

Cabillus pexus, a New Marine Goby (Teleostei, Gobiidae) from Amami-oshima Island, Ryukyu Islands, Japan

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Abstract A new species of gobiine goby, *Cabillus pexus*, is described based on two specimens (15.5 mm and 22.4 mm in standard lengths) from Amami-oshima Island, Amami Group of the Ryukyu Islands, Japan. The species is readily distinguished from congeners (except for *Cabillus caudimacula* from the Hawaiian Islands) by having a pair of modified scales with enlarged ctenii at the base of the caudal fin. *Cabillus pexus* differs from *C. caudimacula* in having: five predorsal scales in adults (vs. predorsal scales absent in *C. caudimacula*); prepelvic area with cycloid scales (vs. naked); ctenoid scale area on side of body extending anteriorly to a vertical through base of third ray of second dorsal fin (vs. extending to a vertical through midbase of first dorsal fin); a narrow black transverse bar at base of caudal fin (vs. a distinctive, large dark blotch posteriorly on side of caudal peduncle and extending onto base of caudal fin); a prominent black submarginal spot at fin membrane between first and third spines of first dorsal fin (vs. prominent black spots absent); 1–2 + 4–5 gill rakers (vs. 1–2 + 2–3).

Key words: *Cabillus pexus*, new species, Gobiidae, Japan.

Introduction

Cabillus Smith, 1959 belongs to the gobiid subfamily Gobiinae (*sensu* Pezold, 1993), and comprises small (up to ca. 40 mm in standard length), cryptic bottom-dwelling gobies found in coral reefs and protected bays of the Indo-Pacific. The genus was described by Smith (1959) based on *Cabillus lacertops* Smith, 1959, and subsequently reviewed and re-diagnosed by Randall *et al.* (2007). The following five species were placed in *Cabillus* by Randall *et al.* (2007): *Cabillus atripelvicus* Randall, Sakamoto and Shibukawa, 2007; *Cabillus caudimacula* Greenfield and Randall, 2004; *Cabillus lacertops* Smith, 1959; *Cabillus macrophthalmus* (Weber, 1909); and *Cabillus tongarevae* (Fowler, 1927). *Cabillus anchialinae*, described by Klauswitz (1975) from the Red Sea, was regarded as a junior syn-

onym of *Coryogalops ocheitica* (Norman, 1927) by Goren (1985, as *Monishia ocheitica*). *Cabillus* can be distinguished from other gobiine genera by having the following combination of characters (Randall *et al.*, 2007; this study): 10 + 16 = 26 vertebrae; dorsal-fin pterygiophore pattern (“P–V” of Akihito *in* Akihito *et al.*, 1984) 3/II II I I 0/9; head depressed (i.e., width of head clearly greater than head depth); anterior margin of tongue emarginate; mental flap slightly developed and nearly rectangular; no fleshy barbel-like processes and ridges on head; gill opening restricted, ending at point equivalent to the lower edge of pectoral-fin base; no free pectoral-fin rays; all fin spines slender and flexible; pelvic fins united medially by thin frenum (between spines, often rudimentary or absent) and connecting membrane (between innermost rays); pelvic frenum with smooth and slightly concave poste-

rior margin; cephalic sensory canals well developed, with associated openings B', C(S), D(S), E, F, G, H', K', L', M', N and O' (pores K' and L' absent in some species); well-developed longitudinal pattern (*sensu* Hoese 1983) of sensory-papillae rows on cheek.

Three species of *Cabillus*, viz. *C. atripelvicus*, *C. lacertops* and *C. tongarevae*, were previously recorded from the Japanese waters (Hayashi *et al.*, 1981; Akihito *et al.*, 1984, 2013), although several additional unidentified species of the genus were photographed and/or collected from the region (Senou *et al.*, 2002, 2004; E. Katayama and H. Senou, pers. comm.). Herein we describe a new *Cabillus* species based on two specimens from Amami-oshima Island, Amami Group of Ryukyu Islands, Japan.

Materials and Methods

Specimens examined in this study are housed in the following institutions: Australian Museum, Sydney, New South Wales, Australia (AMS); Bishop Museum, Honolulu, Hawai'i, U.S.A. (BPBM); Kanagawa Prefectural Museum of Natural History, Odawara, Kanagawa, Japan (KPM); National Museum of Nature and Science, Tsukuba, Japan (NSMT); Yokosuka City Museum, Yokosuka, Kanagawa, Japan (YCM); Zoological Museum Amsterdam, Amsterdam, Netherlands [ZMA, all fish collections are now housed in the Naturalis Biodiversity Center, Leiden, Netherlands (RMNH)].

