

SHORT REPORT

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First record of *Bathygobius hongkongensis* (Perciformes: Gobiidae) from Jeju Island, Korea

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Abstract

Six specimens of *Bathygobius hongkongensis* were collected for the first time from the eastern coast of Jeju Island, Korea, in September–November 2017. This species is characterized by a pectoral fin with free rays and the division of the first dorsalmost pectoral free ray into three branches; a lower jaw with a mental frenum; and an anterior nostril with a tiny flap. *Bathygobius hongkongensis* is similar to *B. fuscus* but differs in having more dorsalmost free pectoral fin rays. The new Korean name proposed for *B. hongkongensis* is “Nam-bang-mu-nui-mang-duk.”

Keywords: Gobiidae, First record, *Bathygobius hongkongensis*, Jeju Island, Tidal pool

Background

Jeju Island, the largest and most southern island of Korea, is the habitat for many subtropical and temperate marine fishes (Kim 2009), and various fish species have recently been reported for the first time in its coastal waters, including in tidal pools (Jang et al. 2018; Kim et al. 2018; Kwun et al. 2016). Jeju Island is affected by the Kuroshio Warm Current (Kim et al. 2009), so it can be regarded as the boundary area in which tropical and subtropical fishes first appear in Korean waters.

The family Gobiidae, one of the largest fish taxa, contains 189 genera and 1359 species worldwide, and most species are distributed in tropical and subtropical regions (Nelson et al. 2016). Marine Gobiidae species inhabit benthic environments on mud, sand, and rocky substrates, from the coast to the continental slope, including estuaries (Hastings et al. 2014). The genus *Bathygobius* Bleeker 1878 is a representative group of this family, and 28 species are recognized worldwide (Froese and Pauly 2019). This genus is characterized by a chin with a mental frenum and free tips of the upper pectoral fin rays (Akihito et al. 2013; Larson and Murdy 2001). In Korea,

only one species of the genus, *Bathygobius fuscus* (Rüppell 1830) has been reported until now (Kim et al. 2005).

In the present study, six specimens of the genus *Bathygobius* were collected from a tidal pool on Jeju Island, and were identified as *Bathygobius hongkongensis* Lam 1986 based on morphology. This species is previously unrecorded in Korean waters, so it is reported for the first time and its morphology described.

Methods

Six specimens of *B. hongkongensis* were collected with a hand net from a tidal pool on the eastern coast of Jeju Island between September and November 2017 (Fig. 1), and were fixed as whole bodies in 99% ethanol. All counts and measurements were made according to Hubbs et al. (2004), and measurements were made to the nearest 0.1 mm with a digital Vernier caliper. The fin rays were counted under a stereomicroscope (SZX16, Olympus, Japan), and the vertebrae were counted from a radiograph (VIX-100, Softex, Japan). The specimens have been deposited at the National Marine Biodiversity Institute of Korea, Marine Fish Diversity (MFD).

