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First specimen-based Indonesian record of a rare scorpionfish, *Scorpaenopsis obtusa* (Actinopterygii: Perciformes: Scorpaenidae), from Alor Island

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Abstract

A single specimen of the shortsnout scorpionfish, *Scorpaenopsis obtusa* Randall et Eschmeyer, 2002 (Scorpaenidae), collected from the south coast of Ampera, Alor Barat Laut, Alor Island, Indonesia, at 5 m depth, represents the first voucher specimen-supported record of the species from Indonesian waters (previous records from Nusa Penida and northern Sulawesi having being based on underwater photographs). At 91.1 mm in standard length, the Alor specimen is the largest recorded individual of the species to date.

Keywords

distribution, largest specimen, ontogenetic change, variation, voucher specimen

Introduction

The scorpionfish genus *Scorpaenopsis* Heckel, 1837 (Scorpaenidae), characterized by 12 dorsal-fin spines, three or more suborbital spines, the absence of palatine teeth and black pigment between the first and third dorsal-fin spines, and a compressed head (Randall and Eschmeyer 2001; Motomura et al. 2011), comprises 28 valid species (Fricke et al. 2013), 10 of which have been recorded in Indonesian waters to date, viz., *Scorpaenopsis diabolus* (Cuvier, 1829); *Scorpaenopsis macrochir* Ogilby, 1910; *Scorpaenopsis neglecta* Heckel, 1837; *Scorpaenopsis obtusa* Randall et Eschmeyer, 2002; *Scorpaenopsis oxycephalus* (Bleeker, 1849); *Scorpaenopsis papuensis* (Cuvier, 1829); *Scorpaenopsis possi* Randall et Eschmeyer, 2002; *Scorpaenopsis ramaraoi* Randall et Eschmeyer, 2002; *Scorpaenopsis venosa* (Cuvier, 1829); and *Scorpaenopsis vittapinna* Randall et Eschmeyer, 2002 (Randall and Eschmeyer 2001; Allen and Adrim 2003; Allen and Erdmann 2012).

A single specimen of *Scorpaenopsis*, collected from Alor Island during a marine rapid assessment project for protected marine areas in Nusa Tenggara Timur and Maluku Provinces, Indonesia, conducted by the Pattimura University, Ambon and the Yayasan Konservasi Cakrawala Indonesia (YKCI), was subsequently identified as the western Pacific scorpionfish *S. obtusa*, a species previously known from only eight collected specimens from Japan, the Philippines, Taiwan, Papua New Guinea, and Australia (Randall and Eschmeyer 2001; Motomura and

Shinohara 2005; Motomura et al. 2011; Allen and Erdmann 2012). In Indonesian waters, *S. obtusa* has previously been photographed underwater (specimens not collected) off Nusa Penida and northern Sulawesi (Allen and Erdmann 2012: 234). The specimen of *S. obtusa* described in the presently reported study represents the first confirmed Indonesian record of the species.

Methods

Counts and measurements generally followed Randall and Eschmeyer (2001) and Motomura and Shinohara (2005), except head width (Motomura et al. 2005) and maxillary depth (Motomura et al. 2006). The last two soft rays of the dorsal and anal fins were counted as single rays, each pair being associated with a single pterygiophore. Standard and head lengths are expressed as SL and HL, respectively. Head spine terminology follows Wibowo and Motomura (2021: fig. 1). Descriptive method generally follows Motomura and Shinohara (2005). Descriptive characters are based on the Indonesian specimen, which was deposited in the Museum Zoologicum Bogoriense (MZB), Indonesia.

Results

Family Scorpaenidae Risso, 1827
Scorpaenopsis Heckel, 1837

Scorpaenopsis obtusa Randall et Eschmeyer, 2002

English common name: shortsnout scorpionfish

(Figs. 1–3)

Material examined. MZB.26532, 1 specimen, 91.1 mm SL, Ampera, Alor Barat Laut, Alor Island, Indonesia, 8°16′03.7″S, 124°25′33.1″E, 5 m depth, hand net, K. Wibowo, 26 February 2022.

