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FULL PAPER

Taxonomic review of the *Sebastes inermis* species complex (Scorpaeniformes: Scorpaenidae)

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Abstract A taxonomic review of three color morphotypes of the *Sebastes inermis* species complex established the existence of three valid species, viz. *S. inermis*, *S. ventricosus*, and *S. cheni*. The complex is defined by having two sharp lachrymal spines, the head weakly armed with nasal, preocular, supraocular and parietal spines, and the caudal fin not distinctly emarginated. *Sebastes inermis*, known from southern Hokkaido southward to Kyushu, Japan, and the southern part of the Korean Peninsula, is characterized as follows: body dark red or light brown dorsally and laterally when fresh, pectoral fin extending beyond level of anus when depressed, pectoral-fin rays 15, anal-fin rays 7, pored lateral line scales 36–44 and gill rakers 31–37. *Sebastes ventricosus*, known from Iwate and Ishikawa Prefecture southward to Kyushu, Japan, and the southern part of the Korean Peninsula, is characterized as follows: body somewhat greenish-black dorsally and dark silver ventrally when fresh, pectoral-fin rays 16, anal-fin rays 7–8, pored lateral line scales 43–49, and gill rakers 35–39. *Sebastes cheni*, known from Iwate and Akita Pref. southward to Kyushu, Japan, and the southern part of the Korean Peninsula, is characterized as follows: body dark golden-brown dorsally and laterally when fresh, pelvic fin extending beyond anus when depressed, pectoral-fin rays 17, anal-fin rays 8, pored lateral line scales 37–46 and gill rakers 32–37. In the genetic analysis, the presence or absence of two AFLP fragments was completely fixed among the three species. *Sebastes tokionis* and *S. guentheri* are regarded as junior synonyms of *S. inermis* and *S. ventricosus*, respectively. A lectotype is designated for *S. cheni*, and a key to the three species of the *S. inermis* species complex provided.

Keywords *Sebastes inermis* species complex · *Sebastes inermis* · *Sebastes ventricosus* · *Sebastes cheni* · Lectotype

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Introduction

Sebastes inermis Cuvier *in* Cuvier and Valenciennes 1829 is a common rockfish found along the coast of southern Hokkaido southward to Kyushu and the southern coast of the Korean Peninsula (Nakabo 2002). The species is very important for both commercial fisheries and sport fishing, but has been confused taxonomically because of so-called color variants. Three color morphotypes, reddish, blackish and brownish, within *S. inermis* have been recognized, sometimes being treated as separate species (Jordan and Evermann 1896; Jordan and Starks 1904; Jordan et al. 1913; Jordan and Hubbs 1925), or as intraspecific variations (Matsubara 1935; Hiyama and Yasuda 1961; Nakabo 2002).

Chen (1985) suggested that the *S. inermis* species complex might be separated into three species based on differences in pectoral- and anal-fin ray counts. Subsequently, recognizing three species of "*S. inermis*" as suggested by Chen (1985), Barsukov (1988) characterized *S. inermis* as having 15 pectoral-fin rays and seven anal-fin rays, and *Sebastes ventricosus* Temminck and Schlegel 1843 as having 16 pectoral-fin rays and 7 or 8 anal-fin rays. He considered the third species having 17 pectoral-fin rays

and 8 anal-fin rays to be new, proposing the name *Sebastes cheni* Barsukov 1988.

However, neither Chen (1985) nor Barsukov (1988) mentioned the coloration of their three species or reproductive barriers among them. Recently, careful comparisons of the three color variants, based on morphological (Kai and Nakabo 2002) and genetic (Kai et al. 2002) analyses, have revealed the presence of reproductive barriers among them, and upheld their treatment as different species. The three color variants of *S. inermis* presented by Kai and Nakabo (2002), morphotype A (reddish), morphotype B (blackish) and morphotype C (brownish), corresponded approximately to the "three species" suggested by Chen (1985), the modes of pectoral fin ray counts of morphotypes A, B and C being 15, 16, and 17, respectively (Kai and Nakabo 2002). However, as noted by Kai and Nakabo (2002) and Kai et al. (2002), the three color morphotypes did not agree strictly with either Chen's (1985) or Barsukov's (1988) three species.

The nominal species related to the *S. inermis* species complex are *Sebastes inermis*, *Sebastes ventricosus*, *Sebastodes guentheri* Jordan and Starks 1904, *Sebastodes tokionis* Jordan and Starks 1904 and *Sebastes cheni*. The relationships among them are still unclear.

A taxonomic review of the three morphotypes of *S. inermis* presented by Kai and Nakabo (2002) is presented herein, following the biological species concept defined by Mayr (1963). Types, original descriptions and specimens identified as the four nominal species were examined critically. In addition, the geographic distribution of each species was clarified.

Materials and methods

Genetic analysis. AFLP analysis (Vos et al. 1995), which has been shown to be useful for discriminating among the three morphotypes (Kai et al. 2002), was applied. In addition to previously examined specimens, a further 68, representing diverse areas within the distributional range of the *Sebastes inermis* species complex, were newly examined here for a total of 129 specimens. All were initially identified by their fresh body coloration, following Kai and Nakabo (2002). Total DNA was extracted using the DNeasy Tissue Kit (Qiagen, Hilden) from muscle tissue preserved in 99.5% ethanol, according to the manufacturer's protocols. AFLP analysis followed Kai et al. (2002), except for the following: the selective PCR products were analyzed on a Model 310 Genetic Analyzer (Applied Biosystems), together with the GeneScan 500 Rox size standard (Applied Biosystems). Fragment data were collected using Applied Biosystems GENESCAN 2.1.1 software. Because slight fragment size differences existed in the results obtained from Model 310 compared to those from Model 377 used by Kai et al. (2002) (PE Applied Biosystems, 1997), the electopherograms between 310 and 377 were aligned by eye for fragment analysis. The presence or absence of 21 AFLP fragments listed in Kai et al. (2002) were scored for specimens examined here. AFLP fragment sizes were taken from those on the Model 310 sequencer (Applied Biosystems).

Morphological description. Counts and measurements followed Kai and Nakabo (2002). "Body depth 1" was measured between the last dorsal spine and first anal spine, "body depth 2" being measured between the base of the first dorsal spine and base of the pelvic spine. All 129 specimens examined in the AFLP analysis were included in the following descriptions.

In Barsukov's (1988) review of the *S. inermis* species complex, he described *S. cheni* as a new species without designation of type specimens. Furthermore, he failed to indicate specimens examined applicable to each scientific name adopted, showing only differences in pectoral-fin ray counts among them (Barsukov 1988: 1–2). In order to clarify the three "species" of Barsukov (1988), we inferred his identification of each specimen listed on pages 1 and 2, following his descriptions of *S. inermis* as having 15 pectoral-fin rays, *S. ventricosus* 16 and *S. cheni* 17. Additionally, following his discussion (Barsukov 1988: 17), one specimen (SU 7369, including four specimens, 141 mm SL according to Barsukov 1988) having 15 pectoral-fin rays on the left side and 16 on the right was regarded here as *S. inermis*, and four specimens (2 of CAS 45866, including 5 specimens, 134 and 124 mm SL, one of CAS 45867, including 6, 142 mm SL, and 1 CAS specimen without catalogue number according to Barsukov 1988) having 16 on one side and 17 on the other, one (SU 23647, including two specimens, 140 mm SL according to Barsukov 1988) having 17 on one side and 18 on the other, and one (CAS, no number according to Barsukov 1988) having 18 on both sides were regarded as *S. cheni* sensu Barsukov (1988).

Because of the loss of coloration from specimens preserved for long periods, their identifications were primarily based on the combination of differences in counts (pectoral- and anal-fin rays, gill rakers and pored lateral line scales) and measurements. These differences in counts and measurements were clarified from the genetically examined specimens here, with additional information from Kai and Nakabo (2002). Terminology of the head spines followed Randall and Eschmeyer (2001) and Kai and Nakabo (2004). Descriptions on the color in life and when fresh were made on the basis of non-type specimens, but those in alcohol were made on the basis of types and non-type specimens, except for the holotype of *S. inermis* and lectotype of *S. ventricosus* (these two are stuffed specimens).

Institutional codes followed Leviton et al. (1985), in addition to the following: Fisheries Science Course, Department of Animal Science, Miyazaki University, Japan (MUFS) and Zoological Institute, Academy of Sciences, St. Petersburg, Russia (ZIN). All measurements were given as percentages of standard length (SL). Characters given in the description of the complex were not repeated in those for each species.

Results

The scores of AFLP fragments for each color morphotype examined here agreed closely with those of Kai et al. (2002). Five AFLP fragments, demonstrated as being fixed among morphotypes (A-C) in Kai et al. (2002), were also completely (*Eco* RI-AAC + *Mse* I-CAC, 250.6 bp; AGC + CTA, 364.7 bp) or almost completely fixed (Table 1), indicating the genetic isolation of each morphotype. Significant differences in frequencies among the three morphotypes were also found in all of the 16 remaining AFLP fragments (Monte Carlo simulation test, $P < 0.01$). Some specimens, which were brown dorsally and orange ventrally, could not be identified as a specific morphotype on the basis of coloration alone, but conformed to morphotype A on the basis of fixed AFLP fragments. The body coloration of such specimens is included as intraspecific variations in the following descriptions. In total, 38 specimens were identified as morphotype A, 47 as morphotype B, and 44 as morphotype C. Meristic character distributions of specimens examined genetically are shown in Table 2. Specimens examined by Barsukov (1988) and their present identifications, based mainly on counts and measurements, are shown in Table 3.

Table 1 Frequency distributions of presence of specific AFLP fragments in the *Sebastes inermis* species complex

AFLP fragment			*S. inermis*	*S. ventricosus*	*S. cheni*
*Mse*I	*Eco*RI	Size	n = 38	n = 48	n = 44
CTA	ACA	219.5	1.00	0.02	1.00
CAC	AAC	250.6	1.00	0.00	0.00
CAC	AAC	309.8	0.03	0.00	0.95
CTA	AGG	273.3	0.95	0.00	0.02
CTA	AGC	364.7	1.00	1.00	0.00
CAA	ACA	324.6	0.97	0.02	0.98
CTA	ACA	204.2	0.71	0.02	0.00
CTA	ACA	223.3	0.61	0.04	0.00
CAG	AAG	187.3	0.92	0.00	0.00
CTA	AGC	140.5	0.84	0.00	0.00
CAA	ACA	184.4	0.63	0.00	0.00
CAG	AAG	250.3	0.16	0.83	0.00
CTA	ACA	243.5	0.08	0.33	0.09
CAA	ACA	255.1	0.00	0.79	0.70
CAG	AAG	243.3	0.13	0.52	0.93
CTA	ACA	234.9	0.08	0.69	0.80
CAG	AAG	208.9	0.39	0.88	0.95
CTA	ACA	327.9	0.79	0.94	1.00
CAG	AAG	304.5	0.97	0.02	0.95
CTA	ACA	254.2	0.05	0.02	0.77
CTA	AGC	344.6	0.00	0.83	0.00

The *Sebastes inermis* species complex

Diagnosis. Lachrymal with two sharp spines pointing slightly backward; head weakly armed with nasal, preocular, supraocular and parietal spines; caudal fin not distinctly emarginated, lobes not pointed; body with five indistinct irregular vertical bands in life, posterior four extending below lateral line.

Description. Body moderately deep, somewhat compressed. Parietal spines present, sometimes partly covered with small scales. Postocular, suborbital, tympanic or nuchal spines absent. Preopercle with five diverging spines directed posteoventrally. Opercle with two spines directed posteriorly. Supracleithral and upper posttemporal spines present, lower posttemporal spine absent. Ventral tip of subopercle and dorsal tip of interopercle each with a small spine. Interorbital region flat or weakly convex. Body covered with ctenoid scales with some accessory scales. Bases of dorsal and anal fins covered with small scales.

Table 2 Counts of genetically examined specimens of the *Sebastes inermis* species complex

	Anal-fin rays				Pectoral-fin rays			
	6	7	8	9	14	15	16	17
S. inermis	1	32	5	–	1	33	4	–
S. ventricosus	–	24	23	–	–	1	42	4
S. cheni	1	7	35	1	–	–	9	35

	Gill rakers								
	31	32	33	34	35	36	37	38	39
S. inermis	2	3	6	12	10	4	1	–	–
S. ventricosus	–	–	–	–	2	10	22	8	5
S. cheni	–	2	8	16	12	4	1	–	–

	Pored lateral line scales													
	36	37	38	39	40	41	42	43	44	45	46	47	48	49
S. inermis	1	–	4	3	11	5	7	4	3	–	–	–	–	–
S. ventricosus	–	–	–	–	–	–	–	8	6	10	11	7	4	1
S. cheni	–	1	3	3	2	12	9	9	2	2	1	–	–	–

Table 3 Species identifications of specimens examined by Barsukov (1988)

