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Review of the East Asian Gobiid Genus *Chaeturichthys* (Teleostei: Perciformes: Gobioidei), with Description of a New Species

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Abstract The East Asian gobiid genus *Chaeturichthys* is reviewed. The genus, belonging to the gobiid subfamily Gobionellinae, is distinguished from the other gobionelline genera by having the following combination of characters: VII–IX-I, 20–23 (usually VIII-I, 20–22) dorsal-fin rays; I, 17–20 (usually I, 18–19) anal-fin rays; 46–59 longitudinal scales; P–V variable, but most frequently 3/I II II I I I i 0/12; 14–15 + 25–28 = 39–42 (usually 14 + 26–27 = 40–41) vertebrae; 2–4 (usually 3) anal pterygiophores anterior to first haemal spine; scales on head and body small cycloid, deciduous, 47–58 in longitudinal series; cheek, operculum, nape, pectoral-fin base and pre-pelvic regions covered by cycloid scales; 3 or 4 pairs of barbels on ventral surface of head; some outwardly-directed, fleshy finger-like projections on lateral margin of lateral wing of cleithrum; gill opening wide, extending anteriorly to a vertical line through posterior margin of eye; pelvic fins united medially by well-developed connecting membrane and pelvic frenum with indented posterior margin; right and left sides of oculoscapular canal connected via well-developed postorbital pseudo-commissure just dorsal to eye; 4 longitudinal rows of sensory papillae on cheek. *Chaeturichthys* comprises 2 species, i.e., *C. jeoni* sp. nov. and *C. stigmatias*, both of which are known from the Bohai Sea to East and South China seas. The new species *C. jeoni*, described based on 68 specimens (including 13 type specimens), differs from *C. stigmatias* in, e.g., the number of scales, fin rays, gill rakers, pseudobranchial filaments and barbels, and head squamation. *Chaeturichthys* and its type species *C. stigmatias* are re-described, and a key to species of the "Acanthogobius Group," a putative monophyletic assemblage including *Chaeturichthys*, is given.

Key words: Gobiidae, *Chaeturichthys stigmatias*, *Chaeturichthys jeoni*, new species, taxonomic review.

Richardson (1844) described *Chaeturichthys stigmatias* as a new gobiid genus and species based on 2 specimens obtained by the Voyage of H.M.S. Sulphur (Fig. 1). Although the specimens were held in a bottle labeled "Southern Pacific," he speculated that the specimens were collected from the Chinese seas, judging from the other fishes found in the bottle (Richardson, 1844: 54). Since then, *C. stigmatias* has been collected from various localities of the Bohai Sea, Yellow Sea, and East and South China seas.

As stated by Richardson (1844), *Chaeturichthys* is an unusual goby genus bearing some pairs of short barbels on ventral surface of head. After Richardson's (1844) description of *C. stigmatias*, an additional 4 nominal species of bearded gobies were placed in *Chaeturichthys* by subsequent researchers (Bleeker, 1853; Jordan and Snyder, 1901b; Koumans, 1931, 1940; Schmidt, 1931; Tomiyama, 1936): *Chaeturichthys hexanema* Bleeker, 1853; *Chaeturichthys polynema* Bleeker, 1853; *Chaeturichthys sciistius* Jordan

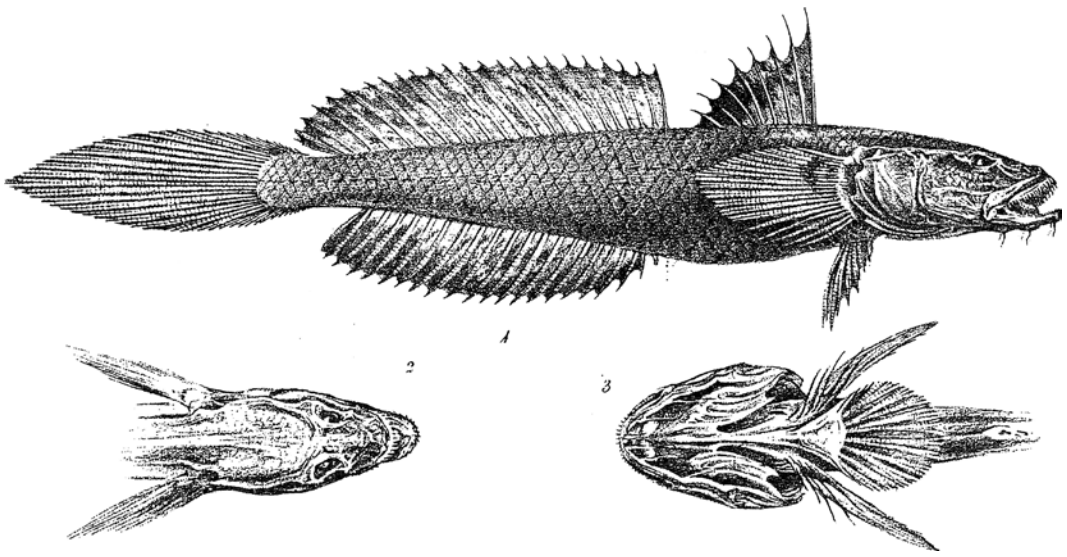

Fig. 1. Original figures of *Chaeturichthys stigmatias* in Richardson (1844, pl. 35, figs. 1–3).

and Snyder, 1901; and *Chaeturichthys tanakae* Schmidt, 1931. The first 3 of these species were later transferred to *Amblychaeturichthys* Bleeker, 1874 (for *hexanema* and *sciistius*) or *Parachaeturichthys* Bleeker, 1874 (for *polynema*) (e.g., Akihito *et al.*, 1984, 1993, 2000, 2002). Judging from the original description and figure (Schmidt, 1931), *Chaeturichthys tanakae* is undoubtedly a junior synonym of *Sagamia geneionema* (Hilgendorf, 1879). *Chaeturichthys* is thus currently recognized as the monotypic, known only by *C. stigmatias*.

Based on their extensive survey of the axial skeletal features of the gobioid fishes, Birdsong *et al.* (1988) placed *Chaeturichthys* in their putative monophyletic assemblage, the Acanthogobius Group, together with the other 6 East Asian genera, viz. *Acanthogobius* Gill, 1859, *Amblychaeturichthys*, *Lophiogobius* Günther, 1873, *Pterogobius* Gill, 1863, *Sagamia* Jordan and Snyder, 1901 and *Suruga* Jordan and Snyder, 1901. These 7 genera share a unique dominant pattern of the dorsal-pterygiophore formula 3/1221110 [= 3/I II II I I I 0/11 in Akihito's system in Akihito *et al.* (1984), followed here] within the gobioids, and also similar in their high vertebral number, typically 13–14 + 19–22 = 32–35 (Birdsong *et al.*, 1989: 183). Birdsong *et al.* (1988) also recognized another gobiid subgroup "Synechogobius Group" comprising a single genus *Synechogobius* Gill, 1863, on the basis of its high number of vertebrae (41–42) and unique number and arrangement of first dorsal-fin pterygiophores (10–11, posteriormost one spineless). We, however, regard *Synechogobius* as a junior synonym of *Acanthogobius* (and, thus, the Synechogobius Group is no longer separated from the Acanthogobius Group), since the type species of *Synechogobius*, *Gobius hasta* Temminck and Schlegel, 1845 (*Gobius ommaturus* Richardson, 1845 and *Ctenogobius clarki* Evermann and Shaw, 1927 are junior synonyms) should be placed in *Acanthogobius* (Akihito *et al.*, 1984, 1993, 2000, 2002; Shibukawa, 1998). Species of *Acanthogobius* have a different number of vertebrae and P–V pattern in each (see key, below), and the condition in *A. hasta* can be regarded as the extremely specialized condition within the genus (Shibukawa, 1998). Subsequently Shibukawa and Iwata (1998) added their new genus *Siphonogobius* to the Acanthogobius Group; currently the number of genera in the group is thus 8. All gobies of the Acanthogobius Group are restricted to East Asian waters, except

for *Acanthogobius flavimanus* (Temminck and Schlegel, 1845) accidentally introduced to, and now established in, New South Wales and California (e.g., Brittan *et al.*, 1963, 1970; Hoese, 1973; Middleton, 1982; Bell *et al.*, 1986; Workman *et al.*, 2007).

During the systematic review of the gobiid fishes placed in the Acanthogobius Group (Shibukawa, 1998), we found 2 distinct species within the museum specimens formerly identified as *Cheaturichthys stigmatias*. One of them agreed well with the original description of *C. stigmatias*, whereas the other differs from *C. stigmatias* in the head squamation, pectoral-fin morphology and number of barbels, fin rays, scales, gill rakers and pseudobranchial filaments. In this paper, the latter one is described as new. *Chaeturichthys* and its type species *C. stigmatias* are re-described, and a key to species of the Acanthogobius Group is given.

Materials and Methods

Specimens examined in this study are deposited in the following institutions: Biological Laboratory, Imperial Palace, Tokyo, Japan (BLIP); Natural History Museum, London, United Kingdom (BMNH); Department of Natural Science, Faculty of Science, Kochi University, Kochi, Japan (BSKU); Natural History Museum, Ewha Womans University, Seoul, Republic of Korea (EWNHM); National Museum of Nature and Science, Tsukuba, Japan (NSMT). The other institutional abbreviation used here is: SFU, Laboratory of Fishes, Shanghai Fisheries University (now Shanghai Ocean University), Shanghai, China.

