A new species of deepwater flathead, *Bembras adenensis* (Scorpaeniformes: Bembridae) from the western Indian Ocean

Hisashi Imamura¹ & Leslie W. Knapp²

¹Hachinohe Branch, Tohoku National Fisheries Research Institute, 25-259 Same, Hachinohe, Aomori 031, Japan

²Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington D.C 20560, USA (e-mail: knapp.leslie@si.edu)

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Abstract A new bembrid, *Bembras adenensis*, is described on the basis of specimens collected from the Gulf of Aden, western Indian Ocean. This species is easily distinguished from *B. japonica*, the only known congener of the genus, by the following combination of characters: larger orbital diameter, longer head length, pectoral-fin with a small black blotch near tip of upper rays, 3 gill rakers on upper gill arch, 19 pectoral-fin rays, and 15 anal-fin rays (vs. smaller orbital diameter, shorter head length, pectoral-fin with several small spots forming irregular bands, 2 gill rakers on upper gill arch, usually 17 pectoral-fin rays, and 14 anal-fin rays in *B. japonica*).

Key words. - *Bembras adenensis* sp. nov.; Gulf of Aden; *B. japonica*.

The bembrid (sensu Nelson, 1994) genus *Bembras*, established by Cuvier (1829) with *B. japonicus* as the type species, is characterized by head only slightly depressed and armed with spines, body long and slender, upper jaw projecting beyond lower with mouth closed, and anal fin without spines. Since Cuvier's original description, *B. japonica* has been reported previously from northern Japan to the South China Sea, the Gulf of Aden, southern Indonesia, and Australia (Jordan and Richardson, 1908; Matsubara, 1955; Matsubara and Ochiai, 1955; Chu et al., 1962; Knapp, 1979; Gloerfelt-Tarp and Kailola, 1984; Ochiai, 1984; Sainsbury et al., 1985; Shao and Chen, 1987; Paxton et al., 1989; Nakabo, 1993). Knapp (1979) described *Bembras japonicus* based on four specimens collected from the Gulf of Aden, by the R/V *Meteor* during the Meteor - expedition to the western Indian Ocean in December 1964. Reexamination of these specimens deposited in Zoologisches Institut und Zoologis-

ches Museum (ZMH) revealed that they represent an undescribed species and that they differ from *B. japonica* in having a larger orbital diameter, a longer head, a pectoral-fin with a small black blotch near tip of upper rays, 3 gill rakers on upper gill arch, 19 pectoral-fin rays, and 15 anal-fin rays. The new species of *Bembras* that we describe in detail here is based on these specimens.

Materials and Methods

Counts and measurements were made according to Hubbs and Lagler (1958) except body depth and width were measured at origin of the second dorsal fin. Specimen lengths were expressed as standard length (SL). Measurements were made with calipers to the nearest 0.1 mm. Vertebral counts were taken from radiographs. Names of head spines follow Knapp (1986). In

Fig. 1. Lateral view of *Bembras adenensis* sr. nov., holotype, ZMH 5291, 154mm SL, Gulf of Aden, western Indian Ocean.

Fig. 2. Dorsal view of head of *Bembras adenensis* sr. nov., holotype, ZMH 5291, 154mm SL, Gulf of Aden, western Indian Ocean.

Fig. 3. Lateral view of scales on midbody (*below* 9th dorsal spine to 3rd soft ray) on left side of *Bembras adenensis* sr. nov., holotype, ZMH 5291 154 mm SL, Gulf of Aden, western Indian Ocean.

stitutional abbreviations follow Leviton et, (1985).

***Bembras adenensis* sp. novo**
(Figs. 1-3)

Bembras japonicus (non Cuvier, 1829): Knapp, 1979: fig. 526 (Gulf of Aden, western Indian Ocean).

Holotype. ZMH 5291, 154 mm SL, Gulf of Aden, western Indian Ocean (12°12'N, 43°36'E), trawled by R/V *Meteor*, 225 m depth, 14 Dec. 1964 (figured in Knapp, 1979).

Paratypes. ZMH 8810 (formerly ZMH 5291), 2 speci-mens, 137-139mm SL, collected with holotype; USNM 338873 (formerly ZMH 5291), 1 specimen, 152mm, SL, collected with holotype.

Diagnosis. A species of *Bembras* with large

orbital diameter (30.4-32.5% of head length [HL]) and head (38.4-42.0% of SL), small black blotch near tip of upper rays of pectoral fin, and a high number of gill rakers on upper gill arch (3), pectoral-fin rays (19) and anal-fin rays (15).

