

# New Record of the Spinecheek Gudgeon, *Eleotris acanthopoma* (Perciformes: Eleotridae) from Jeju Island, Korea

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**ABSTRACT** Based on four specimens (50.9~69.0 mm SL) collected from a small stream of southern coast of Jeju Island, *Eleotris acanthopoma* was described as the second *Eleotris* species as well as the first record from Korea. They were characterized by having two dorsal fins, well-separated pelvic fins, separation of two rows of sensory papillae on opercle and extending the fourth row of sensory papillae beyond the 13th longitudinal sensory-papillae row on cheek. We proposed a new Korean name, “Geom-eun-gu-gul-mu-chi”, for the species.

**Key words :** *Eleotris acanthopoma*, new Korean record, description, Jeju Island

## INTRODUCTION

Four fish specimens belong to the genus *Eleotris* Bloch and Schneider, 1801 were collected at the lower part of a small stream located in the southern part of Jeju Island, Korea in 2013, identified as *E. oxycephala* Temminck and Schlegel, 1845 tentatively, and deposited in the fish collection of the National Institute of Biological Resources (NIBR), Korea. The senior author subsequently re-examined these specimens in detail and revealed that they were not *E. oxycephala* but *E. acanthopoma* Bleeker, 1853 based on the difference in the arrangement pattern of the cephalic sensory papillae (=free neuromast organ). Although it has been known from brackish estuaries and lower reaches of freshwater streams of the Western Pacific widely (Maeda *et al.*, 2011), *E. acanthopoma* was not reported from the Korean waters up to date. More recently the only *Eleotris* species known to be in the Korean waters, *E. oxycephala* Temminck and Schlegel, was redescribed on the basis of a single specimen collected from the lower reach of Jwagwang stream near Busan, Korea (Kim *et al.*, 2014).

We describe, therefore, *E. acanthopoma* as the first record as well as the second species of the genus *Eleotris* from Korea. Counts and measurements are those of Hubbs and Lagler (1964) with some exceptions. Both scale counts and the relation between the pterygiophores of the dorsal fins and vertebrae (P-V), and notations of cephalic sensory canals and papillae follow those of Akihito (1984) and Akihito (1967), respectively. Vertical fins, P-V, and vertebrae were examined by radiographs. Superscripts in the description mean the number of specimens used in counts and measurements.

***Eleotris acanthopoma* Bleeker, 1853**  
(New Korean name: Geom-eun-gu-gul-mu-chi)  
(Figs. 1~2; Table 1).

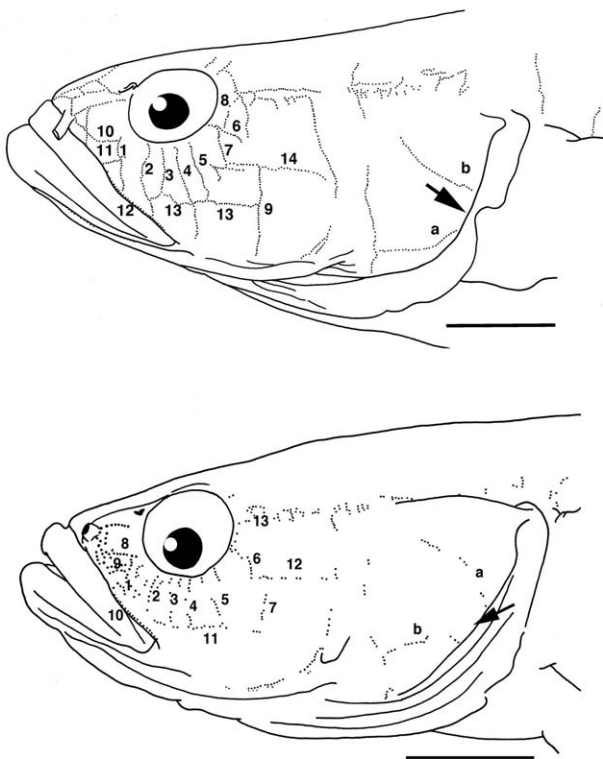
*Eleotris acanthopoma* Bleeker, 1853: 275 (type locality: Western Sumatra, Indonesia); Akihito, 1967: 152 (Japan); Maeda *et al.*, 2011: 257 (French Polynesia); Iwatsubo and Motomura, 2013: 55 (Kagoshima Prefecture, Japan).

