

New Record of the Genus *Chlorophthalmus* (Pisces : Chlorophthalmidae) from Korea

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Four specimens of *Chlorophthalmus albatrossis* Jordan and Starks and one specimen of *Chlorophthalmus acutifrons* Hiyama belonging to the family Chlorophthalmidae were collected for the first time from Korea. We propose "Pa - rang - nun - mae - tung - yi" for *Chlorophthalmus albatrossis* and "Chŭm - mun - pa - rang - nun - mae - tung - yi" for *Chlorophthalmus acutifrons* as a new Korean name.

Introduction

The greeneyes, family Chlorophthalmidae, occur world - wide in deep seas through the temperate and tropical regions (Wheeler, 1975). This family, belonging to the order Aulopiformes, comprises three genera, of which the genus *Chlorophthalmus* is particularly diverse and abundant (Nelson, 1994). In spite of its cosmopolite, little studies have been made.

Kamohara (1953) revised the systematics of Chlorophthalmidae from Japan, in which he described 5 species and key to the species. Okamura (1984), in detail, described 4 species including 2 new species based on the samples collected by bottom trawls in the Okinawa trough. Recently, Gloerfelt - Tarp and Kailola (1984) presented brief descriptions and photos of Chlorophthalmidae from southern Indonesia to northwestern Australia, and Sulak (1986) redescribed 10 species from Africa.

In the case of Korea, Kim *et al.* (1988) proposed the Korean family name for the first time

when they described a bigscale greeneye from the distant water of North Pacific. Thereafter, no greeneyes have been reported from Korea until now.

During our study of the ichthyofauna of the south sea of Korea, we collected two species belonging to Chlorophthalmidae, which are the first record from Korea.

We propose "Pa - rang - nun - mae - tung - yi" for *Chlorophthalmus albatrossis* and "Chŭm - mun - pa - rang - nun - mae - tung - yi" for *Chlorophthalmus acutifrons* as a new Korean name.

Materials and Methods

The specimens were collected northeast to Cheju island (33.7° N, 127° E) with the aid of fishermen. Counts and measurements were made in accordance with the method of Hubbs and Lagler (1964). Specimens were measured with a caliper to the nearest 10th of millimeter. The vertebral counts were taken from

radiographs. All materials examined in this study were fixed in the solution of formaldehyde (HCHO, 30%), and deposited at Ichthyological Laboratory, Department of Marine Biology, Pukyong National University (PKNU, formerly National Fisheries University of Pusan).

Result and Discussion

Family Chlorophthalmidae

(Korean Family Name : Pa - rang - nun - mae - tung - yi - kwa)

Most recognized species live in water of 183 - 732m and occur in temperate and tropical regions of all the oceans. On the whole, they are small, usually less than 30 cm, and compressed posteriorly. Head moderately compressed or depressed with a large eye placed rather high on the head, and their eyes are iridescent green in life. Mouth moderate, maxillary not extending beyond the posterior margin of eye. Scales ctenoid or cycloid, absent from top of head. No spines in fins ; dorsal fin single with 9 - 13 rays ; adipose dorsal fin present ; 7 to 11 rays in anal fin ; pectoral fin large or moderate with 15 - 17 rays ; pelvic fin usually smaller than pectoral fin, sometimes larger and subequal to head length ; caudal fin forked ; anus either near pelvic fin bases or just before anal fin origin.

This family is similar to Aulopodidae, Ipnopidae and Synodontidae, but differs from Aulopodidae in the number of dorsal fin rays (14 - 17 in Aulopodidae), and from Ipnopidae and Synodontidae in the length of maxillary (maxillary considerably extending beyond the posterior margin of eye in Ipnopidae and Synodontidae).

Genus *Chlorophthalmus* Bonaparte, 1840

(Korean Genus Name : Pa - rang - nun - mae - tung - yi - sog)

Chlorophthalmus Bonaparte, 1840 : 140
(type species *Chlorophthalmus agassizii* Bonaparte, 1840)

Body slender and compressed, head slightly compressed. Mouth moderately small, the maxillary not extending beyond a vertical from the middle of pupil. Lateral line scales 38 - 59, operculum smooth. Anus which are closer to the origin of pelvic fin than that of anal fin, encircled with light organ or not. It lives on the edge of the continental shelf, close to the bottom in areas of mud or fine sand. It eats invertebrates especially small crustaceans and squids.

Chlorophthalmus albatrossis Jordan and Starks, 1904

(Fig. 1)

(New Korean Name : Pa - rang - nun - mae - tung - yi)

Chlorophthalmus albatrossis Jordan and Starks, 1904 : 579, fig. 1. (type locality, Sagami Bay, Japan) ; Gloerfelt - Tarp and Kailola, 1984 : 75 (in part) ; Masuda *et al.*, 1984 : 62, pl. 63 - H (descr. ; range) ; Okamura, 1984 : 171, fig. 119 (in part) ; Nakabo, 1993 : 302 (descr. ; in key ; range).

Chlorophthalmus albatrossis albatrossis Kamohara, 1953 : 3, fig. 2, A.

