

Gobiopsis namnas, a New Deep-dwelling Goby (Teleostei: Perciformes: Gobiidae: Gobiinae) from Japan

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Abstract A new species of the gobiid fish, *Gobiopsis namnas*, is described based on 8 specimens (2 males and 6 females, 20.2–35.2 mm SL) trawled at the depth of 101 m of off Toi-misaki Point, Miyazaki of Kyushu, Japan. *G. namnas* has depressed head and characteristic arrangement of cutaneous ridges with sensory papillae on cheek like the other species of *Gobiopsis*, but unique within the genus in having: no head barbels (vs. present in the congeners); 8–9 segmented dorsal-fin rays (vs. typically 10–12); 24–26 longitudinal scales (vs. more than 30); 8–9 transverse scales from anal-fin base upward and forward to base of dorsal fin (vs. 12–26); and scales on upper part of cheek and operculum (vs. absent).

Key words: *Gobiopsis namnas*, New species, Gobiidae, Japan.

Gobiopsis is the Indo-Pacific goby genus of the gobiid subfamily Gobiinae (*sensu* Pezold, 1993), comprising small to moderate-sized (less than 80 mm SL), cryptic, bottom-dwelling gobies found in brackish waters and shallow coastal waters at the depths of less than 30 m (Lachner and McKinney, 1978, 1979). Lachner and McKinney (1978) first revised the genus, and recognized the following 10 species: *Gobiopsis angustifrons* Lachner and McKinney, 1978; *Gobiopsis aporia* Lachner and McKinney, 1978; *Gobiopsis arenaria* (Snyder, 1908); *Gobiopsis bravoii* (Herre, 1940), *Gobiopsis canalis* Lachner and McKinney, 1978; *Gobiopsis macrostoma* Steindachner, 1861; *Gobiopsis malekulae* (Herre, 1935); *Gobiopsis pinto* (Smith, 1947); *Gobiopsis quinquecincta* (Smith, 1931); *Gobiopsis woodsi* Lachner and McKinney, 1978. Lachner and McKinney (1978: 33) noted that the followings were the “salient diagnostic characters shared by the species of *Gobiopsis*”: a broad, depressed head with pug-nosed snout; head barbels in characteristic positions; a conspicuous cutaneous papillae system variously related to a differentiated sensory pore and canal system; well developed fleshy fold on midcheek area; cephalic sen-

sory pore generally large, some on tubes, slit-like and hooded (although *G. aporia* lacks all head pores); and a dark sickle-shaped mark at base of pectoral fin. Subsequently, Lachner and McKinney (1979) added 3 species to *Gobiopsis*: *Gobiopsis atrata* (Griffin, 1933), *Gobiopsis exigua* Lachner and McKinney, 1979; *Gobiopsis springeri* Lachner and McKinney, 1979. Although these 3 shared many characteristics with the other species of *Gobiopsis*, the former was readily distinguished from the latter in several appearances, e.g., reduction of barbels and tuft and folds on head, suborbital sensory-papillae row *a* comprising widely spaced papillae, and one more segmented anal-fin rays (i.e., 10 vs. typically 9 in other species). Lachner and McKinney (1979) treated these 3 as “*Gobiopsis sensu lato*,” whereas the other 10 species (=all species of *Gobiopsis* treated by Lachner and McKinney, 1978) forming a close-knit group were grouped as “*Gobiopsis sensu stricto*.”

Springer and Randall (1992) described a new genus and species *Platygobiopsis akihito* from the Flores, Indonesia. It is highly specialized species with an unusually depressed head and body, promoting Springer and Randall (1992:

349) to say “looks as if someone had stepped on them,” but shares the head barbels and horizontal, papillae-bearing raised cutaneous ridges on cheek (as well as no vertical ridges below eye) with *Gobiopsis*. Monophyly of *Gobiopsis* had been not verified, and Springer and Randall (1992) noted “Although we think it probable, it is unknown whether *Platygobiopsis* will warrant recognition when the cladistic relationships of it, *Gobiopsis*, and other possibly related genera are hypothesized.” *Platygobiopsis* comprises 3 species, 2 of which, i.e. *P. tansei* Okiyama, 2008 and *P. dispar* Prokofiev, 2008, have been recently described from East Asian waters (Okiyama, 2008; Prokofiev, 2008).