All fish lengths given are standard lengths (SL). Measurements were made point-to-point with calipers under a dissecting microscope to the nearest 0.01 mm. The methods for measurements follow those of Hubbs and Lagler (1958), with exceptions given below (the snout tip refers to the mid-anteriormost point of the upper lip); interorbital width is the least width between innermost fleshy rims of right and left eyes; jaw length is measured between the snout tip and the posteriormost point of lip; head width and depth are measured at preopercular margin; body depth is measured in three ways, one at the origin of

first dorsal fin, one at the origin of pelvic fin, and the other at the origin of anal fin; nape width is measured between dorsalmost ends of gill openings; preanal and prepelvic lengths are measured from the snout tip to the origin of each fin; pectoral-fin length is measured from the base to the tip of the longest ray; pelvic-fin length is measured between the base of pelvic-fin spine and the distal tip of the longest segmented ray; heights of pelvic-fin frenum and connecting membrane are least heights; lengths of fin spines and rays are measured between the base to distal tip of each ray. Methods for counts follow Akihito *in* Akihito *et al.* (1984), except for the following: longitudinal scale count is the number of oblique (anterodorsal to posteroventral) scale rows and is taken from just dorsal to the upper attachment of the opercular membrane posteriorly to the mid-base of caudal fin; three methods of transverse scale count are taken (see descriptive accounts); circumpeduncular scale count is the number of scales along a zigzag vertical line through the narrowest point of the caudal peduncle; gill rakers are counted on the outer side of first arch, including all rudiments; count of pseudobranchial filaments includes all rudiments. Pectoral and branched caudal-fin rays are counted and numbered from dorsal to ventral. Scales (except for predorsal and circumpecuncular scales) and paired-fin rays are counted bilaterally; the values are separated by a slash, the first value representing the count of the left side. Osteological features are observed from radiographs. The methods of Akihito *in* Akihito *et al.* (1984) are used in describing the pattern of interdigitation of the dorsal-fin pterygiophores between the neural spines ("P-V"). Cephalic sensory canals and papillae are observed on specimens stained with cyanine blue, and their notations follow Akihito *in* Akihito *et al.* (1984) and Sanzo (1911), respectively.

Cabillus pexus sp. nov.

[New Japanese name: Kushi-yorime-haze]

(Figs. 1–4)

Holotype. NSMT-P 34861, female, 22.4 mm SL, Oshima Strait, Sakinome, Atetsu, Setouchi-cho, Amami-oshima Island, Amami Group of Ryukyu Islands, Japan (28°11'13"N, 129°16'04"E), 12 m depth, 16 June 1991, collected by M. Aizawa.

Paratype. NSMT-P 34803, juvenile (sex indeterminate), 15.5 mm SL, Oshima Strait, Sokari, Setouchi-cho, Amami-oshima Island, Amami Group of Ryukyu Islands, Japan (28°7.6'N, 129°21.2'E), 12 m depth, 11 June 1991, collected by M. Aizawa.

Diagnosis. *Cabillus pexus* is readily distinguished from congeners except for *Cabillus caudimacula* by having a pair of modified scales with enlarged ctenii at the base of the caudal fin

(Fig. 3). *Cabillus pexus* differs from *C. caudimacula* in having: five predorsal scales in adults (vs. predorsal scales absent in *C. caudimacula*); prepelvic area with cycloid scales (vs. naked); ctenoid scale area on side of body extending anteriorly to a vertical through base of third ray of second dorsal fin (vs. extending to a vertical through midbase of first dorsal fin); a narrow black transverse bar at base of caudal fin (vs. a distinctive, large dark blotch posteriorly on side of caudal peduncle and extending onto base of caudal fin); a prominent black submarginal spot at fin membrane between first and third spines of first dorsal fin (vs. prominent black spot absent); 1–2 + 4–5 gill rakers (vs. 1–2 + 2–3).

Description. In the following description, the counts of the holotype (NSMT-P 34861) are given first, followed by the counts of the paratype (NSMT-P 34803) in parenthesis. Dorsal-fin rays VI-I, 9 (VI-I, 9); anal-fin rays I, 8 (I, 8); pec-

