

Notes on the Hawaiian Filefish
Pseudomonacanthus garretti

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Fowler (1928; 459, Fig. 78) described the monacanthid fish *Paramonacanthus garretti* from a specimen 94 mm in total length that had been collected by Andrew Garrett. No other collecting data are available. The type is in the Museum of Comparative Zoology of Harvard University. Andrew Garrett collected fishes for the Museum in the Hawaiian Islands and elsewhere during the period 1856~1864.

Nothing further has been written on this filefish. Fraser-Brunner (1941) failed to include it in his synopsis of the family. Gosline and Brock (1960) also omitted it.

The author examined and photographed the holotype (Fig. 1) in 1962 while making a study of filefishes of the genera *Amanses* and *Cantherhines* in the expectation that it would prove to be the young of a known adult. The specimen seemed to be a pre-juvenile or transforming individual in view of its relatively large eye and silvery abdomen.

It was soon apparent that the fish cannot be classified in the genus *Paramonacanthus*, for it has a fixed pelvic terminus (pelvic spine of most authors), whereas that of *Paramonacanthus* is movable. Though close to *Cantherhines*, it did not seem to belong in this genus either, because the gill opening is centered below the eye instead of the posterior half of the eye, and the first dorsal spine is over the posterior third of the eye. Also, the groove in the back into which the first dorsal spine folds is not as deep as that of species of *Cantherhines*. The specimen was tentatively regarded as a *Pseudomonacanthus*. It could not be linked to the adult of any species.

On August 27~29, 1973, seven unusual striped filefish were taken by the vessel "Valiant Maid" with a trawl at an average depth of 84 m off Haleiwa, Oahu, at night on a predominately sand bottom. The vessel

was under charter at this time to the Hawaii Institute of Marine Biology of the University of Hawaii for a shrimp survey. These fishes proved to be *Pseudomonacanthus garretti*; four were deposited at the Bishop Museum (BPBM 15487, 75~88 mm SL) and three at the University of Hawaii (UH 73~133, 71~88.5 mm SL).

A few days later four frozen specimens of *P. garretti* were presented to the Museum by Paul Struhsaker (BPBM 16264, 135~167 mm SL). He had caught them on August 26 in a fish trap in 67 m at the southern edge of Nero Bank, Leeward Hawaiian Islands (27°58'N; 177°53.5'W), 28 nautical miles SW of Midway Island, during Cruise 80 of the National Marine Fisheries Service vessel "David Starr Jordan". The trap was set for a period of 1.5 hours. The largest of these four fishes was photographed by the author (Fig. 2).

On September 19, still another specimen was obtained from the trawling operation of the "Valiant Maid" off Haleiwa (BPBM 15536, 81 mm SL).

Of the monacanthid genera recognized by Fraser-Brunner (1941), *Pseudomonacanthus* seems best suited for *garretti*. Fraser-Brunner (1940) reviewed the four species of this genus, two of which he described as new. He stated that the genus is apparently confined to the Indo-Australian region, though the locality for one species, *P. elongatus*, was unknown. He presumed that it might be Tasmania; however, it is more likely the Great Barrier Reef as the collector, Saville-Kent, obtained many of his fishes there. The Australian Museum has two specimens of this species collected by De Vis at Cape York (Douglass F. Hoese, personal communication).

If the characteristics given by Fraser-Brunner (1940) are combined with some of the significant features from the key of his synopsis of 1941, the following diagnosis may be obtained: first dorsal spine originating over posterior half of eye, the spine with four rows of spinules (postero-lateral ones larger than anterior); no deep groove for reception of this spine when depressed; pelvic terminus small, not movable; form oblong; ventral

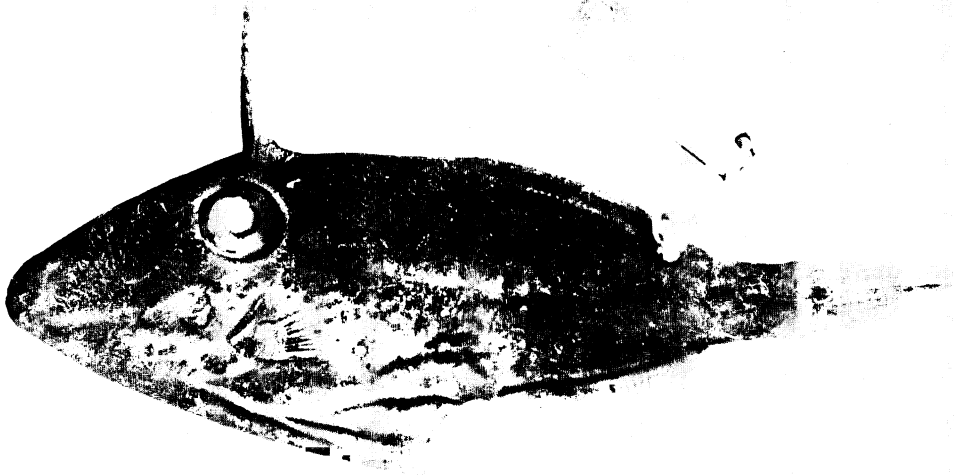


Fig. 1. Holotype of *Pseudomonacanthus garretti* (Fowler). SL 77 mm. MCZ 11808, Hawaiian Islands.