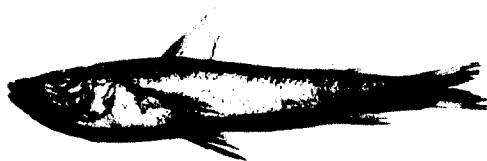


Fig. 1. *Chlorophthalmus albatrossis*, PKNU 904194, 108.1mm SL, Korea.

Material examined : PKNU 904191~4, four specimens, 108.1~144.0mm SL, southwestern area of Cheju island, Korea, 19 April 1990.

Description : Counts and proportional measurements are shown in Table 1 and 2.

Body elongate and compressed, slightly compressed anteriorly but deeply compressed posteriorly ; dorsal profiles before dorsal fin gently curved. Body depth greatest at dorsal fin origin, its depth 6.12~7.26 in standard length. Head moderate ; snout pointed, the length somewhat shorter than the eye diameter, 3.1~3.4 in head length, eye 2.5~2.6 in head length. Mouth terminal and oblique ; maxillary not extending beyond a vertical from the middle of pupil ; lower jaw slightly projecting beyond the upper ; jaw with small, conical teeth. Dorsal fin

single with 10~11 rays, the base very short, the origin near the posterior end of head. Adipose dorsal fin near caudal fin base. Pectoral fin moderate with 15 rays, extending beyond a vertical from posterior end of dorsal fin base. Pelvic fin moderate, the origin under the 4th ray of dorsal fin, extending beyond anus. Anal fin small, the base short, below the adipose fin. Anus encircled by a black area, near pelvic fin base. Caudal fin forked. Scales small, weakly ctenoid.

Color when fresh : Body brown with several dark blotches on the side, silvery below. Each fin light yellowish, but, upper region of pectoral fin base, caudal fin base and inner margin of caudal fin black.

Distribution : South sea of Korea, Southern

Table 1. Comparison of meristic characters of *Chlorophthalmus albatrossis* collected around Cheju island, Korea

Characters	Present study	Jordan and Starks(1904)	Okamura(1984)	Gloerfelt - Tarp and Kailola(1984)
Number of specimens	4	7	20	-
Dorsal fin rays	10~11	1, 10	11	10~12
Anal fin rays	9	-	9	8~9
Pectoral fin rays	15	-	15~16	14~15
Pelvic fin rays	9	-	9	-
Lateral line scales	54~55	-	52~54	53~56
Scales above lateral line	7	-	7½~8½	7~8
Scales below lateral line	6	-	6½~7½	-
Gill rakers	4~5+17	-	3+1+17~18	3~4+17~19
Vertebrae	20+29=49	-	-	-

Table 2. Comparison of proportional measurements of *Chlorophthalmus albatrossis* collected around Cheju island, Korea

Characters	Present study	Jordan and Starks(1904)	Okamura(1984)	Gloerfelt - Tarp and Kailola(1984)
Standard length (mm)	108~144	170	106~168	-
In head length				
Eye diameter	2.5~2.6	2.5	2.3~2.5	2.5~2.7
Interorbital width	6.5~7.5	-	6.8~7.5	-
Snout length	3.1~3.4	3.75	3.4~3.7	3.1~3.9
Upper jaw length	2.3~2.5	2.5	2.2~2.4	-
Lower jaw length	2.0~2.2	-	-	-
In standard length				
Body depth	6.1~7.3	-	5.3~5.9	-
Head length	3.2~3.4	-	3.3~3.6	-
Predorsal length	2.6~2.7	-	2.6~3.0	-
Prepelvic length	2.3~2.5	-	2.4~2.7	-
Preanal length	1.3~1.4	-	1.3~1.4	-
Caudal peduncle length	5.8~6.3	-	5.6~6.0	-
Caudal peduncle depth	12.9~14.8	-	12.3~14.5	-

Japan, East China Sea, Southern Indonesia and Northwestern Australia in depth of 250 - 620m.

Remarks : This species was first recorded as *Chlorophthalmus albatrossis* by Jordan and Starks (1904), thereafter, Kamohara (1953) treated this as a subspecies, *C. albatrossis albatrossis*, and also treated *C. borealis* as *C. albatrossis borealis* based on the slight differences between *albatrossis* and *borealis*. However, many authors like Gloerfelt - Tarp and Kailola (1984), Okamura (1984) and Nakabo (1993) recognized *C. albatrossis* as a valid species.

This species is similar to *C. acutifrons*, but they are easily distinguished by dorsal profile before dorsal fin (gently curved cf. deeply curved in *acutifrons*) and eye length in head length (2.5 ~ 2.6 cf. 3.7 in *acutifrons*). It is also closely allied to *C. borealis*, but differs from the latter in eye length (10.7 ~ 13.0% SL cf. 9.7 ~ 10.9% SL in *borealis*) (Nakabo, 1993). This species most closely resembles *C. pectoralis* in general appearance as well as almost all meristic characters, but *C. pectoralis* is distinguished from *C. albatrossis* in having the long pectoral fin reaching to vertically above tip of the pelvic fin (Okamura, 1984).

