

First Record of *Hozukius emblemarius* (Scorpaeniformes: Scorpaenidae) from the East Sea, Korea

By Jeong-Ho Park, Byoung-Sun Yoon, Myoung Ho Sohn, Young-Min Choi¹ and Jin-Koo Kim^{2,*}

Fisheries Resources and Environment Division, East Sea Fisheries Research Institute, NFRDI,
Haean-ro 1194, Gangneung, Gangwon-do 210-861, Korea

¹Fisheries Resources and Environment Division, West Sea Fisheries Research Institute, NFRDI,
Seonnyeobawi-ro 14, Jug-gu, Incheon 400-420, Korea

²Department of Marine Biology, Pukyong National University, Yongso-ro 45, Nam-gu, Busan 608-737, Korea

ABSTRACT A single specimen (196.4 mm standard length) of the scorpaenid *Hozukius emblemarius* was collected by a bottom trawl from the coastal waters off Ulsan, East Sea, Southern Korea. The specimen is characterized by a deep oblong body, three spines on the lower margin of the eye, a dorsal fin with 12 spines, a head mostly covered with various sizes of scales, and a truncate posterior margin of the caudal fin. This is the first record of *H. emblemarius* in Korea; we therefore add the species to the Korean fish fauna and propose the new Korean name, "Dong-hae-keun-nun-bol-rak" for this species.

Key words : Scorpaenidae, *Hozukius emblemarius*, new Korean record, Ulsan, East Sea

INTRODUCTION

The subfamily Sebastinae, which is one of the seven subfamilies in the family Scorpaenidae, comprises 7 genera and approximately 133 species. However, definitions and relationships of taxonomic groups in the Scorpaenidae are controversial (Nelson, 2006). Recently, following the work of several previous authors (e.g., Ishida, 1994; Imamura and Yabe, 2002), Nakabo and Kai (2013) redefined the order Scorpaeniformes as the suborder Scorpaenoidei, belonging to the order Perciformes; In addition, they upgraded the subfamily Sebastinae to the family Sebastidae. However, thus far, taxonomic relationships in the Scorpaenidae have followed those proposed by Kim *et al.* (2005), based on studies of Korean faunas.

The genus *Hozukius* Matsubara, 1934, which lives in deep water on rocky or seamounts in the Northwest Pacific, comprises two rare species, *Hozukius emblemarius* (Jordan and Starks, 1904) and *Hozukius guyotensis* Barsukov and Fedorov, 1975. Studies on *Hozukius* have shown that *Sebasticus triacanthus* Fowler, 1938, is a junior synonym of *H. emblemarius* (Ishida and Amaoka, 1986) and that the genus is more closely related to *Sebastes* than to *Sebastiscus* (Kai *et al.*, 2003).

Recently, a single specimen resembling *Sebastes* was collected by bottom trawl (depth, 142 ~ 145 m) from coastal waters off Ulsan, Korea. However, the specimen was identified as a rare occurrence of *H. emblemarius*, on the basis of morphological characters such as large eye size, deep body, the presence of three spines below the eye, and the truncate shape of the caudal fin. Until now, *H. emblemarius* has been considered as endemic to Japan. Therefore, we describe the first record of *H. emblemarius* in Korea, thus expanding its geographic distribution.

The bottom temperature and at the location of the sampling site of the *H. emblemarius* specimen were measured using CTD (SBE 9, Seabird, USA). Counts and measurements follow those of Nakabo (2002a) and Hubbs and Lagler (2004). Each body part was measured to the nearest 0.1 mm using digital Vernier calipers. Pored scales along the lateral line were counted by stereomicroscope. The specimen was deposited at the Fisheries Resources Laboratory, East Sea Fisheries Research Institute (ESFRI), Korea.

Genus *Hozukius* Matsubara, 1934
(New Korean name: Keun-nun-bol-rak-sok)

Hozukius Matsubara, 1934: 199 (type species: *Helicolenus emblemarius* Jordan and Starks, 1904).

