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## Two new species of the batfish genus *Malthopsis* (Lophiiformes: Ogcocephalidae) from the Western Indian Ocean

HSUAN-CHING HO<sup>1,2</sup>

<sup>1</sup>National Museum of Marine Biology & Aquarium, no. 2, Houwan Rd., Checheng, Pingtung, Taiwan

<sup>2</sup>Institute of Marine Biodiversity and Evolutionary Biology, National Dong Hwa University; no. 2, Houwan Rd., Checheng, Pingtung, Taiwan. E-mail: hohc@nmmba.gov.tw

### Abstract

Two new species of the triangular batfishes, genus *Malthopsis*, are described from the western Indian Ocean. Both belong to a species group with minute prickles on the ventral surface. *Malthopsis bradburyae* n. sp. differs from its congeners by having the body covered by blunt, flat bucklers; subopercular buckler dull, without well-developed spines, its ventral surface covered by minute prickles and a few large bucklers anterior to the pelvic-fin base; rostrum moderately long, directed forward rather than upward; eye relatively small. *Malthopsis austraficana* n. sp. differs from its congeners by having a long forward and horizontally directed rostrum; subopercular bucklers dull, without well-developed spines; ventral surface evenly covered by minute prickles and small bucklers; small black patches on dorsal surface; and a strong tail. Comments and a key to the Western Indian Ocean species of *Malthopsis* are provided.

**Key words:** Teleostei, taxonomy, new species, Western Indian Ocean

### Introduction

The batfish genus *Malthopsis* is characterized by having a remarkably triangular body disk; a pointed rostral spine; body scales in the form of bucklers; the subopercle with a large triangular buckler, with or without well-developed spines. The genus comprises 11 valid species, including *M. lutea* Alcock 1891 (type species), *M. mitrigeria* Gilbert & Cramer 1897, *M. tiarella* Jordan 1902, *M. jordani* Gilbert 1905, *M. annulifera* Tanaka 1908, *M. kobayashii* Tanaka 1916, *M. gnoma* Bradbury 1998, *M. retifera* Ho Prokofiev & Shao 2009, *M. gigas* Ho & Shao 2010, *M. asperata* Ho, Roberts & Shao 2013, and *M. parva* Ho, Roberts & Shao 2013.

Bradbury (*in* Smith & Heemstra 1986) recorded three species, *M. lutea*, *M. mitrigeria* and *M. tiarella*, from the Western Indian Ocean (WIO). Ho *et al.* (2009) described *M. retifera* from Somalia. Ho & Shao (2010a) described *M. gigas* from the Indo-west Pacific Ocean, including the WIO. Lloyd (1909) and Bradbury (2003) mentioned that the type series of *M. lutea* comprised more than one species and that at least some specimens were misidentifications of *M. mitrigeria*. Ho and Shao (2010b) examined two syntypes of *M. lutea* in the BMNH, designated as lectotype the specimen that possibly was illustrated, and provided diagnostic characters for the species. A generic revision is in preparation by this author.

During the International Indian Ocean Expedition, the vessel *ANTON BRUUN* collected nine specimens of *Malthopsis* from off Tanzania at a depth of 100 m in 1964. The specimens have very unique blunt, flat bucklers and other distinctive characters suggesting that they represented an undescribed species. In addition, specimens previously identified as *M. tiarella* by Bradbury (*in* Smith & Heemstra 1986), plus many recently collected specimens, are recognized as another, undescribed species. Both species are described herein.

## Methods and material

Standard length (SL) is used throughout. Methods for taking measurements and counts follow Ho *et al.* (2009). Institution abbreviations follow Fricke & Eschmeyer (2013, online version). The ratio of orbital diameter to rostral length is shown as OD/RL and that of orbital diameter to interorbital width is shown as OD/IO.

## Taxonomy

### *Malthopsis bradburyae* n. sp.

Common name: Bradbury's triangular batfish

Figs. 1A–C, 2A–E; Table 1

**Holotype.** CAS 227226 (72.4 mm SL), R/V *Anton Bruun*, cruise 9, station 22, 6°51'S, 39°54'E, Tanzania, Western Indian Ocean, 100 m, coll. A. H. Fehlmann, 19 Nov. 1964.

**Paratypes.** CAS 39631 (7 specimens, 35.6–70.9 mm SL) and NMMB-P17824 (1, 59.0), collected with the holotype.

**Diagnosis.** A species of *Malthopsis* distinguished by the following combination of characters: body covered by blunt, smooth bucklers and numerous prickles; rostrum moderately long (mean 7.7% SL) and stout, with a broad base, directed forward horizontally; three irregular rows of bucklers on top of head; ventral surface of disk densely covered by prickles and scattered small bucklers, with some slightly larger bucklers on breast; subopercular buckler blunt, without enlarged spines; orbit small (mean 12.4% SL); interorbital space broad (mean 8.5% SL), forming a deep groove; OD/RL = 1.3–2.2; OD/IO = 1.3–1.7; and anal fin reaches or nearly to the caudal-fin base when fully depressed.

**Description.** Morphometric and meristic data are provided in Table 1. Values are given for the holotype, followed by the range and/or mean values of all types in parentheses.

Body depressed, disk markedly triangular in dorsal view, head elevated above rest of disk; tail base broad; caudal peduncle thick and broad, semi-cylindrical, flattened ventrally and tapering posteriorly; rostrum thick and pointed, directed forward horizontally (Figs. 2A–B), with a broad base, distinctly overhanging illicial cavity and mouth; rostrum moderately long, 6.2% SL (6.2–9.4% SL, mean 7.7% SL), shorter than orbital diameter; orbit small, 13.5% SL (11.1–13.5% SL, mean 12.4% SL), eyes directed dorsolaterally; no pupillary operculum; interorbital space wide 8.1% SL (7.6–9.8% SL, mean 8.5% SL), forming a deep groove (Fig. 2A); frontal ridges strongly convex, elevated above the rostral base (Fig. 2B).

Illicial cavity large, triangular, higher than wide; esca a single bulb, bearing 2 small cirri on dorsal margin; mouth small, terminal; small villiform teeth on jaws forming narrow bands, those on fifth ceratobranchial forming 2 large, elongated patches close together; teeth on vomer and palatines in quadrangular patch.

