

**Bacteriophage application to control the contaminated water with *Shigella***

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**Supplementary Information**

**Table S1. Predicted genes and gene products of pSs-1.**

Gene		Gene product				Amino acid Identity (%)	Putative function [organism] (E-value) {functional group <sup>a</sup> }	Predicted TMH and signal peptide	
ORF No.	Range	Strand	aa size	MW (kD)	pI			TMHMH	SignalP
1	40 - 189	-	50	4.9	9.50	98	hypothetical protein [Shigella phage Shfl2] (2e-21)	1	Y
2	186 - 1514	-	443	50.6	8.45	99	DNA topoisomerase [Shigella phage Shfl2] (0.0) {ii}	0	N
3	1652 - 1810	-	53	5.7	4.21	43	hypothetical protein [Shigella phage Shfl2] (0.021)	1	Y
4	1821 - 1976	-	52	5.6	7.82	75	hypothetical protein [Shigella phage Shfl2] (4e-17)	2	Y
5	2064 - 2519	-	152	17.0	9.90	99	nucleoid disruption protein [Shigella phage Shfl2] (3e-106) {v}	0	N
6	2579 - 2794	-	72	8.2	4.20	99	hypothetical protein [Shigella phage Shfl2] (6e-43)	0	N
7	2910 - 3107	-	66	7.5	9.40	95	hypothetical protein [Shigella phage Shfl2] (1e-36)	1	Y
8	3115 - 3228	-	38	4.3	9.52	61	membrane protein [Shigella phage SP18] (4e-06) {i}	1	N
9	3212 - 3325	-	38	4.6	7.84	94	hypothetical protein [Shigella phage Shfl2] (6e-14)	0	N
10	3472 - 3735	-	88	10.3	4.87	98	hypothetical protein [Shigella phage Shfl2] (2e-55)	0	N
11	3810 - 4286	-	159	18.2	7.66	97	endonuclease [Shigella phage Shfl2] (5e-112) {ii}	0	N
12	4300 - 4629	-	110	12.7	4.61	86	hypothetical protein [Enterobacteria phage T4] (6e-06)	0	N
13	4667 - 4861	-	65	7.6	6.20	48	hypothetical protein [Shigella phage SP18] (8e-13)	0	N
14	4890 - 5828	-	313	35.6	5.68	99	protector from early lysis [Shigella phage Shfl2] (0.0) {v}	0	N
15	5840 - 8017	-	726	82.8	5.84	97	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
16	8028 - 8231	-	68	8.2	6.58	78	hypothetical protein [Shigella phage SP18] (7e-24)	0	N
17	8286 - 10103	-	606	68.4	7.60	99	DNA dependent ATPase [Shigella phage Shfl2] (0.0) {ii}	0	N
18	10173 - 10433	-	87	9.4	7.71	99	hypothetical protein [Shigella phage Shfl2] (3e-55)	0	Y
19	10438 - 10809	-	124	14.3	4.94	96	hypothetical protein [Shigella phage Shfl2] (5e-78)	0	N
20	10812 - 10988	-	59	6.8	8.38	76	hypothetical protein [Shigella phage Shfl2] (6e-25)	0	N
21	10991 - 11410	-	140	16.6	4.76	99	RNA metabolism moderator [Shigella phage Shfl2] (1e-96) {iii}	0	N
22	11410 - 11625	-	72	8.5	5.00	97	T4 tRNAs [Shigella phage Shfl2] (9e-43) {iii}	0	N
23	11798 - 12286	-	163	16.6	4.76	93	modifier of transcription [Shigella phage Shfl2] (2e-102) {iii}	0	N
24	12363 - 12905	-	181	20.4	5.15	75	modifier of transcription [Shigella phage Shfl2] (1e-18) {iii}	0	N
25	12908 - 13408	-	167	20.0	5.97	87	modifier of transcription [Shigella phage Shfl2] (2e-101) {iii}	0	N
26	13472 - 14155	-	228	26.0	4.88	64	exonuclease [Shigella phage SP18] (4e-104) {ii}	0	N
27	14155 - 14397	-	81	9.3	5.36	98	hypothetical protein [Shigella phage Shfl2] (8e-48)	0	N
28	14390 - 14635	-	82	9.5	4.77	99	hypothetical protein [Shigella phage Shfl2] (5e-49)	0	N
29	14622 - 14882	-	87	9.9	7.85	94	hypothetical protein [Enterobacteria phage AR1] (2e-49)	0	N
30	14889 - 16208	-	440	50.0	7.61	99	DNA helicase [Shigella phage Shfl2] (0.0) {ii}	0	N
