

# First Records of Two Ophidiid Fishes, *Glyptophidium argenteum* and *G. lucidum*, from Japan (Actinopterygii, Teleostei, Ophidiiformes)

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**Abstract** Two specimens of *Glyptophidium argenteum* Alcock, 1889 and *G. lucidum* Smith and Radcliffe in Radcliffe, 1913, collected from Suruga Bay, Japan, were recently found in the collection of the National Museum of Nature and Science, Tokyo. The specimens represent the first records from Japan and the northernmost records of the two species. Descriptions and photographs of the Japanese specimens are provided.

**Key words:** Actinopterygii, Ophidiiformes, Ophidiidae, *Glyptophidium argenteum*, *Glyptophidium lucidum*, first record, Japan.

## Introduction

The deep-water fishes of the genus *Glyptophidium* Alcock, 1889 are distributed in the Indo-West Pacific from East Africa to Hawaii (Nielsen *et al.*, 1999). Nielsen and Machida (1988) reviewed the genus and recognized 7 species: *G. argenteum* Alcock, 1889; *G. macropus* Alcock, 1894; *G. lucidum* Smith and Radcliffe in Radcliffe, 1913; *G. oceanium* Smith and Radcliffe in Radcliffe, 1913; *G. japonicum* Kamohara, 1936; *G. longipes* Norman, 1939 and *G. effulgens* Nielsen and Machida, 1988. They classified these species into two species-groups, the *argenteum* and *macropus* species-groups. The *argenteum* species-group comprises *G. argenteum*, *G. lucidum* and *G. effulgens*, and the *macropus* species-group is composed of *G. macropus*, *G. oceanium*, *G. japonicum* and *G. longipes*. The *macropus* species-group is characterized by having 2 pelvic-fin rays (vs. 1 in the *argenteum* species-group), 2 median basi-branchial tooth patches (1), and 12–13 precaudal vertebrae (11) (see Nielsen and Machida, 1988 for detail). In Japan, only 2 species of *Glyptophidium*, *G. japonicum* and *G. oceanium* have been reported (Nielsen and Machida, 1988;

Nakabo, 2002).

Specimens of *G. argenteum* and *G. lucidum* collected from Suruga Bay, Japan, were recently found in the fish collection of the National Museum of Nature and Science, Tokyo. These specimens represent the first records from Japanese waters and the northernmost records of these species. In this paper, the two specimens are described below.

## Materials and Methods

Counts and measurements follow Hubbs and Lagler (1958). Morphometric characters are expressed in percentage of head and preanal length, owing to the lack of a complete tail in many specimens. Although most specimens examined in this study have an incomplete tail, total length (except for regenerated caudal-fin rays) was shown as standard length, because that measure was used in the review of the genus (Nielsen and Machida, 1988). It was difficult for us to clearly distinguish the undeveloped gill rakers on the anterior arch because the gill rakers on the anterior arch gradually decrease anteriorly in length (see figures of Nielsen and Machida, 1988), the lower small (i.e., undeveloped) rakers being defined as

those on the hypobranchial (see Table 1). Institutional abbreviations follow Leviton *et al.* (1985).

### Taxonomic Account

#### *Glyptophidium argenteum* Alcock, 1889

[New Japanese name: Shirogane-choman]

(Figs. 1–2)

*Material examined.* NSMT-P 78388 [93.4+ mm standard length (SL)], off Heda, Suruga Bay, Honshu, Japan, 300–400 m, bottom trawl, 1 Apr. 1986.

*Description.* Meristic and morphometric characters are shown in Table 1. Head scaleless with skeletal thin crests; mouth large, and posterior margin of maxilla slightly over the level below the posterior eye margin; numerous granular teeth on premaxilla, dentary, vomer, palatine and ectopterygoid; eye large and subcircular; orbit di-

ameter slightly greater than snout length; opercular spine broad and weak; dorsal fin origin close to head; dorsal-fin rays longer than corresponding anal-fin rays; pectoral-fin rays broken, but posterior margin of fin reaching level above anus; anal-fin origin just posterior to anus; pelvic-fin ray threadlike and long, reaching above anal-fin origin; tail long, slender and attenuate; caudal fin broken with regenerated rays.

Gill rakers thin and long with numerous spinules (Fig. 2A); raker on angle between epi- and ceratobranchial in anterior arch without knob on inner surface; numerous granular teeth on basi-branchial tooth plate; sagitta large and subcircular outline with deep incision in the dorsal rim (Fig. 2B); sulcus long, reaching near the anterior and posterior rims of the sagitta.

