

# First Reliable Record of an Eleotrid Fish, *Eleotris oxycephala* (Perciformes: Eleotridae) from the Lower Reach of Jwagwang Stream Near Busan, Korea

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**ABSTRACT** *Eleotris oxycephala* was described in detail as the first reliable record from Korea based on a single specimen (62.1 mm SL) collected from the lower reach of Jwagwang stream near Busan, Korea. The specimen is easily distinguished from three congeners occurring in the northern West Pacific by having separation between two rows of sensory papillae on opercle and the fourth row of the papillae on cheek not extending beyond the 11th longitudinal sensory-papillae.

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**Key words :** *Eleotris oxycephala*, description, Jwagwang stream, cephalic sensory papillae

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## INTRODUCTION

From the Korean waters, two eleotrid fishes, *Eleotris oxycephala* Temminck and Schlegel, 1845 and *Perccottus glenii* Dybowski, 1877, have been recognized to date (Kim *et al.*, 2005; Kim, 2011). It has been known that the former species was recorded from Jeju Island and Suwon since Mori (1952) firstly reported in his checklist of the Korean fishes and the latter was known to inhabit in the Tumen and Seongcheon rivers, North Korea (Mori, 1952; Chyung, 1977; Kim, 1997; Kim *et al.*, 1986; Kim *et al.*, 2005). During a survey on ichthyofauna of the Korean Peninsula conducted by junior authors, a single goby-like specimen was accidentally collected from the lower reach of Jwagwang stream near Busan, Korea in 2006 and identified as a member of the genus *Eleotris* Bloch and Schneider, 1801 by having separated dorsal and pelvic fins as well as the number of fin rays (Jang *et al.*, 2007), although their identification of this *Eleotris* specimen did not reach to the species level afterward.

In the present study this goby-like specimen from the Jwagwang stream was identified as *E. oxycephala* on the basis of the pattern of sensory papillae on head region as

well as general morphology. We, therefore, describe *E. oxycephala* as the first reliable record from Korea based on a single specimen collected from the Korean waters to date. Counts and measurements follow generally those of Hubbs and Lagler (1964). Notations of cephalic sensory papillae are those of Akihito *et al.* (2002). Vertical fins and vertebrae were counted by radiographs. The specimen is deposited in the fish collection of the National Institute of Biological Resources (NIBR-P), Korea as voucher.

### *Eleotris oxycephala* Temminck and Schlegel, 1845

(Korean name: Gu-gul-mu-chi)

(Figs. 1~2; Table 1)

*Eleotris oxycephala* Temminck and Schlegel, 1845: 150 (type locality: Japan); Chyung, 1977: 470 (Jeju Island, Seoho, Korea, in part); Kim *et al.*, 1986: 393 (Jeju Island, Korea); Kim, 1997: 422 (Jeju Island, Korea); Kim *et al.*, 2005: 419 (Jeju Island, Korea).