31	16205 - 16516	-	104	12.2	9.69	100	hypothetical protein [Shigella phage Shfl2] (1e-67)	0	N

32	16518 - 17264	-	249	29.1	9.95	98	anti-sigma factor [Shigella phage Shfl2] (3e-174) {iii}	0	N
33	17381 - 17983	-	201	23.4	5.86	99	RNA polymerase [Shigella phage Shfl2] (5e-145) {iii}	0	N
34	17980 - 18603	-	208	24.3	5.46	97	RNA polymerase [Shigella phage Shfl2] (5e-145) {iii}	0	N
35	18671 - 18853	-	61	7.1	4.27	41	hypothetical protein [Shigella phage SP18] (9e-07)	0	N
36	18862 - 19332	-	157	18.3	6.53	97	hypothetical protein [Shigella phage Shfl2] (9e-107)	0	N
37	19325 - 19477	-	51	5.8	5.73	98	hypothetical protein [Shigella phage Shfl2] (6e-26)	0	N
38	19486 - 19671	-	62	7.5	4.88	98	transcription modulator [Shigella phage Shfl2] (2e-34) {iii}	0	N
39	19664 - 20149	-	162	18.3	4.46	98	transcription modulator [Shigella phage Shfl2] (9e-110) {iii}	0	N
40	20158 - 20496	-	113	12.6	3.85	47	hypothetical protein [Shigella phage SP18] (5e-05)	0	N
41	20496 - 20708	-	71	8.4	5.52	60	hypothetical protein [Shigella phage Shfl2] (3e-22)	0	N
42	20806 - 21042	-	79	8.6	5.45	49	outer capsid protein [Shigella phage Shfl2] (2e-14) {i}	0	N
43	21085 - 21603	-	173	20.2	4.62	72	dCTPase [Shigella phage Shfl2] (2e-84) {iv}	0	N
44	21675 - 21875	+	67	7.2	10.00	95	hypothetical protein [Enterobacteria phage T4] (4e-36)	2	Y
45	21872 - 22900	-	343	39.9	9.31	99	DNA primase [Shigella phage Shfl2] (0.0) {ii}	0	N
46	22903 - 23067	-	55	6.0	5.39	98	hypothetical protein [Shigella phage Shfl2] (5e-28)	0	N
47	23069 - 23425	-	119	13.9	4.83	99	hypothetical protein [Shigella phage Shfl2] (8e-79)	0	N
48	23438 - 23731	-	98	11.1	4.62	97	spackle periplasmic protein [Shigella phage Shfl2] (5e-63) {v}	0	Y
49	23790 - 24047	-	86	10.2	9.88	95	hypothetical protein [Shigella phage Shfl2] (2e-45)	0	N
50	24049 - 24231	-	61	7.2	5.69	97	discriminator of mRNA degradation [Enterobacteria phage T4] (6e-33) {ii}	0	N
51	24290 - 25717	-	476	53.6	5.44	99	DNA primase/helicase [Shigella phage Shfl2] (0.0) {ii}	0	N
52	25727 - 26071	-	115	13.4	4.89	46	head vertex assembly protein [Shigella phage SP18] (5e-19) {i}	0	N
53	26064 - 27245	-	394	44.2	5.35	100	recombination protein [Shigella phage Shfl2] (0.0) {ii}	0	N
54	27323 - 28165	-	281	32.5	7.08	99	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
55	28162 - 28902	-	247	28.6	5.43	96	dCMP hydroxymethylase [Shigella phage Shfl2] (3e-176) {iv}	0	N
56	28910 - 29059	-	50	5.6	8.98	48	hypothetical protein [Shigella phage SP18] (1e-06)	1	Y
57	29056 - 29307	-	84	9.5	9.40	100	membrane protein [Shigella phage Shfl2] (4e-49) {i}	2	Y
58	29315 - 29695	-	127	14.3	7.55	98	membrane protein [Enterobacteria phage T4] (9e-85) {i}	0	Y
59	29876 - 32572	-	899	103.6	5.96	99	DNA polymerase [Shigella phage Shfl2] (0.0) {ii}	0	N
60	32651 - 33019	-	123	14.7	8.97	99	translational repressor protein [Enterobacteria phage T4] (6e-84) {ii}	0	N
61	33021 - 33584	-	188	21.5	7.66	54	DNA polymerase [Shigella phage SP18] (1e-63) {ii}	0	N
62	33586 - 34545	-	320	35.9	6.72	71	DNA polymerase [Shigella phage SP18] (2e-167) {ii}	0	N
63	34595 - 35281	-	229	25.0	4.89	61	DNA polymerase [Shigella phage SP18] (3e-95) {ii}	0	N
64	35337 - 35726	-	130	14.8	6.83	99	RNA polymerase [Shigella phage Shfl2] (9e-90) {iii}	0	N
