Review of the Marine Gobiid Genus, *Amblyeleotris* (Pisces: Gobiidae) with Seven New Records from Taiwan

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(Received January 21, 1998)


**Key words:** Fish taxonomy, Gobies, *Amblyeleotris*, New records, Taiwan.

The fishes of the genus *Amblyeleotris* Bleeker are well known for their symbiotic behavior with snapping shrimp in coral reefs. The characters of this genus are as follows: a slender body; with transverse pattern of cheek papillae; VI-I, 12-16 dorsal rays; I, 12-17 anal rays; 18-22 pectoral rays; longitudinal scale series 50-129; transverse scale rows 17-34; vertebrate 26. This genus is easily confused with *Cryptocentrus* and *Vanderhorstia*. The differences between *Amblyeleotris* and *Cryptocentrus* are that *Amblyeleotris* has more fin rays (12-17 soft dorsal rays and 12-17 soft anal rays), *Cryptocentrus* has ray counts (9-12 soft dorsal rays and 9-11 soft anal rays); the latter has a plate or cup-shaped disc of pelvic but it is separated or connected in the former. The genus *Amblyeleotris* can also be distinguished from *Vanderhorstia* by the pattern of papillae (transverse vs. longitudinal), and snout profile (at angles less than 40° with body axis vs. 50°) (Hoese 1986).

Aonuma and Yoshino (1996) listed valid species belonging to the genus *Amblyeleotris* in the Indo-Pacific area. But since Randall et al. (1994) treated *A. exilis* (Smith, 1958) as a junior synonym of *A. periophthalma* (Bleeker, 1853), there should be 23 valid species in this genus. In Taiwan, the 1st record of this group of fish were reported by Shao et al. (1987), who added *A. fasciatus* (Herre, 1927) and *A. guttata* (Fowler, 1938) to the Taiwan fish fauna. But *A. fasciatus* mentioned above should be considered a misidentification of *A. wheeleri* (Polunin and Lubbock, 1977). Thus, the species *A. fasciatus* appearing in the Fishes of Taiwan (Shen et al. 1993) which cited Shao et al. (1987) should be corrected as *A. wheeleri*.

During the past 5 yr (1989-1994), an intensive survey on inshore fish fauna in the waters around Taiwan was supported by a grant from the National Science Council R.O.C. to the 3rd author. The 3rd author and his colleagues have collected and published descriptions of a number of new species as well as new records (Chen and Shao 1993a,b, Ho et al. 1993, Chen et al. 1994, Gill et al. 1994, Wang et al. 1994, Chen and Shao 1995, Wang et al. 1995). Here we report an additional 5 newly recorded species of the genus *Amblyeleotris*: *A. fontanesii* (Bleeker), *A. japonica* Takagi, *A. ogasawarensis* Yanagisawa, *A. periophthalma* (Bleeker), and *A. yanoi* Aonuma and Yoshino. An additional record of *A. steinitzi* (Klauserwitz) was

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based merely on photographs taken by the authors in the Kenting area and Green Is. Thus, the total number of *Amblyeleotris* known from Taiwan should be increased to 8 species.

**MATERIALS AND METHODS**

Specimens were collected from northeastern and southern coasts (Kenting National Park) of Taiwan, the Pescadores, and Orchid Is. by scuba diving during our survey of marine fish fauna in Taiwan. All counts of meristic characters followed Akihito in Masuda et al. (1984) and measurements of morphometric characters followed Hubbs and Lagler (1958). Abbreviations used for characters include: D: dorsal fin; A: anal fin; P1: pectoral fin; P2: pelvic fin; LR: longitudinal scale rows; TR: transverse scale rows; Pred S: predorsal scales; SL: standard length; HL: head length; BD: body length; Pred L: predorsal length; SD2L: length of snout to 2nd dorsal origin; SAL: length of snout to anal origin; CPD: caudal peduncle depth; ED: eye diameter; SnL: snout length; HW: head width; and Int: interorbital width. Descriptions of body coloration were based on fresh specimens. All specimens were deposited in the Institute of Zoology, Academia Sinica (ASIZP).

