 1
L-3039	SAMD00097412	DRX099919	Plasmid 2
LB-18	SAMD00097413	DRX099920	Whole
LB-26	SAMD00097414	DRX099921	Whole
LB-25	SAMD00097415	DRX099922	Whole
L-4131	SAMD00097416	DRX099923	Chromosome
LB-8	SAMD00097417	DRX099924	Whole
L-4133	SAMD00097418	DRX099925	Chromosome
L-4132	SAMD00097419	DRX099926	Chromosome
L-4132	SAMD00097419	DRX099927	Plasmid 1
L-4128	SAMD00097420	DRX099928	Chromosome
L-4128	SAMD00097420	DRX099929	Plasmid 1
L-4129	SAMD00097421	DRX099930	Chromosome
L-4129	SAMD00097421	DRX099931	Plasmid 1
L-4129	SAMD00097421	DRX099932	Plasmid 2
L-1945	SAMD00097422	DRX099933	Chromosome
L-1945	SAMD00097422	DRX099934	Plasmid 1
L-1945	SAMD00097422	DRX099935	Plasmid 2
L-1945	SAMD00097422	DRX099936	Plasmid 3
LB-17	SAMD00097423	DRX099937	Whole
L-4156	SAMD00097424	DRX099938	Chromosome
L-4156	SAMD00097424	DRX099939	Plasmid 1
L-3792	SAMD00097425	DRX099940	Chromosome
L-3792	SAMD00097425	DRX099941	Plasmid 1
LB-24	SAMD00097426	DRX099942	Whole
L-4256	SAMD00097427	DRX099943	Chromosome
L-4256	SAMD00097427	DRX099944	Plasmid 1
L-4256	SAMD00097427	DRX099945	Plasmid 2
L-4228	SAMD00097428	DRX099946	Chromosome
L-4228	SAMD00097428	DRX099947	Plasmid 1
L-4228	SAMD00097428	DRX099948	Plasmid 2
L-4228	SAMD00097428	DRX099949	Plasmid 3
L-4228	SAMD00097428	DRX099950	Plasmid 4
L-4204	SAMD00097429	DRX099951	Chromosome
L-4204	SAMD00097429	DRX099952	Plasmid 1
L-4204	SAMD00097429	DRX099953	Plasmid 2
L-4227	SAMD00097430	DRX099954	Chromosome

Continued on following page

Table S4 –Continued

Isolate	BioSample	Experiment	
L-4227	SAMD00097430	DRX099955	Plasmid 1
L-4227	SAMD00097430	DRX099956	Plasmid 2
L-4209	SAMD00097431	DRX099957	Chromosome
L-4209	SAMD00097431	DRX099958	Plasmid 1
L-4209	SAMD00097431	DRX099959	Plasmid 2
L-4211	SAMD00097432	DRX099960	Chromosome
L-3783	SAMD00097433	DRX099961	Chromosome
L-3783	SAMD00097433	DRX099962	Plasmid 1
L-3783	SAMD00097433	DRX099963	Plasmid 2
L-3785	SAMD00097434	DRX099964	Chromosome
L-3785	SAMD00097434	DRX099965	Plasmid 1
L-3785	SAMD00097434	DRX099966	Plasmid 2
L-3635	SAMD00097435	DRX099967	Chromosome
L-3635	SAMD00097435	DRX099968	Plasmid 1
L-3635	SAMD00097435	DRX099969	Plasmid 2
L-3836	SAMD00097436	DRX099970	Chromosome
L-3836	SAMD00097436	DRX099971	Plasmid 1
LB-5	SAMD00097437	DRX099972	Whole
LB-4	SAMD00097438	DRX099973	Whole
LB-3	SAMD00097439	DRX099974	Whole
L-3823	SAMD00097440	DRX099975	Chromosome
L-3823	SAMD00097440	DRX099976	Plasmid 1
L-3828	SAMD00097441	DRX099977	Chromosome
L-3828	SAMD00097441	DRX099978	Plasmid 1
L-3828	SAMD00097441	DRX099979	Plasmid 2
L-4232	SAMD00097442	DRX099980	Chromosome
L-4232	SAMD00097442	DRX099981	Plasmid 1
L-4232	SAMD00097442	DRX099982	Plasmid 2
L-3130	SAMD00097443	DRX099983	Chromosome
L-3130	SAMD00097443	DRX099984	Plasmid 1
L-3130	SAMD00097443	DRX099985	Plasmid 2
L-4153	SAMD00097444	DRX099986	Chromosome
L-4153	SAMD00097444	DRX099987	Plasmid 1
LB-16	SAMD00097445	DRX099988	Whole
LB-9	SAMD00097446	DRX099989	Whole
L-2929	SAMD00097447	DRX099990	Chromosome
L-2929	SAMD00097447	DRX099991	Plasmid 1
L-2929	SAMD00097447	DRX099992	Plasmid 2
L-2929	SAMD00097447	DRX099993	Plasmid 3
L-2929	SAMD00097447	DRX099994	Plasmid 4
L-4125	SAMD00097448	DRX099995	Chromosome
L-4125	SAMD00097448	DRX099996	Plasmid 1
L-4124	SAMD00097449	DRX099997	Chromosome
L-4124	SAMD00097449	DRX099998	Plasmid 1
L-4149	SAMD00097450	DRX099999	Chromosome
L-4149	SAMD00097450	DRX100000	Plasmid 1
L-4154	SAMD00097451	DRX100001	Chromosome
L-4154	SAMD00097451	DRX100002	Plasmid 1

