Reef Whitetip Shark, *Triaenodon obesus*, from Japan

Toru Taniuchi

(Received July 21, 1975)

Introduction

Fishermen of Takara-jima, a small island of the Tokara Islands, Kagoshima Prefecture, believe that sluggish sharks come to the coastal waters of this island only in the season of spring equinox and sleep between ledges. These sharks are said to be composed of males only. The catch method and their photographs appeared in an article of the weekly magazine, "Sandei Mainichi", March 28, 1967. At that time I tentatively identified the shark as *Triaenodon obesus* (Rüppell) on the basis of the photos which showed the blunt snout, white-tipped first dorsal fin and upper lobe of caudal fin. To investigate it in detail, I visited Dr. Imai of Kagoshima University who kept a dry specimen of the shark. However, I could not determine its scientific name with certainty because of the shrunk condition of the specimen. In the next year I received a complete specimen collected at Takara-jima from Dr. Takashima and it was preserved in formalin. Recently I collected the second specimen of this species from Okinawa.

This report describes Japanese sepcimens of *Triaenodon obesus* (Rüppell, 1837) for the first time.

I already used a Japanese name, nemuribuka, for this species of shark in two popular articles (Taniuchi, 1970; 1973). I prefer "nemuribuka" as the Japanese common name for *T. obesus*. Teng (1962: 104) called this shark kabutozame in Taiwan.

Material and method

The specimens deposited in Shark Collection of the University Museum, University of Tokyo (SCUM), were used in this study.

SCUM 554, an adult male, Takara-jima (29–09 E latitude, 129–13 N longitude), Kagoshima Prefecture, caught by hand at the depth of 20 m in March, 1968.

SCUM 602, a young female, off Yomitan (26–25 N latitude, 127–42 E longitude), caught with bottom longline gear at the depth of 330 m ? in November, 1974.

Measurements follow Bigelow and Schroeder (1948).

Diagnostic characters

Among the members of the family Carcharhinidae, this species is characterized by having teeth with a lateral denticle on either side of the base; second dorsal base that is nearly 3/4 as long as first; white-tipped first dorsal and caudal fins.

Description

Proportional dimensions in percent of total length are presented in Table 1.

Trunk slender, without lateral keels or ridges. Upper precaudal pit well developed but lower pit inconspicuous. Lateral line not prominent. No mid-dorsal ridge between first and second dorsal fin. Dermal denticles moderately closely spaced, partially overlapping, oval in profile, each with seven longitudinal ridges and three posterior teeth.

Head short, depressed, its length to fifth gill opening about one-fifth of total length, its dorsal profile moderately arched posteriorly. Snout thin, broadly rounded, its length in front of mouth about one-seventh of head length. Nostril large, oblique, situated midway between snout tip and mouth, its anterior margin with a large rounded lobe, its posterior margin with a small lobe. Mouth ovate, its width about two times greater than its length. Labial furrow very short, invisible unless mouth opened. Eye small, broad-oval, its horizontal diameter nearly equal to prenarial length, well developed nictitating membrane present. Teeth erect, symmetrical, nearly similar in upper and lower jaw, central teeth small, its length half of the subsequent one, each tooth with one lateral denticle on either side of the base, dental formula 21–2–21/21–2–21 (one specimen). Spiracle absent. Gill opening all about equal in length, about one-sixth of head length. Origin of first dorsal fin behind inner corners of pectoral fin by length of its rear extension, its anterior margin convex, its apex subacute, its posterior margin deeply concave, its rear extension almost at level of ventral origin. Second dorsal fin a

Table 1. Proportional dimensions in percent of total length of *Triaenodon obesus* taken from Japan.

