

Distribution of *Zostera* species in Japan. I *Zostera marina* L. (Zosteraceae)

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Abstract The distribution of *Zostera marina* L. was assessed based on 4,782 herbarium specimens collected throughout Japan from 2004 to 2006. Six-hundred and six sites of *Zostera marina* were recorded from Hokkaido Prefecture in the north to Kagoshima Prefecture in the south. The data reveal that *Z. marina* primarily occurs in sheltered sites and that the species only infrequently inhabits areas of open coastline. The water depth at collection sites ranged from 0 m to 11.1 m, with 95.6% of *Z. marina* collections being made at depths of up to 3 m.

Key words: Distribution, Japan, seagrass, *Zostera marina*, Zosteraceae.

Seagrasses are marine angiosperms that occur in the shallow sub-tidal and intertidal zones of coastal regions from the tropics to the arctic region (Short *et al.*, 2001). About sixty seagrass species in 12 genera of 4 families have been recorded in the world (Kuo and den Hartog, 2001). Sixteen species in 8 genera and 3 families are known from Japan (Omori, 2000). The Japanese seagrass flora is noteworthy since it contains several endemic species, namely *Zostera asiatica*, *Z. caespitosa*, *Z. caulescence*, *Z. japonica*, *Phyllospadix iwatensis* and *P. japonicus* (Zosteraceae), despite the fact that most seagrass species are widespread (Short *et al.*, 2001).

Despite the high species diversity of the Japanese seagrass flora, reports on the distribution of seagrass species around Japan are limited. Miki (1933, 1934) reported the distribution of seagrasses in Japan for the first time, and provided

maps showing their occurrence. However, these data can not be verified because voucher specimens for his descriptions have not been found. More recently, Omori (1993) listed specimens of Japanese Zosteraceae species excluding *Z. marina* and *Z. japonica*, contained in the major herbaria of Japan. In his report, Omori (1993) observed that few studies on the distribution and ecology on Japanese seagrasses have been conducted, despite their potential value for the conservation and rehabilitation of seagrass meadows. The Environment Agency of Japan (1994) has published data on the location and area of seagrass meadows around Japan, but the component species of these meadows were not recorded and voucher specimens were not collected. Since then, only few studies on the distribution of Japanese seagrasses including new locality reports, have been published (Omori, 1996; Kudoh,

1999; Aioi *et al.*, 2000; Shoji *et al.*, 2004; Akaike and Goda, 2006; Tanaka *et al.*, 2006; Yatsuya *et al.*, 2007; Fujiwara *et al.*, 2009; Ishikawa, 2009).

Based on a survey of over 6,000 herbarium specimens held in the herbarium at the National Museum of Nature and Science, Japan (TNS), we have compiled detailed locality data of all *Zostera* (Zosteraceae) species in Japan. Species in this genus are currently the focus of a project being conducted by the Ministry of Agriculture, Forests and Fisheries that seeks to assess levels of genetic diversity within seagrass species in Japan. Many of these species form the dominant component of seagrass communities in temperate parts of the world. In this the first report resulting from this survey, we present distribution data for *Z. marina*, widely distributed in temperate parts of the northern hemisphere, a keystone species that is common in seagrass meadow communities around Japan.

Materials and Methods

Surveys of *Zostera marina* were conducted by making observations from the seashore, from a ship, and by snorkeling and SCUBA diving excursions. Almost the entire Japanese coastline was surveyed from May 2004 to December 2006. Plants with several shoots connected by rhizomes were collected at each population confirmed in the surveys. In addition, around thirty shoots were collected from plants separated by over 3 m (to avoid sampling the same genet) at one-quarter of all populations for use in the population genetic analyses. These samples were stored at -80°C prior to DNA extraction.

Voucher specimens were made for all plants; these have been deposited in the herbarium of the National Museum of Nature and Science, Japan (TNS). Information on habitat parameters including water depth, water temperature, transparency and bottom sediment, were also collected and recorded on the voucher specimen labels.

Results and Discussion

A total of 606 sites of *Zostera marina* were confirmed in 33 Prefectures throughout Japan, based on a total of 4,782 herbarium specimens collected in these surveys (Table 1 and Fig. 1). The northernmost and the southernmost populations were Souya Oomisaki, Wakkanai, Hokkaido Prefecture ($45^{\circ}31'23''$, $141^{\circ}56'53''$) and Tyougamizu, Yamagawa, Kagoshima Prefecture ($31^{\circ}10'01''$, $130^{\circ}35'53''$), respectively. The populations found at Kagoshima Bay (Fig. 1M) were the southernmost in the western Pacific. In some cases, it has been demonstrated that populations at the periphery of a plant species' range exhibit low genetic diversity (Arnaud-Haond *et al.*, 2006; Beatty *et al.*, 2008). However, because the bay is one of the most abundant sites for *Z. marina* in Japan, we regard this population as an important site in progressing the understanding of the species' population genetic structure, as well as that of marginal populations of seagrasses more generally. The density of collection sites was higher in northern Miyagi Prefecture, Sado Island (Fig. 1B), Maizuru Bay (Fig. 1F), the Seto Inland Sea (Figs. 1H, 1I and 1J), Amakusa Islands (Fig. 1L), and Kagoshima Bay (Fig. 1M). In contrast, collection sites were of lower density in Southern and Eastern Hokkaido (Fig. 1A), the Sea of Japan side of Northern Honsyu (Fig. 1B) and Western Honsyu (Fig. 1A), and the Sea of Japan side of Fukushima and Ibaraki Prefectures (Figs. 1A and 1B). Although the density of collection sites does not completely reflect that of natural habitats, as Tanaka *et al.* (2006) reported on distribution of *Z. marina* in the Sagami Sea, it nonetheless clearly reveals that *Z. marina* populations throughout Japan occur primarily in sheltered sites and that this species is absent or does not form well-developed populations in areas of open coastline, especially those lacking sandy or muddy sediments.

Water depths of collection sites ranged from 0 m to 11.1 m (Table 1). The frequency distribution of collection sites indicates that 29.6% of *Z. marina* populations were found at depths of 1.0 m to

Table 1. Herbarium specimens of *Zostera marina* deposited in National Museum of Nature and Science (TNS).

No. *	Collection site	Latitude (N)	Longitude (E)	Water depth (m)	Collection date	TNS accession No.	Population**
1	Funadomari Harbor, Rebun, Hokkaido Pref.	45°12'35"	141°08'21"	5.4	2005.6.1	9535097-9535134	○
2	Motodomari Port, Rishiri, Hokkaido Pref.	45°15'50"	141°11'15"		2005.5.26	9536768	
3	Motodomari Port, Rishiri, Hokkaido Pref.	45°15'50"	141°11'15"		2005.5.26	9536769	
4	Oniwakimura, Rishiriji, Hokkaido	45°06'49"	141°17'31"	6.4	2006.7.4	9533321	
5	Oniwakimura, Rishiriji, Hokkaido	45°06'49"	141°17'31"		2006.7.4	9533322	
6	Shimminato Port, Rishiri, Hokkaido Pref.	45°21'19"	141°08'25"	2.6	2005.5.26	9535055-9535096	○
7	Hourai, Wakkanai, Hokkaido	45°25'31"	141°40'48"		2006.10.23	9533325	
8	Wakkanai Harbor, Wakkanai, Hokkaido Pref.	45°24'09"	141°42'20"		2005.12.28	9536766	
9	Sakanoshita, Wakkanai, Hokkaido Pref.	45°21'17"	141°39'20"	6.2	2004.10.6	9541026	
10	Sakanoshita, Wakkanai, Hokkaido Pref.	45°21'28"	141°39'09"	6.2	2004.10.6	9535167, 9535168	
11	Coast of Sakanoshita, Wakkanai, Hokkaido Pref.	45°21'27"	141°38'43"	7.3	2005.5.13	9535135-9535165	
12	Koetoi Port, Wakkanai, Hokkaido Pref.	45°24'53"	141°42'51"		2004.7.7	9541024	
13	East of Port, Koetoi, Wakkanai, Hokkaido Pref.	45°24'31"	141°45'58"		2004.7.7	9535170	
14	Souya Oomasaki, Wakkanai, Hokkaido Pref.	45°31'23"	141°56'53"		2006.1.20	9536765	
15	Hamasarufutsu Port, sarufutsu, soya, Hokkaido Pref.	45°20'08"	142°08'30"		2005.9.9	9541038	
16	Hamatonbetsu Harbor, Hamatonbetsu, Hokkaido Pref.	45°08'13"	142°22'47"		2004.11.5	9536774	
17	Tokoro, Hokkaido Pref.	44°06'33"	143°57'54"	0.3	2004.7.16	9539791-9539820	○
18	Makoto, Abashiri, Hokkaido Pref.	43°57'49"	144°19'59"	1.0	2005.7.25	9539851-9539880	
19	Odaito Pond raised, Betsukai, Hokkaido Pref.	43°34'50"	140°15'30"	1.0	2005.6.6	9539821-9539850	
20	Akshishi, Hokkaido Pref.	43°03'12"	144°50'37"	0.6	2004.6.4	9539740-9539769	○
21	Nishitru, Yagishiri, Haboro, Hokkaido Pref.	44°26'45"	141°23'55"		2005.2.9	9536772-9536773	○
22	Reuke, Rumoi, Hokkaido Pref.	43°54'43"	141°36'55"		2005.3.8	9536770-9536771	○
23	Oyoro, Otaru, Hokkaido Pref.	43°12'36"	140°51'26"	2.1	2004.8.5	9535430	
24	Oyoro, Otaru, Hokkaido Pref.	43°12'33"	140°52'42"	2.3	2004.12.6	9535438-9535467	
24	Ookawa, Yoichi, Hokkaido Pref.	43°12'07"	140°48'32"	10.0	2005.2.16	9535428	
25	Bikuni, Syakotan, Hokkaido Pref.	43°18'11"	140°36'17"	7.2	2005.8.24	9535398-9535427	
26	Bikuni, Syakotan, Hokkaido Pref.	43°18'19"	140°36'40"	7.2	2005.8.24	9535429	
27	Fukushima, Hokkaido Pref.	41°27'47"	140°14'50"	1.7	2004.6.24	9539770-9539789	○
28	Mobeji Port, Mobeji, Hokuto, Hokkaido Pref.	41°45'28"	140°51'59"	0.4	2006.7.13	9535660, 9535661	○
29	Usu Bay, Usu, Date, Hokkaido Pref.	42°31'06"	140°46'38"	0.4	2004.10.25	9539260-9539400	○
30	Noyanoma, Usu Bay, Usu, Date, Hokkaido Pref.	42°31'06"	140°46'38"	0.3	2004.6.4	9540491-9540495	○
32	Tetsu, Murakami, Minmaya, Aomori Pref.	41°15'13"	140°19'55"		2004.7.22	9526841-9526875	○
33	Yomogida Port, Yomogida, Aomori Pref.	41°02'34"	140°39'30"		2004.7.22	9526784-9526840	○
34	Tofuga-ura, Nohoji Bay, Nohoji, Kitakami, Aomori Pref.	40°52'49"	141°08'58"		2006.8.22	9537266	
35	Obufuruma, Kakkaso, Aomori Pref.	40°57'42"	141°21'52"	0.3	2005.6.16	9539900-9539923	○
36	Hanaki Beach, Miyako Bay, Miyako, Iwate Pref.	39°12'26"	141°25'59"	1.4	2004.11.26	9526588-9526619	○
37	Yonezaki, Onuma, Rikuzentakata, Iwate Pref.	39°00'17"	141°40'40"	1.1	2004.11.26	9526620-9526650	○
38	Hajikami Harbor, Kesenuma Bay, Kesenuma, Miyagi Pref.	38°50'12"	141°35'44"	1.2	2004.7.22	9534988-9535022	○
39	Odanohama Beach, Nagasaki, Kesenuma, Miyagi Pref.	38°51'21"	141°37'45"	3.0	2005.1.6	9535054	
40	Hajikami Harbor, Kesenuma Bay, Kesenuma, Miyagi Pref.	38°50'11"	141°35'47"	1.1	2004.7.8	9535038	
41	Saichimori, Kesenuma, Miyagi Pref.	38°51'10"	141°35'30"	1.0	2004.7.8	9535045	
42	Nagatsomori, Kesenuma, Miyagi Pref.	38°50'48"	141°35'13"	2.0	2004.7.8	9535044	
43	Nagaiso shichibanza, Kesenuma, Miyagi Pref.	38°50'54"	141°35'28"	1.1	2004.7.8	9535040	
44	Nagaiso Beach, Kesenuma, Miyagi Pref.	38°50'22"	141°35'43"	1.5	2004.7.8	9535039	
45	Iwaisaki, Kesenuma, Miyagi Pref.	38°49'27"	141°35'53"	0.1	2004.7.5	9535036	
46	Hajikamiakado, Kesenuma, Miyagi Pref.	38°49'54"	141°35'59"	0.5	2005.8.30	9535023	
47	Suginosita Bay, Kesenuma, Miyagi Pref.	38°49'39"	141°35'32"	0.1	2005.8.30	9535026	
48	Hikado Port, Motoyoshi, Motoyoshi, Miyagi Pref.	38°48'52"	141°35'59"	3.0	2005.8.30	9535029	
49	Nakayama, Minamisanriku, Motoyoshi, Miyagi Pref.	38°45'11"	141°33'42"	0.2	2006.8.8	9535377	
50	Istomae, Minamisanriku, Motoyoshi, Miyagi Pref.	38°42'29"	141°31'39"	0.7	2006.8.23	9535388	
51	Yoriki, Minamisanriku, Motoyoshi, Miyagi Pref.	38°42'48"	141°31'27"	2.0	2006.8.23	9535389	
52	Hosoura, Minamisanriku, Motoyoshi, Miyagi Pref.	38°41'41"	141°29'56"	0.8	2006.5.17	9533623, 9533624	
53	Fusubozaki, Minamisanriku, Motoyoshi, Miyagi Pref.	38°40'55"	141°28'48"	2.6	2006.5.17	9533619	
54	Hiraiso Port, Minamisanriku, Motoyoshi, Miyagi Pref.	38°40'38"	141°28'39"	0.9	2006.5.17	9533615	
55	Sachihama Port, Minamisanriku, Motoyoshi, Miyagi Pref.	38°40'46"	141°27'46"	1.1	2006.5.17	9533613	
56	Minato Port, Minamisanriku, Motoyoshi, Miyagi Pref.	38°44'42"	141°32'23"	0.8	2006.8.23	9535382	
57	Minato Port, Minamisanriku, Motoyoshi, Miyagi Pref.	38°44'58"	141°32'19"	2.4	2006.8.23	9535384	
58	Mouth of Mitobe River, Minamisanriku, Motoyoshi, Miyagi Pref.	38°38'52"	141°27'49"	0.7	2006.5.16	9533603	
59	Mouth of Mizushiri River, Minamisanriku, Motoyoshi, Miyagi Pref.	38°40'31"	141°26'38"	1.6	2006.5.17	9533609-9533611	
60	Oriate, Minamisanriku, Motoyoshi, Miyagi Pref.	38°38'42"	141°26'38"	1.0	2006.5.16	9533605, 9533606	
61	(Shizukawa Bay) Oriate, Minamisanriku, Motoyoshi, Miyagi Pref.	38°38'43"	141°26'44"	1.8	2005.12.13	9534955-9534987	○
62	Kappazawa, Minamisanriku, Motoyoshi, Miyagi Pref.	38°38'41"	141°28'48"	1.6	2006.5.16	9533597	
63	Nagashimizu, Minamisanriku, Motoyoshi, Miyagi Pref.	38°38'23"	141°30'37"	1.2	2006.5.16	9533592	
64	Hamasagayoko, Tateyama, Chiba Pref.	38°25'33"	141°24'34"	1.9	2005.6.23	9539963-9539978	
65	Samenoura Bay, Oshika, Miyagi Pref.	38°20'12"	141°30'24"		2004.6.9	9526929-9526974	
66	Kugunarihana Beach, Ishinomaki, Miyagi Pref.	38°18'48"	141°29'31"	0.5	2006.8.21	9535371-9535376	
67	Uratosabawasa, Shiogama, Miyagi Pref.	38°22'11"	141°07'11"		2006.6.18	9526894-9526928	
68	Torinomi, Watarai, Watarai, Miyagi Pref.	38°02'02"	140°55'10"	0.4	2006.6.13	9535367-9535370	
69	Matsukawaura, Soma, Fukushima Pref.	37°49'14"	140°58'30"	1.0	2006.1.31	9532663-9532693	
70	Matsukawaura, Soma, Fukushima Pref.	37°42'20"	140°58'23"		2005.6.23	9541040	
71	Nakanosaki, Iwaki, Fukushima Pref.	36°57'14"	140°56'46"	1.0	2005.6.21	9532338, 9532339	
72	Onahana, Iwaki, Fukushima Pref.	36°55'59"	140°51'34"	4.6	2006.3.22	9532632-9532662	○
73	Togawan, Togashiohama, Oga, Akita Pref.	35°04'55"	139°50'36"	0.6	2005.6.17	9539933-9539962	
74	Katsunara Harbor, Tobu Is., Sakata, Yamagata Pref.	39°10'54"	139°33'15"	17.0	2006.9.2	9535590-9535610	○
75	Tobishima beach, Tobu Is., Sakata, Yamagata Pref.	39°10'47"	139°32'59"	2.0	2006.9.3	9535601-9535686	○
76	Imazumi, Tsuruoka, Yamagata Pref.	38°58'12"	139°42'32"		2006.9.16	9533673-9533702	○
77	Uchiura, Awashimaura, Awashima Is. Niigata Pref.	38°27'56"	139°15'29"	10.8	2005.7.22	9540084	
78	Uchiura, Awashimaura, Niigata Pref.	38°28'02"	139°15'22"	8.3	2005.7.22	9540767-9540796	
79	Hiramatsu, Sado, Niigata Pref.	33°11'07"	138°29'07"	8.2	2006.8.3	9535759	
80	Shirosue, Sado, Niigata Pref.	38°08'37"	138°27'30"	7.8	2005.8.18	9540048-9540077, 9540086	○
81	Akitsu, Sado, Niigata Pref.	38°04'45"	138°25'56"	1.7	2005.10.17	9540078	
82	Shidomari, Sado, Niigata Pref.	38°03'56"	138°28'59"	5.8	2006.8.3	9535758	
83	Akadomari, Sado, Niigata Pref.	37°51'39"	138°24'59"	7.0	2006.8.2	9535753, 9535754	
84	Hamochi, Sado, Niigata Pref.	37°49'22"	138°18'54"	6.1	2006.8.2	9535751, 9535752	
85	Toyota, Sado, Niigata Pref.	37°57'27"	138°20'25"	2.7	2006.8.21	9535764	
86	Yahata, Sado, Niigata Pref.	37°59'23"	138°19'40"	6.7	2005.7.14	9540082	
87	Futami, Sado, Niigata Pref.	38°05'08"	138°19'44"	11.1	2005.7.13	9540018-9540047, 9540079	○
88	Amazue, Izumozaki, Mishima Niigata Pref.	37°32'26"	138°41'17"	3.1	2006.5.31	9535711-9535748, 9535750	○
89	Kyoden, Uozu, Toyama Pref.	36°51'02"	137°24'23"	4.0	2005.11.24	9540763	
90	Oota, Takaoka, Toyama Pref.	36°49'27"	137°03'00"	10.0	2006.2.13	9540762	
91	Jizou, Himi, Toyama Pref.	36°51'03"	137°00'10"	7.3	2004.7.8	9526446-9526475	○
92	Kozakai, Himi, Toyama Pref.	36°55'05"	137°01'52"	7.0	2005.5.23	9540391-9540420	○
93	Nakanami, Himi, Toyama Pref.	36°57'00"	137°02'40"	6.0	2005.9.2	9540732-9540761	○
94	Shirahama, Minamiboso, Chiba Pref.	34°54'24"	139°53'36"	0.2	2006.5.15	9537206-9537225	
95	Okitsu, Katsura, Chiba Pref.	35°08'03"	140°15'30"	1.5	2005.12.14	9538778-9538817	○
96	Shirahama, Minamiboso, Chiba Pref.	34°54'24"	139°53'36"	0.7	2006.5.15	9537276	
97	Banda Port, Tateyama, Chiba Pref.	34°58'36"	139°46'47"	0.5	2005.11.30	9540513	
98	Hamasagayoko, Tateyama, Chiba Pref.	34°58'49"	139°47'10"	3.1	2005.11.30	9528748-9528777, 9540511	○
99	Kenbutsu Port, Tateyama, Chiba Pref.	34°58'48"	139°47'57"	1.2	2005.11.30	9540512	
100	Tateyama Bay, Tateyama, Chiba Pref.	35°00'32"	139°48'32"	2.1	2006.6.29	9535364	
101	Takasaki Port, Tomiyama, Awa, Chiba Pref.	35°04'58"	139°50'22"	0.6	2005.11.24	9540999-9541022	○
102	Ukushima, Katsuyama, Kyonan, Chiba Pref.	35°06'11"	139°48'56"	4.4	2006.5.10	9535352-9535361, 9533672	○