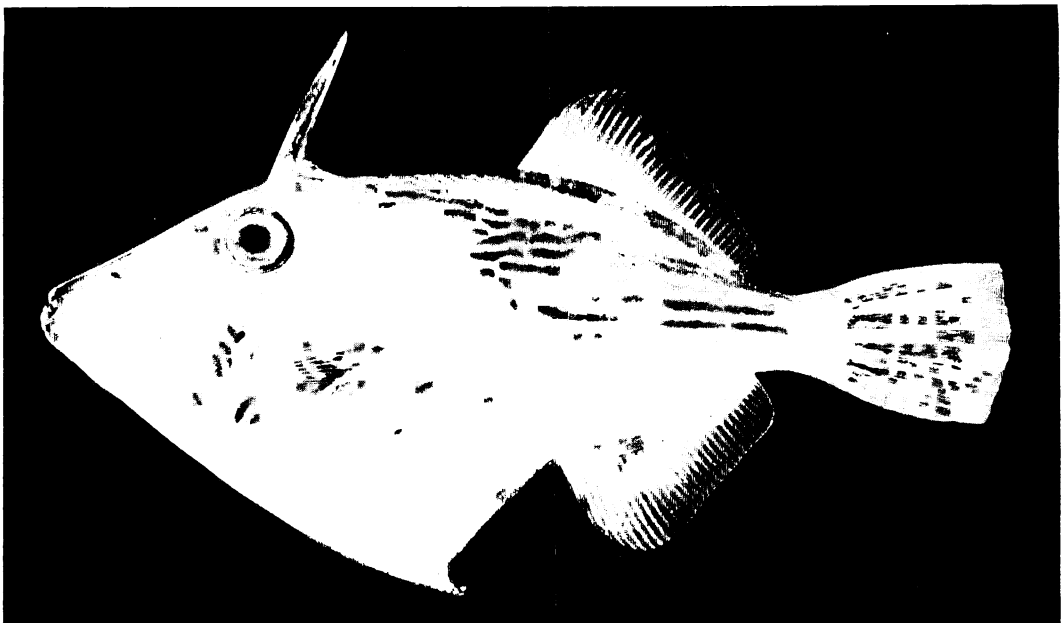


Fig. 2. *Pseudomonacanthus garretti*, SL 167 mm. BPBM 16264, Nero Bank, Hawaiian Islands.

flap moderately developed; gill opening mostly before middle of eye; scales very small without strong spinules or mushroom-like projections; dermal filaments more-or-less developed; soft dorsal and anal fins low.

Only in the last cited characteristic does

P. garretti fail to comply with the diagnosis: its soft dorsal and anal fins are moderately elevated anteriorly; the longest ray of each fin (the eighth) is contained about 2.5 times in the head. This one character should not invalidate the generic allocation, however.

The genus *Cantherhines* has species with low soft dorsal and anal fins and ones in which these fins are elevated anteriorly (Randall, 1964). Still, as Randall (1964) has pointed out, a reappraisal of the generic classification of Fraser-Brunner should be undertaken.

Counts and measurements of specimens of *P. garretti* given in the description below follow those of Berry and Vogeles (1961), except body depth which was taken from the origin of the anal fin vertically to the groove at the base of the dorsal sheath.

Description. Dorsal rays II-33 or 34; anal rays 31 to 33; pectoral rays 13 or 14 (three of 13 specimens with 14 rays) (rudimentary upper ray not counted); caudal rays 12; gill rakers 25 to 29 (nine specimens); vertebrae 7+12 (four specimens).

Depth of body at origin of anal fin 2.6 to 3.2 in SL; greatest depth of body with pelvic bone fully depressed 1.5 to 1.8 in SL; width of body just behind upper end of gill opening 2.3 to 3.2 in depth at origin of anal fin; head length (to upper end of gill opening) 2.9 to 3.1 in SL; snout 3.75 to 3.9 in SL, the upper profile slightly concave to straight, forming an angle of about 30°; gill opening centered below middle of eye, forming an angle of about 50°, its length 3.3 to 3.45 in head; eye 3.0 to 3.7 in head; bony interorbital width 3.3 to 3.75 in head; least depth of caudal peduncle 2.95 to 3.4 in head; length of caudal peduncle (measured horizontally to rear base of anal fin) 3.2 to 4.1 in head; caudal fin moderately rounded, its length 3.45 to 4.7 in SL (relatively shorter with age); first dorsal spine slender, straight to very slightly curved, 1.2 to 1.5 in head length; second dorsal spine small and feeble, its length contained about 6 to 10 times in first spine (second spine relatively longer in juveniles); longest dorsal ray (eighth) 2.2 to 2.7 in head; longest anal ray (eighth) 2.25 to 2.8 in head; first dorsal and anal soft rays 2.25 to 2.8 in longest rays of these fins; last dorsal and anal soft rays 3.5 to 4.4 in longest rays; pectoral fins short, their length 2.5 to 3.15 in HL (these fins relatively shorter on larger individuals).