During the deep-water biological survey in the southern Japan on May 2002, conducted by the National Science Museum, Tokyo (NSMT; now National Museum of Nature and Science), 8 specimens of an undescribed species of goby were captured by beam trawl at the depth of 101 m of off Toi-misaki Point, Miyazaki of Kyushu, Japan. The species has depressed head and characteristic configuration of distinct raised cutaneous ridges with sensory papillae on cheek, suggesting that it appears to close to *Gobiopsis* and/or *Platygobiopsis*. It is, however, readily distinguished from all described species of these 2 genera in some meristic counts and having scales on cheek and operculum, and no head barbels. The species is herein described as new.

Materials and Methods

The examined specimen is deposited in the Australian Museum, Sydney (AMS), National Museum of Nature and Science, Tokyo (NSMT), Osaka Museum of Natural History, Osaka (OMNH), and Yokosuka City Museum, Yokosuka (YCM).

All fish lengths given are standard lengths (SL). Measurements were made point-to-point with calipers under the 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 bony width; jaw length is measured between the snout tip and the posteriormost point of lip; body depth is measured in 2 ways, the first at the first dorsal-fin origin, and the second at the anal-fin origin; head depth and width are measured at preopercular margin; nape width is measured between dorsalmost margins 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; caudal-fin length is measured from the base to the tip of the middle caudal-fin ray. The methods of counts follow Akihito (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; transverse scales are counted in 3 ways (see descriptive accounts); circumpeduncular scale count is the number of scales along a zigzag vertical line through the narrowest point of caudal peduncle; gill rakers including all rudiments are counted on the outer side of first arch; counts of pseudobranchial filaments include all rudiments. Scales (except for predorsal and circumpeduncular scales) and paired-fin rays are counted on both sides, but gill rakers and pseudobranchial filaments are counted on right side only. Osteological features are observed from radiographs (for all specimens) and a single cleared and stained specimen (NSMT-P 94891), following the method of Potthoff (1984). The method of Akihito (1984) is used in describing the pattern of the 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 (1984) and Miller (1986), respectively.

Gobiopsis namnas sp. nov.

[New Japanese name: Bake-isagohaze]

(Figs. 1–2, Table 1)

Holotype. NSMT-P 94889, male, 26.2 mm SL, off Toimisaki Point, Miyazaki Prefecture, Kyushu, Japan (31°20.05'N, 131°17.46'E—31°20.07'N, 131°16.88'E), 101 m depth, R/V *Toyoshio-maru*, beam trawl, 25 May 2002.

Paratypes. Total 7 specimens (20.2–35.2 mm SL), collected with holotype: AMS I. 44860-001, 2 specimens (male and female), 20.2–20.6 mm SL; NSMT-P 94890, 2 specimens (females), 23.9–35.2 mm SL; NSMT-P 94891,

1 specimen (female; cleared, stained, and dissected), 33.7 mm SL; OMNH-P 35377–35378, 2 specimens (females), 22.6–23.0 mm SL.

Diagnosis. *Gobiopsis namnas* is readily distinguished from the congeners in having: no head barbels (vs. present in the latter); 8–9 segmented dorsal-fin rays (vs. typically 10–12); 24–26 longitudinal scales (vs. more than 30); 8–9 transverse scales from anal-fin base upward and forward to base of dorsal fin (vs. 12 or more); and scales on upper part of cheek and operculum (vs. absent).

