

New Record of *Syngnathoides biaculeatus* (Bloch) (Gasterosteiformes: Syngnathidae) from Korea

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ABSTRACT Two specimens of the syngnathid *Syngnathoides biaculeatus* were collected from the coastal waters of Geoje Ialand and Tongyeong, Korea, represent first record of the species and the genus from Korea. This species is characterized by the following combination of characters: caudal fin absent; opercle without keel; superior and inferior trunk ridges continuous with their respective tail ridges; lateral trunk ridge deflected dorsal behind anal ring. Tail shorter than head and body hexagonal in its subdorsal part, posterior quadrangular, rapidly tapering, without caudal fin, prehensile. Head essentially in line with longitudinal axis of body or bent very little. New Korean names are proposed, "Jal-pi-sil-go-gi-sok" for the genus *Syngnathoides*, and "Jal-pi-sil-go-gi" for *S. biaculeatus*.

Key words : Syngnathidae, *Syngnathoides biaculeatus*, first record, Korea

The family Syngnathidae comprising about 52 genera with about 232 species in the world (Nelson, 2006; Escameyer and Fricke, 2010), and about 20 genera and 68 species were recorded from the East Asia (Cheng and Zheng, 1987; Shen, 1993; Senou, 2002; Kim *et al.*, 2005). In Korean waters, 6 genera and 11 species belonging to the family Syngnathidae were reported by Kim *et al.* (2005) and Kim *et al.* (2013). Following Dawson (1985), the present specimens are identified as a member of the genus *Syngnathoides biaculeatus*. Two specimens of syngnathid were collected from the Southern coast of Korean peninsula. We herein described as a new to Korea, this is the first record of the genus *Syngnathoides* from Korea. Two specimen, were collected eelgrass (*Zostera marina*) bed of Jisepo bay on Geoje Ialand and Tongyeong, Korea. This specimens were identified as *Syngnathoides biaculeatus*. The first specimen was deposited in the Laboratory of Marine Bio Education & Research Center, College of Marine Science, Gyeongsang National University (GSNU), Tongyeong, Korea. The second specimen is

deposited in the Laboratory of Fisheries, Department of Ocean Science, College of Natural Sciences, Inha University (FSIU), Incheon, Korea. The methods of counts and measurements generally followed methods of Dawson (1985). Total length is abbreviated as TL, head length as HL throughout text. A key is consulted from Kim *et al.* (2005) and Dawson (1985).

Genus *Syngnathoides* Bleeker, 1851

(New Korean name: Jal-pi-sil-go-gi-sok)

Syngnathoides Bleeker 1851: 231 (type species: *Syngnathoides blochii* Bleeker, 1851 (type locality: Banda Neira, Banda is., Indonesia).

Diagnosis. Distal part of tail clearly prehensile and tapered; head essentially in line with longitudinal axis of body or bent very little in ventral direction; superior and inferior trunk ridges continuous with respective tail ridges; lateral trunk ridge deflected dorsal behind anal ring, ends just below superior tail ridge near rear of dorsal-fin (Fig. 3b); trunk compressed. Median dorsal snout ridge low, entire; dorsal-fin origin on trunk, the fin-base not elevated.

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Key to the genus of the family Syngnathidae in Korea

- 1a. Caudal-fin present 2
 1b. Caudal-fin absent 6
 2a. Superior trunk and tail ridge discontinuous 3
 2b. Superior trunk and tail ridge continuous
 *Urocampus*
 3a. Inferior trunk and tail ridges discontinuous, dorsal-fin rays 30 or less 4
 3b. Inferior trunk and tail ridges continuous, dorsal-fin rays 30 or more *Syngnathus*
 4a. Trunk rings 21 to 24; dorsal-fin rays 24 to 29
 *Trachyrhamphus*
 4b. Trunk rings 20 or less; dorsal-fin rays 18 to 23 5
 5a. Trunk rings 19 to 20; pectoral-fin rays 19 to 23
 *Doryrhamphus*
 5b. Trunk rings 13 to 14; pectoral-fin rays 10 to 12
 *Halicampus*
 6a. Head clearly bent in ventral direction from longitudinal axis of body *Hippocampus*
 6b. Head essentially in line with longitudinal axis of body or bent very little *Syngnathoides*

***Syngnathoides biaculeatus* (Bloch, 1785)**

(New Korean name: Jal-pi-sil-go-gi)

(Fig. 1-3; Table 1)

Syngnathus biaculeatus Bloch, 1785: 10 (type locality: East Indies)

Syngnathoides biaculeatus: Fowler, 1935: 64; Chu *et al.*, 1962: 230; Smith, 1973: 523; Araga in Okada *et al.*, 1981: 237; Araga in Masuda *et al.*, 1984: 89; Dawson, 1985: 181; Dawson 1986: 456; Cheng and Zheng, 1987: 267, 1012; Shen *et al.*, 1993: 230; Paulus, 1999: 2276; Senou in Nakabo, 2000: 532; Randall & Lim in Randall and Lim, 2000: 604; Kimura and Peristiwaky in Matsuura and Peristiwady, 2000: 168; Hutchins, 2001: 27; Senou in Nakabo, 2002: 532; Randall *et al.*, 2004: 10; Kimura *et al.*, 2009: 59.

