

A Review of the Genera *Pholidapus* and *Opisthocentrus* (Stichaeidae)

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Abstract The stichaeid genus *Pholidapus* is recognized as a valid genus distinct from *Opisthocentrus*. Although *Opisthocentrus zonope* and *O. tenuis* have been regarded either a dubious species or a junior synonym of *O. ocellatus*, both of them are valid. A key and descriptions of these genera and species are given.

Opisthocentrus tenuis Bean et Bean, 1897 was considered to be a junior synonym of *O. ocellatus* (e.g., Jordan and Evermann, 1898; Jordan and Gilbert, 1899; Jordan and Snyder, 1902; Schmidt, 1904). *O. zonope* Jordan et Snyder, 1902 was regarded as a dubious species (see Soldatov and Lindberg, 1930) or a southern form of *O. ocellatus* (see Makushok, 1958). The author examined a large number of specimens referable to *Opisthocentrus* and found many taxonomical confusions and errors. In this paper it is shown that both *O. tenuis* and *O. zonope* are valid species.

Although Makushok (1958) synonymized *Pholidapus* Bean et Bean, 1896 with *Opisthocentrus*, *Pholidapus* is sufficiently different to warrant generic separation.

Methods and material

Counts and proportional measurements were made in accordance with the method of Hubbs and Lagler (1958). Nomenclature of osteology and head sensory canals is that of Makushok (1958), except infraorbital sensory canals which are conveniently distinguished into two parts; i.e., the lachrymal canal which lodges in the lachrymal bone, and the suborbital canal which passes through the posterior two suborbital bones (Figs. 2, 3). For counts of vertical fin rays and vertebrae, soft X-ray was used. Osteological descriptions were made on cleared and alizarin-stained specimens. The last two short spines of dorsal and anal fins supported by a single pterygiophore were counted as two. Only principal rays were counted in the caudal fin (upper lobe + lower lobe).

Specimens examined were kept in the following

institutions; Aquaculture Center of Aomori Prefecture (ACAP), Laboratory of Marine Zoology, Hokkaido University (HUMZ), National Science Museum, Tokyo (NSMT-P), Sado Marine Biological Station, Niigata University (NUSMBS), and U. S. National Museum, Smithsonian Institution (USNM).

In the material list, data are arranged in the following order; depository, catalogue number, (the number of specimens), number of specimens examined, the range of standard length and localities. The collection dates were omitted.

Key to the species of the genera *Pholidapus* and *Opisthocentrus*

- A₁. Dorsal spines gradually increasing stoutness posteriorly (about one third of posterior spines pungent and not flexible); 5 openings of interorbital sensory canal; posteriormost teeth on both sides of upper jaw canine-like; head naked.....
.....*Pholidapus dybowskii*
- A₂. Dorsal spines very slender and flexible except posterior 7-17 spines; 3 openings of interorbital sensory canal; no canine-like teeth on either jaw; head scaly.....
.....*Opisthocentrus*
- B₁. 2-4 bands on head to nape; pectoral fin large, 1.3-1.6 in head length
- C₁. 4 bands on head to nape; dorsal ocelli 4; vomerine teeth absent; D LI-LIII.....
.....*O. zonope*
- C₂. 2-4 bands on head to nape; dorsal ocelli 5-7, mostly 5; vomerine teeth present; D LV-LX.....*O. ocellatus*
- B₂. No bands on head to nape; pectoral fin small, 1.7-2.1 in head length...*O. tenuis*

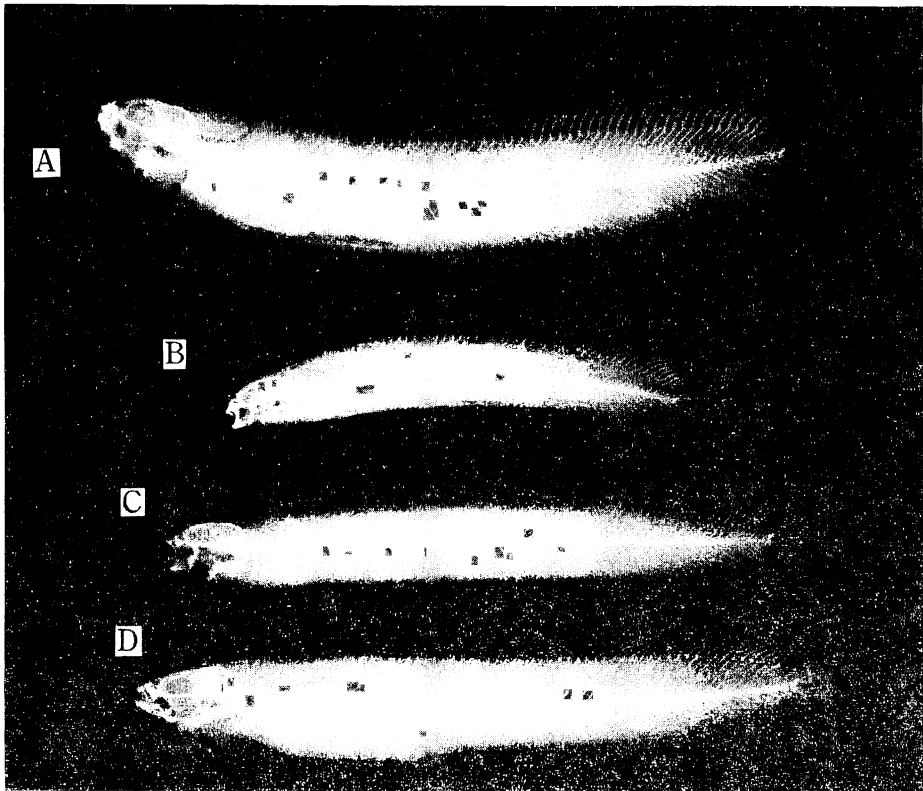


Fig. 1. Soft X-ray photographs of the species of *Pholidapus* and *Opisthocentrus*. A, *Pholidapus dybowskii*, female, ACAP 445, 155 mm SL, collected from Wakkanai, Hokkaido; B, *Opisthocentrus zonope*, male, ACAP 587, 105 mm SL, Moura (Mutsu Bay, Aomori); C, *Opisthocentrus ocellatus*, male, ACAP 480, 135 mm SL, Noheji, Mutsu Bay; D, *Opisthocentrus tenuis*, female, ACAP 857, 149 mm SL, Moura, Mutsu Bay. Stoutness of spines differs by species in the posterior portion of the dorsal fin.

