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Record of the Amarsipa fish (Family Amarsipidae) from Pratas Island, South China Sea

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Abstract

Two specimens of the rare Amarsipa fish, *Amarsipus carlsbergi*, were collected from Pratas Island in the northern South China Sea. They represent the first record of Taiwanese EEZ and fill the distribution gap in the northwestern Pacific Ocean between Japan (East China Sea) and Vietnam. The two specimens were identified based on their diagnostic characteristics, including no pharyngeal sacs, a pelvic fin well in front of the pectoral fin, a slender body and other morphology. Detailed data and descriptions of these two specimens, including a description of otolith morphology, are provided.

Key words: Biodiversity, ichthyology, taxonomy, new record, Taiwan

Introduction

The Stromateoidei fish family Amarsipidae was established by Headrich (1969), with the description of the new genus and species, *Amarsipus carlsbergi* Hearrich, 1969, based on 47 small specimens (8–68 mm SL, no adults) collected from equatorial Indo-Pacific region. Subsequently, more records were documented from eastern Pacific (Ahlstrom et al., 1976), Western Indian Ocean (Haedrich, 1986; Anderson, 2022), Indian Ocean and Vietnam (Konovalenko & Piotrovskiy, 1989; Parin & Piotrovsky, 2004), Hawaiian Islands (Mundy, 2005), Australia (Bray & Hoese, 2006), and Japan (East China Sea) (Okamoto et al., 2011; Matsunuma & Okamoto, 2015). While the species has been discretely documented in the Indo-Pacific Ocean, most of the records pertain to juveniles or young individuals, with sexually mature adults being rare. Only Konovalenko & Piotrovskiy (1989) provided information on sexually mature adults (162–216 mm SL). However, the fundamental biology of *A. carlsbergi* remains poorly understood.

Recently, two distinct specimens of a fish belonging to the family Stromateidae were captured via bottom trawl at approximately 500 meters depth near the Pratas Island (Dongsha Atolls) in the northern South China Sea. Subsequent identification confirmed these two specimens as *A. carlsbergi*, based on the original description and additional references. These specimens were well-preserved, and we extracted their otoliths for future analysis. In this report, we present these two specimens as the first recorded occurrences in Taiwanese EEZ and provide a detailed description of their morphology and otoliths.

Methods and materials

Measurement and counting methodology followed Hubbs & Lagler (1958) in general. Counts were conducted both under a microscope and via radiographs. The terminology and description of otoliths followed Lin & Chang (2012)

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and Nolf (2013). The larger specimen has slight damage to its snout, and as such, measurements related to it were taken from the tip of the lower jaw, as the tips of the snout and lower jaw were vertically aligned. The specimens were deposited in the Pisces Collection of the National Museum of Marine Biology & Aquarium (NMMB-P).

Results

Family Amarsipidae

Amarsipus carlsbergi Headrich, 1969

Figures 1–2; Table 1

Amarsipus carlsbergi Haedrich, 1969: 5 (type locality: equatorial regions of Indo-Pacific Ocean); Ahlstrom et al., 1976: 305 (eastern Pacific); Haedrich, 1986: 842 (Mozambique); Konovalenko & Piotrovskiy, 1989: 86 (adults; Indian Ocean, South China Sea); Parin & Piotrovsky, 2004: 37 (Indian Ocean); Mundy, 2005: 510 (list, Hawaiian Islands); Bray & Hoese, 2006: 1786 (list, Australia); Okamoto et al., 2011:26 (East China Sea); Matsunuma & Okamoto, 2015: 216 (East China Sea); Anderson, 2022:297 (Mozambique Channel and Seychelles).

Specimen examined. NMMB-P38912, 2 specimens, 97.0–102.8 mm SL, Pratas Island, Dongsha Atolls, South China Sea, ca. 500 m, April 2023.

Description. Morphometric data are provided in Table 1. The following proportion values are given for 97.0 mm SL specimen, followed by those of 102.8 mm SL specimen in parentheses, when different or otherwise indicated.