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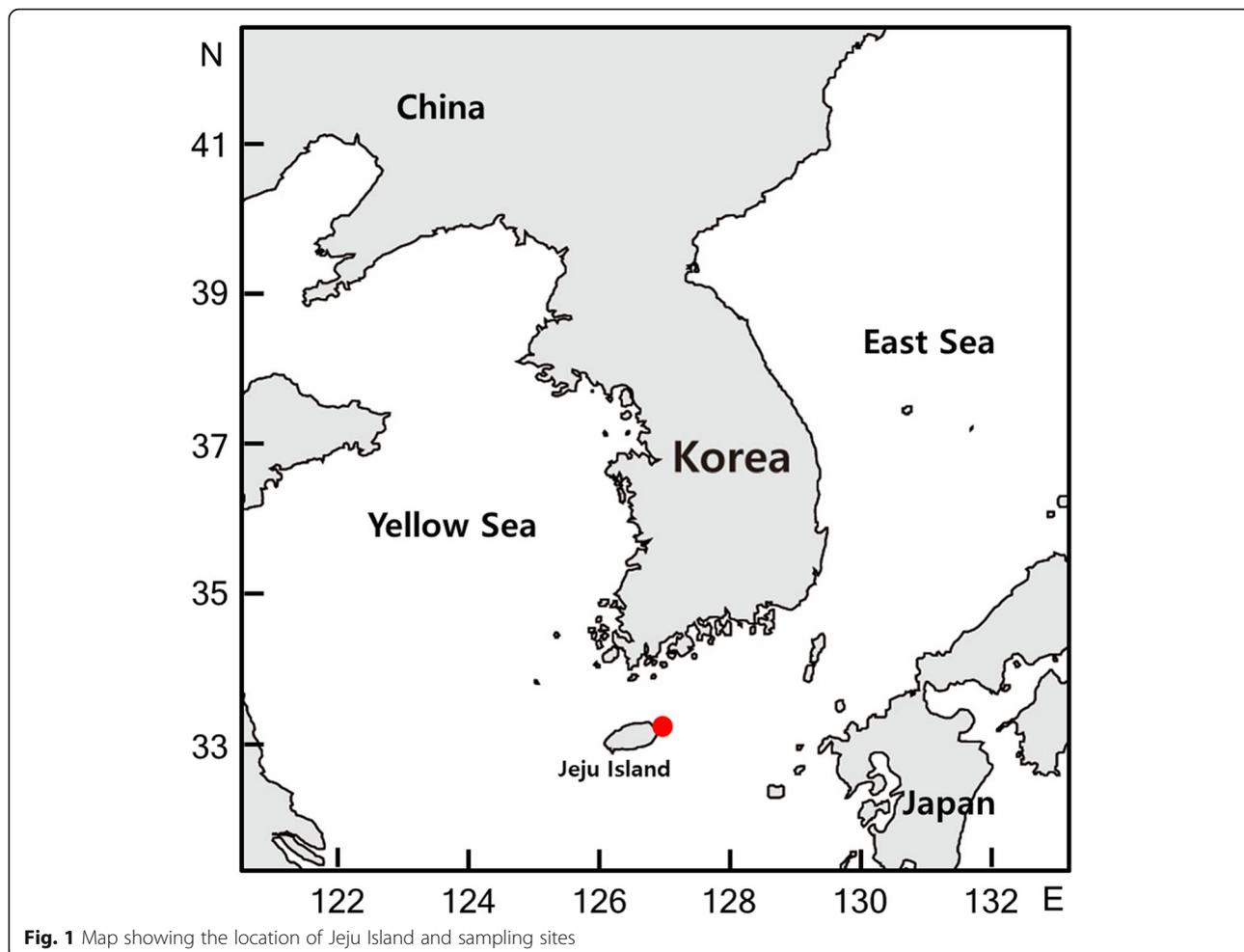


Fig. 1 Map showing the location of Jeju Island and sampling sites

Results

***Bathygobius hongkongensis* Lam 1986**

(New Korean name: Nam-bang-mu-nui-mang-duk) (Fig. 2)

Bathygobius hongkongensis Lam 1986: 76. TL: Chung Hum Kok, Hong Kong; Motomura et al. 2010: 206; Shen and Wu 2011: 674; Prokofiev 2016: 644.

Examined material

MFD-1192–1193, 2 specimens, 24.2–31.5 mm standard length (SL), Seongsan-ri (33° 27' 36.03" N, 126° 56' 06.66" E), Seongsan-eup, Seogwipo, Jeju Island, hand net, 7 Sep. 2017; MFD-1231–1232, 2 specimens, 28.3–34.8 mm SL, Seongsan-ri (33° 27' 36.03" N, 126° 56' 06.66" E), Seongsan-eup, Seogwipo, Jeju Island, hand net, 12 Oct. 2017; MFD-1234–1235, 2 specimens, 34.1–34.8 mm SL, Seongsan-ri (33° 27' 36.03" N, 126° 56' 06.66" E), Seongsan-eup, Seogwipo, Jeju Island, hand net, 14 Nov. 2017.

