

1 **Multilocus sequence analysis, a rapid and accurate tool for taxonomic**
2 **classification, evolutionary relationship and population biology of the genus**
3 ***Shewanella*.**

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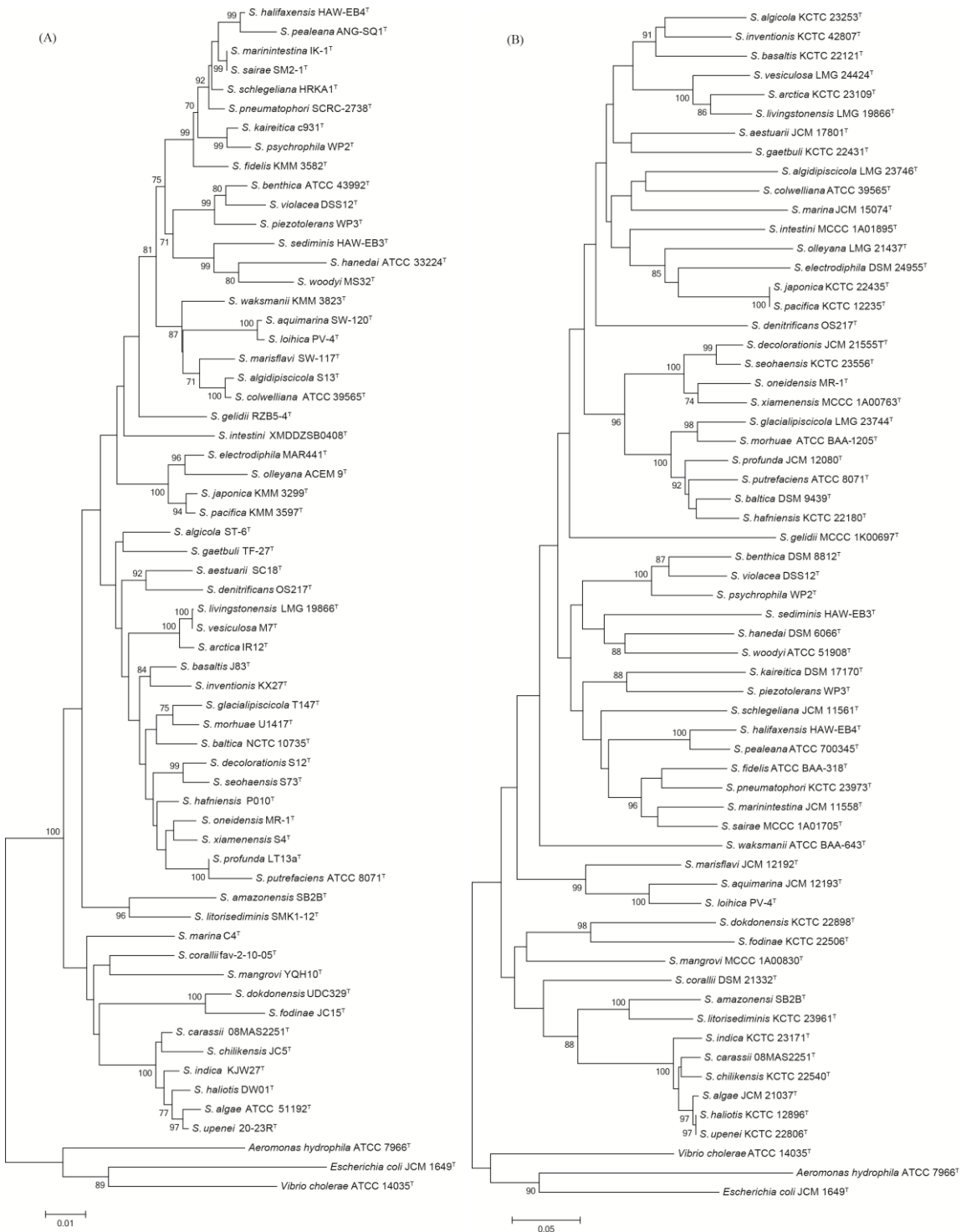
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18 Running title: Multilocus sequence analysis of genus *Shewanella*.

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22 **Supplementary figures**



