

A Taxonomic Revision of the Family Cynoglossidae (Pisces, Pleuronectiformes) from Korea

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Eight species belonging to three genera in the family Cynoglossidae of Korea are reviewed and provisional keys to species and genera are provided, with synonyms and their distribution. Among them six species collected from 1992 to 1993 are redescribed and figured in the present study; *Cynoglossus interruptus*, *C. joyneri*, *C. robustus*, *C. semilaevis*, *C. abbreviatus* and *Paraplagusia japonica*. Three species of *Areliscus rhomaleus*, *A. trigrammus*, and *A. hollandi* were considered as synonyms of *Cynoglossus semilaevis*, *C. abbreviatus* and *C. gracilis* respectively. Many tonguefishes inhabit commonly in the western and southern coast of Korea. And although *Cynoglossus interruptus* and *C. abbreviatus* are restricted only in the southern coast, *C. semilaevis* in the western and southwestern coast of Korea, *Paraplagusia japonica* occurs widely along all of the coasts of Korea.

KEY WORD : Pisces, Cynoglossidae, Tonguefishes, Korea

Introduction

Tonguefishes of the family Cynoglossidae inhabit mostly marine shallow habitats in the warm waters or temperate waters. This group includes four genera and 110 species in the world (Nelson, 1994) and are characterized by dorsal and anal fin confluent with the pointed caudal fin, usually with only a left pelvic developed and the pectorals absent (a fine membrane in *Symphurus*).

The taxonomic studies of the family Cynoglossidae have been conducted by several ichthyologists (Jordan and Starks, 1906; Norman, 1928; Matsuura, 1955; Ochiai, 1959, 1963; Menon, 1977), but this group is not well known in Korea until now. In Korea the latest treatments on this family were those of Mori (1952) and Chyung (1977), who listed 10 species and 4 genera from Korea. In the last few years fish collection in the coastal water of Korea have resulted in additional valuable materials. The purpose of this study is to revise taxonomic and distributional data on the family Cynoglossi-

dae in Korea to update the lists of Mori (1952) and Chyung (1977).

Materials and Methods

Most samples used in this study were collected from the east, south and west coasts of Korea by bottom trawl, and some specimens were taken from fish markets from 1992 to 1993 (Fig. 1). Determination of morphological and meristic characters (Fig. 2) follow the criteria in Hubbs and Lagler (1964), and Menon (1977). The number of vertebrae and fin rays were counted by soft ray and measurements were taken on the ocular side of each specimen, using a 1/20mm dial caliper. Coloration was observed mostly on freshly-caught specimens and supplementary formalin preserved specimens. The materials examined were deposited at the Department of Biology, Chonbuk National University, Chonju, Korea (CNUC).

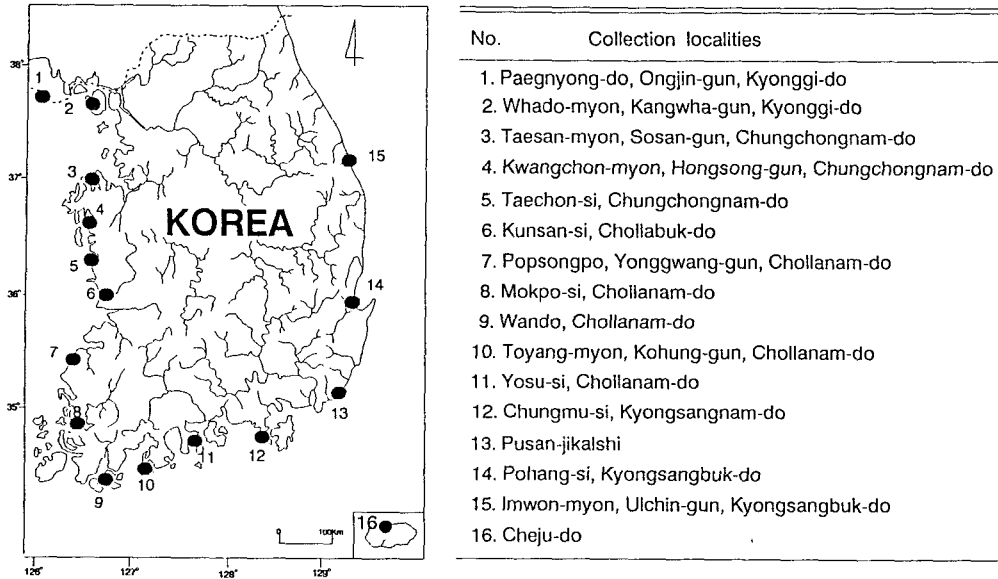


Fig. 1. Localities from which specimens of the present study were collected in Korea.

