

A Record of a Little Squaloid Shark, *Squaliolus laticaudus*, from Suruga Bay

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Recently two little specimens of a squaloid shark, taken along with *Sergestes lucens* HANSEN (deep water shrimp commercially fished in Suruga Bay), have been received for identification from Dr. Yata HANEDA (Yokosuka Museum). The specimens are identified with *Squaliolus laticaudus* SMITH & RADCLIFFE, and a new Japanese name, "Tsuranagakobitozame"* is here given for this shark. It is said to be a dwarf species, and believed not to have been recorded from the Japanese waters, the only locality hitherto known being the Philippines. The present writer takes pleasure in acknowledging the courtesies extended to him by Dr. HANEDA. It is also his pleasing duty to express here his sincere thanks to Dr. Henry B. BIGELOW (Museum of Comparative Zoölogy, Harvard University), Dr. Paul M. FYE (Director) and the other staff members of the Woods Hole Oceanographic Institution for giving the present writer an opportunity to enjoy studies there of sharks and bony fishes during September through November, 1961, and to Dr. Giles W. MEAD (Museum of Comparative Zoölogy, Harvard University) and Mr. James C. TAYLOR (Stanford University) for taking the trouble of sending photocopies of the papers not accessible in Tokyo.

Squaliolus laticaudus SMITH & RADCLIFFE

Squaliolus laticaudus SMITH & RADCLIFFE, 1912, pp. 684 & 685, fig. 4, pls. 50 & 54. One fully developed male, 15 cm. long, Batangas Bay, Luzon, at a depth of 170 fathoms; another specimen, apparently female, 11.5 cm long, from the same locality.

Study material:—A male (Cat. No. 52,040, Zoological Institute, Faculty of Science, University of Tokyo=ABE '61-747), measuring 135 mm. in total length, taken on the night of June 2, 1961, in Suruga Bay.

A specimen, probably female (Cat. No. ABE '61-746), measuring 105 mm. in total length and bearing the same data as above.

* Meaning dwarf shark with long face, or head.

** After the manuscript of the present paper was submitted, 3 additional specimens measuring 108-102 mm. in total length have been received from Dr. HANEDA. They were taken along with the specimens reported upon here. Their gonads are not well developed.

Proportional dimensions of the male specimen expressed in percentages of the total length:—As the male specimen is in a good state, the following account is based on this specimen. The other specimen is partly damaged, but some times mentions will be made of it in the footnotes. Except otherwise stated, the measurements are taken following the method adopted by BIGELOW & SCHROEDER, 1948. Greatest breadth of body (midway between spiracle and 1st gill opening) 11.9, greatest depth of body (at base of 1st dorsal fin) 12.4, least depth of caudal peduncle 2.7¹⁾, distance from snout tip to hindmost point of 5th gill opening²⁾ 31.3 (on either side), distance from snout tip to foremost point of 1st gill opening³⁾ 25.6 (left) & 25.0 (right), distance (measured by dividers) from snout tip to foremost point of orbital rim (just below antero-dorsal part of orbital roof⁴⁾ 11.3 (on either side), distance from snout tip to foremost point of spiracle⁵⁾ 18.5 (on either side), distance from snout tip to anterior mid-ventral corner of mouth⁶⁾ 15.6, distance (measured by dividers) from snout tip to middle point of anterior margin of lower portion of nostril⁷⁾ 4.8 (on either side), distance (measured by dividers) from snout tip to hind end of upper portion of nostril⁸⁾ 6.3 (left) & 6.1 (right), horizontal diameter of orbit (exclusive of postero-dorsal incision)⁹⁾ 4.1 (on either side), vertical diameter of orbit¹⁰⁾ 4.1 (on either side), dorsal interorbital breadth (above eye-centers)¹¹⁾ 9.6, ventral interorbital breadth (below eye-centers)¹²⁾ 8.7, distance from snout tip to hindmost point of orbital rim (posterior corner of distinctive incision)¹³⁾ 16.1 (left) & 15.9 (right), breadth of mouth (between inner lateral corners)¹⁴⁾ 5.9, distance between hind corners of oral furrows¹⁵⁾ 10.2, distance (measured by dividers) from inner lateral corner of mouth to hind corner of oral furrow¹⁶⁾ 5.2 (left) & 5.3 (right), distance from snout tip to base of dorsal spine¹⁷⁾ 38.1, distance from snout tip to hind end of base of 1st dorsal fin¹⁸⁾ 43.9, length of base of 1st dorsal fin^{18')} 5.8, distance from snout tip to base of 2nd dorsal fin¹⁹⁾ 67.8, distance from snout tip to hind end of base of 2nd dorsal fin²⁰⁾ 78.1, length of base of 2nd dorsal fin (measured by dividers)^{20')} 10.7, distance from snout tip to fore end of lower lobe of caudal fin²¹⁾ 83.9, distance from snout tip to fore end of upper lobe of caudal fin²²⁾ 84.6, distance from snout tip to foremost end of pectoral base²³⁾ *ca.* 0.7 (on either side), distance from snout tip to fore end of whitish part of pelvic fin²⁴⁾ *ca.* 64.1 (on either side), interspace between paired fins^{24')} *ca.* 33.4 (on either side) length of clasper (from fore end of vent) 9.3 (left) & 9.2 (right), horizontal diameter of spiracle²⁵⁾ 1.7 (left) & 1.8 (right), vertical diameter of spiracle²⁶⁾ 3.5 (on either side), length of dorsal spine *ca.* 1.5, height of 1st dorsal fin²⁷⁾ 5.9, height of 1st dorsal fin

