Zootaxa 1006: 33–42 (2005)
www.mapress.com/zootaxa/

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

1006

Three new species of *Microbrotula* (Teleostei: Ophidiiformes: Bythitidae) from the Indo-West Pacific

M. ERIC ANDERSON
South African Institute of Aquatic Biodiversity (J.L.B. Smith Institute of Ichthyology), Private Bag 1015, Grahamstown, 6140, South Africa

Abstract

Three new species of the rare Indo-Pacific fish genus *Microbrotula* are described. *Microbrotula bentleyi* sp. n. is known in the western Indian Ocean from the Gulf of Aqaba, Red Sea, and South Africa. Two species occur off Queensland, Australia, *M. polyactis* sp. n. and *M. queenslandica* sp. n. The species of *Microbrotula* are distinguished mainly on the basis of counts of the axial skeleton, scale rows and pectoral-fin rays, but some morphometric characters are also diagnostic, such as orbit diameter, predorsal length and fleshy interorbital width. All species live in coral-reef or rubble areas to depths of about 50 m. New material of *M. randalli* Cohen and Wourms, 1976 was studied and *Microbrotula* is re-diagnosed.

Key words: Bythitidae, Bythitinae, *Microbrotula*, Indo-West Pacific

Introduction

Gosline (1953) established the genus *Microbrotula* for two species of livebearing brotulas from coral reef and rubble areas in Hawaii, with *M. rubra* the type species. The second species, *M. nigra*, was transferred to *Oligopus* Risso where it was a homonym and renamed *O. waikiki*, now *Grammonus waikiki* (Cohen, 1964; Nielsen and Cohen, 1999). Within their redefined subfamily Bythitinae, family Bythitidae, Cohen and Nielsen (1978) suggested *Microbrotula* might be a shallow-water derivative of the bathyal genus *Cataetyx*. Machida (2000) considered his new genus *Acarobythites* close to *Microbrotula* which it resembles in many characters, but differs from it in its lack of scales, 11–12 caudal-fin rays, morphology of the anteriormost neural spines, vomerine teeth arranged in a single row, indistinct lateral line and short pectoral and pelvic fins.

Cohen and Wourms (1976) described *Microbrotula randalli* from five specimens taken on reefs at Efate Island, Vanuatu, and American Samoa. Additional material I have

Accepted by A. Gill: 11 May 2005; published: 10 Jun. 2005

examined is listed below. Cohen and Nielsen (1978) alluded to *Microbrotula* specimens from the Red Sea, and Nielsen and Cohen (1999) stated that several undescribed species occur in the Indo-Pacific region. The first southwestern Indian Ocean record of *Microbrotula* was brought to my attention from scuba collections made by Mr. Andy Bentley at Aliwal Shoal, South Africa, in the summer of 2002. The purpose of this paper is to describe this material and re-diagnose *Microbrotula* Gosline.

Materials and methods

All measurements are straight-line distances made with dial calipers or ocular micrometer to the nearest 0.1 mm. Cohen and Wourms (1976, tab. 1) used four morphometric characters to distinguish *M. randalli* from *M. rubra*, namely orbit diameter, least bony interorbital width and snout length into head length (HL), and predorsal length into standard length (SL). I found one of these characters, orbit diameter, but also fleshy interorbital width, sufficiently diagnostic in *Microbrotula* to incorporate them into the key, except as the reciprocal (as percent HL). Counts of features of the axial skeleton (i.e., vertebrae, ribs, unpaired fin rays) were made from radiographs, and vertebral counts include the urostyle. Ophidiiform terminology follows Cohen and Nielsen (1978) and Nielsen and Cohen (1999). Institutional abbreviations are as listed in Leviton et al. (1985). *Microbrotula rubra*, probably endemic to the Hawaiian Islands and not examined for this study, is apparently still known only from the six type specimens (J. E. Randall, pers. comm., 2003).

