Species Diversity **18**: 175–182
25 November 2013
DOI: 10.12782/sd.18.2.175

First Record of the Rockfish *Sebastes melanops* from the Western North Pacific, with Comments on its Synonymy (Osteichthyes: Scorpaenoidei: Sebastidae)

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(Received 13 March 2013; Accepted 31 July 2013)

Sebastes melanops Girard, 1856, formerly known from the Aleutian Islands and the southeastern Bering Sea to Baja California, USA, is reported from the western Pacific on the basis of two specimens collected from Iwate Prefecture on the Pacific coast of northern Japan. One of the Japanese specimens is described here in detail and compared with specimens from the eastern North Pacific. Sequence data from the mitochondrial DNA control region of this species are also provided and compared with closely related congeners. *Sebastes columbianus* (Hubbs and Schultz, 1933) is herein regarded as a junior synonym of *S. melanops* on the basis of an examination of type specimens. Conversely, another supposed junior synonym, *S. simulans* (Gill, 1864) may not be conspecific with *S. melanops*.

Key Words: Teleostei, Actinopterygii, distribution, mitochondrial DNA, *Sebastes columbianus*, *Sebastes simulans*.

Introduction

The rockfish genus *Sebastes* Cuvier, 1829 is the most species-rich genus in the Sebastidae, containing over 110 species (Nelson 2006) characterized by having a round pectoral fin, 13–15 dorsal-fin spines, and a posteriorly pointed suborbital stay that is not strongly connected with the preopercle (Matsubara 1943). In Japanese waters, 33 species are now recognized as valid (Kai and Nakabo 2013; Nakabo and Kai 2013).

Sebastes melanops Girard, 1856 is one of the most common rockfishes in the eastern North Pacific, known from the Aleutian Islands off Amchitka Island and the southeastern Bering Sea to Baja California (Kramer and O'Connell 1995; Orr *et al.* 2000; Love *et al.* 2002; Mecklenburg *et al.* 2002) (Fig. 1). Recently, Poltev and Shubin (2013) reported "*S. ciliatus*" from the northern Kuril Islands, but the photo given by them is apparently of *S. melanops* (see "Remarks" section below). Although this could be the first record of *S. melanops* from the western North Pacific, the report of Poltev and Shubin (2013) lacked a detailed morphological description based on voucher specimens. In early 2012, two specimens of *Sebastes melanops* were captured by a set-net in Miyako, Iwate, Japan, representing the first reliable record of this species from the western North Pacific (Fig. 2). In this paper, a detailed description of one of these specimens is provided. Comparisons with eastern Pacific specimens, including type specimens of nominal species related to *S. melanops*, are also made. We conclude that *S. columbianus* (Hubbs and Schultz, 1933) is a junior synonym of *S. melanops*. *Sebastes simulans* (Gill, 1864) has been treated as a junior synonym of *S. melanops* (*e.g.*, Jordan and Evermann 1898; Love *et al.* 2002; Barsukov 2003), but it may not be conspecific with the latter. We also present partial sequences of the mitochondrial control region (mtCR) of Japanese and eastern North Pacific specimens of *S. melanops*, confirming our identification.

Materials and Methods

Methods of counts and measurements generally follow Kai and Nakabo (2008). "Body depth 1" is the distance between the origins of the first dorsal-fin spine and the pelvic-fin spine; "body depth 2" is the distance between the origins of the last dorsal-fin spine and the first anal-fin spine. The last two soft rays of both the dorsal and anal fins were counted as single rays, each pair being associated with a single pterygiophore. Terminology of the head spines fol-

