

First Record of the Two-spot Wrasse, *Oxycheilinus bimaculatus* (Perciformes: Labridae) from the Southern Coastal Waters of Jeju Island, Korea

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ABSTRACT Based on three specimens (50.6~67.7 mm SL) collected from the southern coastal waters of Jeju Island, *Oxycheilinus bimaculatus* was described as the first record from Korea. They were characterized by having two small dark spots behind eye on head and body posterodorsally, a rhomboid caudal fin with elongated central rays and produced uppermost ray as a filament in terminal male, six predorsal scales, and two scale rows on cheek. We proposed a new Korean name, “Du-jeom-gin-ju-dung-i-nol-rae-gi”, for the species referring to having two dark spots on head and body.

Key words: *Oxycheilinus bimaculatus*, new Korean record, description, Jeju Island

INTRODUCTION

During an underwater survey on excavation of new coastal fishes from Korea with SCUBA gear, we observed by chance an oblong reddish wrasse in a depth of 17 m of the southern coastal waters of Jeju Island in the late November 2015. The wrasse, being small less than 10 cm in length, was actively swimming among rocks and/or seaweeds near sandy or rocky bottoms. Thereafter, totally six individuals were seen around the first discovery point by the early December 2015 and three specimens (one initial female and two terminal males) were collected using a barrier net. Due to having reddish body color and shape as well as distinguished caudal fin rays showing in larger specimens, they were readily identified as a member of the genus *Oxycheilinus* Gill, 1862 which occurs widely in the Indo-Pacific (Westneat, 1993).

The labrid genus *Oxycheilinus* is characterized by having a moderate shallow body, a lower jaw slightly protruding than upper one, and a horizontal stripe and/or black spot at

the anterior of dorsal fin (Westneat, 2001). According to the recent studies (Westneat, 1993; Randall *et al.*, 2003; Parenti and Randall, 2011, 2018), ten valid species have been recognized worldwide as follows: *O. arenatus* (Valenciennes), *O. bimaculatus* (Valenciennes), *O. celebiensis* (Bleeker), *O. digramma* (Lacepède), *O. lineatus* Randall, Westneat and Gomon, *O. mentalis* (Rüppell), *O. nigromarginatus* Randall, Westneat and Gomon, *O. orientalis* Günther, *O. samurai* Fukui, Muto and Motomura, and *O. unifasciatus* (Streets). Of them more than six species have reported from the northwestern Pacific including China, Taiwan, and Japan (Shin and Wu, 2012; Shimada, 2013; Chen and Zhang, 2015). However, no *Oxycheilinus* species had been known from Korea to date, although 20 labrid fishes belong to 14 genera have been recognized (Kim *et al.*, 2009, 2011; Kim, 2010). We, therefore, describe *O. bimaculatus* as the first record from the Korean waters on the basis of three specimens collected from the southern coastal waters of Jeju Island in this study.

Counts and measurements follow those of Randall *et al.* (2003) and the specimens examined are deposited in the fish collection in the National Institute of Biological Resources (NIBR-P), Korea as voucher.

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Fig. 1. Fresh two specimens (above, NIBR-P0000040105, 67.7 mm SL, terminal phase; below, NIBR-P0000040106, 50.6 mm SL, initial phase) of *Oxycheilinus bimaculatus*, collected from the southern coastal waters of Jeju Island, Korea.

TAXONOMIC ACCOUNTS

Genus *Oxycheilinus* Gill, 1862

(New Korean name: Gin-ju-dung-i-nol-rae-gi-sog)

Oxycheilinus Gill, 1862: 143 (type species: *Cheilinus arena-tus* Valenciennes in Cuvier and Valenciennes, 1840, type by original designation).

Body oblong, head and eyes moderate. Dorsal fin continuous, with nine spines (rarely 10). Cheek with large scales. Dorsal and anal fins angulated at end. Supramaxilla normal (After Gill, 1862).