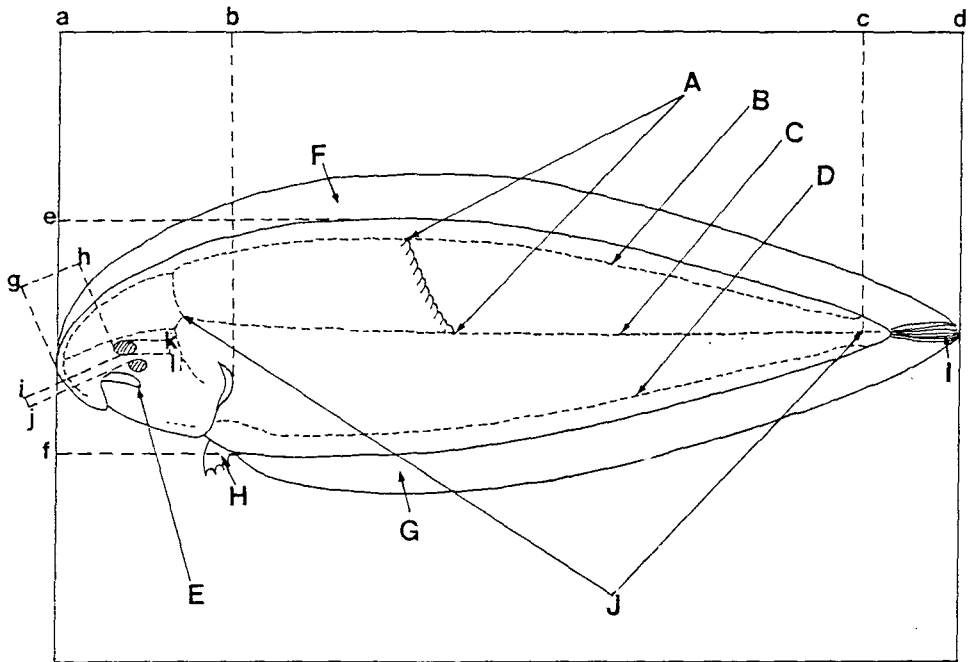


Fig. 2. Terminology and method of measurement for the family Cynoglossidae.
 a-d: total length, a-c: standard length, a-b: head length, e-f: body depth, g-h: snout length,
 i-j: interorbital width, k-l: eye diameter
 A: interlineal scale rows, B: dorso lateral line, C: midlateral line
 D: ventro lateral line, E: corner of mouth cleft, F: dorsal fin,
 G: anal fin, H: ventral fin, I: caudal fin. J: lateral line scales

Results

Systematic accounts

Family Cynoglossidae

Genus *Cynoglossus* Hamilton-Buchanan, 1882

1. *Cynoglossus interruptus* Günther (Fig. 3)
(Korean name: Chil-seo-dae)

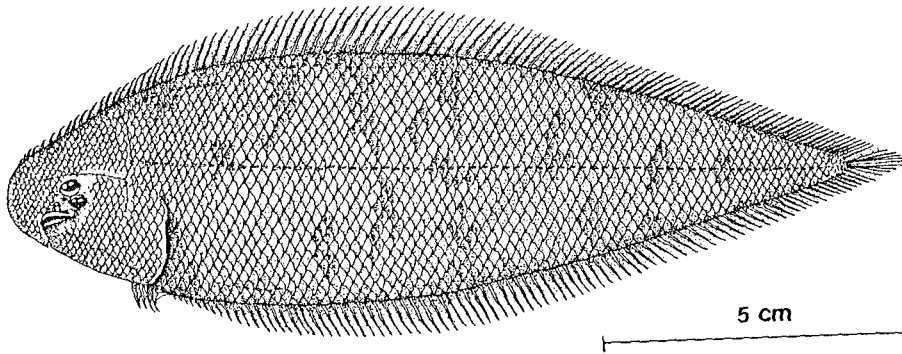


Fig. 3. *Cynoglossus interruptus* Günther

Cynoglossus interruptus Günther, 1880: 70, pl. 30: fig. B, Yokohama, Japan.

Areliscus interruptus; Mori, 1952: 184. Pusan; Chyung, 1977: 581, Pusan, Korea.

Materials examined: CNUC 19351-19360 (specimens, 10), 126.4~156.6mm SL, St. 13, Sep. 10, 1993; CNUC 19376~19384 (9), 119.3~154.7mm SL, St. 11, Sep. 14, 1993.

Description: D. 106~113; A. 84-89; C. 9~10; LL. 64~74; V. 50~53.

Depth of body 26.6~31.4, length of head 19.1~21.6 percent of standard length. Eye small, close together, upper one slightly in advance of lower, diameter of eye 9.3~13.4 percent of length of head. Interorbital space absent. Snout rounded, 33.3~40.4 percent of length of head. Rostral hook short, extending only to front of anterior nostril. Corner of mouth cleft extends to below middle of lower eye. Scales on body rather small, deciduous; those on ocular side moderately serrated with

short ctenii; scales on blind side weakly serrated, as large as those on ocular side. Lateral line scales ctenoid, with numerous grooves in the basal and lateral areas. Two or three lateral lines on ocular side, ventrolateral line is not clear, dorsolateral line undulated, interrupted at middle of body. Median line separated from upper by 10~12 scales. Largest specimen examined, 156.6mm, is from Chungmu, Kyongsangnam Province.

