

## New Records of Three Scorpaenid Fishes (Teleostei: Scorpaeniformes) from Taiwan

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### ABSTRACT

Scorpaenid specimens of *Pterois mombasae* (Smith, 1957), *Scorpaenopsis obtusa* Randall and Eschmeyer, 2002 and *Scorpaenopsis vittapinna* Randall and Eschmeyer, 2002 were found at fish collection of the National Museum of Marine Biology and Aquarium, Pingtung, Taiwan, in July 2011. The three specimens are described herein as the first records of the three species from Taiwan. Remarks on the variation and distribution of each species are also provided.

**Key words:** Scorpaenidae, Lionfish, Scorpionfish, New Records, Taiwan.

### INTRODUCTION

Although scorpionfishes (Scorpaeniformes: Scorpaenidae) were reviewed taxonomically in detail by Chen (1981), numerous mis-identifications had been pointed out (e.g., Motomura *et al.*, 2009a, 2010a, 2011a). Recently, *Scorpaena pepo* Motomura *et al.* (2007) was described as a new species from Taiwan and four species, i.e., *Parascorpaena aurita* (Rüppell, 1838), *Scorpaenopsis albaiensis* (Evermann and Seale, 1907), *Scorpaenodes quadrispinosus* Greenfield and Matsuura (2002) and *Sebastapistes fowleri* (Pietschmann, 1934), were reported as the first accurate Taiwanese records on the basis of voucher specimens (Motomura *et al.*, 2007, 2009a, b, 2010b; Motomura and Senou, 2009).

During examination of scorpionfish specimens deposited at fish collection of the National Museum of Marine Biology and Aquarium, Taiwan, in July 2011, single specimens of *Pterois mombasae* (Smith,

1957), *Scorpaenopsis obtusa* Randall and Eschmeyer (2002) and *Scorpaenopsis vittapinna* Randall and Eschmeyer (2002) were found. The three specimens are briefly described herein as the first records of the three species from Taiwan.

### MATERIALS AND METHODS

Measurements generally follow Motomura (2004a, b), except head width (Motomura *et al.*, 2005b, 2006a), and maxillary depth (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. Counts of preopercular spines begin with the uppermost spine. Standard length is expressed as SL. Terminology of head spines follow Randall and Eschmeyer (2002:

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Fig. 1) and Motomura (2004a: Fig. 1) with the following additions: the spine occurring at the base of the uppermost preopercular spine is referred to as the supplemental preopercular spine (Eschmeyer, 1965); the spine occurring at the lateral surface of the lacrimal bone is referred to as the lateral lacrimal spine (Motomura and Senou, 2008: Fig. 2; Motomura *et al.*, 2011b: Fig. 1); and the coronal and pretympenic (as an extra spine) spines are figured in Chen (1981: Fig. 1) and Motomura *et al.* (2004: Fig. 14b) respectively. Proportional measurements of the three specimens are shown in Table 1. The specimens examined are deposited at the Kagoshima University Museum, Japan (KAUM) and National Museum of Marine Biology and Aquarium, Taiwan (NMMB).

## RESULTS

### *Pterois mombasae* (Smith, 1957)

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#### Fig. 1; Table 1

*Pteropterus mombasae* Smith, 1957: 80, Fig. 7, pl. 6, Fig. D (type locality: Mombasa, Kenya).

*Pterois mombasae*: Matsunuma and Motomura, 2011: 29, Figs. 1-4 (redescription; Indo-West Pacific); Matsunuma *et al.*, 2011: 4, Figs. 1, 2A (Yaku-shima Island, Japan).

*Material examined*: KAUM-I. 39268, 100.5 mm SL, off southwestern Taiwan (obtained at Hsin-Da Port, Kaohsiung), 3 Apr. 2011, coll. H.-C. Ho.

*Description*: Dorsal-fin rays XIII, 10; anal-fin rays III, 6; pectoral-fin rays 18 on each side of body; scale rows in longitudinal series 50; pored lateral-line scales more than 24; scales above lateral line 8; scales below lateral line 13; scale rows between sixth dorsal-fin spine base and lateral line 7; scale rows between last dorsal-fin spine and lateral line 8; predorsal-fin scale rows 7; gill rakers 4 + 11 = 15.

