

**New Record of the Gobiid Fish, *Partoglossus dotui* (Pisces, Gobiidae)  
from Korea**

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韓國産 망둑어科 魚類 1未記錄種, *Partoglossus dotui*

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摘 要

1984年 8월부터 1986年 8월까지 제주도 성산포와 부산시 해운대 沿岸에서 採集한 망둑어 科 魚類 가운데 全長 22.0~38.8mm의 359個體를 調査한 結果 韓國産 未記錄種인 *Partoglossus dotui* Tomiyama로 同定되었다.

本 種은 小形으로 배지느러미가 좌우로 分離되어 있으나, 새조골이 5개로 망둑어亞科 Gobiinae에 속한다. 꼬리지느러미 基底와 接하는 곳에 暗色斑紋이 있어 다른 種과 區別되고, 체측의 비늘은 납작한 돌 모양으로 붙어 있다. 주로 沿岸의 河川 汽水域에 棲息하면서 집단으로 遊泳生活을 한다. 본 種의 韓國名은 등설망둑屬 “등설망둑”으로 命名한다. 그 결과 韓國産 망둑어 科 魚類는 1屬 1種이 추가되어 총 34屬 56種이 된다.

Key words: *Partoglossus dotui*, gobiid, taxonomy, Korea.

## INTRODUCTION

Gobiid fishes belong to the largest marine fish family but is the least known group in Korean waters. Until now 33 genera consisting of 55 species in this region were reported (Kim *et al.*, 1986, 1987; Iwata and Jeon, 1987; Kang, 1990; Lee, 1991, 1992; Lee and Kim, 1992).

The genus *Partoglossus* was defined by Regan (1912) on the basis of its separated ventral fin, strongly compressed head and body, oblique, protractile mouth, small body scales, vertical gill openings and dorsal and anal fins consisting of one spine and 15~16 rays. *Partoglossus* consists of 14 species that inhabit from warm temperate to tropical regions of the western Pacific and Indian Oceans (Rennis and Hoese, 1985). Miller (1971) described the osteology of *Partoglossus* and concluded that the genus belongs to the Gobiidae rather than Eleotridae in the structure with the separation of the pelvic disc having been derived secondarily from the typical fused fins of gobiids.

One species of the genus *Partoglossus* Regan new to Korean fauna was discovered among the fishes from Cheju-do and Pusan coasts of Korea collected between 1984 and 1986. It is described as a first record in Korea in the present paper.

## MATERIALS AND METHODS

In the course of studying the coastal fish fauna from Korea, 359 specimens of the gobiid fish, collected from Cheju-do and Pusan coasts in 1984~1986, were recognized as an unrecorded species, *Partoglossus dotui* Tomiyama in Korea.

Measurements and counts were based on those described by Hubbs and Lagler (1974) except for the lateral scale rows counted from the upper end of the gill opening to the base of the caudal fin and for the transverse scales from the origin of the second dorsal fin to the anal base. This specimens were compared with the original description and additional morphological informations (Dotu, 1956; Tomiyama, 1958, 1959; Akihito *et al.*, 1984; Rennis and Hoese, 1985).

The cephalic sensory pore was observed after staining by cyanine. The terminology used is after the Rennis and Hoese (1985). The osteological characters were examined from the cleared and stained material by Kawamura and Hosoya (1991). The first dorsal fin pterygiophore formula is given according to the annotation of Birdsong *et al.* (1988) and Akihito *et al.* (1984). Sexual maturity was assessed by making an incision in the side of the abdomen and by observing the gonads grossly.

All materials examined are deposited at the Ichthyology Laboratory of Department of Marine Biology, National Fisheries University of Pusan (NFUP).

## RESULTS

***Parioglossus douti* Tomiyama, 1958** (New Korean name: Deungsul mang-dug, 등설망둑)  
(Fig. 1)

*Partoglossus taeniatus*: Dotu, 1956, (p.489, 3 text figs).

*Partoglossus dotui* Tomiyama, 1958, (p.1179, pl. 230, fig. 582); 1959, (p.103, fig. 4); Hayashi, Suzuki, Ito and Senou, 1981, (p.14, pl. 11, fig. 147).

