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(Cuvier, 1829), in Southern Japan (Teleostei: Clupeiformes)**

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Distributional Range Extension of a Clupeid Fish, *Sardinella melanura* (Cuvier, 1829), in Southern Japan (Teleostei: Clupeiformes)

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Abstract. Two specimens (63-94 mm in standard length) of a clupeid fish, *Sardinella melanura* (Cuvier, 1829), collected from Miyazaki, Kyushu Island, southern Japan and 6 specimens (105-124 mm in standard length), originally collected from Tokuno-shima, Ryukyu Islands, southern Japan and subsequently located in a museum collection, represent the first reliable records of the species from Japanese waters except, off the Ogasawara Islands where it has been frequently reported. The 2 specimens from Miyazaki represent the northernmost record for the species.

Key words: Clupeidae; *Sardinella melanura*; distribution; southern Japan.

The clupeid fish, *Sardinella melanura* (Cuvier, 1829), originally described as *Clupea melanura* on the basis of a footnote in Lacepède (1803) (Whitehead, 1967), is distributed in the Indo-West Pacific (Whitehead, 1985). However, although it is known from Chichi-jima and Haha-jima, Ogasawara Islands (e.g. Zama and Fujita, 1977; Hayashi *et al.*, 1991; Randall *et al.*, 1997), the species has not been verified to date on the basis of specimens collected from other Japanese waters (Aonuma, 2000).

Recently, 2 examples of *S. melanura* were collected from Miyazaki, Kyushu, southern Japan during a survey of the fish fauna of the area and 6 examples of the species, collected from Tokuno-shima, Ryukyu Islands, southern Japan, were found in a museum collection. The specimens are described

herein in detail.

Counts and measurements generally followed Hubbs and Lagler (1947), with some modifications following Chan (1965) and Whitehead (1967). Standard length is expressed as SL. Institutional codes follow Leviton *et al.* (1985), with an additional institutional abbreviation as follows: Division of Fisheries Sciences, Miyazaki University, Japan (MUFS).

Sardinella melanura (Cuvier, 1829)

(English name: blacktip sardinella)

(Japanese name: Oguro-iwashi)

(Fig. 1)

Material examined. Eight specimens, 63-124 mm SL. MUFS 13629, 63 mm SL, Meitsu, Nango, Miyazaki, Kyushu, Japan, small set net, less 8 m depth, 15 Nov. 1995, coll. by Y. Iwatsuki; MUFS

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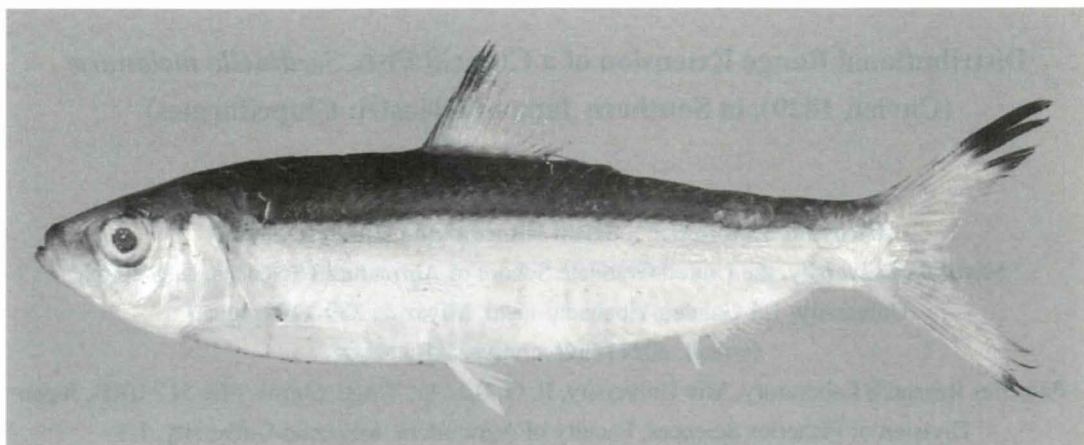


Fig. 1. *Sardinella melanura* (Cuvier, 1829), MUFS 16449, 94 mm SL, Meitsu, Nango, Miyazaki, Kyushu, southern Japan.

16449, 94 mm SL, Meitsu, Nango, Miyazaki, Kyushu, Japan, large set net, less 50 m depth, 21 Oct. 1998, coll. by H. Motomura; URM-P 33569-33574, 6 specimens, 105-124 mm SL, mouth of Akirikami River, Tokuno-shima, Ryukyu Islands, Japan, gill net, less 1 m depth, 17-18 Aug. 1994, coll. by T. Yoshino.

