



New record of *Owstonia kamoharai* Endo, Liao and Matsuura, 2015 (Perciformes: Cepolidae) from the northeastern Indian Ocean

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ABSTRACT

Owstonia kamoharai Endo, Liao and Matsuura, 2015 is reported for the first time from the northeastern Indian Ocean. Two specimens measuring 320 mm and 250 mm (Standard Length) were collected during the exploratory fishery surveys by Fishery Oceanographic Research Vessel Sagar Sampada in Andaman and Nicobar waters, India during April 2016 at a depth of 411 m. A brief description of the specimens collected, comparisons and previous distributional records were provided.

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1. Introduction

Members of the bandfish family Cepolidae are distributed throughout tropical and subtropical waters at a depth range of 80 to 550 m (Prokofiev, 2010; Bineesh et al., 2011; Smith-Vaniz and Johnson, 2016). They are characterized by being moderately to greatly elongate with a compressed, tapering body; lanceolate caudal fin; large mouth with slightly curved teeth, upper jaw posteriorly broad, ending near the posterior margin of the eye; dorsal fin continuous with 0–4 flexible spines and 21–89 branched rays; anal-fin spine present or absent, soft rays 13–102; pelvic fins I, 5 with first ray simple or weakly branched and other rays fully branched; and lateral line high on body, close to dorsal-fin base. All known species have a distinctive dark stripe on the membrane connecting the premaxillary and maxillary bones of the upper jaw.

Cepolidae comprises the 3 genera in two subfamilies Owstoniinae (*Owstonia*) and Cepolinae (*Acanthocephala* and *Cepola*) (Smith-Vaniz and Johnson, 2016). The genus *Owstonia* Tanaka 1908 is the only member of subfamily Owstoniinae, which contains 36 valid species (Smith-Vaniz and Johnson, 2016). *Owstonia* differs from other cepolids in having the dorsal and anal fins not connected to the caudal peduncle by a membrane. It also has fewer dorsal- and anal-fin ray counts, dorsal fin III–IV, 19–26 (vs. 0–III; 54–89), anal fin I–II, 11–19 (vs. 0–I, 50–101); and

fewer caudal and total vertebrae 16–18 and 27–33 (vs. 40–67 and 48–79) (Smith-Vaniz, 1986; Smith-Vaniz and Johnson, 2016). *Owstonia weberi* (Gilchrist, 1922), *Owstonia simotera* (Smith, 1968), *Owstonia whiteheadi* (Talwar, 1973), and *Owstonia totomiensis* Tanaka, 1908 were previously recorded from the Indian Exclusive Economic Zone (EEZ), which includes the Arabian Sea, Bay of Bengal and Andaman waters (Talwar, 1973; Bineesh et al., 2011). This study reports the first occurrence of Kamohara's bandfish *Owstonia kamoharai* (Endo et al., 2015) from the northeastern Indian Ocean. *Owstonia kamoharai* has previously been documented from southern Japan, off Western Australia and the Arafura Sea (Endo et al., 2015; Smith-Vaniz and Johnson, 2016; Fig. 1).

2. Materials and methods

Two specimens of *Owstonia kamoharai* were collected during the exploratory deep-sea fishery surveys of the FORV Sagar Sampada (cruise number 349), conducted along the Andaman coast of India (13°07'626"N, 93°11'633"E) at a depth of 411 m during April 2016 (Fig. 1). Specimens were collected using a High-speed Demersal Trawl—Crustacean Version (HSDCT-CV) operated at a speed of 3 knots. Samples were preserved in 10% formaldehyde and deposited in the Centre for Marine Living Resources and Ecology Referral Centre, Kochi, India. The specimens were identified as *Owstonia kamoharai* following Endo et al. (2015) and Smith-Vaniz and Johnson (2016). Morphometric and meristic measurements were taken from preserved specimens following Endo et al. (2015). Measurements were taken to the nearest 0.1 mm using a digital vernier calliper. All measurements are