65	35736 - 35924	-	63	7.5	5.55	97	hypothetical protein [Shigella phage Shfl2] (2e-36)	0	N
66	35980 - 37662	-	561	63.8	8.49	96	endonuclease [Shigella phage Shfl2] (0.0) {ii}	0	N
67	37659 - 37865	-	69	8.2	4.24	99	hypothetical protein [Enterobacteria phage T4] (2e-40)	0	N
68	37846 - 38109	-	88	10.3	4.21	99	hypothetical protein [Shigella phage Shfl2] (3e-55)	0	N

69	38106 - 39125	-	340	39.2	4.90	99	endonuclease [Shigella phage Shfl2] (0.0) {ii}	0	N
70	39302 - 40504	-	401	46.9	6.05	99	alpha-glucosyl-transferase [Shigella phage Shfl2] (0.0) {iv}	0	N
71	40571 - 40744	-	58	6.7	9.56	89	hypothetical protein [Shigella phage Shfl2] (4e-29)	0	N
72	40748 - 40951	-	68	8.0	9.42	43	hypothetical protein [Shigella phage SP18] (2e-08)	0	N
73	40920 - 41237	-	106	12.5	8.78	42	hypothetical protein [Shigella phage SP18] (3e-17)	0	N
74	41239 - 41382	-	48	5.8	4.14	100	hypothetical protein [Shigella phage Shfl2] (7e-25)	0	N
75	41441 - 41998	-	186	21.6	5.44	79	sigma factor [Shigella phage SP18] (5e-101) {iii}	0	N
76	42077 - 42346	-	90	10.8	5.64	52	hypothetical protein [Shigella phage SP18] (6e-26)	0	N
77	42343 - 42558	-	72	8.2	3.69	58	hypothetical protein [Shigella phage SP18] (2e-17)	0	N
78	42561 - 42887	-	109	12.8	9.70	98	hypothetical protein [Shigella phage Shfl2] (2e-70)	0	N
79	42940 - 43140	-	67	7.8	7.89	94	hypothetical protein [Shigella phage Shfl2] (5e-39)	0	N
80	43141 - 43272	-	44	5.2	9.60	93	hypothetical protein [Shigella phage SP18] (2e-20)	0	N
81	43280 - 43573	-	98	11.9	9.79	74	hypothetical protein [Shigella phage SP18] (1e-45)	0	N
82	43566 - 43748	-	61	7.1	9.37	66	hypothetical protein [Shigella phage Shfl2] (3e-18)	1	N
83	43773 - 43880	+	36	4.2	9.99	96	hypothetical protein [Enterobacteria phage RB14] (5e-09)	0	N
84	43906 - 44214	-	103	11.8	9.14	68	glutaredoxin [Shigella phage SP18] (4e-42) {iv}	0	N
85	44217 - 44429	-	71	8.0	9.22	38	membrane protein [Shigella phage SP18] (2e-07) {i}	1	N
86	44439 - 44552	-	38	4.5	4.54	92	hypothetical protein [Shigella phage SP18] (5e-16)	0	N
87	44545 - 45015	-	157	18.2	5.90	98	ribonucleotide reductase [Shigella phage Shfl2] (6e-110) {iv}	0	N
88	45012 - 46829	-	606	68.1	6.59	99	ribonucleotide reductase [Shigella phage Shfl2] (0.0) {iv}	0	N
89	46826 - 47299	-	158	18.2	8.96	83	endonuclease [Shigella phage SP18] (3e-90) {ii}	0	N
90	47342 - 47518	-	59	7.0	10.15	78	hypothetical protein [Shigella phage SP18] (3e-25)	0	N
91	47518 - 47964	-	149	17.0	4.37	92	host protease inhibitor [Shigella phage Shfl2] (9e-93) {v}	0	N
92	47948 - 48103	-	52	6.2	3.94	73	hypothetical protein [Shigella phage SP18] (2e-14)	0	N
93	48088 - 48408	-	107	12.6	4.48	74	hypothetical protein [Shigella phage SP18] (3e-52)	0	N
94	48419 - 48589	-	57	6.7	4.15	93	hypothetical protein [Shigella phage Shfl2] (9e-28)	0	N
95	48592 - 48804	-	71	8.0	7.79	100	hypothetical protein [Enterobacteria phage RB51] (4e-42)	0	N
96	48804 - 49067	-	88	10.1	6.71	87	thioredoxin [Shigella phage SP18] (2e-51) {iv}	0	N
97	49069 - 49311	-	81	9.5	7.91	79	hypothetical protein [Shigella phage SP18] (6e-36)	0	N
98	49298 - 49615	-	106	12.2	6.51	92	hypothetical protein [Shigella phage Shfl2] (6e-67)	0	N
99	49612 - 50541	-	310	36.0	9.45	97	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