**Materials examined.** Four specimens: NIBR-P28901, 69.0 mm in standard length (SL), NIBR-P28902, 55.8 mm SL, NIBR-P28903, 53.2 mm SL, NIBR-P28904, 50.9 mm SL, Taehueng-ri, Namwon-eup, Seogwipo-si,

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**Fig. 1.** Two species of *Eleotris* collected from Korea. A, *Eleotris acanthopoma*, NIBR-P28901, 69.0 mm SL, male, Jeju Island, Korea; B, *Eleotris oxycephala*, NIBR-P23462, 62.1 mm SL, female, near Busan, Korea.



**Fig. 2.** Sensory papillae on lateral head region in *Eleotris acanthopoma* (above, NIBR-P28901) and *E. oxycephala* (below, NIBR-P23462). Numerals as Akihito (1967) and arrows show the character state (not connected) of the opercular sensory-papillae rows between row 'a' and row 'b'. Bar=5 mm.

Jeju-do, Korea, 29 October 2013, collected by Seung-Ho Cho and Dong-Won Kang.

**Diagnosis.** An eleotrid species with having separation of two rows of sensory papillae on opercle and extending the fourth row of sensory papillae beyond the longitudinal sensory-papillae row 13 (*sensu* Akihito, 1967)

**Description.** Dorsal fin rays VI-I, 8; anal fin rays I, 8; pectoral fin rays 15~16 (mainly 16), upper- and lowermost rays unbranched; pelvic fin rays, I, 5; principal caudal fin rays 15; gill rakers 8~10, only prominent counted; vertebrae 25<sup>2</sup>; P-V 3/I II II I/8<sup>2</sup>; scales in longitudinal row 52~55; scales in transverse row 13~15. Proportion of percentage in SL: body depth at origin of pectoral fin 18.0~24.6 (mean 20.8); body width 17.7~19.4 (18.3); head length 31.6~34.3 (33.0); head width 19.4~20.9 (20.2); eye diameter 6.2~6.7 (6.4); interorbital width 8.8~10.3 (9.6); snout length 7.7~10.0 (8.4); upper jaw length 11.4~14.8 (12.6); postorbital length 18.7~21.0 (20.1); snout to origin of first dorsal fin 40.5~43.9 (42.2); snout to origin of second dorsal fin 60.1~62.9 (61.2); snout to origin of pectoral fin 31.8~35.1 (33.4); snout to origin of pelvic fin 31.0~34.3 (32.4); snout to origin of anal fin 59.5~63.2 (61.3); base of first dorsal fin 16.1~17.2 (16.5); base of second dorsal fin 16.2~18.3 (17.0); base of anal fin 14.1~16.1 (15.1); length of pectoral fin 17.0~26.9 (23.9); length of pelvic fin 16.4~19.6 (18.0); length of caudal fin 24.6~16.7 (25.7)<sup>3</sup>; depth of caudal peduncle 12.8~14.1 (13.4); length of caudal peduncle 24.9~25.9 (25.4).