Description. Counts and proportional measurements [given below as percentages of SL and HL (for head characters; presented in parenthesis)] of presently reported specimen (91.1 mm SL) were as follows: dorsal fin with 12 spines and 9 soft rays; pectoral fin with 1 uppermost unbranched ray, 6 branched rays, 12 lower unbranched rays, total 19 rays; longitudinal scale rows 38; pored lateral-line scales 20; scales above lateral line 5, below 12; gill rakers on upper limb of first gill arch 4, lower limb 9, total 13; body depth 44.5% of SL; body width 30.2; head length 45.6; snout length 11.8 (26.0% of HL); orbit diameter 10.3 (22.7); interorbital width at posterior end of preocular spine bases 11.1 (24.3); caudal-peduncle depth 12.0; caudal-peduncle length 15.7; upper-jaw length 25.9 (57.0); pre-dorsal-fin length 38.5; pre-anal-fin length 71.5; pre-pelvic-fin length 39.3; first dorsal-fin spine length 7.8; second dorsal-fin spine length 11.9; third dorsal-fin spine broken; fourth dorsal-fin spine length 15.8; eleventh dorsal-fin spine length 10.8; twelfth dorsal-fin spine length 12.9; longest dorsal-fin soft ray length 19.2 (third ray); first anal-fin spine length 9.4; second anal-fin spine length 17.5; third anal-fin spine length 15.6; longest anal-fin soft ray length 23.0 (second ray); caudal-fin length 26.9; pectoral-fin length 39.0; pelvic-fin spine length 19.3; longest pelvic-fin soft ray length 29.2 (second ray); head width 21.5 (47.3); postorbital length 27.3 (59.9); maxillary depth 7.6 (16.6).

Body wide anteriorly, progressively compressed posteriorly. Mouth large, oblique, positioned at angle of about 60° to horizontal axis of head and body. Posterior margin of maxilla extending beyond line from posterior margin of orbit to edge of retroarticular. Vomerine plate forming V-shaped patch, with rudimentary teeth. Palatine teeth absent. Nasal spine with 3 spinous points. Ascending process of premaxilla intruding into interorbital space, its posterior margin level with anterior margin of pupil. Median interorbital ridge absent. Interorbital ridges distinct; space between interorbital ridges shallow and broad, its width about half of orbit diameter. Preocular and supraocular spines small, directed upward. Postocular spine large, with 3 points, broadly joined to tympanic spine at base. Tympanic with 2 spinous points, located between postocular spines. Coronal spine absent. Occipital pit deep, its width greater than length. Parietal and nuchal spines about equal size, joined at base. Sphenotic with 2 small spines. Postorbital with 2 small spines. Pterotic spine simple, larger than supraocular spine. Upper posttemporal spine larger than lower spine. Space between parietal, nuchal, pterotic, and lower posttemporal spines with two small spines. Supracleithral spine asymmetric, with 3 and 2 pointed spines on left and right sides, respectively. Cleithral spine flattened, strongly pointed. Anterodorsal lacrimal spine present. Single small spines on middle and posterior end of lacrimal ridge. Anterior lacrimal spine directed anteriorly, its tip reaching dorsal margin of upper lip; two additional small points on posterior margin. Posterior lacrimal spine directed ventrally, larger than anterior spine, its tip not reaching dorsal margin of upper lip; an additional spine present on anterior margin; posterior lacrimal spine associated with short fimbriate flap. Lateral lacrimal spine present, its size approximately equal to anterodorsal lacrimal spine. Suborbital ridge with 3 spines. Suborbital pit present. Preopercle with 5 spines; uppermost spine largest, with supplemental preopercular spine on base; second spine sharp; third to fifth spines blunt. Upper opercular spine with 2 points; lower opercular spine simple, with median ridge.

Lateral surface of body covered with weak ctenoid scales, becoming cycloid ventrally. Exposed cycloid scales covering pectoral-fin base. Cycloid scales embedded in thin skin covering anteroventral surface of body. Body scales not extending onto fin rays or membranes, except basally on seven uppermost pectoral fin rays. Lateral line complete, first two scales with spine-like projection at end of sensory tube. No scales on head.

Numerous tiny papillae scattered on dorsal and lateral surfaces of head, including snout, interorbital space,

Figure 1. Fresh specimen photograph of *Scorpaenopsis obtusa*, MZB.26532, 91.1 mm SL, collected from Alor Island, Indonesia.