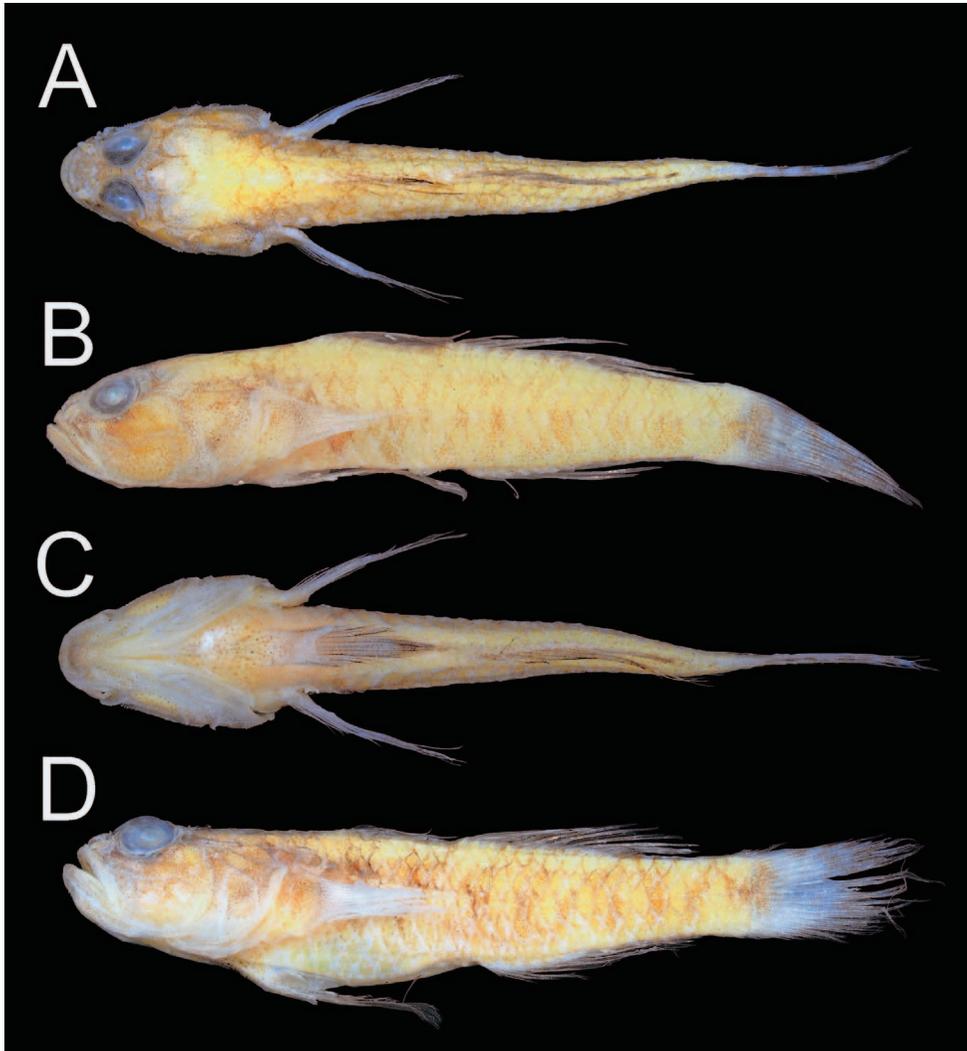


Fig. 1. Preserved specimens of *Gobiopsis namnas* sp. nov. in 75% ethyl alcohol. A–C) NSMT-P 94889, holotype, male, 26.2 mm SL; D) one of NSMT-P 94890, female, 35.2 mm SL. Photographed by K. Shibukawa.

Table 1. Proportional measurements of *Gobiopsis namnas* sp. nov.

	Holotype		Holotype+6 paratypes	
	Male	Males ^a	Females	
	NSMT-P 94889	2 specimens	5 specimens	
Standard length (mm)	26.2	20.2–26.2	20.6–35.2	
In % of standard length				
Head length	31.6	31.5–31.6	30.5–33.6	
Snout length	6.6	6.6–6.7	6.8–8.9	
Eye diameter	7.5	7.5–7.9	7.5–8.6	
Interorbital width	1.7	1.1–1.7	1.2–1.7	
Jaw length	12.9	12.6–12.9	11.8–14.7	
Head width	21.3	19.2–21.3	18.8–22.1	
Head depth	18.0	16.0–18.0	15.1–19.7	
Nape width	15.9	14.0–15.9	11.4–13.1	
Body depth at D ₁ origin	19.3	18.4–19.3	15.5–24.7	
Body depth at A origin	17.4	16.7–17.4	16.8–19.4	
Body width	12.3	12.2–12.3	11.7–17.6	
Predorsal length	40.0	19.4–40.0	34.4–36.1	
Prepelvic length	33.3	28.8–33.3	30.5–35.2	
Preanal length	61.5	54.8–61.5	58.3–60.4	
Caudal-peduncle length	22.0	22.0–22.4	21.8–23.8	
Caudal-peduncle depth	10.8	10.3–10.8	9.7–11.9	
Length of D ₁ base	15.5	15.3–15.5	14.2–17.1	
Length of D ₂ base	23.0	22.4–23.0	20.6–23.3	
Length of A base	17.6	17.6–19.6	14.6–19.7	
P ₁ length	26.3	24.8–26.3	22.8–28.1	
P ₂ length	28.4	25.9–28.4	27.3–29.4	
C length	27.9	27.9–28.3	27.3–30.0	

^a Including holotype.

Abbreviations: A, anal fin; C, caudal fin; D₁, first dorsal fin; D₂, second dorsal fin; P₁, pectoral fin; P₂, pelvic fin.