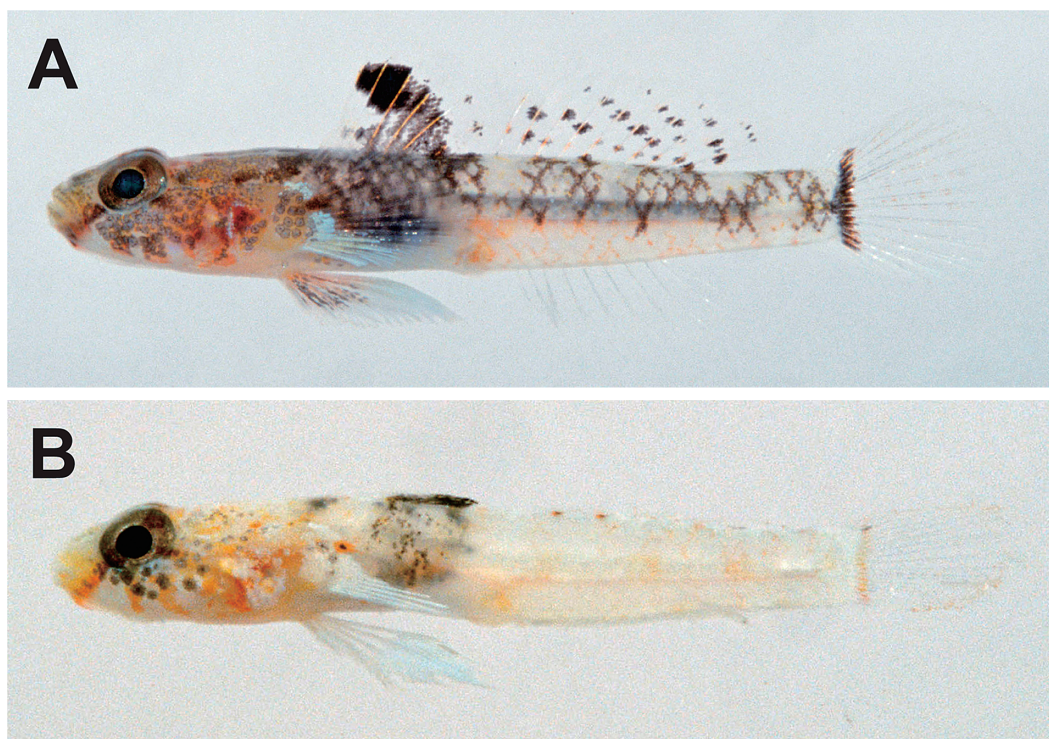


Fig. 1. Lateral view of freshly-collected specimens of *Cabillus pexus* sp. nov. from Amami-oshima Island, Amami Group of Ryukyu Islands, Japan. — A) Holotype, NSMT-P 34861, female, 22.4 mm SL; B) paratype, NSMT-P 34803, sex indeterminate, 15.5 mm SL. Photo by M. Aizawa.



Fig. 2. Lateral (top), dorsal (middle) and ventral (bottom) views of holotype of *Cabillus pexus* sp. nov. (NSMT-P 34861, female, 22.4 mm SL) in 70% ethanol-preserved condition. — Photo and image editing by K. Shibukawa.

toral-fin rays 17/17 (17/17); pelvic-fin rays I, 5/I, 5 (I, 5/I, 5); segmented caudal-fin rays 9 + 8 (9 + 8), all of which branched except for two (two) and one (broken) upper and lower unbranched rays, respectively; upper unsegmented caudal-fin rays 4 (5); lower unsegmented caudal-fin rays 4 (5); longitudinal scales 26/26 (24 + /24 +); transverse scales from anal-fin origin upward and forward to base of first dorsal fin 10/10 (10/9); transverse scales from anal-fin origin upward and backward to base of second dorsal fin 8/7 (8/8); transverse scales from second dorsal-fin origin downward and backward to anal-fin base 8/8 (8/8); predorsal scales 5 (0, see "Remarks" below); circum-peduncular scales 12 (12); gill rakers on outer surface of first arch 2 + 4 (1 + 5); pseudobranchial

filaments 4 (5); vertebrae 10 + 16 = 26; P–V 3/II II I I 0/9; epural 1; anal-fin pterygiophores anterior to first haemal spine 2.

The following measurements are % of SL (the data of the paratype in parenthesis following the data of the holotype): head length 34.5 (35.5); head width 22.0 (19.8); head depth 16.1 (15.1); snout length 7.5 (7.4); eye diameter 9.3 (9.2); interorbital width 1.6 (1.3); nape width 16.9 (13.7); jaw length 12.4 (12.7); body depth at pelvic-fin origin 17.7 (14.4); body depth at origin of first dorsal fin 18.6 (114.3); body depth at origin of anal fin 15.9 (13.5); body width 13.7 (10.6); predorsal length 39.5 (40.0); prepelvic length 32.1 (31.9); preanal length 59.2 (61.4); caudal-peduncle length 23.0 (20.8); caudal-peduncle

