

Notes on *Etmopterus unicolor**

Tokiharu ABE

Since 1912 when ENGEI-HARDT named it, there seem to have been no records of capture of *Etmopterus unicolor*. Recently the present author has collected many specimens of this little-known squaloid shark from Suruga Bay along with more numerous specimens of squaloid sharks attaining much larger size. Probably due to the nature of the flesh and oil which is believed to freeze at an unusually low temperature, all the specimens of *E. unicolor* preserved in freezers have been deformed, but a few specimens put in formalin just after the receipt at the fishing port of Yaizu are in good state enabling the writer to take measurements. It is thought advisable to give account of an adult male specimen accompanied by figures which seem to have never been published and along with account of a female specimen of this species. He takes pleasure in expressing here his sincere thanks to Japan Society for the Promotion of Science for the partial financial support of this study through a grant from this society as a part of the Japan—U.S. Science Cooperative Program, and to the chemists, biologists and fishermen who worked together with him at Yaizu for their kindly assistance.

Study material. A male example (Cat. No. ABE '64-2135 (figs. 1-7)), caught by deep water long line off Yaizu, Suruga Bay, on September 9, 1964. Total length 480 mm. A copepod parasite, *Lerneopoda* sp. ♀**, was found on one of the claspers.

A female example (Cat. No. ABE '64-2005), caught by deep water long line off Yaizu, Suruga Bay, on September 8, 1964. Total length 530 mm. Like the male mentioned above, preserved in a good state, but the mouth is protruded.

Proportional dimensions, in percent of total length, of the male and female specimens mentioned just above. (Parenthesized letters l and r refer to left and right, respectively).

Depth of body: at origin of 1st dorsal fin, 11.5, 12.1; at pelvic origins, 8.3, 10.4.

Depth of head: at eye-centers, 6.3, 6.0.

Least depth of caudal peduncle: 2.8, 2.9.

Width of body: at pectoral origins, 11.9, 10.4; at pelvic origins, 6.3, 6.3; at level a little behind spiracles, 12.5, 9.9.

Width of head: anterior rims of 1st gill-opening, 11.9, 10.4.

Width of caudal peduncle: at dorsal origin of caudal fin, 2.1, 2.4.

* Contribution B No. 422 from the Tokai Regional Fisheries Research Laboratory, Tokyo.

** Identified by Mr. Atsuo ICHIHARA, Meguro Parasitological Museum, Tokyo, whom the writer wishes to thank for kindness.

Distance from snout tip (measured parallel to longitudinal axis of body) to: 1st dorsal fin, 36.0, 36.0; 2nd dorsal fin, 61.7, 61.9; pelvic fin, 54.2 (l) & 54.6 (r), 56.6 (l) & 56.2 (r); pectoral fin, 21.7 (l) & 21.5 (r), 20.9 (l) & 21.1 (r); upper caudal, 78.3, 78.7; subcaudal, 75.4, 76.6; eye, 6.1 (l) & 5.8 (r), 5.7 (l) & 5.3 (r); anterior nostril, 12.7 (l & r); mouth, 9.0, 9.2; upper corner of spiracle, 12.7 (l & r), 12.4 (l & r); 1st gill-opening, 18.1 (l) & 17.9 (r), 16.2 (l) & 16.4 (r); 5th gill-opening, 21.7 (l) & 21.5 (r), 20.9 (l) & 21.9 (r).

Interspace (measured parallel to longitudinal axis of body) between: 1st dorsal and 2nd dorsal fins, 20.1, 19.6; 2nd dorsal and upper caudal fins, 8.3, 9.4; pelvic and subcaudal fins, 17.1, 15.8.

Distance (measured parallel to longitudinal axis of body) from origin to origin of: pectoral and pelvic fins, 33.1 (l) & 33.5 (r), 37.9 (l) & 37.2 (r); pelvic and subcaudal fins, 21.3 (l) & 20.8 (r), 20.0 (l) & 20.4 (r).