Oxycheilinus bimaculatus (Valenciennes, 1840)

(New Korean name: Du-jeom-gin-ju-dung-i-nol-rae-gi)

(Fig. 1, Table 1)

Cheilinus bimaculatus Valenciennes in Cuvier and Valenciennes, 1840: 96 (type locality: Ambon Island, Molucca Islands, Indonesia); Jordan and Evermann, 1905: 320 (Hawaiian Islands); Fowler and Bean, 1928: 344 (East Indies, Melanesia, Hawaii); Chen and Zhang, 2015: 1503 (South China Sea).

Oxycheilinus bimaculatus; Westneat, 1993: 379 (phylogeny); Westneat, 2001: 3396 (key, western Central Pacific); Kudo and Yamada, 2005: 80 (Miura Peninsula, Japan); Shin and Wu, 2012: 578 (Taiwan); Shimada in

Nakabo, 2013: 1132 (southern Japan); Chen and Zhang, 2015: 1503 (China).

Material examined. *Oxycheilinus bimaculatus*, NIBR-P0000040105, 67.7 mm in standard length (SL), NIBR-P0000040106, 50.6 mm SL, 24 November, 2015, NIBR-P0000040107, 59.8 mm SL, 7 December, 2015, Bomok-dong, Seogwipo-si, Jeju-do, Korea, 17 m depth, collected by B. J. Kim and S. K. Kim with SCUBA gear and a barrier net (1 × 3 m, mesh size 8 mm).

Diagnosis. A small *Oxycheilinus* species having two small dark spots behind eye on head and above pectoral fin posterodorsally, a rhomboid caudal fin with elongated central rays and a produced uppermost ray as a filament in terminal male, six predorsal scales, and two scale rows on cheek.

Description. Dorsal fin rays IX, 10; anal fin rays III, 8; pectoral fin rays 11~12 (mainly 12), uppermost ray short and unbranched; pelvic fin rays I, 5; principal caudal fin rays 15; gill rakers 5~7 + 7~8 = 12~15, one at angle included in lower arm; pseudobranchiae absent; predorsal scales 6; lateral line scales 13~14 + 1 + 8~9; scales above lateral line 2; scales below lateral line 6. Proportion of percentage in SL: body depth 33.3~35.3 (mean 34.4); body width 14.5~15.0 (14.7); head length 37.7~39.5 (38.8); orbital diameter 7.4~7.9 (7.6); interorbital width 9.6~10.2 (9.8); snout length 13.1~14.9 (14.0); snout to origin of dorsal fin

38.7~40.3 (39.8); snout to origin of pectoral fin 35.9~38.1 (37.1); snout to origin of pelvic fin 38.7~41.3 (40.2); snout to origin of anal fin 59.7~64.2 (62.6); base of dorsal fin 52.9~56.5 (54.5); length of first dorsal spine 6.9~10.7 (8.7); length of ninth dorsal spine 14.8~19.1 (16.5); length of longest dorsal soft ray (fifth ray), 15.8~20.2 (17.7); length of first anal spine 7.9~14.0 (11.2); length of second anal spine 11.1~15.4 (13.4); length of third anal spine 13.6~16.7 (15.3); length of longest anal soft ray (four or fifth rays) 17.0~28.8 (22.9); caudal fin length 29.4~55.5 (45.4); length of pectoral fin 16.1~18.2 (17.1); length of pelvic spine 11.3~16.2 (13.0); length of pelvic fin 18.4~20.2 (19.6).

Body oblong and compressed with rather deep caudal peduncle. Head moderate and compressed. Snout bluntly pointed; mouth terminal and rather large; lower jaw slightly longer than upper jaw, its posterior tip not reaching a vertical at anterior margin of eye; small conical teeth on each jaw in a single row with a pair of strong canine anteriorly; vomer and palatines without teeth; anterior nostril short, tubular and posterior nostril simple pore. Eye moderate and interorbital space rather broad and slightly convex. Both gill membranes fused each other and free from isthmus. Dorsal fin single and continuous without notch, its posterior margin angulated, all soft rays branched. Pectoral fin short, broad and round, all rays branched, except uppermost short ray, its posterior margin reaching a vertical at fifth dorsal spine. Pelvic fin moderate and rather pointed. Anal fin similar to soft dorsal fin; posterior tip pointed in terminal male. Caudal fin rhomboid with elongated central rays as well as elongated uppermost ray as a short filament in terminal male; round in initial female.

