

A Record of the Rare Filefish, *Thamnaconus garretti* (Fowler, 1928), Collected around Midway Island, Central Pacific (Actinopterygii, Tetraodontiformes, Monacanthidae)

Keiichi Matsuura

Department of Zoology, National Museum of Nature and Science,
4–1–1 Amakubo, Tsukuba, Ibaraki 305–0005, Japan
E-mail: matsuura@kahaku.go.jp

(Received 12 November 2020; accepted 23 December 2020)

Abstract Four specimens of the rare filefish, *Thamnaconus garretti* (Fowler, 1928), were collected from the waters around Midway Island in the central Pacific. Detailed examinations of these specimens provide distinguishing characters of this filefish, placing it in the genus *Thamnaconus* Smith, 1949. Comparisons of the present specimens and previously reported specimens suggest that sexual dimorphism occurs in this rare filefish: the body is more elongate in males than females and the dorsal profile is slightly convex in males and straight in females.

Key words : Taxonomy, distribution, Monacanthidae, Midway Island, *Thamnaconus*.

Introduction

While examining filefish collections of the Maizuru Fisheries Research Station, Kyoto University, I found four specimens of the rare filefish, *Thamnaconus garretti* (Fowler, 1928). This filefish was previously known only from the holotype and additional 12 specimens collected from the Hawaiian Islands (Fowler, 1928; Randall, 1975, 2007). The four newly discovered specimens are described in detail below with comments on the species' taxonomic position and sexual dimorphism.

Materials and Methods

Four specimens of *Thamnaconus garretti* were collected by bottom trawl operated by the RV *Kaiyo-maru* off Midway Island in the central Pacific. Methods for counts and measurements follow Matsuura (1980). Institutional codes are as follows: Bernice Pauahi Bishop Museum, Honolulu (BPBM) and Maizuru Fisheries

Research Station, Kyoto University, (FAKU). Standard length and total length are abbreviated as SL and TL, respectively. Radiographs were used to count the number of vertebrae.

Thamnaconus garretti (Fowler, 1928)

(Figs. 1–2)

Paramonacanthus garretti Fowler, 1928: 459, fig. 78
(Hawaiian Islands)

Thamnaconus garretti: Randall, 2007: 481, unnumbered
figure (Midway Island).

Specimens examined. BPBM 16264 (167 mm SL), southern edge of Nero Bank in 44 fathoms, 28 nautical miles southwest of Midway Island, baited fish trap (1.5 hours), P.J. Struhsaker, aboard R/V *David Starr Jordan*, cruise 80, station 50, 26 August 1973; FAKU 109579 (94.4 mm SL), 109580 (94.4 mm SL), 330 km northwest of Midway Island, 29°25'N, 179°00'E, September 1973; FAKU 109558 (90.1 mm SL), 1000 km northwest of Midway Island, 32°13'N, 172°51.3'E, 9 September 1973; FAKU 125876 (male, 167 mm SL), 400 km northwest of Mid-

