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CONSPECIFICITY OF THE BEMBRID FISHES *Bembras leslieknappi* Imamura, Psomadakis and Thein, 2018 AND *Bembras andamanensis* Imamura, Psomadakis and Thein, 2018 (TELEOSTEI: SCORPAENIFORMES: BEMBRIDAE)

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ABSTRACT: The two bembrid fishes *Bembras leslieknappi* Imamura, Psomadakis and Thein, 2018 and *Bembras andamanensis* Imamura, Psomadakis and Thein, 2018 were each originally described only from a holotype, both specimens having been collected from the Andaman Sea, Indian Ocean. However, eight additional specimens from the Andaman Sea off Thailand revealed that *B. leslieknappi* and *B. andamanensis* represented male and female examples of a single species, respectively. Precedence is given to *B. leslieknappi* as First Reviser, *B. andamanensis* therefore becoming a junior synonym of the former. Because reassessment of the two species was made possible by the additional specimens, which varied intraspecifically in many aspects, a rediagnosis of *B. leslieknappi* is provided to clarify its specific characteristics. A comparison of the latter with five known congeners and a key to species of the genus *Bembras* Cuvier, 1829 are also provided.

Keywords: Andaman Sea, Indian Ocean, precedence, synonym, intraspecific variation

INTRODUCTION

Two bembrid fish species, *Bembras leslieknappi* Imamura, Psomadakis and Thein, 2018 and *Bembras andamanensis* Imamura, Psomadakis and Thein, 2018, were originally described only from the holotype of each, both collected from off Myanmar in the Andaman Sea, Indian Ocean (Imamura *et al.* 2018). Although the two species were considered separable from each other by the second dorsal and pectoral fin colors, and anal-fin ray numbers (Imamura *et al.* 2018), it is now apparent that *B. leslieknappi* and *B. andamanensis* simply represent the male and female forms, respectively, of a single species, owing to examination of an additional eight specimens deposited in the Reference Collection, Phuket Marine Biological Center (PMBC) (Fig. 1), as suggested by Psomadakis *et al.* (2020). The conspecificity of the two species is recognized herein, precedence being given to *B. leslieknappi* as First Reviser following ICZN (1999: Art. 24.2.2); thus, *B. leslieknappi* is recognized as valid, and *B. andamanensis* becomes a junior synonym of the former. Because the additional specimens revealed hitherto unrecognized intraspecific variations in many features, including head spines, a rediagnosis of the species is given here. In addition, a comparison of redefined *B. leslieknappi* is made with five known congeners and a key to species of the genus *Bembras* Cuvier in Cuvier and Valenciennes, 1829 provided.

MATERIAL AND METHODS

Counts and measurements generally followed Imamura and Knapp (1997). Measurements were made with calipers to the nearest 0.1 mm, being routinely taken from the left side. Gill rakers were counted on the right side. In addition to the number of pored scales in the lateral line, numbers of forward and backward slanting body scale rows above the lateral line were counted (Fig. 2). Terminology of head spines follows Knapp (1986). Institutional acronyms are from Fricke and Eschmeyer (2024). Standard length is abbreviated as SL. Sex of specimens was determined by gonad examination.

Comparative material. A total of 82 specimens of *Bembras* Cuvier, 1829, representing all five known species, deposited at AMS, BMNH, CAS, CSIRO, FRLM, HUMZ, NTM, QM, UMMZ and ZMH [all listed in Imamura and Knapp (1998)].