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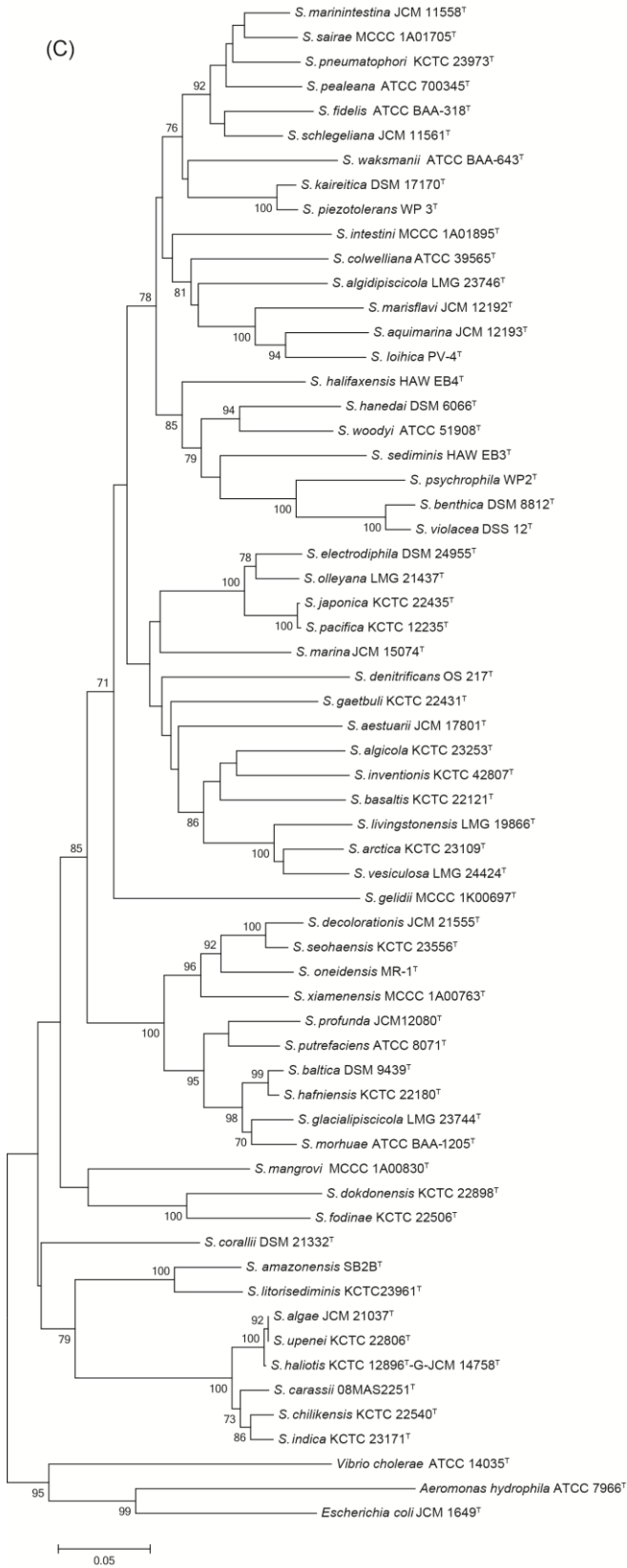
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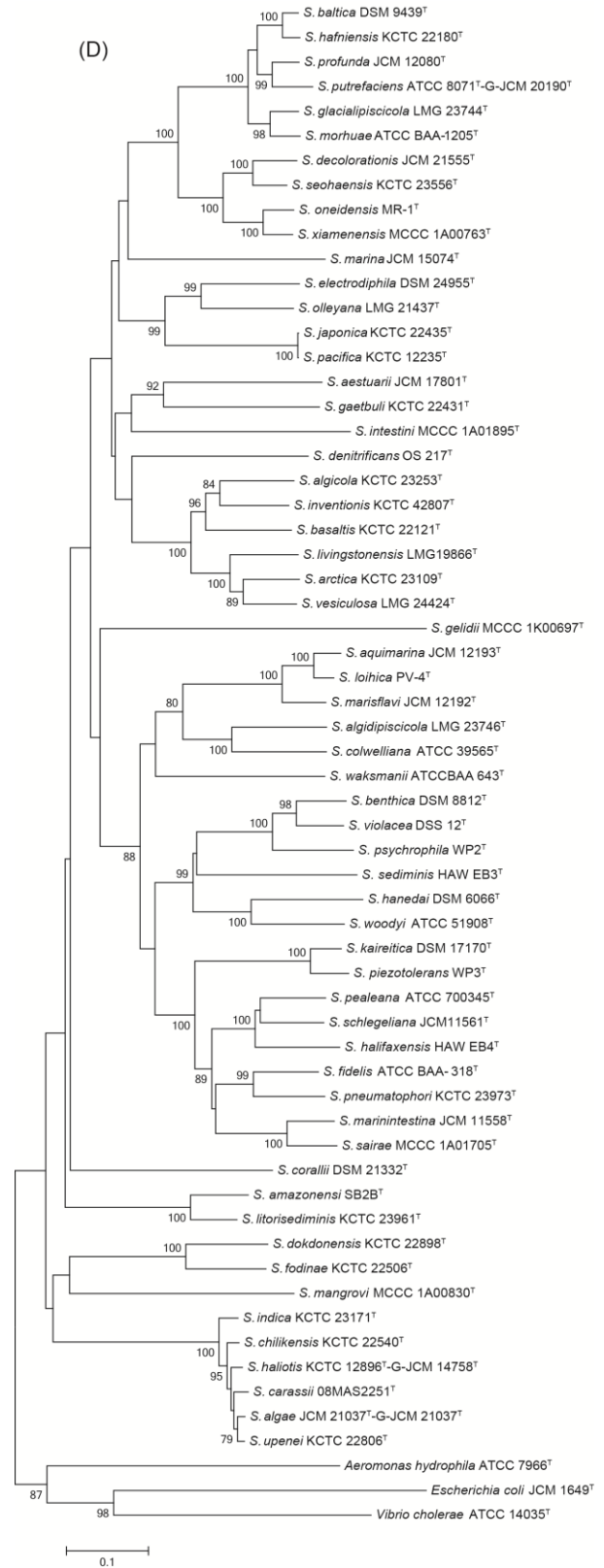
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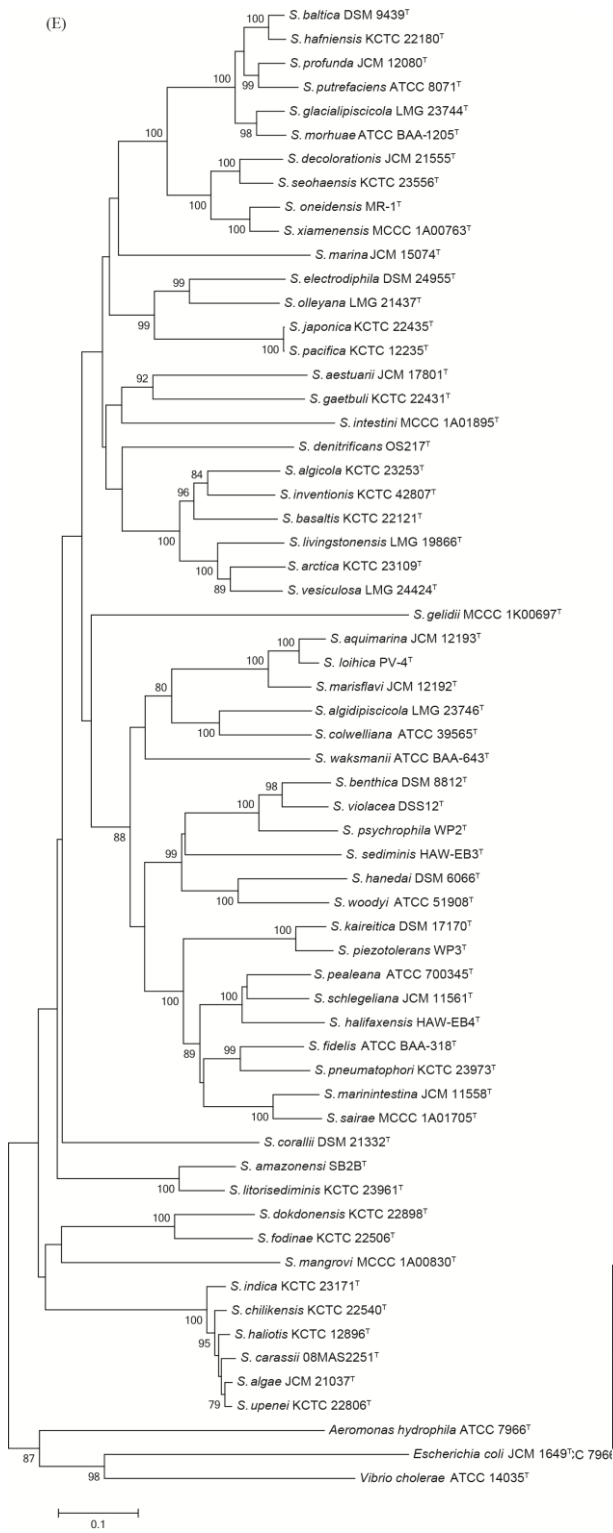
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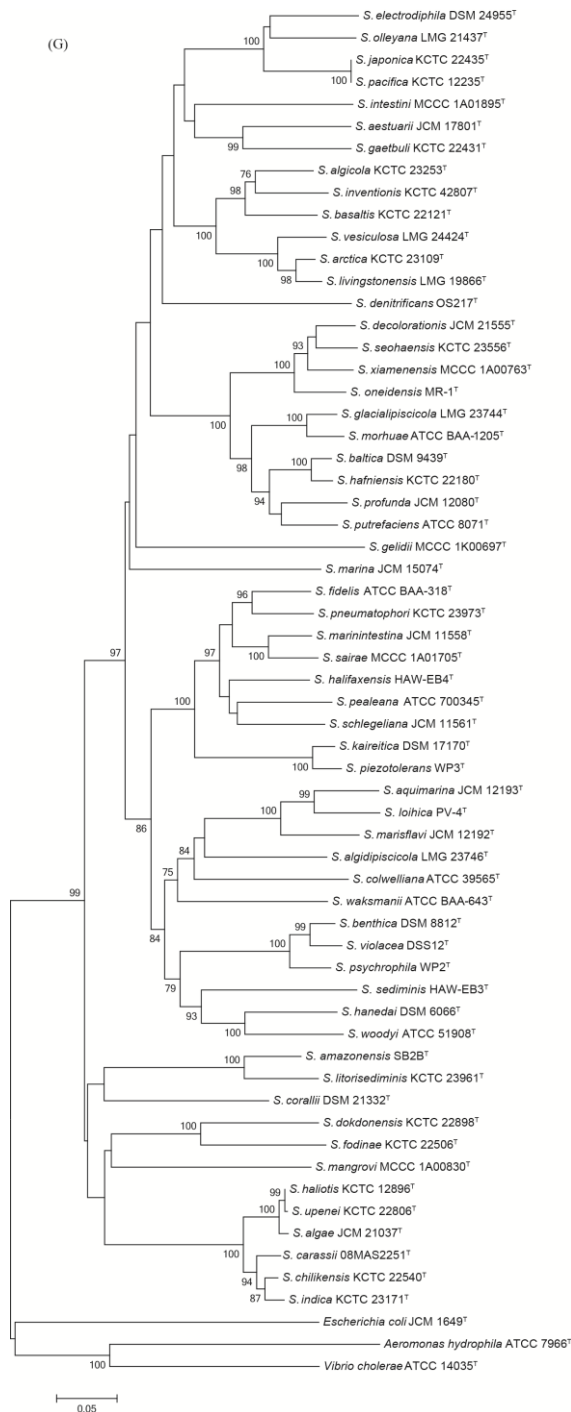
(C)



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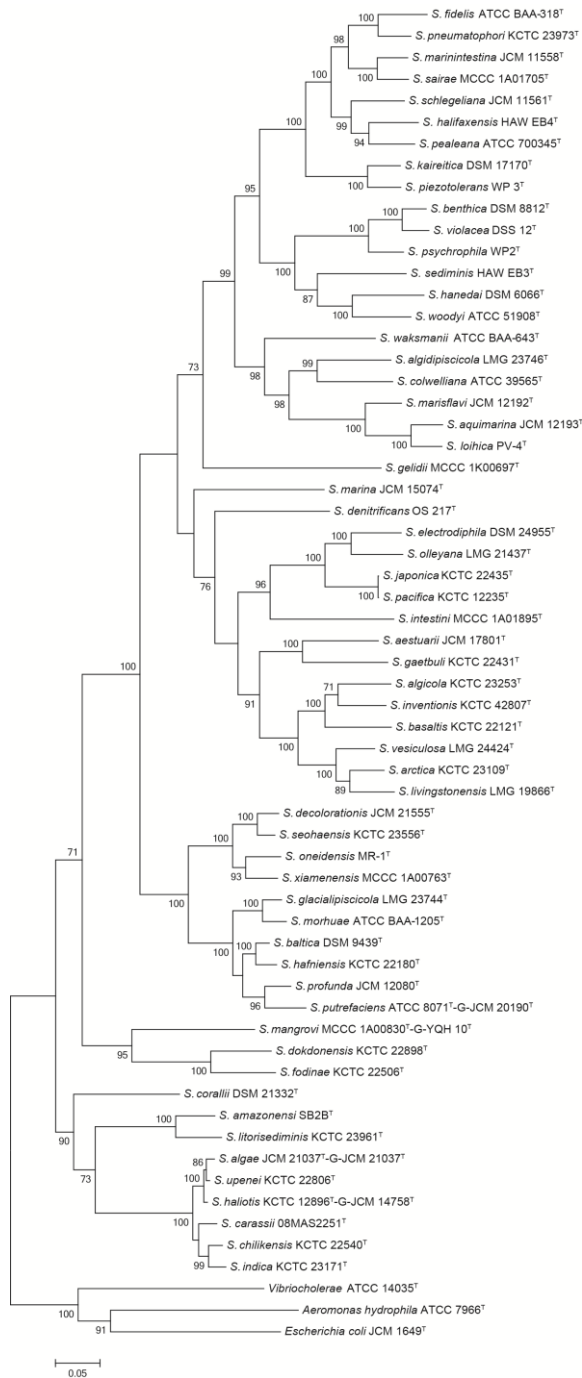