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Table S4 –Continued

Isolate	BioSample	Experiment	
L-4154	SAMD00097451	DRX100003	Plasmid 2
L-4130	SAMD00097452	DRX100004	Chromosome
L-4155	SAMD00097453	DRX100005	Chromosome
L-4155	SAMD00097453	DRX100006	Plasmid 1
L-4135	SAMD00097454	DRX100007	Chromosome
L-4135	SAMD00097454	DRX100008	Plasmid 1
L-4136	SAMD00097455	DRX100009	Chromosome
L-4136	SAMD00097455	DRX100010	Plasmid 1
L-4136	SAMD00097455	DRX100011	Plasmid 2
L-4137	SAMD00097456	DRX100012	Chromosome
L-4137	SAMD00097456	DRX100013	Plasmid 1
L-4138	SAMD00097457	DRX100014	Chromosome
L-4138	SAMD00097457	DRX100015	Plasmid 1
L-4138	SAMD00097457	DRX100016	Plasmid 2
L-4138	SAMD00097457	DRX100017	Plasmid 3
L-4134	SAMD00097458	DRX100018	Chromosome
L-4134	SAMD00097458	DRX100019	Plasmid 1
L-4148	SAMD00097459	DRX100020	Chromosome
L-4148	SAMD00097459	DRX100021	Plasmid 1
L-4148	SAMD00097459	DRX100022	Plasmid 2
L-4147	SAMD00097460	DRX100023	Chromosome
L-4147	SAMD00097460	DRX100024	Plasmid 1
L-4147	SAMD00097460	DRX100025	Plasmid 2
L-4147	SAMD00097460	DRX100026	Plasmid 3
L-4239	SAMD00097461	DRX100027	Chromosome
L-4239	SAMD00097461	DRX100028	Plasmid 1
L-4235	SAMD00097462	DRX100029	Chromosome
L-4235	SAMD00097462	DRX100030	Plasmid 1
L-4235	SAMD00097462	DRX100031	Plasmid 2
L-4150	SAMD00097463	DRX100032	Chromosome
L-4150	SAMD00097463	DRX100033	Plasmid 1
L-4238	SAMD00097464	DRX100034	Chromosome
L-4238	SAMD00097464	DRX100035	Plasmid 1
L-4139	SAMD00097465	DRX100036	Chromosome
L-4139	SAMD00097465	DRX100037	Plasmid 1
L-4152	SAMD00097466	DRX100038	Chromosome
L-4152	SAMD00097466	DRX100039	Plasmid 1
L-4140	SAMD00097467	DRX100040	Chromosome
L-4140	SAMD00097467	DRX100041	Plasmid 1
L-4140	SAMD00097467	DRX100042	Plasmid 2
L-4140	SAMD00097467	DRX100043	Plasmid 3
L-4151	SAMD00097468	DRX100044	Chromosome
L-4151	SAMD00097468	DRX100045	Plasmid 1
L-4151	SAMD00097468	DRX100046	Plasmid 2
L-4141	SAMD00097469	DRX100047	Chromosome
L-4141	SAMD00097469	DRX100048	Plasmid 1
L-4141	SAMD00097469	DRX100049	Plasmid 2
L-4144	SAMD00097470	DRX100050	Chromosome