Material examined. *Bembras leslieknappi*. PMBC 37808, 3 males and 2 females, 171.7–211.0 mm SL, Thailand, Andaman Sea, Indian Ocean (7°01′N, 98°19′E–7°05′N, 98°18′E), otter trawl, 119–116 m depth, R/V Chakratong Tongyai, BIOSHELF St. K4, 23 Feb. 2000, coll. C. Aungtonya and V. Vongpanich; PMBC 37809, 1 male and 2 females, 180.0–205.8 mm SL, Thailand, Andaman Sea, Indian Ocean (07°03.600′N, 98°17.300′E), otter trawl, 122 m depth, 15 Apr. 2007, coll. S. Bussarawit; SAIAB 203646, holotype of *Bembras andamanensis*, female, 182.9 mm SL, off Ayeyarwady Delta, Myanmar, Andaman Sea, Indian Ocean (14°10.26′N, 95°2.55′E), bottom trawl, 116 m, R/V Dr. Fridtjof Nansen, St. 81, 12 May 2015, coll. P.N. Psomadakis; SAIAB 203647, holotype of *B. leslieknappi*, male, 195.0 mm SL, off Tanintharyi coast, Myanmar, Andaman Sea, Indian Ocean (10°23.33′N, 97°24.81′E), bottom trawl, 181–184 m, R/V Dr. Fridtjof Nansen, St. 172, 28 May 2015, coll. P.N. Psomadakis.

Table 1. Anal- and pectoral-fin ray counts in six species of *Bembras*.

	Anal-fin rays				Pectoral-fin rays						
	13	14	15	Average	16	17	18	19	20	21	Average (total)
B. leslieknappi (n = 10)		7	3*	14.3	(L)				7*	3	20.4
					(R)				5*	5	
B. adenensis (n = 4)			4*	15.0	(L)			4*			19.0
					(R)			4*			
B. japonica (n = 35)	1	33	1	14.0	(L)	1	32*	2			17.0
					(R)		33*	2			
B. longipinnis (n = 13)	1	12*		13.9	(L)		1	8	4*		18.2
					(R)		1	10	2*		
B. macrolepis (n = 17)	1	16*		14.9	(L)			16*	1		18.0
					(R)		1	15*	1		
B. megacephala (n = 13)		13*		15.0	(L)				2	11*	19.9
					(R)				1	12*	

*Including holotype
L, left side; R, right side

RESULTS AND DISCUSSION OF SYNONYMY

Bembras leslieknappi and *B. andamanensis* were originally recognized as having the following characters in common: 20 or 21 pectoral-fin rays, a moderately large head, long snout and small orbit, and the caudal fin with a broad blackish band (Imamura *et al.* 2018). However, at that time they were considered as distinguishable from each other by second dorsal- and pectoral-fin coloration (second dorsal fin dusky, with a small blackish spot on first spine and many soft ray bases, and a blackish blotch posterodorsally on pectoral fin in *B. leslieknappi* vs. second dorsal fin pale, with many small scattered blackish spots, and posterodorsal pectoral-fin blotch absent in *B. andamanensis*). In addition, Imamura *et al.* (2018) considered that the anal-fin ray number was also useful for separating *B. leslieknappi* and *B. andamanensis* from each other (15 vs. 14), since that meristic is relatively stable in species of *Bembras* (see Imamura *et al.* 2018: tab. 2) (Table 1). The present study examined an additional eight specimens of *Bembras* collected off Thailand in the Andaman Sea (Fig. 1). Of them, four (180.0–198.2 mm SL) agreed with *B. leslieknappi* in having a dusky second dorsal fin with small dark brownish spots on the first spine and many soft-fin ray bases (Fig. 3B). However, intraspecific variations in the second dorsal-fin spots and pectoral-fin markings were apparent. Two specimens (182.2 and 188.2 mm SL) had spots elsewhere on the second dorsal-fin membrane, and a distinct dark brownish blotch on the pectoral fin posterodorsally (Fig. 3B). The smallest specimen (180.0 mm SL) lacked a distinct posterodorsal blotch on the pectoral fin, but had a paler brownish band posteriorly, and the largest specimen (198.2

mm SL) had a distinct dark brownish band posteriorly. In contrast, the remaining four specimens (171.7–211.0 mm SL) were consistent with *B. andamanensis* in having a pale second dorsal fin with many scattered small dark brownish spots and the pectoral fin without a distinct posterodorsal blotch (but with an indistinct pale brownish band posteriorly) (Fig. 3D).