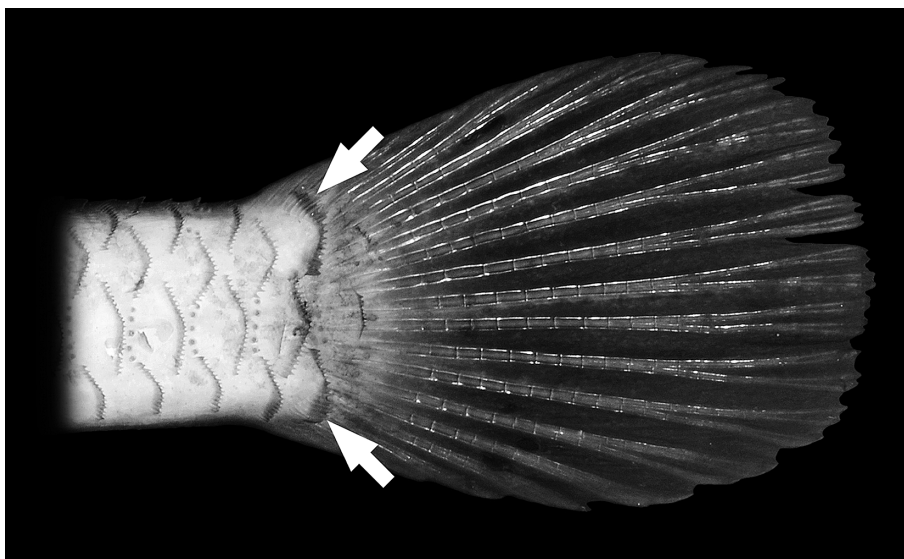


Fig. 3. Close up of caudal peduncle and caudal fin of holotype of *Cabillus pexus* sp. nov. (NSMT-P 34861, female, 22.4 mm SL), temporary stained with cyanine blue. — Arrows show enlarged ctenii of upper and lower scales at base of caudal fin. Photo and image editing by K. Shibukawa.

depth 10.8 (8.8); length of first dorsal-fin base 20.8 (19.9); length of second dorsal-fin base 26.2 (22.6); length of anal-fin base 20.2 (18.8); pectoral-fin length 22.6 (23.8); pelvic-fin length 25.0 (28.2); length of first spine of first dorsal fin 12.5; length of second spine of first dorsal fin 14.6; length of third spine of first dorsal fin 14.6; length of fourth spine of first dorsal fin 14.2; length of spine of second dorsal fin 11.7; length of first segmented ray of second dorsal fin 14.5; length of longest (= seventh) segmented ray of second dorsal fin 16.9; length of anal-fin spine 7.7; length of first segmented ray of anal fin 10.0; length of longest (= seventh) segmented ray of anal fin 16.3; length pectoral fin 22.6; length of pelvic fin 25.0; length of pelvic-fin spine 7.9; length of first segmented ray of pelvic fin 11.8; length of fourth segmented ray of pelvic fin 24.0; length of fifth segmented ray of pelvic fin 23.7; length of caudal fin 27.5.

Body moderately elongate, subcylindrical anteriorly and compressed posteriorly. Head depressed, its depth 73.2% (76.1% in paratype specimen) of its width. Eye large, its diameter longer than snout length. Interorbital space nar-

row, its width narrower than pupil diameter. Mouth oblique, forming an angle of about 30 degrees with body axis. Jaws subequal; posterior end of jaws extending to, or slightly beyond, a vertical line through anterior margin of pupil. Anterior naris a short tube without skin flap. Posterior naris a pore, closer to eye than anterior naris. Gill opening restricted, ending at a level of lower edge of pectoral-fin base; upper edge of gill opening on fleshy pectoral-fin base, reaching dorsally to a horizontal line through base of third (fifth in non-type specimen) pectoral-fin ray. Gill membranes broadly attached to isthmus. Lower half (two-fifth in paratype specimen) of ventral arm of first gill arch connected to lateral wall of buccal cavity by well-developed membrane. Gill rakers on outer surface of first gill arch reduced, short and well-spaced. No fleshy papilla-like projection on lateral margin of lateral wing of cleithrum. Tongue free from floor of mouth, with emarginate anterior margin. Mental flap on chin slightly developed and nearly rectangular, but not projecting posteriorly.

Origin of first dorsal fin posterior to a vertical through posterior edge of base of pelvic fin; no