All fish lengths given are standard lengths (SL). 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): head length is measured between the snout tip and dorsoposterior end of operculum (including opercular membrane); interorbital width is the least width between innermost bony rims of orbits; jaw length is measured between the snout tip and the posteriormost point of lip; body depth is the vertical depth of the body and is measured at the pectoral-fin base; head depth and width are measured at preopercular margin; nape width is measured between uppermost 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; caudal-fin length is measured from the base to the tip of the middle caudal-fin ray. Measurements are made with calipers under dissecting microscopes to the nearest 0.01 mm. The methods for counts follow those of 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; predorsal scale count is the number of scales on predorsal midline between origin of first dorsal fin and transverse bony ridge of frontal just behind the sensory-canal pore D [note: although *Chaeturichthys stigmatias* has scales also on interorbital space before the transverse bony ridge of frontal (Fig. 5A), these scales are not included in the predorsal scale counts]; gill rakers including all rudiments are counted on the outer side of first arch; counts of pseudobranchial filaments include all rudiments. Almost all scales are rubbed off in the specimens of *Chaeturichthys* examined, and the counts are made largely based on scale pockets. Osteological features were observed from radiographs and some specimens cleared and counter stained for bones and cartilages, following the methods of Potthoff (1984). Abdominal vertebrae are the anterior vertebrae lacking a distinct haemal spine, whereas the others (including urostylar complex) are counted as caudal vertebrae. The methods of Akihito *in* Akihito *et al.* (1984) were used in describing the pattern of the interdigitation of the dorsal-fin pterygiophores between the neural spines ("P-

V"). Cephalic sensory canals and papillae were observed on specimens stained with cyanine blue, and their notations follow Akihito (1984) and Sanzo (1911), respectively.

Chaeturichthys Richardson, 1844

[Japanese name: Yakiin-haze zoku]

Chaeturichthys Richardson, 1844: 54 (type species: *Chaeturichthys stigmatias* Richardson, 1844, by original designation and monotypy).

Diagnosis. *Chaeturichthys* is the genus of a gobiid subfamily Gobionellinae (*sensu* Pezold, 1993), and distinguished from the other gobionelline genera by having the following combination of characters: VII–IX-I, 20–23 (usually VIII-I, 20–22) dorsal-fin rays; I, 17–20 (usually I, 18–19) anal-fin rays; 46–59 longitudinal scales; P–V variable, but most frequently 3/I II II I I I i 0/12 (Fig. 2B); 14–15 + 25–28 = 39–42 (usually 14 + 26–27 = 40–41) vertebrae; 2–4 (usually 3) anal pterygiophores anterior to first haemal spine; scales on head and body small cycloid, deciduous, 47–58 in longitudinal series; most of cheek, operculum, nape, pectoral-fin base and pre-pelvic regions covered by cycloid scales (Fig. 3); 3 or 4 pairs of barbels on ventral surface of head; some outwardly-directed, fleshy finger-

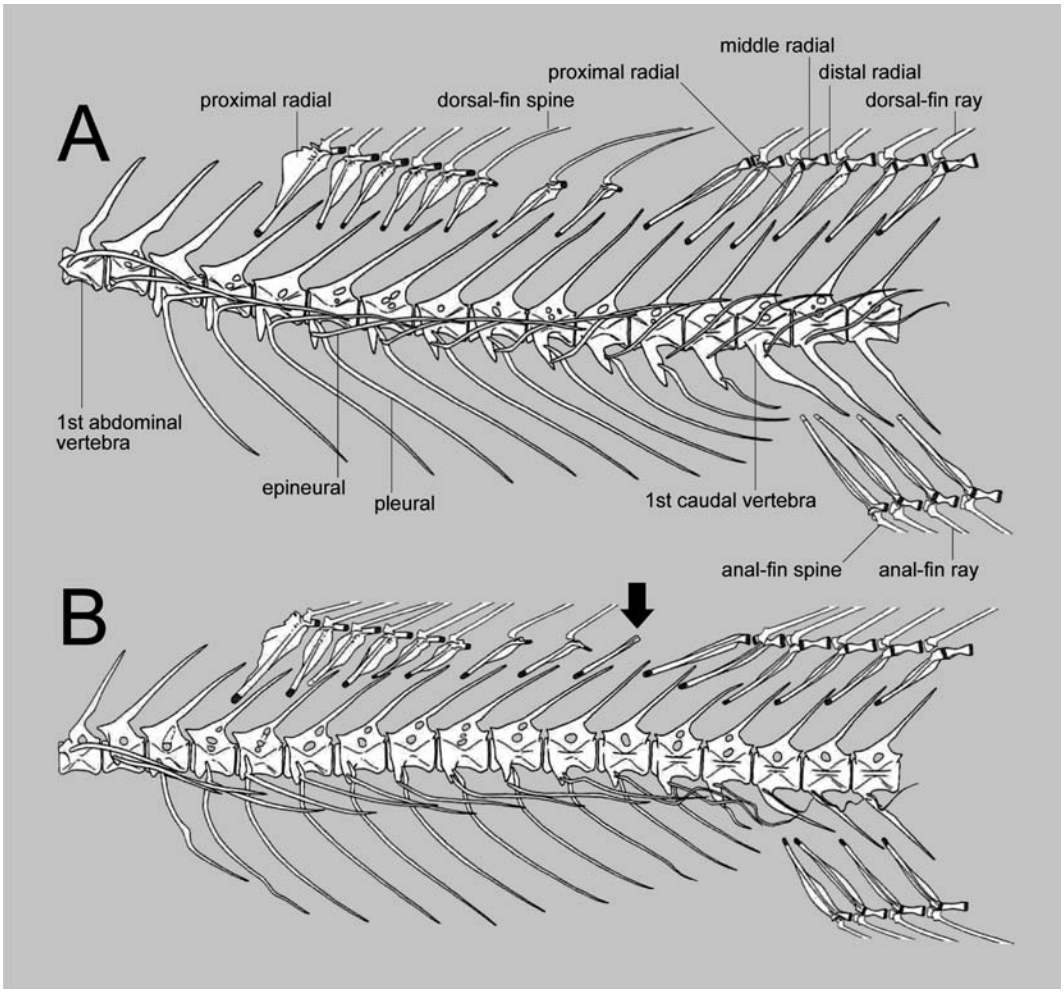

Fig. 2. Anterior part of axial skeletal features of *Amblychaeturichthys hexanema* (NSMT-P 111524, 100 mm SL) and *Chaeturicthys jeoni* sp. nov. (BLIP 20101452, 107.9 mm SL).

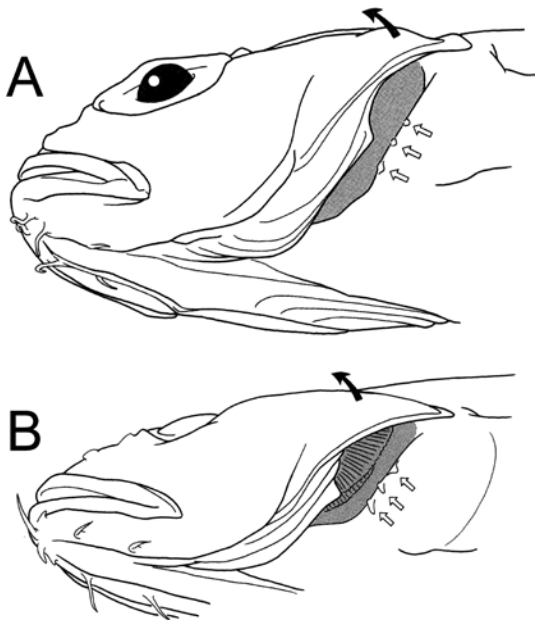

Fig. 3. Schematic illustrations of ventrolateral views of heads of *Amblychaeturichthys sciistius* and *Chaeturichthys jeoni* sp. nov. Open arrows indicate fleshy finger-like projections along lateral margin of lateral wing of cleithrum.

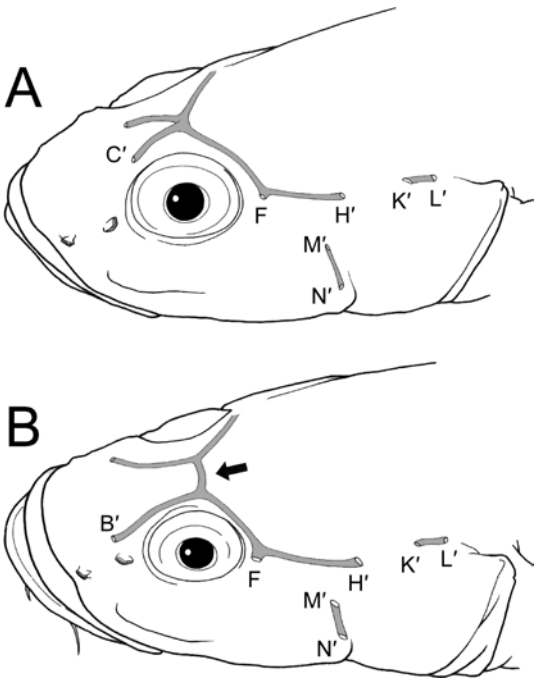

Fig. 4. Schematic illustrations of dorsolateral views of heads of *Amblychaeturichthys hexanema* and *Chaeturichthys jeoni* sp. nov. Arrow indicates the postorbital pseudo-commissure of oculoscapular canal.

like projections on lateral margin of lateral wing of cleithrum (Fig. 4B); gill opening wide, extending anteriorly to a vertical line through posterior margin of eye; pelvic fins united medially by well-developed connecting membrane and pelvic frenum with indented posterior margin; right and left sides of oculoscapular canal connected via well-developed postorbital pseudo-commissure (Takagi, 1989) just behind eye (Fig. 5B); 4 longitudinal rows of sensory papillae on cheek (rows *a*, *b*, *c* and *d*).

Description. Dorsal-fin rays VII–IX-I, 20–23 (usually VIII-I, 20–22); anal-fin rays I, 17–20 (usually I, 18–19); pectoral-fin rays 21–25; pelvic-fin rays I, 5; branched caudal-fin rays 7–9 + 6–8; upper unsegmented caudal-fin rays 11–15 (usually 12–14); lower unsegmented caudal-fin rays 11–15 (usually 12–14); longitudinal scale rows 46–59; transverse scale rows 17–25; predorsal scales 20–29; gill rakers 2–6 + 9–14 = 12–19; pseudobranchial filaments 6–13.

