

Revision of the genus *Hapalogenys* (Teleostei: Perciformes) with two new species from the Indo-West Pacific

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Abstract

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The Indo-West Pacific genus *Hapalogenys* is reviewed and two new species are described: *Hapalogenys dampieriensis* sp. nov. from Australia and *H. filamentosus* sp. nov. from the Philippines. The genus now includes: *Hapalogenys analis* Richardson, *H. dampieriensis* sp. nov., *H. filamentosus* sp. nov., *H. kishinouyei* Smith and Pope, *H. merguensis* Iwatsuki, Ukkrit and Amaoka, *H. nigripinnis* (Schlegel in Temminck and Schlegel) and *H. sennin* Iwatsuki and Nakabo. *Hapalogenys dampieriensis*, *H. filamentosus* and *H. kishinouyei* are similar to each other in overall body appearance and are accordingly identified as the “*Hapalogenys kishinouyei* complex”, defined by having 2–5 longitudinal stripes on the body. *Hapalogenys dampieriensis* has long been confused with *H. kishinouyei* in having similar longitudinal dark stripes, but the two species are easily separable on meristic and morphometric values, and body colour changes with growth. *Hapalogenys filamentosus* differs from *H. dampieriensis* in having a longer pelvic fin, with the filamentous first fin ray almost reaching to or slightly beyond the base of first anal-fin spine when depressed (vs. slightly beyond anus but not reaching to base of first anal-fin spine) and two faint narrow longitudinal stripes on the body (vs. four narrow longitudinal stripes in juveniles, reducing to two with growth). A neotype is designated for *H. analis*. Species of *Hapalogenys* can be distinguished from one another on the basis of meristic and morphometric characters, body colour pattern, maximum size and distribution. The familial position of *Hapalogenys* is briefly discussed.

Keywords

Taxonomy, Pisces, Perciformes, Revision, *Hapalogenys dampieriensis* sp. nov., *Hapalogenys filamentosus* sp. nov.

Introduction

In a study of the Indo-West Pacific genus *Hapalogenys*, Iwatsuki et al., 2000a pointed out the taxonomic confusion among *Hapalogenys* species from Japan. Subsequently, Iwatsuki and Nakabo, 2005 redescribed *H. nigripinnis* and proposed a new species, *H. sennin*. Ongoing investigations of all nominal species of *Hapalogenys*, including those now included in the family Dinopercidae and the genus *Parapristipoma* (Heemstra and Hecht, 1986; Iwatsuki et al., 2000a, b; Heemstra and Iwatsuki, in press; see Discussion), have resulted in the recognition of five species of *Hapalogenys* from the Indo-West Pacific, plus two new species described herein.

Hapalogenys kishinouyei Smith and Pope, 1906, described from Japan, was long considered an endemic East Asian shelf species. However, Gloerfelt-Tarp and Kailola, 1984 reported it from north-western Australia, their specimens having similar

longitudinal stripes on the body, and believed it to be an antitropical species. The East Asian *H. kishinouyei* though are separable from Australian specimens on the basis of counts, proportional measurements, different changes in colouration with growth, and maximum body size. In this paper we conclude that the Australian specimens represent an undescribed species of *Hapalogenys*. A second new species from the Philippines, similar to the Australian species in overall appearance, but differing in having a long pelvic fin with a filamentous first ray and two faint, longitudinal stripes on the body (vs. four at the same size), is also described.

The following account reviews the genus *Hapalogenys* from the Indo-West Pacific, including two new species, on the basis of all known types and a wide range of non-type specimens, from a wide geographic area. The familial position of *Hapalogenys* is briefly discussed.

Methods

Counts and measurements follow Iwatsuki et al., 2000a. Terminology generally follows Johnson, 1980, 1984, although that of the supraneural bones follows Mabee, 1988 and the formula of Ahlstrom et al., 1976. Institutional codes follow Leviton et al., 1985, with the following additions: Division of Fisheries Sciences, University of Miyazaki, Japan (MUFS); Phuket Marine Biological Center, Thailand (PMBC); Kanagawa Prefectural Museum, Kanagawa, Japan (KPM). The very short dense papillae and barbels on the fleshy lower lip in *Hapalogenys analis* (MUFS 7148, 12258) and *H. sennin* (MUFS 2086, 12225) necessitated dissection so as to determine the number of pores on and posterior to the chin.

Systematics

Hapalogenys Richardson, 1844

Hapalogenys Richardson, 1844a: 462 (type species not designated).—Bleeker, 1876: 271 (*Hapalogenys nitens* subsequently designated as type species by Richardson, 1844b [= *H. nigripinnis* Schlegel in Temminck and Schlegel, 1843], see Iwatsuki and Nakabo, 2005).—Johnson, 1984: 465 (placed as *incertae sedis* in Percoidei).—Springer and Raasch, 1995: 93, 104 (established family name Hapalogenidae [sic. Haplogeniidae] for this genus).—Iwatsuki et al., 2000a: 129.—Iwatsuki and Nakabo, 2005: 854.

Definition of the genus *Hapalogenys*

Body compressed, elevated; mouth moderate, horizontal; upper jaw protractile; 10 pores on and behind chin, including a pair of very small pores near symphysis (often hidden by cluster of short dense barbels or papillae, especially in *Hapalogenys analis* and *H. sennin*), plus 2 pores anteroventrally on dentary (often hidden by cluster of short dense barbels or papillae, especially in *H. analis* and *H. nigripinnis*), a single pore ventrally, midway along each dentary and a single pore ventrally at articulation between dentary and angular (sometimes slit-like in *H. dampieriensis* sp. nov., *H. sennin* and *H. kishinouyei*, a pit partially or entirely covered posteriorly by membrane in *H. nigripinnis* and *H. sennin*, especially in larger adults); a cluster of short or long, crowded papillae and barbels on and behind chin, generally developed with age; snout tip naked or with small papillae; teeth uniformly small, in bands on jaws, vomer, and palatines; preopercle serrate; opercle with 1 or 2 short spines; 7 branchiostegals; pseudobranchiae present; air bladder simple; pyloric appendages few; pored lateral-line scales 41–48; soft vertical fins scaled basally; dorsal surface of head, including snout, jaws and opercular elements scaly; dorsal-fin spines 11 with antrorse spine anteriorly (the antrorse spine is, in fact, an anterior projection of the 1st pterygiophore, not a fin spine), rays 13–15; anal fin with 3 spines (2 supernumerary spines on 1st anal pterygiophore; see Johnson, 1980), usually 9 rays (rarely 8); caudal fin generally rounded; pectoral fin pointed; dorsal- and anal-fin pterygiophores with separate proximal, middle and distal radials; supraneural formula 0/0+0/2/1+1/; principal caudal-fin rays 9+8; procurrent rays 5 or 6+5 or 6 (upper + lower); caudal skeleton with 5 hypurals, 3 epurals, 2 uroneurals and 2 autogenous haemal spines; hypural fusions absent; procurrent spur absent; vertebrae 10+14.

Relationships

The genus *Hapalogenys* has been traditionally placed in the Haemulidae (Akazaki, 1984; McKay, 2001, Nelson 2006), although Johnson, 1984 included it as “*incertae sedis*” in the Percoidei because of its uncertain affinities. Springer and Raasch, 1995 established a new family name, Hapalogenidae (sic. Haplogeniidae), for the genus, but without any strong supporting evidence. McKay, 2001 also recognised *Hapalogenys* as removed from the Haemulidae, although he retained it in that family for convenience. He reported *Hapalogenys* is very close to the two species of the family Dinopercidae, but lacks intrinsic muscles on the posterior part of the swimbladder. Based on similarities of larval morphology with *Lobotes* and *Datnioides* (= *Coius*), Leis and Carson-Ewart, 2000, 2004 placed *Hapalogenys* in a group they informally called ‘*Lobotes*-like’, and suggested a possible relationship of *Hapalogenys* to lobotids. Clearly, further study is needed to clarify the familial position of *Hapalogenys*, and until its relationships to other genera can be resolved we provisionally retain *Hapalogenys* in the Haemulidae.

Key to species

1. Scales on maxilla (figs 3A and C) 2
 - No scales on maxilla (figs 3C, 3E, 3G and 4A, E) 3
2. Head and body with 2 oblique dark bands (rarely indistinct), 1st descending from nape to behind pectoral fin and running to posterior part of soft anal-fin rays, 2nd descending from base of anterior 3rd or 4th dorsal-fin spines and soft dorsal-fin base, curving backwards through lateral line to upper part of caudal peduncle (fig. 1G); posterior margin of soft dorsal, anal and caudal fins not dense black (fig. 1G); spinous dorsal-fin membranes mostly yellowish brown, not dense black (fig. 1G) *Hapalogenys nigripinnis* (fig. 1G)
 - Head and body with 5–7 alternating whitish and dark-brown bands, 1st (often indistinct) from just before eye to posterior of lower jaw, 2nd somewhat oblique, extending from nape across opercle to pelvic-fin base (becoming wider posteroventrally), 3rd from base of 2nd and 3rd dorsal-fin spines to just behind pelvic-fin base; posterior margin of soft dorsal, anal and caudal fins dense black (fig. 1A); spinous dorsal-fin membrane dense black (fig. 1A) *Hapalogenys analis* (fig. 1A)
3. Body with 2 oblique dark bands or sometimes no bands 4
 - Body with 2–5 longitudinal dark stripes (sometimes indistinct or faint but visible), 1st from front of 1st dorsal-fin spine along dorsal midline, 2nd from nape to base of mid dorsal-fin soft rays, 3rd from eye to last dorsal-fin ray base, 4th from preopercular flange, through base of pectoral fin, to lower caudal peduncle, last from isthmus to base of anal spinous fin (fig. 2E) 5
4. 1st dark band on body descending from nape to behind pectoral fin, and 2nd from base of anterior 2nd or 3rd dorsal-fin spines and soft dorsal-fin base, curving backwards through lateral line to soft anal-fin and caudal peduncle (fig. 1F), but bands often lost in preserved specimens; orbit diameter large (3.5–3.8 in head length); papillae on fleshy lower lip well-developed but very short on chin (figs 4A–B) *Hapalogenys merguiensis* (fig. 1F)

- 1st dark band descending from nape to behind pectoral fin, and 2nd descending from base of 7–10th dorsal-fin spines, curving downwards above or through lateral line, but bands often lost in preserved specimens (fig. 1H); orbit diameter small (7.4–12.7 in head length); barbels on fleshy lower lip extremely well-developed and in a dense cluster on chin (figs 4E–F) *Hapalogenys sennin* (fig. 1H)
- 5. Filamentous tip of 1st pelvic-fin ray almost reaching to or slightly beyond base of 1st anal-fin spine when depressed (figs 1C–D); 2nd and 3rd longitudinal dark stripes on body faint (fig. 1C); posteriormost angle of jaw reaching to a vertical through centre of eye in specimens between 130–160 mm SL (figs 1C–D) *Hapalogenys filamentosus* sp. nov. (fig. 1C)
- Filamentous tip of 1st pelvic-fin ray extending slightly beyond anus but clearly not reaching to base of 1st anal-fin spine when depressed (figs 1A–B, 1E–H); 4th and 5th longitudinal dark stripes on body indistinct or absent (figs 1A, 1E, 2A–F); jaw reaching to slightly behind a vertical through anteriormost eye membrane in specimens between 130–160 mm SL (figs 1C, 2B–C, 2E–F) 6
- 6. 3rd body stripe narrow, its width below base of 5th and 6th dorsal-fin spines less than pupil diameter in specimens smaller than about 170 mm SL, 3rd, 4th and 5th stripes lost in specimens larger than 200 mm SL (figs 1B, 2A–C) *Hapalogenys dampieriensis* sp. nov. (figs 1B, 2A–C)
- 3rd stripe broad, its width below base of 5th and 6th dorsal-fin spines greater than pupil diameter at all sizes; 1st, 4th and 5th stripes lost in specimens larger than about 250 mm SL (figs 1E, 2D–F) *Hapalogenys kishinouyei* (figs 1E, 2D–F)

Hapalogenys analis Richardson, 1845

English Name: Broadbanded Velvetchin

Japanese Name: Setodai

Figures 1A, 3A–B

Hapalogenys analis Richardson, 1845: 85, pl. 43, fig. 1 (type locality: Canton, China).—Whitehead, 1970: 215 (Canton, China).—Bauchot et al., 1983: 32 (Canton, China).

Pristipoma mucronata Eydoux and Souleyet, 1850 (as 1841 but erroneous, see Bauchot et al., 1982): 161, pl. 2, fig. 1 (type locality: Macao, China).

Hapalogenys mucronatus Günther, 1859: 318 (China).—Bleeker, 1865–1869: 56, 58 (Amoy, China).—Ishikawa and Matsuura, 1897: 54 (Tokyo).—Jordan and Thompson, 1912: 553 (Kobe, Hyogo and Onomichi, Hiroshima).—Izuka and Matsuura, 1920: 150 (Osaka).—Tanaka, 1925: 888, pl. 181, fig. 495 (Tadanoumi).—Fowler, 1930: 605 (Japan).—Shen, 1993: 360, pl. 101 (Kaoshung, Taiwan).—Cheng et al., 1997: 257 (Shandong Province, China).—Sadovy and Cornish, 2000: 229 (Hong Kong, China).—Wang et al., 2001: 223 (Heibe, China).

