

# A New Record of a Spot-fin Porcupinefish, *Diodon hystrix* (Diodontidae, Pisces) off Jeju Island, Korea

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## Abstract

A single specimen belonging to the family Diodontidae was collected from Seo-gwi-po, Jeju Island, Korea in July 2013 and was identified as *Diodon hystrix* Linnaeus, 1758, a species new to the Korean fish fauna. The species is characterized by 14 dorsal fin rays, 14 anal fin rays, spines on the dorsal and ventral surfaces of the caudal peduncle, and many small black spots on all fins except the anal fin. The most similar species, *Diodon holocanthus*, is well distinguished from *D. hystrix* by the absence of black spots on the dorsal and caudal fins, and the lack of a spine on the dorsal surface of the caudal peduncle. Accordingly, we describe herein the morphological traits of *D. hystrix* and suggest its new Korean name, “Jan-jeom-bak-i-ga-si-bok”.

**Key words:** New record, *Diodon hystrix*, Diodontidae, Jeju Island

## Introduction

The family Diodontidae belonging to the order Tetraodontiformes, comprises 19 species in six genera worldwide (Nelson, 2006). Seven species in three genera are known from Japan (Aizawa and Doiuchi, 2013), but only two species in two genera *Diodon holocanthus* (Linnaeus, 1758) and *Chilomycterus reticulatus* (Linnaeus, 1758), have been recorded from Korea (Kim et al., 2005; NIBR, 2011). Diodontidae are characterized by many well-developed spines on the head and body, but not the fins, and pelagic young, but benthic adults (Leis, 1991; Nelson, 2006; Froese and Pauly, 2014). The only study of Diodontidae is that of Leis (1978), who studied the systematics and zoogeography of the genus *Diodon*. In recent years, some species of the family have been included in molecular phylogenetic studies of tetraodontiform fishes (Holcroft, 2005; Yamanoue et al., 2007). During a survey of the fish fauna of Jeju Island, we collected a single specimen belonging to the family Diodontidae. Through morphology-based identification, we confirmed that our specimen, *Diodon hystrix*, is new to the

Korean fish fauna. We herein present morphological traits of the species, and suggest its new Korean name.

## Materials and Methods

A single specimen in the family Diodontidae was caught by seine net south of Seo-gwi-po fishing port, Jeju Island, in July 2013 (Fig. 1). Morphological counts were made and measurements were taken using Vernier calipers and recorded to the nearest 0.1 mm, according to the methods of Hubbs and Lagler (2004). Identification followed Leis (1978, 1991) and Aizawa and Doiuchi (2013). The specimen was registered and preserved at Pukyong National University (PKU), Korea.

**Comparative materials examined.** *Diodon holocanthus*, PKU50115, 1 specimen, 122.0 mm in standard length (SL), Samcheok, Gangwon-do, Korea, 7 Jan 2014.

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Fig. 1. Sampling area of *Diodon hystrix*.

## Results and Discussion

### *Diodon hystrix* Linnaeus, 1758 (Table 1; Fig. 2A)

(new Korean name: Jan-jeom-bak-i-ga-si-bok)

*Diodon hystrix* Linnaeus 1758: 335 (type locality: India); Masuda et al. 1984: 366, Tokyo; Robins & Ray, 1986: 309, Boston; Aguilera Venezuela, 1998: 54, Venezuela; Myers, 1999: 291, Micronesia; Thomson, 2000: 280, the Gulf of California; Schmitter et al. 2000: 171, Mexico; Allen & Adrim, 2003: 65, Indonesia; Randall, 2007: 499, Hawaii; Aizawa & Doiuchi, 2013: 1744, Japan.

### Description

D. 14; A. 14; P. 21. Meristic characters are shown in Table 1.

Measurements as percentage of standard length (SL): head length 41.7; dorsal fin length 19.8; pectoral fin length 16.8; anal fin length 20.1; pre-dorsal fin length 77.2; pre-pectoral fin length 43.9; pre-anal fin length 78.3; pre-anus length 75.1; body depth 37.3; body width 42.4; caudal peduncle length 20.0; caudal peduncle depth 9.6. Measurements as percentage of head length (HL): eye diameter 18.8; snout length 41.2.

Body relatively short, moderately oval, inflatable. Body and head covered with long, sharp, moving spines; most body

spines 2-rooted and erectile; length of spines on forehead 1-1.5 times the eye diameter, longer than spines on dorsal and ventral areas of body. Lateral line inconspicuous. Eye very large and round. Snout short, interorbital width long. Mouth small, upper jaw longer than lower jaw. Upper and lower jaw teeth united in each jaw without a median suture. Posterior tip of lips not reaching to anterior margin of eye. Nasal organ located in front of eye; a short tube with two openings. Gill opening very small, a vertical slit immediately before pectoral fin base. Dorsal and anal fins in posterior region of body, symmetric, lacking fin spines, vertical, slightly rounded. Pectoral fins truncate, not reaching anterior base of dorsal fin. Pelvic fins absent; caudal fin slightly rounded. Dorsal and ventral surfaces of caudal peduncle with one and two small spines, respectively (Fig. 3).

### Coloration

Body and head dark brown dorsally, but white ventrally; body with many black or dark brown spots dorso-laterally, diameter smaller than that of eye; all fins except anal fin with many small black spots.