***Pholidapus* Bean et Bean, 1896**

(Japanese name: Murotan-ginpo zoku)

Pholidapus Bean and Bean, 1896: 389, type species: *Pholidapus grebnitzkii* Bean and Bean, 1896 (= *Centronotus dybowskii*), by monotypy.

Abryois Jordan and Snyder, 1902: 486, type species: *Abryois azumae* Jordan and Snyder, 1092, by monotypy.

Diagnosis and description. Because this genus is monotypic, see *P. dybowskii*.

***Pholidapus dybowskii* (Steindachner, 1880)**

(Figs. 1A; 2A, B; 3A; 4)

(Japanese name: Murotan-ginpo)

Centronotus dybowskii Steindachner, 1880: 259 (type locality: Strielok, Vladivostok).

Pholidapus grebnitzkii Bean and Bean, 1896: 390, p1. 34 (type locality: Volcano Bay, Hokkaido); Jordan and Snyder, 1902: 488 (description).

Abryois azumae Jordan and Snyder, 1902: 486, fig. 22 (type locality: Murotan, Volcano Bay, Hokkaido); Matsubara, 1955: 761, fig. 280 (key).

Pholidapus dybowskii: Jordan and Evermann, 1898: 2430 (description); Jordan and Gilbert, 1899: 480 (description); Jordan and Snyder, 1902: 488 (description); Schmidt, 1904: 178 (description); Soldatov and Lindberg, 1930: 447 (description); Taranetz, 1937: 154 (listed); Matsubara, 1955: 761 (key).

Opisthocentrus dybowskii: Makushok, 1958: 61, 93 (listed); Ueno, 1966: 479 (key); Arai and Abe, 1973: 210, p1. 16, fig. 1 (listed); Lindberg and Krasnyukova, 1975: 108, fig. 84 (description).

Specimens examined. ACAP 444–449; 6 specimens; 144–223 mm; Wakkanai (northern Hokkaido). HUMZ 36992, 36996, 41298, 57573, 57576, 57577, 57579–57581, 57583, 57588–57591, 57597, 57602–57607, 57609, 57844, 57845, 58295, 58299, 58300, 58304–58306, 58308, 58396, 62511, 62516,

Table 1. Counts and measurements in the species of *Pholidapus* and *Opisthocentrus*. Modes are shown in parentheses. Numbers of specimens for each count are shown with asterisks.

Characters	<i>Pholidapus dybowskii</i>	<i>Opisthocentrus zonope</i>	<i>Opisthocentrus ocellatus</i>	<i>Opisthocentrus tenuis</i>
* Number of specimens measured	10	10	14	10
Range of SL (mm)	116–246	93–115	111–182	135–158
In SL:				
Head	5.2–5.9	5.0–5.5	5.5–6.9	5.2–6.0
Body depth	5.3–6.6	5.2–6.3	6.5–7.8	6.7–7.8
In HL:				
Snout	3.3–5.2	3.9–5.3	3.6–5.0	3.7–4.6
Interorbital width	3.5–4.8	3.8–5.3	3.8–4.8	4.5–5.9
Eye diameter	4.2–5.3	3.8–4.5	4.1–5.1	4.6–5.3
Pectoral	1.3–1.6	1.3–1.6	1.3–1.5	1.7–2.1
Caudal peduncle depth	2.3–2.8	2.5–3.5	2.1–2.6	2.4–2.9
Longest dorsal spine	2.2–3.4	2.0–2.7	♂ 1.1–1.7 ♀ 2.4–2.6	2.5–3.0
Counts:				
Dorsal fin	LXI–LXIII (LXII) 20*	LI–LIII (LII) 40*	LV–LX (LVIII) 81*	LIX–LXII (LX) 185*
Anal fin	II, 38–40 (39) 20*	II, 30–33 (32) 40*	II, 33–36 (34, 35) 81*	II, 35–39 (37) 183*
Pectoral fin	18–19 (18) 10*	19–21 (20) 35*	18–21 (20) 35*	18–21 (20) 61*
Caudal fin	15 (8/7) 10*	15 (8/7) 36*	15 (8/7) 81*	15 (8/7) 43*
Ventral fins	absent	absent	absent	absent
Vertebrae	22–24 + 43–44 = 66–68, 18*	19–20 + 37–38 = 57–58 (57) 29*	21–23 + 39–42 = 61–66 (63) 81*	22–23 + 41–44 = 64–67 (65) 182*
Gill rakers	4–7 + 13–15 = 17–21, 11*	4–5 + 9–11 = 13–16, 6*	4 + 11–12 = 15–16, 5*	5 + 12–14 = 16–19, 6*
Pungent spines in D.	numerous but ill defined, 15*	8–12 (10) 11*	7–12 (9) 81*	11–17 (14) 131*
Dorsal ocelli	0–5 (1) 84*	4–5 (4) 48*	5–7 (5) 115*	5–8 (6) 414*
Scales on head	absent	present	present	present
Vomerine teeth	present	absent	present	present