Hapalogenys mucronatus Steindachner and Döderlein, 1883: 11 (Osaka).

Type material. Neotype: MUFS 12258 (fig. 1A), 185 mm SL, East China Sea, bottom trawl, 50–100 m depth, 12 June 1996.

Non-type material. 72–201 mm SL, $n=49$. FAKU 12098, 88 mm SL, East China Sea; FAKU 12098, 72 mm SL, East China Sea; FAKU 29281, 137 mm SL, off Yamaguchi, Sea of Japan; FAKU 34879, 153

mm SL, off Ehime, Bungo Channel; FAKU 100314–100316, 3: 108–137 mm SL, Gulf of Tong-king, northern Vietnam; FRLM 8115, 8145, 2: 87–114 mm SL, East China Sea (31°9'N, 125°00'E, 31°20'N, 125°10'E), trawl, less than 100 m depth; FRLM 8170–8172 and 8189, 4: 102–133 mm SL, East China Sea (31°23'N, 125°05'E, 31°10'N, 125°10'E), trawl, less than 100 m depth; HUMZ 49427–49430, 4: 87–131 mm SL, Yahatahama Market, Ehime, Japan; HUMZ 71708, 115 mm SL, Kaoshung Fish Market, Taiwan; HUMZ 106037, 166 mm SL, Saeki Fish Market, Oita, Japan; HUMZ 108351, 108415, 108650, 74–95 mm SL, East China Sea, about 81–86 m depth; IOCAS 51-118, 117 mm SL, off Chingtao, China; IOCAS 57-1549, 2001, Ryonin, China; IOCAS 73-211, off Amoy China; MNHN 7702 (holotype of *Pristipoma mucronata*), 154 mm SL, near Macao; MUFS 2308, 87 mm SL, Kiryu, Taiwan; MUFS 7148, 129 mm SL, Akamizu, Nobeoka, Miyazaki, Japan, set net, less than 30 m depth; MUFS 8652, 143 mm SL, bottom trawl, 50–100 m depth, off Nobeoka, Miyazaki, Japan; NSMT-P 2116, Kasaoka, Seto Inland Sea; SFU 58-2573, 165 mm SL, off Shanghai, China; SFU 3862-3863, 2: 81–181 mm SL, Shanghai, China; URM-P 751, 102 mm SL, East China Sea; URM-P 10446–10448, 3: 91–95 mm SL, Akashi, Hyogo, Seto Inland Sea; URM-P 19090, 19692–19694, 19737, 5: 90–147 mm SL, East China Sea; URM-P 23097, 112 mm SL, Tainan, Taiwan; ZRC 38018, 105 mm SL, W coast of Singapore; ZRC 41178, 105 mm SL, Razaras I., Singapore.

Diagnosis. A species of *Hapalogenys* with the following combination of characters: fleshy lower lip with dense cluster of short papillae and barbels anteriorly, 10 pores on and behind chin, 4 anteriormost pairs hidden by papillae (figs 3A–B), slightly scaly posteriorly (on posterior abdominal part of angular of lower jaws, fig. 3B); small scales on maxilla (fig. 3A); 5–7 alternating whitish and dark-brown bands on head and body, 1st (often indistinct) from just before eye to posterior of lower jaw, 2nd somewhat oblique, becoming wider posteriorly, from nape to between eye and pelvic-fin base, 3rd from base of 2nd and 3rd dorsal-fin spines to just behind pelvic-fin base; 4th from 7th and 8th dorsal-fin spine base to just before 1st anal-fin spine, 5th from 2nd and 3rd dorsal-fin soft ray base to anterior of anal-fin soft ray base, 6th on caudal peduncle, 7th (often indistinct) on caudal-fin base; soft rayed portions of dorsal and anal fins somewhat rounded posteriorly and slightly angulated posteriorly, respectively (fig. 1A), spinous dorsal-fin and anal-fin (until 1st anal-fin ray) membranes dense black; membrane of soft dorsal- anal- (especially in juveniles and young) and caudal-fins somewhat yellowish in fresh specimens, a dense black margin posteriorly, about same width as pupil diameter (juveniles) or half of this width (adults) (fig. 1A); pelvic-fin tip not reaching to base of 1st anal-fin spine when depressed (fig. 1A); 44–47 (but rarely 43 or 48) pored lateral-line scales; procumbent spine-like process (exposed tip of 1st pterygiophore) at origin of dorsal fin usually covered by predorsal scales.

Description. Counts and proportional measurements as percentage of SL for the neotype and other specimens are given in Table 1. Data for the neotype are presented first, followed by non-type material (if different) in parentheses. Characters given in the diagnosis are not repeated.

Body deep, 49% of SL (47–57% of SL), relatively compressed, covered with ctenoid scales, ctenii free on posterior margin of exposed area; lateral line continuous until on hypural plate; orbit diameter distinctly larger than interorbital space; suborbital depth distinctly less than eye diameter; head covered

Table 1. Counts and proportional measurements, and characters as percentage of standard length for the neotype and non-type specimens of *Hapalogenys analis* Richardson, 1845

<i>Hapalogenys analis</i>			
	Neotype MUFs 12258, 185 mm SL	Non-type specimens 72–201 (mean 116) mm SL <i>n</i> =49	
Dorsal-fin rays	XI, 15	XI, 15–16	
Anal-fin rays	III, 9	III, 9 (rarely 10)	
Pectoral-fin rays	19 (i + 18)	18–19 (rarely 20)	
Pelvic-fin rays	I, 5	I, 5	
Pored lateral-line scales	45 + 4	44–47 but rarely 43 or 48	
Scale rows above and below lateral line	11 / 24	10–14 (rarely 9) / 22–24 (rarely 21)	
Gill rakers including all rudiments	6 + 14	6–7 + 13–14	
Body depth	49	47–57	(52)
Body depth at anal-fin origin	43	42–65	(46)
Head length	38	36–57	(39)
Body width	19	17–30	(20)
Snout length	13	12–20	(14)
Dermal eye opening	9	8–14	(10)
Orbit diameter	10	10–16	(12)
Suborbital depth	7	6–10	(6)
Interorbital width	9	7–12	(8)
Upper jaw length	15	14–22	(15)
Caudal-peduncle depth	11	11–18	(13)
Caudal-peduncle length	15	13–23	(16)
Predorsal length	45	42–68	(48)
Preanal length	70	65–100	(69)
Prepelvic length	43	39–44	(62)
Dorsal-fin base	61	56–88	(62)
Anal-fin base	18	17–28	(20)
Caudal-fin length	24	21–35	(27)
Pelvic-fin spine	18	16–27	(19)
First pelvic-fin ray	6	25–39	(30)
Longest pectoral-fin ray	28	23–37	(27)
First dorsal-fin spine	6	6–10	(7)
Second dorsal-fin spine	13	10–19	(14)
Third dorsal-fin spine	31	27–42	(31)
Fourth dorsal-fin spine	25	21–35	(25)
Fifth dorsal-fin spine	24	19–32	(23)
Last dorsal-fin spine	11	8–14	(11)
First dorsal-fin ray	—	17–27	(20)
Second dorsal-fin ray (longest)	22	18–31	(22)
First anal-fin spine	9	22–24	(23)
Second anal-fin spine	20	8–12	(10)
Third anal-fin spine	12	19–28	(23)
First anal-fin ray	17	11–20	(14)
Second anal-fin ray	22	18–31	(21)
Longest anal-fin ray (third or fourth)	22	18–33	(22)

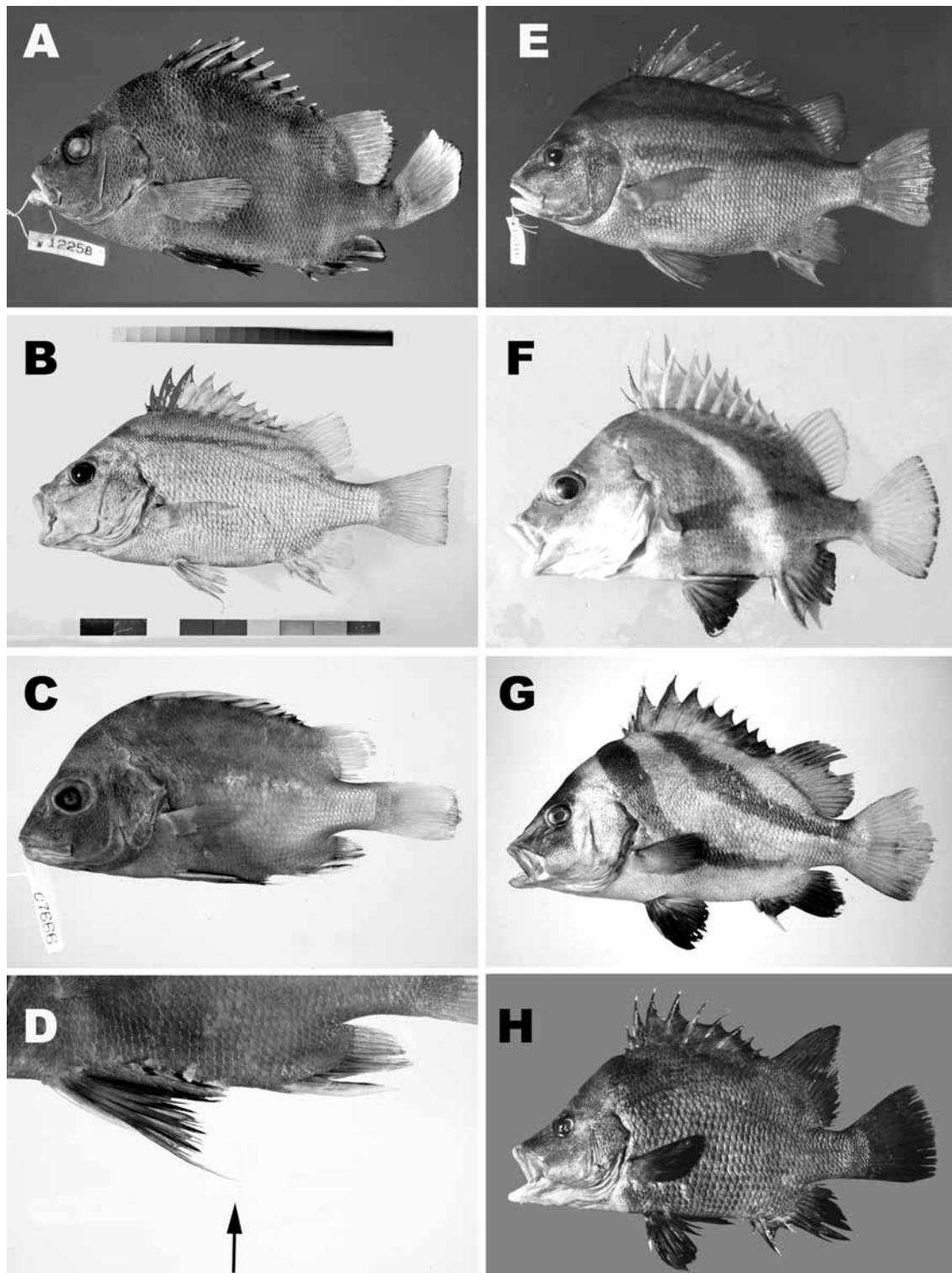


Figure 1. The seven species of *Hapalogenys*. A), *H. analis*, MUFS 12258, 185 mm SL, East China Sea; B) *H. dampieriensis* sp. nov., CSIRO C4036-02, Holotype, 224 mm SL, N of Cape Lambert, north-western Australia; C), *H. filamentosus* sp. nov., MUFS 7666, holotype, off Iloilo, Panay Is., Philippines; D), Right pelvic-fin (reversed) of *H. filamentosus* sp. nov., MUFS 7666, holotype; E), *H. kishinouyei*, MUFS 12316, 266 mm SL, Miyazaki, Kyushu, Japan; F), *H. merguensis*, PMBC 10985, paratype, 199 mm SL, off Satun Province near Phuket, Andaman Sea; G), *H. nigripinnis*, Kanagawa Prefectural Museum's photo database (KPM-NR0001009, photographed by T. Suzuki), about 180 mm SL, Moroyose, Hyogo, Sea of Japan; H), *H. semin*, MUFS11649, holotype, 232 mm SL, Meitsu, Miyazaki, Japan. Arrow shows tip of pelvic-fin ray.