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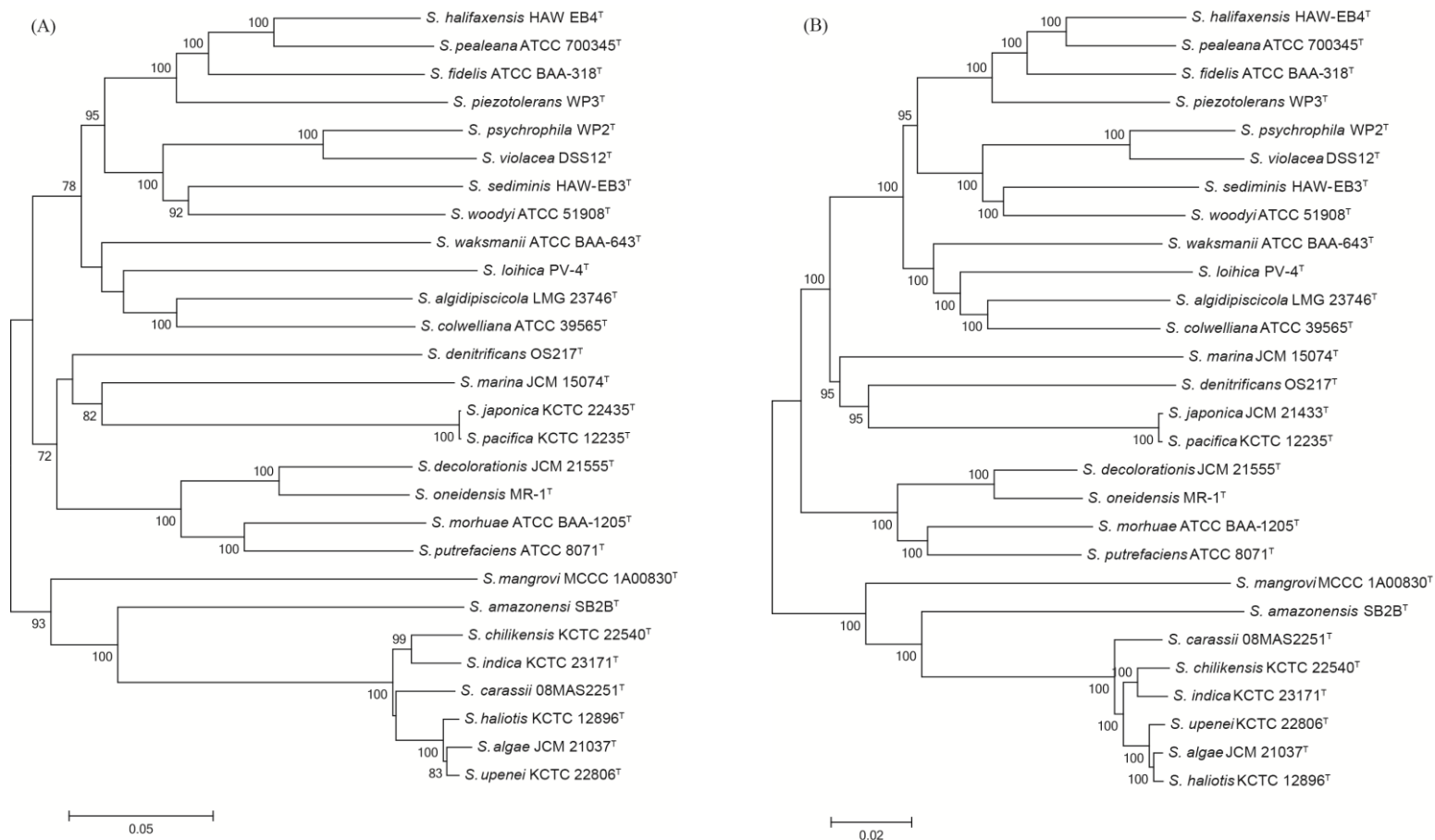
32 **Figure S1.** Phylogenetic trees reconstructed by the neighbour-joining method based
 33 on individual genes of 16S rRNA (A), *gyrA* (B), *gyrB* (C), *infB* (D), *recN* (E), *rpoA* (F)
 34 and *topA* (G). Fifty-nine *Shewanella* type strains were involved in the analysis.
 35 Numbers at nodes indicated bootstrap values (percentage of 1000 replicates)
 36 and >70% were shown at branch points. Bar and values estimated nucleotide
 37 substitutions per site. The type strains of *Aeromonas hydrophila* ATCC 7966^T,
 38 *Escherichia coli* JCM 1649^T and *Vibrio cholerae* ATCC 14035^T served as outgroups.

