

New Records of Seven Species of the Order Perciformes from Cheju Island, Korea

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Seven species of the order Perciformes collected from coastal waters of Cheju Island, Korea were redescribed as new to Korean fish fauna. They are as follows: *Girella melanichthys* (Richardson) and *Kyposus bigibbus* Lacepede of the family Kyphosidae; *Chaetodon wiebeli* Kaup of Chaetodontidae; *Istigobius campbelli* (Jordan and Snyder) of Gobiidae; *Gymnapogon japonicus* Regan of Apogonidae; *Parupeneus chrysoplueron* (Temminck and Schlegel) of Mullidae; *Nemipterus japonicus* (Bloch) of Nemipteridae.

Introduction

The order Perciformes is the most diversified of all fish orders(Nelson, 1984) and most species of them are adapted for life as predators in the shallow or surface waters of the oceans(Moyle and Cech, 1982). Since Uchida and Yabe(1939) on the report of the fish fauna of the Cheju Island, the perciform fishes of Cheju Island were recorded as some fish lists of the Island or Korean waters by several ichthyologists(Mori, 1952; Chyung, 1977; Baek, 1982; 1984; Kim and Kang, 1993).

In the course of studing the fish fauna, we have collected many fish specimens from Cheju Island of which 7 perciform species were recognized as new records from Korea. In this paper we redescribed them and discuss their systematic positions.

Materials and Methods

The specimens were collected from the coastal water in the vicinities of Hallim, Song-san, Cheju, Aewal and Kujwa of Cheju Islands, Korea(Fig. 1).

These specimens were caught by the small seine and gill nets. The specimens examined here were deposited in Department of Biology, Chonbuk National University, Chonju, Korea(CNUC). Measurements of body proportion and meristic counts were based on those of Hubbs and Lagler(1958).

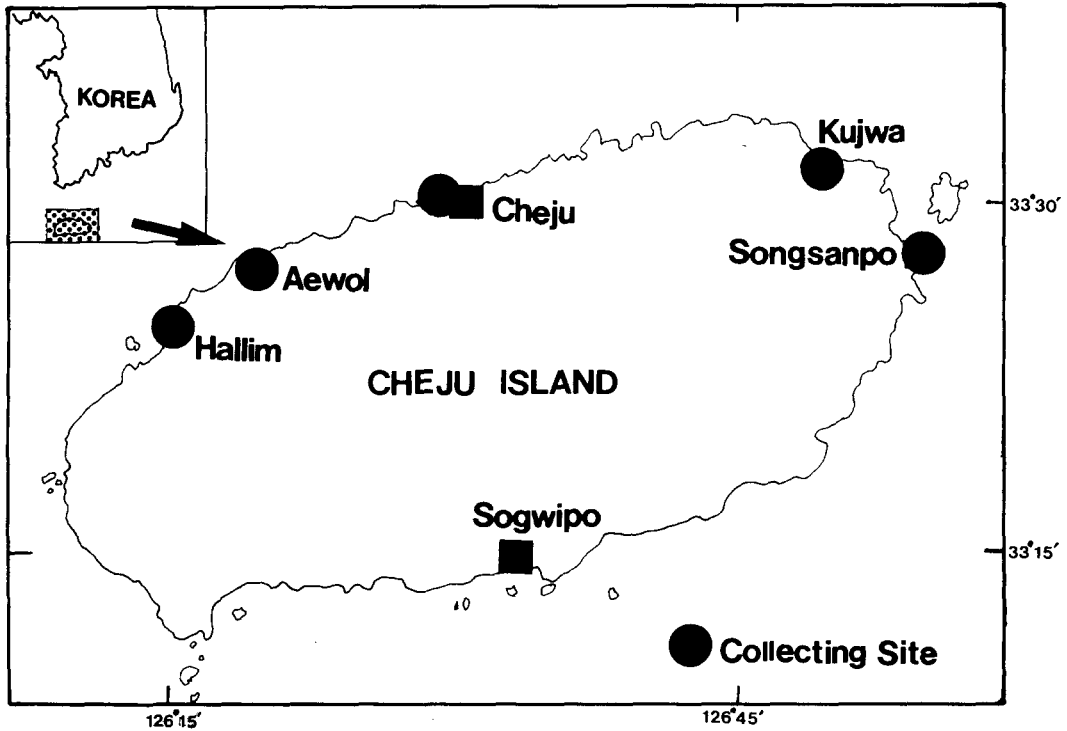


Fig. 1. A map showing the collecting localities from Cheju Island, Korea.