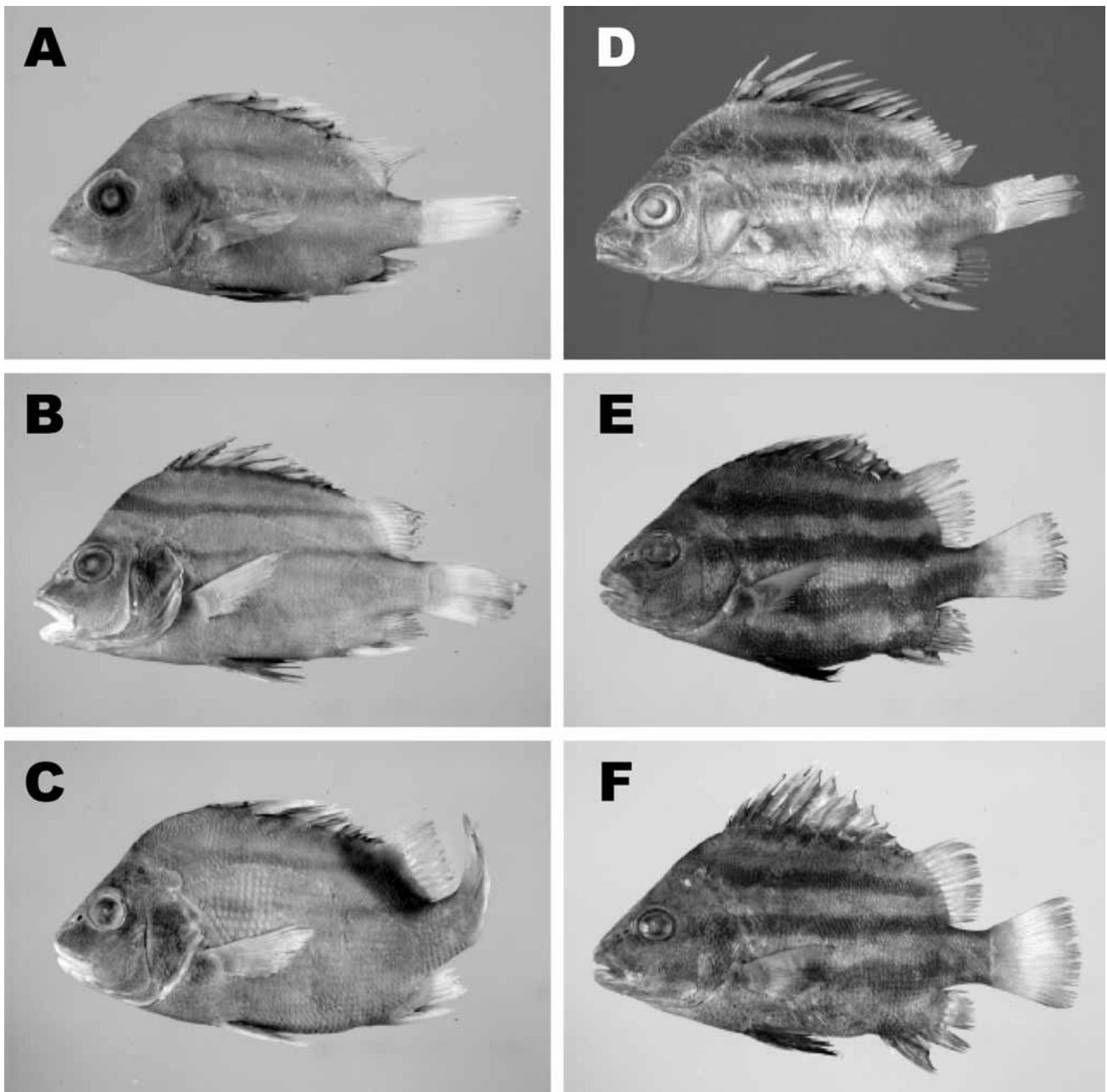


Figure 2. Three stages of 2 species, *Hapalogenys dampieriensis* sp. nov. (A–C) and *H. kishinouyei* (D–F). A), AMS I.22805-035, paratype, 65 mm SL, Northwest Shelf, 170 km off Port Headland, Australia, B), NTM S.13569-010, paratype, 134 mm SL, Arafura Sea, Australia, C), AMS I.22805-035, paratype, 158 mm SL, Northwest Shelf, 170 km off Port Headland, Australia, D) USNM 55610, holotype, 81 mm SL, Tokyo, Japan, E), MUFs 20896, 131 mm SL, Meitsu, Nango, Miyazaki, Japan, F), MUFs 14286, 168 mm SL, Meitsu, Miyazaki, Japan.

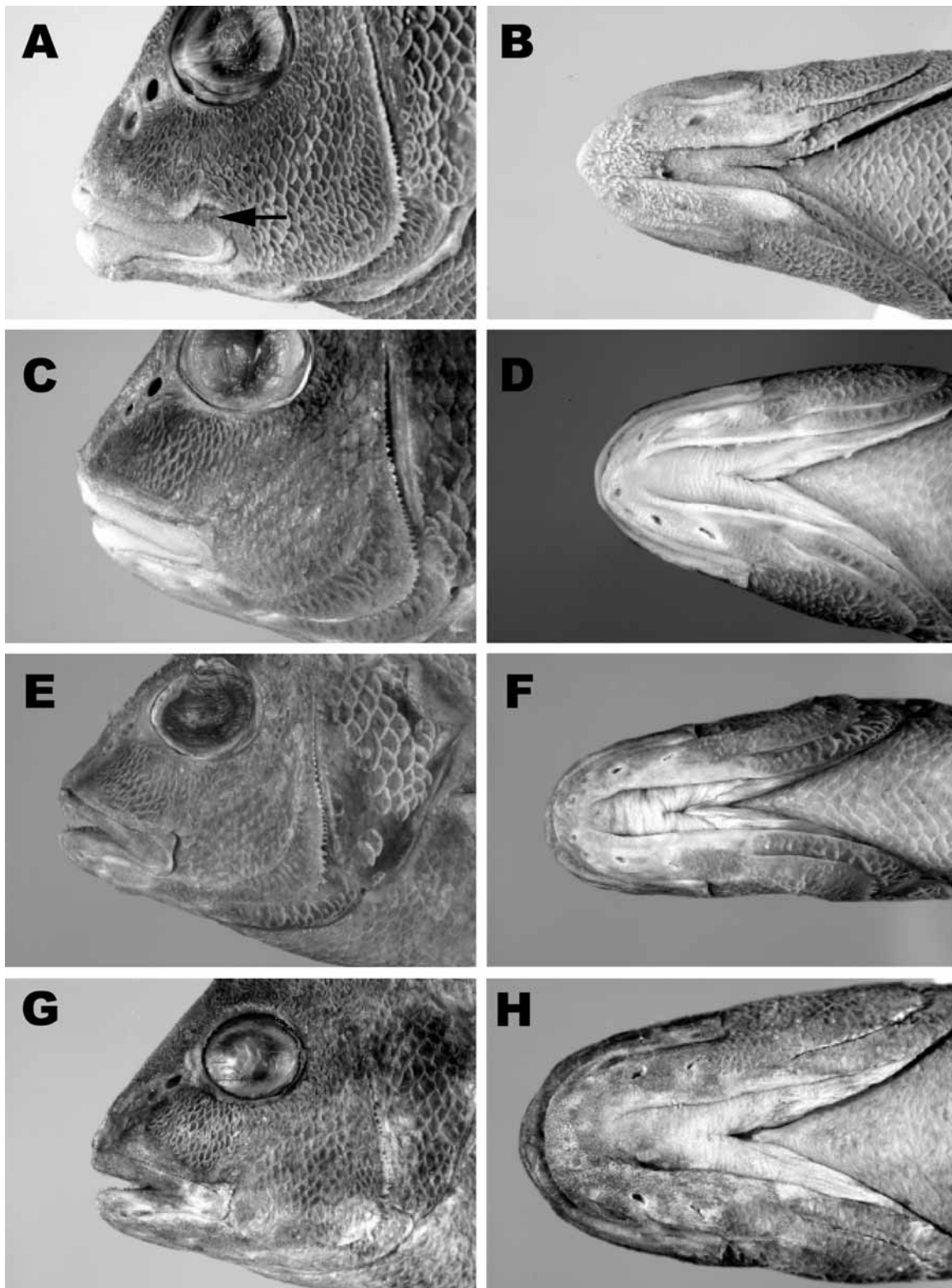


Figure 3. Head (left) and lower jaw ventral view (right) of 4 species, *Hapalogenys analis* (A–B), *H. dampieriensis* sp. nov. (C–D), *H. filamentosus* sp. nov. (E–F) and *H. kishinouyei* (G–H). A–B), HUMZ 106037, 113 mm SL, Saeki, Ooita, Japan; C–D), NTM S13510-010, 134 mm SL, Arafura Sea, Northern Territory, Australia; E–F), MUFS 7654, 134 mm SL, off Iloilo, Panay Is., Philippines; G–H), MUFS 20986, 131 mm SL, Meitsu, Miyazaki, Japan. Arrow indicates squamation on maxilla.

with scales, extending almost to anterior nostrils; lips, chin and ventral part of urohyal naked; cheek and opercle fully scaled; jaws with bands of pointed conical teeth, outermost teeth generally enlarged, but not forming canines; teeth absent on vomer and palatines; preopercle serrate; upper opercle with 2 short spines posteriorly; single notched dorsal fin; 3rd dorsal-fin spine and 2nd dorsal-fin ray longest; 1st dorsal- and anal-fin soft rays not strongly bifurcated; 1st anal-fin spine short, 2nd longest, clearly longer than 3rd; dorsal and anal fins with high scaly sheath; caudal fin generally rounded.

Live colouration. Based on photograph of MUFS 12258 (fig. 1A), neotype, 185 mm SL and MUFS 8422, 113 mm SL: head and body generally dark brownish, with 7 alternating whitish and dark brown bands (see Diagnosis); iris black; lips, lower part of cheek, preopercle and interopercle pale brownish.

Preserved colouration. Based on the neotype and non-type specimens: head and body generally similar to live colouration.

Distribution. *Hapalogenys analis* is currently known from the East Asian Shelf to the Sea of Japan and Pacific coast of southern Japan (except Ryukyu and Ogasawara Is.), including the western part of Taiwan and South China Sea (fig. 5). Lim, 1994 questionably reported *H. analis* from Singapore (3 collected specimens in total) (K. K. P. Lim, ZRC, pers. comm.).

Ecological note. Most specimens of *Hapalogenys analis* have been collected by bottom trawl in depths less than 100 m. Smaller specimens (< about 100 mm SL) have been collected by set nets in depths of 20–50 m.

Remarks. The date of publication of *Hapalogenys mucronatus* Eydoux and Souleyet (as 1841 on cover, but presumably 1850) and status of that species as a junior synonym of *H. analis* Richardson, 1845 as given by Bauchot et al., 1982, 1983, Lim, 1994, and Iwatsuki et al., 2000a is followed here. The type specimens of *H. analis* Richardson, 1845 are lost (J. MacLaine, BMNH, pers. comm.) and a neotype (MUFS 12258, 185 mm SL) of the species is herein designated in order to avoid confusion.

Hapalogenys dampieriensis sp. nov.

New English name: Australian Striped Velvetchin

Figures 1B, 2C–D

Hapalogenys kishinouyei.—non Smith and Pope, 1906: Gloerfelt-Tarp and Kailola, 1984: 197, upper 2nd left picture of p. 196 (north-western Australia).—Sainsbury et al., 1985: 214, lowest picture on p. 215 (north-western Australia).—Allen and Swainson, 1988: 82 (north-western Australia).—Allen, 1997: 128 (north-western Australia and south-eastern Asia).—McKay, 2001: 2969 (in part, north-western Australia).—Hutchins, 2001: 34 (Western Australia).

Type material. Holotype: CSIRO C4036-02, 224 mm SL, north of Cape Lambert, WA, Australia (19°09'S, 117°26'–117°28'E), 121–123 m depth, 1 Sep 1995, coll. A. Graham and G. Yearsley. Paratypes: (all from Australia, $n = 8$): AMS I.22805-035, 3: 66–158 mm SL, North-west Shelf, 170 km N of Port Hedland, WA (18°28'S, 118°15'E), 150–156 m depth, 28 Mar 1982, coll. J. Paxton and M. McGrouther; NTM S.13569-010, 3: 127–134 mm SL, 104–108 m depth, Arafura Sea, NT, 18 Oct 1992, coll. R. Williams; CSIRO CA244, 290 mm SL, north-west of Montebello I., WA (19°58'–19°57'S, 115°12'–115°14'E), 10

May 1978, coll. CSIRO; CSIRO CA1552 (voucher specimen based on Sainsbury et al., 1985), 231 mm SL, north-east of Monte Bello I., WA (19°34'–19°36'S, 116°09'–116°12'E), 7 Jun 1980, coll. CSIRO.

