

***PTEROCAESIO TESSELLATA* (ACTINOPTERYGII: PERCIFORMES: CAESIONIDAE)  
FROM TAIWAN: EXTENDED DISTRIBUTION RANGE**

Keita KOEDA<sup>1\*</sup> and Hsuan-Ching HO<sup>1, 2</sup>

<sup>1</sup> National Museum of Marine Biology & Aquarium, Checheng, Pingtung, Taiwan

<sup>2</sup> Institute of Marine Biology, National Dong Hwa University, Pingtung, Taiwan

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**Abstract.** Six species of the genus *Pterocaesio* (Caesionidae) have previously been recorded from Taiwanese waters. Although *Pterocaesio tessellata* Carpenter, 1987 is known from the eastern Indian to the western Pacific oceans north to the Philippines, it has not previously been reported from Taiwan. The main objective of this paper is to document the presence of this species in the waters of Taiwan. A single specimen (101.6 mm standard length) of *Pterocaesio tessellata* was collected from south-western Taiwan in 2018. The morphology and fresh coloration of the collected specimen are herein described. The majority of the morphological characters closely align with the original descriptions of holotype and paratypes of *Pterocaesio tessellata*: dorsal fin with 10 spines and 15 soft rays; anal fin with 12 soft rays; pectoral fin with 20 rays; lateral-line scales 73; circumpeduncular scales 13 + 15; a single yellow longitudinal stripe on body lateral, about a single scale wide, from upper margin of eye to caudal peduncle, covering lateral line for most of its length. Therefore, the specimen from south-western Taiwan is identified as *Pterocaesio tessellata*. The presently reported specimen represents the first record for Taiwan, as well as the northernmost record of this species up to now. An identification key to the species of genus *Pterocaesio* in Taiwan is shown.

**Keywords:** taxonomy, distribution, coral reef, *Pterocaesio digramma*, *Pterocaesio chrysozona*

## INTRODUCTION

The genus *Pterocaesio* Bleeker, 1876, belong to the family Caesionidae and currently consist of 12 valid species (Fricke et al. 2018). Six of these species have previously been recorded from Taiwanese waters (Shen and Wu 2011, Koeda and Ho 2018), including *Pterocaesio chrysozona* (Cuvier, 1830), *Pterocaesio digramma* (Bleeker, 1864), *Pterocaesio marri* Schultz, 1953, *Pterocaesio pisang* (Bleeker, 1853), *Pterocaesio randalli* Carpenter, 1987, and *Pterocaesio tile* (Cuvier, 1830).

A single specimen of *Pterocaesio tessellata* Carpenter, 1987 was recently collected off Kaohsiung south-western Taiwan. This species has been known from the eastern Indian and western Pacific oceans north to the Philippines (Carpenter 1987). The presently reported specimen is herein described as the first record of *P. tessellata* from Taiwan and the northernmost record of this species. In addition, an identification key to the seven species of genus *Pterocaesio* present in Taiwanese waters is included along with photographs of congeners of the present species.

## MATERIALS AND METHODS

Counts and measurements follow Carpenter (1987). Measurements were made to the nearest 0.1 mm with needle-

point callipers under a dissecting microscope. Standard and head lengths are abbreviated as SL and HL, respectively. The morphological description is based on the specimen collected from Taiwan. The specimens of genus *Pterocaesio* examined in this study are deposited at the Kagoshima University Museum (KAUM) and the National Museum of Marine Biology & Aquarium (NMMB).

**Specimen examined.** KAUM-I. 115115, 101.6 mm SL, off Kaohsiung, landed at Ke-zi-liao Fishing Landing Port, 10 May 2018.

## RESULTS

Family Caesionidae

*Pterocaesio* Bleeker, 1876

*Pterocaesio tessellata* Carpenter, 1987

單帶鱗鰭烏尾鮨 (New Taiwanese name)

Fig. 1; Table 1

*Pterocaesio tessellata* Carpenter, 1987; Carpenter 1987: 47 (type locality: Cebu, Philippines). Myers 1999: 148, pl. 66, fig. A; Carpenter 2000: 618; Carpenter 2001: 2939; Allen and Adrim 2003: 39; Peristiwady et al. 2003: 92; Adrim et al. 2004: 121; Iwatsuki 2009: 147, unnumbered fig.; Allen and Erdmann 2012: 466, unnumbered fig.; Fricke et al. 2014: 90; Tatsukawa 2017: 139, unnumbered fig.

\* Correspondence: Dr Keita KOEDA, 944 屏東縣車城鄉後灣村後灣路2號, Taiwan, phone: (+866) 966543754, e-mail: (KK) [hatampo@gmail.com](mailto:hatampo@gmail.com), (HH) [hohc@nmma.gov.tw](mailto:hohc@nmma.gov.tw).