### Distribution

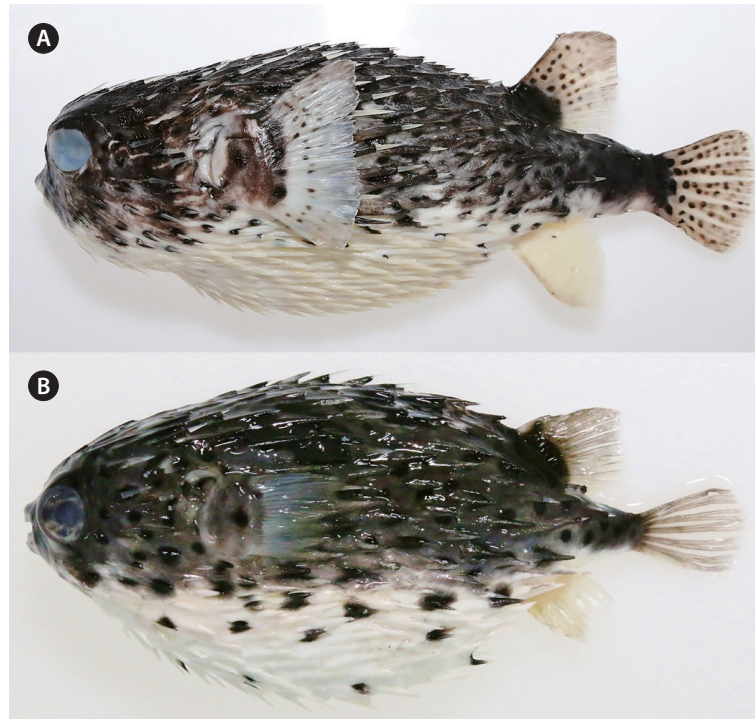
This species is distributed off Jeju Island, Korea (present study), and also in tropical to temperate waters of the Pacific, Atlantic, and Indian Oceans. The species is found near reef areas in water depths of 2-100 m (Leis, 1991; Froese and Pauly, 2014).

### Remarks

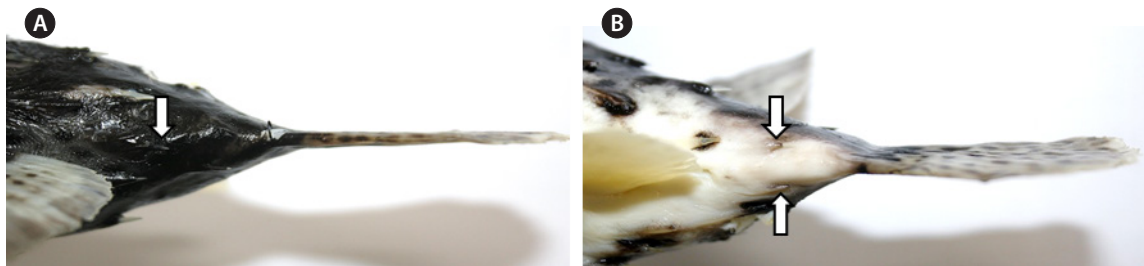
The family Diodontidae is similar to the family Tetraodontidae, but differs in having sharp spines on the surface of the head and body but not the fins, and strong teeth fused into a single beak-like plate in each jaw without a median suture (Leis, 1991; Nelson, 2006). Diodontidae contains six genera, of which the genus *Diodon* is clearly distinguishable from the other genera in having all spines erectile, while species of *Chilomycterus* and *Cyclichthys* have fixed erect spines (Leis, 1991). The length of the spines on the head and body is also

Table 1. Comparison of meristic characters for *Diodon hystrix* among authors

	Present study	Linnaeus (1758)	Leis (1991)	Aizawa and Doiuchi (2013)
Number of specimens	1	1	-	-
Standard length (mm)	199.0	-	-	-
Dorsal fin rays	14	14	14-17	14-17
Anal fin rays	14	14	14-16	14-16
Pectoral fin rays	21	22	21-25	21-25
Caudal fin rays	9	9	-	-



**Fig. 2.** (A) *Diodon hystrix*, PKU 9325, 199.0 mm SL, Seogwipo, Jeju Island, Korea; (B) *Diodon holocanthus*, PKU 50115, 122.0 mm SL, Samcheok, Gangwon-do, Korea.



**Fig. 3.** Dorsal (A) and ventral surface (B) of caudal peduncle for *Diodon hystrix*. Arrows indicate small spines.

regarded as a useful taxonomic character. For example, in species of *Diodon*, the spines are longer than the eye diameter, while the opposite is true for the genera *Chilomycterus* and *Cyclichthys* (Leis, 1991). In *D. hystrix*, the length of the spines on the forehead is 1-1.5 times the eye diameter, and forehead spines are longer than those on the dorsal and ventral areas of the body. *Diodon hystrix* is most similar to the congeneric species *D. holocanthus*, but differs from the latter in having small spines on the dorsal surface of its caudal peduncle, and many black spots on the dorsal and caudal fins (Leis, 1991). Consistent with the features of *D. hystrix*, our specimen has one and two spines on the caudal peduncle's dorsal (Fig. 3A) and ventral surface (Fig. 3B), respectively, and many black spots on the dorsal and caudal fins (Fig. 2A), which are not

found in *D. holocanthus* (Fig. 2B). Meristic characters of our specimen correspond well with those in the original (Linnaeus, 1758) and more recent (Leis, 1991; Aizawa and Doiuchi, 2013) descriptions of *D. hystrix* (Table 1). Therefore, we propose the new Korean name “Jan-jeom-bak-i-ga-si-bok” for this species.

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