Non-type material. 66–300 mm SL, all from Australia, $n = 17$. CSIRO H4036-03, 194 mm SL, northern Cape Lambert, WA (19°09'S, 117°26'–117°28'E), 1 Sep 2002, coll. A. Graham and G. Yearsley; CSIRO H4069-03, 81 mm SL, north-west of Port Hedland, WA (18°38'–18°39'S, 118°7'–118°8'E), 8 Sep 1995, coll. A. Graham and G. Yearsley; CSIRO H4069-04, 2: 74–75 mm SL, north-west of Port Hedland, WA (18°38'–18°39'S, 118°7'–118°8'E), 8 Sep 1995, coll. A. Graham and G. Yearsley; CSIRO CA1106–CA1107, 2: both 192 mm SL, off western Admiralty Bay, WA, 9 Nov, 2002; NTM S12819-002, 300 mm SL, Evans Shoal, Timor Sea, NT, 22 Apr 1990, coll. J. Lloyd; NTM S13373-010, 172 mm SL, 87 m depth, Arafura Sea, NT, 30 Oct 1990, coll. NT Fisheries; NTM S.13569-010, 2: 127–129 mm SL, Arafura Sea, NT, 18 Oct 1992, coll. R. Williams; NTM S13523-008, 169 mm SL, 97–103 m depth, Arafura Sea, NT, 18 Sep 1992, coll. R. Williams, NTM S.13547-002, 65 mm SL, Arafura Sea, NT, 31 Oct, 1992, coll. R. Williams; WAM P25836-002, 269 mm SL, Bernier I., WA (24°40'S, 112°27'E), 128–161 m depth; WAM P26194-018, 166 mm SL, N of Monte Bello I., off Dampier, WA (19°26'S, 116°31'E), 120–128 m depth; WAM P26195-016, 97 mm SL, north of Monte Bello I., off Dampier, WA (19°10'S, 116°46'E), 175–178 m depth; WAM P27244-002, 215 mm SL, Rowley Shoals, WA (18°37'S, 119°33'E), 114 m depth; WAM P30426-001, 248 mm SL, West of Barrow I., off Onslow, WA (20°40'S, 113°43'E), 225–230 m depth; WAM P30658-002, 221 mm SL, 6 miles, NE of Monte Bello I., WA (20°26'S, 115°32'E); WAM P30666-001, 224 mm SL, Broome, WA (17°58'S, 122°14'E).

Diagnosis. A species of *Hapalogenys* with the following combination of characters: fleshy lower lip with dense cluster of very short papillae anteriorly (figs 3C–D), scaly posteriorly (on posterior abdominal part of angular of lower jaws, [fig. 3D]); 10 unobstructed pores on and behind chin (posteriormost 2 sometimes slit-like) (see figs 3C–D; Gloerfelt-Tarp and Kailola, 1984: 197, fig. 2); no scales on maxilla (figs 3C–D); 4 narrow longitudinal dark stripes (2nd and 3rd stripes most distinct, 2nd from nape to base of mid dorsal-fin soft rays, 3rd from eye to last dorsal-fin ray base) in specimens less than about 100 mm SL, thereafter 2nd and 3rd stripes visible only, remainder and 3rd stripes not present in specimens less than about 200 mm SL (figs 1B, 2A–C), their width below base of 5th and 6th dorsal-fin spines clearly narrower than pupil diameter (see figs 2A–C in 65–158 mm SL and fig. 1B); 41–45 pored lateral-line scales; soft rayed portions of dorsal and anal fins somewhat truncated posteriorly and slightly angulated posteriorly, respectively (figs 1B, 2A–C); pelvic-fin tip extending slightly beyond anus but clearly not reaching to base of 1st anal-fin spine when depressed (figs 1B, 2A–C); procumbent spine-like process (tip of 1st pterygiophore) apparent at origin of dorsal-fin but covered by predorsal scales.

Description. For the holotype and 5 paratypes, counts and proportional measurements as percentage of SL are given in Table 2. Data for the holotype are presented first, followed by non-type material (if different) in parentheses. Characters given in the diagnosis are not repeated.

Body deep, 45% of SL (42–55% of SL), relatively compressed, covered with ctenoid scales, ctenii free on posterior margin of exposed area; lateral line continuous until on hypural plate; orbit diameter slightly larger than interorbital space; suborbital depth

Table 2. Counts and proportional measurements, and characters as percentage of standard length of *Hapalogenys dampieriensis* sp. nov., *H. filamentosus* sp. nov., and *H. kishinouyei* (Smith and Pope, 1908)

	<i>Hapalogenys dampieriensis</i> sp. nov.			<i>Hapalogenys filamentosus</i> sp. nov.		<i>Hapalogenys kishinouyei</i>	
	Holotype CSIRO C4036-02	Paratypes* n=8	Non-type specimens n=17	Holotype MUFS 7666	Paratypes** n=3	Holotype USNM 55610	Non-type specimens n=39
Standard length (mm)	224	66–290	74–300	147	129–147	81	45–393
Dorsal-fin rays	XI, 14	XI, 13–14	XI, 13–14	XI, 14	XI, 14	XI, 14	XI, 14 (rarely 15)
Anal-fin rays	III, 9	III, 8–9	III, 8–9	III, 9	III, 9	III, 9	III, 9
Pectoral-fin rays	18	17–18	17–18	18	17–18	17	17–18
Pelvic-fin rays	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5
Pored lateral-line scales	44	41–45	41–45	41	41 or 42	45	44–47
Scale rows above and below lateral line	12/20	10–12 / 20–23	10–12 / 20–23	11/22	10–11 / 20–22	11/23	11–13 / 23–25
Gill rakers including all rudiments	6 + 12	5–6 + 11–12	5–6 + 11–12	5 + 11	5 + 11–12	7 + 11	4–7 + 11–13***
Scales on maxilla	absent	absent	absent	absent	absent	absent	absent
Scales on posterior and ventral aspects of angular	present	present	present	present	present	present	present
Body depth	45	42–55 (48)	74–300 (173)	147	115–149 (136)	50	44–53 (49)
Body depth at anal-fin origin	40	35–47 (41)	42–55 (48)	50	48–50 (49)	44	38–46 (42)
Head length	38	34–46 (41)	35–47 (42)	43	42–43 (42)	40	36–42 (38)
Body width	20	18–23 (20)	18–25 (20)	44	42–44 (43)	15	17–21 (19)
Snout length	13	14–16 (15)	13–16 (14)	19	16–20 (18)	12	12–17 (14)
Dermal eye opening	9	8–12 (10)	7–12 (10)	14	13–16 (14)	12	7–15 (8)
Orbit diameter	8	8–16 (12)	8–16 (11)	11	10–11 (11)	15	8–17 (10)
Suborbital depth	8	5–8 (7)	5–8 (7)	14	14 (14)	6	5–8 (7)
Interorbital width	9	8 (8)	8–9 (9)	8	7–8 (7)	7	8–10 (9)
Upper jaw length	15	15–16 (16)	15–16 (16)	10	8–10 (9)	15	14–16 (15)
Caudal-peduncle depth	12	11–13 (12)	11–13 (12)	16	15–16 (16)	13	11–13 (12)
Caudal-peduncle length	—	12–17 (16)	9–17 (13)	13	12–13 (13)	17	16–18 (17)
Predorsal length	39	38–49 (46)	38–49 (44)	17	17–18 (17)	46	40–49 (44)
Preanal length	70	71–77 (73)	69–77 (72)	49	45–49 (48)	67	67–74 (70)
Prepelvic length	46	40–52 (47)	39–52 (45)	69	69–74 (71)	42	39–48 (41)
Dorsal-fin base	56	54–59 (57)	54–62 (58)	41	41–48 (43)	60	55–62 (59)
Anal-fin base	17	13–17 (15)	13–20 (16)	61	57–61 (59)	18	15–20 (17)
Caudal-fin length	20	18–29 (25)	18–29 (24)	16	16–18 (17)	—	21–31 (25)
Pelvic-fin spine	13	12–19 (16)	12–19 (15)	27	27–28 (27)	20	13–18 (16)
First pelvic-fin ray	22	24–31 (29)	21–31 (27)	20	18–21 (20)	32	22–31 (25)
Longest pectoral-fin ray	22	19–32 (28)	19–32 (26)	34	30–35 (33)	26	23–31 (26)
First dorsal-fin spine	4	4–9 (7)	4–9 (6)	30	30–32 (31)	6	4–9 (6)
Second dorsal-fin spine	9	7–16 (12)	7–16 (11)	10	7–10 (8)	17	6–16 (12)
Third dorsal-fin spine	15	14–24 (19)	13–24 (18)	18	13–18 (15)	24	15–24 (20)
Fourth dorsal-fin spine	17	14–27 (22)	14–27 (20)	26	22–26 (24)	28	17–26 (22)
Fifth dorsal-fin spine	15	13–27 (21)	13–27 (19)	25	25–28 (26)	26	17–25 (21)
Last dorsal-fin spine	5	3–11 (8)	3–11 (6)	23	23–27 (24)	15	6–11 (8)
First dorsal-fin ray	12	13–24 (14)	6–20 (13)	10	10–11 (10)	—	14–19 (17)
Second dorsal-fin ray (longest)	16	13–22 (18)	13–22 (16)	19	17–20 (19)	—	16–21 (19)
First anal-fin spine	7	5–11 (9)	13–24 (17)	21	20–23 (21)	—	24 (24)
Second anal-fin spine	17	13–24 (20)	4–11 (7)	—	23 (23)	10	6–11 (8)
Third anal-fin spine	13	10–15 (13)	13–24 (18)	10	9–10 (10)	21	14–20 (18)
First anal-fin ray	15	13–23 (19)	12–23 (16)	23	22–24 (23)	15	9–14 (12)
Second anal-fin ray	14	11–20 (18)	11–21 (16)	15	14–16 (15)	21	16–24 (19)

*Paratypes, AMS I.22805-035 (2 specimens) and NTM 13547-002, 13523-008, S.13551-003 and 13569-010 (3 specimens); **Paratypes, MUFS 7654, 7667–7668, 3 specimens; ***Upper and lower gill raker counts decrease with growth from 6 or 7 to 4 or 5 and from 12 or 13 to 11 or 12, respectively.

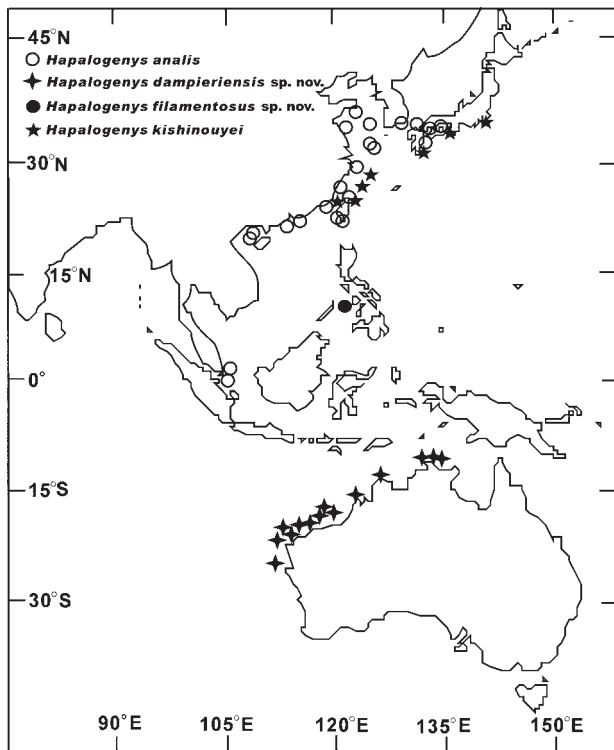


Figure 5. Distribution of 4 *Haploxyphys* species: *Haploxyphys analis*, *Haploxyphys dampieriensis* sp. nov., *Haploxyphys filamentosus* sp. nov. and *Haploxyphys kishinouyei*.

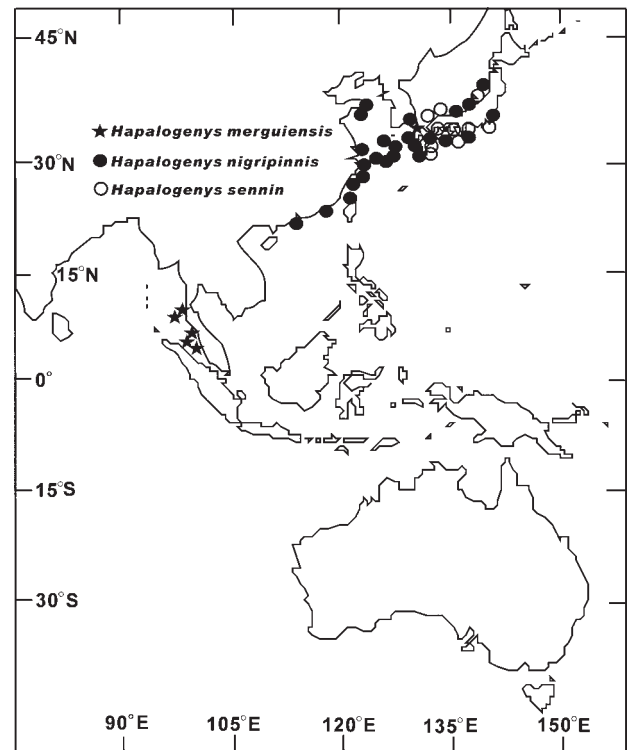


Figure 6. Distribution of 3 *Haploxyphys* species: *Haploxyphys merguensis*, *H. nigripinnis* and *H. sennin*.

distinctly less than eye diameter; head covered with scales, extending almost to snout tip; lips, chin and ventral part of urohyal naked; cheek and opercle fully scaled; jaws with bands of pointed conical teeth, outermost teeth generally enlarged, but not forming canines; teeth absent on vomer and palatines; preopercle serrate; upper opercle with 2 short spines posteriorly; single notched dorsal-fin; 4th dorsal-fin spine and 2nd dorsal-fin ray longest; 1st dorsal- and anal-fin soft rays not strongly bifurcated; 1st anal-fin spine short, 2nd very robust, longest, clearly longer than 3rd; dorsal and anal fins with high scaly sheath; caudal fin rounded in juveniles, becoming truncate with growth.