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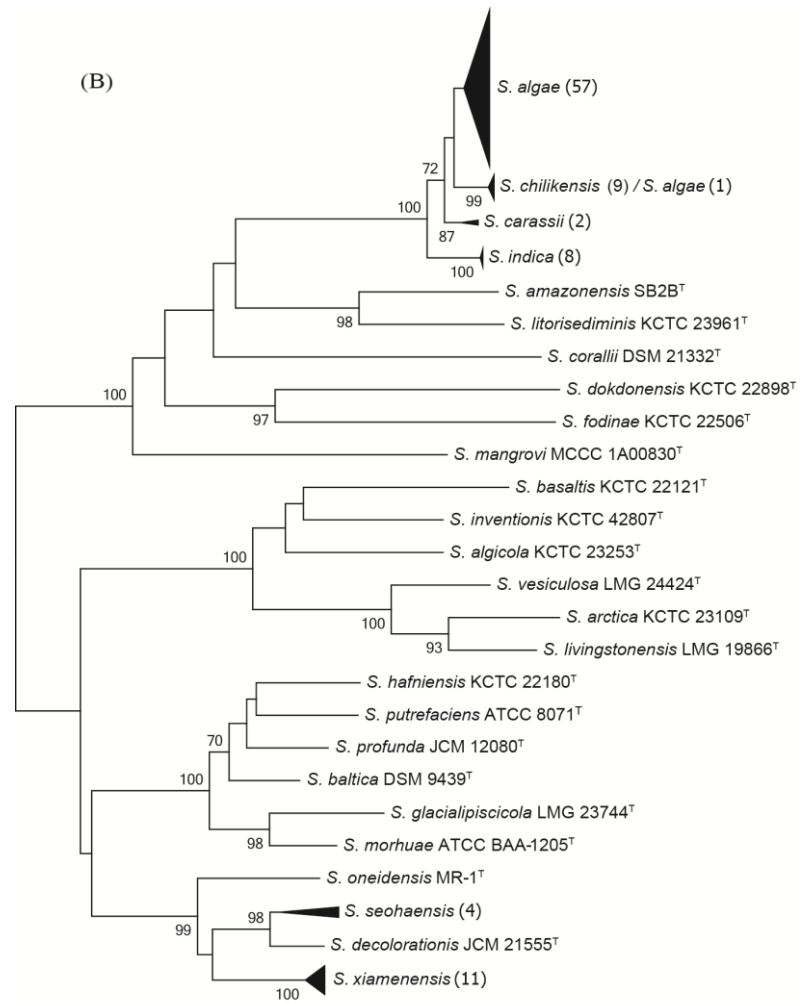
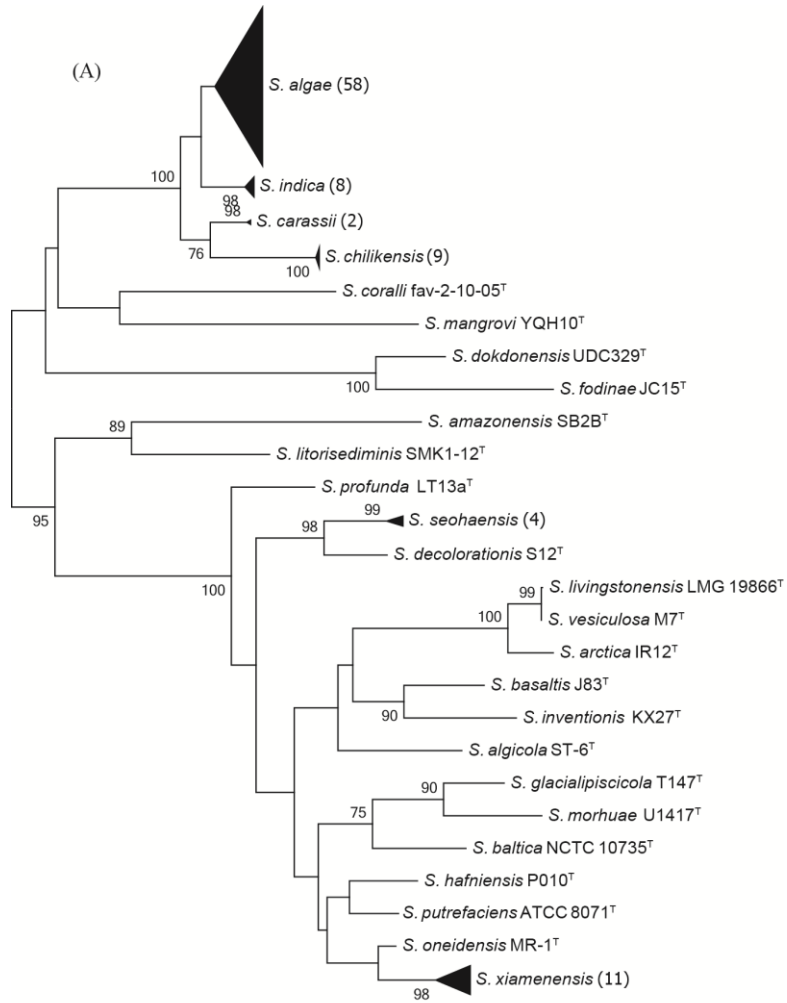
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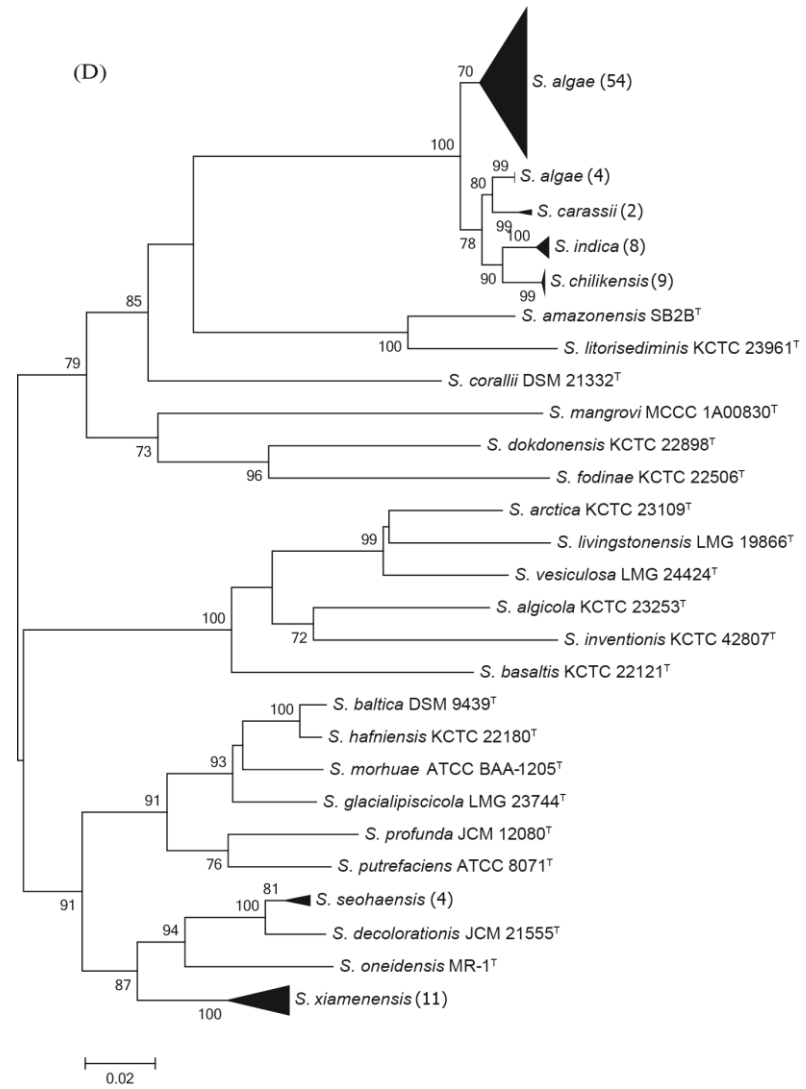
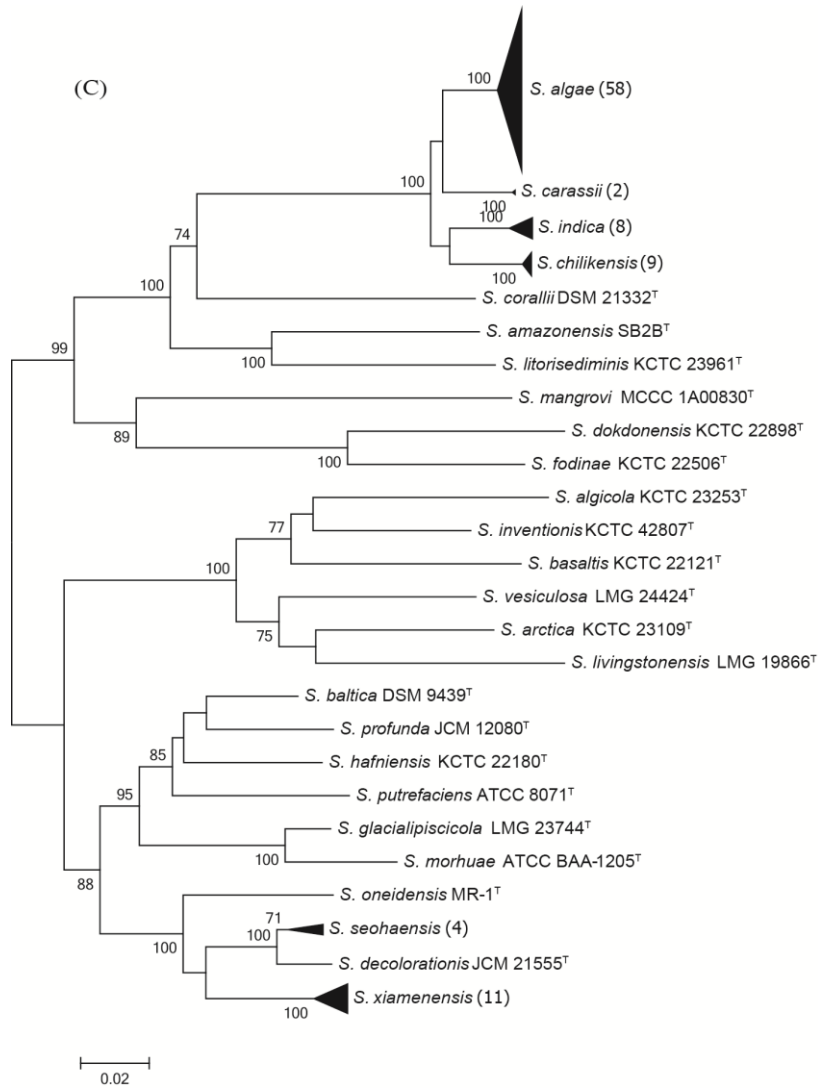
41 **Figure S2.** Phylogenetic tree reconstructed by the maximum-likelihood method based
 42 on concatenated six gene sequences (*gyrA*, *gyrB*, *infB*, *recN*, *rpoA* and *topA*, 4191 bp)
 43 of fifty-nine *Shewanella* type strains. The robustness of tree topologies was evaluated
 44 with 1000 bootstrap replications and values greater than 70% were shown at nodes of
 45 branches. The scale bar indicates substitutions per site. The type strains of *Aeromonas*
 46 *hydrophila* ATCC 7966^T, *Escherichia coli* JCM 1649^T and *Vibrio cholerae* ATCC
 47 14035^T served as outgroups.

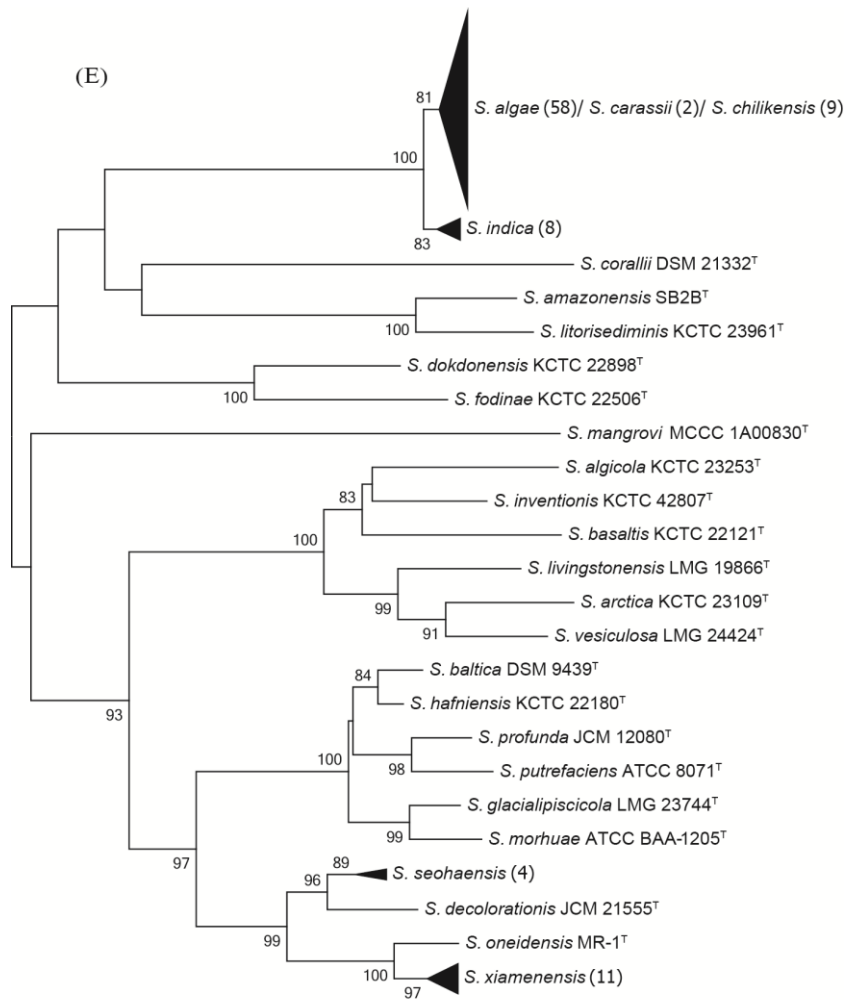


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49 **Figure S3.** Phylogenetic trees reconstructed by the neighbour-joining method for twenty-eight type *Shewanella* strains based on the
 50 concatenated sequences of six HKGs (A) and core genes (B). Bootstrap values were calculated from 1000 replications and values >70 % were
 51 shown at branch points. The scale bar indicates substitutions per site.