Description. Counts and proportional measurements of the above specimens, expressed as percentages of SL, are given in Table 1. Body oblong, strongly compressed; abdomen with sharply-keeled prepelvic and postpelvic scutes, postpelvic more strongly serrated than prepelvic; pelvic scute with ascending arms; upper jaw rounded without distinct median notch or cleft; posterior margin of upper jaw extended slightly beyond level of anterior margin of eye; 2 supramaxillae present, second symmetrical, paddle-shaped; teeth absent from vomer, palatines and ectopterygoids; 2 fleshy outgrowths on posterior margin of gill opening; opercular smooth, without bony spines; dorsal fin origin before midpoint of body; pectoral fin well below midline of body; pelvic fin origin slightly behind level of dorsal fin origin; anal fin origin behind level of posteriormost dorsal fin ray tip; posteriormost anal fin rays slightly enlarged; caudal fin deeply forked; vertical stripes on scales discontinuous, with a wide gap at center; scales lacking perforations posteriorly.

Color when fresh. Based on a color transparency of MUFS 16449, 94 mm SL: upper sides of head and trunk tinged with blue, becoming silver on lower sides; fin membranes hyaline, except tip of dorsal fin slightly black and tips of caudal fin conspicuously black; no dark spot at dorsal fin origin.

Color in preservative. Upper sides of head and trunk tinged with gray, becoming silver on lower sides; 4 faint dark stripes along longitudinal scale rows above body midline, stripes absent below; tip of dorsal fin slightly black and tips of caudal fin conspicuously black; no dark spot at dorsal fin origin.

Remarks. *Sardinella melanura* is characterized by having 8 pelvic fin rays, 27 to 31 (in total) prepelvic and postpelvic scutes, discontinuous vertical stripes on the scales, no perforations posteriorly on the scales (see Munroe *et al.*, 2000, fig. 16), no dark spot on the dorsal fin origin and the tips of the caudal fin black (Whitehead, 1985; Munroe *et al.*, 2000). Characters of the present specimens, from Miyazaki and Tokuno-shima, Japan, agreed closely with those of *S. melanura* described by Whitehead (1985) and Munroe *et al.* (2000) (see Description, Table 1 and Fig. 1).

In Japanese waters, *S. melanura* has been frequently reported from Chichi-jima and Haha-jima, Ogasawara Islands (*e.g.* Zama and Fujita, 1977;

Table 1. Counts and measurements of specimens of *Sardinella melanura*, expressed as percentages of standard length.

	From Miyazaki, Kyushu, Japan <i>n</i> = 2	From Tokuno-shima, Ryukyu Islands, Japan <i>n</i> = 6
Standard length (mm)	63-94	105-124
Counts		
Dorsal fin rays	16-17	16-18
Anal fin rays	19	19-20
Pectoral fin rays	14-15	14-15
Pelvic fin rays	8	8
Lateral line scales	38-39	38-41
Prepelvic + postpelvic = total scutes	16 + 12-14 = 28-30	15-17 + 12-13 = 27-30
Lower gill rakers	40-47	51-63
Measurements		
Head length	24-26	23-24
Body depth	25-27	26-29
Snout length	7-8	7-8
Eye diameter	7	6-7
Interorbital width	6	5-6
Postorbital length	10-12	9-10
Upper jaw length	11	10
Predorsal fin length	44-48	46-48
Preal anal fin length	74-79	75-77
Pelvic fin origin to anal fin origin	25-29	27-30
Dorsal fin base length	14-15	14-15
Anal fin base length	15-16	14-17
Longest pectoral fin ray length (2nd)	17	16-17
Longest pelvic fin ray length (2nd)	12	11-12
Longest dorsal fin ray length (3rd)	16-19	14-16
Longest anal fin ray length (4th)	5-8	5-6
Caudal peduncle length	10-12	10-13
Caudal peduncle depth	9-11	10
Caudal fin length	29	24-29

Hayashi *et al.*, 1991; Randall *et al.*, 1997; Fig. 2). Although the species was reported from Iriomote-jima, Ryukyu Islands on the basis of an underwater photograph by M. Yano (Sato, 1997; Fig. 2), no specimens were collected. Accordingly, the present specimens, collected from Miyazaki, Kyushu and Tokuno-shima, Ryukyu Islands, represent the first reliable records of the species on the basis of

specimens collected from Japanese waters other than around the Ogasawara Islands, those from Miyazaki constituting the northernmost record of the species (see Fig. 2).