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Table S4 –Continued

Isolate	BioSample	Experiment	
L-4144	SAMD00097470	DRX100051	Plasmid 1
L-4145	SAMD00097471	DRX100052	Chromosome
L-4145	SAMD00097471	DRX100053	Plasmid 1
L-4145	SAMD00097471	DRX100054	Plasmid 2
L-4146	SAMD00097472	DRX100055	Chromosome
L-4146	SAMD00097472	DRX100056	Plasmid 1
L-4146	SAMD00097472	DRX100057	Plasmid 2
L-4142	SAMD00097473	DRX100058	Chromosome
L-4142	SAMD00097473	DRX100059	Plasmid 1
L-4143	SAMD00097474	DRX100060	Chromosome
L-4143	SAMD00097474	DRX100061	Plasmid 1
L-4260	SAMD00097475	DRX100062	Chromosome
L-4260	SAMD00097475	DRX100063	Plasmid 1
L-4260	SAMD00097475	DRX100064	Plasmid 2
L-4258	SAMD00097476	DRX100065	Chromosome
L-4258	SAMD00097476	DRX100066	Plasmid 1
L-4258	SAMD00097476	DRX100067	Plasmid 2
L-4231	SAMD00097477	DRX100068	Chromosome
L-4231	SAMD00097477	DRX100069	Plasmid 1
L-4231	SAMD00097477	DRX100070	Plasmid 2
L-4229	SAMD00097478	DRX100071	Chromosome
L-4229	SAMD00097478	DRX100072	Plasmid 1
L-4229	SAMD00097478	DRX100073	Plasmid 2
L-3760	SAMD00097479	DRX100074	Chromosome
L-3760	SAMD00097479	DRX100075	Plasmid 1
L-3760	SAMD00097479	DRX100076	Plasmid 2
L-3764	SAMD00097480	DRX100077	Chromosome
L-3764	SAMD00097480	DRX100078	Plasmid 1
L-3764	SAMD00097480	DRX100079	Plasmid 2
L-3765	SAMD00097481	DRX100080	Chromosome
L-3765	SAMD00097481	DRX100081	Plasmid 1
L-3765	SAMD00097481	DRX100082	Plasmid 2
L-3284	SAMD00097482	DRX100083	Chromosome
L-3284	SAMD00097482	DRX100084	Plasmid 1
L-3284	SAMD00097482	DRX100085	Plasmid 2
L-4218	SAMD00097483	DRX100086	Chromosome
L-3761	SAMD00097484	DRX100087	Chromosome
L-3834	SAMD00097485	DRX100088	Chromosome
L-3834	SAMD00097485	DRX100089	Plasmid 1
L-3834	SAMD00097485	DRX100090	Plasmid 2
L-4205	SAMD00097486	DRX100091	Chromosome
L-4205	SAMD00097486	DRX100092	Plasmid 1
L-4205	SAMD00097486	DRX100093	Plasmid 2
L-3840	SAMD00097487	DRX100094	Chromosome
L-3840	SAMD00097487	DRX100095	Plasmid 1
L-3833	SAMD00097488	DRX100096	Chromosome
L-3833	SAMD00097488	DRX100097	Plasmid 1
L-3833	SAMD00097488	DRX100098	Plasmid 2