100	50594 - 51595	-	334	39.1	5.91	92	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
101	51653 - 52675	-	341	39.6	9.12	92	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
102	52684 - 53574	-	297	34.1	9.17	97	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
103	53582 - 53983	-	134	15.4	6.54	92	hypothetical protein [Shigella phage Shfl2] (3e-62)	2	Y
104	54039 - 54566	-	176	20.8	6.65	68	hypothetical protein [Shigella phage SP18] (6e-82)	0	N
105	54627 - 54929	-	101	12.1	9.68	99	hypothetical protein [Shigella phage Shfl2] (9e-67)	0	N

106	55031 - 55999	-	323	36.5	5.01	99	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
107	56114 - 56359	-	82	9.6	4.69	98	hypothetical protein [Shigella phage Shfl2] (2e-48)	0	N
108	56389 - 57123	-	245	28.4	9.13	95	hypothetical protein [Shigella phage Shfl2] (3e-166)	0	N
109	57123 - 57584	-	154	18.0	9.33	91	hypothetical protein [Shigella phage Shfl2] (6e-79)	2	N
110	57593 - 58114	-	174	19.3	4.89	96	hypothetical protein [Shigella phage Shfl2] (5e-117)	0	N
111	58121 - 58654	-	178	20.8	5.20	84	hypothetical protein [Shigella phage Shfl2] (3e-106)	0	N
112	58656 - 58922	-	89	10.3	6.71	95	hypothetical protein [Enterobacteria phage RB14] (4e-55)	0	N
113	58983 - 59087	-	35	4.3	8.14	91	hypothetical protein [Enterobacteria phage T4] (4e-12)	1	N
114	59148 - 59321	-	58	6.8	5.27	100	hypothetical protein [Shigella phage Shfl2] (2e-32)	0	N
115	59311 - 59505	-	65	7.7	5.04	63	hypothetical protein [Shigella phage Shfl2] (1e-14)	0	N
116	59508 - 59711	-	68	7.7	4.59	93	hypothetical protein [Shigella phage Shfl2] (2e-34)	0	N
117	59711 - 59899	-	63	7.2	4.11	51	hypothetical protein [Shigella phage SP18] (7e-09)	0	N
118	59995 - 60381	-	129	14.7	5.53	56	hypothetical protein [Shigella phage SP18] (2e-45)	0	N
119	60378 - 60671	-	98	11.2	4.90	98	lysis inhibition protein [Shigella phage Shfl2] (8e-64) {v}	0	Y
120	60684 - 60896	-	71	8.4	10.19	100	hypothetical protein [Enterobacteria phage T4] (4e-42)	0	N
121	60939 - 61520	-	194	21.7	6.22	71	thymidine kinase [Shigella phage SP18] (2e-95) {iv}	0	N
122	61522 - 61710	-	63	7.3	4.12	100	hypothetical protein [Enterobacteria phage T4] (8e-34)	0	N
123	61707 - 61838	-	44	5.2	3.91	42	hypothetical protein [Shigella phage SP18] (0.003)	0	N
124	61889 - 62065	-	59	6.6	6.53	59	hypothetical protein [Shigella phage Shfl2] (5e-11)	0	N
125	62062 - 62274	-	71	8.2	5.51	71	hypothetical protein [Shigella phage SP18] (6e-28)	0	N
126	62265 - 62477	-	71	8.6	8.83	99	hypothetical protein [Shigella phage Shfl2] (7e-44)	0	N
127	62449 - 62928	-	160	17.6	5.03	97	hypothetical protein [Shigella phage Shfl2] (3e-110)	0	N
128	62925 - 63272	-	116	13.1	8.95	99	tRNA synthetase modifier [Shigella phage Shfl2] (4e-76) {iv}	0	Y
129	63265 - 63810	-	182	20.8	9.76	68	hypothetical protein [Shigella phage SP18] (1e-76)	0	Y
130	63818 - 64279	-	154	18.0	8.93	60	endonuclease [Shigella phage SP18] (2e-52) {ii}	0	N
131	64339 - 64617	-	93	11.0	5.45	99	hypothetical protein [Shigella phage Shfl2] (1e-58)	0	N
132	64617 - 64883	-	89	10.3	4.66	64	hypothetical protein [Shigella phage SP18] (5e-28)	0	N
133	64876 - 65097	-	74	8.3	4.07	95	hypothetical protein [Shigella phage Shfl2] (1e-42)	0	N