	Barsukov (1988)					This study							Remarks
	SL (mm)	Counts			Species	SL (mm)	Counts					Species	
		P1-l	P1-r	A			P1-l	P1-r	A	LLp	GR		
CAS 1318	57	17	17	8	*S. cheni*	–	–	–	–	–	–	not Scorpaeniformes	
CAS 7178	164	15	15	7	*S. inermis*	–	–	–	–	–	–	not Scorpaeniformes	
	173	15	15	7	*S. inermis*	–	–	–	–	–	–	not Scorpaeniformes	
CAS 45864	145	15	15	7	*S. inermis*	146.7	16	16	8	41	34	?	CAS 45684 in Barsukov (1988)
	154	17	17	8	*S. cheni*	152.2	17	17	8	42	34	*S. cheni*	Paralectotype of *S. cheni*, reregistered as CAS 221441
	?	?	?	?	?	136.5	15	15	7	44	34	*S. inermis*	
	141	15	15	7	*S. inermis*	142.5	15	15	7	43	34	*S. inermis*	
	139	15	15	7	*S. inermis*	140.3	15	15	7	40	34	*S. inermis*	
CAS 45865	149	16	16	8	*S. ventricosus*	148.1	16	16	8	41	36	?	
	109	15	15	7	*S. inermis*	108.0	15	15	7	42	37	*S. inermis*	
	109	16	16	7	*S. ventricosus*	100.6	16	16	7	43	37	?	
	149	16	16	8	*S. ventricosus*	–	–	–	–	–	–	–	
CAS 45866	134	16	17	7	*S. cheni*	130.0	16	17	7	43	36	?	Paralectotype of *S. cheni*
	127	17	17	7	*S. cheni*	122.7	17	17	7	47	35	*S. ventricosus*	Paralectotype of *S. cheni*
	128	17	17	7	*S. cheni*	127.0	17	17	7	46	ND	?	Paralectotype of *S. cheni*
	124	16	17	7	*S. cheni*	124.6	17	17	7	49	ND	*S. ventricosus*	Paralectotype of *S. cheni*
	112	17	17	7	*S. cheni*	112.4	17	17	7	41	33	*S. cheni*	Paralectotype of *S. cheni*
CAS 45867	136	16	16	7	*S. ventricosus*	133.0	15	16	7	43	35	?	
	136	16	16	7	*S. ventricosus*	134.0	17	16	7	43	35	?	
	142	16	17	7	*S. cheni*	139.0	16	17	7	41	34	*S. cheni*	Paralectotype of *S. cheni*, reregistered as CAS 221442
	128	16	16	7	*S. ventricosus*	119.6	16	16	7	41	33	?	
	133	16	16	8	*S. ventricosus*	129.7	16	16	8	44	36	?	
	117	16	16	8	*S. ventricosus*	113.8	16	16	8	39	32	?	
CAS no number	121	18	18	8	*S. cheni*	–	–	–	–	–	–	–	
CAS no number	48	17	17	8	*S. cheni*	–	–	–	–	–	–	–	
CAS no number	51	17	17	8	*S. cheni*	–	–	–	–	–	–	–	
CAS no number	48	17	16	7	*S. cheni*	–	–	–	–	–	–	–	
SU 4620	178	17	17	8	*S. cheni*	175.3	17	17	8	43	35	?	Paralectotype of *S. cheni*, reregistered as SU 69870
	170	17	17	8	*S. cheni*	168.4	17	17	8	38	35	*S. cheni*	Paralectotype of *S. cheni*, reregistered as SU 69870
	111	17	17	8	*S. cheni*	109.3	17	17	8	40	34	*S. cheni*	Paralectotype of *S. cheni*, reregistered as SU 69870
	149	15	15	7	*S. inermis*	145.8	15	15	7	39	33	*S. inermis*	

Table 3 continued

	Barsukov (1988)					This study							Remarks
	SL (mm)	Counts			Species	SL (mm)	Counts					Species	
		P1-l	P1-r	A			P1-l	P1-r	A	LLp	GR		
SU 7178	126	16	16	7	*S. ventricosus*	124.7	16	16	7	41	31	*S. inermis*	
	?	?	?	?	?	161.8	15	15	7	38	35	*S. inermis*	
	?	?	?	?	?	169.5	15	15	7	38	34	*S. inermis*	
	188	17	17	8	*S. cheni*	185.8	17	17	8	41	34	*S. cheni*	Paralectotype of *S. cheni*, reregistered as SU 69871
	134	16	16	7	*S. ventricosus*	132.7	16	16	7	42	35	?	
SU 7194	177	16	16	7	*S. ventricosus*	173.1	16	16	7	48	ND	*S. ventricosus*	Paratype of *S. guentheri*
	167	16	16	7	*S. ventricosus*	165.3	16	16	7	45	ND	?	Paratype of *S. guentheri*
	137	16	16	8	*S. ventricosus*	135.9	16	16	8	44	ND	?	Paratype of *S. guentheri*
	115	16	16	8	*S. ventricosus*	116.6	16	16	8	44	ND	?	Paratype of *S. guentheri*
SU 7334	67	15	15	7	*S. inermis*	–	–	–	–	–	–	not Scorpaeniformes	
	?	15	15	7	*S. inermis*	–	–	–	–	–	–	not Scorpaeniformes	
	72	15	15	7	*S. inermis*	–	–	–	–	–	–	not Scorpaeniformes	
SU 7369	162	15	15	7	*S. inermis*	161.0	15	15	7	40	34	*S. inermis*	Holotype of *S. tokionis*
	125	15	15	7	*S. inermis*	–	–	–	–	–	–	–	
	141	15	15	7	*S. inermis*	–	–	–	–	–	–	–	
	116	15	16	6	*S. inermis*	–	–	–	–	–	–	–	
	141	15	16	6	*S. inermis*	–	–	–	–	–	–	–	
SU 7372	154	16	16	7	*S. ventricosus*	152.2	16	16	7	44	35	*S. ventricosus*	Holotype of *S. guentheri*
SU 7413	138	15	15	7	*S. inermis*	139.4	15	15	7	41	ND	*S. inermis*	
	?	?	?	?	?	135.9	15	15	7	44	ND	?	
	?	?	?	?	?	123.3	15	15	7	ND	ND	?	
	?	?	?	?	?	115.6	17	16	6	38	ND	*S. cheni*	
SU 7434	81	16	16	8	*S. ventricosus*	79.8	16	16	8	39	35	?	
	?	?	?	?	?	70.1	15	15	7	ND	35	?	
	?	?	?	?	?	70.6	15	15	7	ND	34	*S. inermis*	
	?	?	?	?	?	65.1	15	15	7	ND	36	?	
	?	?	?	?	?	71.7	15	15	7	ND	33	*S. inermis*	
SU 22641	152	16	16	8	*S. ventricosus*	150.9	16	16	8	47	39	*S. ventricosus*	
	148	17	17	8	*S. cheni*	145.8	17	17	8	40	33	*S. cheni*	Paralectotype of *S. cheni*, reregistered as SU 69872
	146	16	16	8	*S. ventricosus*	143.6	16	16	8	43	38	*S. ventricosus*	
SU 26556	184	16	16	8	*S. ventricosus*	182.0	16	16	8	39	33	?	SU 22556 in Barsukov (1988)
SU 23647	180	17	17	8	*S. cheni*	175.6	17	17	8	42	35	*S. cheni*	Paralectotype of *S. cheni*
	140	17	18	8	*S. cheni*	136.2	17	17	8	40	34	*S. cheni*	Paralectotype of *S. cheni*
SU 29095	211	17	17	8	*S. cheni*	210.9	17	17	8	43	34	*S. cheni*	Paralectotype of *S. cheni*
	173	17	17	8	*S. cheni*	170.0	17	17	8	43	34	*S. cheni*	Paralectotype of *S. cheni*
ZIN 7460	152	15	15	7	*S. inermis*	ND	15	15	7	ND	34	*S. inermis*	Damaged

Table 3 continued

	Barsukov (1988)					This study							Remarks
	SL (mm)	Counts			Species	SL (mm)	Counts					Species	
		P1-l	P1-r	A			P1-l	P1-r	A	LLp	GR		
ZIN 22611	98	16	16	7	*S. ventricosus*	–	–	–	–	–	–	–	Lost
	?	16	16	7	*S. ventricosus*	–	–	–	–	–	–	–	Lost
	106	16	16	7	*S. ventricosus*	–	–	–	–	–	–	–	Lost
ZIN 22679	150	16	16	7	*S. ventricosus*	148.2	16	16	7	41	36	?	
	197	16	16	8	*S. ventricosus*	194.4	16	16	8	46	37	?	
ZIN 22680	155	15	15	7	*S. inermis*	152.1	15	15	7	40	34	*S. inermis*	
ZIN 22681	113	15	15	7	*S. inermis*	110.0	15	15	8	44	36	?	
	–	–	–	–	–	97.0	16	16	7	ND	35	?	
	–	–	–	–	–	105.6	16	16	7	ND	35	?	
	–	–	–	–	–	97.2	16	16	7	ND	37	?	
	102	15	15	7	*S. inermis*	–	–	–	–	–	–	–	
	147	15	15	7	*S. inermis*	–	–	–	–	–	–	–	
	–	–	–	–	–	–	–	–	–	–	–	–	
ZIN 22682	97	15	15	7	*S. inermis*	96.9	15	15	7	ND	37	?	
	148	16	16	7	*S. ventricosus*	–	–	–	–	–	–	–	
	161	16	16	7	*S. ventricosus*	–	–	–	–	–	–	–	
ZIN 22683	136	15	15	7	*S. inermis*	135.6	15	15	7	40	34	*S. inermis*	
	137	17	17	7	*S. cheni*	–	–	–	–	–	–	–	Reregistered as ZIN 45487, but lost
ZIN 22684	–	–	–	–	–	145.9	15	15	7	43	37	?	
	?	?	?	?	?	101.0	15	15	7	ND	34	*S. inermis*	
	69	15	15	7	*S. inermis*	69.1	15	15	7	ND	31	*S. inermis*	
	–	–	–	–	–	–	–	–	–	–	–	–	
ZIN 22958	185	17	17	7	*S. cheni*	184.2	17	17	8	42	34	*S. cheni*	Lectotype of *S. cheni*
ZIN 23078	88	15	15	7	*S. inermis*	87.8	15	15	7	ND	35	?	
ZIN 23079	136	15	15	7	*S. inermis*	135.4	15	15	7	44	35	?	
	55	15	15	7	*S. inermis*	53.2	15	15	7	ND	ND	?	
ZIN 43647	162	16	16	7	*S. ventricosus*	160.3	16	16	7	41	36	?	
	120	17	17	8	*S. cheni*	118.5	17	17	8	41	36	*S.cheni*	Paralectotype of *S. cheni*, reregistered as ZIN 44651
	154	16	16	7	*S. ventricosus*	152.1	16	16	7	40	37	?	
ZIN 45486	138	17	17	8	*S. cheni*	135.6	17	17	8	43	35	?	ex. ZIN 22682, paralectotype of *S. cheni*

ND no data, *A* anal-fin rays

P1-l left side pectoral-fin rays, *LLp* pored lateral line scales

P1-r right side pectoral-fin rays, *GR* gill rakers

Maxilla, lower jaw, chin and branchiostegal rays completely covered with small scales. Lower jaw projecting anteriorly, with a weak symphyseal knob. Viliform teeth on both jaws, vomer and palatines. Gill rakers long and slender, the longest almost equal to the longest gill-filament. Vertebrae 11 + 15 = 26. Dorsal-fin spines 13, gradually increasing in length to fourth or fifth spine, theafter decreasing in length to 12th spine, 13th spine longer than 12th spine, forming anterior support of soft dorsal fin. Second and third anal-fin spines in similar length, first or second soft ray longest, posterior rays gradually shortening. Distal margin of anal fin slanted slightly backward at body axis. Caudal fin not distinctly emarginated, lobes not pointed. Pectoral fin upper and lower margins not emarginated; rays on upper half branched, those on lower half neither branched nor thickened.

Body with five irregular indistinct vertical bands in life, located under 1st to 3rd, 5th to 7th and 9th to 12th dorsal

spines, anterior part of soft-rayed portion of dorsal fin, and on caudal peduncle. Anterior four bands usually extending dorsally onto dorsal fin. Anteriormost band not extending ventrally to below lateral line; second extending below lateral line to above pectoral-fin base; third, fourth and fifth extending to middle of belly, fourth vertical band V-shaped. Peritoneum pale brown in alcohol.

Sebastes inermis Cuvier *in* Cuvier and Valenciennes 1829 (Japanese name: Aka-mebaru) (Figs. 1a, 2a, 3a, 4a, b)

Sebastes inermis Cuvier *in* Cuvier and Valenciennes 1829: 346 (type locality: Japan); Hilgendorf 1880: 172 (Japan); Hiyama and Yasuda 1961: 110, in part (pl. 146–249, 250); Masuda et al. 1975: 141, color photo (southern Japan); Kanayama and Kitagawa 1982: 36, in part, lower color photo (Iwate Prefecture, Japan); ? Lindberg and Krasyukova 1987: 58–60, in part (? Japan and Korea); Nakabo 1995: 44–48, in part, color photos (Otomi, Fukui Pref., Toba and Ijika, Mie Pref., Suou-ohshima, Yamaguchi Pref., Japan; Cheju Is., Korea); Taguchi 1999: 90, in part, color photo (Shakotan Penin., Hokkaido Pref., Japan); Nakabo 2002: 592, in part, figure of reddish-brown type; Kim et al. 2005: 220, color photo (southern part of Korean Penin., Cheju Is., Korea).

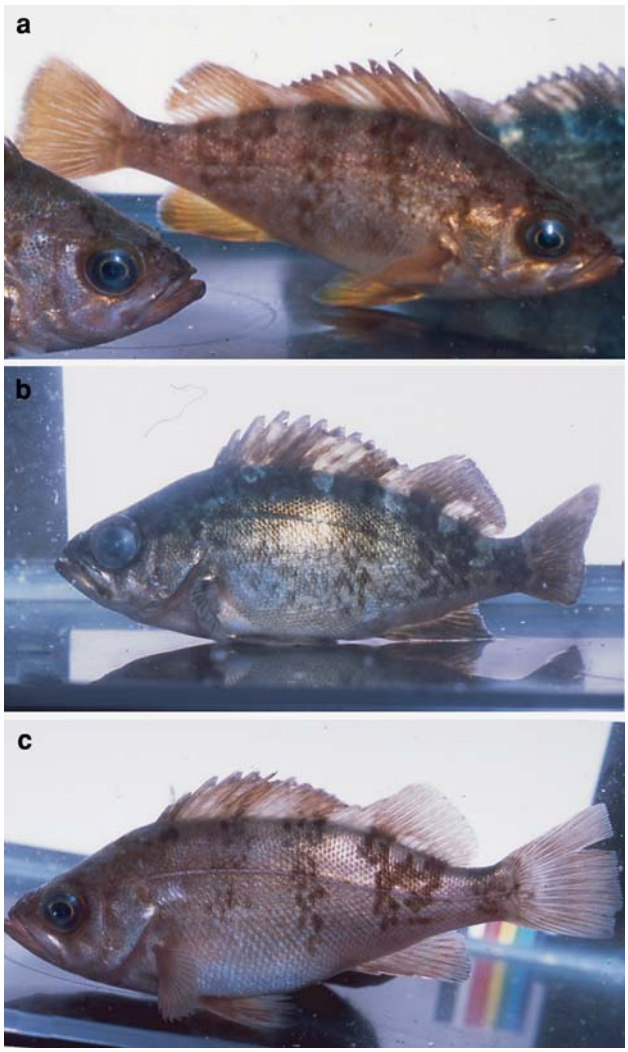

Fig. 1 Underwater photograph of *Sebastes inermis* species complex. **a** *S. inermis*, FAKU 86944, 95.5 mm SL; **b** *S. ventricosus*, FAKU 86942, 82.8 mm SL; **c** *S. cheni*, FAKU 86943, 98.9 mm SL

Sebastes ventricosus (not of Temminck and Schlegel): Nyström 1887: 20 (Japan); Barsukov 1988: 20, in part (Tokyo Pref., Japan); Barsukov 2003: 158, in part (Busan, Korea).