Description. In the following description, the counts of holotype have an asterisk, and the frequency of each count is given in the parentheses following relevant count. Dorsal-fin rays VI-I, 8 (2) or VI-I, 9* (6); anal-fin rays I, 7 (1) [Note that this appears to be abnormal condition, since the ultimate anal-fin pterygiophore of this specimen, one of NSMT-P 94890, supports only a single segmented ray not divided to base], I, 8 (2) or I, 9* (5); number of dorsal-fin segmented rays minus anal-fin segmented rays –1 (1), 0* (5), 1 (1) or 2 (1); pectoral-fin rays 17 (7), 18* (7) or 19 (2); pelvic-fin rays I, 5* (16); segmented caudal-fin rays 9+8* (8), including 7+6* (1), 7+7 (4) or 8+7 (3) branched rays; dorsal unsegmented caudal-fin rays 4 (1), 5* (6) or 6 (1); ventral unsegmented caudal-fin rays 4 (6) or 5* (2); longitudinal scales 24 (2), 25* (12) or 26 (2); trans-

verse scales from anal-fin origin forward and upward to base of dorsal fin 8 (8) or 9* (8); transverse scales from anal-fin origin backward and upward to base of dorsal fin 7 (12) or 8* (4); transverse scales from origin of second dorsal fin backward and downward to base of anal fin 7* (14) or 8 (2); predorsal scales 7* (1) or 8 (7); circumpeduncular scales 12 (8); gill rakers 1+8* (3), 2+8 (2), 1+9 (1) or 2+9 (2); pseudo-branchial filaments 4* (6) or 5 (2).

Proportional measurements are given in Table 1. Body moderately compressed. Head slightly depressed, its depth 80.2–91.4% of width. Snout slightly shorter than eye diameter. Eyes dorsolateral, moderately large, its diameter 23.2–26.8% of head length; interorbital width narrower than pupil diameter. Anterior naris minute, opening at tip of short tube located at near anterior margin

of snout; anterior narial tube radically becoming narrow distally, directed anteroventrally and overlapping upper lip; posterior naris large, typically opening at tip of very short tube (sometimes tube undeveloped), closer to eye than anterior naris; no flaps at tip of anterior and posterior narial tubes. Jaws moderately large, its length 38.7–44.7% of head length; posterior end of jaws extending below anterior margin of pupil; lower jaw slightly projecting upper jaw; gape oblique, forming an angle of about 50 degrees of body axis. No bony projections (e.g., spines or serration) at posterior margin of preopercle. Tongue near truncate with weakly emarginated anterior margin, free from floor of buccal cavity. Bulbous fleshy projection at chin (=mental frenum). Posterior margin of lower lip rather broadly interrupted around lower-jaw symphysis between right and left sides of cutaneous ridges with sensory-papillae row *e*. Gill opening relatively wide, extending anteriorly to a vertical line through preopercular margin or further beyond (but not reaching to below posterior margin of eye); gill membranes attach to isthmus, and typically no free rear fold of gill membranes across isthmus (excluding a single specimen with weakly developed free rear fold of united gill membranes across isthmus). First gill slit well opens. Gill rakers on outer surface of first arch short; gill filament not so well developed and short. No fleshy projections on lateral surface of cleithrum. No cutaneous ridge along predorsal midline. Dorsal fins well separated; second spine of first dorsal fin longest; all dorsal-fin spines slender and flexible; filamentous dorsal-fin spine may be absent (difficult to be confirmed based on the type specimens, because their fin membranes largely damaged); all segmented dorsal-fin rays branched; ultimate dorsal-fin ray split to base (and counted as single ray). Anal fin originates ventral to base of first to second segmented rays of dorsal fin; anal-fin spine slender and flexible; all anal-fin segmented rays branched; ultimate anal-fin ray split to base (and counted as single ray). Pectoral fin elliptical or near lanceolate, almost symmetrical dorsoventrally; pectoral fin slightly shorter than

pelvic fin; almost all pectoral-fin rays branched, but occasionally uppermost 1–2 rays and/or ventral most one ray simple; eighth (1 specimen), ninth (3 specimens) or tenth (4 specimens including holotype) pectoral-fin rays longest; pectoral fin extending to, or slightly behind, a vertical line through anal-fin origin. Pelvic fin fused medially by well-developed frenum (between spines) and connecting membrane (between innermost rays); pelvic fin extending posteriorly beyond anus, but not to anal-fin origin; all pelvic-fin segmented rays multibranching; pelvic frenum moderately thin, with smooth posterior margin (frenum damaged in some paratypes); height of pelvic frenum greater than width, 16.4–23.6% of pelvic-fin length. Caudal fin rounded, almost symmetrical dorsoventrally, shorter than head (caudal-fin length 82.8–94.4% of head length); no elongate caudal-fin rays.