Body elongated, subcylindrical, compressed posteriorly. Head subcyrindrical or slightly depressed. Interorbital space relatively wide, subequal or greater than eye diameter. Mouth terminal, slightly oblique, forming an angle of about 25 degrees to body axis; lower jaw projecting a little beyond upper jaw; posterior end of jaw below between posterior margin of pupil and orbit. Three or 4 pairs of barbels on ventral surface of head. Anterior and posterior nares short tubes, tips without skin flap; posterior nares located at about midway between anterior nares and eye. A minute papilla-like fleshy projection (not the sensory papilla) just above anterior nares. Anterior tip of tongue rounded to nearly truncated, free from floor of mouth. Lower lip interrupted at symphysis of lower jaw. Lower edge of gill opening extends anteriorly to a vertical through posterior margin of eye. Gill membrane attached to isthmus. Some (modally 3) minute, outwardly-directed fleshy finger-like

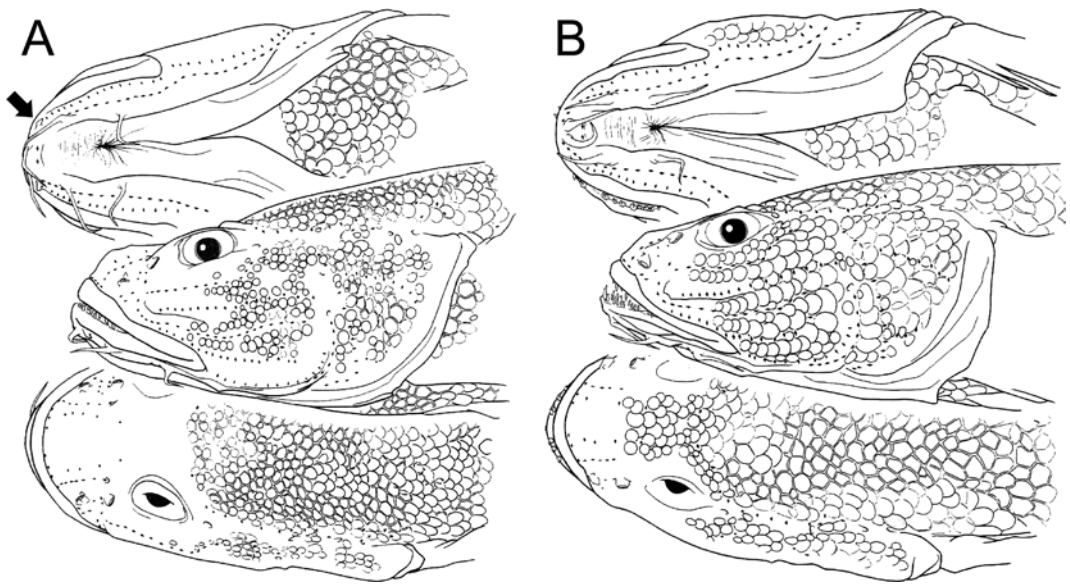

Fig. 5. Ventral (top), lateral (middle) and dorsal (bottom) views of heads of 2 species of *Chaeturichthys*, showing head squamation and barbels. A) *Chaeturichthys jeoni* sp. nov., BLIP 20101470, 108.1 mm SL; B) *Chaeturichthys stigmatias*, BLIP 20101511, 95.9 mm SL. Arrow indicates an additional minute barbel in *C. jeoni*. Note that many scales are missing, where this is the case, the scale pockets are illustrated.

projections along lateral margin of lateral wing of cleithrum (Fig. 3B).

First dorsal fin subequal to second dorsal fin in height; distal margin of first dorsal-fin rounded or nearly triangular, third or fourth spine longest; no dorsal spines elongated or filamentous. All dorsal- and anal-fin spines weak and flexible. Origin of anal fin beneath base of second or third ray of second dorsal-fin. Caudal fin lanceolate, long, the length slightly longer than head length. Pectoral fin oblong or nearly lanceolate, not extending posteriorly to a vertical through end of first dorsal-fin base or anus. All pelvic-fin rays branched, innermost (= fifth) ray longest; right and left pelvic fins united medially by well-developed connecting membrane (between innermost rays) and frenum (between spines); pelvic frenum moderately thin, with indented posterior margin.

Scales on head and body small cycloid, deciduous. Most of cheek and operculum covered by small cycloid scales (Fig. 5). Scales on pectoral-fin base and prepelvic region slightly embedded. Snout, jaws and ventral surface of head naked. Interorbital space with (in *C. stigmatias*) or without (in *C. jeoni*) embedded scales.

Teeth in both jaws simple, conical and slender, a little inwardly curved; each jaw with 2–3 rows of teeth anteriorly, narrowing to single row posteriorly, those in outermost row larger than those on inner row. No enlarged canine-like teeth on both jaws. No teeth on vomer and palatine.

Cephalic sensory systems are illustrated in Figs. 4B and 6. Right and left sides of oculoscapular canal of cephalic sensory system connected via well-developed postorbital pseudo-commissure (Takagi, 1989) just dorsal to eye (Fig. 4B); oculoscapular canal interrupted between pores H′ and K′; anterior oculoscapular canal with pores B′, F and H′; posterior oculoscapular canal with pores K′ and L′; preopercular canal with pores M′ and N′ (M′ absent in *C. stigmatias*). Four rows of sensory papillae on cheek (*a*, *b*, *c* and *d*) with row *cp* comprising single papilla between rows *c* and *d*; all sensory papilla rows on cheek and operculum uniserial; a pair of sensory papillae on just behind lower jaw symphysis (= row *f*). No lateral-line canals on body.

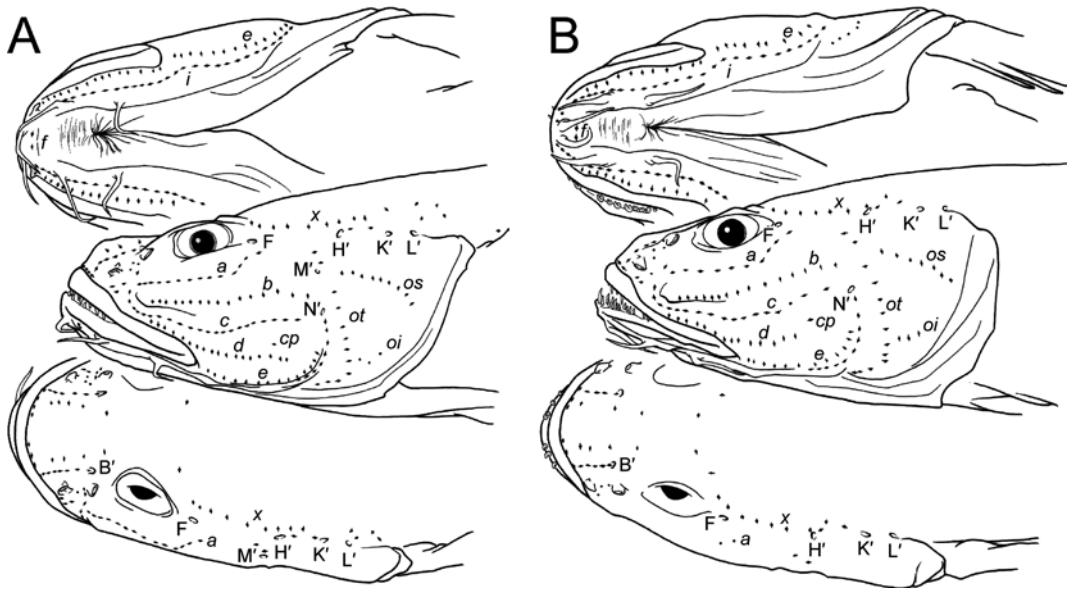

Fig. 6. Ventral (top), lateral (middle) and dorsal (bottom) views of heads of 2 species of *Chaeturichthys*, showing cephalic sensory canal pores (indicated by roman uppercase letters) and papillae (indicated by Roman lowercase letters). A) *Chaeturichthys jeoni* sp. nov., BLIP 20101470, 108.1 mm SL; B) *Chaeturichthys stigmatias*, SFU BLIP 20101511, 95.9 mm SL.

Selective osteology. Typical gobioid features: no parietal; pelvis contacted with cleithrum via pelvic intercleithral cartilage; a small ball-like ventral intercleithral cartilage; no supraneurals. *Typical gobiid features*: no posttemporals; no dorsal postcleithrum; 5 branchiostegal rays; well-developed, elongated procurrent cartilages; cartilaginous rostral; no mesopterygoid; dorsal end of interhyal well separated from dorsal end of symplectic; infrapharyngobranchial 1 absent; no autogenous distal radials on pterygiophores of first dorsal fin. *Typical gobionelline features*: anterior epineurals fused medially with relevant pleurals; 2–4 (usually 3) anal pterygiophores anterior to first haemal spine; 2 epurals; bony gill rakers restricted on outer side of first gill arch (i.e., rakers on inner side of first arch and both sides of second to fourth arches lacking bony elements). *Other selective features*: free minute, narrow thread-like ventral postcleithrum; no teeth on vomer and palatine; 14–15 + 25–28 = 39–42 (usually 14 + 26–27 = 40–42) vertebrae; P–V variable, but most frequently 3/I II II I I I i 0/12 (Fig. 2B); a spinous projection on middle of the posterior margin of dentary (Fig. 8); ventral margin of preopercle expanded ventrally; bran-

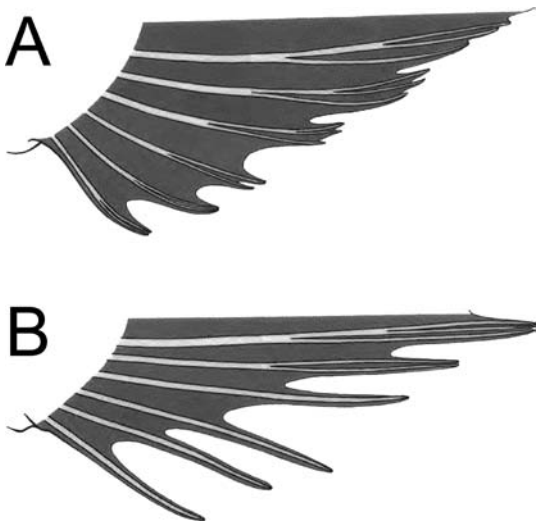

Fig. 7. Ventral part of pectoral fins of 2 species of *Chaeturichthys*. A) *Chaeturichthys jeoni* sp. nov., BLIP 20101469, 119.6 mm SL; B) *Chaeturichthys stigmatias*, BLIP 20101511, 95.9 mm SL.

