

First records of the bandfin scorpionfish, *Scorpaenopsis vittapinna* (Actinopterygii, Scorpaeniformes, Scorpaenidae), from Australia

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Abstract

Seven specimens (15.6–43.5 mm standard length) of *Scorpaenopsis vittapinna* Randall et Eschmeyer, 2002 (Scorpaenidae), a widely distributed Indo-West Pacific species, are recorded from Australian waters for the first time. A full description of the specimens is given, and intraspecific variations in comparison with the type specimens are noted.

Keywords

Australia, description, distribution, morphology, new records, variations

Introduction

The Indo-Pacific scorpionfish genus *Scorpaenopsis* Heckel, 1837 (Scorpaenidae), currently including 28 valid species (Fricke et al. 2013), is characterized by 12 dorsal-fin spines, three or more suborbital spines, and absence of palatine teeth (Randall and Eschmeyer 2001).

Seven small scorpionfish specimens collected from northwestern and northeastern Australia, found recently by HM in the collections of several Australian museums, are herein identified as *Scorpaenopsis vittapinna* Randall et Eschmeyer, 2002, a widely distributed Indo-West Pacific species, although not previously recorded from Australian waters. The first recorded specimens from the Australian region are described herein.

Methods

Counts and measurements followed Randall and Eschmeyer (2001). The last two soft rays of the dorsal and anal fins were counted as single ray, respectively, each pair being associated with a single pterygiophore. Standard length and head length are expressed as SL and HL, respectively. Descriptive characters are based on the Australian specimens. Two specimens (AMS I. 33728-021, 35.9 mm SL and QM I. 15552, 24.7 mm SL) were not measured because of their widely opened mouths. Institutional codes follow Sabaj (2019).

Results

Family Scorpaenidae Risso, 1827 *Scorpaenopsis* Heckel, 1837

Scorpaenopsis vittapinna Randall et Eschmeyer, 2002

[English name: bandfin scorpionfish]

Figs 1–3; Table 1

Material examined. (7 specimens, 15.6–43.5 mm SL). AMS I. 18740-026, 2 specimens, 42.5–43.5 mm SL, Yonge Reef, Lizard Island, Coral Sea, Queensland (Qld), 14°36'S, 145°36'E, 10–12 m, D. Hoese et al., 8 Nov. 1975; AMS I. 33728-021, 35.9 mm SL, outer slope on west side of Ashmore Reef, Coral Sea, Qld, 10°16'11"S, 144°24'07"E, 11–15 m, FNQ Team, 21 Jan. 1993; NTM S. 12319-029, 15.6 mm SL, east channel in Ashmore Reef, Timor Sea, Western Australia (WA), 12°08'S, 123°06'E, 11–12 m, H. Larson, 20 Sep. 1987; NTM S. 13585-027, 20.7 mm SL, outer reef slope of Great Detached Reef, Coral Sea, Qld, 11°42'36"S, 144°04'00"E, 21–23 m, H. Larson et al., 12 Jan. 1993; QM I. 15552, 24.7 mm SL, west of Raine Island, Coral Sea, Qld, 11°36'S, 144°01'E, team of AIMS, AM, and QM, 13 Feb. 1979; WAM P. 28022-012, 42.3 mm SL, Clerke Reef, Rowley Shoals, WA, 17°18'S, 119°22'E, 7–12 m, G. Allen and R. Steene, 4 Aug. 1983.

Description. Body moderately elongate, depth 2.8–3.0 in SL; width 1.4–1.7 in body depth. Head length 2.1–2.2 in

