

New, Rare or Uncommon Fishes from Japanese Waters. II.  
Records of Rare Fishes of the Families *Diretmidae*, *Luvaridae*  
and *Tetragonuridae*, with an Appendix (Description of a New  
Species, *Tetragonurus pacificus*, from off the Solomon Islands)

Tokiharu ABE

(Tokaiiku Suisan Kenkyujo, and Zool. Inst., Fac. Sci., Tokyo Univ.)

A. *Diretmus argenteus* JOHNSON "Nakamura-ginme" (new Japanese name). Figs. 1 and 2

Mr. Chikashi NAKAMURA, chief of the Kesen-numa Branch Station, Miyagi Prefectural Fisheries Experimental Station, Kesen-numa, Miyagi Prefecture, has been interested in learning about the animals taken by deep-water trawls from off the Pacific coast of northern Japan, and sent the present writer several interesting fishes for study. The fish reported upon herewith is an adult of *Diretmus argenteus* JOHNSON which was collected by him a few years ago at Kesen-numa. The exact data of the specimen are lacking, but it is certain that the fish was taken by a deep-water trawl from the region mentioned just above. The present writer wishes to take this opportunity to express his sincere thanks to Mr. NAKAMURA for his kindness and thoughtfulness. The specimen will be returned to him in the near future to be displayed at the museum attached to the Kesen-numa Branch Station.

The specimen measures 299 mm in total length,\* 277 mm in fork length and 251 mm in standard length. The following measurements are given in hundredths of the standard length: - Length of head 34.7 (left), 36.3 (right), greatest depth of body (at origin of dorsal fin) 52.2, greatest breadth of body (a short distance behind dorsal corner of gill-opening) 15.1, least depth of caudal peduncle 10.4, diameter of orbit *ca.* 14.7, length of snout 8.8, bony interorbital breadth (above centers of orbits) 5.2, length of visible portion of longest gill-raker on 1st arch 6.0, length of longest dorsal fin-ray a little more than 13.1, length of longest anal fin-ray 13.5, length of longest pectoral fin-ray 22.3, length of longest ventral fin-ray 25.3, length of longest caudal fin-ray (root having been exposed 22.3.

D. 27 (the last fin-ray bifid to the base). The membrane between the 13th and 14th dorsal fin-rays and the subsequent membranes to the last one (namely, the membrane between the 26th and 27th fin-rays) are each proximally perforated by a distinct rounded window; the membrane between the 8th and 9th fin-rays and subsequent membranes to the one between the 12th and 13th fin-rays have each proximally a rounded light portion suggestive of the "window".

A. 21 the last fin-ray bifid to the base). The membrane between the 3rd and 4th fin-rays and the subsequent membranes to the last one (namely, the membrane between the 20th and 21st fin-rays) are each proximally perforated by a distinct rounded window. The last window is smaller than the others as in the windows of the dorsal fin. The membrane between the 1st and 2nd anal fin-rays is seemingly

---

\* Measured from the tip of the lower jaw to the tip of the caudal fin.