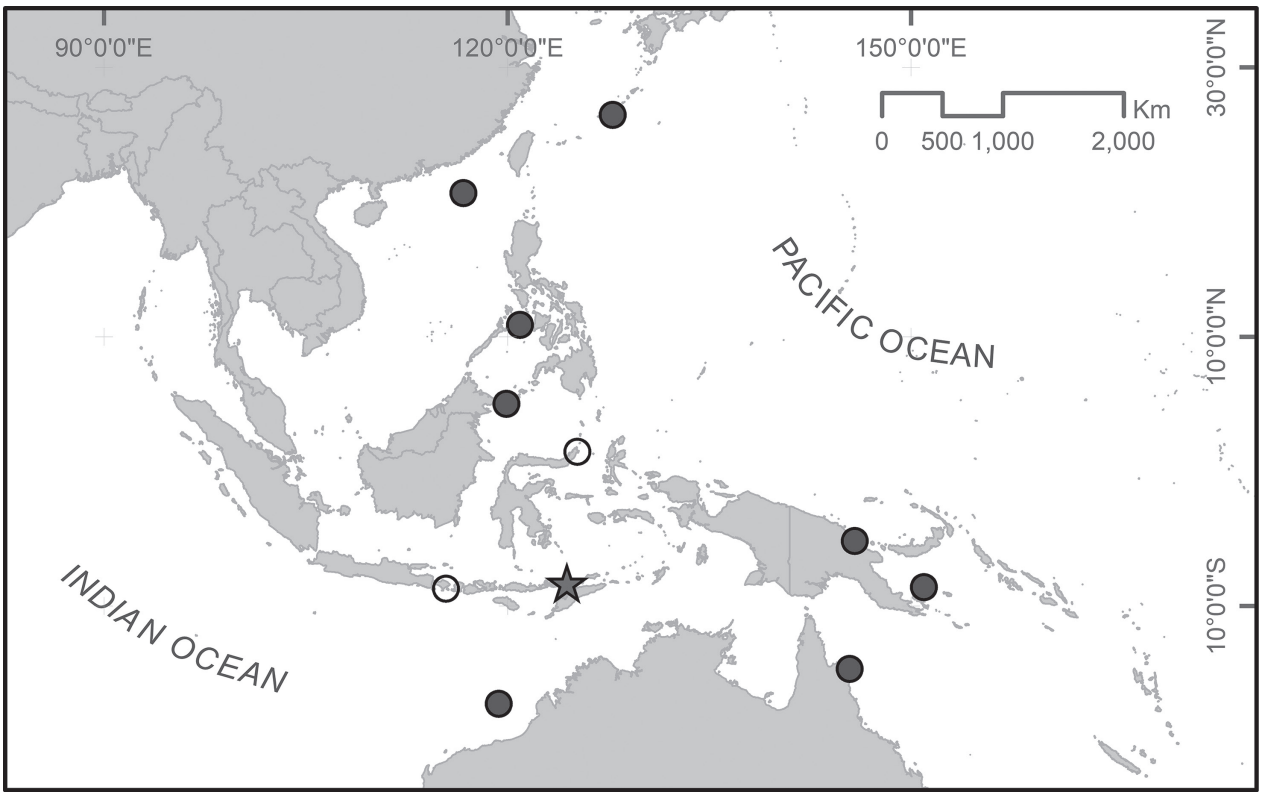

Figure 2. Distributional records of *Scorpaenopsis obtusa*, based on previous studies (circles) and the presently reported study (star). Closed and open symbols indicate specimen- and underwater photograph-based records, respectively.

outer margin of eye membrane, preopercle, and opercle. No papillae on occipital pit. Tentacle on upper posterior edge of low membranous tube associated with anterior nostril. Fleshy tentacle associated with posterior lacrimal spine. Several short, slender tentacles on lateral surface of maxilla. Broad, skin flap associated with each of third to fifth preopercular spines. Many small, round flaps on ventral surface of head and anteroventral surface of body.