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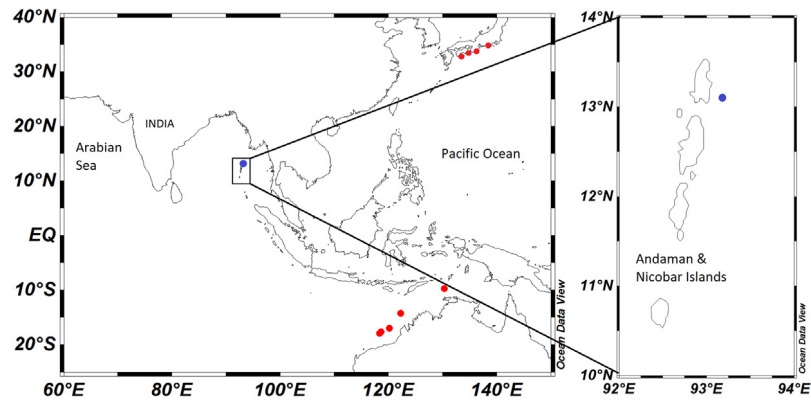


Fig. 1. The map showing the collection locations of *Owstonia kamoharai* (Endo et al., 2015) during April 2016 (blue bullets indicate the location of present study and red bullets indicate previous reports).

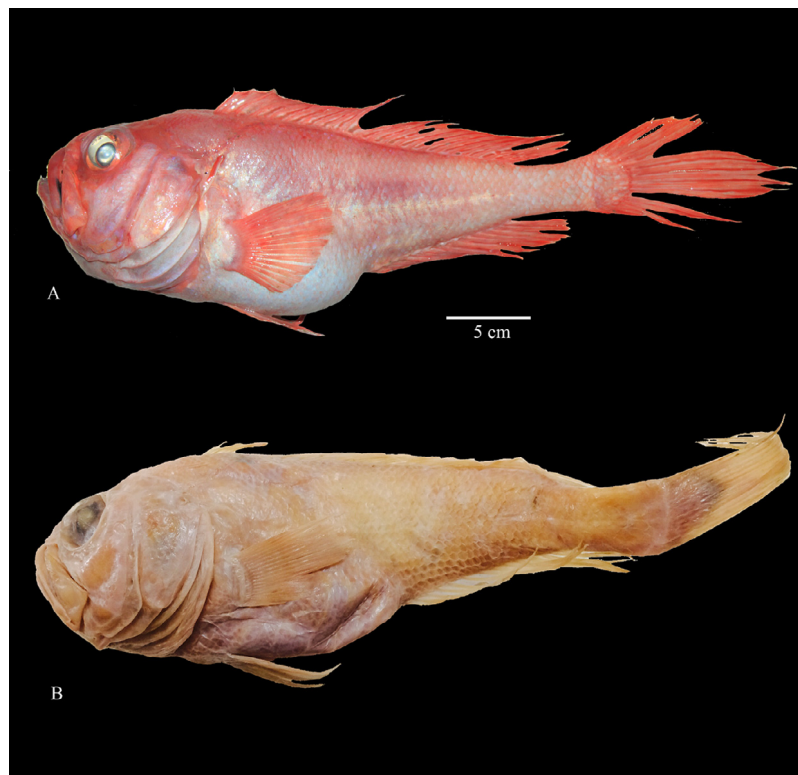


Fig. 2. (Ref No: IO/SS/FIS/00518a) Lateral view of *Owstonia kamoharai* (Endo et al., 2015) from northeastern Indian Ocean (north Andaman Island) (m) (A-fresh specimen, B-formalin preserved specimen.).

expressed as percentages of standard length (SL), which was measured from the tip of the snout to the end of the hypurals. All measurements were compared with data for type specimens following Smith-Vaniz and Johnson (2016).

3. Results

Owstonia kamoharai (Endo et al., 2015)

Materials examined

CMLRE IO/SS/FIS/00518a, 320 mm SL, Cruise 349, station 8 Northern Andaman, 13°07'626"N, 93°11'633"E, 411 m depth, 11th April 2016 (Fig. 2). CMLRE IO/SS/FIS/00518b, 250 mm SL,

Cruise 349, station 8, Northern Andaman, 13°07'626"N, 93°11'633"E; 411 m depth, 11th April 2016.

Diagnosis

Dorsal-fin rays III, 21; anal-fin rays I, 14; pectoral-fin rays 21; pelvic-fin rays I, 5; gill rakers 37–38; lateral line scales 33; pre-dorsal scale rows 9; cheek scale rows 9; preopercle without spine; lower limb margin of preopercle without spines, lateral line pattern type 1, caudal fin is long and round posteriorly.