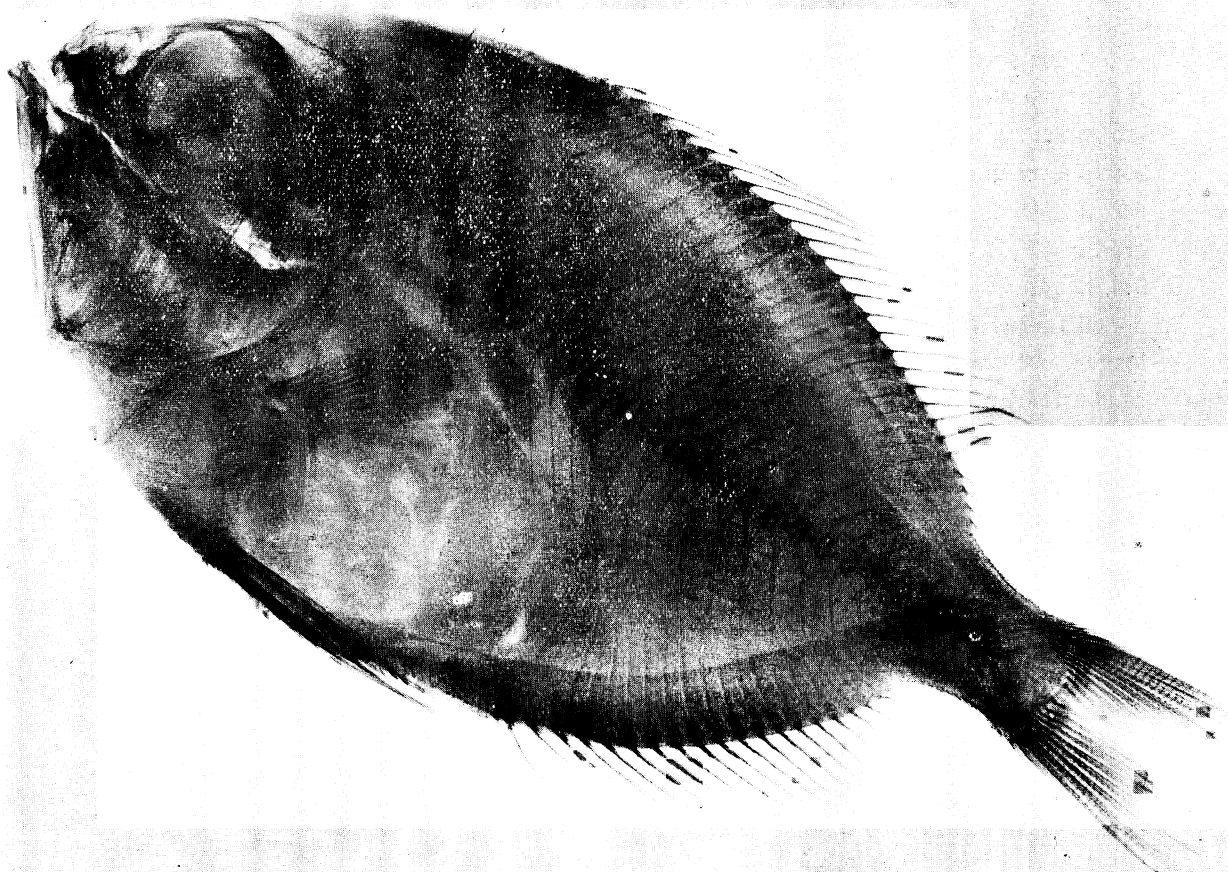
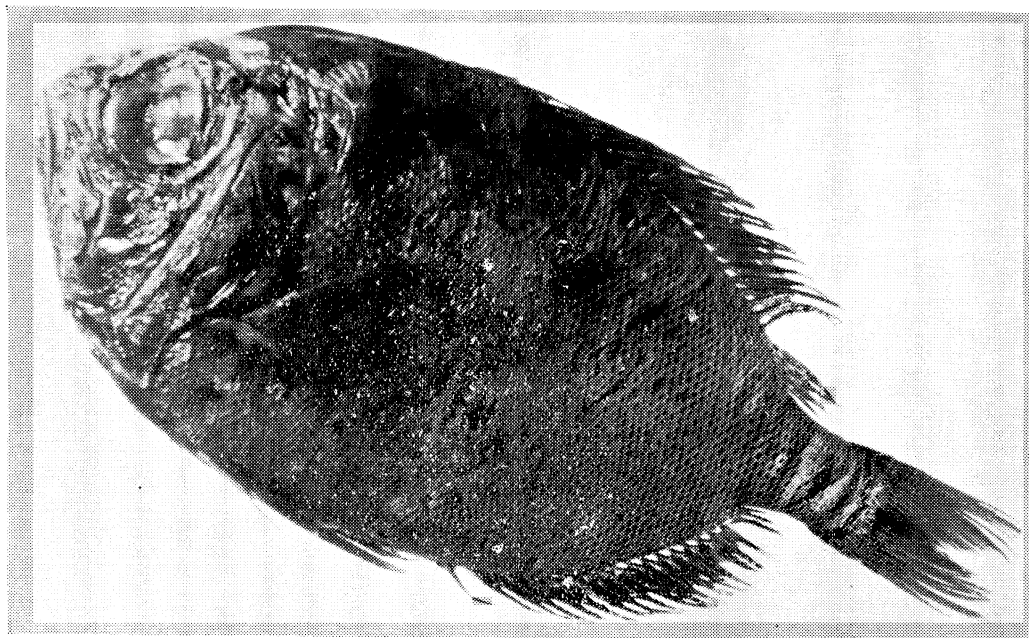


Fig. 1 (above). *Diretmus argenteus* JOHNSON from off the Pacific coast of northern Jap. n. Total length 299 mm.  
Fig. 2 (below). Radiograph of the specimen shown in fig. 1.

damaged.