It was also found that both presumed *B. leslieknappi* and *B. andamanensis* had 14–15 anal-fin rays (Table 2), rendering that character diagnostically invalid. Because of the variable pectoral fin markings (distinct blotch, or distinct or indistinct band present) in the former, such are also invalid as taxonomic characters separating the two nominal species. Finally, the identification of the five specimens each of so-called *B. leslieknappi* (including the holotype) and *B. andamanensis* (including the holotype) as males and females, respectively, with no remarkable differences between them in counts and proportional measurements (Table 2), make reasonable the conclusion that the differing second dorsal-fin colors (dusky in *B. leslieknappi* and pale in *B. andamanensis*) in fact represented sexual dimorphism within a single species, as suggested by Psomadakis *et al.* (2020). *Bembras leslieknappi* and *B. andamanensis* are therefore considered to be conspecific, exhibiting male and female coloration, respectively. Because the pectoral fin marking was variable in males and the posterior band indistinct only in the smallest male specimen (180.0 mm SL), the intensity of such markings may change with growth.

Both *B. leslieknappi* and *B. andamanensis* were originally described on the same date (25 May 2018) in the same publication (Imamura *et al.* 2018). Following ICZN (1999: Art. 24.2.2), which states "If two or more names, different or identical, and based on the same or different types, or two or more nomenclatural acts, are published on the same date in the same or different works, the precedence of the names or acts is fixed by the First Reviser…", the present authors give precedence to *B. leslieknappi* according to First Reviser; thus, *B. leslieknappi* is a valid species, and *B. andamanensis* becomes a junior synonym of the former.

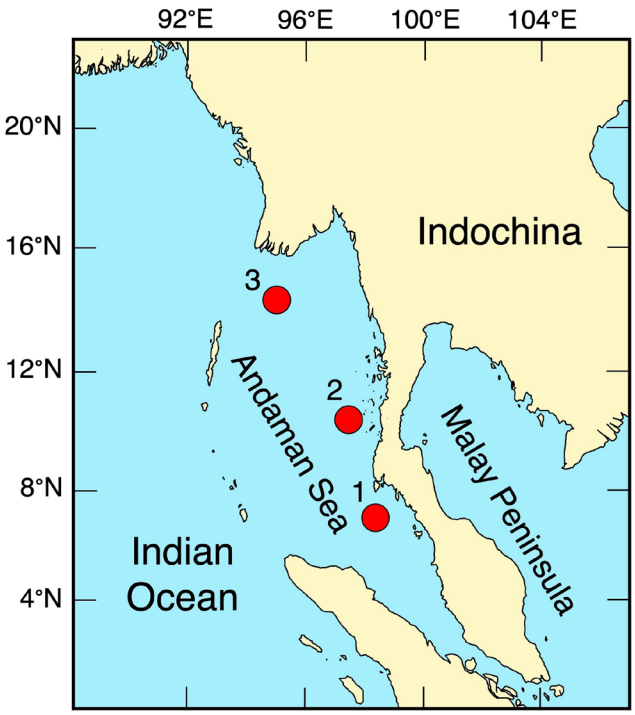

Figure 1. Map showing sampling localities of *Bembras leslieknappi.* 1, eight non-types; 2, holotype; 3, holotype of *Bembras andamanensis,* junior synonym of *B. leslieknappi.*