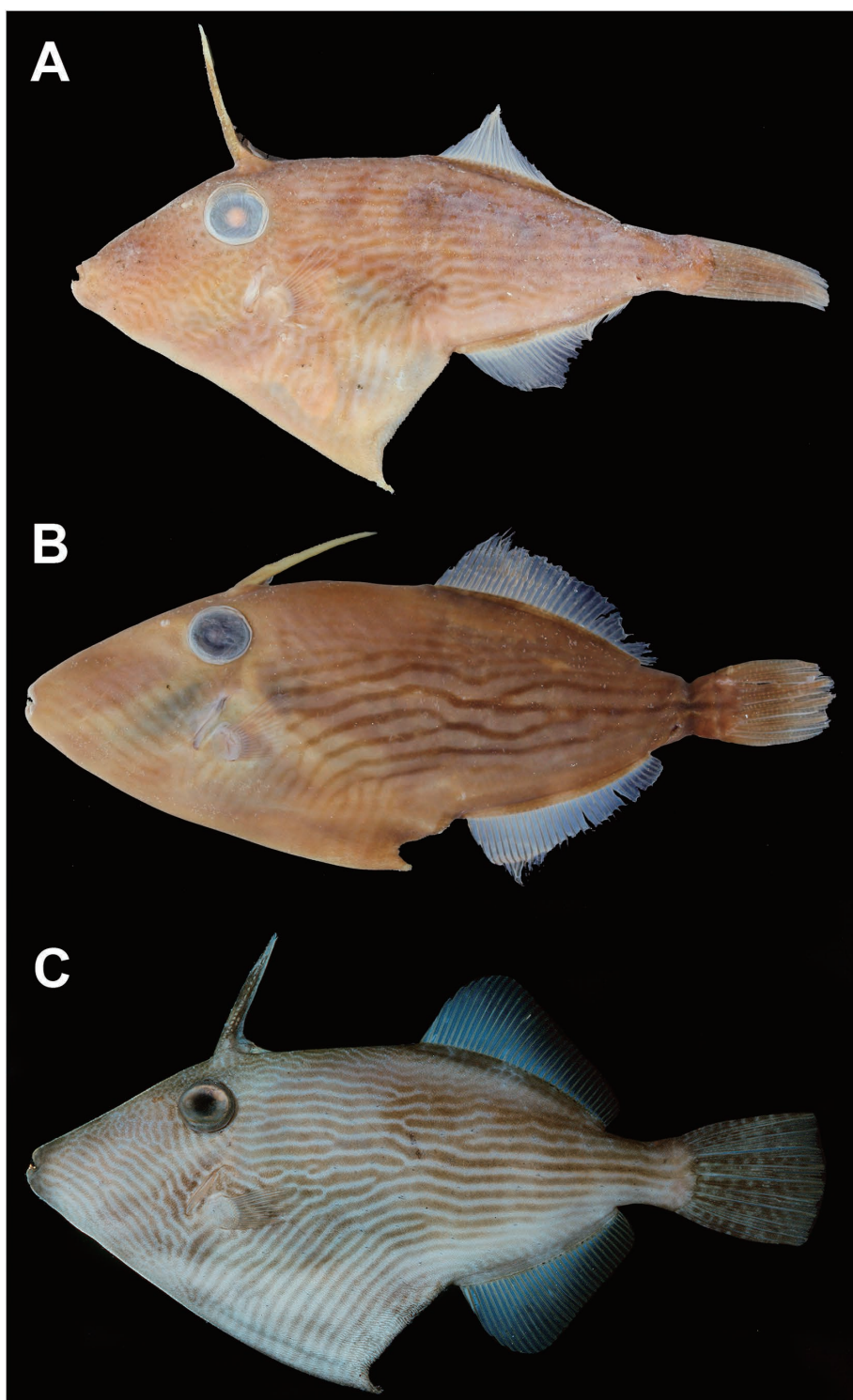


Fig. 1. *Thamnaconus garretti* collected around Midway Island. A, FAKU 109580, 94.4 mm SL; B, FAKU 125876, 167 mm SL (male); C, BPBM 16264, 167 mm SL. A and B, preserved specimens, photographs by F. Tashiro; C, defrosted specimen, photograph by J. E. Randall.



Fig. 2. X-ray photographs of *Thamnaconus garretti*. Top, FAKU 109580; bottom, FAKU 125876.

way Island, 30°15'N, 178°43.2'E, 330–710 m depth, 2 October 1972.

Diagnosis. Distinguished from other species of *Thamnaconus* by the following combination of characters: body behind eye covered with many longitudinal, narrow dark stripes; pelvic flap with many narrow dark stripes running almost parallel to postero-ventral edge of pelvic flap; head with similar narrow dark stripes but at right angles to those on pelvic flap.

Description. Dorsal-fin rays II+33–34; anal-fin rays 31–33; pectoral-fin rays 13; vertebrae 7+12=19. Body depth 2.9–3.1; head length 3.0–3.4; snout length 3.9–4.7; length of snout to first dorsal-fin origin 3.0–3.3; length of snout to anal-fin origin 1.5–1.6; length of snout to end of pelvic fin 1.5–1.7; length of second dorsal-fin base 3.1–3.3; length of anal-fin base 3.4–3.5; all in SL.