Description based on present specimens

Morphometric and meristic values are given in Table 1. Body laterally compressed and elongated, moderately large head. Lateral line originates from posttemporal canal near anterodorsal margin of gill opening, curves dorsally and posteriorly then continues posteriorly just below dorsal-fin base to soft rays. Teeth

Table 1Morphometric measurements and counts of *Owstonia kamoharai* (Endo et al., 2015) collected from northeastern Indian Ocean during April 2016.

Morphometric and meristic measurements	CMLRE - IO/SS/FIS/00518a	CMLRE - IO/SS/FIS/00518b	Holotype- NSMT-P 109686	Paratype-NSMT-P 114189	Smith-Vaniz and Johnson (2016) (n = 10 *including types)
Total length (mm)	461	358	538	396	
Standard length (mm)	320	250	392	282	122–408
% of SL					
Body depth (maximum) *generally at pelvic-fin origin	35.9	33.6	33.9	31.2	23.1–25.3 (at anal-fin origin)
Body width	15.8	14.3	15.8	13.5	
Predorsal length	25.3	28.4	28.6	27.3	25.1–32.2
Preal length	53.4	52.8	56.4	57.8	55.1–61.5
Prepectoral length	31.9	32.5	30.6	30.9	
Prepelvic length	33.1	28.5	34.7	35.1	
1st dorsal-fin spine length	5.6	7.6	5.5	6.3	
2nd dorsal-fin spine length	6.5	10.0	7.3	8.4	
3rd dorsal-fin spine length	7.8	12.8	9.0	–	
Longest dorsal-fin soft ray length			17.7	18.1	
Dorsal-fin base length	55.0	63.2	63.5	61.1	58.5–66.0
Anal-fin spine length	2.8	5.2	4.0	4.7	
Longest anal-soft ray length			18.0	19.3	
Anal-fin base length	27.2	28.8	30.4	29.4	27.3–31.2
Pectoral-fin length	17.5	19.6	17.2	15.0	
Pelvic-fin length	18.4	20.8	17.8	17.2	16.6–20.1
Caudal-fin length	36.5	32.0	37.5	40.1	33.7–40.1
Caudal-peduncle length	15.6	15.6	16.3	16.7	
Caudal-peduncle depth	8.3	9.6	10.4	10.3	
Head length	31.9	33.2	29.3	28.6	27.2–34.7
Snout length	6.6	7.6	7.1	7.5	
Orbital diameter	10.6	10.4	8.5	8.9	8.2–15.7
Interorbital width	5.5	5.7	4.8	4.8	
Upper-jaw length	14.8	15.5	18.0	17.7	15.8–20.0
Height of maxillary end	7.6	7.4	7.8	8.0	
Lower-jaw length	14.2	14.0	19.4	18.7	
Postorbital length	15.3	15.6	15.3	13.5	
Meristic counts					
Dorsal fin	III, 21	III, 21	III, 21	III, 21	III, 21–22
Pectoral fin-rays	21	21	21	22/23	21–23
Anal fin	I, 14	I, 14	I, 14	I, 14	I, 13–14
Cheek scale rows	9	9	9/10	9/10	7–10
Predorsal scales	9	9	8	8	
Scales in longitudinal row	54	56	53/54	56	53–56
Additional scales on caudal fin	4	4	4	4	
Lateral-line scales	33	33	23/25	25/27	
Scales in transverse row	41	40	41	42	
Scales below lateral line	31	35	26/29	27	
Pre-opercle spines	Absent	Absent	Absent	Absent	Absent
Gill rakers on first arch	38	37	40	39	37–40
Vertebrae	28	28	28	28	28–29

small; curved inward; two to three irregular rows near symphysis and one lateral row on upper jaw; no teeth on vomer or palatine. Preopercular spines absent. Scales cycloid; nape scaly and cheek scales with nine irregular rows; scales in longitudinal row 54–56; scales in transverse row 40–41; scales below lateral line 31–35; lateral line with 33 scales; predorsal scales nine. Gill rakers 37–38; pseudobranchiae well developed. Caudal fin lanceolate (rounded); pectoral-fin rays 21; pelvic-fin rays I, 5; dorsal-fin rays III, 21; anal-fin rays I, 14; Vertebrae: precaudal 11, caudal 17, total 28 (see Fig. 3).