Dorsal disk squamation well developed, consisting mainly of blunt, medium-sized, smoothly conical bucklers (Fig. 2C); interspaces between large bucklers covered by small bucklers and prickles; bucklers on frontal ridge small and blunt, 2 enlarged preorbital bucklers which overlap front border of orbit, upper buckler larger, fused to base of rostrum; usually 4 (4–5) smaller, subequal-sized blunt bucklers on supraorbit (Fig. 2B), not well-elevated from the margin; interorbital space densely covered by small bucklers; supraorbital membrane covered with several irregular rows of small bucklers on upper margin of orbit, naked elsewhere. Dorsal surface of head covered by about 3 irregular rows of 3 or 4 slightly larger bucklers on each row, with many smaller ones adjacent (Fig. 2A), followed by two irregular median rows of large bucklers predorsally, ending before dorsal-fin origin as a rectangular cluster of 5 large bucklers (Fig. 2C); shoulder with small scattered naked areas, extending to gill openings and base of pectoral elbows.

Disk margin with cluster of suborbital bucklers anteriorly, forming 3 well-defined rows posteriorly; uppermost row of bucklers elevated, broad based; middle and lower rows of bucklers depressed and associated with lateral line, all blunt; bucklers on middle row directed laterally, lower row directed ventrally and inferior; neuromasts well defined. Subopercular buckler enlarged, extended slightly beyond disk margin laterally; terminating on uppermost and middle rows of disk-margin bucklers; small spinelets (variable in size and coverage) at tip of subopercular buckler; two well-defined, blunt, post-subopercular bucklers (Fig. 2D). Pectoral-fin base at rear of disk; covered dorsally with well-developed bucklers; 4 (3–5) fine bucklers over anterior fin ray, naked elsewhere.

**TABLE 1.** Morphometric and meristic data of two new *Malthopsis* species described in present study. Pectoral-fin rays are counted on both sides.

	<i>M. bradburyae</i> n. sp.			<i>M. australicana</i> n. sp.		
	Holotype	All types		Holotype	All types	
SL	72.4	35.6–72.4 (n = 9)		70.0	45.2–84.0 (n = 17)	
% SL		Mean (Range)	SD		Mean (Range)	SD
Head length	27.2	27.8 (26.0–29.5)	1.1	27.4	27.1 (24.8–30.3)	1.3
Head width	21.5	22.5 (20.8–25.0)	1.2	22.9	23.0 (20.6–25.8)	1.4
Head depth	22.8	23.1 (21.2–25.9)	1.5	21.4	22.2 (19.8–24.0)	1.4
Orbital width	13.5	12.4 (11.2–13.5)	0.8	12.1	12.5 (10.7–14.5)	0.9
Interorbital width	8.1	8.5 (7.6–9.8)	0.7	9.4	8.4 (7.4–9.7)	0.7
Rostral length	6.2	7.7 (6.2–9.4)	1.1	9.4	8.3 (6.0–10.7)	1.7
Predorsal length	66.2	67.5 (65.3–69.8)	1.8	64.3	12.9 (10.7–14.5)	1.0
Preanus length	53.0	55.3 (53.0–58.2)	1.9	54.3	66.5 (63.8–71.4)	2.0
Preanal length	79.8	81.0 (77.5–83.0)	1.8	82.4	54.8 (52.6–57.5)	1.5
Disk margin length	43.0	44.1 (40.1–47.2)	2.7	44.9	80.5 (78.1–82.9)	1.3
Mouth width	14.4	14.4 (13.1–15.9)	0.9	12.9	44.5 (39.6–48.1)	2.7
Dorsal-fin length	18.9	18.6 (16.8–20.2)	1.2	17.4	22.3 (19.6–24.8)	1.4
Anal-fin length	15.1	17.7 (15.1–20.5)	1.9	14.3	17.4 (14.3–19.3)	1.4
Pectoral-fin length	22.0	22.5 (20.9–24.2)	1.1	22.6	17.7 (14.3–20.3)	1.7
Caudal-fin length	25.8	26.1 (24.0–29.2)	1.9	25.7	25.2 (23.1–27.3)	1.3
Meristics		Value (Frequency)			Value (Frequency)	
Dorsal-fin rays	5	5 (7), 6 (2)		5	5 (12), 6 (5)	
Pectoral-fin rays	12/13	11 (2), 12 (15), 13 (1)		13/13	12 (30), 13 (4)	
Anal-fin rays	3	3 (3), 4 (5)		4	3(2), 4 (15)	

Dorsal surface of tail strongly armoured, entirely covered with large blunt bucklers; a row of 4–5 large dorsolateral bucklers, extending from last pair of predorsal bucklers below dorsal fin; a longer, highly irregular, semi-oblique row of slightly smaller bucklers extending along lateral margin of peduncle to caudal-fin base; a single irregular row of flattened bucklers on dorsal midline before caudal fin; dorsal tail rows uniting to form a single, slightly elevated buckler at caudal-fin base. Lateral margin of tail with two rows of small, low bucklers associated with lateral line, similar in appearance to bucklers of disk margin.