Table 1. —(Continued)—

No. *	collection site	latitude	longitude	water depth (m)	collection date	TNS accession No.	population**
103	Tsuhama, Futtsu, Chiba Pref.	35°12'30"	139°50'06"	4.0	2006.10.26	9533565	
104	Oonukigou, Tomi, Chiba Pref.	35°16'42"	139°50'58"	0.6	2005.6.24	9540131-9540162	○
105	Futtsu, Futtsu, Chiba Pref.	35°19'22"	139°47'58"	1.0	2006.6.26	9533562	
106	Shintomikou, Tomitsu, Chiba Pref.	35°20'21"	139°49'37"	1.6	2005.6.27	9540509, 9540510	
107	Shintomikou, Tomitsu, Chiba Pref.	35°20'21"	139°49'37"	1.6	2005.6.27	9540196-9540225	○
108	Kaneda, Kisarazu, Chiba Pref.	35°25'55"	139°53'54"	0.6	2006.6.28	9533563	
109	Jyogasaki, Miura, Kanagawa Pref.	35°08'25"	139°37'31"	1.5	2004.7.16	9526554-9526587	○
110	Sashima, Yokosuka, Kanagawa Pref.	35°13'23"	139°37'05"	1.8	2004.7.7	9526516-9526553	○
111	Tyoyagasaki, Hayama, Kanagawa Pref.	35°15'24"	139°34'38"	1.8	2004.7.22	9526482-9526515	○
112	Mihama Beach, Heda, Numazu, Shizuoka Pref.	34°58'29"	138°45'55"		2006.2.7	9533405-9533473	○
113	Nagisagawa, Maisaka, Hamamatsu, Shizuoka Pref.	34°45'36"	137°56'26"		2004.9.21	9526717-9526759	○
114	South of Ikarise, Maisaka, Hamamatsu, Shizuoka Pref.	34°45'18"	137°36'11"		2004.9.20	9526684-9526716	○
115	North of Ikarise, Maisaka, Hamamatsu, Shizuoka Pref.	34°42'49"	137°30'12"		2004.9.20	9526651-9526683	○
116	Fukue, Tahara, Aichi Pref.	34°38'16"	137°05'12"	1.5	2006.5.26	9535768, 9535769	○
117	Fukue, Tahara, Aichi Pref.	34°38'06"	137°06'07"	2.3	2006.5.26	9535770	○
118	Fukue, Tahara, Aichi Pref.	34°38'09"	137°07'02"	1.6	2006.5.26	9535771, 9535772	○
119	Miya, Gamagori, Aichi Pref.	34°48'14"	137°15'24"	0.6	2005.4.27	9540623	○
120	Miya, Gamagori, Aichi Pref.	34°48'15"	137°15'24"	0.6	2005.4.27	9540642-9540671	○
121	Takeshima, Gamagori, Aichi Pref.	34°48'01"	137°14'11"	1.0	2006.6.12	9535773, 9535774	○
122	Shirahama-Shinden, Kira, Hazu, Aichi Pref.	34°47'58"	137°04'40"	0.1	2005.6.30	9540641	○
123	Yoshida, Kira, Hazu, Aichi Pref.	34°47'04"	137°04'49"	0.5	2005.6.30	9540635	○
124	Ikuia, Ishihiki, Hazu, Aichi Pref.	34°46'18"	137°04'18"	0.6	2005.6.9	9540631, 9540632	○
125	Ikuia, Ishihiki, Hazu, Aichi Pref.	34°45'59"	137°04'15"	0.4	2005.6.9	9540702-9540731	○
126	Koyabu, Ishihiki, Hazu, Aichi Pref.	34°47'40"	137°00'18"	0.2	2005.6.30	9540634	○
127	Toyooka, Minamichita, Chita, Aichi Pref.	34°44'24"	136°56'59"	0.3	2005.6.28	9540633	○
128	Karasaki, Tokoname, Aichi Pref.	34°52'06"	136°51'22"	0.0	2005.5.26	9540624-9540630	○
129	Karasaki, Tokoname, Aichi Pref.	34°51'58"	136°51'22"	0.2	2005.5.26	9540672-9540701	○
130	Matsunose, Matsunose, Mitsuoka, Mie Pref.	34°36'13"	136°35'11"	0.2	2005.5.28	9537956-9537987	○
131	Ikenoura, Futani, Ise, Mie Pref.	34°29'32"	136°49'42"	2.0	2005.1.18	9537953-9537942	○
132	Futanihouchi Ikenoura, Ise, Mie Pref.	34°29'44"	136°48'56"	2.0	2005.10.21	9537988-9538012	○
133	Kouka, Ago, Shima, Mie Pref.	34°18'54"	136°53'28"		2006.9.7	9533630	○
134	Fukaya Waterway, Funakoshi, Daiou, Shima, Mie Pref.	34°15'59"	136°51'54"	1.8	2004.11.24	9537811-9537909	○
135	Tategami, Ago, Shima, Mie Pref.	34°17'56"	136°50'44"	5.0	2005.12.9	9532900-9532929	○
136	Ukata, Ago, Shima, Mie Pref.	34°19'32"	136°48'15"	0.5	2005.5.29	9533631-9533658	○
137	Jonohama Beach, Kinogasima, Kihoku, Kitamura, Mie Pref.	34°11'55"	136°52'27"		2006.5.26	9533626	○
138	Miura, Kinogasima, Kihoku, Kitamura, Mie Pref.	34°09'32"	136°17'12"	3.0	2006.1.26	9533627	○
139	Ukui, Katsura, Nati, Wakayama Pref.	33°39'72"	135°58'63"	1.1	2004.7.15	9533704-9533737	○
140	Ukui, Katsura, Nati, Wakayama Pref.	33°39'57"	135°58'49"	0.1	2005.3.30	9534309-9534311	○
141	Katsura, Katsura, Nati, Wakayama Pref.	33°38'19"	135°56'45"	3.6	2005.7.15	9534318, 9534319	○
142	Uragami, Katsura, Nati, Wakayama Pref.	33°34'17"	135°54'56"	2.7	2004.7.8	9534137-9534166	○
143	Hashigui, Kushimoto, Wakayama Pref.	33°29'04"	135°47'57"	2.5	2005.12.9	9534202-9534234, 9534331	○
144	Takatomu, Kushimoto, Wakayama Pref.	33°28'49"	135°45'48"	2.7	2004.7.16	9534104-9534136	○
145	Mikasa, Shirahama, Wakayama Pref.	33°37'01"	135°23'76"	2.8	2004.7.21	9534167-9534201	○
146	Fujishima, Shirahama, Wakayama Pref.	33°41'32"	135°21'55"	0.2	2005.8.5	9534325, 9534326	○
147	Shinjo, Tanabe, Wakayama Pref.	33°42'04"	135°23'35"		2005.4.14	9541036, 9541037	○
148	Shinjo, Tanabe, Wakayama Pref.	33°42'03"	135°22'43"		2005.4.14	9541033	○
149	Koura, Hii Bay, Hidaka, Wakayama Pref.	33°55'32"	135°04'33"	5.0	2006.3.7	9540505-9540507	○
150	Koura, Hii, Hidaka, Wakayama Pref.	33°55'58"	135°05'52"	0.8	2005.4.28	9534312-9534314	○
151	Karao, Hinoгава, Wakayama Pref.	34°00'41"	135°08'45"	1.2	2006.6.14	9534315, 9534316	○
152	Tomogashima, Wakayama, Wakayama Pref.	34°17'09"	135°00'42"	5.6	2005.8.1	9534322	○
153	Tomogashima, Wakayama, Wakayama Pref.	34°17'09"	135°00'42"	3.8	2005.3.9	9533857-9533891	○
154	Tai, Maizuru, Kyoto Pref.	35°34'11"	135°27'11"	6.0	2006.8.21	9532084, 9532085	○
155	Nariu, Maizuru, Kyoto Pref.	35°35'25"	135°27'77"	3.0	2006.8.21	9532086	○
156	Nariu, Maizuru, Kyoto Pref.	35°35'39"	135°27'27"	3.0	2006.8.21	9532089	○
157	Matsugasaki, Maizuru, Kyoto Pref.	35°29'28"	135°23'49"	1.2	2006.6.14	9532111, 9532112	○
158	Shirahama, Maizuru, Kyoto Pref.	35°29'02"	135°20'43"	1.3	2006.6.14	9532105, 9532106	○
159	Shirahama, Maizuru, Kyoto Pref.	35°29'05"	135°20'52"	0.8	2006.6.14	9532107, 9532108	○
160	Shirahama, Maizuru bay, Maizuru, Kyoto Pref.	35°29'02"	135°20'43"	1.3	2004.7.28	9531937-9531971	○
161	Wada, Maizuru, Kyoto Pref.	35°28'27"	135°20'19"	1.0	2006.6.14	9532101, 9532102	○
162	Nejirimatsuzaki, Maizuru, Kyoto Pref.	35°28'47"	135°20'29"	1.0	2006.6.14	9532103, 9532104	○
163	Shimogata, Maizuru, Kyoto Pref.	35°29'57"	135°19'42"	1.0	2006.6.14	9532099, 9532100	○
164	Ookine, Maizuru, Kyoto Pref.	35°28'38"	135°19'17"	0.9	2006.6.14	9532097, 9532098	○
165	Aoi, Maizuru, Kyoto Pref.	35°29'06"	135°19'30"	1.1	2006.6.14	9532093, 9532094	○
166	Aoi, Maizuru, Kyoto Pref.	35°29'01"	135°19'26"	0.9	2006.6.14	9532095, 9532096	○
167	To Is, Maizuru, Kyoto Pref.	35°29'49"	135°20'53"	1.0	2006.6.14	9532109, 9532110	○
168	Otsu Is, Maizuru, Kyoto Pref.	35°29'24"	135°20'46"	1.0	2006.6.14	9532115	○
169	Karita, Miyazu, Kyoto Pref.	35°53'24"	135°14'22"	2.3	2006.8.4	9532119	○
170	Dell, Shimakage, Maizuru, Kyoto Pref.	35°53'59"	135°14'53"	4.8	2006.8.4	9532123	○
171	Shimakage, Maizuru, Kyoto Pref.	35°54'58"	135°14'54"	6.5	2006.8.4	9532120, 9532121	○
172	Tai, Maizuru, Kyoto Pref.	35°53'27"	135°14'50"	4.0	2006.8.4	9532125	○
173	Tai, Maizuru, Kyoto Pref.	35°54'54"	135°14'15"	3.3	2006.8.4	9532128	○
174	Tai, Maizuru, Kyoto Pref.	35°54'34"	135°13'47"	1.5	2006.8.4	9532130	○
175	Nagahama, Miyazu, Kyoto Pref.	35°29'20"	135°22'6"	0.6	2005.11.5	9532071	○
176	Nagahama, Miyazu, Kyoto Pref.	35°29'20"	135°22'6"	0.3	2005.11.5	9532072, 9532073	○
177	Shishizaki, Miyazu, Kyoto Pref.	35°33'44"	135°12'24"	0.7	2004.12.14	9532040, 9532041	○
178	Shishizaki, Miyazu, Kyoto Pref.	35°33'27"	135°12'15"	0.6	2004.12.14	9532042, 9532043	○
179	Shishizaki, Miyazu, Kyoto Pref.	35°33'17"	135°12'23"	0.6	2004.12.14	9532044, 9532045	○
180	Haji, Miyazu, Kyoto Pref.	35°32'46"	135°12'36"	0.4	2004.12.14	9532046, 9532047	○
181	Suginose, Miyazu, Kyoto Pref.	35°32'52"	135°11'15"	1.7	2004.12.14	9532048, 9532049	○
182	Suginose, Miyazu bay, Miyazu, Kyoto Pref.	35°32'52"	135°11'15"	2.0	2005.1.6	9531973-9532006	○
183	Amanohashidate, Miyazu, Kyoto Pref.	35°33'34"	135°11'17"	2.0	2004.12.14	9532050, 9532051	○
184	Monju, Aso-kai, Miyazu, Kyoto Pref.	35°33'39"	135°11'13"	1.0	2006.4.19	9532078, 9532079	○
185	Ejiri, Aso-kai, Miyazu, Kyoto Pref.	35°34'29"	135°11'42"	0.7	2006.4.19	9532082, 9532083	○
186	Mizohiri, Iwataki, Yosano, Kyoto Pref.	35°34'36"	135°11'22"	0.5	2006.4.19	9532080, 9532081	○
187	Ejiri, Miyazu, Kyoto Pref.	35°34'55"	135°12'18"	1.8	2004.12.14	9532052, 9532053	○
188	Ejiri, Miyazu, Kyoto Pref.	35°35'24"	135°12'39"	4.5	2006.8.4	9532138	○
189	Ejiri, Miyazu, Kyoto Pref.	35°35'51"	135°12'16"	4.0	2006.8.4	9532141	○
190	Heki, Miyazu, Kyoto Pref.	35°36'28"	135°13'53"	6.0	2006.8.4	9532136	○
191	Heki, Miyazu, Kyoto Pref.	35°36'02"	135°13'17"	3.6	2006.8.4	9532137	○
192	Satohami, Miyazu, Kyoto Pref.	35°37'34"	135°14'47"	2.3	2006.8.4	9532132	○
193	Satohami, Miyazu, Kyoto Pref.	35°37'06"	135°14'38"	7.0	2006.8.4	9532134	○
194	Satohami, Miyazu, Kyoto Pref.	35°37'44"	135°14'50"	6.0	2006.8.4	9532142	○
195	Nagae, Miyazu, Kyoto Pref.	35°38'56"	135°15'14"	2.3	2006.8.4	9532151	○
196	Nagae, Miyazu, Kyoto Pref.	35°38'25"	135°15'6"	6.0	2006.8.4	9532143	○
197	Nagae, Miyazu, Kyoto Pref.	35°39'10"	135°15'27"	4.0	2005.4.12	9532061-9532063	○
198	Nagae, Yourou, Miyazu, Kyoto Pref.	35°39'14"	135°15'28"	3.3	2005.7.13	9532007-9532039	○
199	Hide, Inc, Kyoto Pref.	35°40'17"	135°16'31"	3.0	2006.8.23	9532157, 9532158	○
200	Hirata, Inc, Kyoto Pref.	35°40'31"	135°17'14"	3.0	2006.8.23	9532155, 9532156	○
201	Karubihama, Inc, Kyoto Pref.	35°39'50"	135°17'29"	2.0	2006.8.23	9532146	○
202	Kame Is, Inc, Kyoto Pref.	35°39'14"	135°17'41"	3.0	2006.8.23	9532153, 9532154	○
203	Ao Is, Inc, Kyoto Pref.	35°39'54"	135°16'59"	6.0	2006.8.23	9532150	○
204	Kanzaki-Kumihama, Kiyotango, Kyoto Pref.	35°37'41"	134°55'10"	1.0	2005.10.12	9532067	○