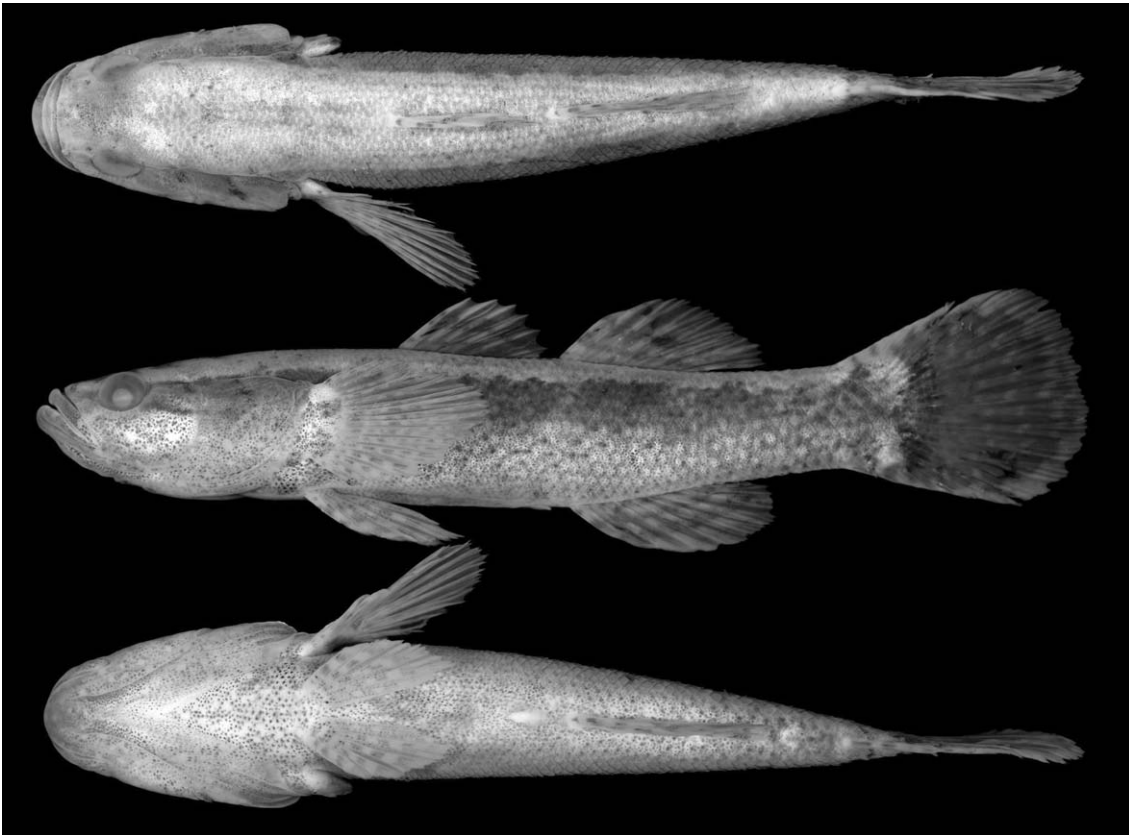
*Eleogris pisonis oxycephala*: Mori, 1952: 140 (Quelpart Island, Korea).

*Eleotris* sp.: Jang *et al.*, 2007: 343 (Jwagwang stream, Gijang, Korea).

**Material examined.** NIBR-P23462, 62.1 mm in standard length (SL), female, Jwagwang stream, Jwacheon-ri, Jangan-eup, Gijang-gun, Busan-si, Korea, January

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**Fig. 1.** Dorsal (top), lateral (middle) and ventral (bottom) aspects of *Eleotris oxycephala*, NIBR-P23462, 62.1 mm SL, collected from the lower reach of Jwagwang stream near Busan, Korea. Right pectoral fin was removed for genetic works.

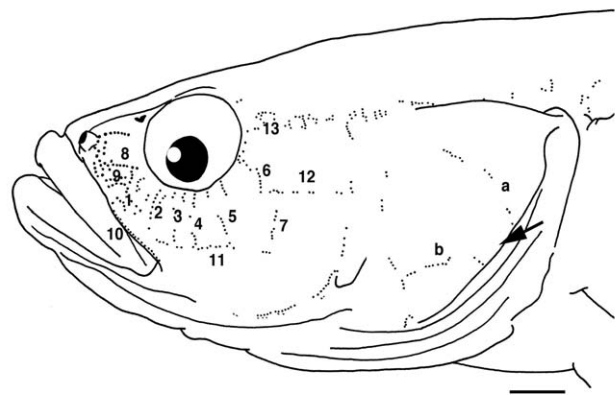
2006, collected by M.H. Jang and J.D. Yoon, kick net.

**Diagnosis.** An eleotrid species with having separation of two rows of sensory papillae on opercle and not extending the fourth row of sensory papillae beyond the longitudinal sensory-papillae row 11 (*sensu* Akihito, 1967).

**Description.** Dorsal fin rays VI-I, 8; anal fin rays I, 8; pectoral fin rays 17; pelvic fin rays, I, 5; principal caudal fin rays 16; gill rakers 4+10; vertebrae 25; scales in longitudinal row 49; scales in transverse row 21.