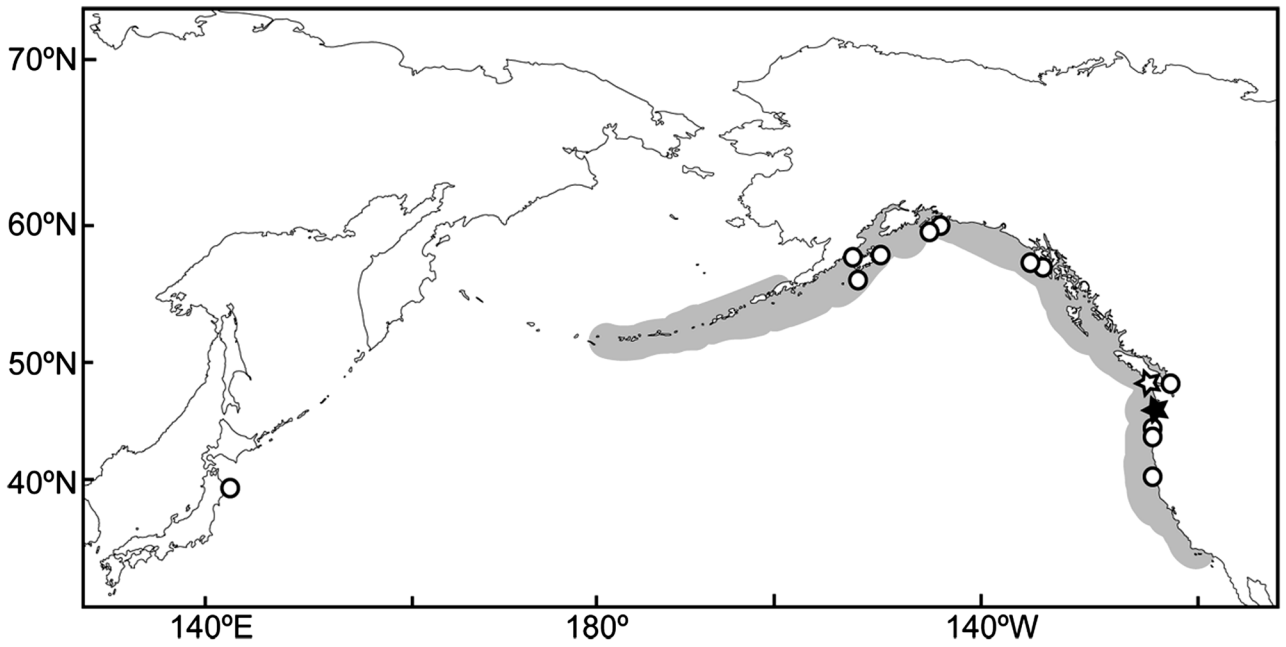

Fig. 1. Distribution of *Sebastes melanops* based on literature records (shaded area) and collection sites of specimens examined (symbols). Open star: syntypes of *S. melanops*; solid star: syntypes of *S. melanops* and *S. columbianus*; open circles: other material.

lows Randall and Eschmeyer (2002: fig. 1). Standard length is abbreviated as SL. The specimens and digital images examined in this study are deposited in the Fish Collection of Kyoto University, Kyoto, Japan (FAKU), the Ichthyological Collection of the Burke Museum, University of Washington, Seattle, WA, USA (UW), the Smithsonian Institution National Museum of Natural History, Suitland, MD, USA (USNM), the Museum of Zoology, University of Michigan, Ann Arbor, MI, USA (UMMZ), the Hokkaido University Museum, Hakodate, Japan (HUMZ), and the National Museum of Nature and Science, Tsukuba, Japan (NSMT). The diagnosis of the species is based on all the specimens examined here, and the description is based on a specimen from Japan (FAKU 134856).

For DNA sequencing, three specimens of *S. melanops* (FAKU 134856, UW 113238, UW 113239) and one specimen of *S. variabilis* (Pallas, 1814) (NSMT-P 76226) were used (see "Materials Examined" section). Total genomic DNA was extracted from muscle tissue preserved in 99.5% ethanol, using the DNeasy Tissue Kit (Qiagen), according to the manufacturer's protocols. The anterior half of mtCR was amplified with the primers L15876 (5′-AAG CAC TTG AAT GAG CTT G-3′; Rocha-Olivares *et al.* 1999) and H16498 (5′-CCT GAA GTA GGA ACC AGA TG-3′; Meyer *et al.* 1990). PCR conditions were: initial denaturation at 94°C for 5 min, followed by 30 cycles of denaturation at 94°C for 15 sec, annealing at 54°C for 15 sec, and extension at 72°C for 30 sec, followed by a final extension step at 72°C for 7 min. The PCR products were purified with ExoSAP-It (USB Corporation) enzyme following the manufacturer's protocols. Automated sequencing was performed for both directions with the primers used in the amplification, using the BigDye terminator sequencing kit (Applied Biosystems) and a model 310 Sequencer (Applied Biosystems). The DNA sequences were edited with the software 4 Peaks ver. 1.7.2 (available at http://www.mekentosj.com/science/4peaks). The sequences determined here were aligned with each other by using the program Clustal X (Thompson *et al.* 1997), and also with the sequences of closely related species of *Sebastes* deposited at the DNA Data Bank of Japan (DDBJ) (Hyde and Vetter 2007): *S. ciliatus* (Tilesius, 1813), DQ 678618; *S. flavidus* (Ayres, 1862), DQ 678548; *S. serranoides* (Eigenmann and Eigenmann, 1890), DQ 678575; *S. variabilis*, DQ 678613. The sequence divergences (uncorrected *p*-distance) among specimens were calculated by MEGA 5.05 (Tamura *et al.* 2011). A non-rooted dendrogram was constructed by the neighbor-joining (NJ) algorithm (Saitou and Imanishi 1987) using MEGA 5.05. A pairwise matrix of genetic distances was prepared using Kimura's (1980) two-parameter (K2P) model. No frequency bias was assumed for transitions or transversions. All the sequences determined here are deposited in DDBJ/EMBL/GenBank under Accession numbers AB778920–AB778923.