Coloration - In freshly caught specimens ocular side of body yellowish brown, maculated with blackish brown. Same side of each fin membrane light brown, rays yellowish. Blind side of body whitish, each fin membrane reddish. In formalin ocular side of body pale yellow with or without dark blotches, blind side of body yellowish.

Distribution: Japan, southern China and southern coast of Korea.

Remarks: Although Mori (1952) and Chyung (1977) recorded this species as genus *Areliscus*, we recorded it as genus *Cynoglossus* based on the systematic monograph of Menon (1977).

2. *Cynoglossus joyneri* Günther (Fig. 4)
(Korean name: Cham-seo-dae)

Cynoglossus joyneri Günther, 1878: 486, Tokyo, Japan.

Areliscus joyneri; Mori, 1952: 184. Pusan; Chy-

ung, 1977: 581. Incheon, Yosu, Korea.

Materials examined: CNUC 19054~19070 (specimens, 16), 167.0~225.0mm SL, St. 11, July 13, 1993; CNUC 19487~19499 (13), 146.5~199.0mm SL, St. 6, Apr. 30, 1993; CNUC 19196~19207 (12), 163.0~219.0mm SL, St. 6, June 30, 1993; CNUC 19417~19436 (20), 129.4~240.0mm SL, St. 6, Aug. 30, 1993; CNUC 19453~19472 (20), 161.2~220.5 mm SL, St. 6, Sep. 16, 1993; CNUC 18860 (1), 170.0mm SL, St. 9, June 20, 1993.

ocular side of body brownish, blind side of body yellowish white.

Distribution: China, Japan, south and west coast of Korea.

Remarks: This species was also recorded as genus *Areliscus* by Mori (1952) and Chyung (1977) from Korea, but now we recognized it as genus *Cynoglossus* according to Menon (1977). This species is the most dominant species in the demer-

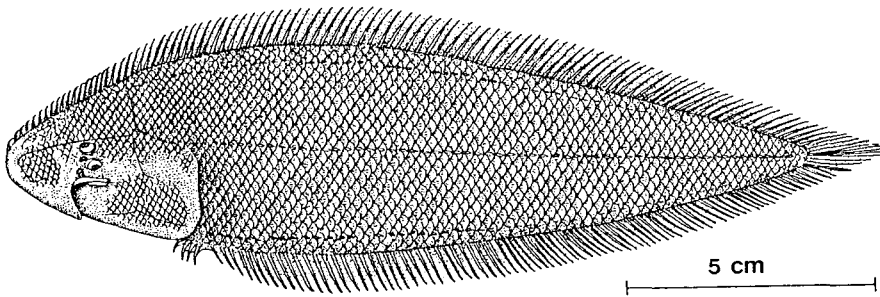


Fig. 4. *Cynoglossus joyneri* Günther

Description: D. 111~117; A. 87~90; C. 8~10; LL. 78~86; V. 51~53.

Depth of body 21.8~26.1, length of head 19.5~21.6 percent of standard length. Eyes very small and approximated with each other, upper one more or less in advance of lower, diameter of eye 5.9~8.3mm percent of length of head. Interorbital space very narrow, 2.8~4.5 percent of length of head. Snout obtusely pointed, 43.0~50.0 percent of length of head. Corner of mouth cleft extends posteriorly far beyond rear border of lower eye. Ctenoid on ocular side, including those of lateral line; scales on blind side cycloid on head region and weakly ctenoid on body. Three lateral line on ocular side, median line separated from the upper by 11~13 scales. Largest specimen examined, 240.0 mm, is from Kunsan, Chollabuk Province.

Coloration - In freshly caught specimens ocular side of body reddish brown. Same side of each fin membrane reddish brown. rays edged with yellow. Blind side of body and fins whitish. In formalin

sal fish from the coast around Kunsan, Chollabuk do.

3. *Cynoglossus robustus* Günther (Fig. 5) (Korean name: Gae-seo-dae)

Cynoglossus robustus Günther, 1873a: 243, Shanghai; Mori, 1952: 183. Cheju Isl; Chyung, 1977: 580. The southwest coast and Cheju Isl., Korea.

Materials examined: CNUC 18853~18855, 19034~19037 (specimens, 7), 223.0~289.0mm SL, St. 11, June 20, 1993; CNUC 19285~19290 (6), 227.0~315.0mm SL, St. 6, Aug. 31, 1993; CNUC 19442~19452 (11), 204.0~349.0mm SL, St. 6, Sep. 16, 1993; CNUC 19023 (1), 378.0mm SL, St. 13, June 14, 1993.

