

A new bythitid genus and species, *Acarobythites larsonae*, from shallow rocky reefs off northern Australia (Pisces, Ophidiiformes, Bythitidae)

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ABSTRACT

A new genus and species of the subfamily Bythitinae (Bythitidae), *Acarobythites larsonae*, is described from two specimens, 25.2 mm and 18.6 mm standard length, collected from pools on rocky reefs in the Northern Territory, Australia. This genus resembles *Microbrotula* Gosline, 1953 in the counts of pectoral and pelvic fin rays, branchiostegal rays and developed rakers on the anterior arch, and in having a normal pectoral peduncle, lower angle of preopercle without spines, sharp-pointed jaw teeth and vomerine and palatine teeth. However, it is clearly distinguishable from the latter in the following characters: head and body scaleless, relatively small eyes (diameter 17.8-18.0 times in head length), snout compressed, posterior end of maxillary rounded and lacking a ventrally-directed process near its postero-ventral corner, opercular spine flat and weak, 11-12 caudal fin rays and 42-43 total vertebrae.

KEYWORDS: Ophidiiformes, Bythitidae, Australia, new genus, *Acarobythites*.

INTRODUCTION

Cohen and Nielsen (1978) included 15 genera in the subfamily Bythitinae of the viviparous fish family Bythitidae. This subfamily is characterised by having dorsal and anal fins continuous with the caudal fin, and is separable from the free-tailed Bromophycinae, the other member of the family (Cohen and Nielsen 1978). Since Cohen and Nielsen (1978), only *Hastatobythites* Machida, 1977 has been added to the Bythitinae (Cohen and Nielsen 1999).

Recently, two small bythitid specimens were sent to the author for examination by Dr Helen K. Larson of the Museum and Art Gallery of the Northern Territory (NTM), Darwin, Australia. These specimens had dorsal and anal fins continuous with the caudal fin. Although they resembled the small-sized bythitine genus *Microbrotula* Gosline, 1953, known from Hawaii (Gosline 1953) and from Samoa and Vanuatu (Cohen and Wourms 1976), they were easily distinguishable from *Microbrotula* by the absence of scales on the head and body. The specimens are here described as a new genus and species.

Measurements and enumeration follow Machida (1993). Standard length and head length are expressed as SL and HL, respectively.

SYSTEMATICS

Family Bythitidae Gill, 1861 Subfamily Bythitinae Gill, 1861 *Acarobythites* new genus

Type species. *Acarobythites larsonae* new species, by monotypy.

Diagnosis. A genus of the subfamily Bythitinae (Cohen and Nielsen 1978: 42) with: head and body scaleless; anal fin origin at about mid-body; eye diameter 17.8-18.0 times in HL, snout compressed; posterior end of maxillary rounded, not sheathed by dermal cheek fold, without ventrally-directed process near postero-ventral corner; opercular spine flat and weak; no pore-bearing skin flap on upper angle of opercle; lower angle of preopercle smooth; pectoral peduncle normal, broader than long; no spine on cleithrum; all tecti sharp-pointed, some needle-like; teeth present in jaws and on vomer and palatines; developed gill rakers on anterior arch 3; pectoral fin rays 13-14; pelvic fin ray 1; caudal fin rays 11-12; branchiostegal rays 7; 12-13 precaudal vertebrae, with sharp-pointed neural spines; and 42-43 total vertebrae.

Description. See species description below.

Remarks. According to Cohen and Nielsen (1972, 1978), Cohen (1987), and Machida (1997), the following genera in the subfamily Bythitinae are known to have

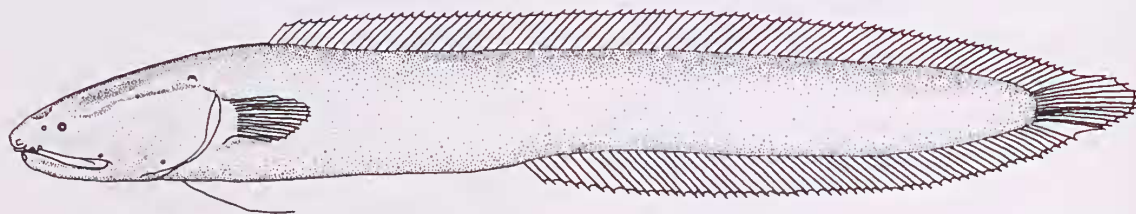
Table 1. Comparison between *Acarobythites* gen. nov. and *Microbrotula* Gosline, 1953. * = orbit diameter.