Sebastes melanops Girard, 1856
[Standard Japanese name: Arasuka-kuro-menuke]
[English name: Black Rockfish]
(Figs 2–3)

Sebastes melanops Girard, 1856: 135 (type locality: Cape Flattery, Washington and Astoria, Oregon, USA); Girard 1859: 81 (Cape Flattery, Washington and Astoria, Oregon, USA); Ueno 1955: 13, fig. 9C (key and list, southern Alaska southward to southern California, USA); Kramer and O'Connell 1995 (key and short description, Aleutian Islands south to Baja California); Orr *et al.* 2000: 27, fig. 7 (key and short description, Aleutian Islands southward to southern California, USA); Love *et al.* 2002: 204 (Aleutian

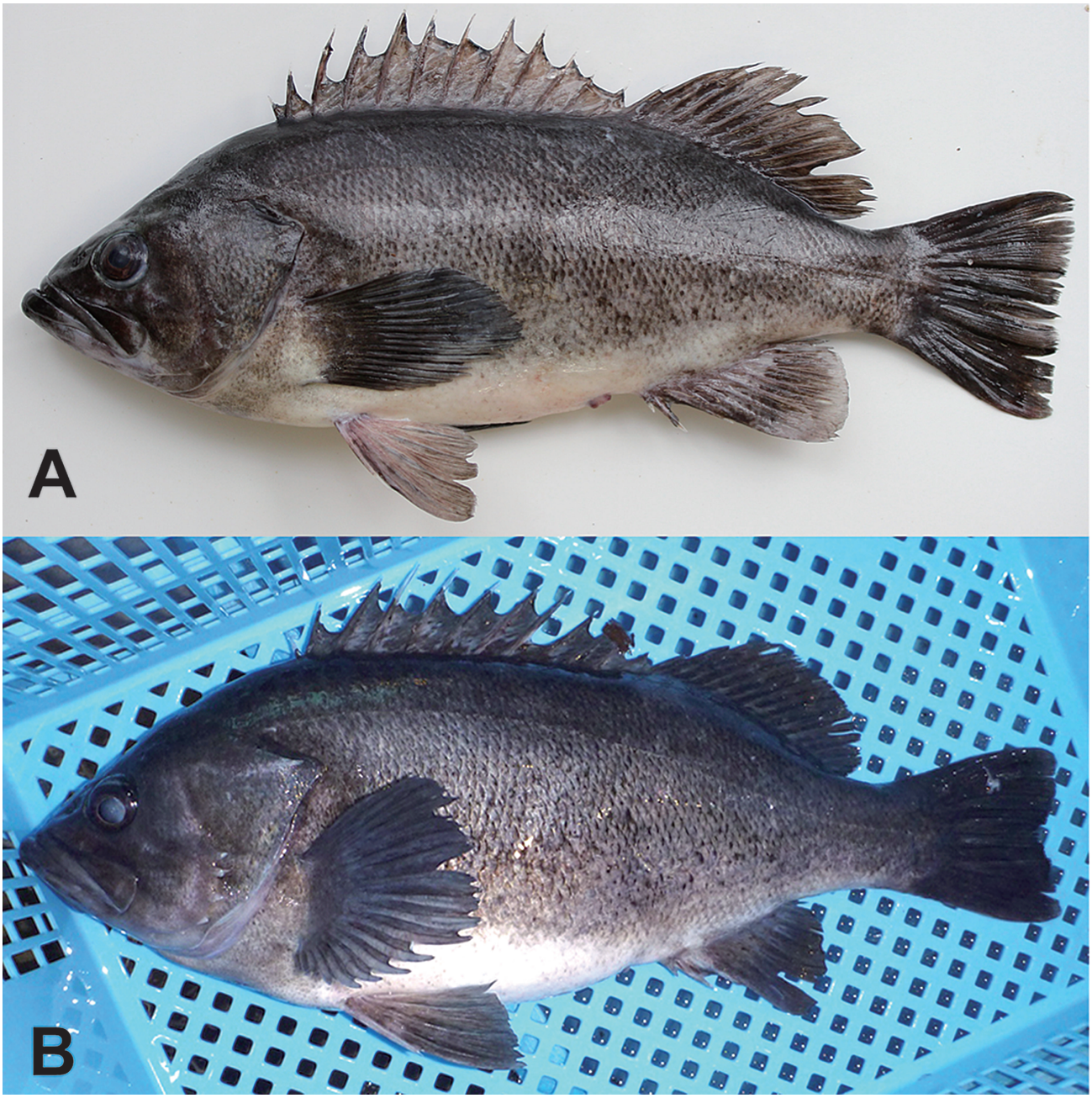

Fig. 2. Color photographs of fresh specimens of *Sebastes melanops*. A: FAKU 134856, 455.0 mm SL, Miyako, Iwate, Japan; B: uncollected specimen, Miyako, Iwate, Japan.

Islands off Amchitka Island to southern California off Huntington Beach, USA); Mecklenburg *et al.* 2002: 361, figure based on Jordan and Evermann (1900) (key and short description, Aleutian Islands off Amchitka Island to southern California off Huntington Beach, USA); Barsukov 2003: 174, fig. 73, pl. 23 (Aleutian Islands to southern California, USA); Orr and Blackburn 2004: 343 (southern Bering Sea).