The dorsal and anal fin-rays are slightly expanded laterally, slightly concave on their anterior surface where a weak ridge is formed along the median line. On either side of these fin-rays are series of spines, or, rather bristles; the most proximal spine of each anal fin-ray is much larger than the others, and the most proximal spine on some of the posterior dorsal fin-rays are a little larger than the other bristles of the dorsal fin-rays.

P. 18 (=ii+16) on each side.

V. 7 (=i+6) on each side.

C. vii/9/8/vii (determined by X-rays).

Branchiostegals 8 on each side. The left branchiostegal membrane covers proximally the right one.

Gill-rakers on the 1st arch 7/1/12 on each side. Pseudobranchiae well developed; a slit behind the 4th gill-arch.

No lateral line. Scales are mostly strongly ctenoid; those behind the gill-opening are larger and cycloid; those behind the nape have been rubbed off (scales probably being a little deciduous). The scales along the mid-ventral line from the origin of the ventral fin to that of the anal fin are ridged medially; the number of these scutes is 12 anterior to the vent, and 9 behind the vent. The number of scales in a row between the origins of dorsal and anal fins is *ca.* 50. Near either side of the base of the upper and lower anteriormost caudal fin-rays is a row of a few small spines. The number of the vertical rows of scales on the preopercle is *ca.* 10.

The body is compressed as in *Beryx*. The lower jaw is projecting beyond the upper jaw which is slightly concave at its anterior margin; the ventral corner of the symphysis is pointed and projecting anteriorly, and dorsal corner is weakly pointed and directed backward, fitted to the concavity of the upper jaw when appressed. In the buccal cavity, a pair of horn-like projections and a keel-like projection are prominent; they are placed just behind the horizontal skinny fold of the inside of the upper jaw. The postero-ventral corner of the preopercle is triangular in shape and projecting posteriorly.

The total number of vertebrae determined by X-rays is 30 (or 31) (counting the hindmost segment as 1), of which 13 (or 14, or 15) are precaudals and 16 or 17 are caudals. The number of the interneurals, also determined by X-rays, is 28 (or 29), of which the anteriormost 2 do not bear dorsal fin-rays. The 1st interneural is between the cranium and the neural spine of the 1st vertebra (or between the neural spines of the 1st and 2nd vertebrae). The number of the interhaemals is *ca.* 21.

### References

- Of the publications cited by Drs. BARNARD and VON BONDE (1944), the papers by CAMPBELL (1879), ROULE (1919), BUEN (1926) and PARR (1933) have not been seen by the present writer; the rest have been seen in the original, but will be omitted here.
- BARNARD, K. H. and VON BONDE, C. 1944. An adult specimen of *Diretmus* (Berycomorphi). Ann. Mag. Nat. Hist., 11th ser., xi., pp. 236-240.
- MAUL, G. E. 1949. Alguns peixes notaveis. Bol. Mus. Municipal do Funchal, iv, art. 11, pp. 22-42.
- SMITH, J. L. B. 1949. The sea fishes of southern Africa, xvi+550 pp., 103 pls. Cape Town.

**B. *Luvarus imperialis* RAFINESQUE** "A-ma-shiira"; "Kajiki-modoki"

On July 18, 1952, an unusual fish weighing some 240 pounds (exclusive of the weight of viscera) was shipped to the Central Wholesale Market of Tokyo, and the fish-dealers there seemed to have been excited to see this strange fish which according to them resembled *Lampris regius* in the coloration and appearance of the flesh. The fish was sold to a retailer early in the morning, and the present writer, when visited his shop in the suburb of Tokyo City following the suggestion by several fish-dealers at the market, could see only the anterior part of the head, caudal fin and several blocks of trunk muscles. He purchased the two former parts of the fish, and examined them. The fish has proved to be *Luvarus imperialis*, the occurrence of which in Japanese waters seems to be very rare. So far as the present writer is aware, there seems to have been only one exact record of this fish from Japan by Dr. K. MATSUBARA (in Drs. OKADA and MATSUBARA's "Keys to the fishes and fish-like animals of Japan", 1938). His record is based on a photograph sent to him by the Iwate Prefectural Fisheries Experimental Station at Kamaishi, northern Japan.