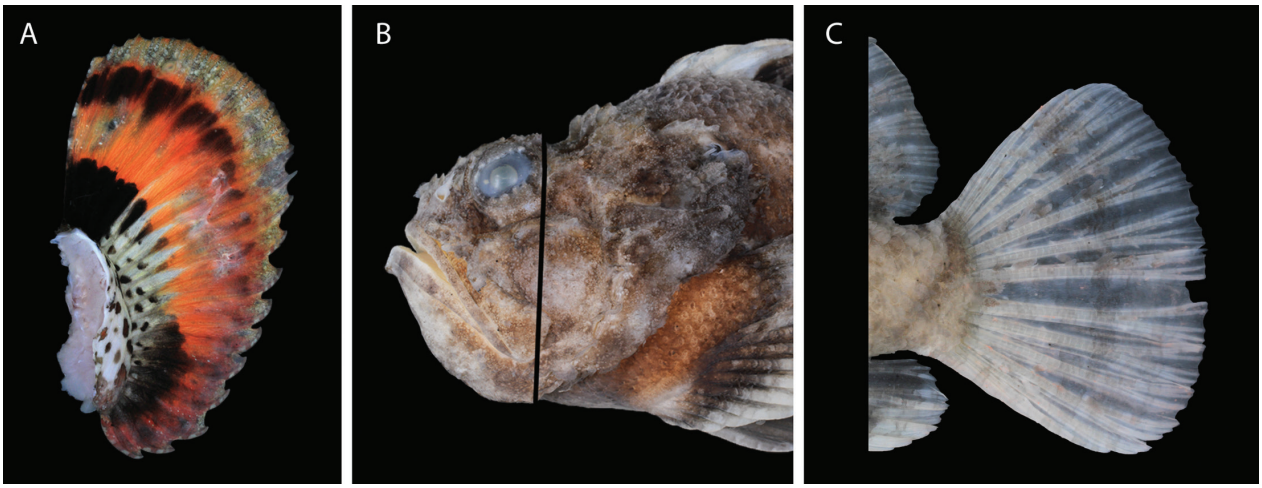

Figure 3. Inner surface of pectoral fin (fresh condition) (**A**), head (showing line from posterior margin of orbit to posteroventral tip of retroarticular) (**B**), and caudal fin (**C**) of *Scorpaenopsis obtusa*, MZB.26532, 91.1 mm SL, collected from Alor Island, Indonesia.

Many slender tentacles associated with posterior margin of opercle, pored lateral scales scattered on lateral and dorsal surfaces of body, and pectoral and caudal fins.

Origin of first dorsal-fin spine above supracleithral spine. Posterior margin of opercular membrane level with posterior margin of third dorsal-fin spine base. Posterior tip of pectoral fin extending beyond third anal-fin spine base. Posterior tip of pelvic fin extending slightly beyond anus when depressed. Origin of last dorsal-fin spine just above origin of first anal-fin spine.

Color when fresh (Figs. 1, 3A). Head and body mottled dark reddish-brown to white. Dorsal fin whitish to reddish-brown, distinct black blotch on base of spinous portion between fourth and eighth spines. Pectoral fin outer surface pinkish-white, blackish basally, with blackish band near tip; inner surface orange, with broad black blotch basally on each of uppermost four and lowermost seven rays, black submarginal band (progressively less distinct on lower unbranched rays), axil and base of membrane of fifth to fourteenth rays white with small black spots. Pelvic fin black, with white distal margin. Anal fin dark reddish with numerous tiny spots and white posterior margin. Caudal fin whitish, with broad pinkish band.

Discussion

The characters of a single specimen of the genus *Scorpaenopsis* from Alor Island, Indonesia (Fig. 1), determined in this study, agreed well with the diagnostic characters of *S. obtusa* given by Randall and Eschmeyer (2001) and Motomura and Shinohara (2005), e.g., pectoral-fin rays 19; pored lateral-line scales 20; longitudinal scale series 38; gill rakers 13; body depth 2.2 times in SL; dorsal profile of anterior spinous portion of dorsal fin highly arched, giving a humpbacked appearance; head length 2.2 in SL; snout short and blunt 3.8 in HL; ascending process of premaxilla intruding into interorbital space; orbit diameter 4.4 in HL; nasal spine with 3 points; mouth oblique, forming an angle of about 60° to horizontal axis of head and body; postocular spine broadly joined to tympanic spine; occipital pit deep; suborbital pit deep; upper opercular spine doubled; first dorsal-fin spine length 1.5 in second dorsal-fin spine length; fourth dorsal-fin spine length 2.9 in HL; penultimate dorsal-fin spine length 1.2 in last dorsal-fin spine length; interorbital width at posterior end of preocular spine bases 4.1 in HL.

