New Records of the Dwarf Scorpionfish, *Sebastapistes fowleri* (Actinopterygii: Scorpaeniformes: Scorpaenidae), from East Asia, and Notes on Australian Records of the Species

Motomura Hiroyuki, Senou Hiroshi
New Records of the Dwarf Scorpionfish, *Sebastapistes fowleri* (Actinopterygii: Scorpaeniformes: Scorpaenidae), from East Asia, and Notes on Australian Records of the Species

Hiroyuki Motomura³ and Hiroshi Senou²

³ The Kagoshima University Museum, 1-21-30 Korimoto, Kagoshima, 890-0065 Japan
E-mail: motomura@kaum.kagoshima-u.ac.jp
² Kanagawa Prefectural Museum of Natural History, 499 Iryuda, Odawara, Kanagawa, 250-0031 Japan

(Received 7 October 2008; Accepted 8 January 2009)

Twenty specimens of the smallest known scorpionfish, *Sebastapistes fowleri* (Pietschmann, 1934), collected from Taiwan and the Ryukyu Islands and recently found in museum collections, represent the first records of *S. fowleri* from East Asia. The Philippines and Guam were previously regarded as the northernmost records of the species. In addition, 15 specimens of *S. fowleri* from the Timor, Coral, and Tasman Seas are also reported, these being the first records from Australian waters. The Tasman Sea represents a new southernmost range extension.

Key Words: Teleostei, Scorpaenidae, *Sebastapistes fowleri*, Japan, Taiwan, Australia, first records.

Introduction

The smallest Indo-Pacific scorpionfish, *Sebastapistes fowleri*, was originally described as *Scorpaena fowleri* by Pietschmann (1934) on the basis of three specimens from the Hawaiian Islands. Since its subsequent redescription by Pietschmann (1938), who changed the generic allocation to *Scorpaenodes* Bleeker, 1857, the species was not regarded as a valid species until Randall (1973) listed it (as a member of *Scorpaenopsis* Heckel, 1840) from Tahiti. Eschmeyer and Randall (1975) also regarded the species as a valid member of *Scorpaenopsis* and designated a lectotype for *Scorpaena fowleri*.

The species has been treated as *Scorpaenopsis fowleri* by many subsequent authors (e.g., Myers 1988; Winterbottom *et al.* 1989; Poss 1999; Randall 1999) because it lacks palatine teeth and this lack is a diagnostic character of that genus; however, several authors (e.g., Kosaki *et al.* 1991; Randall and Anderson 1993; Kulbicki *et al.* 1994; Randall 1996) have questioned this generic allocation. Recently, Randall and Poss (2002) redescribed the species in detail, on the basis of specimens representing a wide distributional range, and reassigned it to *Sebastapistes* Gill in Streets, 1877. Since all other known species of *Sebastapistes* possess palatine teeth, Randall and Poss (2002) considered that loss of palatine teeth in *S. fowleri* had occurred independently from that in *Scorpaenopsis*. They suggested that *S. fowleri* is closest to *Sebastapistes strongia* (Cuvier in Cuvier and Valenciennes, 1829), the type species of *Sebastapistes*.
Randall and Poss (2002) reviewed the distribution of *S. fowleri* on the basis of specimens collected from both tropical and subtropical Indo-Pacific waters, from the Comoro Islands east to Pitcairn and the Hawaiian Islands. The northernmost records of the species in the western Pacific were from the Philippines and Guam. Our examination of numerous scorpionfish specimens in museums in Japan and Taiwan revealed that *S. fowleri* also occurs off the Ryukyu Islands and Taiwan. These specimens are described herein as the first records of *S. fowleri* from East Asia and the northernmost records for the species.

