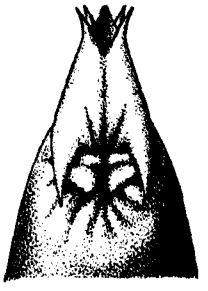
LIST OF FISHES DREDGED BY THE STEAMER ALBATROSS OFF THE COAST OF JAPAN IN THE SUMMER OF 1900, WITH DESCRIPTIONS OF NEW SPECIES AND A REVIEW OF THE JAPANESE MACROURIDÆ.

BY DAVID STARR JORDAN AND EDWIN CHAPIN STARKS.

In the early summer of 1900 the steamer *Albatross*, Jefferson F. Moser, U. S. N., commanding, returning from the South Seas, spent a few weeks in dredging along the coast of Japan. Dredge hauls were made at moderate depths in Owari Bay, Totomi Bay off Owai Point, Suruga Bay off Ose Point, Sagami Bay off Sune Point, Manazuru Point, and Enoshima, in Matsushima Bay off Nagane Point and Doumiki Point, and off the Island of Kinkwazan. In general the bottom was soft and the depths from 20 to 60 fathoms. One hundred and eleven species of fishes were secured, about 58 of these being new to science at the time of discovery. In June of the same year Messrs. Jordan and Snyder visited Japan, and in various papers in the Proceedings of the United States National Museum the collection made by the *Albatross* has been treated, in connection with the very extensive collections secured by them through other methods. The type specimens of the different new species in the collection made by the *Albatross* are all deposited in the U. S. National Museum. The figures used in the original descriptions of the new species from the *Albatross* collection are reproduced in the present paper, through the courtesy of the U. S. National Museum. The new plates are the work of Mr. William S. Atkinson and Mr. Sekko Shimada. The account of the Macrouridæ was prepared by Dr. David S. Jordan and Dr. Charles H. Gilbert.

MYXINIDÆ.



Myxine garmani Jordan & Snyder. Type.

1. Myxine garmani Jordan & Snyder.

Myxine garmani Jordan & Snyder, Proc. U. S. Nat. Mus., XXIII, 1901, 731; off Misaki, Japan.

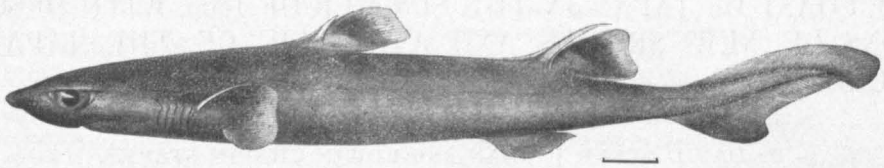
Station 3757, off Suno Point, Sagami Bay, 50 to 41 fathoms.

SQUALIDÆ.

2. Centroscyllium ritteri Jordan & Fowler.

Centroscyllium ritteri Jordan & Fowler, Proc. U. S. Nat. Mus., xxvi, 1903, p. 635; Totomi Bay.

Station 3730, off Owai Point, Totomi Bay, 34 to 37 fathoms.



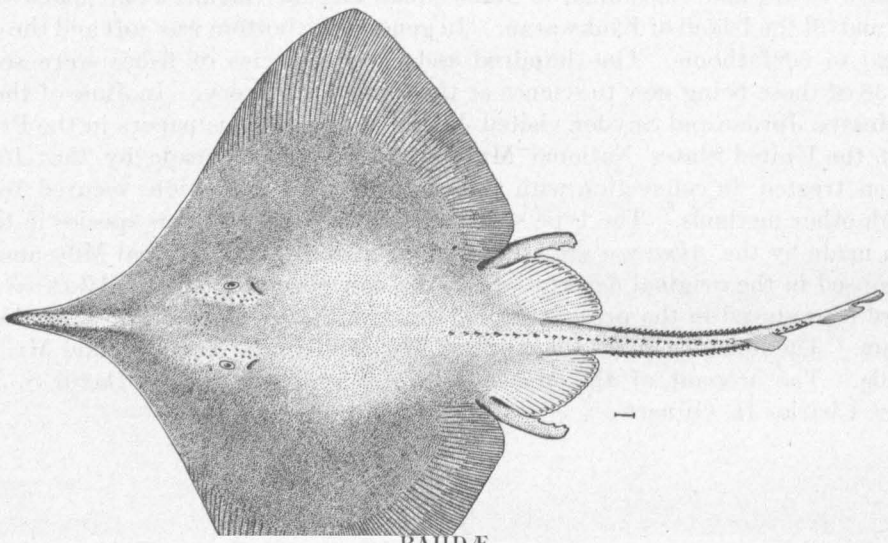
Centroscyllium ritteri Jordan & Fowler.

RAJIDÆ.

3. Raja tengu Jordan & Fowler.

Raja tengu Jordan & Fowler, Proc. U. S. Nat. Mus., xxvi, 1903, p. 654; Matsushima Bay.

Station 3770, off Nagane Point, Matsushima Bay, 42 to 45 fathoms.

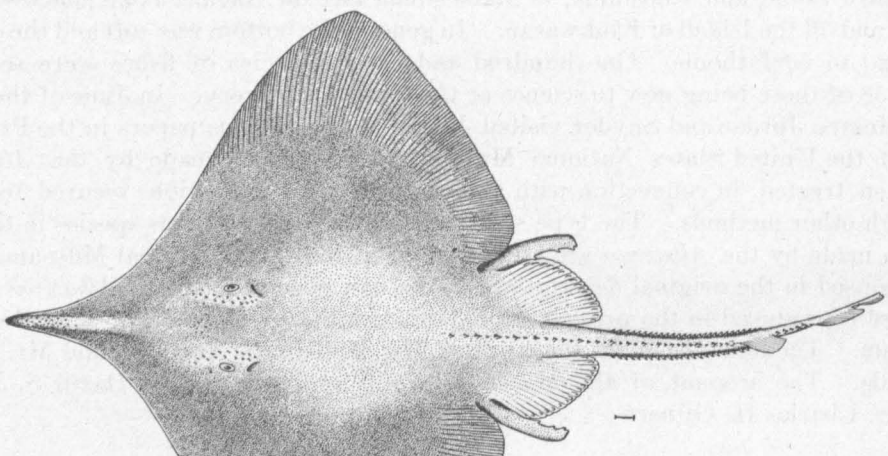


RAJIDÆ.

3. Raja tengu Jordan & Fowler.

Raja tengu Jordan & Fowler, Proc. U. S. Nat. Mus., xxvi, 1903, p. 654; Matsushima Bay.

Station 3770, off Nagane Point, Matsushima Bay, 42 to 45 fathoms.



ALEPOCEPHALIDÆ.

5. Xenodermichthys nodulosus Günther.

One fine specimen 21.5 cm. long, from station 3697, Sagami Bay. It agrees well with Günther's description and excellent figure.

Head 6 in length; depth 7; D. 32; A. 31. Color entirely black. Lateral line well developed, with scale-like structures; the rest of the body naked, covered with fine longitudinal wrinkles; luminous nodules all black.

AULOPIDÆ.

6. Aulopus japonicus Schlegel.

Specimens from stations 3708, 65 to 125 fathoms; 3713 in 500 to 600 fathoms; 3714 in 48 to 60 fathoms, and 3720, 63 fathoms, all in Suruga Bay, and from station 3730, Totomi Bay, 37 fathoms.

7. Chlorophthalmus albatrossis Jordan & Starks, new species. (Pl. 1, fig. 1.)

Type, No. 51446, U. S. Nat. Mus., from station 3698, Sagami Bay, in 153 fathoms. Cotypes, No. 8394, Stanford University.

Head 3 to 23; depth 5 to 12; D. 1, 10; A. 8; scales 53–16; eye 2.5 in head; snout 3.75; maxillary 2.5; interorbital space 4.3 in eye.

Body cylindrical, depressed anteriorly; eyes very large, close together above, with the range largely vertical; mouth terminal, very oblique, maxillary reaching to opposite front of pupil; lower jaw projecting; teeth small, in narrow bands on jaws, in very narrow straight bands on palatines, and in two small, widely separated patches on vomer; body covered with firm scales, those on breast much smaller; cheeks and opercles scaly; no lateral line; dorsal fin inserted well in advance of ventrals, the ventral base nearly under middle of dorsal; dorsal fin rather short and high; anal fin small; ventrals large, inserted well forward; pectoral long, 1.1 in head; adipose fin well developed; caudal widely forked. Color olivaceous, with numerous irregular dark cross-shades on back, these extending upward and backward; scales of anterior parts below silvery, with numerous black dots; axil black; inner rays of ventrals jet black; some black shading at base of caudal, fins otherwise plain.

One specimen 17 cm. long, and two smaller ones, from station 3698, Sagami Bay, 153 fathoms; six still smaller specimens from station 3717, Suruga Bay, 65 to 125 fathoms.

CHAULIODONTIDÆ.

8. Chauliodus emmelas Jordan & Starks, new species. (Pl. 1, fig. 2.)

One specimen 20.8 cm. long, from station 3697, in Sagami Bay, 120 to 265 fathoms; type No. 51464, U. S. Nat. Mus.

Close to *Chauliodus sloani*, the body more slender and the color entirely jet black.

Head 7.5 in length; depth 8; D. 6; A. 10; scales about 60; eye 5 in head; snout 4; longest fang 2; ventral fins unusually long, 5.5 in body; dorsal filament 2.6; pectoral 1.4 in head; barbel at chin pale.

General appearance of *Chauliodus sloani*. Luminous spots similar, 19 in a series from isthmus to ventrals; distance from pectoral to ventral, 4.2 in body; lateral fangs of lower jaw larger than those of upper. Color entirely jet-black, the fins a little paler. In the accompanying plate the artist has restored the squamation, lost in the specimen, from Garman's plates.

GONOSTOMIDÆ.

9. Neostoma gracile (Günther).

Gonostoma gracile Günther, Ann. & Mag. Nat. Hist. 1878, 187. Günther, Deep Sea Fishes, Challenger, p. 174, pl. XLV, fig. *c*, 1887; south of Japan.

One specimen, 2.5 inches long, from station 3712, Suruga Bay (surface); also two others, very small and in poor condition.

Head 5.5 in length; depth 9.5; D. about 10; A. 26; eye 6 in head; maxillary 1.1. Body very elongate, considerably more slender than in *Cyclothone microdon;* teeth stronger, numerous, slender, curved; short canines in each jaw; lower jaw much projecting; body apparently scaleless; anal fin beginning near middle of body, two-fifths of a head's length in advance of dorsal, the fin 3 times as long as dorsal fin; first ray of dorsal over eighth of anal; ventrals short, 1.6 in head, not quite reaching anal; pectoral long and narrow, 1.5 in head; no adipose fin.

Color black; lower side of head and fins abruptly pale; a row of photophores from isthmus to base of pectoral; a double row from between lower pectoral rays along each side of body just above base of anal and along lower side of caudal peduncle to base of caudal fin; a row from behind pectoral base to ventral; two on side above end of ventral; two above anal; two behind shoulder girdle above pectoral; one below eye.

This species has the anal fin more advanced than any other referred to *Gonostoma* or to *Cyclothone*. This trait may be regarded as of generic value. As it appears also, although to a less degree, in *Cyclothone bathyphila*, the type of the nominal genus *Neostoma* of Vaillant, we may provisionally adopt the genus *Neostoma* for these two species, which have the anal inserted well in front of the dorsal.

MYCTOPHIDÆ.

10. Neoscopelus alcocki Jordan & Starks, new species. (Pl. 2, figs. 1 and 2.)

One specimen, 19 cm. long, from station 3709, in Suruga Bay, in 173 to 260 fathoms; type, No. 51477, U. S. Nat. Mus.

Head 3 in length; depth 4; D. 13; A. 12; scales 4–33–4; eye 5 in head; snout 3.5; maxillary 2.

Body rather robust, subfusiform, head rather pointed in profile, broad and somewhat depressed above; mouth large, oblique, maxillary extending to below posterior margin of orbit, not dilated behind, posterior border truncate; teeth small, in villiform bands; eye moderate, cheek broad, not oblique in position; scales large, entire, firm, roughened on the surface, nearly all fallen in specimen examined; lateral line well developed; luminous spots, large, in about 6 rows on breast, about 14 in a lengthwise series from isthmus to ventrals, then a median and two lateral rows, to opposite front of anal, 10 spots in outer row, the posterior one smaller; an oblong circle of 10 small photophores about the vent; a row of 15 small photophores, continuous with inner lateral row before vent, from opposite vent to base of caudal, most of the median members of this series double; there is also an inner series of minute white dots along base of anal rays; a median row of small photophores behind anal below caudal peduncle. Dorsal rather large, inserted before ventral, its longest rays about half head; longest anal ray 2.4 in head; caudal well forked; pectoral long, 1.1 in head; ventral long, 1.75; gillrakers long and slender, 3 + 12 in number.

Color pale or brownish above, belly black; a dusky shade at base of caudal and pectoral; inside of mouth black; luminous spots pale, with a dark ring.

This species is very close to *Neoscopelus macrolepidotus* of the Atlantic. The sole important difference apparently is in the arrangement of the photophores on the posterior part of the body. In the figures (Nos. 108 and 109) given by Goode & Bean, the arrangement is quite unlike that seen in the Japanese fish. In the plate, the two lateral rows of spots found on the abdomen are represented as continuous to the base of caudal. In the Japanese fish the outer row is not continued behind the front of anal. The inner lateral series is continued, the spots becoming smaller. There is a ring of little spots about the vent, and a series of little dots along base of anal.

The species abundant about Hawaii, called *Neoscopelus macrolepidotus* by Gilbert & Cramer, seems to be the same as the Japanese fish.

11. Diaphus watasei Jordan & Starks, new species.

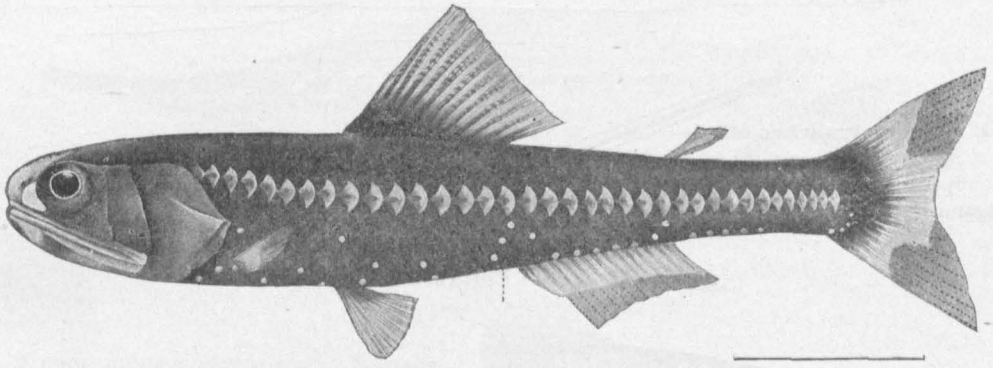
Head 3.8 in length; depth 5.2; eye 4 in head; snout 5.5; maxillary 1.4; D. II, 13; A. II, 13; scales 36.

Body moderately elongate and compressed, more slender than in *Diaphus* (*Æthoprora*) *effulgens*, the nearest related species, head more pointed; eye small; snout very short, truncate at tip; cheeks very oblique; scales caducous, all fallen in type; those along lateral line preserved in one specimen, and considerably enlarged; a lunate luminous gland in front of eye, extending backward to a point a little behind front of pupil; a short luminous tract above this; all these coalescent over snout in a large pale area like the headlight of an engine, the front part distinctly paler than that before the eye; luminous spots distinct, 4 + 4 + 1 + 4 + 4 + 6 + 1 + 5 + 4; the last 4 in a curved row at base of caudal, 5 before this, then 1 posterolateral spot before which are 6 in a curved row continuous with it; then 4 mediolateral spots in a V-shaped series, 4 more, 1 of them out of line, then a single spot above base of ventral; 4 spots before ventral and 4 before pectoral. One single spot shows the characteristic division, or theta-form (θ), which suggested the name *Diaphus*. It is probable that in life more spots had this form, and that there is no real difference between *Æthoprora* and *Diaphus*. Dorsal fin high, its last ray about over first of anal, its longest ray 1.2 in head; anal fin moderate; pectoral short and broken, about 3 in head; ventrals 1.6 in head; caudal broken.

Color dusky, with luminous spots, the one before eye very bright; lower jaw with 3 dark cross shades.

Of this species we have one specimen, the type, No. 51443, U. S. Nat. Mus., in good condition, dredged by the *Albatross*, at station 3698, off Atami, in Sagami Bay, in 153 fathoms, and 4 smaller examples, No. 8393, Stanford University, collected off Misaki, and presented by Professor Sho Watase, of the Imperial University.

In scales, fins, and luminous spots this species agrees with *Diaphus effulgens* of the Atlantic, but the latter species has the head notably shorter, deeper, and more blunt. The species is still nearer *Diaphus engraulis*, from which it apparently differs in the number and arrangement of the postero-anal and posterolateral photophores. The former diverge backward from the mid-ventral line, forming a continuous series with the latter. They are 6 or 7 in number instead of 5.



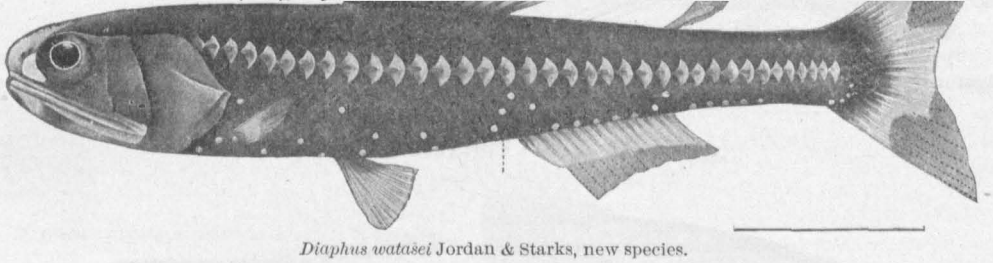
Diaphus watasei Jordan & Starks, new species.

STERNOPTYCHIDÆ.

12. Polyipnus stereope Jordan & Starks, new species. (Pl. 2, fig. 3.)

Head with projecting lower jaw 3 in length; depth 1.6; dorsal 13; anal 15; eye 2.25 in head; maxillary 1.33; pectoral 1.2; ventral 3.

This species differs from *P. spinosus* Günther (its nearest relative), in the character of the nuchal process. The upper of the 3 spines into which the process is divided is long, sharp, and straight; it extends at an oblique angle upward and backward; the distance from its tip vertically down to the outline of the back equals half diameter of pupil. This spine in *P. spinosus*, according to Dr. Günther's plate, extends but little above this outline; second spine shorter, and evidently variable in length. In the type it is at least three-fourths as long as the upper spine; in the 2 cotypes it is reduced to a very small inconspicuous spinule. Lower spine as long as, or not noticeably shorter than upper spine, curved downward and only slightly backward.



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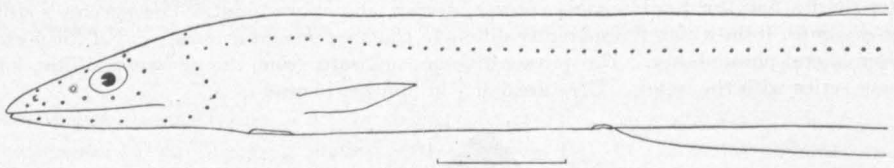
SYNAPHOBRANCHIDÆ.

13. Synaphobranchus jenkinsi Jordan & Snyder.

Synaphobranchus jenkinsi Jordan & Snyder, Proc. U. S. Nat. Mus. XXIII, 1901, 845; Sagami Bay.

One specimen, No. 49727, U. S. Nat. Mus., from station 3696, off Enoshima, Sagami Bay, in 110 to 175 fathoms.



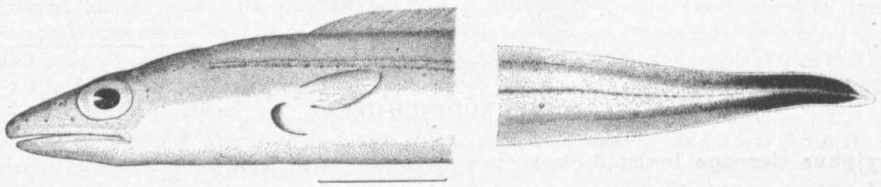
Synaphobranchus jenkinsi Jordan & Snyder.

14. Synaphobranchus affinis Günther.

Synaphobranchus affinis, Jordan & Snyder, Proc. U. S. Nat. Mus. XXIII, 1901, 844.

Specimens from station 3780, Totomi Bay, off Owai Point, in 37 fathoms, and from station 3697, Sagami Bay, off Manazuru Point, in 120 to 265 fathoms.

LEPTOCEPHALIDÆ.



Congrellus megastomus (Günther).

15. Congrellus megastomus (Günther).

Congrellus megastomus, Jordan & Snyder, Proc. U. S. Nat. Mus. XXIII, 1901, 854.

From station 3730 in Totomi Bay, off Owai Point, in 34 fathoms.

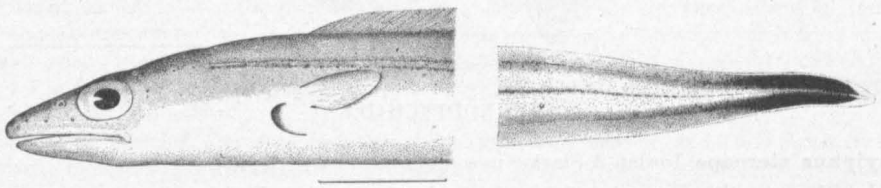
OPHICHTHYIDÆ.

14. Synaphobranchus affinis Günther.

Synaphobranchus affinis, Jordan & Snyder, Proc. U. S. Nat. Mus. XXIII, 1901, 844.

Specimens from station 3780, Totomi Bay, off Owai Point, in 37 fathoms, and from station 3697, Sagami Bay, off Manazuru Point, in 120 to 265 fathoms.

LEPTOCEPHALIDÆ.



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Congrellus megastomus, Jordan & Snyder, Proc. U. S. Nat. Mus. XXIII, 1901, 854.

From station 3730 in Totomi Bay, off Owai Point, in 34 fathoms.

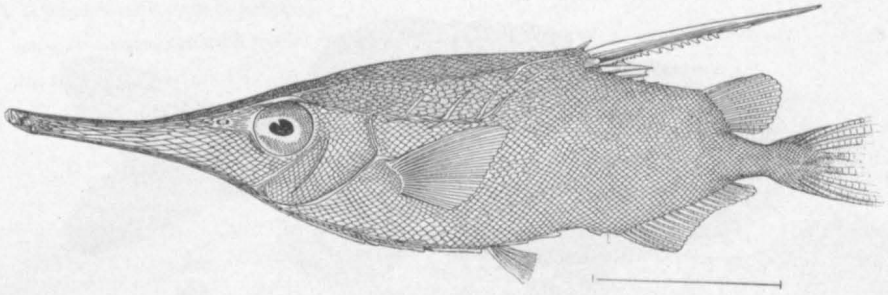
OPHICHTHYIDÆ.

MACRORHAMPHOSIDÆ.

17. Macrorhamphosus sagifue Jordan & Starks.

Macrorhamphosus sagifue Jordan & Starks, Proc. U. S. Nat. Mus., XXVI, 1903, p. 69; Suruga Bay, Totomi Bay, Sagami Bay.

Many specimens, from station 3707, off Ose Point, Suruga Bay, in 68 to 70 fathoms; station 3730, off Owai Point, Totomi Bay, in 34 fathoms; station 3715, off Ose Point, Suruga Bay, in 64 to 65 fathoms; station 3716, off Ose Point, Suruga Bay, in 65 to 125 fathoms; station 3717, off Ose Point, Suruga Bay, in 65 to 125 fathoms; station 3741, Suruga Bay, in 71 fathoms, and station 3763, off Sune Point, Sagami Bay, in 49 fathoms.



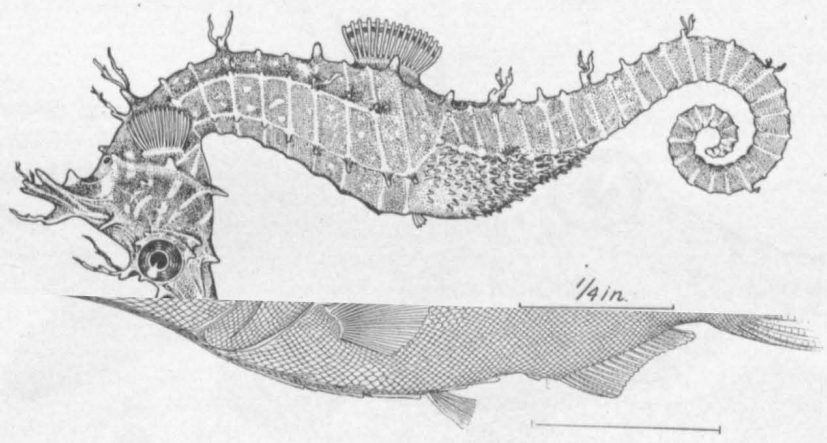
Macrorhamphosus sagifue Jordan and Starks.

HIPPOCAMPIDÆ.

18. Hippocampus sindonis Jordan & Snyder.

Hippocampus sindonis Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 17; Totomi Bay.

From station 3727, Totomi Bay, example No. 47930, U. S. Nat. Mus.



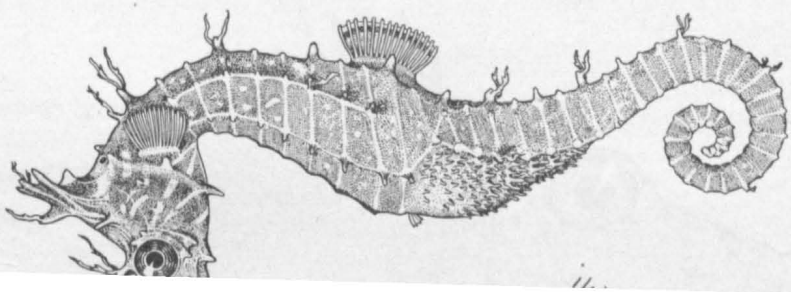
Macrorhamphosus sagifue Jordan and Starks.

HIPPOCAMPIDÆ.

18. Hippocampus sindonis Jordan & Snyder.

Hippocampus sindonis Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 17; Totomi Bay.

From station 3727, Totomi Bay, example No. 47930, U. S. Nat. Mus.



21. Gephyroberyx japonicus (Döderlein).

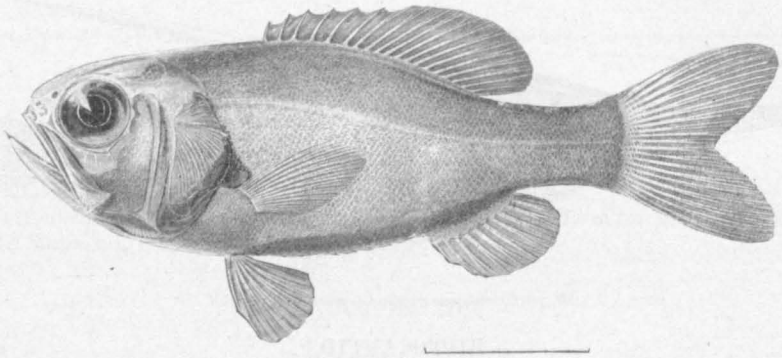
Gephyroberyx japonicus, Jordan & Fowler, Proc. U. S. Nat. Mus., XXVI, 1903, p. 6; Suruga Bay.

Station 3716, off Ose Point, Suruga Bay, 65 to 125 fathoms.

