

## A Review of the Genus *Scolopsis* of Nemipterid Fishes, with Descriptions of Three New Records from Taiwan

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**Shih-Chieh Shen (1997)** A review of the genus *Scolopsis* of nemipterid fishes, with descriptions of three new records from Taiwan. *Zoological Studies* 36(4): 345-352. Diagnosis, distribution, key to species and figures are presented for the 10 Taiwanese species of the genus *Scolopsis*, which includes *S. affinis*, *S. bilineata*, *S. ciliata*, *S. linea*, *S. margaritifera*, *S. monogramma*, *S. taenioptera*, *S. trilineata*, *S. vosmeri*, and *S. xenochroa*. Among these, *S. ciliata*, *S. taenioptera*, and *S. trilineata* are new records for Taiwan.

**Key words:** Fish taxonomy, Nemipteridae, Fish fauna, New records, Taiwan.

The genus *Scolopsis* Cuvier (1815) described in this paper is one of 5 genera included in the family Nemipteridae. The other genera besides *Scolopsis* are: *Nemipterus* Swainson (1839), *Parascolopsis* Boulenger (1901), *Pentapodus* Quoy and Gaimard (1824), and *Scaeius* Whitley (1947) (Russell 1990). *Scolopsis* is distinguished from other nemipterid genera by having the suborbital naked, and a large spine and a series of smaller spines or serrations on its posterior margin. Most authors before 1984 treated the genus *Parascolopsis* as a junior synonym of the genus *Scolopsis* (Masuda et al. 1984, Nelson 1984). In 1984, Russell and Gloerfelt-Tarp separated these 2 genera with 5 osteologic characters: suborbital spine, jaw structure, development of the infraorbital bones, number of epipleural ribs, and development of the 2nd anal spine. Since then, *Parascolopsis* and *Scolopsis* have been widely accepted as 2 valid genera (Russell 1990, Lee 1993).

*Scolopsis* species occur in shallow reef areas and forage on sandy or muddy bottoms. They are common in coastal waters along Taiwan, except the western sandy coast. Jordan and Evermann (1902) first reported 3 nemipterid species from Taiwan. Two of these, *Scolopsis vosmeri* and *S. monogramma*, belong to the genus *Scoplosis*. Later in 1919, Jordan and Richardson recorded a further species, *S. eriomma*, which was subsequently moved to the genus *Parascolopsis*. Chu (1957) reported *S. mar-*

*garifera* from the Pescadore Islands. Chen (1969) recorded 3 more species: *S. temporalis* (= *S. monogramma*), *S. cancellatus* (= *S. linea*) and *S. bilineatus*. Shen (1984a) added 2 species: *S. ciliatus* and *S. personatus*, and considered *S. monogramma* a junior synonym of *S. dubiosus*. In a revision of the Nemipteridae, Lee (1986) added 2 species of *Scolopsis*, *S. inermis* (= *Parascolopsis inermis*) and *S. xanochrous*, and removed *S. ciliatus* from Taiwanese fauna because it had never been found from the surrounding waters of Taiwan. In the key to the genus *Scolopsis*, he listed 9 valid species, two of which were later moved to the genus *Parascolopsis* (Lee 1993).

In the present paper, 10 species of the genus *Scolopsis* from Taiwan are reported and a key, and color figures of different stages, when available, are given.

### MATERIALS AND METHODS

All specimens were caught by scuba diving using rotenone and a hand net. Specimens were first fixed in formalin and then preserved in 70% alcohol. Measurements of body proportion and meristic counts are based on alcohol-preserved specimens. Methods of measurements follow Russell (1990). All specimens are now deposited in the

museum of the Department of Zoology, National Taiwan University (NTUM), Institute of Zoology, Academia Sinica (ASIZP), National Marine Science Museum (NMSM), and Taiwan Fishery Research Institute, Penghu Branch (TFRI-PH).