Table 1. —(Continued)—

No. *	collection site	latitude	longitude	water depth (m)	collection date	TNS accession No.	population**
205	Yurihama, Tohaku, Tottori Pref.	35°30'38"	133°54'42"		2006.5.25	9537691-9537720	○
206	Takugi, Okinoshima, Oki, Shimane Pref.	36°10'17"	133°14'48"		2005.10.20	9540004-9540015	○
207	Takugi, Okinoshima, Oki, Shimane Pref.	36°10'17"	133°14'48"		2005.10.8	9539979-9540003	○
208	Muro, Nobase, Misumi, Nagato, Yamaguchi Pref.	34°22'306"	131°15'34"	3.0	2005.6.1	9534909	
209	Kojima, Misumi, Nagato, Yamaguchi Pref.	34°22'37"	131°13'35"	1.5	2005.5.6	9534907	
210	Shirakata, Senzaki, Nagato, Yamaguchi Pref.	34°22'53"	131°12'32"	2.0	2005.6.1	9534818-9534847	○
211	Shirakata, Senzaki, Nagato, Yamaguchi Pref.	34°22'53"	131°12'53"	2.0	2005.6.1	9534908	
212	Senzaki, Nagato, Yamaguchi Pref.	34°22'42"	131°12'38"	4.0	2005.6.1	9534914	
213	Oohibi, Senzaki, Nagato, Yamaguchi Pref.	34°24'54"	131°12'44"	1.5	2005.6.1	9534912	
214	Oohibi, Senzaki, Nagato, Yamaguchi Pref.	34°24'24"	131°12'49"	4.0	2005.6.1	9534913	
215	Kurose, Kayoi, Nagato, Yamaguchi Pref.	34°25'38"	131°14'35"	3.0	2005.6.1	9534910	
216	Kurose, Kayoi, Nagato, Yamaguchi Pref.	34°25'32"	131°13'52"	3.0	2005.6.1	9534911	
217	Ooura, Yuya-domari, Nagato, Yamaguchi Pref.	34°23'37"	130°57'19"	3.0	2005.6.3	9534888	
218	Yuya-hisahara, Nagato, Yamaguchi Pref.	34°23'58"	131°00'21"	2.5	2005.6.3	9534884	
219	Kakebuchi, Yuya-ookawashiri, Nagato, Yamaguchi Pref.	34°23'04"	131°02'09"	2.5	2005.6.3	9534879	
220	Yuya-oda, Nagato, Yamaguchi Pref.	34°24'26"	131°00'47"	1.5	2005.6.3	9534880	
221	Yūyūgami, Nagato, Yamaguchi Pref.	34°23'25"	131°01'38"	3.0	2005.6.3	9534848-9534878	○
222	Iake is, Yuya, Nagato, Yamaguchi Pref.	34°22'33"	131°00'25"	3.0	2005.6.3	9534897	
223	Kaigawa, Yuya, Nagato, Yamaguchi Pref.	34°22'07"	130°59'28"	2.5	2005.6.3	9534892	
224	Kiyakawayuiki, Ouji, Shimonoeki, Yamaguchi, Yamaguchi Pref.	34°01'47"	131°02'49"	0.3	2006.4.28	9533086	
225	Kiyakawayuiki, Ouji, Shimonoeki, Yamaguchi, Yamaguchi Pref.	34°01'37"	131°02'41"	0.3	2006.4.28	9533087	
226	Kiyakawayuiki, Ouji, Shimonoeki, Yamaguchi, Yamaguchi Pref.	34°01'42"	131°03'42"	0.3	2006.4.28	9533088	
227	Kiyakawayuiki, Ouji, Shimonoeki, Yamaguchi, Yamaguchi Pref.	34°01'49"	135°03'53"	0.3	2006.4.28	9533089	
228	Kiyakawayuiki, Ouji, Shimonoeki, Yamaguchi, Yamaguchi Pref.	34°01'48"	135°03'54"	0.3	2006.4.28	9533090	
229	Ajisu, Yamaguchi, Yamaguchi Pref.	34°00'43"	131°22'50"	0.2	2005.5.9	9533098	
230	Ajisu, Yamaguchi Bay, Yamaguchi, Yamaguchi Pref.	34°00'31"	131°22'41"		2005.5.9	9540387	
231	Yamaguchi Bay, Yamaguchi, Yamaguchi Pref.	34°00'53"	131°24'13"		2005.4.25	9540384	
232	Yamaguchi Bay, Yamaguchi, Yamaguchi Pref.	34°00'47"	131°24'11"		2005.4.25	9540385	
233	Aio, Yamaguchi, Yamaguchi Pref.	34°00'53"	131°24'21"	0.0	2005.4.25	9533099	
234	Aio, Yamaguchi, Yamaguchi Pref.	34°00'41"	131°24'18"	0.0	2005.4.25	9533100	
235	Aiowan, Aio, Yamaguchi, Yamaguchi Pref.	33°59'43"	131°24'11"	0.2	2006.3.28	9533084	
236	Aio, Yamaguchi, Yamaguchi Pref.	34°00'25"	131°24'7"	0.0	2005.4.25	9538905-9538939	○
237	Ihonosho, Yanai, Yamaguchi Pref.	33°55'03"	132°07'29"	2.0	2004.7.1	9534421-9534481	○
238	Tudu, Iwakuni, Yamaguchi Pref.	34°04'46"	132°12'47"	3.5	2005.6.15	9533094	
239	Tudu, Iwakuni, Yamaguchi Pref.	34°04'47"	132°12'43"	1.0	2005.6.15	9533095	
240	Isuzu, Iwakuni, Yamaguchi Pref.	34°04'28"	132°12'46"	3.5	2004.03.09	9540389	
241	Isuzu, Iwakuni, Yamaguchi Pref.	34°04'02"	132°12'5"	3.5	2005.6.15	9538940-9538974	○
242	Yashiro Is., Ooshima, Suou, Ooshima, Yamaguchi Pref.	33°56'02"	132°24'4"	2.0	2004.5.25	9534334-9534370	○
243	Heigun Is., Heigun, Yanai, Yamaguchi Pref.	33°47'03"	132°14'2"	3.0	2004.7.2	9534482-9534508	○
244	Hakotsukuri Coast, Hannan, Osaka Pref.	34°20'29"	135°12'12"	1.1	2005.8.3	9538818-9538871	○
245	New Takeno Harbor, Takeno, Toyooka, Hyogo Pref.	35°51'24"	134°59'55"	4.2	2005.6.9	9535468-9535502	○
246	Uragami, Kasumi, kami, Mikata, Hyogo Pref.	35°50'32"	134°59'51"	2.2	2005.07.29	9535565	
247	Mitahama, Kasumi, kami, Mikata, Hyogo Pref.	35°53'33"	134°45'42"	3.3	2005.9.16	9535503-9535522, 9535553	○
248	Eigashima, Akashi, Hyogo Pref.	34°40'32"	134°54'47"	4.0	2005.9.2	9540536-9540567	○
249	Eigashima, Akashi, Hyogo Pref.	34°40'32"	134°54'47"	4.0	2005.9.2	9540537	
250	Shirahama Beach, Himeji, Hyogo Pref.	34°46'31"	134°42'26"	0.6	2005.9.2	9540568-9540602	○
251	Naragashima Is., Sumoto, Hyogo Pref.	34°17'33"	134°56'59"	2.1	2005.8.8	9538872-9538904	○
252	Naragashima Is., Sumoto, Hyogo Pref.	34°17'33"	134°56'59"	2.1	2005.8.8	9542845	
253	Ostaba, Hinase, Bizen, Okayama Pref.	34°41'06"	134°17'47"	1.6	2004.6.25	9537236-9537265	○
254	North East A of Nagashima Is., Kugu, Setouchi, Okayama Pref.	34°40'58"	134°16'3"	1.1	2004.7.1	9540362, 9540363	
255	Katakami, Bizen, Okayama Pref.	34°43'07"	134°11'57"	1.3	2004.6.1	9540350	
256	Kugui, Bizen, Okayama Pref.	34°43'01"	134°11'36"	0.6	2005.3.7	9532699-9532793	○
257	Kugui, Bizen, Okayama Pref.	34°43'31"	134°12'29"	1.3	2004.6.1	9540351	
258	Mushige, Oku, Setouchi, Okayama Pref.	34°40'33"	134°12'58"	1.0	2004.6.1	9540353	
259	Chio, Kugu, Setouchi, Okayama Pref.	34°38'51"	134°11'32"	0.7	2004.7.1	9540361	
260	In front of Maeshima Kariyon, Ushimado, Setouchi, Okayama Pref.	34°36'48"	134°11'13"	0.9	2004.6.2	9540355, 9540356	
261	Kuroshima Is., Ushimado, Setouchi, Okayama Pref.	34°35'59"	134°09'30"	0.5	2004.6.4	9538013-9538055	○
262	Kuroshima Is., Ushimado, Setouchi, Okayama Pref.	34°36'43"	134°09'38"	0.5	2004.6.2	9540357	
263	in front of Fisheries Experiment Station, Ushimado, Setouchi, Okayama Pref.	34°36'34"	134°08'38"	0.5	2004.6.1	9540352	
264	Kashino, Ushimado, Setouchi, Okayama Pref.	34°36'27"	134°08'7"	0.3	2004.7.2	9540354	
265	Nishiwaki, Ushimado, Setouchi, Okayama Pref.	34°35'54"	134°07'44"	0.4	2004.6.3	9540358	
266	Hokoshima Is., Banda, Tamano, Okayama Pref.	34°33'26"	134°01'52"	0.9	2005.4.27	9540370	
267	Banda, Tamano, Okayama Pref.	34°33'49"	134°01'52"	0.9	2005.4.27	9540369	
268	Ootrizaki, Banda, Tamano, Okayama Pref.	34°33'15"	134°01'46"	0.6	2005.4.27	9540371, 9540372	
269	Desaki, Tamano, Okayama Pref.	34°31'17"	135°58'36"	1.5	2005.6.15	9532794-9532823	○
270	Gokan, Tamano, Okayama Pref.	34°31'53"	133°58'54"	1.0	2005.7.6	9540374, 9540375	
271	Tai, Tamano, Okayama Pref.	34°31'18"	133°57'41"	2.0	2005.7.6	9540376-9540378	
272	Kojima-kayo, Kurashiki, Okayama Pref.	34°27'31"	133°46'25"	1.5	2005.7.20	9540379	
273	Muguchijima Is., Kurashiki, Okayama Pref.	34°25'29"	133°45'40"	1.2	2005.7.20	9540380	
274	Mizushima is., Kurashiki, Okayama Pref.	34°27'42"	133°42'45"	1.0	2005.7.20	9540381	
275	Nagahama, Ooshima, Kasooka, Okayama Pref.	34°27'42"	133°32'39"	0.2	2006.2.2	9540382	
276	Takashima Is., Kasooka, Okayama Pref.	34°25'56"	133°30'36"	0.4	2006.2.2	9540383	
277	Katsuyokujou, Shiraisijima, Kasooka, Okayama Pref.	34°24'24"	133°30'37"	0.0	2006.6.23	9533248	
278	Oyamahigashi, Shiraisijima, Kasooka, Okayama Pref.	34°24'25"	133°30'21"	2.1	2006.6.23	9533247	
279	Miyanoama, Shiraisijima, Kasooka, Okayama Pref.	34°22'55"	133°31'24"	1.4	2006.6.23	9533246	
280	Kajikosima, Kasooka, Okayama Pref.	34°23'03"	133°29'54"	0.5	2006.6.23	9533245	
281	Iwabuto, Manabejima, Kasooka, Okayama Pref.	34°21'38"	133°34'49"	0.6	2006.7.10	9533257	
282	Obanai, Manabejima, Kasooka, Okayama Pref.	34°20'54"	133°34'26"	1.1	2006.7.10	9533254	
283	Sawada, Manabejima, Kasooka, Okayama Pref.	34°21'14"	133°34'06"	1.5	2006.7.10	9533253	
284	Hukura, Manabejima, Kasooka, Okayama Pref.	34°21'16"	133°34'58"	0.6	2006.7.10	9533256	
285	Mimantoinama, Manabejima, Kasooka, Okayama Pref.	34°21'07"	133°34'52"	1.2	2006.7.10	9533255	
286	Motouranishi, Manabejima, Kasooka, Okayama Pref.	34°21'22"	133°34'41"	0.7	2006.7.10	9533252	
287	Motourahigashi, Manabejima, Kasooka, Okayama Pref.	34°21'23"	133°34'49"	1.1	2006.7.10	9533251	
288	Notohara, Numakuma, Fukuyama, Hiroshima Pref.	34°22'26"	133°22'14"	0.3	2004.9.16	9536747	
289	Ooura, Utsumi, Fukuyama, Hiroshima Pref.	34°21'36"	133°18'01"	1.0	2004.9.16	9536745	
290	Oohama, Utsumi, Fukuyama, Hiroshima Pref.	34°20'20"	133°15'34"	0.5	2005.8.23	9536753	
291	Oohama, Utsumi, Fukuyama, Hiroshima Pref.	34°20'34"	133°15'34"	0.5	2005.8.23	9536618-9536647	○
292	Okibe, Yoshina, Takehara, Hiroshima Pref.	34°18'32"	132°52'25"	1.0	2005.9.2	9536752	
293	Okibe, Yoshina, Takehara, Hiroshima Pref.	34°18'54"	132°52'41"	1.3	2005.8.23	9536648-9536707	○
294	Naga Is., Oosakikamijima, Toyota, Hiroshima Pref.	34°15'50"	132°52'36"	4.5	2004.8.24	9536678-9536707	○
295	Mitsuguchi, Yasuura, Toyota, Hiroshima Pref.	34°16'34"	132°48'30"	1.0	2004.9.6	9536708-9536737	○
296	Nagatani, Kurahashi, Kure, Hiroshima Pref.	34°08'33"	132°32'00"	0.1	2004.8.3	9536740, 9536741	
297	Karuga Beach, Kure, Hiroshima Pref.	34°15'23"	132°31'32"	0.2	2004.8.16	9536743, 9536744	
298	Nikai, Ninoshima, Minami, Hiroshima, Hiroshima Pref.	34°18'41"	132°29'59"	0.7	2004.8.10	9541641-9541808	○
299	Edajima, Edajima, Hiroshima Pref.	34°12'35"	132°28'23"	0.5	2004.8.12	9536742	
300	Fukae, Ogaki, Edajima, Hiroshima Pref.	34°08'27"	132°26'14"	0.1	2004.8.3	9536738, 9536739	
301	Ookurokami Is. Okimi, Etajima, Hiroshima Pref.	34°10'00"	132°24'02"	1.0	2004.5.26	9534371-9534400	○
302	Ajima, Hatsuakaichi, Hiroshima Pref.	34°19'01"	132°18'02"	1.0	2004.5.28	9534401-9534419	
303	Ishki, Hiketa, Higashikagawa, Kagawa Pref.	34°12'45"	134°25'36"	2.8	2004.12.9	9540444	
304	Umayado, Hiketa, Higashikagawa, Kagawa Pref.	34°12'41"	134°25'36"	1.3	2004.12.9	9540442	
305	Shroyama-Higashi, Hiketa, Higashikagawa, Kagawa Pref.	34°13'53"	134°24'30"	1.0	2004.12.9	9540445	
306	Komatsubara, Shirotori, Higashikagawa, Kagawa Pref.	34°15'14"	134°22'33"	2.9	2004.12.9	9540448	

