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First Record of the Frogfishes *Antennarius pictus* (Antennariidae, Lophiiformes) from Korea

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ABSTRACT Two specimens of *Antennarius pictus*, belonging to the family Antennariidae, were collected from the coastal waters of Jeju Island, Korea. They were characterized by having 7 anal fin rays, 10 pectoral fin rays, 12 dorsal fin rays, 9 caudal fin rays, and second spine of dorsal fin diminishing and curved backwards distally. Since this species has various sizes of round black spots on head, body and fins, we propose a new Korean fish name "Heuk-jum-bak-ssin-beng-i" for *A. pictus*.

Key words : *Antennarius pictus*, Antennariidae, first record, Jeju Island

INTRODUCTION

Antennariid fishes under the order Lophiiformes are known as the frogfishes and they are distributed in all tropical and subtropical seas except the Mediterranean Sea (Nelson, 2006). Among 42 species belonging to 12 genera in the family Antennariidae reported worldwide (Nelson, 2006), three frogfish species inhabit the coastal waters of Korea thus far (Kim *et al.*, 2005). They include *Antennarius hispidus* Bloch and Schneider, 1801; *Antennarius striatus* Shaw, 1794; and *Histrio histrio* Linnaeus, 1758. Although *Antennarius pictus* was previously reported on basis of the underwater photograph (Yoo *et al.*, 1995), it is difficult to confirm the correctness of species identification without counting or measuring the morphological characters of the actual specimen. Thus, this species has not been officially accepted to the list of Korean fish fauna up to date (Kim *et al.*, 2005). In the present study, the morphological characteristics of *A. pictus* were described based on the specimens in order to be added to the list of Korean fish fauna.

Counts and measurements of these specimens followed the method of Hubbs and Lagler (1964). The examined specimens were deposited at the Fish Genetics and Breeding Laboratory of Jeju National University (JNU), Korea.

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***Antennarius pictus* (Shaw and Nodder, 1794)**
(New Korean name: Heuk-jum-bak-ssin-beng-i)
(Fig. 1; Table 1)

Lophius pictus Shaw in Shaw and Nodder, 1794: 176 (type locality: Tahiti, Society Islands).

Antennarius pictus: Pietsch, 1984: 34 (Indo-West Pacific); Pietsch, 1986: 368 (Indo-West Pacific); Allen and Swainston, 1988: 38 (north-western Australia), Goren and Dor, 1994: 14 (Red Sea); Randall, 1995: 84 (Oman); Allen, 1997: 62 (Australia and south-east Asia); Myers, 1999: 69 (Micronesia); Randall and Lim, 2000: 597 (South China Sea); Senou, 2002: 457 (Japan); Allen and Adrim, 2003: 25 (Indonesia); Mundy, 2005: 264 (Hawaii).

Material examined. JNU20080603, 113.0 mm standard length (SL), gill net, Daepo-ri, Seogwipo-si, Jeju-do, Korea, 3 June 2008. JNU20090826, 86.5 mm SL, bare hands, Sagye-ri, Andek-myen, Seogwipo-si, Jeju-do, Korea, 12 June 2009.

Description. Counts of present specimen shown in Table 1. Measurements as a percentage of SL are as follows: Body depth 60.1~62.7; body width 21.9~25.1; upper jaw 20.0~24.2; snout length 9.4~10.2; eye diameter 4.4~4.5; interorbital length 14.3~16.2; first predorsal fin 2.5~5.0; second predorsal fin 6.9~8.8; third predorsal fin 18.5~26.1; prepectoral fin 52.4~52.5; preanal fin 72.8~78.8; prepelvic fin 24.3~26.5; length of second dorsal spine 10.9~11.1; length of third dorsal spine 17.3~19.0; length of longest pectoral fin ray 19.0~20.5 (4th ray); length of longest anal fin ray 13.9~

