

A New Cottid Species, *Porocottus coronatus*, from the Pacific Coast of Hokkaido, Japan

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Abstract A new cottid species, *Porocottus coronatus*, is described on the basis of nine specimens from the Pacific coast of eastern Hokkaido, Japan. It differs from other species of this genus by having a group of finger-like cirri on the dorsal midline of the head, long uppermost preopercular spine, 15–16 anal fin rays and well developed cephalic sensory system with many small pores.

Fishes of a cottid genus *Porocottus* Gill are distributed along coastal regions of the northern North Pacific from the Sea of Japan to the Gulf of Alaska, and are characterized in having one to three pairs of multifid cirri on head, cirri extending from top of dorsal fin spines, two rows of lateral line pores continuing to end of body, teeth on prevomer but none on palatines, and pelvic fin with one spine and three unbranched soft rays. Seven species, one of which contained two subspecies, have been recognized as the genus *Porocottus* (Neyelov, 1979). Two species, *P. allisi* (Jordan et Starks) and *P. tentaculatus* (Kner), have been known from shallow waters of northern Japan (Masuda et al., 1984). Recently, nine specimens of an undescribed species of this genus were collected from littoral zones near Kushiro, eastern Hokkaido, Japan. They are described below as a new species.

The specimens examined here are deposited in the Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University, Hakodate (HUMZ), and the Department of Zoology, National Science Museum, Tokyo (NSMT-P). Methods for taking counts and measurements follow Hubbs and Lagler (1958) except that body depth was measured between the base of the first spine of dorsal fin and the origin of the pelvic fin, and all fin-ray elements were counted. Caudal-fin rays and vertebrae were counted from radiographs. Caudal vertebrae were counted starting with the first vertebra having a complete haemal spine and ending with the urostylar vertebra. Terminology for the cephalic sensory system follows Nelson (1986).

Porocottus coronatus sp. nov.

(New Japanese name: Kanmuri-fusakajika)

(Figs. 1–3)

Holotype. HUMZ 111575, a female, 78.8 mm SL, 42° 56.5'N, 144° 38.5'E, near Konbumori, Pacific coast of Hokkaido, depth 0.5 m, 22 July 1990.

Paratypes. HUMZ 109999–110001, NSMT-P 35034, a male and three females, 35.2–36.0 mm SL, 42° 57'N, 144° 26'E, Katsurakoi of Kushiro, Pacific coast of Hokkaido, depth 0.5 m, 21 Aug. 1986. HUMZ 117471, a female, 61.8 mm SL, same locality as the holotype, 4 Dec. 1990.

Non-type materials. HUMZ 117633–117635, three juveniles, 24.7–29.3 mm SL, collected with the holotype.

Diagnosis. A member of the genus *Porocottus* with the following features: A group of several finger-like cirri on dorsal midline of head just behind interorbital space. Two pairs of cirri on head; supraocular cirri developed, nuchal cirri usually present. Four preopercular spines, length of uppermost spine 54–66% of orbital diameter. Anal fin rays 15–16. Cephalic sensory system well developed with many small pores and secondary canaliculi; anterior coronal pore and anterior medial pore of occipital canal paired; three posterior coronal pores; a single secondary pore between anterior and posterior nasal pores.

Description. Proportional measurements and meristic counts are given in Table 1. Body stout, somewhat swollen under first dorsal fin; body width at pectoral fin base 1.1 in body depth. Caudal peduncle compressed, its depth 2.5 (2.3–2.7 in paratypes) in its length. Head robust, its length 3.2 (2.9–3.2) in SL. Mouth terminal; maxilla reaching vertical below middle of pupil. Lower jaw shorter