Table 1. —(Continued)—

No. *	collection site	latitude	longitude	water depth (m)	collection date	TNS accession No.	population**
307	South-West of Marukamejima Is., Higashikagawa, Kagawa Pref.	34°16'58"	134°18'27"	2.5	2005.1.14	9540453	
308	South of Menjima Is., Higashikagawa, Kagawa Pref.	34°16'47"	134°18'29"	0.7	2005.1.14	9540456	
309	Kitayama, Umashino, Higashikagawa, Kagawa Pref.	34°16'37"	134°18'00"	3.1	2005.1.14	9540455	
310	Kitayama, Umashino, Higashikagawa, Kagawa Pref.	34°16'23"	134°18'06"	1.9	2005.6.1	9540467	
311	West of Umashino Port, Higashikagawa, Kagawa Pref.	34°16'18"	134°17'20"	3.1	2005.6.1	9540466	
312	Back and East of Detached breakwater, Tsuruwa, Sanuki, Kagawa Pref.	34°16'27"	134°16'32"	2.3	2005.6.1	9540465	
313	Benten-minami, Tsuda, Sanuki, Kagawa Pref.	34°17'05"	134°16'05"	2.4	2005.6.1	9540464	
314	Hirabata, Tsuda, Sanuki, Kagawa Pref.	34°18'33"	134°14'58"	1.5	2004.7.23	9540429	
315	Hirabata, Tsuda, Sanuki, Kagawa Pref.	34°18'33"	134°14'58"	1.5	2004.7.23	9534015-9534017	○
316	Izuka Port, Tsuda, Sanuki, Kagawa Pref.	34°19'25"	134°15'56"	2.0	2005.7.21	9540482	
317	Nishigan, Umagahama, Shido, Sanuki, Kagawa Pref.	34°20'43"	134°14'60"		2006.11.8	9533308	
318	Oda, Ura, Sanuki, Kagawa Pref.	34°20'27"	134°14'05"		2006.9.29	9533287	
319	Back of Detached breakwater, Kouzu, Oda, Sanuki, Kagawa Pref.	34°20'19"	134°13'49"	2.1	2005.7.21	9540483	
320	Back of Detached breakwater, Nagahama, Sanuki, Kagawa Pref.	34°20'28"	134°12'27"	1.5	2005.7.21	9540485	
321	Kaisuyokujou, Oomatoeba, Takamatu, Kagawa Pref.	34°21'48"	134°09'48"		2006.12.20	9533312	
322	Kinokuni, Aji, Takamatsu, Kagawa Pref.	34°22'02"	134°09'30"	0.4	2005.1.14	9540457	
323	Aji, Takamatsu, Kagawa Pref.	34°22'26"	134°06'57"	1.3	2004.7.15	9540425	
324	Kamano, Aji, Takamatu, Kagawa Pref.	34°23'57"	134°09'05"		2006.11.8	9533309	
325	Enohama, Aji, Takamatsu, Kagawa Pref.	34°23'29"	134°07'23"	2.6	2005.6.9	9540481	
326	Oonohita, Aji, Takamatsu, Kagawa Pref.	34°23'25"	134°07'17"	2.1	2004.8.10	9540333	
327	Nebutono-Bana, Aji, Takamatsu, Kagawa Pref.	34°23'35"	134°07'11"	2.1	2004.8.10	9540434	
328	Aji Port, Aji, Takamatsu, Kagawa Pref.	34°23'23"	134°07'19"	2.9	2004.8.10	9540432	
329	Funakushiji, Aji, Takamatsu, Kagawa Pref.	34°22'45"	134°07'21"	1.2	2004.7.15	9540436	
330	Mouth of Yashima Bay, Takamatsu, Kagawa Pref.	34°22'56"	134°05'46"	1.7	2004.7.14	9540423	
331	Mouth of Yashima Bay, Takamatsu, Kagawa Pref.	34°22'56"	134°05'46"	1.7	2004.7.14	9533922-9533951	○
332	Head of Yashima Bay, Takamatsu, Kagawa Pref.	34°21'46"	134°06'47"	0.5	2004.7.14	9540424	○
333	Head of Yashima Bay, Takamatsu, Kagawa Pref.	34°21'46"	134°06'47"	0.5	2004.7.15	9533952-9533981	○
334	East of Oda Fish Farm, Sanuki, Kagawa Pref.	34°20'25"	134°14'22"	2.4	2004.7.23	9534012-9534014	○
335	East of Oda Fish Farm, Sanuki, Kagawa Pref.	34°20'25"	134°14'22"	2.4	2004.7.23	9540427	○
336	Nishigan, Kabutojima, Aji, Takamatu, Kagawa Pref.	34°24'49"	134°07'49"		2005.9.28	9533267	
337	West side of Oshima Is., Aji, Takamatsu, Kagawa Pref.	34°24'09"	134°06'00"	0.6	2005.1.14	9540458	
338	Yatakejima, Aji, Kagawa Pref.	34°24'37"	134°06'19"		2005.9.28	9533265	
339	Yatakejima, Aji, Kagawa Pref.	34°24'37"	134°06'19"		2005.9.28	9533266	
340	Gamou, Yajima, Takamatu, Kagawa Pref.	34°21'47"	134°05'58"		2005.9.28	9533263	
341	Higashioki, Megijima, Takamatu, Kagawa Pref.	34°23'43"	134°03'53"		2006.10.18	9533306	
342	Kaisuyokujou, Oomatoeba, Takamatu, Kagawa Pref.	34°21'13"	134°02'32"		2006.12.20	9533311	
343	Kamitari, Kouzai, Takamatu, Kagawa Pref.	34°21'54"	133°59'09"		2006.9.8	9533282	
344	Ikushima Bay, Takamatsu, Kagawa Pref.	34°22'04"	133°57'42"	0.3	2005.5.25	9540461	○
345	Ikushima Bay, Takamatsu, Kagawa Pref.	34°22'04"	133°57'28"	0.3	2005.5.25	9533982-9534011	○
346	Tarumi Bay, Takamatsu, Kagawa Pref.	34°23'02"	133°56'04"	2.5	2005.5.25	9532890-9532899	○
347	Head of Tarumi Bay, Takamatsu, Kagawa Pref.	34°22'22"	133°56'16"	0.7	2005.5.25	9540462	○
348	Mouth of Tarumi Bay, Takamatsu, Kagawa Pref.	34°22'32"	133°56'04"	2.5	2005.5.25	9540463	○
349	Mouth of Tarumi Bay, Takamatsu, Kagawa Pref.	34°23'07"	133°56'11"	2.5	2006.4.28	9534915-9534944	○
350	Huzawa, Sakaide, Kagawa Pref.	34°22'42"	133°55'13"		2006.9.8	9533283	
351	Huzawa, Sakaide, Kagawa Pref.	34°22'42"	133°55'13"		2006.9.8	9533284	
352	Ooyabu,Sakaide, Kagawa Pref.	34°21'48"	133°53'48"		2006.9.8	9533285	
353	Awashima Is., Takuma, Miyoyo, Kagawa Pref.	34°16'37"	133°37'52"	0.5	2004.12.14	9540450	
354	Back of Detached breakwater, Namari, Takuma, Miyoyo, Kagawa Pref.	34°15'01"	133°34'24"	1.6	2005.6.8	9540475	
355	Nabuto, Oshima, Takuma, Miyoyo, Kagawa Pref.	34°13'11"	133°35'64"	2.2	2004.11.18	9540459	
356	Kotsutajima Is., Nio, Miyoyo, Kagawa Pref.	34°11'37"	133°38'23"	1.6	2005.8.4	9540486	
357	Kotsuta Is., Nio, Miyoyo, Kagawa Pref.	34°11'37"	133°38'23"	1.6	2005.8.4	9533892-9533921	○
358	Muromotogokounai, Kanojji, Kagawa Pref.	34°09'31"	133°38'60"		2006.6.13	9533277	
359	Tanoura, Uchiyumi, Shodoshima, Kagawa Pref.	34°26'52"	134°17'11"	1.5	2004.6.4	9540421	
360	Nouma, Uchiyumi, Shodoshima, Kagawa Pref.	34°28'15"	134°19'00"	2.3	2004.11.16	9540438	
361	Akahana, Furue, Uchiyumi, Shodoshima, Kagawa Pref.	34°28'20"	134°18'14"	0.7	2004.11.16	9540437	
362	Ganoni, Ikeda, Syoudojima, Kagawa Pref.	34°28'72"	134°12'53"		2006.12.25	9533313	
363	Kavajiri, Denpo, Tonosou, Kagawa Pref.	34°28'76"	134°11'46"		2005.10.8	9533272	
364	Nishigan, Oyojima, Tonosou, Kagawa Pref.	34°28'13"	134°11'40"		2005.10.8	9533274	
365	Tutumihagoiki, Kajimari, Tonosou, Kagawa Pref.	34°28'32"	134°10'36"		2005.10.8	9533273	
366	Senge, Tonosou, Shouzu, Kagawa Pref.	34°28'11"	134°08'47"		2006.10.18	9533305	
367	Uegi, Tonosou, Shouzu, Kagawa Pref.	34°29'39"	134°09'24"		2006.10.18	9533303	
368	Minanigan, Ieisu, Tonosou, Shouzu, Kagawa Pref.	34°30'41"	134°09'50"		2006.10.18	9533302	
369	Minanigan, Kuzujima, Tonosou, Kagawa Pref.	34°31'00"	134°09'05"		2006.10.18	9533297	
370	East side of Chiburijima Is., Tonosou, Kagawa Pref.	34°31'27"	134°09'23"	0.0	2005.6.9	9540478	
371	Nagahamakouhigashi, Tonosou, Kagawa Pref.	34°30'59"	134°11'12"		2006.10.18	9533300	
372	Tutumihago, Nagahamari, Tonosou, Kagawa Pref.	34°31'08"	134°10'43"		2006.10.18	9533298	
373	Nansei, Tejimakarato, Tonosou, Kagawa Pref.	34°29'50"	134°05'55"		2006.10.12	9533296	
374	Kitakigan, Tejima, Tonosou, Kagawa Pref.	34°29'59"	134°02'59"		2006.10.12	9533291	
375	Hisaki-Abusaki, Tejima, Tonosou, Kagawa Pref.	34°29'49"	134°04'54"		2006.10.12	9533295	
376	Tutumihago, Hisakirigan, Tejima, Tonosou, Kagawa Pref.	34°29'46"	134°04'06"		2006.10.12	9533294	
377	Ieuryugakoumae, Tejima, Tonosou, Kagawa Pref.	34°29'48"	134°03'74"		2006.10.12	9533293	
378	Mikogahama, Tejima, Tonosou, Kagawa Pref.	34°28'40"	134°02'59"		2006.10.12	9533288	
379	Kitagawa, Mikogahama, Tejima, Tonosou, Kagawa Pref.	34°28'37"	134°02'59"		2006.10.12	9533290	
380	Nishigan, Ijima, Naoshima, Kagawa Pref.	34°29'07"	134°00'48"		2006.8.25	9533281	
381	Mukoujima Is., Naoshima, Kagawa Pref.	34°27'50"	133°59'57"	1.6	2004.6.4	9540422	
382	Kitagan, Mukoujima, Naoshima, Kagawa Pref.	34°28'27"	134°00'35"		2006.6.2	9533276	
383	Higashigan, Naoshima, Naoshima, Kagawa Pref.	34°28'36"	133°59'29"		2006.8.25	9533278	
384	Nishigan, Naoshima, Naoshima, Kagawa Pref.	34°28'04"	133°58'02"		2006.8.25	9533279	
385	East side of Koujijima Is., Naoshima, Kagawa Pref.	34°27'31"	133°57'58"	0.3	2005.6.2	9540470	
386	Kitagan, Arakamijima, Naoshima, Kagawa Pref.	34°27'36"	133°57'57"		2006.8.25	9533280	
387	East side of Ushigakubijima Is., Naoshima, Kagawa Pref.	34°30'22"	133°58'17"	1.5	2005.6.2	9540471	
388	Kyouno-kyouroujima Is., Naoshima, Kagawa Pref.	34°28'35"	133°58'53"	1.2	2005.6.2	9540472	
389	Mukoujima Is., Honjima, Marugame, Kagawa Pref.	34°23'51"	133°47'08"	0.6	2005.8.8	9540488	
390	Minami, Kasashima, Honjima, Marugame, Kagawa Pref.	34°23'29"	133°47'63"		2005.8.8	9533259	
391	Kousyou, Honjima, Marugame, Kagawa Pref.	34°22'59"	133°47'59"		2005.8.8	9533260	
392	Ooura, Honjima, Marugame, Kagawa Pref.	34°23'28"	133°46'08"		2005.8.8	9533261	
393	Munagata-Gomoshima, Ochi, Ehime Pref.	34°11'54"	133°56'09"	1.4	2005.7.11	9534600-9534543	○
394	Asanami, Hojyo, Ehime, Pref.	34°00'37"	132°54'42"	0.5	2005.7.12	9534544-9534573	○
395	Yura Bay, Gogo Is., Matsuyama, Ehime Pref.	33°53'20"	132°40'37"	0.5	2005.7.13	9534574-9534606	○
396	Mitsukue, Seto, Nishi-ura, Ehime Pref.	33°27'06"	132°15'17"	0.5	2005.7.14	9534607-9534638	○
397	Orino, Kitanada, Naruto, Tokushima Pref.	34°12'35"	134°28'24"	2.0	2004.7.5	9532160	
398	Orino, Kitanada, Naruto, Tokushima Pref.	34°12'36"	134°28'23"	2.4	2005.7.5	9532169	
399	Orino, Kitanada, Naruto, Tokushima Pref.	34°13'35"	134°13'09"	1.1	2005.2.14	9532165	
400	Kushiki Harbor, Kitanada, Naruto, Tokushima Pref.	34°13'19"	134°13'30"	7.1	2005.8.31	9532174	
401	Kushiki Beach, Kitanada, Naruto, Tokushima Pref.	34°13'22"	134°13'37"	5.4	2004.7.1	9532159	
402	Hyu, Seto, Naruto, Tokushima Pref.	34°13'25"	134°34'10"	2.1	2004.10.1	9532163	
403	Hyu Bay, Seto, Naruto, Tokushima Pref.	34°13'24"	134°34'09"	2.4	2005.7.29	9532170	
404	Dounoura, Seto, Naruto, Tokushima Pref.	34°12'48"	134°35'05"	0.6	2004.7.28	9532161	
405	Dounoura, Seto, Naruto, Tokushima Pref.	34°12'48"	134°35'05"	0.6	2004.7.28	9532218-9532247	○
406	Takushima, Naruto, Tokushima Pref.	34°12'28"	134°35'11"	1.1	2005.8.16	9532171	
407	Mitsuisi, Naruto, Tokushima Pref.	34°12'26"	134°48'30"	1.2	2006.7.11	9532209	
408	Tosadomari-ura, Naruto, Tokushima Pref.	34°12'39"	134°48'30"	1.0	2006.7.11	9532208	

