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Second Record of a Sculpin, *Phasmatocottus ctenopterygius*, from the Deepsea off Iturup Island, Kuril Archipelago (Scorpaeniformes : Cottidae)

Mamoru YABE[1] and Ryouji FUJII[2]

Abstract

A rare cottid fish, *Phasmatocottus ctenopterygius* Bolin, is redescribed on the basis of six specimens (43.5-56.3 mm SL) collected from the western North Pacific off Iturup Island in the Kuril Archipelago, from a deep of about 500 m. Prior to this report, the species was known only from the holotype collected from Sendai Bay, Miyagi Prefecture, northern Japan. The present specimens constitute the second record for the species.

Key words : *Phasmatocottus ctenopterygius*, Cottid fish, Second record, Western North Pacific, Redescription

Introduction

Bolin (1936) described *Phasmatocottus ctenopterygius* on the basis of a single specimen collected from deep water off Sendai Bay, Pacific Ocean off Miyagi Prefecture, northern Japan, by the Albatross Expedition in 1906. Since that time, no additional specimens have been available. During deepsea trawl surveys in the Pacific Ocean off eastern Hokkaido and the southern Kuril Islands in 1997, six specimens of this species were collected from near Iturup Island. Here we describe these specimens as the second record of *Phasmatocottus ctenopterygius*, and provide brief comments on morphological variation.

The specimens examined here were deposited in the Laboratory of Marine Biodiversity, Graduate School of Fisheries Sciences, Hokkaido University, Hakodate (HUMZ). Other institutional abbreviations in this study follow those provided by Eschmeyer et al. (1998). Methods for taking counts and measurements follow Hubbs and Lagler (1958) and Yabe (1991), except for following : head depth and width were measured on a vertical from the base of the uppermost preopercle spine ; the length of the bases of the first and second dorsal fins and anal fin were measured from the base of the first ray to the base of the terminal ray, respectively ; the length of the inter-dorsal fins was measured between the bases of the terminal ray of first dorsal fin and the first ray of the second dorsal fin. Caudal fin rays and vertebrae were observed and counted from radiographs. Standard length (SL) was used throughout.

Phasmatocottus ctenopterygius Bolin, 1936

Figs. 1 and 2, Table 1
Japanese name : kushibire-kajika

Phasmatocottus ctenopterygius Bolin, 1936 : 33 (original description ; type locality, off Sendai Bay, 38°11′33″N, 142°08′00″E, in about 587 m ; Albatross station 5050).

Materials

HUMZ 150597 and 150598, two males, 44°54.1′N, 148°57.9′E, depth 508 m (Pacific Ocean off Iturup Island, southern Kuril Archipelago), July 25, 1997, bottom trawl, collected by Keiichi Sato. HUMZ 175435-175438, four males, 44°38.3′N, 148°38.8′E, depth 514 m (Pacific Ocean off Iturup Island, southern Kuril Archipelago), July 26, 1997, bottom trawl, collected by Keiichi Sato.

Diagnosis

Head and body without scales, except for enlarged lateral line scales under skin. Teeth present on prevomer, absent on palatines. Distinct nuchal spine on occipital region. Four preopercular spines, uppermost spine with bifid tip and usually a small spine on dorsal margin. Branchiostegal membranes broadly united, forming a free fold across isthmus. Membrane

[1] *Laboratory of Marine Biodiversity, Graduate School of Fisheries Sciences, Hokkaido University, Hakodate, Hokkaido 041-8611, Japan* (e-mail : myabe@fish.hokudai.ac.jp)
(北海道大学大学院水産科学研究科多様性生物学講座)
[2] *Gifu Prefectural Fresh Water Fish Research Institute, Hane 2605-1, Hagiwara-cho, Mashita-gun, Gifu 509-2592, Japan* (e-mail : fujii@fish.rd.pref.gifu.jp)
(岐阜県淡水魚研究所)

Fig. 1. *Phasmatocottus ctenopterygius* Bolin, HUMZ 175436, a male, 56.3 mm SL, collected from western North Pacific off Iturup Island, Kuril Archipelago. *Above* : lateral view. *Below* : dorsal view.

between spines of first dorsal fin deeply incised almost to base, spines nearly free from each other. First dorsal fin spines 6–7, second dorsal fin rays 11–13, anal fin rays 9–10, pectoral fin rays 18–20, pelvic fin rays I, 2, lateral line scales 27–29, total vertebrae 28–29.