**Key to species of the genus Amblyeleotris in Taiwan**

1a. Body without vertical bands, scattered orange spots; abdomen with black bar

**Amblyeleotris guttata** (Fowler, 1938) (Figs. 2, 3)

Pteroculisops guttata Fowler, 1938: 133 (Marinduque Is.).

_Material:_ Two specimens, ASIZP 056123, 40.6-64.2 mm in SL., 2 Feb. 1985, Tantzuwan, 6 m; 1 specimen, ASIZP 056124, 44.5 mm in SL., 8 Jan. 1986, Tantzuwan, 6 m; 1 specimen, ASIZP 056125, 55.6 mm in SL., 27 May 1986, Chingwashi, 12 m.

_Diagnosis:_ D VI-I,15, A I,16, P1, 20, P2 1.5, LR 105, TR 28, Pred S 20. HL 4.1, BD 5.8, HW 8.1, Pred L 3.47, SD2L 2.0, SAL 1.7, CPD 8.8 all in SL, ED 3.9, Int 9.7, SnL 5.7 all in HL.


_Distribution:_ West Pacific: Philippines, Micronesia, Indonesia, Singapore, and Taiwan. In Taiwan, this species had been only found at Nanwan, Kenting National Park, south Taiwan (Table 1).

_Remarks:_ Although Tomiyama (1936) recorded this species from Japan, it should be considered a misidentification of *Amblyeleotris japonica,* Takagi (Aizawa and Senou, 1991). Recently, Iwata et al. (1996) recorded this species in Japanese waters.

_Amblyeleotris guttata* (Fowler, 1938) *(Figs. 2, 3)*

1b. Body with 5 vertical bands, without orange spots; abdomen without black bar

2a. Anal rays 14 or more

3a. Longitudinal scales less than 80; transverse scales 24 ...

**Amblyeleotris japonica**

3b. Longitudinal scales more than 80; transverse scales 25-32

4a. Predorsal with 9-28 scales

**Amblyeleotris fontanesii** (Bleeker, 1852) *(Fig. 1)*

_Gobius fontanesii* Bleeker, 1852: 764 (Bulucumba, Celebes).

**Biat lunzonica** Seale, 1909: 532.

**Gobius fontanesii:** Günther, 1861: 74.

**Gobius** (Cryptocenturus) *fontanesii*; Weber, 1913: 474.


**Amblyeleotris fontanesii** Myers, 1989: 226.

_Material:_ One specimen, ASIZP 058108, 134.8 mm SL, 12 Apr. 1990. The 3rd nuclear power plant (N3) at Nanwan, Pingtung, 8 m depth.

_Diagnosis:_ D VI-I,15, A I,16, P1, 20, P2 1.5, LR 105, TR 28, Pred S 20. HL 4.1, BD 5.8, HW 8.1, Pred L 3.47, SD2L 2.0, SAL 1.7, CPD 8.8 all in SL, ED 3.9, Int 9.7, SnL 5.7 all in HL.


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**Amblyeleotris fontanesii** (Bleeker, 1852)

**Cryptocenturus fontanesii:** Herre, 1927: 242; Koumans in Weber and De Beaufort, 1953: 89.

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**Amblyeleotris fontanesii** (Bleeker, 1852)

**Gobius fontanesii** Bleeker, 1852: 764 (Bulucumba, Celebes).

**Biat lunzonica** Seale, 1909: 532.

**Gobius fontanesii:** Günther, 1861: 74.
dorsal fin longest and lower than body. 2nd dorsal fin as high as 1st one. Caudal fin pointed. Body pale yellow, head and body with scattered orange spots. Two blackish-brown zones on anterior part of body, one between thorax and isthmus, another behind pelvic and forming a triangle, its upper part extending to middle of body. Except transparent pectoral and blackish pelvic fins, all other fins with scattered orange spots.

**Distribution**: In West Pacific, from East Indies to Samoa, North to Ryukyu Is. This species had been found in coral reef areas around Taiwan (Table 1).