Table 1. —(Continued)—

No. *	collection site	latitude	longitude	water depth (m)	collection date	TNS accession No.	population**
409	Mouth of Shinmachi River, Tsuda, Tokushima, Tokushima Pref.	34°03'14"	134°34'58"	0.3	2005.6.13	9532168	
410	Yokosu Coast, Yokosu, Komatoshima, Tokushima Pref.	33°59'60"	134°35'59"	1.9	2005.11.2	9532182	
411	Yokosu Coast, Yokosu, Komatoshima, Tokushima Pref.	33°59'60"	134°35'56"	2.0	2005.11.10	9532278-9532307	o
412	Akaishi, Wada, Komatoshima, Tokushima Pref.	34°00'04"	134°37'50"	1.2	2005.8.24	9532173	
413	Wada-no-hana, Wadajima, Komatoshima, Tokushima Pref.	34°00'39"	134°37'47"	1.6	2006.1.31	9532186	
414	Nakashima, Nakagawa, Anan, Tokushima Pref.	33°57'12"	134°41'32"	0.8	2005.11.10	9532183	
415	Kotajima, Tsunomine, Anan, Tokushima Pref.	33°52'47"	134°48'30"	2.0	2006.8.31	9532210	
416	Kotajima, Tsunomine, Anan, Tokushima Pref.	33°52'45"	134°39'46"	1.2	2005.8.19	9532162, 9532172	
417	Kotajima, Tsunomine, Anan, Tokushima Pref.	33°52'45"	134°39'45"	2.1	2004.8.10	9532248-9532277	o
418	Ushiodo, Fukui, Anan, Tokushima Pref.	33°50'51"	134°38'29"	0.8	2005.12.21	9532185	
419	Kou, Tsubaki, Anan, Tokushima Pref.	33°50'38"	134°48'30"	1.0	2006.9.20	9532211, 9532212	
420	Hiramatsu, Tsubaki, Anan, Tokushima Pref.	33°49'59"	134°48'30"	1.0	2006.9.20	9532213	
421	Kojima, Tsubaki, Anan, Tokushima Pref.	33°50'09"	134°42'50"	3.0	2004.11.2	9532164	
422	Kojima, Tsubaki, Anan, Tokushima Pref.	33°50'08"	134°42'50"	3.3	2005.9.28	9532179	
423	Ishima Is., Ishima, Anan, Tokushima Pref.	33°50'54"	134°48'29"	4.5	2005.12.21	9532184	
424	Abu Harbor, Minami, Kaifu, Tokushima Pref.	33°47'20"	134°48'29"	2.5	2006.6.6	9532207	
425	Shiwagi Harbor, Yuki, Kaifu, Tokushima Pref.	33°46'43"	134°36'34"	2.0	2005.10.20	9532181	
426	Yuki Harbor, Yuki, Kaifu, Tokushima Pref.	33°46'12"	134°35'33"	2.4	2005.10.20	9532180	
427	Kiki Harbor, Minami, Kaifu, Tokushima Pref.	33°45'43"	134°48'29"	2.0	2006.4.27	9532206	
428	Mugi-oshima Is., Mugi, Kaifu, Tokushima Pref.	33°38'13"	134°29'16"	2.5	2005.2.20	9532167	
429	Oshima Harbor, Mugi-oshima Is., Mugi, Kaifu, Tokushima Pref.	33°38'13"	134°29'16"	3.0	2005.12.16	9532308-9532337	o
430	Funagami Harbor, Mugi, Kaifu, Tokushima Pref.	33°39'50"	134°29'25"	5.5	2005.9.15	9532175	
431	Kashima, Asakawa Bay, Kainan, Kaifu, Tokushima Pref.	33°37'58"	134°22'25"	0.3	2006.2.3	9532187	
432	Sabi Is., Shishikui, Kaifu, Tokushima Pref.	33°33'31"	134°18'59"	3.0	2005.9.22	9532178	
433	Kaname, Shishikui, Kaifu, Tokushima Pref.	33°32'54"	134°18'24"	0.7	2005.9.22	9532176	
434	Takegashima Is., Shishikui, Kaifu, Tokushima Pref.	33°32'45"	134°18'55"	2.4	2005.9.22	9532177	
435	Kannoura, Toyo, Kochi Pref.	33°32'52"	134°18'19"	2.6	2005.7.8	9533363-9533392	o
436	Ryu, Usa, Tosa, Kochi Pref.	33°25'57"	133°25'57"	3.8	2005.7.1	9533393-9533396	o
437	Otonashi, Susaki, Kochi Pref.	33°24'26"	133°22'07"	3.4	2005.6.20	9533333-9533362	o
438	Otonashi, Susaki, Kochi Pref.	33°24'26"	133°22'07"	3.4	2005.7.8	9533404	
439	Yamaga, Ashiya, Onga, Fukuoka Pref.	33°54'39"	130°39'52"	1.8	2005.5.10	9532930-9532955	
440	Tsuayaki, Fukuoka, Fukuoka Pref.	33°33'39"	130°08'07"	1.2	2005.10.10	9533131-9533160	o
441	Outside of South Ooshima Port, Ooshima Is. Munakata, Fukuoka Pref.	33°53'32"	130°26'02"	5.1	2006.10.11	9532442	
442	Imazu, Nishi, Fukuoka, Fukuoka Pref.	33°55'44"	130°16'19"	1.0	2004.7.2	9538635-9538657	o
443	Funakoshi, Shima, Fukuoka Pref.	33°53'53"	130°25'04"	1.5	2005.5.2	9533101-9533130	o
444	Okua, Karatsu, Saga Pref.	33°29'51"	129°57'19"	4.2	2005.2.14	9538727-9538756	o
445	Okua, Karatsu, Saga Pref.	33°30'16"	129°57'24"	2.0	2005.11.28	9541043	
446	Yakataishi, Karatsu, Saga Pref.	33°32'14"	129°55'46"	3.3	2005.10.11	9538975-9539004	o
447	Syosho, Tsurumaki, Bizen, Karatsu, Saga Pref.	33°26'51"	129°50'48"	0.6	2004.6.16	9538697-9538726	o
448	Kurota, Kurokawa, Imari, Saga Pref.	33°19'00"	129°50'39"	2.1	2005.2.14	9538757-9538786	o
449	Goya, Toyotama, Tsushima, Nagasaki Pref.	34°21'59"	129°22'52"	0.6	2005.5.18	9540165	
450	Knuabo ura, Mitushima, Tsushima, Nagasaki Pref.	34°18'11"	129°22'03"	1.5	2005.5.19	9540166	
451	Manzeki, Tsushima, Nagasaki Pref.	34°18'11"	129°22'03"	1.3	2005.5.19	9537781-9537810	o
452	Yamasakifure, Ishida, Iki, Nagasaki Pref. (Uchiumi Bay)	33°45'59"	129°46'24"	1.9	2005.6.11	9540170	
453	Yamasaki, Ishida, Iki, Nagasaki Pref.	33°45'59"	129°46'24"	1.7	2004.6.25	9537721-9537750	o
454	Hatsuyama Port, Gounoura, Iki, Nagasaki Pref.	33°43'18"	129°41'55"	4.3	2006.3.9	9532438	
455	Mugiyabure, Gounoura, Iki, Nagasaki Pref.	33°45'42"	129°40'38"	4.0	2005.5.17	9540163, 9540164	
456	Aouramen, Takashima, Matsaura, Nagasaki Pref.	33°27'52"	129°45'58"	1.0	2006.11.30	9533500, 9533501	o
457	Shiohamanen Minamizaki, Fukushima, Matsaura, Nagasaki Pref.	33°21'05"	129°49'24"	2.0	2006.11.29	9533498, 9533499	o
458	(Kubire Shinden) Shiohamanen, Fukushima, Matsaura, Nagasaki Pref.	33°21'49"	129°48'50"	2.0	2006.11.29	9533496, 9533497	o
459	(Kawauchi Port) Kawauchi, Hirado, Nagasaki Pref.	33°19'37"	129°31'04"	5.5	2006.11.28	9533487, 9533488	o
460	(Shishiki Bay) Shishiki, Hirado, Nagasaki Pref.	33°11'37"	129°24'14"	5.0	2006.11.28	9533485, 9533486	o
461	EGamitru, Sasebo, Nagasaki Pref.	33°05'16"	129°46'05"	3.3	2005.5.12	9532956-9532985	o
462	Kukidze, Oomura, Nagasaki Pref.	32°54'24"	129°56'45"	2.0	2005.5.25	9540167-9540169	o
463	Funatsu, Oomura, Nagasaki Pref.	32°52'08"	129°58'10"	1.1	2005.5.13	9532986-9533105	o
464	Douzaki, Arie, Minami-Takaki, Nagasaki Pref.	32°55'02"	130°12'43"	3.7	2005.1.12	9537751-9537780	o
465	Douzaki, Arie, Minamitakaki, Nagasaki Pref.	32°38'49"	130°20'21"	1.0	2005.1.12	9541028	
466	(Tateishi) Ogawara, Shinkamigoto, Minamimatsaura, Nagasaki Pref.	32°59'48"	129°08'14"	0.5	2006.5.26	9533480, 9533481	
467	Beach, Shinkamigoto, Minamimatsaura, Nagasaki Pref.	32°58'55"	129°07'26"	0.0	2006.5.25	9533474-9533476	
468	Naname, Shinkamigoto, Minamimatsaura, Nagasaki Pref.	32°58'49"	129°07'45"	0.0	2006.5.26	9533477, 9533478	
469	Tohase Is. Misumi, Uto, Kumamoto Pref.	32°55'57"	130°28'51"	2.9	2005.5.31	9532338, 9532339	
470	Tohase Is. Misumi, Uto, Kumamoto Pref.	32°53'34"	130°28'45"	2.9	2005.5.31	9532340	
471	Terashima Is. Misumi, Uto, Kumamoto Pref.	32°53'34"	130°28'12"	3.5	2005.5.31	9532341	
472	Umenoki, Iwa Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°53'13"	130°28'10"	2.6	2005.5.31	9532343	
473	Kijima Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°53'55"	130°27'27"	1.8	2005.5.31	9532342	
474	Kijima Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°53'38"	130°27'22"	3.2	2005.5.31	9532345	
475	Kijima Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°53'59"	130°27'08"	2.8	2005.5.31	9532344	
476	Oogata, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°53'24"	130°27'17"	3.0	2005.5.31	9532346	
477	Oogata, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°53'21"	130°27'35"	2.5	2005.5.31	9532347	
478	Oogata, Ooyano, Kamiyamakusa, Kumamoto Pref.	32°53'26"	130°27'34"	3.1	2005.5.31	9532401	
479	Oogata, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°53'16"	130°27'35"	3.9	2005.5.31	9532348	
480	Oogata, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°53'01"	130°27'27"	2.5	2005.5.31	9532349	
481	Oogata, Ooyano, Kamiyamakusa, Kumamoto Pref.	32°53'24"	130°27'17"	3.0	2005.5.31	9532400	
482	Jiro, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°34'48"	130°27'17"	3.2	2005.5.31	9532350	
483	Arakihama, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°34'20"	130°26'54"	3.5	2005.5.31	9532351	
484	Oosakura, Iwa Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°34'16"	130°27'41"	2.0	2005.5.31	9532352	
485	Oosakura, Iwa Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°34'06"	130°27'42"	2.0	2005.5.31	9532353	
486	Oosakura, Iwa Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°34'04"	130°27'42"	1.6	2005.5.31	9532354	
487	Senzoku, Iwa Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°33'46"	130°27'42"	2.6	2005.5.31	9532355	
488	Kunotori Is. Shimoyama, Iwa Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°32'42"	130°27'44"	2.0	2005.5.29	9532357	
489	Satsumase, Iwa Is. Ooyano, Kamiyamakusa, Kumamoto Pref.	32°32'46"	130°27'21"	4.5	2005.5.31	9532356	
490	Yamagi, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°32'47"	130°26'07"	2.4	2005.5.29	9532358	
491	Shingai, Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°32'46"	130°25'58"	3.9	2005.5.29	9532359	
492	Ooyano Is. Kamiyamakusa, Kumamoto Pref.	32°32'51"	130°25'40"	3.2	2005.5.29	9532360	
493	Kitaiki Is. Matsusima, Kamiyamakusa, Kumamoto Pref.	32°32'09"	130°25'42"	3.0	2005.5.30	9532362	
494	Kotke Is. Matsusima, Kamiyamakusa, Kumamoto Pref.	32°32'05"	130°26'21"	3.5	2005.5.30	9532361	
495	Kotke Is. Matsusima, Kamiyamakusa, Kumamoto Pref.	32°31'43"	130°25'56"	4.5	2005.5.30	9532363	
496	Onitsuka, Matsusima, Kamiyamakusa, Kumamoto Pref.	32°31'38"	130°26'18"	1.6	2005.5.29	9532365	
497	Amura, Matsushima, Kamiyamakusa, Kumamoto Pref.	32°31'34"	130°27'25"	1.9	2005.5.30	9532399	
498	Amura, Matsushima, Kamiyamakusa, Kumamoto Pref.	32°31'37"	130°27'43"	0.7	2004.11.9	9538599	
499	Amura, Matsushima, Kamiyamakusa, Kumamoto Pref.	32°30'57"	130°27'11"	0.0	2004.11.9	9538666-9538598	o
500	Himeura, Himedo, Kamiyamakusa, Kumamoto Pref.	32°29'16"	130°26'21"	3.5	2005.5.29	9532366	
501	Mita, Himedo, Kamiyamakusa, Kumamoto Pref.	32°28'40"	130°26'11"	2.8	2005.5.29	9532367	
502	Kochidomaru, Ryugatake, Kamiyamakusa, Kumamoto Pref.	32°25'52"	130°24'03"	5.0	2005.5.28	9532370	
503	Akasaki, Ryugatake, Kamiyamakusa, Kumamoto Pref.	32°23'34"	130°20'59"	2.0	2005.5.27	9532371	
504	Tanasoko, Kuratake, Kamiyamakusa, Kumamoto Pref.	32°24'53"	130°20'52"	4.8	2005.5.26	9532374	
505	Tanasoko, Kuratake, Kamiyamakusa, Kumamoto Pref.	32°24'42"	130°20'47"	2.5	2005.5.26	9532375	
506	Akebono, Kuratake, Kamiyamakusa, Kumamoto Pref.	32°24'14"	130°20'25"	2.4	2005.5.26	9532376	
507	Tanoshiri, Makishima Is. Goshoura, Kamiyamakusa, Kumamoto Pref.	32°21'07"	130°19'25"	3.0	2005.5.27	9532372	
508	Maejima Is. Goshoura Is. Goshoura, Kamiyamakusa, Kumamoto Pref.	32°21'23"	130°18'01"	3.7	2005.5.28	9532373	
509	Ooniyada, Kuratake, Kamiyamakusa, Kumamoto Pref.	32°23'48"	130°18'56"	2.3	2005.5.26	9532377	
510	Umeki, Kuratake, Kamiyamakusa, Kumamoto Pref.	32°23'47"	130°18'23"	3.6	2005.5.26	9532404	