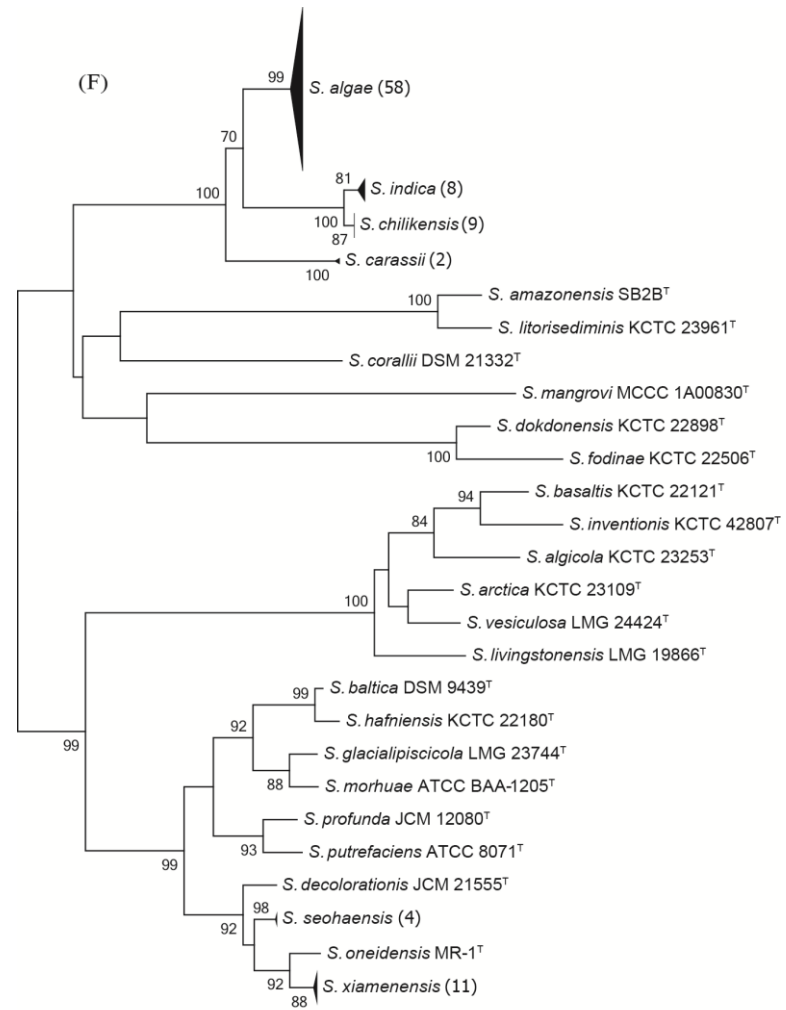






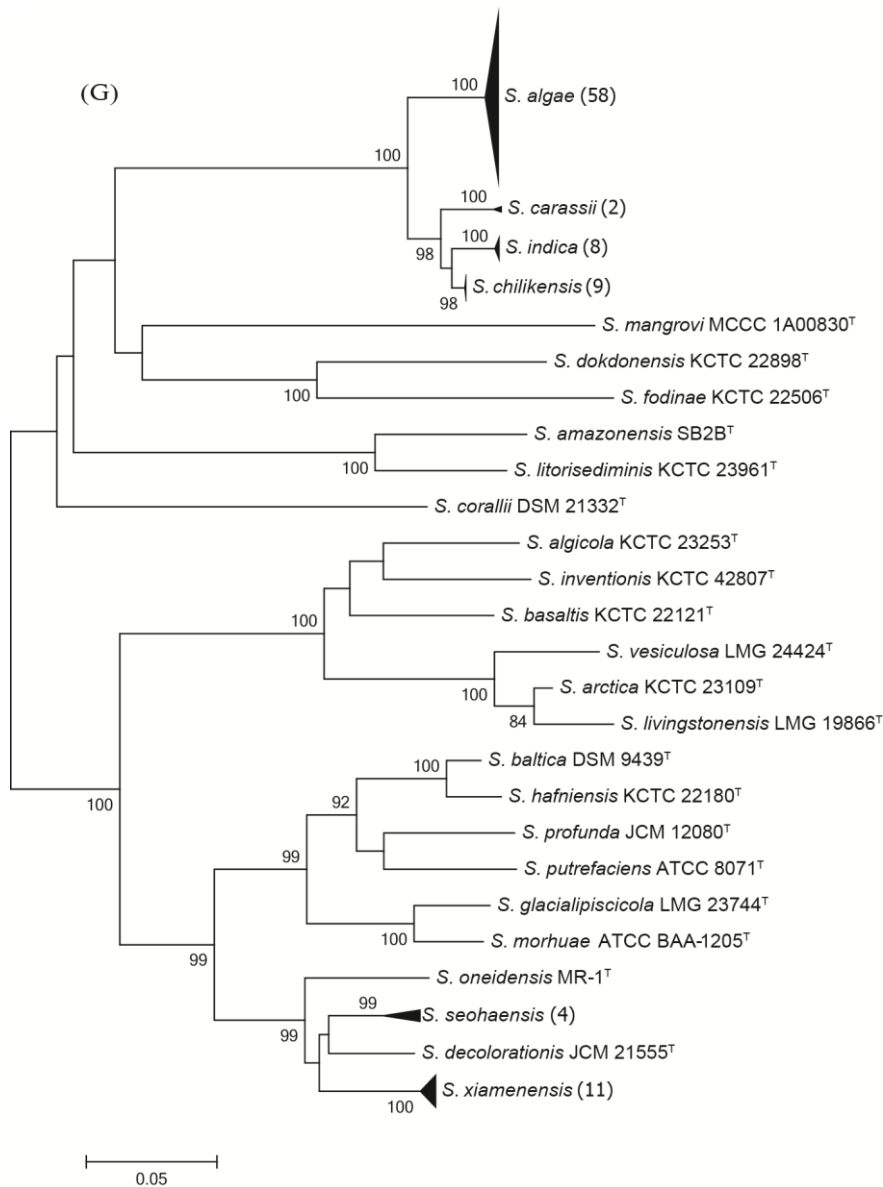
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0.05



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0.01



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56 **Figure S4.** Phylogenetic trees reconstructed by the neighbour-joining method for
 57 eighty-six *Shewanella* tested strains and twenty-six related *Shewanella* type strains.
 58 The trees were based on the nucleotide sequences of the 16S rRNA gene (A), *gyrA*
 59 (B), *gyrB* (C), *infB* (D), *recN* (E), *rpoA* (F) and *topA* (G). Strain number of tested
 60 strains for each compact cluster (black triangle) was shown in parentheses. Bootstrap
 61 values were calculated from 1000 replications and values >70 % were shown at
 62 branch points. Bar, 0.01 substitutions per nucleotide position.

63 **Table S1.** Detailed information of fifty-nine *Shewanella* type strains involved in this study.

Species	Strain	Isolation place	Isolation source	Isolation year	Accession numbers
<i>Shewanella aestuarii</i>	JCM 17801 ^T	Suncheon bay, Korea	A tidal flat	2011	-
<i>Shewanella algae</i>	JCM 21037 ^T	Japan	Red alga	1990	BALO00000000
<i>Shewanella algicola</i>	KCTC 23253 ^T	Jeju Island, Korea	Brown alga, <i>Sargassum thunbergii</i>	-	-
<i>Shewanella algidipiscicola</i>	LMG 23746 ^T	Baltic Sea, Denmark	Plaice	2001	QPQT00000000
<i>Shewanella amazonensis</i> *	SB2B ^T	Brazil	Mud flat sediment	1996	CP000507
<i>Shewanella aquimarina</i>	JCM 12193 ^T	Yellow Sea, Korea	Seawater	-	-
<i>Shewanella arctica</i>	KCTC 23109 ^T	Tempelfjorden, Norwegian Svalbard archipelago	Arctic marine sediment	-	-
<i>Shewanella baltica</i>	DSM 9439 ^T	Japan	Oil brine	1998	-
<i>Shewanella basaltis</i>	KCTC 22121 ^T	Jeju Island, Korea	Marine black sand	-	-
<i>Shewanella benthica</i>	DSM 8812 ^T	Walvis Ridge, South Atlantic Ocean	The intestine of holothurian	-	-
<i>Shewanella carassii</i>	08MAS2251 ^T	Anhui, China	Surface of crucian carp, <i>Carassius carassius</i>	2008	NGVS00000000
<i>Shewanella chilikensis</i>	KCTC 22540 ^T	Orissa, India	Sediment of a lagoon	2007	NIJM00000000
<i>Shewanella colwelliana</i> *	ATCC 39565 ^T	MD, USA	Marine invertebrate	1988	JAEC00000000
<i>Shewanella corallii</i>	DSM 21332 ^T	Red Sea, Israel	A coral	2005	-
<i>Shewanella decolorationis</i>	JCM 21555 ^T	Guangzhou, China	Activated sludge	2002	AXZL00000000
<i>Shewanella denitrificans</i> *	OS217 ^T	Baltic Sea	Oxic-anoxic interface of the Gotland Deep	1986	CP000302
<i>Shewanella dokdonensis</i>	KCTC 22898 ^T	East Sea, Korea	Seawater	2006	-
<i>Shewanella electrodiphila</i>	DSM 24955 ^T	Mid-Atlantic Ridge	Deep-sea sediment	2007	-
<i>Shewanella fidelis</i> *	ATCC BAA-318 ^T	the South China Sea, China	Sediment	1998	JADX00000000
<i>Shewanella fodinae</i>	KCTC 22506 ^T	Andhra Pradesh, India	A coal mine sludge	2007	-
<i>Shewanella gaetbuli</i>	KCTC 22431 ^T	Korea	A tidal flat	-	-
<i>Shewanella gelidii</i>	MCCC 1K00697 ^T	Yellow Sea, China	Red alga, <i>Gelidium amansii</i>	2014	-
<i>Shewanella glacialipiscicola</i>	LMG 23744 ^T	Baltic Sea, Denmark	Cod	1996	-
<i>Shewanella hafniensis</i>	KCTC 22180 ^T	Baltic Sea, Denmark	Cod	2001	-
<i>Shewanella halifaxensis</i> *	HAW-EB4 ^T	Emerald Basin, Atlantic Ocean	Sediment	-	CP000931
<i>Shewanella haliotis</i>	KCTC 12896 ^T	South Sea, Korea	Abalone, <i>Haliotis discus hannai</i>	2006	BALL00000000
<i>Shewanella hanedai</i>	DSM 6066 ^T	Arctic Ocean	Marine sediment	-	-
<i>Shewanella indica</i>	KCTC23171 ^T	Karwar jetty, India	Sediment of the Arabian Sea	2006	NIJK00000000
<i>Shewanella intestini</i>	MCCC 1A01895 ^T	Fujian, China	The intestine of abalone	2015	-