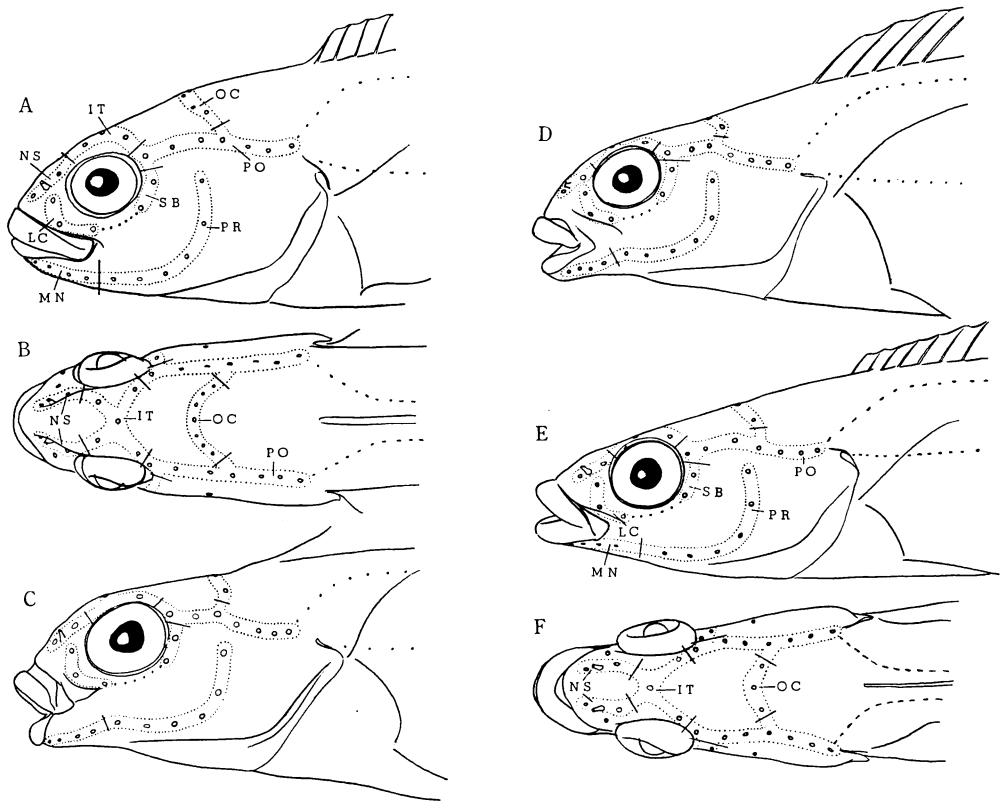


Fig. 2. Arrangements of head sensory canals in the species of *Pholidapus* and *Opisthocentrus*. A, B, *Pholidapus dybowskii*; C, *Opisthocentrus zonope*; D, *Opisthocentrus ocellatus*; E, F, *Opisthocentrus tenuis*. IT, interorbital canal; LC, lachrymal canal; MN, mandibular canal; NS, nasal canal; OC, occipital canal; PO, postorbital canal; PR, preopercular canal; SB, suborbital canal. Openings of the sensory canals are indicated as open circles and pit organs as small dots. The separation of each canal is shown by short cutting lines.

69073-69075, 69285-69297, 69306, 69307, 69309, 69870, 70809, 72297, 75529, 75845, 80735, 80736, 80899-80901, 80905, 86908-86916; 73 specimens; 80-272 mm; Rakuma, Ohdomari (Sakhalin); Rishiri I., Wakkanai, Usujiri, Muroran (Hokkaido); Etorofu I., Kuril Is.

Diagnosis. Pelvic fin absent. Infraorbital sensory canal interrupted medially. Dorsal spines flexible anteriorly but less slender than those of *Opisthocentrus*; gradually stouter posteriorly; about posterior one third spines rigid and pungent (Fig. 1A). Interorbital sensory canal with five openings. Head naked. In dorsal fin, generally 1-2 black spots present, which are restricted to anterior part. Posterior-most tooth of upper jaw canine-like. Pectoral fin large, with numerous (18-19) rays; its length 1.3-1.6 in HL.

Description. Counts and proportional measurements are shown in Table 1. Body compressed and deep, its depth 5.3-6.6 in SL. Head moderate, its length 5.2-5.9 in SL. Snout short and blunt. Interorbital space fleshy and wide; its width equal to or larger than eye diameter.

Pectoral fin fan-like and large with numerous rays (18-19). Pelvic fin absent; pelvic girdle vestigial, single and slender. Dorsal fin low, originating from just above gill opening; its base long. End of dorsal fin clearly incised but continuous to caudal fin by membrane. Anal fin separated from caudal fin. Last interneural supporting 2 short spines; last interhaemal 2 rays. Anal fin low, with 2 slender spines; its origin a little anterior to midpoint of body and opposite a vertical through 24-25th dorsal spine.

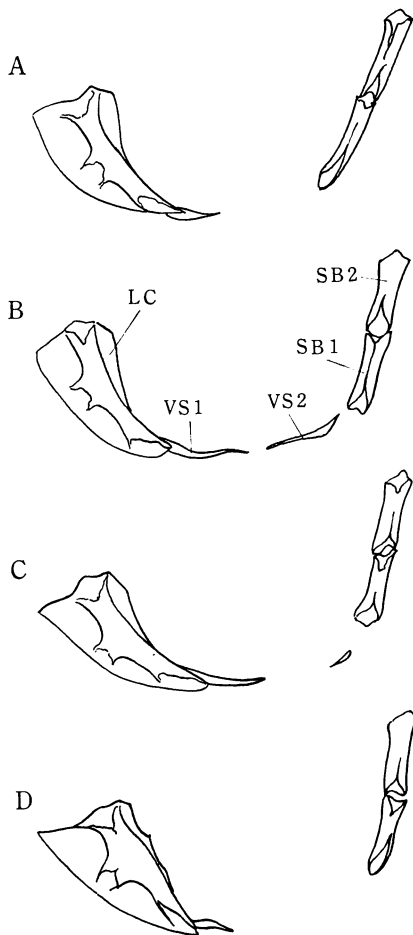


Fig. 3. Infraorbital bones in the species of *Pholidapus* and *Opisthocentrus*. A, *Pholidapus dybowskii*; B, *Opisthocentrus zonope*; C, *Opisthocentrus ocellatus*; D, *Opisthocentrus tenuis*. LC, lachrymal; SB, suborbitals; VS, vestigial suborbitals without sensory canals.