Although Yearsley et al. (2006) and Allen et al. (2007) published extensive lists of scorpionfishes from Australia, *S. fowleri* was excluded. Similarly, Randall and Poss (2002) were apparently unaware of the existence of Australian specimens. During our examination of scorpionfish specimens deposited in Australian museums, 15 specimens of *S. fowleri* from the Tasman, Coral, and Timor Seas were found. These specimens are the first confirmed records of *S. fowleri* from Australia and the Tasman Sea represents a new southernmost locality for the species.

**Material and Methods**

Measurements follow Motomura (2004a, b), with additional measurements (i.e., head width) following Motomura et al. (2005b, 2006a) and maxillary depth following Motomura et al. (2006b). Counts follow Motomura et al. (2005a–c) and Motomura and Johnson (2006), with predorsal scale counts following Motomura et al. (2006b). The last two soft rays of the dorsal and anal fins are counted as single rays, each pair being associated with a single pterygiophore. Standard length is expressed as SL. Terminology of head spines follows Randall and Eschmeyer (2002, fig. 1) and Motomura (2004b, fig. 1) with the following additions: the spine at the base of the uppermost preopercular spine is referred to as the supplemental preopercular spine (Eschmeyer 1965); the spine on the lateral surface of the lacrimal bone is referred to as the lateral lacrimal spine (Motomura and Senou 2008, fig. 2); and the coronal and pre tympanic (as an extra spine) spines are as figured in Chen (1981, fig. 1) and Motomura et al. (2004, fig. 14b) respectively. The diagnosis of *S. fowleri* given here is based on specimens from East Asia (this study) and the Indo-Pacific [comparative material in this study and Randall and Poss (2002)], and the description is based on specimens from East Asia.

Specimens examined in this study have been deposited in Australian Museum, Sydney (AMS), Biodiversity Research Center, Academia Sinica, Taipei (ASIZP), Biological Laboratory, Imperial Household, Tokyo (BLIH), Field Museum of Natural History, Chicago (FMNH), Kagoshima University Museum, Kagoshima (KAUM), Kanagawa Prefectural Museum of Natural History, Odawara (KPM), Museum of Comparative Zoology, Harvard University, Cambridge (MCZ), Museum of New Zealand Te Papa Tongarewa (NMNZ), National Museum of Nature and Science, Tokyo (NSMT), Museum and Art Gallery of the Northern Territory, Darwin (NTM), Smithsonian Institution Museum Support Center, Suitland (USNM), and Yokosuka City Museum, Yokosuka (YCM).

For comparison, the following specimens of *S. fowleri* were examined: AMS I. 19472-042, 2 specimens, 24.9 and 25.0 mm SL, Lizard Island, Coral Sea, Australia, AMS party, Nov. 1975; AMS I. 21646-032, 6 specimens, 15.3–21.5 mm SL, Moorea Is-
New records of *Sebastapistes fowleri* 3

land, Society Islands, 17°S, 149°W, 15–20 m depth, B. Goldman, 18 June 1976; AMS I. 26742-025, 18.5 mm SL, Ashmore Reef, Timor Sea, Australia, 12°10′S, 123°04′E, G. Allen and C. Bryce, 16 Sept. 1986; AMS I. 26746-036, 22.2 mm SL, Ashmore Reef, Timor Sea, Australia, 12°12′S, 122°58′E, 15–18 m depth, G. Allen and T. Knight, 18 Sept. 1986; AMS I. 27144-003, 4 specimens, 17.0–26.0 mm SL, off “Fuku Maru” wreck, Middleton Reef, Tasman Sea, Australia, 29°29′06″S, 159°08′06″E, 18–20 m depth, S. Reader et al., 7 Dec. 1987; AMS I. 27149-028, 15.0 mm SL, outer northeast slope of Elizabeth Reef, Tasman Sea, Australia, 29°57′42″S, 159°02′48″E, 15–18 m depth, A. Gill and S. Reader, 10 Dec. 1987; AMS I. 33747-026, 18.0 mm SL, northeast of Boot Reef, Coral Sea, Australia, 09°58′42″S, 144°42′31″E, 23–30 m depth, FNQ team, 27 Jan. 1993; FMNH 17337, holotype of *Sebastapistes badiorufus*, 23.7 mm SL, Takaroa Island, Tuamotu Islands, Crane Pacific Expedition, 12 Feb. 1929; FMNH 90660, 2 specimens, 26.1 and 27.0 mm SL, northeast of Boot Reef, Coral Sea, Australia, 12°10′00″S, 123°01′00″E, 19 m depth, H. Larson and B. Russell, 24 Sept. 1987; NTM S.12328-044, 18.0 mm SL, north of West Islet, Ashmore Reef, Timor Sea, Australia, 12°31′24″S, 123°33′18″E, 12–23 m depth, J. Short, 7 May 1992; NTM S.13615-017, 22.0 mm SL, southeast corner of Boot Reef, Coral Sea, Australia, 10°02′52″S, 144°41′53″E, 14–17 m depth, FNQ team, 29 Jan. 1993; USNM 349973, 2 specimens, 12.0 and 22.1 mm SL, Baie de la Petite Rivière, Mauritius, 20°12′30″S, 57°23′20″E, 30 m depth, P. Heemstra et al., 26 May 1995.