134	65097 - 65459	-	121	13.9	5.94	96	hypothetical protein [Shigella phage Shfl2] (5e-78)	0	N
135	65466 - 65795	-	110	12.9	8.89	96	hypothetical protein [Shigella phage Shfl2] (2e-71)	0	N
136	65792 - 66331	-	180	20.4	8.72	94	hypothetical protein [Shigella phage Shfl2] (2e-112)	0	N
137	66485 - 66958	-	158	17.8	8.91	99	hypothetical protein [Enterobacteria phage RB51] (6e-109)	0	N
138	66968 - 67384	-	139	16.4	9.28	72	endonuclease [Shigella phage SP18] (1e-68) {ii}	0	N
139	67444 - 67938	-	165	18.7	9.59	98	lysozyme [Shigella phage Shfl2] (6e-114) {v}	0	N
140	67975 - 68415	-	147	17.0	5.05	96	hydrolase [Shigella phage Shfl2] (9e-101) {v}	0	N
141	68412 - 68900	-	163	19.2	9.06	90	hypothetical protein [Shigella phage Shfl2] (1e-101)	2	N
142	68897 - 69271	-	125	14.7	8.81	86	hypothetical protein [Shigella phage Shfl2] (3e-61)	2	Y

143	69253 - 69645	-	131	15.1	9.67	85	hypothetical protein [Shigella phage Shfl2] (1e-64)	2	N
144	69614 - 70228	-	205	24.2	5.37	96	hypothetical protein [Shigella phage Shfl2] (5e-139)	0	N
145	70270 - 70863	-	198	22.2	6.06	99	hypothetical protein [Shigella phage Shfl2] (3e-133)	0	N
146	70906 - 71436	-	177	19.8	6.90	92	hypothetical protein [Enterobacteria phage RB32] (1e-111)	0	N
147	71493 - 71756	-	88	10.2	4.46	99	hypothetical protein [Enterobacteria phage T4] (2e-56)	0	N
148	71997 - 72560	-	188	20.9	9.43	97	hypothetical protein [Shigella phage Shfl2] (5e-124)	0	N
149	72686 - 73159	-	158	17.3	9.46	99	hypothetical protein [Enterobacteria phage AR1] (9e-107)	0	N
150	74479 - 74766	-	96	11.3	4.91	96	hypothetical protein [Shigella phage Shfl2] (2e-59)	0	N
151	74769 - 75179	-	137	16.2	4.85	98	hypothetical protein [Shigella phage Shfl2] (2e-93)	0	N
152	75181 - 75366	-	62	6.7	7.80	95	hypothetical protein [Shigella phage Shfl2] (2e-31)	2	Y
153	75437 - 75694	-	86	9.4	9.34	96	hypothetical protein [Enterobacteria phage RB51] (2e-50)	0	N
154	75767 - 76222	-	152	17.2	5.14	99	hypothetical protein [Shigella phage Shfl2] (8e-106)	0	N
155	76222 - 76464	-	81	8.8	4.26	96	tail fiber assembly protein [Shigella phage Shfl2] (1e-42) {i}	0	N
156	76464 - 77195	-	244	27.7	5.06	96	deoxynucleotide monophosphate kinase [Shigella phage Shfl2] (2e-169) {iv}	0	N
157	77245 - 77775	-	177	19.8	4.39	99	tail completion and sheath stabilizer protein [Shigella phage Shfl2] (1e-124) {i}	0	N
158	77882 - 78706	-	275	31.7	10.12	99	DNA end protector protein [Shigella phage Shfl2] (0.0) {ii}	0	N
159	78706 - 79158	-	151	17.7	9.75	66	head completion protein [Shigella phage SP18] (7e-69) {i}	0	N
160	79206 - 79796	+	197	23.0	5.92	99	baseplate wedge [Shigella phage Shfl2] (3e-140) {i}	0	N
161	79780 - 81507	+	576	63.2	5.28	99	baseplate hub protein [Shigella phage Shfl2] (0.0) {i}	0	N
162	81500 - 82036	+	179	20.2	4.46	97	hypothetical protein [Shigella phage Shfl2] (2e-121)	0	N
163	82037 - 82330	+	98	10.3	8.60	100	hypothetical protein [Enterobacteria phage T4] (1e-63)	0	N
164	82339 - 84321	+	661	74.4	4.62	99	baseplate wedge [Shigella phage Shfl2] (0.0) {i}	0	N
165	84318 - 87416	+	1033	119.2	5.11	99	baseplate wedge [Shigella phage Shfl2] (0.0) {i}	1	N
166	87409 - 88413	+	335	38.1	4.61	97	baseplate wedge [Shigella phage Shfl2] (0.0) {i}	0	N
167	88477 - 89343	+	289	31.0	5.09	99	baseplate wedge [Shigella phage Shfl2] (0.0) {i}	0	N