Table 2. Counts and proportional measurements of *Bembras leslieknappi.*

	Males		Females	
	Holotype (SAIAB 203647)	Non-types (n = 4)	Holotype of *B. andamanensis* (SAIAB 203646)	Non-types (n = 4)
SL (mm)	195.0	180.0–198.2	182.9	171.7–211.0
Counts:				
First dorsal-fin rays	XI	X (1) or XI (3)	XI	XI
Second dorsal-fin rays	I, 11	I, 11	I, 11	I, 11
Anal-fin rays	15	14 (3) or 15 (1)	14	14 (3) or 15 (1)
Pectoral-fin rays (upper, unbr. + middle, br. + lower, unbr.)	2 + 10 + 8 = 20 (both sides)	2 + 10–13 + 6–9 = 20–21 (left) 2 + 10–12 + 7–8 = 20–21 (right)	2 + 11 + 7 = 20 (left) 2 + 11 + 8 = 21 (right)	2 + 10–13 + 6–9 = 20–21 (left) 2 + 10–12 + 7–8 = 20–21 (right)
Pelvic-fin rays	I, 5	I, 5	I, 5	I, 5
Branched caudal-fin rays (upper + lower)	8 + 6 = 14	8 + 6 = 14	8 + 6 = 14	8 + 6 = 14
Pored scales in lateral line [with spine]	55 [4]	53–55 [4–6]	54 [4]	53–54 [4–6]
Backward slanting body scale rows above lateral line	56	54–55	56	54–55
Forward slanting body scale rows above lateral line	80	75–82	74	75–82
Gill rakers of first arch (upper + lower limbs)	3 + 10 = 13	2–3 + 11–12 = 13–14	4 + 11 = 15	3 + 10–12 = 14–15
Proportional measurements (% SL):				
Head length (HL)	41.5	39.2–40.9	42.1	39.2–40.3
Body depth at first dorsal-fin origin	16.1	15.7–16.0	17.6	15.8–17.2
Body depth at second dorsal-fin origin	12.9	10.8–12.3	12.2	10.2–12.0
Predorsal length	36.7	34.7–36.4	37.1	33.5–35.5
Length of first dorsal-fin base	25.3	22.6–25.9	24.4	24.3–25.9
Length of second dorsal-fin base	25.7	25.6–26.1	23.9	24.7–25.6
Length of anal-fin base	25.7	28.8–29.4	26.8	27.1–29.4
Caudal peduncle length	14.5	14.7–15.1	15.0	13.3–15.1
Caudal peduncle depth	5.2	5.0–5.1	4.7	4.9–5.3
Snout length	14.3	12.9–13.6	13.8	13.1–13.6

Table 2. Continued.

	Males		Females	
	Holotype (SAIAB 203647)	Non-types (n = 4)	Holotype of *B. andamanensis* (SAIAB 203646)	Non-types (n = 4)
Orbit diameter	10.4	10.1–11.4	10.9	9.8–10.2
Upper jaw length	14.9	13.4–14.3	14.7	13.8–14.2
Lower jaw length	19.7	18.2–19.3	18.5	18.0–19.1
Interorbital width	2.1	2.2–2.4	2.4	2.0–2.5
Pectoral-fin length	19.7	18.1–18.9	18.5	17.8–18.9 (3)
Pelvic-fin length	17.1	16.6–17.3	16.0	16.1–16.8
Caudal-fin length	20.0	17.8–19.2	18.4	18.3–19.1 (3)
Length of first spine of first dorsal fin	6.4	6.8–8.1	6.9	7.2–7.7
Length of second spine of first dorsal fin	10.7	10.9–12.2	11.0	10.8–14.0
Length of first spine of second dorsal fin	3.4	4.4–9.9	9.0	9.1–9.7 (3)
Length of first soft ray of second dorsal fin	12.7	12.1–12.8	11.5	11.2–11.8
Length of first anal-fin ray	5.9	5.3–6.6	5.7	4.5–5.4
Proportional measurements (% HL):				
Snout length	34.4	32.9–34.4	32.9	32.5–34.3
Orbit diameter	24.9	25.9–27.8	25.8	24.2–25.5
Upper jaw length	35.8	34.6–35.4	34.8	35.0–35.5
Lower jaw length	47.5	46.9–48.2	44.0	45.7–47.6
Interorbital width	4.9	5.6–5.9	5.6	5.1–6.1

Number of examined specimens shown in parentheses after counts and measurements if specimen damaged or variation recognized.