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Table S4–Continued

Isolate	BioSample	Experiment	
L-3750	SAMD00097489	DRX100099	Chromosome
L-3750	SAMD00097489	DRX100100	Plasmid 1
L-3750	SAMD00097489	DRX100101	Plasmid 2
L-3751	SAMD00097490	DRX100102	Chromosome
L-3751	SAMD00097490	DRX100103	Plasmid 1
L-3751	SAMD00097490	DRX100104	Plasmid 2
L-4210	SAMD00097491	DRX100105	Chromosome
L-4210	SAMD00097491	DRX100106	Plasmid 1
L-4210	SAMD00097491	DRX100107	Plasmid 2
L-4210	SAMD00097491	DRX100108	Plasmid 3
L-3822	SAMD00097492	DRX100109	Chromosome
L-3822	SAMD00097492	DRX100110	Plasmid 1
L-3822	SAMD00097492	DRX100111	Plasmid 2
L-3575	SAMD00097493	DRX100112	Chromosome
L-3575	SAMD00097493	DRX100113	Plasmid 1
L-3575	SAMD00097493	DRX100114	Plasmid 2
L-4208	SAMD00097494	DRX100115	Chromosome
L-4208	SAMD00097494	DRX100116	Plasmid 1
L-4208	SAMD00097494	DRX100117	Plasmid 2
L-3824	SAMD00097495	DRX100118	Chromosome
L-3824	SAMD00097495	DRX100119	Plasmid 1
L-3824	SAMD00097495	DRX100120	Plasmid 2
L-3829	SAMD00097496	DRX100121	Chromosome
L-3829	SAMD00097496	DRX100122	Plasmid 1
L-3829	SAMD00097496	DRX100123	Plasmid 2
L-3825	SAMD00097497	DRX100124	Chromosome
L-3825	SAMD00097497	DRX100125	Plasmid 1
L-3825	SAMD00097497	DRX100126	Plasmid 2
L-3825	SAMD00097497	DRX100127	Plasmid 3
L-3826	SAMD00097498	DRX100128	Chromosome
L-3826	SAMD00097498	DRX100129	Plasmid 1
L-3826	SAMD00097498	DRX100130	Plasmid 2
L-4234	SAMD00097499	DRX100131	Chromosome
L-4233	SAMD00097500	DRX100132	Chromosome
L-4233	SAMD00097500	DRX100133	Plasmid 1
L-4261	SAMD00097501	DRX100134	Chromosome
L-4261	SAMD00097501	DRX100135	Plasmid 1
L-4261	SAMD00097501	DRX100136	Plasmid 2
L-4261	SAMD00097501	DRX100137	Plasmid 3
L-4259	SAMD00097502	DRX100138	Chromosome
L-4257	SAMD00097503	DRX100139	Chromosome
L-4257	SAMD00097503	DRX100140	Plasmid 1
L-3841	SAMD00097504	DRX100141	Chromosome
L-3838	SAMD00097505	DRX100142	Chromosome
L-3837	SAMD00097506	DRX100143	Chromosome
L-4071	SAMD00097507	DRX100144	Chromosome
L-4071	SAMD00097507	DRX100145	Plasmid 1
LB-7	SAMD00097508	DRX100146	Whole

Continued on following page

Table S4 –Continued

Isolate	BioSample	Experiment	
LB-6	SAMD00097509	DRX100147	Whole
LB-19	SAMD00097510	DRX100148	Whole
L-3844	SAMD00097511	DRX100149	Chromosome
L-3835	SAMD00097512	DRX100150	Chromosome
L-3846	SAMD00097513	DRX100151	Chromosome
L-3846	SAMD00097513	DRX100152	Plasmid 1
L-3846	SAMD00097513	DRX100153	Plasmid 2
L-3846	SAMD00097513	DRX100154	Plasmid 3
L-4126	SAMD00097514	DRX100155	Chromosome
L-4127	SAMD00097515	DRX100156	Chromosome
LB-10	SAMD00097516	DRX100157	Whole
LB-22	SAMD00097517	DRX100158	Whole
LB-13	SAMD00097518	DRX100159	Whole
LB-20	SAMD00097519	DRX100160	Whole
LB-23	SAMD00097520	DRX100161	Whole
LB-14	SAMD00097521	DRX100162	Whole
LB-21	SAMD00097522	DRX100163	Whole
LB-15	SAMD00097523	DRX100164	Whole
LB-12	SAMD00097524	DRX100165	Whole
LB-11	SAMD00097525	DRX100166	Whole