**Description of Taiwanese specimen.** (Counts and measurements of the presently reported specimen are given in Table 1.) Body moderately elongate and fusiform; depth of caudal peduncle less than 1/3 of body depth. Head pointed; dorsal profile of head equally sloping. Interorbital space convex. Anterior nostril with low membranous rim, closer to orbit than snout; posterior nostril without rim or flap. Margin of opercle with dorsoposterior flap. Lateral line nearly straight from upper end of opercle to middle of caudal-fin base.

Mouth oblique, forming angle of about 40° to horizontal, lower jaw projecting slightly; maxilla extending posterior to vertical at anterior edge of orbit. Jaws with minute conical teeth; premaxilla with single row of teeth restricted to anteriormost portion; lower jaw with single row of teeth laterally, becoming patch anteriorly; teeth in lateral row distinctly less numerous just posterior to apex of jaw; vomer and palatines edentate. Origin of dorsal fin posterior to vertical above pelvic-fin origin; 1st dorsal-fin spine short, its base close to base of 2nd spine; dorsal-fin spines and soft rays anterior to 5th dorsal-fin spine gradually shorter. 1st of anal fin below base of 1st soft ray of dorsal fin; 1st spine of anal fin shorter than 2nd and 3rd spines; first soft ray of anal fin longest. Dorsal and anal fins scaled, dorsal with 4/5–1/2 of its greatest spinous height covered with scales. Pectoral fins pointed, 5th ray longest, reaching vertical drawn through base of 8th spine in dorsal fin. Origin of pelvic fin slightly posterior to lower base of pectoral fin. Caudal fin deeply forked.

**Coloration**—When fresh, body and head pink, dark red dorsally; a single yellow longitudinal stripe on body lateral, about a single scale wide, from upper margin of eye to caudal peduncle, covering lateral line for most of its length; snout faintly yellowish. Dorsal-fin faint yellowish with pink outer margin; anal fin and pelvic fin pinkish white; pectoral fin pinkish translucent, axil black; caudal fin red with dark red to brown blotch on tip of upper and

lower lobes. When preserved, body and head pale with dark pigments on centre of scales of body lateral; longitudinal stripe disappeared; dark blotch on tip of caudal-fin lobes.

**Distribution.** *Pterocaesio tessellata* is currently known from the eastern Indian to the western Pacific oceans, westward to Sri Lanka, eastward to Vanuatu, and north to the Philippines (Carpenter 1987, 2001, Allen and Erdmann 2012, Tatsukawa 2017), and now from south-western Taiwan (presently reported study).

## DISCUSSION

The majority of morphological characters of the presently reported specimen are consistent with those of the holotype and paratypes of *P. tessellata* given by Carpenter (1987): dorsal fin with 10 spines and 15 soft rays; anal fin with 12 soft rays; pectoral fin with 20 rays; lateral-line scales 73; circumpeduncular scales 13 + 15; a single yellow longitudinal stripe on body lateral, about a single scale wide, from upper margin of eye to caudal peduncle, covering lateral line for most of its length (Table 1). The length of caudal peduncle length and length of 2nd dorsal-fin spine of presently reported specimen differed 0.1% from the holotype and paratypes. These small differences are herein simply considered as intraspecific variations.

Among its congeners, *P. tessellata* is similar to *P. chrysozona*, *P. digramma*, and *P. marri*, sharing a longitudinal stripe covering lateral line with two distinct blotches on the tips of each caudal-fin lobes (Carpenter 1987) (Fig. 2). *Pterocaesio chrysozona* also has only one stripe on body side, but has another upper stripe on dorsal midline along base of dorsal fin (vs. absent in *P. chrysozona*). In addition, the mid-lateral stripe of *Pterocaesio chrysozona* is broader anteriorly, the width of two or three scales (vs. a stripe of a single width throughout), and directly below lateral line in anterior and above lateral line on caudal peduncle (vs. covering lateral line throughout).



**Fig. 1.** Fresh specimen of *Pterocaesio tessellata* from south-western Taiwan; KAUM-I. 115115, 101.6 mm SL

Table 1

Counts and measurements of specimen from south-western Taiwan and holotype and paratypes of *Pterocaesio tessellata*; data for type series extracted from Carpenter (1987)