Table 3. Comparison of selected characters in known species of *Bembras.*

	B. leslieknappi (n = 10)	*B. adenensis* (n = 4)	*B. japonica* (n = 35)	*B. longipinnis* (n = 13)	*B. macrolepis* (n = 17)	*B. megacephala* (n = 13)
SL (mm)	171.7–211.0	137.0–153.5	56.1–244.7	127.1–199.9	109.9–273.1	128.7–230.2
Pectoral-fin rays	20 or 21	19	16–18 (usually 17)	17–19 (usually 18)	17–19 (usually 18)	19 or 20 (usually 20)
Forward slanting body scale rows above lateral line	74–82	70–75	77–85	79–85	55–62	77–84
Upper limb gill rakers of first arch	2–4 (usually 3)	3	1 or 2	1 or 2	2 or 3	2–4 (usually 3–4)
Head length (% SL)	39.2–42.1	38.4–42.0	34.1–37.6	36.2–38.3	35.1–38.5	38.2–41.2
Snout length (% SL)	12.9–14.3	12.1–12.5	11.2–13.3	1.5–12.4	11.2–12.8	12.9–14.0
Orbit diameter (% SL)	9.8–11.4	11.8–13.2	8.5–11.0	9.6–10.6	9.5–10.9	9.7–11.1
Caudal-fin marking	Broad band	Broad band*	Large blotch	Large blotch	Broad band	Several narrow bands

*From Knapp (1979), as *Bembras japonicus* (non Cuvier in Cuvier and Valenciennes 1829)

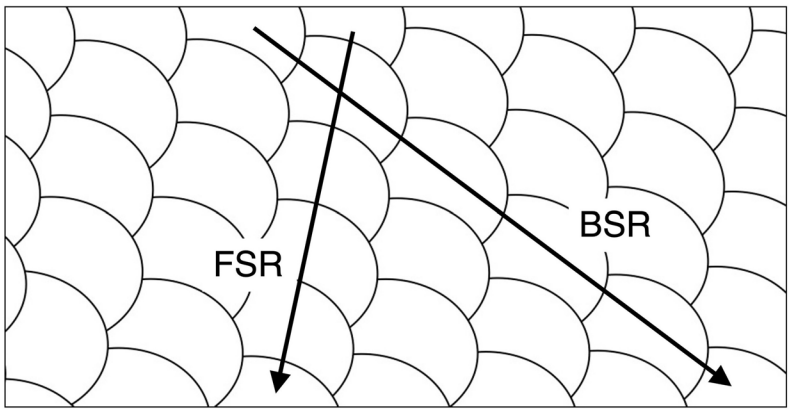

Figure 2. Diagrammatic illustration showing backward and forward slanting body scale rows above lateral line (BSR and FRS, respectively) in *Bembras* (from Imamura *et al.* 2018).