Distribution, Fig. 1:

Owstonia kamoharai is previously known from 200–350 m depth around the Shikoku and Honshu islands in southern Japan; off Western Australia at 420 m depth SW of the Imperieuse Reef (17°56'S, 118°21'E); 375 m depth NNW of Port Hedland (18°00'S, 118°13'E); 413 m depth E (16°58'S, 120°13'E) and 400 m depth NW (17°37'S, 118°40'E) off Rowley Shoals; 358 m depth S of Scott Reefs (14°16'S, 122°16'E); and in the Arafura Sea at 210 m depth N of Bathurst Island (9°42'S, 130°22'E) and 298 m depth S of Tanimbar Island (9°20'S, 131°8'E). The newly reported record

of *Owstonia kamoharai* is from 411 m depth in the northeastern Indian Ocean (13°07'626"N, 93°11'633"E).

Colouration:

Freshly Dead Colouration, Fig. 2A

Head, body and fins reddish, ventrum whitish; membrane between maxilla and premaxilla black. Prominent white margins in the fins except pectoral fins.

Preserved Colouration, Fig. 2B

All reddish colour faded to yellowish, skin between premaxillary and maxillary membrane with blackish markings.

Remarks

This is the first record of *Owstonia kamoharai* in Andaman waters, India. *Owstonia kamoharai* is poorly known species known from only 10 specimens (Endo et al., 2015; Smith-Vaniz and Johnson, 2016). Other members of this genus known from Andaman waters are *O. nudibucca* Smith-Vaniz and Johnson (2016) and *O. taeniosoma* (Kamohara, 1935). Both these species reported from Andaman waters have preopercular spines that are absent in *O. kamoharai*. By all characters available, the investigated specimens agree with the description of *O. kamoharai* reported from



Fig. 3. Radiograph of *Owstonia kamoharai* (CMLRE IO/SS/FIS/00518a).

off southern Japan (Endo et al., 2015). *Owstonia kamoharai* is very similar to *O. ainonaka* (Smith-Vaniz and Johnson, 2016), but differs in counts of anal-fin rays and lateral line scales. *Owstonia ainonaka* has a lanceolate and long caudal fin (its length is 54.5% of the SL in the original description) while *O. kamoharai* have shorter caudal fin which is rounded posteriorly (33.7–40.0% SL). The maxilla of *O. ainonaka* extends only to vertical from posterior margin of pupil when closed and for *O. kamoharai*, it extends or slightly beyond the posterior margin of orbit. *Owstonia kamoharai* and *O. simotera* (Smith, 1968) significantly differ in cheek scale rows (7–10 vs. 11–12, respectively). *Owstonia simotera* possess lanceolate and a shorter caudal fin compared to longer and posteriorly rounded caudal fin for *O. kamoharai*. *Owstonia simotera* possess large curved dentary canines which are absent in *O. kamoharai* (Smith-Vaniz and Johnson, 2016). It is also noted that Indian Ocean (Andaman) specimens of *O. kamoharai* differ slightly morphometrically from the holotype or types. The upper jaw lengths of current specimens (14.8–15.5% of SL) are slightly shorter than the known size range of *O. kamoharai* (16.3–18.1% of SL) (Endo et al., 2015), and (Smith-Vaniz and Johnson, 2016) (15.8–20.0% of SL). Head length of the present specimens differs from those of Japanese collections (27.2–30.6% SL). Previous studies by Smith-Vaniz and Johnson (2016) were based on a larger size range (122–408 mm) from Japan and non-Japanese waters (Arafura Sea and western Australia) compared to the present specimens (250 and 320 mm SL) from Andaman waters. There exist morphometric and meristic differences in geographical scale in the *O. kamoharai* specimens collected from Andaman waters versus Japan and non-Japanese, on their lateral line scales (and position of ending) and gill raker counts. The lateral line scale count varies from 23–27 in type specimens to 33 for the Andaman specimens. The lateral line ends at 8–10 soft rays in Japanese specimens compared to 13–14 in Andaman specimens and 14–18 in specimens from Japan and western Australia. This indicates short lateral lines in *O. kamoharai* from Japan compared to northwestern Australia and Andaman waters. The report of *O. kamoharai* from Andaman waters extends its known distributional range for more than 2500 nautical miles. The deep-sea faunal diversity of Andaman waters of India remains largely unexplored after the major studies performed by Alcock (1891, 1894). Recent exploratory studies by FORV *Sagar sampada* point towards higher species diversity in these regions (Rajeeshkumar et al., 2016, 2017; Nikki et al., 2018), which indicates the need for more dedicated surveys.

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