Genus (Source)	<i>Acarobythites</i> gen. nov. (this work)	<i>Microbrotula</i> Gosline, 1953 (Gosline 1953; Cohen and Wourms 1976; Cohen and Nielsen 1978)
Head squamation	scales absent	partly naked
Body squamation	scales absent	complete
Anal fin origin	at about mid-body	at about mid-body
Eye diameter	17.8-18.0 in HL	(6.4-15.4 in HL)*
Snout	compressed	depressed
Posterior end of maxillary	rounded, not sheathed, without ventrally-directed process	expanded, not sheathed, with ventrally-directed process
Pectoral peduncle	broader than long	broader than long
Opercular spine	flat and weak	sharp and needle-like
Lower angle of preopercle	smooth	smooth
Teeth	sharp-pointed	not all tiny and granular
Palatine teeth	present	present
Vomerine teeth	present	present
Developed rakers on anterior arch	3	3-4
Pectoral fin rays	13-14	10-14
Pelvic fin ray	1	1
Caudal fin rays	11-12	4-6
Branchiostegal rays	7	7
Precaudal vertebrae	12-13	11-13
Total vertebrae	42-43	51-56

seven branchiostegal rays: *Bythites* (7-8 rays), *Calamopteryx*, *Microbrotula*, *Saccogaster* (7-9 rays), *Stygnobrotula* and *Thalassobathia*. Although Cohen and Nielsen (1978) did not report the number of branchiostegal rays for *Bellotia*, this genus apparently differs from *Acarobythites* only in lacking pelvic fins. Among these genera having seven branchiostegal rays, two of them, *Calamopteryx* and *Saccogaster*, are well characterized by having an elongated pectoral peduncle (Cohen and Nielsen 1978). *Stygnobrotula* lacks palatine teeth, and *Thalassobathia* has two rays in each pelvic fin (Cohen and Nielsen 1978). *Bythites* has a scaleless head, completely scaled body, 24-30 pectoral fin rays, 0-1 developed gill rakers on the anterior arch, and the anal fin origin is positioned well behind the mid-body (Nielsen and Cohen 1973; Cohen and Nielsen 1978). Cohen and Wourms (1976) gave a revised diagnosis for

Microbrotula, when they described a new species, *M. randalli*. They regarded small eyes, less than six times in head length, as one of the diagnostic characteristics of *Microbrotula* (Cohen and Wourms 1976). Orbit diameter ranges from 6.4 to 8.4 times and from 11.0 to 15.4 times in head length in *M. randalli* and in *M. rubra*, respectively (Cohen and Wourms 1976). Table 1 compares *Acarobythites* and *Microbrotula*. *Acarobythites* appears to be distinguishable from the latter by its naked head and body, small eye, compressed snout, posterior end of maxillary rounded, no ventrally-directed process at the postero-ventral corner of maxillary, opercular spine flat and weak, and 11-12 caudal fin rays.

Etymology. The generic name is derived from the Latin, *acaro* (small), in reference to its small body, combined with *Bythites* (gender: masculine), one of the known genera in the family Bythitidae.

**Fig. 1.** *Acarobythites larsonae* sp. nov., NTM S.14665-026, holotype, 25.2 mm SL, from Australia. Scale bar indicates 5 mm.

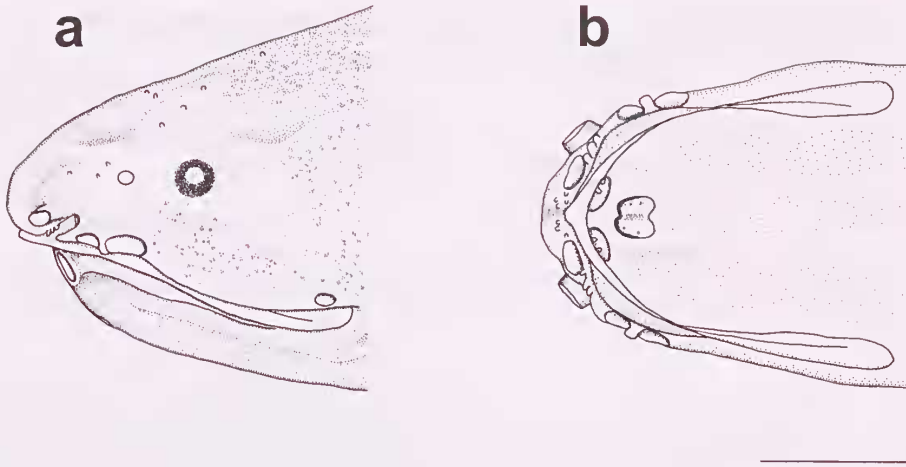


Fig. 2. Lateral (a) and ventral (b) views of anterior part of head of NTM S.14665-026, holotype of *Acarobythites larsonae* sp. nov. Scale bar indicates 1 mm.

Acarobythites larsonae new species

(Figs 1-4)

Type material. HOLOTYPE - NTM S.14665-026, 25.2 mm SL, sex unknown, northwestern side of Field Island (12°04.20'S, 132°19.31'E), Northern Territory, Australia, rock pools on reef, depth 0.3 m, substrate sand, mud, oyster covered rocks, coll. R. Williams and party, 5 June 1998. PARATYPE - NTM S.10015-049, 18.6 mm SL, sex unknown, on silty sand with isolated coral clumps and rubble piles, off reef flat on E side of Coral Bay, Cobourg Peninsula, Northern Territory, depth 3-4 m, coll. H. K. Larson, 17 Oct. 1981.