Through the kindness of Mr. Mitsugi YAMAGUCHI, Toto Suisan Co., the data of the specimen of *Luvarus imperialis* examined by the present writer have been received from Mr. Yosuke SAITO who shipped the fish to the market mentioned above. According to him, the fish was taken by a long-line for tunas of the fishing boat, "Gyo-un-maru", at 146°00' E., 39°25' N., around July 8, 1952. The surface temperature of the fishing ground, according to him, was 20°.5 C.

**References**

- GREGORY, W. K. 1933. Fish skulls: a study of the evolution of natural mechanisms. Trans. Amer. Phil. Soc., n. s., xxiii, pt. 2, pp. i-vii, 75-481, pl. 1.
- and CONRAD, G. M. 1943. The osteology of *Luvaris imperialis*, a scombroid fish: a study in adaptive evolution. Bull. Amer. Mus. Nat. Hist., lxxxi, art. 2, pp. 225-283.
- HARRY, G. Y. 1941. A record of the rare fish *Luvaris imperialis* from Oregon. Copeia, 1951, no. 2, pp. 172, 173.
- OKADA, Y. and MATSUBARA, K. 1938. Keys to the fishes and fish-like animals of Japan, 2+x1+584 pp., 112 pls. Tokyo. In Japanese.
- PHILIPPS, W. J. 1941. New or rare fishes from New Zealand. Trans. Proc. Roy. Soc. N. Z., lxxi, no. 3, pp. 231-246, pls. 40, 41. Not seen in the original.
- RIPLEY, W. E. 1948. An extension of the range of *Luvaris imperialis* RAFINESQUE. California Fish and Game, xxxiv, pp. 39, 40. Not seen in the original.
- WAITE, E. R. 1902. Skeleton of *Luvaris imperialis*, RAFINESQUE. (A fish new to the western Pacific fauna). Rec. Aust. Mus., iv, no. 7, pp. 292-297, pls. 45, 46.

**C. *Tetragonurus cuvieri* RISSO** "Doku-uroko-ibodai" (new Japanese name)\*. Figs. 3, 4 and 7

In 1939, when the present writer just began to prepare MS. of a report on a

---

\* Dr. KAMOHARA called this fish "Uroko-ibodai" in his book published in 1941 (1940), but the name was used by Drs. OKADA and MATSUBARA (1938) for *Cubiceps squamiceps* (LLOYD). In order not to lead to confusion, the present writer proposes the new Japanese name, "Doku-uroko-ibodai", meaning poisonous "uroko-ibodai", for *Tetragonurus cuvieri*.

specimen of *Tetragonurus cuvieri* RISSO from Onahama, Fukushima Prefecture, a detailed account of another specimen of this cosmopolitan species taken near Tateyama, Chiba Prefecture, was published by Dr. KATSUZO KURONUMA. The present writer then thought it advisable to defer the publication of his report mentioned just above till the time when further material would be accumulated, and left aside the specimen and the MS. (which had not been completed) for future study. Unfortunately, the specimen has been lost sight of because of the confusion arisen during and after the end of World War II, only the incomplete MS. with a photograph of the specimen having been safe.

Early in the morning of March 28, 1953, an adult male specimen of *Tetragonurus cuvieri* was taken by a trap net (mainly for *Seriola* and *Trachurus*) at Manazuru, Kanagawa Prefecture, and was put in formalin solution by Mr. Masaji HIRAI, Manazuru Branch Station, Tokaiku Suisan Kenkyujo. In the afternoon of the same day the present writer happened to visit Manazuru to gather plankton samples and fish specimens which Mr. HIRAI had collected for him. The color of the specimen of *Tetragonurus cuvieri*, according to Mr. HIRAI, had remained almost unchanged when the writer observed the specimen. In the following pages, a photograph with some data of the specimen mentioned above of *T. cuvieri* taken at Onahama some 18 years ago and a brief account of another specimen just mentioned of the species taken at Manazuru will be given. Description of a close ally of this species found in the alimentary canal of a yellowfin tuna taken off the Solomon Islands on December 30, 1952, will also be given below as an appendix.

i. *A specimen collected at Onahama, Fukushima Prefecture.* As mentioned above, this specimen has been lost sight of, but according to the incomplete MS. of the present writer, the total length was *ca.* 315 mm. It was collected around 1935, by Mr. Haruhiko TSUNODA, then teacher at Onahama Primary School, and sent to Zool. Inst., Fac. Sci., Tokyo Imperial Univ. The following brief account is made after the MS. mentioned above: D. XVI, 12; A. 12; P. 16; V, I, 5. Scales firmly adherent, 98 in longitudinal series from the upper angle of the gill-opening to the origins of the caudal keels. Color in formalin was uniform brown.