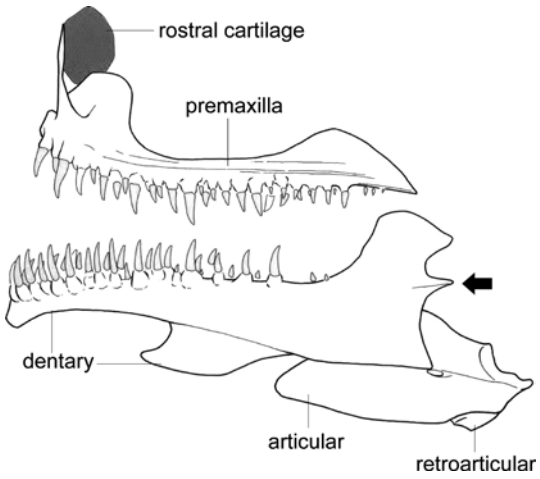

Fig. 8. Lateral view of jaws of *Chaeturichthys jeoni* sp. nov. (BLIP 20101452, 107.9 mm SL). Arrow indicates a spinous projection at middle of posterior margin of dentary.

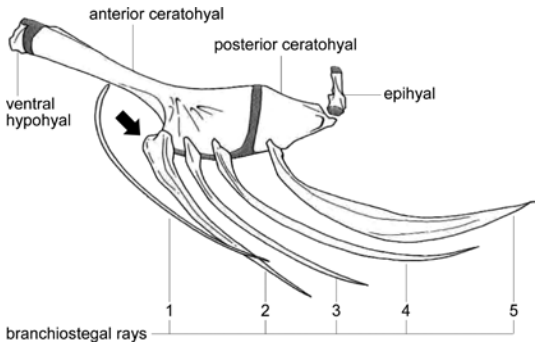

Fig. 9. Lateral view of hyoid arch of *Chaeturichthys jeoni* sp. nov. (BLIP 20101452, 107.9 mm SL). Arrow indicates a dorsoanteriorly expanded part of second branchiostegal ray.

chiostegal ray 2 expanded dorsoanteriorly (Fig. 9).

Comparison. *Chaeturichthys* resembles *Amblychaeturichthys* by sharing: 3 or 4 pairs of barbels on ventral surface of head (Fig. 3); some finger-like fleshy projection on lateral margin of lateral wing of cleithrum (Fig. 2, see "Remarks" below); almost always 8 spines of first dorsal fin; cheek and operculum largely covered by cycloid scales; wide gill opening, extending anteriorly well beyond a vertical line through posterior margin of preopercle; lanceolate caudal fin (except for *Amblychaeturichthys sciistius* with a rounded caudal fin); a minute papilla-like fleshy projection (not sensory papilla) just above anterior nostril; well-developed longitudinal pattern of sensory-papilla rows on cheek, and; similar body shape and dull coloration. Other than these 2 genera, no gobiids are known to have the combination of 8 spines of first dorsal fin and 3–4 pairs of barbels on ventral surface of head. Of the other genera of the Acanthogobius Group, *Sagamia* and *Lophiogobius* also have barbels, but the barbels in these two genera are much more numerous. *Amblychaeturichthys*, comprising 2 species, viz. *A. hexanema* and *A. sciistius*, is distinguished from *Chaeturichthys* by having: 13–16 segmented rays of second dorsal fin (vs. 20–23 in *Chaeturichthys*); 10–13 segmented rays of anal fin (vs. 18–20); 33–39 longitudinal scales (vs. 47–59); 13 + 20–22 = 33–35 vertebrae (vs. 14–15 + 25–28 = 39–42); P–V usually 3/I II II I I I 0/11 (vs. variable, but most frequently 3/I II II I I I I i 0/12) (Fig. 2); weak ctenoid scales at least part of body (vs. all scales on head and body cycloid); anterior oculoscapular canal terminated anteriorly at pore C′ (vs. pore B′, nearby the posterior nares) (Fig. 4), and; postorbital pseudocommisure of oculoscapular canal undeveloped (vs. well developed) (Fig. 4).

Remarks. Within the Acanthogobius Group (Birdsong *et al.*, 1988; Shibukawa, 1998; Shibukawa and Iwata, 1998), fishes of *Chaeturichthys* and *Amblychaeturichthys* are close together in general physiognomy, and the latter has been regarded as the junior synonym of the former by several researchers. Actually, *Chaeturichthys* + *Amblychaeturichthys* is presumed to be a monophyletic group (Shibukawa, 1998), owing to sharing several unique, apparently derived, characters within the Acanthogobius Group, viz.: some finger-like fleshy projections on lateral margin of lateral wing of cleithrum; 3 or 4 pairs of barbels on ventral surface of lower jaw; a spinous projection on middle of the posterior margin of dentary (Fig. 8); ventral margin of preopercle expanded ventrally; branchiostegal ray 2

expanded dorsoanteriorly (Fig. 9); short preopercular canal not extending below pore N; sensory papilla rows just behind chin comprising a pair of sensory papillae. Nevertheless, *Chaeturichthys* differs significantly from its sister group *Amblychaeturichthys* (Shibukawa, 1998) by the characters listed in the "Comparison" (above), and these 2 are retained as distinct genera.

The other previous researchers, who recognized these 2 are distinct, indicated that *Chaeturichthys* differs from *Amblychaeturichthys* by having higher meristic counts and some finger-like fleshy lobes on lateral margin of lateral wing of cleithrum (e.g., Herre, 1927; Matsubara, 1955; Akihito *et al.*, 1984; Yamada, 1986). The second feature is uncommon within the Gobioidei, and has been reported only from a few gobionelline genera, i.e., *Chaeturichthys*, *Awaous*, *Parawaous*, *Stenogobius*, and *Mugilogobius* and its allies (e.g., Koumans, 1953; Watson, 1991, 1992, 1993; Larson, 2001). Nevertheless, we also confirmed similar fleshy lobes in *Amblychaeturichthys* (Fig. 3A), although weaker and smaller than those of *Chaeturichthys*. This feature is thus not useful to distinguish these 2 genera. These projections appear to be easily rubbed off in *Amblychaeturichthys*, and it is sometimes difficult to confirm their existence in damaged material (e.g., specimens obtained by the bottom trawls).

Tomiyama (1953) suggested the occurrence of an undescribed species of *Chaeturichthys* from China, which was closely allied to *Chaeturichthys hexanemus* (= *Amblychaeturichthys hexanema*). He noted that the former distinguished from the latter by irregular arrangement of the scales on the posterior part of body and caudal peduncle, and the specimens examined by him were "left in a bottle, labeled *Chaeturichthys variegatus*, in the Shanghai Science Institute." This name is clearly invalid nomenclaturally, according to Article 9.6 of ICZN (1999). No specimens that agreeing with this description of "*C. variegatus*" were found in this study, and the taxonomic status of the Tomiyama's species is thus uncertain.

Included species. *Chaeturichthys* comprises 2 species, *C. jeoni* sp. nov. and *C. stigmatias* (type species).

Chaeturichthys jeoni sp. nov.

[Japanese name: Yakiin-haze]

(Figs. 2A, 3B, 4B, 5A, 6A, 7A and 8–10; Table 1)

Chaeturichthys stigmatias (not of Richardson); Jordan and Snyder, 1901a: 764 (Sasuna, Tsushima, Japan), 1901b: 105 (Sasuna, Tsushima, Japan); Jordan *et al.*, 1913: 357 (Sasuna, Tsushima, Japan); Akihito *et al.*, 1984: 279 (Tsushima Islands, Japan); Yamada, 1986: 286 (East China Sea and Yellow Sea); Akihito *et al.*, 1993: 1044 (Tsushima Islands, Japan); Akihito *et al.*, 2000: 1206 and 1291 (Tsushima Islands, Japan); Akihito *et al.*, 2002: 1206 and 1291 (Tsushima Islands, Japan); Yamada *et al.*, 2007: 929–931 (East China Sea and Yellow Sea).

Chaeturichthys stigmatius [*sic*]: Jordan and Metz, 1913: 57 (Tsushima).

Holotype. NSMT-P 54146, male, 140.5 mm SL, East China Sea (33°14.7′N, 123°27.2′E), 49–50 m depth, R/V/ Yoko-maru, 4 Oct., 1989, collected by U. Yamada.

Paratypes. Total 12 specimens, 49.2–131.9 mm SL: BSKU 47099, 1 specimen (female), 119.4 mm SL, East China Sea (32°17′N, 125°14′E to 32°20′N, 125°14′E), 60 m depth, R/V/ Kaiho-maru, 11 Oct. 1989 ; BSKU 47134–47136, 3 specimens, 88.4–131.7 mm SL, East China Sea (33°44′N, 122°20′E to 33°41′N, 123°15′E), 61 m depth, R/V/ Kaiho-maru, 30 Sept. 1989; EWNHM 80239–80335, 7 specimens, 49.2–74.4 mm SL, off Chebu Island, Soshin-myon, Hwasong-gun, Kyonggi-do, Korea, 17 Aug. 1993, collected by S.-R. Jeon and K. Shibukawa; NSMT-P 111523 (out of NSMT-P 54146), 1 specimen (female), 131.9 mm SL, collected with holotype.

Other materials. Total 55 specimens, 67.2–157.9 mm SL: BLIP 19840185 and 20101469–20101471, 4 specimens, 89.0–119.6 mm SL, Yellow Sea, China (34°20′N, 122°20′E), 0–20 m depths, collected by M. Aizawa; BLIP 19870618 and 20101472–20101474, 4 specimens, 88.4–136.6 mm SL, Chimwangtao, Hopeh Province, China, 28 Oct. 1987, collected by S. Hosoya and

Fig. 10. Dorsal (A), ventral (B) and lateral (C) views of *Chaeturichthys jeoni* sp. nov. (NSMT-P 54146, holotype, 140.5 mm SL) in 70% ethanol-preserved condition.