Scorpaenopsis obtusa was originally described by Randall and Eschmeyer (2001) on the basis of specimens from the Philippines (1 specimen, 79.0 mm SL) and Papua New Guinea (2, 36.5–49.7 mm SL). Motomura and Shinohara (2005) reassessed the diagnostic characters of *S. obtusa* given by Randall and Eschmeyer (2001), and reported the first specimen-based records of *S. obtusa* from Japan (1, 40.4 mm SL) and Australia (2, 34.8–37.8 mm SL), and second record from Papua New Guinea (25.6 mm SL). Subsequently, Motomura et al. (2011) reported the first record of the species from Taiwan (based on a single specimen, 47.7 mm SL). Later, *S. obtusa* was reported by Allen and Erdmann (2012: 234) from Indonesian waters (Nusa Penida and northern Sulawesi), based on underwater photographs. The presently reported specimen of *S. obtusa* from Alor Island, the ninth reported overall and largest known example of the species (91.1 mm SL), represents the first specimen-based record of the species from Indonesia (Fig. 2).

Scorpaenopsis obtusa, most similar to the western Indian Ocean humpback species *Scorpaenopsis gibbosa* (Bloch et Schneider, 1801) in inner pectoral fin surface color pattern (Eschmeyer and Randall 1975: 307, fig. 17c; Randall and Eschmeyer 2001; Motomura and Shinohara 2005: fig. 1), differs from the latter in four morphological characters: snout length, location of the premaxilla ascending process, and numbers of longitudinal scale rows and pectoral-fin rays (Randall and Eschmeyer 2001). Motomura and Shinohara (2005) confirmed the validity of these four characters, in addition to finding several additional diagnostic characters for *S. obtusa*, following

a comparison between *S. obtusa* (6 specimens, 25.6–49.7 mm SL) and *S. gibbosa* (9 specimens, 37.4–99.4 mm SL), e.g., distance between ventral margin of orbit and suborbital ridge, interorbital width between posterior end of preocular spine bases, condition of posterior margin of maxilla, and caudal-fin color pattern in preserved specimens.

However, the color pattern of the pectoral fin inner surface on a fresh specimen photograph of the presently reported specimen of *S. obtusa* (Fig. 3A) differed slightly from the illustration given by Motomura and Shinohara (2005: fig. 1), i.e., small black spots scattered on the axil and extending to the base of the membranes between the fifth to fourteenth rays (presently reported study) (vs. restricted to axil), and a broad blotch basally on the upper and lower rays (vs. on upper rays only). These differences are regarded here as intraspecific variations.

Although Motomura and Shinohara (2005) noted that the distance between the ventral margin of the orbit (VMO) and suborbital ridge in *S. obtusa* and *S. gibbosa* did not reflect growth-related changes (see fig. 4), examination of the presently reported specimen indicated that the proportion measured in the presently reported specimen (91.1 mm SL; distance between VMO and suborbital ridge: 2.3 mm) is significantly larger than that of the largest one (49.7 mm SL; ca. 1.1 mm) examined by Motomura and Shinohara (2005: fig. 4). Thus, this morphometric character actually reflect the growth-related change. Notwithstanding, the distance between the VMO and suborbital ridge remains a useful character for separating similarly-sized individuals of *S. obtusa* and *S. gibbosa*.

The interorbital space between the posterior ends of the preocular spine bases in the presently reported specimen of *S. obtusa* was contained 4.1 times in HL, confirming the reliability of this diagnostic character for *S. obtusa*. However, because it is subject to growth-related changes (see Motomura and Shinohara 2005: fig. 5), the proportion is unlikely to be reliable for distinguishing between similarly-sized individuals of *S. obtusa* and *S. gibbosa* greater than 100 mm SL.

The presently reported specimen of *S. obtusa* also had the posterior margin of the maxilla extending well beyond a line from the orbit posterior margin and posteroventral tip of the retroarticular (Fig. 3B), as noted by Motomura and Shinohara (2005). In addition, the caudal-peduncle band on the presently reported specimen was almost lost following preservation (Fig. 3C), as was noted in smaller specimens of *S. obtusa* (<49.6 mm SL), which were uniformly white (see Motomura and Shinohara 2005: fig. 3).

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