Anterior edge of first dorsal spine above or slightly behind a vertical through center of eye (thus axis of spine is posterior to middle

of eye); spine with two rows of down-curved spinules on anterior surface and one row on each postero-lateral surface, the number of spinules in the latter rows varying from 15 in smaller specimens to 24 in the larger ones (longest spinule of 167 mm specimen 1.3 mm); groove in back posterior to first dorsal fin shallow, only the basal half or less of first dorsal spine fitting into groove when spine depressed. Origin of anal fin below base of fifth to seventh dorsal soft rays. All fin rays unbranched except median 10 caudal rays.

Pelvic terminus immobile, small, its length about one-third to one-half eye diameter, containing two backward-directed pairs of spines, one upward pair, one diagonally upward and forward, and one forward-directed pair, in addition to a number of small spinules on ventral surface. Anus large, its length when pelvic flap is fully stretched contained 0.6 to 0.8 in eye diameter.

Dentition typical of the family.

Scales small, each with about 7 to 23 slender spinules (not over 0.3 mm in 167 mm specimen). Scattered small slender dark-colored cutaneous filaments on head and body.

Color in alcohol light bluish gray with narrow dark brown stripes on body approximately equal in width to pale interspaces, these stripes slightly irregular and occasionally branching; stripes on lower posterior half of body angling downward onto ventral flap as they pass anteriorly; stripes on head diagonal, running at about right angles to those on ventral flap, and breaking into spots dorsally; spots also present mid-dorsally between dorsal fins; scattered tiny cutaneous filaments blackish, hence more evident on pale interspaces than dark stripes; orbit with a very narrow margin of dark brown; posterior median edge of ventral flap narrowly brown, becoming dark brown at rim of anus; first dorsal spine brown except tip of spinules which are whitish; membrane of first dorsal fin brown except basally where pale; soft dorsal, anal, and pectoral fins pale, the rays edged in brown; caudal fin with membranes pale, the rays brown with large brown spots which form irregular vertical bands when fin not expanded.

The following color note was made of the

juveniles of BPBM 15487 by the author when picked up from the deck of the "Valiant Maid" a few hours after being trawled: pale yellowish with brown stripes (diagonal on abdomen and diagonal in opposite direction on head) which break into spots on upper snout; membranes of second dorsal, anal, pectoral, and caudal fins clear; rays of second dorsal fin yellow; rays of anal and pectoral fins broadly banded in light yellowish and brown; caudal rays brown, banded in dark brown.

After being frozen for one month, the adult of Fig. 2 was whitish with yellowish brown stripes; the soft dorsal and anal rays were yellowish brown, the membranes pale; the caudal rays were alternately spotted with brown and whitish.

Remark. Only juveniles of this filefish were taken in the shrimp trawl, thus suggesting that the adults were either not present in this habitat or, more likely, that they succeeded in avoiding the trawl.

Food material was present in the intestine (principally posteriorly) of the four juveniles of BPBM 15487. This consisted almost entirely of hydroids: *Corhiza complexa*, *Theocarpus niger*, and *Solanderia secunda*.

Three of the four adults collected by Struhsaker in the trap at Nero Bank contained food in the stomachs. These fishes had fed primarily on green algae *Ulva* sp., didemnid tunicate, and a small amount of foraminifera. One stomach also contained some small echinoid spines. This is an unusual depth for *Ulva*; there was no algae on the trap, and it had been baited with shrimp (*Heterocerpus*).

The gonads of the adults were small, and microscopic examination was necessary to determine that two are males and two females.

Fraser-Brunner (1940) noted that three of the four species included in his review of *Pseudomonacanthus* may have a series of three antrorse spines on the ventral half of the caudal peducle. Such spines, he added, appear to be confined to females (which is unusual for monacanthid fishes; one would expect a greater spine development at this location in males). None of the specimens of *P. garretti* display such spines.

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ハワイ産のカワハギ科魚類 *Pseudomonacanthus garretti* について John E. Randall

Pseudomonacanthus garretti は従来未成熟の模式標本によってのみ知られていた。この種の成魚標本が最近ハワイから得られたので記載する。