Vertebral counts and some of the fin ray counts were made from radiographs by soft x-ray. Classification system is after that of Nelson (1984).

Systematic Accounts

Family Kyphosidae

Girella melanichthys (Richardson) (Fig. 2)

New Korean name: Gin-ggori-bengedom

Crenidens melanichthys Richardson, 1846, p. 243 (Nagasaki Bay, Kyushu, Japan).

Girella melanichthys: Jordan and Thompson, 1912, p. 592-594; Fowler, 1940, p. 522; Matsubara, 1955, p. 647; Masuda *et al.*, 1984, p. 227.

Material examined: CNUC 19764-19765, 2 specimens, 41.8-220.0mm SL, Hallim-up, Pukcheju-gun, Cheju-do, Korea, 23 July, 1993; CNUC 19766-19770, 5 specimens, 36.5-50.5mm SL, Soungsan-up, Namcheju-gun, Cheju-do, 29 July, 1993; CNUC 19771-19772, 2 specimens, 137.2-137.3mm SL, Kujwa-up, Pukcheju-gun, Cheju-do, 14 January, 1990.



Fig. 2. *Girella melanichthys* (Richardson), 137.2mm SL.

Description: D. IV-XV,15-16; A. II,12-13; lateral line pores 58-60; gill rakers 12+23; vertebrae 27-28. Body oblong ovate, compressed; head compressed; snout short; eye little elevated and advanced in head; mouth small. Opercular with small spine; scales finely ctenoid, very small on cheeks; top of head and opercles chiefly naked. Caudal emarginate or lunate, tips of fin sharp; pectoral low, rounded.

Color: Black and white coloration as in fig. 2. Body black, marbled with sky-blue and a brownish-red tint on the breast. Ventrals blackish-gray and blue; other fins black. Black margin on operculum.

Measurement: Nine specimens(36.5-220.0mm SL) in percent of standard length: body depth 36.4-38.4%; head length 27.6-31.1%; snout length 9.2-9.5%; orbit length 6.0-9.3%; interorbital width 9.7-10.1%; upper jaw length 7.1-8.6%; pectoral fin length 19.9-23.7%; pelvic fin length 18.4-19.9%; length of third dorsal spine 8.3-12.9%; length of first dorsal ray 9.8-12.9%; length of third anal spine 9.3-10.2%; length of first anal ray 11.1-13.1%; caudal peduncle length 17.9-20.3%; caudal peduncle depth 11.3-13.4%.

Distribution: Southern Korea(Songsan-up, Sogwipo'-shi, Cheju-shi; Cheju island), southern Japan, Taiwan and China.

Remarks: Although the two species of the genus *Girella*, *G. mezina* and *G. punctata* were reported in Korea, *G. melanichthys* is confirmed for the first time. This species resembles *Girella punctata*, but differ in having 14-15 dorsal soft rays(versus, 12-13), upper 1/3 of operculum scaled(versus, at least 1/2) and with black opercular margin(versus, without black margin).

***Kyphosus bigibbus* Lacepede (Fig. 3)**

New Korean name: Muni-ggam-jaeng-i

Kyphosus bigibbus Lacepede, 1802, p. 115, pl. 8, fig. 1(type locality not given)

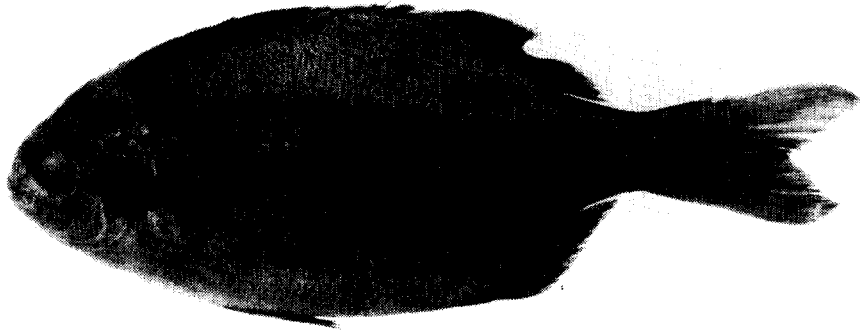


Fig. 3. *Kyphosus bigibbus* Lacepede, 185.2mm SL.