Sebastes ciliatus (not of Tilesius, 1813): Poltev and Shubin 2013: 191, fig. 2 (east of northern Kuril Islands, Russia).

Sebastodes columbianus Hubbs and Schultz, 1933: 24, pl. 1, fig. 3 (type locality: Columbia River mouth, on the Washington side between Chinook and Sand Islands, USA).

Sebastodes melanops: Jordan and Evermann 1898: 1782 (Monterey Bay northward to Kodiak Island, USA); Jordan and Evermann 1900: fig. 655.

Sebastodes melanops melanops: Alverson and Welander 1952: 138 (Washington, USA, British Columbia, Canada, and adjacent areas).

Sebastodes melanops columbianus: Alverson and Welander 1952: 138 (Columbia River mouth).

? *Sebastosomus simulans* Gill, 1864: 147 (type locality: Cape Flattery, Washington).

Material examined. FAKU 134856, 445.0 mm SL, Miyako, Iwate, Japan, 39.64°N, 141.96°E, 20 April 2012, coll. by T. Noda.

Comparative material. *Sebastes melanops* (24 speci-

mens, 167.4–510.0 mm SL): USNM 342 (syntype of *S. melanops*, dry specimen, snout broken), Astoria, Oregon, coll. by Lt. Trowbridge; UMMZ 94369 (holotype of *S. columbianus*), 427.6 mm SL, Columbia River mouth, on the Washington side between Chinook and Sand Islands, USA; FAKU 122358, 295.8 mm SL, Aleutian Islands, no further detailed collection data; UW 17539, 251.5 mm SL, Humboldt Bay, California, 31 March 1962, coll. by D. Greenfield; UW 41758, 400+ mm SL, Gulf of Alaska, 56.36°N, 154.57°W, 28 June 1996; UW 43057, 235.0 mm SL, Gulf of Alaska, 57.85°N, 152.40°W, 28 July 1977; UW 43252 (3 specimens), 357.0–510.0 mm SL, Gulf of Alaska, 22 July 1996; UW 43421 (2), 386.0 and 423.3 mm SL, Gulf of Alaska, 60.27°N, 145.71°W, 5 September 1993; UW 43422, 410.4 mm SL, Gulf of Alaska, 60.23°N, 146.42°W, 2 April 1994; UW 43425, 410.8 mm SL, Gulf of Alaska, 57.67°N, 155.30°W, 21 March 1994; UW 43489 (3), 167.4–188.8 mm SL, Lisianski Strait, Alaska, 12 July 1998; UW 43490 (2), 177.4 and 213.4 mm SL, Cross Sound, Chichagof Island, Alaska, 11 July 1988; UW 112793–112795 (3), 246.8–307.8 mm SL, 45.48°N, 124.04°W, 29 May 2005; UW 112802, 298.0 mm SL, 45.47°N, 124.01°W, 29 May 2005; UW 113238–113239 (2), 228.1–237.0 mm SL, Whidbey Island, Washington, 48.12°N, 122.43°N, 11 October 2005.

Sebastes ciliatus (11 specimens, 269.1–384.4 mm SL): FAKU 119878, 119880, 376.8 and 384.4 mm SL, 59.33°N, 142.36°W; FAKU 121170, 121171, 121173–121175 (5), 336.0–376.4 mm SL, Gulf of Alaska, 55.24°N, 134.13°W; FAKU 131037, 131038, 284.6 and 269.1 mm SL, Aleutian Islands, 51.96°N, 176.03°E; FAKU 131039, 131040, 297.3 and 348.4 mm SL, Gulf of Alaska, 54.32°N, 161.81°W.

Sebastes mystinus (Jordan and Gilbert, 1881) (2 specimens, 197.9–202.0 mm SL): USNM 27085 (one of three syntypes of *S. mystinus*), 202.0 mm SL, San Francisco, California, USA, coll. by D. S. Jordan; UW 112795, 197.9 mm SL, 45.48°N, 124.04°W.

Sebastes variabilis (7 specimens, 246.1–350.8 mm SL): FAKU S2677, S2679, 328.0 and 345.8 mm SL, Aleutian Islands, 53.39°N, 165.28°W; FAKU S3207, S3210, 332.4 and 350.8 mm SL, Aleutian Islands, 53.37°N, 165.17°W; HUMZ 53427, 319.1 mm SL, Bering Sea, 56.20°N, 169.20°W; NSMT-P 76226, 350.1 mm SL, Pacific coast of eastern Hokkaido, Japan.

Diagnosis. A species of the genus *Sebastes* with the following characters: dorsal fin XII–XIII, 14–16 (usually XIII, 15); anal fin III, 8–9 (usually III, 8); pectoral fin 18–19 (usually 19), ventral 9–10 (usually 10) rays unbranched; head completely covered with scales; nasal spine weak; preocular spine usually absent, small and reduced if present; supraocular spine always absent; postocular spine usually absent, small and reduced if present; parietal spine reduced and covered with small scales; symphyseal knob small or absent; distal margin of anal fin slightly rounded below and slanting anteriorly above; caudal fin not distinctly emarginate; body color in life black dorsally, with light blotches below bases of dorsal fins, becoming gray mottled with black on sides, whitish on belly; peritoneum white.