## RESULTS

### Species accounts

#### Key to species of the genus *Scolopsis* from Taiwan

- 1a. Antrorse suborbital spine present..... 2
- 1b. Antrorse suborbital spine absent..... 5
- 2a. Maxillary denticulated along its external edge..... *S. ciliata*
- 2b. Maxillary smooth along its external edge ..... 3
- 3a. Head scales reaching anteriorly only to the level between anterior margin of eyes and posterior nostrils .....  
..... *S. xenochroa*
- 3b. Head scales reaching anteriorly or in front of anterior nostrils..... 4
- 4a. Pectoral fin reaching the level of anus; anterior part of anal fin dark red or black; opercle without white vertical bar.....  
..... *S. bilineata*
- 4b. Pectoral fin not reaching the level of anus; anterior part of anal fin neither dark red nor black; opercle with a white vertical bar.....  
..... *S. vosmeri*
- 5a. Lateral-line scales less than 40, with 35~39 scales .....  
..... *S. margaritifera*
- 5b. Lateral-line scales more than 40, with 41~49 scales..... 6
- 6a. Head scales reaching forward only to the level of mid-pupil .....  
..... *S. trilineata*
- 6b. Head scales reaching forward to or in front of level of anterior margin of eye ..... 7
- 7a. Three scale rows above L.I. to dorsal origin; pectoral fin ii+14.....  
..... *S. lineata*
- 7b. Four or 5 scale rows above L.I. to dorsal origin; pectoral fin ii+15~16..... 8
- 8a. Lower limb of preopercle naked .....  
..... *S. taenioptera*
- 8b. Lower limb of preopercle scaly ..... 9
- 9a. Head scales reaching the level of posterior nostril .....  
..... *S. affinis*
- 9b. Head scales not reaching the level of posterior nostril.....  
..... *S. monogramma*

#### *Scolopsis affinis* Peters, 1877

(Fig. 1)

*Scolopsis affinis* Peters, 1877: 832 (New Britain, New Ireland).  
*Scolopsis personatus* (not Cuvier and Valenciennes): Lee, 1986:  
 166.

**Materials:** NMSM 639, 140 mm SL., 15 Jan.  
 1991 (Hengchun); ASIZP 055716, 149 and 181.5  
 mm SL., 15 Feb. 1980 (Hengchun).

**Diagnosis:** D.X,9; A.III,7; P.ii+14-16 (usually  
 ii+14 or 15); V.i+5; L.1.43-46; ltr.3.5/13; gill rakers of  
 1st lower arch 7-8.

Head length 3.04-3.18, body depth 2.93-3.14 in  
 standard length.

Snout length about equal to diameter of eye; head scales reaching anteriorly the level of posterior nostrils; maxilla smooth, reaching below the anterior border of eye; bony opercular ridge scaly; lower limb of preopercle scaly; antrorse suborbital spine absent; pelvic fin long, reaching or beyond level of anus; caudal fin forked. Color in life pale grayish brown above, silvery below; a broad yellow mid-lateral stripe from behind eye to caudal peduncle; caudal and pectoral fins yellow; dorsal fin light yellow; ventral and anal fins transparent, with yellow margin.

#### *Scolopsis bilineata* (Bloch, 1793)

(Figs. 2, 3, 4)

*Anthias bilineatus* Bloch, 1793: 3 (Japan).

*Scolopsis bilineatus*: Shen, 1984b: 63; Lee, 1986: 165.

**Materials:** NMSM 578, 180 mm SL., 22 May 1991 (Hengchun).

**Diagnosis:** D.X,9; A.III,7; P.ii+14-16 (usually  
 ii+15); V.i+5; L.1.43-47 (usually 45-46); ltr.3.5/14-15;  
 gill rakers of 1st lower arch 5-7.

Head length 3.26-3.32, body depth 2.41-2.61 in  
 standard length.