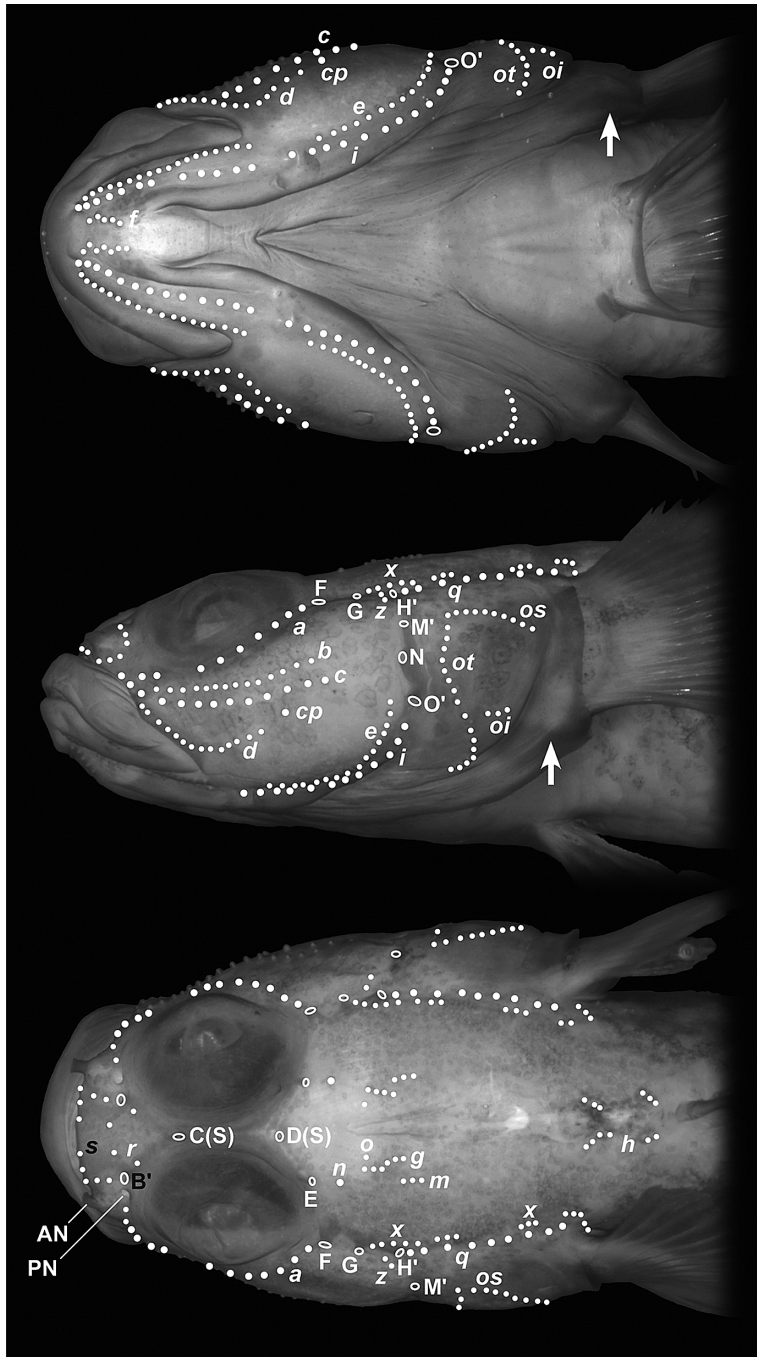


Fig. 4. Dorsal (top), lateral (middle) and ventral (bottom) views of head of *Cabillus pexus* sp. nov. (NSMT-P 34861, holotype, female, 22.4 mm SL), showing cephalic sensory canal pores (indicated by roman uppercase letters, except for AN and PN) and papillae (indicated by roman lowercase letters). — AN and PN, anterior and posterior nares, respectively. Arrows show position where gill membrane attached to isthmus. Photo and image editing by K. Shibukawa.

filamentous spines in first dorsal fin; second or third spine longest; when adpressed, distal tip of first dorsal fin extending slightly beyond base of spine of second dorsal fin; dorsal fins continuous via very low connecting membrane in holotype. All segmented rays of anal and second dorsal fins branched in holotype (anterior rays may be unbranched in paratype specimen); when adpressed, distal tips of second dorsal and anal fins not reaching to procurvent rays of caudal fin; seventh ray longest in second dorsal and anal fins each in holotype; anal-fin origin at a vertical line between first and second rays of second dorsal fin. Pectoral fin extending posteriorly to a vertical line through base of spine of second dorsal fin; twelfth ray longest; all pectoral-fin rays branched. Pelvic fins fused medially by well-developed frenum (between spines) and connecting membrane (between innermost rays); pelvic frenum with slightly concave and smooth posterior margin; height of pelvic frenum 8.4% of pelvic-fin length in holotype. Caudal fin elliptical, shorter than head (its length 79.8% of head length in holotype).

Scales on body cycloid anteriorly, ctenoid posteriorly; ctenoid-scale area narrowing anteriorly and wedge-shaped, extending to a vertical through third ray of second dorsal fin; a pair of scales with enlarged ctenii on dorsal and ventral part of base of caudal fin in holotype (Fig. 3, see also "Remarks" below); scales on predorsal midline embedded under mucus layer extending anteriorly to a vertical line through posterior part of operculum in holotype; prepelvic scales embedded under mucus layer, extending anteriorly slightly beyond a vertical through preopercular margin; head, anterior part of nape and pectoral-fin base naked.

All teeth in both jaws unicuspid, slender and inwardly-curved. Upper jaw with four rows of teeth anteriorly, narrowing to single row posteriorly. Lower jaw with four rows of teeth anteriorly, narrowing to single row posteriorly. Teeth on outermost row largest in upper jaws; outermost and innermost row of teeth larger than teeth on middle rows. No enlarged canine-like teeth in

either jaw. No teeth on vomer or palatine.