<i>Shewanella inventionis</i>	KCTC 42807 ^T	Okinawa Trough	Deep-sea sediment	2014	-
<i>Shewanella japonica</i> *	KCTC 22435 ^T	Troitsa Bay, Japan	Seawater	1994	CP020472
<i>Shewanella kaireitica</i>	DSM 17170 ^T	Suruga Bay, Japan	Deep-sea sediment	-	-
<i>Shewanella litorisediminis</i>	KCTC 23961 ^T	Saemankum, Korea	A tidal flat sediment	-	-
<i>Shewanella livingstonensis</i>	LMG 19866 ^T	Johnson's Dock, Antarctica	Water	-	-
<i>Shewanella loihica</i> *	PV-4 ^T	South Rift of Loihi Seamount, Hawaii	Microbial mats	-	CP000606
<i>Shewanella mangrovi</i>	MCCC 1A00830 ^T	Fujian, China	Mangrove sediment	2013	JPEO00000000
<i>Shewanella marina</i> *	JCM 15074 ^T	South Sea, Korea	Seawater	-	BALM00000000
<i>Shewanella marinintestina</i>	JCM 11558 ^T	Yokohama, Japan	Squid body	1994	-
<i>Shewanella marisflavi</i>	JCM 12192 ^T	Yellow Sea, Korea	Seawater	-	-
<i>Shewanella morhuae</i> *	ATCC BAA-1205 ^T	Baltic Sea, Denmark	Cod	1996	FTNN00000000
<i>Shewanella olleyana</i>	LMG 21437 ^T	Tasmania, Australia	Saline waters of estuary	1998	-
<i>Shewanella oneidensis</i> *	MR-1 ^T	NY, USA	Sediment	-	AE014299
<i>Shewanella pacifica</i>	KCTC 12235 ^T	Chazhma Bay, Japan	Seawater	-	QPQU00000000
<i>Shewanella pealeana</i> *	ATCC 700345 ^T	-	Squid, <i>Loligo pealei</i>	-	CP000851
<i>Shewanella piezotolerans</i> *	WP3 ^T	Pacific Ocean	Deep-sea sediment	-	CP000472
<i>Shewanella pneumatophori</i>	KCTC 23973 ^T	Japan	The intestines of Pacific mackerel, <i>Pneumatophorus japonicus</i>	1987	-
<i>Shewanella profunda</i>	JCM 12080 ^T	Pacific Ocean	Deep marine sediment	2000	-
<i>Shewanella psychrophila</i> *	WP2 ^T	Pacific Ocean	Deep-sea sediment	-	CP014782
<i>Shewanella putrefaciens</i>	ATCC 8071 ^T	England	Butter	1931	BCUO00000000
<i>Shewanella sairae</i>	MCCC 1A01705 ^T	Pacific Ocean	Saury intestine	1995	-
<i>Shewanella schlegeliana</i>	JCM 11561 ^T	Hiroshima, Japan	Black porgy intestine	1998	-
<i>Shewanella sediminis</i> *	HAW-EB3 ^T	Halifax Harbour, Atlantic Ocean	Marine sediment	-	CP000821
<i>Shewanella seohaensis</i>	KCTC 23556 ^T	Saemankum, Korea	A tidal flat sediment	-	-
<i>Shewanella upenei</i>	KCTC22806 ^T	South Sea, Korea	Bensasi goatfish, <i>Upeneus bensasi</i>	-	NIJL00000000
<i>Shewanella vesiculosa</i>	LMG 24424 ^T	Deception Island	Marine sediments	-	-
<i>Shewanella violacea</i> *	DSS12 ^T	Ryukyu Trench	Deep-sea sediment	-	AP011177
<i>Shewanella waksmanii</i> *	ATCC BAA-643 ^T	Troitsa Bay, Japan	A sipuncula, <i>Phascolosoma japonicum</i>	1997	JAEH00000000
<i>Shewanella woodyi</i> *	ATCC 51908 ^T	Alboran Sea	Detritus	-	CP000961
<i>Shewanella xiamenensis</i>	MCCC 1A00763 ^T	Fujian, China	Coastal sea sediment	-	-

64 * Genomes of type strains were used for primers design and sequences analyses.

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Table S2. The GenBank accession numbers of 16S rRNA gene and individual HKGs sequences used in this study.

No.	Species	Strain	16S rRNA	<i>gyrA</i>	<i>gyrB</i>	<i>infB</i>	<i>recN</i>	<i>rpoA</i>	<i>topA</i>
1	<i>S. aestuarii</i>	JCM 17801 ^T = KACC 16187 ^T = SC18 ^T	JF751044	MH090144	KC175545	MH090203	MH090245	MH090287	MH090329
2	<i>S. algae</i>	JCM 21037 ^T = NBRC 103173 ^T = DSM 9167 ^T = CIP 106454 ^T = CCUG 39064 ^T = ATCC 51192 ^T = IAM 14159 ^T = OK-1 ^T	AF005249	MH090145	AF005686	MH090204	MH090246	MH090288	MH090330
3	<i>S. algicola</i>	KCTC 23253 ^T = JCM 31091 ^T = ST-6 ^T	FJ903681	MH090146	KP748519	MH090205	MH090247	MH090289	MH090331
4	<i>S. algidipiscicola</i>	LMG 23746 ^T = NBRC 102032 ^T = S13 ^T	AB205570	MH090147	MH090186	MH090206	MH090248	MH090290	MH090332
5	<i>S. amazonensis</i>	SB2B ^T = CIP 105786 ^T = ATCC 700329 ^T	AF005248	CP000507					
6	<i>S. aquimarina</i>	JCM 12193 ^T = KCCM 41821 ^T = SW-120 ^T	AY485225	MH090148	FJ589042	MH090207	MH090249	MH090291	MH090333
7	<i>S. arctica</i>	KCTC 23109 ^T = JCM 16723 ^T = IR12 ^T	GU564402	MH090149	MH090187	MH090208	MH090250	MH090292	MH090334
8	<i>S. baltica</i>	DSM 9439 ^T = LMG 2250 ^T = CIP 105850 ^T = CCUG 39356 ^T = CECT 323 ^T = IAM 1477 ^T = NCTC 10735 ^T	AJ000214	MH090150	AB231331	MH090209	MH090251	MH090293	MH090335
9	<i>S. basaltis</i>	KCTC 22121 ^T = JCM 14937 ^T = J83 ^T	EU143361	MH090151	FJ589041	MH090210	MH090252	MH090294	MH090336
10	<i>S. benthica</i>	DSM 8812 ^T = ATCC 43992 ^T = W 145 ^T	X82131	MH090152	MH090188	MH090211	MH090253	MH090295	MH090337
11	<i>S. carassii</i>	08MAS2251 ^T = DSM 104682 ^T = CGMCC 1.16033 ^T	MF164482	MH090153	MF164484	MH090212	MH090254	MH090296	MH090338
12	<i>S. chilikensis</i>	KCTC 22540 ^T = NBRC 105217 ^T = CCUG 57101 ^T = JC5 ^T	FM210033	MH090154	HM016091	MH090213	MH090255	MH090297	MH090339
13	<i>S. colwelliana</i>	ATCC 39565 ^T = LST-W ^T	AY653177	JAEC00000000					
14	<i>S. corallii</i>	DSM 21332 ^T = LMG 24563 ^T = fav-2-10-05 ^T	FJ041083	MH090155	MH090189	MH090214	MH090256	MH090298	MH090340
15	<i>S. decolorationis</i>	JCM 21555 ^T = CCTCC M 203093 ^T = NBRC 103170 ^T = IAM 15094 ^T = S12 ^T	AJ609571	MH090156	MH090190	MH090215	MH090257	MH090299	MH090341
16	<i>S. denitrificans</i>	OS217 ^T = LMG 21692 ^T = DSM 15013 ^T	AJ311964	CP000302					
17	<i>S. dokdonensis</i>	KCTC 22898 ^T = DSM 23626 ^T = UDC329 ^T	GQ245918	MH090157	GQ132057	MH090216	MH090258	MH090300	MH090342
18	<i>S. electrodiphila</i>	DSM 24955 ^T = ATCC BAA-2408 ^T = MAR441 ^T	FR744784	MH090158	MH090191	MH090217	MH090259	MH090301	MH090343
19	<i>S. fidelis</i>	ATCC BAA-318 ^T = LMG 20552 ^T = KMM	AF420312	JADX00000000					