22. Paratrachichthys prosthemius Jordan & Fowler.

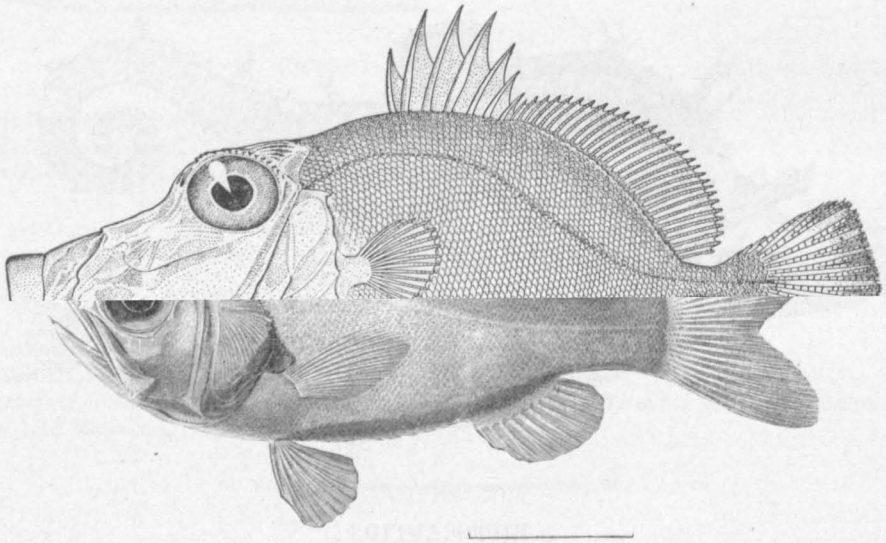
Paratrachichthys prosthemius Jordan & Fowler, Proc. U. S. Nat. Mus., XXVI, 1903, p. 9; Totomi Bay.

Station 3730, Owai Point, Totomi Bay, in 34 fathoms. One specimen, No. 50575, U. S. Nat. Mus.



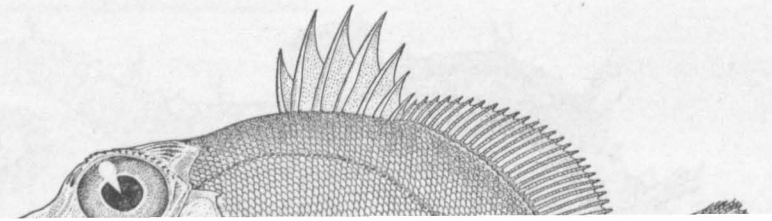
Paratrachichthys prosthemius Jordan and Fowler. Type.

ZEIDÆ.



Paratrachichthys prosthemius Jordan and Fowler. Type.

ZEIDÆ.



24. Zeus japonicus Schlegel.
Station 3713, off Ose Point, Suruga Bay, in 50 to 60 fathoms.

CARANGIDÆ.

25. Carangus equula (Schlegel).
One specimen, from station 3738, Suruga Bay, 167 fathoms.

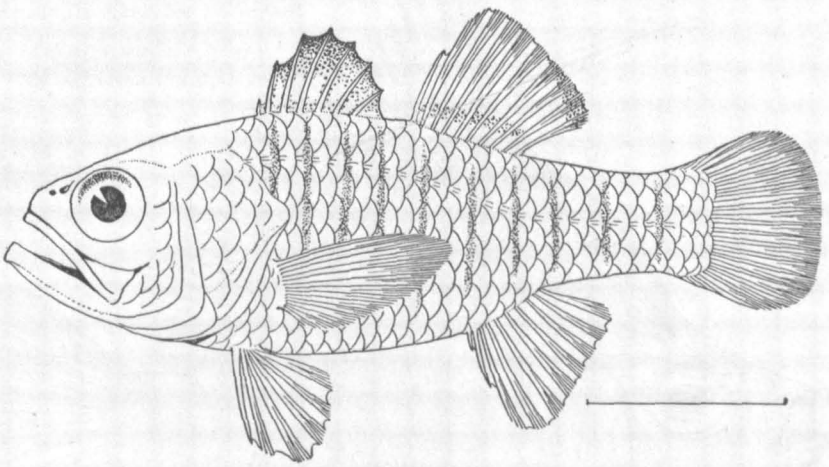
26. Seriola purpurascens Schlegel.
Many young taken at the surface in Sagami Bay.

APOGONIDÆ.

27. Apogon lineatus Schlegel.

Apogon lineatus, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIII, 1901, p. 898; Owari Bay.

Station 3722, Owari Bay, in 3 to 9 fathoms.



Apogon lineatus Schlegel.

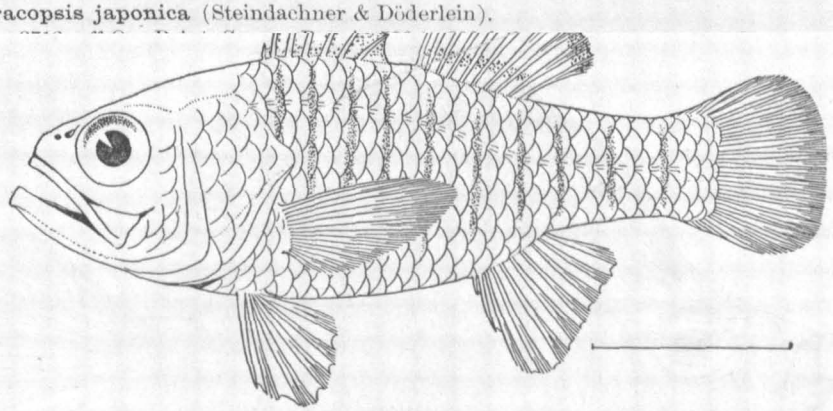
28. Synagrops japonica (Steindachner & Döderlein).

Melanostoma japonicum, Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1901, p. 573; Suruga Bay.

Station 3707, off Ose Point, Suruga Bay, in 68 to 70 fathoms.

SERRANIDÆ.

29. Labracopsis japonica (Steindachner & Döderlein).



Apogon lineatus Schlegel.

28. Synagrops japonica (Steindachner & Döderlein).

Melanostoma japonicum, Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1901, p. 573; Suruga Bay.

Station 3707, off Ose Point, Suruga Bay, in 68 to 70 fathoms.

SERRANIDÆ.

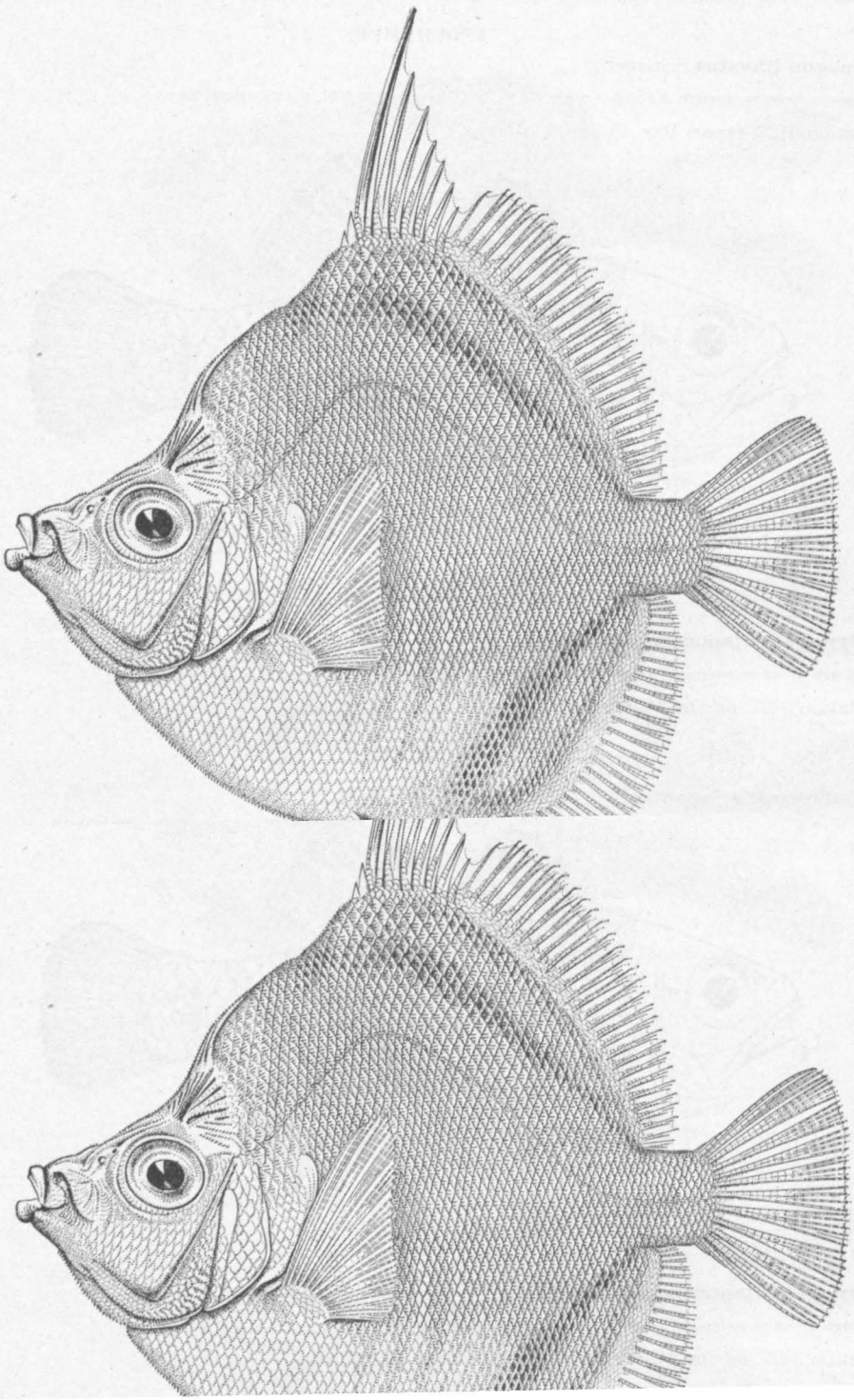
29. Labracopsis japonica (Steindachner & Döderlein).
Station 3713, off Ose Point, Suruga Bay, in 500 to 600 fathoms; one young specimen.

ANTIGONIDÆ.

32. Antigonia rubescens (Günther).

Antigonia rubescens, Jordan & Fowler, Proc. U. S. Nat. Mus., xxv, 1903, p. 523; Suruga Bay, Totomi Bay.

Station 3707, off Ose Point, Suruga Bay, in 63 to 75 fathoms; station 3713, off Ose Point, Suruga Bay, 500 to 600 fathoms; station 3715, off Ose Point, Suruga Bay, 64 to 65 fathoms; station 3717, off Ose Point, Suruga Bay, 65 to 125 fathoms; station 3729, off Owai Point, Totomi Bay, 37 fathoms, and station 3734, off Owai Point, Totomi Bay, 48 to 36 fathoms.



CHÆTODONTIDÆ.

34. Chætodon nippon Steindachner & Döderlein.

Chætodon nippon, Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1903, p. 537; Totomi Bay.

Station 3730, off Owai Point, Totomi Bay, in 37 fathoms.

TROPIDICHTHYIDÆ.

35. Tropidichthys rivulatus (Schlegel).

Eumycterias rivulatus, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 255; Totomi Bay

Station 3729, off Owai Point, Totomi Bay, in 37 fathoms.

MONACANTHIDÆ.

36. Stephanolepis cirrhifer (Schlegel).

Stephanolepis cirrhifer, Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1902, p. 264.

Station 3730, off Owai Point, Totomi Bay, in 34 fathoms.

OSTRACIIDÆ.

37. Aracana aculeata (Houttuyn).

Arcana aculeata, Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1902, 284, Sagami Bay, Suruga Bay, Owari Bay.

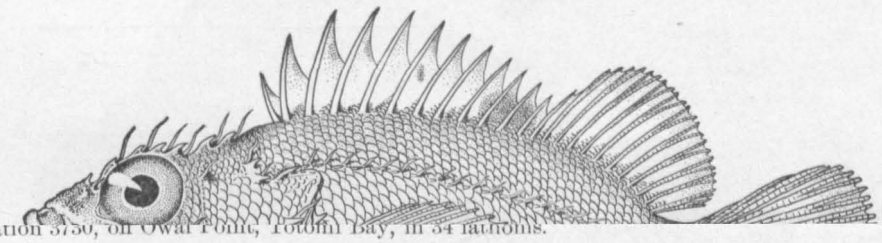
Station 3707, off Ose Point, Suruga Bay, 68 to 70 fathoms; station 3754, off Sune Point, Sagami Bay, 50 fathoms; station 3762, Owari Bay, in 42 fathoms.

SCORPÆNIDÆ.

38. Sebastolobus macrochir (Günther).

Sebastolobus macrochir, Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 94; Sagami Bay.

Station 3697, off Manazuru Point, Sagami Bay, in 265 to 120 fathoms.



Station 3730, off Owai Point, Totomi Bay, in 34 fathoms.

OSTRACIIDÆ.

37. Aracana aculeata (Houttuyn).

Arcana aculeata, Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1902, 284, Sagami Bay, Suruga Bay, Owari Bay.

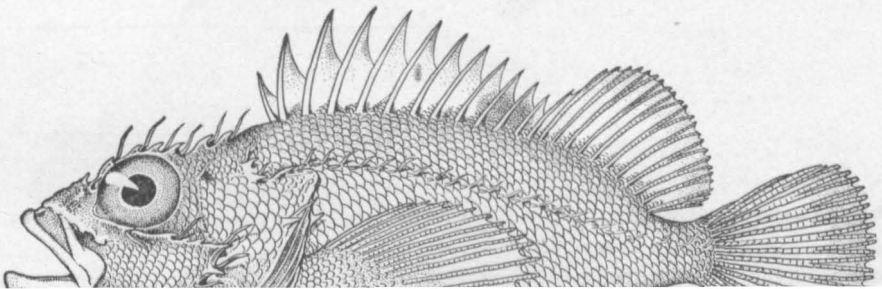
Station 3707, off Ose Point, Suruga Bay, 68 to 70 fathoms; station 3754, off Sune Point, Sagami Bay, 50 fathoms; station 3762, Owari Bay, in 42 fathoms.

SCORPÆNIDÆ.

38. Sebastolobus macrochir (Günther).

Sebastolobus macrochir, Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 94; Sagami Bay.

Station 3697, off Manazuru Point, Sagami Bay, in 265 to 120 fathoms.



40. Setarches albescens (Steindachner & Döderlein).

Setarches albescens, Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 138; Totomi Bay.

Station 3729, off Owai Point, Totomi Bay, in 37 fathoms.

41. Helicolenus dactylopterus (De la Roche).

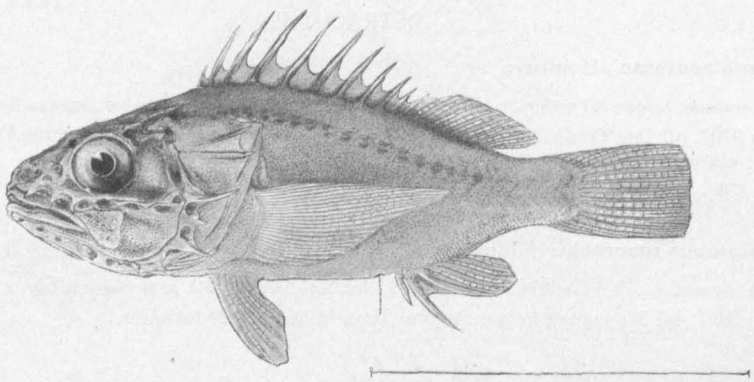
Helicolenus dactylopterus, Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 128; Sagami Bay, Suruga Bay.

Station 3698, off Manazuru Point, Sagami Bay, in 153 fathoms; station 3717, off Ose Point, Suruga Bay, 65 to 125 fathoms; station 3719, off Ose Point, Suruga Bay, in 70 to 100 fathoms.

42. Lythrichthys eulabes Jordan & Starks.

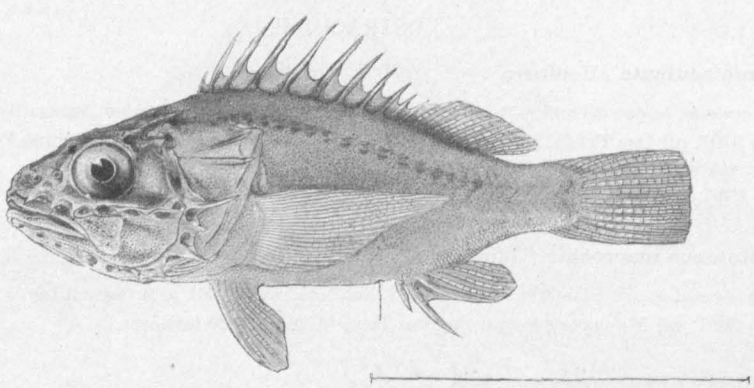
Lythrichthys eulabes Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 140: Suruga Bay

Station 3708, off Ose Point, Suruga Bay, 65 to 125 fathoms.



Lythrichthys eulabes Jordan & Starks.

43. Sebastiscus marmoratus (Cuvier & Valenciennes)



Lythrichthys eulabes Jordan & Starks.

43. Sebastiscus marmoratus (Cuvier & Valenciennes).

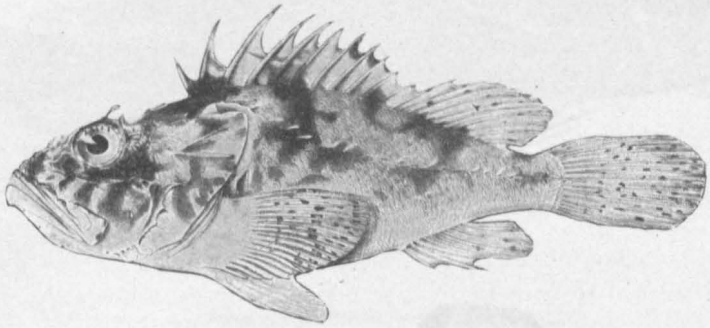
Sebastiscus marmoratus, Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 124; Suruga Bay.

Station 3718, off Ose Point, Suruga Bay, in 65 fathoms.

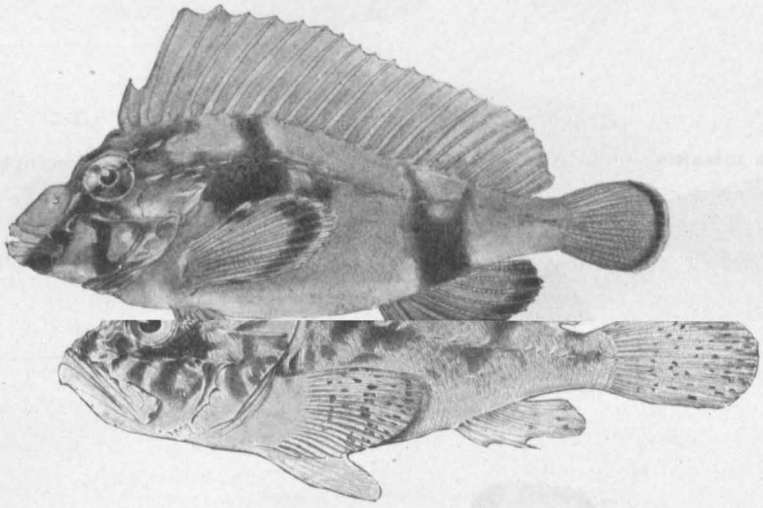
46. Scorpæna izensis Jordan & Starks.

Scorpæna izensis Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 134; Suruga Bay, Totomi Bay.

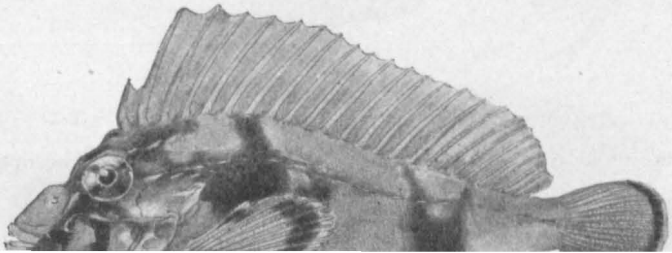
Station 3708, off Ose Point, Suruga Bay, 65 to 125 fathoms; station 3713, off Ose Point, Suruga Bay, 500 to 600 fathoms; station 3715, off Ose Point, Suruga Bay, 64 to 65 fathoms; station 3717, off Ose Point, Suruga Bay, 65 to 125 fathoms; station 3720, off Ose Point, Suruga Bay, in 63 fathoms; station 3729, off Owai Point, Totomi Bay, in 37 fathoms.



Scorpæna izensis Jordan & Starks.



Scorpæna izensis Jordan & Starks.

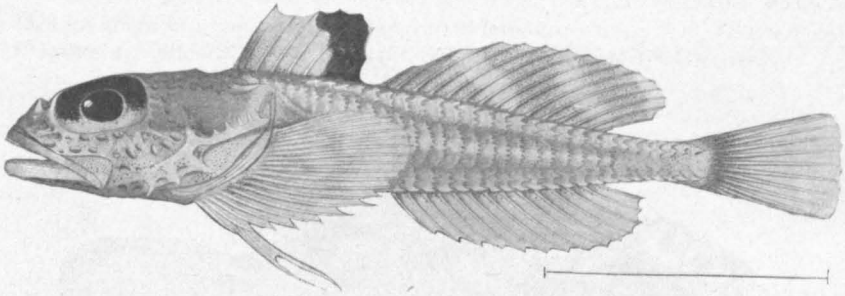


COTTIDÆ.

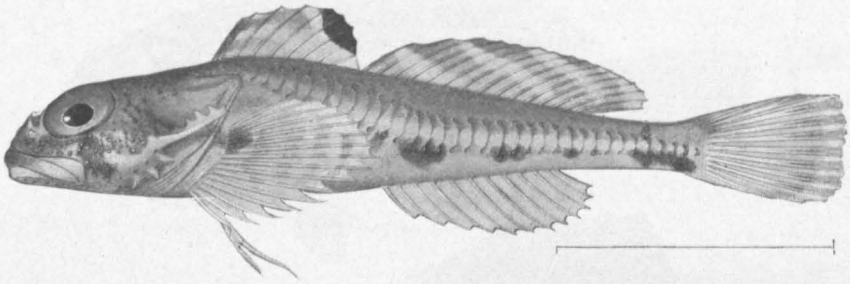
48. Stlengis osensis Jordan & Starks.

Stlengis osensis Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 236; Suruga Bay.

Station 3738, off Ose Point, Suruga Bay, in 167 fathoms.



Stlengis osensis Jordan & Starks.



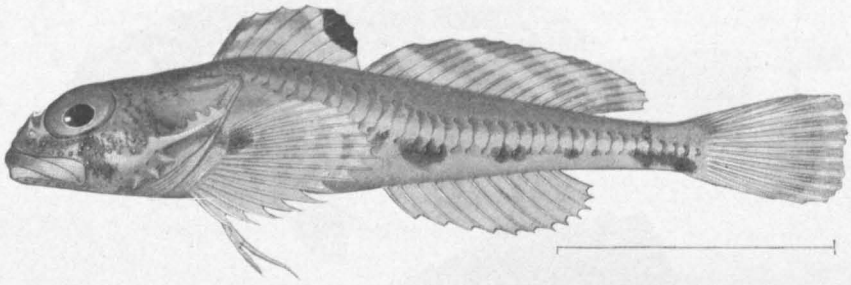
Schmidtina misakia Jordan & Starks.

49. Schmidtina misakia Jordan & Starks, new generic name, *Schmidtia* being preoccupied.

Schmidtia misakia Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 237; Sagami Bay.

Station 3698, off Manazuru Point, Sagami Bay, in 153 fathoms.

Stlengis osensis Jordan & Starks.



Schmidtina misakia Jordan & Starks.

49. Schmidtina misakia Jordan & Starks, new generic name, *Schmidtia* being preoccupied.

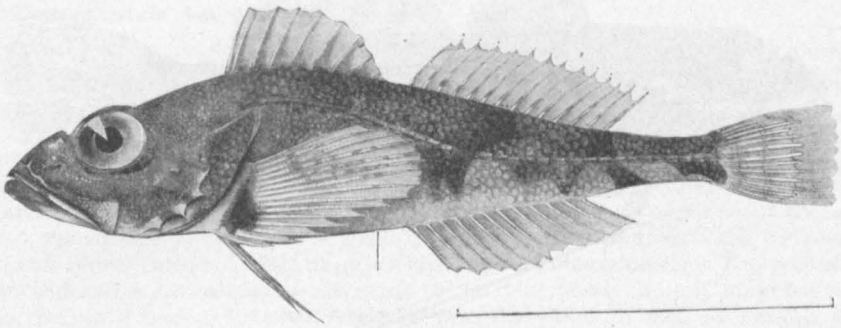
Schmidtia misakia Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 237; Sagami Bay.

Station 3698, off Manazuru Point, Sagami Bay, in 153 fathoms.

51. Ricuzenius pinetorum Jordan & Starks.

Ricuzenius pinetorum Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 243; Matsushima Bay

Station 3773, off Kinkwazan Island, in Matsushima Bay, in 78 fathoms.

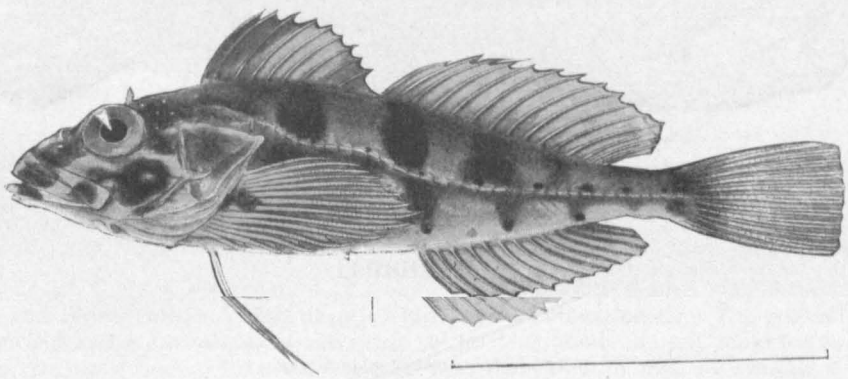


Ricuzenius pinctorum Jordan & Starks.

52. Pseudoblennius totomius Jordan & Starks.

Pseudoblennius totomius Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 315; Sagami Bay.

Station 3759, off Sune Point, Sagami Bay.

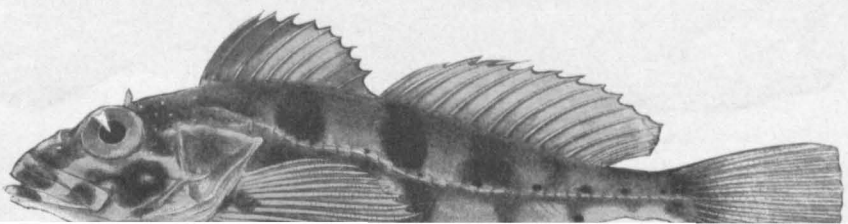


Ricuzenius pinctorum Jordan & Starks.

52. Pseudoblennius totomius Jordan & Starks.

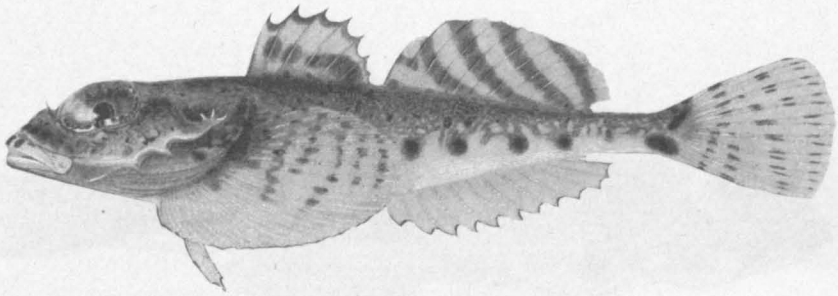
Pseudoblennius totomius Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 315; Sagami Bay.