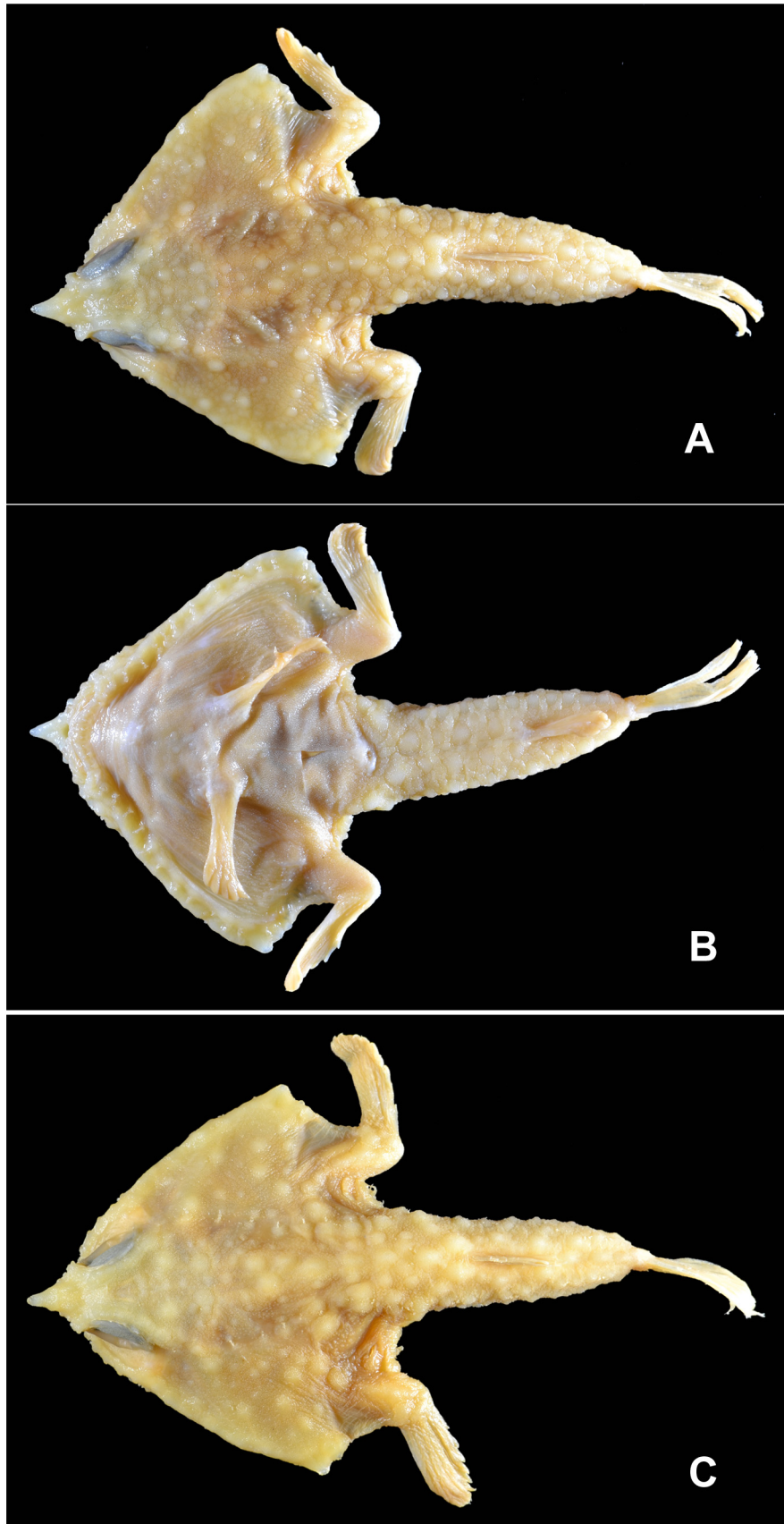
Ventral surface of disk predominantly covered with small, flat bucklers; no apical spines on these bucklers; belly densely covered with prickles and scattered small bucklers, some slightly larger on breast than posteriorly (Fig. 2E); rear margin of anus surrounded by 5 (4–5) blunt bucklers; large naked area outside gill chamber; ventral surface of tail with a single regular row of blunt bucklers on each side, coalescing to bulbous buckler at caudal-fin base.

Fins generally naked, without bucklers, sometimes with small bucklers on rays near caudal-fin base; interradials of pectoral fins thin, transparent; dermal cirri short, thin, flap-like, present on disk margin and lateral sides of tail and associated with lateral-line neuromasts. Anal fin reaches to or slightly short of caudal-fin base when fully laid back.

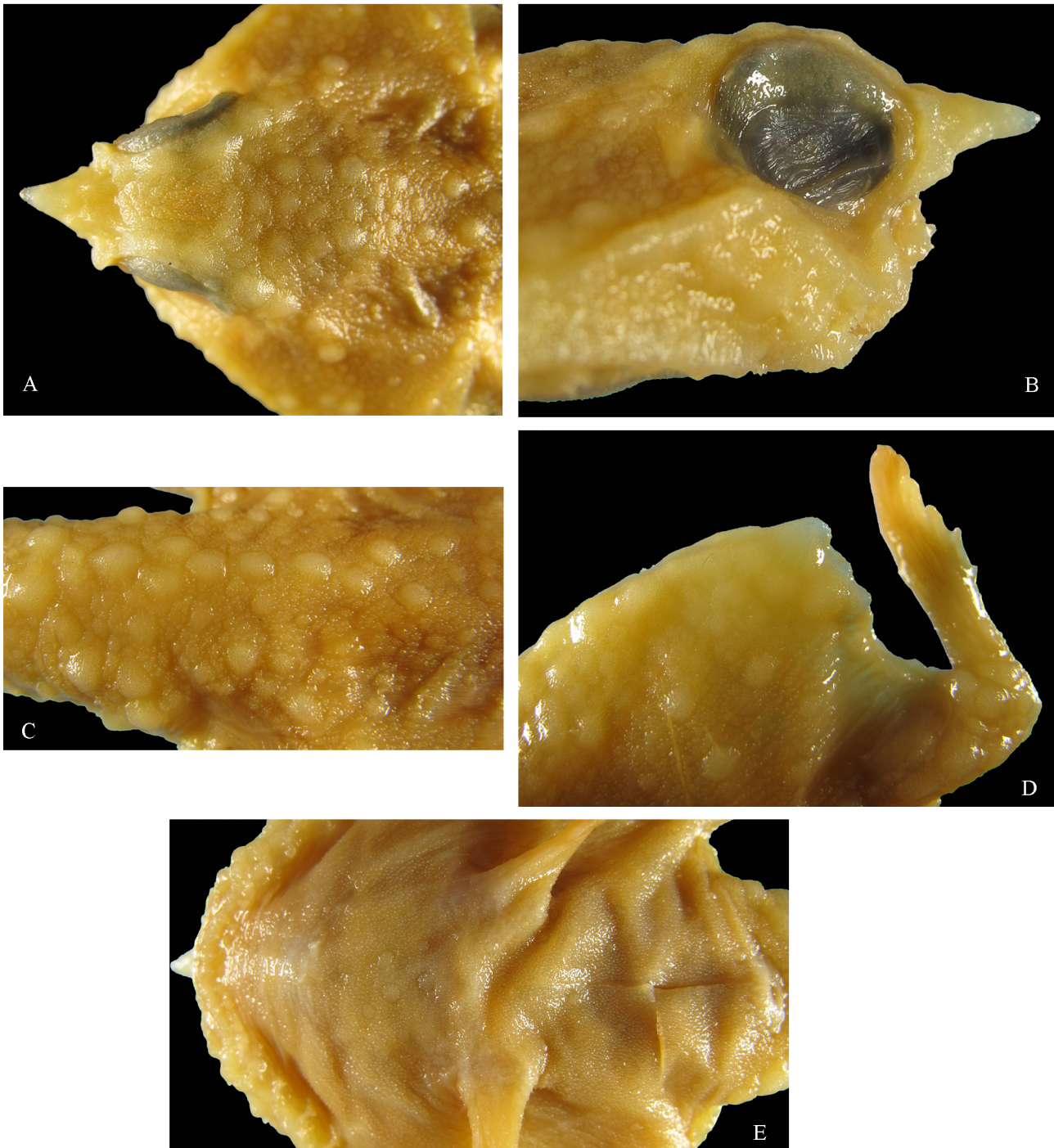
**Coloration.** Fresh color unknown. Preserved specimens (Figs. 1A, C) uniformly creamy yellowish. Holotype and some paratypes with very fine brown reticulations on dorsal surface.