(cite from Zama, 1976, p. 101); Zama, 1976, p. 100-104.

Material examined: CNUC 19327, 1 specimen, 185.2mm SL, Hallim-up, Pukchejgun, Cheju-do, Korea, 7 July, 1993.

Description: D. XI,12; A. III,11; P. 18; lateral line pores 54; scales in lateral line 67; scales above lateral line 12; scales below lateral line 21; vertebrae 26. Body elongate-ovate, regularly elliptical, moderately compressed, head short, with blunt snout; eye large; mouth small, horizontal; maxillary barely reaching front of eye; villiform teeth; fine teeth on vomer, palatines and tongue; gill raker long. Preopercle obsolete serrate; scales small, thick, ctenoid; body, head(except preorbital region) and maxillary covered with scales.

Color: Black and white coloration as in fig. 3. Body color dark gray above, grayish below; body with pale streaks along scale rows; opercular membrane dark; fins dark gray; pelvic fin darkish distally; caudal fin edged with dark.

Measurement: One specimen(185.2mm SL) in percent of standard length: body depth 41.2%; head length 26.7%; snout length 8.4%; orbit length 7.3%; interorbital width 10.7%; upper jaw length 7.7%; pectoral fin length 16.4%; pelvic fin length 17.0%; length of 3rd dorsal spine 7.3%; length of 6th dorsal spine 11.3%; length of 4th dorsal ray 9.0%; length of 3rd anal spine 6.2%; length of 2nd anal ray 10.8%; caudal peduncle depth 11.3%.

Distribution: Southern Korea(Hallim-up; Cheju Island), southern Japan(Ryukyu and Izu Islands), South Africa, Red Sea, Philippines and Hawaii(Zama, 1976).

Remarks: This species resembles *Kyphosus cinerascens* and *K. lembus* but differs from *K. cinerascens* in having the soft portion of dorsal fin lower than the spineous portion, and more scales in lateral line pores, above and below lateral line, and differs from *K. lembus* in having dorsal fin ray XI,12(versus, XI,14) and anal fin ray III,11-12(versus, III, 13-14).

Family Chaetodontidae

***Chaetodon wiebeli* Kaup (Fig. 4)**

New Korean name: Ggorijul-nabigogi

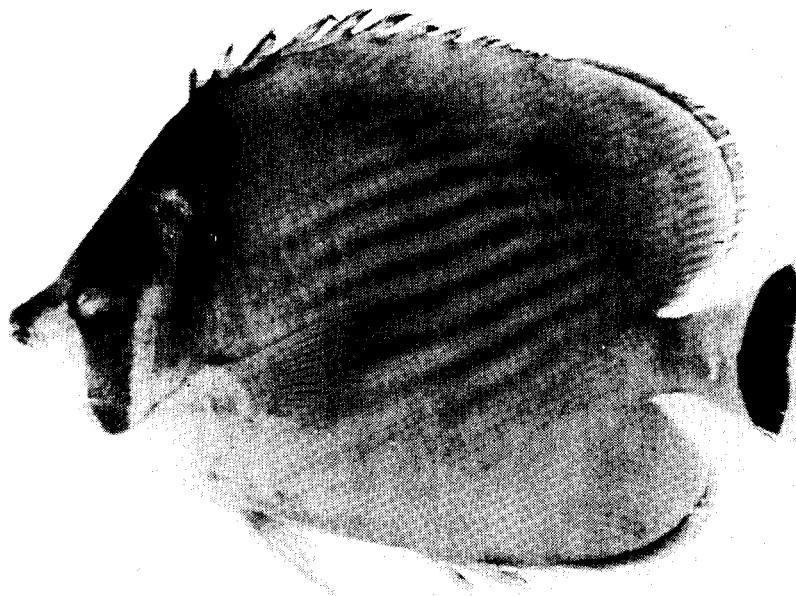


Fig. 4. *Chaetodon wiebeli* Kaup, 130.8mm SL.