Cephalic sensory systems are shown in Fig. 4; anterior oculoscapular canal with pores B', C (S), D (S), E, F, G, and H'; posterior oculoscapular canal absent; preopercular canal with pores M', N, and O'; four long, essentially longitudinal sensory-papillae rows (= rows *a*, *b*, *c*, and *d*) on cheek; anterior end of row *a* reaching to a vertical line through anterior margin of pupil or anterior half of lens; rows *b* and *c* nearly parallel and very close together; row *cp* comprising a single sensory papilla; row *d* simple (not bifurcated ventrally), extending posteriorly to around a vertical line through posterior margin of pupil; rows *e* and *i* interrupted at midway; two parallel longitudinal rows of sensory papillae just behind chin (= row *f*).

Color when freshly-collected (Fig. 1). Freshly-collected coloration of the holotype (NSMT-P 34861, Fig. 1A) is as follows: ground color of head pale grayish brown dorsally, pale ventrally; most of cheek and operculum with clusters of diffuse melanophores; posterior part of cheek and operculum tinged with orange or pale orange; iris dark golden, with an oblique blackish brown band through pupil; this oblique band courses across the upper jaw and terminates at the lower jaw; ground color of body pale grayish and subtranslucent, a little darkened dorsally; edges of many scale pockets on midlateral and dorsal part of body dark blackish brown, forming four vague saddle-like blotches; anteriormost blotch below first dorsal fin, largest and most intense; scale pockets on ventral half of tail narrowly edged by orange, forming a faint reticulation; first dorsal fin with a broad translucent (possibly whitish) distal margin; a black spot as large as eye on fin membrane between first and fourth spines of first dorsal fin, continuous to a nearly triangular blackish gray blotch posteroventrally; small black spots at tip of fifth and sixth spine of first dorsal fin; second dorsal fin with about six oblique rows of small black spots; pectoral-fin base pale orange, with many large melanophores; basal part of pectoral fin with a bright white crescent-like marking, continuous to four lower-

most whitish rays; a dark brown elliptical spot at base of pectoral fin between fifth and eighth rays; pelvic fin whitish distally, grayish basally; a conspicuous, narrow vertical blackish bar with a short mid-anterior projection at base of caudal fin; other part of caudal fin and anal fin unpigmented.

Freshly-collected coloration of smaller specimen (paratype, Fig. 1B) is fairly similar to that of the holotype, but pigmentation of head and body is much reduced; for example, saddle-like blotches on tail are barely visible, and pelvic fin is entirely whitish.

Color in alcohol (Fig. 2). Similar to color when freshly-collected, except as follows: ground color of head and body pale yellow; all orange and whitish colors faded; vertical dusky bar at base of caudal fin faded in paratype specimen (although still vivid in holotype).

Distribution and habitat. *Cabillus pexus* is currently known only from two specimens, collected from the southwestern coast of Amami-oshima Island, Amami Group of Ryukyu Islands, Japan. Like its congener *C. tongarevae*, the two specimens of *C. pexus* were found amongst a pile of dead-coral rubble in coral reefs, although the depth (12 m) was greater than the typical habitat of *C. tongarevae* (usually less than 3 m).

Etymology. The new species is from the Latin noun “*pexus*” (meaning “comb”) in reference to its enlarged ctenii of a pair of scales at base of caudal fin.

Remarks. Of the six species of *Cabillus*, *C. pexus* and *C. caudimacula* are peculiar in having a pair of scales with enlarged ctenii at the base of the caudal fin (Fig. 3). The other four species have scales with moderately developed ctenii (similar to those of the other ctenoid scales) in the same position. *Cabillus pexus* is similar to *C. caudimacula* also in general appearance, but can be distinguished by some minor differences in coloration and squamation (see “Diagnosis” above). *Cabillus pexus* appears to be the larger species (the largest specimen examined, 22.4 mm SL); *C. caudimacula* reaches up to 18 mm SL (Greenfield and Randall, 2004).

The smaller specimen examined here (paratypes, NSMT-P 34803, 15.5 mm SL) is a juvenile, and the scales on anteriormost part of body appear to be not yet developed; no scales are found on the predorsal region in this specimen (although the prepelvic region is broadly scaled like the holotype). And, unfortunately, many scales on the posterior part of the body are missing, and the ctenii-condition of the scales at the caudal-fin base cannot be confirmed in this specimen. We identify here the specimen as *C. pexus* based on its overall coloration, meristic characters (other than predorsal scales), configuration of cephalic sensory canals and sensory papillae, and its collection locality.