**Size.** A medium-sized species. The largest adult is 72.4 mm SL.

**Distribution.** Known only from the type series taken off Tanzania at a depth 100 m.



**FIGURE 1.** *Malthopsis bradburyae* n. sp. A. Holotype, CAS 227226, 72.4 mm SL, dorsal view, preserved. B. holotype, ventral view, preserved. C. Paratype, CAS 39631, 1 of 7, 70.9 mm SL, dorsal view, preserved.



**FIGURE 2.** Close-up view of body portions of *Malthopsis bradburyae* n. sp., from the holotype. A. Dorsal view of head. B. Lateral view of head. C. Dorsal view of dorsal surface between dorsal fin and cranium. D. Dorsal view of right portion of disk. E. Ventral view of surface of central disk. Anterior to left in Figs. A, D, E. Anterior to right in Figs. B, C. Not to scale.

**Etymology.** The species is named after the late Dr. Margaret G. Bradbury, in recognition of her great contribution to our knowledge of batfishes, and her friendship.

**Remarks.** *Malthopsis bradburyae* n. sp. belongs to a species group with the ventral surface densely covered by minute prickles (e.g., *M. kobayashii*, *M. tiarella*, *M. asperata* and *M. gnoma*). It differs from *M. tiarella* by having 5–6 dorsal-fin rays (modally 5, vs. 6–7 in *M. tiarella*), bucklers on body surface blunt and smooth (vs. pointed and rough), and lacking brown bands on the caudal peduncle (vs. bands present on peduncle); from *M. kobayashii* in its rostral spine directed forward horizontally (vs. directed forward and upward), in having a relatively wide interorbital space (7.6–9.8% SL vs. 6.0–7.5% SL), and bucklers on body surface blunt and smooth

(vs. relatively pointed and rough); from *M. asperata* in having all bucklers blunt (vs. pyramid-like bucklers with spinelets); and from the western Atlantic species, *M. gnoma*, in lacking gill filaments on the fourth gill arch (vs. filaments on the fourth gill arch); and in the rostral spine directed forward horizontally (vs. upward and forward).

It is also similar to *M. annulifera* from the western Pacific in having the rostral spine directed forward horizontally and principal bucklers on the body are relatively flat and smooth. It can be distinguished from *M. annulifera* in having ventral surface covered by prickles (vs. no prickles); blunt subopercular bucklers without well-developed spines (vs. 1 well-developed spine directed forward), and lacking ring marks on the dorsal surface (vs. few to more than 20 rings present).

***Malthopsis australifera* n. sp.**

English name: Southern African triangular batfish

Figs. 3A–C, 4, 5A–E; Table 1

*Malthopsis lutea* (non Alcock, 1891): Smith 1961: 573.

*Malthopsis tiarella* (non Jordan, 1902): Bradbury 1986: 373.