Dorsal-fin rays XII, 23 (XII, 22); anal-fin rays 30 (first ray weak, assumed unsegmented); all dorsal and anal soft rays branched, last to base; pectoral-fin rays 18 (left side)/17 (right side) (16/17), all branched except uppermost; pelvic-fin rays I, 5; principal caudal-fin rays 9 (upper) + 8 (lower) = 17; procurrent caudal-fin rays present, about 6 or 7 on each upper and lower portion, anterior rays weakly developed; scales between first dorsal-fin base and lateral line ca. 15 (ca. 17), scales below lateral line and anal-fin origin ca. 35. Gill rakers of outer first gill arch 7 + 14 = 21. Pseudobranchial filaments ca. 20 (ca. 22). Branchiostegal rays 6. Vertebrae 17 + 29 (16 + 30) = 46.

Body relatively slender, deepest at pectoral-fin base, its depth 5.8 (5.6) times in SL, 1.4 (1.3) in HL, gradually becoming narrower posteriorly with slender caudal peduncle; body laterally compressed. Head relatively short and small, compressed, its length 4.1 (4.2) in SL; ventral part of head, chest, and abdomen slightly convex; snout short, its length 3.5 (3.7) in HL, subequal to eye diameter; eye moderately large, orbit diameter 3.4 (3.5) in HL; interorbital space broad, slightly concave at middle, its width 3.7 (broken) in HL; caudal peduncle long and compressed, even in depth, its depth 3.6 (3.4) in HL; its length 1.3 (1.1) in HL.

Mouth small, posterior end of maxilla reaching vertical through center of eye, upper jaw relatively short, its length 2.4 (2.7) in HL; first suborbital long and broad, covering most of maxilla; mouth slightly oblique, forming an angle of ca. 35 (30) degree to horizontal axis of body, lower jaw included, not projecting beyond tip of upper jaw, bearing a small knob at symphysis.

Pectoral fin moderately short, its length 1.9 (1.8) in HL, prepectoral length 4.0 (4.2) in SL, fin base broad, its upper end slightly above horizontal through middle of eye. Pelvic fin small, originated well in front of pectoral fin, its length 2.1 (2.8) in HL, prepelvic length 4.6 (4.7). Origin of first dorsal fin well behind gill cover, over posterior half of pectoral fin, predorsal length 3.0 in SL. Dorsal fins connected, with deep notch between two fins. First dorsal fin with short base, its length 6.3 (6.4) SL, all spines thin and weak, forming arch with middle spines longer, longest spine 4.6 (4.7) in HL; second dorsal fin with long base, its length 3.9 (3.6) in SL, higher than spinous dorsal fin, fin rays about equal in length with middle rays slightly longer, longest ray 2.9 in HL. Origin of anal fin about same vertical through origin of second dorsal fin, preanal length 2.1 (2.2) in SL, fin base slightly longer than that of second dorsal fin, length 3.0 in SL, shape similar to that of second dorsal fin, longest ray 2.9 (2.8) in HL. Caudal fin assumable forked (fin damaged in both specimens).

Single row of small, thin teeth on upper and lower jaws, loose and regular in arrangement and absent on posterior portion of both jaws; teeth on lower jaw slightly longer than those on upper. Single row of similar teeth on vomer. No teeth on palatine. Small spine-like teeth on pharyngeal arches and fifth ceratobranchial.

Gill membranes free from isthmus. Gill rakers short to moderately long, compressed, longest at angle, about half length of eye diameter; each bears scattered spine-like teeth. Nostrils small, anterior nostril lightly larger than posterior; nostrils well separated, anterior nostril well in front of midpoint of snout, posterior nostril before eye.

Gill cover weakly calcified, membrane-like; opercle with two broad, weak spines, upper spine smaller than lower one; small serrations on lower margins of subopercle, preopercle, and interopercle.

Scales small, deciduous, no scale remained on body in both specimens.

Coloration. Body dark gray to dark brown (Fig. 1); head darker; abdomen dark blue. Heavy melanophores on inner surface of gill cover; loose melanophores on gill arches and mouth cavity. Peritoneal membrane black.