Sebastes (*Mebarus*) *inermis*: Matsubara 1943: 195–196, 204–205, in part (?Japan and Korea); Matsubara 1955: 1074, in part (?Japan and Korea); Chen 1985: 23–37, in part (Japan).

Sebastes tokionis: Lindberg and Krasyukova 1987: 57–58, in part (Yokohama, Kanagawa Pref., Tokyo Pref., Japan).

Sebastes (*Sebastodes*) *inermis*: Barsukov 1988: 20–21, in part (Yokohama, Kanagawa Pref., Tokyo Pref., Tottori Pref., Japan; Busan, Korea); Barsukov 2003: 159, in part, fig. 64 (Kanagawa Pref., Japan).

Sebastes inermis, morphotype A: Kai and Nakabo 2002: 260–261, fig. 1A–C (Fukui Pref., Noto, Ishikawa Pref., Mie Pref., Tokushima Pref., Wakayama Pref., Japan).

Sebastodes inermis: Jordan and Starks 1904: 103–104, in part (Japan); Jordan and Hubbs 1925: 261–263 (Japan); Matsubara 1935: 217–223, in part (Japan, Korea); Moiseyev 1937: 126, in part (Yokohama, Kanagawa Pref., Tokyo Pref., Japan).

Sebastodes tokionis Jordan and Starks 1904: 104, fig. 3 (type locality: Misaki, Kanagawa Pref., Japan); Jordan et al. 1913: 234, fig. 169 [followed Jordan and Starks (1904)]; Jordan and Hubbs 1925: 263–264 (Misaki, Kanagawa Pref., Toba, Mie Pref., Osaka Pref., Japan); Moiseyev 1937: 125–126, in part (Misaki, Kanagawa Pref., Japan, Busan, Korea).

Sebastodes (*Sebastosomus*) *inermis*: Schmidt 1931: 95, in part (Tokyo Pref., Japan).

Sebastodes (*Sebastosomus*) *tokionis*: Schmidt 1931: 95–96, in part, fig. 22 (Misaki, Kanagawa Pref., Japan).

Materials examined. 56 specimens. 38 specimens subjected to taking counts and measurements and genetic examination indicated by asterisk (*), counts and measurements only (15) by double asterisks (**). Others (3) not subjected to taking counts and measurements, nor genetic examination without asterisk. CAS 45864** (in part, 3 of the 5 specimens), 136.5–142.5 mm SL, Tottori, Japan. CAS 45865** (in part, 1 of 4), 108.0 mm SL,

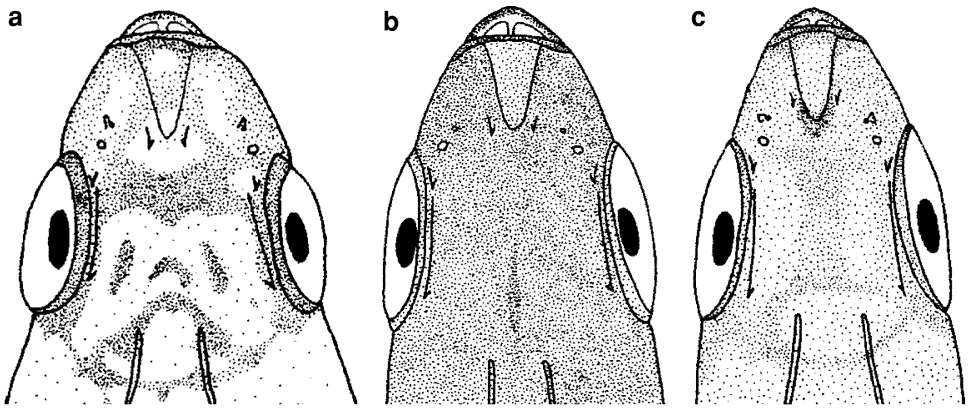

Fig. 2 Schematic drawings of frontal views of *Sebastes inermis* species complex in life. **a** *S. inermis*, FAKU 67059, 110.9 mm SL; **b** *S. ventricosus*, 150.7 mm SL; **c** *S. cheni*, 131.8 mm SL

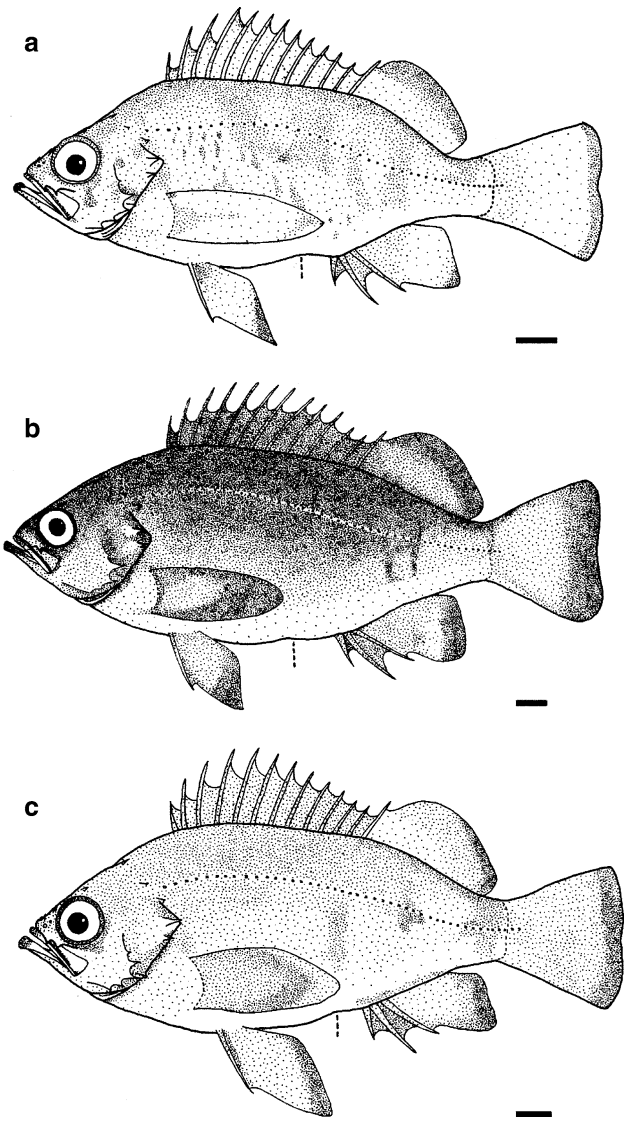

Fig. 3 Schematic drawings of preserved specimens of *Sebastes inermis* species complex. **a** *S. inermis*; **b** *S. ventricosus*; **c** *S. cheni*

Busan, Korea. FAKU 66237*, 150.6 mm SL, Nohara, Kyoto Pref., Japan. FAKU 67059*, 67061*, 67073*, 110.9–123.5 mm SL, Hatsushima, Wakayama Pref., Japan. FAKU 69086*, 69087*, 69091*, 69092*, 96.4–113.7 mm SL, Shodo-shima, Kagawa Pref., Japan. FAKU 69339*, 104.2 mm SL, Toshi-jima, Mie Pref., Japan. FAKU 69342*, 74464*, 74465*, 110.1–141.7 mm SL, Kuzaki, Mie Pref., Japan. FAKU 70025*, 130.0 mm SL, Okozu, Fukui Pref., Japan. FAKU 71133–71139*, 145.9–169.4 mm SL, Nanao, Ishikawa Pref., Japan. FAKU 74367*, 74433*, 74435*, 74453*, 115.9–178.7 mm SL, Enome, Ishikawa Pref., Japan. FAKU 74389*, 74397*, 74398*, 129.0–145.1 mm SL, Ogi, Ishikawa Pref., Japan. FAKU 74401*, 74402*, 74406*, 74407*, 123.3–145.8 mm SL, Noto, Ishikawa Pref., Japan. FAKU 78759–78764*, 81.0–112.8 mm SL, Heta, Shizuoka Pref., Japan. FAKU 82466*, 75.7 mm SL, Tarumi, Hyogo Pref., Japan. FAKU 86808, 86809, 138.4–144.3 mm SL, Tsutsuishi, Niigata Pref., Japan. FAKU 86944*, 95.5 mm SL, Ogi, Ishikawa Pref., Japan. MUFS 8099, 156.0 mm SL, Totoro, Nobeoka, Miyazaki Pref., Japan. SU 4620** (in part, 1 of 4), 145.8 mm SL, Tokyo Pref., Japan. SU 7178** (in part, 3 of 5), 124.7–169.5 mm SL, Tokyo Pref., Japan. SU 7369** (holotype of *S. tokionis*), 161.0 mm SL, Misaki, Kanagawa Pref., Japan. SU 7413** (apparent paratype of *S. tokionis*, in part, 1 of 4), 139.4 mm SL, Misaki, Kanagawa Pref., Japan. SU 7434** (in part, 2 of 5), 70.6–71.7 mm SL, Misaki, Kanagawa Pref., Japan. ZIN** 7460, damaged, Yokohama, Kanagawa Pref., Japan. ZIN 22680**, 152.1 mm SL, Tokyo Pref., Japan. ZIN 22682**, 96.9 mm SL, Nagasaki Pref., Japan. ZIN 22683**, 135.6 mm SL, Misaki, Kanagawa Pref., Japan. ZIN 22684** (2 specimens), 69.1–101.0 mm SL, Busan, Korea. ZMB 10553** (holotype of *S. inermis*), 116.7 mm SL, Japan, coll. by F. von Langsdorf.

Diagnosis. Body dark red or light brown dorsally and laterally, somewhat whitish ventrally when fresh; pectoral and pelvic fins dark red or orange when fresh; pectoral fin long, extending beyond the level of anus when depressed; tips of pectoral and pelvic fins pointed; pectoral fin rays usually 15 (rarely 14 or 16); pored lateral line scales 36–44 (mode 40); gill rakers 31–37 (mode 34).

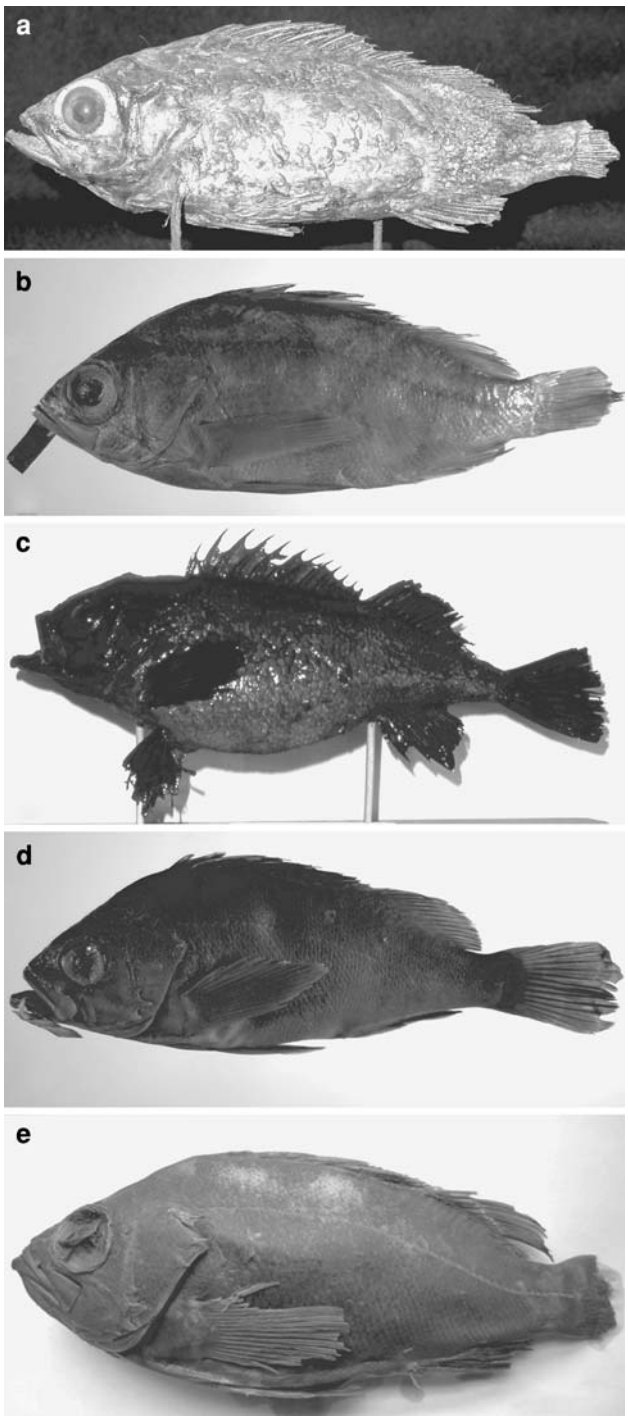

Fig. 4 Type specimens of nominal species of *Sebastes inermis* species complex. **a** holotype of *S. inermis*, ZMB 10553, 116.7 mm SL; **b** holotype of *S. tokionis*, SU 7369, 161.0 mm SL; **c** lectotype of *S. ventricosus*, RMNH D 575, 226.8 mm SL; **d** holotype of *S. guentheri*, SU 7372, 152.5 mm SL; **e** lectotype of *S. cheni*, ZIN 22958, 184.2 mm SL

Description. Counts and proportional measurements shown in Table 4.