**Holotype.** SAIAB 81896 (70.0 mm SL), 25°23'S, 34°29.3'E, off Mozambique, bottom trawl, 311–314 m, 6 Oct. 2007.

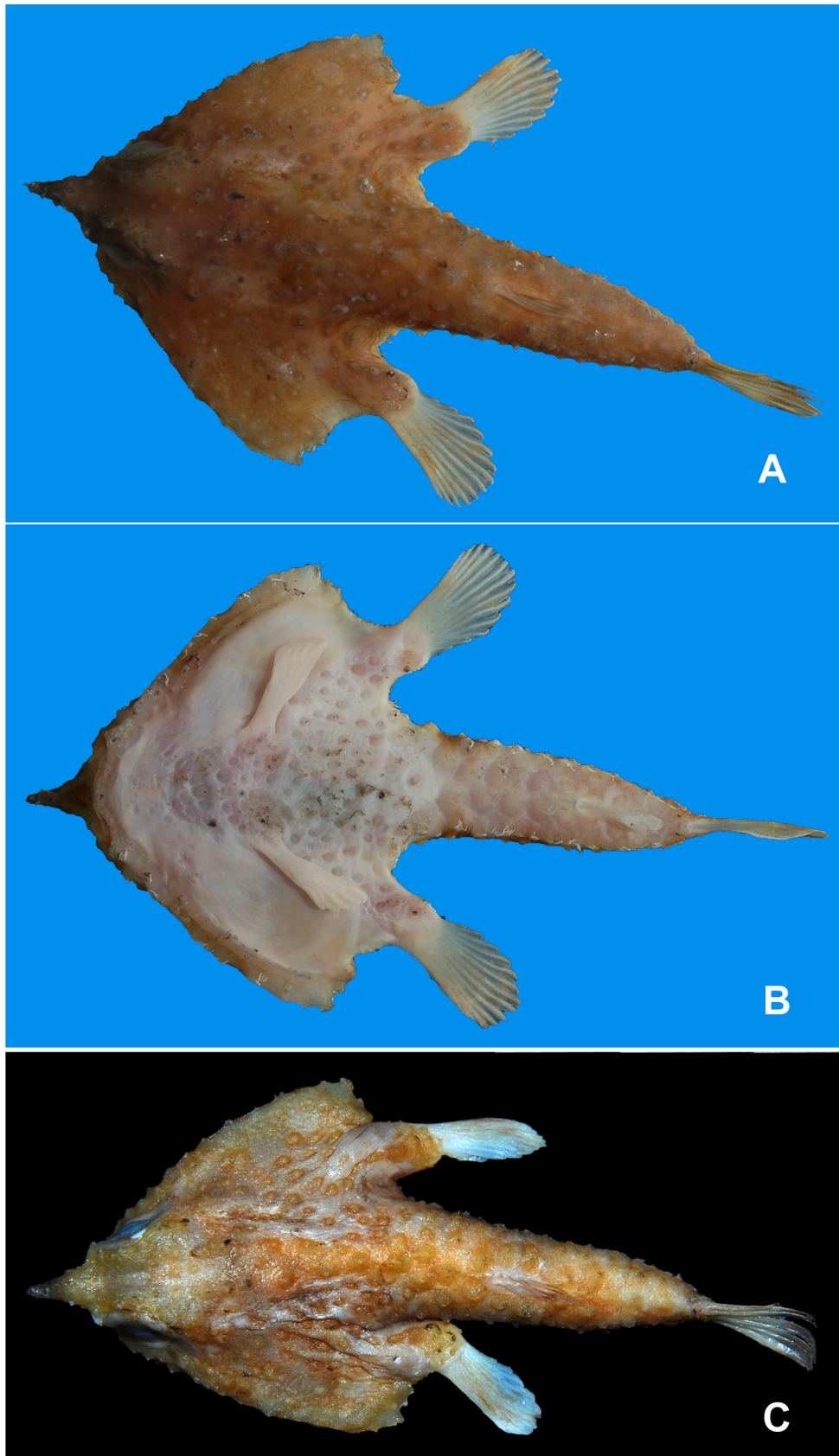
**Paratypes.** 16 specimens, 45.2–84.0 mm SL. MNHN 1986-10–11 (2 specimens, 64.8, 75.1 mm SL), N.o.vauban, 23°36'00"S, 43°31'05"E, Madagascar, 395–410 m, 26 Feb. 1973. MNHN 1986-0019 (1, 84.0), N.o.vauban, 12°43'01"S, 48°15'00"E, Madagascar, 348–360 m, 14 Jul. 1971. MNHN 1986-91 (1, 53.9), 12°30'00"S, 48°13'59"E, 410 m, 11 Oct. 1974. MNHN 1986-0124 (1, 65.6), 13°45'07"S, 47°38'02"E, 430–700 m, 28 Feb. 1975. SAIAB 13721 (1, 47.5), 31°59'S, 29°09'E, Coffee Bay lagoon, Eastern Cape, South Africa, 23 Aug. 1973. SAIAB 28477 (2, 45.2, 66.0), S of Maputo, Mozambique, Dec. 1987. SAIAB 48433 (1, 47.3), Port Alfred, Eastern Cape, South Africa, 28 Feb. 1995. SAIAB 81903 (2, 53.4–54.4), 25°5.5'S, 35°18.4'E, off Mozambique, 347–353 m, 7 Oct. 2007. SAIAB 186428 (1, 58.6), 29°10.49'S, 32°5.27'E, off Dokodweni, KwaZulu-Natal, South Africa, 248–251 m, 21 Mar. 2010. SAIAB 188875 (2, 56.0–58.0), northern Madagascar, 8 Aug. 2009. SAIAB 188811 (2, 63.8–67.0), 29°10.32'S, 32°5.37'E, Tugela Deep, KwaZulu-Natal, South Africa, 250 m, 18 Aug. 2010.

**Non-types.** 22 specimens, 31.5–70.0 mm SL. MNHN 1986-8 (1, 31.5), N.o. Vauban, 12°40'01"S, 48°18'00"E, Madagascar, 185–190 m, 1 Aug. 1973. MNHN 1986-22 (1, 53.5), N.o. Vauban, 12°52'05"S, 48°10'05"E, Madagascar, 400–410 m, 4 Mar. 1971. MNHN 1986-57 (1, 41.4), N.o. Vauban, 12°33'07"S, 48°17'02"E, Madagascar, 355–265 m, 18 Jan. 1972. MNHN 1986-58 (1, 55.7), N.o. Vauban, 22°21'07"S, 43°04'05"E, Madagascar, 450 m, 27 Nov. 1973. MNHN 1986-79–90 (12, 45.8–70.0), N.o. Vauban, 12°30'00"S, 48°13'59"E, Madagascar, 410 m, 11 Oct. 1974. MNHN 1986-92–93 (2, 48.3, 51.9), N.o. Vauban, 12°30'00"S, 48°13'59"E, Madagascar, 410 m, 11 Oct. 1974. MNHN 1986-0116 (1, 61.9), N.o. Vauban, 12°52'01"S, 48°10'05"E, Madagascar, 420–428 m, 4 Mar. 1971. MNHN 1988-1573 (1, 34.8), N.o. Vauban, 15°19'59"S, 46°11'02"E, Madagascar, 170–175 m, 19 Jan. 1975. SAIAB 4632 (1, 42.5), 29°51'S, 31°E, off Durban, KwaZulu-Natal, South Africa, no date. SAIAB 28266 (1, 40.0), 33°31'S, 27°06'E, Great Fish River mouth, Eastern Cape, South Africa, 27 Jan. 1988 [dried out].

**Diagnosis.** A species of *Malthopsis* distinguished by the following combination of characters: body covered by conical bucklers and numerous prickles; rostrum long (mean 8.3% SL) and stout, pointed, with a broad base, directed forward horizontally; 3 irregular rows of bucklers on top of head; ventral surface of disk densely covered by prickles and small flat bucklers, some slightly larger and denser bucklers on breast than on belly; subopercular buckler blunt, without well-developed spines; orbit small (mean 12.5% SL); both post-subopercular bucklers with small spinelets on the tips; interorbital space broad (mean 8.4% SL), forming a deep groove; OD/RL = 1.1–1.9; OD/IO = 1.3–1.7; anal fin reaches to or beyond the caudal-fin base when depressed.

**Description.** Body depressed, disk markedly triangular in dorsal view, cranium elevated above rest of disk; tail base narrow; caudal peduncle very strong and broad, semi-cylindrical, flattened ventrally and tapering posteriorly; rostrum pointed, strong, with a broad base, directed forward horizontally (Figs. 5A–B), distinctly overhanging illicial cavity and mouth; rostrum long, 9.4% SL (6.0–10.7% SL, mean 8.3% SL), much shorter than orbital diameter; orbit small, 12.1% SL (10.7–14.5% SL, mean 12.5% SL), directed dorsolaterally; no pupillary

operculum; interorbital space wide 9.4% SL (7.4–9.7% SL, mean 8.4% SL), forming a deep groove (Fig. 5A); frontal ridge slightly convex.