168	89343 - 91148	+	602	66.4	4.50	85	baseplate wedge [Shigella phage Shfl2] (0.0) {i}	0	N
169	91148 - 91807	+	220	24.1	5.18	68	baseplate wedge [Shigella phage Shfl2] (4e-104) {i}	0	N
170	91804 - 93354	+	517	55.5	5.85	65	tail fiber protein [Shigella phage Shfl2] (0.0) {i}	0	N
171	93364 - 94821	+	486	52.5	4.77	82	neck whisker protein [Shigella phage Shfl2] (0.0) {i}	0	N
172	94854 - 95783	+	310	34.7	4.93	99	neck protein [Shigella phage Shfl2] (0.0) {i}	0	N
173	95785 - 96555	+	257	29.6	4.57	99	head completion protein [Shigella phage Shfl2] (0.0) {i}	0	N
174	96597 - 97415	+	273	31.6	4.95	55	tail completion and sheath stabilizer protein [Shigella phage SP18] (9e-95) {i}	0	N
175	97424 - 97918	+	165	18.5	4.55	99	terminase [Shigella phage Shfl2] (2e-115) {ii}	0	N
176	97902 - 99734	+	611	69.8	5.53	100	terminase [Shigella phage Shfl2] (0.0) {ii}	0	N
177	99766 - 101745	+	660	71.4	4.83	99	tail sheath protein [Shigella phage Shfl2] (0.0) {i}	0	N
178	101785-102402	+	206	23.9	9.53	51	hypothetical protein [Enterobacteria phage T6] (3e-52)	0	N
179	102510-103001	+	164	18.5	4.67	100	tail tube protein [Shigella phage Shfl2] (3e-116) {i}	0	N

180	103085-104659	+	525	61.1	5.36	99	head vertex protein [Shigella phage Shfl2] (0.0) {i}	0	N
181	104659-104916	+	86	9.8	3.81	96	prohead core protein [Shigella phage Shfl2] (1e-21) {i}	0	N
182	104916-105341	+	142	16.0	9.98	67	prohead core protein [Shigella phage SP18] (1e-48) {i}	0	N
183	105341-105979	+	213	23.3	4.98	88	prohead core scaffold protein [Shigella phage SP18] (3e-131) {i}	0	N
184	106010-106819	+	270	29.9	4.58	99	prohead core scaffold protein [Shigella phage Shfl2] (0.0) {i}	0	N
185	106838-108403	+	522	56.2	5.34	99	major head protein [Shigella phage Shfl2] (0.0) {i}	0	N
186	108487-109770	+	428	47.1	4.70	99	head vertex protein [Shigella phage Shfl2] (0.0) {i}	0	N
187	109800-110804	-	335	37.7	5.65	98	RNA ligase [Shigella phage Shfl2] (0.0) {ii}	0	N
188	110814-110915	-	34	4.0	4.29	97	hypothetical protein [Enterobacteria phage T4] (2e-14)	0	N
189	111078-111263	-	62	7.2	10.35	59	hypothetical protein [Shigella phage SP18] (1e-04)	0	N
190	111383-112801	-	473	50.9	4.44	78	head outer capsid protein [Shigella phage Shfl2] (0.0) {i}	0	N
191	112811-113491	-	227	25.6	4.42	98	prohead protein [Shigella phage Shfl2] (6e-159) {i}	0	N
192	113542-115053	+	504	58.0	9.29	99	DNA helicase [Shigella phage Shfl2] (0.0) {ii}	0	N
193	115079-115309	+	77	8.9	4.24	75	hypothetical protein [Shigella phage SP18] (8e-23)	0	N
194	115365-115532	-	56	6.1	4.44	82	hypothetical protein [Shigella phage SP18] (4e-26)	0	N
195	115561-115785	-	75	9.1	4.85	95	hypothetical protein [Shigella phage Shfl2] (1e-44)	0	N
196	115785-116198	-	138	15.9	7.76	99	ssDNA binding protein [Shigella phage Shfl2] (7e-92) {iii}	0	N
197	116265-116663	-	133	15.2	4.57	100	baseplate wedge protein [Shigella phage Shfl2] (2e-89) {i}	0	N
198	116663-117289	-	209	24.0	5.57	99	baseplate protein [Shigella phage Shfl2] (4e-148) {i}	0	N
199	117340-118089	+	250	29.4	5.82	98	baseplate hub protein [Shigella phage Shfl2] (1e-178) {i}	0	N
200	118089-119264	+	392	44.5	5.21	99	baseplate hub protein [Shigella phage Shfl2] (0.0) {i}	0	N