Most characteristics of the present specimens conform well to the original description by Jordan and Starks (1904) and others. However, body depth in standard length is slightly differentiate with that of Okamura (1984), it seems to be a regional variation.

***Chlorophthalmus acutifrons* Hiya-
ma, 1940**

(Fig. 2)

(New Korean Name : Chŭm - mun -
pa - rang - nun - mae - tung - yi)

Chlorophthalmus acutifrons Hiyama, 1940 :
171, fig. 2. (type locality, Kumano - nada) ;

Kamohara, 1953 : 4, fig. 3, B ; Okamura *et al.*,
1984 : 171, fig. 118 (in part) ; Masuda *et al.*,
1984 : 62, pl. 63 - E (descr. ; range) ; Nakabo,

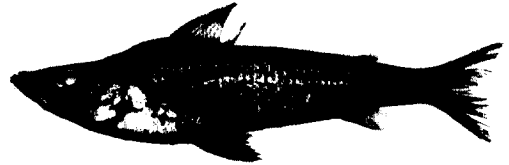


Fig. 2. *Chlorophthalmus acutifrons*, PKNU 904195,
227.0mm SL, Korea.

1993 : 301 (descr. ; in key ; range).

Material examined : PKNU 904195, 1
specimen, 227.0mm SL, southwestern area of
Cheju island, Korea, 19 April 1990.

Description : Counts and proportional mea-
surements are shown in Table 3 and 4.

Body compressed, body depth 4.6 in standard length, with the dorsal edge rising into a ridge before dorsal fin. Snout long and slightly compressed, more than eye diameter, 2.9 in head length, eye 3.7 in head length. Mouth moderate, rather oblique, maxillary extending backward slightly beyond a vertical from anterior margin of eye. Jaw with small, conical teeth, which composed of one row in upper jaw and two rows in lower. Dorsal fin single with 11 rays, the base short, the origin before middle of body. Adipose dorsal fin near caudal fin base. Pectoral fin moderate with 16 rays, extending backward slightly beyond a vertical from posterior end of dorsal fin base. Pelvic fin origin below middle of dorsal fin base, extending beyond anus. Anus encircled by a black area, near pelvic base. Caudal fin forked. Scales small, weakly ctenoid.

Color when fresh : Body brown, silvery

below. Each fin light yellowish except pelvic fin, more or less dark.

Distribution : South sea of Korea, southern Japan, East China Sea, Philippine archipelago in depth of 260~435m.

Remark : This species was first recorded as *Chlorophthalmus acutifrons* by Hiyama (1940), thereafter, Kamohara (1953) provided with its redescription as well as a key to species from

Japan. He also described a new subspecies named as *C. acutifrons nigromarginatus* showing slight differences with *C. acutifrons*. However, some authors like Gloerfelt - Tarp and Kailola (1984) and Nakabo (1993) recognized *C. nigromarginatus* as a valid species.

The present species is very similar to *C. nigromarginatus*, but they are distinguished by the color of dorsal and caudal fin (black margin in

Table 3. Comparison of meristic characters of *Chlorophthalmus acutifrons* collected around Cheju island, Korea

Characters	Present study	Hiyama (1940)	Okamura (1984)
Number of specimens	1	1	13
Dorsal fin rays	11	11	11~12
Anal fin rays	9	9	9~10
Pectoral fin rays	16	-	15~16
Pelvic fin rays	9	10	8~9
Lateral line scales	51	53	50~53
Scales above lateral line	7	-	7½~8½
Scales below lateral line	7	-	7½~8½
Gill rakers	4+15	-	3~4+1+14~15
Vertebrae	19+27=46	-	45~46

Table 4. Comparison of proportional measurements of *Chlorophthalmus acutifrons* collected around Cheju island, Korea

Characters	Present study	Hiyama (1940)	Okamura (1984)
Standard length (mm)	227	-	156~248
In head length			
Eye diameter	3.7	4.0	3.4~3.6
Interorbital width	9.2	-	7.5~8.8
Snout length	2.9	2.9	2.9~3.1
Upper jaw length	2.7	-	2.9~3.1
In standard length			
Body depth	4.6	4.3	4.5~4.9
Head length	3.4	3.4	3.2~3.3
Predorsal length	2.6	-	2.6~2.8
Prepelvic length	2.4	-	2.2~2.3
Preanal length	1.3	-	1.3
Caudal peduncle length	7.1	-	5.9~6.4
Caudal peduncle depth	12.8	-	12.8~14.5

nigromarginatus), and snout length to eye diameter (subequal in *nigromarginatus*) (Kamohara, 1953).

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1990년 4월 19일 제주도의 남서부 해역에서 파랑눈매통이과에 속하는 어류 *Chlorophthalmus albatrossis* 4개체 및 *Chlorophthalmus acutifrons* 1개체가 각각 채집되어 한국산 미기록종으로 보고한다. 본 조사 결과 처음으로 한국에서의 서식이 확인된 파랑눈매통이과 어류 2종에 대하여, *Chlorophthalmus albatrossis*는 "파랑눈매통이", *Chlorophthalmus acutifrons*는 "참문파랑눈매통이"로 각각 명명한다.