Description: D. 129~135; A. 101~108; C. 10; LL. 77~82; V. 59~62

Depth of body 24.4~26.9, length of head 20.4~

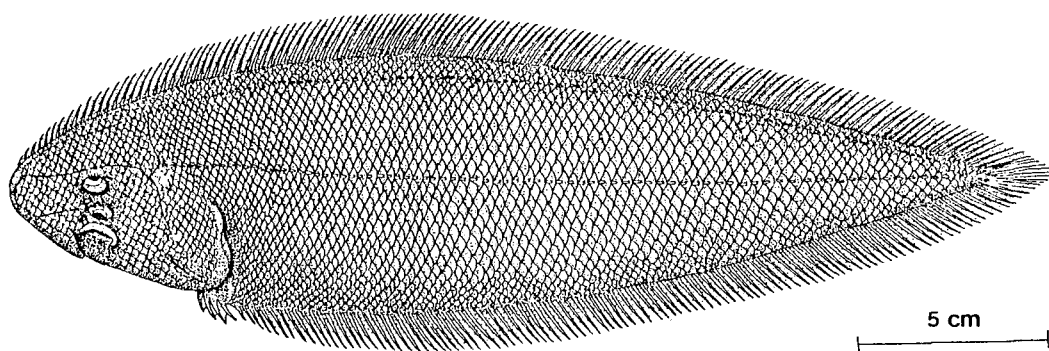


Fig. 5. *Cynoglossus robustus* Günther

21.3 percent of standard length. Diameter of eye 5.3~7.6 percent length of head. Interorbital space very narrow, 3.8~5.7 percent of length of head. Snout obtusely pointed 44.7~48.0 percent of length of head. Corner of mouth cleft extends well posteriorly far beyond rear border of lower eye. Scales deciduous, finely serrated on ocular side, smooth on blind side. Two lateral line on ocular side, median line separated from upper by 10~13 scales. Largest specimen, 378.0mm SL, is from Pusan.

Coloration - In freshly caught specimens ocular side of body yellowish brown. Same side of each fin membrane light brown, rays edged with yellow. Blind side of body and fins yellowish white. In formalin ocular side of body light brown, blind side of body whitish.

Distribution: China, Japan, south and west coast of Korea.

4. *Cynoglossus semilaevis* Günther (Fig. 6)
(Korean name: Bak-dae)

Cynoglossus semilaevis Günther, 1873b: 379, Chefoo, China.

Areliscus rhomaleus Jordan and Metz, 1913: 63; Mori, 1952: 184, Chemulpo, Korea; Chyung, 1977: 581-582. Inchon, Korea.

Materials examined: CNUC 19370~19375 (specimens, 6), 238.0~261.0mm SL, St. 11, Sep. 13, 1993; CNUC 19291~19295, 19298~19299 (7), 282.0~510.0mm SL, St. 6, Jan. 25, 1992; CNUC 19477~19486 (10), 198.0~373.5mm SL, St. 6, Apr. 30, 1993; CNUC 19046~19053 (8), 236.0~337.0mm SL, St. 6, Jul. 13, 1993; CNUC 19265~19276 (12), 146.5~427.2mm SL, St. 6, Aug. 30, 1993.

Description: D. 120~127; A. 93~99; C. 8~10;

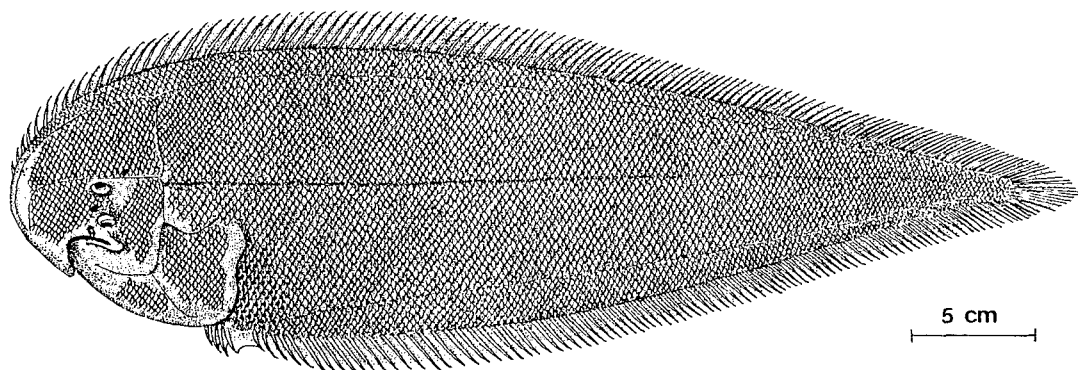


Fig. 6. *Cynoglossus semilaevis* Günther

LL. 136~150; V. 56~58

Depth of body 24.9~30.0, length of head 19.2~23.5 percent of standard length. Head rounded anteriorly. Diameter of eye 4.1~6.4 percent of length of head. Interorbital space rather broad, up to 1.5 times eye diameter, 4.7~8.3 percent of head length. Snout rather rounded, 35.4~42.9 percent of head length. Corner of mouth cleft extends posteriorly far beyond hind border of lower eye. Scales on body very small, more or less serrated on ocular side, smooth on blind side. In bigger specimen scales on blind side appear more or less cycloid, especially anterior of body, but ctenoid on ocular side. Three lateral lines on ocular side, median line separated from upper by 22~27 scales. Largest specimen, 510.0mm SL, is from Kunsan, Chollabuk Province.

Coloration - In freshly caught specimens ocular side of body reddish brown. Same side of each fin membrane reddish brown, rays edged with yellow. Blind side of body and fins whitish. In formalin ocular side of body dark brown, blind side of body whitish.