Description. Counts and measurements of *S. melanops* given in Table 1. Body relatively deep, especially at nape, and compressed. Profile of dorsal margin of head steep from snout to nape. Interorbital region weakly convex. Head and body covered with ctenoid scales with some accessory scales, especially in posterior field. Maxilla, lower jaw, chin, and branchiostegal rays completely covered with small scales. Base of dorsal fin covered with small scales, extending onto spinous and soft-rayed portions. Base of anal fin covered with small scales, extending onto basal membranes.

Nasal spine weak, directed posterodorsally (Fig. 3). Preocular, supraocular, and postocular spines absent. Parietal spine reduced to ridge and covered with small scales (Fig. 3). Anterior and posterior lacrimals both without spine; latter forming weak rounded lobe, its tip below level of anterior margin of pupil. Supracleithral spine simple and flattened, directed posteriorly. Sphenotic, tympanic, and pterotic spines absent. Posttemporal spine embedded, not visible. Preopercle with five diverging spines: upper three large and distinct, directed posteriorly; lower two relatively small and blunt, directed posteroventrally. Opercle with two flattened spines, upper larger than lower, both directed posteriorly. Ventral tip of subopercle and dorsal tip of interopercle each with small spine.

Mouth large, slightly oblique; posterior margin of maxilla extending to posterior rim of orbit. Lower jaw projecting anteriorly; symphyseal knob absent. Mandibular pores small and indistinct except for anteriormost one. Villiform teeth on both jaws, vomer, and palatines; those on vomer forming V-shaped patch. Gill rakers long and slender, longest somewhat shorter than longest gill-filament. Dorsal-fin spines 13, gradually increasing in length to fifth spine, thereafter decreasing in length to 12th spine, 13th spine longer than 12th spine, forming anterior support of soft dorsal fin. Second anal-fin spine shorter than third; second anal-fin ray longest, posterior rays gradually shortening. Distal margin of anal fin slightly rounded below and slanting anteriorly above. Caudal fin not distinctly emarginate, lobes not pointed. Pectoral fin not pointed; its tip not reaching level of anus; ventral 10 rays neither branched nor thickened. Posterior tip of depressed pelvic fin extending to level of pectoral-fin tip, not reaching to anus.

Coloration in life. Body black dorsally, with light blotches below base of dorsal fins, becoming gray mottled with black on sides, whitish on belly. Head black; mandible whitish. Dorsal fin dark bluish-brown with indistinct dark spots on basal part. Anal fin dark bluish-brown, distal margin somewhat paler. Caudal and pectoral fins black. Pelvic fin light bluish-brown, basal part somewhat whitish. Peritoneum white.

Coloration in preservative. Body dark on back, becoming pale with indistinct dark dots on side, light on belly. Head dark; mandible pale. Dorsal, anal, caudal, and pectoral fins dark. Pelvic fin whitish. Peritoneum light.

Distribution. Currently known from the eastern North Pacific, *i.e.*, from the Aleutian Islands off Amchitka Island and the southeastern Bering Sea to Baja California off Huntington Beach, and from the western North Pacific east of the northern Kuril Islands and off Miyako, Iwate, Japan

Table 1. Counts and measurements of *Sebastes melanops*. Modes for counts and means for measurements are in parentheses.