Diameter of eye: horizontal, 4.5 (l) & 4.8 (r), 4.2 (l) & *ca.* 4.5 (r); vertical, 2.1 (l) & 1.8 (r), 1.7 (l) & 2.4 (r).

Interorbital width: above eye-centers, 9.3, 6.6*.

Width of mouth: 7.1, 5.6 (7.2, appressed).

Width of snout at level of posterior margins of posterior (=inner) nostrils: 8.9, 7.7.

Distance between inner corners of posterior (=inner) nostrils: 3.3, 2.6.

Length of preoral cleft: 4.4 (l) & 3.9 (r), 3.8 (l) & 4.2 (r).

Length of gill-opening: 1st, 1.9 (l) & 1.8 (r), 1.7 (l) & 2.2 (r); 3rd, 1.7 (l) & 1.8 (r), 1.4 (l) & 1.9 (r); 5th, 1.6 (l) & 1.8 (r), 1.0 (l) & 1.2 (r).

Spiracle: distance between inner (or, dorsal) corners, 7.3, 6.3; vertical diameter of depression around spiracle, 1.7 (l) & 1.6 (r), 2.3 (l) & 2.1 (r); horizontal diameter of depression around spiracle, 1.4 (l) & 1.3 (r), 1.0 (l) & 1.2 (r); length of spiracle, 1.3 (l) & 1.1 (r), 1.6 (l & r).

First dorsal fin: maximum height, 5.7, 5.8; height of spine, 2.9, 3.1; length of naked portion of spine, 1.5, 2.1; length of hind margin, 4.7, 4.2; length of base, 5.5, 6.3.

Second dorsal fin: maximum height, 7.3, 7.5; height of spine, 6.1, 5.7; length of naked portion of spine, 3.5, 3.6; length of hind margin, 5.7, 5.8; length of base, 8.4, 8.3.

Caudal fin: upper margin, 21.7, 21.5; lower anterior margin, 11.7, 10.9.

Pectoral fin: maximum length, namely, distance from antero-dorsal corner to hindmost point, 9.7 (l & r), 9.1 (l) & 9.4 (r); maximum width, 6.3 (l) & 5.6 (r), 6.0 (l) & 6.4 (r); length of base, 4.6 (l & r), 5.7 (l) & 4.7 (r).

Pelvic fin: maximum width, *ca.* 5.7 (l) & *ca.* 5.3 (r), 7.5 (l & r); length of base, 4.2 (l & r), 4.5 (l & r); distance between origins, 5.6, 5.6; width of flat area

* Skin hangs down.

between bases at level of anterior blackish corner of cloaca, 5.0, \times ; distance from line connecting origins to dermal hind end of clasper, 14.0 (l) & 14.2 (r); length of clasper measured from anterior blackish corner of cloaca to dermal hind end, 10.0 (l) & 10.2 (r).

Distance between lateral line on either side: above eye-centers, 4.6, 4.0; below origin of 1st dorsal fin, 6.5, 6.4; below origin of 2nd dorsal fin, 4.8, 4.3.

General appearance. The body is elongate, subcylindrical behind the pectoral origins, and depressed and wide anteriorly. The caudal peduncle is little compressed and without lateral keels or precaudal pits. The overall color is an almost uniform dark grey, very slightly darker on the ventral surface, and much lighter or whitish in the naked parts of the dorsal spines and distal part of the dorsal fins. The lateral lines are black. There is a black line of demarcation between the upper grey region and the lower blackish region on either side of the anterior part of the subcaudal. Though less pronounced, there is a similar black horizontal line on either side of the trunk ending above the pelvic origin, and another black horizontal line originating from a point postero-dorsal to the hind end of the former line and ending near the vertical through the tip of the clasper on either side. These lines are very similar to those of *Etmopterus baxteri* GARRICK (*cf.* GARRICK, 1957, fig. 1A). The mouth, soft regions near the cloaca and the dorsal part of the claspers are mostly whitish.