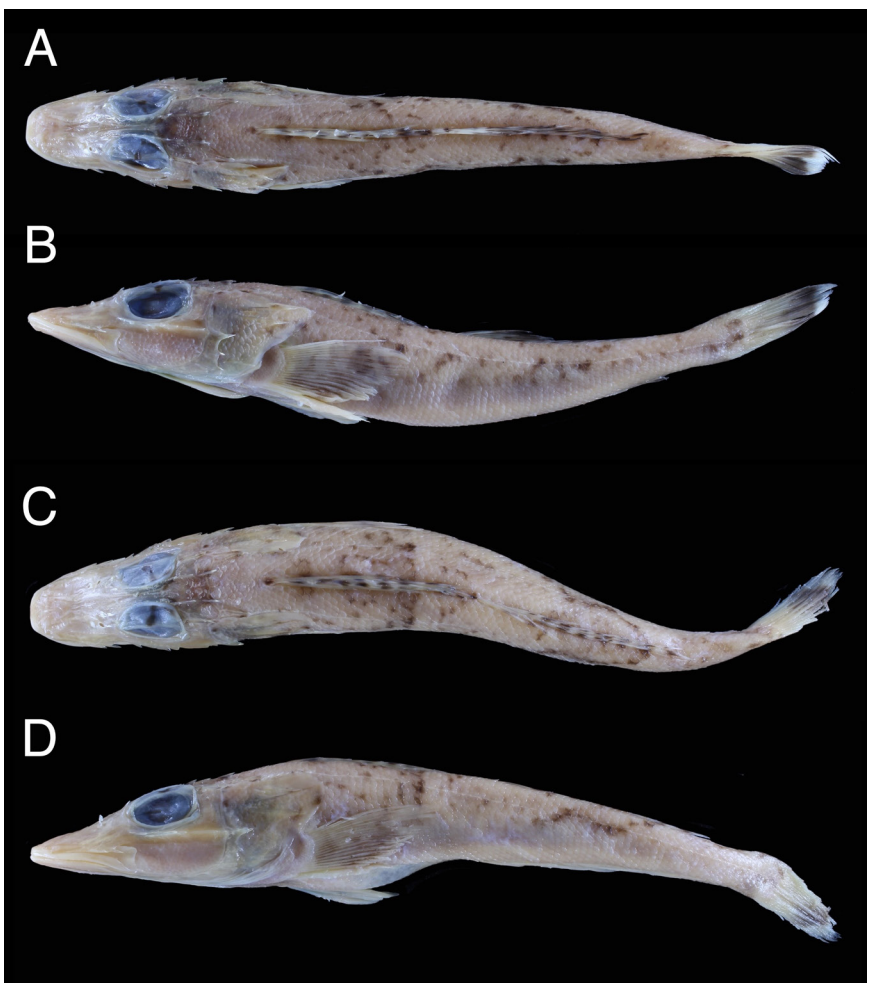

Figure 3. Dorsal (A, C) and lateral (B, D) views of *Bembras leslieknappi.* A, B, PMBC 37808, 182.2 mm SL, male; C, D, PMBC 37808, 204.1 mm SL, female.

TAXONOMIC ACCOUNT

Bembras leslieknappi Imamura, Psomadakis and Thein, 2018 (Common English name: Leslie Knapp's Deepwater Flathead)

(Fig. 3; Tables 1–3)

Bembras leslieknappi Imamura, Psomadakis and Thein, 2018: 2nd p., fig. 3 (type locality: off Tanintharyi coast, Myanmar, Andaman Sea, Indian Ocean); Psomadakis *et al.* 2020: 368 (Myanmar, Andaman Sea, Indian Ocean).

Bembras andamanensis Imamura, Psomadakis and Thein, 2018: 3rd p., fig. 4 (type locality: off Ay eyarwady Delta, Myanmar, Andaman Sea, Indian Ocean); Psomadakis *et al.* 2020: 368 (Myanmar, Andaman Sea, Indian Ocean).

Diagnosis. A species of *Bembras* with the following combination of characters: first dorsal-fin rays X or XI; second dorsal-fin rays I, 11; anal-fin rays 14 or 15; pectoral-fin rays 20 or 21; pored scales in lateral line 53–55 (anterior 4–6 scales with spine); backward slanting body scale rows above lateral line 54–56; forward slanting body scale rows above lateral line 74–82; gill rakers on first arch 2–4 + 10–12 = 13–15; head length 39.2–42.1% SL; snout length 12.9–14.3% SL; orbit diameter 9.8–11.4% SL; nasal spine 0 or 1; suborbital spines 4–7; supraocular spines 7–10; preopercular spines 4–7; pterotic spines 1 or 2; 0–3 spines present between posteriormost supraorbital and parietal spines on frontal; posttemporal spine strong, usually with or rarely without single small spine laterally; second dorsal fin dusky (except for pale basal area and tips of rays), with small blackish or dark brownish spots only on first spine and bases of many soft rays or also on membranes between rays in males, pale, with many scattered small blackish or dark brownish spots in females; pectoral fin with a distinct blackish or dark brownish blotch posterodorsally or band posteriorly, or indistinct pale brownish band posteriorly in males, with an indistinct pale brownish band posteriorly or middle portion dusky in females; caudal fin with a broad blackish or dark brownish band posteriorly.