Otolith morphology. Otoliths fusiform (Fig. 2), with pointed anterior rim and blunt posterior rim. Dorsal rim gently curved. Ventral rim also curved, angled anteriorly. Deep notch in anterior rim, forming largely extended, triangular rostrum and brief, obtuse antirostrum. All margins crenulated or lobate. Otoliths notably thin, with inner face slightly convex and outer face slightly concave. Sulcus centrally positioned, well-divided into ostium and cauda, with collum centrally located. Ostium vastly opens antero-dorsally, nearly entirely filled with low, oblong colliculum. Cauda elongated, straight, without colliculum. Cristae well-delineated, except at both ends. Shallow dorsal depression present above crista superior.

TABLE 1. Morphometric data of *Amarsipus carlsbergi* Haedrich, 1969, with comparison of two Japanese specimens retrieved from Okamoto et al. (2011) and Matsunuma & Okamoto (2015).

	NMMB-P38912		Japan	
Standard length (mm)	102.8	97.0	72.0	92.6
% SL				
Head length	23.5	24.4	28.1	28.4
Body depth	17.9	17.1	16.8	18.5
Snout length	6.3	7.0	-	-
Eye diameter	6.7	7.2	-	-
Interorbital width	-	6.6	-	-
Upper jaw length	8.8	10.0	-	-
Post-eye width	9.6	10.1	-	-
Predorsal length	33.3	33.5	34.3	33.0
Prepectoral length	23.8	25.3	-	-
Prepelvic length	21.2	22.0	21.9	23.9
Preanal length	45.0	48.0	41.8	47.4
1st dorsal-fin-base length	15.6	15.8	13.5	15.8
1st dorsal-fin height	5.1	5.4	-	-
2nd dorsal-fin-base length	27.7	25.9	33.5	32.8
2nd dorsal-fin height	8.1	8.6	-	-
Anal-fin-base length	33.8	33.5	36.7	38.2
Anal-fin height	8.6	8.5	-	-
Pectoral-fin length	12.8	12.7	16.9	17.2
Pelvic-fin length	8.4	11.6	-	-
Caudal peduncular length (upper)	24.5	22.8	-	-
Caudal peduncular length (lower)	21.6	19.5	18.8	17.3
Caudal peduncular depth	6.9	6.7	6.7	7.0
% HL				
Snout length	26.9	28.7	25.2	25.6
Eye diameter	28.4	29.3	31.2	30.1
Interorbital width	-	27.0	21.8	20.3
Upper jaw length	37.2	40.9	45.0	39.1
Post-eye width	40.9	41.4	-	-

FIGURE 1. *Amarsipus carlsbergi* Haedrich, 1969, NMMB-P38912, fresh, from Dongsha Atolls. A. 97.0 mm SL. B. 102.8 mm SL, with anterior portion of anal fin folded.

Distribution. Known from tropical regions of the Indian and Pacific oceans, two records from high latitude off Japan (East China Sea) (ca. 26–29°N).

Remarks. The original description of the species reveals significant variation in the dorsal-fin elements, ranging from 10 to 12 spines and 22 to 27 rays (mainly 11–12 spines and 24–25 rays) (Headrich, 1969). In contrast, both Japanese specimens consistently exhibited 11 spines and 26 rays (Okamoto et al., 2011; Matsunuma & Okamoto, 2015). Notably, our specimens have 12 spines and 22 or 23 rays, which fall in the lower range, suggesting a potential distinction from the East China Sea population.

Both of our specimens are immature based on the absence of developed gonads. Nevertheless, these two specimens are larger than the majority of specimens on record (e.g., Headrich, 1969 [8–68 mm SL, n=50]; Ahlstrom et al., 1976 [20.0–88.2 mm SL, n=19; 124.0, n=1]). Although their overall appearance resembles that of adults, they differ from the sexual adults documented by Konovalenko and Piotrovskiy (1989) in two aspects: the absence of palatine teeth (vs. teeth present) and the location of the pelvic fin, which is jugular in our specimens (vs. thoracic).