Body moderately compressed. Body depth slightly less than longest dorsal-fin spine length. Ctenoid scales on lateral surface of body. Exposed cycloid scales covering pectoral-fin base and ventral surface of body. No scale on snout and both jaws. Posterior margin of maxilla reaching a vertical through middle of eye. About 5 rows of small conical teeth forming a V-shaped patch on vomer. No palatine teeth. Three short barbells on tip of snout. A tentacle on



Fig. 1. *Pterois mombasae* from Kaohsiung, southwestern Taiwan (KAUM-I. 39268, 100.5 mm SL).

**Table 1.** Proportional measurements of *Pterois mombasae*, *Scorpaenopsis obtusa* and *S. vittapinna*, expressed as percentages of standard length

	<i>Pterois mombasae</i>	<i>Scorpaenopsis obtusa</i>	<i>Scorpaenopsis vittapinna</i>
	KAUM-I. 39268	NMMB-P7637	NMMB-P7038
Standard length (mm)	100.5	47.7	44.7
Body depth	39.2	43.8	34.2
Body width	28.5	31.0	23.3
Head length	42.2	49.5	47.0
Head width	14.0	21.4	15.7
Snout length	11.8	12.6	14.1
Orbit diameter	14.6	11.9	10.1
Interorbital width at middle of eye	8.7	13.4	6.3
Interorbital width at preocular spine base	8.4	12.4	5.8
Postorbital length	17.4	28.1	23.5
Upper-jaw length	19.6	28.5	24.4
Maxillary depth	7.8	8.4	7.4
Suborbital distance <sup>1</sup>	0.6	1.7	2.7
Predorsal-fin length	36.6	43.4	42.5
Preanal-fin length	73.4	73.0	70.5
Prepelvic-fin length	37.0	39.6	44.3
1st dorsal-fin spine length	17.7	7.8	6.5
2nd dorsal-fin spine length	26.0	14.5	11.0
3rd dorsal-fin spine length	30.1	—	14.3
4th dorsal-fin spine length	—	15.5	16.3
5th dorsal-fin spine length	39.7	14.5	17.4
Penultimate dorsal-fin spine length	15.2 (12th)	11.5 (11th)	10.1 (11th)
Last dorsal-fin spine length	14.3 (13th)	15.3 (12th)	14.3 (12th)
Longest dorsal-fin soft ray length	26.1 (5th)	23.3 (3rd)	20.8 (2nd)
1st anal-fin spine length	8.5	10.1	11.6
2nd anal-fin spine length	15.5	20.1	20.8
3rd anal-fin spine length	17.2	19.1	19.2
Longest anal-fin soft ray length	—	24.5 (1st)	23.7 (1st)
Pectoral-fin ray length	—	39.2 (6th)	31.8 (9th)
Pelvic-fin spine length	20.2	19.5	17.4
Longest pelvic-fin soft ray length	43.0 (3rd)	30.6 (2nd)	27.1 (2nd)
Caudal-fin length	33.3	27.9	29.3
Caudal-peduncle length	15.4	18.0	17.4
Caudal-peduncle depth	10.3	11.1	11.6

<sup>1</sup>: Distance between ventral margin of orbit and suborbital ridge.

posterior edge of low membranous tube associated with anterior nostril. Supraocular tentacle long, its length about 1.4 times of orbit diameter; with 4 branches on each sides. A small skin flap on upper portion of orbital surface. Two rounded skin flap

on posterior margin of preopercle. A short barbell on anterior part of ventral margin of lacrimal, its length subequal to that of tentacle on anterior nostril. A rounded skin flap on tip of posterior lacrimal spine. No other skin flap on head or body.

Nasal spine simple. Median interorbital ridge absent. Interorbital ridges indistinct. Interorbital space deep, about one third of orbit extending above dorsal profile of head. Preocular with two spinous points. Supraocular spine simple covered with skin. Postocular spine fan-shaped, with 7 (5 on right side) spinous points. Coronal and tympanic spines simple. Occiput nearly flat without surrounding ridges. Parietal and sphenotic spines with 2-4 spinous points. Postorbital without spine or sensory canal. Pterotic spine with 5 (4) points. Lower posttemporal spine with 3 points. Supracleithral spine with 3 spinous points. Lateral lacrimal spine with 2 (1) points. No anterior lacrimal spine. Posterior lacrimal spine flat and broad plate-shaped with a single (2) spinous point, its tip covered with skin. Suborbital with 16 (13) spines. Preopercle with 3 spines; all spines subequal in length; lowermost spine flat, with broad base; no supplemental spine. No opercular spine. Posterior margin of opercular membrane reaching a vertical through forth dorsal-fin spine base. Posterior tip of pectoral fin extending beyond caudal-fin base, but not reaching to posterior tip of caudal fin. Origin of pelvic-fin spine just below origin of pectoral fin. Posterior tip of depressed pelvic fin just reaching to third anal-fin spine base. Origin of first anal-fin spine just below origin of last dorsal-fin spine.