SL; snout length 3.3 in HL. Orbit diameter 4.3–4.6 in HL. Interorbital width 5.8–6.9 in HL. Dorsal profile of head not arched (Fig. 1). Dorsal fin with 12 spines and 9 soft rays; fifth or sixth spine longest; all soft rays branched, second longest; posterior branch of last soft ray joined by membrane to caudal peduncle for about three-fourths its length. Origin of dorsal fin above supracleithral spine. Anal fin with 3 spines and 5 soft rays; first spine shortest, second longest; all soft rays branched, second longest; origin of first anal-fin spine below base of eleventh dorsal-fin spine. Pectoral fin with 1 uppermost unbranched ray, 4 or 5 branched rays, 12 or 13 lower unbranched rays (all rays unbranched in two smallest specimens 15.6–20.7 mm SL), total 18 rays (17 in one specimen 24.7 mm SL), eighth or ninth rays longest. Pelvic fin with 1 spine and 5 branched soft rays; second soft ray longest; last soft ray joined by membrane to abdomen for more than half its length. Caudal fin slightly rounded, with 13 principal rays. Lateral-line scales 20–22. Longitudinal scale series 41 or 42. Scale rows above lateral line in middle of body 5, below lateral line to base of first anal-fin spine 13 or 14. Gill rakers on upper limb of first gill arch 3–5 (mode 4), lower limb 8–10 (8) on ceratohyal and absent on hypobranchial, total 11–15 (12). Rakers short with small spinules, longest at angle about two-thirds length of longest gill filament. Branchiostegal rays 7.

Mouth large, slightly oblique, forming an angle of 20–25 degrees to horizontal axis of head and body. Posterior margin of maxilla slightly beyond posterior margin of or-

Table 1. Morphometrics (expressed as percentages of standard length) of *Scorpaenopsis vittapinna*.

	AMS I. 18740-026	AMS I. 18740-026	NTM S. 12319-029	NTM S. 13585-027	WAM P. 28022-012	Mean value
Standard length [mm]	42.5	43.5	15.6	20.7	42.3	
Body depth	36.0	35.2	35.3	33.3	35.2	35.0
Body width	24.0	23.4	20.5	21.7	24.8	22.9
Head length	46.4	45.5	48.7	48.3	45.9	47.0
Snout length	14.1	13.8	14.7	14.5	13.9	14.2
Orbit diameter	10.1	10.6	10.9	11.1	10.4	10.6
Interorbital width	7.1	6.7	8.3	8.2	6.6	7.4
Upper-jaw length	24.5	23.0	23.7	24.2	23.4	23.7
Postorbital length	23.1	23.7	23.7	23.2	23.6	23.5
Pre-dorsal-fin length	43.3	43.4	46.2	46.9	43.5	44.7
Pre-anal-fin length	66.1	69.0	66.7	69.6	67.1	67.7
Pre-pelvic-fin length	36.2	37.2	39.1	36.7	37.8	37.4
1 st dorsal-fin spine length	4.7	5.3	3.8	5.3	4.7	4.8
2 nd dorsal-fin spine length	7.8	8.5	6.4	8.2	7.3	7.6
Longest dorsal-fin spine length	15.3	15.9	16.0	15.9	15.1	15.7
11 th dorsal-fin spine length	9.4	10.3	6.4	8.2	8.7	8.6
12 th dorsal-fin spine length	13.9	—	13.5	13.0	12.5	13.2
Longest dorsal-fin soft ray length	20.5	20.0	16.0	17.9	22.5	19.4
1 st anal-fin spine length	10.4	11.7	—	11.1	9.0	10.5
2 nd anal-fin spine length	21.4	20.9	—	17.4	18.0	19.4
3 rd anal-fin spine length	18.4	18.4	16.0	15.0	16.1	16.8
Longest anal-fin soft ray length	22.8	21.6	—	17.9	22.0	21.1
Pectoral-fin length	36.0	34.0	—	30.9	31.0	32.9
Pelvic-fin spine length	16.9	17.0	17.3	17.9	16.5	17.1
Longest pelvic-fin soft ray length	26.4	26.0	25.0	24.6	25.5	25.5
Caudal-fin length	28.2	28.5	29.5	28.5	27.0	28.3
Caudal-peduncle length	17.9	17.5	16.0	15.9	18.2	17.1
Caudal-peduncle depth	11.8	11.7	12.2	11.6	11.3	11.7



Figure 1. Preserved specimen of *Scorpaenopsis vittapinna*, AMS I. 18740-026, 42.5 mm SL, Lizard Island, Queensland, Australia.

bit (not reaching the posterior orbit margin in two smallest specimens). Jaws with a band of slender, incurved, conical teeth; about 7 tooth rows at anterior of upper jaw and 6 in lower; band narrowing to 1 or 2 teeth posteriorly; teeth progressively longer inwardly. Vomer with short conical teeth, longer posteriorly, forming a V-shaped patch. Palatine teeth absent. Tongue thick, rounded, with fleshy tip and a median skeletal rim.