**Taxonomy**

*Sebastapistes fowleri* (Pietschmann, 1934)

[New standard Japanese name: Puchi-fusakasago]

[English name: Dwarf Scorpionfish]

(Fig. 1)

*Scorpaena fowleri* Pietschmann, 1934: 100. [Type locality: Makaua, Oahu, Hawaiian Islands. Lectotype designated by Eschmeyer and Randall (1975)]

*Sebastapistes badiorufus* Herre, 1935: 409. [Type locality: Takaroa Atoll, Tuamotu Archipelago]

*Sebastapistes hassi* Klausewitz, 1970: 72, fig. 1. [Type locality: Addu Atoll, Maldive Islands]

**Material examined.** 20 specimens, 13.4–29.4 mm SL, from Taiwan and Japan: ASIZP 62420, 25.7 mm SL, Wan-li-tung, Ping-tung, Taiwan, J.-P. Chen, 20 Dec. 1989; ASIZP 62421, 4 specimens, 15.5–21.1 mm SL, Wan-li-tung, Ping-tung, Taiwan, J.-P.
Chen, 6 Mar. 1989; ASIZP 62429, 6 specimens, 13.4–26.4 mm SL, same data as ASIZP 62420; BLIH 36670069, 36670070, 21.1 and 29.4 mm SL, respectively, off Isso, Yaku Island, Osumi Islands, Ryukyu Islands, Japan, 30°27′26″N, 130°29′26″E, 10–12 m depth, M. Aizawa, 29 Sept. 2008; KPM-NI 4045, 21.5 mm SL, Ie Island, Okinawa Islands, Ryukyu Islands, Japan, 7 m depth, T. Nomura, 13 June 1997; KPM-NI 8403, 24.6 mm SL, Ie Island, Okinawa Islands, Ryukyu Islands, Japan, 20 m depth, T. Nomura, 15 Sept. 2001; KPM-NI 8527, 8528, 16.4 and 15.9 mm SL, respectively, Ie Island, Okinawa Islands, Ryukyu Islands, Japan, 9 m depth, T. Nomura, 19 Sept. 2001; NSMT-P 61961, 23.5 mm SL, Urazoko Bay, Ishigaki Island, Ryukyu Islands, Japan, 23°28′N, 124°12′E, 15 m depth, K. Matsuura and K. Shibukawa, 23 Aug. 1996; YCM-P. 38092, 13.9 mm SL, Saneku, Kakeroma Island, Amami Islands, Ryukyu Islands, Japan, 28°11′01″N, 129°15′32″E, 10–23 m depth, Sagami Bay Marine Biological Research Club, 24 Aug. 1998; YCM-P. 38125, 26.0 mm SL, Hamazaki, Kakeroma Island, Amami Islands, Ryukyu Islands, Japan, 28°09′31″N, 129°11′00″E, 6–15 m depth, Sagami Bay Marine Biological Research Club, 25 Aug. 1998.