Snout length less than diameter of eye; head scales reaching or just in front of anterior nostrils; maxilla smooth, reaching slightly beyond vertical through anterior border of eye; lower limb of preopercle scaly; suborbital spine large, about 1/3 eye diameter, with 5-6 spinules below it; antrorse suborbital spine present beneath eye; pectoral fin reaching the level of anus; pelvic fin long, reaching or almost to level of origin of anal fin. Color in life of adults grayish-brown above, silvery below; a black-bordered oblique white band running from mouth to the base of anterior soft dorsal fin; 2 narrow yellow stripes, parallel to the white band, from eye to base of spiny dorsal; spiny dorsal fin yellow, soft dorsal fin with anterior 1/2 deep red or black, remaining part transparent; anterior 1/2 of anal fin deep red or black, remaining part transparent. Juvenile with 3 horizontal black stripes, interspaces between stripes yellow.

#### *Scolopsis ciliata* (Lacépède, 1802)

(Fig. 5)

*Holocentrus ciliatus* Lacépède, 1802: 333 (no type locality given)

*Scolopsides lycogenis* Cuvier in Cuvier and Valenciennes, 1830:  
 346

**Materials:** ASIZP 058165, 61.2 mm SL., 13 Oct.  
 1992 (Kenting); NTUM 01188, 85 mm SL., 15 Oct.  
 1943 (Manila).

**Diagnosis:** D. X,9; A.III,6; P. ii+15; V.i+5; L.I. 43; Itr. 3.5/13; gill rakers of 1st lower arch 5.

Head length 3.34, body depth 3.21 in standard length.

Eye large; maxillary denticulate along its external edge; head scales reaching anterior nostrils; lower limb of preopercle scaly; antorse suborbital spine present beneath eye; caudal fin forked. Color when fresh olive above with a white stripe on the back beneath the dorsal fin; abdomen white; caudal fin with upper and lower edges reddish; dorsal, pectoral, pelvic, and anal fins transparent. Specimen in alcohol pale brown with a whitish stripe on the back.

### ***Scolopsis lineata* Quoy and Gaimard, 1824** (Figs. 6, 7)

*Scolopsis lineatus* Quoy and Gaimard, 1824: 322, (Waigiu; Gueba Island).

*Scolopsis cancellatus* Cuvier in Cuvier and Valenciennes, 1830: 351.

*Scolopsis cancellatus*: Chen, 1969: 398; Shen, 1984b: 62; Lee, 1986: 166.

**Materials:** uncataloged (59 mm SL., 11 Nov. 1970, Hengchun).

**Diagnosis:** D.X,9; A.III,7; P.ii+12-15 (usually ii+14); V.i+5; L.1.40-46 (usually 42 or 43); Itr. 3/12-13; gill rakers of 1st lower arch 5-7.

Head length 3.03-3.15, body depth 2.79-2.88 in standard length.

Snout length less than diameter of eye; head scales reaching forward or just in front of level of anterior margin of eye; maxilla smooth, reaching below front border of eye; lower limb of preopercle naked; suborbital spine about 1/3 eye diameter, with 4 spinules below it; antorse suborbital spine absent; pelvic fin long, reaching beyond level of anus; caudal fin forked. Color in life olive brown above, silvery below; 3 yellow to white stripes on body, the upper most one almost extending to whole dorsal profile, the next one from the eye to the end of the dorsal fin base, the lower one mid-laterally; stripes obscure and inter-connected in a lattice-like pattern with age. Body white in juveniles, with 3 black bands on upper 1/2 of body, interspace between lower pairs of bands yellow; black spot at anterior dorsal fin; anal fin transparent.

### ***Scolopsis margaritifera* (Cuvier, 1830)** (Fig. 8)

*Scolopsides margaritifera* Cuvier in Cuvier and Valenciennes, 1830: 337 (Waigiu).

*Scolopsis leucotaenia* Bleeker, 1852: 439

*Scolopsis margaritifera*: Shen, 1984a: 273; Lee, 1986: 164.

**Materials:** NTUM 01182, 107 mm SL., 29 Aug. 1958 (Pescadore Islands).

**Diagnosis:** D.X,9; A.III,7; P.ii+14-15 (usually ii+14); V.i+5; L.1.35-39 (usually 37 or 38); Itr.3.5/13-14; gill rakers of 1st lower arch 5.