Distance from tip of snout to anal origin, 2.1–2.2 in SL.

Mouth small, protractile and oblique, with fleshy lips. Jaws subequal. End of maxillary just below anterior margin of eye. Gill membranes broadly united to each other and free from the isthmus. Head naked. Body and bases of vertical fins covered with small cycloid scales. Lateral line composed of median and upper branches of rows of pit organs; upper branch extending over anus; median one to cau-

dal base in straight line (Fig. 2).

Teeth on both jaws small, conical with rounded tips; 3–4 rows on upper jaw anteriorly but reduced to a single row posteriorly; a single row on lower jaw. Posteriormost tooth on upper jaw large and canine-like. Vomerine teeth small, 4–6 in number, arranged in a single transverse row. Palatines smooth. Gill rakers on outer row of 1st gill arch slender, 17–21; those on inner row of 1st gill arch and other arches blunt and short with many spinelets at tips. Pseudobranchiae present. Branchiostegals 5. Postcleithrum composed of a single slender element. Scapula and coracoid broad.

Infraorbital sensory canals interrupted. Only one vestigial suborbital bone, without canal, posterior to lachrymal bone (Fig. 3A). There are 5–6 pit organs in a line between the openings of lachrymal and suborbital canals. Other head sensory canals well developed. Nasal openings 2, interorbital 5, postorbital 7, infraorbital 5 (lachrymal 3, suborbital 2), preopercular 6 and mandibular 4. Occipital openings varying 3–10 (mostly 7) (Fig. 2A, B).

In dorsal fin, 0–5 (usually 1–2) black spots present, smaller than eye diameter and without white circles as those of ocelli in *Opisthocentrus* and restricted to anterior part (Table 2, Fig. 4); additional several obscure dark blotches larger than eye diameter following in an equal interval. On head, a crescent-like band connecting eyes on postorbital region, often interrupted medially; other two bars radiating ventrally from eye.

D LXI–LXIII, A II, 38–40, C 15, P 18–19. Vertebrae 66–68.

Color of fresh specimens: Body greenish to yellowish brown, with or without irregular longitudinal and vertical streaks, which tend to be obscure posteriorly and ventrally. Pectoral fin, ventral side of head and abdomen greenish to orange yellow. Caudal fin grayish orange with white margin; basal one third grayish. Dorsal fin brownish gray with several greenish black-blue spots. Anal fin greenish gray with white margin. Pectoral fin base dark brown.

Sexual dimorphism. Male during the spawning season: snout to postorbital region swollen; body color uniformly blackish brown with very distinct black spots on dorsal fin.

Distribution. As far north as Tartary Strait, Sakhalin; Peter the Great Bay; Wonson (Korea);

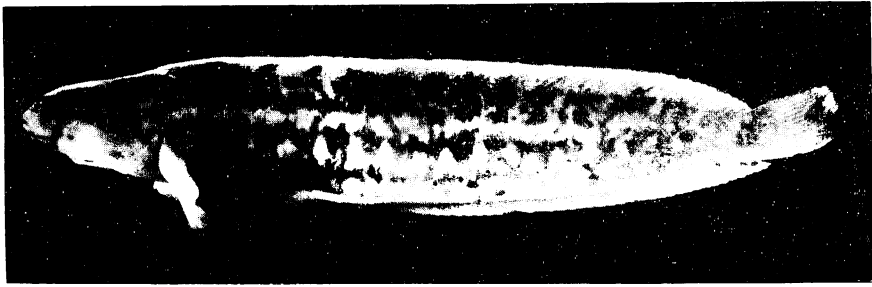


Fig. 4. *Pholidapus dybowskii*, female, HUMZ 57573. 140 mm SL, collected from Wakkanai, Hokkaido on June 7, 1978.

Wakkanai, Rishiri I., northern Hokkaido (Okhotsk Sea and Japan Sea). Volcano Bay to northeastern Hokkaido; Kuril Is. (Okhotsk Sea and western North Pacific).

***Opisthocentrus* Kner, 1868**

(Japanese name: Okikazunagi-zoku)

Opisthocentrus Kner, 1868: 341, type species: *Centronotus quinquemaculatus* Kner, 1868.

Blenniophidium Boulenger, 1892: 583, type species: *Belniophidium petropauli* Boulenger, 1892, by monotypy.

Diagnosis. Pelvic fin absent. Infraorbital sensory canal interrupted medially. Dorsal spines very slender and flexible but posterior 7–17 spines abruptly stout. Interorbital sensory canal with three openings. Head scaly. In dorsal fin, 4–8 ocelli present. No canine-like tooth on both jaws. Pectoral fin large or small, 1.3–2.1 in HL; with numerous (18–21) rays.

Description. Body compressed, its depth 5.2–7.8 in SL. Head length 5.0–6.9 in SL. Interorbital space flat; its width equal to eye

diameter. Caudal fin rounded. Paired or a single vestigial pelvic girdle remaining. Dorsal fin low or high in male of *O. ocellatus*, originating from just above gill opening; its base long. End of dorsal fin clearly incised but continuous to caudal fin by membrane. Anal fin separated from caudal fin. Last interneural supporting 2 short spines; last interhaemal 2 rays. Anal fin low, with 2 slender spines; its origin a little anterior to midpoint of body and opposite a vertical through 20–25th dorsal spines. Distance from tip of snout to anal origin, 2.1–2.2 in SL.

Mouth protractile and oblique, with fleshy lips. Jaws subequal. End of maxillary just below anterior margin of eye. Gill membranes broadly united to each other and free from the isthmus. Scales on head extending anteriorly to snout or beyond posterior end of eye. Body and bases of vertical fins covered with small cycloid scales. Lateral line composed of median and upper branches of rows of pit organs; upper branch extending over anus; median one to caudal base

Table 2. Frequency distribution in the number of dorsal ocelli in *Pholidapus* and *Opisthocentrus*. Localities: A, Mutsu Bay, Aomori; H, Hokkaido and P, Petropavlovski, Kamtchatka.