Station 3759, off Sune Point, Sagami Bay.



54. Cottiusculus schmidti Jordan & Starks.

Cottiusculus schmidti Jordan & Starks, Proc. U. S. Nat. Mus., XXVII, 1904, p. 300; stations 3772 and 3773, in Matsushima Bay.

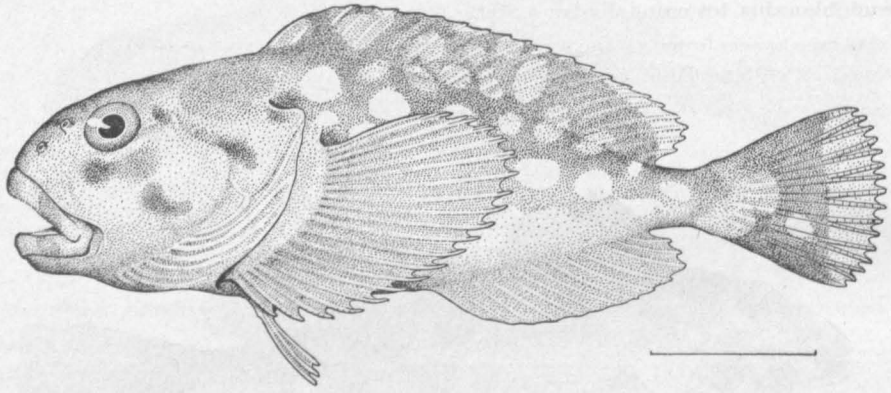


Cottiusculus schmidti Jordan & Starks.

55. Cottunculus brephocephalus Jordan & Starks.

Cottunculus brephocephalus Jordan & Starks, Proc. U. S. Nat. Mus., XXVI, 1903, p. 689; Suruga Bay.

Station 3704, Suruga Bay, in 150 fathoms.



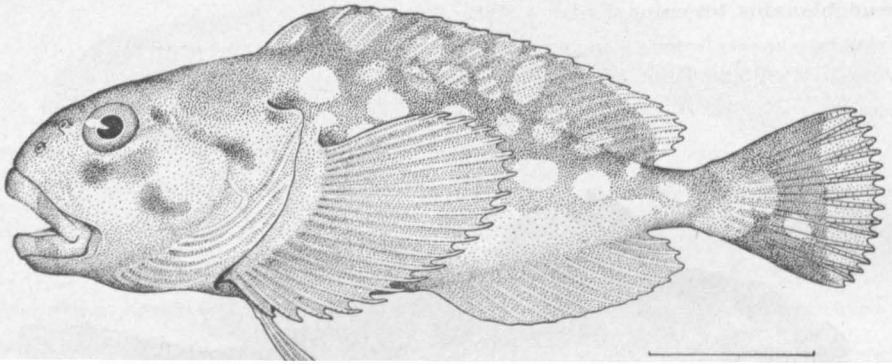
Cottunculus brephocephalus Jordan & Starks.

Cottiusculus schmidti Jordan & Starks.

55. Cottunculus brephocephalus Jordan & Starks.

Cottunculus brephocephalus Jordan & Starks, Proc. U. S. Nat. Mus., XXVI, 1903, p. 689; Suruga Bay.

Station 3704, Suruga Bay, in 150 fathoms.



HOPLICHTHYIDÆ.

57. Hoplichthys langsdorfi Cuvier & Valenciennes.

Station 3717, off Ose Point, Suruga Bay, 65 to 125 fathoms.

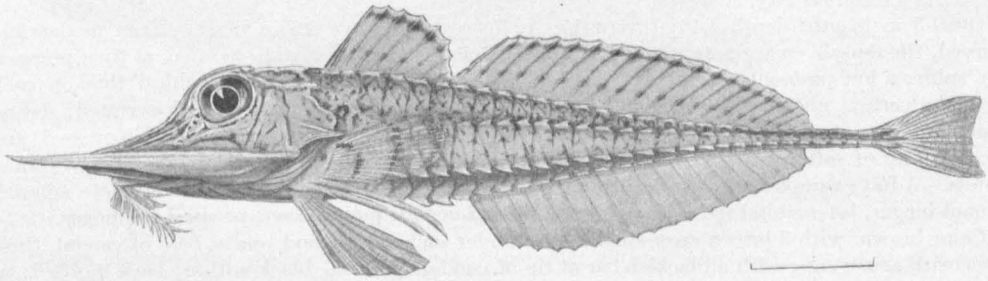
PERISTEDIIDÆ.

58. Peristedion orientale Schlegel.

Station 3707, off Ose Point, Suruga Bay, 68 to 70 fathoms; station 3708, off Ose Point, Suruga Bay, 65 to 125 fathoms; station 3715, off Ose Point, Suruga Bay, 64 to 65 fathoms; station 3716 and station 3717, off Ose Point, Suruga Bay, 65 to 125 fathoms.

Numerous specimens in fine condition, similar to others taken off Misaki and Atami, the largest, from station 3707, about a foot in length.

The original description and figure of this species are very incomplete, Schlegel's specimen having lost its fins and apparently its coloration also. The processes on the front of the snout are normally nearly parallel, but diverge more or less in some, especially young, examples. The body and head are covered with vermiculations of dark brown, which are very characteristic. The pectoral has 3 dark crossbars and a dark submarginal streak exists on the front dorsal; the soft dorsal has two rows of dark dots. Barbels numerous but small, the outer branched almost to base, not forming a brush, not much longer than eye.



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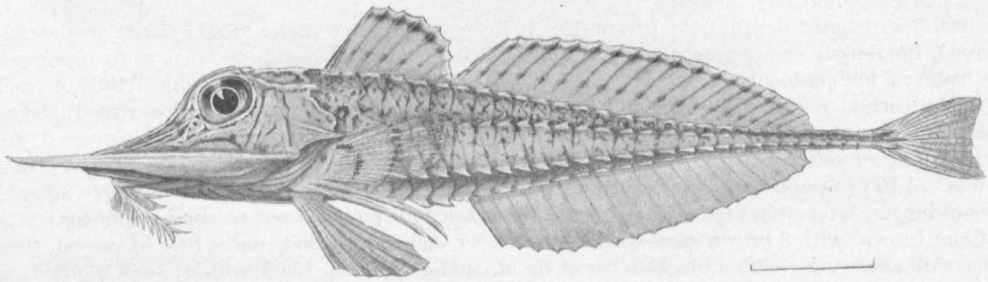


spine, two-thirds length of eye, preceded by a sharp ridge and extending posterior to all other parts of head; opercle with a small, short, sharp spine, preceded by a low, sharp ridge; a small spine over front of eye, a high spine over posterior part of eye; a very high sharp occipital spine, two-thirds diameter of eye; no spines above muzzle; lower jaw with many barbels, the outermost a long branched brush over two-thirds length of head, and reaching to within a diameter of pupil of the vent; breast with soft skin; fins moderate; spinous dorsal beginning between second and third spines of dorsal series of plates; tips of spines when depressed reaching to base of second dorsal ray; anal projecting posteriorly beyond soft dorsal, its origin opposite that of the latter. Tip of pectoral reaching fifteenth spine of upper series of plates; ventrals reaching just past middle of vent; caudal concave, its length 2.75 in head.

Color brown, probably red in life, with no black spots or marblings except a spot behind eye and a few dark edgings on ridges of head; pectoral black, pale-edged below; spinous dorsal black; soft dorsal, caudal, and ventral mottled; a dusky shade below last rays of soft dorsal; outer barbels of mouth black on distal half.

One specimen, the type No. 51428, U. S. Nat. Mus., from station 3698, off Manazuru Point, Sagami Bay, in 153 fathoms.

TRIGLIDÆ.

60. **Lepidotrigla guntheri** Hilgendorf.

Lepidotrigla guntheri Hilgendorf, Ges. Naturf. Freunde, 1879, 106; Tokyo.
Lepidotrigla longispinis Steindachner, Fische Japans, IV, 1262, taf. IV, fig. 1, 1887; Tokyo.

Station 3708, 65 to 125 fathoms; station 3713, 500 to 600 fathoms; station 3714, 48 to 60 fathoms; station 3715, 64 to 65 fathoms; and station 3717, 65 to 125 fathoms, all off Ose Point, Suruga Bay; and station 3727 in Totomi Bay.

Head 3 in length; depth 4.16; D. VIII–15; A. 15; scales 55; eye 3.5 in head. Head moderately decurved, the muzzle emarginate, the lateral prominences moderate, weakly toothed, at tip a preopercular spine; a low postocular spine with a cross furrow behind it, a low spine behind this, on each side of the vertex; nuchal spine long and sharp, the inner edge of the bone strongly serrated; second dorsal spine very strong, 1.33 in head, reaching far past the other spines when fin is depressed, and well past front of soft dorsal; pectoral 1.16 in head; longest detached pectoral ray reaching to tip of ventrals. Adult examples a foot in length have the head smoother, spines on vertex obsolete, spinules on snout longer, interorbital space less concave, second dorsal spine higher, pectoral fin longer.

Color brown, with 3 brown cross-shades, one under each dorsal and one at base of caudal, these fainter with age; young with a blackish bar at tip of caudal; pectoral black within; back mottled; no black dorsal spot, but sometimes a dusky cross-shade on dorsal; no sharp line on side bounding the pale color of belly.

The long dorsal spine and the broad, serrated nuchal process are especially characteristic of this species.

Five young specimens with the body and caudal fin banded and with the spines on the head rougher, the dorsal spines lower, we regard as the young of *Lepidotrigla guntheri*. Station 3708, off Ose Point, Suruga Bay, in 65 to 125 fathoms, two examples; station 3717, off Ose Point, Suruga Bay, in 65 to 125 fathoms, two examples; station 3727, Totomi Bay, one example. Head short and deep, snout steep, little produced, emarginate at tip, its lobes slightly serrate; eyebrow elevated, coarsely toothed, posterior serra a strong spine; a sharp spine on each side of vertex; a sharp parietal spine; nuchal spine strong, broad, with inner edge serrate; humeral and opercular spines strong; dorsal spines rather long, strongly serrated, second 1.66 in head; pectoral short, 1.2 in head (young).

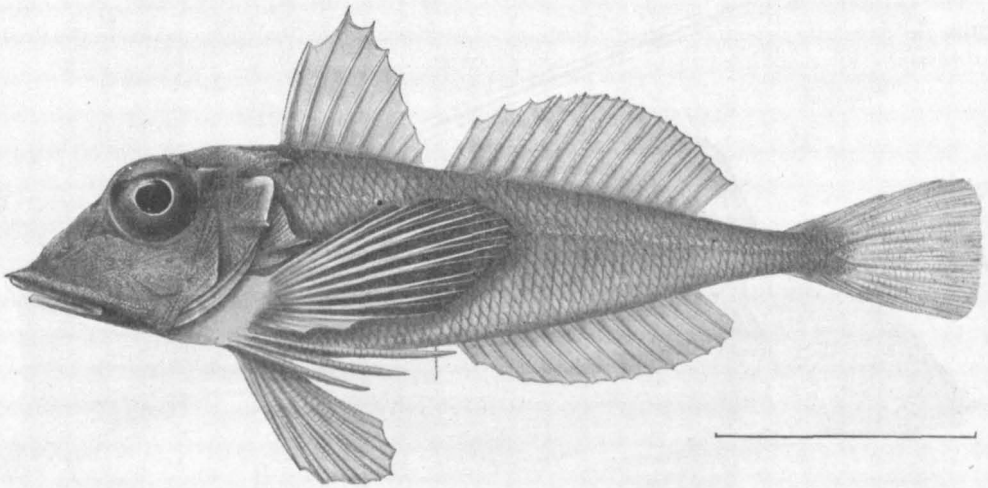
Head gray, marbled with blackish and with numerous black specks; pectoral closely spotted with black, so that the fin appears blackish; a blackish cross-shade on body below spinous dorsal; another below soft dorsal, these extending on fins; another at base of caudal; caudal with a round black blotch near tip.

The longest of these is 4 inches long, smallest 1.5 inches. We have also a large example nearly a foot in length from the Yokohama market.

61. Lepidotrigla abyssalis Jordan & Starks, new species.

Head 3 in length; depth 4.2; D. VIII–15; A. 15; scales 56; eye 3.16 in head; snout 2.5; maxillary 2.75; interorbital space 4; first dorsal spine 2.1; second dorsal spine 1.75; pectoral 1.1; ventral 1.25; caudal 1.4.

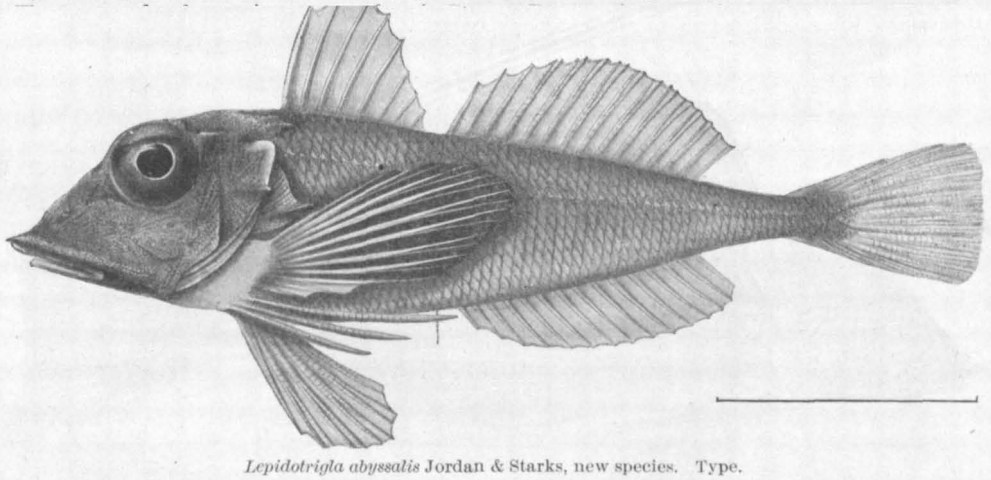
Head rather high, about as in *L. guntheri*. Snout almost truncate at tip; a sharp spine slightly projects at each angle; interorbital rather deeply concave; a short narrow cross-furrow above posterior margin of eye on supraorbital region, but not extending across top of head medially; slight indications of ridges on parietal region; nuchal spines and ridges but little developed; a slight ridge running back from upper posterior orbital rim; humeral spine moderately strong; second dorsal spine longest, though scarcely the strongest; when fin is depressed its tip reaches to front of soft dorsal, or barely past the tips of the other spines, while the third, fourth, and fifth are coterminal; first spine reaching only a little past base of last; upper detached pectoral ray reaching tip of ventral, which reaches base of second anal ray; pectoral reaching to opposite base of sixth anal ray.



Lepidotrigla abyssalis Jordan & Starks, new species. Type.

Color mottled red; pectoral bluish black; other fins without markings; no traces of a spot on spinous dorsal.

This species differs from *L. guntheri* in having more slender dorsal spines, the second dorsal spine not enlarged, top of head without spines. These comparisons are made between fishes of about the same size. In large specimens of *L. guntheri* the top of the head is as smooth as in this species, while in very small specimens the second dorsal spine is not much enlarged.



Lepidotrigla abyssalis Jordan & Starks, new species. Type.

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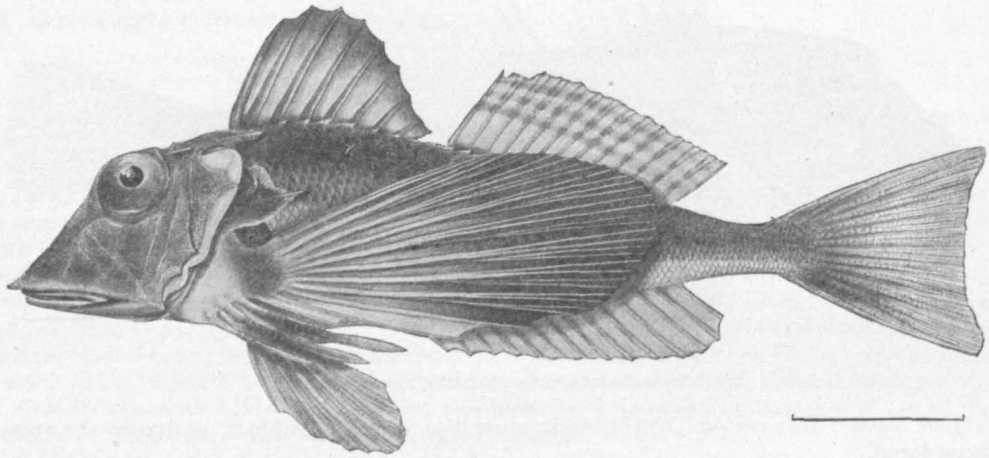
This species differs from *L. guntheri* in having more slender dorsal spines, the second dorsal spine not enlarged, top of head without spines. These comparisons are made between fishes of about the same size. In large specimens of *L. guntheri* the top of the head is as smooth as in this species, while

We refer these specimens to *Lepidotrigla microptera* Günther (Ann. & Mag. Nat. Hist. 1873, 241)= *Lepidotrigla strauchii* Steindachner, Ich. Beitr., v, p. 166, 1876, Hakodate. The latter is without much doubt the same, although a shore fish, without any of the brilliant coloration of the specimens in hand. The only difference we can find is that these specimens were red, while shore examples are olive-green.

Lepidotrigla microptera may be known by the black spot on the posterior part of dorsal, the dorsal and anal slightly longer than in *L. guntheri* and *L. abyssalis*, and the short detached pectoral rays which do not reach to tip of ventral.

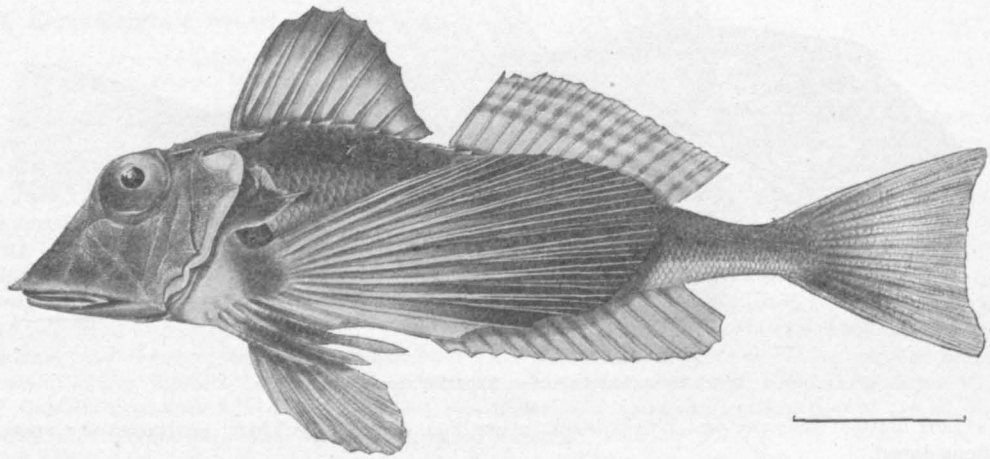
We have large examples of *Lepidotrigla microptera* from the Tokyo market corresponding to *Lepidotrigla strauchi* Steindachner. In these the sharp line separating the silvery of the belly from the darker color of the back is still more apparent than in our species. In specimens a foot long there is no trace of black on the dorsal fin, but in the young of 4 inches the black ocellus is still evident. In these large specimens each lobe of the snout ends in a large spine and several smaller serræ. This is the commonest species of the genus in Japan, extending its range well to the northward. We have numerous specimens from Aomori, Hakodate, Tsuruga, Matsushima, and Hiroshima.

The remaining Japanese species of *Lepidotrigla* is *L. alata* (Houttuyn)=*L. burgeri* (Schlegel). Of this we have many specimens from the shores of southern Japan, but none taken in the dredge. In this species the snout has two long diverging processes.



Lepidotrigla japonica (Bleeker).

63. Lepidotrigla japonica (Bleeker).
Of this we have many specimens from the shores of southern Japan, but none taken in the dredge. In this species the snout has two long diverging processes.

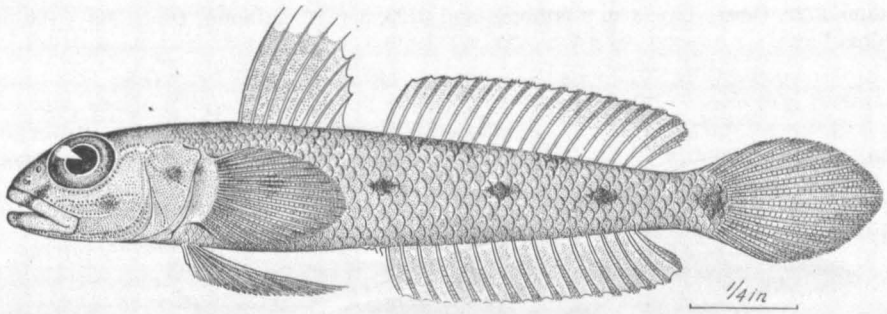


Lepidotrigla japonica (Bleeker).

65. Suruga fundicola Jordan & Snyder.

Suruga fundicola Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 96; Sagami Bay, Suruga Bay, Owari Bay, Matsushima Bay.

Station 3698, off Manazuru Point, Sagami Bay, in 153 fathoms; station 3708, off Ose Point, Suruga Bay, in 65 to 125 fathoms; station 3714, 48 to 60 fathoms, station 3715, 64 to 65 fathoms, station 3716, 65 to 125 fathoms, and station 3719 in 70 to 100 fathoms, all off Ose Point, Suruga Bay; station 3722, Owari Bay, in 3 to 9 fathoms; station 3723, Owari Bay, in 5 to 15 fathoms; station 3741, in Suruga Bay, 71 fathoms; station 3775, in Matsushima Bay.

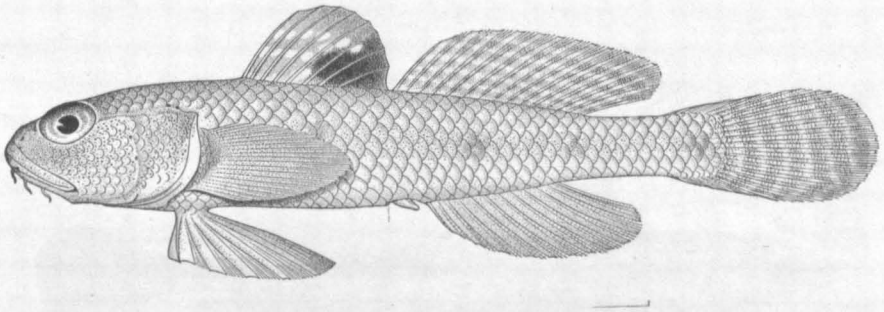


Suruga fundicola Jordan & Snyder.

66. Chæturichthys hexanemus (Bleeker).

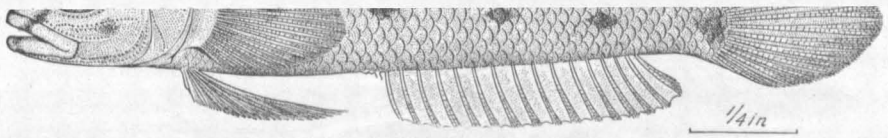
Chæturichthys hexanemus, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 106; Owari Bay, Matsushima Bay.

Station 3722, Owari Bay, in 3 to 9 fathoms; station 3723, Owari Bay, 5 to 15 fathoms; station 3724, Owari Bay, 19 to 20 fathoms; station 3768, Matsushima Bay.



Chæturichthys sciistius Jordan & Snyder.

67. Chæturichthys sciistius Jordan& Snyder.

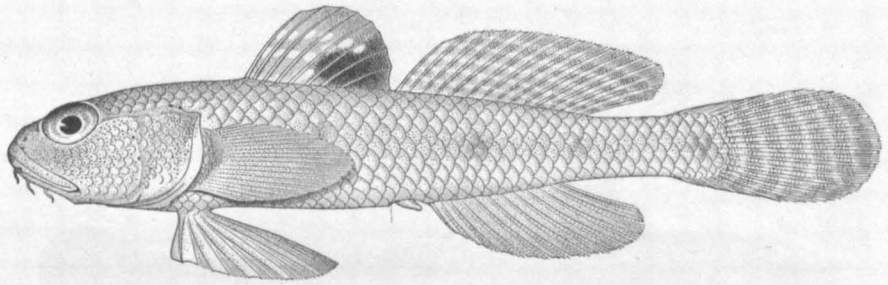


Suruga fundicola Jordan & Snyder.

66. Chæturichthys hexanemus (Bleeker).

Chæturichthys hexanemus, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 106; Owari Bay, Matsushima Bay.

Station 3722, Owari Bay, in 3 to 9 fathoms; station 3723, Owari Bay, 5 to 15 fathoms; station 3724, Owari Bay, 19 to 20 fathoms; station 3768, Matsushima Bay.



CALLIONYMIDÆ.

69. Callionymus lunatus Schlegel.

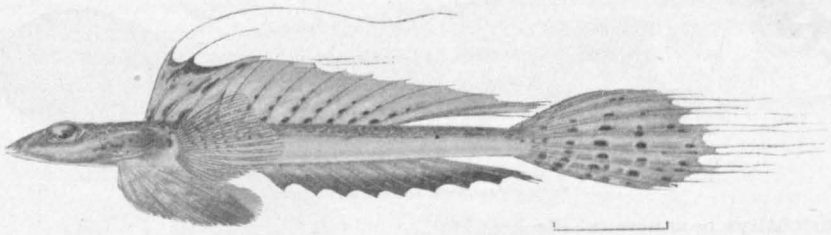
Callionymus lunatus, Jordan & Fowler, Proc. U. S. Nat. Mus., xxv, 1903, p. 949; Owari Bay.

Station 3722, 3 to 9 fathoms, and station 3723, 5 to 15 fathoms, Owari Bay.

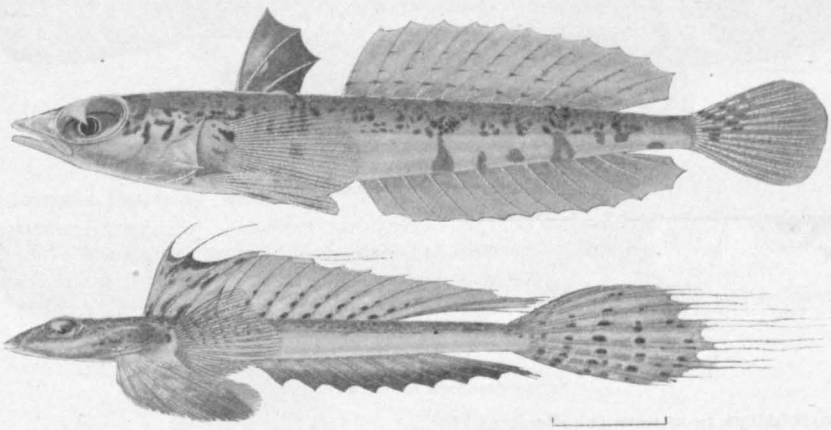
70. Callionymus flagris Jordan & Fowler.

Callionymus flagris Jordan & Fowler, Proc. U. S. Nat. Mus., xxv, 1903, p. 952; Owari Bay, Matsushima Bay.