Table S5 AS-PCR primers used for the SNP genotyping

SNP genotype	Locus of SNP			Nucleotide			Sequence (5'-3') ^f	Product size (bp)	
	Gene	Locus tag ^a	Gene ID	Position ^b	Reference	Variant			
1	<i>menF</i>	STM2310	1253832	2417681	G	T	Reference sequence	GTAAGTGGTGCAGGCAGAGC	510
							Variant sequence	GTAAGTGGTGCAGGCAGAG <u>C</u>	
							SNP1_F	GTAAGTGGTGCAGGC <u>AA</u> ATC	
							SNP1_R	ACGGTTGGGTGAAGCTGATT	
2	<i>yhdP</i> <i>cafA</i> (Intergenic region)	STM3369 STM3370	1254892 1254893	3539842	G	C	Reference sequence	ATACTCGTACGGGTGCGGGT	493
							Variant sequence	ATACTCGTACGGGTGCGG <u>C</u> T	
							SNP2_F	ATACTCGTACGGGTGCG <u>CA</u> CT	
							SNP2_R	AGCTACGCCTGCGTAATCTG	
3		STM0765	1252285	829687	A	C	Reference sequence	TGTACCCCAATGGCTATTAC	480
							Variant sequence	TGTACCCCAATGGCTATT <u>C</u>	
							SNP3_F	TGTACCCCAATGGCTA <u>T</u> TAC	
							SNP3_R	TCGGTAATGGCAACCGTCAT	
4	<i>ydiF</i>	STM1357	1252875	1439201	A	T	Reference sequence	CCGCATAGCGCCCATTTTAC	476
							Variant sequence	CCGCATAGCGCCCATTT <u>T</u> TAC	
							SNP4_F	CCGCATAGCGCCCAT <u>T</u> TTC	
							SNP4_R	GCCGATCTGCGTACCGTATT	
5	<i>ycaQ</i>	STM0986	1252504	1074020	C	T	Reference sequence	CTTCTTTCGAGCTGGAACC	517
							Variant sequence	CTTCTTTCGAGCTGGA <u>A</u> TC	
							SNP5_F	CTTCTTTCGAGCTGGAG <u>T</u> C	
							SNP5_R	GGCAGCGCATGATTTCAAGC	
6	<i>thiH</i>	STM4159	1255685	4377220	A	C	Reference sequence	GACGTTGTTGATTGCCAGAG	515
							Variant sequence	GACGTTGTTGATTGCCAG <u>G</u>	
							SNP6_F	GACGTTGTTGATTGCC <u>AA</u> CG	
							SNP6_R	CCATCCGCGTCAATTTTCC	
7	<i>cdd</i>	STM2183	1253705	2279715	T	C	Reference sequence	GACGAGCAGGATCATGGCTT	480
							Variant sequence	GACGAGCAGGATCATGG <u>C</u> T	
							SNP7_F	GACGAGCAGGATCATGG <u>T</u> CT	
							SNP7_R	AGACGTAGCGCAAGAAACCG	
8	<i>ydhM</i>	STM1437	1252955	1514452	G	C	Reference sequence	CGATGATTACCGGGACCGGA	514
							Variant sequence	CGATGATTACCGGGACCG <u>CA</u>	
							SNP8_F	CGATGATTACCGGGAC <u>T</u> GCA	
							SNP8_R	CGACAAGCCGCGAGTACATT	
9	<i>ydhC</i>	STM1428	1252946	1505734	T	G	Reference sequence	GTCTCAGCGCAATCTGCATG	480
							Variant sequence	GTCTCAGCGCAATCTGC <u>A</u> GG	
							SNP9_F	GTCTCAGCGCAATCTG <u>T</u> AGG	
							SNP9_R	TATTCTCAGCGCGATGGGTT	

^aLocus tag in reference strain *S. enterica* serovar Typhimurium LT2 (NC_003197.1).^bNucleotide position in reference strain *S. enterica* serovar Typhimurium LT2 (NC_003197.1).^cUnderline and double underline indicate the distinctive SNP of each clade and mismatch nucleotide inserted deliberately, respectively.