Number of ocelli	Species name	<i>Pholidapus dybowskii</i>	<i>Opisthocentrus zonope</i>	<i>Opisthocentrus ocellatus</i>			<i>Opisthocentrus tenuis</i>	
	Locality	H	A+H	A	H	P	A	H
0		3	0	0	0	0	0	0
1		40	0	0	0	0	0	0
2		27	0	0	0	0	0	0
3		8	0	0	0	0	0	0
4		5	47	0	0	0	0	0
5		1	1	74	20	8	23	5
6		0	0	3	3	6	253	97
7		0	0	0	0	1	28	6
8		0	0	0	0	0	2	0

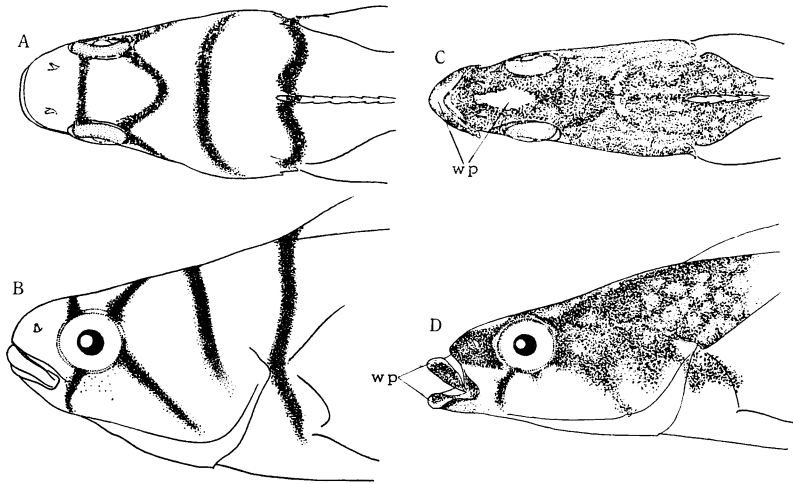


Fig. 5. Head zonation and coloration of *Opisthocentrus zonope* (A, B) and *Opisthocentrus tenuis* (C, D). wp, white patches.

in straight line (Fig. 2).

Teeth on both jaws small, conical with rounded tips. No canine-like teeth. Vomerine teeth small and few in a transverse row, or absent. Palatines smooth. Gill rakers on outer row of 1st gill arch slender, 13–21; those on inner row of 1st gill arch and other arches blunt and short with many spinelets at tips. Pseudobranchiae present. Branchiostegals 5. Postcleithrum composed of a single slender element. Scapula and coracoid broad.

Infraorbital sensory canals interrupted. One or two vestigial suborbitals without canal between lachrymal and postero-dorsal 2 normally developed suborbital bones (Fig. 3 B–D). There are 5–6 pit organs in a line between openings of lachrymal and suborbital canals. Other head sensory canals well developed and the number of openings in each canal consistent; nasal 2, interorbital 3, postorbital 7, infraorbital 5 (lachrymal 3, suborbital 2), occipital 3, preopercular 6 and mandibular 4 (Fig. 2C–F).

In dorsal fin 4–8 ocelli present (Table 2). Usually 2 dark bars radiating ventrally from eye (Fig. 5).

D LI–LXII, A II, 30–39, C 15, P 18–21. Vertebrae 57–67.

Opisthocentrus zonope Jordan et Snyder, 1902

(Figs. 1B; 2C; 3B; 5A, B; 6A, B)
(Japanese name: Oki-kazunagi)

Opisthocentrus quinquemaculatus: (non Kner, 1868) Steindachner, 1880: 262 (Decastris Bay: northern Tartary Strait; description).

Opisthocentrus zonope Jordan and Snyder, 1902: 485, fig. 21 (type locality: Muroran, Volcano Bay, Hokkaido); Soldatov and Lindberg, 1930: 444 (brief description); Taranetz, 1937: 153 (key); Ueno, 1954: 105 (counts and measurements); Matsubara, 1955: 760 (key); Ueno, 1966: 479 (key); Lindberg and Krasnyukova, 1975: 106, fig. 83 (key and brief description).

Specimens examined. ACAP 568–591; 24 specimens; 38–108 mm; Moura, Shirasu (Mutsu Bay, Aomori Pref.). HUMZ 4051, 4059–4069, 4071, 4072, 4079, 4102, 4150, 4152, 51213, 70211, 77991, 77992; 22 specimens; 61–114 mm; Rakuma (Sakhalin), Otaru, Oshoro, Muroran (Hokkaido). NSMT-P 17500–17502; 3 specimens; 58–121 mm; Otaru (Hokkaido).

Diagnosis. Vomerine teeth absent. Dorsal ocelli 4. On head to nape 4 distinct narrow bands. Teeth on upper jaw in 3–4 rows anteriorly. Dorsal spines LI–LIII. Body deep, its depth 5.2–6.3 in SL. Pectoral fin large, 1.3–1.6 in HL.