Dermal denticles. The dermal denticles are very small, close-set, not forming regular rows, and in the form of thorns, slightly curved and directed mostly posteriorly. They are each borne on four-rooted base, the central part of which is in many places of the male specimen exposed, appearing as a whitish four-angled area under microscope. The dermal denticles are easily taken off from the skin in the male while they are firmly adherent to the skin in the female. The length of the denticles below the first dorsal spine and just above the lateral line is approximately 0.13 to 0.17% of the total length. The maximum distance from the tip to tip of the roots of the base of dermal denticles is a little less than half the length of the denticles. The bases of the denticles are fairly close to each other, but do not touch each other.

Teeth. $\frac{13-1-14}{17-16+i} \left(\begin{array}{c} ii+12-12+ii \\ 18 \text{ (or } 19) - 19 \end{array} \right)$, dissimilar in the two jaws. The upper teeth are upright, each provided with a sharply-pointed, awl-shaped major cusp and two or one lesser cusps on each side of the major cusp. The number of the lesser cusp seems not to differ between the sexes (several specimens have been examined). The lower teeth are blade-like, each provided with a strongly oblique triangular cusp. It is directed outwards.

Lateral line. The lateral line on each side of the body, if seen from above, is nearly parallel to each other, and connected anteriorly with each other by a w-shaped line above the hind margin of the spiracle on each side. There is a transverse branch of the lateral line descending midway between the hind margin of the orbit

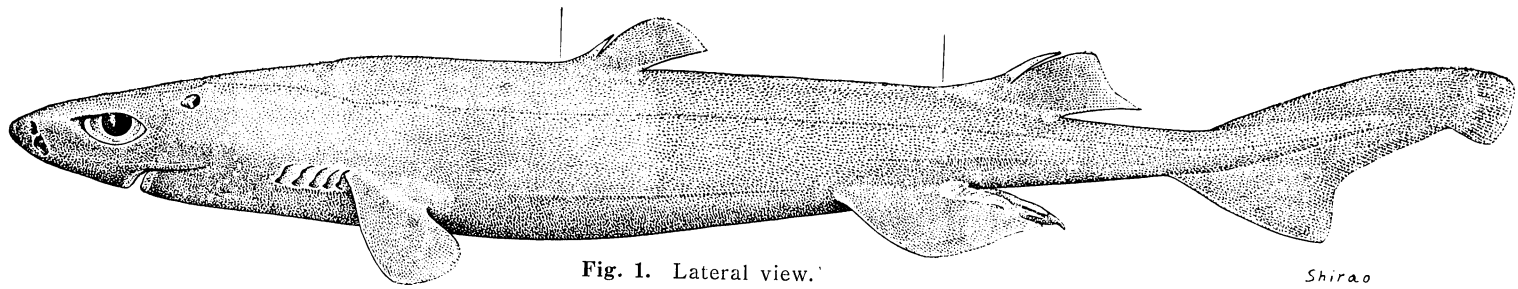


Fig. 1. Lateral view.

Shirao

Figs. 1-7. *Etmopterus unicolor* (ENGELHARDT), ♂. Cat. No. ABE, '64-2005.

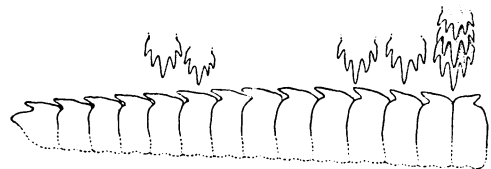


Fig. 7. Some of the jaw teeth.

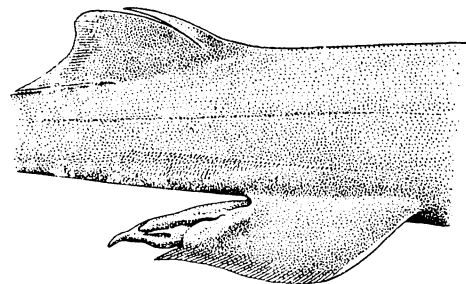


Fig. 5. Right clasper.