Live colouration. Based on a colour photograph in Gloerfert-Tarp and Kailola, 1984: 2nd upper left figure on p. 196, registered as CSIRO CA1552, 270 mm SL, from north-western Australia – specimen not seen by us and CSIRO C4036-02, holotype, 234 mm SL: head and body generally pale silvery bronze, usually lighter than in *H. kishinouyei* (figs 1B, 1E, and 2A–F); dorsal and anal fins translucent or pale brownish; soft dorsal fin pale; pelvic-fin rays and membranes dusky; pelvic-fin spine dark-brownish; iris golden-brown; lips, lower parts of cheek, preopercle, and interopercle pale-brownish.

Preserved colouration. Based on all type specimens: head and body generally dark-brownish; 4 narrow longitudinal brownish

pale-brown dark stripes (2nd and 3rd stripes most distinct) in specimens smaller than about 100 mm SL, 2nd and 3rd stripes only present in larger specimens, their width below base of 5th and 6th dorsal-fin spines narrower than pupil diameter (see figs 2A–C in 65–158 mm SL and fig. 1B); pelvic-fin rays, including membrane, dusky; pelvic-fin spine pale-brown; iris, lips, ventral portion of cheek, preopercle, and interopercle brown.

Distribution. *Haploxyphys dampieriensis* sp. nov. is currently known only from north-western Australia (see fig. 5) in depths of 87–230 m. The species is likely to have a continuous distribution in similar depths between known localities.

Ecological note. The specific habitat at the collection sites of the type specimens is uncertain, but likely to be dominated by a muddy rocky bottom, similar to that of *H. kishinouyei*.

Etymology. The name “*dampieriensis*” refers to the Dampierian Province (named after the explorer William Dampier), a biogeographic region extending from approximately Geraldton in Western Australia across northern Australia to Cape York, approximating the distribution of the new species in Australia.

Remarks. The largest recorded size of *H. dampieriensis* sp. nov. is 300 mm SL (NTM S12819-002), compared with more than 500 mm SL for *H. kishinouyei*.

***Hapalogenys filamentosus* sp. nov.**

New English name: Philippines Dark Velvetchin

Figures 1C–D, 3E–F

Type material. Holotype: MUFS 7666, 147 mm SL, off Iloilo, Panay I., Philippines, 10 Mar 1981, bottom trawl, 30–80 m, coll. M. Akazaki. Paratypes: MUFS 7654, 149 mm SL, off Iloilo, Panay I., Philippines, bottom trawl, about 40 m depth, 11 Mar 1981, coll. M. Akazaki; MUFS 7667–7668, 2: 129–143 mm SL, same data as holotype.

Diagnosis. A species of *Hapalogenys* with the following combination of characters: fleshy lower lip with dense cluster of very short papillae (figs 3E–F), scaly posteriorly (on posterior abdominal part of angular of lower jaws, (fig. 3F); 10 unobstructed pores on and behind chin (fig. 3F; see Gloerfelt-Tarp and Kailola, 1984:197, fig. 2); no scales on maxilla (fig. 3E); 2 faint longitudinal dark stripes on body, 1st from nape to base of mid dorsal-fin soft rays, 2nd from eye to base of last dorsal-fin soft ray, their width below base of 5th and 6th dorsal-fin spines clearly narrower than pupil diameter (see figs 2A–C in 65–158 mm SL and fig. 1B); soft rayed portions of dorsal and anal fins somewhat rounded posteriorly and slightly angulated posteriorly, respectively (fig. 1C); pelvic-fin tip almost reaching to or slightly beyond base of 1st anal-fin spine when depressed (figs 1C–D); 41 or 42 pored lateral-line scales; a procumbent spine-like process (exposed tip of 1st pterygiophore) apparent at origin of dorsal fin but covered by predorsal scales.

Description. Counts and proportional measurements as percentage of SL of the holotype and 5 paratypes are given in Table 2. Data for the holotype are presented first, followed by paratype material (if different) in parentheses. Characters given in the diagnosis are not repeated.

Body deep, 50% of SL (45–55% of SL), relatively compressed, covered with ctenoid scales, ctenii free on posterior margin of exposed area; lateral line continuous until on hypural plate; orbit diameter slightly larger than interorbital space; suborbital depth clearly less than eye diameter; head covered with scales, extending almost to snout tip; lips, chin and ventral part of urohyal naked; cheek and opercular bones fully scaled; jaws with bands of pointed conical teeth, outermost teeth generally much enlarged but no distinct canines; teeth absent on vomer and palatines; preopercle serrate; upper opercle with 2 short spines posteriorly; single notched dorsal fin; 4th dorsal-fin spine and 2nd dorsal-fin ray longest; 1st dorsal- and anal-fin soft rays not strongly bifurcated; 1st anal-fin spine short, 2nd very robust, longest, clearly longer than 3rd; dorsal and anal fins with high scaly sheath; pectoral-fin tip not reaching to vertical at anus or pelvic-fin tip when depressed; caudal fin slightly rounded.

Preserved colouration. Based on all type specimens: head and body generally dark-brownish; 2 faint longitudinal stripes on head and body.

Distribution. *Hapalogenys filamentosus* sp. nov. is currently known only off Iloilo, Panay I., Philippines. Efforts by the first author to collect other examples of the species from fish markets and trawl catches throughout the Philippine Is. (Luzon, Mindoro, Panay, Cebu and Mindanao Is.) have been in vain.

Apart from the type specimens, no examples are known to exist in museum collections.

Ecological note. The habitat of *H. filamentosus* sp. nov. is likely to be similar to that of *H. kishinouyei* and *H. dampieriensis* sp. nov.

Etymology. The name “*filamentosus*” refers to the filamentous 1st ray of the pelvic fin in this species.

***Hapalogenys kishinouyei* Smith and Pope, 1906**

English name: Striped Velvetchin

Japanese Name: Shimasetodai

Figures 1E, 2D–F, 3G–H

Hapalogenys kishinouyei Smith and Pope, 1906: 476, fig. 6 (type locality: Urado, Kanagawa, Japan).—Jordan and Thompson, 1912: 554, fig. 3 (Tokyo).—Izuka and Matsuura, 1920:150 (Takamatsu, Kagawa, Japan).—Fowler, 1931: 269 [Urado, Kanagawa and Takamatsu, Kagawa, Japan, Philippines (doubtful locality)].—Kyushin et al., 1982: 102 (South China Sea).—Akazaki, 1984: 173 (East Asian Shelf).—Okamura et al., 1985: 489, 678 (Okinawa Trough).—Chen et al., 1997: 102, fig. 306 (South China Sea).—Iwatsuki et al., 2000a: 133 (East Asian Shelf and Australian specimens now referred to *H. dampieriensis* sp. nov.).—Shimada, 2000: 841 [southern Japan, Philippines (doubtful locality), and north-west Australian specimens now referred to *H. dampieriensis* sp. nov.].—Randall and Lim, 2000: 619 (South China Sea).—Shinohara et al., 2001: 326 (Tosa Bay, Japan).—Shimada, 2002: 841 [southern Japan, Philippines (doubtful locality) and north-west Australian specimens now referred to *H. dampieriensis* sp. nov.].—Youn, 2002: 339, 613 (Korea).

Type material. Holotype: USNM 55610, 81 mm SL, Tokyo, Japan (see fig. 2D).

Non-type material. 45–393 mm SL, $n = 39$. MUFS 770, 235 mm SL, Osaka Fish Market, Japan; MUFS 12316, 12343, 164–264 mm SL, Meitsu, Nango, Miyazaki, Japan, set net, about 25 m; MUFS 12421, 338 mm SL, Ooshima I., Meitsu, Nango, Miyazaki, Japan, large set net, about 50 m depth; MUFS 12589, 45 mm SL, off Kihachi, Miyazaki, Japan; MUFS 12852–12854, 3: 242–268 mm SL, Meitsu, Nango, Miyazaki, Japan, set net, about 50 m; MUFS 14041, 14286, 153–168 mm SL, Meitsu, Nango, Miyazaki, Japan; MUFS 14937, 145 mm SL, Meitsu, Nango, Miyazaki, Japan; MUFS 16351, 262 mm SL, Meitsu, Nango, Miyazaki, Japan; SFU 1325, 133 mm SL, Shanghai, China; SFU Chingtao, China; SFU South China Sea; SFU 58-2573, 183 mm SL, China; SFU 63-0092, 187 mm SL, China; SFU 3858, 147mm SL, Taiwan Strait, China; URM-P 28055, 221 mm SL, East China Sea; URM-P 28056, 207 mm SL, East China Sea near Taiwan.

Diagnosis. A species of *Hapalogenys* with the following combination of characteristics: fleshy lower lip with dense cluster of very short papillae (figs 3G–H), scaly posteriorly (on posterior abdominal part of angular of lower jaws, fig. 3H); 10 pores on and behind chin, including a single very small pore near symphysis, plus 2 moderately-sized pores anteroventrally on each dentary, a single large pore ventrally at midpoint of dentary, and a single large pore ventrally at midpoint of angular (2 posteriormost pores sometimes slit-like) (see Gloerfelt-Tarp and Kailola, 1984:197, fig. 2); no scales on maxilla (fig. 3G); 5 broad distinct longitudinal stripes, 1st from front of 1st dorsal-fin spine along dorsal midline, 2nd from nape to base of mid dorsal-fin soft rays, 3rd from eye to last dorsal-fin ray base, 4th from preopercular flange, through base of pectoral fin, to lower caudal peduncle,

last from isthmus to base of anal spinous fin; the 1st, 4th and 5th stripes lost in specimens larger than about 250 mm SL (figs 1E, 2D–F) and their width below base of 5th and 6th dorsal-fin spines clearly greater than pupil diameter at all sizes; soft rayed portions of dorsal and anal fins somewhat rounded posteriorly and somewhat angulated posteriorly, respectively (figs 1E, 2D–F); pelvic-fin tip extending slightly beyond anus but clearly not reaching to base of 1st anal-fin spine when depressed (figs 1E, 2D–F); 44–47 pored lateral-line scales; a procumbent spine-like process (exposed tip of 1st pterygiophore) at origin of dorsal.

Description. Counts and proportional measurements as percentage of SL of the holotype and 5 paratypes are given in Table 1. Data for the holotype are presented first, followed by non-type material (if different) in parentheses. Characters given in the diagnosis are not repeated.

Body deep, 49% of SL (44–53% of SL), relatively compressed, covered with ctenoid scales, ctenii free on posterior margin of exposed area; lateral line continuous until on hypural plate; orbit diameter clearly larger than interorbital space; suborbital depth clearly less than eye diameter; head covered with scales, extending almost to anterior nostrils; chin and ventral part of urohyal naked; cheek and opercular bones fully scaled; jaws with bands of pointed conical teeth, outermost teeth generally much enlarged but no distinct canines; teeth absent on vomer and palatines; preopercle serrate; upper opercle with 2 short spines posteriorly; single notched dorsal fin; 4th dorsal-fin spine longest; 1st dorsal- and anal-fin soft rays not strongly bifurcated; 1st anal-fin spine short, 2nd anal fin longest, clearly longer than 3rd; dorsal and anal fins with high scaly sheath; pectoral-fin tip not reaching to vertical at anus or pelvic-fin tip when depressed; caudal fin generally truncate.

Live colouration. Based on colour photographs of specimens (MUFS 20896, 14286): head and body generally dark-brownish, slightly lighter on jaws; dorsal, anal and pectoral fins dark-brownish (similar to body); pelvic-fin rays and membranes black; pelvic-fin spine dark-brownish; iris brownish-golden (orange-golden); lips, lowest parts of cheek and preopercle, and interopercle pale-brownish.

Preserved colouration. Based on the holotype and non-type specimens: head and body generally dark-brownish; 5 longitudinal stripes on body; pelvic-fin rays with black membrane, pelvic-fin spine pale-brown; iris, lips, ventral portion of cheek and preopercle, and interopercle brown.

Distribution. *Hapalogenys kishinouyei* is currently known only from the East Asian Shelf (fig. 5).

Biological note. The largest specimen of *Hapalogenys kishinouyei* studied was 556 mm SL, collected from a set net catch at Meitsu fish market, Nango, Miyazaki, Japan on 14 Nov 1994 (specimen not kept). This species commonly reaches 150–300 mm SL.

Remarks. Although Fowler, 1931 reported *Hapalogenys kishinouyei* from the Philippines and adjacent regions, the species was originally based on specimens from Urado,

Tokyo, and Takamatsu, Kagawa, Japan. Despite subsequent reports including the Philippines in the species' distribution (Iwatsuki et al., 2000a; Shimada, 2000, 2002), attempts by us to locate *H. kishinouyei* specimens in fish markets and museum collections over the past ten years have been unsuccessful in documenting any Philippine occurrences of this species. This strongly suggests that the species is not distributed in the Philippines. However, Chen et al., 1997 provided a fine colour plate of the species from the South China Sea and van Quan (unpublished document) listed the species from northern Vietnam.