**Material examined.** NFUP 05101~05200, 100 specimens, 22.0~37.7mmTL, Haewundae, Pusan, 1984~1986; NFUP 05201~5459, 259 specimens, 22.4~38.8mmTL, Sungsanpo, Cheju-do, 1984-1986.

**Diagnosis.** For diagnostic characters of the species Table 1 and Table 2. Dorsal fins VI-1, 17~18; anal fin I, 17~18; pectoral fin 18~20; branched caudal rays usually 6~7+6~7; gill opening moderate, extending ventrally to below middle of operculum; gill rakers 3~4+11~14=14~18 (Fig. 2, A); anterior nasal tube short; nuchal crest a low fold in both sexes, extending forward to above middle of operculum; no dorsal spine elongate in either sex; dorsal and anal rays, excluding first ray of each fin, branched in specimens larger than 23mm; caudal fin truncates to emarginate; prominent dark stripe present from posterior margin of eye to upper pectoral fin base and from caudal peduncle to tips of rays 9~10 of caudal fin; faint stripe on side of body ventral to midside.

**Description.** Body elongate and slightly compressed laterally. Scales on sides of body thin (Fig. 2, B), small, cycloid, not closely set, and about 82~98 in number in longitudinal series from upper end of gill opening to base of caudal fin; transverse scales, 20~28. Rostral cartilage not replaced by bone; ventral postcleithrum absent. Anterior extent of predorsal scales from above middle of operculum in straight line to just below dorsal spine 2; scales on body extending posteriorly on to caudal fin base, not present immediately below dorsal fins; belly and pectoral fin base scaled, prepelvic naked or with few scales. Lateral line indistinct or absent.

Head compressed, without barbels. Preopercular margin not armed with spines. Gill openings not extending anteroventrally. Cephalic sensory canal pores present (Fig. 3, A); head pores 5 in number, located above and behind eye; preopercular pores, posterior interorbital pore, supraocular pore, infraorbital pore absent.

Mouth strongly oblique; upper jaw protractile. Teeth in both jaws simple, not bilobed or trilobed (Fig. 3, B). Teeth in upper jaw are arranged in 2 rows; those in outer row are larger and about 14~19 in number on each side. Teeth near symphysis of lower jaw large, aggregated in 2 or 3 rows, with 1 patch of teeth on each side. Vomer and palatines toothless.

Dorsal pterygiophore formula (DF), 3-22110; number of abdominal and caudal vertebrae, 10+16=26; number of interhemal spines anterior to first hemal spine, 2; epural number, 1 (Fig. 4). Branchiostegals 5 in number on each side; number of ribs, 7~8. Membrane from first dorsal fin spine 6 to second dorsal fin low in both sexes; dorsal spines increasing in length to spine 5; this spine longer than spine 6; second dorsal fin and anal fin rays 3 and 4 longest, posterior rays decreasing in length gradually; last ray not reaching beyond caudal peduncle; pectoral fins oblong, with length of fins less than head length; inner ventral fin ray unbranched, others branched; ventral fin ray 3 longest, but not elongated.

**Colour in life.** The ground color is beautiful pale green with a longitudinal blackish band along the middle of each side of the body and with a silvery luster on each opercle. Tomiyama (1958) noted down that this fish in life has a silvery operculum and a pale green body with a dark stripe

along the side.

**Colour in formalin.** The ground color is greyish brown and yellowish; head dusky; dusky to dark stripe across snout, posterior to eye, over upper edge of operculum and pectoral fin base, continuing across body ventral to midside (usually faded) to caudal peduncle (usually dark), on to caudal fin at bases of rays 8~12 to tips of rays 9~10; dusky to black stripe on dorsal midline from head to posterior caudal peduncle; dorsal fins dusky; outer half of anal fin dark (often faded) in males; other fins very pale.

**Sexual dimorphism.** The specimens are all nearly matured in period of June to September. Secondary sexual dimorphisms are distinct in urogenital papilla. It is pointed in male, but truncated in female. The shape and length of fins not different from each sex. The anal fin of the females and immature males is not margined with dark color. The females have prominent black ring around anus; the males have narrow dark ring around the anus (Fig. 5). The black anus in female is a distinguishing character. The number of the ripe ovarian eggs was enumerated from 455 to 1403 according to the size of the parent fish (Table 3). The spawning season extended from July to September in Amakusa Islands Kyushu, Japan (Dotu, 1956).