Body oblong, nape somewhat convex. Ctenoid scales on head and body, except on tip of snout (completely scaled in some specimens; unknown in holotype). Scales deciduous. Eye large, about one third of head length. Mouth terminal, moderately oblique, reaching to below posterior edge of pupil. Distal margin of caudal fin slightly notched in middle in most specimens, otherwise truncate (damaged in holotype). Pectoral fin long extending beyond level of anus when depressed. Lower half of pectoral-fin rays (6–7, mode 6) unbranched (damaged in holotype). Pelvic fin often extending beyond anus when depressed (damaged in holotype).

Size. The maximum size 178.7 mm SL in this study.

Color in life (Figs. 1a, 2a). Body light reddish or red dorsally and laterally, somewhat lighter ventrally; sometimes orange or dark gold dorsally and laterally, bright orange ventrally. Red or brown vertical bands on body. Light brown marking below eye, sometimes indistinct. Interorbital region with irregular reddish stripes and some dots (Fig. 2a). Cornea margined with red or orange. Margin of maxilla usually light brown. Upper half of soft-rayed portion of dorsal fin reddish. Caudal fin usually uniform orange-yellow, sometimes margined with dark brown, rays somewhat paler. Anal fin orange-yellow, distal margin somewhat paler. Pelvic fin reddish-yellow anteriorly, pale yellow posteriorly. Anterior half of pelvic fins light red, posterior half paler. Pectoral fin orange-yellow in most specimens, posterior tip dark in some.

Color when fresh. Body usually dark red or light brown dorsally and laterally, somewhat whitish ventrally; sometimes brown dorsally and laterally, orange ventrally [see lowermost photo (left column) of Nakabo (1995: 46) and lowermost photo (right column) of Kim et al. (2005: 47)]. Body with five indistinct brown vertical bands becoming even less clear (lost in some specimens) after death. Usually a brown marking below eye. Reddish irregular stripes and some dots in interorbital region lost in most specimens. Cornea margined with red or orange. Maxilla usually margined with light brown ventrally. Dorsal fin uniformly brown or dark brown, rays somewhat orange, vertical band lost. Anal fin dark red or orange, spinous portion and distal margin somewhat reddish. Caudal fin brown or dark brown, rays reddish or somewhat orange. Pectoral fin dark red or orange, tip somewhat darker. Pelvic fin dark red anteriorly, somewhat paler posteriorly. In brown-bodied specimens, pectoral fin dark brown, posterior margin somewhat reddish. Pelvic fin orange or rather yellowish, posterior margin dark.

Color in alcohol (Fig. 3a). Body light brown dorsally and laterally, whitish ventrally. Five vertical bands (in life) represented by five vertical patches of irregular dark brown spots in most specimens. Dark marking below eye. Dorsal fin faintly darkish, upper half of soft-rayed portion somewhat darker. Anal fin faintly darkish, posterior tip darker. Caudal fin faintly darkish, sometimes margined with dark brown. Pectoral and pelvic fins somewhat paler or whitish. Tip of pelvic fin dark.

Table 4 Proportional measurements and counts for the *Sebastes inermis* species complex

	Sebastes inermis			*S. ventricosus*				*S. cheni*		
	Holotype	*S. tokionis*	Other specimens Mean (range,	Lectotype	*S. guentheri* Holotype	*S. cheni* Paralectotypes	Other specimens Mean (range,	Lectotype	Paralectotypes	Other specimens Mean (range,
	ZMB 10553	Holotype SU 7369	sample size)	RMNH D 575	SU 7372	$n = 2$	sample size)	ZIN 22958	$n = 12$	sample size)
SL (mm)	116.7	161.0	69.1–178.7	226.8	152.2	122.7–124.6	80.8–194.1	184.2	109.3–210.9	57–221.3
Head length	33.8	35.6	34.5 (32.3–36.3, 52)	32.0	33.6	35.6 (35.3–35.8, 2)	33.2 (31.3–35.9, 50)	36.0	34.7 (32.2–36.0, 12)	35.1 (32.1–38.0, 46)
Snout length	–	7.9	7.9 (7.5–9.5, 53)	7.2	8.3	8.1 (7.8–8.4, 2)	8.0 (7.3–9.0, 50)	8.8	8.0 (7.5–8.6, 12)	8.1 (7.3–9.2, 46)
Orbital diameter	–	11.9	11.6 (9.7–13.6, 53)	10.4	9.3	11.8 (11.8, 2)	10.6 (8.0–11.6, 50)	11.4	11.2 (9.7–12.2, 12)	11.7 (10.4–13.7, 46)
Interorbital width	–	8.3	7.7 (6.9–8.6, 53)	8.4	8.5	7.9 (7.6–7.7, 2)	8.4 (7.8–9.1, 50)	8.4	8.3 (7.9–9.1)	8.0 (7.1–9.3, 46)
Body depth 1	–	31.4	31.2 (28.6–35.0, 53)	–	32.4	31.3 (31.2–31.3, 2)	32.4 (24.4–35.3, 50)	33.0	33.1 (30.1–35.2, 12)	32.0 (26.8–35.3, 46)
Body depth 2	–	37.7	37.8 (33.6–41.7, 53)	–	39.2	36.8 (35.9–37.7, 2)	37.4 (34.2–40.8, 50)	41.4	39.4 (35.8–42.5, 12)	38.4 (34.7–42.0, 46)
Caudal peduncle depth	–	11.8	11.1 (10.4–13.0, 53)	7.7	12.0	11.0 (11.0, 2)	11.1 (10.1–13.0, 50)	12.4	12.0 (10.2–12.9, 12)	11.6 (10.0–12.9, 46)
Upper jaw length	–	15.9	15.1 (14.3–17.0, 53)	13.4	14.3	14.2 (13.9–14.4, 2)	14.5 (13.7–15.8, 50)	16.3	15.7 (14.6–16.7, 12)	15.8 (14.8–16.7, 46)
Predorsal length	–	38.3	36.0 (32.5–38.6, 53)	32.0	35.2	36.8 (35.9–37.7, 2)	35.0 (32.5–37.5, 50)	37.7	36.4 (34.7–37.9, 12)	35.8 (33.9–38.9, 46)
Pectoral-fin length	–	32.3	33.1 (29.5–36.0, 53)	25.7	29.8	29.8 (29.7–29.9, 2)	30.4 (27.3–32.4, 49)	–	29.9 (26.2–31.7, 12)	30.2 (26.7–32.7, 46)
Pelvic-fin length	–	26.5	24.9 (22.4–28.9, 53)	–	26.4	22.6 (22.6–22.7, 2)	24.1 (22.2–26.3, 49)	27.1	27.0 (22.9–30.3, 12)	26.9 (23.9–32.6, 46)
Pelvic-spine length	–	15.4	15.4 (13.5–18.6, 53)	–	16.6	14.1 (13.6–14.7, 2)	15.3 (12.6–16.8, 49)	15.5	15.6 (14.5–17.0, 12)	15.9 (14.0–18.1, 46)
1st dorsal-spine length	–	6.3	6.3 (4.8–7.7, 53)	–	5.8	6.9 (6.5–7.2, 2)	6.2 (5.0–7.7, 49)	5.6	6.3 (5.4–6.9, 11)	6.3 (5.4–7.4, 44)
2nd dorsal-spine length	–	10.0	10.2 (8.3–11.9, 52)	–	11.2	11.4 (11.1–11.6, 2)	9.9 (8.7–11.4, 46)	9.4	10.1 (8.4–11.2, 11)	10.1 (8.6–12.1, 45)
3rd dorsal-spine length	–	14.9	15.8 (13.6–19.5, 52)	12.0	15.8	15.0 (14.7–15.3, 2)	15.3 (13.1–16.9, 46)	13.9	16.0 (13.0–18.1, 10)	15.9 (13.4–18.5, 41)
4th dorsal-spine length	–	18.6	17.8 (12.1–20.8, 50)	13.7	18.4	16.2 (16.0–16.5, 2)	17.3 (15.2–18.9, 45)	16.3	17.7 (15.5–20.1, 10)	17.9 (16.0–19.9, 42)
5th dorsal-spine length	–	18.2	18.0 (16.1–20.4, 49)	13.7	17.5	16.5 (16.2–16.8, 2)	17.2 (14.9–18.9, 47)	17.4	18.0 (15.5–20.1, 10)	18.3 (16.5–20.2, 43)
12th dorsal-spine length	–	8.7	9.3 (6.2–11.2, 53)	5.8	8.0	7.6 (6.9–8.2, 2)	8.7 (7.0–10.3, 48)	–	8.2 (7.2–9.5, 10)	8.4 (6.8–10.7, 44)
13th dorsal-spine length	–	11.2	12.5 (10.0–15.1, 50)	–	10.2	11.4 (11.4–11.5, 2)	11.6 (9.9–13.1, 49)	–	11.6 (10.2–13.1, 10)	12.1 (10.6–14.2, 44)
1st anal-spine length	–	7.6	7.4 (5.5–8.9, 51)	5.8	7.3	7.3 (7.2–7.3, 2)	6.9 (5.7–8.3, 49)	6.2	7.0 (6.0–7.7, 12)	7.3 (6.2–8.8, 45)
2nd anal-spine length	–	15.3	15.0 (12.4–18.1, 52)	10.4	13.9	13.2 (13.1–13.4, 2)	13.8 (11.4–16.5, 49)	14.4	13.9 (12.1–15.9, 12)	14.3 (11.4–17.0, 43)
3rd anal-spine length	–	15.5	15.7 (12.7–19.4, 53)	11.9	13.0	13.4 (13.3–13.5, 2)	14.5 (12.5–17.0, 49)	14.9	14.7 (12.4–16.3, 12)	15.1 (13.1–17.0, 44)
Pelvic to anal spine distance	–	32.8	33.3 (26.6–40.0, 52)	–	29.6	29.3 (28.5–30.0, 2)	33.0 (29.3–38.7, 50)	31.9	32.6 (26.1–40.2, 12)	32.8 (27.5–40.1, 44)
Dorsal fin	XIII, 15	XIII, 14	XIII, 13–15	XIII, 15	XIII, 14	XIII, 14	XIII, 14–16	XIII, 14	XIII, 14–15	XII-XIII, 13–16
Anal fin	III, 7	III, 7	III-IV, 6–8	III, 7	III, 7	III, 7	III, 7–8	III, 8	III, 7–8	III, 6–9
Pectoral fin	14 (right side)	15	14–16	16	16	17	15–17	17	17	16–17
Pelvic fin	–	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5
Pored lateral line scales	–	40	36–44	–	44	47–49	43–49	42	38–43	37–46
Gill rakers	–	34	31–37	–	35	35	35–39	34	33–36	32–37

Distribution and habitat. Distributed from southern Hokkaido southward to Kyushu, Japan, and southern part of Korean Peninsula (Fig. 5a). Usually in loose, slow-moving aggregations just above and among *Zostera* and *Sargussum* beds (Keiichi Sakai, personal communication).

Remarks. *Sebastes inermis* was originally described from Japan (no precise locality) by Cuvier *in* Cuvier and Valenciennes (1829). Later, Hilgendorf (1880) redescribed *S. inermis* on the basis of a single specimen, ZMB 10553 (Fig. 4a), noting it to be the type of *S. inermis* Cuvier. In the MNHN type catalog, Blanc and Hureau (1968) confused *Scorpaena inermis* with *Sebastes inermis*, and listed MNHN 0693 as the holotype of *Scorpaena inermis* Cuvier *in* Cuvier and Valenciennes (1829: 311), being the same as *Sebastes inermis* Cuvier *in* Cuvier and Valenciennes (1829: 346). The former species clearly differs from the latter in having a developed suborbital stay (not developed in the latter) and 12 dorsal spines (13), and occurs only in the western Atlantic (the northwestern Pacific) (Uyeno and Sato 1983). On the other hand, no record of the type of *Sebastes inermis* was included in the type catalog of Scorpaeniformes in ZMB (Paepke and Fricke 1992), and the type was believed to have been lost (Eschmeyer et al. 1988). However, ZMB 10553 was recently found in the ZMB collection, being the original type of *Sebastes inermis* (Peter Bartsch, personal communication). Because Cuvier and Valenciennes (1829) described *Sebastes inermis* in singular form, giving no count or measurement ranges, we regarded his description as having being based on a single specimen. The specimen cataloged as ZMB 10553 is therefore the holotype of *Sebastes inermis*, according to Article 73.1 (ICZN 1999).

The holotype of *S. inermis*, ZMB 10553, stuffed and with the left pectoral fin damaged (Fig. 3a), has 14 pectoral-fin rays on the right side. The count of 15 in the original description suggests that the pectoral-fin ray count had been made on the left side. In any case, the pectoral-fin ray count agrees well with specimens of morphotype A (Table 2). Furthermore, the holotype of *S. inermis* agrees with the latter in having 7 anal-fin rays and a moderately sized head (33.8% in SL).

Sebastodes tokionis was described by Jordan and Starks (1904) as a new species from Misaki, Kanagawa Pref., Japan, based on a single specimen, SU 7369, designated by them as the "type." In addition, they designated USNM 50905 (one specimen) as cotypes of the species. Later, Jordan and Hubbs (1925) described *S. tokionis* based on "the type and four paratypes from Misaki, and one specimen from Tokyo, collected by Jordan and Snyder in 1900." Subsequently, Böhlke (1953) listed SU 7369 as the holotype and SU 7413 (four specimens) as the paratypes of *S. tokionis* as follows: "Holotype: SU 7369; Misaki, Japan.