Distribution: China, west and southwest coast of Korea.

Remarks: This species is closely related to *C. abbreviatus*, but it is mainly separated from *C. abbreviatus* in the number of caudal fin rays (10), short rounded snout, and cycloid scales on the blind side of body. On the other hand, the au-

thors confirmed that the number of caudal fin rays (8~10) in *C. semilaevis* was overlapped with that (7~8) of *C. abbreviatus*, and that morphology of scales on the blind side was also similar to these species each other. Therefore, we think that the *C. semilaevis* is separated from *C. abbreviatus* by its less number of anal rays (93~99, cf. 101~108), more interlinear scale rows (23~27, cf. 16~20), more scales on midlateral line (123~148, cf. 110~135), smaller eyes (diameter 4.1~6.5 percent of head, cf. 6.7~9.7 percent). This is endemic species of the Yellow Sea, and it has the largest size, attains 50cm SL. Up to now many Korean ichthyologists have considered it as *Areliscus rhomaleus* described by Jordan and Starks(1906).

5. *Cynoglossus abbreviatus* (Gray) (Fig. 7)
(Korean name: Yong-seo-dae)

Plagusia abbreviata Gray, 1835, pl. 94: fig. 3, China.

Areliscus abbreviatus Jordan and Metz, 1913: 62, Pusan; Mori, 1952: 184, Pusan, Korea; Chyung, 1977: 580, Pusan, Y su, Korea.

Materials examined: CNUC 19000~19009 (specimens, 10), 196.0~302.0mm SL, St. 10, May 25, 1993; CNUC 19361~19368, 19385~19388 (12), 195.0~292.0mm SL, St. 10, Sep. 14, 1993; CNUC 18866~18867 (2), 317.0~376.0mm SL, St. 9, June 30, 1993; CNUC 18847 (1), 290.0mm SL, St. 11, June 20, 1993; CNUC 19834~19844 (11), 217.0~

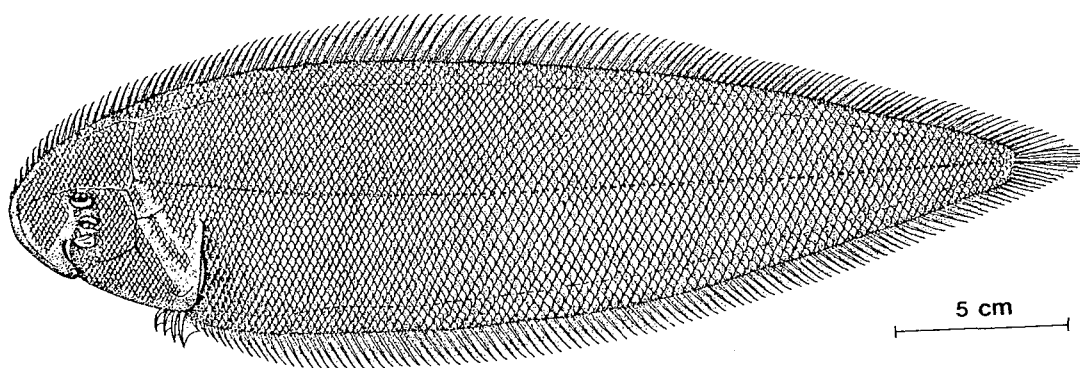


Fig. 7. *Cynoglossus abbreviatus* (Gray)

327.0mm SL, St. 10, Apr. 1, 1993.

Description: D. 124~132; A. 101~108; C. 7-8; LL. 110~130; V. 58~60.

Depth of body 23.2~28.4, length of head 17.6~19.7 percent of standard length. Diameter of eye 6.7~9.7 percent of length of head. Interorbital space very narrow, as wide as a vertical diameter of eye, 3.5~7.6 percent of head length. Snout obtusely pointed, 37.4~42.8 percent of head length. Corner of mouth cleft extends to below hind border of lower eye. Scales on body very small, more or less adhesive, ctenoid on ocular side but cycloid on head region of blind side. Three lateral lines on ocular side, median line separated from upper by 16~20 scales. Largest specimen, 376.0mm SL, is from Kohung, Chollanam Province.

Coloration - In freshly caught specimens ocular side of body reddish brown. Same side of each fin membrane reddish brown, rays edged with yellow. Blind side of body and fins whitish. In formalin ocular side of body light brownish, blind side of body whitish.

Distribution: China, Japan, south coast of Korea.

Remarks: The species of *C. abbreviatus* from Korea was collected only at coasts around Kohung and Wando of Chollanam Province. This species differs from other species in the interlinear scale rows reported formerly by other ichthyologists. The number of interlinear scale rows of this species is recorded as 18~23 rows (Menon, 1977), 19~20 (Cheng and Zheng, 1987) and 18~19 (Masuda *et al.*, 1984; Yamada *et al.*, 1986), while specimens in this study have 16~20 interlinear scale rows.

6. *Cynoglossus gracilis* Günther
(Korean name: Mul-seo-dae)

Cynoglossus gracilis Günther, 1873a: 244, Shanghai, China.