Description

The counts are listed in Table 1. Proportions as % SL: head length 28.9–31.9; body depth 19.7–22.7; snout

length 7.0–8.7; postorbital length 14.4–16.9; caudal peduncle depth 11.7–14.5; predorsal length 34.0–37.8; prepectoral length 29.8–33.3; preanal length 58.0–65.3. Proportions as % head length (HL): interorbital width 7.7–11.9; eye diameter 22.0–26.2; upper jaw length 17.1–25.2; pectoral fin length 64.9–97.0.

Body moderate and tapering posteriorly. Head slightly blunt and depressed. Anterior nostril with small flap.

Table 1 Comparison of meristic characters of *Bathygobius hongkongensis*

	<i>Bathygobius hongkongensis</i>		
	Present study	Lam (1986)	Akihito et al. (2013)
Number of specimens	6	18	-
Standard length (mm)	24.2–34.8	25.6–45.9	-
Counts			
Dorsal fin	VI-I, 9	VI-I, 9	VI-I, 9–10
Anal fin	I, 8	I, 8	I, 7–8
Pectoral fin	20–21	19–21	-
Vertebrae	27	26	-



Fig. 2 *Bathygobius hongkongensis*. **a** Lateral view, MFD-1192, 31.5 mm SL. **b** Dorsal view, MFD-1234, 34.8 mm SL

Snout short, mouth terminal, and both lips thick. Upper and lower jaws with irregular rows of small conical teeth. Posterior tip of maxilla not reaching anterior margin of eye. Posterior margin of mental frenum slightly straight. Two dorsal fins separated. Origin of anal fin located behind origin of second dorsal fin. Upper rays of pectoral fin free from membrane (Fig. 3) and first dorsalmost free ray divided into three branches. Pelvic disk circular. Caudal fin rounded. Body covered in scales from predorsal and preanal regions to caudal base. Head without scales. Well-developed sensory canal system on head.

Coloration

When fresh, head and body speckled darkish brown dorsally and whitish ventrally. Wide blackish brown blotch, like a band, on the body below the first dorsal fin (Fig. 2b). Small dark spot on upper pectoral fin base. All fins semi-transparent and pale brown, and dorsal, caudal, and pectoral fins with several small brown spots.

Distribution

Bathygobius hongkongensis is distributed in parts of the western Pacific region, including around Hong Kong, Vietnam, Taiwan, and Japan (Akihito et al. 2013; Froese and Pauly 2019; Lam 1986; Prokofiev 2016; Shen and Wu 2011). The present specimens were found in an intertidal rockpool on the eastern coast of Jeju Island.

Discussion and conclusion

The present specimens can be assigned to the genus *Bathygobius* based on the following characters: the

presence of a small flap at the tip anterior nostril, the tip of upper pectoral fin is free from the fin membrane and the lower jaw has a mental frenum (Akihito et al. 2013; Larson and Murdy 2001). The specimens were identified as *B. hongkongensis* because they correspond to the original description of that species (Lam 1986): first free upper pectoral fin separated into three branches, the posterior margin of the mental frenum is straight, and the cheek and operculum have no scales. When *B. hongkongensis* is compared with the closely related species *B. fuscus*, the former differs from the latter in having more dorsalmost free pectoral fin rays (9–22 in *B. hongkongensis* vs. 5–7 in *B. fuscus*), total length (TL) > 25 mm, and a small flap on the anterior nostril (present vs. absent, respectively) (Lam 1986; Akihito et al. 2013).

Bathygobius hongkongensis inhabits rocky shores in tropical and subtropical regions such as Hong Kong,



Fig. 3 Free rays on the dorsalmost pectoral fins, MFD-1231, 34.8 mm SL

Thailand, Taiwan, and Japan (Froese and Pauly 2019), and adult specimens have now been found in the southern region of Korea. This represents an extension of the *B. hongkongensis* range northward into the western Pacific. The new Korean name, “Nam-bang-mu-nui-mang-duk” is proposed for *B. hongkongensis*.

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Author's contributions

Author collects a specimen and writes the manuscript. The author(s) read and approved the final manuscript.

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