Color when fresh (based on a photograph of the specimen when fresh): Head and body reddish white dorsally, whitish ventrally. Four reddish brown bars on head; anteriormost bar on snout from anteroventral margin of orbit to ventral margin of lacrimal; second bar from ventral margin of orbit to upper edge of maxilla; third bar from supraocular tentacle base to subopercle through eye; fourth bar saddled on nape. About 16 bars on lateral surface of body, extending onto membrane of soft-rayed portions of dorsal and anal fins. Supraocular tentacle reddish orange, with 4 reddish brown bands; skin flap on orbit surface dark red; other skin flaps on head pale reddish white. Two to 5 reddish brown bars on dorsal-fin spines; soft-rayed portion of the fin semi-translucent, with 68 small

black spots on rays. Soft-rayed portion of anal fin semi-translucent, with 45 small black spots on rays. Caudal fin semi-translucent, with 86 small black spots on rays. Pectoral-fin membrane reddish orange, brownish distally, with 17 brownish red blotches.

*Color in preservative:* Reddish coloration disappeared. Head and body whitish; pectoral-fin membrane with black blotches; fin rays with indistinct bands.

*Remarks:* The present specimen belongs to the genus *Pterois* in having three anal-fin spines, unbranched pectoral-fin rays, no ridges and scales on the ventral surface of the lower jaw, and the parietal spines not elevated, the bases of the spine diverging posteriorly in dorsal view. The following characters found in the Taiwanese specimen agreed with those of *P. mombasae* given by Smith (1957) and Matsunuma and Motomura (2011): dorsal-fin rays XIII, 10; pectoral-fin rays 18 (18 or more in Matsunuma and Motomura, 2011); suborbital ridge closed to ventral margin of orbit; head and upper portion of body covered with ctenoid scales; scale rows in longitudinal series 50 (44-51); pectoral fin with 17 (6-24) small blotches on its membrane and numerous bands on rays. The Taiwanese specimen slightly differed from specimens from Indo-Pacific Ocean described by Matsunuma and Motomura (2011) in having a wider body width (28.5% SL vs. 18.0-28.0% in the latter) and a shallower caudal-peduncle depth 10.3% SL (vs. 10.6-12.8%). These minor differences are most likely to represent intraspecific variation.

*Pterois mombasae* is distributed in the Indo-West Pacific where it ranges from the east coast of Africa east to New Caledonia and southern Japan (Smith, 1957; Matsunuma and Motomura, 2011; Matsunuma *et al.*, 2011). However, since the species has never been recorded from Taiwanese waters, the present specimen represents the first record of *P. mombasae* from Taiwan.

***Scorpaenopsis obtusa* Randall and Eschmeyer, 2002**

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**Fig. 2; Table 1**

*Scorpaenopsis obtusa* Randall and Eschmeyer, 2002: 37, fig. 10 (type locality: Observation Island, Tawitawi Group, Sulu Archipelago, Philippines); Motomura and Shinohara, 2005: 296, Figs. 1-5, 6A, 7 (redescription; western Pacific).