Diagnosis. See generic diagnosis.

Description. Data on the holotype given first, data on the paratype in parentheses when differing from holotype.

Counts: dorsal fin rays 79 (73), anal fin rays 57 (53), caudal fin rays 12 (11), pectoral fin rays 14 (13), pelvic fin ray 1, branchiostegal rays 7, developed gill rakers on anterior arch 3, pseudobranchial filaments 0, precaudal vertebrae 13 (12), caudal vertebrae including urostyle 29 (32). Measurements in % SL: HL 21.4 (24.2), predorsal length 26.6 (29.3), preanal length 49.3 (46.2), body depth at dorsal fin origin 13.5 (15.9), body depth at vent 11.5 (13.7), head width 5.9 (8.6), pectoral fin length 8.7 (11.3), pelvic fin length 11.9 (13.7). Measurements in % HL: eye diameter 5.6 (5.6), snout length 22.2 (21.1), maxillary length 48.1 (48.9), fleshy interorbital width 18.5 (22.2).

Head and body compressed, tail not tapered posteriorly (Fig. 1). Head small, slightly less than 1/2 preanal length. Snout round from lateral view, slightly projecting beyond upper jaw (Fig. 2a). Eye small, about

1/4 snout length. Anterior nostril tubular, just above upper lip. Posterior nostril small, rounded, slightly before anterior margin of eye, at mid-eye level. Mouth large, nearly horizontal. Maxillary extending backward far behind posterior margin of eye, its posterior end rounded, not sheathed by dermal cheek fold, without ventrally-directed process near its postero-ventral corner. Lower jaw included in upper jaw. Opercular spine flat and weak, completely covered by skin. Posterior and lower margins of preopercle smooth, completely covered by skin. Gill opening wide; gill membranes united slightly behind posterior margin of eye, free from isthmus. Pore-bearing skin flap absent from just above upper angle of gill opening. A single pore with short tube in front of upper angle of gill opening. Infraorbital pores four; three large, slit-like pores between slightly behind anterior nostril and just below posterior nostril, a single, small pore above posterior end of maxillary. Supraorbital pore single, large, on underside of snout tip before anterior nostril (Fig. 2b). Two mandibular pores on each side; left and right anterior pores separated, left and right posterior pores united on ventral mid-line of head. A single, small pore near lower angle of preopercle.

All teeth sharp-pointed (Fig. 3). Upper jaw teeth uniserial, becoming longer anteriorly, needle-like. Lower jaw teeth biserial, inner teeth larger. About six teeth on vomer, uniserial, well separated, nearly equal to inner teeth on lower jaw. Palatine teeth about five, uniserial, slightly shorter than vomerine teeth. Tongue short, its tip bluntly pointed, free from mouth floor.

Developed rakers on anterior arch three, short, about equal in length to eye diameter. Pseudobranchial filaments absent.



Fig. 3. Upper and lower dentition of NTM S.14665-026, holotype of *Acarobythites larsonae* sp. nov. Scale bar indicates 0.5 mm.

Dorsal fin originating above mid-length of pectoral fin. Origin of anal fin at about mid-body. Pectoral fin short, no separated or free rays. Pectoral peduncle normal, broader than long. No spine on posterior margin of cleithrum. Pelvic fins not reaching to below tip of pectoral fin, closely adjacent at their bases, inserted slightly behind posterior margin of preopercle.

Head and body covered with mucous coating, completely devoid of scales. Tiny papillae sparsely present on anterior half of head. Lateral line indistinct.

Tips of neural spines of precaudal vertebrae pointed; first neural spine short, 2nd spine longest, erect, 5th to 11th spines short, well depressed (Fig. 4).

In alcohol, head and body uniformly creamy-yellow, slightly darker on dorsum of head and body, paler on belly. All fins and buccal cavity pale.

Distribution. Known only from the type locality (Field Island) and Cobourg Peninsula, western Arnhem Land, Northern Territory, Australia.

Etymology. Named *larsonae* after Dr. Helen K. Larson (NTM), who kindly sent me valuable bythitid and ophidiid specimens for study.

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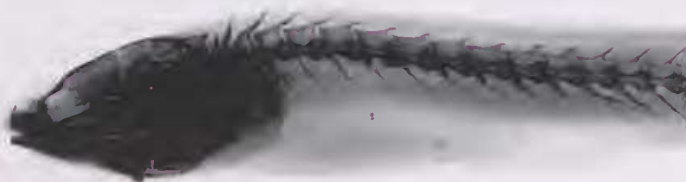


Fig. 4. Positive image of X-ray photograph of NTM S.14665-026, holotype of *Acarobythites larsonae* sp. nov.