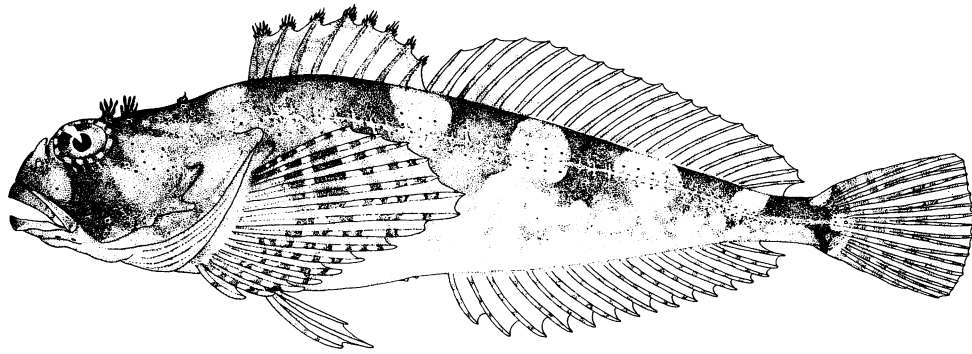


Fig. 1. *Porocottus coronatus* sp. nov., holotype, HUMZ 111575, female, 78.8 mm SL, from the Pacific coast of Hokkaido, Japan, 42°56.5'N, 144°38.5'E.

Table 1. Proportional measurements and meristic counts of *Porocottus coronatus* sp. nov.

| | Holotype | Paratypes | | | | |
|--------------------------------|----------------|-----------------|----------------|----------------|----------------|----------------|
| | HUMZ 111575 | NSMT-P 35034 | HUMZ 109999 | HUMZ 110000 | HUMZ 110001 | HUMZ 117471 |
| Standard length (mm) | 78.8 | 35.4 | 36.0 | 35.2 | 35.7 | 61.8 |
| Sex | female | female | female | female | male | female |
| In % of standard length | | | | | | |
| Body depth | 25.3 | 24.6 | 23.9 | 22.7 | 24.4 | 25.9 |
| Body width | 23.7 | 23.2 | 22.2 | 21.3 | 21.6 | 24.8 |
| Predorsal length | 30.6 | 31.9 | 32.8 | 32.1 | 32.2 | 31.1 |
| Preanal length | 54.7 | 51.7 | 50.8 | 52.6 | 52.1 | 51.0 |
| Snout to pelvic origin | 33.6 | 32.2 | 30.6 | 32.1 | 31.9 | 27.8 |
| Caudal peduncle length | 15.1 | 16.7 | 15.6 | 18.2 | 17.1 | 15.9 |
| Caudal peduncle depth | 6.1 | 6.2 | 6.9 | 6.8 | 6.7 | 6.1 |
| Head length | 31.6 | 32.8 | 34.4 | 33.0 | 33.1 | 30.9 |
| Snout length | 9.4 | 9.6 | 9.7 | 9.7 | 10.1 | 8.3 |
| Orbital diameter | 7.7 | 9.0 | 9.2 | 9.4 | 9.2 | 7.9 |
| Upper jaw length | 11.8 | 11.9 | 11.9 | 11.6 | 11.8 | 11.7 |
| Lower jaw length | 11.3 | 11.0 | 11.1 | 11.1 | 11.2 | 10.7 |
| Postorbital head length | 15.6 | 15.0 | 16.7 | 15.3 | 15.1 | 15.5 |
| Interorbital width | 3.8 | 3.7 | 3.6 | 3.7 | 3.9 | 5.0 |
| Basal length of 1st dorsal fin | 18.7 | 18.1 | 18.9 | 15.9 | 19.6 | 23.1 |
| Basal length of 2nd dorsal fin | 42.3 | 39.3 | 41.7 | 37.8 | 39.5 | 39.3 |
| Basal length of anal fin | 36.2 | 33.9 | 36.9 | 33.5 | 34.7 | 36.9 |
| Basal length of pectoral fin | 13.8 | 13.3 | 14.4 | 13.4 | 14.3 | 14.2 |
| Pectoral fin length | 26.8 | 27.4 | 28.3 | 27.8 | 28.6 | 29.0 |
| Pelvic fin length | 16.9 | 17.8 | 18.1 | 17.6 | 18.5 | 16.5 |
| Caudal fin length | 18.7 | 21.2 | 22.5 | 22.4 | 22.1 | 19.4 |
| Meristic counts | | | | | | |
| Dorsal fin rays | VIII, 20 | VIII, 18 | VIII, 20 | VIII, 19 | IX, 18 | VIII, 18 |
| Pectoral fin rays | 15 | 15 | 15 | 15 | 15 | 15 |
| Anal fin rays | 16 | 15 | 16 | 16 | 16 | 16 |
| Pelvic fin rays | I, 3 | I, 3 | I, 3 | I, 3 | I, 3 | I, 3 |
| Lateral line scales | 37 | 37 | 37 | 38 | 39 | 37 |
| Vertebrae | 11 + 26 | 11 + 25 | 11 + 26 | 11 + 26 | 11 + 25 | 11 + 25 |