Distribution. Known only from Myanmar (Imamura *et al.* 2018; Psomadakis *et al.* 2020) and Thailand (this study), Andaman Sea, Indian Ocean.

COMPARISONS

Although Imamura *et al.* (2018) compared *Bembras leslieknappi* and *B. andamanensis* with five congeners (*Bembras adenensis* Imamura and Knapp, 1997, *Bembras japonica* Cuvier in Cuvier and Valenciennes, 1829, *Bembras longipinnis* Imamura and Knapp, 1998, *Bembras macrolepis* Imamura in Imamura and Knapp, 1998 and *Bembras megacephala* Imamura and Knapp, 1998), the comparison of *B. leslieknappi* with the latter is repeated since the former is here redefined and its taxonomic characters revised.

Imamura *et al.* (2018) observed that anal-fin ray numbers were relatively stable in species of *Bembras*; usually 14 in *B. japonica* (33 of 35 specimens, 94.3%) and *B. longipinnis* (12 of 13, 92.3%); usually 15 in *B. macrolepis* (16 of 17, 94.1%); and always 15 in *B. megacephala* (13 of 13). Therefore, that character is comparatively less stable in *B. leslieknappi* (often 14; 7 of 10, 70.0%) than in the former three species (Table 1). Nevertheless, the number of anal-fin rays can be used to help distinguish *B. leslieknappi* from some other species of *Bembras* (see following key).

Bembras leslieknappi is most similar to *B. megacephala*, both species having higher numbers of pectoral-fin rays, upper limb gill rakers of the first arch and forward slanting body scale rows above the lateral line, a longer head and snout, and smaller orbit [pectoral-fin rays 20 or 21 and 19 or 20 (usually 20); upper limb gill rakers of first arch 2–4 (usually 3) and 2–4 (usually 3 or 4); body scale rows 74–82 and 77–84; head lengths 39.2–42.1 and 38.2–41.2% SL; snout lengths 12.9–14.3 and 12.9–14.0% SL; and orbit diameters 9.8–11.4 and 9.7–11.1% SL in *B. leslieknappi* and *B. megacephala,* respectively] (Figs. 4–6; Table 1). However, *B. leslieknappi* is easily separable from the latter in having a broad blackish band on the caudal fin (vs. several narrow irregular dark bands). *Bembras leslieknappi* can be separated from *B. adenensis, B. japonica, B. longipinnis* and *B. macrolepis* by the greater head and snout lengths (head lengths 38.4–42.0 vs 34.1–37.6, 36.2–38.3 and 35.1–38.5% SL, and snout lengths 12.1–12.5 vs 11.2–13.3, 11.5–12.4 and 11.2–12.8% SL, respectively) (Figs. 4–5). *Bembras leslieknappi* also differs from *B. adenensis* in having a smaller orbit (orbit diameter 9.8–11.4 vs 11.8–13.2% SL in *B. adenensis*; Figs. 5–6), from *B. japonica* and *B. longipinnis* in having higher

numbers of pectoral-fin rays and upper limb gill rakers, and a broad blackish band on the caudal fin [vs. pectoral-fin rays 16–18, usually 17 in *B. japonica* and 17–19, usually 18 in *B. longipinnis*, and upper limb gill rakers 1 or 2 and a large dark blotch on the caudal fin in both species) (Table 1), and from *B. macrolepis* in having a larger number of forward slanting body scale rows above the lateral line (vs. 55–62 in *B. macrolepis*). Selected characters which distinguish *B. leslieknappi* from other congeners are summarized in Table 3.