Head length 3.07, body depth 2.16 in standard length.

Snout length less than diameter of eye; head scales reaching or almost to posterior nostrils; maxilla smooth, reaching below front border of eye or not too far; lower limb of preopercle scaly; suborbital spine moderate, about 1/3 eye diameter, with 6 denticulations below it; antorse suborbital spine absent; pelvic fin long, reaching almost to or beyond level of origin of anal fin; caudal lobes blunt, not ending in filaments. Color in life olive above, silvery below; scales on ventral side of body with yellowish dots, forming longitudinal and transverse lines.

### ***Scolopsis monogramma*** (Kuhl and Van Hasselt, 1830) (Fig. 9)

*Scolopsides monogramma* Kuhl and Van Hasselt in Cuvier and Valenciness, 1830: 338 (Java, Batavia).

*Scolopsis monogramma*: Lee, 1986: 164.

*Scolopsis dubiosus* (not Weber): Shen, 1984b: 63.

*Scolopsis taeniopterus* (not Kuhl): Chen, 1969: 398.

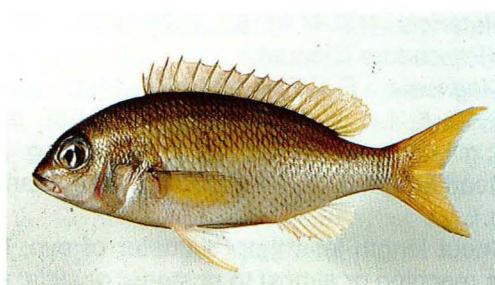
**Materials:** ASIZP 055425, 108.2 mm SL., 6 Oct. 1979 (Tungkang); ASIZP 055711, 100.8 mm SL., 6 Oct. 1975 (Hengchun); ASIZP 057549, 87 mm SL., 4 Oct. 1995 (Manila).

**Diagnosis:** D.X,9; A.III,7; P.ii+16-17 (usually ii+16); V.i+5; L.1.46-49 (usually 47-48); Itr.5-6/14; gill rakers of 1st lower arch 6-7.

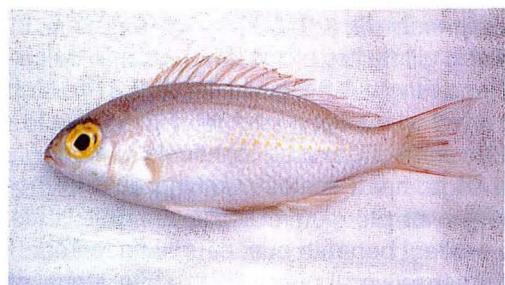
Head length 3.11-3.24, body depth 2.50-2.56 in standard length.

Snout length greater than diameter of eye; head scales reaching between anterior margin of eye and posterior nostrils; maxilla smooth, reaching below the anterior nostril; lower limb of preopercle scaly; antorse suborbital spine absent; suborbital spine about 1/4 eye diameter, with 5-6 denticulations below it; pelvic fin long, almost reaching level of origin of anal fin; caudal fin forked or lunate, upper lobe a little longer than lower lobe (upper lobe extending to form short filamentous process in larger specimens). Color in life grayish above, silvery below; pale on lateral line region; a brown mid-lateral stripe, expanded in the middle; dorsal, ventral and anal fins transparent; caudal fin yellow.

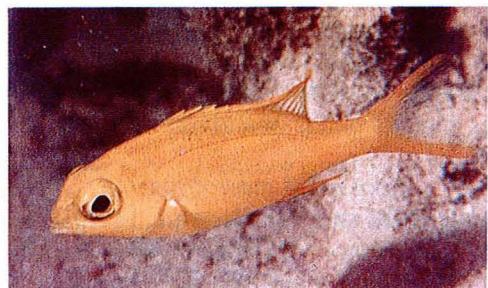
### ***Scolopsis taenioptera*** (Kuhl and Van Hasselt, 1830) (Fig. 10)