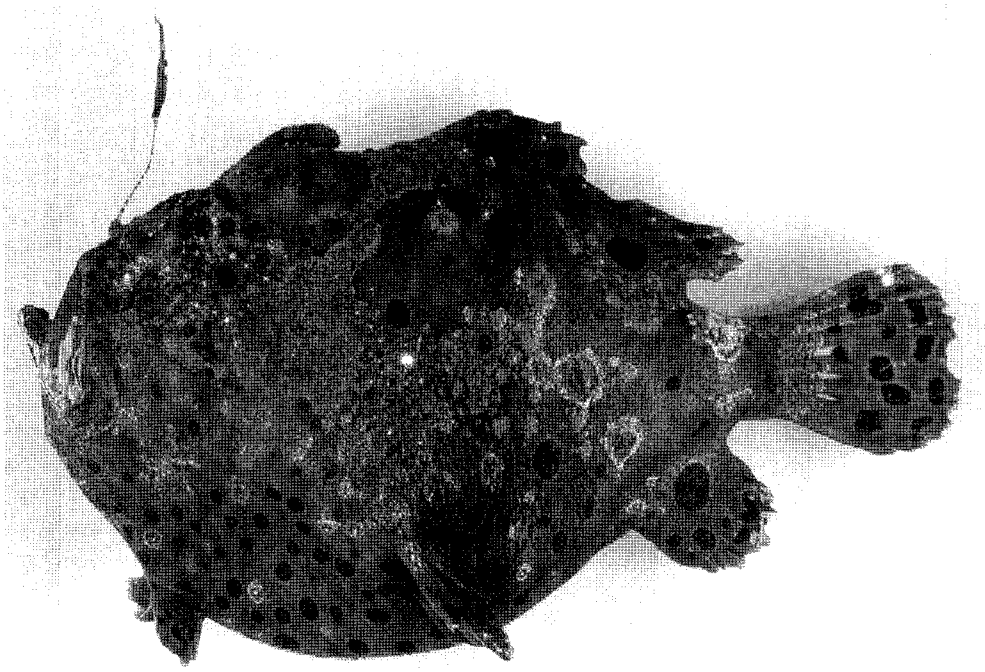

Fig. 1. *Antennarius pictus*, JNU 20080603, 113.0 mm SL, Daepo-ri, Seogwipo-city, Jeju-do, Korea.

Table 1. Morphological characters compared between present specimen and previous studies on *Antennarius pictus*

Morphological characters	Present study	Pietsch and Grobecker (1987)	Yokota (1991)
Total length (mm)	117.7/145.0		
Standard length (SL, mm)	86.5/113.0 (n=2)	12~160 (n=145)	26.3~70.6 (n=4)
Counts			
Dorsal fin rays	12	11~13 (usually 12)	12
Pectoral fin rays	10	9~11 (usually 10)	10
Ventral fins rays	5	–	5
Anal fin rays	7	6~7 (usually 7)	7
Caudal fin rays	9	–	9

14.7 (4th ray); caudal peduncle depth 14.2~15.7; caudal peduncle length 10.4~12.6.

Body round and compressed; body partially covered with wart-like swellings; skin of body covered with close-set dermal spinules; dorsal profile of head sloping and smoothly convex; head small; eye small; mouth large; presence of three well-developed dorsal spines, length of first dorsal spine (illicium) longer than that of second and third dorsal spines; second dorsal spine slightly tapered from base; membrane behind second dorsal spine thin; tip of second dorsal spine curved backwards; extending across area between second and third spines reaching to base of third; gill opening located below or behind of pectoral fin base; pectoral fin located behind the pelvic fin; anal fin rounded and caudal fin fan-shaped.

Color when fresh. Whole body uniformly orange; scattered and round black spots on head, body and fins, and which are various sizes.

Color in alcohol. Body uniformly pale orange; scattered and round pale black spots on head, body and fins, and which are various sizes.

Distribution. Known throughout the Indo-Pacific from Mozambique, East Africa, to the Hawaiian and Society Islands, including the Indian Ocean, the Philippines and Moluccas, tropical Australia, Guam, the Marshall Islands, Samoa, Tonga (Pietsch and Grobecker, 1987) and Korea (Jeju Island, Present study).

Remarks. The present specimens had the morphological characters of the genus *Antennarius* by having skin covered with close-set dermal spinules, all rays of caudal fin bifurcate and 12 dorsal rays. In addition, since the specimens possessed 7 anal fin rays, 10 pectoral fin rays, 12 dorsal fin rays, second spine of dorsal fin dilating distally, tip of second spine of dorsal fin curved backwards, and many black spots on the body, the morphological

Table 2. Comparison of dorsal, anal and pectoral fin rays of three *Antennarius* species

Species	Dorsal fin rays	Anal fin rays	Pectoral fin rays	References
A. pictus	11~13 (usually 12)	6~7 (usually 7)	9~11 (usually 10)	Pietsch and Grobecker (1987)
A. maculatus	11~12 (usually 12)	6~7 (usually 7)	10~11 (usually 10)	Pietsch and Grobecker (1987)
A. commerson	11~13 (usually 13)	8	10~11 (usually 11)	Pietsch and Grobecker (1987)