Chaetodon wiebeli Kaup, 1863, p. 127 (type locality: Canton, China) (cited from Fowler, 1949, p. 23)

Material examined: CNUC 19325, 1 specimen, 130.8mm SL, Hallim-up, Pukcheju-gun, Cheju-do, Korea, 28 July, 1993.

Description: D. XII,24; A. III,19; P. 16; lateral line pores 38; scales above lateral line 7; scales below lateral line 12; vertebrae 24. Body strongly compressed, elevated, oval to rhombic; mouth small, protractile, terminal; moderate eyes lateral; teeth bristlelike; palate toothless; snout more or less conic, equal to or larger than eye. Scales regularly round. Spinous fin equals or longer than soft fin. Interorbital broadly convex; preopercle edge feebly and minutely serrate; gill raker rudimentary.

Color: Black and white coloration as in fig. 4. Mostly pale olive with slight grayish tinge over middle of sides; broad blackish brown band on head above eyes, wider than eye though narrowing until less than eye in crossing iris and then continuous down over cheek, but reaching chest. Each row of scales on body with narrow median ochre yellow to buff band, through on bases of soft dorsal and anal yellow ochre predominates. Lips blackish; spinous dorsal membranes grayish, neutral or slate black terminally; soft dorsal

and anal yellow ochre, terminally pale to whitish with narrow blackish submarginal line. Caudal pale or dull yellow ochre basally, then light brown medially and terminal half with wide black band, hind edge white.

Measurement: One specimen(130.8mm SL) in percent of standard length: body depth 75.2%: head length 31.1%: snout length 10.9%: orbit length 8.8%: interorbital width 10.8%: caudal fin length 16.2%: pectoral fin length 26.0%: pelvic fin length 25.1%: length of 5th dorsal spine 14.5%: length of 7th dorsal spine 11.3%: length of 2nd anal spine 14.4%.

Distribution: Southern Korea(Hallim-up; Cheju Island), southern Japan, Taiwan, China, Boroneo, Java, East Indies, Philippines and Hong Kong.

Remarks: This species resembles *Chaetodon collaris*, but differ in having 24 dorsal soft rays(versus, 22-23), 7 scales above lateral line, 12 below(versus, 9 or 10 above, 15 or 16 below), caudal fin color pale or dull yellow ochre basally, then light brown medially and terminal half with wide black band, hind edge white(versus, broadly pale behind, inner half of band yellowish) and different head band color.

Family Gobiidae

Istigobius campbelli (Jordan and Snyder) (Fig. 5)

New Korean name: Sajak'o-mangduk



Fig. 5. *Istigobius campbelli*(Jordan and Snyder), 56.1mm SL.

Ctenogobius campbelli Jordan and Snyder, 1901, p. 62, fig. 8(type locality: Wakanoura, Kii, Japan); Fowler, 1960, p. 119-120.

Acentrogobius campbelli: Matsubara, 1955, p. 831.

Istigobius campbelli: Murdy and Hoese, 1985, p. 18-21.

Material examined: CNUC 19399, 1 specimen, 56.1mm SL, Songsan-up, Namcheju-gun, Cheju-do, Korea, 14 October, 1992; 11 specimens, 20.6-30.5mm SL, Aewol-up, Pukcheju-gun, Cheju-do, Korea, 11 September, 1990.

Description: D. VI,11: A. I,9: P. 18: lateral line pores 29: transverse scales 9: predorsal scales 10: vertebrae 26. Body thickset, cylindrical anteriorly, caudal peduncle deep: Eye very large, directed obliquely upward: interorbital space narrow, concave: mouth

somewhat oblique, lips narrow. Head naked, body with large ctenoid scales. Caudal fin round; pectoral fin pointed, its upper edge without free filaments; ventrals free posteriorly, their tips reaching anal opening.

Color: Black and white coloration as in fig. 5. Body color dusky brown dorsally and pale brown ventrally, with a longitudinal series of dark brown spots. Head with small dark spots; those on nape arranged in longitudinal rows; a sharply defined, narrow, dark line running backward from eye; a large dusky blotches on cheek. Dorsal spines and rays with small, oblong, dark spots; caudal fin with small, dark spots on upper two-thirds; anal fin black distally; pelvic fins dusky.