Description. Data for the holotype are presented first, followed by paratype data in parentheses: dorsal-fin rays XI-I, 1 1 (XI-I, 11); anal-fin rays 15 (15); pectoral-fin rays 2 (upper, unbranched)+ 10 (middle, branched)+7 (lower, unbranched) = 19 (2+9-10+7-8= 19); pelvic-fin rays I, 5 (I, 5); branched caudal-fin rays 8 (upper)+6 (lower) (8+6); vertebrae 10+ 17=27 (10+17=27); gill rakers 3+11=14 (3+10 11 = 13-14); scales in lateral line 54, anterior 4 scales with a distinct spine (54-55, 5-6 with spine); scale rows slanting backward and downward above lateral line 54 (54-56). Proportions as % SL: HL 40.8 (38.4-42.0); body depth 12.0 (12.0-13.4); body width 9.8 (8.8-10.4); predorsal length 37.1 (35.5-40.5); length of first dorsal-fin base 25.6 (23.5-25.6); length of second dorsal-fin base 25.9 (24.9-26.1); length of anal-fin base 29.1 (28.8-30.0); length of caudal peduncle 13.6 (12.6-14.4); depth of caudal peduncle 5.3 (5.5-5.8); snout length 12.5 (12.1-12.5); orbital diameter 12.4 (11.8-13.2); upper-jaw length 15.1 (14.0-15.3); lower-jaw length 19.5 (18.5-19.9); interorbital width 2.3 (2.2-2.4); pectoral-fin length 20.2 (20.8-21.5); pelvic-fin length 17.7 (17.7-18.8); caudal-fin length 19.0 (19.9-20.9); length of first spine of first dorsal-fin 7.6 (7.7-8.8); length of second spine of first dorsal-fin 10.8 (11.5-11.7); length of first spine of second dorsal-fin 9.1 (9.6-9.9); length of first ray of second dorsal-fin (12.5-12.8); length of first anal-fin ray 6.0 (5.6-6.2). Proportions as % HL: snout length 30.7 (29.7-31.5); orbital diameter 30.4 (30.4-32.5); upper-jaw length 37.1 (34.8-37.9); lower-jaw length 47.9 (46.2-49.3); interorbital width 5.6 (5.5-6.4).

Body long and slender, depth 8.3 (7.5-8.3), width 10.2 (9.6-11.3) in SL; mostly covered with ctenoid scales, some cycloid scales on under surface. Head large, posterior margin opercle reaching beyond below to fourth spine of first dorsal fin, length 2.5 (2.4-2.6) in SL; posterior dorsal surface, opercle, postorbital and

cheek regions scaly. Snout slender, as long as orbital diameter, 3.3 in HL (as long as, or slightly shorter than orbital diameter, 3.2-3.4 in HL). Iris lappet absent. Interorbit narrow, less than one fifth orbit diameter, 17.9 (15.7-18.1) in HL. Top and sides of head armed with spines (Figs. 1 and 2). Posttemporal with strong spine posteriorly, bearing small spine laterally. Opercle armed with two strong spines, with a distinct ridge lacking serrations. Preopercle armed with five spines, uppermost longest, all without supplementary spines. Subopercle with a distinct spine posteroventrally. Parietal ridge with one strong spine. Lateral surface of head with a suborbital ridge armed with five spines. Lachrymal with one forward and two backward spines. Weak nasal spine present. Preorbital spine absent. A preocular spine in front of eye. Supraorbital ridge with rough serration comprised of nine (right side) and twelve (left) spines. A spine present between posteriormost supraorbital and parietal spines on left side, but absent on left. Postocular spine present. Pterotic ridge armed with one (right side) and two (left) spines. Interopercular flap absent. Maxilla not reaching middle of eye, length 2.7 (2.6-2.9) in HL. Anterior tip of upper jaw slightly projecting beyond that of lower jaw when mouth closed. Small canine teeth in bands on jaws and palatine, in a V-shaped patch on prevomer. Body scales small, number of oblique scale rows slanting downward and forward above lateral line more than that of lateral line scales; number of oblique scale rows slanting downward and backward above it about equal to latter (Fig. 3). Each pored scales in lateral line with a exterior opening posteroventrally (Fig. 3). First dorsal-fin originating well behind posterior margin of opercle. First and second dorsal fins separated narrowly. Origin of pectoral-fin posterior to that of pelvic-fin. Pectoral-fin rounded posteriorly, length 2.0 (1.8-2.0) in HL. Pelvic fin short, not reaching to anus, its length 2.3 (2.2-2.3) in HL. Caudal fin slightly concave posteriorly, length 2.2 (1.9-2.1) in HL.

Color in ethanol. - According to Knapp (1979), dorsum light brown with a few small darker spots; both dorsal fins with a series of small brown spots; caudal fin with a broad submarginal black band; pectoral-fin with a small

Fig. 4. Relationship between orbital diameters of *Bembras adenensis* sr. novo (@: holotype; B: paratype) and *B. japonica* (O).

black blotch near tip of upper rays; and anal- and pelvic-fins pale. The color patterns now are mostly faded. Only a few spots on the dorsal fins, a small black blotch on pectoral-fin and the large black patch on caudal-fin have persisted (Fig. 1).

Distribution. Known only from the Gulf of Aden, the western Indian Ocean, at a depth of 225m.

Etymology. The name of *adenensis* is derived from the type locality, the Gulf of Aden.