Description. Counts and proportional measurements are shown in Table 1. Body com-

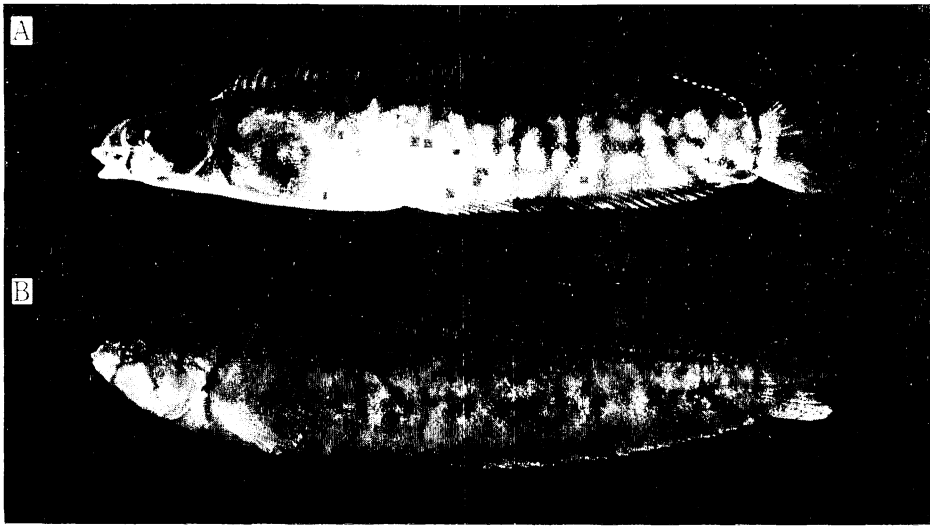


Fig. 6. *Opisthocentrus zonope*. A, gravid female, ACAP 590, 76 mm SL, collected from Moura, Mutsu Bay on Nov. 10, 1978. B, female, ACAP 570, 95 mm SL, collected from the same locality on June 14, 1974.

pressed and deep; head moderate. Snout blunt and short, equal to eye diameter.

Pectoral fin large and rounded. Dorsal fin moderate in height; its spines very slender and flexible; posterior 8–12 spines abruptly stout (Fig. 1B), and margin of posterior pungent spines slightly concave. Anal fin low; its origin opposite a vertical through 20–21st dorsal spine.

Teeth on upper jaw in 3–4 rows anteriorly and 1–2 rows on lower jaw anteriorly. Vomer and palatines toothless. Scales on head extending anteriorly to snout.

Dorsal ocelli 4–5, mostly 4 (Table 2), larger than eye diameter except posteriormost one; distance between origin of dorsal fin and 1st ocellus equals head length.

Four bands on head to nape; 2 bars radiating ventrally from eye (Fig. 5A, B).

Two vestigial ossicles between lachrymal and postero-dorsal 2 postorbitals; each bone without sensory canal, elongate and relatively large (Fig. 3B). Pelvic bones vestigial, slender and fused medially.

Color of fresh specimens: Body greenish to yellowish brown with numerous irregular narrow dark brown streaks and silvery white spots smaller than eye diameter (Fig. 6B); sometimes vertical streaks forming irregular reticulations (Fig. 6A). A vertical dark brown band on cau-

dal fin base. Pectoral, caudal and anal fins orange-yellow. Belly white. Dorsal ocelli brownish black, tinted orange dorsally, margined with white circles. Dorsal fin membrane mottled.

Distribution. Sakhalin. Hokkaido, Aomori Pref. (Northern Japan). Oliga Bay, Peter the Great Bay (North-western Japan Sea).

***Opisthocentrus ocellatus* (Tilesius, 1811)**
(Figs. 1C; 2D; 3C; 7A, B)
(Japanese name: Genna)

Ophidium ocellatus Tilesius, 1811: 237, pl. 8, fig. 2 (type locality: Kamtchatka).

Gunnellus apos Valenciennes, 1836: 426 (after Tilesius).

Centronotus apus: Günther, 1861: 288 (after Tilesius; listed).

Centronotus quinqueaculatus Kner, 1868: 340, pl. 7, fig. 20 (type locality: Pinang or Singapore. According to Steindachner (1880), actual type locality is Decastris Bay, northern Tartary Strait).

Opisthocentrus reticulatus Steindachner, 1881: 189, pl. 5, fig. 2 (type locality: Japan Sea).

Blenniophidium petropauli Boulenger, 1892: 584, fig. (type locality: Kamchatka).

Opisthocentrus quinqueaculatus: Bean and Bean, 1896: 391, pl. 35 (listed).

Opisthocentrus ocellatus: Jordan and Evermann, 1898: 2429 (description); Jordan and Gilbert, 1899: 480, pl. 79 (listed); Jordan and Snyder, 1902:

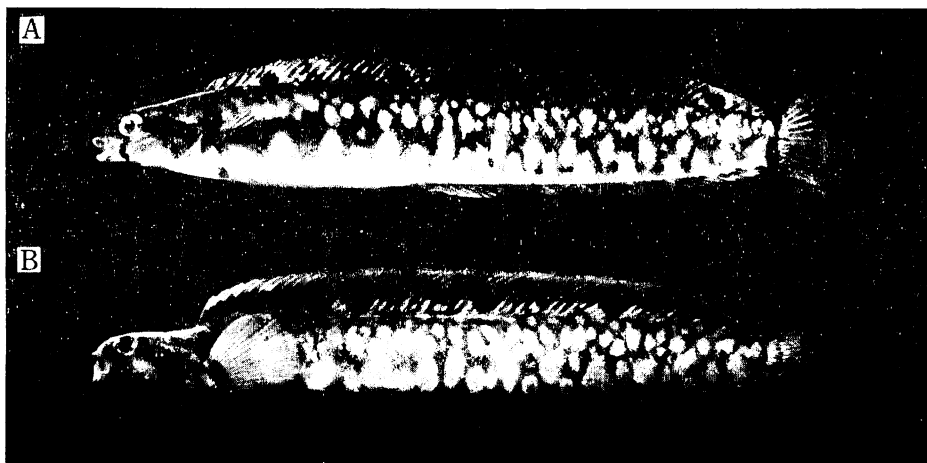


Fig. 7. *Opisthocentrus ocellatus*. A, mature female, ACAP 477, 141 mm SL, collected from Moura, Mutsu Bay on Nov. 2, 1978. B, mature male, ACAP 480, 135 mm SL, collected from Noheji, Mutsu Bay on Nov. 25, 1978.