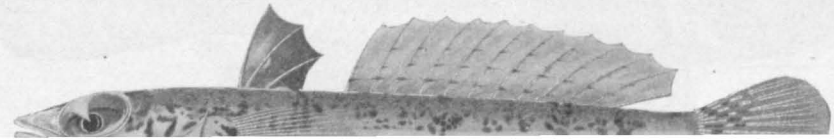
Stations 3722, Owari Bay, 3 to 9 fathoms, and 3723, 5 to 15 fathoms, Owari Bay; station 3777, Matsushima Bay.



Callionymus flagris Jordan & Fowler.



Callionymus flagris Jordan & Fowler.



CHAMPSODONTIDÆ.

72. Champsodon vorax Günther.

Champsodon vorax, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 481; Suruga Bay.

Station 3713, 45 to 48 fathoms, and station 3714, 48 to 60 fathoms, both off Ose Point, Suruga Bay.

PTEROPSARIDÆ.

73. Neopercis sexfasciata (Schlegel).

Neopercis sexfasciata, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 467; Totomi Bay, Sagami Bay, Suruga Bay.

Station 3730, off Owari Point, Totomi Bay, 34 fathoms; station 3707, off Ose Point, Suruga Bay, 68 to 70 fathoms; station 3727, in Totomi Bay; station 3763, off Sune Point, Sagami Bay, 49 fathoms.

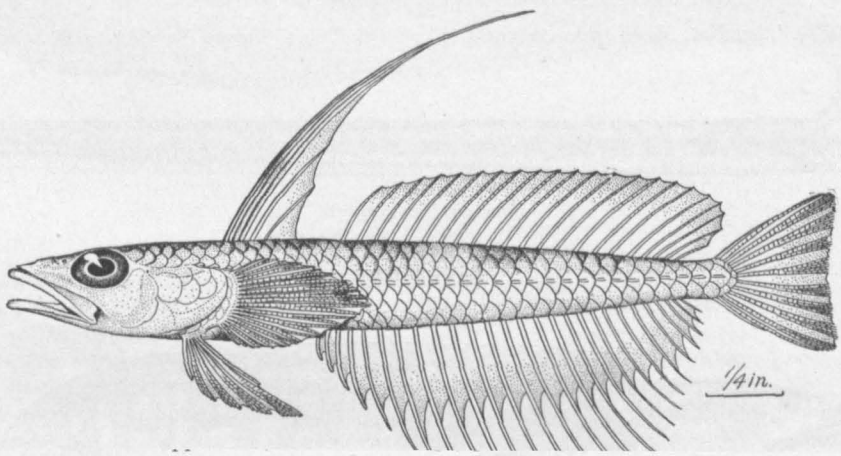
This species frequently bears small parasitic isopods.

When fresh the specimens dredged in Suruga Bay were orange red, with black bars and markings, which on head and belly shaded into yellow. Caudal bright yellow above, orange red below, with three black cross bars on upper half; lower fins orange; pectoral golden.

74. Neopercis aurantiaca (Döderlein).

Neopercis aurantiaca, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 468; Suruga Bay, Sagami Bay, Owari Bay.

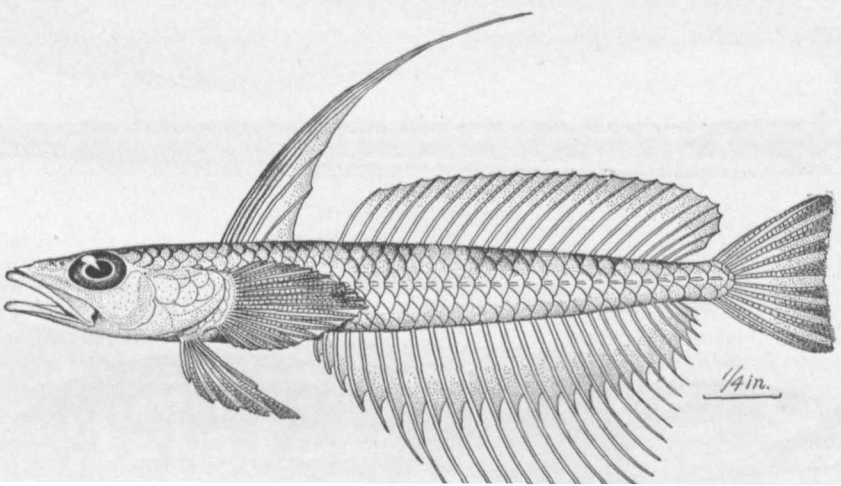
Station 3708, off Ose Point, Suruga Bay, 65 to 125 fathoms; also in Sagami and Owari bays.



74. Neopercis aurantiaca (Döderlein).

Neopercis aurantiaca, Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 468; Suruga Bay, Sagami Bay, Owari Bay.

Station 3708, off Ose Point, Suruga Bay, 65 to 125 fathoms; also in Sagami and Owari bays.

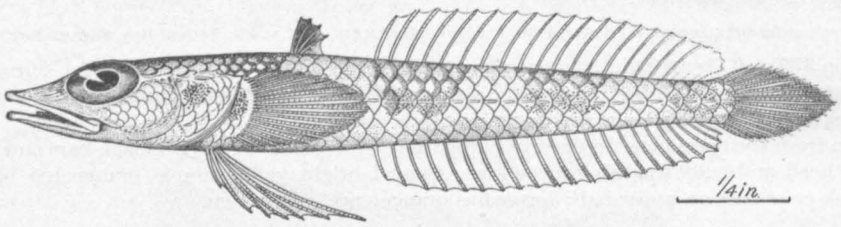


76. Osopsaron verecundum (Jordan & Snyder).

Pteropsaron verecundum Jordan & Snyder, Proc. U. S. Nat. Mus., XXIV, 1902, p. 472; Suruga Bay.

One specimen, No. 50009, dredged at station 3716, off Ose Point, Suruga Bay, 65 to 125 fathoms.

This species seems to belong to a different genus from the preceding, distinguished by the low fins and scaly cheeks. It resembles *Acanthaphritis*, described by Günther from the Ki Islands, but is distinguished from the latter by the smooth scales, a character in which it agrees with *Pteropsaron*. For this genus we suggest the name of *Osopsaron*.



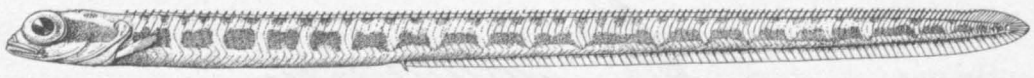
Osopsaron verecundum (Jordan & Snyder).

BLENNIIDÆ.

77. Eulophias tanneri Smith.

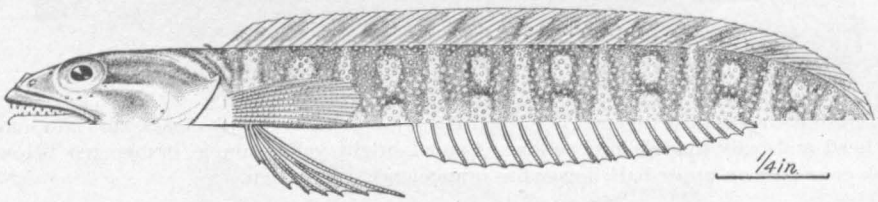
Eulophias tanneri Smith, Bull. U. S. Fish Comm., 1901, p. 94; Suruga Bay.

No. 49798, U. S. Nat. Mus., from station 3715, off Ose Point, Suruga Bay, 64 to 65 fathoms.



Eulophias tanneri Smith.

ZOARCIDÆ.



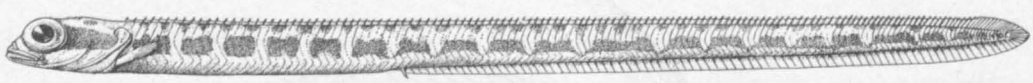
Osopsaron verecundum (Jordan & Snyder).

BLENNIIDÆ.

77. Eulophias tanneri Smith.

Eulophias tanneri Smith, Bull. U. S. Fish Comm., 1901, p. 94; Suruga Bay.

No. 49798, U. S. Nat. Mus., from station 3715, off Ose Point, Suruga Bay, 64 to 65 fathoms.



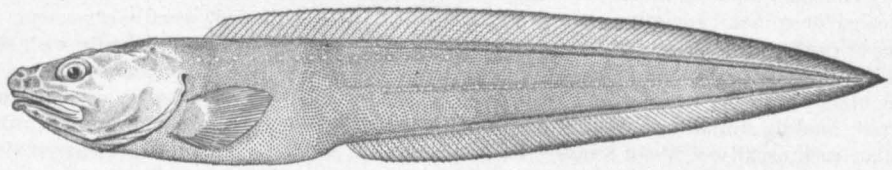
Eulophias tanneri Smith.

ZOARCIDÆ.

79. Bothrocara zesta Jordan & Fowler.

Bothrocara zesta Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1903, p. 749; Sagami Bay.

Station 3696, Sagami Bay, 110 to 175 fathoms.



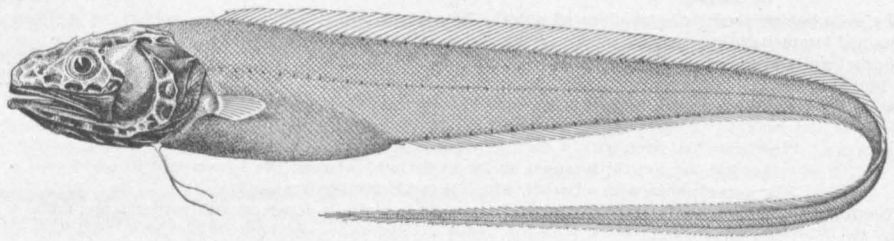
Bothrocara zesta Jordan & Fowler.

BROTULIDÆ.

80. Porogadus guntheri Jordan & Fowler.

Porogadus guntheri Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1903, p. 762; Sagami Bay.

Station 3696, Sagami Bay, 110 to 175 fathoms.



Porogadus guntheri Jordan & Fowler.

81. Watasea sivicola Jordan & Snyder. (Pl. 3, fig. 3.)

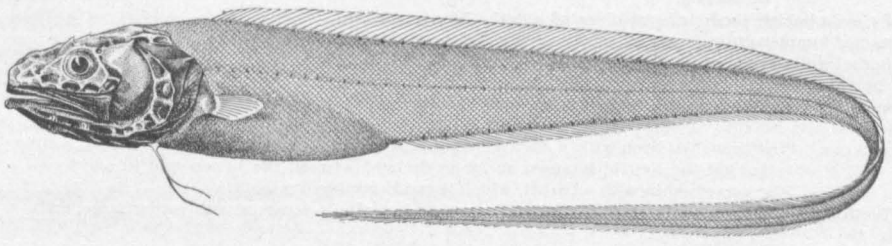
Watasea sivicola Jordan & Snyder, Proc. U. S. Nat. Mus., XXIII, 1901, p. 765; pl. XXXVII; op. cit., XXV, 1903, p. 759; Misaki.

Station 3738, Suruga Bay, 167 fathoms (one specimen); station 3695, Sagami Bay (two specimens).

These specimens are very close to the type of *Watasea sivicola* taken at Misaki. They differ in the shorter head, smaller mouth, greater distance from the snout to the vent, and in having three or more black blotches on the dorsal fin besides dark shading on the body. None of the three specimens

Porogadus guntheri Jordan & Fowler, Proc. U. S. Nat. Mus., XXV, 1903, p. 762; Sagami Bay.

Station 3696, Sagami Bay, 110 to 175 fathoms.



Porogadus guntheri Jordan & Fowler.

81. Watasea sivicola Jordan & Snyder. (Pl. 3, fig. 3.)

Watasea sivicola Jordan & Snyder, Proc. U. S. Nat. Mus., XXIII, 1901, p. 765; pl. XXXVII; op. cit., XXV, 1903, p. 759; Misaki.

Station 3738, Suruga Bay, 167 fathoms (one specimen); station 3695, Sagami Bay (two specimens).

These specimens are very close to the type of *Watasea sivicola* taken at Misaki. They differ in the shorter head, smaller mouth, greater distance from the snout to the vent, and in having three or more black blotches on the dorsal fin besides dark shading on the body. None of the three specimens

is as large as the type and the latter is faded through long exposure to the sunlight in the museum

MACROURIDÆ.[a]

By David Starr Jordan and Charles Henry Gilbert.

Body elongate, tapering into a very long compressed tail, which ends in a point; scales moderate, often keeled or spinous, sometimes smooth. Suborbital bones enlarged, usually cavernous. Teeth villiform or cardiform, in bands or single series, on jaws only; tip of lower jaw usually with a barbel; premaxillary protractile. Dorsal fins 2, the first short and high, its second ray usually stiff and spine-like, the others branched; the second dorsal very long, usually of very low feeble rays, continued to end of tail; anal fin similar to second dorsal, but usually much higher; no caudal fin; ventrals small, subjugular, each usually of about 8 rays. Branchiostegals 6 or 7. Lateral line present. Gills 3.5 or 4, usually but not always with a slit behind fourth. Gillrakers small; gill-membranes free or narrowly united to isthmus, usually more or less connected; pseudobranchiæ wanting or rudimentary; pyloric cæca numerous; air-bladder present. Hypercoracoid usually without foramen.

Genera 18; species about 50, chiefly of the northern seas, all in deep water. They differ from the cod-fishes chiefly in the elongate and degenerate condition of the posterior part of the body. Dr. Gill succinctly defines the group as "Gadoidea with an elongated tail tapering backward and destitute of a caudal fin, postpectoral anus, enlarged suborbital bones, inferior mouth, subbrachial ventrals, a distinct anterior dorsal, and a long second dorsal and anal converging on end of tail."

I. BATHYGADINÆ. First branchial arch free, without fold of membrane across it; mouth large; second dorsal well developed.
- *a.* Gills 4, a slit behind the fourth; no elevated anterior lobe to anal fin.
  - *b.* Coracoid foramen entirely within the hypercoracoid, as in blennoid fishes.
    - *c.* Barbel well developed ..... GADOMUS
    - *cc.* Barbel none ..... REGANIA
  - *b.* Coracoid foramen between the hypercoracoid and hypocoracoid; skull papery; gill membranes jet black. MELANOBRANCHUS

II. MACROURINÆ. First branchial arch with a fold of membrane across its terminal portion; gills 4; a slit behind the fourth; foramen, so far as known, between the hypercoracoid and hypocoracoid; chin with a barbel, which is rarely minute or absent.
- *c.* Teeth not all in villiform bands; those of the lower jaw in a single series; mouth rather large, more or less lateral.
  - *d.* Upper jaw without a villiform band behind the anterior teeth; inner teeth, if present, chiefly in one series.
    - *e.* Dorsal fins widely separated, interspace greater than base of first; dorsal spine serrate, scales nearly smooth, the ridges not spiniferous ..... DOLLOA
  - *dd.* Upper jaw with a villiform band behind outer series of enlarged teeth; scales cycloid, smoothish.
    - *f.* Dorsal spine serrate; dorsal fins not widely separate ..... CHALINURA
    - *ff.* Dorsal spine smooth; dorsal fins well separated; pectoral fin elongate ..... ABYSSICOLA
- *cc.* Teeth in villiform bands above and below, *the outer like the rest and scarcely enlarged or separated*; lower band sometimes reduced laterally to a single series.
  - *g.* Mouth wide, with considerable lateral cleft.
    - *h.* Dorsal spine finely barbed; bones of skull rather firm; dorsals moderately separated ... CORYPHÆNOIDES
    - *hh.* Dorsal spine entirely smooth; bones of skull very thin and papery; dorsals well separated; barbel small or absent ..... HYMENOCEPHALUS
  - *gg.* Mouth small, inferior, with little lateral cleft; suborbital ridge usually prominent.
    - *i.* Scales spinous, very rough.
      - *j.* Scales distinct, regularly imbricated.
        - *k.* Ventral rays 7 to 10.
          - *l.* Dorsal spine serrate; snout short ..... MACROURUS
          - *ll.* Dorsal spine entire; snout produced, sturgeon-like ..... CŒLORHYNCHUS
        - *kk.* Ventral rays 13 to 15 ..... NEZUMIA
      - *jj.* Scales indistinct, scarcely imbricated, the whole body rough-villous; dorsal spine smooth. TRACHONURUS

[a] In the account of this family all the Macrouridæ known from Japan are treated.

GADOMUS Regan.

Gadomus Regan, Ann. Mag. Nat. Hist., 1903, p. 459 (*longifilis*).

Head large, fleshy, without prominent ridges, spiny armature or external depressions; nape elevated, hump-like. Snout broad, obtuse, not produced; mouth terminal, very large, with small villiform teeth or none; suborbital ridge very low, not joined to the angle of the preoperculum. Maxillary entirely received within a groove under the prefrontal and suborbital bones, its tips narrowed and blade-like; premaxillaries protractile downward, separated anteriorly, rib-shaped, compressed vertically, very broad and without true teeth; provided posteriorly with a short flange, which is received under the maxillary; mandible received within intermaxillary bones, without true teeth, but with minute asperities, similar to those in the upper jaw; vomer and palatines toothless. Barbel well developed. No pseudobranchiæ. Gillrakers numerous, moderate, lanceolate, with minute denticulations along their inner edge. Branchiostegal membrane free from isthmus, deeply cleft. Branchiostegals 7, very stiff. Gill-opening very wide; gills 4, a slit behind last gill; anterior gill-arch free. Operculum with a blunt, spine-like prominence at its angle. A round foramen, as usual in fishes, entirely within the hypercoracoid. Ventrals below pectorals, many-rayed, anterior rays produced; dorsal consisting for the most part of branched rays, higher than anal, the first dorsal low, without differentiated spine. Scales cycloid, unarmed; lateral line strongly arched over pectoral. Deep seas.

This genus, with *Bathygadus*, differs from *Macrourus* and its allies in the structure of both the first and last gill arches. It is, perhaps, the most primitive of the family, and as such is nearest allied to the *Gadidæ*.

According to Regan, this genus differs from all other *Macrouridæ* in the presence of a foramen within the hypercoracoid bone as in ordinary fishes, not between the coracoids as in gadoid fishes, and from *Bathygadus* in having a slit behind the last gill, as usual in *Macrouridæ*. The mental barbel is well developed. In the related genus *Melanobranchus* Regan, the foramen is between the coracoids; the hypercoracoid being imperforate, there is no barbel, and a slit is present behind the last gill.

(*Gadus*, cod; ὦμος, shoulder.)

85. Gadomus colletti Jordan & Gilbert, new species.

Type 332 mm. long; from station 3721, Suruga Bay, 207 to 250 fathoms. No. 50930, U. S. Nat. Mus.

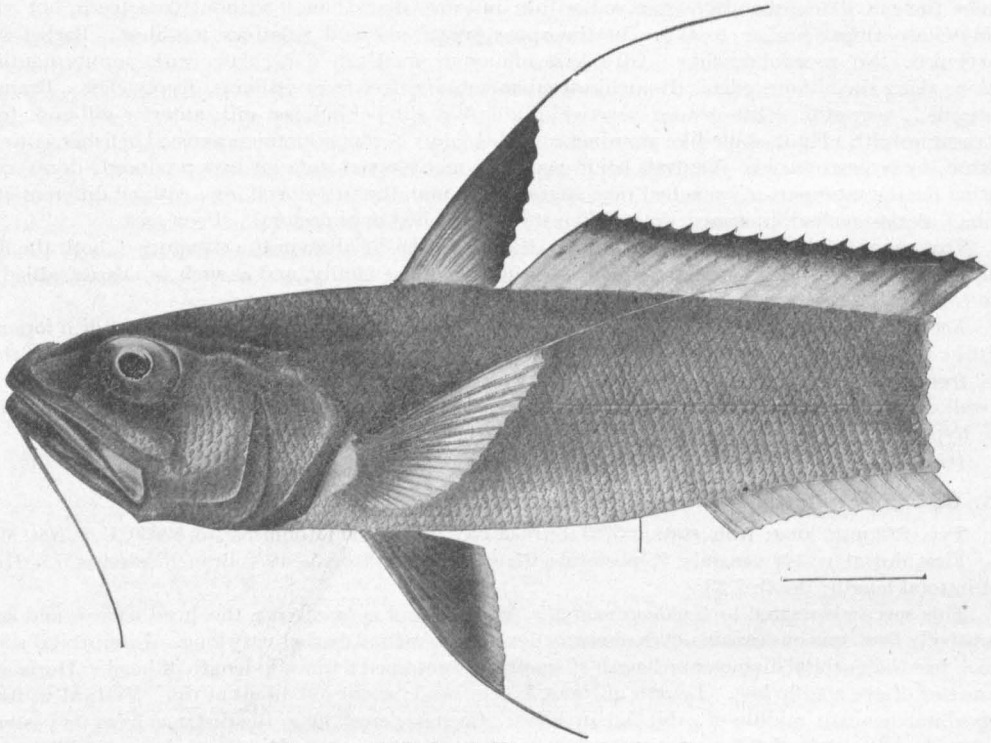
First dorsal II, 10; ventrals, 9; pectorals, 21. Gillrakers 4 or 5+19. Branchiostegals, 7. Head 5.4 in total length; depth 7.33.

This species is related to *Gadomus multifilis*, *longifilis*, and *melanopterus*, the head narrow and comparatively firm, mucous canals not excessively developed, mental barbel very long. Interorbital width much less than orbital diameter or length of snout and contained 6 times in length of head. Horizontal diameter of eye a trifle less. Length of snout 3.57 in head; snout not blunt at tip. Vertical width of suborbital beneath middle of orbit 5.6 in head. Occipital crest long, the distance from its posterior end to dorsal contained 3.8 times in its distance from tip to snout. Mouth moderately oblique, the mandible everywhere included, maxillary not reaching vertical from hinder edge of orbit, its length half that of head. Teeth excessively minute, crowded, forming a wide band in premaxillaries, a much narrower band in mandibles. The premaxillary band increases in width laterally to end of second third of its length, its width there equaling one-third the orbital diameter. Individual teeth are scarcely to be made out, and constitute a fine shagreen-like surface. Barbel very long, two-thirds the length of head. Preopercle rather narrowly rounded, width at angle slightly increased, about two-fifths orbital diameter. Opercle firm, without evident ridges or spines.

The gill-membranes form a rather wide free fold across the isthmus, to which they are not joined. No trace of pseudobranchiæ can be detected. Gills 4 in number, the large slit behind the fourth arch equaling orbital diameter. Gillrakers very slender and comparatively short, the longest one-third the orbital diameter. A very deep pit marks the usual pseudobranchial area, more developed than in related species. Hypercoracoid with a well-marked foramen, as in blennioid fishes.

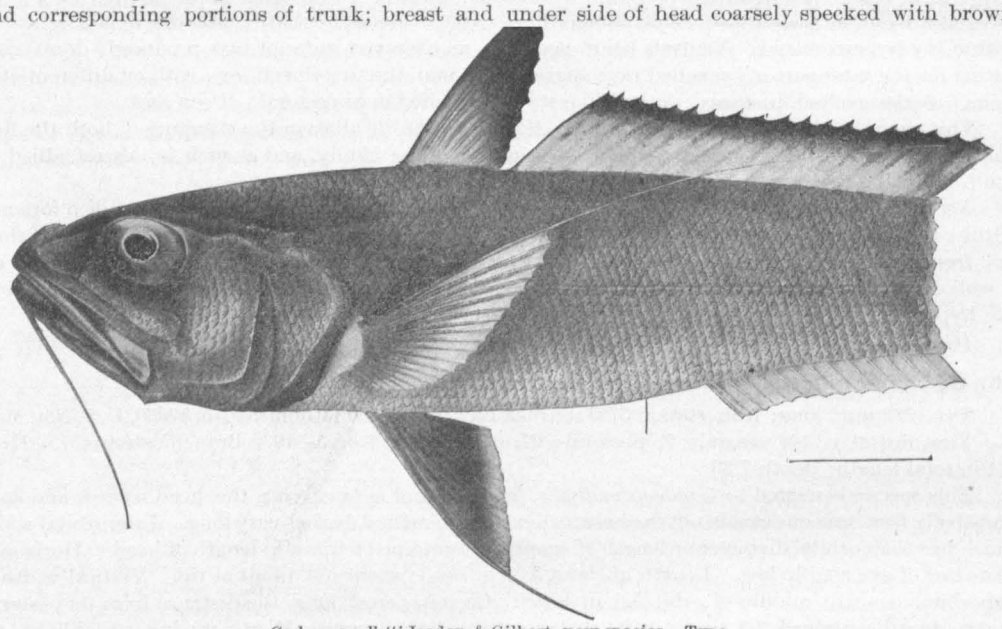
Second dorsal spine, second pectoral and outer ventral ray enlarged and greatly elongated; dorsal ray 3.66 times in total length; pectoral ray 3 times; ventral ray 5.5 times. Base of pectoral fin in advance of insertions of first dorsal and ventral which are vertically opposite; first dorsal spine represented by a small nodule, concealed at base of second; succeeding rays forked in their distal third, the longest articulated ray three-fifths length of head; no interval between dorsals; longest ray of the

second dorsal two-fifths length of head; origin of anal fin vertically below tenth ray of second dorsal base of outer ventral ray midway between origin of anal and front of eye; vent more anteriorly placed than in related species, its distance from front of anal equaling two-thirds orbital diameter. Scales unarmed, with very fine concentric striae. The lateral line runs posteriorly a little below middle of sides, and rises anteriorly by a gently concave curve, differing strikingly in this from most other species of the genus, in which the lateral line describes a strong convex curve above the pectorals. Scales covering top and sides of head, and present in a series along mandibular ramus; absent on opercular and gular membranes. About 9 to 11 scales in a series between the straight portion of lateral line and base of dorsal.



Gadomus colletti Jordan & Gilbert, new species. Type.

Color in spirits, light brownish on back and sides, silvery on cheeks and under side of head, and corresponding portions of trunk; breast and under side of head coarsely specked with brown.

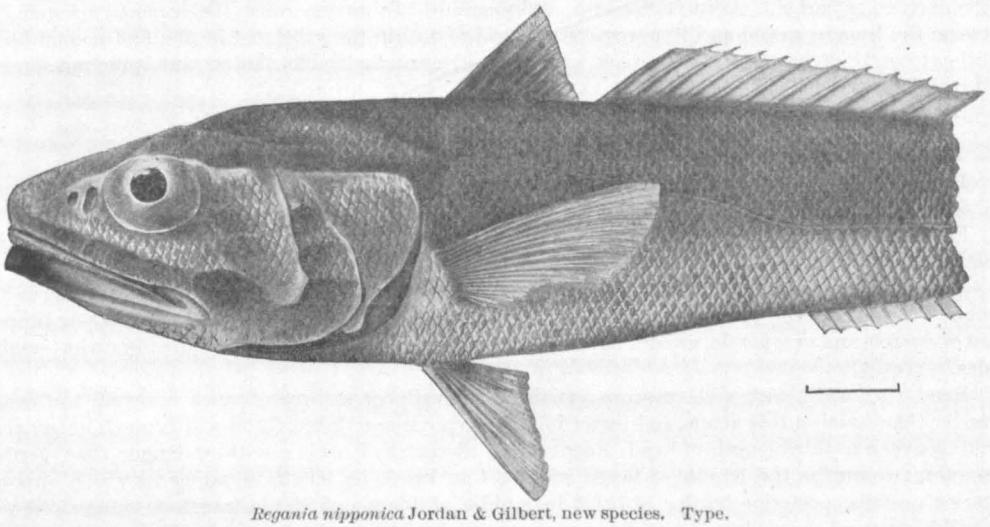


86. Regania nipponica Jordan & Gilbert, new species.

Type No. 50931, U. S. Nat. Mus. 590 mm. (tail slightly injured), from station 3721, Suruga Bay, depth 207 to 250 fathoms.