*Color in alcohol.* Head and body brown; dorsal surface of head and dorsal fin base with dark

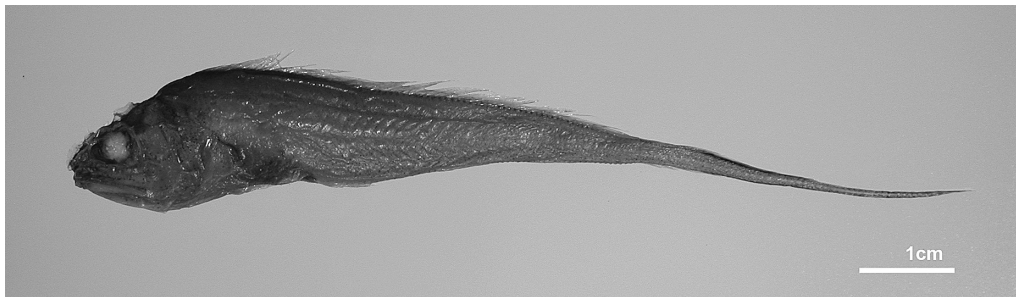


Fig. 1. *Glyptophidium argenteum*, NSMT-P 78388, 93.4+mm SL, off Heda, Suruga Bay, Honshu, Japan, 300–400 m, bottom trawl, 1 Apr. 1986.

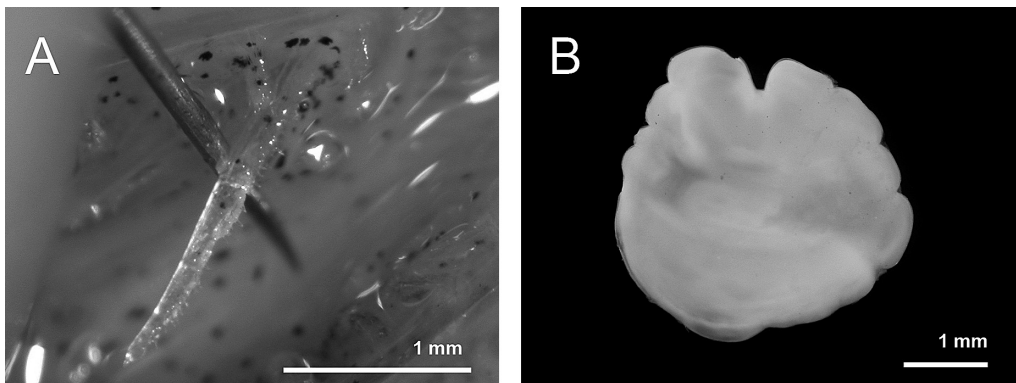


Fig. 2. Gill raker (A) and sagitta (B) of *Glyptophidium argenteum*, NSMT-P 78388. A, gill raker on angle between epi- and ceratobranchial in left anterior arch; B, medial view of right sagitta.

Table 1. Meristic and morphometric characters of 3 species of *Glyptothidium* (*argenteum* species-group) fishes. Data from Nielsen and Machida (1988) in parentheses.

Species	<i>G. argenteum</i> 15 specimens from USNM and ZMUC	<i>G. effulgens</i> 3 type specimens from USNM and ZMUC	<i>G. lucidum</i> 20 specimens from USNM and ZMUC	<i>G. argenteum</i> NSMTP 78388	<i>G. lucidum</i> NSMTP 48338
Standard length (mm)	133.8*–243.8* (127–287)	200.6*–227.5 (202–228)	91.1*–211* (115–196)	93.4*	149.1*
Dorsal-fin rays	143–155 (140–158)	107*–144* (141)	133–140 (133–146)	135*	135*
Anal-fin rays	118–130 (114–133)	89*–122* (124–125)	110–122 (109–122)	114*	110*
Pectoral-fin rays	20–22 (20–24)	21–22 (21–22)	23–26 (23–26)	24	24
Pelvic-fin rays	1 (1)	1 (1)	1 (1)	1	1
Caudal-fin rays	6 (6–7)	— (—)	7–8 (7–8)	—	—
Gill rakers on anterior arch:	1–4+17–21+4–7	1–3+18–19+6	1–4+17–20+5–7	1+18+5	1+18+5
dorsal small+long+ventral small	(0–5+17–23+3–8)	(1–3+19+5–6)	(0–3+14–20+4–9)		
Total gill rakers on anterior arch	24–28 (23–31)	25–27 (25–28)	24–28 (23–27)	24	24
Median basibranchial tooth patch	1 (1)	1 (1)	1 (1)	1	1
Precaudal vertebrae	11 (11–12)	11 (11)	11 (11)	11	11
Caudal vertebrae	78–79 (74–85)	51*–74 (73–74)	72–73 (70–81)	72*	68*
Dorsal-fin origin above vertebra number	3–4 (2–4)	3 (3)	3–4 (3–4)	3	3
Anal-fin origin below dorsal-ray number	19–21 (18–23)	19–21 (20–21)	19–23 (20–24)	21	20
Anal-fin origin below vertebra number	13–15 (13–16)	13–14 (13–14)	13–15 (12–15)	14	14
Pseudobranchial filaments	7–12 (7–12)	7–9 (7–8)	12–15 (11–15)	12	11
In % of head length					
Orbit diameter	27.1–30.6 (21.5–28.5)	28.5–29.3 (29–31)	31.4–34.6 (31.5–40.5)	29	33
Body depth at dorsal fin origin	66.4–81.0 (66–91)	76.2–76.8 (78–81)	71.9–81.3 (75–88)	76.9	80.9
Body depth at anal fin origin	56.4–67.1 (52–69)	62.8–65.4 (63–65)	57.5–70.3 (61–77)	66.3	69.1
In % of preanal length					
Head length	60–68.3 (55–74)	63.6–65.9 (—)	56.7–66.1 (53–66)	65.3	57.5
Condition of gill rakers	long and thin	long and thin	short and robust	long and thin	short and robust