Discussion

The six described species of *Cabillus* appear to be divided into two distinct subgroups. One (herein named as *C. atripelvicus* complex) comprises *C. atripelvicus*, *C. caudimacula*, *C. macrophthalmus* and *C. pexus*, and the other (*C. lacertops* complex) contains *C. lacertops* and *C. tongarevae*. The *C. atripelvicus* complex differs from the *C. lacertops* complex in the following features: a pair of longitudinal rows of sensory papillae just behind chin (= row *f*) (vs. a patch of sensory papillae or a short transverse row of sensory papillae and an additional 1–3 pairs of sensory papillae posterolateral to the transverse row); sensory-papillae row *cp* comprising a single papilla (vs. 2–4 papillae); posterior oculoscapular canal and associated pores K and L absent (vs. present in the *C. lacertops* complex); scales present in predorsal midline in many species (except for *C. caudimacula*) (vs. predorsal midline naked). Interrelationships of these two subgroups are currently unresolved; our research on comparative morphology/osteology is still premature, and hitherto no attempts to analyze the molecular phylogeny are known for species of *Cabillus*. A putative undescribed species from the Ryukyu Islands (Japan), Sulawesi Island (Indonesia) and the Marshall Islands (see “Comparative materials” below; photograph of the

Sulawesi specimen was provided by Kimura and Matsuura, 2003: 178, as *C. tongarevae*) possesses an intermediate condition of cephalic sensory systems between these two subgroups, and morphological characteristics that we know for several unidentified species from Japan (see "Introduction" above) are fragmentary. We, therefore, continue to assign all six described species to the genus *Cabillus* pending a phylogenetic analysis. A molecular analysis will help clarify species diversity of *Cabillus* as well as aid our understanding on systematics of these subgroups.

Comparative materials. *Cabillus atripelvicus*: NSMT-P 72568, holotype of *C. atripelvicus* (male), 40.4 mm SL, Miyano-hama Bay, Chichijima Island, Ogasawara Islands, Japan, 20 July 1991, collected by J. L. Earle. *Cabillus caudimacula*: AMS I. 42940-001, paratype of *C. caudimacula* (female), 14.6 mm SL, Kâne'ohe Bay, O'ahu, Hawaiian Islands (21°25'N, 157°48'W), 15.2–16.8 m depths, 29 Aug. 2002, collected by R. C. Langston; NSMT-P 67809, paratype of *C. caudimacula* (female), 14.5 mm SL, collected with AMS I. 42940-001. *Cabillus lacertops*: BLIP 19960140, 1 specimen, Amitori Bay, Iriomote-jima Island, Yaeyama Group of Ryukyu Islands, Japan, 11 m depth, 10 July 1996, collected by A. Iwata, K. Sakamoto, Y. Ikeda and K. Shibukawa; YCM-P 12096, 1 specimen, 23.7 mm SL, Iriomote-jima Island, Yaeyama Group of Ryukyu Islands, Japan, 15–19 Mar. 1983, collected by T. Hayashibara. *Cabillus macrophthalmus*: ZMA 110.952, holotype of *Quisquilius macrophthalmus* (female), 23.5 mm SL, Tanahdjampea Island, Flores Sea, Indonesia, 120–400 m depths, 6 May 1899, collected by M. Weber. *Cabillus tongarevae*: NSMT-P 23364, 1 specimen (female), 17.8 mm SL, east coast of Makambo Island, Florida Islands, Solomon Islands, 24 Aug. 1984, collected by K. Matsuura; NSMT-P 23497, 1 specimen (female), 13.3 mm SL, Abemama Atoll, 25 July 1984, collected by K. Matsuura; NSMT-P 31776, 1 specimen (female), 21.7 mm SL, tidepool on Ayamaru beach, northern part of Amami-oshima Island,

Amami Group of Ryukyu Islands, Japan (28°27.93'N, 129°34.25'E), 17 Sept. 1989, collected by K. Matsuura and party; NSMT-P 32716, 1 specimen (male), 20.1 mm SL, collected with NSMT-P 31776; NSMT-P 75536, 1 specimen (male), 13.1 mm SL, Atetsu Bay, Setouchicho, Amami-oshima Island, Amami Group of Ryukyu Islands, Japan, 17 Nov. 2006, collected by Y. Takata; NSMT-P 76917, 1 specimen, 20.6 mm SL, Yuraki-domari, Kuro-shima Island, Yaeyama group of Ryukyu Islands, Japan, 28 Mar. 2007, collected by K. Kameda; NSMT-P 114507, 1 specimen (female), 22.0 mm SL, Barasu, Iriomote-jima Island, Yaeyama Group of Ryukyu Islands, Japan, 1 Aug. 1993, collected by T. Suzuki and M. Hosokawa; NSMT-P 114508, 1 specimen (male), 18.3 mm SL, Hoshizunano-hama Beach, Iriomote-jima Island, Yaeyama Group of Ryukyu Islands, Japan, 5 Aug. 1993, collected by T. Suzuki and M. Hosokawa; NSMT-P 114509, 1 specimen (male), 16.6 mm SL, collected with NSMT-P 114508; NSMT-P 114510, 1 specimen (male), 16.6 mm SL, collected with NSMT-P 114508; NSMT-P 114511, 1 specimen (male), 21.6 mm SL, Nakano, Iriomote-jima Island, Yaeyama Group of Ryukyu Islands, Japan, 22 Aug. 2002, collected by T. Suzuki, M. Hosokawa and A. Kawai; NSMT-P 114512, 1 specimen (sex indeterminable), 13.0 mm SL, Kurasaki Beach, Amami-oshima Island, Amami Group of Ryukyu Islands, Japan (28°26.07'N, 129°37.85'E), 17 Dec. 2003, collected by T. Yonezawa; NSMT-P 114513, 1 specimen (male), 25.4 mm SL, Sukuji beach, Ishigaki-jima Island, Yaeyama Group of Ryukyu Islands, Japan, 29 July 2002, collected by E.O. Murdy, K. Shibukawa and T. Yokoo. *Cabillus* sp.: BPBM 40365, 1 specimen, 12.3 mm SL, Uliga (= Rosalie) islet, Majuro Atoll, Marshall Islands, 18 May 2004, collected by J. E. Randall; BPBM 40366, 1 specimen (male), 17.5 mm SL, Majuro Atoll, Marshall Islands, 12–18 May 2004, collected by J. E. Randall; BPBM 40428, 2 specimens (males), 15.7–16.6 mm SL, Majuro Atoll, Marshall Islands, 2 January 2006, collected by B. D. Greene; KPM-NI 35053, 1 speci-