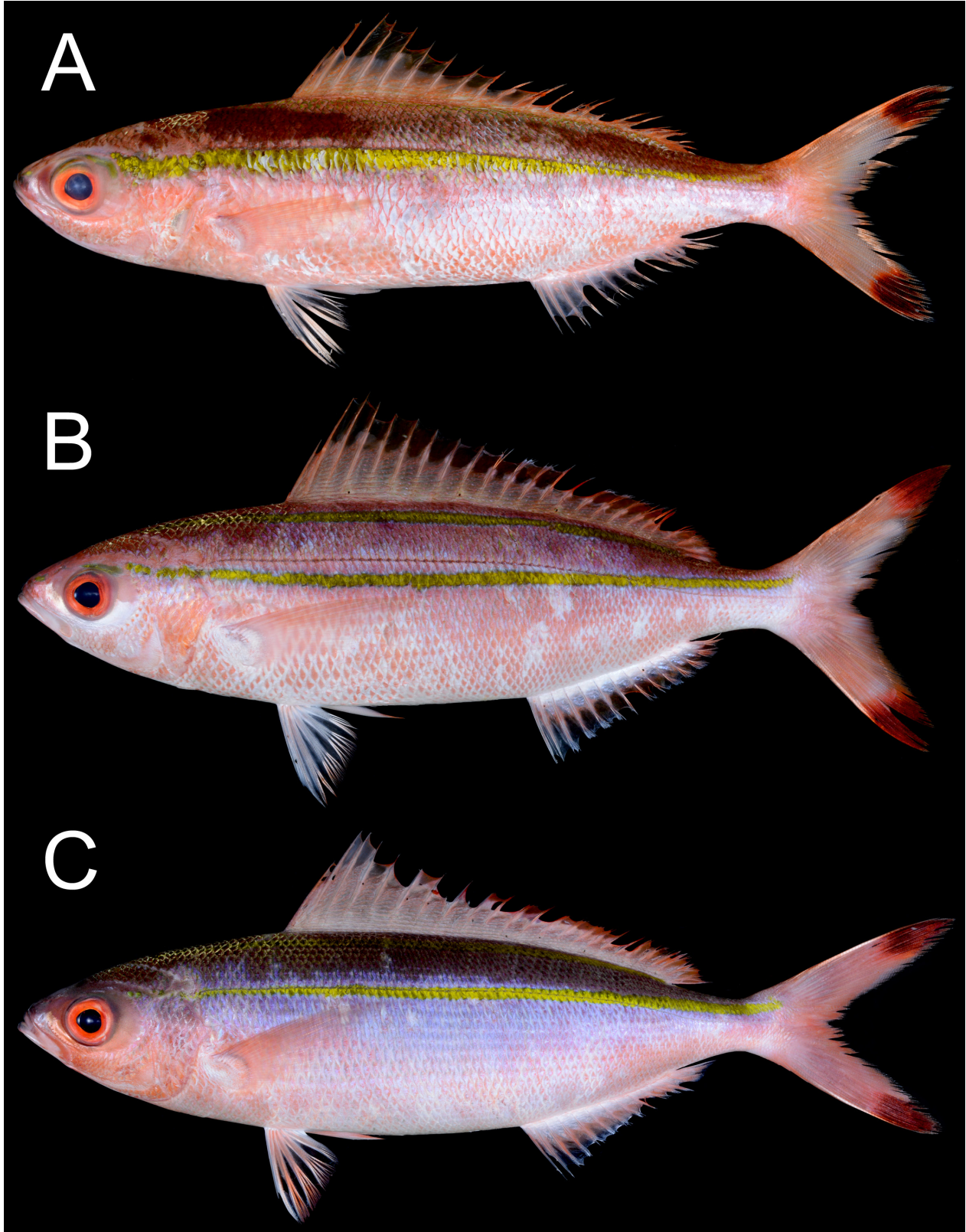
	Non-type KAUM-I. 115115	Holotype BPBM 30821	Paratypes <i>n</i> = 5
Standard length (SL) [mm]	101.6	104.0	89.3–175.0
Counts			
Dorsal-fin rays	X, 15	X, 15	X–XI, 14–16
Anal-fin rays	III, 12	III, 12	III, 12–13
Pectoral-fin rays	20	21	20–22
Pelvic-fin rays	I, 5	I, 5	I, 5
L-L scales	73	73	69–77
L-L scales anterior to vertical at anal-fin origin	32	32	31–35
L-L scales anterior to vertical at dorsal-fin origin	9	9	9–10
L-L scales anterior to vertical at pelvic-fin origin	6	7	5–8
Circumpeduncular scales	13+15	11+15	11–14 + 15–17
Scales above lateral line to origin of dorsal fin	9	10	9–11
Scales below lateral line to origin of anal fin	15	17	16–18
Scales on cheek	4	5	4–5
Pre-dorsal-fin scales	damaged	23	22–29
Gill rakers	10+26	9+26	8–11 + 24–28
Measurements [% of SL]			
Body depth	24.9	25.0	24.9–30.2
Body width	16.2	15.8	15.1–17.3
Head length	damaged	29.2	29.2–30.5
Snout length	7.1	7.1	6.4–7.2
Eye diameter	8.0	7.9	6.6–8.3
Bony interorbital width	7.7	7.4	6.9–7.8
Caudal peduncle depth	8.1	8.1	8.1–8.4
Caudal peduncle length	14.1	16.3	14.2–17.0
Predorsal-fin length	damaged	37.2	35.9–38.3
Preanal-fin length	63.5	64.0	63.0–68.2
Prepelvic-fin length	34.8	36.9	34.9–37.0
Dorsal-fin base length	50.8	50.5	50.1–52.6
Anal-fin base length	23.2	23.5	21.2–22.9
Pectoral-fin length	25.5	26.7	26.4–29.5
Pelvic-fin length	17.5	16.3	16.0–17.7
Pelvic-fin spine length	12.3	11.9	11.5–12.5
Length of 1st dorsal-fin spine	3.8	4.6	3.4–4.1
Length of 2nd dorsal-fin spine	13.1	11.9	10.8–13.0
Length of 3rd dorsal-fin spine	damaged	14.9	13.3–16.0
Length of 4th dorsal-fin spine	15.1	14.5	13.2–15.5
Length of last dorsal-fin spine	8.9	8.0	6.1–9.0
Length of 1st dorsal-fin soft ray	8.5	8.1	6.6–9.3
Length of 1st anal-fin spine	2.9	2.7	2.2–3.4
Length of 2nd anal-fin spine	10.4	10.6	9.8–10.8
Length of 3rd anal-fin spine	10.7	10.5	9.7–11.2
Length of 1st anal-fin soft ray	10.2	9.6	7.9–10.5
Longest caudal-fin ray length	30.5	29.2	29.2–31.6