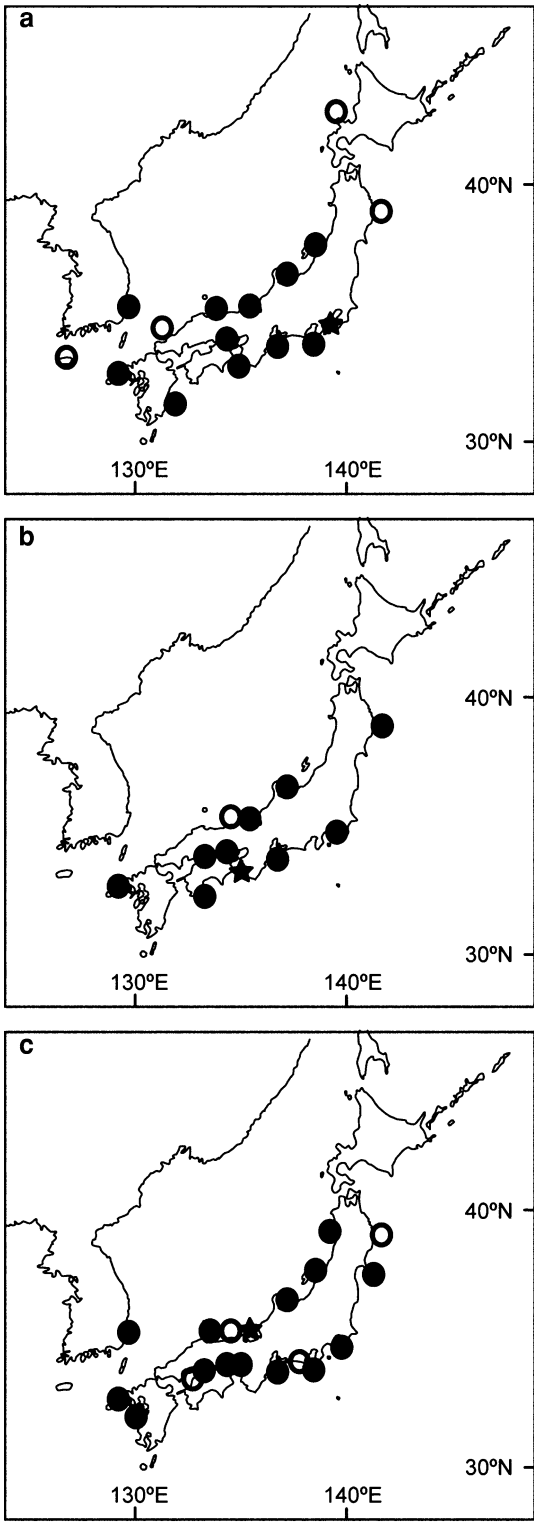

Fig. 5 Geographical distribution of the *Sebastes inermis* species complex. *Solid circles* localities based on the specimens, *open circles* collection sites based on literature records. **a** *Sebastes inermis*, *solid star* indicates type locality of *S. tokionis*; **b** *S. ventricosus*, *solid star* indicates type locality of *S. guentheri*; **c** *S. cheni*, *solid star* indicates type locality of *S. cheni*

Collectors: David Starr Jordan and John O. Snyder; summer of 1900. Paratypes (4): SU 7413; data exactly as for holotype."

On the other hand, Eschmeyer et al. (1988) recorded the types and related specimens of *S. tokionis* as follows: "Holotype: SU 7369. Paratypes: USNM 50905 (1). Additional material: SU 7413 (4). Type catalog: Böhlke 1953: 124." To add to this confusion, the USNM 50905 lot appears to have been lost (Susan Lee Jewett, personal communication).

Judging from the above, the four specimens of SU 7413 may indeed be the paratypes of *S. tokionis*, having been intended for reregistration as USNM 50905, since they had been collected from Misaki, Japan, together with the holotype, by Jordan and Snyder in 1900. Although we assume that Böhlke (1953) may have been correct, the relationship between the registration numbers USNM 50905 and SU 7413 is still uncertain.

In any case, because the original description of *S. tokionis* was based on the holotype, the status of the paratypes of the species has little bearing on the relationship between *S. inermis* and *S. tokionis*. The holotype of *S. tokionis* (SU 7369, Fig. 4b) agrees well with specimens regarded herein as *S. inermis*, in both counts and proportional measurements, viz., 15 pectoral-fin rays, smaller numbers of pored lateral line scales (40) and gill rakers (34), and long pectoral fins (32.3% SL), in addition to both having pointed pectoral and anal fins. Accordingly, *S. tokionis* is regarded as a junior synonym of *S. inermis*.

Of the four specimens included in SU 7413, one (139.4 mm SL) conformed to *S. inermis*, as recognized here, in having 15 pectoral-fin rays, a smaller number of pored lateral line scales (41) and longer pectoral fins (33.3% SL); one (115.6 mm SL) conformed to *S. cheni* in having 17 pectoral-fin rays (16 on the right side), a smaller number of pored lateral line scales (38) and a larger head (38.0% SL); the other two (123.3 and 135.9 mm SL) were unidentifiable because of the lack of body coloration and equivocal pectoral-fin ray, pored lateral line scale and gill-raker counts.

Although Jordan and Starks (1904) considered *S. inermis* to be specifically distinct from *S. tokionis* and *S. guentheri*, they believed *S. ventricosus* to be a junior synonym of *S. inermis*. They described *S. inermis* as follows: dorsal fin XIII, 14; anal fin III, 8; pored lateral line scales 43; gill rakers on lower limb of first arch 24; color brassy-green, pale or dusky; and maxilla with a stripe. Because the counts and description of a "maxilla with a stripe" characterize all three species recognized in the *S. inermis* complex, we cannot identify the species referred to here. The "brassy green" coloration conforms to that of *S. ventricosus*, and the "pale or dusky" coloration to that of both *S. cheni* and dark gold specimens of *S. inermis*.

Jordan and Hubbs (1925) described *Sebastodes* (*Sebastosomus*) *tokionis* as having 35–45 pored lateral line scales (usually fewer than 42). They noted the color of a fresh specimen as follows: "body brown above, bright red on lower parts; dorsal fin dusky; all other fins red." These conditions agreed well with specimens regarded here as *S. inermis*. On the other hand, *Sebastodes* (*Sebastosomus*) *inermis* sensu Jordan and Hubbs (1925) overlapped the ranges of all three species recognized here (*S. inermis*, *S. ventricosus* and *S. cheni*) in counts of dorsal- and anal-fin rays, and pored lateral line scales. The color descriptions given, "brassy green," "blackish" and "dusky silvery," are applicable to *S. ventricosus*, "dull reddish" to smaller *S. ventricosus* and "reddish brown" to *S. inermis* and *S. cheni*.

Nyström (1887) reported *Sebastes ventricosus* from Japan characterized by 15 pectoral-fin rays and long sharpened (pointed) pectoral fins. Such characters agreed well with those of the present specimens regarded as *S. inermis*.

Schmidt (1931) recognized *Sebastodes* (*Sebastosomus*) *inermis* and *Sebastodes* (*Sebastosomus*) *tokionis* as separate species, his description of *S. inermis* being based on two specimens of ZIN 22679 and one specimen of ZIN 22680. Although ZIN 22680 agrees with the present specimens identified as *S. inermis* in having 15 pectoral- and 7 anal-fin rays, 40 pored lateral line scales and 34 gill rakers, the two specimens of ZIN 22679 were equivocal in both counts and color descriptions, "brownish-black with traces of black spots on side" being applicable to both *S. ventricosus* and *S. cheni*.

Sebastodes (*Sebastosomus*) *tokionis* sensu Schmidt (1931) was described on the basis of ZIN 22681 (three specimens noted by him, but four specimens presently included), seven specimens of ZIN 22682, two specimens of ZIN 22683 and five specimens of ZIN 22684. Few specimens in the last three lots were available for examination (see Table 3), the others apparently being lost. One (135.6 mm SL) of the two specimens of ZIN 22683 and two (69.1 and 101.0 mm SL) of the five specimens of ZIN 22684 identified as *S. inermis* had 15 pectoral- and 7 anal-fin rays, and smaller numbers of pored lateral line scales (40) and gill rakers (31–34) (Table 3). The remaining specimens could not be identified because of their equivocal counts of pectoral- and anal-fin rays, pored lateral line scales and gill rakers. Schmidt's (1931) characterization of *S. tokionis* as "brownish, sometimes greenish and dusky dorsally" agrees with both *S. cheni* (brownish) and *S. ventricosus* (greenish), suggesting that *S. tokionis* sensu Schmidt (1931) may have included all three species of the *S. inermis* species complex recognized here.

According to Matsubara (1935), the numbers of pored lateral line scales of *Sebastodes inermis* ranged from 39 to 48 and anal-fin ray from 6 to 9, in addition to pectoral-fin

length in head length ranging from 1.00 to 1.35. In the present specimens, pored lateral line scales ranged between 36–44 in *S. inermis*, 43–49 in *S. ventricosus* and 37–46 in *S. cheni*, counts of anal-fin rays between 6–8, 7–8 and 6–9, respectively, and pectoral-fin length in head length between 0.96–1.14, 1.00–1.21 and 1.06–1.37, respectively, suggesting that *S. inermis* sensu Matsubara (1935) included all three species. Later observations by Matsubara (1943, 1955) were based on Matsubara (1935), although both in 1943 and 1955 he noted that "most of the specimens have 17 pectoral-fin rays," which suggests an abundance of *S. cheni* among Matsubara's specimens.

Moiseyev (1937) recognized *Sebastodes inermis* and *Sebastodes tokionis* as separate species, based on the specimens examined by Schmidt (1931), and some additional specimens. *Sebastodes inermis* sensu Moiseyev (1937) was described on the basis of ZIN 22679–22680, all identified as *S. inermis* by Schmidt (1931), plus one specimen of ZIN 5765 (not available here), one specimen of ZIN 7460 and one specimen of ZIN 22958. He characterized *S. inermis* as having a blackish head and body and 39–47 pored lateral line scales. We identified ZIN 22680 here as *S. inermis*, as well as ZIN 7460 (with 15 pectoral- and 7 anal-fin rays, 40 pored lateral line scales and 34 gill rakers), but we identified ZIN 22958 as *S. cheni* (designated here as its lectotype, see remarks under *S. cheni*), and we could not identify ZIN 22679 (as noted above). The description of blackish coloration by Moiseyev (1937) may have simply followed Schmidt (1931).

Sebastodes tokionis sensu Moiseyev (1937) was described on the basis of one specimen of ZIN 23078 and one specimen of ZIN 23079, and the following specimens identified as "*S. tokionis*" by Schmidt (1931): three specimens of ZIN 22681, seven specimens of ZIN 22682, one specimen of ZIN 22683 and five specimens of ZIN 22684. Although we identified some of the specimens examined by Schmidt (1931) as *S. inermis* (as noted above), the two additional specimens examined by Moiseyev (1937) were equivocal. Therefore, *S. tokionis* sensu Moiseyev (1937) partly agrees with *S. inermis* as recognized here. Furthermore, Moiseyev (1937) noted the coloration of *S. tokionis* as being reddish-brown, black dorsally. Reddish-brown coloration is characteristic of *S. inermis* as presently recognized, black coloration being applicable to *S. ventricosus*, suggesting that both species may have been included in the equivocal specimens of Moiseyev (1937).

Hiyama and Yasuda's (1961) description of *S. inermis* included the following: "dorsal fin XIII, 13–14; anal fin III, 7–8; pored lateral line scales 39–48; head without scales; and body color variable in accordance with the water depth, showing the illustrations of the three color variants, such as reddish, blackish and whitish ones." Such counts cover all ranges of the *S. inermis* species complex. The illustration of a blackish variant given by Hiyama and Yasuda (1961: pl. 146, fig. 249) shows close agreement with a brown individual of *S. inermis* in life, in having a dark brown back and orange abdomen. On the other hand, the illustrations of reddish (Hiyama and Yasuda 1961: pl. 146, fig. 250) and whitish (Hiyama and Yasuda 1961: pl. 146, fig. 251) variants match *S. inermis* and *S. cheni*, respectively, as recognized here. However, the head scale conditions described by Hiyama and Yasuda (1961) differed from those seen in the *S. inermis* species complex, possibly due to mistaken observation.

Kanayama and Kitagawa (1982) reported *S. inermis* from Iwate Pref., Japan, on the basis of two specimens with two photographs. The upper photograph shown by them agreed with the specimens regarded here as *S. cheni*, in having long pelvic fins extending past the anus (see the description under *S. cheni*). However, the coloration of the upper photograph is rather darker than normally expected for *S. cheni*, probably having been taken after the specimen had started to dry out. The lower photograph agrees with the specimens regarded here as *S. inermis* in having a reddish body, pectoral and pelvic fins. The counts given for *S. inermis* by Kanayama and Kitagawa (1982), including 14 dorsal-fin rays, 7–8 anal-fin rays, 16–17 pectoral-fin rays, 42–43 pored lateral line scales and 33–35 gill rakers, cover the ranges of both *S. inermis* and *S. cheni*.