Remarks. The new species, *Bembras adenensis*, can be easily distinguished from *B. japonica*, its only congener, in having larger orbital diameter (as long as, or longer than snout, 30.4–32.5% of HL in *B. adenensis* vS. shorter than snout, 24.8–28.7% in *B. japonica*) (Fig. 4), pectoral-fin with a small black blotch near tip of upper rays (vs. with several small spots forming irregular bands), 3 gill rakers on upper gill arch (vs. 2), and 19 pectoral-fin rays (vs. 16–18, usually 17, 16 in left side of one specimen, and 18

Fig. 5. Relationship between head lengths of *Bembras adenensis* sr. novo and *B. japonica*. Symbols as in

in right side and left side of one specimen). In addition, at comparative sizes, *B. adenensis* has slightly larger head than *B. japonica* (38.4–42.0% in SL vS. 32.7–38.7%) (Fig. 5). The number of anal-fin rays was helpful to distinguish *B. adenensis* from *B. japonica* (15 vS. 13–15, usually 14, 13 and 15 in only one specimen each examined in this study), although minor intraspecific variation occurred in *B. japonica*.

The authors are studying three probable new species of *Bembras* from southern Indonesia and Australia. They had been reported as *B. japonicus* by Gloerfelt-Tarp and Kailola (1984), Sainsbury et al. (1985) and Paxton et al. (1989). In addition, *B. japonica* is not distributed in the Gulf of Aden. Therefore, distribution of *B. japonica* is restricted to the western Pacific, from southern Japan to the South China Sea. A discussion of *Bembras laevis* Nystrom, 1887, which was placed in the genus *Bembradon* by Jordan and Richardson (1908), is not included here as that species does not appear to be a bembroid. It is certainly quite distinct from *Bembras japonica* and, with no spines and ridges on head, lower jaw projecting considerably be-

yond upper, VI-14 dorsal-fin rays, 23 pectoralfin rays and 40 lateral line scales (Nystrom, 1887), may belong in the percophid *Bembrops* as pointed out by Nakabo (1993).

Comparative materials. *Bembras japonica*. 35 specimens: CAS 58562, 2 specimens, 120-124mm SL, South China Sea (20°15'N, 112°30'E), 82m, 20 July 1958, coll. R. L. Bolin; CAS 20774, 2 specimens, 75-105 mm SL, For-mosa Strait (27°30'N, 121°30'E), 80-100m, 17 June 1971, coll. F. B. Steiner; HUMZ 33704, 1 specimen, 197 mm SL, East China Sea (30°09'-31°30'N, 124°13'-127°53'E), 14 July 1968; HUMZ 35465, 1 specimen, 233 mm SL, fish market, Mimase, Kouchi, Japan, 17 Nov. 1974, coll. K. Matsuura; HUMZ 38991, 39009, 39747 and 39760, 4 specimens, 141-245mm SL, fish market, Mimase, Kouchi, Japan, 2 Mar. 1974, coll. K. Matsuura; HUMZ 41017, 1 specimen, 194 mm SL, fish market, Hamada, Kouchi, Japan, 6 Mar. 1975, coll. M. Toyoshima; HUMZ 47634, 1 specimen, 174mm SL, fish market, Mimase, Kouchi, Japan, 12 Oct. 1972, coll. T. Shimizu; HUMZ 48188, specimen, 105 mm SL, fish market, Mimase, Kouchi, Japan, 6 Oct. 1972, coll. T. Shimizu; HUMZ 49406-49408 and 9410, 4 specimens, 146-237mm SL, fish market, Mimase, Kouchi, Japan, 15 Nov. 1975, coll. T. Shimizu and T. Kanayama; HUMZ 75359, 1 specimen, 227 mm SL, fish market, Mimase, Kouchi, Japan, 1 Mar. 1978, coll. E. Yamamoto; HUMZ 79535, 1 specimen, 192 mm SL, fish market, Mimase, Kouchi, Japan, 1 Dec. 1978, coll. M. Yabe; HUMZ 90521, 1 specimen, 137mm SL, East China Sea (31°00'N, 127°28'E), 122m, 8 Apr. 1981; HUMZ 110622-110623, 2 specimens, 87-104mm SL, off Saga, Hata, Kouchi, Japan, 3 Aug. 1986, coll. K. Amaoka and K.O. Nato; HUMZ 35778, 35869, 36191, 36742, 36752, 37307, 37327 and 37494, 65-188mm SL, fish market, Mimase, Kouchi, Japan (?), date unknown, coll. K. Amaoka; UMMZ 183212, 3 specimens, 208-249mm SL, Hata fish market, Toudshima Strait, Japan, 13 July 1929, coll. C. L. Hubbs and M. Oshima; UMMZ 183211, 1 specimen, 240 mm SL, East China Sea (at approx. 28°N, 123°E), China, date unknown, coll. C. L. Hubbs; USNM 342025, 1 specimen, 126 mm SL, South China Sea (15°40'N, 109°24'E), 110-198m, 27 Feb. 1960, coll. R. L. Bolin.

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