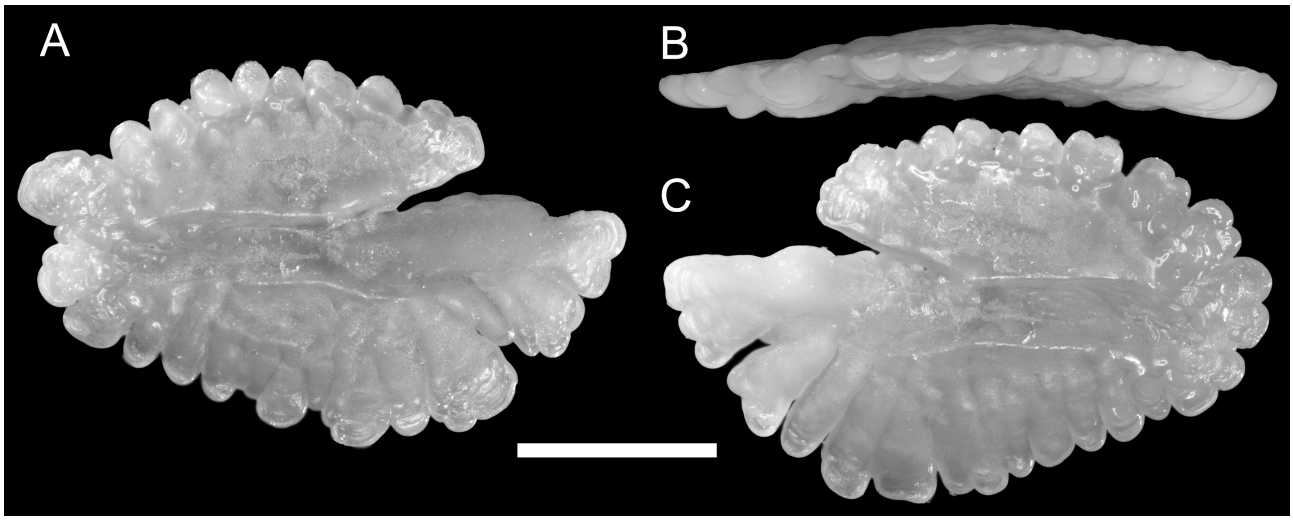

FIGURE 2. Otoliths (a pair of sagittae) of *Amarsipus carlsbergi* Haedrich, 1969. Specimens (CHLOL 24423) were taken from NMMB-P38912, 102.8 mm SL. A. Left otolith. B, C. Right otolith. A, C. Inner (mesial) views. B. ventral view. Scale bar = 1 mm.

The majority of smaller specimens were collected at depths of less than 200 meters according to Headrich (1969). In the East China Sea, the 72.0 mm specimen was collected from a depth of 599–601 meters, while a 92.6 mm specimen was found at a shallower depth of 0–35.2 meters (Matsunuma & Okamoto, 2015). Konovalenko & Piotrovskiy (1989) provided a large adult (166 mm SL) collected off southern Vietnam, was found at a depth of 760–800 meters. Our specimens were collected at a depth of approximately 500 meters by bottom trawl, as indicated by the bycatch in the same haul. Further investigation is required to understand the ecology of this species.

For the first time, this study provides a detailed description and visual representation of the otoliths of *A. carlsbergi*. The otoliths exhibit a fusiform outline typical of percomorph-type, featuring a distinct rostrum; they present a centrally situated sulcus that is well-divided into ostium and cauda, alongside well-developed cristae. Their lobate rims and remarkably slender profile share resemblances with otoliths observed in families such as Centrolophidae and Nomeidae (Smale et al., 1995; Lin & Chang, 2012; Nolf, 2013), taxa that may share a close phylogenetic relationship. It is worth noting that a recent molecular study by Harrington et al. (2022) has suggested a closer relationship between Amarsipidae and Tetragonuridae, although the otoliths of Tetragonuridae typically possess a very high dorsal area (Smale et al., 1995; Lowry, 2011; Nolf, 2013) and do not closely resemble those of Amarsipidae.