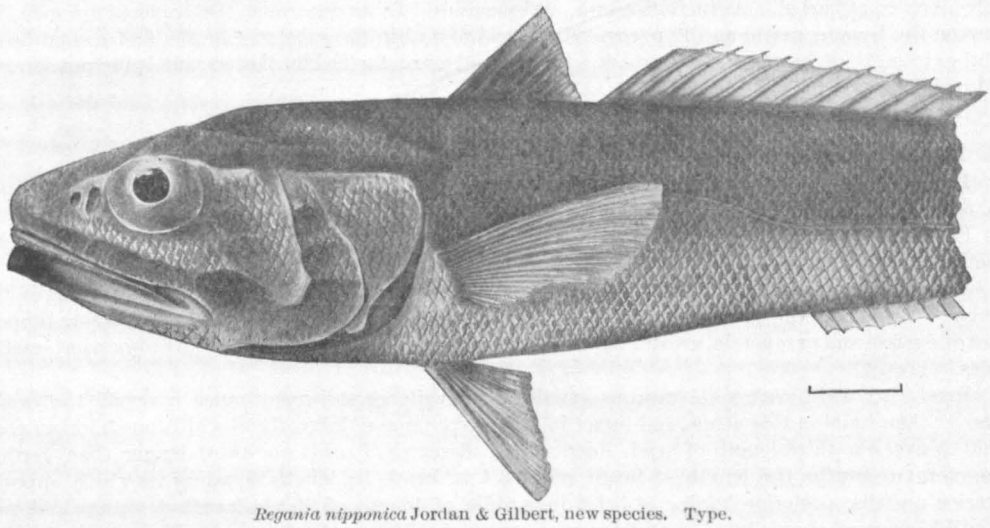
First dorsal II, 10; ventrals 9; pectorals 17; gillrakers 5 + 16; branchiostegals 7. Head 5.12 in total length; depth 7.66.

Head intermediate in width and texture between *Gadomus multifilis* and *Bathygadus cottoides*, somewhat nearer former in appearance, but the barbel wholly lacking, as in latter; form elongate, head tapering regularly to a rather sharp snout; mucous canals large, covered by thin membrane, which is supported by thin, long septa; interorbital width exceeds length of snout, much exceeds diameter of large eye, and is contained 3.43 times in length of head; length of snout 3.71; longitudinal diameter of eye 4.2, the vertical diameter five-sevenths the horizontal; nostrils unusually large, anterior vertically elliptical, but little more than half the height of posterior, which is about one-fourth diameter of orbit; occipital crest short, the difference from its posterior end to origin of dorsal contained 2.25 times in its distance from tip of snout. Posterior margin of orbit a trifle in advance of middle of length of head.



Regania nipponica Jordan & Gilbert, new species. Type.

Mouth comparatively little oblique, maxillary reaching a little beyond vertical from posterior edge of orbit, its length 1.87 in that of head. Mandible wholly included; a slight symphyseal knob; no barbel. Teeth fine, crowded, but individually visible without aid of lens, growing much smaller toward angle of mouth, distinctly arrow-shaped, as usual in the allies of *Bathygadus*; premaxillary



Regania nipponica Jordan & Gilbert, new species. Type.

Mouth comparatively little oblique, maxillary reaching a little beyond vertical from posterior

Scales large, somewhat more closely adherent than usual, still present over considerable areas of body, covering entire head, including mandible and gular region, but not the branchiostegals; scales unarmed, finely striated; lateral line runs posteriorly considerably below middle of sides, and rises anteriorly in a low convex curve above pectorals; chord of curve equals length of head; 9 or 10 scales in an oblique line upward and backward from posterior (submedian) portion of lateral line to base of dorsal, 21 scales upward and backward from first anal ray to base of dorsal.

Color of head and body nearly uniform light grayish, with some silvery luster, breast and belly not darker, opercular and gill membranes not black on outer surfaces; symphyseal portion of mandible, and corresponding portions of lower lip, dusky; inside of mouth and the gill cavity purplish black; posterior margins of opercular and gill membranes irregularly lighter or whitish; fins dusky, dorsal and anal blue-black posteriorly.

Known only from the type.

MELANOBRANCHUS Regan.

Melanobranchus Regan, Ann. & Mag. Nat. Hist., 1903, p. 459 (*melanobranchus*).

This genus is closely allied to *Bathygadus*, differing in the presence of a slit behind the last gill and in the absence of barbel. As in *Bathygadus*, and macrourid fishes generally, the coracoid foramen lies between the hypercoracoid and hypocoracoid instead of within the substance of the first-named bone. Skull extremely cavernous. Scales weak, caducous. Dorsal fin feeble, the second spine not serrate. Gill membranes black. Deep seas.

(*μέλας*, black; *βραγχός*, gill.)

87. Melanobranchus antrodes Jordan & Gilbert, new species. (Pl. 4, fig. 1.)

Type, 265 mm. long (tail slightly injured), from station 3696, Sagami Bay, 501–749 fathoms: No. 50932, U. S. Nat. Mus.

First dorsal II, 8; ventrals 9; pectoral 14; gillrakers 6+20; branchiostegals 7. Head 4.66 in total length. Depth 6.5.

Very closely related to *Melanobranchus bowersi*, from vicinity of Hawaiian Islands, differing in the lighter color of anterior parts, the slightly firmer consistency of the bones of head, differing proportions of opercle and preopercle, greater development of upper opercular ridge, and the somewhat smaller scales.

Head very wide, with wide mucous canals and fragile crests; membranes covering the canals stronger than usual in this genus, and intact in all the specimens; interorbital width much longer than snout or eye, one-third length of head; longitudinal diameter of orbit one-third longer than vertical diameter, two-ninths the length of head; snout 3.4 in head, its length equaling its width opposite anterior nostrils; posterior border of orbit in middle of length of head; mouth terminal, oblique, mandible everywhere included, maxillary everywhere reaching vertical from hinder margin of orbit, its length contained 1.86 times in head; no trace of mandibular barbel; teeth minute, equal, with narrowly arrow-shaped tips, in a broad premaxillary, and a narrow mandibular band; preopercle rather narrowly rounded, greatest width of its posterior expanded portion, at angle, equaling one-eighth length of head; vertical width of suborbital below middle of orbit 5.33 in head; distance from hinder margin of orbit to preopercular angle equals less than half length of head; anterior margin of nape is slightly nearer tip of snout than front of dorsal; exposed portion of opercle much less in proportion to opercular width than in *Melanobranchus bowersi*. Opercle with two diverging ridges ending in weak spines. Above upper ridge is a third much lower ridge, which ends in from one to three very weak spines, nearly as long as the one beneath them.

Gill-membranes moderately joined, free from isthmus. Four full gills, with a narrow slit behind fourth arch; outer gillrakers very long and slender, two-thirds the diameter of orbit (shorter in an older specimen). A few unmistakable free pseudobranchial filaments are present, these most abundant in the largest specimen. Coracoids thin and papery, the foramen lying between the hypercoracoid and the hypocoracoid.

Origin of dorsal is a little in advance of pectorals. All the rays of the vertical fins seem to be slender, unbranched. The dorsal rays are injured in the type, but in two cotypes the second ray is filamentous, reaching base of eleventh or twelfth ray of second dorsal, and contained 1.71 times in head. Dorsals immediately contiguous, rays of second dorsal much higher than anal rays. Upper pectoral ray filamentous, reaching as far as base of seventh anal ray, its length four-fifths that of head; it is probable that this ray was longer in life; outer ventral ray also very slender and filamentous, reaching the tenth anal ray and equaling length of head.

Scales very small, thin, caducuous, fallen in most of our specimens. As usual in the genus, they are unarmed, marked with extremely fine concentric striæ. The lateral line runs posteriorly along middle of sides, rising anteriorly in a wide, low arch, the chord of which nearly equals length of head; entire head covered with scales (except gill and gular membranes); smaller than in *M. bowersi*, being little larger than the scales on sides.

Light brownish on head and body, breast and belly little darker except in young specimens, where the belly is blue-black and the breast brown; head light brown like body; opercles blackish in young. Rows of very small brown spots on top and sides of head, and along the rami of mandibles in some specimens; mouth and gill cavities and peritoneum black; fins dusky.

(*ἀντροδής*, full of cavities, from the spongy head.)

Station 3696, Sagami Bay, 501 to 749 fathoms; station 3711, Suruga Bay, 500 to 677 fathoms; station 3736, Suruga Bay, 480 to 599 fathoms.

DOLLOA Jordan.

Moseleya Goode & Bean, Oceanic Ichthyology, p. 417, 1896 (*longifilis*) (name preoccupied).
Dolloa Jordan, American Naturalist, XXXIV, 1900, p. 897 (*longifilis*).

Mouth rather large, upper teeth in one or two series; dorsal fins well separated, spine weakly serrate, scales feebly ridged, nearly or quite smooth; otherwise essentially as in *Chalinura*.

(Named for Louis Dollo of the Museum of Brussels.)

88. Dolloa longifilis Günther.

Coryphænoides longifilis Günther, Ann. & Mag. Nat. Hist., XXV, p. 439, 1877; south of Tokyo.
Macrurus longifilis Günther, Deep Sea Fishes of the Challenger, p. 151, pl. XXV, 1887; Coast of Japan, south of Tokyo, in 565 fathoms. One specimen 28 inches long.
Moseleya longifilis Goode & Bean, Oceanic Ichthyology, p. 417, 1896, after Günther.

This species is known from the description and figure published by Günther.

(*Longus*, long; *filum*, thread.)

ABYSSICOLA Goode & Bean.

Abyssicola Goode & Bean, Oceanic Ichthyology, 1895, 417 (*macrochir*).

Upper teeth in villiform bands; lower in one series. Snout produced, four-angled; interorbital space flat and wide. Mouth wide, lateral. Pectoral fin very long, its base in line with front of dorsal and base of ventral. Dorsal fins well separated; dorsal spine smooth; scales smooth; barbel small.

Coast of Japan.

(*Abyssicola*, living in the abyss.)

89. Abyssicola macrochir Günther.

Macrurus macrochir Günther, Ann. Mag. Nat. Hist., 1877, XX, p. 438; Hyalonema ground; off Enoshima, in Sagami Bay. Günther, Deep Sea Fishes, Challenger, XXII, 1887, p. 148, pl. XXIX, fig. B, Enoshima.
Abyssicola macrochir Goode & Bean, Oceanic Ichthyology, 1895, p. 417, fig. 348; after Günther.

Of this species, well figured and described by Dr. Günther, three large specimens were dredged in Sagami Bay, by the *Albatross*, near the original locality.

(*μακρός*, long; *χεῖρ*, hand, from the very long pectorals, which are broadened at tip and not filamentous.)

CHALINURA Goode & Bean.

Chalinura Goode & Bean, Bull. Mus. Comp. Zool., X, No. 5,198, 1883 (*simula*).
Chalinurus Günther, Challenger Report, XXII, 124, 144, 1887; change in spelling.

Scales cycloid, fluted longitudinally, with slight, radiating striæ; snout long, broad, truncate, not much produced; mouth lateral, subterminal, very large; head without prominent ridges, except the subocular ones and those on snout; suborbital ridge not reaching angle of preopercle; teeth in upper jaw in villiform band, with an outer series much enlarged, those of lower jaw uniserial, large; no teeth on vomer or palatines; small pseudobranchiæ present; gillrakers spiny, strong, depressible, in double series on anterior arch; ventrals below pectorals; chin with a barbel; dorsal spine serrate; soft dorsal much lower than anal; species numerous.

This genus is allied to *Macrourus*, differing in dentition.

(*χάλινος*, a strap or thong; *οὐρά*, tail.)

90. Chalinura liocephala (Günther).

Macrurus liocephala Günther, Deep Sea Fishes, Challenger, p. 145, pl. XXXVIII, fig. a, 1887; near Yokahama in 1,375 fathoms; middle Pacific in 2,050 fathoms.

This species is known to us solely from Dr. Günther's figure and description.

(λεῖος, smooth; κεφαλή, head.)

CORYPHÆNOIDES Gunner.

Coryphænoides Gunner, Trondhj. Selsk. Skrift., III, 50, 1765 (*rupestris*).
Branchiostegus Rafinesque, Analyse de la Nature, 1810, 86 (substitute for *Coryphænoides*).

Snout short, obtuse, high, obliquely truncated, soft to the touch, except its bony center; mouth broad, terminal, its cleft lateral; head without prominent ridges, membrane bones of side of head rather soft, but not papery; teeth villiform in both jaws, those in outer series of upper jaws somewhat enlarged. Scales spinous, second or elongate dorsal ray finely serrated in front, the serræ sometimes scarcely appreciable. Lower jaw with a barbel at tip. Deep sea. Close to *Macrourus*, differing in the larger terminal mouth.

(*Coryphæna*; εἶδος, resemblance.)

a. Dorsal spine filamentous at tip.
  b. Basal half of dorsal spine smooth; ventrals filamentous.
    c. Scales small, 10 to 12 series above lateral line; pectorals not filamentous ..... *altipinnis*, 91
    cc. Scales moderate, about 7 series above lateral line; dorsal spine almost entire, its spinules scarcely appreciable; pectoral filamentous; head 5.3 in length; scales each with 13 to 17 ridges ..... *awæ*, 92
  bb. Basal half of dorsal spine with about 6 spinules; head 5.75 in length; scales each with about 12 ridges... *marginatus*, 93
aa. Dorsal spine not filamentous at tip.
    d. Scales large, about 5 series above lateral line; dorsal spine with its spinules evenly developed; head 5.5 in length ..... *germani*, 94
    dd. Scales small, about 10 above lateral line; dorsal spine finely serrulate, except at base and tip; ventral not filamentous .... *misakius*, 95

91. Coryphænoides altipinnis Günther.

Coryphænoides altipinnis Günther, Ann. & Mag. Nat. Hist. 1877, XX, p. 439; south of Tokyo in 1,879 fathoms; off Japan in 565 fathoms.
Macrurus altipinnis Günther, Deep Sea Fishes, Challenger, 1887, p. 138, pl. XXXIX, fig. A, three specimens.

This well-marked species is known to us from Dr. Günther's description and figure.

(*Altus*, high; *pinna*, fin.)

92. Coryphænoides awæ Jordan & Gilbert, new species.

Type No. 8547, L. S. Jr. Univ. Coll., 620 mm. long, from off Nanaura in Awa at the entrance of the bay of Tokyo; presented by the Imperial University.

First dorsal II, 9; ventrals 7 and 8 respectively; pectorals 21. Head 5.3 in total length, equaling depth. Seven scales in a vertical series between lateral line and median line between dorsals.

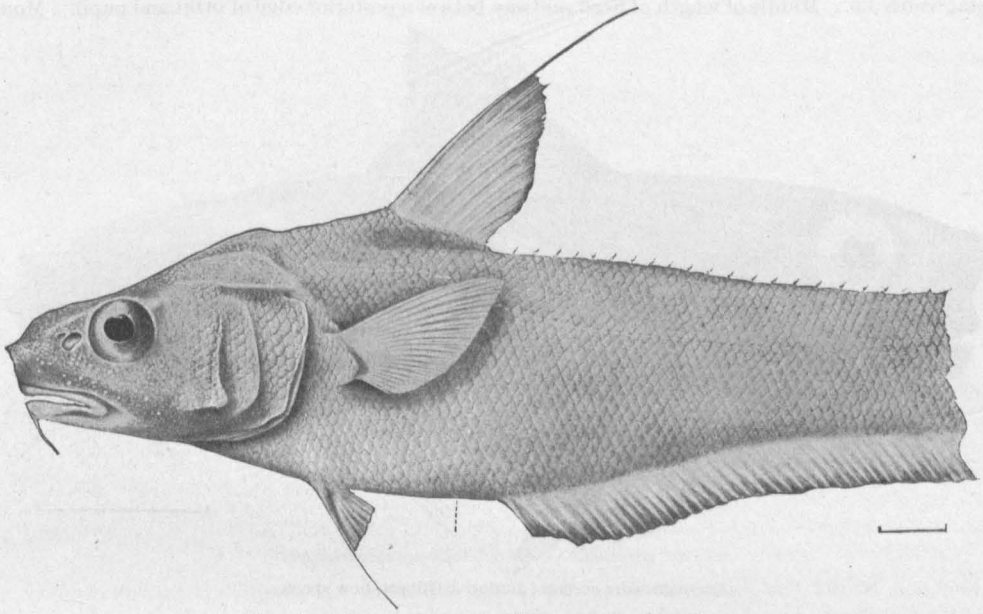
Head and body high and compressed, greatest depth of head at posterior end of occipital crest equaling length of head anterior to upper end of preopercle; snout short and gibbous, its outline everywhere convex, its extreme tip formed by a small protruding tubercle; supraocular region depressed, longitudinal profile strongly concave, nearly flat transversely; head everywhere firm, mucus canals comparatively little developed, sides of head nearly vertical, suborbital ridge evident but very low, ending on middle of cheek; posterior nostril very large, anterior small, roundish.

Eye 4.33 in head; interorbital width 5; length of snout 3.4; posterior border of orbit in middle of length of head; preopercle not produced at angle; posterior margin vertical and convex.

Mouth but little overpassed by snout, the axial projection of which does not exceed one-half diameter of pupil; mouth nearly horizontal, comparatively short, the maxillary not passing vertical from middle of orbit; width of mouth at angle slightly exceeding length of cleft; mandibular barbel short, four-fifths diameter of pupil; teeth slender, in moderate villiform or cardiform bands in each jaw, bands tapering laterally, but not to a single series; outer teeth not at all enlarged. Gill-opening wide, membranes anteriorly united with isthmus, apparently without free fold along posterior margin. Anterior gill-slit contracted to little more than a pore just below angle of arch, its length less than half diameter of pupil. Posterior gill-slit half diameter of eye. Pseudobranchiæ wanting.

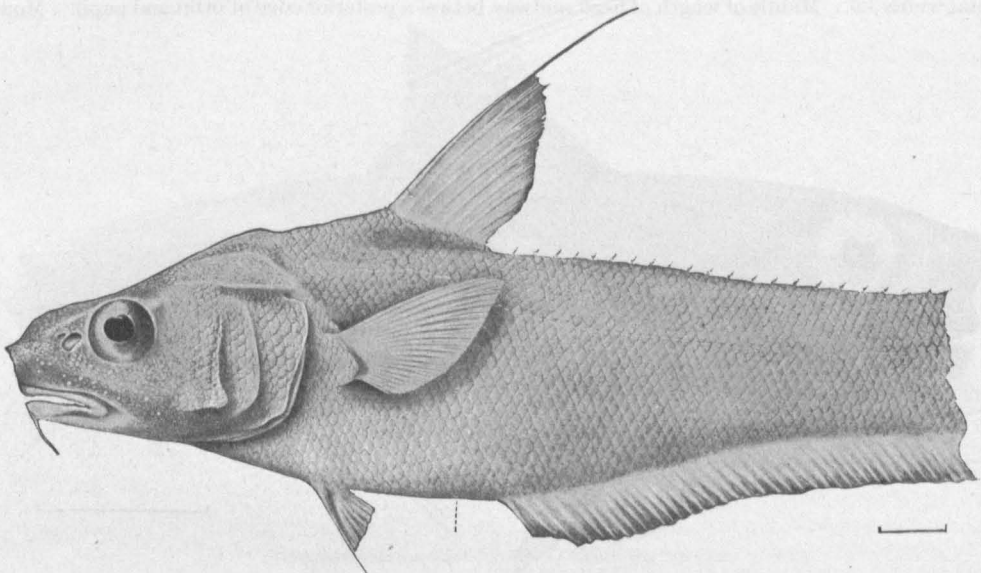
First dorsal inserted well behind pectorals and ventrals, which are in the same vertical; second spine strong, mostly smooth, with a very few distant and very weak spinules distally. These are scarcely perceptible even under the lens. Its tip is produced into a slender filament, which projects beyond first branched ray for half the length of latter; length of spine very slightly exceeds length of head; second dorsal very low and indistinct anteriorly, where the short rays are entirely disconnected and lie concealed beneath the scales; they were detected as far forward as a point distant from the first dorsal half the length of base of latter; by dissection, they could probably be traced still farther forward; anal origin below origin of second dorsal, as above described; anal opening immediately in front of first ray; ventrals wide, with rounded posterior margin, outer ray slender and filamentous, reaching vent, its length half that of head; pectorals broad, reaching vertical from the anal origin, their length three-fifths that of head.

Scales on body large, with numerous very minute spines arranged in 13 to 17 subparallel series; scales on opercles similar, but on the top and sides of head greatly reduced in size, the spines longer and with less definite arrangement. The naked area includes the gill-membranes, a narrow strip along lower portion of interopercle, all of mandible except a narrow band of scales along middle of its proximal portion, and a narrow strip along lower margin of suborbital.



Coryphænoides awæ Jordan & Gilbert, new species. Type.

its proximal portion, and a narrow strip along lower margin of suborbital.



93. Coryphænoides marginatus Steindachner & Döderlein.

Coryphænoides marginatus Steindachner & Döderlein, Fische Japans, IV, 284, 1887; Tokyo.

This species, evidently close to *Coryphænoides awæ*, is known to us only from the original description.

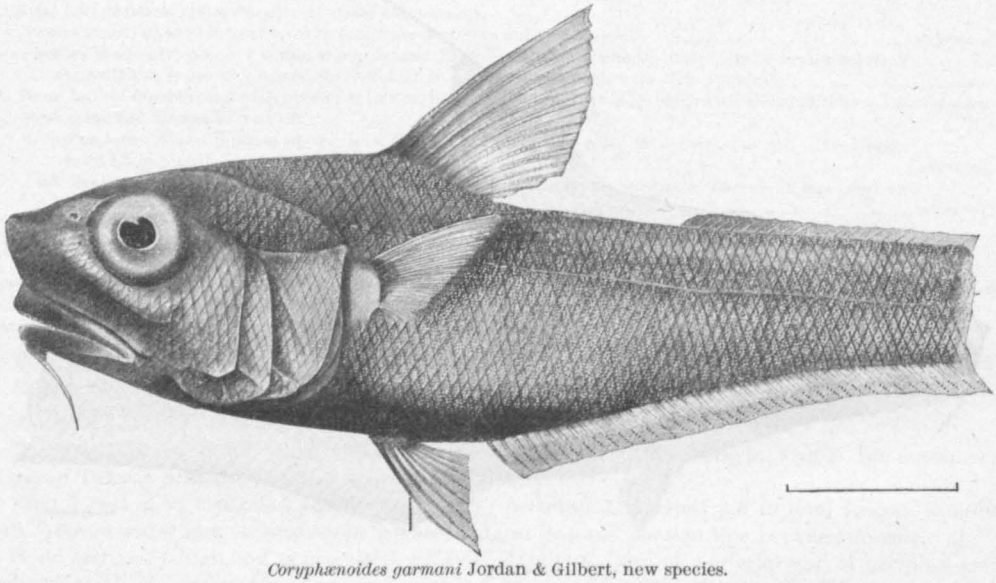
(*Marginatus*, margined.)

94. Coryphænoides garmani Jordan & Gilbert, new species.

Type No. 50933, U. S. N. M., 292 mm. long, taken at station 3695, Sagami Bay, Cotype No. 8548, L. S. Jr. Univ. Museum.

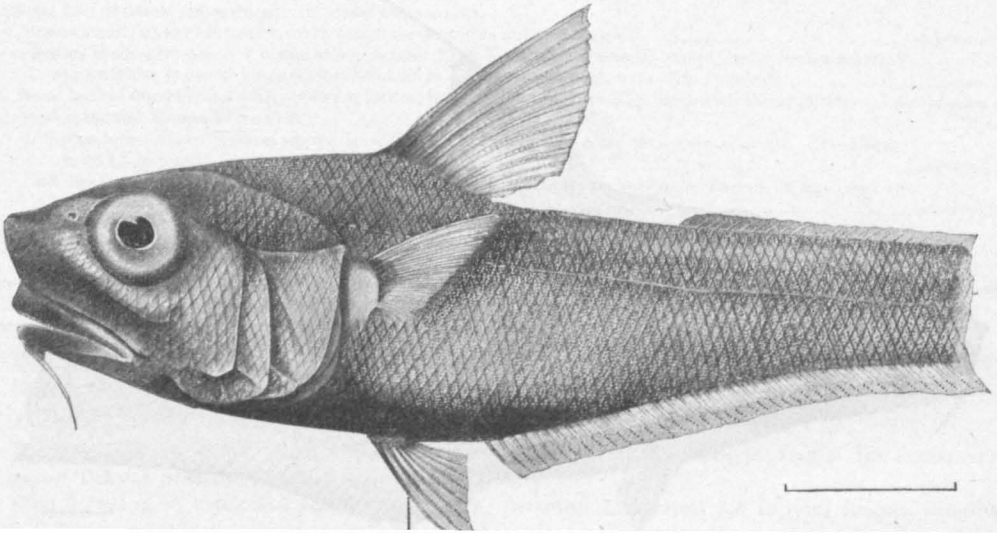
First dorsal II, 10; ventrals 8; pectorals 20 or 21; 5 scales between lateral line and origin of second dorsal. Head 5.5 in total length (tail a little injured); depth 6.5.

Head and body compressed, interorbital area transversely and longitudinally convex, not depressed. Cheeks vertical; suborbital area slightly tumid, without definite ridge. Snout short, depressed, its antero-lateral profiles, seen from above, meeting to form a definite, slightly obtuse angle at tip; lower outline of snout very oblique, its length four-sevenths the ocular diameter, axial projection of snout one-third ocular diameter. Length of snout 3.8 in head; longitudinal diameter of orbit 3.25; interorbital width 3.6. Middle of length of head midway between posterior edge of orbit and pupil. Mouth



Coryphænoides garmani Jordan & Gilbert, new species.

with moderate lateral cleft, the maxillary reaching a point behind pupil, but in advance of posterior outline of snout very oblique, its length four-sevenths the ocular diameter, axial projection of snout one-third ocular diameter. Length of snout 3.8 in head; longitudinal diameter of orbit 3.25; interorbital width 3.6. Middle of length of head midway between posterior edge of orbit and pupil. Mouth



Color, light greyish or brownish above, silvery on middle of sides; mandibles, branchial, and gular membranes, breast, and belly, and an area along anterior portion of anal black or blue-black; gular membrane coarsely vermiculated with brown; upper lip black; mouth cavity light, except the extreme posterior part of roof, which is black; gill cavity black; lower portion of shoulder girdle and isthmus silvery; hyoid arch light, the narrow posterior margin of gill and opercular membranes white; ventral portion of lining of abdominal cavity bright silvery; axil of pectorals black; fins dusky.

This species is closely allied to *Coryphænoides ctenomelas*, from the Hawaiian Islands, differing in the much smaller outer premaxillary teeth, which are scarcely enlarged in this species, and in spination of scales, as well as in many small details.