Lindberg and Krasyukova (1987) recognized *Sebastes inermis*, *S. tokionis* and *S. ventricosus* [see comments on *S. ventricosus* sensu Lindberg and Krasyukova (1987) noted in remarks under *S. cheni*] each as separate species. *Sebastes inermis* was described on the basis of two specimens of ZIN 22679 (*S. inermis* sensu Schmidt 1931 and Moiseyev 1937), four specimens of ZIN 22681 (*S. tokionis* sensu Schmidt 1931 and Moiseyev 1937), one specimen of ZIN 23078 (*S. tokionis* sensu Moiseyev 1937), two specimens of ZIN 43646 and three specimens of ZIN 43647. In addition to the specimens examined by Schmidt (1931) and Moiseyev (1937) that we were unable to identify (as noted above), ZIN 43646 was not available here, and two specimens (152.1 mm SL, 160.3 mm SL) of ZIN 43647 had equivocal fin ray, pored lateral line scale and gill-raker counts. We identified the third specimen (118.5 mm SL) of ZIN 43647 (reregistered as ZIN 44651, see remarks under *S. cheni*) as *S. cheni*. The illustrated specimen of ZIN 43467 [described as being 204 mm SL by Lindberg and Krasyukova (1987)] having 16 pectoral- and 7 anal-fin rays and 40 pored lateral line scales could not be identified. According to Lindberg and Krasyukova (1987), *S. inermis* was characterized by the pectoral fin ca. 28% SL, pelvic fin ca. 26% SL, usually 16 pectoral-fin rays, 41–44 pored lateral line scales and a black or reddish body. Although the pectoral-fin length agreed with that of *S. ventricosus* and *S. cheni* as recognized here, as did the pectoral-fin ray

count of the former, the remaining counts and measurements were not diagnostic for any of the species considered here (Table 4). Although it is unclear if their description was based on fresh specimens or otherwise, the reddish coloration noted indicates *S. inermis*, the blackish coloration indicates *S. ventricosus*.

Sebastes tokionis sensu Lindberg and Krasyukova (1987) was described on the basis of one specimen of ZIN 7460, one specimen of ZIN 22680, one of the three specimens of ZIN 22682, one of the two specimens of ZIN 22683, three specimens of ZIN 22684 and two specimens of ZIN 23079. As noted above, some of these specimens were presently identified as *S. inermis*, the others remaining unknown. The illustration of *S. tokionis* given by Lindberg and Krasyukova (1987) had been modified from that of *S. tokionis* presented by Jordan and Starks (1904), the accompanying description noting 15 pectoral- and 7 anal-fin rays, and the body reddish dorsally and whitish ventrally. Such characters conform to those of *S. inermis*, *S. tokionis* sensu Lindberg and Krasyukova (1987), therefore being mostly in accordance with *S. inermis* as presently recognized.

As noted under Materials and methods, 27 specimens among Barsukov's (1988) materials were considered as his *S. inermis* (Table 3). Among these 27 specimens, 1 specimen of ZIN 7460, 1 specimen of ZIN 22680, 1 (135.6 mm SL) of the 2 specimens of ZIN 22683, and 1 (69.1 mm SL) of the 3 specimens of ZIN 22684 agreed with *Sebastes inermis* presently recognized as noted above. In addition, two specimens (140.3 and 142.5 mm SL) of CAS 45864 (a total of five specimens in this lot, but Barsukov failed to examine one specimen, 136.5 mm SL, identified as *S. inermis* here, see Table 3), one (108.0 mm SL) of the four specimens of CAS 45865, one (145.8 mm SL) of the four specimens of SU 4620, and one (139.4 mm SL) of the four specimens of SU 7413 agreed with *S. inermis* in having 15 pectoral- and 7 anal-fin rays, and low numbers of pored lateral line scales (39–43) and the number of gill rakers (33–37) (Table 3). On the other hand, one (110.0 mm SL) of the four specimens of ZIN 22681, one (96.9 mm SL) of the three specimens of ZIN 22682, one specimen of ZIN 23078, and two specimens of ZIN 23079 could not be identified here, and two [102 and 147 mm SL in Barsukov (1988)] of the seven specimens of ZIN 22681 were not available, as noted above. Moreover, one (146.7 mm SL) of CAS 45864 was unidentifiable because of the equivocal pectoral- and anal-fin ray, pored lateral line scale and gill-raker counts. Five specimens [CAS 7178 (two) and SU 7334 (three)] were not members of Scorpaeniformes (Table 3). Barsukov (1988) supposedly examined five specimens in SU 7369, but SU 7369 in fact comprises only a single specimen, the holotype of *S. tokionis*. Although Barsukov (1988) stated "notch in the posterior edge of the vomerine band rather well developed" and "interorbital space usually flat" as characters of *S. inermis*, we found no distinct differences in the vomerine tooth band or interorbital condition among the three species in the *S. inermis* species complex. One specimen of five included in SU 7178 (124.7 mm SL) was identified as *S. ventricosus* by Barsukov (1988), but is here considered to be *S. inermis* (see remarks under *S. ventricosus*).

Nakabo (2002) described *S. inermis* with comments on color variants (blackish, reddish-brown, and whitish), suggesting that they may represent separate species. Although the pectoral- and anal-fin ray, and pored lateral line scale counts given by Nakabo (2002) covered the overall ranges of the three species recognized herein, his illustrations of the reddish-brown type is consistent with *S. inermis* in its convex nape and body coloration, the blackish type with *S. ventricosus* in its rounded nape and body coloration, and the whitish type with *S. cheni* in its convex nape and body coloration.

After V. V. Barsukov's death in 1989, Dorofeyeva and Sideleva edited and published his final review "Annotated and illustrated check-list of rockfishes of the world" (Barsukov 2003). This work described *S. inermis* as having 17 pectoral-fin rays, a count applicable to *S. cheni*, whereas the illustration of the species shows 15 pectoral-fin rays and 7 anal-fin rays, consistent with *S. inermis*.

Motomura and Iwatsuki (1997) described *S. inermis* on the basis of a single specimen (MUFS 8099) from Nobeoka, Miyazaki Pref., southern Japan. We confirmed the identity of that specimen, which represents the southernmost record of the species (Fig. 5a).

The illustration of *S. inermis* given by Temminck and Schlegel (1843) shows three lachrymal spines, 18 pectoral-fin rays and a round caudal fin, characters applicable to *S. schlegelii* Hilgendorf 1879, as suggested by Boeseman (1947).

Sebastes inermis as recognized here was given the Japanese name, "Aka-mebaru," by Jordan et al. (1913) (as *S. tokionis* Jordan and Starks 1904). Because *S. tokionis* is a junior synonym of *S. inermis*, we apply the Japanese name "Aka-mebaru" to *S. inermis*.

***Sebastes ventricosus* Temminck and Schlegel 1843**

(Japanese name: Kuro-mebaru) (Figs. 1b, 2b, 3b, 4c, d)

Sebastes ventricosus Temminck and Schlegel 1843: 48, pl. 20, figs. 1, 2 (type locality: Japan); Barsukov 2003: 158, in part (Wakayama Pref., Japan).

Sebastes (*Mebarus*) *inermis* (not of Cuvier): Matsubara 1943: 195–196, 204–205, in part (?Japan and Korea); Matsubara 1955: 1074, in part; Chen 1985: 23–37, in part (Japan).

Sebastes inermis (not of Cuvier): ? Lindberg and Krasyukova 1987: 58–60, in part (? Japan and Korea); Nakabo 1995: 44–48, in part of color photos (Mio, Hyogo Pref., Hinase, Okayama Pref., Yuasa, Totsui, and Yura, Wakayama Pref., Japan); Murai 2001: 175 (Iburi, Kochi Pref., Japan); Nakabo, 2002: 592, in part, figure of blackish type.

Sebastes (*Sebastodes*) *ventricosus*: Barsukov 1988: 20, in part (Osaka Pref., Tokyo Pref., Wakayama Pref., Japan).

Sebastes inermis, morphotype B: Kai and Nakabo 2002: 260–261, fig. 1d–f (Fukui Pref., Noto, Ishikawa Pref., Mie Pref., Tokushima Pref., Wakayama Pref., Japan).

Sebastes guentheri: Barsukov 2003: 147–149, in part (Wakayama Pref., Japan).

Sebastodes guentheri Jordan and Starks 1904: 102, fig. 2 (type locality: Wakayama Pref., Japan); Jordan, Tanaka and Snyder 1913: 234, fig. 169 [followed Jordan and Starks (1904)].

Sebastodes inermis (not of Cuvier): Jordan and Starks 1904: 103–104 (in part, Japan); Jordan and Hubbs 1925: 261–263, in part (Japan); Matsubara 1935: 217–223, in part (Japan, Korea).

Sebastodes (*Sebastosomus*) *inermis* (not of Cuvier): ? Schmidt 1931: 95, in part (Japan).

Sebastodes (*Sebastosomus*) *tokionis* (not of Jordan and Starks): ? Schmidt 1931: 95–96, in part, fig. 22 (Japan).

Materials examined. 56 specimens, 47 specimens subjected to taking counts and measurements and genetic examination indicated by asterisk (*), counts and measurements only (7) by double asterisk (**), and genetic examination only (1) by triple asterisk (***). Other (1) not subjected to taking counts and measurements or genetic examination without asterisk. CAS 45866** (in part, 2 of the 5 specimens, originally included in the paralectotype series of *S. cheni*), 122.7, 124.6 mm SL, Tokyo Pref., Japan. FAKU 66588***, 38.0 mm SL, Iburi, Kochi Pref., Japan. FAKU 67010*, 70343*, 70345*, 75570*, 123.8–149.2 mm SL, Hayase, Fukui Pref., Japan. FAKU 67051*, 67054*, 67056*, 67062–67064*, 141.9–167.0 mm SL, Hatsushima, Wakayama Pref., Japan. FAKU 69074*, 114.8 mm SL, Dohnoura, Tokushima Pref., Japan. FAKU 69340*, 69343*, 69344*, 69347*, 129.1–154.1 mm SL, Kuzaki, Mie Pref., Japan. FAKU 69930*, 127.5 mm SL, Hiruga-ko, Fukui Pref., Japan. FAKU 70115*, 70817*, 131.6–194.1 mm SL, Nanao, Ishikawa Pref., Japan. FAKU 70813*, 164.9 mm SL, Noto, Ishikawa Pref., Japan. FAKU 74403*, 74415–74418*, 74436–74445*, 128.9–163.0 mm SL, Ogi, Ishikawa Pref., Japan. FAKU 75312, 197.9 mm SL, Sakito, Nagasaki Pref., Japan. FAKU 81609–81610*, 133.2–150.7 mm SL, Miyako, Iwate Pref., Japan. FAKU 81733*, 81736*, 120.0–137.5 mm SL, Suma, Hyogo Pref., Japan. FAKU 82459*, 82461–82465*, 82467*, 82468*, 82.7–93.3 mm SL, Tarumi, Hyogo Pref., Japan. FAKU 86942*, 82.8 mm SL, Ogi, Ishikawa Pref., Japan. RMNH D575** (lectotype of *S. ventricosus*), 226.8 mm SL, Japan, 1834, collected by Burger. SU 7194** (paratypes of *S. guentheri*, in part, 1 of 4), 173.1 mm SL, Kii Suido, Wakayama Pref., Japan. SU 7372** (holotype of *S. guentheri*), 152.5 mm SL, Kii Suido, Wakayama Pref., Japan. SU 22641** (in part, 2 of 3), 143.6, 150.9 mm SL, Osaka Pref., Japan.

Diagnosis. Body somewhat greenish-black dorsally, dark silverish ventrally when fresh; pectoral fin black when fresh; pelvic fin whitish with dark posterior tip when fresh; pectoral fin length moderate, not extending posteriorly to above anus when depressed; tips of pectoral and pelvic fins somewhat rounded; pectoral-fin rays usually 16 (rarely 15 or 17); pored lateral line scales 43–49 (mode 46); gill rakers 35–39 (mode 37).

Description. Counts and proportional measurements shown in Table 4.

Body oblong, somewhat high, nape rounded. Body and head usually completely covered with ctenoid scales, but tip of snout without scales in some specimens. Scales not deciduous. Eye moderate, less than one third of head length. Mouth terminal, moderately oblique, reaching to below center of pupil. In larger specimens (over ca. 160 mm SL, including lectotype), tip of snout below level of pupil. Caudal fin slightly notched in middle or truncate (damaged in lectotype). Pectoral fin moderate usually shorter than or sometimes just reaching to above anus. Lower half of pectoral-fin rays (6–8, mode 7, including lectotype) unbranched. Pelvic fin reach anus or not when depressed. Tips of pectoral and pelvic fins usually somewhat rounded.

Size. Maximum recorded size 226.8 mm SL (lectotype of *S. ventricosus*), but adults usually less than 200 mm SL.

Color in life (Figs. 1b, 2b). Body somewhat greenish-black dorsally, dark silverish ventrally. Black vertical bands on body. Black marking below eye, sometimes indistinct. Interorbital region uniformly greenish-black, lacking stripes or dots (Fig. 2b). Cornea margined with greenish-black. Maxilla usually margined with black ventrally. Upper half of soft-rayed portion of dorsal fin black. Caudal fin usually uniform black, but sometimes paler on posterior half, rays somewhat paler. Anal fin black, rays somewhat paler. Pectoral fin gray, somewhat darker basally. Pelvic fin black, spine and rays somewhat paler or whitish. In specimens under ca. 100 mm SL, body somewhat reddish ventrally, ventral half of pectoral fin somewhat reddish and pelvic-fin rays somewhat reddish.

Color when fresh (Fig. 3b). Body somewhat greenish-black dorsally, dark silverish ventrally. Greenish coloration usually faint, occasionally lost. Vertical bands on body faint or remaining only as black blotches. Black marking below eye usually paler. Cornea margined with black. Maxillary usually margined ventrally with black. Dorsal fin

uniformly black, margin of soft-rayed portion paler. Caudal fins black, posterior half sometimes paler. Anal fin black, but rays somewhat paler. Pectoral fin usually black. Pelvic fin white or pale gray, with dark posterior tip. In specimens under ca. 100 mm SL, body pale grey dorsally, pale red ventrally; dorsal fin somewhat paler; anal-fin rays reddish; lower half of pectoral fin somewhat pale brown or reddish; pelvic-fin rays reddish.

Color in alcohol. Body black or dark brown dorsally, paler ventrally, lateral line somewhat paler. Anterior three vertical bands lost, remaining bands usually as indistinct patches of irregular black spots. Dark marking below eye. Dorsal fin black, lower half of soft-rayed portion somewhat pale. Anal fin dark, distal margin somewhat dark brown or blackish posteriorly. Caudal fin faintly dark, posterior half dark, rays pale. Pectoral fin dark, basal part somewhat paler. Pelvic fin faintly dark, tip somewhat darker.

