

New Record of the Two Anglerfishes (Pisces: Lophiiformes) from Korea

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Two species of anglerfishes, *Lophiodes insidiator* (Regan, 1921) and *Halieutaea fumosa* Alcock 1894 that were unrecorded in Korea, were collected from the adjacent waters of Busan, Korea. These species were described and figured as first record from Korea. New Korean names, Yong-Ah-Gui and Min-Bu-Chi were proposed for *Lophiodes insidiator* and *Halieutaea fumosa*.

Key words : *Lophiodes insidiator*, *Halieutaea fumosa*, anglerfishes

Introduction

Fishes of order Lophiiformes are inactive fishes with large head and mouth, cryptic coloration, and greatly depressed body shape. They usually occur in tropical and subtropical deep seas and are composed of 16 families with 65 genera and 297 species (Nelson, 1994).

In Korea, anglerfishes are mainly distributed in the South Sea and around Jeju Island, and are composed 4 families with 7 genera and 9 species without the revision of systematics for the scarcity of specimens (Mori, 1952; Chyung, 1977; Lee and Kim, 1999).

During surveys of the fish fauna of the adjacent water of Busan from 1998 to 2000, *Lophiodes insidiator* (Regan 1921) and *Halieutaea fumosa* Alcock 1894, were collected for the first time by otter trawls in Korea.

In this paper, we described the morphological characteristics of these fishes, and were presented the key to them.

The specimens were measured and counted following Hubbs (1958) and Okamura *et al.* (1984) with some modifications. All measurements were made with dial calipers. The numbers of fin rays and vertebrae were counted from radiographs. The specimens examined were deposited at the

Department of Biology, Seonam University, Namwon, Korea (SNUB).

Family Lophiidae 아귀과

Genus *Lophiodes* Goode et Bean, 1896

용아귀속

(New Korean name: Yong-Ah-Gui-Sok)

Lophiodes Goode et Bean, 1896: 537. Type species: *Lophius mutilus* Alcock; Eschmeyer, 1998. 2002.

Lophiodes insidiator (Regan 1921), 용아귀

(New Korean name : Yong-Ah-Gui) (Fig. 1)

Fig. 1. *Lophiodes insidiator* (Regan, 1921), SNUB 1374, 193.5 mm in SL, off Wollae-ri, Gijang-eup, Busan-si.

Chirolophius insidiator Regan, 1921: 418. (type locality : Natal, South Africa)

Lophiodes insidiator Okamura *et al.*, 1984: 269, 377; Caruso, 1986: 364.

Material examined : SNUB 1374, one specimen, 193.5 mm SL, off Wollae-ri, Gijang-eup, Busan-si, April 20, 2000.

Description : D₁. II~I~III, D₂. 7, A. 6, P. 15, V. I, 5, Vert. 17. In the percentage of the standard length, head length 37.8%, length of 1st dorsal spine 20.1%, length of 2nd dorsal spine 23.2%, length of 3rd dorsal spine 29.0%, length of dorsal fin base 17.8%, length of anal fin base 12.6%. In the percentage of head length, snout length 54.9%, eye diameter 16.8%, length of upper jaw 60.1%, distance between inner sphenotic spines 36.2%, distance between posterior frontal spines 25.3%, distance from pterotic spine to inner sphenotic spine 14.9% (Table 1). Head very large and deeply depressed, the body of the posterior gill moderately depressed. Lower jaw protruded than upper jaw, the posterior margin of upper jaw extend to the below center of pupil. The front of upper jaw with 2 to 3 rows of sharp teeth, posterior teeth of those with one row of sharp teeth, lower jaw with one row of canined-teeth, palatine with one row of canined-teeth, vomer teeth with three rows of canined-teeth.