*Corresponding author: Jin-Koo Kim Tel: 82-51-629-5927
Fax: 82-51-629-5931, E-mail: taengko@hanmail.net



Fig. 1. *Hozukius emblemarius*, ESFRI 1423, 196.4 mm SL, Ulsan, East Sea, Korea.

Table 1. Comparison of meristic and morphometric characters of *Hozukius emblemarius*

	Present study	Matsubara (1943)	Kanayama (1982)	Ishida and Amaoka* (1986)
Number of specimens	1	6	3	10
Standard length (mm)	196.4	113.2~336.0	223~280	117.2~336.9
In % of Standard length				
Body depth	42.4	—	38.6~41.3	37.3~41.8
Body width	26.8	—	—	—
Head length	41.2	—	41.9~43.1	40.5~43.5
Postorbital length	18.0	—	—	—
Snout length	11.0	—	—	8.1~10.2
Upper jaw length	18.5	—	—	18.8~21.2
Eye diameter	12.5	—	—	13.5~18.3
Suborbital length	3.7	—	—	—
Interorbital width	6.0	—	—	4.9~5.9
Caudal peduncle length	19.6	—	—	—
Caudal peduncle depth	9.3	—	—	—
Predorsal length	38.4	—	—	37.0~41.1
Prepectoral length	39.0	—	—	—
Preanal length	70.4	—	—	—
Prepelvic length	45.6	—	—	—
Preanus length	65.6	—	—	—
Pectoral fin length	29.0	—	24.8~26.9	26.1~30.8
Pelvic fin length	19.5	—	—	21.1~25.2
Dorsal fin length	17.5	—	—	14.3~22.4
Dorsal fin base length	57.0	—	—	—
Anal fin length	21.0	—	—	15.5~21.7
Anal fin base length	16.4	—	—	—
Counts				
Dorsal fin rays	XII, 12	XII, 12	XII, 11~12	XII, 11~13
Anal fin rays	III, 6	III, 6	III, 6	III, 6
Pectoral fin rays	18	18	18~19	17~19
Pelvic fin rays	I, 5	—	I, 5	—
Gill rakers (upper+lower)	23 (8+15)	21~23	24~25	21~25 (6~8+15~17)
Pored scales in lateral line	27	28~30	28~29	27~29

*including type specimens

Deep body; three spines on lower margin of eye; dorsal fin with 12 spines; caudal fin truncate (Nakabo and Kai, 2013).

***Houkius emblemarius* (Jordan & Starks, 1904)**

(New Korean name: Dong-hae-keun-nun-bol-rak)

(Fig. 1; Table 1)

Helicolenus emblemarius Jordan and Starks, 1904: 129, fig. 9 (type locality: Misaki, Japan).

Sebastiscus triacanthus Fowler, 1938: 53, fig. 20 (Japan).

Hozukius emblemarius: Matsubara, 1943: 263, figs. 87, 88 (Japan); Kanayama in Okamura *et al.*, 1982: 271, fig. 188 (southern Japan); Amaoka in Masuda *et al.*, 1984: 313, pl. 279-F (Iwate and southern to Kyushu, Japan); Ishida and Amaoka, 1986: 323, fig. 2 (Japan); Nakabo in Nakabo, 2002b: 586 (key, description, Japan); Kai *et al.*, 2003: 241 (Japan); Shinohara *et al.*, 2011: 42 (Hyogo, Japan); Nakabo and Kai in Nakabo, 2013: 671 (Japan).

Material examined. ESFRI 1423, one specimen, 196.4 mm in standard length (SL), 35° 19.36'N, 129° 44.52'E → 35° 17.07'N, 129° 44.52'E, Ulsan, East Sea, 142 ~ 145 m depth, 9 September 2013, R/V Tamgu-20, bottom trawl, 2.72°C, 34.08 psu, collected by J.H. Park.