**FIGURE 3.** *Malthopsis australiana* n. sp., holotype, SAIAB 81896, 70.0 mm SL. A. Dorsal view, fresh condition. B. Ventral view, fresh condition. C. Dorsal view, preserved condition. A, B. Photo by P. C. Heemstra.



**FIGURE 4.** Paratypes of *Malthopsis australifricana* n. sp., SAIAB 188811, 2 specimens. Upper, 67.0 mm SL, with brownish patches on dorsal surface and rostral spine abnormally bifurcated. Lower, 63.8 mm SL, with many small dots on dorsal surface. Photo by A. D. Connell.

Illicial cavity small, oval, as high as wide; esca a single bulb, bearing 2 small cirri on dorsal margin; mouth small, terminal; small villiform teeth on jaws forming narrow bands, those on fifth ceratobranchial forming 2 large, elongated, adjacent patches; teeth on vomer and palatines in quadrangular patch.

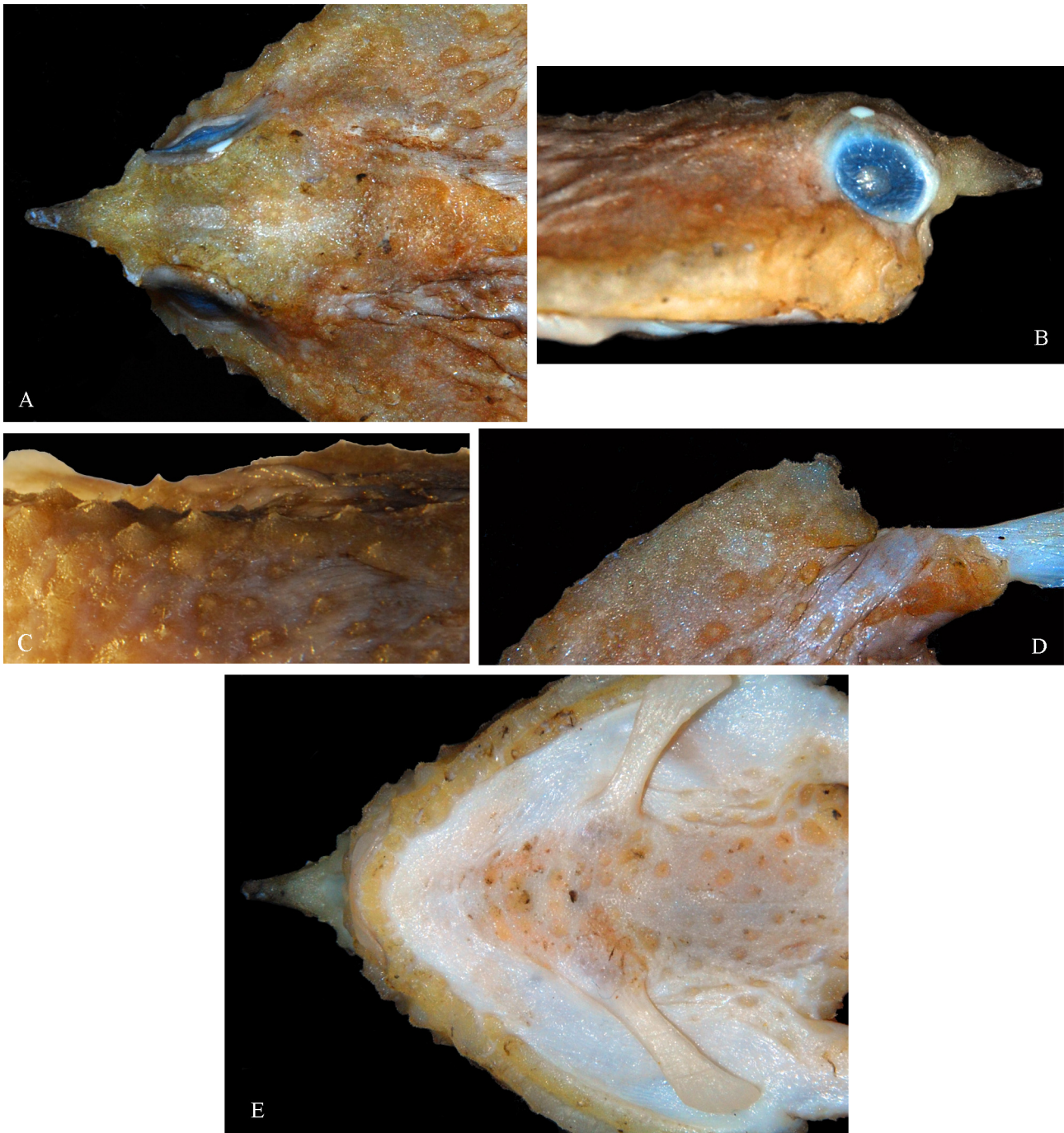
Squamation on dorsal disk well developed, consisting mainly of low, pointed, conical, variable-sized bucklers (Fig. 5C), interspaces between large bucklers covered by small bucklers and prickles; bucklers on frontal ridge small and blunt, two enlarged preorbital bucklers which overlap anterior border of orbit, upper buckler larger, fused to base of rostrum, with rostral spine forming a trident; usually 5 smaller, subequal-sized bucklers on supraorbit (Fig. 5B); interorbital space densely covered by small bucklers; supraorbital membrane covered with 2 (2–3) rows of small bucklers on upper margin of orbit, naked elsewhere. Dorsal surface of cranium covered by 3 (2–3) regular rows of bucklers, two outer rows with 3 (2–3) large bucklers on each, those on median row smaller, usually with a few smaller ones adjacent (Fig. 5A); shoulder with small naked areas, extending to gill openings and base of pectoral elbows; two irregular median rows of large bucklers predorsally, ending before dorsal-fin origin as a rectangular cluster of 5 large bucklers (Fig. 5C).

Disk margin with a cluster of suborbital bucklers anteriorly, forming three well-defined rows posteriorly; uppermost row of bucklers elevated, slightly pointed, broad based; middle and lower rows of bucklers depressed, associated with lateral line, apices elevated; on median row directed laterally, on lower row directed ventrally; neuromasts well defined. Subopercular buckler enlarged, extended slightly beyond disk margin laterally;



terminating on uppermost and middle rows of disk-margin bucklers; smaller spinelets (variable in size and coverage) at its tip (Fig. 5D); two well-defined, post-subopercular bucklers, each bearing small spinelets. Pectoral-fin base on rear part of disk; covered dorsally with well-developed conical bucklers; 4 (3–5) fine bucklers over anterior fin ray, naked elsewhere.