Proportion of percentage in SL: body depth at origin of pectoral fin 17.7; body width 17.4; head length 32.2; head width 19.6; head depth at center of interorbital region 13.0; eye diameter 5.8; interorbital width 5.6; snout length 7.4; length between nostrils 2.3; upper jaw length 11.4; postorbital length 19.5; snout to origin of first dorsal fin 41.5; snout to origin of second dorsal fin 60.1; snout to origin of pectoral fin 32.9; snout to origin of pelvic fin 31.2; snout to origin of anal fin 61.8; base of first dorsal fin 16.9; base of second dorsal fin 15.0; base of anal fin 14.2; length of pectoral fin 23.2; length of pelvic fin 19.2; length of caudal fin 22.9; depth of caudal peduncle 12.1; length of caudal peduncle 25.0.

Body elongate, cylindrical anteriorly and slightly compressed posteriorly with rather deep caudal peduncle.



**Fig. 2.** Sensory papillae on lateral head region in *Eleotris oxycephala*, NIBR-P23462. Numerals as Akihito (1967) and arrow shows the character state of the opercular sensory-papillae rows between row 'a' and row 'b'. Bar=2 mm.

Head moderate and somewhat depressed anteriorly. Mouth oblique, lower jaw slightly longer than upper jaw, its posterior tip reaching a vertical at anterior margin of eye; small conical teeth on upper and lower jaws, in three to four and five to six irregular rows, respectively; vomer

**Table 1.** Comparison of major meristic characters of *Eleotris oxycephala*

	Present study	Temminck and Schlegel (1854)	Akihito (1967)
Standard length (mm)	62.1 (n=1)	101.6~190.5 (n=2)	54.0~227.0 (n=78)
Dorsal fin rays	VI-I, 8	VI-9*	VI-I, 8
Anal fin rays	I, 8	9*	I, 8
Pectoral fin rays	17	17	16~18
Gill rakers	14	—	11~13 <sup>10</sup>
Scales in longitudinal row	49	—	41~53 <sup>10</sup>
Scales in transverse row below 2nd dorsal fin	13	—	11~14
Predorsal scales	49	—	37~50
Sensory-papillae row			
on opercle (a and b rows as in Fig. 1)	Disconnected	Not mentioned	Disconnected
on cheek (4th and 11th rows as in Fig. 1)	Inter-crossed	Not mentioned	Inter-crossed
Two blackish bars posterior to eye	Present	Present	Present

\*, spine and soft ray not differentiated. Superscription means the number of specimens examined.

and palatines without teeth. Anterior nostril tubular and posterior nostril simple pore. Eye rather large and interorbital space somewhat convex. Preopercle with a blunt spine directed downward. Upper end of gill opening situated over origin of pectoral fin and gill membranes fused to isthmus. Dorsal fin two and separated each other; second dorsal fin slightly higher than first dorsal fin and of nearly equal height as anal fin. Fin rays of first dorsal fin not elongated and third to fourth spines longest; all soft rays of second dorsal fin branched. Pectoral fin rather large, all rays branched, its posterior margin nearly reaching a vertical at last dorsal spine of first dorsal fin when depressed. Pelvic fin separated. Caudal fin round.

Head and body with ctenoid scales, except for snout region including upper and lower jaws as well as lower part of head. Cephalic sensory canal absent. Upper and lower papillae rows on opercle not connected each other at posterior opercular margin; fourth transverse row of sensory papillae not extending beyond longitudinal sensory-papillae row 11 (*sensu* Akihito, 1967).

**Color after preservation.** Head dusky laterally with small whitish dots at lower part and two dark brownish thin bands on postorbital region, upper band longer than lower one and its upper margin nearly connected to lateral brown color of body and also dusky ventrally with small whitish dots scattered irregularly. One fourth of lateral body pale brownish and remaining part dark brown and pale ventrally. First dorsal fin with two dark bands; broadly pale brownish on dorsal aspect from tip of mouth to base of caudal fin. Second dorsal and anal fins with three dark bands, distal ones pale. Pectoral fin transparent with small dark dots along each ray and two rough round blotches on base. Pelvic fin with four dark bands, proximal one pale. Caudal fin dark broadly with whitish margin and caudal base rather pale.