201	119284-119742	+	153	17.3	5.01	99	baseplate hub protein [Shigella phage Shfl2] (5e-105) {i}	0	N
202	119739-121511	+	591	64.5	5.07	96	baseplate hub protein [Shigella phage Shfl2] (0.0) {i}	1	N
203	121520-122614	+	365	39.8	8.40	95	baseplate tail protein [Shigella phage Shfl2] (0.0) {i}	0	N
204	122614-123579	+	322	35.0	5.08	99	baseplate tail protein [Shigella phage Shfl2] (0.0) {i}	0	N
205	123608-123898	-	97	10.8	4.67	59	hypothetical protein [Shigella phage SP18] (1e-29)	0	N
206	123959-126016	-	686	76.0	6.05	99	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
207	126020-128074	-	685	76.1	5.73	72	RNA polymerase [Shigella phage Shfl2] (0.0) {iii}	0	N
208	128127-128315	-	63	7.2	4.50	90	hypothetical protein [Shigella phage Shfl2] (3e-34)	0	N
209	128312-129772	-	487	55.2	5.85	98	DNA ligase [Shigella phage Shfl2] (0.0) {ii}	0	N
210	129769-130038	-	90	10.9	7.82	98	hypothetical protein [Shigella phage Shfl2] (2e-58)	0	N
211	130038-130874	-	279	32.5	5.84	90	hypothetical protein [Shigella phage Shfl2] (0.0)	0	N
212	130871-131329	-	153	17.2	9.20	97	hypothetical protein [Shigella phage Shfl2] (2e-83)	0	N
213	131322-131537	-	72	8.3	4.94	49	hypothetical protein [Shigella phage Shfl2] (2e-14)	0	N
214	131542-131829	-	96	10.8	7.80	97	hypothetical protein [Shigella phage Shfl2] (1e-61)	0	N
215	131870-132235	-	122	14.2	6.05	100	hypothetical protein [Shigella phage Shfl2] (3e-85)	0	N
216	132303-132635	-	111	13.0	6.11	97	hypothetical protein [Shigella phage Shfl2] (2e-71)	0	N

217	133318-133566	-	83	9.4	8.06	89	lysis inhibition protein [Shigella phage SP18] (4e-42) {v}	0	N
218	133714-134049	-	112	12.2	5.30	80	head assembly protein [Shigella phage SP18] (3e-55) {i}	0	N
219	134106-134414	-	103	11.5	9.35	99	hypothetical protein [Shigella phage Shfl2] (1e-65)	0	N
220	134415-134651	-	79	9.5	9.71	95	hypothetical protein [Shigella phage Shfl2] (2e-46)	0	N
221	134651-135232	-	194	21.3	8.04	99	dCMP deaminase [Shigella phage Shfl2] (2e-139) {iv}	0	N
222	135229-135567	-	113	12.9	7.87	100	hypothetical protein [Shigella phage Shfl2] (5e-75)	0	N
223	135564-135800	-	79	8.8	5.75	99	hypothetical protein [Shigella phage Shfl2] (2e-46)	0	N
224	135794-136324	-	177	20.5	4.99	94	hypothetical protein [Shigella phage Shfl2] (6e-103)	0	N
225	136387-136662	-	92	10.2	4.87	99	hypothetical protein [Shigella phage Shfl2] (8e-58)	0	N
226	136665-136796	-	44	4.9	3.35	81	hypothetical protein [Shigella phage Shfl2] (6e-15)	0	N
227	136860-137057	-	66	7.7	6.71	95	hypothetical protein [Enterobacteria phage T4] (6e-38)	0	N
228	137057-137965	-	303	34.9	8.64	94	polynucleotide kinase/phosphatase [Shigella phage Shfl2] (0.0) {iv}	0	Y
229	137962-138282	-	107	12.2	8.55	98	hypothetical protein [Shigella phage Shfl2] (2e-69)	0	N
230	138286-138510	-	75	8.8	6.82	100	hypothetical protein [Shigella phage Shfl2] (6e-47)	0	N
231	138507-138806	-	100	11.7	8.76	65	hypothetical protein [Shigella phage SP18] (8e-37)	0	N
232	138803-139156	-	118	13.2	8.89	99	hypothetical protein [Shigella phage Shfl2] (8e-75)	1	N
233	139147-139653	-	169	19.2	6.42	100	inhibitor of host transcription [Shigella phage Shfl2] (6e-120) {iii}	0	N
234	139715-140839	-	375	43.6	5.02	99	RNA ligase [Shigella phage Shfl2] (0.0) {ii}	0	N