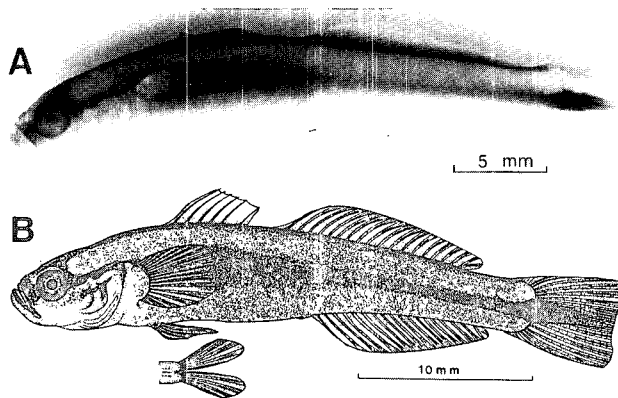


Fig. 1. *Parioglossus dotui*, NFUP 5101, 35.0mm TL, female, Pusan. A. Lateral view of Photograph ;B. Lateral view and ventral fin of ventral view of Figure.

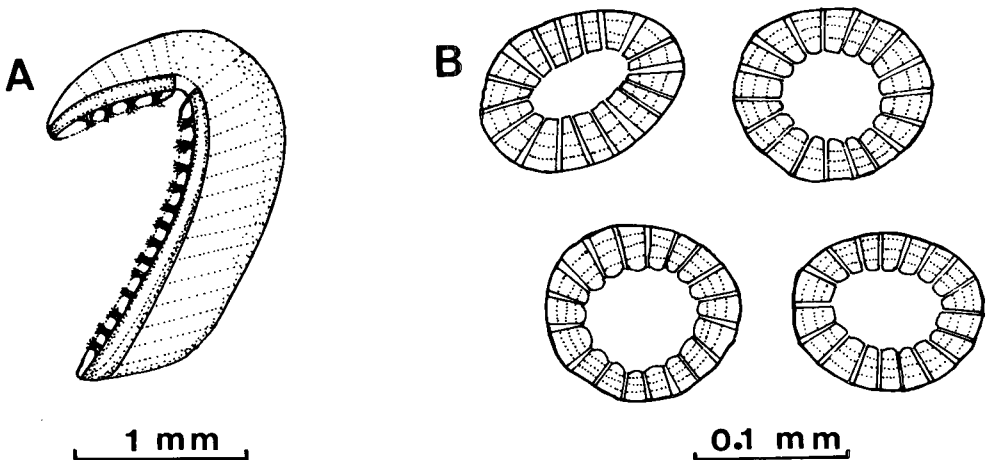


Fig. 2. Right first gill arches and scales of *Parioglossus dotui*. A. Right first gill arches; B. Scales of the adult.

**Table 1.** Frequency distribution of meristic characters in *Partoglossus dotui*

Meristic Characters	Present study		Tomiyama (1958)	Dotu (1956)	Rennis and Hoese(1985)
	Cheju	Pusan			
Dorsal fin rays	VI, I -17~18	VI,I-17~18	VI,I-17	VI,I-15~17	VI,I-16~17
Anal fin rays	I, 17	I, 17~18	I, 18	I, 16~17	I, 16~18
Pectoral fin rays	18~20	18~19	18	18	18~20
Ventral fin rays	I, 4	I, 4	I, 4	I, 4	I, 4
Caudal fin rays	6~7+6~7	6~7+6~7	13	-	7~8+6~8
Longitudinal scales	82~98	85~93	110	110	74~88
Transverse scales	24~28	20~27	-	-	-
Gill rakers	14~17	14~17	-	18	17~19
Vetebrae	26	26~27	26	25	26
Branchiostegal rays	5	5	5	-	-
Ribs	7~8	8	-	-	-

**Table 2.** Proportions measurements of observed specimens of *Partoglossus dotui* expressed as a percentage of the standard length