**Diagnosis.** A species of *Sebastapistes* with the following combination of characters: 16 pectoral-fin rays; 30–34 scale rows in longitudinal series; no palatine teeth; posterior lacrimal spine directed ventrally or anteroventrally; two suborbital spines; no coronal spine; lower opercular spine with median ridge, not covering by scales; ctenoid scales on dorsal and lateral surface of body; largest specimen recorded 37 mm SL.


---

Fig. 1. *Sebastapistes fowleri*, KPM-NI 8527, 16.4 mm SL, Ie Island, Ryukyu Islands, Japan.
rows between sixth dorsal-fin spine base and lateral line 4–6. Scale rows between last dorsal-fin spine base and lateral line 3–5. Predorsal scale rows 3–5. Gill rakers on upper limb 4–6, lower limb 8–10 (7–9 and 0–2 rakers on ceratohyal and hypobranchial respectively), total rakers 12–15.

**Morphometrics** (% of SL). Body depth at pelvic-fin base 38.8–43.9 (mean 40.3); body width 18.7–20.7 (19.5); head length 42.7–46.3 (45.1); snout length 10.6–11.6 (11.1); orbit diameter 11.8–15.9 (13.8); interorbital width at vertical midline of eye 6.5–7.4 (7.0); interorbital width at posterior end of preocular spine base 6.3–7.1 (6.7); head width 15.4–17.1 (16.2); upper-jaw length 24.2–26.7 (25.5); maxillary depth 6.5–7.9 (7.3); postorbital length 20.4–22.0 (21.3); predorsal-fin length 40.0–43.3 (41.0); preanal-fin length 69.8–73.2 (71.0); prepelvic-fin length 39.2–42.8 (41.1); first dorsal-fin spine length 4.7–7.2 (5.8); second dorsal-fin spine length 8.8–10.8 (9.9); third dorsal-fin spine length 14.0–15.9 (14.5); fourth dorsal-fin spine length 16.3–17.5 (16.9); fifth dorsal-fin spine length 15.8–20.0 (17.6); sixth dorsal-fin spine length 18.9–19.2 (19.1); longest dorsal-fin ray length (first or second ray) 18.1–19.5 (18.7); first anal-fin spine length 7.9–8.4 (8.2); second anal-fin spine length 17.2–19.1 (18.1); third anal-fin spine length 12.6–15.2 (14.2); longest anal-fin ray length (first ray) 18.9–19.2 (19.1); pectoral-fin ray length (ninth ray longest) 28.9–32.9 (31.3); pelvic-fin spine length 16.3–18.0 (17.2); longest pelvic-fin ray length (second ray) 20.7–26.5 (23.4); caudal-fin length 26.0–26.5 (26.3); caudal-peduncle length 15.2–17.7 (16.4); caudal-peduncle depth 11.8–12.8 (12.2).

**Morphology.** Ctenoid scales covering lateral surface of body, becoming cycloid ventrally. Embedded cycloid scales covering ventral surface of body and pectoral-fin base (several scales exposed). Vomerine tooth plate distinct, forming V-shaped patch. No palatine teeth. Median interorbital ridge, interorbital spine, and coronal spine absent. Interorbital ridges poorly developed; interorbital space shallow; occipital region flat. Tips of nasal and preocular spines sometimes embedded in skin. Supraocular and postocular spines simple, poorly developed, smaller than tympanic spine. Parietal and nuchal spines not joined at base. Sphenotic with small spine. Pterotic, upper and lower posttemporal, and supracleithral spines simple, poorly developed. Lateral lacrimal spine absent; ventral surface of lacrimal with 3 pointed spines, first spine directed anteriorly, second directed ventroanteriorly, third directed ventrally. Suborbital ridge with 2 tiny spines, first spine below eye and second at end of ridge. Preopercular margin with 5 spines; supplemental spine occurring at base of uppermost spine. Upper and lower opercular spines simple, each with median ridge. Posterior tip of pectoral fin extending slightly beyond that of depressed pelvic fin.