483, fig. 20 (description); Schmidt, 1904: 180 (brief description); Soldatov and Lindberg, 1930: 443 (listed); Taranetz, 1937: 154, fig. 93 (listed); Schmidt, 1950: 76 (listed); Ueno, 1954: 105 (in part; counts and measurements); Matsubara, 1955: 760, fig. 279 (in part; key); Ueno, 1966: 479 (in part; key); Arai and Abe, 1973: 210, pl. 16, fig. 2 (listed, with brief misleading comment on identity of *O. ocellatus* and *O. zonope*); Lindberg and Krasnyukova, 1975: 105, fig. 81 (key and description).

Opisthocentrus ochotensis Ueno, 1954: 103, fig. 3 (type locality: off Monbetsu, Hokkaido; based on nuptial colored male).

Specimens examined. ACAP 475–559, 84 specimens; 30–157 mm; Moura, Higashitazawa, Shirasu, Noheji, (Mutsu Bay, Aomori Pref.). HUMZ 15550, 36968, 36969, 50586, 64718, 64719, 70208–70210, 75536, 75846, 77514, 77725–77730, 78020, 78021, 82053–82055; 23 specimens; 58–189 mm; Rakuma (Sakhalin); Volcano Bay, off Erimo Pen. (335 m deep), Akkeshi Bay, Odaito (Hokkaido). NUSMBS (not numbered); 1 specimen; 133 mm; Sado I. (Niigata Pref.). USNM 33848 (1), 33859 (3), 38937 (3), 38958 (8); 15 specimens; 60–141 mm; Petropavlovski (Kamchatka).

Diagnosis. Vomerine teeth present. Dorsal ocelli mostly 5, larger than eye diameter except posteriormost one. On head to nape 2–4 very narrow bands; posterior 2 obscure or absent. Teeth on upper jaw in 2–3 rows anteriorly. Dorsal spines LV–LX. Body slender, its depth 6.5–7.8 in SL. Pectoral fin large, its length

1.3–1.5 in HL.

Description. Counts and proportional measurements are shown in Table 1. Body compressed and slender, head small. Snout blunt and short, equal to eye diameter.

Pectoral fin large and rounded. Dorsal spines very slender and flexible; posterior 7–12 spines abruptly stout (Fig. 1C), and margin of posterior pungent spines slightly concave. Anal fin low; its origin opposite a vertical through 21st–23rd dorsal spine.

Teeth in a single row on both jaws except anterior part of upper jaw (in 2–3 rows). Vomerine teeth small and 5–6 in a transverse row; palatines toothless. Scales on head extending anteriorly to interorbital region.

Dorsal ocelli 5–7, mostly 5 (Table 2) and each ocellus situating at similar interval. Bands on head to nape 4, similar to those of *O. zonope*; anteriormost one straight, connecting eyes on interorbital region; 2nd one crescent-like, connecting eyes on postorbital region; 3rd one short, on occipital region, interrupted medially; 4th one just crossing the origin of dorsal fin and reaching to pectoral fin base. In specimens of southern Hokkaido and Aomori Pref., 3rd band absent and 4th one rarely present. Two bars radiating ventrally from eye.

Two vestigial ossicles between lachrymal and 2 postero-dorsal suborbitals; posterior one especially small (Fig. 3C). Pelvic bones composed

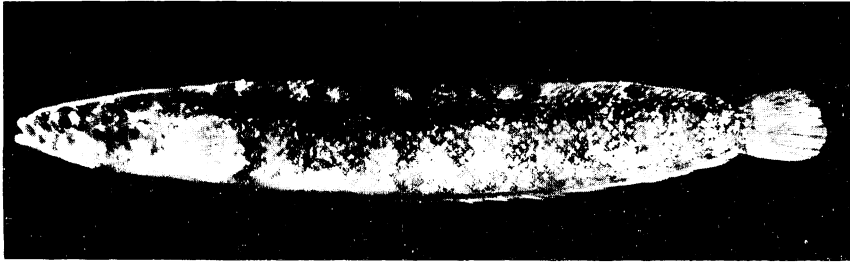


Fig. 8. *Opisthocentrus tenuis*, female, ACAP 635, 117 mm SL, collected from Moura, Mutsu Bay on Nov. 10, 1978.

of a slender vestigial pair, not fused medially.

Color of fresh specimens: Body greenish to yellowish brown, with numerous rounded yellowish pale mottlings and reticulations. Pectoral, caudal and anal fins orange yellow. Caudal fin base dark brown. Dorsal ocelli brownish black, with marginal white circles.

Sexual dimorphism. In matured male, dorsal fin highly prolonged except posterior pungent spines; longest spine 1.1–1.7 in HL; in female, dorsal fin not prolonged and its longest spine 2.4–2.6 in HL. Characteristic nuptial coloration in male is: body reticulations disordered to form irregularly arranged large, oblong, reddish orange blotches; distal half of dorsal fin deep bluish black margined reddish orange, screening distal halves of ocelli; basal half scattered with small orange mottles. Anal fin also deep bluish black. Pectoral and caudal fins remaining orange yellow. Ventral sides of lower jaw white in contrast to reddish orange lateroventral side of head.

Distribution. As far north as Komandorski Is., Kamtchatka; Sakhalin, Kuril Is., Hokkaido (Bering and Okhotsk seas). Tartary Strait, Peter the Great Bay, Hokkaido, Aomori Pref., Sado I., Niigata Pref., Toyama Pref.; Wonsan, Korea (Japan Sea). Aomori Pref., Hokkaido (western North Pacific Ocean).

Opisthocentrus tenuis Bean et Bean, 1897

(Figs. 1D; 2E, F; 3D; 5C, D; 8)

(Japanese name: Hanajiro-gaji)

Opisthocentrus quinquemaculatus (?): Bean and Bean, 1896: 391 (listed with brief description.

Material with the same scientific name without (?) on the same page are referable to *O. ocellatus*).

Opisthocentrus tenuis Bean and Bean, 1897: 463, pl. 35 (type locality: Muroran, Volcano Bay, Hok-

kaido).

Opisthocentrus ocellatus: Ueno, 1954: 105 (in part; counts and measurements); Matsubara, 1955: 760 (in part, key); Ueno, 1966: 479 (in part, key); Abe and Arai, 1968: 149 (listed: specimens examined by the present author).