Material examined. GSNU 051014-1, 226.5 mm TL, eelgrass (*Zostera marina*) bed of Jisepo bay from by seine net, Geoje Ialand, Korea, approx., 128° 42'E, 34° 49'N, October 14, 2005, collected by B.G. Kim and J.M. Jeong. FSIU 8895, Tongyeong, Korea, November 15, 2009, collected by J.G. Myoung.

Description. Rings 16+53, dorsal fin rays 39-42, anal fin ray 4, pectoral fin rays 22-23; Counts are given in Tables 1. Measurements in mm (in % TL in parentheses, GSNU)-226.5 mm TL, head length 19.6, body depth 3.9, predorsal length 56.5. Measurements in mm (in % HL in parentheses)- snout length 57.5~61.2, eye diameter 11.1~11.5, interorbital width 10.0~11.9. Measurements in mm (in % SL in parentheses) snout depth 13.7~14.2. Body elongate, trunk depressed, tetragonal, with narrow dorsal surface. Ventral surface widened, head frontal ridge (Fig. 3a); snout tube-like; caudal fin absent, dorsal fin origin just above or before anus; opercle without keel; superior and inferior trunk ridges continuous with their respective tail ridges; lateral trunk ridge deflected dorsal behind anal ring. Tail shorter than head and body hexagonal in its subdorsal part, posterior quadrangular, rapidly tapering, without caudal, prehensile.

Color in life. Pale green, dark spots ventrally along median keels of trunk.

Distribution. Southern coast of Korean peninsula (present study); East and South China Sea (Chu *et al.*, 1962; Cheng and Zheng, 1987; Shen *et al.*, 1993); Southern Japan (Senou 2000; Senou 2002); Pacific Ocean (Northwestern, Eastern-western central); Indian Ocean (Red Sea, South Africa, Mozambique), (Dawson, 1985, 1986).

Remarks. Following Dawson (1985), the present species is identified as a member of the species *Syngnathoides*. The genus and species has not been reported in Korea until now. But this was already reported in China (Chu *et al.*, 1962; Cheng and Zheng, 1987) and Japan (Araga, 1981; Araga, 1984; Senou, 2000) and Taiwan (Shen *et*



Fig. 1. Photograph of *Syngnathoides biaculeatus* from Jisepo bay in Geoje Island, Korea, GSNU 051014-1, 226.5 mm TL. Scale bar indicates 10 mm. A. Lateral view; B. Dorsal view; C. Ventral view.

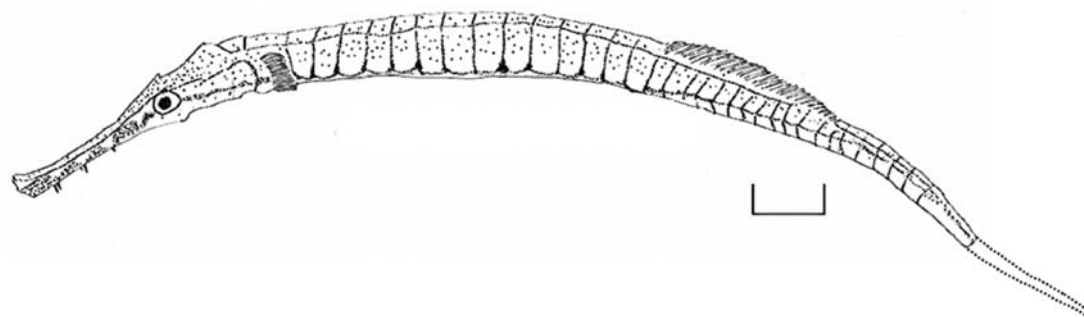


Fig. 2. Schematic drawing of *Syngnathoides biaculeatus* from Tongyeong, Korea, FSU 8895 (tail damaged). Scale bar indicates 10 mm.