Catalog No. (SCUM)	554	602
Sex	male	female
Total length (mm)	1259	885
Snout tip to:		
outer nostrils	1.5	1.9
eye	3.9	4.2
mouth	2.8	3.1
1st gill opening	14.3	14.6
5th gill opening	18.8	18.9
pectoral origin	17.9	19.2
ventral origin	47.6	46.1
1st dorsal origin	35.3	34.4
2nd dorsal origin	62.4	60.1
anal fin origin	62.1	60.2
upper caudal origin	76.5	75.7
Diatance between inner corners of nostrils	4.1	4.1
Mouth:		
width	9.2	8.6
length	4.9	4.5
Length of 3rd gill opening	3.4	2.8
1st dorsal fin:		
length of base	8.0	8.7
length of post. margin	3.8	4.3
height	8.7	8.7
2nd dorsal fin:		
length of base	6.1	6.6
length of post. margin	3.3	3.9
height	5.6	6.2
Anal fin:		
length of base	5.8	5.8
length of post. margin	2.9	2.9
height	4.6	4.9
Pectoral fin:		
length of base	5.5	4.9
length of ant. margin	14.5	14.1
length of dist. margin	13.4	12.1
length of post. margin	4.4	4.9
Ventral fin:		
length of base	5.4	4.8
length of ant. margin	6.9	7.2
length of post. margin	6.6	6.0
Caudal fin:		
length of dorsal lobe	23.5	25.2
length of ventral lobe	13.1	13.0
depth of notch	2.7	2.7
Horizontal eye diameter	1.5	2.0

little smaller than first dorsal, its base about three-fourths of first dorsal base. Caudal fin with narrowly rounded tip and well developed subterminal notch, its terminal sector one fourth of length of dorsal lobe, its ventral lobe a little smaller than half of dorsal lobe. Anal fin similar to second dorsal in size but its apex more sharply pointed, its origin opposite to second dorsal origin. Pectoral fin long, its anterior margin as long as length from snout tip to first gill opening, its distal margin concave, its inner corner rounded not exceeding first dorsal origin even though depressed to side of body. Ventral fin with nearly straight anterior margin and slightly concave distal margin.

In the preserved specimen, dark grey above, grayish below, with some dark blotches on trunk, pectoral and ventral fins, apex of first dorsal and dorsal lobe of caudal fin whitish but second dorsal and ventral lobe of caudal fin not whitetipped. In fresh young specimens margins of second dorsal, anal, dorsal and ventral lobes of caudal fin dusky.

Discussion

Since *Triaenodon obesus* was first described by Rüppell (1837) from Djetta, Red Sea, as *Carcharias obesus*, it has been recorded from many localities of the Indo-Pacific region, for example, South Africa (Smith, 1965), western Indian Ocean (Wheeler, 1960), India (Day, 1889), Ceyron (Munro, 1955), Philippines (Herre, 1953), Marshall and Mariana (Schultz et al., 1953), Formosa (Teng, 1962), and Central and Eastern Pacific (Kato et al., 1967). As far as I know, this report is the northernmost record of *T. obesus* in the world. This shark is probably distributed in Ogasawara Islands, the most southern islands of Japan, judging from television programs and photos taken there.

Day (1888: 720, pl. 189, fig. 3 a) described the second species of the genus, *T. obtusus* from Kurrachi. It has not been recorded elsewhere. Garman (1913: 162) clearly distinguished the two species. Fowler (1941: 194) placed *T. obtusus* into the synonymy of *T. obesus*. However, Wheeler (1960) stated that in *T. obtusus* first dorsal is placed much forward and second dorsal fin is considerably smaller. These characters were all pointed out by Day (1888). Wheeler also stated, examining small specimens, that *T. obtusus* (19 inches =46 cm in length in the original description) was not a growth stage of *T. obesus* (3 1/2 Fufs=107 cm in length in the