Comparative material examined of Microbrotula randalli. **Philippines**: USNM 227223 (male; 29.1 mm SL); Apo Island; 09°04. 6'N, 123°16.7'E; scuba in 0–40 m; 7 June 1978. ROM 54978 (female; 35.2 mm SL); Siquijor Island; 09°12..3'N, 123°27.3'E; scuba in 8–15 m; 14 May 1987. ROM 54979 (male; 32.5 mm SL); Sumilon Island; 09°26.2'N, 123°23.1'E; scuba in 15–26 m; 20 May 1987. **Caroline Islands**: Pohnpei (Ponape): USNM 223137 (female; 20.3 mm SL); off barrier reef; 06°52'N, 158°06'E; scuba in 0–37 m; 15 Sept. 1980. Senyavin Islands: USNM 223442 (male; 19.3 mm SL); scuba in 0–24 m; 16 Sept. 1980. **Vanuatu**: USNM 363745 (female; 38.0 mm SL); Rowa Islands; 13°38.5'S, 167°30.3'E; scuba in 23–29 m; 20 May 1997. **Papua New Guinea**: USNM 227225 (female; 39.5 mm SL); Hermit Islands; 01°33'S, 144°59'E; scuba in 0–15 m; 30 Oct. 1978. USNM 365994 (female, 19.4 mm SL); Hermit Islands; 01°33'S, 144°59'E; scuba in 0–46 m; 31 Oct. 1978.

Microbrotula Gosline, 1953

Microbrotula Gosline, 1953: 218 (type species: *Microbrotula rubra* Gosline, 1953, by original designation). Cohen and Wourms, 1976: 81 (new diagnosis). Cohen and Nielsen, 1978: 48 (diagnosis; mention of undescribed species). Nielsen and Cohen, 1999: 106 (diagnosis, key).

Included species. *Microbrotula* comprises five species, *M. bentleyi* sp. n., *M. polyactis* sp. n., *M. queenslandica* sp. n., *M. randalli* and *M. rubra*.

Diagnosis. The genus is distinguished from all other Bythitinae as defined by Cohen and Nielsen (1978) by the following combination of characters: Dwarf species reaching only 45 mm SL (*M. rubra*). Body relatively short, head length 25.7–29.2% SL. Vertebrae 11–13 + 33–44 = 44–56. Dorsal fin retrograde, its origin above vertebrae 7–11, anal-fin origin beneath vertebrae 14–17. Neural spines of vertebrae 4–8 depressed; spine of first vertebra much reduced. Eye small, 6.5–17.5% HL. Anterior nostril with slight tube, located just above upper lip. Rear portion of maxilla ensheathed in *M. bentleyi* and *M. polyactis*, free in remaining species, and with small, ventrally-directed projection at lower rear corner. Tongue with short, anterior projection, rounded at tip. Vomerine teeth in two small patches; palatine teeth viliform, in single row. Opercular spine strong, usually imbedded. Developed gill rakers 2–4, with tiny denticles on outer surface. Branchiostegal rays 7. Scales very small, imbricated, present on top of head and cheeks in adults. Lateral line mediolateral, of tiny papillae. Pectoral-fin rays 9–17, set on short peduncle that is higher than long. Pelvic fin of a single ray, its length growth-related but reaching almost to anus in adults. Caudal-fin rays 4–6 except in *M. polyactis* which has 7–8 rays. Male intromittent organ simple, without ossified or sclerified parts (pseudoclasper).

Key to the species of *Microbrotula*

1 Pectoral-fin rays 9–11 2
- Pectoral-fin rays 13–17 3
2 Five head pores at interorbital area; predorsal length 40.0–47.6% SL (dorsal-fin origin directly above vertebrae 10–11); prepelvic length 19.9–22.2% SL; distance symphysis of cleithra to pelvic fin insertion 10.7–14.8% HL; lateral scale rows 63–66; anal-fin rays 71–76; total vertebrae 52–56 ..... *M. randalli*
- No head pores; predorsal length 34.6% SL (dorsal-fin origin above vertebra 7); prepelvic length 23.4–24.6% SL; distance symphysis of cleithra to pelvic fin insertion 26.2–28.2% HL; lateral scale rows 56–57; anal-fin rays 62–64; total vertebrae 48–49 .... *M. queenslandica*
3 Pectoral-fin rays 13–14; caudal-fin rays 4–6; lateral scale rows 54–ca.60; orbit diameter 6.5–13.9% HL 4
- Pectoral-fin rays 16–17; caudal-fin rays 7–8; lateral scale rows 47–50; orbit diameter 16.0–18.7% HL ..... *M. polyactis*
4 Vertebrae 11 + 40–41; dorsal-fin rays 81–92; anal-fin rays 72–80; predorsal length 43.5–47.6% SL; orbit diameter 6.5–9.1% HL; fleshy interorbital width 23.8–27.8% HL; lateral scale rows ca. 60 ..... *M. rubra*
- Vertebrae 11 + 33–35; dorsal-fin rays 65–71; anal-fin rays 55–59; predorsal length 36.5–41.3% SL; orbit diameter 10.9–13.9% HL; fleshy interorbital width 16.8–19.8% HL; lateral scale rows 54–55..... *M. bentleyi*