Distribution and habitat. Distributed from Iwate and Ishikawa Pref. southward to Kyushu, Japan, and southern part of Korean Peninsula (Fig. 5b). More abundant along coasts facing the open sea (e.g., more common along the Pacific coast of southern Wakayama Prefecture than in the Seto Inland Sea). Solitary inhabiting rocky reefs, usually motionless near bottom, occasionally resting on substrate (Keiichi Sakai, personal communication).

Remarks. The lectotype of *Sebastes ventricosus* Temminck and Schlegel 1843 (RMNH D575, Fig. 4c) is a somewhat deformed and slightly damaged stuffed specimen with 16 pectoral- and 7 anal-fin rays, a small eye (10.4% SL, right side without artificial eye) and short pectoral fin (25.7% of SL). Furthermore, the figure given by Temminck and Schlegel (1843) shows a short pelvic fin (not reaching the anus) and blackish body, somewhat greenish dorsally. Such characters agreed well with specimens of morphotype B (Kai and Nakabo 2002), which are here regarded as *S. ventricosus*.

The original description of *Sebastodes guentheri* was based on a single specimen, SU 7372, although specimens registered as USNM 50904 were noted as cotypes. On the other hand, Böhlke (1953) noted "Holotype: SU 7372; Wakanoura, Japan. Collectors: D. S. Jordan and J. O. Snyder; summer of 1900. Paratypes (4): SU 7194; data exactly as for holotype." Subsequently, Eschmeyer (1998) described the types and related specimens of *S. guentheri* as follow; "Holotype: SU 7372. Paratypes: USNM 50904 (1?). Additional material: SU 7194 (4)." Although the relationship between USNM 50904 and SU 7194 remains unclear, SU 7372 is the holotype of *S. guentheri* according to Article 73. 1. 1. (ICZN 1999). That specimen (Fig. 4D) has a small eye (9.3% SL), short pectoral fin (29.8% SL) and 16 pectoral fin rays. Furthermore, the original description included the coloration of the species as "black on back and sides, dusky silvery below," probably based on a fresh specimen, as the holotype was collected by D.S. Jordan. These characters conform to those of *S. ventricosus* as recognized here, indicating *S. guentheri* is a junior synonym of the latter. However, USNM 50904 was identified as *S. cheni*, having 17 pectoral-fin rays, and low numbers of pored lateral line scales (41) and gill rakers (34). One of the four specimens of SU 7194 was identified as *S. ventricosus*, having 16 pectoral-fin rays and a larger number of pored lateral line scales (48), but the other three specimens could not be identified owing to equivocal pored lateral line scale counts.

As noted in Materials and methods, 28 specimens among Barsukov's (1988) materials were considered as his *S. ventricosus* (Table 3). SU 7372 (holotype of *S. guentheri*) and one (173.1 mm SL) of the four specimens of SU 7194 agreed with *S. ventricosus* as noted above, and two (143.6 and 150.9 mm SL) of the three specimens of SU 22641 agreed with *S. ventricosus* in having 16 pectoral-fin rays, a larger number of pored lateral line scales (43–47) and the number of gill rakers (38–39). One (124.7 mm SL) of the five specimens of SU 7178 was identified as *S. inermis* in having low numbers of pored lateral line scales (41) and number of gill rakers (31) (see remarks under *S. inermis*). Two specimens of ZIN 22679 and two (118.5 and 160.3 mm SL) of the three specimens of ZIN 43647 could not be identified as noted above. In addition, two (100.6 and 148.1 mm SL) of the four specimens of CAS 45865, five (113.8, 119.6, 129.7, 133.0 and 134.0 mm SL) of the six specimens of CAS 45867, one (132.7 mm SL) of the five specimens of SU 7178, three (116.6, 135.9 and 165.3 mm SL) of the four specimens of SU 7194, one (79.8 mm SL) of the five specimens of SU 7434 and one specimen of SU 26556 could not be identified because of the equivocal pectoral- and anal-fin ray, pored lateral line scale, and gill-raker counts (Table 3). As well, one [149 mm SL in Barsukov (1988)] of the four specimens of CAS 45865, two [148 and 161 mm SL in Barsukov (1988)] of the three specimens of ZIN 22682 and one of the three specimens of ZIN 22611 were not found in the CAS or ZIN collections. Barsukov (1988) identified CAS 45866 (five specimens, paralectotypes of *S. cheni*) as *S. cheni*; we identified two of them as *S. ventricosus*, as stated in remarks under *S. cheni*.

Although Barsukov (2003) described *S. ventricosus* as the species usually having 17 pectoral-fin rays, 41–44 pored lateral line scales and 35–38 gill rakers, such characters all conform to morphotype C (*S. cheni*) recognized here.

Barsukov (2003) also described *S. guentheri* as a distinct species from *S. ventricosus*, despite earlier (Barsukov 1988) having regarded the former as a junior synonym of the latter. Because no diagnostic characters were given in his description in 2003, supposed differences between *S. ventricosus* and *S. guentheri* sensu Barsukov (2003) are not clear. According to the description of Barsukov (2003), *S. guentheri* had 17 pectoral-fin rays, 35–36 gill rakers and

a pelvic fin length of about 26% SL. However, his illustration of *S. guentheri* indicated 18 pectoral-fin rays and 8 anal-fin rays. These characters are indicative of *S. cheni*, as recognized here.

A juvenile *S. inermis* described by Murai (2001), characterized by a reddish body, was identified here as *S. ventricosus* on the basis of having 16 pectoral-fin rays and 44 pored lateral line scales. Furthermore, specific AFLP fragments also supported the latter identification (Y. Kai, K. Sakai, R. Doiuchi, and T. Nakabo, unpublished data). As the color patterns of juveniles differ significantly from conspecific adults, the descriptive morphology of juveniles in the *S. inermis* species complex will be presented in a forthcoming paper.

The Japanese name "Kuro-mebaru" was first applied to *S. ventricosus* by Ishikawa and Matsuüra (1897), following a local name used in the Tokyo Fish Market, near Misaki. We here use "Kuro-mebaru" as the standard Japanese name of *S. ventricosus*.

***Sebastes cheni* Barsukov 1988** (Japanese name: Shiro-mebaru) (Figs. 1c, 2c, 3c, 4e)

Sebastes (*Sebastodes*) *cheni* Barsukov 1988: 19 (type locality: Tsuruga, Fukui Pref., Japan); Barsukov 2003: 159 (Fukui Pref., Japan, Busan, Korea).

Sebastes inermis (not of Cuvier); ? Steindachner and Döderlein 1884: 205, (Tokyo Pref., Japan); Hiyama and Yasuda 1961: 110, pl. 146–251 (Japan and Korea); Amaoka 1984: pl. 276-H (Japan); Kanayama and Kitagawa 1982: 36, upper color photo (Iwate Pref., Japan); Lindberg and Krasyukova 1987: 58–60, in part (Busan); Masuda and Kobayashi 1994: 83, color photo (Izu, Shizuoka Pref., Japan); Amaoka et al. 1995: 138, pl. 223 (northern Japan); Nakabo 1995: 44–48, color photos, in part (Wakasa-ohshima, Fukui Pref., Toyoshima, Hiroshima Pref., Hamasaka and Awaji, Hyogo Pref., Ijika and Osatsu, Mie Pref., Shimotsui and Mushiage, Okayama Pref., Nanko, Osaka Pref., Japan); Yamada et al. 1995: 26, pl. 95; Yokogawa 1997: 27, color photo (Seto Inland Sea, Japan); Taguchi 1999: 90, color photos, in part (Shizuoka Pref., Niigata Pref., Japan); Nakabo 2002: 592, whitish type (Japan); Kim et al. 2004: 98, color photo (Korea).

Sebastes ventricosus (not of Temminck and Schlegel): Lindberg and Krasyukova 1987: 60–62, fig. 24, in part (Tsuruga, Fukui Pref., Japan); Barsukov 1988: 20, in part (Wakayama Pref., Japan); Barsukov 2003: 158, in part (Japan).

Sebastes (*Mebarus*) *inermis* (not of Cuvier): Matsubara 1943: 195–196, 204–205, in part (?Japan and Korea); Matsubara 1955: 1074, in part; Chen 1985: 23–37, in part (Japan).

Sebastes inermis, morphotype C: Kai and Nakabo 2002: 260–261, fig. 1G-I (Fukui Pref., Noto, Ishikawa Pref., Mie Pref., Osaka Pref., Tokushima Pref., Japan).

Sebastes guentheri (not of Jordan and Starks): Barsukov 2003: 147–148, fig. 59, in part (Wakayama Pref., Tsuruga, Fukui Pref., Japan).

Sebastodes inermis (not of Cuvier): ? Jordan and Evermann 1896: Cuvier and Valenciennes 1829, [followed Steindachner and Döderlein (1884)]; Jordan and Starks 1904: 103–104, in part (Japan); Jordan and Hubbs 1925: 262–263, in part (Japan); Matsubara 1935: 217–223, in part (?Japan and Korea); Okada et al. 1935: the lowest photo of pl. 112 (Japan); Moiseyev 1937: 126, in part (Tsuruga, Fukui Pref., Japan).

Sebastodes tokionis (not of Jordan and Starks): Jordan and Hubbs 1925: 263–264, in part (Kanagawa Pref., Japan)

Sebastodes (*Sebastosomus*) *inermis* (not of Cuvier): ? Schmidt 1931: 95, in part (Japan).

Sebastodes (*Sebastosomus*) *tokionis* (not of Jordan and Starks): ? Schmidt 1931: 95–96, in part, fig. 22 (Japan).

Lectotype (designated here) (Fig. 4e). ZIN 22958, 184.2 mm SL, Tsuruga, Fukui Pref., Japan, September 1, 1917.

Paralectotypes (identified as *S. cheni*). 12 specimens. CAS 45866 (in part, 1 of 5 specimens), 112.4 mm SL, Tokyo Pref., Japan. CAS 221441 [ex. CAS 45864 (part)], 152.2 mm SL, Tottori Pref., Japan. CAS 221442 [ex. CAS 45867 (part)], 139.0 mm SL, Akita Pref., Japan. SU 23647 (2 specimens), 136.2, 175.6 mm SL, Naoetsu, Niigata Pref., Japan. SU 29095 (2 specimens), 170.0–210.9 mm SL, Sendai, Miyagi Pref., Japan. SU 69872 [ex. SU 22641 (part)], 145.8 mm SL, Osaka Pref., Japan. SU 69870 [in part, 2 of 3, ex. SU 4620 (part)], 109.3, 168.4 mm SL, Tokyo Pref., Japan. SU 69871 [ex. SU 7178 (part)], 185.8 mm SL, Tokyo Pref., Japan. ZIN 44651 [ex. ZIN 43647 (part)], 118.5 mm SL, Busan, Korea.

Paralectotypes (identified as *S. ventricosus*). 2 specimens. CAS 45866 (in part, 2 of 4), 122.7, 124.6 mm SL, Tokyo Pref., Japan.

Paralectotypes (unidentified). 9 specimens. CAS 45866 (in part, 2 of 4), 127.0–130.0 mm SL, Tokyo Pref., Japan. SU 69870 [in part, 1 of 3, ex. SU 4620 (part)], 175.3 mm SL, Tokyo Pref., Japan. ZIN 22683 [in part, 1 of 2, 137 mm SL, see Barsukov (1988)], Misaki, Kanagawa Pref., Japan. ZIN 45486, 135.6 mm SL, Nagasaki Pref., Japan. Uncataloged specimens used in Barsukov (1988) (4 specimens): 121 mm, Chiba Pref., Japan; 48–51 mm SL (2 specimens), Kobe, Hyogo Pref., Japan; 127 mm SL, Yeosu, Korea.

Paralectotypes (not Scorpaeniformes). 1 specimen. CAS 1318 [99 mm SL in Barsukov (1988)], Hiroshima Pref., Japan.

Other materials. 46 specimens. 47 specimens subjected to taking counts and measurements and genetic examination indicated by asterisk (*), counts and measurements only (2) by double asterisk (**). Other (1) not subjected to taking counts and measurements or genetic examination without asterisk. FAKU 66334*, 66335*, 66339*, 157.6–186.9 mm SL, Nanko, Osaka Pref., Japan. FAKU 66345*, 166.0 mm SL, Hayase, Fukui Pref., Japan. FAKU 67009*, 154.3 mm SL, Hiruga-ko, Fukui Pref., Japan. FAKU 69070*, 69072*, 112.2–146.0 mm SL, Dohnoura, Tokushima Pref., Japan. FAKU 70033*, 103.1 mm SL, Okozu, Fukui Pref., Japan. FAKU 70105–70107*, 70109*, 70111*, 70829*, 74366*, 142.4–221.3 mm SL, Nanao, Ishikawa Pref., Japan. FAKU 73685*, 57.0 mm SL, Mushiage, Okayama Pref., Japan. FAKU 74382–74383*, 74392*, 74400*, 153.6–198.1 mm SL, Noto, Ishikawa Pref., Japan. FAKU 74426*, 74428*, 74430*, 74431*, 74446*, 74448–74452*, 120.7–189.8 mm SL, Enome, Ishikawa Pref., Japan. FAKU 74466–74471*, 107.5–154.5 mm SL, Kuzaki, Mie Pref., Japan. FAKU 81734*, 131.8 mm SL, Suma, Hyogo Pref., Japan. FAKU 81811–81813*, 151.3–185.5 mm SL, Shimabara, Nagasaki Pref., Japan. FAKU 82458*, 82460*, 82469*, 82.3–91.2 mm SL, Tarumi, Hyogo Pref., Japan. FAKU 84102, 203.3 mm SL, Kesennuma, Miyagi Pref., Japan. FAKU 86943*, 98.9 mm SL, Ogi, Ishikawa Pref., Japan. SU 7413** (in part, 1 of 4, paralectotype of *S. tokionis*), 115.6 mm SL, Misaki, Shizuoka, Japan. USNM 50904** (paratype of *S. guentheri*), 130.6 mm SL, Japan.