Head and body nearly fully scaled with cycloid, except snout, ventral and posterior margins of preopercle and antero-ventral portion of head. Cheek and operculum with 2 rows of scales. Basal scales on dorsal and anal fins elevated. Lateral line interrupted, with anterior segment ending below posterior dorsal fin, and posterior segment beginning one or two scale rows below anterior segment. Small axillary scale present in terminal male.

Color when fresh. In terminal male: Head vivid blue anteriorly, pale olive postero-dorsally and pinkish postero-ventrally, with narrow irregular reddish orange lines radiating from greenish olive eye. Body yellowish green generally with a black spot below fifth or sixth dorsal rays; dark reddish irregular lines and several black spots on midbody. Dorsal fin olive green anteriorly and reddish posteriorly with transparent reticulations; a dark blue spot in first dorsal fin membrane and its dorsal margin dark red. Pectoral fin

pale pinkish with a blight yellow spot on its base. Pelvic fin pale grayish with reddish lines or dots. Anal fin reddish with grayish or yellowish dots scattered irregularly; dark small dots scattered distally. Caudal fin reddish with yellowish dots scattered irregularly and small greyish dots on distal margin of lower lobe; elongated central rays greenish yellow.

In initial female: Head and body reddish brown with a irregular rather broad dark stripe from opercle to caudal base. Snout pale greenish. Dorsal fin reddish with many small dark spots scattered with a prominent dark spot on first and second dorsal fin rays anteriorly, rather pale posteriorly. Pectoral fin transparent. Pelvic fin with small red dots. Anal fin pale yellowish with irregular reddish marks and small red dots distally making round markings. Caudal fin pale pinkish with scattered reddish small dots.

Color after preservation. In terminal male: Head and body yellowish brown. A dark brown blotch immediately behind eye and a similar one below lateral line just behind pectoral fin posterior-dorsally. Spinous portion and anterior portion of soft-rayed portion of dorsal fin dark with white distal margin and posterior portion of soft-rayed portion without dark spots. Pectoral fin without any dark spots. Pectoral fin with dusky anteriorly. Anal fin with small dark dots distally. Caudal fin with a dusky blotch on its base, small dark spots scattered distally, and median filamentous rays dark.

In initial female: Head and body yellowish brown with two broad dusky bands; along base of dorsal fin and from posterior end of operculum to caudal fin base, lower one broader than upper one. A dusky blotch in anterior portion, two or three rows of dusky spot posteriorly in dorsal fin. Pectoral fin without any dark spots. Pelvic fin slightly dusky. Anal fin with three or four rows of small dusky dots. Caudal fin with four rows of dark spots.

Distribution. Known widely from the Indo-Pacific, i.e., East Africa and Red Sea east to the Hawaiian and Marquesan islands, north to southern Japan and Korea, and south to Vanuatu and southern Australia (Myers, 1999; Westneat, 2001; Liu *et al.*, 2010; Shimada in Nakabo, 2013; Chen and Zhang, 2015; this study). In Korea, from the southern coastal waters of Jeju Island only at present (this study).