Body width 0.9–1.0; eye diameter 2.6–3.3; interorbital width 2.9–3.5; depth of caudal

peduncle 3.2–3.7; length of caudal peduncle 2.4–2.8; gill opening length 3.3–3.8; length of first dorsal-fin spine 1.2–1.3; length of longest dorsal-fin ray 1.9–2.0; length of longest anal-fin ray 1.7–2.2; length of longest pectoral-fin ray 2.4–2.8; length of caudal fin 1.2–1.7; all in HL.

Body moderately elongate and laterally compressed; dorsal profile of head straight or slightly convex; gill opening below eye; first dorsal-fin spine above posterior half of eye; two rows of 15–21 downward directed spinules on its anterior surface and one row of 10–20 downward directed spinules on each postero-lateral surface; second dorsal-fin spine short and feeble, embedded in fin membrane; a shallow groove behind first dorsal-fin spine on dorsal surface of body; second dorsal and anal fins elevated anteriorly; pectoral fin short and rounded; caudal fin slightly rounded; pelvic terminus immovable, composed of two pairs of encasing scales.

Color in alcohol: ground color of body light brown covered with many longitudinal, dark brown stripes; pelvic flap with many narrow dark stripes running almost parallel to postero-ventral edge of pelvic flap; head with similar narrow dark stripes but at right angles to those on pelvic flap; first dorsal-fin spine light brown; caudal fin dark brown; pectoral, second dorsal and anal fins pale.

Remarks. Fowler (1928) described *Paramonacanthus garretti* based on a single specimen (77 mm SL, 94 mm TL) collected by Andrew Garrett from the Hawaiian Islands. Randall (1975) redescribed this species and placed it in the genus *Pseudomonacanthus* Bleeker, 1865 based on the holotype and 12 additional specimens (71–167 mm SL) collected by trawl and fish trap at depths of 67–84 m off O'ahu Island and Nero Bank 28 nautical miles southwest of Midway Island. Uchida and Uchiyama (1986) included this filefish under the name of *Pseudomonacanthus garretti* in the list of fishes collected by trawl at depths of 31–187 m northwest of the Hawaiian Islands. However, this species is different from members of *Pseudomonacanthus* in having the second dorsal and anal fins elevated anteriorly.

Pseudomonacanthus is characterized by the following combination of characters: moderately elongate body; gill opening mostly before middle of eye; first dorsal-fin spine over posterior half of eye, the spine with four rows of spinules (posterolateral ones larger than anterior); no deep groove on dorsal surface of body for reception of this spine when depressed; pelvic terminus immovable, composed of two pairs of encasing scales; and second dorsal and anal fins not elevated anteriorly (Fraser-Brunner, 1940; Hutchins, 1977; Randall, 1975). Randall (2007) removed this filefish from *Pseudomonacanthus* to *Thamnaconus* Smith, 1949. He stated that he followed the suggestion of Barry Hutchins about the classification of this species, however, he did not indicate by which characters he placed this rare filefish in *Thamnaconus*.

Thamnaconus is distinguished from other genera of the Monacanthidae by the following combination of characters: first dorsal-fin spine with a row of laterally-directed barbs along each lateral edge; its origin over center or posterior half of eye; shallow groove for receiving first dorsal-fin spine when depressed; second dorsal and anal fins elevated anteriorly; pelvic terminus immovable, composed of two pairs of encasing scales; 19 vertebrae (Matsuura, 1978; Hutchins, 1977, 1986). All these characters are found in *P. garretti*, therefore reasonably classifying it within *Thamnaconus*.

Examination of the gonads of FAKU specimens showed that FAKU 125876 (167 mm SL) is male but it was not possible to determine the sex of the other three specimens because of the poor condition of the gonads. Randall (1975) said "the gonads of the adults were small, and microscopic examination was necessary to determine that two are males and two females." However, he did not mention whether he found sexual dimorphism and which specimens are males and females. The male, FAKU 125876 (167 mm SL), suggests that *T. garretti* has sexual dimorphism in the body and head shape. It has a more elongate body than BPBM 16264 (167 mm SL), and the dorsal profile of head is slightly convex in the

FAKU specimen and straight in the BPBM fish. Considering the same size of these specimens, the differences of the body and head shape may well be due to sexual dimorphism. This speculation is supported by the fact that the same sexual dimorphism in body and head shape was reported in members of *Paramonacanthus* by Hutchins (1997), *Thamnaconus modestus* (Günther, 1877) by Ebina (1932) and Yamada (2007), and *T. hypargyreus* (Coper, 1871) by Yamada (2007).