		3582 ^T							
20	<i>S. fodinae</i>	KCTC 22506 ^T = NBRC 105216 ^T = CCUG 57102 ^T = JC15 ^T	FM203122	MH090159	MH090192	MH090218	MH090260	MH090302	MH090344
21	<i>S. gaetbuli</i>	KCTC 22431 ^T = KCCM 41648 ^T = JCM 11814 ^T = TF-27 ^T	AY190533	MH090160	KC175546	MH090219	MH090261	MH090303	MH090345
22	<i>S. gelidii</i>	MCCC 1K00697 ^T = KCTC 42663 ^T = JCM 30804 ^T = RZB5-4 ^T	KR080702	MH090161	KT899956	MH090220	MH090262	MH090304	MH090346
23	<i>S. glacialipiscicola</i>	LMG 23744 ^T = NBRC 102030 ^T = T147 ^T	AB205571	MH090162	MH090193	MH090221	MH090263	MH090305	MH090347
24	<i>S. hafniensis</i>	KCTC 22180 ^T = NBRC 100975 ^T = ATCC BAA-1207 ^T = P010 ^T	AB205566	MH090163	MH090194	MH090222	MH090264	MH090306	MH090348
25	<i>S. halifaxensis</i>	HAW-EB4 ^T = DSM 17350 ^T = NCIMB 14093 ^T	AY579751	CP000931					
26	<i>S. haliotis</i>	KCTC 12896 ^T = JCM 14758 ^T = DW01 ^T	EF178282	MH090164	HM016089	MH090223	MH090265	MH090307	MH090349
27	<i>S. hanedai</i>	DSM 6066 ^T = JCM 20706 ^T = NBRC 102223 ^T = LMG 19004 ^T = CIP 103207 ^T = CCUG 16097 ^T = ATCC 33224 ^T = 281 ^T	U91590	MH090165	AF005693	MH090224	MH090266	MH090308	MH090350
28	<i>S. indica</i>	KCTC 23171 ^T = NCIM 5388 ^T = BCC 41031 ^T = KJW27 ^T	HM016084	MH090166	HM016092	MH090225	MH090267	MH090309	MH090351
29	<i>S. intestini</i>	MCCC 1A01895 ^T = KCTC 52125 ^T = XMDDZSB0408 ^T	KU663649	MH090167	MH090195	MH090226	MH090268	MH090310	MH090352
30	<i>S. inventionis</i>	KCTC 42807 ^T = CGMCC 1.15339 ^T = KX27 ^T	KT781407	MH090168	MH090196	MH090227	MH090269	MH090311	MH090353
31	<i>S. japonica</i>	KCTC 22435 ^T = JCM 21433 ^T = NBRC 103171 ^T = LMG 19691 ^T = CIP 106860 ^T = ATCC BAA-316 ^T = KMM 3299 ^T	AF145921	CP020472					
32	<i>S. kaireitica</i>	DSM 17170 ^T = JCM 11836 ^T = c931 ^T	AB094598	MH090169	MH090197	MH090228	MH090270	MH090312	MH090354
33	<i>S. litorisediminis</i>	KCTC 23961 ^T = CCUG 62411 ^T = SMK1-12 ^T	JQ824139	MH090170	JQ824140	MH090229	MH090271	MH090313	MH090355
34	<i>S. livingstonensis</i>	LMG 19866 ^T = CECT 5933 ^T = NF22 ^T	AJ300834	MH090171	MH090198	MH090230	MH090272	MH090314	MH090356
35	<i>S. loihica</i>	PV-4 ^T = DSM 17748 ^T = ATCC BAA-1088 ^T	DQ286387	CP000606					
36	<i>S. mangrovi</i>	MCCC 1A00830 ^T = JCM 30121 ^T = YQH10 ^T	KJ751544	MH090172	JPEO01000 023	MH090231	MH090273	MH090315	MH090357
37	<i>S. marina</i>	JCM 15074 ^T = KCTC 22185 ^T = C4 ^T	EU290154	BALM00000000					

38	<i>S. marinintestina</i>	JCM 11558 ^T = LMG 21403 ^T = IK-1 ^T	AB081757	MH090173	AB081763	MH090232	MH090274	MH090316	MH090358
39	<i>S. marisflavi</i>	JCM 12192 ^T = KCCM 41822 ^T = SW-117 ^T	AY485224	MH090174	FJ589037	MH090233	MH090275	MH090317	MH090359
40	<i>S. morhuae</i>	ATCC BAA-1205 ^T = NBRC 100978 ^T = U1417 ^T	AB205576	FTNN00000000					
41	<i>S. olleyana</i>	LMG 21437 ^T = ACAM 644 ^T = ACEM 9 ^T	AF295592	MH090175	MH090199	MH090234	MH090276	MH090318	MH090360
42	<i>S. oneidensis</i>	MR-1 ^T = LMG 19005 ^T = CIP 106686 ^T = ATCC 700550 ^T	AF005251	AE014299					
43	<i>S. pacifica</i>	KCTC 12235 ^T = DSM 15445 ^T = CIP 107849 ^T = KMM 3597 ^T = R10SW1 ^T	AF500075	MH090176	MH090200	MH090235	MH090277	MH090319	MH090361
44	<i>S. pealeana</i>	ATCC 700345 ^T = CIP 106450 ^T = ANG-SQ1 ^T	AF011335	CP000851					
45	<i>S. piezotolerans</i>	WP3 ^T = CGMCC 1.6160 ^T = JCM 13877 ^T	AJ551090	CP000472					
46	<i>S. pneumatophori</i>	KCTC 23973 ^T = JCM 13187 ^T = NCIMB 14060 ^T = SCRC-2738 ^T	AB204519	MH090177	MH090201	MH090236	MH090278	MH090320	MH090362
47	<i>S. profunda</i>	JCM 12080 ^T = DSM 15900 ^T = LT13a ^T	AY445591	MH090178	FJ589036	MH090237	MH090279	MH090321	MH090363
48	<i>S. psychrophila</i>	WP2 ^T = CGMCC 1.6159 ^T = JCM 13876 ^T	AJ551089	CP014782					
49	<i>S. putrefaciens</i>	ATCC 8071 ^T = JCM 9294 ^T = JCM 20190 ^T = LMG 2268 ^T = DSM 6067 ^T = CIP 80.40 ^T = CCUG 13452 D ^T = CFBP 3033 ^T = CFBP 3034 ^T = NCTC 12960 ^T = NBRC 3908 ^T = NCIMB 10471 ^T = Hammer 95 ^T	X82133	MH090179	AF005669	MH090238	MH090280	MH090322	MH090364
50	<i>S. sairae</i>	MCCC 1A01705 ^T = JCM 11563 ^T = LMG 21408 ^T = SM2-1 ^T	AB081762	MH090180	AB081768	MH090239	MH090281	MH090323	MH090365
51	<i>S. schlegeliana</i>	JCM 11561 ^T = LMG 21406 ^T = HRKA1 ^T	AB081760	MH090181	AB081766	MH090240	MH090282	MH090324	MH090366
52	<i>S. sediminis</i>	HAW-EB3 ^T = DSM 17055 ^T = NCIMB 14036 ^T	AY579750	CP000821					
53	<i>S. seohaensis</i>	KCTC 23556 ^T = CCUG 60900 ^T = S7-3 ^T	GU944672	MH090182	GU944673	MH090241	MH090283	MH090325	MH090367
54	<i>S. upenei</i>	KCTC 22806 ^T = CCUG 58400 ^T = 20-23R ^T	GQ260190	MH090183	GQ260193	MH090242	MH090284	MH090326	MH090368
55	<i>S. vesiculosa</i>	LMG 24424 ^T = CECT 7339 ^T = M7 ^T	AM980877	MH090184	MH090202	MH090243	MH090285	MH090327	MH090369
56	<i>S. violacea</i>	DSS12 ^T = JCM 10179 ^T = LMG 19151 ^T = CIP 106290 ^T	D21225	AP011177					
57	<i>S. waksmanii</i>	ATCC BAA-643 ^T = CIP 107701 ^T = KMM 3823 ^T	AY170366	JAEH00000000					

58	<i>S. woodyi</i>	ATCC 51908 ^T = DSM 12036 ^T = CIP 105547 ^T = MS32 ^T	AF003549	CP000961					
59	<i>S. xiamenensis</i>	MCCC 1A00763 ^T = CCTCC M 209017 ^T = JCM 16212 ^T = S4 ^T	FJ589031	MH090185	FJ589040	MH090244	MH090286	MH090328	MH090370
60	<i>Aeromonas hydrophila</i>	ATCC 7966 ¹ = BCRC 13018 ¹ = CCRC 13018 ^T	AY264937	CP000462					
61	<i>Escherichia coli</i>	JCM 1649 ^T = ATCC 11775 ^T = CCUG 24 ^T	AB242910	BAIM00000000					
62	<i>Vibrio cholerae</i>	ATCC 14035 ¹ = CCUG 9118 A ^T = CECT 514 ^T	EF032498	JHXR00000000					

Table S3. The similarity matrix for twenty-eight type *Shewanella* strains based on *is*DDH (lower left) and MLSA (upper right).