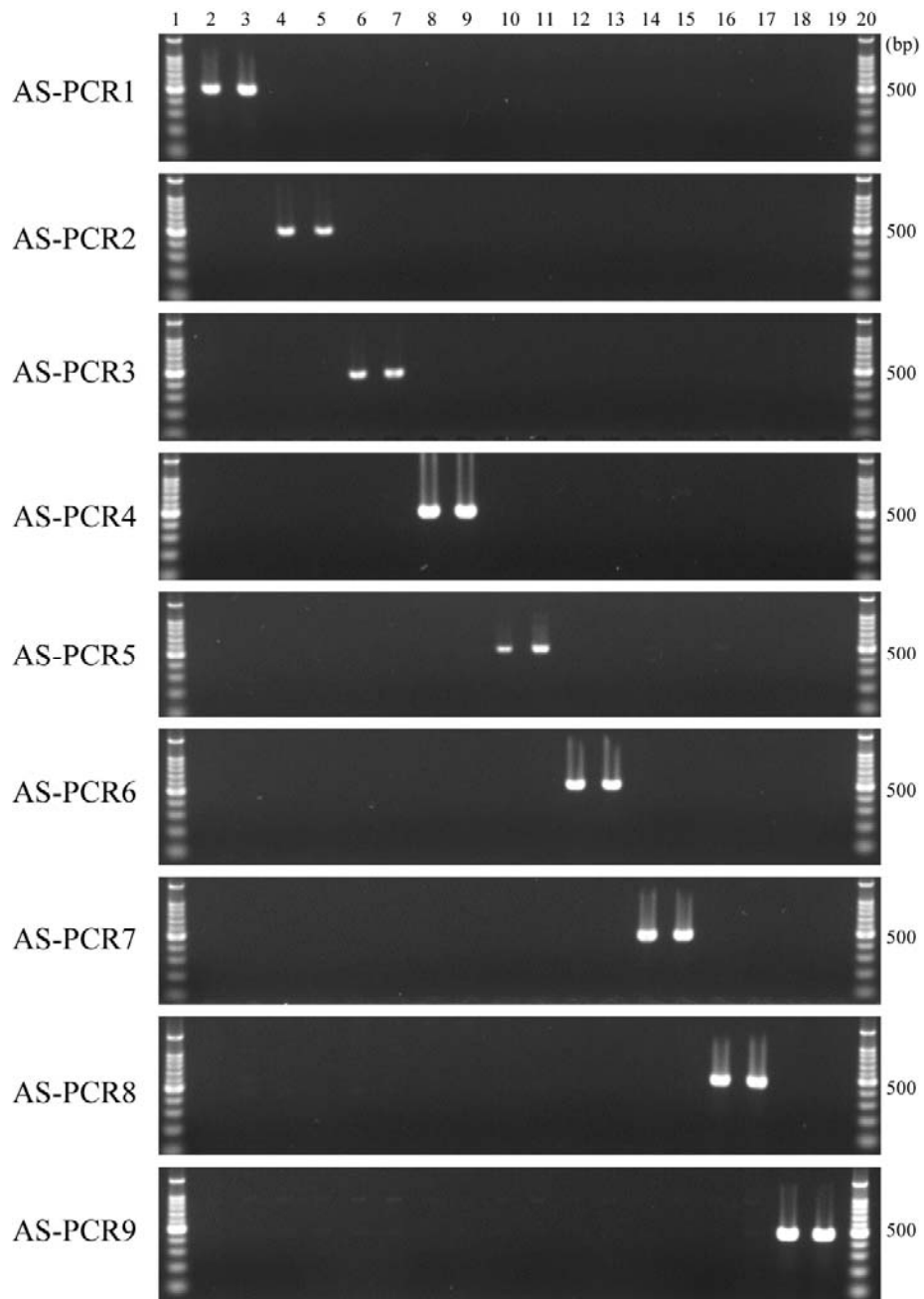


FIG S1 Detection of distinctive SNPs by nine different AS-PCRs. Lanes 1 and 20, 100 bp ladder marker; lanes 2 and 3, clade 1 isolates L-3843 and L-4122; lanes 4 and 5, clade 2 isolates L-4131 and L-4133; lanes 6 and 7, clade 3 isolates L-1995 and L-4156; lanes 8 and 9, clade 4 isolates L-3783 and L-3785; lanes 10 and 11, clade 5 isolates L-3130 and L-4232; lanes 12 and 13, clade 6 isolates L-4124 and L-4125; lanes 14 and 15, clade 7 isolates L-4135 and L-4136; lanes 16 and 17, clade 8 isolates L-4258 and L-4260; and lanes 18 and 19, clade 9 isolates L-4233 and L-4234.