Measurement: One specimen(56.1mm SL) in percent of standard length: body depth 17.8%; head length 28.2%; head depth 16.0%; orbit length 6.4%; pectoral fin length 29.2%; pelvic fin length 23.6%; upper jaw length 7.8%; lower jaw length 8.0%; caudal peduncle length 23.0%; caudal peduncle depth 11.4%.

Distribution: Southern Korea(Songsan-up, Aewol-up; Cheju Island). Japan, Taiwan, Hong Kong.

Ecology: This species is commonly found on sandy and rocky bottoms in shallow waters(0-14m), and living solitarily or in small schools near crevices on under stones. The present specimen collected from Songsan-up was found sand bottoms in a depth of 1m, and Aewol specimens was taken from a depth of 50cm in tide pool.

Remarks: Among the species of the genus *Istigobius*, *I. hoshinonis* was recently known in Korean water(Lee, 1991), *I. campbelli* is known to Korea as the second species of this genus. This species resembles *I. hoshinonis*, but differ in having the 11 second dorsal rays(12 in *I. hoshinonis*), 10 anal fin rays(versus, 11), 10 predorsal scales(versus, 12 or more), and different body color.

Family Apogonidae

Gymnapogon Regan, 1905

New Korean name: Min-donggaldom-sok

Gymnapogon japonicus Regan (Fig. 6)

New Korean name: Min-donggaldom

Gymnapogon japonicus Regan, 1905, p. 20(type locality: Inland Sea of Japan).

Material examined: CNUC 19335-19337, 3 specimens, 24.0-41.1mm SL, Aewol-up, Pukcheju-gun, Cheju-do, Korea, 11 September, 1991.

Description: D. VI, I 10; A. II 9; P. 12; gill rakers 10; vertebrae 24. Body oblong, laterally compressed. No scales on body, pit organs well developed. Sides of head with ser-



Fig. 6. *Gymnapogon japonicus* Regan, 41.1mm SL.

ies of small pores arranged in a reticulate pattern; sides with 20 or more vertical rows of small pores and with lateral line consisting of two sections. Mouth wide, oblique; jaws of equal length anteriorly, maxillary clearly distinguished posteriorly. Teeth small, in a single row on jaws and on palatine; few vomerine teeth. Single downward short spine on the preopercular edge. Pectoral symmetrical, rounded or blunt-pointed; caudal subtruncate, usually slightly emarginate at posterior edge.

Color: Black and white coloration as in fig. 6. Color when fresh, body ground color as a whole pinkish-red, with brownish pigments on the center of caudal fin base. Color in formalin: whole pale-olive, with light brown on the center of caudal fin base.

Measurement: Three specimens(24.0-41.1mm SL) in percent of standard length: body depth 20.9-22.9%; head length 37.7-40.0%; eye diameter 7.1-8.0%; pectoral fin length 22.5-28.8%; longest dorsal soft ray length 17.5-19.7%; caudal peduncle length 20.4-23.8%; caudal peduncle depth 11.3-12.5%.

Distribution: Southern Korea(Aewol-up; Cheju Island), Southern Japan and the Philippines.

Ecology: The present specimen collected from muddy and sandy bottoms of the tide pool in Aewol-up, Cheju-do, Korea.

Remarks: Six species of the genus *Gymnapogon* are recognized in the world. Of these three species: *G. japonicus*, *G. philippinus* and *G. urospilotus*, were recorded from the southern Japan(Lachner, 1953; Masuda *et al.*, 1984; Hayashi, 1993) and three species, *G. philippinus*, *G. annona* and *G. urospilotus* were recorded from the Taiwan(Shao and Chen, 1986). *Gymnapogon japonicus* is reported for the first time from Korea by the present study.

Family Mullidae

Parupeneus chrysoplueron (Temminck et Schlegel) (Fig. 7)

New Korean name : Juhwang-ch'ogsu



Fig. 7. *Parupeneus chrysoplueron* (Temminck and Schlegel), 228.8mm SL.

Mullus chrysoplueron Temminck et Schlegel, 1845, p. 29, pl. XII, fig. 1 (type locality: Nagasaki, Japan).

Parupeneus chrysoplueron: Bleeker, 1874, p. 142; Masuda *et al.*, 1984, p. 164.