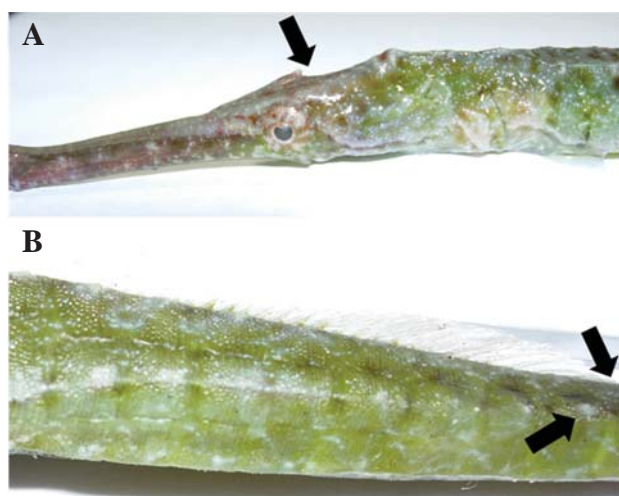


Fig. 3. Photograph of *Syngnathoides biaculeatus*, GSNU 051014-1 A: Lateral view of head (frontal ridge), B: Lateral view of midbody (lateral trunk ridge).

al., 1993). Measurement and counts characters of present specimens coincide with Previous report by Bloch (1785) and Chu *et al.* (1962), except for Snout length 61.2 (1.6 time: Dawson 1985, 1.7~1.8; Chu *et al.*, 1962, 1.7), eye diameter 11.1~11.5 (8.7~9.0 time: Chu *et al.*, 1962, 7.8~8.4), dorsal-fin rays 39~42 (Bloch, 1785, 34). It seems to population difference due to the present species grows over a wide area. Dawson (1985), mentioned regional difference. Trunk rings are 15~17 (usually 16) in most populations but number 17~18 in examined western Austrian material. These fish also tend to have high frequencies of dorsal-fin rays (44~49 versus 38~45) and otherwise differ from material from other areas. This genus have been confusion in taxonomy, for example Dawson (1985) and Nelson (2006) placed subfamily Syngnathinae, but Araga (1984) and Senou (2002) placed subfamily Hippocampinae. Chu (1931) described *Solegnathus hardwickii* as *Syngnathoides hardwickii*, but one species (*S. biaculeatus*) of the genus *Syngnathoides* are recognized in the world. This genus resembles to *Soleg-*

Table 1. Comparison of the counts and measurement of *Syngnathoides biaculeatus*

| Characters | Present study | | Bloch (1785) | Dawson (1985) |
|--------------------|---------------|--------------|--------------|-----------------|
| | GSNU 051014-1 | FSIU 8895* | | |
| Total length, mm | 226.5 | — | — | 37~283 |
| Counts | | | | |
| Dorsal fin rays | 39 | 42 | 34 | 38~48 |
| Anal fin rays | 4 | 4 | 4 | — |
| Pectoral fin rays | 23 | 22 | 21 | 20~24 |
| Rings | 16+53 | 16+? | — | 15~18+ 40~54 |
| Measurements | | | | |
| In total length | | | | |
| Head length | 5.1 (19.6%) | — | — | 4.9~6.3 |
| Dorsal fin origin | 1.7 (56.5%) | — | — | — |
| In Head length | | | | |
| Snout length | 1.6 (61.2%) | 1.7 (57.5%) | — | 1.7~1.8 |
| Eye diameter | 9.0 (11.1%) | 8.7 (11.5%) | — | — |
| Interorbital width | 8.4 (11.9%) | 10.0 (10.0%) | — | — |
| In Snout length | | | | |
| Snout depth | 7.3 (13.7%) | 7.1 (14.2%) | — | 5.3~7.8 |

*tail damaged

nathus. However, *Solegnathus* is superior trunk and tail ridge continuous and discontinuous, *Syngnathoides* is lateral trunk ridge bent dorsally, ending just below superior ridge near rear of dorsal fin base (Dawson, 1985). Thus the new record species clearly differs from its congeners in these characters, so we have identified the present specimen with *Syngnathoides biaculeatus* (Bloch, 1785). Most of report specimens of *S. biaculeatus* were found on tropical and subtropical waters, but the present specimens was found extratropical waters. This distributional range is now extended northward. This species is reported for the first time Korea.

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한국산 실고기과(Gasterosteiformes: Syngnathidae) 어류 1미기록종, *Syngnathoides biaculeatus*

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요 약 : 경남 통영과 거제에서 실고기과 어류 2개체가 채집되었다. 한국에서는 미기록종인 *Syngnathoides biaculeatus*로 동정되었고, 본종이 포함되는 속(*Syngnathoides*) 역시 한국 미기록으로 확인되었다. 본 종의 형태는 긴 형태를 띠며, 체륜상 골판으로 덮여 있다. 몸통부는 두부와 꼬리부보다 굵으며, 두부와 몸통은 일자형이다. 주둥이는 긴 관모양이며, 눈 후연에서 아가미 후연까지의 길이보다 길다. 등지느러미는 몸의 뒤쪽에 위치하고, 매우 작은 뒷지느러미가 있으며, 연조이다. Genus *Syngnathoides*는 “잘피실고기속”, *S. biaculeatus*는 “잘피실고기”로 각각 국명을 신청한다.

찾아보기 낱말 : *Syngnathoides biaculeatus*, 실고기과, 잘피실고기속, 잘피실고기, 한국미기록종