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# Studies on Deep-water Fishes from off Hokkaido and Adjacent Regions. VIII–IX*

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In the recent time, some rare bathypelagic and bathybenthic fishes which have never been recorded previously from the waters of Hokkaido were captured one after another from off the Pacific coast of Hokkaido. We would like to report, therefore, those interested species as new record for occurrence as unusual fishes from Japan in this series.

Before going further we wish to express here our gratitude to Mr. Motohiro SAKURAI, Chief of Kushiro Fisheries Experimental Station, for allowing him to examine those remarkable specimens for study. Acknowledgement is made of the partial financial support of this study through a grant from the Japan Society for the Promotion of Science as part of the Japan-U.S. Cooperative Science Program.

## VIII. Record of a beautiful red whale-fish, *Barbourisia rufa* PARR from the Pacific coast of Hokkaido. (pl. 5, fig. 1)

On October 25, 1965, a single specimen of red whale-fish was caught in a trawl net operated from a commercial boat at a depth of more than 120 m off Mitsuishi, Hidaka District, Hokkaido. This specimen at first had carried into the Kushiro Fisheries Experimental Station for identification. Then it was forwarded to the senior author's hand for detailed examination. Nevertheless the specimen had put into the formalin solution for near one month after the receipt, the body and head including all fin rays are still kept bright red color except a damaged area in the central portion of body on each side when it arrived in the senior author's hand. These scare might be given at the operation in take off it from mesh.

The present specimen is apparently referable to *Barbourisia rufa* PARR in good agreement with the original description of this species. This species has only been recorded from the Gulf of Mexico (the type specimen) by PARR (1945), from off Cape Amber, Madagascar (the second specimen) by ROFEN (1959), and from off Kurile Islands (the third specimen) by ABE & MARUYAMA (1964). This is, therefore, the second specimen from the northwestern Pacific Ocean and the first occurrence from our territorial waters as well as the fourth specimen from the world.

* (I.) of this series is in Jap. Jour. Ichthyol., 3(2), pp. 79-82. (II.) is in 3(3-5), pp. 102-106, of the same journal (1954), and (III.-VII.) were reported from Bull. Hokkaido Regional Fish Res. Lab., (28), pp. 1-22, 1964.

Table 1. Comparison of measurements and counts of two specimens of *Barbourisia rufa* PARR from off Kurile Islands and from off Hokkaido.

| | ABE & MARUYAMA'S Specimen (1963) | Present Specimen |
|---|---|---|
| Locality | Off Kurile Islands | Off Mitsuishi Hokkaido |
| Date | Nov. 11, 1959 | Oct. 25, 1965 |
| Depth at capturing | Less than 450 m | More than 120 m |
| Total length | 320 mm | 315 mm |
| Fork length | 305 | 298 |
| Standard length | 280 | 276 |
| Greatest depth of body (at the tip of pectoral fin) | 74 | 66 |
| Greatest width of trunk (at pectoral origins) | 38 | 37 |
| Greatest width of head | 44 | 38 |
| Length of head | *l* 92<br>*r* 90 | *l* 93<br>*r* 93.5 |
| Least depth of caudal peduncle | 24 | 25.5 |
| Length of snout | *l* 34<br>*r* 33 | *l* 33<br>*r* 33 |
| Greatest diameter of eye | *l* 7<br>*r* 8 | *l* 7<br>*r* 7 |
| Width of interorbital space (above eye-centers) | 32 | 32 |
| Length of upper jaw | *l* 64<br>*r* 62 | *l* 64<br>*r* 64.5 |
| Distance from tip of snout of origin of dorsal fin | 162 | 164 |
| Distance from tip of snout of origin of anal fin | 180 | 182 |
| Distance from tip of snout to outer edge of pelvic origins | *l* 132<br>*r* 131 | *l* — *<br>*r* 140 |
| Length of base of dorsal fin | 78 | 74 |
| Length of base of pectoral fin | *l* 6<br>*r* 7 | *l* 6<br>*r* 6.5 |
| Length of base of pelvic fin | *l* 5<br>*r* 6 | *l* — *<br>*r* 5 |
| Length of longest gill-raker (situated just below the raker at the junction of the upper and lower limbs) | *l* 7<br>*r* 7 | *l* 7<br>*r* 7 |
| Length of longest dorsal ray | — | 25.5 |
| Length of longest anal ray | — | — ** |
| Length of longest ray of pectoral fin | —<br>— | *l* 18<br>*r* 17 |
| Length of longest ray of pelvic fin | —<br>— | *l* — *<br>*r* 15.5 |
| Dorsal rays | 21 | 21 |
| Anal rays | 16 | 16 |
| Pectoral rays | *l* 13<br>*r* 13 | *l* 13<br>*r* 14 |
| Pelvic rays | *l* 6<br>*r* 6 | *l* 6<br>*r* 6 |
| Caudal rays (branched rays) | 8+1+8 | 8+1+8 |
| Number of pores in lateral line | *l* 29<br>*r* 30 | *l* 31<br>*r* 32 |
| Number of gill-rakers on the first arch | *l* 5+1+13<br>*r* 5+1+14 | *l* 5+1+14<br>*r* 5+1+13 |
| Number of pyloric caeca | *ca.* 14 | *ca.* 13 |
| Number of vertebrae | *ca.* 17+*ca.* 25 | — |