Hapalogenys merguiensis Iwatsuki, Satapoomin and Amaoka, 2000

New English name: Mergui Velvetchin

Figures 1F, 4A–B

Hapalogenys merguiensis Iwatsuki, Satapoomin and Amaoka, 2000a: 133, fig. 1A–C (type locality: Mergui Basin, southern Myanmar Sea, Andaman Sea).

Type material. Holotype: HUMZ 90021, 242 mm SL, Mergui Basin, southern Myanmar Sea (11°27'N, 97°16'E). Paratypes (174–242 mm SL, *n*=6): AMS I. 22739-001, 192 mm SL, southern Andaman Sea, off Satun Province near Phuket, W coast of southern Thailand; HUMZ 90022, 178 mm SL, same data as holotype; MUFS 15800, 177 mm SL, Taninthayi Coast, southern Myanmar Sea; PMBC 10985, 199 mm SL, off Satun Province near Phuket, W coast of southern Thailand, southern Andaman Sea; PMBC 10986, 179 mm SL, southern Andaman Sea, off Satun Province near Phuket, W coast of southern Thailand.

Non-type material. HUMZ 33397, 172 mm SL, Andaman Sea.

Diagnosis. A species of *Hapalogenys* with the following combination of characters: fleshy lower lip with dense cluster of very short papillae and barbels (figs 4A–B), slightly scaly posteriorly (fig. 4B); 10 pores on and behind chin, including a single very small pore near symphysis, plus 2 moderately-sized pores anteroventrally on each dentary, a single large pore ventrally, at midpoint of dentary, and a single large pore ventrally at midpoint of dentary and angular (2 posteriormost pores sometimes slit-like) (see Gloerfelt-Tarp and Kailola, 1984:197, fig. 2); no scales on maxilla (fig. 3A); 2 indistinct oblique dark bands, 1st descending from nape to behind pectoral fin, and 2nd from base of anterior 2nd or 3rd dorsal-fin spine and soft dorsal-fin base, curving backwards through lateral line to soft anal fin and caudal peduncle (1 whitish or indistinct pale brown oblique band, curving backward and becoming wider, from base of first 3 dorsal-fin spines, to anus and spinous anal-fin base) (fig. 1F); soft rayed portions of dorsal and anal fins rounded posteriorly and somewhat truncate posteriorly, respectively (fig. 1F); pelvic-fin tip not reaching to 1st anal-fin spine when depressed (fig. 1F); 39–42 pored lateral-line scales; a procumbent spine-like process (exposed tip of 1st pterygiophore) at origin of dorsal fin.

Description. A detailed description was given by Iwatsuki et al., 2000a and is not repeated here.

Distribution. *Hapalogenys merguiensis* is currently known only from the Andaman Sea, in depths from about 80–180 m (see Iwatsuki et al., 2000a).

Hapalogenys nigripinnis Schlegel in Temminck and Schlegel, 1843

New English name: Short Barbeled Velvetchin
 Japanese name: Higesoridai

Figures 1G, 4C–D

Pogonias nigripinnis Schlegel in Temminck and Schlegel, 1843: 59, pl. 25 (type locality: Nagasaki Bay, Nagasaki, Japan).

Hapalogenys nitens Richardson, 1844b: 84, pl. 43, figs 1–2 (type locality: Canton, China).—Richardson, 1844a: 463 (Macao, China).

Hapalogenys aculeatus Nyström, 1887: 10 (type locality: Japan).

Hapalogenys guentheri Matsubara, 1933 (originally *güntheri*): 86, fig. 6 (type locality: Pusan, South Korea).

Type material. Lectotype: RMNH D282, 292 mm SL, Nagasaki Bay, Nagasaki, Japan. Paralectotypes: RMNH D283 (dried), 245 mm SL, RMNH D284 (dried), 206 mm SL, RMNH 722, 240 mm SL, RMNH D2216 (dried), 347 mm SL, ZMB 8121 (dried), 198 mm SL, all as Nagasaki, Japan.

Non-type material. BMNH 1968.3.11.1 (holotype of *Hapalogenys nitens*), 107 mm SL, Canton, China; FAKU 51028–51029 (holotype and paratype of *Hapalogenys guentheri*, [originally *güntheri*]), 2: 205 mm SL and 138 mm SL, respectively, Pusan, Korea, holotype coll. date unknown, paratype coll. 30 Apr. 1927; ZMUU 275 (holotype of *Hapalogenys aculeatus*), 320 mm SL, Nagasaki, Japan. 43 other specimens examined (53–404 mm SL) are listed in Iwatsuki and Nakabo, 2005.

Diagnosis. A species of *Hapalogenys* with the following combination of characters: fleshy lower lip with dense cluster of very short papillae and barbels (figs 4C–D), scaly posteriorly (on posterior abdominal part of angular of lower jaws, fig. 4D); 10 pores on and behind chin, including a single very small pore near symphysis (usually not apparent owing to dense covering papillae), plus 2 moderately-sized pores anteroventrally on each dentary, a single large pore ventrally at midpoint of dentary, and single large pore ventrally at articulation of dentary and angular (2 posteriormost pores usually slit-like concave traces or slit-like) (see figs 4C–D; Gloerfelt-Tarp and Kailola, 1984: 197, fig. 2); scales on maxilla (fig. 4C); body often with 2 indistinct oblique dark bands, 1st descending from nape to behind pectoral fin and running to posterior part of soft anal-fin rays, 2nd descending from base of anterior 3rd or 4th dorsal-fin spines and soft dorsal-fin base, curving backwards through lateral line to upper part of caudal peduncle (fig. 1G, often uniformly dark or pale-brown); soft rayed portions of dorsal and anal fins strongly rounded posteriorly and slightly angulated posteriorly, respectively (fig. 1G); pelvic-fin tip not reaching to base of 1st anal-fin spine when depressed (fig. 1G); 45–48 (rarely 44 or 49) pored lateral-line scales; a procumbent spine-like process (exposed tip of 1st pterygiophore) almost completely hidden by predorsal scales at origin of dorsal fin.

Description. A detailed description was given by Iwatsuki et al., 2000a and is not repeated here.

Distribution. *Hapalogenys nigripinnis* is currently known only from the East Asian Shelf in depths less than 100 m (see Iwatsuki and Nakabo, 2005; see fig. 6). The species has not been confirmed as occurring around the Ryukyu or Ogasawara Is., or southern Japan.

Remarks. The status of *H. aculeatus* Nyström, 1887, *H. nitens* Richardson, 1844b and *H. guentheri* Matsubara, 1933 (originally *H. güntheri*) as junior synonyms of *H. nigripinnis* Schlegel in Temminck and Schlegel, 1843, was discussed by Iwatsuki and Nakabo, 2005.

Hapalogenys sennin Iwatsuki and Nakabo, 2005

New English name: Long Barbeled Velvetchin
 Japanese name: Higedai

Figures 1H, 3E–F

Hapalogenys sennin Iwatsuki and Nakabo, 2005: 861 (type locality: Meitsu, Miyazaki, Japan).

Type material. Holotype: MUFS 11649 (fig. 1H), 232 mm SL, Meitsu, Nango, Miyazaki, Kyushu I., Japan (31°31.9'N, 131°23.5'E), set net, less than 30 m depth. Paratypes ($n=13$, all from Japan): FAKU 38698, 234 mm SL, Oki I., Shimane; FAKU 85960, 227 mm SL, Tateyama, Chiba, Boso Peninsula; FRLM 3715, Shima-cho, Shima-gun, Mie; KPM-NI 49, 208 mm SL, Kanagawa; MUFS 2086, 176 mm SL, Miyazaki fish market, Miyazaki, Japan; MUFS 7149, 68 mm SL, mouth of the Kaeda R., Miyazaki, Japan; MUFS 11678, 207 mm SL, female, Meitsu, Nango, Miyazaki; MUFS 14627, 79 mm SL, mouth of the Kaeda R., Miyazaki; MUFS 16060, 248 mm SL, Shirahama, Wakayama; MUFS 20810, 194 mm SL, Moroyose, Hyogo, Sea of Japan; MUFS 21573, 296 mm SL, female, Meitsu, Nango, Miyazaki; MUFS 22226, 46 mm SL, Hitotsuba Inlet, Ooyodo R., Miyazaki; NSMT-P 60236, 174 mm SL, Suzaki, Chiba; OMNH-P 2682, 183 mm SL, Moroyose, Hyogo, Sea of Japan, set net.

Non-type material. 21 specimens examined (49–296 mm SL, all from Japan) are listed in Iwatsuki and Nakabo, 2005.

Diagnosis. A species of *Hapalogenys* with the following combination of characters: fleshy lower lip with dense cluster of long and short papillae and barbels on chin (figs 4E–F), not scaly posteriorly (on posterior abdominal part of each angular of lower jaws, fig. 4F); 10 pores on and behind chin (only 4 slit-like pores on angular on each lower jaw in young and then becoming covered in adults; fig. 4F); no scales on maxilla (fig. 4E); 2 faint oblique dark bands on body, 1st descending from nape to behind pectoral fin and then running to posterior part of soft anal-fin rays, and 2nd from base of anterior 3rd or 4th dorsal-fin spines and soft dorsal-fin base, curving backward through lateral line to upper part of caudal peduncle, or often becoming uniform dark-brown on body (fig. 4E–H of Iwatsuki and Nakabo, 2005); soft rayed portions of dorsal and anal fins strongly angulated posteriorly (fig. 1H, anal more strong angulated than dorsal); pelvic-fin tip not reaching to base of 1st anal-fin spine when depressed (fig. 1H); 44–45 (rarely 43 or 46) pored lateral-line scales; a procumbent spine-like process (exposed tip of 1st pterygiophore) at origin of dorsal fin, sometimes hidden by predorsal scales.

Description. A detailed description was given by Iwatsuki and Nakabo, 2005 and is not repeated here.

Distribution. *Hapalogenys sennin* is currently known only from the southern part of Japan (excluding the Ryukyu and Ogasawara Is.) and is possibly endemic to the Japanese region (fig. 6; see Iwatsuki and Nakabo, 2005).

Ecological notes. Collection data indicate that habitat of *Hapalogenys sennin* is restricted to river mouths and coastal rocky-sandy bottoms in depths of less than 50 m. Detailed habitat features are given in Iwatsuki and Nakabo, 2005.

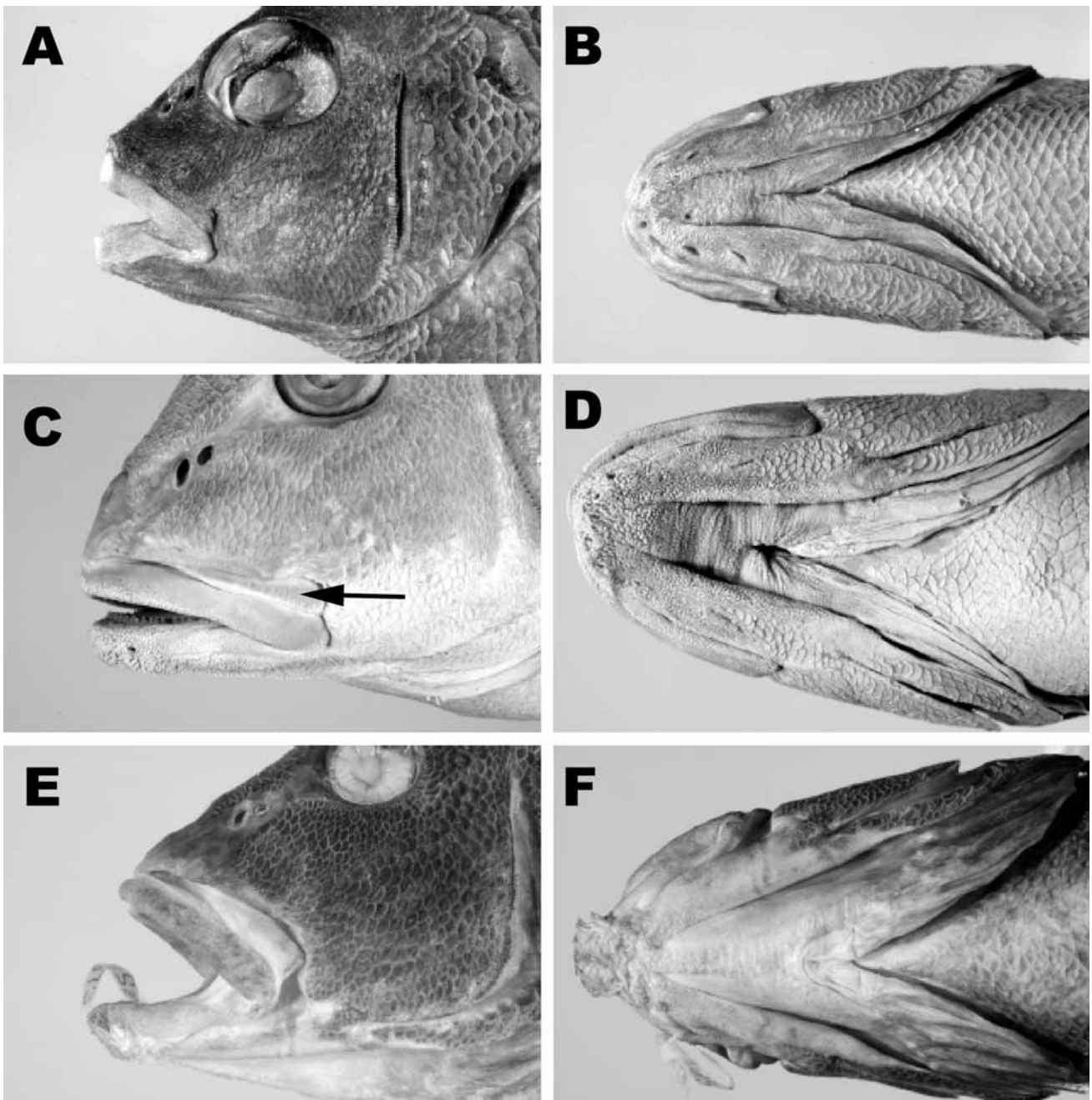


Figure 4. Head (left) and lower jaw ventral view (right) of 3 species, *Hapalogenys merguiensis* (A–B), *H. nigripinnis* (C–D) and *H. sennin* (E–F). A–B), HUMZ 33397, 172 mm SL, Andaman Sea; C–D), ZMUU 275, holotype of *H. aculeatus*, 320 mm SL, Nagasaki, Japan; E–F), MUFS 11649, holotype, 232 mm SL, Meitsu, Nango, Miyazaki, Japan. Arrow indicates squamation on maxilla.