***Microbrotula bentleyi* sp. nov.**
(Fig. 1)

Holotype. RUSI 65261 (female, 40.7 mm SL), South Africa, Aliwal Shoal at Eelskin, 30°15.0'S, 30°49.0'E, SCUBA coll., 25 m, sta. ACB 02-01, 24 Jan. 2002, A. C. Bentley.

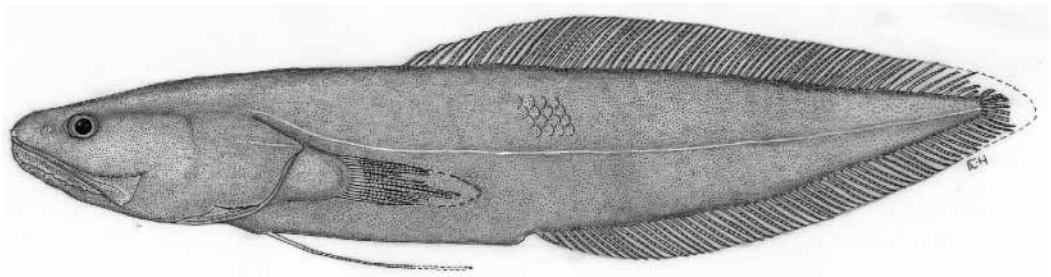

FIGURE 1. *Microbrotula bentleyi*, holotype, RUSI 65261, 40.7 mm SL, South Africa.

Paratypes (all Red Sea, Gulf of Aqaba). USNM 227220 (male, 36.0 mm SL; female, 40.7 mm SL), bay at El Hamira, Egypt, SCUBA coll., 9–12 m, sta. VGS 69-23, 09:45–12:15 hr., 8 Sept. 1969, V. G. Springer and party. USNM 227226 (female, 29.2 mm SL; male, 33.4 mm SL), bay at El Hamira, Egypt, SCUBA coll., 0–16 m, sta. VGS 69-4, 11:40–15:30 hr., 19 July 1969, V. G. Springer and party. BPBM 37875 (male, 37.3 mm SL), Ras Abu Galum, Egypt, SCUBA coll., 52–55 m, 2 Aug. 1976, J. E. Randall, O. Gon and R. Kurutz.

Diagnosis. A species of *Microbrotula* distinguished by the following combination of characters: vertebrae 11 + 33–35; pectoral-fin rays 14; lateral scale rows 54–55; dorsal-fin origin above vertebrae 7–8; anal-fin origin below vertebra 14; orbit diameter 10.9–13.9% HL; fleshy interorbital width 16.8–19.8% HL; predorsal length 36.5–41.3% SL.