Dorsal surface of tail strongly armoured, entirely covered with large, elevated, apically pointed bucklers; a row of 4–5 large dorsolateral bucklers extending from last pair of predorsal bucklers below dorsal fin; a longer, highly irregular, semi-oblique row of slightly smaller bucklers along lateral margin of tail to caudal-fin base; an irregular row of flattened bucklers on dorsal midline before caudal fin; dorsal tail rows uniting to form a single, slightly elevated buckler at its base. Lateral margin of tail with two rows of small, low bucklers associated with lateral line, similar to those of disk margin.



**FIGURE 5.** Close-up view of body portions of *Malthopsis austraficana* n. sp., from the holotype. A. Dorsal view of head. B. Lateral view of head. C. Dorsolateral view of dorsal surface between dorsal fin and cranium. D. Dorsal view of right disk. E. Ventral surface of central portion of disk. Anterior to left in Figs. A, D, E. Anterior to right in Figs. B, C. Not to scale.

Ventral surface of disk predominantly covered with low, flat bucklers; no apical spines on each buckler; belly densely covered with prickles and small bucklers, some slightly larger and denser on breast than on belly (Fig. 5E); rear margin of anus surrounded by 7 (6–7) flat bucklers; a large naked area present outside gill chamber in holotype and some paratypes (smaller naked areas in some paratypes); ventral surface of tail with a regular row of conical bucklers on each side, coalescing to a bulbous buckler at caudal-fin base.

Fins generally naked, without bucklers, sometimes with small bucklers on rays near caudal-fin base; interradials of pectoral fins thin, transparent; dermal cirri short, thin, flap-like, present on disk margin and lateral sides of tail associated with lateral-line neuromasts.

**Coloration.** When fresh (Figs. 3A–B, 4), dorsal surface uniformly yellowish brown in holotype, with some deeper patches or small dots on dorsal surface and lateral sides of disk and tail in paratypes; dorsal surface of pectoral fin pale brownish; dorsal fin coloured as surrounding background; ventral surface uniformly pale; pelvic and anal fins pale; caudal fin pale, with light brownish base, a pale ventral margin and broad brownish band in rear portion; cirri along lateral disk and tail bright white.

When preserved (Fig. 3C), dorsal surface uniformly brownish, bucklers pale yellowish to medium brown; no brown patches on dorsal surface of holotype, some paratypes with a small irregular dark brown patch on each shoulder and some paratypes have one additional patch at front margin of gill opening; one paratype with many small spots running from anterior shoulder to gill opening; naked areas on shoulder often paler; a light brown patch on each disk margin and lateral side of tail of holotype; 2–3 patches on each disk margin and lateral side of tail in paratypes; eyelid dark blue; eye black; peritoneum pale with few small scattered dots; dermal cirri white; caudal fin pale with broad band on rear of caudal fin; pectoral fin of holotype pale, with a broad band on outer margin in some paratypes; ventral and anal fins of holotype pale, with black margin in some paratypes.

**Distribution.** Known from off South Africa (Dokodweni, Port Alfred, Durban, Coffee Bay), Maputo, Mozambique, and Madagascar. Bathymetric range 170–428 m, with a paratype collected from a lagoon, which might be stranded and another paratype collected from a depth between 430–700 m. This species is likely endemic to the southwestern Indian Ocean.

**Size.** A medium-sized species, the largest adult to 84.0 mm SL.

**Etymology.** Named for southern Africa, the area from which the type series was collected.

**Remarks.** Specimens of *Malthopsis australifricana* n. sp. were identified as *M. tiarella* by Bradbury (in Smith & Heemstra 1986), indicating the similarity of their general appearance. It differs from *M. tiarella* by having 4–5 dorsal-fin rays (vs. 6–7); a very strong tail (vs. thinner); and relatively strong bucklers on its dorsal surface. It differs from *M. kobayashii* in the rostral spine directed forward horizontally (vs. directed forward and upward) and a relatively wide interorbital space (7.4–9.7% SL vs. 6.0–7.5% SL); from *M. asperata* in having lower bucklers (vs. pyramid-like bucklers with spinelets); and from the western Atlantic species, *M. gnoma*, in lacking gill filaments on the fourth gill arch (vs. filaments present on the fourth gill arch) and in the rostral spine directed forward horizontally (vs. rather than upward).

A specimen collected from New Zealand (NMNZ P.052283, 72.8 mm SL) is tentatively identified as *M. australifricana*. However, more specimens are needed to verify the status of the New Zealand population.

## Discussion

Bradbury (in Smith & Heemstra 1986) recorded three species of *Malthopsis* from South Africa: *M. lutea*, *M. mitrigeria* and *M. tiarella*. The presence of *M. mitrigeria* in the WIO is confirmed from specimens taken off South Africa. However, the other two species do not occur in the WIO. Bradbury (*op. cit.*: 372) mentioned in the key to species that *M. lutea* and *M. tiarella* have “ventral surface of disc with scales in form of minute tubercles” (= minute prickles in present study) and “bucklers may be scattered over ventral surface of disc...” Ho & Shao (2010a) reviewed *M. lutea* and found ventral surface covered with small bucklers and naked elsewhere, which indicates that the account of *M. lutea* is another species. Also, Bradbury (*op. cit.*: 373) reported that her specimen of *M. tiarella* has 4 or 5 dorsal-fin rays, which differs from the count of 6 or 7 rays for *M. tiarella* given by Jordan (1902) and Nakabo (2002). Examination of specimens deposited at SAIAB revealed that specimens identified as *Malthopsis lutea* were actually *M. gigas* and those of *M. tiarella* are described as *M. australifricana* in the present work.

In summary, five species of *Malthopsis* are now known from the WIO, and the number is lower than I suspect for the area. With two new species described, we may expect more species will be discovered in the future because there are still large area in the WIO without detailed explorations.