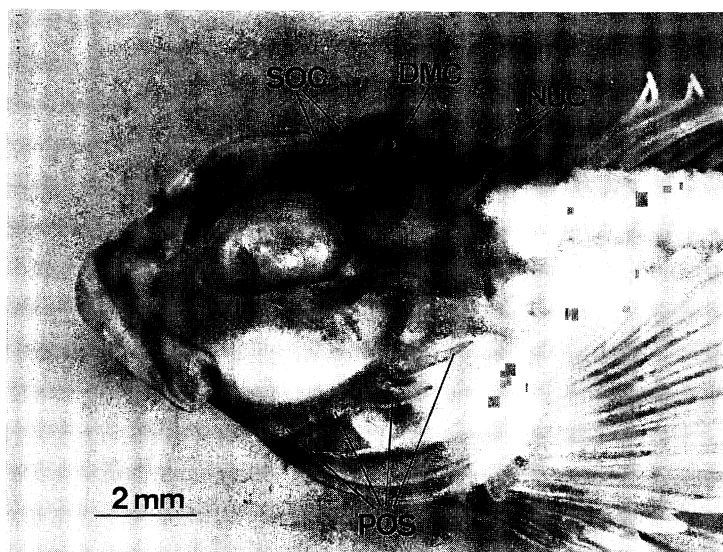


Fig. 2. Photomicrograph of dorsolateral surface of head of *Porocottus coronatus* sp. nov., paratype, HUMZ 110000, 35.2 mm SL, stained by alizarin red-S and injected hematoxylin into sensory canals. DMC, cirrus on dorsal midline of head; NUC, nuchal cirrus; POS, preopercular spines; SOC, supraocular cirrus.

than the upper, included. Small villiform teeth on jaws and prevomer, none on palatines. Snout short and steep, its length 3.4 (3.3–3.5) in head length. Nasal spine strong, about in line with profile of snout. Both nostrils in well developed tubes of about equal size. Eye moderate in size, orbital diameter 4.1 (3.5–4.1) in head length; upper orbital margin protruding slightly above general profile of head. Interorbital space narrow, slightly concave, its width 2.5 (2.3–2.7) in length of snout. Occipital region shallowly concaved; front-parietal ridge obscure. Four preopercular spines (POS in Fig. 2); the uppermost (1st) simple and sharp, slightly curved upward, its length 1.5 (1.6–1.8) in orbital diameter; the second simple and sharp, directed backward (slightly curved upward), about two-thirds as long as the uppermost; the third smallest, knob-like; the lowermost simple and sharp, directed forward and downward; lower two spines hidden under skin. Gill membranes broadly united to its antimer, free from isthmus. Two pairs of cirri on dorsal surface of head; supraocular cirrus (SOC) compounded with 4 (2–5) finger-like elements arising from a common base; nuchal cirrus (NUC) small with 1 (1–3); obscure in a paratype HUMZ 117471) finger-like elements. Five (5–11) short finger-like cirri on dorsal midline of head (DMC) just behind interorbital space. Two to 8 filamentous cirri at top of each spine

of dorsal fin. Lateral line descending in an almost straight line to about vertical below third ray from end of second dorsal fin and continued posteriorly along body-axis. A double row of lateral line pores continued to end of body; a single terminal pore on caudal fin somewhat posterior from end of body. A small central pore between successive lateral line scales on anterior half of body. Head and body almost naked except for subcutaneous lateral line scale and for several tiny spinal scales on pectoral axilla. Anus about half of orbital diameter before anal fin origin.