**Fig. 1.** *Scolopsis affinis*, adult phase.



**Fig. 5.** *Scolopsis ciliata*, adult phase.



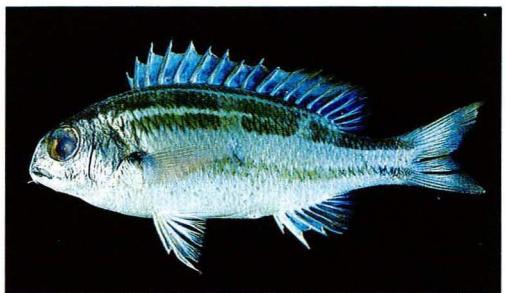
**Fig. 2.** *Scolopsis bilineata*, juvenile yellow phase, mimicry (G. R. Allen).



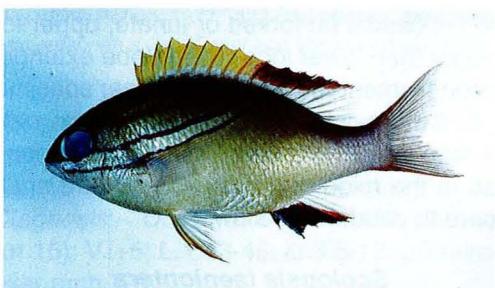
**Fig. 6.** *Scolopsis lineata*, juvenile phase with similar color pattern as the juvenile phase of *S. bilineata*, but differing by the lack of black margins of dorsal and anal fins.



**Fig. 3.** *Scolopsis bilineata*, juvenile phase with longitudinal yellow and black bands.



**Fig. 7.** *Scolopsis lineata*, adult fish.



**Fig. 4.** *Scolopsis bilineata*, adult phase.



**Fig. 8.** *Scolopsis margaritifera*, adult phase.

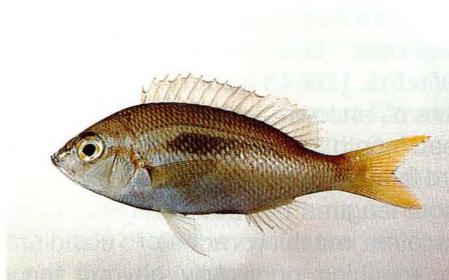


Fig. 9. *Scolopsis monogramma*, adult phase.

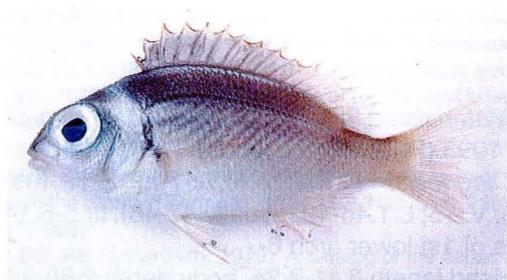


Fig. 13. *Scolopsis vosmeri*, juvenile phase.



Fig. 10. *Scolopsis taenioptera*, adult phase.

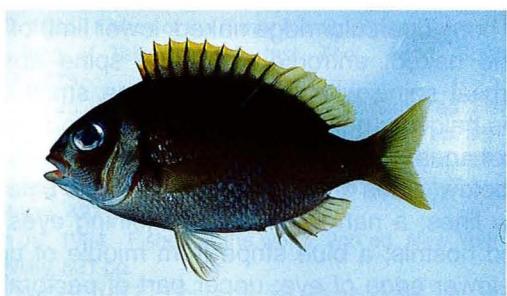


Fig. 14. *Scolopsis vosmeri*, adult phase.

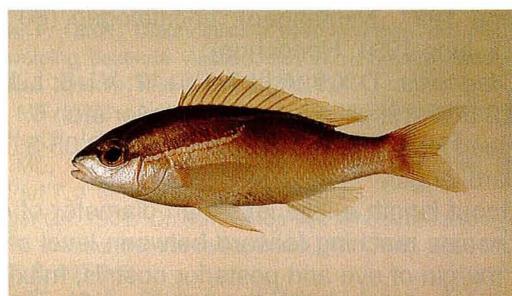


Fig. 11. *Scolopsis trilineata*, adult phase.