### Key to WIO species of *Malthopsis*

- 1a. Ventral surface covered by minute prickles (sometimes mixed with small bucklers) . . . . . 2
- 1b. Ventral surface only covered by bucklers, naked elsewhere. . . . . 3
- 2a. Bucklers on body very blunt; ventral surface covered by minute prickles, some small bucklers present anterior to base of pelvic fin; very fine reticulate pattern present on dorsal surface . . . . . *M. bradburyae* n. sp.
- 2b. Bucklers on body somewhat pointed; ventral surface covered by mix of small bucklers and minute prickles; small black patches on dorsal surface. . . . . *M. australicana* n. sp.
- 3a. Two anteriorly directed spines on subopercular bucklers; vomer with an elongate patch of villiform teeth; pectoral fin rays 14 or 15 . . . . . *M. mitrigeria*
- 3b. One anteriorly directed spine on subopercular bucklers; vomer with an quadrangular patch of villiform teeth; pectoral fin rays 12 or 13 (rarely 11 or 14). . . . . 4
- 4a. Body covered by a reticulate pattern; five pairs of black spots at lateral margins of body . . . . . *M. retifera*
- 4b. Body uniformly grayish with some black dots on dorsal surface; reticulate pattern and lateral black spots absent . . . . . *M. gigas*

**Other material examined.** *Malthopsis mitrigeria*: MNHN 1986-7 (1, 68.6), N.o. Vauban, 12°53'02"S, 43°09'04"E, Madagascar, 480–520 m, 4 Mar. 1971. MNHN 1986-12 (1, 59.7), N.o. Vauban, 23°36'00"S, 43°31'05"E, Madagascar, 395–410 m, 26 Feb. 1971. MNHN 1986-21 (1, 61.80, N.o. Vauban, 12°49'59"S, 48°09'00"E, Madagascar, 580–585m, 14 Sep. 1972. SAIAB 39822 (1, 42.0), 32°6.5'S, 29°7.6'E, off Mncwasa Point, Eastern Cape, South Africa, 90 m, 17 Jul. 1982. SAIAB 80117 (1, 27.7), 34°39.02'S, 18°19'E, SW of Cape Point, Western Cape, South Africa, 460 m, 11 Jan. 2007. *Malthopsis gigas*: SAIAB 87697 (1, 119.3), 29°55'S, 31°18'E, Durban Deep, KwaZulu-Natal, South Africa, 360 m, May 2007. SAIAB 13953(1, 72.7), 2°50'S, 40°31'E, off Ras Ngomeni, Kenya, 275 m, 17 Dec. 1980. SAIAB 14101 (7, 51.6–82.0), 3°11'S, 40°38'E, off Malindi, Kenya, 438 m, 12 Dec. 1980. SAIAB 188810 (1, 108), 29°7.5'S, 31°45'E, Tugela Deep, KwaZulu-Natal, South Africa, 330 m, 15 Jun. 2009. Other WIO specimens examined are listed in Ho & Shao (2010a) and Ho *et al.* (2009).

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### References

Alcock, A.W. (1891) Natural history notes from H.M. Indian marine survey steamer 'Investigator', Commander R.F. Hoskyn, R.N., commanding - Series II., No. 1. On the results of deep-sea dredging during the season 1890 91. *Annals and Magazine of Natural History, Ser. 6*, 8 (43), 16–34.  
<http://dx.doi.org/10.1080/00222939109460385>

Bradbury, M.G. (1986) Ogocephalidae. In: Smith, M.M. & Heemstra, P.C. (Eds.), *Smith's Sea Fishes*. Macmillan South Africa, Johannesburg, pp. 370–373.

Bradbury, M.G. (1998) A new species of *Malthopsis* (Lophiiformes: Ogocephalidae) from the western Atlantic Ocean. *Bulletin of Marine Science*, 63 (1), 207–211.

Fricke, R. & Eschmeyer, W.N. (2013) *Guide to Fish Collections*. Available from: <http://researcharchive.calacademy.org/research/ichthyology/catalog/collections.asp> (Accessed 3 May 2013)

- Gilbert, C.H. (1905) The aquatic resources of the Hawaiian Islands. II. The deep-sea fishes of the Hawaiian Islands. *Bulletin of the U. S. Fish Commission*, 23 (2), 577–713.
- Gilbert, C.H. & Cramer, F. (1897) Report on the fishes dredged in deep water near the Hawaiian Islands, with descriptions and figures of twenty-three new species. *Proceedings of the United States National Museum*, 19 (1114), 403–435.  
<http://dx.doi.org/10.5479/si.00963801.19-1114.403>
- Ho, H.-C. & Shao, K.-T. (2010a) A review of *Malthopsis jordani* Gilbert, 1905, with description of a new batfish from the Indo-Pacific Ocean (Lophiiformes: Ogcocephalidae). *Bulletin of the National Museum of Nature and Science, Ser. A, Supplement* 4, 9–19.
- Ho, H.-C. & Shao, K.-T. (2010b) Redescription of *Malthopsis lutea* Alcock, 1891 and resurrection of *M. kobayashi* Tanaka, 1916 (Lophiiformes: Ogcocephalidae). *Journal of the National Taiwan Museum*, 63 (3), 1–18.
- Ho, H.-C., Prokofiev, A.M. & Shao, K.-T. (2009) A new species of the batfish genus *Malthopsis* (Lophiiformes: Ogcocephalidae) from the northwestern Indian Ocean. *Zoological Studies*, 48 (3), 394–401.
- Ho, H.-C., Roberts, C.D. & Shao, K.-T. (2013) Revision of batfishes (Lophiiformes: Ogcocephalidae) of New Zealand and adjacent waters, with description of two new species of the genus *Malthopsis*. *Zootaxa*, 3626 (1), 188–200.  
<http://dx.doi.org/10.11646/zootaxa.3626.1.8>
- Jordan, D.S. (1902) A review of the pediculate fishes or anglers of Japan. *Proceedings of the United States National Museum*, 24 (1261), 361–381.  
<http://dx.doi.org/10.5479/si.00963801.24-1261.361>
- Lloyd, R.E. (1909) A description of the deep-sea fish caught by the R. I. M. S. ship ‘Investigator’ since the year 1900, with supposed evidence of mutation in *Malthopsis*. *Memoirs of the Indian Museum*, 2 (3), 139–180.
- Nakabo, T. (2002) *Fishes of Japan with pictorial keys to the species. English edition. Part I.* Tokai University Press, Tokyo, 2428 pp.
- Tanaka, S. (1908) Descriptions of eight new species of fishes from Japan. *Annotations Zoologicae Japonenses*, 7 (1), 27–47.
- Tanaka, S. (1916) A new species of Japanese fish. *Zoological Magazine Tokyo*, 28, 348.