Interorbital ridges low, rounded, beginning with indistinct ridge from anterior interorbital space, conjoined level with tympanic spines posteriorly and forming a low ridge to anterior angular edge of occipital pit. Occipital pit very shallow. Nasal, preocular, supraocular, and postocular spines simple; postocular spine slightly canted laterally, base wide. Tympanic spine simple, pointed, slightly canted laterally; base joined to interorbital ridge or to parietal-spine base by low ridge. Parietal spine simple, base distinctly medial to tympanic spines. Nuchal spine simple, base continuous with parietal spine. A low transverse ridge posteriorly in occipital pit between bases of parietal and nuchal spines. Sphenotic with two small spines. Postorbital smooth, without pointed spines or with 1 or 2 tiny spines. Pterotic spine simple, located below parietal spine. Upper and lower posttemporal spines simple, upper shorter than lower. Supracleithral spine simple, with distinct ridge on dorsal margin. Cleithral spine flattened, strongly pointed. Upper opercular spine divided into 2 points (simple and divided into 3 points, respectively, in two specimens 15.6 and 35.9 mm SL), with low median ridges (Fig. 2A). Lower opercular spine simple, with distinct median ridge. Suborbital pit rimmed anteriorly by vertical lacrimal ridge, narrow, relatively deep, deepest anteriorly below anterior part of orbit. Suborbital ridge with four spines (five in one specimen 43.5 mm SL), first on lacrimal, small; first and second directed slightly ventrally. Preopercle with five spines, uppermost longest with a supplemental spine, second to fifth flat. Lacrimal

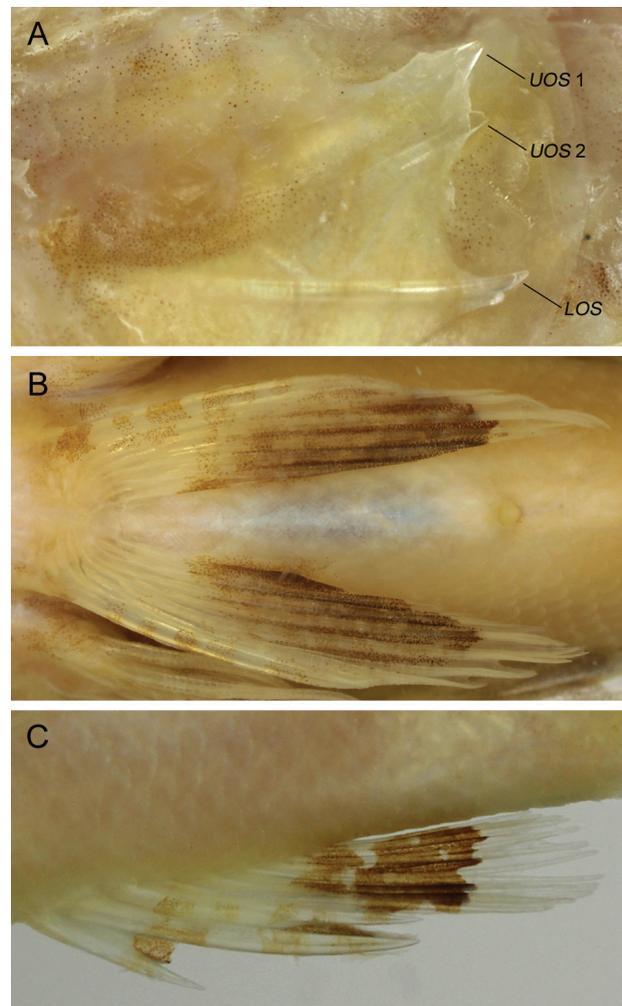


Figure 2. Preserved specimens of *Scorpaenopsis vittapinna*. (A) opercular spines of WAM P. 28022-012, 42.3 mm SL (*UOS*, upper opercular spine; *LOS*, lower opercular spine); (B) ventral view of pelvic fins of same individual as Fig. 1; (C) anal fin of same individual as Fig. 2A.