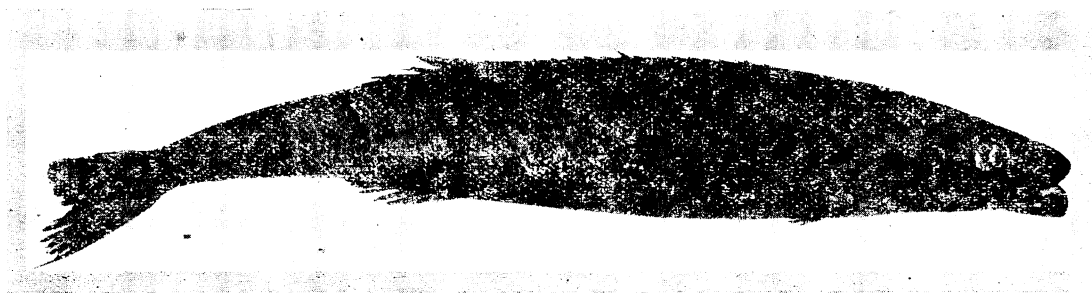


Fig. 3. *Tetragonurus cuvieri* RISSO from Onahama, Fukushima Prefecture, Japan. Total length *ca.* 315 mm.

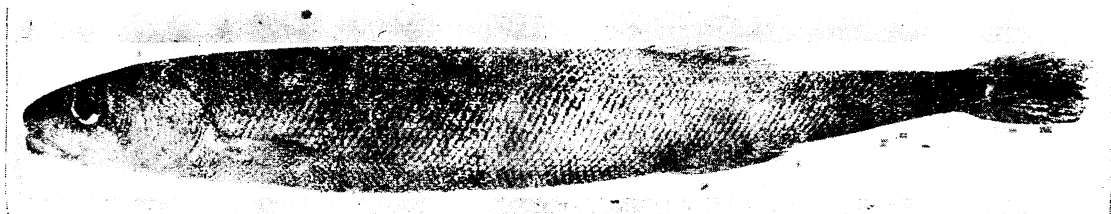


Fig. 4. *Tetragonurus cuvieri* Risso taken at Manazuru, Kanagawa Prefecture, Japan. Total length 340 mm.

ii. A specimen taken at Manazuru, Kanagawa Prefecture. The legend about its capture has been given above. The total length of body is 340 mm, fork length 321 mm and standard length 302 mm. The following measurements are given in hundredths of the standard length:—Length of head 20.2, greatest depth of body 14.6, greatest breadth of body 10.6, least depth of caudal peduncle 4.3, diameter of orbit 3.9 (5.1 in head), length of snout 6.5, interorbital breadth (above centers of orbits) 5.6, least distance between ventral edge of preorbital and lower orbital rim 3.6, length of longest pectoral fin-ray 10.3, length of 2nd and 5th (probably the longest) dorsal spines 3.6.

D. XIX, 13 (=iii+10). A. I,\* 12 (ii+10). P. 16 (=ii+12+ii) on each side. V. 4 on the left side; the right ventral fin is absent; the left ventral fin is received in a groove. C. xi/8 or 7/6/xii (examined by X-rays). The dorsal and anal fins are received in shallow furrows. The origin of the spinous dorsal fin is above the last fifth of the appressed pectoral fin; the origin of the anal fin is below the 6th dorsal fin-ray.

The right branchiostegal membrane lies proximally over the left. Branchiostegals 6 on each side. Gill-rakers in the anterior row of the 1st arch 6+13 (on the left) and 6+14 (on the right). Pseudobranchiae are well developed; 5 soft projections are arranged in a row just below the pseudobranchiae. There is a large opening behind the 5th arch.

Scales are arranged regularly; the number of scales counted from the one just above the upper corner of the gill-opening to the one in the oblique row passing the anterior end of the lower lateral keel of the caudal peduncle is 104 on the left side, 103 on the right. The number of scales in a row below the origin of the 2nd dorsal fin to the one just above the lateral line is  $\frac{1}{2}+9$ ; the number of scales in a row above the origin of the anal fin to the one just below the lateral line  $\frac{1}{2}+12$ . The number of predorsal scales is 23 or 24. The number of scales counted from the one just below the 1st dorsal spine to the one just anterior to the 1st fin-ray of the second dorsal is 39. The scales on the preopercle are arranged regularly, forming 6 long vertical rows, and there are a few short rows of scales below the eye. The scales are difficult to pull out. The number of the spines on the hind free margin of a scale on the side is 9–12.