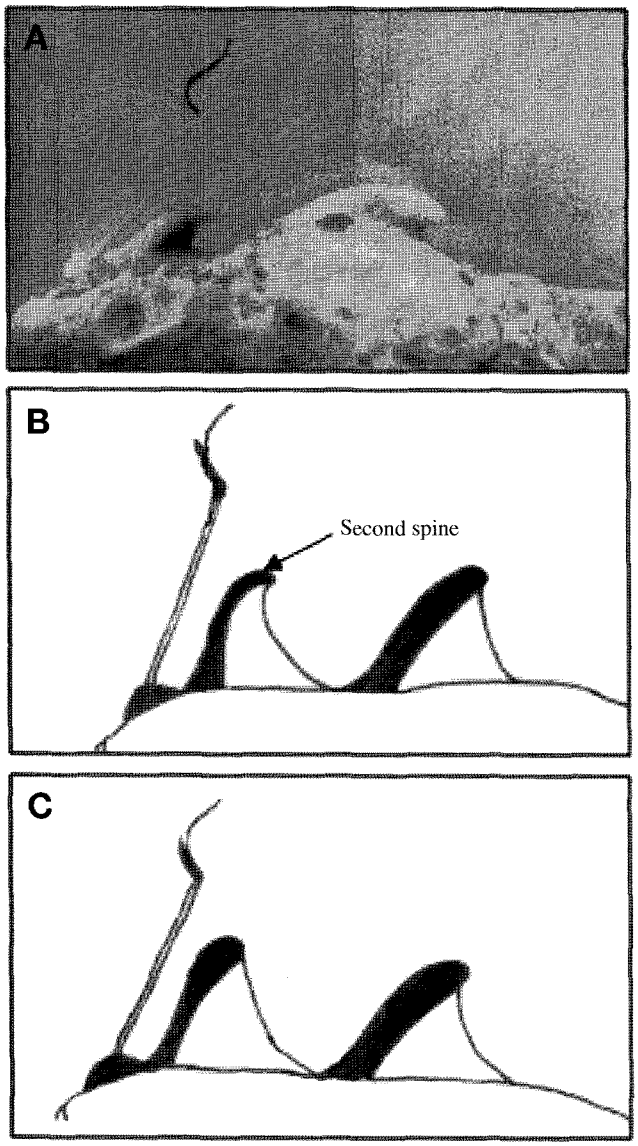

Fig. 2. Comparison of dorsal fin spines of *A. pictus* (A and B) and *A. maculatus* (C). The figure for *A. maculatus* was cited from Senou (2002).

characteristics of the specimens well matched with descriptions and counts of *A. pictus* given by previous studies (Pietsch and Grobecker, 1987; Yokota, 1991; Senou, 2002) (Table 1). Thus the present specimens were identified as *A. pictus*.

On the other hand, *A. pictus* is morphologically very similar to *A. commerson* and *A. maculatus*. But the former is easily distinguishable from *A. commerson* by having 7 anal fin rays (vs. 8 in *A. commerson*) (Table 2). Also *A. pictus* has the second spine of dorsal fin diminishing distally (vs. dilating distally in *A. maculatus*) and its tip curved backwards (vs. almost straight in *A. maculatus*) (Senou, 2002) (Fig. 2). *A. pictus* is also morphologically similar to Korean *Antennarius* species such as *A. hispidus* and *A. striatus*. However, *A. pictus* is easily distinguished from *A. hispidus* and *A. striatus* by having base of lst dorsal spine behind upper jaw symphysis (vs. protruding anteriorly at upper jaw symphysis for *A. hispidus* and *A. striatus*) (Senou, 2002).

As *A. pictus* has various sizes of round black spots on head, body, and fins, we suggest the new Korean name "Heuk-jum-bak-ssin-beng-i".

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한국산 씬벵이과 어류 1미기록종 *Antennarius pictus*

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요 약 : 씬벵이과(Antennariidae)에 속하는 *Antennarius pictus* 2개체가 제주도 연안에서 처음으로 채집되었다. 이 종은 뒷지느러미 연조가 7개, 가슴지느러미 연조 10개, 등지느러미 연조 12개, 꼬리지느러미 연조 9개를 가지며, 제2등지느러미 가시의 말단은 기부보다 좁고 뒷방향으로 굽어져 있는 특징을 갖는다. 그리고 어류의 머리, 몸통, 지느러미 부위에 다양한 크기의 검은 점들을 가지고 있기 때문에 본종의 신한국명을 "흑점박씬벵이"로 명명하였다.

찾아보기 낱말 : *Antennarius pictus*, 미기록종, 제주도