**Table 1.** Comparison of major meristic and morphometric characters of *Eleotris acanthopoma*

	Present study	Bleeker (1853)	Akihito (1967)	Maeda <i>et al.</i> (2011)	Iwatsubo and Motomura (2013)
Standard length (mm)	50.9 ~ 69.0 (n=4)	89.0* (n=1)	54.0 ~ 227.0 (n=78)	33.3 ~ 45.7 (n=4)	32.0 ~ 81.4 (n=7)
Dorsal fin rays	VI-I, 8	VI-I, 8	VI-I, 8	VI-I, 8	VI-I, 8
Anal fin rays	I, 8	I, 9	I, 8	I, 8	I, 8
Pectoral fin rays	15 ~ 16	16	16 ~ 18	16	16 ~ 17
Gill rakers	8 ~ 10	—	8 ~ 10 <sup>10</sup>	—	—
Vertebrae	25	—	—	25	—
Scales in longitudinal row	52 ~ 55	52	48 ~ 56 <sup>72</sup>	50 ~ 54	—
Scales in transverse row below 2nd dorsal fin	13 ~ 15	13*	12 ~ 15 <sup>72</sup>	13 ~ 15	—
Sensory-papillae row					
on opercle (a and b rows as in Fig. 1)	Disconnected	Disconnected*	Disconnected	Disconnected	Disconnected
on cheek (4th and 13th rows as in Fig. 1)	Inter-crossed	Inter-crossed*	Inter-crossed	Inter-crossed	Inter-crossed
In % of standard length					
Body depth at pectoral fin base	18.0 ~ 24.6	—	—	18.6 ~ 20.8	20.8 ~ 22.5
Head length	31.6 ~ 34.3	—	—	34.5 ~ 39.1	31.2 ~ 33.8
Snout length	7.7 ~ 10.0	—	—	8.1 ~ 11.0	7.6 ~ 8.9
Eye diameter	6.2 ~ 6.7	—	—	7.2 ~ 8.0	5.9 ~ 6.8
Postorbital length	18.7 ~ 21.0	—	—	19.8 ~ 21.8	—
Upper jaw length	11.4 ~ 14.8	—	—	11.7 ~ 13.8	11.6 ~ 14.4
Length of caudal peduncle	24.9 ~ 25.9	—	—	25.2 ~ 27.6	21.0 ~ 25.8
Depth of caudal peduncle	12.8 ~ 14.1	—	—	12.9 ~ 13.5	12.1 ~ 13.5
Snout to origin of first dorsal fin	40.5 ~ 43.9	—	—	41.9 ~ 43.8	—
Snout to origin of second dorsal fin	60.1 ~ 62.9	—	—	59.5 ~ 62.5	—
Snout to origin of anal fin	59.5 ~ 63.2	—	—	53.5 ~ 60.0	—
Base of first dorsal fin	16.1 ~ 17.2	—	—	15.5 ~ 17.1	15.2 ~ 18.6
Base of second dorsal fin	16.2 ~ 18.3	—	—	14.5 ~ 16.4	15.2 ~ 17.3
Base of anal fin	14.1 ~ 16.1	—	—	14.6 ~ 15.5	13.1 ~ 15.8
Length of pectoral fin	17.0 ~ 26.9	—	—	24.9 ~ 27.0	—
Length of pelvic fin	16.4 ~ 19.6	—	—	18.6 ~ 22.1	—

\*from Akihito (1967). Superscription means the number of specimens examined.

Body elongate, cylindrical anteriorly and slightly compressed posteriorly with rather deep caudal peduncle. Head moderate and somewhat depressed. Mouth oblique, lower jaw slightly longer than upper jaw, its posterior tip reaching a vertical at center of pupil; small conical teeth on upper and lower jaws, in three to four and five to six irregular rows, respectively; vomer and palatines without teeth; anterior nostril tubular and posterior nostril simple pore. Eye rather large and interorbital space somewhat convex. 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 aligned vertically. Pelvic fin fully separated. Caudal fin round.

Lateral side of body with ctenoid. Predorsal region, most part of cheek, opercles, most of abdominal region, and bases of pectoral and caudal fins with cycloid. Dorsal and ventral sides of head including snout region, and gill membrane naked. Cephalic sensory canal absent.

Upper and lower papillae rows on opercle not connected each other at posterior margin of opercle; fourth transverse row of sensory papillae extending beyond longitudinal sensory-papillae row 13 (*sensu* Akihito, 1967).