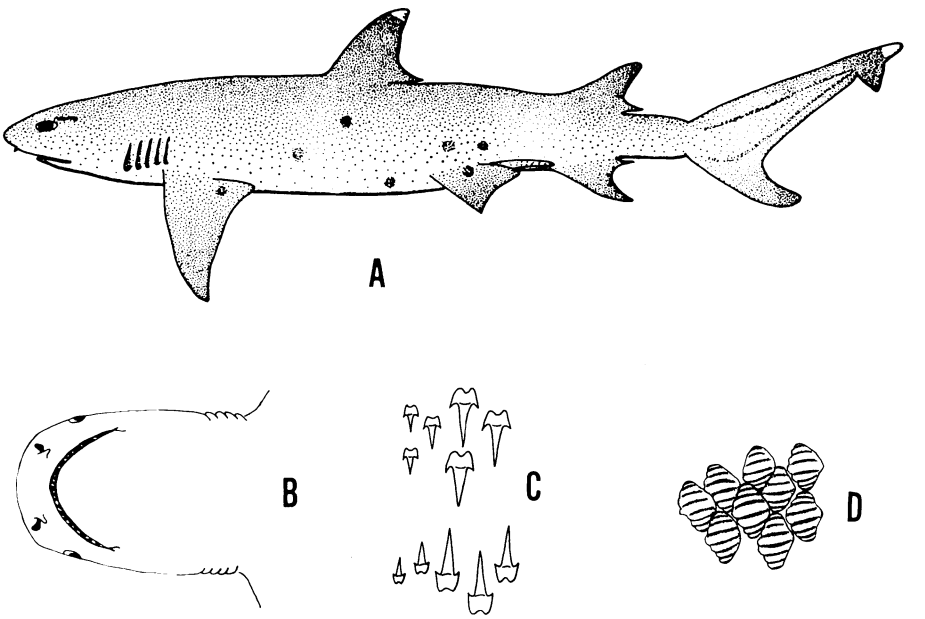

Fig. 1. *Triaenodon obesus* (Rüppell), an adult male, 1259 mm in total length, taken from Takara-jima, Kagoshima Prefecture, Japan. A, lateral view; B, ventral view of head; C, first three teeth on left side, ×3/2; D, dermal denticles, ×20.

original description). I agree with Wheeler, because the relative position of the pectoral and first dorsal fins and the relative size of first and second dorsal fins are not much influenced by growth. Accordingly, *T. obtusus* should be considered to be a valid species.

Whitley (1939) described the third species, *T. apicalis*, from Queensland, and he noted that this species differed from *T. obesus* in the shape of snout and mouth and in having first dorsal nearer pectorals. Japanese specimens resemble *T. apicalis* more than *T. obesus* on the basis of original descriptions. However, the shape of snout is known to vary widely with growth, and the shape of mouth is influenced by the condition in preserving specimens. In fact, description of *T. obesus* from the Red Sea, type locality of the species (Klausewitz, 1959, 1960; Gohar and Mazhar, 1964), nearly coincides with those of *T. apicalis* and Japanese specimens. Zoogeographically, the distribution of this species is continuous from South Africa to West America through the Indian and Pacific Oceans. Thus, there is no reason to separate the Australian form from the Indo-Pacific form.

Regarding the date of the publication of *T. obesus*, I. followed Klausewitz (1960) who designated the lectotype of *T. obesus*.

I included the genus *Triaenodon* in the family Carcharhinidae, following Gohar and Mazhar (1964), Kato et al. (1967), and Compagno (1973), because *Triaenodon* has nictitating membrane rather than nictitating fold, no spiracle, and well developed upper precaudal pit.

Acknowledgments

I thank Professor Michihiko Imai of Kagoshima University, Dr. Fumio Takashima of Tokyo University of Fisheries, and Mr. Kozo Iramina of Sumiya Food Co Ltd., for their help in collecting specimens. I also acknowledge Dr. Teruya Uyeno of Nippon Luther Shingaku Daigaku and Mr. Susumu Kato of Tiburon Laboratory, National Marine Fisheries Service, U. S. A., for their useful advice in the preparation of the manuscript. I am also indebted to the staff of Department of Zoology, the University Museum, University of Tokyo, for the help in references.

Literature cited

Bigelow, H. W. and W. C. Schroeder. 1948.

Sharks. *In* Fishes of the western north Atlantic. Mem. Sears Found. Mar. Res., 1 (1): 59～546, 106 figs.