Scales cycloid, deciduous (although almost all scales are missing in the type specimens, it is confirmable on scales remaining on various parts of head and body); scales present on most of body, caudal-fin base, prepelvic region (extending anteriorly to around attachments of gill membranes to isthmus), pectoral-fin base, nape, and upper part of cheek and operculum (operculum naked in single paratype); predorsal scales, reaching to just behind postorbital part of oculoscapular canal, largest anteriorly; scales on cheek and operculum slightly smaller than pupil.

Teeth on jaws conical, more or less inwardly curved; about 4 rows of teeth on upper jaw anteriorly, narrowing to single row posteriorly; outermost row of teeth on upper jaw largest; some pairs of posteriorly directed, slender large teeth around upper-jaw symphysis just behind fine, tiny teeth rows; 3 or 4 rows of teeth on lower jaw anteriorly, narrowing to single row posteriorly; outer- and innermost rows of teeth larger than teeth on intermediate row(s); no stout, enlarged canines on side of jaws; no teeth on vomer and palatine.

Cephalic sensory systems are illustrated in Fig. 2. Anterior oculoscapular canal with pores B', C (unpaired), D (unpaired), E and F'; all sen-

sory-canal pores enlarged; posterior oculoscapular and preopercular canals absent. Sensory-papillae rows on cheek representing the longitudinal pattern; row *a* comprising 3 papillae; rows *b*, *d*, *e*, *oi*, *os*, *ot*, *x*¹ and *z* on well-developed ridged flaps; row *c* and *cp* comprising 3 and single papillae, respectively; a pair of sensory papillae just behind chin (=row *f*).

Osteology. Frontals not fused medially; frontal crest not developed; frontals narrow at interorbital region, only a slightly wider than parasphenoid at interorbital region; dorsal surface of interorbital and postorbital parts of frontals with a Y-shaped trough-like structure, supporting oculoscapular canal; no bony canal support developed on sphenotic and pterotic; no spinous posterior projecting process on epioccipital (although small bump developed); interorbital part of mesethmoid well ossified, with narrow cartilaginous posterior margin; anterior margin of mesethmoid rounded, not contact with vomer (narrow ethmoid cartilage lies between anterior margin of mesethmoid and dorsoposterior margin of vomer); vomer nearly rounded anteriorly, with a notch at anterior margin; no vomerine teeth; subtemporal fossa (Birdsong, 1975) not developed; Baudelot's ligament connects anteriorly to basioccipital. Nasal very small, thin and near ovoid, not stained by alizaline red; lacrymal elongate pear-shape, thin, weakly stained by alizaline red dorsomedially. Rostral cartilage well developed, large, attached anteriorly to ascending process of premaxilla; ascending process of premaxilla high (higher than articular process), well differentiated from articular process; postmaxillary process of premaxilla well developed; palatine edentate, T-shaped (namely, ethmoid process moderately developed), well separated from quadrate; ectopterygoid moderately long, extending dorsally to about two-thirds of palatine shaft and ventrally to dorsoanterior edge of quadrate; mesopterygoid absent; metapterygoid broad, with greatly developed dorsal lamina; dorsal lamina of metapterygoid broadly overlapping to quadrate, and very closed (but not contact) to ectopterygoid; symplectic process of premaxilla not devel-

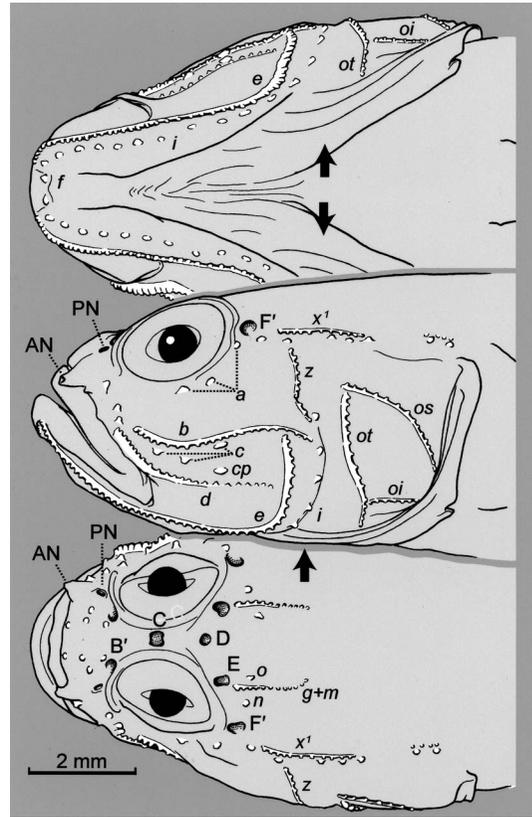


Fig. 2. Ventral (top), lateral (middle), and dorsal (bottom) views of heads of *Gobiopsis namnas* (NSMT-P 94889, holotype, male, 26.2 mm SL), showing cephalic sensory canal pores (indicated by roman uppercase letters, except for AN and PN) and sensory-papillae rows (indicated by roman lowercase letters). AN and PN, anterior and posterior nares, respectively. Arrows show position where gill membrane is attached to isthmus, and white areas show sensory papillae and raised cutaneous ridges. Drawn by K. Shibukawa.