**Amblyeleotris japonica** Takagi, 1957

(Figs. 4, 5)

*Amblyeleotris japonica* Takagi, 1957: 105 (Kagoshima, Japan).


**Material**: One specimen, ASIZP 058106, 55.8 mm SL, 2 Sept. 1991, Yehliu, Taipei Co.; 10 m depth.

**Diagnosis**: D VI-I,14; A I,14, P 1 20; P 2 1, 5; LR 76; TR 25; Pred S 0, HL 3.9, BD 5.8, HW 7.6, Pred L 3.1, SD 1.8, SAL 1.8, CPD 9.4 all in SL. ED 3.9, Int 12.7, SnL 7.2 all in HL.

Mouth oblique, maxillary extending beyond vertical of midline of eye. Snout obtuse. Head roundish; body elongate and compressed. Scales on body small cycloid anteriorly, becoming larger and ctenoid posteriorly. Head and nape naked. Pelvic frenum present, connecting membrane only on basal part of 5th ray in adult. 3rd spine longest in 1st dorsal. Anal as high as 2nd dorsal. Body color pale yellow, with 5 dark brown bands, the 1st from nape to opercle, the last on caudal peduncle. First dorsal dusky in lower part. Midline of 2nd dorsal with a yellow stripe. Anal fin pale yellow, a brown stripe along middle, lower part pale grey. Caudal fin with a C-shaped, dark brown blotch.

**Distribution**: Until now this species has only been found in Japan and Taiwan. It was found in northern Taiwan and Penghu (the Pescadores) (Table 1).

**Amblyeleotris ogasawarenensis**

*Yanagisawa, 1978* (Figs. 6, 7)

*Amblyeleotris ogasawarenensis* Yanagisawa, 1978: 303 (Ogasawara Is., Japan).

*Amblyeleotris ogasawarenensis*: Akihito in Masuda et al., 1984: 255.

**Material**: One specimen, ASIZP 058107, 59.3 mm SL, 7 Jul. 1993, Kaiyuankang, Orchid Is., Taitung Co., 20 m depth.

**Diagnosis**: D VI-1,13; A I,13; P 19; P 2 1, 5; LR 84; TR 28; Pred S 5, HL 3.9, BD 5.8, HW 7.3, Pred L 3.0, SD 1.9, SAL 1.8, CPD 9.6 all in SL. ED 4.0, Int 8.9, SnL 5.6 all in HL.

Mouth oblique, maxillary reaching point of midline of eye. Snout obtuse. Head round, body elongate and compressed. Scales on body small and cycloid, becoming larger and ctenoid posteriorly. Head naked, predorsal with few scales. No frenum, connecting membrane not fully complete on 5th ray in pelvic. In 1st dorsal, 3rd and 4th spines longest. 2nd dorsal and anal as high as 1st dorsal. Body color pale yellow, with 5 transverse red-brown bands; the 1st from nape to opercle, the last on caudal peduncle. A vertical line from eye to end of jaw. Head with scattered small blue spots. First dorsal with small specks and a dark blotch on midbasal part. Second dorsal with some rows of brown stripes on lower part. Anal with a brown line in middle, distal edge pale brown. Pelvic dusky. Caudal fin with a C-shaped brown blotch.

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<thead>
<tr>
<th>Species names</th>
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<tr>
<td><strong>Amblyeleotris from Taiwan</strong></td>
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<td>A. fontanesii (Bleeker, 1852)</td>
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<td>A. ogasawarenensis Yanagisawa, 1978</td>
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<td>A. perioptaldima (Bleeker, 1853)</td>
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<td>A. steinitzi (Klauswitz, 1974)</td>
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<td>A. wheeleri (Polunin and Lubbock, 1977)</td>
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<td>A. yanoi Aonuma and Yoshino, 1996</td>
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Fig. 1. *Amblyeleotris fontaesii*, ASIZP 058108, 134.8 mm in SL.

Fig. 2. *A. guttata*, ASIZP 056124, 44.5 mm in SL.