men (female), 14.5 mm SL, Nago, Okinawa-jima Island, Okinawa Group of Ryukyu Islands, Japan, 29 Aug. 2010, collected by M. Hosokawa; NSMT-P 61470, 1 specimen (male), 13.2 mm SL, Serena Basar (= Large Serena Island), Lembah Strait, Bitung, Sulawesi, Indonesia (1°27.5'N, 125°14'E), 15 July 2000, collected by K. Matsuura.

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References

- Akihito, K. Sakamoto, Y. Ikeda and M. Aizawa. 2013. Gobioidae. In Nakabo, T. (ed.): Fishes of Japan with Pictorial Keys to the Species, Third Edition. pp. 1347–1608 and 2109–2211. Tokai University Press, Tokyo.
- Akihito, Prince, M. Hayashi, T. Yoshino, Y. Shimada, H. Senou and T. Yamamoto. 1984. Suborder Gobioidae. In Masuda, H., K. Amaoka, C. Araga, T. Uyeno and T. Yoshino (eds.): The Fishes of the Japanese Archipelago. English text. pp. 236–289 and pls. 235–258 and 353–355. Tokai University Press, Tokyo.
- Fowler, H. W. 1927. Fishes of the tropical central Pacific. Bulletin of the Bernice P. Bishop Museum, 38: 1–32, pl. 1.
- Goren, M. 1985. A review of the gobiid fish genus *Monishia* Smith, 1949, from the western Indian Ocean and Red Sea, with description of a new species. Contributions in Science, National History Museum of Los Angeles County, (360): 1–9.
- Greenfield, D. W. and J. E. Randall. 2004. The marine gobies of the Hawaiian Islands. Proceedings of the California Academy of Sciences, 55(27): 498–549.
- Hayashi, M., T. Suzuki, T. Ito and H. Senou. 1981. Gobiid fishes of the Ryukyu Islands, southern Japan (III). — Suborder Gobioidae. Science Report of the Yokosuka City Museum, (28), 1–25, pls. 1–14.
- Hubbs, C. L. and K. F. Lagler. 1958. Fishes of the Great Lakes Region. Cranbrook Institute of Science, Bloomfield Hills, Michigan. vii + 213 pp., 44 pls.
- Klausewitz, W. 1975. *Cabillus anchialinae*, eine neue Meergrundel von der Sinai-Halbinsel (Pisces: Gobiidae: Gobiinae). Senckenbergiana Biologica, 56(4/6): 203–207.
- Randall, J. E., K. Sakamoto and K. Shibukawa. 2007. *Cabillus atripelvicus*, a new species of gobiid fish from the Ogasawara Islands, with a key to species of the genus. Ichthyological Research, 54(1): 38–43.
- Sanzo, L. 1911. Distribuzione delle papille cutanee (organi ciatiformi) e suo valore sistematico nei gobi. Mitteilungen aus der Zoologischen Station zu Neapel, 20: 249–328.
- Senou, H., G. Shinohara, K. Matsuura, K. Furuse, S. Kato and T. Kikuchi. 2002. Fishes of Hachijo-jima Island, Izu Islands Group, Tokyo, Japan. Memoires of National Science Museum, Tokyo, (38): 195–237.
- Senou, H., T. Suzuki, K. Shibukawa and K. Yano. 2004. A Photographic Guide to the Gobioid Fishes of Japan. Heibonsha, Tokyo. 536 pp.
- Smith, J. L. B. 1959. Gobioid fishes of the families Gobiidae, Periophthalmidae, Trypauchenidae, Taenioididae and Kraemeriidae of the western Indian Ocean. Ichthyological Bulletin, Department of Ichthyology, Rhodes University, (13): 185–225, pls. 9–13.
- Weber, M. 1909. Diagnosen neuer Fische der Siboga-Expedition. Notes from the Leyden Museum, 31(4): 143–169.