	Syntype of *S. melanops*	Holotype of *S. columbianus*	Japanese specimen	Eastern Pacific specimens
	USNM 342	UMMZ 94369	FAKU 134856	n=25
Standard length (SL, mm)	—	427.6	445.0	167.4–510.0
Counts				
Dorsal-fin rays	XII, 14	XIII, 14	XIII, 15	XII-XIII, 14–16 (XIII, 15)
Anal-fin rays	III, 8	III, 9	III, 8	III, 8–9 (III, 8)
Pectoral-fin rays (left side)	19	19	19	19
Unbranched pectoral-fin rays (left side)	—	9	10	9–10 (10)
Pectoral-fin rays (right side)	—	19	19	18–19 (19)
Unbranched pectoral-fin rays (right side)	—	9	10	9–10 (10)
Pelvic-fin rays	I, 5	I, 5	I, 5	I, 5
Pored lateral-line scales	<50	48	51	47–53 (50)
Gill rakers	—	—	34	32–38 (34)
% of SL				
Head length	—	34.8	34.3	33.2–38.6 (35.5)
Snout length	—	9.2	9.0	8.4–9.9 (9.2)
Orbit diameter	—	6.9	7.5	7.0–9.3 (8.3)
Interorbital width	—	8.2	8.7	7.8–9.3 (8.6)
Body depth 1	—	35.4	36.5	33.5–40.5 (37.1)
Body depth 2	—	30.4	33.2	30.8–36.5 (33.2)
Body width	—	17.0	18.0	16.4–21.4 (18.1)
Upper jaw length	—	16.6	16.3	15.4–17.9 (16.9)
Mandible length	—	20.0	19.8	18.2–21.7 (20.3)
Pre-dorsal-fin length	—	35.5	34.7	32.3–39.3 (35.6)
Pre-anal-fin length	—	69.4	69.6	64.6–72.7 (69.5)
Pre-pelvic-fin length	—	38.2	38.2	38.0–46.8 (40.3)
Pectoral fin length	—	23.3	26.4	25.6–29.9 (27.7)
Pelvic fin length	—	21.2	22.7	21.7–25.8 (24.1)
Pelvic-fin spine length	—	11.1	12.0	11.9–15.1 (13.6)
Caudal fin length	—	16.8	18.6	17.8–21.1 (19.7)
1st dorsal-fin spine length	—	3.4	3.6	3.6–5.5 (4.6)
2nd dorsal-fin spine length	—	—	7.1	6.1–8.6 (7.6)
3rd dorsal-fin spine length	—	—	11.9	10.5–12.8 (11.6)
4th dorsal-fin spine length	—	—	—	11.7–14.6 (13.0)
5th dorsal-fin spine length	—	—	14.4	12.4–15.8 (13.8)
Penultimate dorsal-fin spine length	—	—	6.8	4.8–6.8 (5.4)
Last dorsal-fin spine length	—	—	7.7	6.9–10.1 (8.7)
Longest dorsal-fin soft ray length	—	16.8	16.7	16.0–19.1 (17.1)
1st anal-fin spine length	—	—	3.1	3.1–5.5 (4.2)
2nd anal-fin spine length	—	—	7.6	7.1–10.1 (9.0)
3rd anal-fin spine length	—	—	10.8	8.9–12.4 (10.7)
Longest anal-fin soft ray length	—	17.7	20.9	16.7–22.1 (20.8)
Space between pelvic and anal fins	—	32.9	34.0	27.7–36.5 (32.5)
Caudal peduncle depth	—	11.5	11.9	11.1–13.3 (12.3)
Upper caudal peduncle length	—	12.8	13.8	11.8–14.9 (13.6)
Lower caudal peduncle length	—	19.8	17.8	16.0–22.6 (20.0)

(Kramer and O'Connell 1995; Love *et al.* 2002; Mecklenburg *et al.* 2002; Poltev and Shubin 2013; this study) (Fig. 1).

Remarks. The counts and measurements of the specimen collected from Japan are consistent with those from the eastern North Pacific (Table 1). In addition, the head spine structure, absence of a symphyseal knob, rounded anal fin, and light peritoneum of the Japanese specimen completely agree with the specimens from the eastern North Pacific. In the comparison of mtCR sequence variation (371 aligned base pairs including 5 indels), the Japanese specimen clustered with the eastern North Pacific specimens of *S. melanops* with high bootstrap probability, and were distinct from *S. flavidus* and *S. serranoides*, which were the most closely related species within *Sebastes*, as well as the more distantly related *S. ciliatus* and *S. variabilis* (Hyde and Vetter 2007) (Fig. 4). Although *S. variabilis* was paraphyletic with respect to *S. ciliatus*, such relationships between closely related species are well known in *Sebastes* (reviewed by Muto

et al. 2011). The uncorrected distance between the Japanese and the eastern Pacific specimens of *S. melanops* was 0.27–1.35%, which falls within the typical range of intraspecific variation of *Sebastes* (Kai *et al.* 2002, 2011; Hyde and Vetter 2007; Muto *et al.* 2011). *Sebastes melanops* was previously known from the Aleutian Islands and the southeastern Bering Sea to Baja California, USA, and the present specimen represents the first confirmed record of this species from the western North Pacific (Mecklenburg *et al.* 2002; Parin *et al.* 2002; Barsukov 2003; Nakabo and Kai 2013). An additional specimen (*ca.* 400 mm SL) of *S. melanops* was also captured by a set-net in Miyako, Iwate, Japan (Fig. 2B), but was not available for examination in this study. The presently described specimen was a spent male with small testes, but it is unclear whether this species reproduces in Japanese waters.

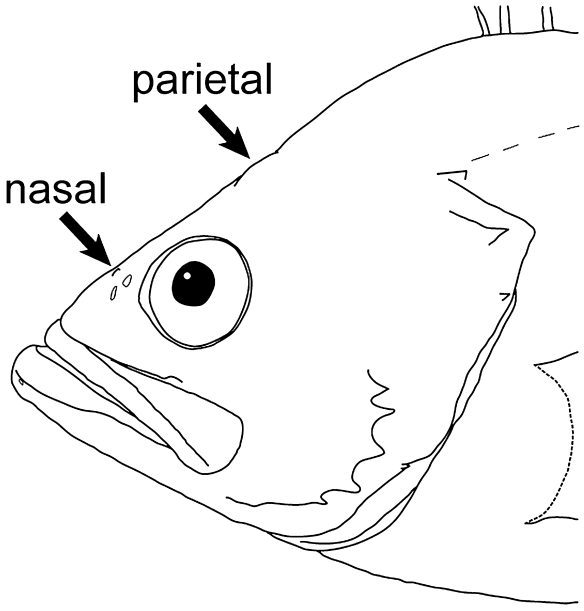

Fig. 3. Lateral view of head of *Sebastes melanops*, FAKU 134856, 455.0 mm SL.