Table 1. —(Continued)—

No. *	collection site	latitude	longitude	water depth (m)	collection date	TNS accession No.	population**
511	Furue, Kuratake, Kamiamakusa, Kumamoto Pref.	32°23'50"	130°18'12"	1.4	2005.5.26	9532378	
512	Sumoto Drained land, Sumoto, Kamiamakusa, Kumamoto Pref.	32°24'33"	130°15'53"	3.5	2005.5.26	9532379	
513	Sumoto Drained land, Sumoto, Kamiamakusa, Kumamoto Pref.	32°24'32"	130°15'46"	3.0	2005.5.26	9532406	
514	Kanayaki, Shimoura, Hondo, Kumamoto Pref.	32°23'35"	130°14'24"	0.3	2005.5.25	9532380	
515	Ishiba, Shimoura, Hondo, Kumamoto Pref.	32°24'36"	130°14'36"	2.7	2005.5.25	9532381	
516	Ishiba, Shimoura, Hondo, Kumamoto Pref.	32°24'42"	130°14'34"	1.5	2005.5.25	9532382	
517	Ishiba, Shimoura, Hondo, Kumamoto Pref.	32°24'48"	130°14'34"	2.0	2005.5.25	9532402	
518	Kama, Kusurua, Hondo, Kumamoto Pref.	32°25'30"	130°12'58"	2.5	2005.5.25	9532384	
519	Ooshigaura, Shimoura, Hondo, Kumamoto Pref.	32°25'39"	130°12'50"	2.5	2005.5.25	9532383	
520	Funazu, Kusuura, Hondo, Kumamoto Pref.	32°25'16"	130°12'42"	3.1	2005.5.25	9532385	
521	Souzu Is. Ootao, Shinwa, Amakusa, Kumamoto Pref.	32°20'53"	130°12'31"	3.1	2005.5.24	9532386	
522	Souzu Is. Ootao, Shinwa, Amakusa, Kumamoto Pref.	32°20'50"	130°12'29"	1.0	2005.5.24	9532406	
523	Komiyaji Nihongi, Shinwa, Amakusa, Kumamoto Pref.	32°18'55"	130°10'08"	2.2	2005.5.25	9532387	
524	Komiyaji Nihongi, Shinwa, Amakusa, Kumamoto Pref.	32°19'01"	130°10'36"	2.1	2005.5.25	9532388	
525	Kurosaki, Miyanakawachi, Kawaura, Amakusa, Kumamoto Pref.	32°16'22"	130°09'15"	5.0	2005.5.23	9532395	
526	Nishitakane, Miyanakawachi, Kawaura, Amakusa, Kumamoto Pref.	32°18'34"	130°08'39"	4.8	2005.5.25	9532389	
527	Funazu, Miyanakawachi, Kawaura, Amakusa, Kumamoto Pref.	32°18'22"	130°08'32"	0.9	2005.5.24	9532390	
528	Hongou minami, Miyanakawachi, Kawaura, Amakusa, Kumamoto Pref.	32°16'59"	130°08'33"	5.3	2005.5.24	9532391	
529	Hongou minami, Miyanakawachi, Kawaura, Amakusa, Kumamoto Pref.	32°17'12"	130°08'19"	4.0	2005.5.24	9532392	
530	Hongou minami, Miyanakawachi, Kawaura, Amakusa, Kumamoto Pref.	32°17'19"	130°08'05"	2.9	2005.5.24	9532393, 9532394	
531	Ubu Is. Miyanakawachi, Kawaura, Amakusa, Kumamoto Pref.	32°16'26"	130°08'06"	3.7	2005.5.24	9532396	
532	Shimshira, Nakami, Amakusa, Kumamoto Pref.	32°15'44"	130°06'38"	1.6	2005.5.23	9532407	
533	Koboshihana, Yamanoura, Ushibuka, Kumamoto Pref.	32°12'42"	130°04'29"	3.0	2005.5.23	9532397	
534	Kawaura, Amakusa, Kumamoto Pref.	32°17'17"	130°03'50"	0.7	2005.11.17	9541042	
535	Kawaura, Amakusa, Kumamoto Pref.	32°17'27"	130°03'49"	0.7	2005.11.17	9538601-9538630	○
536	Kawaura, Amakusa, Kumamoto Pref.	32°16'48"	130°03'46"		2005.11.19	9538632	
537	Kojima Is. Hatatou Is. Tanoura, Ashikita, Kumamoto Pref.	32°23'07"	130°30'31"	3.1	2005.1.18	9532412	
538	Kyoudomari, Tsunagi, Ashikita, Kumamoto Pref.	32°14'06"	130°11'55"	2.9	2005.1.17	9532410	
539	Kyoudomari, Tsunagi, Ashikita, Kumamoto Pref.	32°14'03"	130°12'57"	2.9	2005.1.17	9532408	
540	Hoppozaki, Nagashima, Nagashima, Izumi, Kagoshima Pref.	32°12'35"	130°06'37"		2005.6.30	9532417	
541	Hamasakura, Nagashima, Nagashima, Izumi, Kagoshima Pref.	32°12'06"	130°06'52"		2005.6.30	9532415	
542	Hamasakura, Nagashima, Nagashima, Izumi, Kagoshima Pref.	32°11'59"	130°07'00"		2005.6.30	9532416	
543	Onsaki, Nagashima, Nagashima, Izumi, Kagoshima Pref.	32°11'42"	130°06'44"		2005.6.30	9532414	
544	Kuranomotomaka, Nagashima, Nagashima, Izumi, Kagoshima Pref.	32°11'20"	130°06'31"		2005.6.30	9532413	
545	Wakimoto, Akune, Kagoshima Pref.	32°04'41"	130°11'19"	4.0	2006.5.23	9534788-9534817	○
546	Wakimoto, Akune, Kagoshima Pref.	32°04'43"	130°11'22"		2005.7.22	9532860, 9532861	
547	Wakimoto, Akune, Kagoshima Pref.	32°04'42"	130°11'31"		2006.5.23	9533028, 9533029	
547	Okake, Ibusuki, Kagoshima Pref.	31°16'28"	130°38'22"		2005.5.20	9532858	
548	Sakiyama, Kasa, Minamisatsuma, Kagoshima Pref.	31°24'56"	130°11'40"	5.5	2005.4.25	9534699-9534728	○
549	Sakiyama, Kassa, Minamisatsuma, Kagoshima Pref.	31°25'52"	130°11'55"		2005.4.25	9532855	
550	Sakiyama, Kassa, Minamisatsuma, Kagoshima Pref.	31°25'13"	130°11'53"		2005.4.25	9532857	
551	Yougamizu, Yamagawa, Kagoshima Pref.	31°10'01"	130°35'53"		2006.5.8	9533023	
552	Yougamizu, Yamagawa, Kagoshima Pref.	31°10'09"	130°35'34"		2006.5.8	9533024	
553	Yougamizu, Yamagawa, Ibusuki, Kagoshima Pref.	31°10'06"	130°35'39"		2004.1.13	9532825	
554	Yougamizu, Yamagawa, Ibusuki, Kagoshima Pref.	31°10'06"	130°35'38"		2004.6.7	9532846	
555	Ginsyosita, Ibusuki, Kagoshima Pref.	31°13'45"	130°39'33"		2006.5.29	9533030	
556	Ibusukikou, Ohmure, Ibusuki, Yatsugou, Kagoshima Pref.	31°14'44"	130°39'15"		2004.5.14	9532826	
557	Ibusukikou, Ohmure, Ibusuki, Yatsugou, Kagoshima Pref.	31°14'46"	130°39'17"		2004.6.7	9532847	
558	Iwamoto, Ibusuki, Kagoshima Pref.	31°17'36"	130°35'56"		2004.5.17	9532827	
559	Okakeminami, Ibusuki, Kagoshima Pref.	31°16'26"	130°38'54"		2006.6.20	9533036	
560	Miyagahama, Ibusuki, Kagoshima Pref.	31°16'42"	130°37'27"		2006.5.15	9533025	
562	Nukumikami, Kiire, Kagoshima, Kagoshima Pref.	31°18'58"	130°34'36"		2004.6.4	9532845	
563	Nukumi, Kiire, Kagoshima, Kagoshima Pref.	31°18'60"	130°34'48"		2004.5.17	9532828	
564	Nukumikami, Kiire, Kagoshima, Kagoshima Pref.	31°18'41"	130°34'47"		2005.4.11	9532856	
565	Akaidani, Kiire, Kagoshima, Kagoshima Pref.	31°19'38"	130°33'48"		2006.6.21	9533037	
566	Teramae, Kiire, Kagoshima, Kagoshima Pref.	31°22'55"	130°33'03"		2004.6.17	9532853	
567	Sesegushiminami, Kiire, Kaoshima, Kagoshima Pref.	31°25'15"	130°31'44"		2006.6.31	9532863	
568	Sesegushi, Kiire, Kagoshima, Kagoshima Pref.	31°25'15"	130°31'44"		2005.6.8	9532859	
569	Sesegushikita, Kiire, Kagoshima, Kagoshima Pref.	31°25'26"	130°31'45"		2006.6.31	9532862	
570	Kamokkoku, Kagoshima, Kagoshima Pref.	31°33'45"	130°33'65"		2004.6.17	9532852	
571	Kamokkewa, Kagohima, Kagoshima Pref.	31°33'47"	130°33'42"		2004.6.16	9532848	
572	Yousuikoku, Kagoshima, Kagoshima Pref.	31°33'36"	130°33'48"		2004.6.16	9532849	
573	Yousuikoku, Kagoshima, Kagoshima Pref.	31°33'54"	130°33'57"		2004.6.16	9532850	
574	Inarigawakougawa, Kagoshimahonkou, Kagoshima, Kagoshima Pref.	31°36'09"	130°34'22"	2.5	2005.2.21	9534639-9534668	○
575	Inarigawa, Kagoshima, Kagoshima Pref.	31°36'10"	130°34'20"		2004.6.17	9532851	
576	Inarigawa, Kagoshima, Kagoshima Pref.	31°36'09"	130°34'22"		2005.2.21	9532854	
577	Beppugawa, Kajiki, Kagoshima Pref.	31°43'13"	130°38'54"		2004.5.25	9532829	
578	Amikakekoku, Kajiki, Kagoshima Pref.	31°43'59"	130°39'53"		2006.4.24	9533020	
579	Amikakegawa, Kajiki, Kagoshima Pref.	31°43'36"	130°39'54"		2004.5.25	9532850	
580	Hamanohi, Hayato, Kirishima, Kagoshima Pref.	31°42'55"	130°43'51"		2004.5.25	9532831	
581	Shimizukaku, Hayato, Kagoshima Pref.	31°43'52"	130°42'42"		2006.4.25	9533021	
582	Hayatokoumae, Hayato, Kagoshima Pref.	31°43'00"	130°43'33"		2006.4.25	9533022	
583	Amorigawa, Hayato, Kirishima, Kagoshima Pref.	31°42'34"	130°44'58"		2004.5.25	9532832	
584	Satogawa, Kokubu, Kirishima, Kagoshima Pref.	31°42'30"	130°45'38"		2004.5.25	9532833	
585	Wakamiko, Fukuyama, Kirishima, Kagoshima Pref.	31°41'42"	130°47'57"		2004.5.25	9532834	
586	Fukuyama, Fukuyama, Kirishima, Kagoshima Pref.	31°40'57"	130°48'42"		2004.5.25	9532835	
587	Heta, Tarumizu, Kagoshima Pref.	31°33'38"	130°45'54"		2004.5.25	9532836	
588	Sakurajima, Shinmura, Kagoshima Pref.	31°36'39"	130°36'50"		2006.6.12	9533032	
589	Ihinankou, Sakurajima, Kagoshima Pref.	31°36'19"	130°36'50"		2006.6.12	9533031	
590	Kokenishi, Sakurajima, Kagoshima Pref.	31°35'49"	130°36'17"		2004.5.27	9532844	
591	Keike, Sakurajima, Kagoshima Pref.	31°35'49"	130°36'08"		2006.5.22	9533027	
592	Najiri, Sakurajima, Kagoshima Pref.	31°33'38"	130°37'19"		2004.5.27	9532843	
593	Najiri, Sakurajima, Kagoshima Pref.	31°33'38"	130°37'20"		2006.5.22	9533026	
594	Shiosai, Tarumizu, Kagoshima Pref.	31°28'38"	130°41'39"		2004.5.27	9532842	
595	Osako, Tarumizu, Kagoshima Pref.	31°27'36"	130°42'09"		2004.5.27	9532841	
596	Minamikou, Tarumizu, Kagoshima Pref.	31°27'39"	130°42'20"		2006.6.14	9533035	
597	Namimata, Tarumizu, Kagoshima Pref.	31°27'39"	130°42'27"		2006.6.14	9533034	
598	Shinjou, Tarumizu, Kagoshima Pref.	31°26'15"	130°44'38"		2006.6.14	9533033	
599	Kanoyakou, Naka, Kanoya, Kagoshima Pref.	31°24'47"	130°45'50"		2004.5.26	9532840	
600	Kanoyakouitagawa, Naka, Kanoya, Kagoshima Pref.	31°24'45"	130°45'54"	1.5	2005.4.19	9534760-9534787	○
601	Naka, Kanoya, Kagoshima Pref.	31°23'38"	130°46'17"		2006.4.19	9533018, 9533019	
602	Kozono, Kanoya, Kagoshima Pref.	31°23'15"	130°46'42"		2004.5.26	9532839	
603	Arabira, Kanoya, Kagoshima Pref.	31°22'39"	130°46'19"		2006.4.19	9533017	
604	Arabira, Kanoya, Kagoshima Pref.	31°22'54"	130°46'46"		2005.5.26	9532838	
605	Minakurakita, Ohnejime, Kagoshima Pref.	31°17'04"	130°47'56"		2006.4.18	9533016	
606	Ohhashi, Ohnejime, Kagoshima Pref.	31°14'20"	130°46'22"		2004.5.26	9532837	