oped; no spinous projections along posterior margin of preopercle; bony canal support developed from posterior to mid-ventral margin of preopercle. Basihyal moderately large, its length 1.7 mm [including cartilaginous anterior margin (ossified part, 1.6 mm)] in specimen 33.7 mm SL (NSMT-P 89194); basihyal spatulate anteriorly, with weakly emarginated anterior margin; 5 branchiostegal rays, comprising 4 and one rays in contact with anterior and posterior ceratohyals,

respectively; second branchiostegal ray wider than third; no transverse bony shelf developed along ventral margin of urohyal. Infrapharyngobranchial 1 absent; interarcual cartilage small ovoid, well separated from infrapharyngobranchial 2; ossified gill rakers on outer surface first arch relatively short, spine- or narrow blade-like, middle some rakers typically forked or trilobed; no accessory spines on gill rakers on outer surface of first arch; inner surface of first gill arch and both inner and outer surfaces of second to 4th gill arches with stout, very short, dorsally spinulose ossified gill rakers. Four pectoral radials; entirely cartilaginous scapula reduced in size, and, thus, uppermost pectoral radial attached to cleithrum; dorsal postcleithrum absent; short thread-like ventral postcleithrum present. Pelvis articulates with cleithrum via well-developed pelvic intercleithral cartilage; postpelvic process (Akihito and Meguro, 1981) moderately developed. Vertebrae $10+16=26$; all but posteriormost neural spines much longer than respective centra, inclined posteriorly about 30 degrees off vertical; posteriormost neural spine (on 15th caudal vertebra) narrow blade-like, subequal or slightly shorter than respective centra; pleurals on third to ninth precaudal vertebrae; all epineurals not fused with pleurals; anterior dorsal prezygapophysis not developed, except for second to sixth precaudal vertebrae with blunt, anteriorly directed projections; P-V 3/II II I I 0/9; anterior 2 pterygiophores of second dorsal fin lack middle radials; 2 anal-fin pterygiophores anterior to first haemal spine; single epurals; hypurals 3+4 fused to urostyle, articulating with hypurals 1+2; parhypural moderately developed, pointed medially; dorsal and ventral procurrent cartilages moderately large, extending anteriorly to tips of neural and haemal spines of 3rd pleural centrum (PU3), respectively.

Coloration. Coloration when alive or fresh is unknown. Coloration of preserved specimens in 75% ethyl alcohol is as follows: ground color of head and body pale yellow; head covering numerous, very minute and coarse melanophores (lacrymal and suborbital region especially dark-

ened); chin darkened anteriorly; gill membrane pale yellow, with melanophores along each branchiostegal rays; dorsalmost part of pectoral-fin base typically with a triangular paler space (indistinct in larger specimens); the other part of pectoral-fin base paler, covered by sparse melanophores; body (except for belly) with numerous melanophores, coarsened particularly at distal margin of each scale pocket; belly paler, sometimes with sparse melanophores at distal margin of each scale pocket; ca. 9–10 vague mid-lateral dusky blotches on body, the posteriormost one of which near triangular (broadened posteriorly), covering posterior end of caudal peduncle and anterior part of caudal fin; prepelvic region covered by sparse melanophores; first dorsal fin with sparse melanophores, with a distinct, black distal blotch margined by narrow white space distally; second dorsal fin entirely covered by melanophores, may form some narrow longitudinal dusky stripes; anal fin also entirely covered by melanophores, darkened distally; pectoral fin typically with coarse melanophores anteroventrally (sparse melanophores may also appeared on dorsoposterior part in larger specimens); pelvic-fin membranes blackened, whereas rays almost unpigmented; pelvic-fin frenum covered by sparse melanophores distally; 4–5 indistinct, narrow transverse dusky bars on caudal fin.

Sexual dimorphisms. Urogenital papilla narrow and pointed in male, whereas broad and rounded in female.