Characters	Present Study		Tomiyama (1958)	Rennis and Hoese (1985)
	Cheju	Pusan		
Number of specimens	20	20	1	28
Total length (mm)	30.4~38.8	28.1~33.5	42.0	-
Standard length (mm)	25.6~28.8	24.6~29.6	36.0	15.9~28.7
Head length	22.5~24.6	20.7~24.8	22.7	21.3~26.4
Snout length	5.0~ 7.6	4.9~ 6.5	-	3.1~ 5.7
Body depth	11.5~19.5	14.3~20.3	19.6	14.8~18.1
Eye diameter	7.3~10.7	7.5~ 9.0	-	6.7~10.1
Predorsal length	30.7~35.3	31.2~34.9	31.3	31.4~34.7
Preanal length	48.6~59.9	52.3~59.5	55.6	-
First dorsal fin length	12.5~17.6	14.3~19.5	20.8	-
Second dorsal fin length	25.7~35.2	27.9~37.7	37.0	-
Pectoral fin length	12.0~19.9	11.3~19.7	-	16.2~19.5
Anal fin length	23.2~31.41	20.7~31.0	34.5	-
Ventral fin length	12.4~14.3	12.5~16.2	-	13.1~17.2
Caudal fin length	15.7~31.4	15.6~31.9	-	17.8~24.5
Caudal peduncle length	9.7~12.9	9.3~12.7	-	10.1~13.5
Caudal peduncle depth	8.9~11.9	9.4~11.8	11.1	9.3~11.5

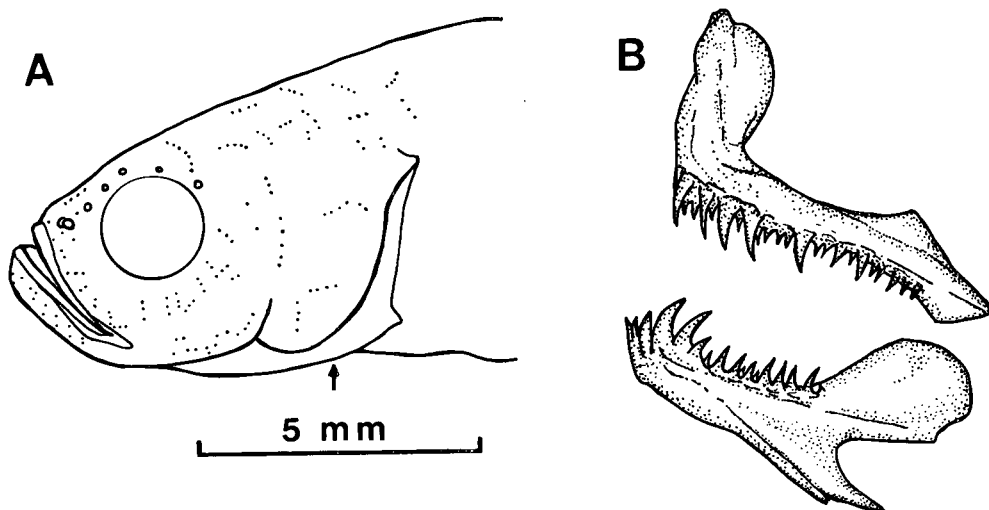


Fig. 3. Sensory canal and jaw teeth of *Partoglossus dotui*. A. Sensory canal and pit organs; B. Premaxilla and dentary. The arrow showing the position where the gill membranes are attached to the isthmus.

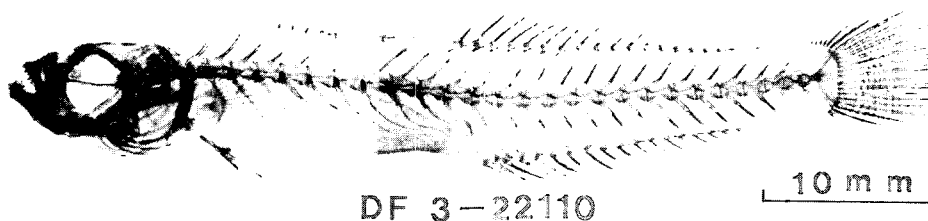
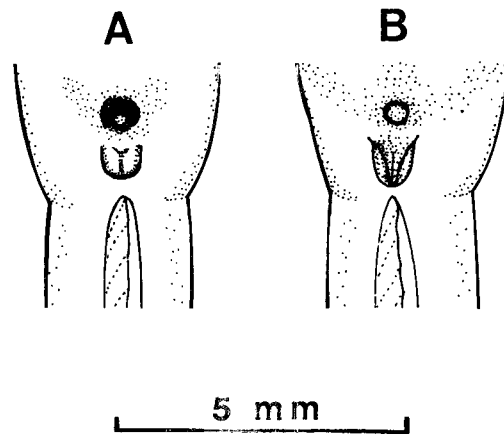


