

New species of *Paratriacanthodes* spikefish (Triacanthodidae: Tetraodontiformes) from the South China Sea

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Abstract.—A new species of deep-water triacanthodid spikefish from the MacClesfield Bank in the South China Sea between the Philippines and Vietnam is described in the subfamily Triacanthodinae as *Paratriacanthodes abei*. It differs from the other two species of that western Pacific and Indian Ocean genus in several meristic and proportional characteristics and in coloration.

Among fishes received from the Fisheries Research Station of Hong Kong in 1972 for deposit in the Smithsonian Institution's National Museum of Natural History (USNM) is the single specimen of a new species of the genus *Paratriacanthodes* described below. It had been identified for shelving purposes when received as the more common of the two species then known.

Methods.—Descriptive data are in conformity with those of the revision of the family by Tyler (1968).

Paratriacanthodes abei, new species

Fig. 1

Holotype.—USNM 342571, 49.9 mm SL, mature male, MacClesfield Bank, South China Sea, 16°19.3'–16°22.2'N, 114°29'–114°24.5'E, 200–210 fathoms (366–384 m), 20 Jun 1964, RV *Cape St. Mary*, cruise 3/64, station 55, Agassiz trawl.

Diagnosis.—A member of the Triacanthodinae (posterior process of pelvis flattened and tapering posteriorly; supraoccipital flattened, as determined from a radiograph) referable to *Paratriacanthodes* by the unique combination in that genus of: short snout; conical teeth in a single series; short pseudobranch with few lamellae; dorsal-fin spines decreasing gradually in length posteriorly; and gill opening moderate. Differs from the two previously known species

of the genus, *P. retrospinis* Fowler and *P. herrei* Myers, by having: 16 dorsal-fin rays (versus usually 15 in the other two species); 14 anal-fin rays (versus usually 13); 13 pectoral-fin rays (versus usually 14); 7–8 olfactory lamellae (versus 10–14); greater body depth (54% SL versus about 40–47% SL); longer first dorsal-fin spine (38% SL versus about 28–32% SL); and color pattern with wavy reticulate stripes (versus alternating dark and light horizontal lines).

Description.—See Table 1 for meristics of the fins, teeth, gill rakers, and olfactory and pseudobranch lamellae of the new species in comparison to those of related species. The intact right side (left side has a large cut) is shown in Fig. 1.

Body depth 54.3% SL. Head length 38.9% SL, with a slightly concave profile. Snout short, 12.4% SL. Distance between tip of snout and base of first dorsal-fin spine 47.7% SL. Orbit 15.6% SL; width of relatively flat interorbital 7.0% SL. Postorbital length of head 9.4% SL. Gill opening relatively short, reaching ventrally only to a level about one-fifth down pectoral-fin base, 4.8% SL. Lamellae of pseudobranch reaching ventrally to a level just above top of pectoral-fin base. Width of slightly supraterminal mouth 7.0% SL. A single series of strong, bluntly conical teeth in each jaw. Vertebrae 8 + 12 = 20.

Length of pelvic-fin spine 34.3% SL;

Table 1.—Meristics of the species of *Paratriacanthodes* and *Mephisto*.

	<i>P. retrospinis</i>			<i>P. herrei</i>			<i>P. abei</i>	<i>M. fraserbrunneri</i>	
	No. Spec.	Range	Average	No. Spec.	Range	Average	Holotype	No. Spec.	Range
Dorsal rays	65	14–16	15.0	3	15	—	16	5	16
Anal rays	65	12–14	13.0	3	13	—	14	5	14
Pectoral rays*	128	13–15	13.9	6	14–15	14.2	13	9	14
Pelvic rays*	130	1	—	6	1–2	1.7	1	10	1
Olfactory lamellae	38	10–13	11.8	2	13–14	—	7–8	2	9–10
Pseudobranch lamellae	36	12–16	13.5	3	21–24	22.3	12	2	18–19
Gill rakers	37	17–23	20.3	3	19–21	20.0	18	2	19
Teeth, upper jaw	45	10–18	14.7	3	13–17	15.0	15	2	17
Teeth, lower jaw	45	15–24	19.2	3	16–19	17.3	23	2	19–20