Description

Proportional measurements and meristic counts are given in Table 1. Body moderately elongate, somewhat depressed anteriorly, almost cylindrical posterior to anal fin origin, depth at dorsal fin origin 1.0–1.2 (mean 1.1) in width. Head large, extremely depressed, head depth at base of first preopercular spine 2.1–2.5 (2.3) in its width. Caudal peduncle moderately deep, depth 3.5–4.2 (3.9) in length. Mouth large, maxilla reaching to a vertical through middle of pupil ; a minute cirrus on posterior end of maxilla. Lower jaw shorter than upper jaw. Small teeth on both jaws and prevomer, none on palatines. Snout short, blunt, length 1.4–1.6 (1.4) in orbital diameter. Nasal spine small, pointed. Anterior nostril with a slender tube, posterior nostril with a short tube. Eye large, orbital diameter 2.5–3.1 (2.9) in head length. Anterior margin of orbit slightly swollen. Dermal skin of eye somewhat hypertrophied anterodorsally. Interorbital space narrow, flat, width 4.1–4.7 (4.4) in orbital diameter. Supraocular spine absent. Nuchal spine distinct, with two small tips. Occipital region gently concave between distinct fronto-parietal ridges. Four preopercular spines ; uppermost spine longest, slightly curved upward, bearing with bifid tip and usually a small spine on dorsal margin, length 4.4–5.6 (3.1–3.2) in head length. Lower three preopercular spines small, simple, sharp. Branchiostegal membranes broadly united, forming a free fold across isthmus. Cephalic sensory pores extremely well developed ; seven large pores on infraorbital sensory canal ; a single terminal mandibular pore on just behind symphysis. Lateral line distinct with flexible scales under skin. Lateral line pores with a double opening, upper opening smaller than the lower ; small central pores irregularly present on lateral line ; a single terminal pore on end of body followed by some tiny pores on proximal midline of caudal fin.

Spiny rays of first dorsal fin extremely elongate, membrane between spines deeply incised almost to base, spines nearly free from each other ; first two spines with close-set base, succeeding spine bases evenly spaced ; third or fourth spine longest, length 1.7–2.0 (1.8) in head length. Space between first and second dorsal fins almost equal to half of a snout length. Soft rays of second dorsal fin moderately elongated, fin membrane not incised ; anterior three or four rays unbranched, posterior seven to nine rays branched. No free spiny rays before anal fin. Dorsalmost eight rays of pectoral fin branched ; ventral rays simple, thickened. Pelvic fin originating on a vertical below base of nuchal spine ; a spiny ray adhered to outer soft ray ; inner soft ray longer than the outer. Caudal fin slightly rounded ; 12 rays

Table 1. Proportional measurements and meristic counts of *Phasmatocottus ctenopterygius*.