* numbers of sites are shown in Fig. 1.

** collection site where multiple sampling was conducted for population genetic analysis

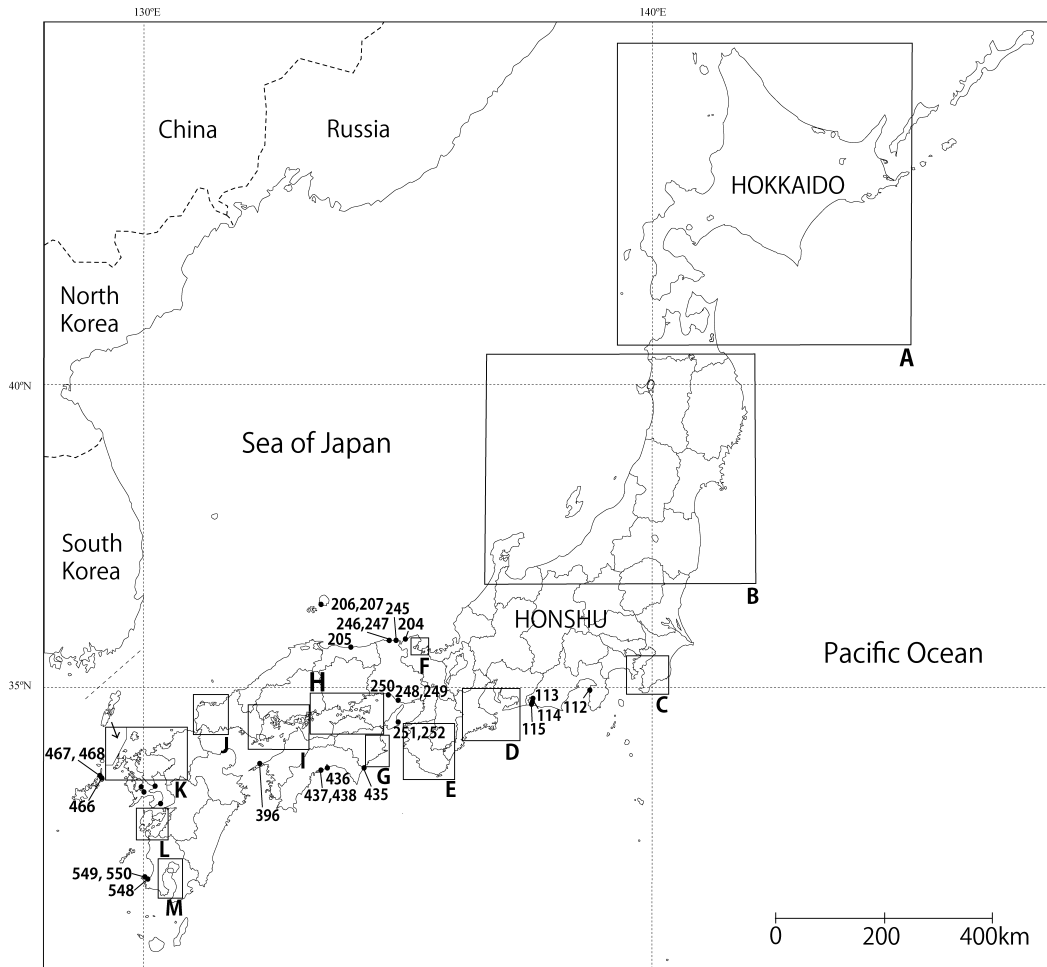


Fig. 1. Distribution of *Zostera marina* in Japan. Numbers on the map correlate to collection numbers in Table 1. The positions of Figs. 1A–1M are indicated on the map.

1.5 m (Fig. 2). Moreover, 62.6% of *Z. marina* populations were found at depths of up to 1.5 m, 75.1% at depths of up to 2 m, and 95.6% at up to 3 m. Nakaoka and Aioi (2001) reviewed the depth distribution of *Z. marina* in Japan by conducting a literature search and concluded that *Z. marina* occurs mostly at depths of 1–5 m deep. The results of the present study demonstrates that *Z. marina* occurs primarily in shallower waters in Japan, at depths of up to 3 m.

Detailed distribution data on *Z. marina* in Japan has been presented in this paper. Information about the population genetic structuring of *Z. marina* in Japan and neighboring areas (in-

cluding eastern Asia and the Russian Far East), as well as associated ecological factors, is now required to reveal further aspects of the species' distribution, and to facilitate the conservation and rehabilitation of *Z. marina* populations in Japan.

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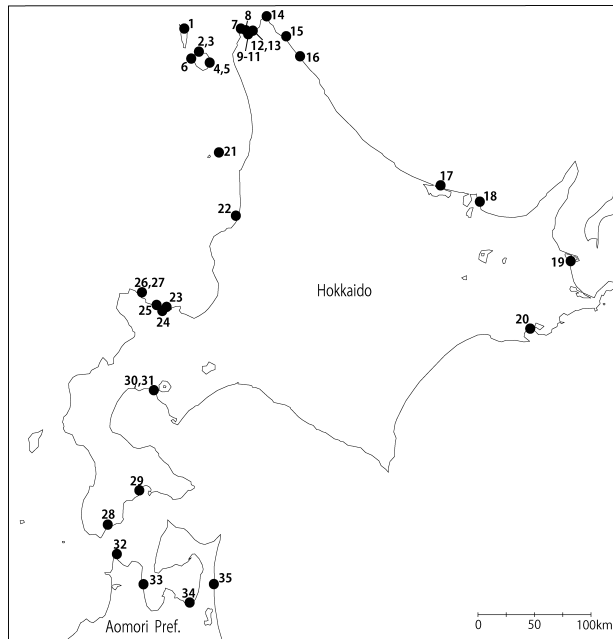


Fig. 1A. Distribution of *Zostera marina* in Hokkaido and Aomori Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

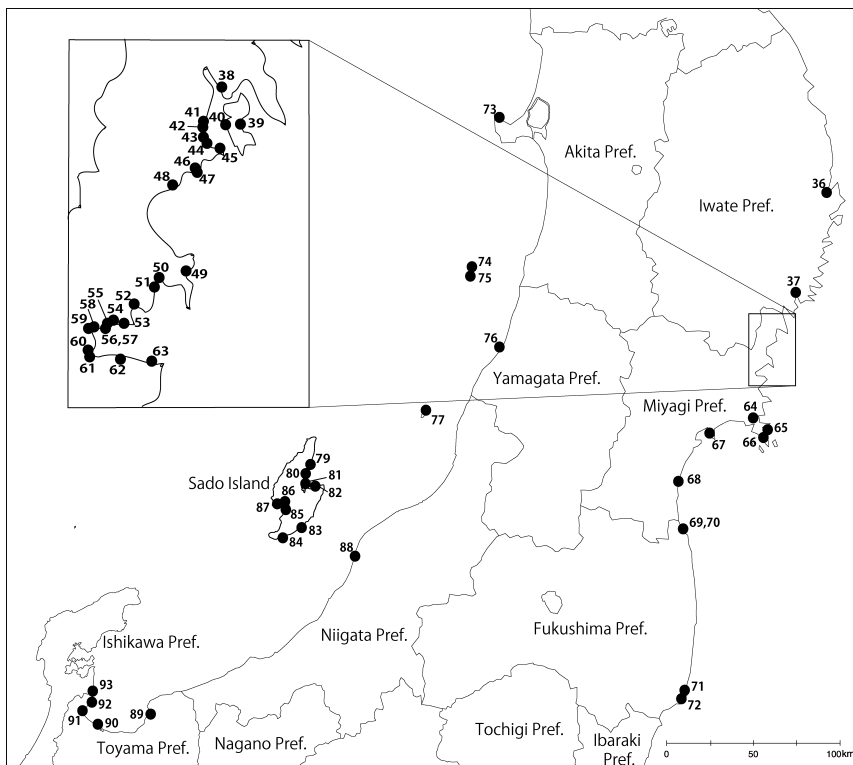


Fig. 1B. Distribution of *Zostera marina* in northern Honshu. The orientation of this map in Japan as a whole is shown in Fig. 1.

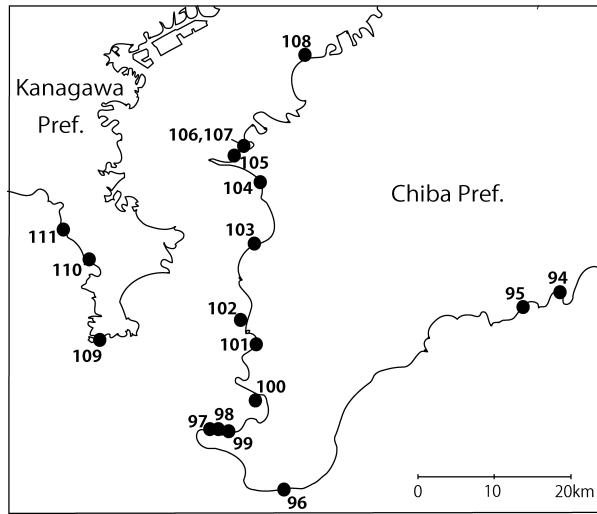


Fig. 1C. Distribution of *Zostera marina* in Chiba and Kanagawa Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

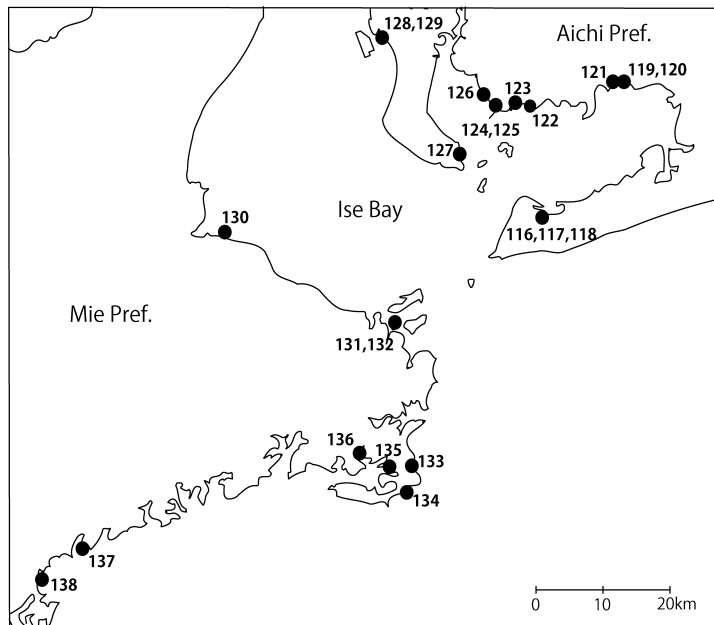


Fig. 1D. Distribution of *Zostera marina* in Aichi and Mie Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

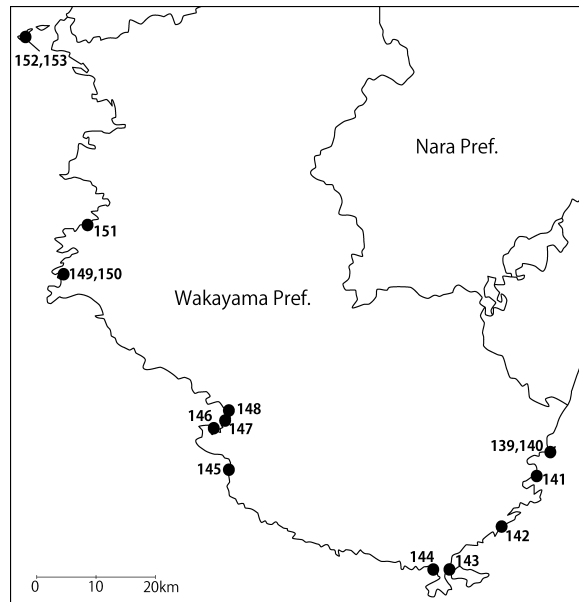


Fig. 1E. Distribution of *Zostera marina* in Wakayama Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