Description. Counts and proportions, holotype first followed in parentheses by range of paratypes: Vertebrae 11 + 34 = 45 (11 + 33–35 = 44–46); dorsal-fin rays 70 (65–71); anal-fin rays 55 (55–59); caudal-fin rays 6 (6); pectoral-fin rays 14 (14); lateral scale rows 54 (54–55); horizontal scale rows, anal-fin origin to dorsal base 16 (16); developed gill rakers 3 (3); vomerine teeth 10 (4–16). Following proportions as percent SL: head length 29.2 (28.1–29.2); head width 14.3 (12.2–15.5); head depth 14.0 (14.0–16.3); predorsal length 37.6 (36.5–41.3); preanal length 51.6 (50.0–52.1); prepelvic length 24.6 (24.3–26.7); body depth 15.0 (13.4–17.2); pectoral-fin length 14.7 (14.1–15.6); pelvic-fin length — (18.0–19.8 [8.1 in 29 mm SL juvenile]). Following proportions as percent HL: head width 48.7 (41.7–54.5); head depth 47.9 (47.9–57.9); prepelvic length 84.0 (83.9–95.1); orbit diameter 10.9 (10.9–13.9); snout length 18.1 (16.7–19.8); fleshy interorbital width 16.8 (16.8–19.8); body depth 51.2 (46.2–60.4); upper jaw length 45.0 (48.5–53.5); pectoral base depth 21.9 (15.6–18.8); pectoral-fin length 50.4 (48.5–53.2); pelvic-fin length —

(52.8–68.2 [27.8 in 29 mm SL juvenile]); distance symphysis of cleithra to pelvic-fin insertion 33.6 (26.6–34.8).

Head moderately elongate, postorbital length almost four times snout length; nape and snout depressed. Head slightly deeper than wide at occiput. Tip of snout not projecting much beyond upper lip; low fleshy ridge at snout tip with weakly defined lobes under which lies row of sensory papillae. Upper jaw expanded posteriorly, ensheathed in long, fleshy pocket posteriorly; posteroventral corner with slight projection that is less developed in 29.2 mm SL juvenile than in adults. Teeth on jaws viliform, in 3–4 bands, with few caniniform teeth anteriorly in upper jaw and laterally in lower jaw. Caniniform vomerine teeth in two patches of 2–8 teeth, with 2–3 tiny teeth in each patch in largest specimens. Low, convoluted fleshy ridges on top of head, especially snout. Minute unpigmented sensory papillae on head in two irregular rows under eye and along upper jaw; uppermost courses behind eye and runs ventrally along anterior margin of preopercle; scattered papillae (not in rows) on snout (densest there) to nape; three irregular rows on lower jaw. No head pores. Tube of anterior nostril not well developed. Eye rounded, translucent orbital spectacle not reaching lens.

Body fully scaled including dorsal- and anal-fin bases, abdomen to posterior isthmus area and pectoral base, with three scale rows extending onto fin. Scales on head extend anteriorly on nape almost to interobital area, including cheeks and operculum.

Gill opening extending ventally to vertical through rear margin of upper jaw. Gill membranes united, free of isthmus posteriorly. Three developed gill rakers on lower limb of first arch; rakers slanted forward so rear margin oriented dorsally; row of minute denticles on rear margin. Pectoral fin on short peduncle; rays almost reach vertical through anus. At least one pelvic fin ray unbroken in four specimens, length growth-related (above). Pelvic-fin insertion on vertical slightly in advance of base of pectoral peduncle. Dorsal-fin origin above middle of pectoral rays; above vertebrae 7–8; anal-fin origin at mid-body, under vertebra 14. Male copulatory apparatus with fleshy hood elevated above abdomen immediately before anal-fin origin. Inner surface of anterior end of hood enclosing the simple, conical genital papilla, posterior to which is another, much smaller, median papilla.

Live coloration: Gulf of Aqaba specimen BPBM 37875 generally gray with brownish swathes on shoulder, dorsum and head; fins pink (from slide courtesy of J. E. Randall). South African specimen more uniformly light brown with light pink fins.

Etymology. Named in honor of Andrew Charles Bentley of Port Elizabeth, South Africa, now at the University of Kansas, USA, for his enthusiasm and help in the development of a program on western Indian Ocean fishes, and for collecting the holotype.

Distribution. Northeastern South Africa and Gulf of Aqaba, Red Sea, from near surface to 55 m in protected reef structures.

Remarks. This species appears closest to *M. polyactis* (below) in its morphometrics and most meristics, especially the low vertebral and unpaired fin ray counts, and the posi-

tion of the unpaired fin origins. However, *M. bentleyi* differs from *M. polyactis* in its lower caudal-fin ray count (6 vs. 7–8), pectoral-fin ray count (14 vs. 16–17) and smaller scales (lateral scale rows 54–55 vs. 47–50.).