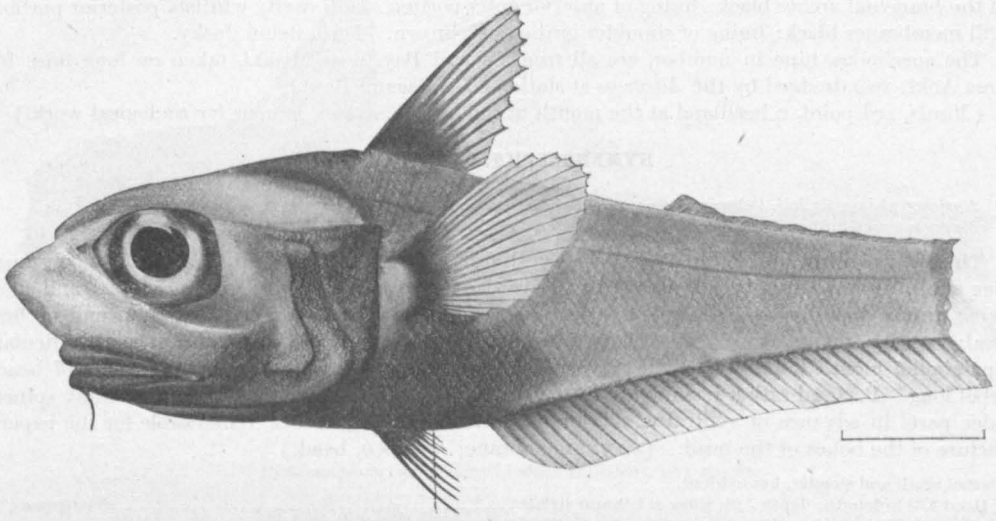
(Named for Samuel Garman.)

From station 3695, Sagami Bay, 110 to 259 fathoms; station 3697, Sagami Bay, 120 to 265 fathoms; station 3698, Sagami Bay, 153 fathoms; station 3737, Suruga Bay, 161 to 167 fathoms.

95. Coryphænoides misakius Jordan & Gilbert, new species.

Type 340 mm. long, from Misaki; collectors, Jordan & Snyder: No. 8107 L. S. Jr. Univ.

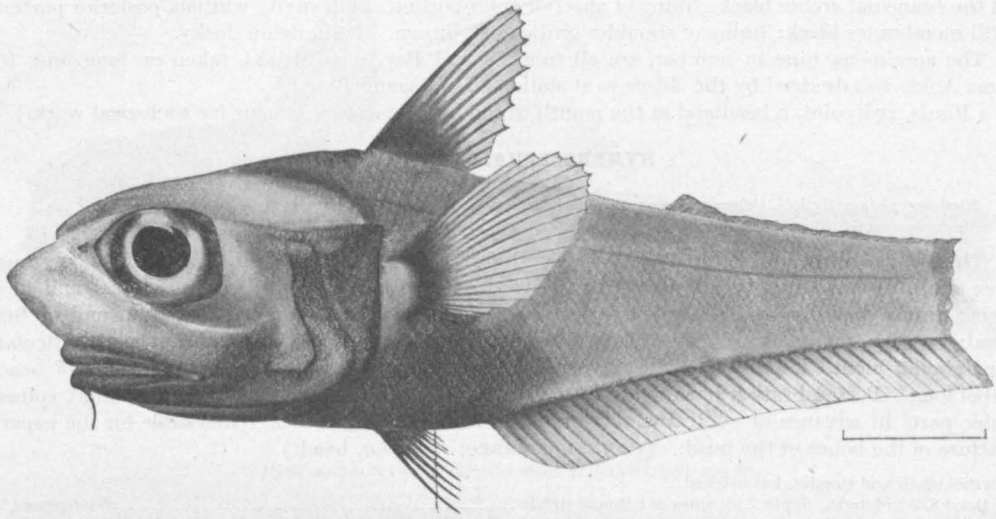
First dorsal II, 11 (II, 10 to 11, 12); ventrals 8; pectorals 21 (19 to 21); 10 scales in a vertical series between lateral line and origin of second dorsal; head 5 in total length (tail slightly injured); depth 6.5.



Coryphænoides misakius Jordan & Gilbert, new species.

In form and general appearance, including the character of the scales and lateral line, and the presence of a ventral pit, this species strongly resembles *Malacocephalus lævis* and *hawaiiensis*, to which it may have real affinity, notwithstanding the pluriserial dentition and the serrated dorsal spine.

series between lateral line and origin of second dorsal; head 5 in total length (tail slightly injured); depth 6.5.



Coryphænoides misakius Jordan & Gilbert, new species.

The branchiostegal membranes form a wide free fold across isthmus. Outer gill-slit wide, about two-thirds of orbital diameter. Pseudobranchiæ present, very short. Origins of first dorsal, pectorals and ventrals in the same vertical; second dorsal spine finely serrulate throughout, except for a very short distance at base and tip; tip not filamentous and fails to reach origin of second dorsal; length of spine contained 1.4 in the head; interval between dorsals contains length of base of first dorsal 2 to 2.33 times; second dorsal is very low and inconspicuous throughout; anal rather high, its origin under last rays of first dorsal; vent well forward, between basal portions of inner ventral rays, separated by a band of scales from a round, scaleless depression, which lies between middle of bases of ventral fins; distance from anal origin to base of outer ventral ray contained 3.25 times in head; outer ventral ray not produced, 2.6 in head; pectoral 1.5. Scale small, very rough and adherent, higher than wide, covered with numerous rather long, thick-set spines arranged quincuncially; spines on head much shorter; scales covering margins of shoulder girdle perfectly smooth; entire snout, suborbitals, and mandibles scaled, the latter with several series; lateral line very conspicuous, rising anteriorly in a weak, convex curve.

General color dark brownish, breast, belly, and lower side of head blue-black; opercles and posterior part of cheeks dusky; fins all dusky, a black line along base of anterior portion of anal fin; basal portion of pectorals and axil black. Mouth whitish or yellowish anteriorly, posterior portion of roof and the branchial arches black; lining of anterior outer portion of gill cavity whitish, posterior portion of gill membranes black; lining of shoulder girdle dark brown. Peritoneum dusky.

The specimens, nine in number, are all from Sagami Bay, near Misaki, taken on long lines by Kuma Aoki; two dredged by the *Albatross* at station 3695, Sagami Bay.

(*Misaki*, red point, a headland at the mouth of the bay of Sagami, famous for zoological work.)

HYMENOCEPHALUS Giglioli.

Hymenocephalus Giglioli, Pelagos, Genoa, 228, 1884 (*italicus*).
Mystaconurus Günther, Deep Sea Fishes, Challenger, 1887, p. 124 (*longibarbis*).

This genus is closely allied to *Coryphænoides*, differing in the smooth dorsal spine and membranaceous skull. First dorsal broad, placed far forward over base of pectoral; second dorsal and anal origins nearly opposite, and separated by a considerable space from the vertical from end of first dorsal; vent far from ventrals. Head large, naked, soft, and cavernous; snout abrupt, perpendicular, or parabolic; mouth lateral, wide. Eye very large, orbital margin forming part of profile of head. Barbel long. Pectoral rather narrow (10 to 16 rays). Scales thin, deciduous, with fine, short spines. Under parts in advance of ventral wholly or partly naked. Small fishes, remarkable for the papery structure of the bones of the head. (ὑμήν, membrane; κεφαλή, head.)

a. Barbel small and slender, but evident.
b. Head 5.33 in length; depth 7.25; sides of isthmus striate ..... *striatissimus*, 96
bb. Head 6 in length; depth 7.5; dorsal spine slender, not filamentous ..... *papyraceus*, 97
aa. Barbel obsolete; head 5.4 in length; depth 8; dorsal spine slender ..... *lethonemus*, 98

96. Hymenocephalus striatissimus Jordan & Gilbert, new species.

Type 108 mm. long, from station 3738, Suruga Bay; depth, 167 fathoms. No. 50934, U. S. Nat. Mus.

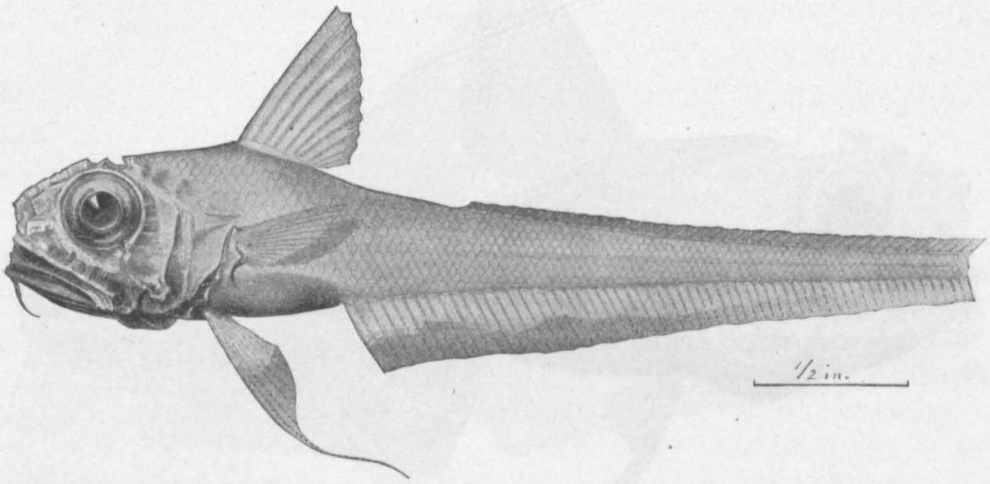
This species seems most nearly related to *H. longibarbis* Günther, from the vicinity of the Fiji Islands, having a well-developed barbel, only 8 ventral rays, and 8 soft dorsal rays, as in that species. It differs from *longibarbis* in its shorter, higher head and blunter snout, in its much wider interorbital space, wider dentate preoperculum, and shorter barbel. The pair of lens-like spots on mid-ventral line and the minute striation of sides of isthmus are not described in *brevibarbis*, but are probably present as in all other species of the genus.

First dorsal II, 8 to II, 10; ventral 8; head 5.33 in total; depth 7.25; branchiostegals 7, the fourth much widened toward base.

In form most closely resembling *H. antræus*, from the Hawaiian Islands. Head large, subquadrate in cross section, the short, bluntly rounded snout not ending in a sharp point and not protruding beyond the premaxillaries; orbital rims greatly expanded, the median rostral ridge not greatly projecting above general level of interorbital space. As in other species the crests are all thin and papery and the membranes roofing the canals extremely delicate and easily ruptured. Eye large, circular as in *antræus*, its diameter two-fifths the length of head; interorbital width one-third of head; length of snout 4.1. The middle of length of head lies immediately in front of hinder margin of pupil.

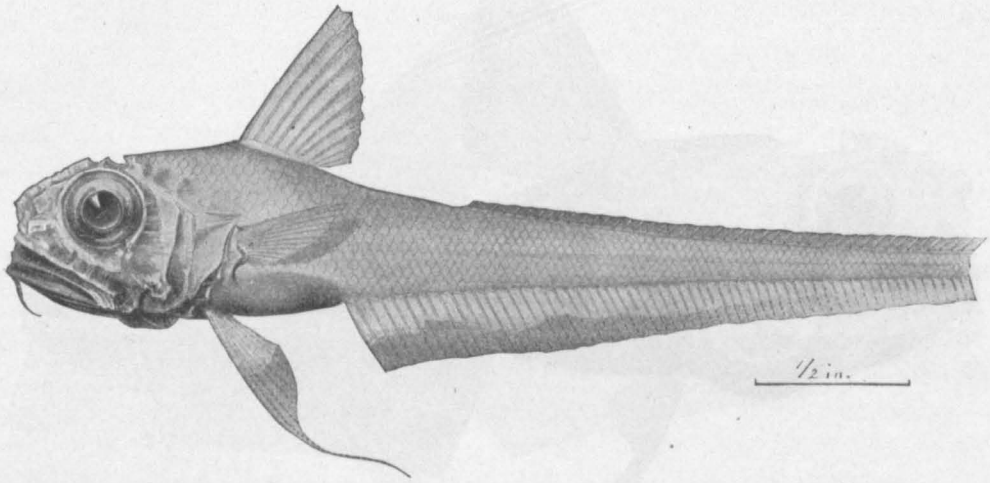
Mouth wide, oblique, the maxillary reaching a vertical which intersects the orbit nearer to hinder margin of eye than to pupil, its length 1.8 in head. Teeth minute, all similar, in narrow bands in both jaws; barbel slender, similarly developed in the type and the two cotypes, its length half diameter of orbit. Preopercle of moderate width, the latter equaling one-third of orbital diameter; preopercular margin crinate, the margin above angle oblique and gently incurved. Gill membranes forming a free fold across the isthmus, to which they are not joined; outer gill-slits wide, the outer arch free from its angle forward for a distance equaling about one-third the length of head. No pseudobranchiæ can be detected, nor is there any trace of the deep suprabranchial pit so conspicuous in *Bathygadus*. Gill-rakers similar throughout the genus, those on inner arches short, compressed, movable, strongly spinous on inner margins, 17 or 18 on second arch. The length of the fins can not be given, as they are injured in all our specimens. The origin of the second dorsal fin can not be made out with certainty, but appears to be distant from the first dorsal 1.5 to 2 times the base of latter. The vertical from origin of anal intersects the back at a distance behind first dorsal equal to half its base length.

Color light brownish, darker along anterior portion of back, silvery on lower part of sides. A silvery streak along upper half of suborbital, a black streak occupying lower half and strongly contrasting. Corner of mouth whitish, premaxillaries black, mandible largely black but with a whitish



Hymenocephalus striatissimus Jordan & Gilbert, new species.

line following the lip; snout translucent; inside of mouth shining with metallic luster; posterior portion of buccal cavity black; gill cavity largely whitish, gill membranes and a blotch on opercle black. As in other species, the breast and belly are purplish, sides of isthmus and an area extending thence to above and behind the ventral fins silvery, finely cross lined with black or purple, this pattern



Hymenocephalus striatissimus Jordan & Gilbert, new species.

line following the lip; snout translucent; inside of mouth shining with metallic luster; posterior portion of buccal cavity black; gill cavity largely whitish, gill membranes and a blotch on opercle black.

97. Hymenocephalus papyraceus Jordan & Gilbert, new species.

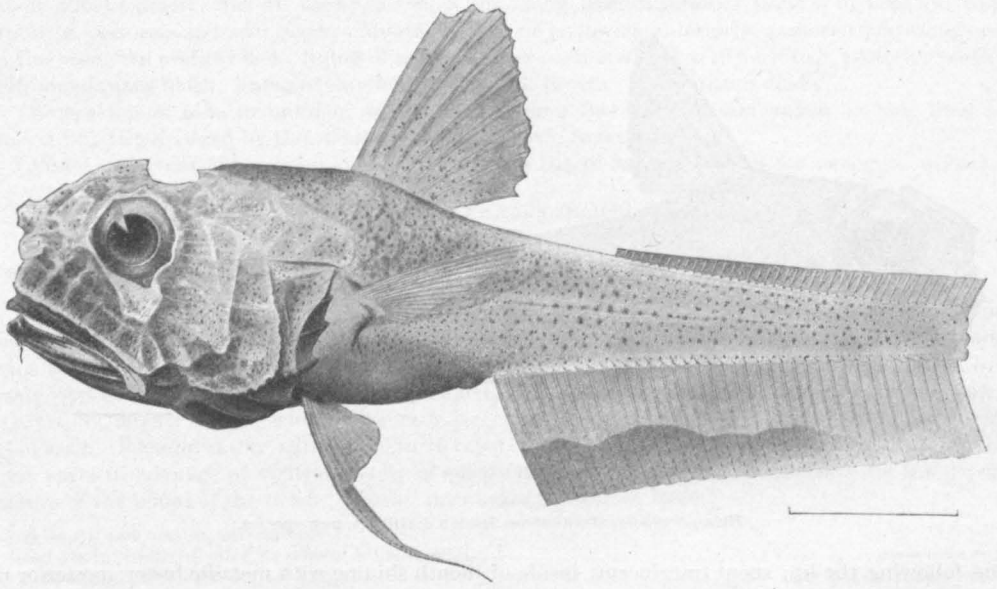
Type 147 mm. long, from station 3697, in Sagami Bay, depth 120 to 265 fathoms; No. 50935, U. S. Nat. Mus.

Differing from *H. lethonemus* and from all the Hawaiian species in having a distinct mandibular barbel. It also differs strikingly in the much more robust head and body.

First dorsal II, 9; ventral 11; head 6 in total length; depth 7.5; branchiostegals, 7.

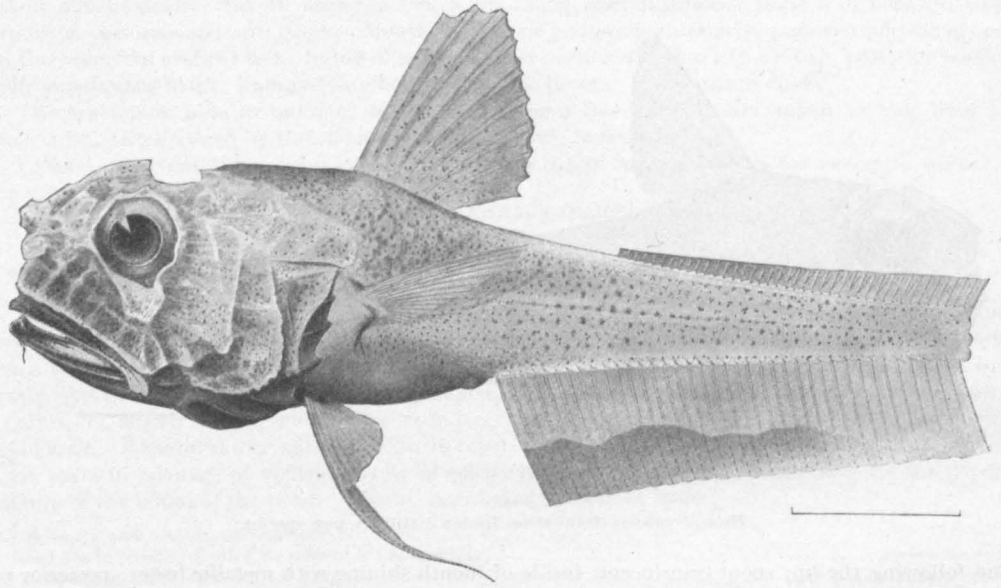
Body heavy anteriorly, tapering very rapidly behind first dorsal; head very deep, with a high, median crest, which extends well above upper line of orbits; cheeks vertical, suborbitals hardly at all swollen; crests on head very high, thin, and papery, bridged over by excessively delicate membrane; interorbital width 2.6 in head; longitudinal diameter of orbit 4; length of snout 3.4; middle of length of head between hinder edge of orbit and pupil; snout massive, wide, and bluntly rounded, with a very short projecting point at tip, which extends beyond premaxillaries a distance less than half diameter of pupil.

Mouth oblique, nearly terminal, wide, the maxillary reaching a vertical from hinder margin of pupil; its length 1.9 in that of head; teeth minute, equal, in narrow bands in both jaws, the mandibular band the narrower; barbel short, but evident, less than half diameter of pupil; preopercle



Hymenocephalus papyraceus Jordan & Gilbert, new species. Type.

greatly widened: its width, an angle, two-ninths that of head; its margin coarsely crenate, dentate;

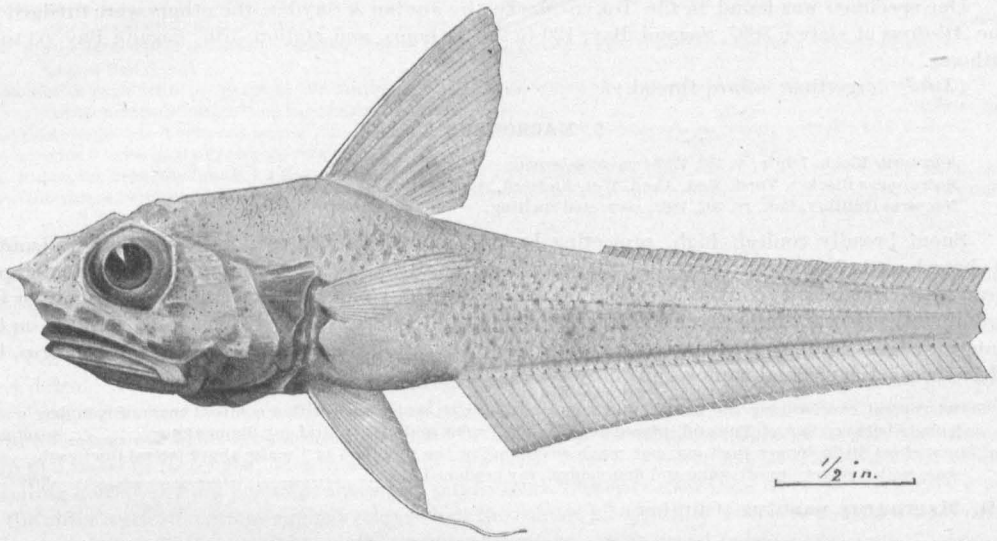


Hymenocephalus papyraceus Jordan & Gilbert, new species. Type.

98. Hymenocephalus lethonemus Jordan & Gilbert, new species.

Type 142 mm. long, from station 3697, in Sagami Bay, Japan, depth 120 to 265 fathoms; No. 50936, U. S. Nat. Mus. Closely allied to *H. antræus* and *H. striatulus* from vicinity of the Hawaiian Islands, but well distinguished from other species by proportions and number of ventral rays. First dorsal II, 10 or II, 11; ventrals 11. Head 5.4 in total length; depth 8. Branchiostegals 7.

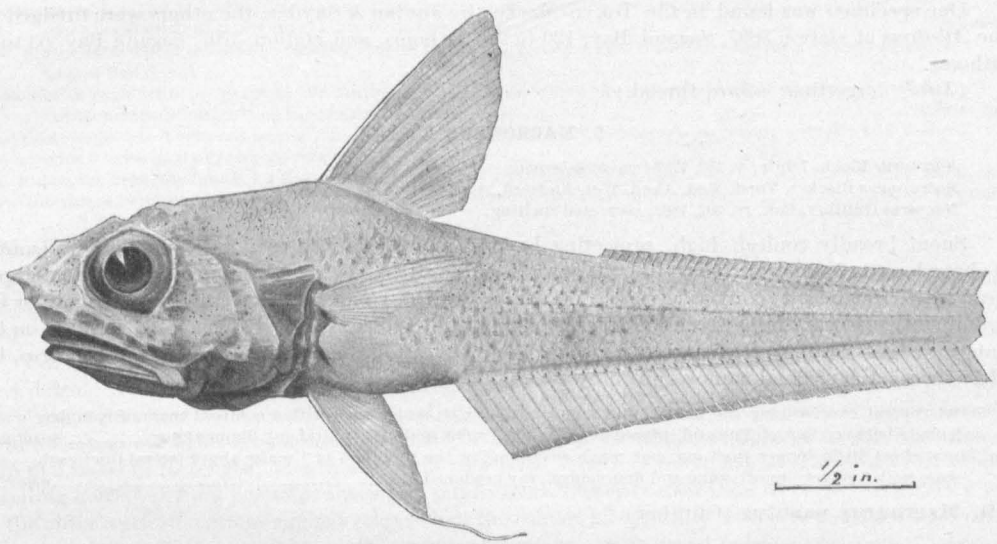
Body very slender, tapering to a very long whip-like tail. Head subquadrate in cross section, interorbital area nearly flat, sides of head vertical; ridges on top and sides of head thin and papery, the large mucous canals roofed over by delicate transparent membrane; orbital rim projects above and behind as a thin membrane-like expansion; median crest on snout and interorbital protrudes but little above general level; snout terminates anteriorly in a sharply projecting point, similar to that in *H. striatulus*, but slenderer and a little longer, projecting axially beyond the mouth for a distance slightly less than half orbital diameter; interorbital width 3.33 times in head; longitudinal diameter of orbit, 3; length of snout, 3.5; middle of length of head midway between hinder margin of orbit and pupil; posterior line of occiput midway between origin of dorsal fin and anterior edge of nasal fossa; mouth large, its width nearly equal to greatest width of head, the maxillary reaching vertical from hinder margin of orbit, its length 1.87 in that of head; teeth minute, of uniform size, in very narrow bands in each jaw, the bands interrupted mesially: no trace of mandibular barbel.



Hymenocephalus lethonemus Jordan & Gilbert, new species.

Preopercle dilated to form a wide membranous expansion at its angle, the greatest width of which is two-fifths the diameter of orbit, the margin crenulate; above the angle the preopercular

each jaw, the bands interrupted mesially: no trace of mandibular barbel.



Hymenocephalus lethonemus Jordan & Gilbert, new species.

As in other species of the genus, there are two small lens-like bodies on the mid-ventral line, one immediately in front of anal opening, the other on middle of breast.

Color light-grayish or brownish above, silvery on lower half of sides; sides of body and tail marked by rather coarse brown specks, which form a definite line along middle of sides. A strip along bases of dorsal and anal fins is devoid of specks, a sharp line between this and the spotted area often marked by a series of coarser dots; dots on sides of tail arranged partly in oblique lines which seem to correspond with those separating the myotomes; a dark vertebral line between dorsals and a dark spot at base of each ray of second dorsal and anal. The first dorsal occupies a conspicuous colorless area of the back which is margined with dusky; a dark blotch behind occiput; tip of snout faintly dusky. Upper jaw black in its anterior two-thirds, the lower jaw in its anterior third; posterior portions of both jaws white. Gular membrane silvery, with a fine network of dark lines, most of which are short and transverse, arranged in a right and a left series, those of each series united by a lengthwise commissure. Lateral portions of isthmus, concealed by the gill flap, bright silvery, crossed by fine parallel hair lines of brownish purple. This striated area extends backward above and behind base of ventrals; breast and belly purplish-black. The roof of mouth shines with a silvery luster. Mouth and gill cavity light in color, region about entrance to gullet blackish. Peritoneum silvery, overlaid with brown. Fins translucent, unmarked.

One specimen was found in the Tokyo Market by Jordan & Snyder; the others were dredged by the *Albatross* at station 3697, Sagami Bay, 120 to 265 fathoms, and station 3707, Sagami Bay, 63 to 75 fathoms.

(*ληθός*, forgetting; *νῆμα*, thread.)

9. MACROURUS Bloch.

Macrourus Bloch, Ichth., v, 152, 1787 (*rupestris-berglax*).
Macruroplus Bleeker, Versl. Med. Akad. Wet. Amsterd., viii, 1874, 369 (*serratus*).
Macrurus Günther, Cat., iv, 392, 1862; corrected spelling.

Snout broadly conical, high, projecting beyond mouth; mouth moderate, its cleft horizontal; U-shaped, entirely inferior; teeth in both jaws in villiform bands, those of outer series not enlarged, head with roughened bony ridges, one of which, on the suborbital and preorbital, is more or less prominent; eyes very large; scales imbricate, very rough, keeled. Dorsal spine long, serrated on the anterior edge. Deep water fishes. (*μακρός*, long; *οὐρά*, tail, hence correctly written *Macrurus*, but *Macrourus* is the original name as given by Bloch.)

a. Snout conical, overhanging the mouth, much longer than eye; scales each with a compact mass of spinules; 6 scales between lateral line and spinous dorsal; dorsal spine and first ventral ray filamentous.....*nasutus*, 99
aa. Snout short, little longer than eye, not much overhanging the mouth; 7 or 8 scales above lateral line; each scale with 5 ridges; dorsal spine and first ventral ray produced.....*asper*, 100

99. Macrourus nasutus (Günther).

Coryphænoides nasutus Günther, Ann. & Mag. Nat. Hist., xx, 1877, p. 440.
Macrurus nasutus Günther, Deep Sea Fishes, Challenger, 1887, p. 132, pl. xxx, fig. B; south of Tokyo in 565 fathoms; off Enoshima in 345 fathoms.

Short snout with a terminal and a pair of lateral spinous tubercles; mandibular rami are completely invested in scales; interorbital width slightly exceeding two-thirds the vertical diameter of orbit, which is contained 4.33 to 4.5 times in length of head. The first dorsal contains 10 rays, the second filamentous and well serrate, the pectoral 21 to 23, and the ventrals 9 (not 10, as stated by Günther), the first ray filamentous. Scales everywhere covered with closely packed long, slender spines, posterior spines well overlapping margin of scale; while not in longitudinal rows, these spines are definitely arranged in quincunx order, as can be readily seen on viewing them from different angles.