Areliscus hollandi Jordan and Metz, 1913: 62, pl. 9: fig. 3, Pusan, Korea.

Areliscus gracilis; Mori, 1952: 184, Pusan; Chyung, 1977: 580, Pusan, Yosu, Korea.

Materials examined: Absent

Description: D. 133~137; A. 104~108; C. 8; LL. 122~138; V. 62~64.

Depth of body 19.1~23.2, length of head 16.9~23.2 percent of standard length. Diameter of eye 4.2~7.8, interorbital space 5.0~8.2 percent of length of head. Three lateral lines on ocular side, median line separated from the upper by 19 to 22 scales (by Menon, 1977).

Distribution: China, Pusan in Korea.

Remarks: Günther (1873a) described *C. gracilis* on the basis of one specimen from Shanghai and characterized it as a species having three lateral line, the upper and midlateral line being separated by 21 scales, extremely small eye, and elongated body, the depth of body being five times in total length. Although Jordan and Metz (1913) described *A. hollandi* from Pusan, Korea on the basis of a single specimen, most subsequent workers considered *A. hollandi* as synonymy of *C. gracilis* (Menon, 1977; Nakabo, 1993). This species was not collected in the present study.

Genus *Paraplagusia* Bleeker, 1870

7. *Paraplagusia japonica* (Temminck et Schlegel) (Fig. 8)
(Korean name: Heug-dae-gi)

Plagusia japonica Temminck et Schlegel, 1842: pl. 95, fig. 2, Nagasaki, Japan.

Rhinoplagusia japonica Mori, 1952: 185, Pusan, Cheju Isl.; Chyung, 1977: 582, Pusan, Cheju Isl., Korea.

Materials examined: CNUC 19506~19515 (specimens, 10), 210.5~269.5mm SL, St. 6, May 30, 1993; CNUC 19207~19218 (12), 213.0~302.0mm SL, St. 6, June 30, 1993; CNUC 19173~19180 (8), 196.5~296.0mm SL, St. 11, July 31, 1993; CNUC

19811~19813 (3), 187.9~200.5mm SL, St. 14, Aug. 15, 1993; CNUC 19815 (1), 268.0mm SL, St. 15, June 15, 1993; CNUC 19816~19817 (2), 230.5-247.0mm SL, St. 10, Apr. 30, 1993.

we regarded it as genus *Paraplagusia* based on the Ochiai(1963) and Nakabo(1993).

Genus *Symphurus* Rafinesque, 1810

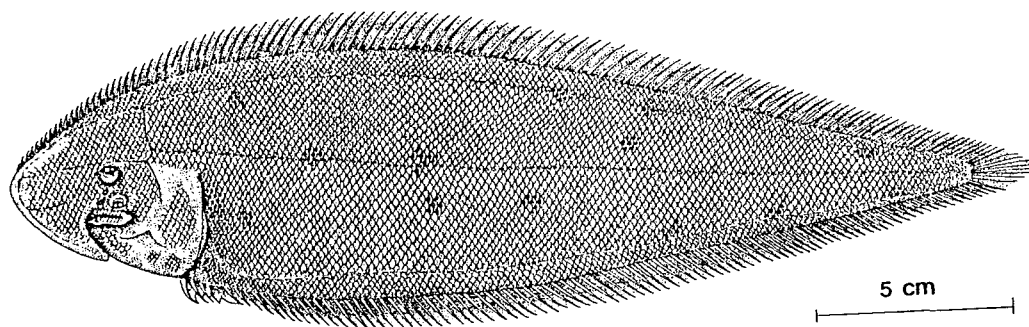


Fig. 8. *Paraplagusia japonica* (Temminck et Schlegel)

Description : D. 115~118; A. 91~93; C. 7~8; LL. 113~123; V. 52~53.

Depth of body 25.2~28.3, length of head 19.1~21.1 percent of standard length. Diameter of eye 6.7~7.9, interorbital space 5.7~7.6, snout length 50.1~53.2 percent head length. Lips on ocular side fringed with tentacles. Rostral hook reaches below rear border of lower eye. Scales on ocular side of body small, rather weakly serrated with small, cycloid on blind side. Three lateral lines on ocular side, median line separated from upper by 19~21 scales. Largest specimen, 302.0mm SL, is from Kusan, Chollabuk do.

Coloration - Young (120mm SL); In life ground color of body yellowish brown, scattered with numerous rounded light brown blotches. In formalin ocular side of body dark brown, with some light blotches. Adult; In freshly caught specimens ocular side of body dark green brownish with blackish spots, fin membrane blackish. Blind side of body milk-white, fin membrane black, edged with pale yellow.

Distribution: China, Japan, Korea.

Remarks: Although Mori (1952) and Chyung (1977) recorded this species as genus *Rhinoplagusia*,

8. *Symphurus orientalis* (Bleeker)
(Korean name: Bo-seob-seo-dae)

Aphoristia orientalis Bleeker, 1879: 31, pl II, fig. 1. Japan.