***Microbrotula polyactis* sp. n.**
(Fig. 2)

Holotype. AMS I .20779-128 (male, 40.0 mm SL), Australia, Cape York Peninsula, Queensland, north end of Tijou Reef, 13°05'S, 143°57'E, scuba, 2–25 m, AMS group, 22 Feb. 1979.

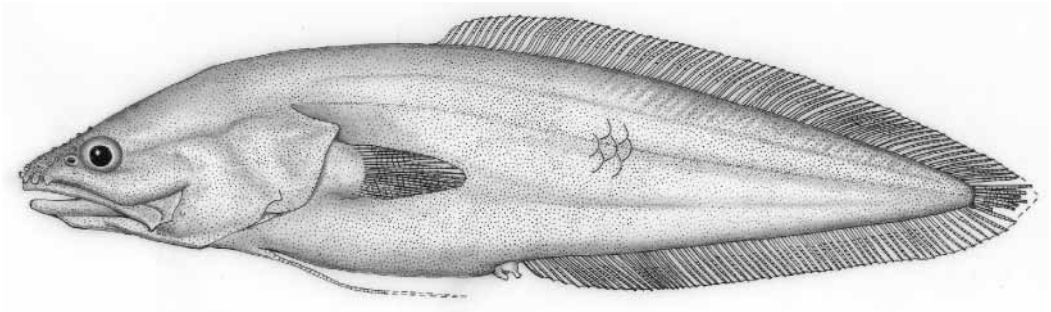

FIGURE 2. *Microbrotula polyactis*, holotype, AMS I.20779-128, 40.0 mm SL, Queensland, Australia.

Paratypes. **Indonesia**: USNM 227227 (4 males, 21.4–33.4 mm SL; female, 25.4 mm SL), Ambon Island, 03°47'S, 128°06'E, scuba, 11–18 m, V.G. Springer & M. Gomon, 14 Mar. 1974. WAM P.30811-005 (female, 28.7 mm SL), Sulawesi Island, at Manado, 01°34'N, 124°55'E, scuba, 14–15 m, G. R. Allen, 3 Jun. 1994. **Philippines**: USNM 227221 (male, 38.7 mm SL), Negros Island, off Bais, 09°36.9'N, 123°10.1' E, scuba, 0–37 m, V. G. Springer & party, 13:15–14:00 hrs., 17 Jun. 1978. USNM 227224 (female, 26.3 mm SL; male, 32.4 mm SL), Cebu Island, Caceres Reef, scuba, 24–31 m, J. Libbey & party, 14:15–15:15 hrs., 18 May 1979.

Diagnosis. A species of *Microbrotula* distinguished by the following combination of characters: vertebrae 11–12 + 33–37 = 45–48; pectoral-fin rays 16–17; caudal-fin rays 7–8; lateral scale rows 47–50; dorsal-fin origin above vertebrae 7–8; anal-fin origin below vertebrae 14–15; orbit diameter 16.0–18.7% HL; fleshy interorbital width 20.0–24.4% HL; predorsal length 34.4–39.9% SL.

Description. Counts and proportions, holotype first followed in parentheses by range of paratypes. Vertebrae 11 + 34 = 45 (11–12 + 33–37 = 45–48) dorsal-fin rays 70 (68–76); anal-fin rays 60 (53–66); caudal-fin rays 8 (7–8); pectoral-fin rays 17 (16–17); lateral scale rows 47 (47–50); horizontal scale rows, anal-fin origin to dorsal base 16 (16–17); devel-