1) 2.5. 2) 31.3 (on either side). 3) 24.8 (on either side). 4) 11.1 (on either side). 5) 18.5 (left) & 18.2 (right). 6) 15.4. 7) 4.5 (on either side). 8) 5.8 (left) & 6.1 (right). 9) 4.2 (left) & 4.5 (right). 10) 4.2 (left) & 4.3 (right). 11) 10.3. 12) 8.3. 13) 15.4 (left) & 15.1 (right). 14) 6.7. 15) 9.5. 16) 5.6 (on either side). 17) *ca.* 38.8. 18) 44.6, 18') *ca.* 5.8. 19) 68.2. 20) 78.5. 20') 11.0. 21) 84.8. 22) 84.8. 23) *ca.* 31.8 (left) & *ca.* 30.8 (right). 24) *ca.* 66.4 (on either side) 24') *ca.* 34.6 (left) & 35.6 (right). 25) 1.8 (left) & 2.0 (right). 26) 2.5 (on either side). 27) 5.1, 28) 5.1.

(at rear end)²⁸⁾ 5.7, greatest height of 2nd dorsal fin²⁹⁾ 4.7, length of pectoral fin³⁰⁾ *ca.* 8.1 (on either side), breadth of pectoral fin³¹⁾ *ca.* 9.3 (on either side), greatest length of white (naked) portion of pelvic fin (measured parallel to horny fibre)³²⁾ *ca.* 4.3 (on either side).

General appearance of the two specimens:—The body is slender. The caudal peduncle is very slender, being provided with a prominent ventral ridge on either side. The ventral side of the caudal peduncle, bordered on either side by the ridge just mentioned, is nearly flat, and there is a less pronounced lateral keel on either side of the caudal peduncle. In front of the first dorsal fin is a mid-dorsal ridge extending nearly to a point above the spiracles, and the cross section of the trunk at the pectoral origins is nearly triangular. The head is pointed in front of the nostrils. The eyes are placed low down, the distance from the upper margin of the orbit to the mid-dorsal line of the head being much smaller than the distance from the lower margin of the orbit to the mid-ventral line of the head. The preoral part of the head is long, slightly longer than the distance from the foremost point of the lower lip to the pectoral origin. The gill openings are very small, much smaller than the spiracles. The upper portion of the nostril on either side of the head is nearly horizontal, and smaller than the lower portion of the nostril which is nearly vertical. The distance between the ventral corner of the lower portion of the nostril on either side is nearly equal to the vertical diameter of the lower portion of the nostril. The anterior margin of the lower lip is very slightly concave in the male specimen, and slightly convex in the other specimen. The oral furrow on either side is straight, extending dorsally and rearwards beyond the vertical with the hind margin of the spiracle, and approaching the horizontal line through the ventral corner of the first gill opening. The first dorsal fin is short-based, and originates above the posterior half of the pectoral fins on either side. The base of the second dorsal fin is long, its length being nearly twice as long as the length of the base of the first dorsal fin, $\frac{1}{3}$ (in the larger specimen) and $\frac{1}{3.5}$ (in the smaller specimen) of the interspace between the origins of the paired fins,* and the second dorsal fin originates above the middle (in the smaller specimen) or slightly in advance of the hind end (in the larger, male specimen) of the base of the ventral fin on either side. The pectoral fin on either side is short, broad, and very broadly rounded. The ventral fin on either side is scaled proximally, short, and its tip reaches the vertical with the middle of the base of the second dorsal fin (in the larger specimen) or further rearwards. The caudal fin is short, expanded vertically, and the central elevated black axis ends at the turning point of the curvature of the upper lobe.

The color of the body is uniformly blackish, and the distal parts of all the fins, the inside of the spiracle and the lower lip are whitish. There is a very conspicu-

29) 3.7. 30) 7.0 (on either side). 31) *ca.* 8.0 (on either side). 32) *ca.* 3.1 (on either side).