Symphurus orientalis; Mori, 1952: 183, Pusan; Chyung, 1977: 582. Pusan, Korea.

Materials examined: Absent.

Description: D. 86~100; A. 74~86; C. 10~12; V. 52~54.

Mouth very small, nearly straight. Head contained 4.2 to 5.3 times in SL. Lateral line entirely absent on both side. Anal fin free from pelvic fin. Dorsal and anal fin with dark streaks. Attains 10cm SL (by Ochiai, 1963).

Distribution: China, Japan, east coast of Korea.

Remarks: This species were not collected in the present study, but Son (1980) reported from North Korea that the species was distributed in eastern coast of Korea.

Key to genera and species of family Cynoglossidae from Korea

- 1a. Ventral fins connected with anal, lateral line on ocular side, snout hooked, mouth inferior ... 2
- 1b. Ventral free from anal, no lateral line on ocular side, snout not hooked, mouth anterior
Genus *Symphurus*; *Symphurus orientalis*
- 2a. Lips without fringes around mouth ... Genus *Cynoglossus* 3
- 2b. Lips with fringes around mouth ... Genus *Paraplagusia*; *Paraplagusia japonica*
- 3a. Eyes not contiguous 4
- 3b. Eyes contiguous *Cynoglossus interruptus*
- 4a. Less than 90 scales on midlateral line 5
- 4b. More than 100 scales on midlateral line ... 6
- 5a. Two lateral lines on ocular side, more than 59 vertebrae *C. robustus*
- 5b. Three lateral line on ocular side, less than 54 vertebrae *C. joyneri*
- 6a. Body deep, more than 23 percent of SL ... 7
- 6b. Body slender, about 20 percent or less than 20 percent of SL *C. gracilis*
- 7a. 16~20 interlinear scale rows between upper and midlateral line, anal rays 101~108
..... *C. abbreviatus*
- 7b. 22~27 interlinear scale rows between upper and midlateral line, anal rays 93~99
..... *C. semilaevis*

Discussions

The family Cynoglossidae of the order Pleuronectiformes is composed of four genera with 110 species including two subfamilies of Symphurinae and Cynoglossinae (Nelson, 1994), and it was studied by several ichthyologists (Jordan and Starks, 1913; Ochiai, 1959, 1963; Menon, 1977). Specifically, Menon (1977) presented a systematic monograph of about 49 species in the genus *Cynoglossus* of the world. This family was recorded for 28 species of 3 genera in China (Cheng and Zheng, 1987), and 17 species of 4 genera in Japan (Nakabo, 1993).

First report of Cynoglossidae from Korea was described by Jordan and Metz (1913). After that, Mori (1952) and Chyung (1977) reported that the Cynoglossidae from Korea were classified into 10 species and 4 genera. They treated *Areliscus* as the genus name of *Cynoglossus*. But among them, *Cynoglossus hollandi* has been considered as synonym of *C. gracilis* by all ichthyologists long before *Cynoglossus trigrammus* was also considered as *C. abbreviatus* by Menon (1977). The authors believe that family Cynoglossidae from Korea is 8 species of 3 genera as the result in this study, they are *Paraplagusia japonica*, *Cynoglossus interruptus*, *C. joyneri*, *C. robustus*, *C. gracilis*, *C. abbreviatus*, *C. semilaevis* and *Symphurus orientalis*. Among these species, *Cynoglossus abbreviatus* is closely related to *C. gracilis*, but it is distinguished by its deeper body and larger eyes.

The members of this family were so various morphologically that a number of synonyms were used by ichthyologists. That is, Ochiai (1963) synonymized *C. purpureomaculatus* Regan with *C. trigrammus*, and Fowler (1934) included *Arelia rhomaleus* in the synonymy of *C. abbreviatus*. However, both *C. purpureomaculatus* and *C. trigrammus* were placed under *C. abbreviatus*, and *A. rhomaleus* under *C. semilaevis* by Menon (1977). In all other features including the osteology, genus *Symphurus* is the most primitive group within the family Cynoglossidae, while genus *Paraplagusia* is a very specialized group. In the well-developed and more strongly hooked snout, the tip reaching the rear of the lower eye or even beyond, genus *Paraplagusia* is considered as a form more highly specialized than genus *Cynoglossus* and genus *Symphurus* for a burrowing habit (Menon, 1977).

The fish of Cynoglossidae is distributed in the eastern tropical Atlantic, Indo-Pacific and west Pacific from China, Korea to Japan in the world, and they inhabit sandy or muddy shores. Among the species of the family Cynoglossidae in Korea *C. joyneri* and *C. robustus* inhabit commonly in the western and southern coasts. But *C. semilaevis* is distributed in the southwest and the west of the Korean coast, while the both *C. abbreviatus* and *C. interruptus* are distributed only in the southern co-

ast of Korea, and *Paraplagusia japonica* is found in all the coasts of Korea. It is remarked that the distribution of *C. semilaevis* occurs only around the Yellow Sea, and *C. joyneri* is the dominant species around the coast of Kunsan, Chollabuk province.