Eye relatively small, interorbital space deeply concave with bony ridges at the margin of eye. Gill opening surrounded pectoral fin except the above margin. Dorsal spine six, two spines elongated at the space between nasal spines, four spines elongated from the posterior margin of eye to secondary dorsal fin, the end of 1st spine with dermal processes, 2nd spine without those, 4th to 6th spine with many leaf-like black dermal process, 5th spine attached 6th spine by fin membrane, the 3rd spine is the longest, 6th spine is the shortest, its length is half length of 3rd spine. The pelvic fin located in the front of ventral surface. Leaf-like dermal processes developed all body side, except secondary fin, the post region of anal fin and ventral surface. Humeral spine sharp and simple. Pectoral fin extending to below anus. The form of caudal fin truncated.

Color in 10% formalin : Dorsal surface and lateral surface slightly brown. Ventral surface, pelvic fin and margin of pectoral fin lightly yellow. Caudal fin with pale black spots. The end of dermal process of 1st dorsal fin with three black spots. The color of mouth cavity lightly black.

Distribution : Korea (Busan), East China Sea and Indo-Pacific Ocean (Yamada, 1993).

Remarks : *Lophiodes insidiator* is similar to *Lophiomus setigerus* and *Lophius litulon* by ex-

Table 1. Morphometric and meristic characters of *Lophiodes insidiator*

Characters	Present study	Okamura <i>et al.</i> (1984)
Number of specimens	1	3
Standard length (mm)	193.5	156~207
In percentage of standard length		
head length	37.8	34.4~36.1
length of 1st dorsal spine	20.1	30.1~33.1
length of 2nd dorsal spine	23.2	29.3~32.7
length of 3rd dorsal spine	29.0	37.0~42.9
length of dorsal fin base	17.8	21.3~23.1
length of anal fin base	12.6	15.9~18.4
In percentage of head length		
snout length	54.9	59.2~59.7
eye diameter	16.8	15.2~21.2
length of upper jaw	60.1	69.5~75.2
distance between inner sphenotic spines	36.2	42.9~49.0
distance between posterior frontal spines	25.3	28.2~34.5
distance from pterotic spine to inner sphenotic spine	14.9	11.9~17.3
Dorsal fin rays	II~I~III, 7	II~I~III, 8
Anal fin rays	6	6
Pectoral fin rays	15	14~16
Pelvic fin rays	I, 5	I, 5
Vertebrae	17	

ternal morphological characters. But this species differs from *Lophius litulon*, in having pectoral soft ray 15, all dorsal spines elongated and the large gill opening that surround pectoral fin, and differs from *Lophiomus setigerus* in having the simple humeral spine, pectoral soft ray 15, all dorsal spines elongated and the large gill opening that surround pectoral fin (Regan, 1921; Okamura *et al.*, 1984; Yamada, 1993).

Key to the species of the family Lophiidae from Korea

- 1a. Pectoral fin soft rays 15, the large gill opening that surround pectoral fin
 *Lophiodes insidiator* 용아귀 (국명신칭)
 1b. Pectoral fin soft rays more than 20, gill opening at the behind of pectoral fin 2
 2a. Humeral spine simple
 *Lophius litulon* 황아귀
 2b. Humeral spine bifurcate
 *Lophiomus setigerus* 아귀

Family Ogcocephalidae 부치과

Genus *Haliutaea* Cuvier et Valenciennes, 1837 빨강부치속

***Haliutaea fumosa* Alcock 1894 민부치**

(New Korean name: Min-Bu-Chi) (Fig. 2)

Haliutaea fumosa Alcock, 1894: 119. (type locality: Bay of Bengal); Bradbury, 1967: 413; Paxton *et al.* 1989: 285.

Material examined : SNUB 1375, one specimen, 75.7 mm SL, off Wollnae-ri, Gijang-eup,

Busan-si, August 15, 2000.