The number of the grooves on the hind margin of the orbit is 15 on the

\* Very small spine.

left side, 16 on the right.

The teeth of each jaw are flattened and proximally seemingly continuous with one another, only the apices being free. The number of the teeth in the upper jaw is *ca.* 30 (left) + *ca.* 32 (right); that of the lower jaw is *ca.* 48 (left) + *ca.* 47 (right). The vomer and palatines bear a row of small teeth; the tongue has also a row of very small teeth on either side.

The testes are fairly well developed. The flesh is white and oily as in *Ruvettus* or *Erilepis*.

The total number of vertebrae determined by X-rays is 53, of which probably 30 are precaudals; the anteriormost 6 interhaemals are placed below the haemal spine of the 31st vertebra.

The color in formalin solution is dark grey; the rows of scales are very distinct because of the hexagonal dark violet outline of each scale. After a few hours' preservation in formalin solution, each scale had a bluish spot, and the tint of the body was a little bluish.

Compared with the specimen described by Dr. KURONUMA, the rounded lower part of the symphysis of the present specimen coupled with the discrepancy in several meristic characters, body proportions and shorter lower jaw, seems to suggest that the present species is an extremely polymorphic species, or that there might be more than one species in the genus *Tetragonurus* in Japanese waters. It is also striking that the conspicuous grooves on the hind margin of the orbit are not depicted in Dr. KURONUMA's figure.

#### Appendix. - Description of *Tetragonurus pacificus*, new species, from off the Solomon Islands. Figs. 5 and 6

*Type*: A specimen (Cat. No. 47823, Zool. Inst., Fac. Sci., Tokyo Univ.) collected by Mr. Masahiro NAGANO, Katsu-ura Branch Station, Chiba Prefectural Fisheries Experimental Station, from the stomach of a large yellowfin tuna taken at 6° 36'S, 152° 29'E (west of the Solomon Islands) by the research vessel "Fusa-maru" of the Station on December 30, 1952. The surface temperature of the sea was 29.5 C.

The upper part of the head, caudal fin and the hind portion of the caudal peduncle have been damaged. The following measurements are given in hundredths of the standard length, 122.5 mm:—Length of head 26.1, greatest depth of body 14.7, greatest breadth of body 12.7, diameter of orbit *ca.* 7.3, length of snout *ca.* 7.8, bony interorbital breadth (above centers of orbits) *ca.* 6.4, least depth of preorbital 3.7, length of longest pectoral fin-ray 14.3, length of 2nd and 4th (probably longest) dorsal spines 5.3.

D. X, 12. A. I, 10. P. *ca.* 16 on each side. V. 6 on each side. The ventral fin are not fitted to a groove. The origin of the first dorsal fin is above the last third of the appressed pectoral fin; the origin of the anal fin is below the 7th dorsal fin-ray.

The left branchiostegal membrane covers proximally the right one. Branchio-

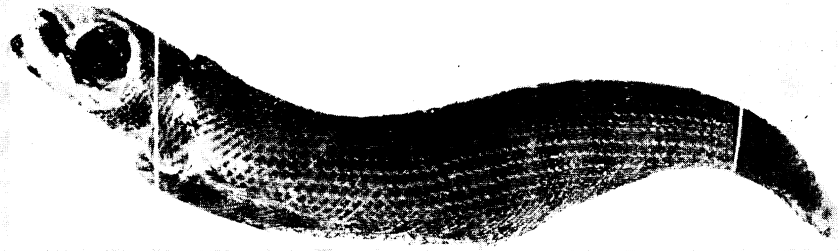


Fig. 5. *Tetragonurus pacificus*, new species. Type. Standard length 122.5 mm.