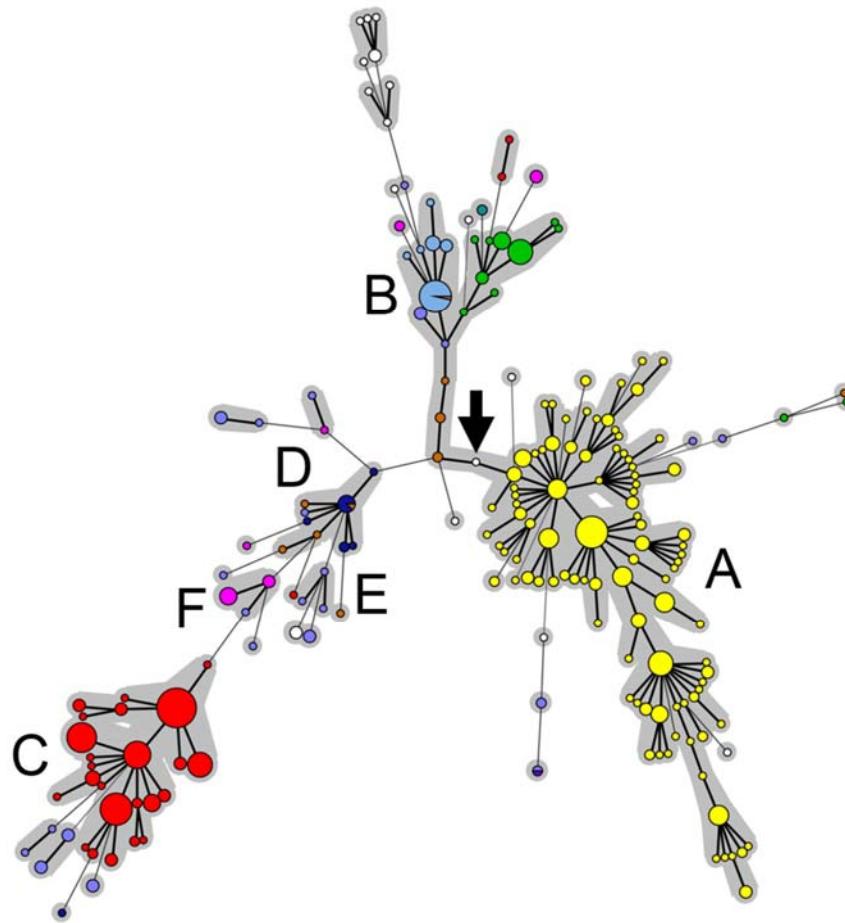


FIG S2 Minimum spanning tree based on the MLVA allelic profiles of *S. enterica* serovar Typhimurium and its monophasic variant. The 21 SNP-untypable isolates are shown as white circles. All but one of these isolates were located outside of the six MLVA clusters (A to F), which were determined in a previous study (Kurosawa et al., 2012). The remaining isolate was located between clusters A and B, as indicated by the black arrow. This analysis was performed as previously described (Kurosawa et al., 2012) using the same 562 isolates and the additional 21 SNP-untypable isolates used in this study.

Reference

Kurosawa A, Imamura T, Tanaka K, Tamamura Y, Uchida I, Kobayashi A, Hata E, Kanno T, Akiba M, Yukawa S, Tamura Y. 2012. Molecular typing of *Salmonella enterica* serotype Typhimurium and serotype 4,5,12:i:- isolates from cattle by multiple-locus variable-number tandem-repeats analysis. *Vet Microbiol* 160:264-8.