Diagnosis. Body dark golden-brown dorsally and laterally, pale brown or white ventrally when fresh; pectoral fin reddish-brown or pale brown, but dark brown in larger specimens (over ca. 200 mm SL); pelvic fin usually pale brown, dusky posteriorly, rays whitish or paler, when fresh; pectoral fin relatively short, not reaching above anus; pelvic fin long, extending past anus when depressed; tips of pectoral and pelvic fins somewhat rounded; counts of pectoral fin rays 17 (rarely 16), pored lateral line scales 37–46 (mode 41); gill rakers 32–37 (mode 34).

Description. Counts and proportional measurements of the lectotype, paralectotypes, and other materials shown in Table 4.

Body oblong, moderately high, nape somewhat convex. Ctenoid scales on head and body, sometimes absent from snout tip. Scales somewhat deciduous. Eye large, about one third of head length. Mouth terminal, moderately oblique, reaching to below posterior edge of pupil. Tooth patch on tip of lower jaw protruding in larger male specimens (over ca. 150 mm SL, including lectotype); females and smaller specimens without distinct tooth block. Caudal fin (broken in lectotype) usually truncate, slightly notched in middle in some specimens. Pectoral fin (broken in lectotype) relatively short, almost reaching to above anus. Lower half of pectoral-fin rays (7–9, mode 8, including lectotype) unbranched. Pelvic fin long, extending past anal fin origin in lectotype (usually reaching to above anus in other specimens) when depressed. Tips of pectoral (pectoral fin broken in lectotype) and pelvic fins usually moderately rounded (including lectotype).

Size. Adults attain over 200 mm SL, maximum size 221.3 mm SL in this study.

Color in life (Figs. 1c, 2c). Body golden-brown or brown dorsally, whitish or golden-brown laterally, white ventrally. Vertical bands on body brown or dark brown, sometimes absent except for basal part of dorsal fin. Brown marking usually present under eye, but sometimes indistinct. Cornea margined with yellow or light brown. Margin of maxilla usually margined with dark brown. Interorbital region uniformly dark brown, usually lacking stripes or dots, rarely with a faint stripe (Fig. 2c). Upper half of soft-rayed portion of dorsal fin pale brown, lower half usually with two brown vertical bands. Caudal fin light brown or brown, distal margin and rays somewhat paler. Pectoral fin pale brown, darker basally. Pelvic fin light brown, somewhat paler on posterior half, rays whitish.

Color when fresh. Body usually dark golden-brown dorsally and laterally, pale brown or whitish ventrally. In some specimens, body pale brown dorsally and whitish laterally and ventrally. Vertical bands usually lost or faint. Indistinct brown marking below eye. Cornea margined with brown. Margin of maxilla usually dark brown, pale brown in some specimens. Dorsal fin dark brown, spinous portion somewhat pale. Caudal dark brown with paler margin. Anal fin dark brown, basal part darker, rays somewhat paler. Pectoral fin reddish-brown or pale brown, but dark brown in specimens over ca. 200 mm SL. Pelvic fin usually pale brown, dusky posteriorly, rays paler or whitish. Pelvic fin white in some specimens.

Color in alcohol (Fig. 3c). Body brown, paler or whitish ventrally (paler ventrally in lectotype). Anterior three vertical bands lost, two posterior bands represented by patches of irregular dark brown spots in most specimens. Dark marking below eye. Dorsal fin dark, soft-rayed portion margined with black. Anal fin dark, basal part of soft-rayed portion somewhat paler. Caudal fin faintly dark, sometimes with darker margin (damaged in lectotype). Pectoral and pelvic fins paler including lectotype, or whitish. Distal margin of pelvic fin dark.

Distribution and habitat. Distributed from Iwate and Akita Pref. southward to Kyushu, Japan, and southern part of Korean Peninsula (Fig. 5c). Most common of the three species of *S. inermis* species complex around Japan. Usually inhabits inner coastal areas (c.f. *S. ventricosus*), often motionless in loose aggregations just above protective recesses of rocky shores (Keiichi Sakai, personal communication).

Remarks. Barsukov's (1988) original description of *Sebastes* (*Sebastodes*) *cheni* noted the species usually has 17, rarely 16 or 18 pectoral-fin rays, but failed to designate type specimens. However, 25 specimens deposited in CAS, SU and ZIN were here regarded to be used in Barsukov's (1988) description of *S. cheni* and are automatically considered to be the syntypes of *S. cheni*, according to Article 73.2 of ICZN (1999).

Among the syntypes of *S. cheni*, ZIN 22958 (one specimen; *S. inermis* in Moiseyev 1937, and *S. ventricosus* in Lindberg and Krasyukova 1987) and one (118.5 mm SL) of the three specimens of ZIN 43647 (*S. inermis* in Lindberg and Krasyukova 1987) were identified as our morphotype C as noted above. In addition, one (152.2 mm SL) of the five specimens of CAS 45864, one (112.4 mm SL) of the five specimens of CAS 45866, one (139.0 mm SL) of the six specimens of CAS 45867, two (109.3 and 168.4 mm SL) of the four specimens of SU 4260, one (185.8 mm SL) of the five specimens of SU 7178, one (145.8 mm SL) of the three specimens of SU 22641, two specimens of SU 23647 and two specimens of SU 29095 also agreed with our morphotype C in having 17 pectoral-fin rays and lower numbers of pored lateral line scales (38–43) and gill rakers (33–36). Two of the five specimens of CAS 45866 were identified as *S. ventricosus* (= morphotype B) in having a large number of pored lateral line scales (47–49). Three syntypes (two of the five specimens of CAS 45866 and one of the four specimens of SU 4620) could not be identified because of equivocal counts of pored lateral line scales and gill rakers. One [137 mm SL in Barsukov (1988)] of the two specimens of ZIN 22683 [= ZIN 45487; *S. tokionis* in both Schmidt (1931) and Moiseyev (1937), and *S. ventricosus* in Lindberg and Krasyukova (1987)] has been subsequently lost, and one specimen of ZIN 45486 [formerly ZIN 22682; *S. tokionis* both in Schmidt (1931) and Moiseyev (1937)] could not be identified by us. CAS 1318 (one syntype) was not a member of Scorpaeniformes (D. Catania, personal communication). The status of four other syntypes could not be investigated here because they had not been given catalog numbers in Barsukov (1988).

Barsukov's (1988) *S. cheni* included at least two species, viz. *S. inermis* and *S. ventricosus*. Accordingly, designation of a lectotype is necessary in order to avoid further taxonomic confusion. Syntypes of *S. cheni* comprised 13 specimens of morphotype C, two of *S. ventricosus* (= morphotype B) and 10 unidentifiable or unavailable specimens. Accordingly, we considered that morphotype C should be identified as *S. cheni* and herein designate ZIN 22958 (Fig. 3e), collected from Tsuruga, Fukui Prefecture, Japan, as the lectotype of *S. cheni* in accordance with the ICZN recommendation 74D (ICZN 1999).

Steindachner and Döderlein (1884) reported *S. inermis* from Tokyo Pref., Japan, characterized by the following: dorsal fin XIII, 15; anal fin III, 7; pored lateral line scales 38–42; pelvic fin long, reaching below the level of tip of pectoral fin or reaching the origin of anal fin in some specimens when depressed; and blackish gray or reddish violet colorations. Although the pored lateral line scale counts of *S. inermis* sensu Steindachner and Döderlein (1884) agreed with those of *S. inermis* and *S. cheni* as recognized here, their pelvic fin measurement (nearly reaching to the origin of anal fin when depressed) does not conform to *S. inermis*, and the color description is equivocal. However, they described a long pelvic fin in "*S. inermis*," sometimes reaching the origin of the anal fin when depressed, a characteristic of *S. cheni*. Accordingly, *S. inermis* sensu Steindachner and Döderlein (1884) may have been an example of morphotype C (*S. cheni*).

Photographs of "*S. inermis*" have been published on a number of occasions, including Okada et al. (1935), Amaoka (1984), Amaoka et al. (1995), Yamada et al. (1995), Yokogawa (1997) and Kim et al. (2004). In each of these, the species depicted was *S. cheni* (morphotype C), although the accompanying descriptions varied from having no specific diagnostic characters (Amaoka et al. 1995) to having those of all three species recognized here (Okada et al. 1935; Amaoka 1984; Kim et al. 2004).

Lindberg and Krasyukova (1987) described *S. ventricosus* on the basis of ZIN 22958 [one specimen; *S. inermis* in Moiseyev (1937)], ZIN 45486 [one specimen; formerly ZIN 22682; *S. tokionis* in Moiseyev (1937), not identifiable here] and ZIN 45487 (one specimen, not available here). The figure of *S. ventricosus* shown by Lindberg and Krasyukova (1987) was based on ZIN 22958, which was designated here as the lectotype of *S. cheni*.

Barsukov's (2003) description of *S. cheni* includes the following significant characters: dorsal-fin rays usually 14, pectoral-fin rays usually 17, anal-fin rays usually 8, pored lateral line scales 41–43, and gill rakers 34–36. His description conformed to *S. cheni* as recognized here.

Hiyama and Yasuda (1961) proposed a new Japanese name "Shiro-mebaru" for a whitish variant of their *S. inermis* (herein *S. cheni*). Although they treated *S. cheni* as an intraspecific color variant of *S. inermis*, "Shiro-mebaru" is rightfully applicable to that species and should be retained as the standard Japanese name.

Remarks on the *Sebastes inermis* species complex

Although Günther (1860) described both *Sebastes inermis* and *S. ventricosus* from the Sea of Japan, the counts of anal-fin rays (6) and pored lateral line scales (60) given for the former and pored lateral line scales (53) for the latter were contrary to those of any species of the *S. inermis* species complex. Furthermore, Günther's (1860)

descriptions of these two species of "*Sebastes*" failed to conform with the diagnostic characters of any species of *Sebastes* from the northwest Pacific. Accordingly, the identities of *S. inermis* and *S. ventricosus* sensu Günther (1860) could not be confirmed. Jordan and Evermann (1896) subsequently described *S. ventricosus* following Günther (1860); the identity of that species is unclear.

Bleeker (1857) reported *S. ventricosus* from Nagasaki, Japan, characterized as follows: pectoral fin rounded; dorsal fin XIII, 14; anal fin III, 8–9; pectoral fin 17; and pored lateral line scales ca. 50. Although the rounded pectoral fin and dorsal-, anal- and pectoral-fin counts agreed with those of *S. cheni*, the pored lateral line scale counts indicated *S. ventricosus*. Accordingly, *S. ventricosus* sensu Bleeker (1854) could not be identified clearly with a particular species.

Sebastodes inermis and *S. tokionis* from Japan (Snyder 1912), *Sebastodes inermis* and *S. guentheri* from Korea (Jordan and Metz 1913) and *Sebastodes inermis* and *S. tokionis* from Japan (Jordan and Thompson 1914) were listed without descriptions and remain unclear for their taxonomic status.

Some confusion over the status of *Sparus fuscens* Houttuyn (1782) has persisted since Jordan and Snyder (1901) described *Sebastes fuscescens* (Houttuyn 1782) as a senior synonym of *S. inermis* and *S. ventricosus.* However, Jordan and Starks (1904), Schmidt (1931) and Tortonese (1939) considered *S. fuscescens* to be a valid species, being a senior synonym of *S. schlegelii* rather than *S. inermis* or *S. ventricosus*. In fact, their descriptions differed from those of the three species in the *S. inermis* complex in having three lachrymal spines, as does *S. schlegelii* (e.g., Nakabo 2002). Synder (1912) and Jordan and Hubbs (1925) also listed *S. fuscens* as valid, without descriptions, probably following Jordan and Starks (1904). On the other hand, Lindberg and Krasyukova (1987) and Matsubara (1943) considered *S. fuscescens* as questionable, but included it under *S. schlegelii*. Because the whereabouts of the holotype of *Sparus fuscescens* is unknown (Eschmeyer et al. 1988) and the description is insufficient for confident species determination, we regarded *Sparus fuscescens* as a nomen dubium.

Morphological key to the three species of the *Sebastes inermis* species complex

1a. Body somewhat greenish-black dorsally, dark silverish ventrally, pectoral fin black, and pelvic fin whitish with dark posterior tip when fresh. Body black or dark brown dorsally in alcohol. Nape rounded. Scales not deciduous. Counts of pectoral-fin rays usually 16, pored lateral line scales 43–49 (usually 45–46), gill rakers 35–39 (usually 36–37).....*S. ventricosus*

1b. Body and pectoral fin reddish to dark brownish when fresh (not darker). Body brown or light brown in alcohol. Nape somewhat convex. Scales deciduous. Counts of pectoral-fin rays usually 15 or 17, pored lateral line scales 36–46 (usually 40–43), gill rakers 31–37 (usually 33–35).....2

2a. Body dark red or light brown dorsally and laterally, somewhat whitish ventrally, when fresh. Body light brown in alcohol. Interorbital region with reddish irregular stripes and some dots in life. Pectoral and pelvic fins dark red or orange when fresh. Body sometimes brown dorsally and laterally, tending orange ventrally when fresh; pectoral and pelvic fins dark brown, rays orange when fresh. Pectoral fin long, extending past anus. Pelvic fin rather short, reaching to or past anus when depressed. Tips of pectoral and pelvic fins pointed. Pectoral-fin rays usually 15.....*S. inermis*

2b. Body dark golden-brown dorsally and laterally, pale brown or whitish ventrally, when fresh. Body brown in alcohol. Interorbital region without distinct markings in life. Pectoral fin reddish-brown or pale brown (dark brown in specimens over ca. 200 mm SL) when fresh; pelvic fin usually pale brown, dusky posteriorly, but rays whitish when fresh. Pectoral fin rather short, not reaching to anus. Pelvic fin long, extending past anus when depressed. Tips of pectoral and pelvic fins somewhat rounded. Pectoral-fin rays usually 17.....*S. cheni*

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