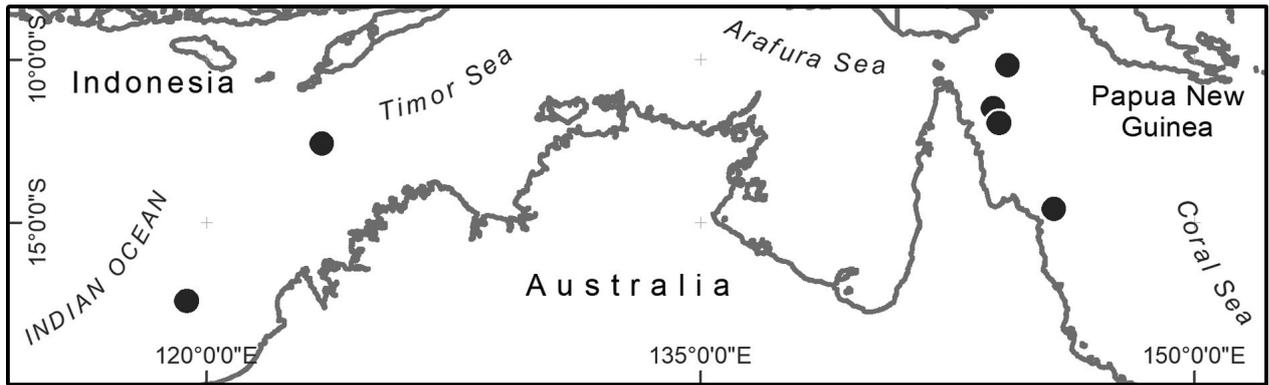


Figure 3. Distributional records of *Scorpaenopsis vittapinna* in Australian waters.

with two anterior parallel ridges. Anterior lacrimal spine simple, directed slightly anteroventrally. Posterior lacrimal spine simple (2 points in two specimens 35.9 and 42.5 mm SL), directed posteroventrally.

Lateral surface of body covered with ctenoid scales, becoming cycloid ventrally. Exposed cycloid scales covering pectoral-fin base and anteroventral surface of body. Cycloid or ctenoid scales embedded in thin skin covering cheek. Body scales not extending onto fin rays or membranes, except basally on pectoral and caudal fins. Ctenoid scales covering preopercle behind eye, below pterotic and lower posttemporal spines, and distal area between upper and lower opercular spines. Lateral line complete, first two scales with spine-like projection at end of sensory tube.

Underside of dentary with three sensory pores; single pores behind and on each side of lower-jaw symphyseal knob; a small pore behind nasal spine and on each of mid-interorbital ridge; some small pores associated with suborbital ridge and preopercular spine bases.

A short slender tentacle on posterior end of preopercular spine base. A fleshy tentacle associated with supraocular spine, length about equal to orbit diameter. A slender tentacle posteriorly on parietal and nuchal spine bases. Many small papillae on outer margins of eye membrane. A tentacle, with several short branches along distal margin, on upper posterior edge of low membranous tube associated with anterior nostril, extending beyond posterior nostril when laid back. Anterior lacrimal spine associated with a short slender tentacle. Posterior lacrimal spine associated with a broad fleshy tentacle; its length greater than that of anterior nostril tentacle; posterior lacrimal spine tentacle linked posteriorly to head by fringed skin. A broad, thin skin flap associated with each of 3rd–5th preopercular spines. Many fleshy tentacles on ventral surface of head, anteriormost longest. A slender, fleshy tentacle centrally on cheek. Several slender tentacles associated with pored lateral scales, scattered on lateral surface of body.