* In this respect the present specimens differ from the statement by HUBBS & McHUGH, 1951, p. 161, line 14 from bottom.

ous black elliptical blotch near the postero-dorsal corner of the pectoral fin, and there is a small black spot near the antero-lateral corner of the ventral fin.

Teeth.—The teeth are all smooth edged, and the shape and arrangement of the upper jaw teeth differ greatly from those of the lower jaw teeth. The upper jaw teeth are slender, sharp, symmetrical and slightly curved, the tips being directed rearwards. They are arranged in short straight longitudinal lines (in the larger specimen somewhat irregular) instead of in quincunx (as in *Euprotomicrus*; HUBBS & MCHUGH, 1953). The number of these tooth-rows is *ca.* 14 in the larger, male specimen, and *ca.* 16 in the other. The lower jaw teeth are each provided with a triangular cusp directed obliquely outward. The inner edge of the cusp is rather weakly convex (differing in this respect from the statement by BIGELOW & SCHROEDER, 1957, p. 129). There is a deep notch on the outer side of each lower jaw teeth at the transition from the broad base to the cusp. The number of the lower jaw teeth is 9 (left)+8 (right) in the larger, male specimen, and 8 (left)+7 (right) in the other. The innermost tooth of the right side is a little smaller than the neighbouring teeth, and may be regarded as the median teeth.

Dermal denticles. The dermal denticles are low, nearly quadrangular in outline, centrally concave and fairly closely spaced.

Relationships. As little is known as to the individual variation and secondary sex characters of the present species from the Pacific, the present writer is doubtful of its identity with the Atlantic species, *Squaliolus sarmenti* DI NARONHA. The differences between the two species mentioned by DI NARONHA (1926, p. 387) and those mentioned by BIGELOW & SCHROEDER (1957, pp. 131 and 132) are mostly not convincing. The distance from the snout tip to the first dorsal fin is $\frac{246}{92} \doteq 2.67$ in the total length in the type of *sarmenti* (DI NARONHA, 1926, pp. 387 and 388), and 2.62 and 2.58, respectively in the present specimens. The grooves extending from the inner and outer ends of the nostrils suggested as distinctive by BIGELOW & SCHROEDER (1957, p. 132) for *laticaudus* are lacking in the present specimens. The position of the first dorsal fin in relation to the tips of the pectoral fins seems to differ between *laticaudus* and *sarmenti* as stated by DI NARONHA (p. 387) and by BIGELOW & SCHROEDER (p. 132). In *sarmenti* the pectoral fins, when laid back, reach only as far as the concealed first dorsal spine, while they reach well past the fore end of the base of the first dorsal fin. In the present specimens, the larger male agrees in this respect with *laticaudus*, but in the smaller (probably female) one, the pectoral fins do not reach so conspicuously rearwards. Though difficult to measure exactly, the distance from the snout tip to the foremost point of the base of the pectoral fins is larger in the present specimens [31.8% (left) & 30.8% (right) of the total length in the larger specimen, and 31.5% (on either side) in the smaller specimen] than in the type of *sarmenti* ($\frac{62}{246} \times 100 \doteq 25.2$) (DI NARONHA, pp. 387 and 388).

As for the dentition, it may be pointed out that the median tooth of the lower jaw, though inclined very slightly outwards (and counted as one of the teeth of the right half of the jaw in the statement above), is a little smaller than the neighboring teeth in the present specimens. In the type of *sarmenti*, the presence of the median tooth in the lower jaw is mentioned by DI NORONHA, p. 386, and it is not stated as existent in *sarmenti* by BELLOC, 1937, p. 371, and in the genus *Squaliolus* by BIGELOW & SCHROEDER, 1957, p. 129. The outline of the inner edge of the lower jaw teeth is not concave in the present specimens contrary to the statement for the genus by BIGELOW & SCHROEDER, 1957, p. 129. As HUBBS & MCHUGH stated (1951, p. 162), there seems to be no valid ground for separating *sarmenti* from *laticaudus*, but in the absence of sufficient material, the present writer tentatively adopts the name of *laticaudus* for the present specimens from Suruga Bay.

The differences between *Squaliolus* and *Euprotomicrus* are well described by HUBBS & MCHUGH (1951, pp. 161, 162 and 165) and BIGELOW & SCHROEDER (1957, pp. 112 and 113). It may be pointed out here that the length of the base of the second dorsal fin in the present specimens of *laticaudus* is about one-third (instead of one-half) the interspace between the origins of the paired fins [*cf.* HUBBS & MCHUGH, p. 161, caption (4)].

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