Y. Niimura; BLIP 20101435–20101440, 6 specimens, 74.8–120.8 mm SL, Shihung, Kyonggi-do, Korea, 27 May 1985, collected by S.-R. Jeon; BLIP 20101441–20101451, 11 specimens (including 2 cleared and stained specimens), 73.7–136.0 mm SL, Inch'on, Kyonggi-do, Korea, 12 Nov. 1995, collected by S.-R. Jeon; BLIP 20101452–20101461, 10 specimens, 46.1–107.9 mm SL, Inch'on, Kyonggi-do, Korea, 14 Sept. 1995, collected by S.-R. Jeon; BLIP 20101462–20101463, 2 specimens, 70.0–76.8 mm SL, Inch'on, Kyonggi-do, Korea, 14 Sept. 1995, collected by S.-R. Jeon; BLIP 20101464–20101465, 2 specimens, 67.2–84.8 mm SL, Inch'on, Kyonggi-do, Korea, 14 Sept. 1995, collected by S.-R. Jeon; BLIP 20101466–20101468, 3 specimens, 86.2–101.9 mm SL, Inch'on, Kyonggi-do, Korea, 12 Sept. 1995, collected by S.-R. Jeon; BLIP 20101514 (formerly SFU 3019), 1 specimen, 99.0 mm SL, Shanwei, Kwangtung Province, China (22°47′N, 115°25′E), Apr. 1980; BLIP 20101515 (formerly SFU 59B-573), 1 specimen, 127.0 mm SL, Pingtan, Fukien Province, China (25°30′N, 119°45′E), Apr. 1959; BLIP 20101516 (formerly SFU 1058), 1 specimen, 98.5 mm SL, Dongshan, Zhangzhou, Fukien Province, China (23°43′N, 119°45′E), Aug. 1958; FRLM 8125, 1 specimen, East China Sea (31°20′N, 125°10′E), T/V Seisui-maru, 7 Dec. 1988; NSMT-P 54147, 4 specimens, 108.8–142.7 mm SL, East China Sea (33°15′N, 123°34.3′E), 52 m depth, trawl, R/V Yoko-maru, 15 Oct. 1959, collected by U. Yamada; ZUMT 51395, 1 specimen (male), 122.9 mm SL, Yellow Sea (33°30′–34°00′N, 122°30′–123°00′E), 23 Oct. 1959; ZUMT 51486, 1 specimen (male), 157.6 mm SL, collected with ZUMT 51395; ZUMT 51487, 1 specimen (female), 103.0 mm SL, collected with ZUMT 51395; ZUMT 51737, 1 specimen (female), 82.6 mm SL, East China Sea, R/V Tenyo-maru, 17 Aug. 1959; ZUMT 54570, 1 specimen, 116.6 mm SL, Yellow Sea.

Diagnosis. The new species *Chaeturichthys*

jeoni is distinguished from the only congener, *C. stigmatias*, by having: no scales on interorbital space (vs. embedded scales present on interorbital space in *C. stigmatias*, Fig. 5); usually 4 pairs of barbels on ventral surface of head, comprising 3 pairs of long barbels and a pair of short one (vs. usually 3 pairs of long barbels only, Fig. 5); pectoral-fin rays 22–25, modally 24 (vs. 21–23, modally 22); most of pectoral-fin rays branched, not forming free rays (vs. ventral 3–5 rays of pectoral fin simple, forming free rays, Fig. 7); longitudinal scale rows 50–58 (vs. 47–53); transverse scale rows 20–25 (vs. 17–21); predorsal scales 23–29 (vs. 20–22); gill rakers on outer surface of first gill arch 2–6 + 9–13 = 12–16 (vs. 4–6 + 11–14 = 16–19); pseudobranchial filaments 7–13, usually 9–11 (vs. 6–8, usually 7); preopercular canal with pores M′ and N′ (vs. only with pore N′, Fig. 6); longer snout, its length 7.7–10.0% of SL (vs. 6.1–8.1% of SL).

Description. Proportional measurements are given in Table 1. In the following description of meristic counts, the counts of the holotype are identified by an asterisk, and the frequency of each value is given in parentheses following relevant value. Dorsal-fin rays VIII-I, 20* (27), VIII-I, 21 (35), VIII-I, 22 (1) or IX-I, 20 (1); anal-fin rays I, 18 (27), I, 19* (35) or I, 20 (2); pectoral-fin rays 22* (5), 23* (19), 24 (27) or 25 (10); pelvic-fin rays I, 5* (61); branched caudal-fin rays 7 + 7 (2), 8 + 6 (1), 8 + 7 (40), 8 + 8 (7), 9 + 7 (3) or 9 + 8 (4); upper unbranched caudal-fin rays 11 (1), 12 (21), 13 (28) or 14 (7), all of which unsegmented excluding posteriormost 0–1 (usually 1) segmented ray; lower unbranched caudal-fin rays 11 (2), 12 (17), 13 (27), 14 (10) or 15 (1), all of which unsegmented excluding posteriormost 0–1 (usually 1) segmented rays; longitudinal scale rows 50 (3), 51 (1), 52 (11), 53 (10), 54 (6), 55 (13), 56* (9), 57* (4), 58 (2) or 59 (2); transverse scale rows 20 (7), 21 (18), 22* (21), 23* (13), 24 or 25 (1); predorsal scales 23 (2), 24 (6), 25 (10), 26 (11), 27 (13), 28 (8) or 29* (4); vertebrae 14 + 26 = 40 (6), 14 + 27 = 41* (49), 14 + 28 = 42 (4), 15 + 26 = 41 (1); dorsal-pterygiophore formulae 3/I II II I I I i 0/12 (53),

Table 1. Proportional measurements of 2 species of *Chaeturichthys*.

	Chaeturichthys jeoni sp. nov.		*Chaeturichthys stigmatias*		
	Holotype (NSMT-P 54146)	All specimens measured (51 specimens)	Syntypes (BMNH 1855.9.19.357)		All specimens measured (20 specimens)
Standard length (mm)	140.5	46.1–157.6	111.3	97.5	54.4–111.3
In % of standard length					
Head length	27.8	25.4–30.0	22.9	26.1	22.8–28.2
Head width	14.8	11.5–14.8	13.2	14.1	11.0–14.1
Snout length	10.0	7.7–10.0	6.1	7.1	6.4–8.1
Eye diameter	2.9	2.9–6.8	3.3	3.8	3.3–5.9
Bony interorbital width	3.9	3.0–4.7	3.7	4.5	2.9–4.5
Jaw length	12.6	11.0–13.6	10.0	11.3	9.5–13.2
Body width	12.6	9.8–17.3	11.1	12.8	8.8–12.9
Body depth	16.1	13.2–18.0	14.2	16.9	11.7–16.9
Predorsal length	31.3	28.8–35.5	28.2	31.1	27.5–33.8
Prepelvic length	27.9	22.7–32.0	23.6	26.2	23.2–34.0
Preanal length	52.2	50.3–57.5	49.5	52.9	49.0–54.5
Caudal peduncle length	15.6	14.4–18.6	16.5	17.1	14.7–18.4
Caudal peduncle depth	7.3	5.3–7.5	6.1	7.9	6.0–8.3
Length of D1 base	14.0	12.2–16.0	13.7	17.0	12.7–17.0
Length of D2 base	37.5	33.0–39.4	41.5	38.0	36.5–44.0
Length of A base	33.4	27.9–33.6	34.5	31.9	29.8–36.7
Length of pectoral fin	20.7	19.1–24.7	broken	broken	20.4–27.1
Length of pelvic fin	15.5	14.2–19.7	broken	broken	16.0–20.6
Length of caudal fin	33.3	25.5–41.4	broken	broken	31.5–44.5

Abbreviations: A, anal fin; D_1, first dorsal fin; D_2, second dorsal fin.

3/I II I II I I i 0/12 (4), 3/I II II I I I i 0 0/13* (1) or 3/I II I II I I I 0 i/13 (1); anal-fin pterygiophore anterior to first haemal spine 2 (15), 3* (43) or 4 (2); epurals 2* (59); gill rakers on outer surface of first gill arch 2 + 10 (1), 3 + 9 (3), 3 + 10 (5), 3 + 11 (1), 3 + 12 (2), 3 + 13 (1), 4 + 9* (7), 4 + 10 (10), 4 + 11 (1), 5 + 9 (2), 5 + 10 (12), 5 + 11 (5) or 6 + 9 (1); pseudobranchial filaments 7 (1), 8 (2), 9 (17), 10* (18), 11 (7), 12 (2) or 13 (1).

Color when fresh. Based on color photograph by Yamada (1986: 286, as *Chaeturichthys stigmatias*): ground color of head and body yellowish brown, darkened dorsally; ventral surface of head and belly pale; numerous indistinct, irregular-shaped small dark grayish brown blotches on upper half of head; 3 indistinct dark grayish brown saddle-like blotches on body; a series of some irregularly-shaped dark grayish brown blotches on midlateral body; a conspicuous black blotch at rear part of first dorsal fin; pectoral fin subtranslucent, yellowish brown, with pale ventral margin; pelvic and anal fins pale; caudal fin gray with 3 indistinct vertical rows of blackish spots at anterior half of the fin. Coloration of freshly-collected specimen shown by Akihito *et al.* (1984, as *C. stigmatias*) is similar to that of the Yamada's (1986) specimen, except as follows: ground color of ventral half of head and body paler; dark brown reticulation on upper half of head and nape; many small dark brown blotches on dorsal half of body, forming irregular reticulation; ca. 3 longitudinal rows of small black spots on second dorsal fin.

Color in alcohol. — Similar to coloration of freshly-collected specimen.