**Distribution.** Known from Viet Nam, Taiwan, China, Hongkong, Japan (Akihito, 1967; Akihito *et al.*, 2002), and in also Korea (Jang *et al.*, 2007; present study). In

Korea, the species has been reported only from Jeju Island (Mori, 1952) and Jwagwang stream near Busan (present study).

**Remarks.** In the genus *Eleotris*, about 30 species have been recognized as valid worldwide and the following four species of them have been reported from the northern West Pacific: *E. fusca* (Forster in Bloch and Schneider, 1801), *E. melanosoma* Bleeker, 1853, *E. acanthopoma* Bleeker, 1853, and *E. oxycephala* Temminck and Schlegel, 1854. According to both Akihito (1967) and Akihito *et al.* (2002), the above four *Eleotris* species were divided into two groups by the row pattern of cephalic sensory papillae on opercle, *i.e.*, two rows of sensory papillae in the latter two species are separated each other at the posterior margin of opercle (Fig. 2, arrow), whereas those in former two species are connected. The specimen examined in this study has separation between two rows of sensory papillae on opercle and the fourth row of sensory papillae on cheek also does not extending beyond the 11th longitudinal sensory-papillae row (Fig. 2) in accordance with *E. oxycephala* noted as Akihito (1967). The general morphology including meristic and morphometric characters of the present specimen agrees well with the original description of *E. oxycephala* (Table 1).

Chyung (1977) reported that *E. oxycephala* was distributed at also Seodun stream, flowing into Seoho (Lake), Suwon, middle Korea as well as from Jeju Island with reference of Mori (1952). He briefly described the species providing a color photograph (Color Pl. 99: 3) and also selected 'Gu-gul-mu-chi' as a standard Korean name for the species among several vernacular names to avoid taxonomical confusion between *E. oxycephala* and a cyprinid species, *Gobiobotia macrocephala* Mori which was named as 'Gu-gu-ri' or 'Gu-gul-mu-chi' in Suwon, Korea. However the occurrence of the species in the Seodun stream and its adjacent waters at present is doubtful due to not only the absence of any specimen record but also not any additional reports of the species to date (Kim *et al.*, 1986).

The specimen used in Chyung (1977)'s description does not exist any more at present and his figure of *E. oxycephala* was not of an actual specimen but of an illustration by Abe (1958, not listed in the references of Chyung, 1977). The present specimen collected from Jwagwang stream, Korea is therefore the first reliable and only specimen from Korea to date since Mori (1952)'s first record from Jeju Island. As mentioned by Kim *et al.* (1986), occurrence of *E. pisonis oxycephala* (= *E. oxycephala*) in the Seodun Stream, Suwon, Korea by Chyung (1977) may be erroneous identification of *Odontobutis interrupta* Iwata and Jeon or *O. platycephala* Iwata and Jeon (Odontobutidae) resulted from the morphological similarities (for example, general body appearance, separated pelvic fins, and so on). Although Choi (1969) reported *E. pisonis oxycephala* from three stations in the Chuncheon Reservoir, middle Korea, Choi (2005) reported *Odontobutis oxycephala* at the same reservoir without *E. oxycephala*.

#### ACKNOWLEDGMENTS

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## 경남 기장군 좌광천에서 채집된 구굴무치 *Eleotris oxycephala*의 기재

김병직 · 장민호<sup>1</sup> · 윤주덕<sup>2</sup> · 송호복<sup>3</sup>

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**간추림** : 2006년 부산시 기장군 일광읍 좌광천 하류역에서 채집된 구굴무치 *Eleotris oxycephala* 1개체 (표준체장 62.1 mm)를 근거로 국내에서 표본에 근거한 구굴무치의 최초 기록으로서 보고한다. 본 종은 새개부 상하 공기열이 새개부 후단에서 서로 만나지 않는 점, 협부 4번째 공기열이 11번째 공기열을 넘지 않는 점 등에서 북부 서태평양에 출현하는 3종의 동속 유사종과 쉽게 구별된다.

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**찾아보기 낱말** : *Eleotris oxycephala*, 기재, 좌광천, 두부 공기열