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References

Ahlstrom, E.H., Butler, J.L. & Sumida, B.Y. (1976) Pelagic Stromateoid fishes (Pisces, Perciformes) of the Eastern Pacific: kinds, distributions, and early life histories and observations on five of these from the northwest Atlantic. *Bulletin of Marine Science*, 26 (3), 285–402.

Anderson, M.E. (2022) Suborder Stromateoidei. *In*: Heemstra, P.C., Heemstra, E., Ebert, D.A., Holleman, W. & Randall, J.E. (Eds.) *Coastal Fishes of the Western Indian Ocean. Vol. 5*. South African Institute for Aquatic Biodiversity, Makhanda, pp. 296–298.

Haedrich, R.L. (1969) A new family of aberrant stromateoid fishes from the equatorial Indo-Pacific. *Dana Report*, 76, 1–14. https://doi.org/10.1575/1912/7481

Haedrich, R.L. (1986) Amarsipidae. *In*: Smith, M.M. & Heemstra, P.C. (Eds.), *Smiths' Sea Fishes*. Springer-Verlag, Berlin, pp. 842.

Harrington, R.C., Friedman, M., Miya, M., Near, T.J. & Campbell, M.A. (2022) Phylogenomic resolution of the monotypic and enigmatic *Amarsipus*, the Bagless Glassfish (Teleostei, Amarsipidae). *Zoologica Scripta*, 50 (4), 411–422. https://doi.org/10.1111/zsc.12477

Hoese, D.F., Bray, D.J., Paxton, J.R. & Allen, G.R. (2006) Fishes. *In:* Beasley, O.L. & Wells, A (Eds.) *Zoological Catalogue of Australia. Vol. 35.3*. ABRS & CSIRO Publishing, Clayton, pp. 1473–2178.

Hubbs, C.L. & Lagler, K.F. (1958) *Fishes of the Great Lakes Region*. University of Michigan Press, Ann Arbor, Michigan, 213 pp.

Konovalenko, I.I. & Piotrovskiy, A.S. (1988) First description of a sexually mature Amarsipa, *Amarsipus carlsbergi*. *Journal of Ichthyology*, 28 (5), 86–89.

Lin, C.-H. & Chang, C.-W. (2012) *Otolith Atlas of Taiwan Fishes*. National Museum of Marine Biology and Aquarium, Pingtung, 400 pp.

Lowry, M.S. (2011) Photographic catalog of California marine fish otoliths: Prey of California sea lions (Zalophus californianus). *NOAA Technical Memorandum*, 483, 1–250.

Matsunuma, M. & Okamoto, M. (2015) Second Japanese record of *Amarsipus carlsbergi* (Amarsipidae) from the East China Sea. *Bulletin of the Biogeographical Society of Japan*, 70, 215–219.

Mundy, B.C. (2005) Checklist of the fishes of the Hawaiian Archipelago. *Bishop Museum Bulletins in Zoology*, 6, 1–704.

Nolf, D. (2013) *The Diversity of Fish Otoliths, Past and Present*. Royal Belgian Institute of Natural Sciences, Brussels, 222 pp.

Okamoto, M., Hoshino, K. & Jintoku, T. (2011) First record of *Amarsipus carlsbergi* (Perciformes: Stromateoidei: Amarsipidae) from Japan and a northernmost range extension. *Biogeography*, 13, 25–29.

Parin, N.V. & Piotrovsky, A.S. (2004) Stromateoid fishes (Suborder: Stromateoidei) of the Indian Ocean (species composition, distribution, biology and fisheries). *Journal of Ichthyology*, 44 (1), S33–S62.
Smale, M.J., Watson, G. & Hecht, T. (1995) *Otolith atlas of southern African marine fishes*. J.L.B. Smith Institute of Ichthyology, Grahamstown, 420 pp.
https://doi.org/10.5962/bhl.title.141860