* Usually two fins from the same specimen.

length of unbranched rudimentary ray 1.0% SL. Basal flange of pelvic-fin spine only slightly grooved, apparently with a single position of spine erection against pelvis

(fully erect, at a right angle to pelvis). External surface of posterior process of pelvis flattened, with upturned lateral edges and tapering to a blunt point posteriorly. Length

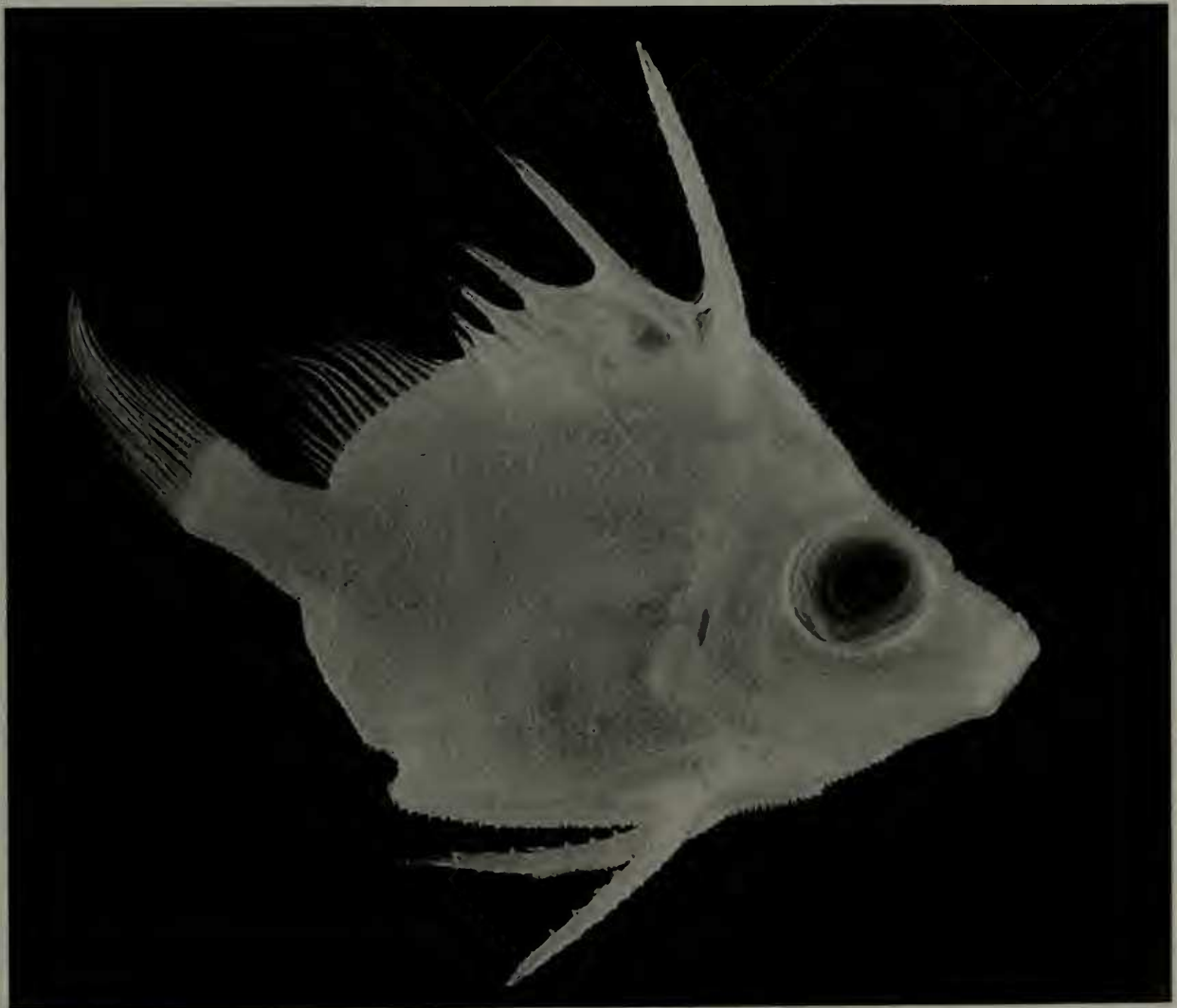


Fig. 1. *Paratriacanthodes abei*, new species, holotype, USNM 342571, 49.9 mm SL, South China Sea: the anal fin is folded up against the side of the body; the pelvic-fin spines from both sides of the body are visible, that of the left side less fully erected than the other.

of posterior pelvic process 36.3% SL; its width between pelvic-fin spines 8.8% SL. Pectoral-fin length 17.2% SL; length of uppermost ray 5.1% SL. Lengths of dorsal-fin spines, from first to last, 38.0, 33.3, 24.4, 16.8, 9.4, and 4.0% SL. Soft dorsal-fin base 20.0% SL; longest ray 21.0% SL. Anal-fin base 17.6% SL; longest ray 17.4% SL. Anal-fin origin at level of about third dorsal-fin ray. Caudal-peduncle depth 10.0% SL; its length 17.0% SL. Caudal-fin length 30.5% SL. Caudal-fin rays 12, with 10 unbranched.

Most of the scales of the body have a row of three upright spinules, the center one the longest, but some scales have only a single central spinule, and the lateral-line scales have a pair of spinules surrounding the pore; the spinules are all simple. There is a broad patch of spinulose scales on the upper lip but none on the lower lip. Spinulose scales extend out most of the length of the soft dorsal-fin rays and along all but the distal one-tenth of the length of the dorsal-fin spines. Some of the spinulose scales are slightly enlarged laterally on the first dorsal-fin spine, but none of them is retrorse.