\* Posterior end of tail lacking.

pigmentation; peritoneum dark; membranes of fins transparent.

**Distribution.** Western Bay of Bengal eastward to northern Philippines, southward to Sulawesi (Nielsen and Machida, 1988), and northward to Suruga Bay, Japan (this study).

**Remarks.** Within the *argenteum* species-group, meristic and morphometric characters of all 3 species are mostly overlapping (Table 1). Although our specimen was lacking the posterior end of the tail, which made it impossible to obtain the exact counts of dorsal and anal fin rays and vertebrae, it was provisionally identified as *G. argenteum* by the following combination of characters: 24 pectoral-fin rays, 12 pseudo-branchial filaments, long and thin gill rakers, and proportional relationship between orbit diameter and body depth at anal-fin origin (Fig. 3). *Glyptophidium argenteum* has been reported primarily from seas around Southeast Asia (Nielsen and Machida, 1988). The present specimen represents the first record from Japan and the northernmost record of the species.

***Glyptophidium lucidum* Smith and Radcliffe in Radcliffe, 1913**

[New Japanese name: Sukashi-choman]

(Figs. 4–5)

**Material examined.** NSMT-P 48338 (149.1+ mm SL), South Senoumi Bank (34°45'37"N, 138°29'32"E–34°45'58"N, 138°28'23"E), Suruga Bay, Honshu, Japan, 240–410 m, bottom trawl, 4

Oct. 1995.

**Description.** Meristic and morphometric characters are shown in Table 1. Most features of the specimen are the same as in *G. argenteum* (NSMT-P 78388). Head scaleless with skeletal thin crests; mouth large, and posterior margin of maxilla reaching level below the posterior eye margin; numerous granular teeth in premaxilla, dentary, vomer, palatine and ectopterygoid; eye large, slightly elliptic horizontally; orbit diameter greater than snout length; opercular spine broad and weak; dorsal-fin origin close to head; dorsal-fin rays longer than corresponding anal-fin rays; anal-fin origin below the posterior pectoral-fin margin; pelvic-fin ray threadlike and long, reach-

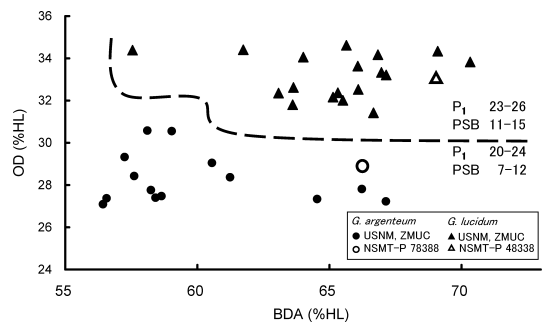


Fig. 3. Relationship between orbit diameter and body depth at anal fin origin in *Glyptophidium argenteum* and *G. lucidum*. Three damaged specimens (1 *argenteum*, 2 *lucidum*) are excluded. Abbreviations: BDA, body depth at anal-fin origin; HL, head length; OD, orbit diameter; P<sub>1</sub>, pectoral-fin rays; PSB, pseudo-branchial filaments.



Fig. 4. *Glyptophidium lucidum*, NSMT-P 48338, 149.1+ mm SL, South Senoumi Bank (34°45'37"N, 138°29'32"E–34°45'58"N, 138°28'23"E), Suruga Bay, Honshu, Japan, 240–410 m, bottom trawl, 4 Oct. 1995.