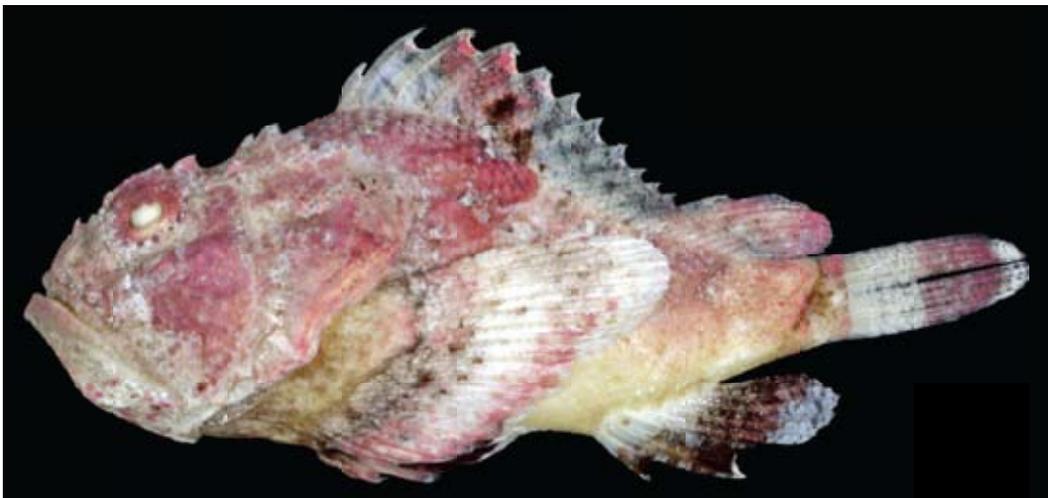
*Scorpaenopsis diabolus* (not of Cuvier, 1829): Chen *et al.*, 2010: 99, unnumbered Fig., inserted in fig. E (Dong-sha Island, Taiwan)

*Material examined*: NMMB-P7637, 47.7 mm SL, Dong-sha Islands (Paratas Islands), South China Sea, 21 Aug. 2004, coll. J.-P. Chen.

*Description*: Dorsal-fin rays XII, 9; anal-fin rays III, 5; pectoral-fin rays 18 on each side of body; scale rows in longitudinal series 39; pored lateral-line scales 21; scales above lateral line 6; scales below lateral line 19; scale rows between sixth dorsal-fin spine base and lateral line 5; scale rows between last dorsal-fin spine and lateral line 6; predorsal-fin scale rows 4; gill rakers 4 + 8 = 12. Body not compressed anteriorly, but progressively more compressed posteriorly. Mouth large, oblique, forming an angle of about 60° to horizontal axis of head and body; posterior margin of maxilla slightly extending beyond a straight line linking

posterior margin of orbit with edge of retroarticular. Vomerine tooth plate forming a V-shaped patch, with few teeth; no palatine teeth. Nasal spine simple, directed dorsally, its length slightly greater than posterior nostril diameter. Ascending process of premaxilla intruding into interorbital space; posterior margin of ascending process extending well beyond level of anterior margin of orbit. No median interorbital ridge. Interorbital ridges poorly developed; interorbital space shallow and broad, its width greater than orbit diameter. Preocular and supraocular spines small. Postocular spine simple, larger than supraocular spine, broadly joined to tympanic spine at base. No coronal or pretympanic spines. Occipital pit deep, anterior edge distinct and curved posteriorly. Parietal and nuchal spines joined at base. Sphenotic with 2 small spines. Postorbital with 4-6 small spines. Pterotic, and upper and lower posttemporal spines simple. Supracleithral spine bearing 4 spinous points.

Anteriorly directed lacrimal ridge serrated. Lateral lacrimal spine simple. Anterior lacrimal spine simple, directed anteroventrally; posterior lacrimal spine simple, directed posteroventrally; posterior lacrimal spine associated with a short fimbriate flap, linked posteriorly to head by fringed skin; posterior lacrimal spine larger



**Fig. 2.** *Scorpaenopsis obtusa* from Dong-sha Islands, South China Sea (NMMB-P7637, 47.7 mm SL).

than anterior spine. Suborbital ridge with 3 spines. Suborbital pit present. Preopercle with 5 spines; uppermost spine largest and bearing supplemental preopercular spine; lower 4 spines simple, blunt. Upper opercular spine with 2 points, no median ridge; lower opercular spine simple with a strong median ridge.

Origin of first dorsal spine just above supracleithral spine. Posterior margin of opercular membrane reaching a vertical through fourth dorsal-fin spine base. Posterior tip of pectoral fin extending well beyond a vertical through first anal-fin soft ray base. Posterior tip of depressed pelvic fin extending slightly beyond anus. Origin of last dorsal-fin spine just above origin of first anal-fin spine.

Color in preservative: Head and body mulberry dorsally, whitish ventrally. An indistinct black blotch on dorsal fin between fourth and eighth spines basally. Axil of pectoral fin white with 20–26 small black spots; inner surface of pectoral fin white with a semicircular black blotch near base of first 8 rays and associated membranes, and a broad submarginal black band extending over first 10 rays and associated membranes. Pelvic fin black, except white distal margin. Anal fin whitish with a broad black band. Caudal fin white with a broad mulberry band submarginally. Color when fresh of the specimen shown in Chen *et al.* (2010: 99).