Material examined: CNUC 19763, 1 specimen, 228.8mm SL, Dongmun fish market, Cheju-shi, Cheju-do, Korea, 27 July, 1993

Description: D. VIII,I-8; A. I,6; P. 16; pores in lateral line scales 28; scales above lateral line 3; scales below lateral line 6; vertebrae 24. Body ablong, elongate, with slight lateral compressed; head moderate, dorsal profile curved. Mouth small, to some extent protractile, subterminal. 2 barbels long, extending beyond the vertical from the posterior edge of the preopercle. Scales large, cycloid or slightly ctenoid, lateral line complete. Two dorsal fins, well separated, both short, first with 8 spiny rays. Caudal fin bifurcate.

Color: Black and white coloration as in fig. 7. Body color bright red. A longitudinal golden-yellow band extending from head to base of caudal fin rays. All fins reddish yellow.

Measurement: One specimen (228.8mm SL) in percent of standard length: body depth 29.6%; head length 30.6%; eye diameter 5.5%; snout length 18.0%; interorbital width 8.7%; pectoral fin length 22.2%; pelvic fin length 18.9%; length of 3rd dorsal spine 14.7%; length of first dorsal ray 9.3%; length of first anal ray 10.8%; caudal peduncle length 25.7%; caudal peduncle depth 11.1%.

Distribution: Southern Korea (Cheju-shi: Cheju Island), China, Taiwan, the Philippines and Japan.

Remarks: This species is easily recognized in absence of transverse band or spots, color bright red, and all fins reddish yellow.

Family Nemipteridae

Nemipterus japonicus (Bloch) (Fig. 8)

New Korean name: Hwangjul-silggoridom

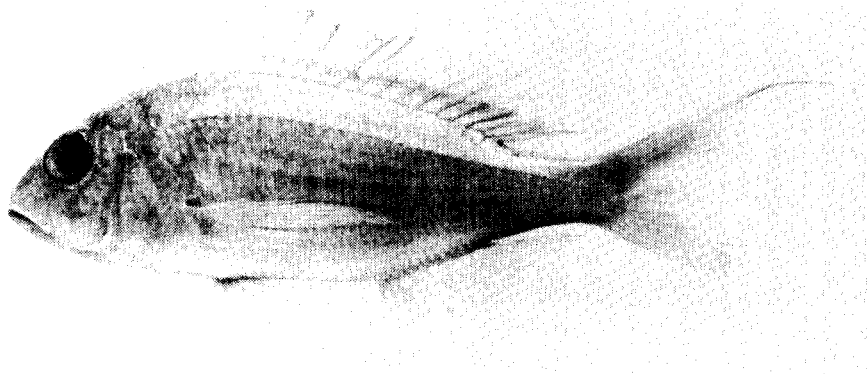


Fig. 8. *Nemipterus japonicus* (Bloch). 175.6mm SL.

Sparus japonicus Bloch, 1791, p. 110, pl. 277, fig. 1 (type locality not given) (recite from Russell, 1993, p. 302-303).

Nemipterus japonicus: Masubara, 1955, p. 667; Russell, 1993, p. 302-303.

Material examined: CNUC 19329, 1 specimen, 175.6mm SL, Dongmun Fish Market, Cheju-shi, Cheju-do, Korea, 14 October, 1992

Description: D. X,9; A. III,7; P. II,16; lateral line scales 46; vertebrae 24. Body elongate, oval, markedly compressed laterally; body depth small, approximately equaling head length. Scales caducous, particularly on the operculum; cheeks with 3 rows of large scales. No scales on interorbital space or along posterior edge of preopercle and opercular. Pectoral fins very long, reaching to or just beyond level of anal fin origin; pelvic fins moderately long; upper lobe of caudal fin with short or moderately long, trailing filament.

Color: Black and white coloration as in fig. 8. Color of body pinkish red, silvery red below; 11 pale golden-yellow stripes along body from behind head to base of caudal fin; prominent red-suffused, yellow blotch below origin of lateral line; dorsal fin suffused pale whitish, margin of fin yellow, edged with red; pale lemon stripe extending along dorsal fin near base, this stripe narrow anteriorly and widening on posterior part of fin; anal fin suffused pale whitish with pale lemon scribbings or broken lines over most of fin; pectoral and pelvic fin pale pink; caudal fin pink, upper tip and filament yellow.