Origin of first dorsal fin above middle of opercular flap or nearly so, its basal length 2.3 (1.9–2.4) in that of second dorsal fin; fourth spine longest, its length 1.9 (1.6–2.2) in fin base. Second dorsal fin contiguous to first dorsal fin; its origin vertically above anus or nearly so; terminal membrane attached to caudal peduncle under about 0.8 of depressed last ray. Anal fin originating about under base of third ray of the second dorsal fin, ending under base of second ray from end of second dorsal fin; its base 1.2 (1.1–1.2) in that of second dorsal fin; terminal membrane attached to caudal peduncle under about 0.6 of depressed last ray. Pectoral fin broadly rounded; its length 1.2 in head length; base of uppermost ray below base of first spine of dorsal fin; distal tip of appressed fin above origin of anal fin; width of fin

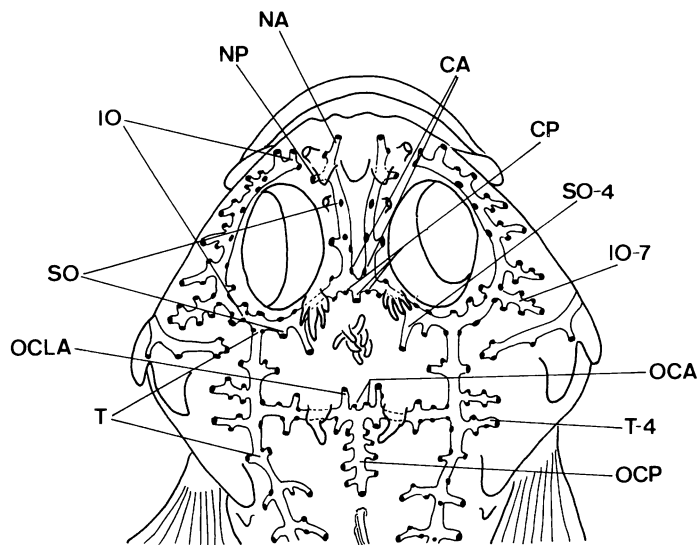


Fig. 3. Cephalic sensory system of *Porocottus coronatus* sp. nov., paratype, HUMZ 110000, 35.2 mm SL. CA, anterior coronal pores; CP, posterior coronal pores; IO (IO-7), infraorbital canal and pores (seventh canaliculus); NA, anterior nasal pore; NP, posterior nasal pore; OCA, anterior medial pores of occipital canal; OCLA, lateral anterior central pore of occipital canal; OCP, posterior medial canaliculus and pores of occipital canal; SO (SO-4), supraorbital canal and pores (fourth canaliculus); T (T-4), postorbital canal and pores (fourth canaliculus).

base 1.9 (2.0–2.1) in length of pectoral fin. Pelvic fin originating below base of first spine of dorsal fin; its length 1.9 (1.8–1.9) in head length. Caudal fin rounded, its length 1.7 (1.5–1.6) in head length; 11 rays supported by hypural plate; among them upper two and lowermost rays unbranched, other middle rays branched; 7 (6–7) upper and 5 (5–6) lower procurent rays. Soft rays of all fins except for *middle* rays on caudal fin unbranched.

Cephalic sensory system (Fig. 3): Sensory canals well developed and branched to form many small sensory pores on dorsolateral surface of head. A single secondary pore between anterior and posterior nasal pores (a pair of secondary pores in a paratype HUMZ 117471). Five paired or single pores on supraorbital canal (SO); posterior opening of the fourth pore (SO-4) at distal tip of elongate canaliculus. Anterior coronal pore (CA) paired; posterior coronal pore (CP) three, medial pore opened on short canaliculi. Sixth and 7th canaliculi of infraorbital canal (IO) well developed with a few secondary canaliculi and pores. Anterior medial pore of occipital canal (OCA) paired, but pore of left side absent in the holotype; posterior medial canaliculus of occipital canal (OCP) extending well posteriorly with three or four pairs of secondary canaliculi and

pores. Third and 4th canaliculi of postorbital canal (T) developed with a few secondary canaliculi and pores. Terminal pores of mandibular canal opening separately on either side of symphysis. Upper and lower canaliculi of lateral line canal well developed with a few secondary pores.