oped gill rakers 3 (3); caniniform vomerine teeth 6 (4–6). Following proportions as percent SL: head length 28.3 (25.1–28.7); head width 13.0 (12.7–15.5); head depth 16.8 (12.6–17.0); predorsal length 35.8 (34.4–39.9); preanal length 48.0 (44.7–57.5); prepelvic length 25.1 (20.9–25.6); body depth 16.8 (12.2–17.1); pectoral-fin length (two undamaged paratypes)16.8–19.4; pelvic-fin (three undamaged paratypes) 15.2–26.6. Following proportions as percent HL: head width 46.0 (44.1–53.4; head depth 59.3 (48.5–58.3); prepelvic length 88.9 (83.0–93.1); orbit diameter 16.8 (16.0–18.7); snout length 17.7 (15.2–19.4); fleshy interorbital width 21.2 (20.0–24.4); body depth 59.3 (47.1–62.5); upper jaw length 50.4 (47.2–51.4); pectoral base depth 19.5 (16.6–20.8); pectoral-fin length (two undamaged paratypes) 58.5–70.8; distance symphysis of cleithra to pelvic-fin insertion 24.8 (17.7–34.3).

Head ovoid, postorbital length three times snout length; nape and snout depressed. Head much deeper than wide at occiput. Tip of snout fleshy, projecting beyond upper lip, with four low lobes under each of which lies short row of sensory papillae. Upper jaw expanded posteriorly, deeply ensheathed in long fleshy pocket that runs the length of the jaw; posteroventral corner with well developed projection. Teeth on jaws viliform, in 6–7 bands anteriorly in upper jaw, four anterior bands in lower, with short row of lateral canine teeth in lower jaw only. Caniniform vomerine teeth in two patches of 2–3 each; both patches with 3–5 minute teeth in a row in front of canines. Low, convoluted fleshy ridges on top of head, snout, cheeks and under eye. Minute unpigmented sensory papillae on head in a row under eye and another along upper jaw; uppermost courses behind eye and runs ventrally along anterior margin of preopercle; numerous scattered papillae (not in rows) on snout to occiput; three irregular rows on lower jaw. No head pores. Tube of anterior nostril little developed. Eye round, translucent orbital spectacle not reaching lens.

Body fully scaled including dorsal- and anal-fin bases, abdomen to posterior isthmus area and pectoral base, with 1–2 scale rows extending onto fin in paratypes, three rows in holotype. Scales on head extending anteriorly to interobital area, including cheeks and operculum.

Gill opening extending ventrally to vertical just in front of rear margin of upper jaw. Gill membranes united, free of isthmus posteriorly. Three developed gill rakers on lower limb of first arch; rakers slanted forward so rear margin oriented dorsally; two rows of minute denticles on rear margin; 3–4 denticulated raker plates below developed ones in paratypes, five plates in holotype. Pectoral fin on short peduncle, middle rays longest, almost reaching vertical through anus. Pelvic-fin insertion on vertical through base of pectoral peduncle; tips of fin broken off, when apressed, just before vertical through mid-pectoral fin. Dorsal-fin origin above middle of pectoral rays; above vertebra 7–8; anal-fin origin at mid-body, under vertebra 14–15. Copulatory organ with low fleshy hood immediately anterior to anal-fin origin. Inner surface of anterior end of hood encasing a simple, elongate genital papilla, posterior to which is a pair of much smaller papillae; tip of genital papilla with thin, fleshy lobe.

Live coloration unknown, uniformly brown in preservative. Eye blue.

Etymology. From the Greek πολυς (many) and ακτις (ray, beam) in reference to its having the highest caudal- and pectoral-fin ray counts in the genus.

Distribution. Southern Philippines to northern Cape York Peninsula, Australia, in reef areas to 37 m.

***Microbrotula queenslandica* sp. n.**
(Fig. 3)

Holotype. AMS I.20206-019 (female, 29.5 mm SL), Australia, Great Barrier Reef, One Tree Island, 23°30'S, 152°05'E, scuba in 22–30 m, Frank Talbot and party, 3 Dec. 1969.