The color pattern is faded, but melanophores indicate a pattern of wavy reticular stripes, one below the spiny and soft dorsal fins and another with very irregular outlines from the eye, over the pectoral-fin base, and onto the top of the abdomen, with an irregular pattern in the region between these two wavy stripes. There are no well-defined horizontal lines or spots in the pattern. The peritoneum is tan, lightly speckled with darker color.

The color in life is unknown, but if the new species is like other triacanthodins for which living color is known, the wavy reticulate stripes are probably pale blue and the background color pinkish red.

Etymology.—The patronym is given in honor of the late Dr. Tokiharu Abe (3 Apr 1911–9 Aug 1996), of the Museum of Tokyo University and of the Fish Museum at Tsukiji Fish Market, an authority on the fishes of Japan, and especially on the te-

traodontiform fugus; he always shared his enthusiasm, knowledge, and specimens with other researchers having similar interests.

Remarks.—One of the two previously described species of *Paratriacanthodes*, *P. herrei* Myers, is known from only the three type specimens from the Philippines, and until recently the other species, *P. retrospinis* Fowler, was known from only twelve specimens, the four type specimens from the South China Sea and eight others from Japan and east Africa (Tyler 1968, Amaoka 1982). However, a large series of 65 specimens of *P. retrospinis* has recently been collected by ORSTOM expeditions around New Caledonia in the South Pacific, and the species has been redescribed by Matsuura & Tyler (1997) on the basis of these 65 specimens. Therefore, the degree of variability in meristics of *P. retrospinis* can be compared with the meristics of the new species.