Distribution and habitat. All type specimens of *Gobiopsis namnas* were captured by a beam trawl at the depth of 101 m of off Toi-misaki Point, Miyazaki Prefecture, Kyushu, Japan. No substratum data of the habitat are available. These specimens were found out with many other fish specimens, e.g., the champsodontid *Champsodon snyderi* and the gobiid *Amblychaeturichthys sciiistius*.

Comparison. In the following comparison, a single species currently assigned to *Gobiopsis*, i.e., *G. atrata*, is not included, because its generic assignment is doubtfulness (see below “Discussion”).

The new species *Gobiopsis namnas* differs from all gobies of the Indo-Pacific gobiine genera other than *Gobiopsis* in having the following combination of characters: slightly depressed head and compressed body; characteristic long, essentially longitudinal raised cutaneous ridges with sensory papillae on cheek (whereas no transverse ridges with sensory papillae on cheek); sensory-papillae row *b* very long, extending anteriorly to just behind middle of upper jaw; a pair of sensory papillae just behind chin (=row *f*); the “Priolepis Group” (Birdsong *et al.*, 1988) type of axial skeletal features, i.e., 10+16=26 vertebrae, P-V 3/II II I I 0/9, single epural, and 2 anal-fin pterygiophores anterior to first haemal arch. *Platygobiopsis* resembles to *Gobiopsis* in sharing most of these features, but readily distinguished from the latter in its heavily depressed head and body (see Springer and Randall, 1992). Also, another gobiine genera *Cristatogobius* and *Mangarinus* have similar arrangement of long, longitudinal papillae-bearing cutaneous ridges on cheek (see Akihito and Meguro, 1977, 2000; Akihito *et al.*, 1993, 2002), but these 2 genera differ from *Gobiopsis* in having: 14-17 pectoral-fin rays (vs. 17-23); mental frenum undeveloped (vs. more or less developed, bearing barbels in many species of *Gobiopsis*); and sensory-papillae row *f* comprising a pair of short longitudinal rows of sensory papillae (vs. row *f* comprising a pair of, or a transverse row of, sensory papillae). Furthermore, *Cristatogobius* has compressed head and a distinct, mid-predorsal dermal crest on nape (vs. such crest absent in *Gobiopsis* and *Mangarinus*).

Within the genus *Gobiopsis*, the new species resembles to *G. exigua* and *G. springeri*, both of which belong to “*Gobiopsis sensu lato*” (Lachner and McKinney, 1979). These 3 species are distinguished from the other congeners (=“*Gobiopsis sensu stricto*”) in having: counts of segmented dorsal- and anal-fin rays typically equal one another (vs. dorsal fin with typically one more ray than anal fin in the latter); relatively wide gill opening, extending well forward from pectoral base (vs. restricted to pectoral base or extending to slightly anterior part); eyes closed together,

viz., interorbital width narrower than half of eye diameter [vs. interorbital wide, typically wider than eye diameter (although slightly narrower than eye diameter in *G. angustifrons*)]; no distinct anterior cheek tufts (Lachner and McKinney, 1978) (vs. present); anterior margin of tongue weakly emarginated (vs. rounded); sensory papillae of rows *a* and *c* widely spaced each other (vs. coarse); row *cp* comprises a single papillae or absent (vs. more than some sensory papillae); very long row *g+m*, reaching posteriorly to a vertical line through preopercular margin (vs. very short); vertical portion of row *e* located slightly to well apart from preopercular margin, and its dorsal end slightly anterior to a vertical line through posterior end of row *b* (vs. more or less closed to preopercular margin, and its dorsal end posterior to a vertical line through posterior end of row *b*); row *f* comprises a pair of sensory papillae (vs. some pairs, forming a transverse row); neural and haemal spines of second preural centra narrow (vs. broad). *G. namnas* differs from *G. exigua* and *G. springeri* in having: VI-I, 8-9 dorsal-fin rays [vs. VI-I, 10-11 (typically 10) in the latter 2]; I, 8-9 anal-fin rays (vs. I, 10); 27-28 longitudinal scales (vs. more than 30); 8-9 transverse scales from anal-fin origin upward and forward to base of dorsal fin (vs. 12-17); scales present on upper part of preopercle and operculum (vs. absent); 8-9 gill rakers on outer surface of lower limb of first gill arch (vs. 10-13); no head barbels (vs. one or 2 pairs of short barbels on chin); anterior and posterior nasal tubes well separated one another, latter of which closer to eye than anterior nasal tube (vs. closed together, posterior nasal tube closer to anterior nasal tube than eye).

Etymology. The new species is named *namnas*, an arbitrarily-making abbreviation of National Museum of Nature and Science, since all type specimens were collected during the deep-water biological survey conducted by the institution.