**Remarks:** The genus *Scorpaenopsis* Heckel was revised by Randall and Eschmeyer (2002), who recognized 24 valid species in the genus. Subsequently, *S. eschmeyeri* Randall and Greenfield, 2004, *S. insperatus* Motomura, 2004 and *S. crenulata* Motomura and Causse, 2011 were described as new species from the southwestern Pacific Ocean. The genus is characterized by having 12 dorsal-fin and three or more suborbital spines, and lacking palatine teeth, black pigment between the first and third dorsal-fin spines, and a strongly compressed head (Randall and Eschmeyer 2002; Motomura 2004a; Motomura *et al.* 2004; Motomura and Senou, 2005).

Color photograph of the present specimen when fresh was reported as *Scorpaenopsis diabolus* (Cuvier, 1829) by Chen *et al.* (2010: 99, unnumbered fig., inserted in fig. E). However, characters of the present specimen are well consistent with those of *S. obtusa* given by Randall and Eschmeyer (2002) and Motomura and Shinohara (2005). The species can be easily distinguished from all other congeners by the ascending process of the premaxilla intruding into the interorbital space and the posterior margin of the process extending well beyond level of the anterior margin of the orbit (vs. not intruding into interorbital space in the latter). Detailed comparisons of *S. obtusa* with other congeners, including *S. diabolus*, were given in Motomura and Shinohara (2005).

Incidentally, Chen *et al.*'s (2010) *Parascorpaena mcadamsi* (Fowler, 1938) (94, Fig. B), *Parascorpaena picta* (Cuvier in Cuvier and Valenciennes, 1829) (94, Fig. C), *Scorpaenodes littoralis* (Tanaka, 1917) (96, Fig. A), *Scorpaenopsis cirrosa* (Thunberg, 1793) (98, Fig. A) and *Scorpaenopsis cirrosa* (Thunberg, 1793) (98, Fig. B) are re-identified here as *Parascorpaena mossambica* (Peters, 1855), *Parascorpaena aurita* (Rüppell, 1838), *Scorpaenodes evides* (Jordan and Thompson, 1914), *Scorpaenopsis oxycephala* (Bleeker, 1849) and *Scorpaenopsis papuensis* (Cuvier in Cuvier and Valenciennes, 1829) respectively.

*Scorpaenopsis obtusa* is distributed in the eastern Indian (Western Australia) and western Pacific Oceans, and its close relative, *S. gibbosa* (Bloch and Schneider, 1801), is replaced with *S. obtusa* in the western and central Indian Ocean (Motomura and Shinohara, 2005: Fig. 2). *Scorpaenopsis obtusa* has been reported only from seven specimens, including holotype and two paratypes, and from a single specimen (40.4 mm SL, Okinawa-jima Island, Ryukyu Islands) from East Asia (Motomura and Shinohara, 2005). Thus, the present specimen represents the first record of *S. obtusa* from Taiwan and the second specimen of the species from East Asia.

***Scorpaenopsis vittapinna* Randall and Eschmeyer, 2002**

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**Fig. 3; Table 1**

*Scorpaenopsis vittapinna* Randall and Eschmeyer, 2002: 71, pl. 9 (Fig. D), pl. 12 (Figs. G-H) (type locality: off Sodwana Bay, KwaZulu-Natal, South Africa); Motomura *et al.*, 2004: 105, Fig. 12 (Okinawa, Ryukyu Islands, Japan); Motomura *et al.*, 2011a: 69 (Wallis and Futuna Islands and Comoro Islands).

*Material examined*: NMMB-P7038, 44.7 mm SL, Shiao-liu-qi, Pingtung, southwestern Taiwan, 12 Dec. 2003, coll. J.-P. Chen.

*Description*: Dorsal-fin rays XII, 8; anal-fin rays III, 5; pectoral-fin rays 18 on each side of body; scale rows in longitudinal series 41; pored lateral-line scales ca. 19; scales above lateral line 7; scales below lateral line 13; scale rows between sixth dorsal-fin spine base and lateral line 5; scale rows between last dorsal-fin spine and lateral line 5; predorsal-fin scale rows 6; gill rakers 3 + 8 = 11.