**Color when fresh** (based on photographs of KPM-NI 8527–8528 and NSMT-P 61961). Head and body reddish, mottled with white or pink. Spinous portion and basal soft-rayed portion of dorsal fin, and basal parts of pectoral, pelvic, anal, and caudal fins reddish.

**Color in alcohol.** Head and body entirely pale yellow, except for dusky basal parts of pectoral and pelvic fins and anteroventral surface of body.

**Remarks.** *Sebastapistes fowleri* was redescribed and compared in detail with congeners by Randall and Poss (2002), and the characters of the East Asian specimens described here agree with those of their specimens of *S. fowleri* from the Indo-Pacific. The 11 Taiwanese and nine Japanese specimens of *S. fowleri* represent the first reliable records of this species from East Asia, and the northernmost
records for the species. The previously recognized northernmost records were from the Philippines and Guam (Randall and Poss 2002).

*Sebastapistes fowleri* is similar to *S. taeniophrys* (Fowler, 1943) and *S. strongia* in having a median ridge on the lower opercular spine, ctenoid body scales, and 15 or 16 pectoral-fin rays, and in lacking coronal spines (Randall and Poss 2002; Motomura 2009; this study). It differs, however, from the latter two species in lacking palatine teeth (vs teeth present), having the posterior lacrimal spine directed ventrally or anteroventrally (vs strongly directed posteroventrally), and possessing 30–34 scale rows in longitudinal series (40–44 scale rows in *S. strongia*, based on 43 specimens examined; Motomura 2009).

**Notes on Australian records.** Randall and Poss (2002) reviewed the distribution of *S. fowleri* in the Indo-Pacific. They recorded four specimens (BPBM 33810, 23–26.5 mm SL) from the Chesterfield Islands, Coral Sea (New Caledonian territorial waters), but none from Australian waters (cf. Yearsley et al. 2006; Allen et al. 2007). During our examination of Australian scorpionfish specimens, 15 from the Tasman Sea, Coral Sea, and Timor Sea were identified as *S. fowleri* (all specimens listed in Material and Methods section), and these represent the first confirmed records of *S. fowleri* from Australia. One Tasman Sea specimen (AMS I. 27152-040, 29°57′H11032′S) represents the southernmost record for the species.

**Acknowledgments**

The first author is especially grateful to M. McGrouther and all staff of the Fish Section of the AMS, K.-T. Shao, Y.-C. Liao, and H.-C. Ho of the ASIZP, A. M. Rogers and K. Swagel of the FMNH, K. Hartel and A. Williston of the MCZ, C. Roberts, A. Stewart, and C. Struthers of the NMNZ, and J. Williams, S. Raredon, and all staff of the USNM for their kind hospitality during his stay at their museums. The first author’s visits to AMS, ASIZP, and NMNZ were supported by a Visiting Collection Fellowship grant from AMS, a Grant-in-Aid for Scientific Research (A) from the Japan Society for the Promotion of Science, Tokyo, Japan (19208019), and the Biosystematics of New Zealand Exclusive Economic Zone Fishes Programme (New Zealand Foundation for Research Science and Technology contract MNZX0203), respectively. We thank M. Aizawa (BLIH), K. Matsuura and G. Shinhara (NSMT), H. Larson, G. Dally, and S. Gregg (NTM), and K. Hagiwara (YCM) for specimen loans, Y. Haraguchi, M. Matsunuma, G. Ogihara, and M. Meguro (KAUM) for their curatorial assistance, and G. Hardy (Ngunguru, New Zealand) for reviewing the manuscript. This study was supported in part by a Grant-in-Aid for Young Scientists (B) from the Ministry of Education, Science, Sports and Culture, Japan (19770067).

**References**