Color when fresh: Ground color pale brown dorsolaterally, yellowish white ventrally. Five broad reddish brown saddles; one below first dorsal fin, three below second dorsal fin, and one on caudal peduncle. Ventrolateral surface of body with brownish marblings and small white spots. A broad dark brown band through eye and across cheek. Occipital region dark brown. Operculum pale grey. Dusky white mottles before origin of first dorsal fin. Spines of first dorsal fin reddish brown; fin membranes between spines almost translucent on middle of fin. Second dorsal and caudal fin irregularly barred with reddish brown. Fin rays of anal and pelvic fins with small blackish spots; their fin membranes almost translucent.

Distribution. Known from the littoral zones near Kushiro and Konbumori, Pacific coast of the eastern Hokkaido, Japan.

Etymology. From the Latin *corona* (crown) in reference to a group of cirri on dorsal midline of

head.

Comparison. Neyelov (1979) reviewed the fishes of the genus *Porocottus*, and recognized seven species, one of which contained two subspecies: *P. quadrifilis* Gill, *P. allisi* (Jordan et Starks), *P. minutus* (Pallas), *P. tentaculatus* (Kner), *P. camtschaticus* (Schmidt), *P. japonicus* Schmidt, *P. bradfordi bradfordi* Rutter, and *P. bradfordi albomaculatus* (Schmidt). *Porocottus coronatus* differs from these species by having a group of cirri on dorsal midline of head. The former six species have one to three pairs of cirri on dorsal surface of head, but no unpaired cirrus on dorsal midline. Although *P. b. bradfordi* and *P. b. albomaculatus* have unpaired cirri on dorsal surface of head, those cirri are scattered or covered on occipital region and do not form a group on dorsal midline (Schmidt, 1916 and 1940; Neyelov, 1979). In addition to such a difference, *P. coronatus* has larger counts of anal fin rays (15–16) than the latter two subspecies (11–14; usually less than 13). Neyelov (1979) described the cephalic sensory system of *Porocottus* and other related sculpins in detail, and regarded this feature as diagnostic of each taxon. Although *P. coronatus* has a few intraspecific variations noted in the description, the condition of the cephalic sensory system of *P. coronatus* closely resembles that of *P. tentaculatus*, *P. japonicus* and *P. b. bradfordi* by having many secondary canaliculi and pores branched from each main canal, especially having three or more paired secondary canaliculi and pores of posterior medial canaliculus of occipital canal (OCP). However, *P. coronatus* differs from *P. tentaculatus* in having paired anterior coronal pores (CA) and paired anterior medial pores of occipital canal (OCA) (single pore in both cases in the latter species), and from *P. japonicus* and *P. b. bradfordi* in having three posterior coronal pores (CP) (a single pore in the latter two). Moreover, *Porocottus coronatus* has a single secondary pore between anterior and posterior nasal pores normally, while the above three taxa have one or two pairs of secondary pores there.

Remarks. Three juveniles of *P. coronatus* were not designated as the type-specimens, because some of the diagnostic characters were not yet apparent. The smallest specimen (HUMZ 117634; 24.7 mm SL) does not have cirri on dorsal midline of head, but it is identified as *P. coronatus* by having the typical condition on the cephalic sensory system of this species. Other juveniles (26.8–29.3 mm SL) have a few papillae on dorsal midline which are very

small but distinguishable as central cirri of *P. coronatus*. The uppermost preopercular spine of the three juveniles is longer than that of the type-specimens, its length is 72–83% of orbital diameter.

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北海道の太平洋沿岸から採集されたカジカ科の1新種
カンムリフサカジカ

矢部 衛

北海道釧路市桂恋及び昆布森近郊の太平洋沿岸の潮間帯から採集された9個体(24.7–78.8 mm SL)に基づき、カジカ科クロカジカ属の1種 *Porocottus coronatus* カンムリフサカジカを記載した。本属魚類は頭部背面に1–3対の皮弁を持つことで特徴づけられるが、本種は眼上部及び頸部の2対の皮弁に加え、眼後部正中線上に冠状の小皮弁群を持つことで、本属の他種とは明瞭に識別される。また本種は、前鰓蓋骨最上棘が長く、その長さは眼

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高径の 54-66% あること, 臀鰭条数が 15-16 であること, 頭部側線系が発達し多数の感覚孔を持つことなどの特徴を示す.

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