Distribution and habitat. The specimens of *Chaeturichthys jeoni* examined here were collected from the continental shelf of East Asia between the Bohai Sea and South China Sea. Jordan and Snyder (1901a) recorded this species (as *Chaeturichthys stigmatias*) from the Tsushima Islands, the southernmost islands of the Sea of Japan, based on 2 specimens collected by P.L. Jouy at the port of Sasuna. Subsequently, several authors mentioned that this species is present in the Tsushima Islands (Jordan and Snyder, 1901b; Jordan and Metz, 1913; Jordan *et al.*, 1913; Tomiyama, 1936; Akihito *et al.*, 1984, 1993, 2000), apparently following Jordan and Snyder's (1901a) record. Of these, Akihito *et al.* (1984, 1993, 2000) provided the photograph and line drawing of whole body and head (the latter showing the cephalic sensory systems) of *Chaeturichthys jeoni* (as *C. stigmatias*) within their monographs of the Japanese gobies, but the specimens used in the illustrations were collected from the East China Sea. As far as we know, no specimens other than those reported by Jordan and Snyder (1901a) have been collected from the Tsushima Islands and adjacent waters. Considering the distribution data of *C. jeoni* shown by Yamada *et al.* (2007, as *C. stigmatias*), the Jouy's [= Jordan and Snyder's (1901a)] specimens were possibly transported from another area (probably somewhere in the Yellow Sea or East China Sea) to the port of Sasuna, Tsushima Islands.

Yamada (1986) noted that *Chaeturichthys jeoni* (as *C. stigmatias*) was commonly found on the sandy-mud bottoms at the depths of 60–90 m in the East China Sea; subsequently Yamada *et al.* (2007) reported that this species (as *C. stigmatias*) was collected from muddy bottoms at the depths of 11–110 m (most frequently 43–85 m depths). Fishes of *Chaeturichthys* are also known from estuaries and adjacent shallow coastal waters (e.g., Zhuang *et al.*, 2006), but the species identification needs to be confirmed based on the voucher specimens.

Remarks. The Japanese vernacular name "Yakiin-haze" (meaning "branded goby") first appeared in the catalogue of fishes of Japan (Jordan *et al.*, 1913); they applied the name for *Chaeturichthys stigmatias* of Jordan and Snyder (1901a), which was based on 2 specimens from the port in the Tsushima Islands. According to Jordan and Snyder (1901a, b), their specimens possessed: 24 pectoral-fin rays, 3 + 11 gill rakers, 57 scale rows in longitudinal series, and small rounded scales on "occiput, opercles, and preopercles", snout lengths 8% and 9% of SL. All of these features agree with those of *C. jeoni* rather than *C. stigmatias*. The Japanese vernacular

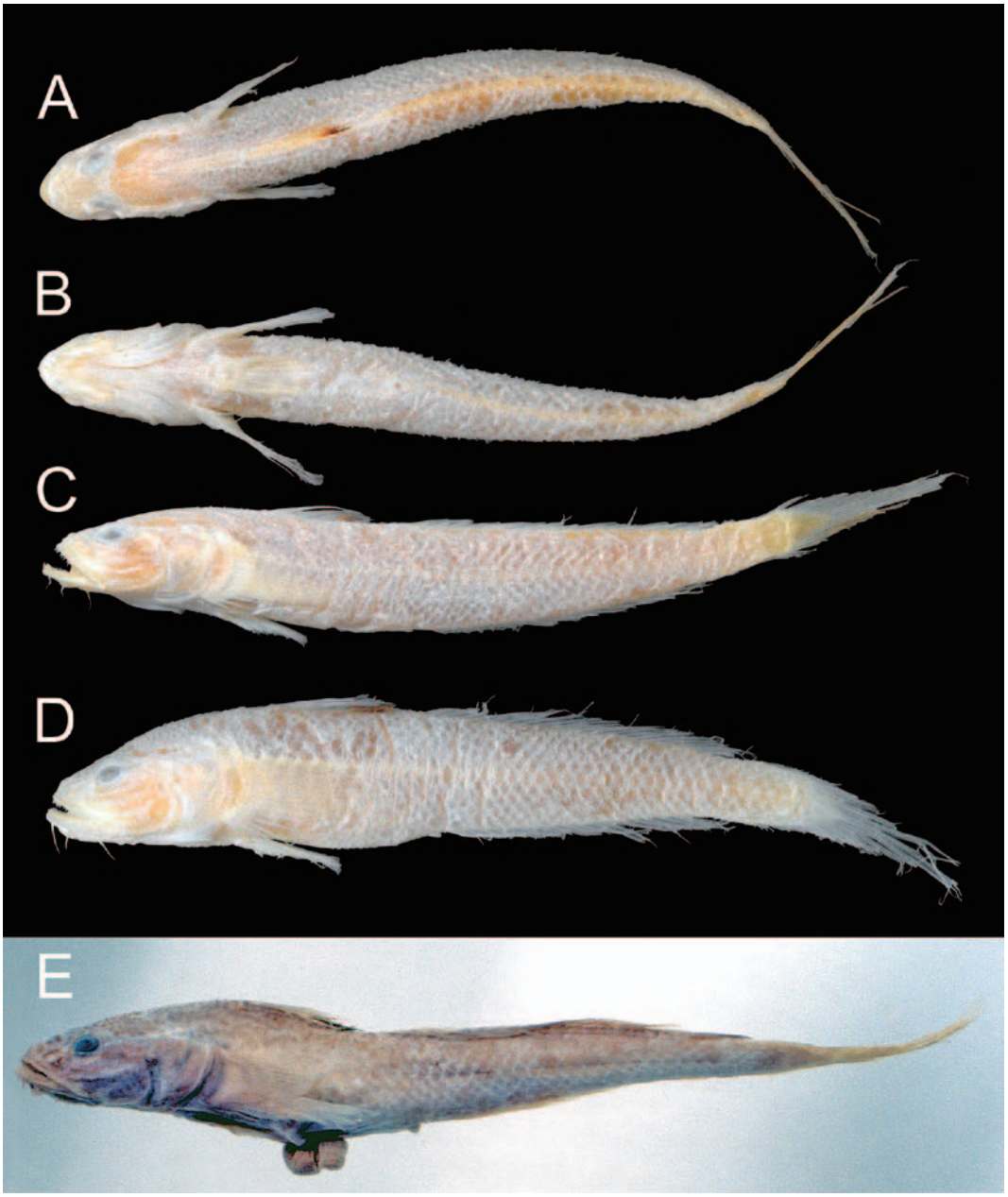

Fig. 11. *Chaeturichthys stigmatias* in 70% ethanol-preserved condition. A–C) dorsal (A), ventral (B) and lateral (C) views of one of the BMNH 1855.9.19.357 syntypes, 111.3 mm SL; D) lateral view of the other BMNH 1855.9.19.357 syntype, 97.5 mm SL; E) lateral view of BLIP 20101512, 107.3 mm SL.

name "Yakiin-haze" thus should be applied to *C. jeoni*.

Although Akihito *et al.* (1984, 1993, 2000), Yamada (1986) and Yamada *et al.* (2007) reported *Chaeturichthys stigmatias* with the Japanese name "Yakiin-haze," all of them were re-identified as *C. jeoni*, judging from their descriptive accounts and illustration of cephalic sensory systems. There are many other records of *C. stigmatias* from Korean and Chinese waters,

but the records clearly based on *C. stigmatias* as herein re-described were not available for this study, except for the original description (Richadson, 1844) and subsequent works citing that paper (e.g., Günther, 1861). Namely, most of these records are presumed to be based on misidentification of *C. jeoni* (e.g., Fowler, 1961; Kim *et al.*, 2005; Liu and Qin, 1987), possibly mixed it up with *C. stigmatias* (e.g., Ni, 1990; Zhuang *et al.*, 2006; Shen, 2008), or of uncertain affinity (e.g., Herre, 1927).

Chaeturichthys jeoni attains ca. 30 cm in total length (Yamada, 1986, as *C. stigmatias*) or 20 cm SL (Yamada *et al.*, 2007, as *C. stigmatias*). Shen (2008, as *C. stigmatias*) reported 180–220 mm SL.

Etymology. The new specific name, *jeoni*, refers to the family named of Sang-Rin Jeon (Professor Emeritus of Sang Myung University, Seoul), who very kindly assisted our research of the fishes in Korea, and gave us the opportunity to examine many specimens of Korean fishes, including several type-specimens of this new species.

Chaeturichthys stigmatias Richardson, 1844

[English name: Branded goby]

(Figs. 1, 5B, 6B, 7B and 11; Table 1)

Chaeturichthys stigmatias Richardson, 1844: 55 (type locality: ?Southern Pacific).

Gobius stigmatias. Günther, 1861: 78 (?Southern Pacific).

Syntypes. BMNH 1855.9.19.357, 2 specimens (syntypes of *Chaeturichthys stigmatias*), 97.5–111.3 mm SL, "Southern Pacific" (see "Distribution and habitat", below).

Other materials. Total 19 specimens, 53.5–107.3 mm SL: BLIP 20101511 (formerly SFU 3006), 1 specimen, 95.9 mm SL, Zhanjiang, Kwangtung Province, China (21°10′N, 110°24′E), 23 May 1985; BLIP 20101512 (formerly SFU 3012), 1 specimen, 107.3 mm SL, Swatow, Kwangtung Province, China (23°23′N, 110°24′E), Mar. 1986; BLIP 20101513 (formerly SFU 3022), 1 specimen, 105.1 mm SL, Amoy, Fukien Province, China (24°30′N, 118°10′E), Aug. 1978; BLIP 20101475–20101489, 15 specimens, 54.4–78.9 mm SL, Haenam, Haenam-gun, Chollanam-do, Korea, 11 Oct. 1985; ZUMT 33299, 1 specimen, 53.5 mm SL, collecting locality and date unknown.

Diagnosis. See diagnosis of the only other congener, *Chaeturichthys jeoni*.