Remarks. The present specimens collected from the southern coastal waters of Jeju Island, Korea were readily assigned to the genus *Oxycheilinus* Gill by having a continuous dorsal fin with nine spines, two scales rows on cheek and opercle, normal supramaxilla, and dorsal and anal fins angulated at their ends. In addition, its generic allocation was also supported by several morphological characteris-

Table 1. Comparison of meristic characters of *Oxycheilinus bimaculatus*

	Present study	Jordan and Evermann (1905)	Fowler and Bean (1928)	Shimada (2013)
	Korea	Hawaiian islands	Philippine seas	Japan
Standard length (mm)	50.6~67.7 (n=3)	ca. 127 (n=1)	32~125 (n=31)	–
Dorsal fin rays	IX, 10	IX, 10~11	IX, 10	IX, 10
Anal fin rays	III, 8	III, 8~9	III, 8	III, 8
Pectoral fin rays	11~12	–	–	12
Gill rakers	12~15	–	10	–
Predorsal scales	6	–	6~7	–
Lateral line (LL) scales	22~24	30	19~24	23~24
Scales above LL	2	–	2	–
Scales below LL	6	–	5~6	–

tics including interrupted lateral line, anal fin with three spinous and eight soft rays, six median predorsal scales, and non-protrusible lower jaw.

From the Northwest Pacific, six *Oxycheilinus* species (i.e., *bimaculatus*, *celebicus*, *digramma*, *orientalis*, *oxyrhychus*, *unifascitus*) have been recognized to date. Of them, the present specimens were well agreed to the original description of *O. bimaculatus* Valenciennes (Valenciennes, 1840) in having two blackish spots both behind eye and on lateral body above pectoral fin, blackish margin of anal fin and elongated rays like filament on uppermost and median caudal fin rays in adult male. In addition, the general body color in terminal male of the Korean specimens was well accordance with those of the previous reports from the various localities from Hawaii to Japan and Taiwan (Jordan and Evermann, 1905; Fowler and Bean, 1928; Kudo and Yamada, 2005; Shin and Wu, 2012). Most meristic characters the present Korean specimens were well accordance with those of the previous studies (Table 1), with some exceptions, i.e., gill rakers (Fowler and Bean, 1928) and lateral line scales (Jordan and Evermann, 1905). However, it is likely to come from the difference in examination method or individual variation, although it is impossible to confirm due to no specification. We, therefore, identified finally the Korean specimens as *Oxycheilinus bimaculatus*.

O. bimaculatus is easily discriminated from its five congeners distributed in the Northwest Pacific by following diagnostics: a rhomboid caudal fin with elongated rays like filament on uppermost and median rays and two dark spots on head and lateral body in spirit (Westneat, 2001).

We proposed new Korean names, “Gin-ju-dung-i-nol-regi-sog” and “Du-jeom-gin-ju-dung-i-nol-rae-gi” for *Oxycheilinus* and *O. bimaculatus*, respectively. They were refer-

red to a elongated snout and the presence of two blackish spots both on behind eye and on lateral body after preservation, respectively.

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제주도 남부 연안해역에서 채집된 농어목 놀래기과 한국 첫기록종, *Oxycheilinus bimaculatus*

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요 약 : 우리나라 연안성 어류자원 미발굴 분류군 탐색을 위해 제주도 남부 연안해역에서 SCUBA를 이용한 수중조사 중 2015년 11~12월에 수심 약 17 m 부근에서 놀래기과 한국미기록종인 *Oxycheilinus bimaculatus* 3개체 (표준체장 50.6~67.7 mm)를 채집하였다. 본 종은 체형이 길쭉한 계란형으로 체고가 다소 낮아 두장보다 작은 점, 아래턱이 위턱보다 약간 긴 점, 눈의 후단과 가슴지느러미 후상방에 2개의 소형 흑색 반점이 있는 점, 성숙한 수컷의 꼬리지느러미 상부와 중앙의 기조가 실처럼 신장하는 점, 등지느러미 극조부 전반부가 검고, 등지느러미와 뒷지느러미 가장자리에 작은 흑색 반점이 산재하는 특징에서 동속 타종과 쉽게 구별된다. 본 종의 신한국명으로 체측에 2개의 흑색 반점이 있는 점에서 ‘두점긴주둥이놀래기’를 제안한다.

찾아보기 낱말 : 두점긴주둥이놀래기, 놀래기과, 한국첫기록종, 기재, 제주도