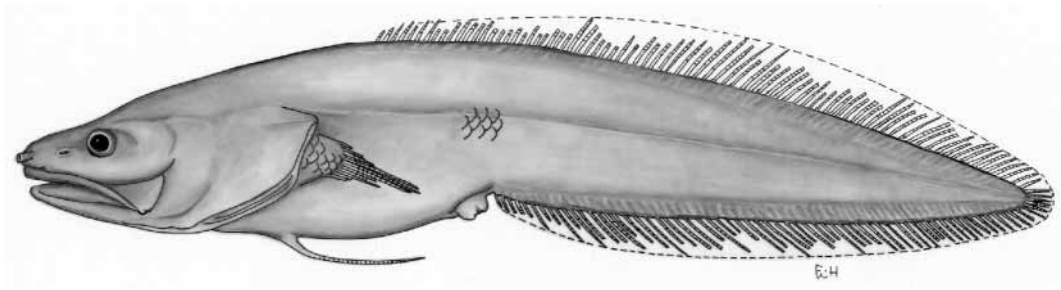

FIGURE 3. *Microbrotula queenslandica*, holotype, AMS I.20206-019, 29.5 mm SL, Great Barrier Reef, Australia.

Paratype. AMS I.20206-041 (male, 31.2 mm SL), same collection as holotype.

Diagnosis. A species of *Microbrotula* distinguished by the following combination of characters: vertebrae 12 + 36–37 = 48–49; pectoral-fin rays 11; lateral scale rows 56–57; dorsal-fin origin above vertebra 7; anal-fin origin below vertebrae 15–16; orbit diameter 12.2–13.1% HL; fleshy interorbital width 15.2–16.1% HL; predorsal length 34.6% SL.

Description. Counts and proportions, holotype first followed in parentheses by paratype. Vertebrae 12 + 37 (12 + 36); dorsal-fin rays 80 (80); anal-fin rays 62 (64); caudal-fin rays 6 (6); pectoral-fin rays 11 (11); lateral scale rows 56 (57); horizontal scale rows, anal-fin origin to dorsal base 15 (15); developed gill rakers 3 (3); vomerine teeth 7 (4). Following proportions as percent SL: head length 27.8 (27.9); head width 12.5 (13.1); head depth 13.6 (13.3); predorsal length 34.6 (34.6); preanal length 46.1 (53.2); prepelvic length 24.6 (23.4); body depth 13.9 (13.5); pectoral-fin length 9.8 (11.5); pelvic-fin length 14.2 (15.1). Following proportions aas percent HL: head width 45.1 (47.1); head depth 48.8 (47.7); prepelvic length 88.4 (83.9); orbit diameter 12.2 (13.1); snout length 19.5 (20.1); fleshy interobital width 15.2–16.1; body depth 50.0 (48.3); upper jaw length 50.6 (50.6); pectoral base depth 16.5 (16.1); pectoral-fin length 35.4 (41.4); pelvic-fin length 51.2 (54.0); distance symphysis of cleithra to pelvic-fin insertion 26.2 (28.2).

Head ovoid, postorbital length 3.4–3.5 times snout length; nape and snout depressed. Head very slightly deeper then wide at occiput. Tip of snout fleshy, projecting beyond upper lip, with four weak lobes under which lies short row of sensory papillae. Upper jaw expanded posteriorly, shallowly ensheathed in fleshy pocket running almost the length of the jaw; posteroventral corner with slight projection. Teeth in jaws viliform, in four bands anteriorly in upper jaw, three in lower, with short row of lateral canine teeth in lower jaw and group of three canines in upper jaw at symphysis in both specimens. Caniniform vomerine teeth in two patches of 3 + 4 teeth in holotype and 2 + 2 teeth in paratype. Low fleshy ridges on head above, below and behind eyes; snout ridges weakly developed in these subadults. Minute unpigmented sensory papillae on head in row under eye and scattered on snout, preorbital and interorbital areas; three irregular rows on lower jaw. No head pores. Tube of anterior nostril weak. Eye round, translucent orbital spectacle not reaching lens.

Body fully scaled; no scales on dorsal- and anal-fin bases in these subadults. Scales present on abdomen to posterior isthmus area and pectoral base, with a single scale row extending onto fin. Scales on head extending anteriorly only to nape. Small patch of scales on cheeks, none yet developed on operculum.