Measurement: One specimen (175.6mm SL) in percent of standard length: body depth 33.4%; head length 33.5%; eye diameter 9.3%; snout length 11.1%; interorbital distance 7.1%; pectoral fin length 34.7%; pelvic fin length 25.6%; caudal peduncle length 20.1%; caudal peduncle depth 10.4%.

Distribution: Southern Korea (Cheju-shi: Cheju Island). This species is widespread in the Indo-West Pacific (China, Taiwan, the Philippines, Indonesia, Thailand and India) ranging from East Africa, including the Persian Gulf and Red Sea, to the Indo-malay Archipelago (Russell, 1993).

Remarks: The 50 nominal species of the genus *Nemipterus*, have been described. Recently, 9 species of the *Nemipterus* were reviewed by Russell(1993) from Japan and Taiwan. Until now, only *Nemipterus virgatus* is known only from Korean waters(Chyung, 1977), but *Nemipterus japonicus* recorded for the first time from Cheju-do, Korea. This species resembles *N. virgatus* but differs in having 7 anal soft ray(8 in *N. virgatus*), pectoral fin with more than 18 rays(versus, pectoral fin with 16 or 17 rays), 46 lateral line scale(versus, 47-48), very long pelvic fins(reaching to or beyond level of origin of anal fin), and 11-12 pale golden-yellow stripes color along body(one yellow stripe on back above lateral line and 5 yellow stripes on sides beneath lateral line in *N. virgatus*).

Discussion

The order Perciformes is the most diversified of all fish orders representing 150 families, 1,367 genera and about 7,800 species(Nelson, 1984) and a higher teleostean group having adaptively radiated in their habitat utility and swimming ability(Gosline, 1971).

Although the classification of these taxa is controversial, Lindberg and Krasnyukova (1971, 1989) reviewed the order Perciformes with keys and brief descriptions covering 85 families, 243 genera and 438 species in the 13 orders from the Sea of Japan and the adjacent areas of the Okhotsk and the Yellow Sea.

In Korea, the latest treatments on this order were Mori(1952) and Chyung(1977) who listed fish species of Korea. After that, some ichthyologists added some species to the perciform fish list through the fragment revisionary works on the Gobiidae(Kang, 1990; Kim *et al.*, 1986; 1987; Iwata and Jeon, 1987; Lee, 1991; Lee and Kim, 1992), Callionymidae (Fricke and Lee, 1993; Lee, 1991; Lee and Kim, 1993; Nakabo and Jeon, 1985; 1986; Nakabo *et al.*, 1987; 1991), and Blennoidei and Zoarcoidei(Kim and Kang, 1991).

In the fish fauna of Cheju Island of Korea, Uchida and Yabe(1939) reported 162 species and Baek(1982, 1984) recorded 366 species including some unrecorded fishes. About 160 species of them belong to the Perciformes which dominate in tropical and subtropical waters.

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제주도 연안에서 채집된 농어목 어류 7 미기록종

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1991년 부터 1993년까지 제주도 연안에서 채집한 농어목 어류 가운데서 다음과 같은 7 미기록종이 확인되었기에 보고한다. 미기록종은 황줄깜쟁이과에 긴꼬리벵에돔(국명신칭) *Girella melanichthys*(Richardson)와 무늬깜쟁이(국명신칭) *Kyposus bigibbus* Lacepede, 나비고기과에 꼬리줄나비고기(국명신칭) *Chaetodon wiebeli* Kaup, 망둑어과에 사자코망둑(국명신칭) *Istigobius campbelli*(Jordan and Snyder), 동갈돔과에 민동갈돔(국명신칭) *Gymnapogon japonicus* Regan, 촉수과에 주황촉수(국명신칭) *Parupeneus chrysoplueron* (Temminck et Schlegel) 그리고 실꼬리돔과에 황줄실꼬리돔(국명신칭) *Nemipterus japonicus* (Bloch) 이다. 이중에 동갈돔과에 민동갈돔속(국명신칭) *Gymnapogon*은 국내에서 보고된 적이 없는 미기록속이었다.