Acknowledgements

The present study was supported by the Basic Science Research Institute Program; Ministry of Education, 1993. Project no. BSRI 93~414. The authors are grateful to Dr. B. S. Ryu of Kunsan National University. He helped us to collect samples in this work.

References

- Chyung, M. K. 1977. The Fishes of Korea. Iljisa, Seoul, 727pp. (In Korea).
- Cheng, Q. and B. Zheng. 1987. Systematic synopsis of Chinese fishes. Science Press. Beijing, China, pp. 509~513.
- Fowler, H. W. 1934. A synopsis of the Fishes of China, Part V (continued): the Cods, Ophs. Flounders, Soles, Jhon Dories, Berycoids, Pipe, Fishes, Silversides, Mulletts, Baracaudas, and Thread Fishes. Hongkong Naturalist, 5(3): 210~225, 9 figures.
- Günther, A. 1873a. Report on Collections of Fishes from China. Ann. Mag. Nat. Hist., Ser., 4, 12: 239~250.
- Günther, A. 1873b. On Collection of Fishes from Chefoo, North China. Ann. Mag. Nat. Hist., Ser., 4, 12: 377~380.
- Günther, A. 1878. Notes on Collection of Japanese Sea-Fishes. Ann. Mag. Nat. His., Ser. 5, 1: 485~487.
- Hubbs, C. L. and K. F. Lagler. 1964. Fishes of the Great Lakes region. Michigan Univ. Press. pp. 19~26.
- Jordan, D. S. and E. C. Starks. 1906. A review of the flounders and soles of Japan. Proc. U. S. Nat. Mus. 31: 161~246.
- Jordan, D. S. and C. W. Metz. 1913. A catalogue of the fishes known from the waters of Korea. Mem. Can. Mus. 9 (1): 1~65.
- Masuda, H. K. Amaoka, C. Araga, T. Uyeno and T. Yoshino. 1984. The Fishes of the Japanese Archipelago. Tokai Univ. Press. Tokyo. Text 456 pp, Plate 378pp.
- Matsubara, K., 1955. Fish morphology and hierarchy. Ishizaki Shorten. Tokyo, XI+1605pp. 135 pls (In Japanese).
- Mori, T., 1952. Checklist of the fishes of Korea. Mem. Hyogo Univ. Agr. 1(3): 1~228.
- Menon, A. G. K. 1977. A systematic monograph of the tongue soles of the genus *Cynoglossus* Hamilton-Buchanan (Pisces: Cynoglossidae). Smithon. Contr. Zool., 238, i-iv+1-129.
- Nakabo, T. 1993. Fishes of Japan with Pictorial Keys to the species. Tokai Univ. Press. Tokyo. pp. 1191~1195.
- Nelson, J. S., 1994. Fishes of the World (3rd ed.). John Wiley & Sons, New York. 600pp.
- Norman, J. R. 1928. The Flat-Fishes (Heterosomata) of India, with a List of the specimens in the Indian Museum. Record of the Indian Museum, 30(2): 173~215, 4 plate, 30 figures.
- Ochiai, A. 1959. Morphology, taxonomy and ecology of the soles of Japan (In Japanese. mimeographed). 1~236, pls. 1~2.
- Ochiai, A. 1963. Fauna Japonica: Solenia (Pisces). Biogogr. Soc. Japan, 114pp. 24pls.
- Son, Y. H. 1980. The Fishes of East Sea of Chosen. Science Press, Pyonyang, 464pp. (In Korean).
- Yamada, U., M. Tagawa, S. Kishida and K. Honjo. 1986. Fishes of the East China Sea and Yellow Sea. Seikai Reg. Fish. Res. Lab. Nagasaki, pp. 410~419.

Received May 23, 1994

Accepted October 30, 1994

한국산 참서대과 Cynoglossidae 어류의 분류학적 재검토

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요 약

본 연구에서는 한국산 참서대과 어류 3속 8종에 대하여 재검토하고 그들의 검색표를 제시하였으며, 1992년 부터 1993년 까지 우리나라 전 연안에서 채집되어진 다음의 6종의 참서대과 어류는 그림과 함께 재기재 하였다; 칠서대 *Cynoglossus interruptus*, 참서대 *C. joyneri*, 개서대 *C. robustus*, 박대 *C. semilaevis*, 용서대 *C. abbreviatus*, 흑대기 *Paraplagusia japonica*. 종전에 보고된 한국산 참서대과 어류 가운데 까지서대 *Areliscus trigrammus*, 서대기 *A. hollandi*, 박대 *A. rhomaleus*는 각각 용서대 *Cynoglossus abbreviatus*, 물서대 *C. gracilis* 박대 *C. semilaevis*의 동종이명이다. 우리나라의 참서대과 어류는 주로 서해와 남해안에 서식하지만 *C. interruptus*와 *C. abbreviatus*의 서식지는 남해안에만 한정되어 있으며 *C. semilaevis*는 서해안과 남해의 서부 연안에, *Paraplagusia japonica*는 동해를 비롯한 서해와 남해의 모든 연안에 분포하는 것으로 확인되었다.