Description. Proportional measurements are given in Table 1. In the following description of meristic counts, the counts of syntypes are identified by an asterisk, and the frequency of each value is given in parentheses following relevant value. Dorsal-fin rays VII-I, 20 (1), VII-I, 21 (1), VIII-I, 20 (2), VIII-I, 21 (7), VIII-I, 22* (6), VIII-I, 23 (2), IX-I, 20 (1) or IX-I, 21* (1); anal-fin rays I, 17 (2), I, 18* (6), I, 19* (11) or I, 20 (2); pectoral-fin rays 21* (2), 22* (11) or 23 (9); pelvic-fin rays I, 5* (21); branched caudal-fin rays 8 + 7 (9), 8 + 8 (4) or 9 + 8 (2); upper unbranched caudal-fin rays 12 (3), 13 (5), 14 (7) or 15 (1), all rays unsegmented except for posterior most 0–1 segmented ray; lower unbranched caudal-fin rays 12 (3), 13 (4) or 14 (9), all rays unsegmented except for posteriormost 0–1 segmented ray; longitudinal scale rows 46* (2), 47 (1), 48 (2), 49* (5), 50 (5), 51 (4), 52 (1) or 53 (2); transverse scale rows 17* (5), 18* (5), 19* (6), 20 (3) or 21 (3); predorsal scales (see Materials and Methods) 20 (5), 21 (9), 22* (5) or 23* (1); vertebrae 14 + 25 = 39 (2), 14 + 26 = 40* (12), 14 + 27 = 41* (6) or 15 + 25 = 40 (1); dorsal pterygiophore formulae 3/I II II I I I i 0/12 (14), 3/I II II I I i 0 i/12 (1), 3/I II I II I I i 0/12* (2), 3/I II I II I I I 0/12* (1), 3/I II I II I I 0 i/12 (1), 3/I II II I I i i 0/12 (1) or 3/I I II II I I I 0 i/13 (1); anal pterygiophroes anterior to first haemal spine 2* (4) or 3* (17); epurals 2* (21); gill rakers on outer surface of first gill arch 4 + 13 (2), 4 + 14 (1), 5 + 11* (2), 5 + 12* (5), 5 + 13 (6), 6 + 12 (2) or 6 + 13 (2); pseudobranchial filaments 6 (3), 7 (14), 8* (2) or 9* (1).

Color when fresh. No live or fresh specimens are examined in this study.

Color in alcohol. No significant differences are found in the coloration from that of the congener, *Chaeturichthys jeoni*. Any traces of color

patterns are faded in the syntypes, except for a blackish brown blotch at rear part of the first dorsal fin (Fig. 9). Richardson (1844) noted that the syntypes "retain a slight rosaceous tint, with a whitish under-surface, three whitish streaks on the cheek, and a black mark on the first dorsal" when he examined them.

Distribution and habitat. The specimens of *Chaeturichthys stigmatias* examined herein were collected from the southwest coast of Korea and the Chinese coast of South China Sea. Its distribution pattern appears to entirely overlap that of *C. jeoni*. As noted above, the syntypes were in a bottle labeled "Southern Pacific" when Richardson (1844) examined them, but he speculated that they were collected from the Chinese seas, based on the other fishes found in the bottle (Richardson, 1844: 54).

No information on the habitat of *C. stigmatias* is available, and we did not find any examples of a single collection lot containing specimens of both *C. jeoni* and *C. stigmatias*. This suggests that *C. stigmatias* is not syntopic with *C. jeoni* (i.e., the habitats of these 2 species may be different).

Key to Species of the Acanthogobius Group

According to Akihito *et al.* (2008), *Pterogobius zonoleucus* Jordan and Snyder, 1901 (type locality: Misaki, Kanagawa Prefecture of Japan) previously recognized was paraphyletic, but formed monophyletic if the population of Sea of Japan was excluded; the population of Sea of Japan has not yet been described/named, and, as in the previous works, it is tentatively included within *P. zonoleucus* here.

1a. No free rays on upper part of pectoral fin; posterior margin of pelvic frenum indented; 32–82 longitudinal scales; 8–28 transverse scales; counts of vertebrae variable, but usually not as in 1b . . . 2

1b. Free rays present on upper part of pectoral fin; posterior margin of pelvic frenum smooth or bilobate; 59–130 longitudinal scales; 19–53 transverse scales; usually 14 + 20 = 34 or 15 + 19 = 34 vertebrae 14

2a. Ventral surface of head lacking barbels or flaps (except for mental frenum); gill opening moderate, its lowermost edge not or just extending to a vertical line through posterior margin of preopercle 3

2b. Ventral surface of head with some or numerous barbels and/or short flaps; gill opening wide, its lowermost edge extending well beyond a vertical line through posterior margin of preopercle 10

3a. Eye large, its diameter greater than snout length (27.5–34.4% of head length); usually 16–17 segmented rays of second dorsal fin; typically P–V 3/I II II I I I 0 i/12; each cephalic sensory papilla modified into minute skin flap; posterior oculoscapular canal absent (Sea of Japan, off Pacific coasts of Honshu, Shikoku and Kyushu of Japan, and East China Sea) . . . . . *Suruga fundicola* Jordan and Snyder, 1901

3b. Eye moderate in size, its diameter usually less than snout length (15.6–31.2% of head length); usually 11–14 or 18–20 segmented rays of second dorsal fin; P–V not as in 3a; cephalic sensory papillae not as in 3a; posterior oculoscapular canal and its terminal pores K′ and L′ present . . . . . 4 (*Acanthogobius*)

4a. Segmented rays of second dorsal fin 9–13 (usually 10–12); difference in number of segmented rays between second dorsal and anal fins usually 1; 33–38 longitudinal scales; 8–11 transverse scales; 0–16 predorsal scales; less than 10 pseudobranchial filaments; no transverse rows of sensory papillae on cheek; poteriormost precaudal vertebra usually lacking pleural ribs 5

4b. Segmented rays of second dorsal fin 12–21 (usually more than 13); difference in number of seg-

mented rays between second dorsal and anal fins usually 2–5; 44–82 longitudinal scales; 16–28 transverse scales; 22–42 predorsal scales; more than 11 pseudobranchial filaments; anterior part of sensory-papillae row *a* forming some transverse rows; posteriormost precaudal vertebra usually bearing pleural ribs 8

5a. Segmented rays of second dorsal fin 12–13 (modally 12); 11–12 (modally 11) segmented rays of anal fin; body greatly elongate, its depth 10.6–14.2% of SL; caudal fin elongate, elliptical, entirely gray with pale margin; tongue largely adhered to floor of mouth; anterior tip of snout slightly overhanging upper lip; oculoscapular canal lacking pore D; body coloration not as below (Korean and Chinese coasts of Bohai Sea, Yellow Sea and East China Sea)
. . . . . *Acanthogobius elongatus* (Fang, 1942)

5b. Segmented rays of second dorsal fin 10–12 (usually 11); 9–11 (usually 10) segmented rays of anal fin; body moderately elongate, its depth 14.8–20.3% of SL; caudal fin rounded or near truncate, with several vertical rows of arrowhead-shaped black spots on dorsal two-thirds of fin; anterior tip of tongue distinctly separated from floor of mouth; anterior tip of snout not overhanging upper lip; oculoscapular canal usually with pore D; several narrow pale transverse bars on body in adult (indistinct in preserved specimens). 6

6a. Caudal vertebrae 19–21 (usually 20); sensory-papillae rows *e* and *i* usually uninterrupted between pore O′ to chin (Amami-oshima Island and Okinawa-jima Island, Ryukyu Islands, Japan) . . . . . *Acanthogobius insularis* Shibukawa and Taki, 1996

6b. Caudal vertebrae 18–20 (usually 19); sensory-papillae rows *e* and *i* usually interrupted at middle
. 7

7a. Predorsal scales more than 13; upper part of operculum and pectoral-fin base covered with embedded scales; spines of first dorsal fin not elongate and filamentous in either sex; posteriormost spot on midlateral caudal peduncle usually i-shaped (Korean and Chinese coasts of Bohai Sea, Yellow Sea and East China Sea) . . . . . *Acanthogobius luridus* Ni and Wu, 1985

7b. Predorsal scales less than 11; head and pectoral-fin base naked; spines of first dorsal fin usually elongate and filamentous in adult male; posteriormost spot on midlateral caudal peduncle T- or Y-shaped (Russian Far East from Amur to Peter the Great Gulf, Korean Peninsula, Bohai Sea, Yellow Sea and East China Sea of China, and Hokkaido to Kyushu of Japan)
. . . . . *Acanthogobius lactipes* (Hilgendorf, 1879)

8a. Segmented rays of second dorsal fin 18–21; 15–18 segmented rays of anal fin; 60–82 longitudinal scales; 15–17 + 25–28 = 40–44 vertebrae; posteriormost pterygiophore of first dorsal fin spineless; interneural gap usually located in front of posteriormost pterygiophore of first dorsal fin; usually three anal pterygiophores anterior to first haemal spine; caudal fin entirely gray with pale margin, sometimes (usually in young specimens) with some indistinct vertical rows of dusky arrowhead-shaped spots around its base (Ariake and Yatsushiro sounds of Japan, and Korean and Chinese coasts of Bohai Sea, Yellow Sea and East and South China Sea)
. . . . . *Acanthogobius hasta* (Temminck and Schlegel, 1845)

8b. Segmented rays of second dorsal fin 12–14; 10–12 segmented rays of anal fin; 44–52 longitudinal scales; 12–14 + 19–23 = 33–37 vertebrae; posteriormost pterygiophore of first dorsal fin bearing a spinous ray; interneural gap usually located behind posteriormost pterygiophore of first dorsal fin; usually two anal pterygiophores anterior to first haemal spine; upper two-thirds of caudal fin with several distinct vertical rows of black arrowhead-shaped spots. 9

9a. Spines of first dorsal fin usually 8; usually P–V 3/I II II I I I 0/11; usually 13 + 20 = 33 vertebrae (Russian Far East from Amur to Peter the Great Gulf, Korean Peninsula, Bohai Sea, Yellow Sea and East China Sea of China, and Hokkaido to Kyushu of Japan)

. . . . . *Acanthogobius flavimanus* (Temminck and Schlegel, 1845)

9b. Spines of first dorsal fin usually 9; usually P–V 3/I II II I I I I 0/12; 14 + 22–23 = 36–37 vertebrae (South China Sea and Gulf of Tonkin) . . . *Acanthogobius stigmothonus* (Richardson, 1845)