The dorsal-, anal-, and pectoral-fin rays of *P. abei* are, respectively, 16, 14, and 13, whereas in *P. retrospinis* only 3 of 65 specimens (7 from Tyler 1968, and 58 from Matsuura & Tyler 1997) have 16 dorsal-fin rays, only 2 of 65 have 14 anal-fin rays, and only 6 of 128 pectoral fins counted have 13 rays; all three specimens of *P. herrei* have 15 dorsal-, 13 anal-, and 14 pectoral-fin rays, like the large majority of specimens of *P. retrospinis*. There is no overlap in the number of olfactory lamellae between *P. abei* (7–8) and the other two species (10–14) of the genus.

There also is no overlap in the proportional measurements of body depth and dorsal-spine length between *P. abei* and the other two species of the genus. Relative body depth decreases somewhat with increasing body length from juveniles to adults in triacanthodids. The average body depth in *P. retrospinis* is 46% SL at sizes between 22–40 mm SL and 40% SL at sizes between 51–110 mm SL. Thus, *P. retrospinis* at all sizes has a more slender body than *P. abei* (54% SL), as do the three

specimens of *P. herrei*, with an average depth of 47% SL for the 66–71 mm SL specimens. The length of the first dorsal-fin spine in *P. retrospinis* ranges from 28–33% SL (\bar{X} 31% SL) and in *P. herrei* from 31–33% SL (\bar{X} 32% SL), whereas it is 38% SL in *P. abei*.

There are some similarities between *P. abei* and one or the other previously described species of the genus. The number of pseudobranch lamellae is relatively low in both *P. abei* (12) and *P. retrospinis* (12–16), versus *P. herrei* (21–24). The gill opening is relatively shorter in both *P. abei* (4.8% SL) and *P. retrospinis* (3.7–6.6% SL, \bar{X} 5.3), versus *P. herrei* (7.0–7.6% SL, \bar{X} 7.3). The postorbital portion of the head is relatively shorter in *P. abei* (9.4% SL) and *P. retrospinis* (8.0–10.5% SL, \bar{X} 9.2), versus *P. herrei* (10.8–11.7% SL, \bar{X} 11.2). The pelvic-fin ray is relatively shorter in *P. abei* (1.0% SL) and *P. retrospinis* (1.5–3.8% SL, \bar{X} 2.4), versus *P. herrei* (5.1–7.2% SL, \bar{X} 6.3). Conversely, both *P. abei* and *P. herrei* lack retrorse barbs on the first dorsal- and pelvic-fin spines, whereas these are well developed in *P. retrospinis*. *Paratriacanthodes abei* and *P. herrei* have only slightly grooved flanges at the base of the pelvic-fin spine and only a single position of erection, whereas this flange is well grooved in *P. retrospinis*, allowing for multiple positions of erection.

Paratriacanthodes abei shares several features with the single species of *Mephisto*, *M. fraserbrunneri* Tyler, including numbers of dorsal- and anal-fin rays (respectively 16 and 14 in both species) and low numbers of olfactory lamellae (7–8 in *P. abei* and 9–10 in *M. fraserbrunneri*). Both *P. abei* and *M. fraserbrunneri* have relatively irregular wavy stripes or blotches on the body versus more regular horizontal lines in *P. retrospinis* and *P. herrei*. These similarities between *P. abei* and *M. fraserbrunneri* presumably are either primitive or independently derived. The two species can

most easily be distinguished by the much greater depth of the gill opening in *M. fraserbrunneri* (12–14% SL, reaching to a level slightly below the pectoral-fin base, versus 5% SL and reaching only to the upper region of the pectoral-fin base in *P. abei*).

All three species of *Paratriacanthodes* are known to occur in either the South China Sea (*P. abei* and *P. retrospinis*) or the adjacent Philippines (*P. herrei*). Only *P. retrospinis* is known to have a wider distribution outside of this area, with records from Japan and China to South Africa and into the western Pacific as far as New Caledonia (Matsuura & Tyler 1997). A specimen of *P. retrospinis* from Fiji examined for this paper extends the range even further to the east (University of the South Pacific cat. no. 4393, 33.7 mm SL, from 485 m depth on the Suva Barrier Reef, 30 September 1981, R/V *Nautilus*).

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