Color of preserved specimens (based on all specimens). Head and body yellowish brown or whitish; faint brownish blotches below eye and dorsally on operculum;

ca. three faint broad brownish blotches dorsolaterally on body. Dorsal fin with small brownish spots scattered on basal membranes of spinous and soft-rayed portions in some specimens. Pectoral fin with some small brownish spots dorsally or dark brownish membranes between rays. Pelvic fin with broad dark brown medial band (Fig. 2B). Anal fin with broad dark brown medial band across soft rays (Fig. 2C).

Discussion

Scorpaenopsis vittapinna can be distinguished from all other congeners by the following combination of characters: pectoral-fin rays 17–19 (usually 18, rarely 19), longitudinal scale series 40–44; interorbital width 5.7–6.9 in HL; snout length 3.0–3.3 in HL; mouth slightly oblique; posterior margin of maxilla just reaching a vertical through posterior margin of orbit or slightly beyond (except in juveniles); occipital pit shallow; upper opercular spine usually with 2–4 points; lower opercular spine single; and a broad dark brown medial band on pelvic and anal fins (Randall and Eschmeyer 2001; this study).

The present specimens were identified as *S. vittapinna*, agreeing closely with the diagnostic features of the species given by Randall and Eschmeyer (2001). However, the Australian specimens differed slightly from the type specimens of *S. vittapinna* in the following characters (regarded here as intraspecific variations): head length 2.1–2.2 in SL (vs. 2.2–2.3 in SL in the latter); orbit diameter 4.3–4.6 in HL (vs. 4.5–5.0 in HL); and interorbital width 5.8–6.9 in HL (vs. 5.7–6.5 in HL). Although Randall and Eschmeyer (2001) and Motomura et al. (2011) indicated that *S. vittapinna* had the posterior maxilla margin just reaching a vertical through posterior margin of orbit or slightly beyond, and the upper opercular spine with two or more points, the two smallest of the present specimens (15.6–20.7 mm SL) had the posterior maxilla margin not reaching the posterior orbit margin (both specimens), and a simple upper opercular spine (the smallest specimen).

Randall and Eschmeyer (2001) indicated that the number of spinous points on the posterior lacrimal spine in *S. vittapinna* changes with growth [simple in juveniles, two points in adults (largest recorded size 65 mm SL)]. The three apparently juvenile Australian specimens (15.6–24.7 mm SL) had simple posterior lacrimal spines, the remaining (subadult) specimens having double (35.9 and 42.5 mm SL) and simple (42.3 and 43.5 mm SL) posterior lacrimal spines. In addition, Randall and Eschmeyer (2001) also indicated that the second to fifth pectoral-fin rays are branched. However, of the present specimens, the two smallest (15.6–20.7 mm SL) had all pectoral-fin rays unbranched, the largest (43.5 mm SL) had 5 rays branched, and the remaining specimens (24.7–42.5 mm SL) had 4 rays branched, suggesting that the number of branched pectoral-fin rays in *S. vittapinna* tends to increase with growth, a well-known feature of Scorpaenidae (e.g., genus *Scorpaena*) (Motomura et al. 2005; Wibowo et al. 2019).

Scorpaenopsis vittapinna is widely distributed in the Indo-West Pacific, having been recorded from the following localities: Red Sea, South Africa (type locality), Mauritius, Comoro Islands, Seychelles, Maldives Islands, Indonesia, Philippines, Papua New Guinea, Caroline Islands, Coral Sea (New Caledonia), Fiji, Wallis and Futuna Islands, Samoa, French Polynesia (Randall and Eschmeyer 2001); Ryukyu Islands, Japan (Motomura et al. 2004); Madagascar (Fricke et al. 2018); Taiwan (Moto-

mura et al. 2011); and Marquesas Islands (Delrieu-Trottin et al. 2015), occurring on coral reefs or rubble bottoms in depths 0–40 m (Randall and Eschmeyer 2001). The present specimens, being the first records from Australian waters, were distributed from Rowley Shoals, Western Australia to Lizard Island, Queensland in depths of 10–23 m (Fig. 3).

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