Description : D. 5, A. 4, P. 12, V. 5, Vert. 19. In the percentage of the standard length, disc length 59.3%, disc width 87.4%, head length 60.4%, predorsal length 73.1%, preanal length 82.0%. In the percentage of disc length, disc width 144.7%, snout length 16.2%, eye diameter 16.3%, interorbital width 15.5%, length of upper jaw 32.2%, mouth width 54.7%, caudal peduncle depth 8.3%, length of longest dorsal ray 16.6%, length of longest anal ray 21.7%, length of longest pectoral ray 41.1%, length of longest pelvic ray 39.2%, and length of longest caudal fin 43.8% (Table 2). Body deeply depressed and circular. Disc length shorter than the width, its length equal to three-fifth of its width. Mouth located on ventral surface. Maxilla extending to the front of eye.

Table 2. Morphometric and meristic characters of *Haliutaea fumosa*

Characters	Present study	Alcock (1894)
Number of specimens	1	
Standard length (mm)	75.7	
In percentage of standard length		
disc length	59.3	50.0
disc width	87.4	80.0
head length	60.4	
predorsal length	73.1	
preanal length	82.0	
In disc length		
disc width	144.7	
snout length	16.2	
eye diameter	16.3	
interorbital width	15.5	
length of upper jaw	32.2	
mouth width	54.7	
caudal peduncle depth	8.3	
length of longest dorsal fin ray	16.6	
length of longest anal fin ray	21.7	
length of longest pectoral fin ray	41.1	
length of longest pelvic fin ray	39.2	
length of longest caudal fin ray	43.8	
In disc width		
length of upper jaw	37.8	40.0
In disc length		
eye diameter	12.6	12.5~14.3
In length of longest caudal fin ray		
length of longest pectoral fin ray	93.8	100.0
Dorsal fin rays	5	4
Anal fin rays	4	4
Pectoral fin rays	12	13
Pelvic fin rays	5	5
Vertebrae	19	

Fig. 2. *Haliutaea fumosa* Alcock, 1894, SNUB 1375, 75.7 mm in SL, off Wollae-ri, Gijang-eup, Busan-si.

Both jaws and tongue with villiform teeth. Eye on cephalic surface, interorbital width equal to eye diameter, slightly concave with small stellate spines. Gill opening on cephalic region, and on the front of pectoral fin, its size shorter than eye diameter. Cephalic surface and lateral body with many stellate spines, ventral surface absolutely very smooth, without spines. Cephalic margin of disc, ventral margin of disc and lateral body with 2 to 4 branched small spines. Rostral spines and frontal spines simple and small. Illicial cavity with trilobe process under rostral spines. The pelvic fin located on ventral surface. Caudal fin truncated.

Color in 10% formalin : Cephalic surface slightly brown, ventral surface slightly yellow. Dorsal fin, pectoral fin and anal fin with slightly black band.

Distribution : Korea (Busan), Taiwan, and Philippines, and India (Masuda *et al.*, 1988).

Remarks : *Halieutaea fumosa* differs from its relative species, *H. stellatus*, in having very smooth ventral surface without spines and spinules (Alcock, 1894; Chyung, 1977; Yamada, 1993).

Key to the species of the family Ogcocephalidae from Korea

- 1a. Cephalic disc circular 2
 1b. Cephalic disc triangular 3
 2a. Ventral surface without spines and spinules
 *Halieutaea fumosa* 민부치 (국명신칭)
 2b. Ventral surface with spines and spinules
 *Halieutaea stellata* 빨강부치
 3a. Remarkably curved supraorbital spine toward the snout, seven black circles on cephalic surface
 *Malthopsis annulifera* 원꼭갈치
 3b. No curved supraorbital spine toward the snout, no circle on cephalic surface
 *Malthopsis lutea* 꼭갈치

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아귀목 (Order Lophiiformes) 어류의 2미기록종

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아귀목 어류에 속하는 *Lophiodes insidiator* (Regan, 1921)과 *Halieutaea fumosa* Alcock 1894의 한국산 미기록 어류를 부산주변의 해역에서 각각 1개체씩 채집하였다. *Lophiodes insidiator*의 국명은 “용아귀”, *Halieutaea fumosa*는 “민부치”라 신칭하였으며, 이들 종들의 계수계측형질을 기재하고 검색표와 사진을 제시하였다.