Fig. 3. Underwater photography of *A. guttata*, Nov. 7, 1990, Hsiaoliuchiu by LT Ho.

Fig. 4. *A. japonica*, ASIZP 058106, 55.8 mm in SL.

Fig. 5. Underwater photography of *A. japonica*, Apr. 25, 1991 Penghu, by JP Chen.

Fig. 6. *A. ogasawarensis*, ASIZP 058017, 59.3 mm in SL.

Fig. 7. Underwater photography of *A. ogasawarensis*, Jul. 7, 1993, Orchid Is., by JP Chen.

Fig. 8. *A. periophthalma*, ASIZP 058100, 35.9 mm in SL.
Distribution: From Japan to Taiwan. In Taiwan, this species had been found at 3 places: southern Taiwan, Green Is., and Orchid Is.

**Amblyeleotris periophthalma** (Bleeker, 1853)  
(Figs. 8, 9)

*Eleotris periophthalma* Bleeker, 1853: 477 (Jakarta, Indonesia).

*Cryptocentrus exillis* Smith 1958: 153 (Zanzibar).

*Amblyeleotris maculata* Yanagisawa 1976 (Okinawa, Japan).

*Amblyeleotris periophthalma*: Bleeker 1874: 373; Polunin and Lubbock, 1980: 51.

**Material**: One specimen, ASIZP 058100, 35.9 mm SL, 9 July 1993, Tungao, Ilan Co., 12 m.

**Diagnosis**: D VI-I,12; A I,12; P, 18; LR 76; TR 26; Pred S 0. HL 3.2, BD 5.5, HW 7.8, Pred L 2.3, SD 1.7, SAL 1.7, CPD 9.3 all in SL. ED 5.0, SnL 21.4, Int 5.6 all in HL.


**Distribution**: Indo-Pacific.

**Amblyeleotris steinitzi** (Klausewitz, 1974)  
(Fig. 10)

*Cryptocentrus steinitzi* Klausewitz, 1974: 70 (Gulf of Aqaba).

**Diagnosis**: Mouth oblique, maxillary extends to midline of eye. Body whitish, with 5 brown bands. Interspaces between bands wider than dark bands, and with some faint yellow lines. A row of blue spots scattered from postorbital area to 1st dark band.

**Distribution**: Indo-Pacific.

Fig. 9. Underwater photography of *A. periophthalma*, Sept. 3, 1991, Kueihou, north Taiwan, by JP Chen.

Fig. 10. Underwater photography of *A. steinitzi*, Jan. 21, 1991, Nanwan, by JP Chen.

Fig. 11. *A. wheeleri*, ASIZP 057018, 30.9 mm in SL.


Fig. 13. *A. yanoi*, ASIZP 058099, 60.5 mm in SL.
**Distribution:** Indo-Pacific area, from Red Sea to Samoa.

**Remarks:** This species was identified from an underwater photo (Fig. 10). Specimen is not available.

**Amblyeleotris wheeleri**
(Polunin and Lubbock, 1977)
(Figs. 11, 12)


**Materials:** Two specimens, ASIZP 056121, 34.1-40.5 mm in SL., 17 Mar. 1985, Tantzuwan, 8 m; 1 specimen, ASIZP 056122, 34.8 mm in SL., 19 Mar. 1986, Tantzuwan, 8 m; 1 specimen, ASIZP 057018, 30.88 mm in SL., 19 Apr. 1994, Taiping Is. (Spratly Is.), 16 m.

**Diagnosis:** D VI-I,12; A I,12, P 1 18-19; LR 65-70, TR 19-21; Pred S 20-21. HL 3.2-3.6, BD 4.8-5.2, Pred L 2.6-2.8, SD2 L 1.6-1.8, SAL 1.7-1.9 all in SL. SnL 6.0-6.5, ED 3.5-3.8, Int 13.7-15.2 all in HL.