Fig. 4. Skeleton system in *Partoglossus dotui* illustrating the first dorsal pterygiophore formula (DF).

Table 3. Number of the ovarian eggs in *Partoglossus dotui*

	Number of the Specimen	Total length (mm)	Standard length (mm)	Number of the ovarian eggs		
				Right ovary	Left ovary	Total
Present Study	20	25.4~36.8	21.8~28.5	219~612	214~791	455~1403
Dotu (1956)	3	33.0~38.0	27.0~31.0	492~1215	481~1218	947~2433

**Distribution and habit.** Estuarine to marine in bays and coastal waters of Japan and Korea. These fishes are normally found around the roots of mangroves, or around algae in estuaries and coastal coral reefs. Of ninety-five mature fish, collected with a small net, were kept for seventy in an aquarium. During this period, it was observed that the fish swam in the aquarium in day time, but they rested at night under a vacant hollow of the valves of large or small shells lying on the sand-floor of the aquarium.



**Fig. 5.** Urogenital papilla of *Partoglossus dotui*. A. Female; B. Male.

**Remarks.** The genus *Partoglossus* is readily distinguishable from other gobioids by the following several characters: Ventral fin ray 1, 4; first dorsal pterygiophore formula 3-22110; gill opening narrow to moderate, ending ventrally below operculum; interorbital head pores paired laterally when present; second dorsal fin ray 1, 13~19. The species of *Partoglossus* are most similar to those of *Ptereleotris*, which differs in having a broader gill opening reaching ventrally to below the posterior preopercular margin, the first dorsal pterygiophore formula 3-32010 and the second dorsal fin ray 1, 24~39.

*Partoglossus dotui* has been confused with *P. philippinus* by Miller (1971) and *P. taeniatatus* by Dotu (1956) due to a similarity of body coloration. The black anus in females of *P. dotui* is a distinguishing character. The only another species with a black anus in females is *P. marginalis* which can be separated from other species on the basis of fin ray counts and body coloration (Rennis and Hoese, 1985).

*Partoglossus philippinus* (Miller, 1971) has a narrower gill opening extending ventrally to just below the pectoral base, a ventral postcleithrum (versus absent), similar second dorsal fin ray counts (usually 1, 17~18 versus usually 1, 17~18), lower longitudinal scale counts (usually 61~72 versus 82~98), higher procurrent caudal-ray counts, usually unbranched posterior dorsal and anal rays, less extensive development of anterior scales, a naked pectoral fin base, longer ventral fins in males and a more elongated fifth dorsal spine in males. *Partoglossus taeniatatus* and *P. formosus* (Rennis and Hoese, 1985) can be distinguished from *P. dotui* by fin ray counts, the difference of dorsal spine length in males, and the absence of preopercular pores in *P. dotui*.

## ABSTRACT

A gobiid fish, *Partoglossus dotui* Tomiyama is described from 359 specimens collected at Cheju-do and Pusan, in August 1984 of 1986. This is the first definitive record of the species in the Korean waters. *Partoglossus dotui* having a small-sized body usually is found swimming in schools. The

branchiostegals are 5 in number on each side. It grows up to 40mm in total length. Most of ventral fins are separated and connected with rudimentary membrane. In this species, the lateral line were indistinct or absent. The caudal fin slightly emarginates or truncates in both sexes, with a dark spot at the border of the base. It inhabits inlet waters and estuaries of rivers. "Deungsul mang-dug" is proposed as Korean name of this species.

## ACKNOWLEDGEMENTS

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