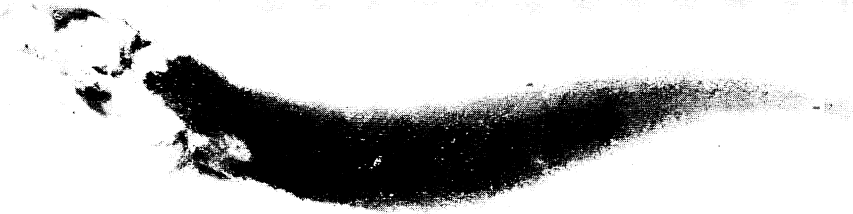


Fig. 6. Radiograph of the type of *Tetragonurus pacificus*.

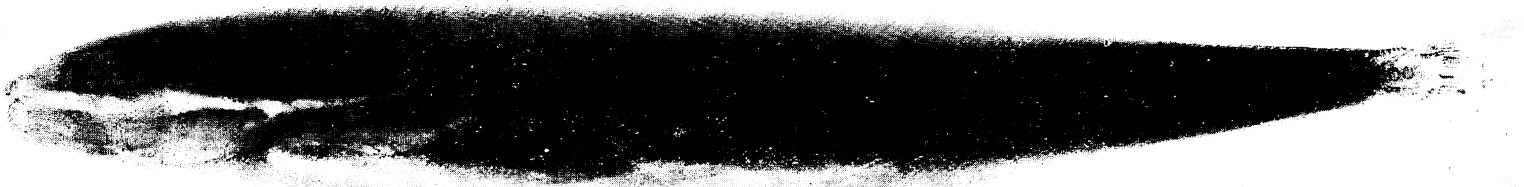


Fig. 7. Radiograph of *Tetragonurus cuvieri* Risso from Manazuru (cf. fig. 4).



stegals 6 on each side. Gill-rakers on the 1st arch 7+14 (on the left) and 6+13 (on the right).

Scales are larger than in the other species of *Tetragonurus*; the number of scales counted from the one at the dorsal corner of the gill-opening to the one at the point where the lateral keels were supposedly originated is *ca.* 78 on each side; predorsal scales *ca.* 20; the number of scales below the origin of the second dorsal fin down to the one just above the lateral line is only  $\frac{1}{2} + 5$ , the number of the scales above the origin of the anal fin to the one just below the lateral line is only *ca.*  $9 + \frac{1}{2}$ . The number of scales between the origins of the first and second dorsal fins is only 23.

The teeth of the upper jaw are conical and well separated from one another at their distal half or one third; their number is 29+29. The teeth of the lower jaw are seemingly connected with one another at their proximal two thirds by a semitransparent membrane; their number is 39 (left)+37 (right).

The total number of vertebrae determined by X-rays is *ca.* 43, of which probably 18 are caudals.

The color in formalin solution is dark grey with bluish longitudinal lines formed by bluish dots.

*Remarks.* The present new species differs from the other congeners in the remarkably low number of some of their meristic characters and in body proportions. The number of the dorsal spines and that of the vertebrae are far less than in the other forms of the genus, and the body is much more robust than in the latter.

### References

- With the exception of the publications by GUIGLIA (1950), PARROTT (1948), RAMSAY & OGILBY (1832), RISSO (1810) and SEURAT (1933), those cited by Dr. KURONUMA (1939) and Mr. FITCH (1951, 1952) have been seen in the original. They will be omitted here.
- FITCH, J. 1951. Notes on the squaretail, *Tetragonurus cuvieri*. Calif. Fish & Game, xxxvii, no. 1, pp. 57-59.
- 1952. Toxicity and taxonomic notes on the squaretail, *Tetragonurus cuvieri*. Calif. Fish & Game, xxxviii, no. 2, pp. 251-252.
- KURONUMA, K. 1939. A record of *Tetragonurus cuvieri* Risso from Japan. Bull. Biogeogr. Soc. Japan, ix, no. 12, pp. 201-206, pls. 6, 7.
- SMITH, J. L. B. 1952. Discovery of *Tetragonurus* Risso, 1810, in South African waters. Nature, clxx, p. 496 (Sept. 20, 1952).
- 1953. The genus *Tetragonurus* Risso. Ann. Mag. Nat. Hist., 12th ser., vi, no. 61, pp. 53-66, pl. 1.

## 雜 錄 Ichthyological and Editorial Notes

ホツケの幼魚 宮古—金華山沿岸に出現す

Occurrence of *Pleurogrammus azonus* JORDAN et METZ along the Pacific coast of the northern part of the mainland of Japan

ホツケの原記載は朝鮮の鎮南浦産の標品に就いてなされたものとされて居り、日本海方面ではホツケは確かに