Description. D. XII, 12; A. III, 6; P₁. 18; P₂. I, 5; GR. 8+15; Pored scales on lateral line 27. Meristic and morphometric characters are shown in Table 1. Body deep and oblong, tapering posteriorly; many sharp spines on head; three triangle spines on lower margin of eye; eye large and protruding; snout short, posterior margin of upper jaw reaching to below of the middle of eye; small teeth on jaws and vomer; gill slit broad and extending to ventral; every spines at fin strong; notch between spine and rays part at dorsal fin, 4th spine the longest; posterior margin of pectoral fin rounded with upper unbranched rays 2, middle branched rays 7 and lower unbranched rays 9; all rays at dorsal, pelvic and anal fins branched; posterior margin of pectoral fin reaching to the origin of anal fin; posterior margin of pelvic extend to anus; anus located just before origin of anal fin; lateral line curved; posterior margin of caudal fin truncate; whole head covered with various sizes of scales, opercle's scales larger than them cheek's them.

Color of specimen. When fresh, body and fins overall bright red; pupil dark black. After fixation, body uniformly light brown, opercle black, brown dot dorsally, margin of membrane at spine part of dorsal fin black.

Distribution. Ulsan, East Sea, southern Korea at 142 ~ 145 m depth (present study) and Japan at 250 ~ 900 m (Nakabo, 2002; Shinohara *et al.*, 2011; Nakabo, 2013).

Remarks. The present specimen was identified as *Hozukius emblemarius* (Jordan and Starks, 1904) on the basis of a deep body, three spines located below the eye, most of the head covered with scales, 12 dorsal fin spines,

and truncate caudal fin (Nakabo and Kai, 2013). The species is readily distinguished from *H. guyotensis* Barsukov and Fedorov, 1975, by scales on the snout, maxilla, and lower jaw (present in the former vs. absent in the latter) and its geographic distribution (Japan in the former vs. Emperor Seamounts, Northwest Pacific, in the latter). Meristic and morphometric characters of the present specimen agree well with those of previous descriptions of *H. emblemarius* (Table 1).

H. emblemarius is known to occur in relatively deep water on rocky beds, at depth of 250 ~ 900 m; however, our specimen was collected in shallow water, at a depth of approximately 140 m. We herein propose the new Korean name, "Dong-hae-keun-nun-bol-rak" for this species.

ACKNOWLEDGMENTS

This study was funded by a grant from National Fisheries Research and Development Institute (NFRDI) (No: RP-2014-FR-021), Korea.

REFERENCES

- Amaoka, K. 1984. Family Scorpaenidae. In: Masuda, H. *et al.* (eds.), The fishes of the Japanese archipelago. Tokai Univ. Press, Tokyo, pp. 309-318.
- Barsukov, V.V. and V.V. Fedorov. 1975. Species of the genus *Hozukius* (Scorpaenidae, Sebastinae) from the guyots of the Hawaiian Submarine Ridge. *J. Ichthyol.*, 15: 869-876.
- Fowler, H.W. 1938. Descriptions of new fishes obtained by the United States Bureau of Fisheries steamer Albatross, chiefly in Philippine seas and adjacent waters. *Proc. U.S. Natl. Mus.*, 85: 31-135.
- Hubbs, C.L. and K.F. Lagler. 2004. Fishes of the great lakes region, revised ed. Michigan Univ. Press, Ann Arbor, 332pp.
- Imamura, H. and M. Yabe. 2002. Demise of the Scorpaeniformes (Actinopterygii: Percomorpha): an alternative phylogenetic hypothesis. *Bull. Fish. Sci. Hokkaido Univ.*, 53: 107-128.
- Ishida, M. 1994. Phylogeny of the suborder Scorpaenoidei (Pisces: Scorpaeniformes). *Bull. Nansei Natl. Fish. Res. Inst.*, 27: 1-112.
- Ishida, M. and K. Amaoka. 1986. *Sebastiscus triacanthus* Fowler a junior synonym of *Hozukius emblemarius* (Jordan et Starks). *Jap. J. Ichthyol.*, 33: 323-325.
- Jordan, D.S. and E.C. Starks. 1904. A review of the scorpaenoid fishes of Japan. *Proc. U.S. Natl. Mus.*, 27: 91-175, pls. 1-2.