Whitehead (1985) described *S. melanura* as being distributed in the western Indian Ocean (from Gulf of Aden to Madagascar and Mauritius, except in the Persian Gulf and Red Sea) and western Pacific (from

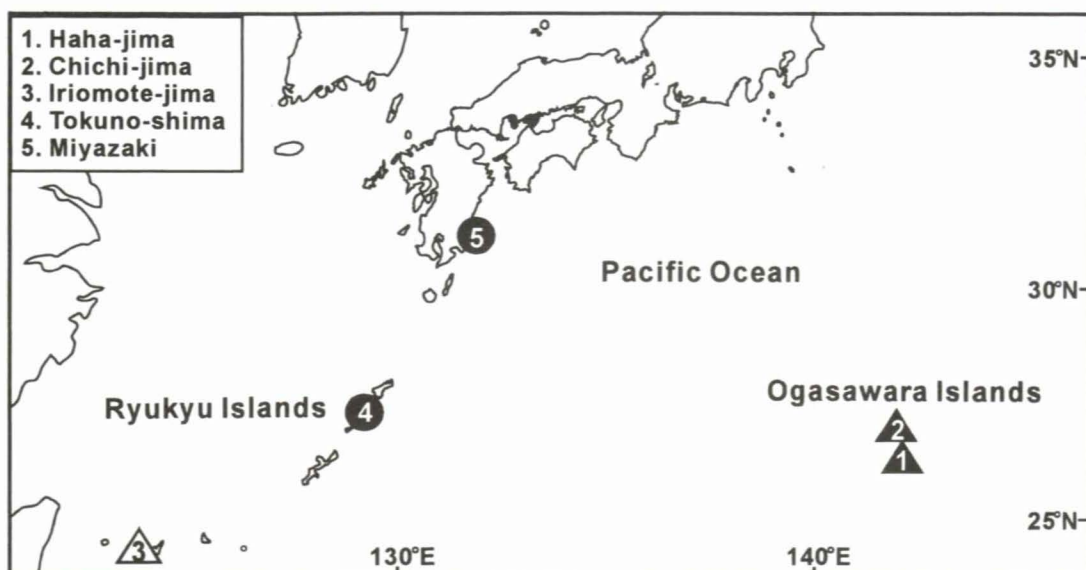


Fig. 2. Distribution of *Sardinella melanura* in Japanese waters. Closed triangles, localities based on literature records; open triangle, locality based on an underwater photograph; circles, localities based on specimens examined in this study.

eastern Indonesia to Samoa). Subsequently, Munroe *et al.* (2000) reported the distribution of the species in the tropical Pacific Ocean. Both reviews indicated the easternmost record of the species as being Samoa (Fig. 3), although Fowler (1928) reported the species from Tahiti, Society Islands, on the basis of specimens collected (Fig. 3). During this study, 4 specimens, collected from Tahiti were examined and found to be *S. melanura*. Accordingly, the

easternmost recorded range of the species is considered to be Tahiti (Fig. 3).

Comparative material examined. *Sardinella melanura*: MUFS 13619-13628, 10 specimens, 102-128 mm SL, Ambon, Indonesia; URM-P 34919-34920, 2 specimens, 101-119 mm SL, Ambon, Indonesia; URM-P 34922, 8 specimens, 97-123 mm SL, Ambon, Indonesia; YCM-P 25439, 124 mm SL,

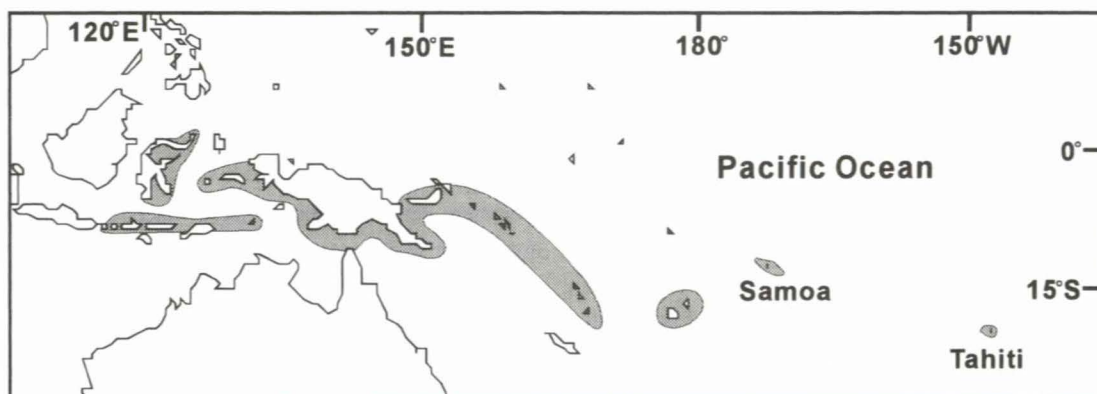


Fig. 3. Distribution of *Sardinella melanura* in the tropical Pacific Ocean (indicated by dotted regions), based on literature records and specimens examined in this study.

Miyano-hama, Chichi-jima, Ogasawara Islands, Japan; USNM 65859, 81 mm SL, Papeete, Tahiti, Society Islands; USNM 327723, 3 specimens, 82-92 mm SL, Port Phaeton, off Tiupi, Tahiti, Society Islands.

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