The alcoholic specimens are all very light olive-gray, fins blue or blue black; lips black; mouth, gill-cavity, and peritoneum, black; opercular membrane more or less black.

Fifteen specimens, each about 15 inches long, were dredged by the *Albatross* in Sagami Bay, near Enoshima, at station 3696, 501 to 749 fathoms; station 3699, 400 to 726 fathoms; station 3711, 500 to 677 fathoms.

Another, presented by Kuma Aoki, came from off the shore of Izu.

(*Nasutus*, long-nosed.)

100. Macrourus asper (Günther).

Coryphænoides asper Günther, Ann. & Mag. Nat. Hist., 1877, XX, p. 440; south of Japan in 1,875 fathoms.
Macrurus asper Günther, Deep Sea Fishes, Challenger, p. 137, pl. XXXVI, fig. A, 1887.

This species is known from the description and figure published by Günther.
(*Asper*, rough.)

10. CŒLORHYNCHUS Giorna.

Cœlorhynchus Giorna, Mém. Ac. Sci. Turin, XVI, 178, 1803 ("*Cœlorhynche la ville*").
Krohnius Cocco, Lettera al Sig. Augusto Krohn, Pesci del Mare de Messina, 1, 1844 (*filamentosus*; larva).
Paramacrurus Bleeker, Versl. Med. Ak. Wetensk. Amsterd. 1874, 103 (*australis*).
Oxymacrurus Bleeker, Versl. Med. Ak. Wetensk. Amsterd. 1874, 103 (*japonicus*).

This genus agrees with *Macrourus* in all essential respects, except that the small mouth is wholly below the long-pointed, sturgeon-like snout. Dorsal spine smooth in typical species, those with serrate spine having been separated under the preoccupied generic name *Cœlocephalus* Gilbert & Cramer, which is replaced by *Mataeocephalus* Berg. Species numerous.
(κοῖλος, hollow; ῥύγχος, snout.)

a. Scales smaller, 5 to 6 series between dorsal spine and lateral line.
b. Scales each with 3 to 5 strong radiating ridges; snout nearly twice as long as eye, which is 4.5 in head; interspace between dorsals one-third more than base of first ..... *japonicus.*
bb. Scales each with 2 to 5 strong parallel ridges; snout nearly twice eye; interspace between dorsals equal to base of first dorsal ..... *parallelus.*
bbb. Scales each with many (16 to 19) nearly parallel ridges, which are rather weak; snout short; interspace between dorsals longer than base of first ..... *kishinouyei.*
aa. Scales large, 3 to 4 between lateral line and first dorsal; snout short and broad, suggesting a duck's bill; scales with 6 to 9 weakly divergent ridges.
b. Interspace between dorsals 1.4 times base of first; snout 2.4 in head; eye 1.5 in snout ..... *anatirostris.*
bb. Interspace between dorsals much less; snout longer; eye smaller than in preceding ..... *tokiensis.*

101. Cœlorhynchus japonicus (Schlegel). *Hige.*

Macrurus japonicus Schlegel, Fauna Japonica, 1846, p. 256, pl. CXII, fig. 2, Nagasaki; Günther, Deep-sea Fishes, *Challenger*, 1887, p. 127, pl. XXIX, fig. c, Enoshima, in 345 fathoms; Steindachner & Döderlein, Fische Japans, IV, 283, Tokyo.

Dorsal II, 9 or II, 10; ventrals 7; pectoral 18; 5 or 6 scales in a series from lateral line to base of first dorsal. Snout long, narrow, subtrihedral, tapering to a very acute point, the lateral margins with very slight curve, or none, continuing in a direct line the infraorbital ridge; width of snout opposite anterior margin of orbit is contained 1.4 to 1.6 in its length; its height at front of mouth is contained 1.75 to 2 times in its length; mouth comparatively large, length of maxillary equaling diameter of eye, reaching a vertical from posterior margin of pupil; teeth rather coarser than usual in this genus, a few of the outer teeth sometimes slightly longer than the others, all typically with arrow-shaped tips; inner pair of occipital ridges converge gently backward; outer pair decurved behind eye; 7 or 8 tubercles represent the gillrakers of outer arch. The gill membranes have a well-marked free margin behind, on median line.

Second dorsal spine smooth throughout, its height contained 1.2 in that of snout. Interspace between dorsals is four-thirds the base of first; origin of second dorsal vertically above second or third anal ray; largest pectoral rays slightly exceed length of postorbital part of head; scales on back and sides marked with 3 to 5 strongly radiating, subequal, spinous ridges, posterior spines projecting beyond margin of scale; scales on breast similar, but smaller and more crowded; on upper surface of snout the scales have usually only the median crest developed, but the median series of 12 scales attached to the subjacent bony ridge contain each 6 or 7 strongly radiating ridges; on top and sides of head scales with a single median crest predominate, but the temporal region and the upper part of the head cheeks and opercles contain also many scales with 3 to 5 ridges; lower surface of head, except gular and branchiostegal membranes, densely covered with smaller scales, bearing each a median spinous crest; nail-like process at tip of snout longitudinally rugose and spinous; no depression or naked pit in front of ventral fins.

Color is dark brownish, lighter in snout, fins all blackish, including ventral filament; lining of buccal cavity blue-black; gill cavity and peritoneum brownish black.

Seven specimens, 33 to 43 cm. in length, were obtained at Misaki. A stuffed skin was obtained at Nagasaki. The species is not infrequent in the markets of southern Japan.

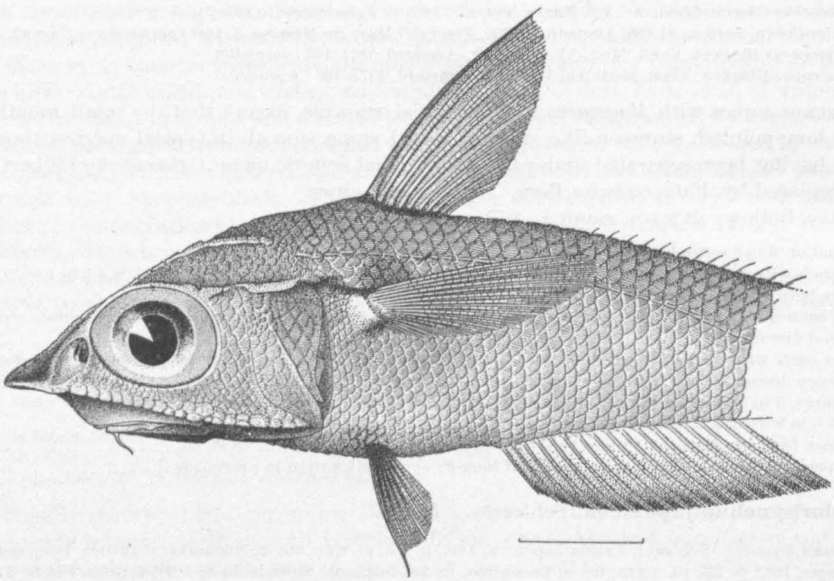
This species, with others in the family, is known as *hige*, a word meaning moustache, perhaps from the large interorbital ridge. Possibly the word *grenadier* has the same origin in its relation to these fishes.

102. Cœlorhynchus kishinouyei Jordan & Snyder.

Cœlorhynchus kishinouyei Jordan & Snyder, Proc. U. S. Nat. Mus. xxiii, 1901, 376, pl. xx, Misaki. Coll. K. Otaki, No. 49395, U. S. Nat. Mus.

This species is known from the original type now in the U. S. National Museum, obtained by Professor Otaki at Misaki. No second example has been seen.

(Named for Dr. Kamakichi Kishinouye, head of the Imperial Fisheries Bureau of Japan.)



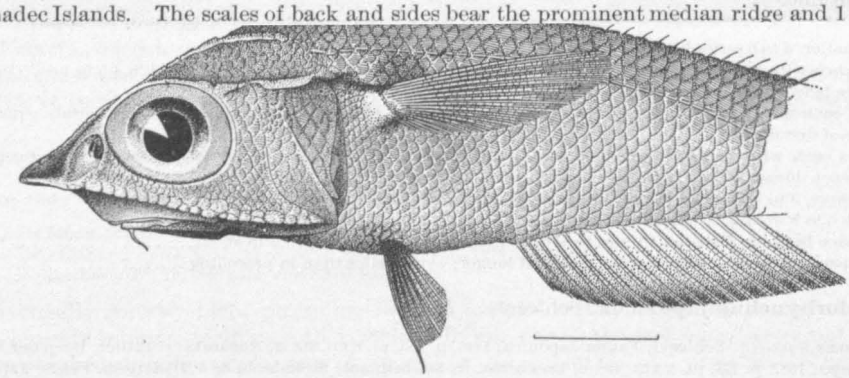
Cœlorhynchus kishinouyei Jordan & Snyder. Type.

103. Cœlorhynchus parallelus (Günther).

Macrurus parallelus Günther, Ann. & Mag. Nat. Hist. 1877, vol. xx, p. 439, Enoshima, in 345 fathoms (south of Japan); Günther, Deep Sea Fishes, Challenger, 1887, p. 125, New Zealand, Kermadec Islands, Enoshima (two species included, pl. xxix, fig. A, representing a distinct species, *C. kermadecus*).

A specimen 245 mm. long from Misaki was presented by the Imperial University.

Scutes on head, between prominent ridges and scales on back in front of dorsal fin, are furnished each with a prominent, high, thin median crest, which bears 1 to 3 spinous points, the posterior the longer; no lateral ridges on these scales and no approach to the radiating or stellate ridges described and figured by Günther (Deep-sea Fishes, Challenger, p. 126, pl. xxix, Fig. A) from specimens from the Kermadec Islands. The scales of back and sides bear the prominent median ridge and 1 to 3 pairs



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103. Cœlorhynchus parallelus (Günther).

Macrurus parallelus Günther, Ann. & Mag. Nat. Hist. 1877, vol. xx, p. 439, Enoshima, in 345 fathoms (south of Japan); Günther, Deep Sea Fishes, Challenger, 1887, p. 125, New Zealand, Kermadec Islands, Enoshima (two species included, pl. xxix, fig. A, representing a distinct species, *C. kermadecus*).

A specimen 245 mm. long from Misaki was presented by the Imperial University.

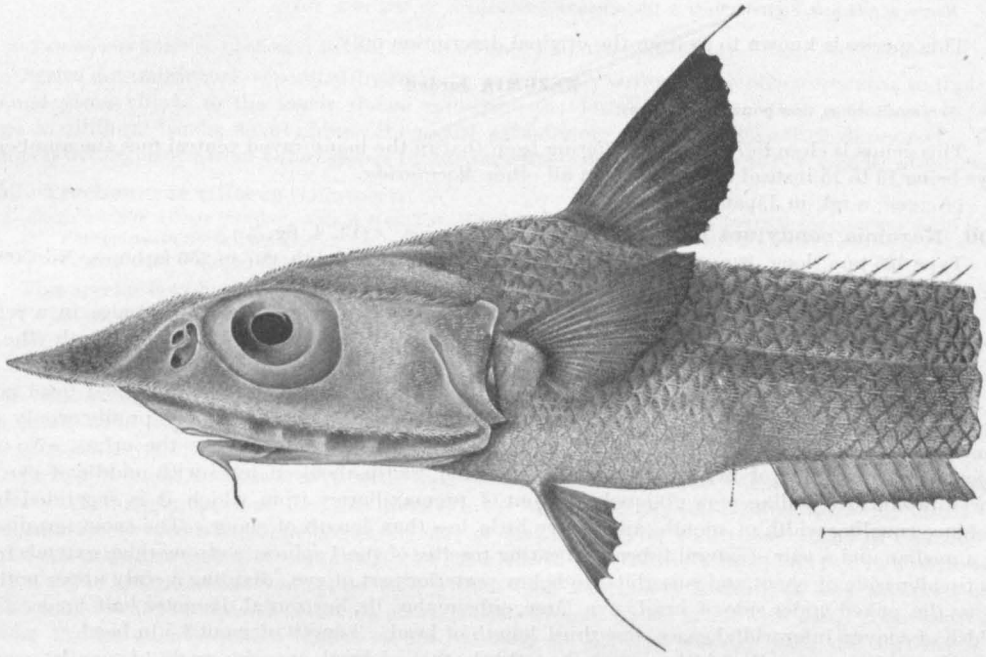
Scutes on head, between prominent ridges and scales on back in front of dorsal fin, are furnished each with a prominent, high, thin median crest, which bears 1 to 3 spinous points, the posterior the longer; no lateral ridges on these scales and no approach to the radiating or stellate ridges described

is represented as twice the length of the base of the anterior fin and as crossed by 10 transverse series of scales. If correctly shown there would seem to be no doubt of the specific distinctness of this form from the Japanese type. It may be named *Cœlorhynchus kermadecus* (new specific name). *C. parallelus* has been recorded from the Gulf of Manaar by Alcock (Ann. & Mag. Nat. Hist., 1889, p. 391) on the basis of "two young specimens, in bad preservation, believed to be this species." Ample verification of this record is to be desired.

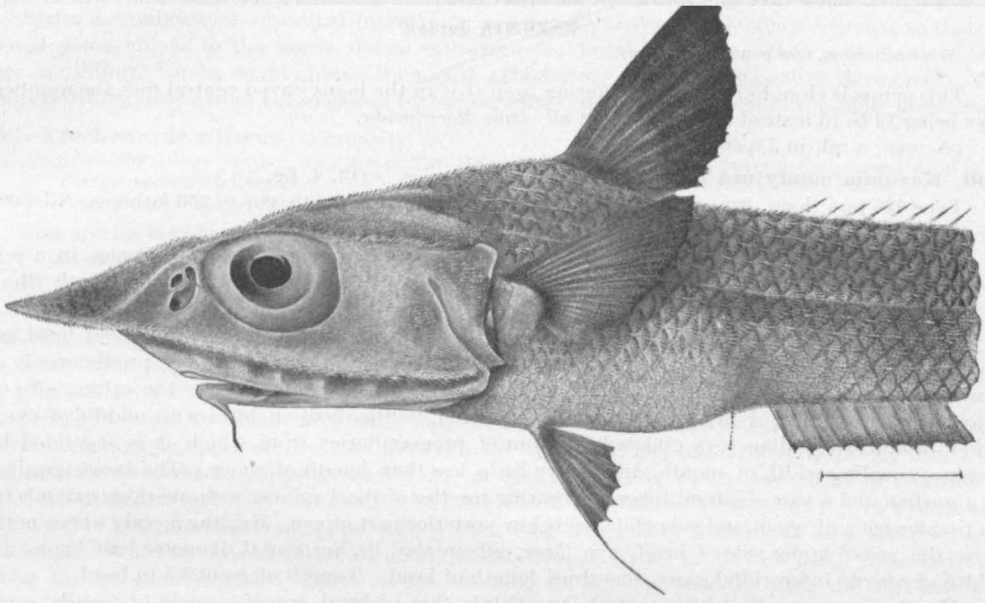
104. Cœlorhynchus anatirostris Jordan & Gilbert, new species.

Type, 40 cm. long, from Misaki, No. 8550, L. S. Jr. U.

First dorsal 11, 9; ventrals, 7; pectorals, 18. Scales, 3.5 to 4 in a series between lateral line and middle of dorsal base. Snout comparatively short, wide and depressed, shaped like a duck's bill, diameter of orbit two-thirds its length. Its lateral outlines more strongly curved than suborbital ridge along sides of head. Least interorbital width nearly three-fourths diameter of eye; length of snout (without the terminal spine, which is broken) is 2.4 times length of head. Barbel short, about half length of eye. Mouth small, its width at angle of gape contained 2.4 times in width of head on



Cœlorhynchus anatirostris Jordan & Gilbert, new species.



Cœlorhynchus anatirostris Jordan & Gilbert, new species.

spines, the last spines projecting beyond margin of scales; scales on breast similar, but smaller, with shorter spines; those on top and sides of head similar to those on body, but anteriorly on snout their size is greatly decreased and the radiating ridges reduced to 2 or 3; lower side of head is wholly naked, except 3 or 4 very small scales in a series below preopercular angle. No depressed area or naked pit on breast.

Color light brownish above, under parts lighter, fins blackish; buccal, branchial, and abdominal cavities lined with black, scarcely apparent externally.

Only one specimen seen; it was taken on long lines at Misaki by Kuma Aoki and presented to us by Professor Mitsukuri.

C. anatirostris is closely related to *C. tokiensis* (Steindachner & Döderlein), but differs in its shorter snout, much larger eye, shorter maxillary, sharper keels on occiput, and much wider interspace between dorsals. There is but one instead of two series of enlarged scales along the lateral ridge of the head, and the median series on the snout are not square.

105. Cœlorhynchus tokiensis (Steindachner & Döderlein).

Macrurus tokiensis, Steindachner & Döderlein, Fische Japans, IV, 283, 1887; Tokyo.

This species is known to us from the original description only.

NEZUMIA Jordan.

Nezumia Jordan, new genus (*condylura*).

This genus is close to *Macrourus*, differing from that in the many-rayed ventral fins, the number of rays being 13 to 15 instead of 7 to 10, as in all other *Macrouridæ*.

(*Nezumi*, a rat, in Japanese.)

106. Nezumia condylura Jordan & Gilbert, new species. (Pl. 4, fig. 2.)

Type 195 mm. long, from station 3721, Suruga Bay, Japan, depth 207 to 250 fathoms, No. 50937, U. S. Nat. Mus. Cotypes, No. 8551, L. S. Jr. University.

First dorsal II, 11 (or II, 10); ventrals 14 or 15, rarely 13; pectorals 21 to 23. Scales in a series between lateral line and anterior portion of second dorsal, 10 or 11. Head 6.3 in total length (the tip of tail broken); depth 7.4.

The profile is strongly angulated at origin of first dorsal, base of fin very oblique; head compressed, its sides vertical, its width less than two-thirds its greatest depth. Upper profile evenly and gently convex from tip of snout to origin of dorsal, without depression above the orbits. No conspicuous ridges on top of head; snout short, depressed, its tip about on level with middle of eye, its lower profile descending very obliquely to front of premaxillaries, from which it is separated by a distance equaling width of mouth, and a very little less than length of snout. The snout terminates in a median and a pair of lateral tubercles bearing rosettes of short spines; a strong ridge extends from its tip alongside of snout and suborbital to below posterior part of eye, dividing a scaly upper portion from the naked under side of head; eye large, subcircular, its horizontal diameter half longer than width of convex interorbital space, one-third length of head. Length of snout 3.5 in head.

Mouth is narrow, its width scarcely two-thirds that of head opposite angle of mouth, greatly overpassed by snout both anteriorly and laterally; length of maxillary one-third that of head, its tip reaching a vertical from behind middle of pupil; mandibular teeth small, cardiform, none of them enlarged, anteriorly in a wide band which tapers to a point near angle of mouth; premaxillary teeth similar, in a narrower band, outer series not enlarged. Mandibular barbel robust, more than half length of mandible, three-fifths diameter of orbit. Preopercular margin nearly vertical, evenly rounded at angle, the angle not at all produced backward. Branchiostegal membranes narrowly joined to isthmus, with a slight free border posteriorly. Branchiostegal rays 7. Pseudobranchiæ present, covered by the lining membrane of opercles; anterior gill slit much contracted, its width slightly less than half diameter of orbit; posterior gill slit two-thirds the anterior; base of pectorals and ventrals and origin of first dorsal approximately in same vertical; second dorsal spine slender, produced beyond soft rays but not filamentous, furnished with 10 to 14 long slender retrorse barbs, evenly spaced from near base to tip; length of spine about equal to that of head; space between dorsals equals length of base of anterior dorsal, which equals diameter of eye; second dorsal low throughout; a series of smooth cycloid scales along its base anteriorly on each side; first anal ray under or slightly behind last ray of first dorsal; pectorals five-eighths length of head; outer ventral ray filamentous, reaching base of the seventh anal ray; distance from base of ventrals to first anal ray equals length of snout and half eye; vent about equidistant between ventral base and anal and passed by all the ventral rays.

Scales all small, those on back and sides of body mostly with 7 or 8 nearly parallel series of recumbent spines, the posterior in each series projecting beyond margin of scale; series inclined a little obliquely downward, those on successive scales often falling in same straight line; on the nape the scales are smaller and furnished with much longer spines less distinctly arranged in series; on the snout and interorbital region the spines are thicker and stand erect or nearly so; on the breast the spines are suberect and arranged in more numerous series on each scale.

Color light brown, under side of head and abdomen purplish black, this color extending to above base of pectorals and backward to include the first 10 or 12 anal rays; the mouth, the branchial and abdominal cavities lined with black membrane. Basal half of first dorsal whitish, distal half blackish. Ventrals blackish.

The known specimens were dredged by the *Albatross* in Sagami and Suruga bays. Stations 3695, 110 to 259 fathoms; 3697, 120 to 265 fathoms, both in Sagami Bay; station 3721, Suruga Bay, 207 to 250 fathoms.

(*Condylura*, the star-nosed mole.)

TRACHONURUS Günther.

Trachonurus Günther, Challenger Report, Deep-Sea Fishes, XXII, 124, 1887 (*villosus*).

Scales not imbricated, separated by furrows, and densely covered with sharp spinules, so that the animal seems villous to the touch; dorsal spine smooth; dorsal much lower than anal; teeth in both jaws in villiform bands; snout obtuse, the mouth subinferior; suborbital ridge little developed. This genus is distinguished from *Cœlorhynchus* by the indistinct squamation. (τραχύς, rough; οὐρά, tail.)

107. Trachonurus villosus (Günther).

Coryphænoides villosus Günther, Ann. & Mag. Nat. Hist. 1877, XX, p. 441; south of Tokyo in 343 fathoms; south of the Philippines in 500 fathoms.

Macrurus villosus Günther, Deep Sea Fishes of Challenger, 1887, p. 142, pl. XXXVI, f. B.

This species is known to us from Günther's account only.

(*Villosus*, hairy.)

PLEURONECTIDÆ.

108. Atheresthes evermanni Jordan & Starks, new species. (Pl. 5, fig 1.)

Head 3.3 in length; depth 3; D. 114; A. 94; scales 109; upper eye 4.75 in head; snout from upper eye 4; maxillary 1.9; pectoral of eyed side 2.1; of blind side 3.25; upper lobe of caudal 1.75.

Profile of snout on same curve with that behind eye; very slightly depressed above eye; eyes scarcely reaching to upper profile, the lower one the more anterior; interorbital appearing rather flat and moderately broad, the bone, however, narrow and convex, its width less than half diameter of pupil; nostrils close together, the posterior of eyed side in a broad short tube, anterior in a narrower, longer tube; anterior nostril of blind side with a long flap nearly a third as long as upper eye, broadening toward its tip and becoming conspicuously opaque white; snout with many pores scattered among the irregularly placed scales; mouth reaching to, or very slightly past, the vertical from posterior margin of lower eye; teeth long and slender and with lance-shaped points, in a single row on lower jaw, their length unequal; a double row of smaller teeth on side of upper jaw, the outer row the smaller; they grow larger anteriorly, become curved inward, fang-like and some of them depressible; gillrakers rather slender, the longest a trifle less than half length of eye, their number 3+10; scales very finely ctenoid, the spinules short, fine, and numerous, only seen upon careful examination with a lens; many scales have only a few irregular spinules; others are entirely without them, appearing as if they had been rubbed off; head and body everywhere with numerous, small, cycloid supplementary scales crowded in; scales of blind side all cycloid; snout, mandible, maxillary, and interorbital with numerous small cycloid scales, those on latter extending out on eyeball to edge of iris; all fins rather closely covered with fine scales; lateral line slightly bending upward from opposite tip of pectoral. Pectoral of eyed side longer and more pointed than that of blind side; first ray of dorsal inserted above anterior margin of pupil; ventral short, scarcely reaching to front of anal. Caudal shallowly concave on posterior outline.

Color uniformly dark brown without markings.

This species differs from *Atheresthes stomias*, of the Alaskan fauna, in having only a single row of teeth on lower jaw, and the upper eye not reaching the upper profile. The scales are more strongly ctenoid and the anterior nostril bears a long flap.

The type and sole specimen is 270 cm. in length; it is from station 3772 in Matsushima Bay, and is numbered 51490, U. S. Nat. Mus.

CLEISTHENES Jordan & Starks, new genus

Cleisthenes Jordan & Starks, new genus of *Pleuronectidæ* (*pinetorum*).

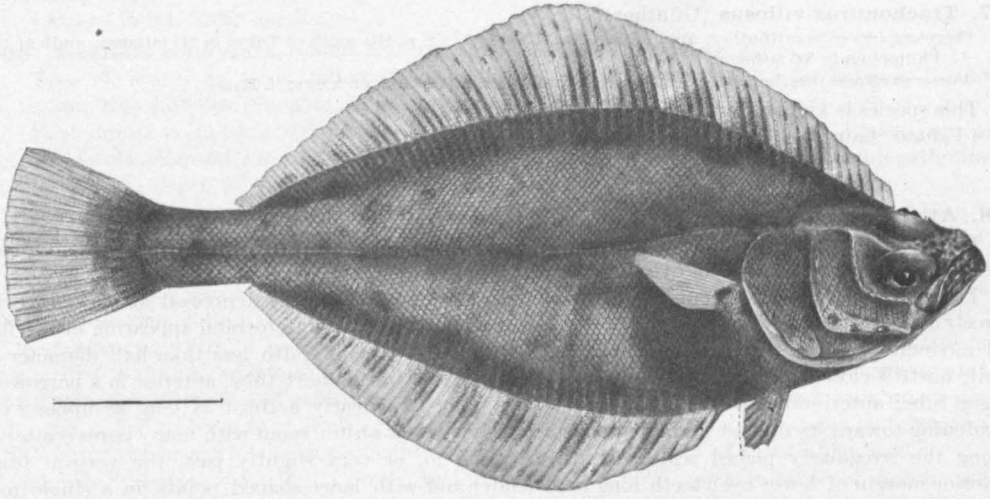
This genus is closely allied to *Hippoglossoides*, differing in having cycloid scales everywhere in the young, and an increased number of gillrakers. The adult has a single row of ctenoid scales along anterior base of dorsal and anal, a few on snout on ridge behind interorbital space, and on opercle. The dorsal begins at the orbital rim slightly on the blind side. Eyes and color on right side.

(*Cleisthenes*, the effeminate, an Athenian noted by Aristophanes.)

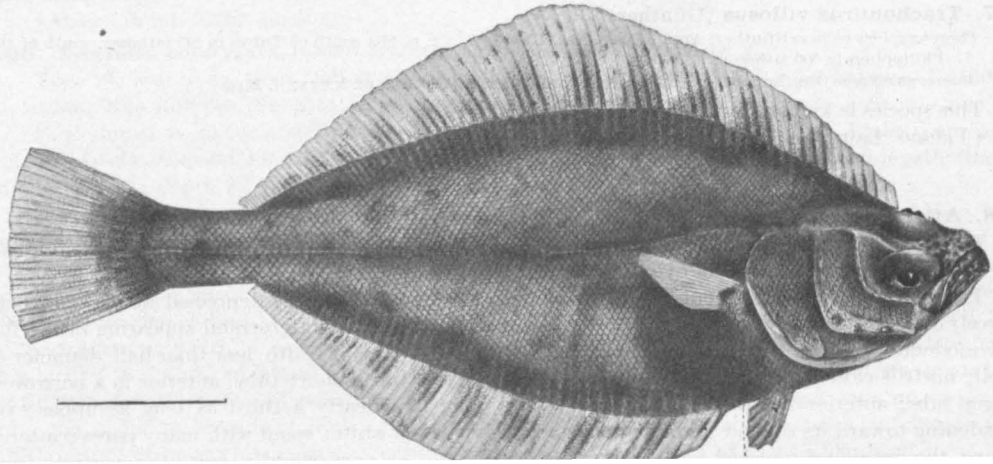
109. Cleisthenes pinetorum Jordan & Starks, new species.