* Left side's pelvic fin is broken out without base.

** Tip of anal fin rays are all cut off.

The specimen is male with inmature gonads, measuring 410 mm. in the total length and 276 mm. in the standard length, and as equal as the Kurile's specimen in size. The measurments were made in the same manner with those done by ABE & MARUYAMA and a comparative table of both specimens was given in Table 1.

The general appearance and coloration of this specimen well agree with the type and also are quite similar to other two known specimens. No distinct difference is found from the previous descriptions on this species and no additional character should be describe is also observed from our specimens more than those given by previous authors.

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## IX. On an electric ray, *Toropedo tokionis* (TANAKA) taken from off Konbumori, near Kushiro, Hokkaido (pl. 5, fig. 2)

The electric rays have not previously been reported from the waters of Hokkaido. A single female specimen which may be referable to *Toropedo tokionis* was caught by a long-line for octopuses on November 24, 1965, at a depth of 60-100 m or more off Konbumori. The present specimen is belived to be the first definite record of electric rays from the Pacific coast of Northern Japan. This species has only been known from the depths off Pacific coasts of southern and central Japan as far north to off Chyoshi (MATSUBARA, 1955). Therefore the present specimen represents a northern extension of the range of over 850 km on our waters.

The total length of this specimen is 835 mm. The measurments of body parts were given in Table 2.

The body greatly depressed, almost circular. The disk wider than the length, and much longer than tail which is short, stout, and compressed posteriorly. The outline of body and pectoral fin round, very broad, and the frontal margin of snout bluntly rounded and flattened. The skin of body entirely smooth lacking the dermal denticles. Two dorsal fins are present on the tail. The first one larger than the second, and separated each other about a distance equal to two-third of the length of base of first dorsal fin. Caudal fin well developed, flat, nearly truncate at the posterior margin. Pectoral fin very broad, and the ventral fins separated. There is a weak longitudinal fold on each side of tail between the second dorsal fin and the caudal fin. Mouth rather small, its width a little shorter than the distance from tip of snout to mouth. Teeth on jaws arranged in mosaic, each tooth plate is flat

but with a single median cusp.

The back of body bluish gray and with small rounded dark spots. Those spots are also present on the caudal lobs. Underside of body entirely white with dusky shad.

Table 2. The measurements of body parts of *Toropedo tokionis* (TANAKA) taken off Konbumori.