Discussion

Iwatsuki et al., 2000a demonstrated that *Hapalogenys maculatus* Richardson, 1846, from Canton, China, should be considered as a “*nomen dubium*”, because the seven presently known valid species of *Hapalogenys* all lack the round spots on the upper half of the body, tail and vertical fins that supposedly characterise *H. maculatus*. The description of *H. maculatus* is highly suggestive of *Plectorhinchus cinctus* Schlegel in Temminck and Schlegel, 1843, a haemulid (Iwatsuki et al. 2000a).

Other nominal species previously placed in *Hapalogenys* include: *Hapalogenys meyenii* Peters (synonymized under *Parapristipoma trilineatum* Thunberg by Iwatsuki et al., 2000b); *Hapalogenys petersi* Day (subsequently removed to the genus *Dinoperca*, and assigned to a new family Dinopercidae, by Heemstra and Hecht, 1986); and *Hapalogenys pictus* Tortonese (transferred to *Plectorhinchus* by Smith, 1962). In addition, the holotype (ZMB 10179, 215 mm SL) of *H. atlanticus* Reichenow from Chinchou (= Chichoua), Gabon, West Africa, was shown to be a senior synonym of *Centrarchops chapini* Fowler by Heemstra and Iwatsuki (in press). *Hapalogenys nigripinnis* Schlegel in Temminck and Schlegel, 1843 was shown to be a senior synonym of *H. nitens* Richardson, 1844b, *H. aculeatus* Nyström, 1887 and *H. guentheri* Matsubara, 1933, by Iwatsuki and Nakabo, 2005. Accordingly, we recognise seven valid *Hapalogenys* species, including two new species: *H. analis*, *H. dampieriensis* sp. nov., *H. filamentosus* sp. nov., *H. kishinouyei*, *H. merguiensis*, *H. nigripinnis* and *H. sennin* (figs 1A–H and t 3).

Table 3 includes selected characters of the above seven *Hapalogenys* species. All have the following combination of characters: dorsal-fin rays X or XI, 13–17, anal-fin rays III, nine or ten, relatively deep body, a procumbent spine-like process (exposed tip of first pterygiophore) at origin of dorsal fin, ten pores (total) on and behind chin, including a single very small pore near symphysis plus four pores on each lower jaw, and a cluster of very short dense barbels and/or papillae on the fleshy lower lip (figs 3–4; Iwatsuki et al., 2000a).

Hapalogenys analis differs from other congeners in having five to seven alternating whitish and dark-brown bands on the head and body (fig. 1A), a black margin posteriorly on the dorsal-, anal- and caudal-fin soft rays (fig. 1A), black membrane on the spinous dorsal- and anal-fin (until first anal-fin ray), and pelvic-fin rays (fig. 1A), and well-developed papillae and barbels on the fleshy lower lip (figs 1A, 3A–B). Other congeners lack these characters (figs 1B–H). *Hapalogenys nigripinnis* and *H. sennin* differ from other *Hapalogenys* species in having vertical and longitudinal stripes on the body (fig. 1B–H), higher counts of pored lateral-line scales (usually 44–48 vs. 44–45; Table 3). In addition, *H. sennin* has extremely well-developed papillae and barbels on the fleshy lower lip with a dense cluster on the chin (fig. 4F). *Hapalogenys nigripinnis* differs from the latter in having scales on the maxilla (vs. absent in *H. sennin*; fig. 4C, E) and rounded soft dorsal fin posteriorly (vs. strongly angulated in *H. sennin*; fig. 1G, 1H).

Hapalogenys dampieriensis sp. nov., *H. filamentosus* sp. nov. and *H. kishinouyei* are similar to each other in overall appearance and are accordingly identified as the “*Hapalogenys kishinouyei* complex”, a species group defined by having two to five longitudinal stripes on the body. However, *H. dampieriensis* sp. nov. differs from the two other species in having four narrow dark longitudinal stripes, two of which are lost in adults (figs 2A–C in 65–158 mm SL and fig. 1B in about 270 mm SL). In contrast, *H. kishinouyei* has five (only two in adults) broad dark longitudinal stripes on the body (figs 2D–F in 81–168 mm SL and fig. 1E in 266 mm SL), and *H. filamentosus* has two faint narrow longitudinal body stripes, the filamentous pelvic-fin ray almost reaching to or slightly beyond base of first anal-fin spine when depressed (vs. slightly beyond anus but not reaching to first anal-fin spine base in *H. dampieriensis* and *H. kishinouyei*; figs 1C, D). Furthermore, *H. filamentosus* differs from *H. dampieriensis* sp. nov. in having the posteriormost angle of the jaw reaching to a vertical through the centre of the eye (vs. the jaw reaching slightly beyond a vertical through the anteriormost eye membrane in *H. dampieriensis* sp. nov. and *H. kishinouyei* in similar sized specimens of 130–160 mm SL, fig. 1C and figs 2B–C, 2E–F).

Randall, 1981 reported many marine antitropical and anti-equatorial species from the Indo-Pacific, and the distribution of the genus *Hapalogenys* itself also seems to be generally anti-tropical (figs 5–6; Randall, 1981). *Hapalogenys analis*, *H. kishinouyei*, *H. nigripinnis* and *H. sennin* have sympatric distributions and occur essentially in the same areas, viz. “East Asian Shelf”, except off the Ryukyu and Ogasawara Is. However, within this general area the collection data indicate they occupy different niches.

Hapalogenys kishinouyei is distributed in depths less than 200 m along the Pacific coast of Japan from Boso Peninsula, Honshu I., through the southernmost Shikoku and Kyushu Is.; the East China Shelf slope from Senkaku I. to southern Kyushu; and in the South China Sea. *Hapalogenys analis* is distributed in the East China Sea (including western Japan) and South China Sea in shallow coastal waters, in depths less than 100 m. *Hapalogenys nigripinnis* is densely distributed off southern Japan (except the Ryukyu and Ogasawara Is.), southern Korea, East China Sea, Taiwan Strait and Hong Kong, in depths less than 50 m (Iwatsuki and Nakabo, 2005). *H. sennin* is generally distributed off southern Japan (except the Ryukyu and Ogasawara Is.) and inhabits shallow coastal rocky and sandy shores in depths less than about 30 m during spring and autumn (unknown in winter; Iwatsuki and Nakabo, 2005). By comparison, *H. dampieriensis* sp. nov., *H. filamentosus* sp. nov. and *H. merguiensis* have allopatric distributions and occur off north-western Australia, the Philippines (off Iloilo, Panay I.), and in the Andaman Sea, respectively.

Comparative material examined. *Centrarchops chapini*: ZMB 10179 (holotype of *Hapalogenys atlanticus*), 215 mm SL, Chinchou (=Chichoua), Gabon, west Africa *Parapristipoma trilineatum*: ZMB 1050 (holotype of *Hapalogenys meyenii*), 340 mm SL, Manila, Philippines.

Table 3. Selected characters of 7 species of the genus *Hapalogenys*

	<i>H. analis</i> * 72–201 mm SL (<i>n</i> =50)	<i>H. dampieriensis</i> sp. nov. 66–300 mm SL (<i>n</i> =26)	<i>H. filamentosus</i> sp. nov. 115–149 mm SL (<i>n</i> =4)	<i>H. kishinouyei</i> 45–393 mm SL (<i>n</i> =40)	<i>H. merguensis</i> 172–242 mm SL (<i>n</i> =7)	<i>H. nigripinnis</i> 54–404 mm SL (<i>n</i> =59)	<i>H. sennin</i> 49–292 mm SL (<i>n</i> =36)
Dorsal-fin rays	XI, 15–16	XI, 13–14	XI, 14	XI, 14 (rarely 15)	XI, 14	XI, 15–16	XI, 16–17 (rarely 18)
Anal-fin rays	III, 9 (rarely 10)	III, 8–9	III, 9	III, 9	III, 9–10	III, 9 (rarely 10)	III, 9–10
Pectoral-fin rays	18–19 (rarely 20)	17–18	17–18	17–18	17–18	18–20	17–18
Gill rakers	6–7 + 13–14	5–6 + 11–12	5 + 12	4–7 + 11–13	5–7 + 12–13	5–6 (rarely 7) + 12–13	5–6 + 12–14
Pored lateral-line scales	usually 44–47 but rarely 43 or 48	41–45	41 or 42	44–47	39–42	45–48 (rarely 44 or 49)	44–45 (rarely 43 or 46)
Scale rows above and below lateral line	10–14 (rarely 9) / 22–24 (rarely 21)	10–12/21–23	10–11/20	11–13/23–25	9–10/18–20	12–14/22–25	9–11/15–17
A procumbent spine-like process (exposed tip of 1st pterygiophore) at origin of dorsal fin	apparent	apparent	apparent	apparent	apparent	apparent; rarely not apparent in smaller specimens of ca. 100 mm SL	usually not apparent; hidden by dorsal scales
Papillae and barbels on fleshy lower lip	developed	poorly developed	poorly developed	poorly developed	developed	developed	extremely well-developed but like a dense cluster
Scales on maxilla	present	absent	absent	absent	absent	present	absent
Scales on posterior abdominal part of angular of lower jaws	present	present	present	present	present	present	absent
1st soft pelvic-fin ray	not filamentous	weakly filamentous	extremely filamentous	not filamentous	not filamentous	not filamentous	not filamentous
Tip of first pelvic-fin ray (when depressed)	not reaching to base of first anal-fin spine	extending slightly beyond anus but not to first anal-fin spine base	almost reaching to or slightly beyond base of first anal-fin spine	extending slightly beyond anus but not to first anal-fin spine base	not reaching to base of first anal-fin spine	not reaching to base of first anal-fin spine	not reaching to base of first anal-fin spine
Condition of chin pores	10 pores, anterior pores usually hidden by cluster of papillae; often slit-like pores posteriorly	10 obvious pores; often slit-like pores posteriorly	10 obvious pores; often slit-like pores posteriorly	10 obvious pores; often slit-like pores posteriorly	10 obvious pores; often slit-like pores posteriorly	10 pores, including 2 very small pores near symphysis plus 4 pores on jaw (sometimes slit-like posteriorly); posterior pores rarely covered by membrane	10 pores, including 2 very small pores (perfectly hidden by cluster of barbels) near symphysis plus 4 pores on each lower jaw (sometimes slit-like, a pit partially or perfectly covered posteriorly by membrane)
Dense black margin on soft dorsal, caudal and anal fins posteriorly	present	absent	absent	absent	absent except caudal fin	absent	absent
Stripe and band patterns on head and body	5–7 alternating whitish and dark brown bands on head body	4 narrow longitudinal dark stripes in specimens < ca. 100 mm SL, and then 2nd and 3rd stripes remain but their width becoming narrow (less than pupil diameter)	2 faint narrow longitudinal stripes	5 broad longitudinal dark stripes even in specimens > 200 mm SL, and width of 4th stripe nearly equal to pupil diameter	2 indistinct oblique bands	2 indistinct oblique bands	2 indistinct oblique bands on body in young or stressed specimens but usually indistinct in larger adults

*Lim (1994) reported a single specimen of *H. analis* from Singapore (as questionably), but a total of 3 specimens of the species have been collected in the vicinity of Singapore (K. K. P. Lim, ZRC, pers. comm.).