Sebastes melanops was first described by Girard (1856) based on several specimens collected from two localities, Cape Flattery, Washington, and Astoria, Oregon, USA, without designation of a holotype. Therefore, all the specimens used by Girard (1856) are syntypes (Art. 73.2., ICZN 1999) and the type locality of *S. melanops* includes both Cape Flattery and Astoria. Although no catalog numbers of type specimens were given in the original description, USNM 342 (two specimens, collected from Astoria, Oregon, USA) has been regarded as containing the syntypes of *S. melanops* (J. T. Williams, USNM, personal communication; Eschmeyer 2013). Later, Girard (1859) redescribed *S. melanops* on the basis of four specimens: USNM 341 (two specimens, collected from Cape Flattery, Washington, USA) and USNM 342. Because the collection localities of USNM 341 and 342 are the same as the type localities of *S. melanops*, it is most plausible that both USNM 341 and 342 are the syntypes of *S. melanops*. According to Girard (1859), both USNM 341 and 342 included two specimens, but only a single specimen of USNM 342 is now extant in the USNM, and was thus available for this study. The counts of anal- and pectoral-fin rays, and the head spine structure of the present specimens identified as *S. melanops*, including the specimens collected from Japan, agree well with USNM 342. In addition, the original description of Girard (1856) noted that the type specimens had a blackish brown body mottled with black, consistent with the *S. melanops* examined here. However, USNM 342 has 12 dorsal-fin spines, a count different from the present specimens. Species of *Sebastes* usually have 13 dorsal-fin spines (Matsubara 1943), but many species show a range of variability from 12 to 14 spines (*e.g.*, Orr and Blackburn 2004; Kai and Nakabo 2008, 2013). Therefore, we regard the count of 12 dorsal-fin spines of USNM 342 as intraspecific variation within *S. melanops*.

After Girard (1856), Gill (1864) stated that "two spe-

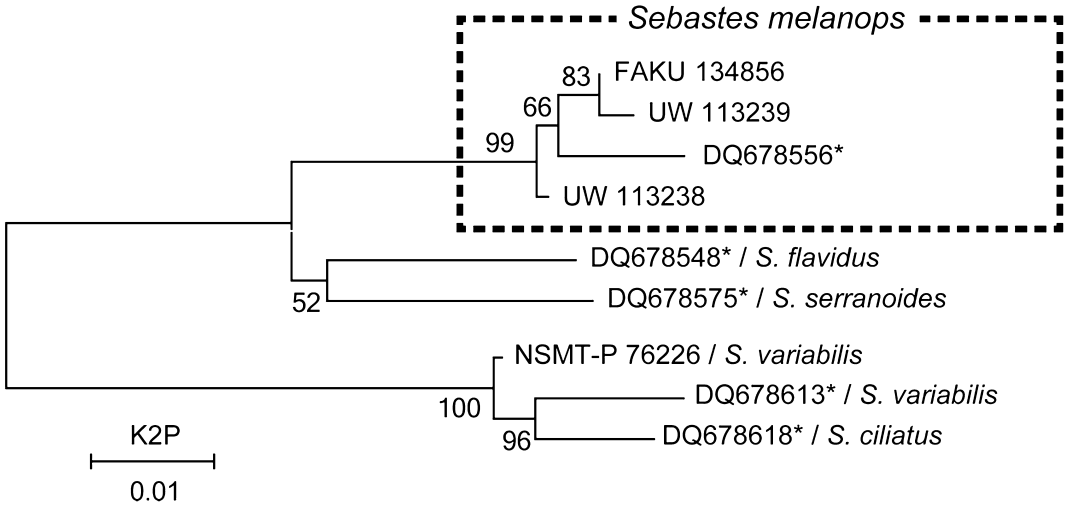

Fig. 4. Unrooted neighbor-joining tree based on sequence variations of the mitochondrial control region. Sequences used here are referred to by catalog numbers of the specimens (determined here) or DDBJ registration numbers (indicated by asterisks, determined in previous studies). Numbers at branches indicate bootstrap probabilities in 1,000 bootstrap replications. The scale bar equals 0.01 of Kimura's (1980) distance.

cies are apparently confused by Girard under the name *Sebastes melanops*." According to Gill (1864), the specimens collected from Astoria and those from Cape Flattery were different species. He claimed the former should be identified as *S. melanops*, and the latter he named as a new species. *Sebastosomus simulans* described on the basis of USNM 3309. This may indicate that USNM 3309 from Cape Flattery is also one of the type series of *Sebastes melanops*, but no such records were found in the database of the USNM (J. T. Williams, personal communication). Although many authors, including Jordan and Evermann (1898), Love *et al.* (2002), and Barsukov (2003), have treated *S. simulans* as a synonym of *S. melanops* without any clear reason, USNM 3309 is inconsistent with the present specimens of *S. melanops* in that it has 18 pectoral-fin rays and a short upper jaw not reaching below the posterior rim of the pupil. We confirmed these characters in USNM 3309 from a photo and a radiograph; thus *S. simulans* may not be conspecific with *S. melanops*. Further study will be needed, including a detailed examination of the holotype, to conclusively determine the status of *S. simulans*.