10a. Ventral surface of head entirely covered by numerous short barbels or flaps; pelvic fin large, extending far beyond origin of anal fin; most of pectoral-fin rays bifurcated; interorbital space wide, its fleshy width 2.8–3.0 in eye diameter; lateral margin of lateral wing of cleithrum smooth, without any fleshy projections; infraorbital canal well developed, extending below eyes with several additional branches ventrally; oculoscapular canal uninterrupted between pores B′ and L′; preopercular canal extending ventrally to pore O′, with posteroventrally curved dorsal tip; sensory-papillae row *f* comprising aggregation of several papillae; sensory-papillae row *z* comprising more than 3 sensory papillae (Korean and Chinese coasts of Bohai Sea, Yellow Sea and East China Sea). . . . . *Lophiogobius ocellicauda* Günther, 1873

10b. Ventral surface of head with 3–4 pairs of rather long barbels; pelvic fin moderate in size, not reaching to origin of anal fin; most of pectoral-fin rays with multiple branches (except for *Chaeturichthys stigmatias* with lower one-third of pectoral-fin rays unbranched); interorbital space narrow to moderate in width, its fleshy width 0.2–1.5 in eye diameter; lateral margin of lateral wing of cleithrum with some laterally-directed finger-like fleshy projections (minute in *Amblychaeturichthys*); infraorbital canal reduced in a short tube restricted posterior to eye; oculoscapular canal interrupted between pores H′ and K′; preopercular canal extending ventrally to pore N′, with its dorsal tip directed dorsally; sensory-papillae row *f* comprising a pair of sensory papillae; sensory-papillae row *z* comprising 2 sensory papillae 11

11a. Segmented rays of second dorsal fin 13–16; segmented rays of anal fin 10–13; scales on body largely ctenoid, 33–39 longitudinal scales; 13 + 20–22 = 33–35 vertebrae; P–V usually 3/I II II I I I 0/11; anterior oculoscapular canal terminated anteriorly as pore C; postorbital pseudo-commisure undeveloped . . . . . 12 (*Amblychaeturichthys*)

11b. Segmented rays of second dorsal fin 20–23; segmented rays of anal fin 18–20; scales on body largely ctenoid, 47–58 longitudinal scales; 14–15 + 25–28 = 39–42 vertebrae; P–V usually 3/I II II I I I i 0/12; anterior oculoscapular canal terminated anteriorly as pore B; postorbital pseudo-commisure well developed. . . . . 13 (*Chaeturichthys*)

12a. Segmented rays of second dorsal fin 15–16; 11–13 (usually 13) segmented rays of anal fin; predorsal scales extending onto interorbital area; no conspicuous black spot on first dorsal fin; caudal fin lanceolate, entirely dark gray with some vague vertical dusky bars near its base (Hokkaido to Kyushu of Japan, Bohai Sea, Yellow Sea and East and South China Sea)
. . . . . *Amblychaeturichthys hexanema* (Bleeker, 1853)

12b. Segmented rays of second dorsal fin 13–15 (usually 13 or 14); 10–13 (usually 11 or 12) segmented rays of anal fin; predorsal scale not extending onto interorbital area; a conspicuous black spot on first dorsal fin; caudal fin rounded (rather than lanceolate), with several distinct vertical bars (Hokkaido to Kyushu of Japan and East China Sea)
. . . . . *Amblychaeturichthys sciistius* (Jordan and Snyder, 1901)

13a. Interorbital space with embedded cycloid scales; usually 3 pairs of barbels on ventral surface of lower jaw; 21–23 (usually 22 or 23) pectoral-fin rays; lowermost 3–5 pectoral-fin rays simple, interradial membrane between these rays much reduced and deeply emarginate; 47–53 longitudinal scales; 17–21 transverse scales; 20–22 predorsal scales on nape and occipital region; 16–19 gill rakers; 6–8 pseudobranchial filaments; snout relatively short, its length 6.7–8.1% of SL; pore M′ of preopercular canal absent; sensory-papillae row *d* not extending posteriorly to a vertical line through row *cp* (southwestern coast of Southern Korea and South China Sea)

. . . . . *Chaeturichthys stigmatias* Richardson, 1844

13b. Interorbital space with embedded cycloid scales; usually 4 pairs of barbels on ventral surface of lower jaw; 22–25 (modally 24) pectoral-fin rays; all pectoral-fin rays branched, interradial membrane between these rays not emarginate; 50–58 longitudinal scales; 20–25 transverse scales; 23–29 predorsal scales on nape and occipital region; 12–16 gill rakers; 7–13 pseudobranchial filaments; snout relatively long, its length 7.7–9.9% of SL; pore M′ of preopercular canal present; sensory-papillae row *d* extending posteriorly beyond a vertical line through row *cp* (Bohai Sea, Yellow Sea, and East and South China Seas) . . . . . ***Chaeturichthys jeoni*** sp. nov.

14a. Ventral surface of head with many (usually 30–35) barbels; 13–15 (usually 14) segmented rays of second dorsal-fin rays; 12–14 (usually 13) segmented rays of anal fin; difference in number of segmented rays between second dorsal and anal fins usually 1; 59–64 longitudinal scales; 19–22 transverse scales; 19–21 predorsal scales; postorbital pseudo-commissure undeveloped; anterior part of sensory-papillae row *a* comprising many aggregated sensory papillae; upper two-thirds of caudal fin with several vertical rows of dusky arrowhead-shaped spots (Honshu to Kyushu of Japan, and east and southeast coast of Korean Peninsula)
. . . . . *Sagamia geneionema* (Hilgendorf, 1879)

14b. Ventral surface of head without barbels; 12–13 or 19–27 segmented rays of second dorsal-fin rays; 9–11 or 18–27 segmented rays of anal fin; difference in number of segmented rays between second dorsal and anal fins usually 2 or more; 72–130 longitudinal scales; 30–53 transverse scales; 26–43 predorsal scales; postorbital pseudo-commissure well developed; anterior part of sensory-papillae row *a* uniserial; coloration of caudal fin not as above. 15

15a. Segmented rays of second dorsal fin 12–13; 9–11 segmented anal-fin rays; scales on body cycloid; each free pectoral-fin ray polyfurcated; segmented pelvic-fin rays stout and highly branched (see Shibukawa and Iwata, 1998: 144, fig. 3); usually only a single interneural space with 2 pterygiophores of second dorsal fin (viz., other interneural spaces beneath second dorsal fin with a single pterygiophore in each); 5 or 5.5 caudal-fin rays attached to lower hypural plate (hypurals 1 + 2); a row of short fleshy lobes fringed from ventral margin of cheek to chin; tip of anterior nasal tube with minute skin flap; oculoscapular canal uninterrupted between pores A′ and L′, with no opening except for the terminal pores (i.e., pores A′ and L′) and pore D; infraorbital canal well developed, extending below eye (Pacific coasts of Honshu, Japan)
. . . . . *Siphonogobius nue* Shibukawa and Iwata, 1998

15b. Segmented rays of second dorsal fin 19–27; 18–29 segmented anal-fin rays; scales on body largely ctenoid; each free pectoral-fin ray bifurcated; segmented pelvic-fin rays not as above; 4 or more interneural space with 2 pterygiophores of second dorsal fin in each; 6 caudal-fin rays attached to lower hypural plate (hypurals 1 + 2); no distinct fleshy lobes fringed from ventral margin of cheek to chin; tip of anterior nasal tube without skin flap; oculoscapular canal interrupted between pores H′ and K′, the configuration of sensory pores not as above; infraorbital canal reduced in short tube, restricted posterior to eye . . . . . 16 (*Pterogobius*)

16a. Segmented rays of second dorsal fin 19–23; 18–22 pectoral-fin rays; including uppermost 3–6 rays free from fin membrane; 72–89 longitudinal scales; 28–39 transverse scales; usually 15 + 19 = 34 vertebrae; P–V usually 3/I II II I I I 0/11; 3–5 (usually 4) anal-fin pterygiophores anterior to first haemal spine; first dorsal fin horn-like or falcate, with greatly elongate middle spines; prepercular canal with pore N; a yellow to orange (pale brown or beige in alcohol specimen) or black saddle-like marking on nape 17

16b. Segmented rays of second dorsal fin 24–27; 24–28 pectoral-fin rays; including uppermost 1–3 rays free from fin membrane; 94–130 longitudinal scales; 33–53 transverse scales; usually 14

+ 20 = 34 vertebrae; P–V usually 3/II I II I I I 0/11; 3–4 (usually 3) anal-fin pterygiophores anterior to first haemal spine; first dorsal fin oblong, with no elongate spines; preopercular canal lacking pore N; no saddle-like markings on nape 18

17a. Body dark brown to reddish brown (grayish brown in alcohol specimen) with 6–7 distinct black vertical bars bordered narrowly with yellow; 78–87 longitudinal scales; 33–39 transverse scales; 33–41 predorsal scales (southern Hokkaido to Kyushu of Japan, and east and southeast coasts of Korean Peninsula) . . . . . *Pterogobius elapoides* (Günther, 1872)

17b. Body pinkish or reddish brown (brown to pale brown in alcohol specimen), with narrow yellow to reddish orange vertical bars (indistinct in alcohol specimen); 72–82 longitudinal scales; 26–31 transverse scales; 28–34 predorsal scales (Honshu to Kyushu of Japan, and east and southeast coasts of Korean Peninsula). . . . . *Pterogobius zonoleucus* Jordan and Snyder, 1901

18a. A broad orange (pale brown in alcohol specimen) longitudinal midlateral stripe bordered narrowly with bright blue (dusky in alcohol specimen) on head and body; 117–130 longitudinal scales; 46–53 transverse scales; 15–18 pseudobranchial filaments (southern Hokkaido to Kyushu of Japan, and east and southeast coast of Korean Peninsula) . . . . . *Pterogobius virgo* (Temminck and Schlegel, 1845)

18b. Five broad black vertical bars on body; 94–106 longitudinal scales; 33–40 transverse scales; 10–14 pseudobranchial filaments (southern Hokkaido to Kyushu of Japan, east and southeast coast of Korean Peninsula and Bohai Sea) . . . . . *Pterogobius zacalles* Jordan and Snyder, 1901

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