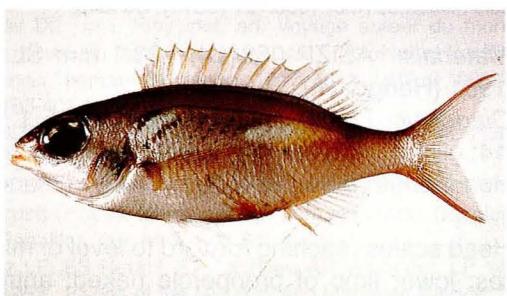


Fig. 15. *Scolopsis xenochroa*, adult phase.



Fig. 12. *Scolopsis trilineata*, in life.



Fig. 16. *Scolopsis xenochroa*, showing a different color pattern from Fig. 15.

*Scolopsidea taeniopterus* Kuhl and Van Hasselt in Cuvier and Valenciennes, 1830: 346 (Java).  
*Scolopsis dubiosus* Weber, 1913: 282.

**Materials:** TFRI-PH 810603C, 165 mm SL., 3 June 1993 (Pescadore Islands).

**Diagnosis:** D.X,9; A.III,7; P.ii+16-17 (usually ii+16); V.i+5; L.1.46-49 (usually 47-48); Itr.5-6/14; gill rakers of 1st lower arch 6-7.

Head length 3.11-3.24, body depth 2.50-2.56 in standard length.

Snout length about equal to diameter of eye; head scales reaching forward between level of anterior margin of eye and posterior nostrils; maxilla smooth, reaching below front border of eye or nearly so; bony opercular ridge naked; lower limb of preopercle naked; antorse suborbital spine absent; suborbital spine with or without some small blunt spines below it; pelvic fin long, reaching or beyond level of anus. Color in life grayish yellow above, silvery below; sides of body with faint oblique blue and yellow lines; a narrow blue stripe joining eyes just behind nostrils; a blue stripe from middle of upper lip to lower edge of eye; upper part of pectoral fin-base with a reddish-orange spot.

#### ***Scolopsis trilineata* Kner, 1868**

(Figs. 11, 12)

*Scolopsis trilineatus* Kner, 1868: 27 (Savay, Samoa)

**Materials:** ASIZP 058164, 133.1 mm SL., 15 Jan. 1991 (Hengchun).

**Diagnosis:** D. X,9; A.III,7; P. ii+14; V. I,5; L.I.44; Itr. 3/14; gill rakers of 1st lower arch 5.

Head length 3.34, body depth 3.25 in standard length.

Head scales reaching forward to level of middle of eyes; lower limb of preopercle naked; antorse suborbital spine absent; predorsal scales about 17; suborbital serrated; caudal fin forked. Color in life brown on back; a white line from upper edge of eye to middle part of dorsal fin; a 2nd white line from eye to the end of dorsal fin; a 3rd white line beneath eye curving upwards and joining the 2nd line at lateral line; 3 bluish-white stripes on snout; dorsal, pelvic, and caudal fins transparent.

#### ***Scolopsis vosmeri* (Bloch, 1792)**

(Figs. 13, 14)

*Anthias vosmeri* Bloch, 1792: 120, pl. 321 (Japan Sea).

*Scolopsis vosmeri*: Shen, 1984b: 62; Lee, 1986: 165.

**Materials:** NTUM 00042, 120 mm SL., 15 Sept. 1958 (Makung, Pescadore Islands); NTUM 01185, 108 mm SL., 10 Aug. 1978 (Hokoto); NTUM 01184,

98 mm SL., 14 Aug. 1948 (N. Borneo).

**Diagnosis:** D.X,9; A.III,7; P.ii+15-17 (usually ii+16); V.i+5; L.1.39-45 (usually 41-44); Itr.3.5/12-14; gill rakers of 1st lower arch 8-9.

Head length 3.00-3.08, body depth 2.14-2.44 in standard length.

