

New Record of the Roundbelly Cowfish, *Lactoria diaphana* (Ostraciidae, Tetraodontiformes) from Korea

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ABSTRACT This is the first report of *Lactoria diaphana* (Tetraodontiformes: Ostraciidae) from Korea. A single specimen (208.0 mm standard length) was collected off the coast of Jeju Island by gill net on 14 November, 2011. This species is characterized by having a pair of strong spines in front of the eyes, a slightly curved spine on the dorsal ridge, a pair of strong and short spines on the ventro-lateral ridge and various-sized spots on the body. We add *L. diaphana* to the Korean fish fauna and propose a new Korean name, "So-ppul-bok" for the species.

Key words: *Lactoria diaphana*, Ostraciidae, new record, Jeju Island, Korea

INTRODUCTION

The boxfishes (Family Ostraciidae) has been reported 14 genera with about 33 species worldwide (Nelson, 2006) and two genera with four species in Korea (Kim *et al.*, 2005; Kim *et al.*, 2008). It is characterized having body encased in a bony carapace, no pelvic skeleton, no spine in dorsal and anal fins, no isolated bony plates on caudal peduncle and usually 18 vertebra (Matsuura, 2001; Nelson, 2006).

The genus *Lactoria* Jordan and Fowler, 1902, belonging to family Ostraciidae, is characterized by having a short sharp spine projecting anteriorly from the eyes and a sharp, stout spine projecting posteriorly from rear end of ventro-lateral ridge (Matsuura, 2001). Four species in genus *Lactoria* have been reported worldwide (Froese and Pauly, 2016), of which two species, *L. cornuta* (Linnaeus, 1758) and *L. fornasini* (Bianconi, 1846) have been reported from Korean waters (Kim *et al.*, 2008).

A single specimen belonging to genus *Lactoria*, which was previously unknown from Korea, was collected in the coastal waters of Jeju Island by gill net on 14 November, 2011. The specimen was identified as *Lactoria*

diaphana (Bloch and Schneider, 1801) on the basis of morphological characters such as the presence and shape of spines in front of the eyes, and at the ventro-lateral and dorsal ridges as well. Here, we describe the morphological characters of *L. diaphana* and added the species to the list of Korean fish fauna.

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

Lactoria diaphana (Bloch and Schneider, 1801)

(New Korean name: So-ppul-bok)

(Fig. 1; Table 1)

Ostracion diaphanus (Bloch and Schneider, 1801: 501 (No locality stated, East Indies/Indonesia; holotype).

Lactoria diaphana: Eschmeyer and Herald, 1983: 296 (North America); Smith, 1986: 892 (East Africa); Allen and Swainston 1988: 154 (Australia); Paulin *et al.* 1989: 283 (New Zealand); Randall and Lim 2000: 648 (South China Sea); Hayashi in Nakabo, 2002: 1415 (Japan); Allen and Adrim 2003: 65 (Indonesia); Myers and Donaldson, 2003: 650 (Micronesia); Heemstra and Heemstra, 2004: 447 (southern Africa); Mundy, 2005: 530 (Hawaii).

Lactoria schlemmeri Jordand and Snyder, 1904: 945

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Fig. 1. *Lactoria diaphana* (Bloch and Schneider), JNU-0433, 208.0 mm SL, gill net, Seongsan-eup, Seogwipo-si, Jeju-do, Korea.

Table 1. Morphological characters compared between present specimen and previous studies on *L. diaphana*

Morphological characters	Present study	Leis and Moyer (1985)	Okamura <i>et al.</i> (1995)
Standard length (mm)	208.0	12.5~13.0	186.0
Number of specimens	1	2	1
Counts			
Dorsal fin rays	9	9	9
Pectoral fin rays	10	11	10
Anal fin rays	9	9	9
Caudal fin rays	10	10	—

(Hawaii).

Material examined. JNU-0433, single specimen, 208.0 mm in standard length (SL), Seongsang-eup, Jejudo Island, Korea, with gill net, 14 November 2011, collected by Joon Sang Kim.

Description. Counts for the present specimen are shown in Table 1.