L-L = lateral line.



*Pterocaesio tessellata* has not been previously recorded from Taiwanese waters, and the northernmost record of the species was from the Philippines (Carpenter 1987, Tatsukawa 2017). The specimen collected from south-western Taiwan represents the first record of *P. tessellata* from Taiwan and, the northernmost

record of the species. Combined with Koeda and Ho (2018), two species of genus *Pterocaesio* are newly reported from Taiwan, bringing the total number of *Pterocaesio* species known from Taiwan to seven. An identification key to the species of genus *Pterocaesio* in Taiwan is provided below (Table 2).



**Fig 2 (A–C).** Fresh specimens of genus *Pterocaesio* collected from south-western Taiwan; *P. chrysozona*, NMMB-P26621, 160.5 mm SL (A); *P. digramma*, NMMB-P26632, 187.3 mm SL (B); *P. marri*, NMMB-P26634, 179.4 mm SL (C)



**Fig 2 (D–E).** Fresh specimens of genus *Pterocaesio* collected from south-western Taiwan; *P. pisang*, NMMB-P26622, 155.2 mm SL (**D**); *P. tile*, NMMB-P29737, 211.4 mm SL (reversed horizontally) (**E**)

**Comparative materials.** All specimens collected off Kenting, southern Taiwan. *Pterocaesio chrysozona*: NMMB-P26621, 160.5 mm SL; *P. digramma*, NMMB-P26632, 187.3 mm SL; *P. marri*, NMMB-P26634, 179.4 mm SL; *P. pisang*, NMMB-P26622, 155.2 mm SL; *P. tile*, NMMB-P29737, 211.4 mm SL. A key to the species of genus *Pterocaesio* in Taiwan is provided in Table 2.

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Table 2

Key to the species of genus *Pterocaesio* in Taiwan

1a. Dorsal-fin rays XI–XII, 19–22; a blackish streak in each caudal-fin lobe .....	<i>Pterocaesio tile</i> (Fig. 2E)
1b. Dorsal-fin rays X–XI, 14–16; tip of each caudal-fin lobes with a blackish blotch .....	2
2a. No stripes on body side; a large distinct blotch present or absent on body side .....	3
2b. One or two stripes on body lateral; no large distinct blotch on body side .....	4
3a. A large yellow blotch above pectoral fin .....	<i>Pterocaesio randalli</i> (not reliable record from Taiwan)
3b. Body without distinct coloration on body side .....	<i>Pterocaesio pisang</i> (Fig. 2D)
4a. One yellow longitudinal stripe on body side .....	6
4b. Two yellow longitudinal stripes on body side .....	5
5a. No stripe on dorsal midline; stripe on body thin (width of one scale), covering lateral line for most its length .....	<i>Pterocaesio tessellata</i> (Fig. 1)
5b. One stripe on dorsal midline on nape and along base of dorsal fin; stripe on body side broader (width of two to three scales) anteriorly, directly below lateral line for most of its length .....	<i>Pterocaesio chrysozona</i> (Fig. 2A)
6a. Lower longitudinal stripe distinctly below lateral line for most its length .....	<i>Pterocaesio digramma</i> (Fig. 2B)
6b. Lower longitudinal stripe covering lateral line for most its length .....	<i>Pterocaesio marri</i> (Fig. 2C)

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