Gill opening extending ventrally to vertical just in front of rear margin of upper jaw. Gill membranes united, free of isthmus posteriorly. Three developed gill rakers on lower limb of first arch; rakers slanted forward so rear margin oriented dorsally; two rows of minute denticles on rear margin; five denticulated raker plates below developed ones. Pectoral fin on short peduncle, middle rays longest, almost reaching vertical through anus. Pelvic-fin insertion on vertical through posterior third of opercle. Dorsal-fin origin above middle of pectoral fin, above vertebra 7; anal-fin origin slightly in advance of mid-body, under vertebrae 15–16. Male copulatory organ as in *M. polyactis*, with low, fleshy hood before anal-fin origin and simple, elongate genital papilla anteriorly followed posteriorly by pair of much smaller papillae; no discernible lobe at tip of genital papilla.

Live coloration unknown, uniformly straw-colored in preservative. Eye blue.

Etymology. Named after the Australian state of Queensland where the types were collected (Great Barrier Reef).

Distribution. A single collection from coral reef habitat at One Tree Island, Capricorn Group.

Remarks. This species appears close to *M. randalli* in most meristics, especially the more numerous precaudal vertebrae and few pectoral-fin rays. However, *M. randalli* is quite distinct from all other congeners, as discussed below.

Discussion

The pelvic-fin insertion in the three new species is more retrograde than in *M. randalli* and *M. rubra*, with the insertion under the base of the pectoral peduncle or slightly in advance

of it in the new species and farther forward in *M. randalli* and *M. rubra* (distance cleithral symphysis to pelvic insertion 10.7–14.8% HL in *M. randalli* [not studied in *M. rubra*, but see Gosline, 1953, fig. 1c] vs. 26.2–34.8% HL in the three new species). The three new species differ from *M. rubra* in their larger eyes (orbit diameter 10.9–18.7% HL in the new species vs. 6.5–9.1% HL in *M. rubra*) and narrower fleshy interorbital width (width 15.2–24.4% HL in the new species vs. 23.8–27.8% HL in *M. rubra*). *Microbrotula randalli* chiefly differs from all four of its congeners in its five head pores, high vertebral counts (52–56 vs. 44–49 in the new species, 51–52 in *M. rubra*), low pectoral ray count (9–11 vs. 11–17 in congeners), smaller scales (lateral scale rows 63–67 vs. 47–57 in the new species, ca. 60 in *M. rubra*), and shorter prepelvic distance (19.9–22.2% SL vs. 20.9–26.7% SL in congeners).

Acknowledgments

For assistance in arranging loans and with collection information I thank J. E. Randall and A. Suzumoto, BPBM, F. Krupp and H. Zetzsche, SMF, S. Jewett and V.G. Springer, USNM, D. M. Cohen, CAS, M. McGrouther, AMS, D. Golani, HUJ and M. Goren, TAU. Elaine Heemstra illustrated the holotypes of the new species.

References

Cohen, D.M. (1964) A review of the ophidioid genus *Oligopus* with the description of a new species from West Africa. *Proceedings of the United States National Museum*, 116, 1–22.

Cohen, D.M. & Nielsen, J.G. (1978) Guide to the identification of genera of the fish order Ophidiiformes, with a tentative classification of the order. *NOAA Technical Report, NMFS Circular*, 417, 1–72.

Cohen, D.M. & Wourms, J.P. (1976) *Microbrotula randalli*, a new viviparous ophidioid fish from Samoa and New Hebrides, whose embryos bear trophotaeniae. *Proceedings of the Biological Society of Washington*, 89, 81–98.

Gosline, W.A. (1953) Hawaiian shallow-water fishes of the family Brotulidae, with the description of a new genus and notes on brotulid anatomy. *Copeia*, 1953, 215–225.

Leviton, A.E., Gibbs, Jr., R.H., Heal, E. & Dawson, C.E. (1985) Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia*, 1985, 802–832.

Machida, Y. (2000) A new genus and species, *Acarobythites larsonae*, from shallow rocky reefs off northern Australia. *The Beagle*, 16, 123–126.

Nielsen, J.G. & Cohen, D.M. (1999) Family Bythitidae. *In*: Nielsen, J.G., Cohen, D.M., Markle, D. F. & Robins, C.R. (Eds.), *FAO Species Catalogue, Vol. 18, Ophidiiform Fishes of the World (Order Ophidiiformes)*, FAO, Rome, pp. 94–135.