Snout length a little less than diameter of eye; head scales reaching anterior nostrils; maxilla smooth, reaching or slightly beyond the anterior edge of orbit; lower limb of preopercle scaly; suborbital spine short but strong; some small spines below it; antorse suborbital spine present beneath eye; pectoral fin not reaching level of anus; pelvic fin long, reaching or just beyond level of anus. Color in life purplish brown; a broad white bar from top of head to opercle; sometimes a whitish horizontal stripe below lateral line from edge of opercle to below soft part of dorsal fin; operculum membrane reddish; all fins orange, outer 1/2 of dorsal fin yellow.

#### ***Scolopsis xenochroa* Günther, 1872**

(Figs. 15, 16)

*Scolopsis xenochrous* Günther, 1872: 423 (Misola, Moluccas).

*Scolopsis xenochrous*: Lee, 1986: 165.

**Materials:** NMSM 578, 140 and 143 mm SL., 13 Oct. 1990 (Hengchun); ASIZP 057707, 105 mm SL., 15 Mar. 1991 (Tungkang); uncataloged (98 mm SL., 15 June 1991, Nanfangao); uncataloged (80 mm SL., 15 June 1991, Hengchun)

**Diagnosis:** D.X,9; A.III,7; P.ii+17; V.i+5; L.1.43-44; Itr.3.5/12-13; gill rakers of 1st lower arch 6.

Head length 3.20-3.22, body depth 3.05-3.08 in standard length.

Snout length a little less than diameter of eye; head scales reaching forward between level of anterior margin of eye and posterior nostrils; maxillary smooth, reaching below nostrils; lower limb of preopercle scaly; suborbital spine large, 1/4-1/3 eye diameter, with 6 spinules below it; antorse suborbital spine present beneath eye; caudal fin moderately forked with a short filamentous tip on upper lobe. Color in life bluish- or grayish-brown above and silvery below; an oblique blue bar with brown edge above pectoral fin; many black spots after the oblique blue bar; an elongated white blotch below lateral line on posterior half of body; all fins pale yellow or blue, caudal fin with red outer margin.

#### **REMARKS**

Since Cuvier (1815) established the genus *Scolopsis*, it has been variously retained in the fami-

lies Sciaenidae (Cantor 1849), Pristipomatidae (Günther 1859), Haemulidae (Jodan and Richardson 1919), Pomadasytidae (Fowler 1931), or Lutjanidae (Schultz et al. 1953), and it was transferred to the family Nemipteridae (Akazaki 1962). Before 1990, some authors included *Parascolopsis* in the genus *Scolopsis*, but they are retained here as separated taxa on the basis of differences in jaw structure, development of the infraorbital bones, number of epipleural ribs, and degree of development of the 2nd anal spine (Russell 1990). Therefore several species [such as *S. eriomma* (= *Parascolopsis eriomma*) and *S. inermis* (= *Parascolopsis inermis*)] recorded from Taiwan, had been placed in the genus *Scolopsis* but are now transferred to *Parascolopsis*.

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## 臺灣產眶棘鱸屬 (*Scolopsis*) 之覆檢及三新記錄種

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臺灣產眶棘鱸屬 (*Scolopsis*) 共十種，包括小眶棘鱸 (*S. affinis*)、雙線眶棘鱸 (*S. bilineata*)、齒頷眶棘鱸 (*S. ciliata*)、單線眶棘鱸 (*S. lineata*)、珠斑眶棘鱸 (*S. margaritifera*)、單斑眶棘鱸 (*S. monogramma*)、條紋眶棘鱸 (*S. taenioptera*)、三線眶棘鱸 (*S. trilineata*)、伏氏眶棘鱸 (*S. vosmeri*)、稀眶棘鱸 (*S. xenochroa*)。其中齒頷眶棘鱸、條紋眶棘鱸和三線眶棘鱸是臺灣新記錄種。本文係報告臺灣產眶棘鱸屬各種的描述、照片及種的檢索表。

**關鍵詞：**魚類分類，金線魚科，魚類相，新記錄種，臺灣。

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