Specimens examined. USNM 47565, holotype; 130 mm; Muroran (Volcano Bay, Hokkaido), (radiographs and photos examined). ACAP 599–932; 334 specimens; 30–166 mm; Yomogita, Moura, Shirasu, Kominato (Mutsu Bay, Aomori Pref.). HUMZ 4166, 4168–4170, 4172–4176, 4179–4182, 4184–4186, 4188, 4189, 4209, 17529, 18038, 18040, 18041, 19471, 51177–51180, 51182, 51183, 51185–51206, 51208–51212, 52899, 53051, 54412, 57567, 57568, 57574, 57575, 57578, 57582, 57584–57586, 57592–57596, 57598–57601, 57608, 57610, 57612, 58297, 58298, 58301–58303, 58307, 58310, 58394, 58395, 63532–63534, 68188, 68189, 68191, 69005, 69488, 70512–70514, 70775, 72298–72301; 106 specimens; 45–179 mm; Rishiri I., Okushiri I., Wakanai, Oshoro, Fukuyama, Moheji, Hakodate, Shirikishinai, Usujiri (Hokkaido). NSMT-P 5002, 5067, 5077–5086, 5117, 5119–5130, 17505–17516; 36 specimens; 61–137 mm; Otaru (Hokkaido); Taneichi, Miyako Bay, Yamada Bay (Iwate Pref.). NUSMBS (not numbered); 3 specimens; 36–121 mm; Tassya (Sado I., Niigata Pref.).

Diagnosis. Vomerine teeth present. Dorsal ocelli mostly 6, smaller than eye diameter. On head to nape no distinct bands. White patches on snout and tips of both jaws. Teeth on upper jaw villiform, in 5–6 row anteriorly. Dorsal spines LIX–LXII. Body slender, its depth 6.7–7.8 in SL. Pectoral fin small, its length 1.7–2.1 in HL.

Description. Counts and proportional measurements are shown in Table 1. Body highly compressed and slender. Head small. Snout sharp and short, its length equal to eye diameter.

Pectoral fin small. Dorsal and anal fins low. Dorsal spines very slender and flexible in anterior part; posterior 11–17 spines abruptly stout (Fig. 1D), and margin of posterior pungent spines slightly concave. Anal origin opposite a vertical through 22nd–24th dorsal spine.

Anterior teeth on upper jaw small, conical, closely set in 5–6 rows. Lower jaw teeth in 2–3 rows anteriorly; in a single row posteriorly. Vomerine teeth small, 6–9 in a transverse row. Palatines toothless. Snout and interorbital region scaleless.

Dorsal ocelli 5–8, mostly 6 (Table 2), margined with white circles, smaller than eye diameter; each ocellus situated at similar interval.

No bands on head to nape. Two bars radiating ventrally from eye; anterior one directly downward; posterior one obscure and oblique (Fig. 5C, D).

One or two vestigial ossicles between lachrymal and postero-dorsal postorbitals; posterior one very small or absent (Fig. 3D). Pelvic bones, a vestigial pair of slender elements.

Color of fresh specimens: Body greenish to yellowish brown, with numerous pale mottles of size of pupil. On body, sometimes 9–10 obscure broad vertical dark bands appeared. Pectoral and anal fins orange yellow. Abdomen white. Lower pectoral base silvery white. Cheeks white with faint mottlings.

Distribution. Rishiri I., Okushiri I. Wakkanai to south-western Hokkaido (not found from Okhotsk Sea coast). Whole coast of Aomori Pref. and Iwate Pref. (North-western Pacific Ocean). Sado I., Niigata Pref. (Japan Sea).

Sexual dimorphism. In mature males, dorsal and anal fins and body blackish brown, and no prolonging of dorsal spines, as those of *O. ocellatus*.

Remarks. Counts of the holotype given by Bean and Bean (1897) are corrected as follows; D LIX (instead of 39, XV), A II, 36 (instead of 38).

Discussion

In the series of three species of *Opisthocentrus*, *O. zonope*, *O. ocellatus*, *O. tenuis*, graduated increase of numbers of dorsal and anal fin rays, vertebrae, dorsal ocelli, and pungent spines in the posterior dorsal fin occurs with elongation of body. Paralleling with the order of above

series, vestigial suborbitals, which are present between lachrymal and last two well developed suborbitals, reduce their number and size; scaled area on head also retire backward. *O. zonope* is, however, specialized in the absence of vomerine teeth and having a reduced single pelvic bone.

The genus *Pholidapus* is closely related with *Opisthocentrus* in reduction of anterior suborbitals, accompanied with interrupted infraorbital sensory canal; loss of pelvic fins.

The less flexible anterior dorsal spines, more numerous openings in interorbital and occipital canals and the presence of canine-like teeth on upper jaw in the genus *Pholidapus* suggest the genus to be more primitive than *Opisthocentrus*.

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- ムロランギンボ属およびオキカズナギ属魚類の分類学的再検討
- 塩垣 優
- タウエガジ科 Stichaeidae のオキカズナギ亜科 Opisthocentrinae 魚類のうち、分類学的混乱の大きいムロランギンボ属 (*Pholidapus* Bean et Bean) とオキカズナギ属 (*Opisthocentrus* Kner) 魚類の再検討を行った。*Opisthocentrus* 属のシノニムとされてきた *Pholidapus* 属は独立属として認めることが妥当と考えられる。
- Pholidapus* にはムロランギンボ *P. dybowskii* 1 種を、*Opisthocentrus* にはオキカズナギ *O. zonope*, ゲンナ *O. ocellatus*, ハナジロガジ *O. tenuis* の 3 種を認めた。*O. tenuis* Bean et Bean はこれまで *O. ocellatus* のシノニムとされてきたが、筆者はこれを有効種と認めた。これら 2 属 4 種の再記載を行い、検索表を与えた。
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