Mouth oblique, maxillary reaching point of midline of eye or a little beyond. Snout obtuse. Body elongate and compressed. Scales on body small cycloid anteriorly, becoming larger and ctenoid posteriorly. Head and nape naked. No frenum; membrane connected only on basal part of 5th rays in adults. Third and 4th spines of 1st dorsal fin longest. Second dorsal and anal as high as 1st dorsal. Fresh color of body pale yellow with 5 orange-brown bands. The 5th bands fused with medial caudal stripe. Pectoral and pelvic fins translucent. Dorsal and anal fins yellow with pale network. Caudal fin yellow with medial and upper orange stripes, each edged with blue margin. Color in alcohol, body pale yellow, with 4 brown dorsal bars. Dorsal, pectoral, pelvic, and anal fins translucent. Two orange caudal stripes faded to translucent with darkened edges which are bluish when fish is alive.

**Distribution:** This species was recently described as a new species by Aonuma and Yoshino (1996). The Ryukyu and Indonesia were the only 2 localities where specimens were collected. It is a new record for Taiwan.

**DISCUSSION**

Several genera of gobid fishes are symbiotic with snapping shrimp of the genus *Alpheus*. These gobies assigned to the genera *Amblyeleotris* Bleeker, *Cryptocentrus* Valenciennes, *Ctenogobiops* Smith, *Flabelligobius* Smith, *Lotilia* Klausewitz, *Mahidolia* Smith, *Myersina* Herre, *Psilogoibiops* Baldwin, *Stonogobiops* Polunin and Lubbock, *Tomiyamichthys* Smith, and *Vanderhorstia* Smith are distributed throughout the Indo-Pacific region. The endemic, monotypic genus *Nes* Ginsburg is found only in the West Atlantic. Among the above genera, the genus *Cryptocentrus* is the largest and is comprised of 40 species (Hoese 1986). The genus *Amblyeleotris* is the 2nd largest. However, in most areas, *Amblyeleotris* seems to have more species number than the genus *Cryptocentrus*. For example, the species number of *Amblyeleotris* in the Red Sea (Dor 1984), Indonesia (Kuiter 1992), Maldives (Randall and Goren 1993), Oman (Randall 1995), and Ogasawara Islands (Randall et al. 1997) are greater than those of *Cryptocentrus*.

In Taiwan, our collecting efforts have increased the species number in *Amblyeleotris* from 2 in Shao et al. (1987) to 8 as described in this paper, while *Cryptocentrus* remains unchanged, with 6 species after Shao et al. (1987).

Zoogeographic distributions of these fishes around Taiwan are easily influenced by the Kuro-
shio current. Thus, some widely distributed Indo-West Pacific species are expected to share common occurrence between Japan and Taiwan. The species found in Japan presumably should be found in Taiwan, especially in the waters of southern Taiwan, including Green Is., Lanyu, and Hsiaoliuchiu which the Kuroshio current directly influences. Thus, we expect that the 2 rare and habitat-specialist species A. randalli and A. diagonalis, may be discovered in Taiwan in the future.

Acknowledgments: This study was supported by the National Science Council of R.O.C. to K.T. Shao. We are grateful to Miss C. Y. Wu for typing this manuscript.

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Taiwán産海水鰕虎魚之鈍鰕屬(Amblyeleotris)之整理兼記七種新記錄種

陳正平¹ 陳義雄¹ 邵廣昭¹

本文係對臺灣産的鈍鰕屬魚類作分類整理，他們分別是巨鈍鰕(Amblyeleotris fontanesii)、斑點鈍鰕(A. guttata)、日本鈍鰕(A. japonica)、小笠原鈍鰕(A. ogasawarenensis)、黑斑鈍鰕(A. perioptalma)、細環紋鈍鰕(A. steintzi)、黑帶鈍鰕(A. wheeleri)和矢野氏鈍鰕(A. yanoi)。除了斑點鈍鰕外，其餘種均為臺灣之新記錄種。文中敘述每種魚的特徵、分布及附註外，並附上標本或生態照片以利參考。

關鍵詞 魚類分類，鰕虎，魚類相，新記錄，臺灣。

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