Acknowledgments

I am grateful to Yoshiaki Kai (FAKU) for specimen loan. I thank John E. Randall and Arnold Suzumoto for providing a photograph of *Thamnaconus garretti* (Fig. 1C) and collection data, and Fumihito Tashiro (FAKU) for taking photographs of FAKU specimens (Fig. 1A and B). Masanori Nakae of the National Museum of Nature and Science kindly took X-ray photographs of *T. garretti*. Helen K. Larson of the Museum and Art Gallery of the Northern Territory provided helpful comments on the manuscript.

References

- Bleeker, P. 1865. Atlas ichthyologique des Indes Orientales Néerlandaises, publié sous les auspices du Gouvernement colonial néerlandais. Tome V. Baudroies, Ostracions, Gymnodontes, Balistes. 1–152, pls. 194–231.
- Cope, E. D. 1871. Contribution to the ichthyology of the Lesser Antilles. Transactions of the American Philosophical Society (New Series), 14: 445–483.
- Ebina, K. 1932. Sexual dimorphism in a file-fish, *Cantherhinus modestus* (Günther). Journal of the Imperial Fisheries Institution, 27: 15–18.
- Fowler, H. W. 1928. The fishes of Oceania. Memoirs of the Bernice Pauahi Bishop Museum, (10): i–iii+1–540, pls. 1–49.
- Fraser-Brunner, A. 1940. The fishes of the genus *Pseudomonacanthus* with descriptions of two new species. Bulletin of the Raffles Museum, 16: 62–67, ps. 21–23.
- Günther, A. 1877. Preliminary notes on new fishes collected in Japan during the expedition of H. M. S. 'Challenger.' Annals and Magazine of Natural History, (Series 4), 20: 433–446.
- Hutchins, J. B. 1977. Descriptions of three new genera and eight new species of monacanthid fishes from Australia. Records of the Western Australian Museum, 5: 3–58.
- Hutchins, J. B. 1986. Monacanthidae. In Smith, M. M. and P. C. Heemstra (eds.): Smith's Sea Fishes, pp. 882–887, pls. 137–139. Springer-Verlag, Berlin.
- Hutchins, J. B. 1997. Review of the monacanthid fish genus *Paramonacanthus*, with descriptions of three new species. Records of the Western Australian Museum, Supplement 54: 41–57.
- Matsuura, K. 1978. Phylogenetic studies of the superfamily Balistoidea, with the taxonomy of the species found around Japan and its adjacent waters. 336 pp., Doctoral Dissertation of Hokkaido University, Hakodate.
- Matsuura, K. 1980. A revision of Japanese balistoid fishes. I. Family Balistidae. Bulletin of the National Science Museum, Series A, 6: 27–69.
- Randall, J. E. 1975. Notes on the Hawaiian filefish *Pseudomonacanthus garretti*. Japanese Journal of Ichthyology, 21: 223–226.
- Randall, J. E. 2007. Reef and Shore Fishes of the Hawaiian Islands. xvi+546 pp., University of Hawai'i, Honolulu.
- Smith, J. L. B. 1949. The Sea Fishes of Southern Africa. 550 pp., 111 pls., Central News Agency, Ltd., South Africa.
- Uchida, R.N. & Uchiyama, J.H. (eds.) 1986. Fishery atlas of the Northwestern Hawaiian Islands. National Oceanic and Atmospheric Administration, Technical Report of the National Marine Fisheries Service, 38: 1–142.
- Yamada, U. 2007. Monacanthidae. In Yamada, U., M. Tokimura, H. Horikawa and T. Nakabo (eds.): Fishes and Fisheries of the East China and Yellow Seas, pp. 1169–1189.