Discussion

In the present paper, *Gobiopsis atrata* is tentatively excluded from the "Comparison" above and the below discussion, owing to its considerable differences in sensory-papillae rows on head between it and the other species of *Gobiopsis*. Namely, *G. atrata* has: row *b* not arranged on raised cutaneous ridges (vs. arranged on raised cutaneous ridges in the other species of *Gobiopsis*); row *b* short, well separated from upper jaw (vs. very long, its anterior end more or less approaching to middle of upper jaw); row *d* obviously divided ventrally (vs. simple, not divided ventrally). Configuration of sensory-papillae rows on cheek, a well-developed distinct mental frenum on chin, rounded or truncated tongue and $10+17=27$ vertebrae suggest that *G. atrata* has a possible affinity with *Bathygobius* and its allies.

Present assignment of the new species *Gobiopsis namnas* to *Gobiopsis* is provisional, because the limit of *Gobiopsis* is not well explored. Namely, monophyly of *Gobiopsis* has not been verified (Springer and Randall, 1992), plausible sister group of the genus has not been ascertained (Lachner and McKinney, 1979), and the relationship between *Gobiopsis* and highly specialized representative, *Platygobiopsis*, is still not clear. Presently, however, there are no gobiine genera having the characteristic combination of 1) 2 long, raised horizontal cutaneous ridges with sensory-papillae rows *b* and *d* on cheek, 2) no transverse raised cutaneous ridges with sensory papillae on cheek, and 3) a single or some pairs of sensory papillae forming a transverse row just behind chin (=row *f*), other than *Gobiopsis* and *Platygobiopsis*. Further assignment of the new species to *Gobiopsis* is based merely on the lack of specializations found in *Platygobiopsis*, e.g., heavily depressed head and body and probably correlated modification in neural spines (see Springer and Randall, 1992).

Gobiopsis namnas differs most obviously from the other members of *Gobiopsis* in having scales on cheek and operculum, and no head barbels. The head squamation is, however, subject to great variation among gobiines, even among the

closely-related congeners. Also, the head-barbels condition varies from "well developed" to "reduced" within the genus *Gobiopsis* (Lachner and McKinney, 1978, 1979). Namely, the species of "*Gobiopsis sensu stricto*" typically have barbels on snout, anterior part of cheek, ventral surface of lower jaw, and lips (excluding *G. canalis*, *G. macrostoma* and *G. pinto* lack those on lower jaw and/or lips), whereas 2 species of "*Gobiopsis sensu lato*" with only a single to some pairs of short barbels restricted around chin. Although *G. namnas* lacks any head barbels, it has a fleshy bump (or indistinct mental frenum) at chin. This situation resembles to that found between *Glossogobius* (with a distinct mental frenum but no chin barbels) and *Illana* (with a pair of chin barbels, modified from the posterolateral corner of mental frenum), the latter of which is currently recognized as a junior synonym of the former (Akihito and Meguro, 1975). Consequently, these morphological discrepancies between *G. namnas* and the other species currently placed in *Gobiopsis* could not be strong evidences suggesting the former should not be placed in *Gobiopsis*. To ascertain more plausible allocation of *G. namnas*, however, further study on the inter- and intra-relationships of *Gobiopsis*, *Platygobiopsis* and their allies is clearly needed. Naomi Delventhal (University of Manitoba, Manitoba) and Randall D. Mooi (Manitoba Museum, Manitoba) are now tackling on the systematics of this problematic assemblage.

Allocation of the new species to *Gobiopsis* slightly modifies the generic diagnosis from the previous recognition. The genus can be distinguished from the other gobiine genera in having the following combination of features: head more or less depressed, whereas body moderately compressed; well developed, essentially longitudinal raised cutaneous ridges with sensory papillae on cheek; short barbels, not associated with sensory papillae, present on head in many species; no transverse papillae-bearing cutaneous ridges on anterior part of cheek; typically 5 longitudinal rows of sensory papillae on cheek [=rows *a*, *b*, *c*, *cp* (may be absent), and *d*], in addition to 2 paral-

1el rows along posterior margin (=rows *e* and *i*); row *b* very long, more or less approaching anteriorly to upper jaw; row *d* simple, not divided ventrally; single or some pairs of sensory papillae just behind chin, forming a uniserial transverse row (=row *f*); the “Priolepis Group” type of axial skeletal features (i.e., 10+16=26 vertebrae, P-V 3/II II I I 0/9, single epural, and 2 anal-fin pterygiophores anterior to first haemal spine).

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