**Color after preservation.** Head and body uniformly dark. Dorsal tips of anterior three to four spines and their membranes of first dorsal fin without any dark spots. Dorsal and anal fins darkish with densely scattered minute black dots, become paler distally. In smaller specimens, two rather broad horizontal bars on first dorsal and three to five blackish dotted lines on second dorsal and anal fins.

**Distribution.** Known from the Western Pacific widely: Japan, Taiwan, Hong Kong, Ogasawara Islands, Mariana Islands, Cebu, western Sumatra, Lombok, northeastern Australia, Solomon Island, New Caledonia, Moorea (Maeda *et al.*, 2011), and Korea (Jeju Island, present study).

**Ecological notes.** *E. acanthopoma* was found near stones in the shallow-water area (ca. 0.3 ~ 0.5 m in water depth at ebb tide) of the lower reach of a small stream, southern coast of Jeju Island, Korea, with *Tridentiger obscurus* which occurs dominantly.

**Remarks.** The specimens collected from the southern stream of Jeju Island, Korea in this study were easily identified as a member of the genus *Eleotris* Schneider in having well-separated two dorsal fins and pelvic fins without formation of sucking disc (Akihito, 1967; Miller, 1998). Out of four species occurring from the northern West Pacific, these specimens showed well accordance with *E. acanthopoma* Bleeker, 1853 as following characteristics: two rows of sensory papillae are separated each other at the posterior margin of opercle, the fourth row of sensory papillae on cheek extending beyond the 13th longitudinal sensory-papillae row (*sensu* Akihito, 1967) as shown in Fig. 2. Additionally, they were also have no lateral line, having six spines of the first dorsal fin, no serration on interorbital region, having a blunt preopercular spine embedded beneath skin, no free pectoral rays, no whitish spots on ventral side of head when alive, as mentioned by Maeda *et al.* (2011). Both the Korean and Japanese specimens of *E. acanthopoma* have a smaller head and eyes than those from French Polynesia, however, they were shown well-accordance between them in other characters (Table 1). Although further examination is needed, the size difference seems to be come from geographical variation of the species.

*Eleotris acanthopoma* is similar to *E. oxycephala* in having separation of two rows of sensory papillae on opercle, however the former is easily differentiated from the latter by having the fourth row of sensory papillae extending beyond the 13th longitudinal sensory-papillae row (*sensu* Akihito, 1967) (*vs.* not extending the 11th longitudinal row for *E. oxycephala*) as shown in Fig. 2. We proposed a new Korean name, “Geom-eun-gu-gulmu-chi” for *E. acanthopoma* referring to its blackish body color.

**Comparative materials.** *Eleotris oxycephala*: NIBR-P23462, 62.1 mm SL, Jwagwang stream, Jwacheon-ri, Jangan-eup, Gijang-gun, Busan-si, Korea, January 2006, collected by M.H. Jang and J.D. Yoon

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## 제주도 남부 연안역에서 채집된 농어목 구굴무치과 한국미기록종, *Eleotris acanthopoma*

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**요 약** : 2013년 제주도 남부 연안으로 유입되는 소하천에서 구굴무치과(Eleotridae) 구굴무치속(*Eleotris*)에 속하는 어류 4개체(표준체장 50.9~69.0 mm)를 채집하였다. 이들은 등지느러미가 2개이며 배지느러미가 서로 유합하지 않고 분리되어 있는 점, 새개부 상하 공기열이 새개부 후단에서 서로 만나지 않는 점, 협부 4번째 공기열이 13번째 공기열을 지나 하방으로 신장하는 점 등에서 *E. acanthopoma*로 동정되었다. 본 종은 이러한 특징에서 북부 서태평양 해역에 분포하는 구굴무치를 포함한 같은 속의 유사종과 쉽게 구별되며, 신한국명으로는 체색이 대체로 흑색인 점에서 ‘검은구굴무치’를 제안한다.

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**찾아보기 낱말** : 검은구굴무치, 구굴무치과, 한국미기록종, 기재, 제주도