Hubbs and Schultz (1933) described *Sebastodes columbianus* as a new species on the basis of five specimens collected from the mouth of the Columbia River, Washington, USA. They diagnosed it by its small eye, 14 dorsal-fin rays, and nine unbranched pectoral-fin rays. The holotype of *S. columbianus* (UMMZ 94369) has a relatively smaller eye and shorter pectoral and pelvic fins than the specimens presently identified as *S. melanops*, but these differences seem insignificant and attributable to its large body size (Table 1). In addition, the counts of unbranched pectoral-fin rays and dorsal-fin rays were within the range of the present specimens identified as *S. melanops* (Table 1). Therefore, we regard *S. columbianus* as a junior synonym of *S. melanops*. Alverson and Welander (1952) recognized two subspecies, *S. melanops melanops* and *S. melanops columbianus*, under *S. melanops*, mainly based on a difference in the number of unbranched pectoral-fin rays. They considered *S. melanops columbianus* to be distributed only in the Columbia River mouth, but in tagging experiments, Mathews and Barker (1983) recovered a few individuals of *S. melanops* from the San Juan Islands in areas between Westport, Washington, and the Columbia River mouth, and also mentioned that a tagged *S. melanops* moved 619 km from the central Oregon coast northward into Puget Sound. In addition, USNM 342, one of the syntypes of *S. melanops*, was collected from Astoria, Oregon in the Columbia River mouth, which is very close to the type locality of *S. columbianus*. In the absence of morphological evidence, the recognition of *S. melanops columbianus* as a valid subspecies is thus not appropriate.

Poltev and Shubin (2013) reported "*S. ciliatus*" from the northern Kuril Islands, but the photo given by them agrees instead with the present specimens regarded as *S. melanops* in body coloration and the absence of a symphyseal knob. Although they reported 11 specimens, their report lacked a detailed morphological description based on voucher specimens. Nonetheless, we tentatively identify the two specimens shown in their photo as *S. melanops*, noting that the site is midway between Amchitka Island and the present site off northern Honshu (Fig. 1).

Ueno (1955) proposed new Japanese names for the species of *Sebastes* known from the Bering Sea and Gulf of Alaska provided brief descriptions of them, and also made comparisons with the species known from Japanese waters. Although *S. melanops* had not been recorded previously from these waters, Ueno (1955) gave it the Japanese name "Arasuka-kuro-menuke." We adapt this name here.

Comparison. *Sebastes melanops* most closely resembles *S. ciliatus*, *S. variabilis*, *S. flavidus*, and *S. serranoides* in having a weak head spine structure and dark coloration on the back, but it can be distinguished from them by the symphyseal knob, color of the peritoneum, shape of the anal fin, and the counts of the pectoral-fin rays (Orr *et al.* 2000; Orr and Blackburn 2004; this study). The symphyseal knob is absent or reduced in *S. melanops*, consisting only of a fleshy pad at the tip of the mandible, unlike the distinct bony knob of *S. ciliatus* and *S. variabilis*. In *S. melanops*, the peritoneum is usually light (white in life), but it is typically jet black in *S. ciliatus* and dark gray in *S. variabilis*. The distal margin of the anal fin of *S. ciliatus*, *S. flavidus*, *S. melanops*, and *S. serranoides* is rounded, but that of *S. variabilis* is typically pointed. There are typically 19 pectoral-fin rays in *S. melanops*, but typically 18 in *S. ciliatus*, *S. flavidus*, and *S. variabilis*, and typically 17 in *S. serranoides*.

Sebastes mystinus is also similar to *S. melanops* but may be distinguished by the four distinct dark bars across its head and nape. The mouth of *S. mystinus* is smaller than that of *S. melanops*, and the maxilla extends only to the middle of the pupil rather than reaching the posterior margin of the orbit as in *S. melanops*.

Acknowledgments

We greatly appreciate the help of T. W. Pietsch and K. P. Maslenikov (UW), G. Shinohara and K. Matsuura (NSMT), J. T. Williams, D. G. Smith, S. Raredon, and K. Murphy (USNM), and M. Yabe, H. Imamura, and T. Kawai (HUMZ), who facilitated our visits to examine specimens, and provided gifts of tissue as well as radiographs and photographs. Special thanks also go to D. W. Nelson (UMMZ) for the loan of specimens. D. E. Stevenson and E. A. Laman (NOAA, National Marine Fisheries Service, Alaska Fisheries Science Center) reviewed of earlier drafts. This study was supported in part by a Grant-in-Aid for Scientific Research (B) from the Japan Society for the Promotion of Science (JSPS) (24370036).

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