- Kai, Y., K. Nakayama and T. Nakabo. 2003. Molecular phylogenetic perspective on speciation in the genus *Sebastes* (Scorpaenidae) from the Northwest Pacific and the position of *Sebastes* within the subfamily Sebastinae. *Ichthyol. Res.*, 50: 239-244. DOI 10.1007/s10228-003-0163-9.
- Kanayama, T. 1982. Fishes of the Kyushu-Palau Ridge and Tosa Bay. In: Okamura, O., K. Amaoka and F. Mitani (eds.), *The intensive research of unexploited fishery resources on continental slopes*. Japan Fisheries Resource Conservation Association, Tokyo, pp. 270-271, 393.
- Kim, I.S., Y. Choi, C.L. Lee, Y.J. Lee, B.J. Kim and J.H. Kim. 2005. *Illustrated book of Korean fishes*. Kyo-Hak Publishing Co, Seoul, 615pp. (in Korean)
- Matsubara, K. 1934. Studies on the scorpaenoid fishes of Japan. I. Descriptions of one new genus and five new species. *J. Imp. Fish. Inst. Tokyo*, 30: 199-210. (in Japanese)
- Matsubara, K. 1943. Studies on the scorpaenoid fishes of Japan. Anatomy, phylogeny and taxonomy (II). *Trans. Sigenkagaku Kenkyusyo*, 2: 147-486, pls. 1-4. (in Japanese)
- Nakabo, T. 2002a. Introduction of Ichthyology. In: Nakabo, T. (ed.), *Fishes of Japan with pictorial keys to the species*, English ed. Tokai Univ. Press, Tokyo, pp. xxi-xlii.
- Nakabo, T. 2002b. Family Scorpaenidae. In: Nakabo, T. (ed.), *Fishes of Japan with pictorial keys to the species*, English ed. Tokai Univ. Press, Tokyo, pp. 565-595.
- Nakabo, T. and Y. Kai. 2013. Family Sebastidae. In: Nakabo, T. (ed.), *Fishes of Japan with pictorial keys to the species*, 3rd ed. Tokai Univ. Press, Kanagawa, pp. 668-681. (in Japanese)
- Nelson, J.S. 2006. *Fishes of the world*, 4th ed. John Wiley and Sons Inc., Hoboken, New Jersey, 601pp.
- Shinohara, G., A.M. Shirai, M.V. Nazarkin and M. Yabe. 2011. Preliminary list of the deep-sea fishes of the Sea of Japan. *Bull. Natl. Mus. Nat. Sci. (Ser. A)*, 37: 35-62.

한국산 양볼락과(Scorpaenidae) 어류 1 미기록종, *Hozukius emblemarius*

박정호 · 윤병선 · 손명호 · 최영민¹ · 김진구²

국립수산과학원 동해수산연구소, ¹국립수산과학원 서해수산연구소
²부경대학교 자원생물학과

요 약 : 솜뱅이목 양볼락과에 속하는 *Hozukius emblemarius* 1개체(표준체장 196.4 mm)가 울산 연안에서 저층 트롤로 채집되었다. 본 개체는 체고가 높은 난형이고 눈 하단에 3개의 가시가 있으며, 등지느러미 극조가 12개, 두부 대부분이 다양한 크기의 비늘로 덮여 있으며 꼬리지느러미 후단부가 직선형인 것이 특징이다. 우리나라에서 처음 보고되는 본 종의 국명으로 “동해큰눈볼락”을 제안한다.

찾아보기 낱말 : 양볼락과, 큰눈볼락속, 동해큰눈볼락, 미기록종, 울산, 동해