No.	species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
1	<i>S. algae</i>		75.3	79.9	95.6	95.5	73.9	77.4	75.3	74.2	74.8	98.5	94.8	73.5	77.7	76.2	74.0	76.4	76.9	73.6	74.1	73.9	75.0	76.2	74.9	98.7	75.2	74.9	74.3	
2	<i>S. algidipiscicola</i>	18.5		75.7	75.7	75.4	85.4	78.0	77.9	80.2	80.2	75.5	75.4	77.9	81.2	75.1	77.9	77.7	77.7	77.9	80.1	79.3	79.4	78.2	79.3	75.5	78.4	80.8	79.4	
3	<i>S. amazonensi</i>	19.9	19.0		79.7	79.6	74.9	76.8	75.6	75.0	74.9	80.3	79.7	73.8	77.8	75.9	74.6	76.2	77.0	73.8	74.2	74.1	75.4	76.0	75.1	80.2	74.9	75.4	74.1	
4	<i>S. carassii</i>	51.5	18.5	19.9		95.7	74.5	77.4	75.5	75.0	75.4	96.0	95.7	73.6	77.9	76.7	74.4	77.0	77.0	73.6	75.0	74.2	75.4	76.7	75.0	95.8	75.6	75.5	74.6	
5	<i>S. chilikensis</i>	55.9	18.5	19.8	50.4		74.6	77.4	75.5	74.4	75.0	95.7	96.6	74.1	77.6	76.8	74.4	76.4	77.2	74.1	74.4	73.8	75.3	76.4	74.7	95.8	75.3	75.3	74.4	
6	<i>S. colwelliana</i>	18.1	20.8	17.8	18.1	18.1		77.2	77.3	79.5	79.7	74.3	74.7	78.4	80.7	75.3	77.7	77.4	77.3	78.4	79.5	79.7	79.4	78.1	79.4	74.4	79.1	81.2	80.3	
7	<i>S. decolorationis</i>	18.8	21.0	19.3	18.9	18.6	18.8		79.1	77.1	76.9	77.6	77.3	77.1	76.5	76.6	77.8	84.6	91.5	77.1	76.7	76.0	76.9	86.0	76.3	77.6	76.6	76.1	77.3	
8	<i>S. denitrificans</i>	20.4	20.5	22.0	20.8	19.9	19.6	21.0		77.3	77.0	75.7	76.0	79.0	75.8	74.6	78.3	79.0	79.7	79.0	77.4	77.6	75.9	79.2	76.7	75.6	76.0	77.4	75.9	
9	<i>S. fidelis</i>	18.5	20.5	18.6	18.8	18.5	19.5	19.1	20.0		86.4	74.6	74.5	78.5	77.7	75.0	78.5	76.7	77.1	78.5	86.6	84.0	79.5	77.5	80.3	74.5	79.0	79.8	80.8	
10	<i>S. halifaxensis</i>	20.6	20.3	21.6	20.4	19.7	19.6	19.9	21.8	22.0		75.2	75.4	78.3	78.3	75.0	78.5	76.9	77.4	78.3	90.2	84.3	79.9	77.3	80.7	75.2	79.3	78.9	81.3	
11	<i>S. haliotis</i>	84.6	18.8	20.0	51.7	56.1	18.1	18.9	20.4	18.4	20.4		95.2	73.8	78.1	76.6	74.2	76.5	77.0	73.8	74.6	74.2	75.3	76.7	75.0	99.0	75.5	75.1	74.6	
12	<i>S. indica</i>	55.3	18.5	20.0	51.2	64.0	18.3	18.9	20.1	18.6	20.6	55.3		73.8	77.7	76.7	74.3	76.4	77.1	73.9	74.5	74.0	75.1	76.7	74.8	95.0	75.0	75.6	74.6	
13	<i>S. japonica</i>	19.5	20.0	21.1	19.9	19.1	19.8	19.9	20.8	20.1	21.9	19.7	19.7		74.6	74.2	79.2	77.6	77.6	99.9	78.0	77.7	76.4	78.0	76.1	73.8	76.3	77.7	77.2	
14	<i>S. loihica</i>	20.2	20.0	20.3	19.9	19.7	19.2	19.8	21.9	19.3	20.9	20.0	20.0	22.7		75.4	75.1	75.4	76.9	74.6	77.6	77.8	79.4	76.0	78.5	78.0	78.8	79.5	79.2	
15	<i>S. mangrovi</i>	18.8	18.8	20.3	18.7	18.5	18.8	19.0	21.6	18.8	20.2	18.8	19.0	21.2	20.7		75.3	75.2	76.0	74.2	74.3	73.9	73.7	76.1	74.0	76.5	73.5	75.4	73.8	
16	<i>S. marina</i>	19.4	19.9	19.9	19.3	19.1	19.6	20.6	21.4	19.4	21.2	19.4	19.4	20.9	20.4	18.8		78.2	78.1	79.1	77.6	77.0	76.5	78.2	76.1	74.3	76.1	77.4	78.1	
17	<i>S. morhuae</i>	18.5	19.2	19.1	18.7	18.4	19.9	21.5	20.8	19.3	20.0	18.4	18.8	20.1	19.5	18.9	19.9		85.3	77.6	76.3	76.1	76.0	88.9	75.9	76.7	76.7	76.5	77.0	
18	<i>S. oneidensis</i>	19.1	19.6	20.1	19.4	19.1	18.7	29.7	23.1	19.2	20.4	19.3	19.0	20.9	20.4	20.1	21.2	21.5		77.6	76.8	76.0	76.5	86.5	75.9	77.3	76.4	76.9	76.7	
19	<i>S. pacifica</i>	18.1	19.5	18.3	18.6	18.3	19.9	19.1	19.5	20.0	20.0	18.2	18.5	88.9	19.7	19.2	19.5	19.9	19.7		78.0	77.7	76.4	77.9	76.0	73.8	76.3	77.6	77.2	
20	<i>S. pealeana</i>	20.2	20.4	22.1	20.7	19.3	19.8	20.3	23.3	22.0	25.5	20.0	20.0	21.9	20.6	19.9	21.3	20.7	20.8	20.2		84.4	79.8	76.5	81.4	74.4	79.1	78.5	80.6	
21	<i>S. piezotolerans</i>	19.6	20.1	21.0	19.7	19.3	19.9	19.7	21.2	20.4	21.3	19.5	19.5	22.0	20.5	20.4	21.1	19.9	20.3	20.4	21.4		79.1	76.0	79.5	74.2	78.5	79.3	80.5	
22	<i>S. psychrophila</i>	19.9	19.9	21.2	20.0	19.4	19.2	19.8	22.0	19.6	21.1	20.0	19.8	22.1	20.6	20.9	21.5	19.7	20.9	19.9	21.5	21.7		76.0	82.5	75.3	90.6	78.5	82.1	
23	<i>S. putrefaciens</i>	18.5	19.2	18.7	18.6	18.2	18.6	22.5	20.9	18.8	19.8	18.5	18.6	20.4	19.2	19.6	19.7	23.8	22.9	19.4	20.1	19.4	19.5		75.6	76.6	76.0	76.6	77.3	
24	<i>S. sediminis</i>	20.2	19.9	22.1	20.3	19.5	19.8	20.0	22.1	19.7	21.7	20.2	20.0	22.1	20.7	20.8	21.4	19.9	20.7	19.7	21.7	21.9	21.2	20.0		74.9	81.9	78.6	83.8	
25	<i>S. upenei</i>	83.7	18.2	19.9	51.8	56.5	18.1	18.9	20.2	18.7	19.9	84.1	55.4	19.1	20.1	18.7	19.3	18.8	19.1	18.3	19.7	19.1	19.5	18.6	19.8		75.3	75.2	74.8	
26	<i>S. violacea</i>	20.4	19.9	21.6	20.8	19.5	19.3	20.3	22.5	19.6	21.4	20.2	20.0	23.3	21.2	21.2	22.3	20.4	21.6	20.0	21.9	21.6	28.2	20.5	21.5	19.7		77.7	81.8	
27	<i>S. waksmanii</i>	18.5	19.6	18.4	18.5	18.5	19.2	19.0	19.3	20.4	20.1	18.5	18.7	21.0	19.0	18.8	19.4	19.2	18.9	21.3	20.5	19.9	19.5	18.8	19.9	18.6	19.7		79.0	
28	<i>S. woodyi</i>	20.3	20.0	21.6	20.4	19.7	19.8	20.1	22.4	20.3	22.2	20.2	20.4	22.8	20.6	20.9	21.8	19.9	21.5	20.5	22.9	21.9	20.6	20.1	21.4	19.6	20.8	19.8		

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