Compagno, L. J. V. 1973. *Gogolia filewoodi*, a new genus and species of sharks from New Guinea (Carcharhiniformes:Triakidae), with a redefinition of the family Triakidae and a key to triakid genera. Proc. Calif. Acad. Sci., 4th Ser., 39 (19): 383～410, 7 figs.

Day, F. 1878～1888. The fishes of India. Vol. 1 and 2, London, 778 pp., 195 pls.

Day, F. 1889. The fauna of British India. Fishes —Vol. 1. London, 548 pp., 104 figs.

Folwer, H. W. 1941. Contribution to the biology of the Philippine Archipelago and adjacent regions. The fishes of the groups Elasmobranchii... Bull. U.S. Nat. Mus., 100 (13): 1～879, 30 figs.

Herre, A. W. 1953. Check list of Philippine fishes. Fish and Wildlife Serv., Res. Rept. 20: 1～997.

Garman, S. 1913. The Plagiostomia (Sharks, skates, and rays). Mem. Mus. Comp. Zool. Harvard, 36: 1～515, 77 pls.

Gohar, H. A. F. and F. M. Mazhar. 1964. The elasmobranchs of the north-western Red Sea. Pub. Mar. Biol. St. Al-Ghordaqa (Red Sea), 13: 1～144, 81 figs, 16 pls.

Kato, S., S. Springer, and M. H. Wagner. 1967. Field guide to eastern Pacific and Hawaian sharks. U.S. fish and Wildlife Serv., Bur. Comm. Fish., Circular 271: 1～47, 75 figs.

Klausewitz, W. 1959. Fische aus dem Roten Meer. 1. Knorpelfische (Elasmoblanchii). Senck. Biol., 40 (1/2): 43～50, 7 figs.

Klausewitz, W. 1960. Die Typen und Typoide des Naturmuseums Senckenberg, 23: Pisces, Chondrichthyes, Elasmobranchii. Senck. Biol., 41 (5/6): 289～296, 6 figs.

Munro, I. S. R. 1955. The marine and freshwater fishes of Ceyron. xvi+349 pp., 56 pls.

Rüppell, E. 1835～1838. Neue Wirbelthiere zu der Fauna von Abyssinien gehörig—Fische des Rothen Meeres. 48 pp., 33 pls.

Schultz, L. P. and collaborators. 1953. Fishes of the Marshall and Marianas Islands. Vol. 1. U.S. Nat. Mus. Bull., 202: xxxii+685 pp., 90 figs., 3 pls.

Smith, J. L. B. 1965. The sea fishes of southern Africa (5th ed.). 580 pp., 111 pls.

Taniuchi, T. 1970. Nemuribuka. Marine Diving, 7: 36～37, 1 fig. In Japanese.

Taniuchi, T. 1973. Nemuribuka. Animal Life, 99: 2760～2761, 2 figs. In Japanese.

Teng, H. R. 1962. Study on classification and distribution of chondrichthyean fishes of Taiwan. 404 pp., 77 figs. In Japanese.

Wheeler, J. F. G. 1960. Sharks of the western Indian Ocean—II. *Triaenodon obesus* (Rüppell). East Afr. Agric. J., 25 (3): 202～204, 1 fig.

Whitely, G. P. 1939. Taxonomic notes on sharks and rays. Aust. Zool., 9 (3): 227～262, pls. xx～xxii, 18 figs.

(Department of Fisheries, Faculty of Agriculture, University of Tokyo, Yayoi, Bunkyo-ku, Tokyo 113 Japan)

本邦のネムリブカ *Triaenodon obesus* について

谷内　透

鹿児島県宝島沿岸と沖縄県読谷村沖からの標本に基いてネムリブカ *Triaenodon obesus* (Rüppell, 1837) が記載された．宝島からの標本は本種の最北限の記録となる．いくつかの証拠からオーストラリア産の*T. apicalis* Whitley, 1939 は本種と同一種であると推定した．

(113　東京都文京区弥生 1-1-1　東京大学農学部水産学科)