235	140892-141302	-	137	15.9	9.21	74	endonuclease [Shigella phage SP18] (2e-67) {ii}	0	N
236	141330-142508	-	393	46.1	4.93	92	ribonucleotide reductase [Shigella phage Shfl2] (0.0) {iv}	0	N
237	142560-144824	-	755	86.1	5.87	99	ribonucleotide reductase [Shigella phage Shfl2] (0.0) {iv}	0	N
238	144815-145102	-	96	11.0	8.98	99	hypothetical protein [Shigella phage Shfl2] (3e-63)	0	N
239	145095-145358	-	88	10.1	5.73	99	hypothetical protein [Shigella phage Shfl2] (3e-55)	0	N
240	145382-146242	-	287	33.2	6.07	81	dTMP synthase [Shigella phage Shfl2] (3e-177) {iv}	0	N
241	146242-146448	-	69	8.0	10.26	98	hypothetical protein [Enterobacteria phage vB_EcoM_ACG-C40] (9e-21)	0	N
242	146445-147029	-	195	21.8	6.09	96	dihydrofolate reductase [Shigella phage Shfl2] (3e-136) {iv}	0	N
243	147029-147274	-	82	9.8	4.05	99	hypothetical protein [Shigella phage Shfl2] (6e-50)	0	N
244	147285-147527	-	81	9.6	4.93	94	hypothetical protein [Shigella phage Shfl2] (4e-47)	0	N
245	147582-147962	-	127	15.0	5.62	92	hypothetical protein [Shigella phage Shfl2] (2e-78)	0	N
246	148008-148235	-	76	8.9	3.88	100	hypothetical protein [Enterobacteria phage T4] (3e-46)	0	N
247	148381-149289	-	303	33.6	4.82	99	ssDNA binding protein [Shigella phage Shfl2] (0.0) {iii}	0	N
248	149389-150042	-	218	26.1	9.37	75	DNA helicase [Shigella phage SP18] (1e-116) {ii}	0	N
249	150039-150377	-	113	12.9	4.47	64	transcription accessory protein [Shigella phage SP18] (4e-28) {iii}	0	N
250	150355-150624	-	90	10.5	5.04	60	dsDNA binding protein [Shigella phage SP18] (6e-23) {iii}	0	N
251	150633-151550	-	306	35.6	8.61	99	ribonuclease [Shigella phage Shfl2] (0.0) {ii}	0	N
252	151655-155527	+	1291	140.4	5.19	95	tail fiber protein [Shigella phage Shfl2] (0.0) {i}	0	N
253	155536-156651	+	372	40.3	5.16	96	tail hinge connector [Shigella phage Shfl2] (0.0) {i}	0	N



254	156714-157370	+	219	23.4	6.07	81	tail fiber protein [Shigella phage Shfl2] (6e-122) {i}	0	N
255	157379-160687	+	1103	118.7	5.62	35	tail fiber protein [Shigella phage Shfl2] (2e-98) {i}	0	N
256	160719-161498	+	260	26.2	8.48	41	tail fiber protein [Shigella phage Shfl2] (5e-16) {i}	0	N
257	161529-162185	+	219	25.2	7.70	99	holin [Shigella phage Shfl2] (8e-158) {v}	1	N
258	162186-162458	-	91	10.7	5.42	53	anti-sigma factor [Shigella phage SP18] (1e-18) {iii}	0	N
259	162471-162623	-	51	6.0	4.92	98	hypothetical protein [Shigella phage Shfl2] (3e-25)	0	N
260	162620-162898	-	93	10.9	4.48	97	nuclease [Enterobacteria phage T4] (7e-56) {ii}	0	N
261	162888-163007	-	40	4.7	10.20	97	hypothetical protein [Shigella phage Shfl2] (9e-17)	0	N
262	162982-163200	-	73	8.8	8.51	98	hypothetical protein [Enterobacteria phage T4] (2e-22)	0	N
263	163184-163480	-	99	11.4	8.93	95	hypothetical protein [Shigella phage Shfl2] (4e-62)	0	N
264	163480-163941	-	154	18.0	5.15	99	hypothetical protein [Shigella phage Shfl2] (3e-109)	0	N
265	163938-164267	-	110	12.8	9.24	98	hypothetical protein [Shigella phage Shfl2] (6e-43)	0	N
266	164278-164913	-	212	23.7	7.78	76	hypothetical protein [Shigella phage SP18] (2e-56)	0	N

<sup>a</sup> i, phage structure and packaging; ii, DNA replication and modification; iii, signal transduction and regulation; iv, nucleotide metabolism; v, host lysis.