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References

- Ahlstrom, E.H., Butler, J.L., and Sumida, B.Y. 1976. Pelagic stromateoid fishes (Pisces, Perciformes) of the eastern Pacific: kinds, distributions, and early life histories and observations on five of these from the Northwest Atlantic. *Bulletin of Marine Science* 26(3): 285–402.
- Akazaki, M. 1984. Pomadasyidae. Pp. 173–174 in: Masuda, H., Amaoka, K., Araga, C., Uyeno, T. and Yoshino, T. (eds). *The fishes of the Japanese Archipelago*. Tokai University Press: Tokyo.
- Allen, G.R. 1997. *Marine fishes of tropical Australia and south-east Asia*. Western Australian Museum: Perth. 292 pp.
- Allen, G.R., and Swainson, R. 1988. *The marine fishes of north-western Australia. A field guide for anglers and divers*. Western Australian Museum: Perth. 201 pp.
- Bleeker, P. 1865–1869. Atlas ichthyologique des Indes Orientales Néerlandaises, publié sous les auspices du Gouvernement colonial néerlandais. Tome V. Baudroies, Ostracions, Gymnodontes, Balistes. *Atlas Ichthyologique* 5: 1–152.
- Bleeker, P. 1876. Systema Percarum revisum. Pars Ia. Percae. *Archives Néerlandaises des Sciences et Naturelles, Haarlem* 11(1): 247–288.
- Bauchot, M.L., Dessoutter, M., and McKay, R.J. 1983. Catalogue critique des types de poissons du Muséum national d'Histoire naturelle (Suite)(Familles des Haemulidae et des Sillaginidae). *Bulletin Muséum National d'Histoire Naturelle, Paris, 4e (Séries 5), section A, no. 2, Supplement*: 27–61.
- Bauchot, M.L., Whitehead, P.J.P., and Monodo, T. 1982. Date of publication and authorship of the fish names in Eydoux and Souleyet's zoology of La Bonite, 1841–1852. *Cybiurn* (Ser. 3) 6(3): 59–73.
- Chen, Q.-C., Cai, Y.-Z., and Ma, X.-M. (eds). 1997. *Fishes from Nansha Islands to South China coastal waters I*. Beijing: Science Press. 202 pp.
- Eydoux, J.F.T., and Souleyet, F.A. 1850. *Voyage autour du monde exécuté pendant les années 1836 et 1837 sur la corvette La Bonite, commandée par M. Vailant*. Vol. 1 (Part 2). Paris: Zoologie, pp. 155–216.
- Fowler, H.W. 1930. Notes on Japanese and Chinese fishes. *Proceedings of the Academy of Natural Sciences of Philadelphia* 81(for 1929): 589–616.
- Fowler, H.W. 1931. Contributions to the biology of the Philippine Archipelago and adjacent regions. The fishes of the families Pseudochromidae, Lobotidae, Pempheridae, Priacanthidae, Lutjanidae, Pomadasyidae, and Teraponidae collected by the United States Bureau of Fisheries Steamer "Albatross," chiefly in Philippine seas and adjacent waters. *Bulletin of the United States Natural History Museum No. 100*, 11: 1–388.
- Gloerfelt-Tarp, P., and Kailola, P.J. 1984. *Trawled fishes of southern Indonesia and northwestern Australia*. Singapore: Australian Development Assistance Bureau (ADAB), Directorate General of Fisheries, Indonesia (DGF) and German Agency for Technical Cooperation (GTZ). 406 pp.
- Günther, A. 1859. Catalogue of the fishes in the British Museum. Catalogue of the acanthopterygian fishes in the collection of the British Museum. Gasterosteidae, Berycidae, Percidae, Aphredoderidae, Pristipomatidae, Mullidae, Sparidae. *Catalogue of Fishes* 1: 1–524.
- Heemstra, P.C., and Hecht, T. 1986. Dinopercaidae, a new family for the percid marine fish genera *Dinoperca* Boulenger and *Centrarchops* Fowler (Pisces: Perciformes). *Ichthyological Bulletin of J. L. B. Smith Institute of Ichthyology* (51): 1–20.
- Heemstra, P.C., and Iwatsuki, Y. In press. The family Dinopercaidae in: Carpenter, K.E. (ed.) *Species identification guide for fisheries purposes. The living marine resources of the Eastern Central Pacific*. Rome: FAO.
- Hutchins, J.B. 2001. Checklist of the fishes of Western Australia. *Records of the Australian Museum, Supplement* (63): 9–50.
- Ishikawa, C., and Matsuura, K. 1897. *Preliminary catalogue of fishes including Dipnoi, Cyclostomi and Cephalochorda in the collection of the Natural History Department*. Tokyo: Imperial Museum of Tokyo. 579 pp. [In Japanese.]
- Iwatsuki, Y., Satapoomin, U., and Amaoka, K. 2000a. New species: *Hapalogenys merguensis* (Teleostei; Perciformes) from Andaman Sea. *Copeia* 2000(1): 129–139.
- Iwatsuki, Y., Paepke, H.-J. Kimura, S., and Yoshino, T. 2000b. A poorly known haemulid fish, *Hapalogenys meyenii* Peters, 1866, a junior synonym of *P. trilineatum* (Thunberg, 1793). *Ichthyological Research* 47(4): 393–396.
- Iwatsuki, Y., and Nakabo, T. 2005. Redescription of *Hapalogenys nigripinnis* (Schlegel in Temminck and Schlegel, 1843), a senior synonym of *H. nitens* Richardson, 1844, and a new species from Japan. *Copeia* 2005(4): 854–867.
- Izuka, A., and Matsuura, K. 1920. *Catalogue of the zoological specimens exhibited in the Natural History Department, Tokyo Imperial Museum (Vertebra)*. Tokyo: Tokyo Imperial Museum. 987 pp. [In Japanese.]
- Johnson, G.D. 1980. The limits and relationships of the Lutjanidae and associated families. *Bulletin of Scripps Institution of Oceanography* 24: 1–111.
- Johnson, G.D. 1984. Percoidei: development and relationships in: Moser, H.G., Richards, W.J., Cohen, D.M., Fahay, M.P., Kendall, A.W. Jr. and Richardson, S.L. (eds.) *Ontogeny and systematics of fishes* pp. 464–498. American Society of Ichthyologists and Herpetologists, Special Publication. No. 1.
- Jordan, D.S., and Thompson, W.F. 1912. A review of the Sparidae and related families of perch-like fishes found in the waters of Japan. *Proceedings of the United States National Museum* 41(for 1875): 521–601.

- Kyushin, K., Aamaoka, K., Nakaya, K., Ida, H., Tanino Y., and Senta, T. (eds). 1982. *Fishes of the South China Sea*. Tokyo: Japan Marine Fishery Resource Research Center. 333 pp. [In Japanese and English.]
- Leis, J.M., and Carson-Ewart, B.M. (eds). 2000. *The larvae of Indo-Pacific coastal fishes. An identification guide to marine fish larvae*. (Fauna Malesiana Handbooks 2). Leiden: E. J. Brill. 870 pp.
- Leis, J.M., and Carson-Ewart, B.M. (eds). 2004. *The larvae of Indo-Pacific coastal fishes. An identification guide to marine fish larvae*. (Fauna Malesiana Handbooks 2). Soft cover edition. Leiden: E. J. Brill. 870 pp.
- Leviton, A.E., Gibbs, R.H. Jr., Heal, E., and Dawson, C.E. 1985. Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia* 1985(3): 802–832.
- Lim, K.K.P. 1994. First record of *Hapalogenys analis* (Teleostei: Perciformes: Haemulidae) from the Indo-Australia region. *The Raffles Bulletin of Zoology* 42(2): 983–985.
- Mabe, P.M. 1988. Supraneural and predorsal bones in fishes: development and homologies. *Copeia* 1988(4): 827–838.
- Matsubara, K. 1933. A review of *Hapalogenys*, a genus of perch-like fishes, from Japan and adjacent regions. *Journal of the Imperial Fishery Institute* 28(2): 111–130.
- McKay, R.J. 2001. Family Haemulidae in: Carpenter K. and Niem V.H. (eds.) *Species identification guide for fishery purposes. The living marine resources of the western central Pacific. Bony fishes part 3 (Menidae to Pomacentridae)*. Rome: FAO.
- Nelson, J.S. 2006. *Fishes of the world*. 4th Edition. New Jersey: John Wiley and Sons. 601 pp.
- Nyström, E. 1887. Redogörelse för den Japanska Fisksamlingen i Upsala Universitets Zoologiska Museum. *Bihang Kongliga Svenska Vetenskaps-Akademien Handlingar* 13(4): 1–54.
- Okamura, O., Machida, Y., Yamakawa, T., Matsuura, K., and Yatou, T. 1985. *Fishes of the Okinawa Trough and the adjacent waters. Vol. 2. The intensive research of unexploited fishery resources on continental slopes*. Tokyo: Japan Fisheries Resource Conservation Association, 781 pp. [In Japanese with English summary.]
- Randall, J. 1981. Examples of antitropical and antiequatorial distribution of Indo-West-Pacific Fishes. *Pacific Science* 35(3): 197–208.
- Randall, J., and Lim, K.K.P. 2000. A checklist of the fishes of the South China Sea. *Raffles Bulletin of Zoology, Supplement* (8): 569–667.
- Richardson, J. 1844a. Description of a genus of Chinese fish. *Annals and Magazine of Natural History (N. S.)* 13: 461–464.
- Richardson, J. 1844b. Ichthyology.—Part 1 in: Hinds R.B. (ed.) *The zoology of the voyage of H.M.S. Sulphur, under the command of Captain Sir Edward Belcher, R.N., C.B., F.R.G. S., etc., during the years 1836–42, No. 5, Voyage Sulphur 1, Ichthyology*. pp. 51–70, pls. 35–44. London: Smith, Elder and Co.
- Richardson, J. 1845. Ichthyology.—Part 2 in: Hinds R.B. (ed.) *The zoology of the voyage of H.M.S. Sulphur, under the command of Captain Sir Edward Belcher, R.N., C.B., F.R.G.S., etc., during the years 1836–42, No. 9, Voyage Sulphur 2, Ichthyology*. pp. 71–98, pls. 45–54. London: Smith, Elder and Co.
- Richardson, J. 1846. Report on the ichthyology of the seas of China and Japan. *Report of the British Association and Advisory Science* (for 1845): 187–320.
- Sadovy, Y., and Cornish, A.S. 2000. *Reef fishes of Hong Kong*. Hong Kong: Hong Kong University Press, xi + 321 pp.
- Sainsbury, K., Kailola, P.J., and Leyland, G.G. 1985. *Fishes of Northern and North-Western Australia*. Canberra: CSIRO. 375 pp.
- Shen, S.-C. (ed). 1993. *Fishes of Taiwan*. Taipei: National Taiwan University. 956 pp.
- Shimada, K. 2000. Haemulidae in: Nakabo T. (ed.) *Fishes of Japan with pictorial keys to the species, Second edition*, Vol. 1. pp. 841–846, 1564–1566. Tokyo: Tokai University Press. [In Japanese.]
- Shimada, K. 2002. Haemulidae in: Nakabo T. (ed.) *Fishes of Japan with pictorial keys to the species, English edition*, Vol. 1. pp. 841–846, 1556–1557. Tokyo: Tokai University Press.
- Shinohara, G., Endo, H., Matsuura, K., Machida, Y., and Honda, H. 2001. Annotated Checklist of the Deepwater Fishes from Fishes from Tosa Bay, Japan. *National Science Museum, Tokyo, Monograph* 20: 283–434.
- Smith, J.L.B. 1962. The identity of *Hapalogenys pictus* Tortonese, 1935. *Annals and Magazine of Natural History, Series* 13(5): 637–638.
- Smith, H.M., and Pope, T.E.B. 1906. List of fishes collected in Japan in 1903, with descriptions of new genera and species. *Proceedings of the United States National Museum* 31(1489): 459–499.
- Springer, V.G., and Raasch, M.S. 1995. Fishes, Angling, and Finfish Fisheries on Stamps of the World. *American Topical Association. Fishes on stamps Handbook* (129): 1–110.
- Steindachner, F., and Döderlein, L. 1883. Beiträge zur Kenntniss der Fische Japan's. (II.). *Denkschr Akademie Wissensch Wien Abth* 48(1): 1–40.
- Tanaka, S. 1925. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea and southern Sakhalin. *Figures and Descriptions of Fishes of Japan* 34: 629–644, pls. 151–153. [In Japanese and English.]
- Temminck, C.J., and Schlegel, H. 1843. Pisces, Parts 2–4 in: *P. F. de Siebold's Fauna Japonica*, pp. 21–72, pls. 10–36. Amsterdam: Müller.
- Wang, S.-A., Wang, Z.-M., Li, G.-L., and Cao, Y.-P. 2001. *The fauna of Hebei, China. Pisces*. Beijing: Hebei Science and Technology Publishing House. 366 pp. [In Chinese.]
- Whitehead, P.J.P. 1970. The Reeves Collection of Chinese fish drawings. *Bulletin of the British Museum (Natural History), Zoology* 3(7): 191–233, 29 pls.
- Youn, C.-H. 2002. *Fishes of Korea, with pictorial key and systematic list*. Seoul: Il Ji Sa Publishing. 747 pp.