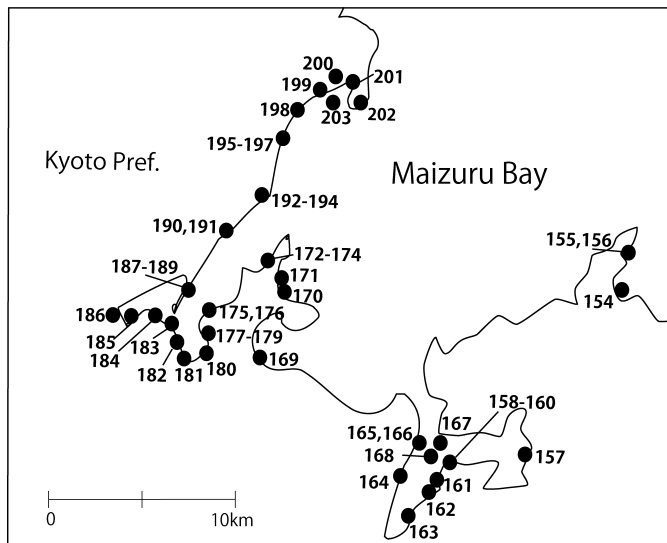


Fig. 1F. Distribution of *Zostera marina* in Kyoto Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

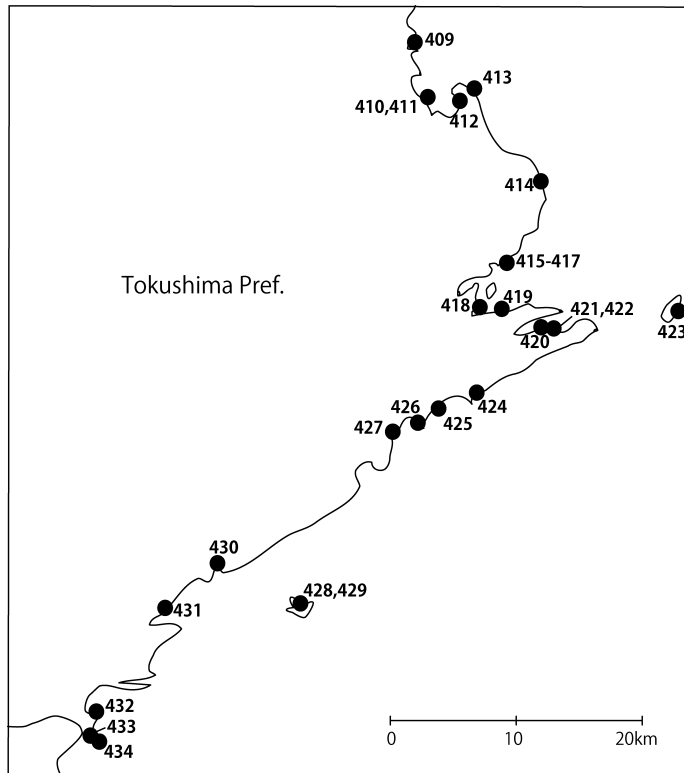


Fig. 1G. Distribution of *Zostera marina* in Tokushima Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

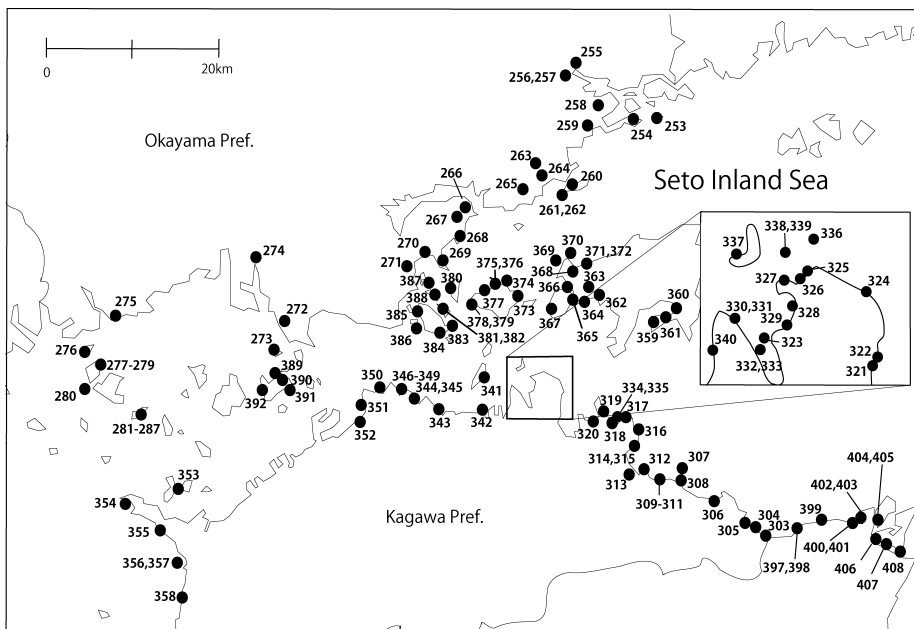


Fig. 1H. Distribution of *Zostera marina* in eastern Seto Inland Sea. The orientation of this map in Japan as a whole is shown in Fig. 1.

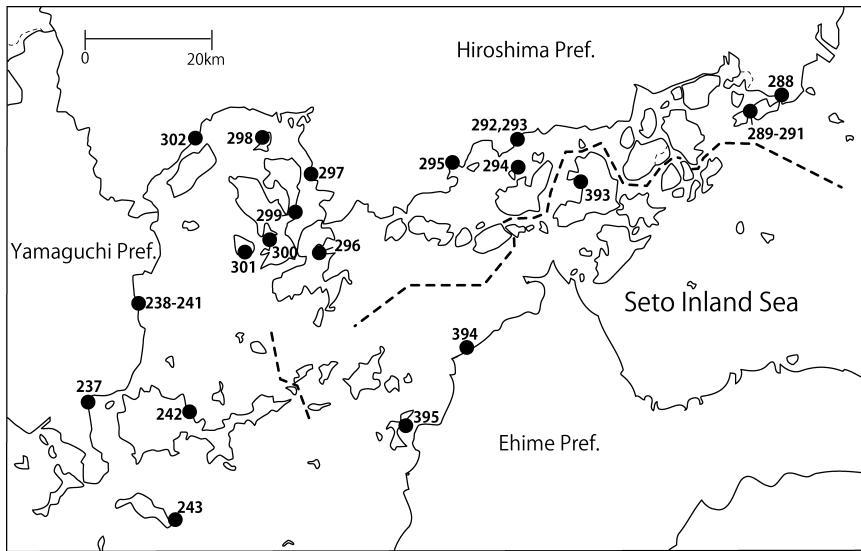


Fig. 1I. Distribution of *Zostera marina* around western Seto Inland Sea. The orientation of this map in Japan as a whole is shown in Fig. 1.

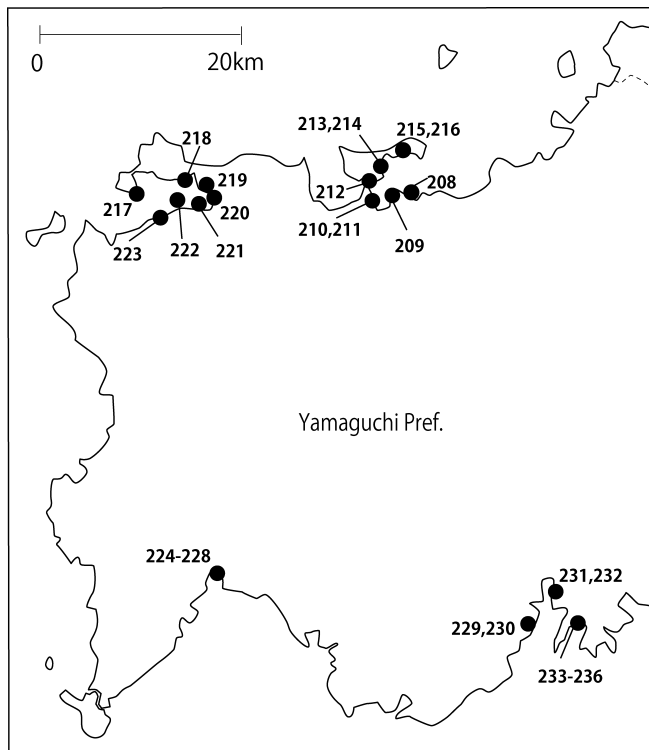


Fig. 1J. Distribution of *Zostera marina* in Yamaguchi Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

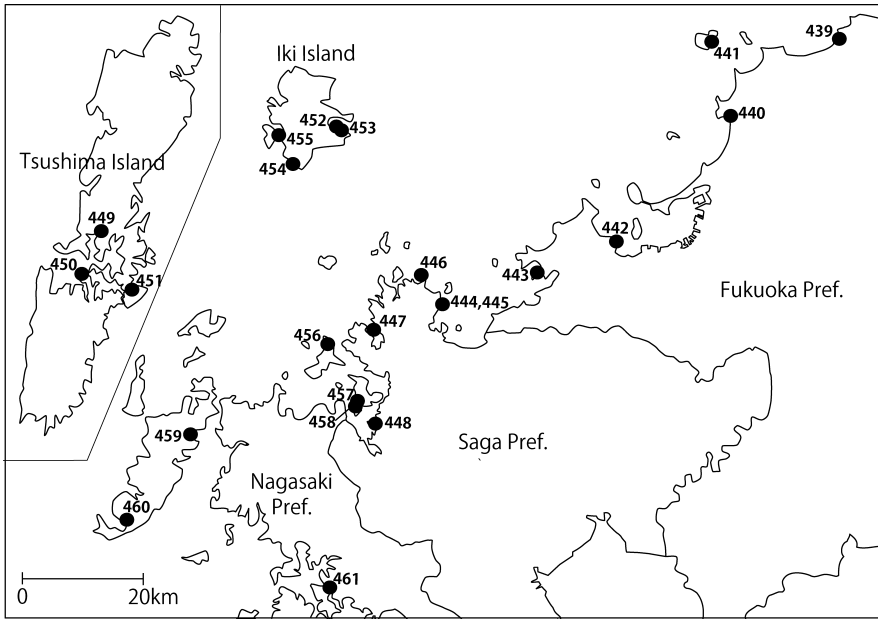


Fig. 1K. Distribution of *Zostera marina* in Fukuoka, Saga and Nagasaki Prefecture. The orientation of this map in Japan as a whole is shown in Fig. 1.

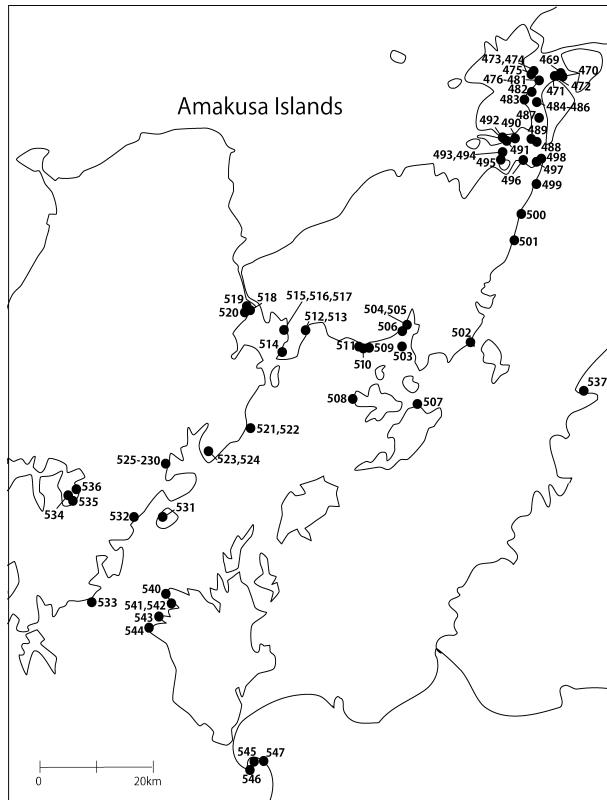


Fig. 1L. Distribution of *Zostera marina* around Amakusa Islands. The orientation of this map in Japan as a whole is shown in Fig. 1.

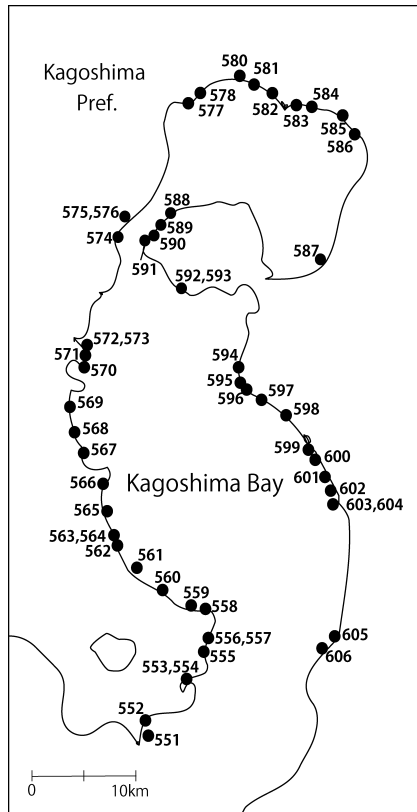


Fig. 1M. Distribution of *Zostera marina* in Kagoshima Bay. The orientation of this map in Japan as a whole is shown in Fig. 1.

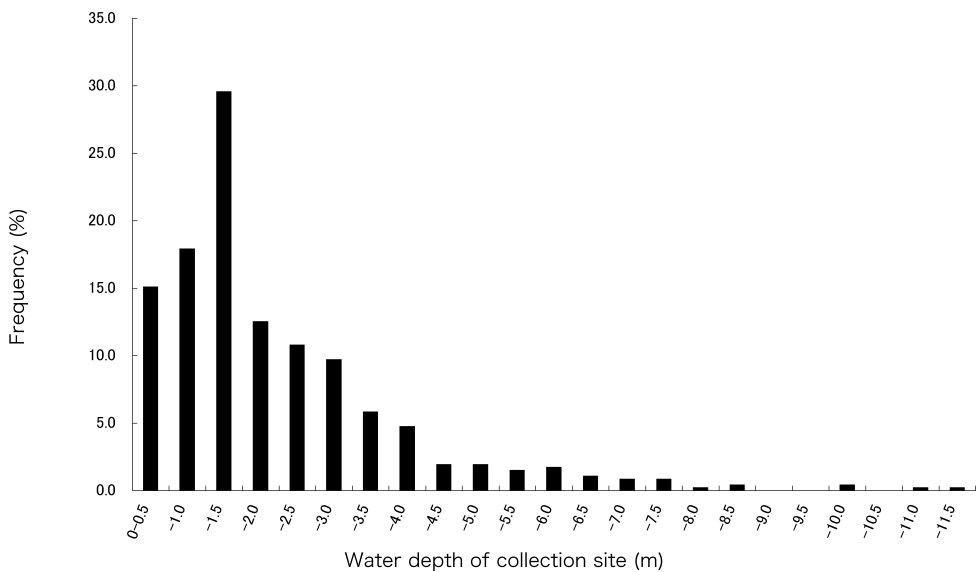


Fig. 2. Frequency distribution of water depths at the *Zostera marina* collection sites.