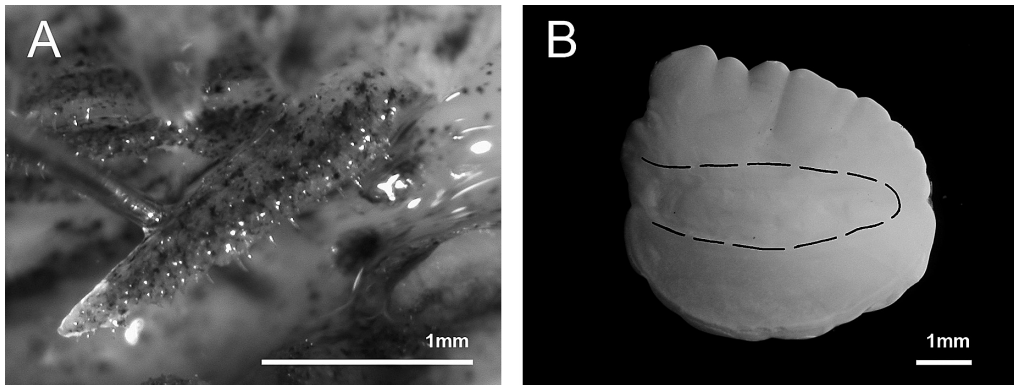


Fig. 5. Gill raker (A) and sagitta (B) of *Glyptophidium lucidum*, NSMT-P 48338. A, gill raker on angle between epi- and ceratobranchial in left anterior arch; B, medial view of right sagitta. Broken line indicate outline of sulcus.

ing near anus; tail long, slender and attenuate; caudal fin broken with regenerated rays.

Gill rakers robust and short with numerous spinules (Fig. 5A); raker on angle between epi- and ceratobranchial in anterior arch without knob on inner surface; numerous granular teeth on basibranchial tooth plate; sagitta large and slightly rectangle with 3 shallow incisions in the dorsal rim (Fig. 5B); sulcus long, reaching near the anterior and posterior rims of the sagitta.

*Color in alcohol.* Head and body brown; snout and dorsal parts of head and anterior half of body with dark pigmentation; peritoneum dark; membranes of fins transparent.

*Distribution.* Suruga Bay, Japan southward to northwestern Australia (Nielsen and Machida, 1988; this study).

*Remarks.* Our specimen was identified as *G. lucidum* by the following combination of characters: 24 pectoral-fin rays, 11 pseudobranchial filaments, robust and short gill rakers, and relationship between orbit diameter and body depth at anal-fin origin (Fig. 3). The previous northernmost record of the species was from Taiwan (Yeh *et al.* 2005; however, considering the description, their specimen may be *G. argenteum*). The NSMT-P specimen examined in this study extends the distributional range of the species to Japan.

### Comparative Material Examined

*Glyptophidium argenteum* (15 specimens): USNM 99057 (205.2+–243.9 mm SL, 3 specimens), “Albatross” sta. D-5410 (10°28'45"N, 124°05'30"E), 704 m, Agassiz trawl, 18 Mar. 1909; USNM 99160 (178.7+–217.2+mm SL, 3), “Albatross” sta. 5405 (10°49'20"N, 124°24'23"E), 479 m, Agassiz trawl, 17 Mar. 1909; USNM 99179 (170.9–228.7+mm SL, 3), “Albatross” sta. D-5373 (13°40'N, 121°31'10"E), 618 m, beam trawl, 2 Mar. 1909; ZMUC P77772-P77777 (133.8+–233.9+mm SL, 6), “Galathea” sta. 436 (10°12'N, 124°14'E), 710 m, sledge trawl, 9 Aug. 1951.

*Glyptophidium effulgens* (3 type specimens): USNM 99158 (200.6+mm SL, holotype), “Albatross” sta. D-5410 (10°28'45"N, 124°05'30"E), 704 m, bottom trawl, 17 Mar. 1909; USNM 272001 (209.7+mm SL, paratype), same data as holotype; ZMUC P77783 (227.5 mm SL, paratype), same data as holotype.

*Glyptophidium lucidum* (20 specimens): USNM 74144 (211.0+mm SL, holotype), “Albatross” sta. 5625 (0°7'N, 127°28'E), 421 m, beam trawl, 29 Nov. 1909; USNM 99107 (148.7+–181.9+mm SL, 7, paratypes), “Albatross” sta. D-5626 (0°07'30"N, 127°29'E), 485 m, trawl, 29 Nov. 1909; ZMUC P77548 (157.0+mm SL, paratype), “Albatross” sta. D-5626 (0°07'30"N,

127°29'E), 485 m, trawl, 29 Nov. 1909; USNM 99272 (91.1+–195.4 mm SL, 11), “Albatross” sta. 5625 (0°7'N, 127°28'E), 421 m, beam trawl, 29 Nov. 1909.

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