	Present specimens						Holotype
	HUMZ						USNM
	150597	150598	175435	175436	175437	175438	102107
Standard length (mm)	43.7	51.0	55.9	56.3	43.5	48.6	37.0
Proportional measurements (%SL)							
Body depth at first dorsal fin origin	16.7	17.8	17.4	18.1	18.2	17.7	17.1
Body depth at anal fin origin	12.8	15.7	14.0	13.7	14.0	14.0	—
Body width at first dorsal fin origin	18.1	20.6	17.9	19.9	19.1	17.9	18.6
Body width at anal fin origin	11.9	14.5	13.1	14.0	13.6	13.6	—
Head length	37.3	39.2	36.5	35.2	37.0	37.0	38.3
Head depth	16.0	16.5	14.5	15.1	18.2	15.0	15.9
Head width	24.8	28.2	26.1	25.7	25.6	26.9	25.5
Predorsal length	31.4	35.1	31.5	32.0	31.7	32.3	33.2
Prepelvic length	23.6	26.1	24.3	23.6	24.6	25.9	26.5
Preanal length	47.6	50.2	47.6	49.0	51.0	52.1	52.5
Length of first dorsal fin base	13.6	15.2	16.3	16.2	14.3	14.6	14.3
Length of second dorsal fin base	31.1	30.8	29.7	27.2	27.8	28.6	27.3
Length of inter-dorsal fins	4.3	4.5	3.6	4.1	6.4	5.3	5.2
Length of anal fin base	26.8	24.7	24.2	25.9	24.8	26.7	21.6
Length of pectoral fin base	17.4	18.0	17.7	17.6	16.6	16.3	16.7
Length of caudal peduncle	23.6	23.3	26.5	25.0	24.8	23.9	24.2
Depth of caudal peduncle	5.6	5.7	5.6	5.6	5.6	5.5	4.8
Snout length	8.9	10.0	8.8	8.5	9.0	8.4	8.9
Length of orbit	12.1	13.5	12.5	12.6	12.4	12.8	12.5
Interorbital width	3.0	3.1	2.7	2.7	3.0	2.9	2.6
Length of upper jaw	15.6	15.5	14.5	15.3	15.9	15.4	15.0
Length of mandible	13.5	14.5	12.5	13.5	13.8	13.8	14.3
Postorbital length of head	18.5	17.8	16.8	16.7	17.5	16.5	17.8
Pectoral fin length	25.4	26.5	24.3	21.1	23.9	24.9	22.3
Pelvic fin length	16.0	19.4	16.6	14.6	18.4	17.5	16.8
Caudal fin length	29.1	31.1	27.4	26.5	—	29.3	—
Meristic counts							
First dorsal fin spines	6	6	7	7	6	6	6
Second dorsal fin rays	13	13	12	11	12	13	12
Pectoral fin rays	18	19	19	19	18	20	18
Pelvic fin rays	I, 2	I, 2	I, 2	I, 2	I, 2	I, 2	I, 2
Anal fin rays	10	10	10	10	10	10	9
Lateral line scales	27	29	29	28	29	28	28
Abdominal vertebrae	9	8	9	9	9	9	9
Caudal vertebrae	20	20	20	20	20	20	20
Total vertebrae	29	28	29	29	29	29	29

supported by hypural plate, middle eight or nine rays branched; seven to nine upper and four or five lower procurrent rays. Color in alcohol: Head and body uniformly dark brown, ventral side and fins darker.

Distribution

The holotype was collected in the Western North Pacific, Sendai Bay off Miyagi Prefecture, Japan. The present specimens were collected from the western North Pacific, off Iturup Island, Kuril Archipelago, depth 508–514 m.

Remarks

Phasmatocottus ctenopterygius is characterized in having four preopercular spines, the uppermost spine enlarged and antlerlike; branchiostegal membranes

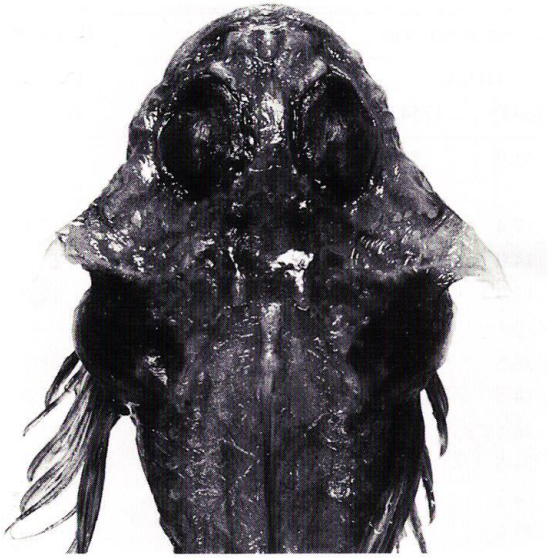

Fig. 2. Dorsal view of head region of *Phasmatocottus ctenopterygius*, HUMZ 175436, 56.3 mm SL.

united, forming a fold across the isthmus ; six branchiostegal rays ; teeth present on prevomer, absent on palatines ; dorsal fin spines not connected by membrane ; pelvic fin rays I, 2 ; lateral line pores double (Bolin, 1936). The present specimens agreed well with the type specimen and the original description of *Phasmatocottus ctenopterygius*. In the original description, Bolin (1936 : 34) noted, "The small structure at the anterior end of the anal fin in this fish certainly appears to be a spine, although it may possibly be the basal portion of a broken ray that has attained a sharp point and smooth appearance. —— It may be possible that this species has retained one anal spine as a primitive feature, and only examination of a second specimen can clear up this point." Although such a structure was reconfirmed by our observation of the holotype and its radiograph, we regarded it as the base of a broken soft ray of the anal fin, because it is supported by the anteriormost pterygiophore of the anal series, and because the present specimens do not have such a spiny ray on the anal fin.

Comparative material

Phasmatocottus ctenopterygius, USNM 102107 (holotype, 37.0 mm SL).

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