KEY TO KNOWN SPECIES OF *Bembras*

1a. Caudal fin with several irregular dark narrow bands or a large intense dark blotch on lower lobe.....2
1b. Caudal fin with a broad dark band posteriorly...4
2a. Anal-fin rays 15; upper limb gill rakers of first arch usually 3 or 4 (northern and northwestern Australia and Indonesia).....*B. megacephala*
2b. Anal-fin rays usually 14; upper limb gill rakers of first arch 1 or 2.....3
3a. Pectoral fin usually with 17 rays, shorter than caudal fin (southern Japan to South China Sea).....*B. japonica*
3b. Pectoral fin usually with 18 rays, longer than caudal fin (northern and northwestern Australia).....*B. longipinnis*
4a. Forward slanting body scale rows above lateral line 62 or fewer (eastern Australia)...*B. macrolepis*
4b. Forward slanting body scale rows above lateral line 70 or more …….....5
5a. Snout relatively short, length 12.1–12.5% SL; orbit relatively large, diameter 11.8–13.2 % SL (Gulf of Aden).....*B. adenensis*
5b. Snout relatively long, length 12.9–14.3% SL; orbit relatively small, diameter 9.8–11.4% SL (Andaman Sea)…….....*B. leslieknappi*

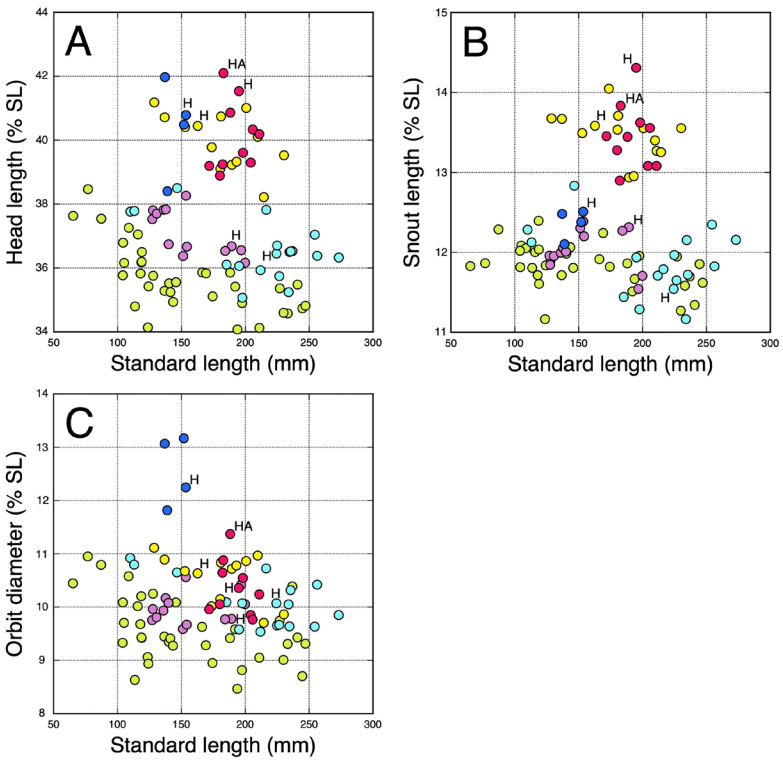

Figure 4. Comparisons of three body proportions (% SL) with standard length (mm) in six species of *Bembras.* A, head length; B, snout length; C, orbit diameter. Red, *B. leslieknappi*; blue, *B. adenensis*; green, *B. japonica*; sky blue, *B. macrolepis*; yellow, *B. megacephala*; violet, *B. longipinnis*. H indicates holotypes. HA indicates holotype of *B. andamanensis*, a junior synonym of *B. leslieknappi*.

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