Body moderately compressed anteriorly, progressively more compressed posteriorly. Mouth large, oblique, forming an angle of about 20° to horizontal axis of head and body; posterior margin of maxilla just reaching a vertical through posterior margin of orbit. Vomerine tooth plate forming a

V-shaped patch, with few teeth; no palatine teeth. Nasal spine simple, directed dorsally, its length subequal to posterior nostril diameter. Ascending process of premaxilla not intruding into interorbital space; posterior margin of ascending process not extending beyond level of posterior margin of posterior nostril. No median interorbital ridge. Interorbital ridges poorly developed; interorbital space shallow and narrow, its width less than orbit diameter. Preocular and supraocular spines small. Postocular spine simple, larger than supraocular spine, joined to tympanic spine at base. No coronal or pretympanic spines. Occipital pit shallow, anterior edge indistinct and strongly curved posteriorly. Parietal and nuchal spines joined at base. Sphenotic with 2 small spines. Postorbital with 2 small spines. Pterotic, and upper and lower posttemporal spines simple. Supracleithral spine bearing a spinous point.

Anteriorly directed lacrimal ridge smooth. Lateral lacrimal spine simple. Anterior lacrimal spine simple, directed anteroventrally; posterior lacrimal spine simple, but with an indistinct bump on anterior margin; posterior lacrimal spine associated with a short fimbriate flap, linked posteriorly to head by fringed skin; posterior lacrimal spine larger than anterior spine. Suborbital ridge with 3 spines (2 spines on left side of head). Suborbital pit present. Preopercle with 5 spines; uppermost spine largest and bearing supplemental



**Fig. 3.** *Scorpaenopsis vittapinna* from Shiao-liu-qi, southwestern Taiwan (NMMB-P7038, 44.7 mm SL).

preopercular spine; lower 4 spines simple, blunt. Upper opercular spine with 2 points, no median ridge; lower opercular spine simple with a strong median ridge.

Origin of first dorsal-fin spine just above supracleithral spine. Posterior margin of opercular membrane reaching a vertical through fourth dorsal-fin spine base. Posterior tip of pectoral fin just reaching a vertical through third anal-fin spine base. Posterior tip of depressed pelvic fin reaching origin of anal fin. Origin of last dorsal-fin spine just above origin of first anal-fin spine.

Color in preservative: Head and body gray dorsally, whitish ventrally. Distinct melanophores scattered on head; dark blotches on body. No black blotch on spinous portion of dorsal fin. No distinct markings on axil and inner surface of pectoral fin. Pelvic fin whitish with a black band. Anal fin white with irregular black bands.

*Remarks:* Characters of the present specimen agree with those of *Scorpaenopsis vittapinna* given by Randall and Eschmeyer (2002) and Motomura *et al.* (2004). The species can be distinguished from all other congeners by the following combination of characters: upper opercular spine divided into 2 or more spinous points; pectoral-fin rays usually 18; eyes small, orbit diameter 58.8–83.3% of snout length; interorbital space narrow, interorbital width 15.4–17.5% of head length; nape and anterior body not highly arched; and a black band across pelvic and anal fins.

The posterior lacrimal spine of *S. vittapinna* is simple when young and divides into two spinous points with growth (Randall and Eschmeyer, 2002). Although the present Taiwanese specimen (44.7 mm SL) is likely to be subadult (largest recorded size of *S. vittapinna*, 65 mm SL), its posterior lacrimal spine on each side of the head was simple. A Japanese specimen (42 mm SL) smaller than the Taiwanese specimen has already had the two spinous points on the posterior lacrimal spine (Motomura *et al.*, 2004).

Although *S. vittapinna* is widely distributed in the Indo-Pacific, except for the Hawaiian Islands (Randall and Eschmeyer, 2002), it rarely occurs in the East Asian waters.

Only two Japanese specimens (42–51 mm SL, Okinawa-jima Island, Ryukyu Islands) have previously been recorded from East Asia (Motomura *et al.*, 2004). Thus, the present specimen represents the first record of *S. vittapinna* from Taiwan and the third specimen of the species from East Asia.

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## 台灣產三個新紀錄種魷科魚類

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本研究重新檢視臺灣國立海洋生物博物館魷科魚類典藏後，發現三種產於台灣之新紀錄種，分別為黑頰蓑魷(*Pterois mombasae*)、鈍頭擬魷(*Scorpaenopsis obtusa*)及紋棘擬魷(*Scorpaenopsis vittapinna*)。本文提供此三種之簡短描述及其相關資訊。

**關鍵詞：**黑頰蓑魷，鈍頭擬魷，紋棘擬魷。

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