Meristic counts appear in Table 1. Measurements as a percentage against SL are as follows: body depth 34.8; head length 19.7; upper body width 21.4; lower body width 40.4; snout length 9.2; interorbital width 17.2; eye diameter 9.9; predorsal fin length 59.6; prepectoral fin length 21.6; preanal fin length 79.5; dorsal fin base length 8.0; pectoral fin base length 5.5; anal fin base length 6.6; length of longest dorsal fin ray 15.0; length of longest pectoral fin ray 15.2; caudal peduncle length 16.4; caudal peduncle depth 8.7; caudal peduncle depth 6.3; spine length in front of eyes 4.5; spine length on ventro-lateral ridge 2.7; spine length on the dorsal center 2.1.

Body encased in carapace without caudal peduncle, carapace closed behind dorsal and anal fins; dorsal snout

profile steep, concave; ventral surface broadly rounded; a small spine on middle part of dorsal ridge; a pair of spines projecting from eyes; a posteriorly directed spine on each side of lower rear edge of the carapace just before caudal peduncle; mouth small, not protractile; teeth in both jaws uniserial, bluntly pointed; gill opening small, vertical to oblique in front of pectoral fin base; lower body width more extensive than upper body width; dorsal and anal fins rounded; no pelvic fins; caudal fin slightly rounded.

Live coloration. Body yellowish brown with numerous spots; pectoral, dorsal and anal fins yellow; caudal fin yellow with several spots; ventral part white; spines in front of eyes brown with white posterior margin; the end of spine on back and ventro-lateral ridge white.

Color in preservation. Body pale brown; all fins brown but caudal fin dark brown with several spots; ventral part white; spines in front eyes brown; spine on back and ventro-lateral ridge brown.

Distribution. Widely known from Indo-western Pacific Ocean: east Africa (Smith and Heemstra, 1986) to Indonesia (Allen and Adrim, 2003), north Australia (Matsuu-

ra, 2001), the South China Sea (Randall and Lim, 2000), southern Japan (Hayashi, 2002) eastward to the Micronesia (Myers and Donaldson, 2003), Hawaii (Mundy, 2005) and Korea (Jejudo Island, present study).

Remarks. The present specimen collected from the coastal waters of Korea, belongs to genus *Lactoria* based on a pair of spines projecting anteriorly from the eyes and a sharp, stout spines projecting posteriorly from rear end of ventro-lateral ridge (Matsuura, 2001). The morphology of the specimen also match the diagnostic characters of *L. diaphana* by having a dorsal ridge low, a slightly curved spine in the middle of dorsal ridge, no blue lines on the body and fin counts (Okamura *et al.*, 1995; Hayashi, 2002; Table 1) although several taxonomically important counting or measuring characters were not examined in the original paper (Bloch and Schneider, 1801).

L. diaphana morphologically resembles the two species of Korean boxfishes, *L. fornasini* and *L. cornuta*. However, *L. diaphana* is distinguished from the *L. fornasini* by having several spots (vs. wavy blue lines on the body in *L. fornasini*), dorsal ridge low (vs. high) and middle of dorsal ridge with slightly curved spine (vs. strongly) (Hayashi, 2002). Also, it can be distinguishable from *L. cornuta* by having supraorbital spine short (vs. long in *L. cornuta*), spine on the middle of dorsal ridge acute (vs. obtuse), spine on ventro-lateral ridge short (vs. long) and caudal fin not long (vs. long) (Hayashi, 2002). We propose a Korean name, “So-ppul-bok” for *L. diaphana*. To avoid possible confusion with regards to the Korean name of *L. diaphana*, we use the name that was previously suggested by Kim and Ryu (2016).

ACKNOWLEDGMENTS

This work was funded by a grant from the National Institute of Fisheries Sciences (R2016034).

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한국산 거북복과(Ostraciidae) 어류 1미기록종, *Lactoria diaphana*

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요 약 : 복어목, 거북복과에 속하는 *Lactoria diaphana* (표준체장 208.0 mm) 1개체가 2011년 11월 14일에 제주
도 성산읍 연안에서 채집되었다. 이 종은 눈의 앞부분에 전방으로 1쌍의 가시가 돌출되었으며, 등의 용기부 중앙에
는 약간 휘어진 가시가 있고, 꼬리지느러미 아래쪽의 배쪽 용기선으로부터 후방으로 1쌍의 가시를 가지며 몸통에
는 검은 반점들이 분포하고 있다. 이 미기록종의 한국명을 “소빨복”으로 명명하였다.

찾아보기 낱말 : 거북복과, 소빨복, 미기록종, 제주도