| | |
|---|---|
| Total length | 835 mm |
| Length of body (from tip of snout to the center of cloaca) | 495 |
| Greatest width of disk | 530 |
| Length of tail (from the center of cloaca to the posterior end of upper lob of caudal fin) | 316 |
| Length of head (from tip of snout to the center of 5th gill slits of both sides) | 260 |
| Length of snout (from tip of snout to the anterior margin of eye) | 52.6 |
| Width of interorbital space (the least horizontal distance between the inner dorsal ridges of both orbit) | 59.0 |
| Diameter of eye (longer axis of orbit) | 27.0(*l*)<br>25.0(*r*) |
| Width of mouth cleft | 65.5 |
| Length of preoral part (from tip of snout to the outer lip of upper jaw) | 61.0 |
| Length of base of first dorsal fin | 51.0 |
| Length of base of second dorsal fins | 48.0 |
| Distance between second dorsal fin and caudal fin | 50.0 |
| Depth of caudal peduncle (at origin of caudal fin) | 26.0 |
| Width of caudal peduncle (at the same with above) | 16.2 |
| Width of base of tail (distance between inner insertions of both ventral fins) | 57.0 |
| Width of waist (distance between inner insertions of both pectoral fin) | 190 |

As far as color of body is concern, the present specimen is more similar to the North American species, *Toropedo californica* AYRES than to the Japanese species in which the back of body is dark brown or dark purple uniformly without any distinct round dark spots. But the American species has only been known from the Pacific coast of North America extending from Southern California to Queen Charlotte Islands, B.C. There are no records of occurrence for electric rays from the Bering Sea and the North Pacific Ocean. On the other hand, no evident differences which separable it from *Toropedo tokionis* were observed except for the coloration. Actually, both species are very close in their general appearances without the coloration and it raises suspicion in our minds that both species may be identical. However, this problem will be settled when the detailed study on their relationships is succeeded.

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## Explanaton of plate 5

Fig. 1. *Barbourisis rufa* PARR taken from off Mitsuishi, Hokkaido. (Lateral view)
Fig. 2. *Toropedo tokionis* (TANAKA) taken from off Konbumori, Hokkaido. (Above view)

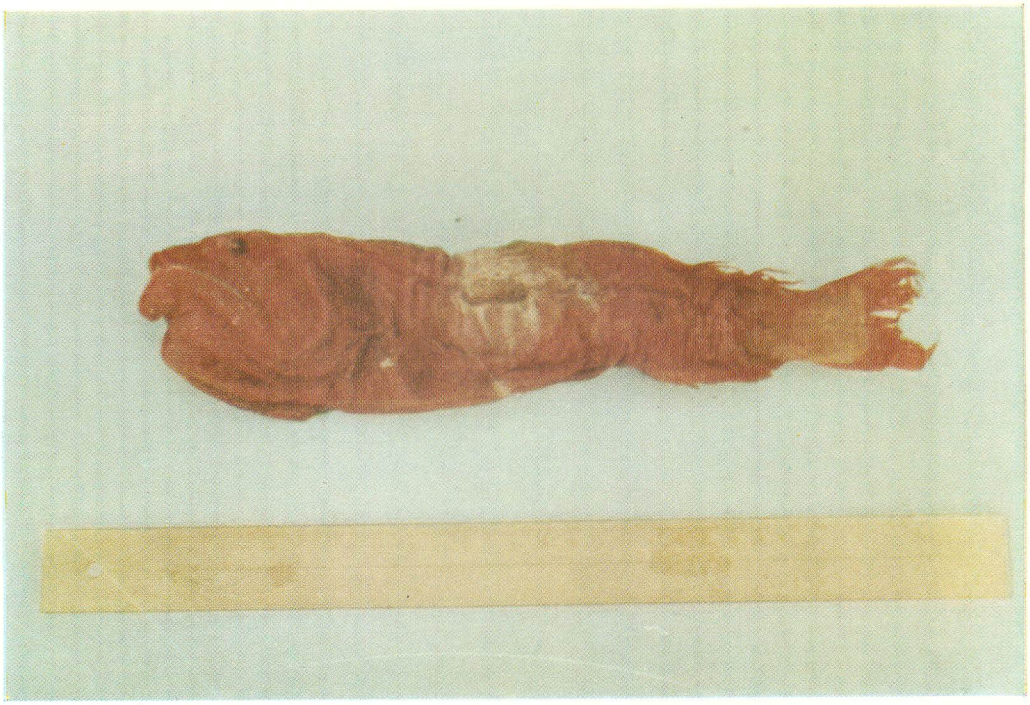

Fig. 1

Fig. 2