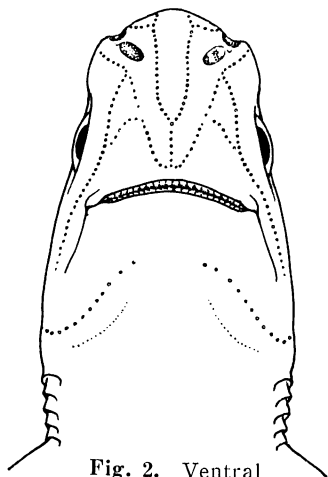


Fig. 2. Ventral view of head.

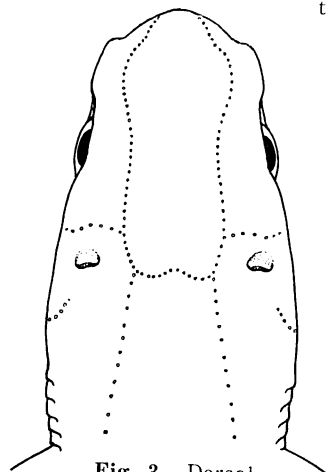


Fig. 3. Dorsal view of head.

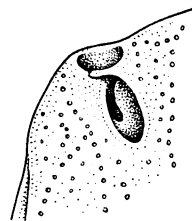


Fig. 4. Right nostrils.

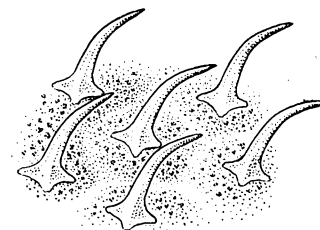


Fig. 6. Dermal denticles from middle on left side at level of 1st dorsal.

and the anterior margin of the depression around the spiracle on each side. The anterior end of each lateral line is antero-dorsal to the anterior corner of the orbit. In front of the bridging line above the spiracle mentioned above are a few rows of whitish pores arranged mostly internal to the lateral line, and reaching nearly the snout tip.

Remarks. So far, some twenty recognizably distinct species of *Etmopterus* are known of which four have been recorded from Japanese waters. The present writer has not been able to see specimens of *E. brachyurus* SMITH & RADCLIFFE recorded from Japan by BIGELOW & SCHROEDER, 1947, p. 41, fig. 6D, and the specimens of alien species of *Etmopterus*. It is thought better to limit the statement to the following:

Despite the lack of specimens of *brachyurus* now at hand, *E. unicolor* is distinguished from the other three Japanese species of *Etmopterus*, first, by the shape and arrangement of the dermal denticles. In *E. lucifer* JORDAN & SNYDER and *E. brachyurus*, they form well-marked longitudinal lines on the upper surface of the body while they are irregularly placed in *E. frontimaculatus* PIETSCHMAN and *E. unicolor*. Further, in *frontimaculatus*, the dermal denticles lack central spine appearing as tubercles. The coloration is also useful to distinguish these species; *unicolor* is easily recognized by its uniform dark grey color and lack of pronounced contrast between the darker color of the lower part of the body and the lighter color of the upper part.

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ニセカラスザメ *Etmopterus unicolor* (ENGELHARDT) に就いて

阿 部 宗 明

抄 録

アブラツノザメ科に属するやゝ小型の種類であるニセカラスザメは、1912年 ENGELHARDT が命名してから後には1度も採集された報告が無いと思われるが、1963年11月、日米科学協同研究計画の一部として、外洋性魚類の分類、分布及び生活史の研究を開始し、1964年1月以来駿河湾で毎月数回宛、深海延縄による採集を行った所、本種の標本をかなり多数入手した。

肝臓が大きく、全形がくずれ易いけれども、幸、雌雄一尾宛、形の整った標本を入手したので、これに基づいて ENGELHARDT の記載の不充分な所を補う事にした。繁殖期其の他、生物学的の事柄に就いては、別報で報告したいと思う。