Head 3.66 in length; depth 2.6; D. 76; A. 56; scales 80; upper eye 4.6 in head; snout from upper eye 4.6; pectoral of eyed side 2; of blind side 2.5; ventral 3; caudal 1.4.

Dorsal outline of anterior part of body and head an even concave curve to near tip of snout, broken only by protruding upper eye. Upper eye cutting into profile, and ranging nearly vertically upward, about two-fifths of it being visible from the blind side. Tip of snout blunt and rounded; mouth rather strongly curved; maxillary reaching scarcely to middle of lower eye, not covered along middle of its length by the prefrontal as in *Hippoglossoides hamiltoni;* teeth small, acute, in a single series in each jaw, scarcely enlarged anteriorly; nostrils moderate, the anterior in a short tube which does not reach to edge of preorbital; preorbital with a blunt spine on anterior edge; eyes about equal in size, separated by a flat interspace, covered with cycloid scales; gillrakers slender, equal to half the eye in length, 8 to 10 above and 24 to 27 below the angle.



strongly curved; maxillary reaching scarcely to middle of lower eye, not covered along middle of its length by the prefrontal as in *Hippoglossoides hamiltoni;* teeth small, acute, in a single series in each jaw, scarcely enlarged anteriorly; nostrils moderate, the anterior in a short tube which does not reach to edge of preorbital; preorbital with a blunt spine on anterior edge; eyes about equal in size, separated by a flat interspace, covered with cycloid scales; gillrakers slender, equal to half the eye in length, 8 to 10 above and 24 to 27 below the angle.



Head, 3.5 in length; depth, 2.66; length of upper eye, 3.75 in head; snout from upper eye, 4.66; pectoral of eyed side, 2.1; pectoral of blind side, 3; ventral, 3; length of middle dorsal rays, 2.16; middle anal rays, 2.16; caudal, 1.4; interorbital space narrower and more concave than in adult; color light, with fine points scattered over a flesh-colored ground, these following more especially the outline of scales; indefinite dark brown spots scattered over body; one always present on lateral line at beginning of posterior third; one or two usually placed irregularly along lateral line anteriorly; a few following dorsal and ventral outlines of body; fins light, mottled with grayish brown.

All of our numerous specimens were dredged off Kinkwazan Island, Matsushima Bay, at stations 3769 and 3770. The type is 22 cm. in length, No. 51403, U. S. Nat. Mus.; cotypes are No. 8391, Stanford University.

110. Xystrias grigorjewi (Herzenstein).

Hippoglossus grigorjewi Herzenstein, Bull. Ac. Imp. Sci., Petersb., 1890, p. 134.
Verasper otakii Jordan & Snyder, Proc. U. S. Nat. Mus., XXIII, 1901, p. 378; Tokyo.

A large specimen, taken at station 3699, Suruga Bay, in 400 to 726 fathoms.

This species differs from others referred to *Verasper* in having long, slender gillrakers, the scales all cycloid on blind side, and those of eyed side more finely ctenoid; spinules more even and numerous. It may be made the type of a distinct group or genus, called *Xystrias*, from the long gillrakers.

111. Pleuronichthys cornutus (Schlegel).

Two specimens taken in Suruga Bay, station 3708, off Ose Point, in 65 to 125 fathoms, and station 2356. A larva with the eyes still symmetrical perhaps belongs to this species.

112. Limanda herzensteini Jordan & Snyder.

Pleuronectes japonicus Herzenstein, not of Houttuyn. *Limanda herzensteini* Jordan & Snyder Proc. U. S. Nat. Mus., XXIII, 1901, p. 746, after Herzenstein.

One specimen dredged in Matsushima Bay, station 3768, 25 cm. in entire length, differs from Herzenstein's description in having 84 series of scales (88 pores). Others collected by Jordan & Snyder at Tsuruga, Matsushima, Hakodate, and Aomori have from 80 to 85 scales.

ALÆOPS Jordan & Starks, new genus.

Alæops Jordan & Starks, new genus of *Pleuronectidæ* (*plinthus*).

Allied to *Pœcilopsetta*, but with large ctenoid scales which are somewhat caducous. Eyes and color on the right side. Lateral line simple, with a broad flat-topped arch in front; mouth moderate; teeth small, in bands. Gillrakers short and sharp.

113. Alæops plinthus Jordan & Starks, new species. (Pl. 5, fig. 2.)

Head 4 in length; depth 2.4; D. 61; A. 53; scales 65 (pores); upper eye 3 in head; snout from upper eye, 4.16; maxillary 3.16; pectoral of eyed side 2.25; ventral median; caudal rays 1.

Anterior body outline strongly arched above; orbital rim of upper eye protruding beyond rest of profile; snout a little produced, blunt; anterior nostril in rather broad, short tube, which does not reach to edge of preorbital; maxillary curved, reaching to below or very slightly past anterior rim of pupil of lower eye; teeth small, in a very narrow band on eyed side, growing wider anteriorly, somewhat smaller on premaxillary. On blind side the teeth on both jaws are in moderately wide bands. Eyes equal in size, the lower slightly more anterior, separated by a narrow naked ridge; vertical limb of premaxillary short; gillrakers short and rather sharp, the longest one-half to one-third diameter of pupil, 5+10 in number; caudal peduncle very wide and flat, its length one-third of its width; scales large, rather finely but very evidently ctenoid on eyed side, cycloid on blind side; head on eyed side, anterior to posterior rim of pupil above, and posterior end of mandible below, without scales; lateral line turning abruptly upward at a sharp angle two-thirds the head's length behind head, and forming a conspicuous flat-topped arch, as high as half length of head; dorsal beginning slightly on blind side, a little behind middle of eye, length of first ray contained 1.1 in upper eye, longest rays near posterior end of fin, the longest 2.25 in head; pectorals equal in size; caudal broad and pointed behind; no lateral angles, the sides broadly rounded from tips of the long median rays to lateral edges of fin base.

Color pinkish slaty-brown, usually mottled with black; 2 inconspicuous semiocellated spots, one near dorsal and one near anal base a head's length anterior to base of caudal; less conspicuous dark irregular spots along side above anal and below dorsal, one below arch of lateral line; a black spot on

outer rays of caudal; all fins except ventral and pectoral of blind side irregularly spotted and mottled with black. The membrane has drawn away from the scales in our specimen leaving them light at base.

The type is 155 mm. in entire length, taken at station 3708 in Suruga Bay. It is numbered 51406, U. S. Nat. Mus. Cotypes were taken at the same station, and at stations 3715, 3716, and 3717 in Suruga Bay, and at station 3725 in Owari Bay. Cotype No. 8389, Stanford University.

DEXISTES Jordan & Starks, new genus.

Dexistes Jordan & Starks, new genus of *Pleuronectidæ* (*rikuzenius*).

This genus differs from *Pseudopleuronectes* in having large scales, and large eyes narrowly separated by a high, sharp, naked interorbital ridge. Eyes and color on the right side.

114. Dexistes rikuzenius Jordan & Starks, new species. (Pl. 6, fig. 1.)

Head 3.83 in length; depth 2.75; D. 73; A. 59; scales 64 (pores); upper eye 3.1 in head; snout from upper eye 4.83; maxillary of eyed side 3.83; of blind side 3; pectoral of eyed side 2; of blind side 3; ventral 3.1; highest dorsal rays 2.5; median caudal rays 1.5.

Body moderately narrow; anterior dorsal curve slightly broken by the raised orbital rim; snout blunt; lower jaw projecting, and with a knob developed at symphysis below tip; eyes large, upper slightly the larger and placed farther back; narrowly separated by a high, sharp, naked ridge; mouth much larger on blind side; maxillary of eyed side reaching to opposite anterior edge of pupil; teeth blunt and not very even or closely set, in one moderately straight row except on blind side of lower jaw, where 3 or 4 are irregularly placed inside the row; gillrakers short and triangular, 7 on lower limb of arch, 1 developed and 2 rudimentary ones on upper limb; scales large and ctenoid on eyed side, cycloid on blind side; spinules on scales very slender, sharp, and numerous; a few scales on anterior part of interorbital where it widens on snout; upper eye with a patch of ctenoid scales, each with 2 or 3 spinules; a row of small scales running out on each fin ray; lateral line without an arch, a branch of it curves down behind eyes and around lower edge of lower eye; dorsal beginning above middle of eye; pectoral of eyed side longer and more pointed than that of blind side; ventrals equal in length, the last rays the longest; median caudal rays produced, upper edge obliquely truncate, lower slightly concave.

Color brown, with a few irregular inconspicuous dark brown spots, one on lateral line at beginning of its posterior two-fifths, one near base of caudal, one below middle of lateral line, one near top of pectoral; small ones show little color except a few brown spots, the one on lateral line the most conspicuous.

The type from which this description is taken is 22 cm. in length, and was taken at station 3774, in Matsushima Bay, in 84 fathoms. Two small cotypes were taken at station 3717, off Ose Point, Suruga Bay, in 65 to 125 fathoms.

The type is No. 51423, U. S. Nat. Mus. A cotype is No. 8388, Stanford University.

115. Araias ariommus Jordan & Starks, new genus and species. (Pl. 6, fig. 2.)

Head 3.8 in length; depth 2.6; D. 71 to 74; A. 57 to 60; scale 60; upper eye 2.8 in head; snout from upper eye 4.33; maxillary 3.75; pectoral of eyed side 1.87; of blind side 2.75; caudal 1.16.

Rim of upper orbit very slightly protruding above rest of upper profile; eyes separated by a narrow sharp ridge; anterior rim of lower scarcely or very slightly anterior to that of upper, posterior rim anterior to that of upper (to a greater degree in the type than in cotype); mouth very small, considerably larger on blind side, the maxillary reaching to just below anterior edge of orbit; teeth blunt, set in a single, very irregular row, those of lower jaw projecting around on eyed side farther than those of premaxillary; gillrakers short and triangular, 3 + 7 on first arch; dorsal beginning above middle of upper eye; pectoral of eyed side a little longer and not so bluntly rounded as that of blind side; caudal doubly truncate, median rays the longer; lateral line not arched, gradually curved up anteriorly; scales cycloid, with occasionally a ctenoid scale with long irregular spinules (as the spinules are easily broken, leaving no trace, it appears probable that the scales may have all been ctenoid); a few small scales running out on fin rays.

Color light pinkish brown, without definite markings; dorsal, anal, and caudal with very faint wavy cross marks.

Two specimens taken in Matsushima Bay, at stations 3770 and 3773. The type is the larger, and is 13 cm. in length. It is No. 51417, U. S. Nat. Mus. The other from station 3773 is No. 8386, Stanford University.

The new genus *Araias* is technically near *Pleuronectes*, differing in its thin, scarcely ctenoid scales and in its fragile body.

116. Clidoderma asperr'mum (Schlegel).

A larval flounder, 33 mm. in length, which we take to be the young of this species, since it agrees in fin rays, was collected in Matsushima Bay, station 3770. It is covered on both sides with small spinules of about equal size, those of blind side finer and more sparse than on eyed side; no enlarged plates, but groups of 4 or 5 spinules scattered over the eyed side probably represent them; body outline rounder and anterior curves more convex. Pectoral very short, broader than long, covered on base by a sheath of spinules, beyond which the short rays project fanlike.

Color, light cream everywhere with blended brown spots; irregular in size, position, and intensity of color.

VERÆQUA Jordan & Starks, new genus

Veræqua Jordan & Starks, new genus of *Pleuronectidæ* (*achne*).

Allied to *Microstomus* and *Limanda*.

Body rather elongate, covered with very fine cycloid scales; lateral line with a small arch in front, without accessory dorsal branch; mouth small and with about 7 large blunt teeth in a single row on blind side; eyes close together, separated by a high naked ridge which is continued backward; gillrakers very small, not numerous; no anal spine; caudal rounded; eyes and color on right side.

117. Veræqua achne Jordan & Starks, new species. (Pl. 7, fig. 1.)

Head 4.33 in length; depth 2.87; D. 85; A. 69; scales 135; upper eye 3.16 in head; snout from upper eye 4; pectoral 2; ventral 4; highest dorsal rays 2; caudal 1.1.

Form rather slender, the outlines forming low even curves; anterior upper outline of head unbroken and continuous with body curve; mouth very small, the maxillary reaching a little past front of lower eye but scarcely to edge of pupil; 7 large and very blunt teeth, set in a single row on blind side only; eyes narrowly separated by a high naked ridge, the lower the more anterior; interorbital ridge continued backward and upward along lower margin of upper eye, forming a high, conspicuous, smooth ridge; a slight angle on lower edge where it turns upward, but no tubercles developed; nostrils close together, in short broad tubes, anterior reaching to edge of preorbital; gill-slit stopping at upper edge of pectoral; gillrakers very small, 8 on lower limb of arch. Scales very fine, everywhere cycloid; very small nonimbricated scales present on dorsal and anal nearly to tips of rays except on the brown streak behind each ray; caudal thickly covered with similar scales; scales on pectoral rays only; on base of ventral only on both rays and membrane; small imbedded scales on snout; lateral line perfectly straight and horizontal to tip of pectoral where it turns up and forms a low but conspicuous arch, the cord of its curve 3 times its height. Dorsal beginning slightly on blind side above middle of eye; low anteriorly, gradually growing higher to beginning of its last third or fourth where it reaches its greatest height; pectorals rounded, that of eyed side, in our specimen, very slightly longer than that of blind side; ventral short and rather broad, the second ray longest, making the fin pointed; caudal broadly rounded.

Color slaty brown, mottled with darker brown blended into the ground color; a brown streak behind and partly on each dorsal and anal ray; caudal uniform dark brown; pectoral with dark brown membrane.

A single specimen, the type, dredged at station 3772, Matsushima Bay, in 79 fathoms. It is 18 cm. in length, and is numbered 51447 U. S. Nat. Mus.

(ἄχνη, a whiff of foam.)

118. Microstomus kitaharæ Jordan & Starks, new species. (Pl. 7, fig. 2.)

Head 4.25 to 4.5 in length; depth 3.5 to 3.75; D. 91 to 96; A. 75 to 83; scales 87 to 96 (pores); eye 2.83 to 3.16 in head; snout from upper eye 4.33 to 4.75; maxillary 3.75 to 4; pectoral of eyed side 1.83 to 2.33, of blind side 2.25 to 3; ventral 3.5; caudal 1.25.

Anterior upper profile evenly convex; the upper eye protruding above it; lower eye much in advance of upper, the eyes separated by a very narrow ridge; maxillary short, rather strongly curved, reaching to below anterior edge of pupil of lower eye; teeth rather blunt, in a single row, forming a continuous even cutting edge; a small bony knob developed below tip of mandible; anterior nostril of eyed side in a short broad tube; gillrakers very short, 8 of them on lower limb of arch; scales everywhere cycloid, the snout, maxillary, and mandible naked; lateral line conspicuous, curving up just behind tip of pectoral above upper end of gill opening, but not at all arched; dorsal beginning above posterior margin of pupil of upper eye; the longest dorsal and anal rays are at beginning of posterior fourth of

body length; pectoral narrow, pointed, variable in length, the upper edge of its base distant one diameter of pupil from upper end of gill slit; ventrals reaching just to front of anal; caudal rounded or double truncate, the middle rays projecting beyond outer rays a distance slightly greater than half eye.

Color uniform brown, pectoral and caudal growing black toward tips of rays; no color on blind side except black toward end of caudal.

The type is 18 cm. in length, taken with several cotypes at station 3770, Matsushima Bay, in 42 to 45 fathoms. Other cotypes were taken near the same locality at stations 3769, 3771 (in 61 fathoms), and 3772 (in 79 fathoms); at station 3717, off Ose Point, Suruga Bay, in 65 to 125 fathoms, and station 3699, Suruga Bay, in 400 to 726 fathoms; others were collected by Jordan and Snyder in the market at Tokyo, several of which were deposited as cotypes in the Imperial University at Tokyo. Dried salted specimens were obtained in the market of Tsuruga.

The type is No. 51418, U. S. Nat. Mus. Cotypes are Nos. 8390, 8995, 8996, Stanford University.

The species is named for Mr. T. Kitahara, author of a paper on the *Scombridæ* of Japan. In the same journal of the Fisheries Bureau, 1897, the present species is figured by Mr. Otaki as *Pleuronectes cynoglossus*.

119. Pseudorhombus pentophthalmus Günther.

Head 3.33 in length without caudal; depth 2; D. 71; A. 52; pores in lateral line 68; upper eye 5 in head; snout 3.87; maxillary 2; pectoral (eyed side) 1.75; blind side 2.4; caudal 1.33.

Body broad and thin, ventral and dorsal outlines evenly curved; snout blunt, obliquely truncated, separated from anterior profile by a notch; eyes separated by a narrow sharp ridge which is continuous backward and upward above cheek; anterior edge of eyes about even, posterior edge of upper one a little more posterior than that of lower; mouth much curved, the maxillary reaching to posterior edge of lower eye; teeth sharp and curved, set in a single row on each jaw, some of them very slightly arrow-shaped at tips; on blind side teeth on premaxillary grow smaller backward and disappear opposite the middle of length of maxillary; gillrakers moderately slender and long, the longest slightly exceeding half diameter of eye, 6+16 in number. Dorsal beginning slightly toward blind side a little in front of anterior edge of upper eye, the first ray at notch separating the snout, anterior rays somewhat produced beyond the membrane; pectoral of eyed side longer than that of blind side; ventrals similar in size and position; caudal with the middle rays produced and with no lateral angles, the sides being broadly rounded. Scales ctenoid on eyed side, spinules short, sharp, and numerous; cycloid on blind side; scales on all fin-rays rather large, even, and ctenoid on eyed side; lateral line strongly arched anteriorly, a branch from above gill-opening running to dorsal profile above posterior edge of eye, opposite eighth ray of dorsal. The color has nearly all bleached in alcohol. There is a dark brown spot narrowly ringed with white just above arch of lateral line, and another two-thirds of the head's length behind it midway between lateral line and outline of back; traces of two similar spots on lower part of side midway between lateral line and ventral outline and slightly behind those above.

We identify this species with *Pseudorhombus pentophthalmus* described from China and recorded by Steindachner from Kobe. It has much in common with *Pseudorhombus russelli* described from Canton by Gray. It seems to differ in color and also in the larger size of the mouth. *Pseudorhombus arsius* from the Ganges, as described by Bleeker, is different from our species, and the names given by Richardson to Chinese drawings (*Platessa velafracta, Platessa balteata*) are wholly unidentifiable. *Pleuronectes chinensis* of Lacépède is probably unrecognizable. *Pleuronectes chrysopterus* of Schneider seems to be *Pseudorhombus oligolepis*.

A specimen 13 cm. in length was taken by the *Albatross* at Hakodate in 1896, having been overlooked in our earlier studies. A larger one in poor condition was taken in the Bay of Yokohama. The latter is so badly preserved that only its anterior half remains.

The genus *Pseudorhombus* is distinguished from *Paralichthys* by the presence of an accessory lateral line from the nape running forward and upward to the dorsal fin. The body is deeper than in *Paralichthys*, the mouth is smaller and the teeth are weaker. *Rhombiscus*, based by Jordan and Snyder on *Pseudorhombus cinnamomeus*, is identical with *Pseudorhombus*.

120. Engyprosopon iijimæ Jordan & Starks, new species. (Pl. 8, fig. 1.)

Head 4 in length; depth 2.33 to 2.5; D. 80 to 89; A. 69 to 72; scales 50 to 53; eye 3 in head; maxillary 3.5; pectoral of eyed side 1.2; of blind side 3; ventral 2.25; caudal equal to head. Anterior profile evenly curved, the orbits not reaching to its edge; eyes separated by a narrow sharp ridge, the lower the more anterior; mouth small, the maxillary very much curved and reaching to a little past

front of orbit; teeth small and set in a single row; six very short gillrakers on lower arch of first gill. Scales finely ctenoid, the spinules on the scales slender and very numerous; blind side with cycloid scales; lateral line with a very abrupt, short, high curve, its height contained 1.83 in its chord, which is half length of head, its beginning opposite the terminal third of pectoral. Dorsal beginning in advance of eye; pectoral of eyed side long and slender, of blind side less than half as long; ventral with 6 rays, that of blind side not prolonged, its base beginning behind front of ventral of eyed side and its tip reaching further past front of anal; caudal rounded behind, its outer edges broadly rounded, scarcely angulated.

Color light brown, spotted with dark brown, ocellated spots, 3 above and 3 below lateral line, the anterior upper spot in advance of that below; 5 spots with edges more blended along body near base of dorsal, 4 similar ones along body near base of anal, these involving base of fins; one on opercle just above gill-opening; pectoral of eyed side dark brown.

Two small specimens taken in from 45 to 60 fathoms, in Suruga Bay, stations 3713 and 3714; the former, the type, 65 mm. in length, is numbered 51461, U. S. Nat. Mus.; the other is No. 8387, Stanford University.

The species differs somewhat from the type of *Engyprosopon*, but it is doubtless referable to the same genus. It is named for Dr. S. Iijima, professor of zoology in the Imperial University of Tokyo.

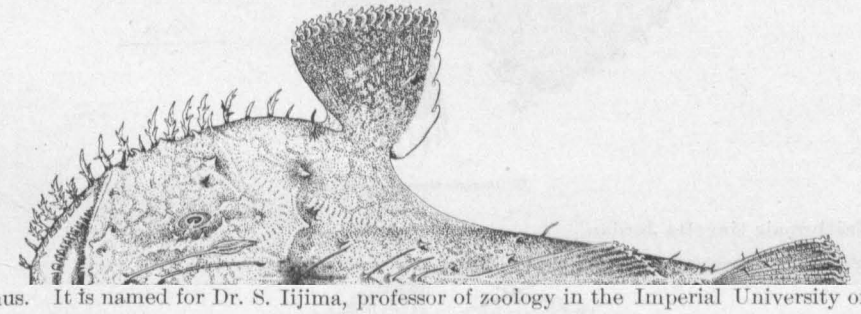
121. Scæops grandisquama (Schlegel). (Pl. 8, fig. 2.)

Two small specimens taken; one at station 3762, Owari Bay, in 42 fathoms, the other at station 3754, off Sune Point, Sagami Bay, in 50 fathoms.

This is a common shore fish of southern Japan.

This species is the type of a distinct genus, *Scæops* Jordan & Starks, allied to *Platophrys*, but distinguished by the large deciduous scales. In the more closely related genus *Engyprosopon*, the scales are firm, the gillrakers long and slender, and the teeth in two rows. In *Scæops*, the gillrakers are very short and triangular and the teeth in one row. *Platophrys pœcilurus* Bleeker, from the East Indies, is also a species of *Scæops*.

LOPHIIDÆ.



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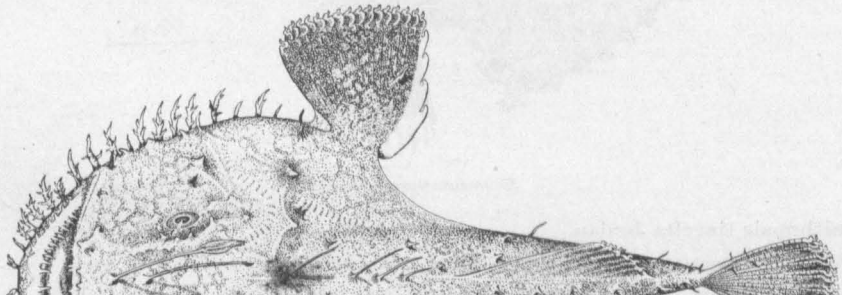


SOLEIDÆ.

123. Usinosita japonica (Temminck & Schlegel).

A very young specimen taken in Suruga Bay, station 3700.

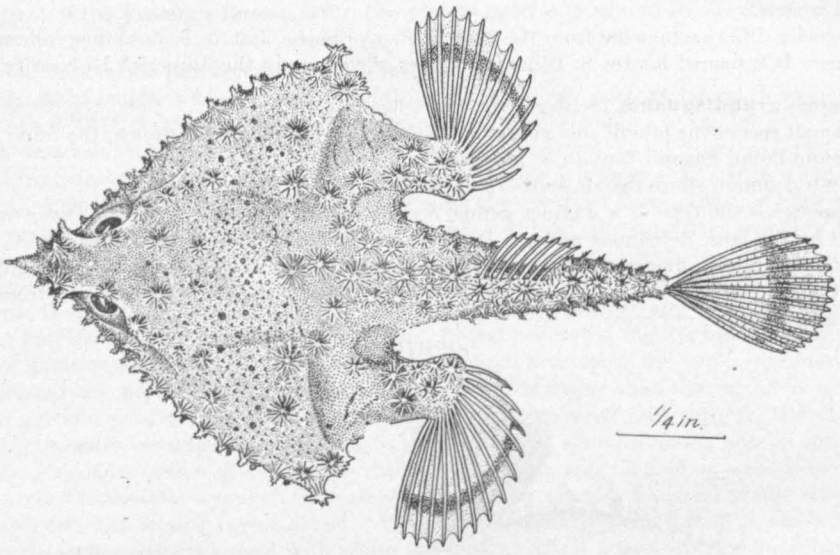
ANTENNARIIDÆ.

124. Chaunax fimbriatus Hilgendorf.

Chaunax fimbriatus Jordan, Proc. U. S. Nat. Mus., XXIV, 1902, 377; Suruga Bay.

Station 3717, off Ose Point, Suruga Bay, 65 to 125 fathoms; station 3741, Suruga Bay, in 71 fathoms.

OGCOCEPHALIDÆ.

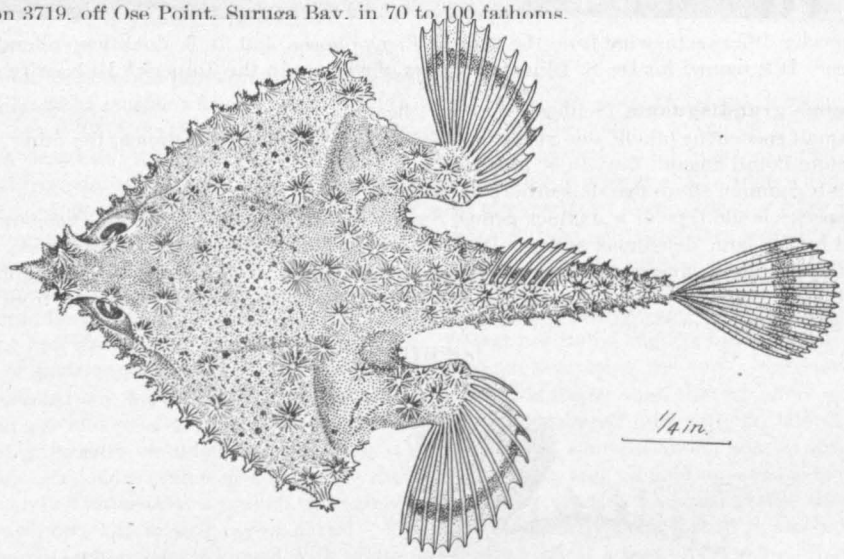


Malthopsis tiarella Jordan.

125. Malthopsis tiarella Jordan.

Malthopsis tiarella Jordan, Proc. U. S. Nat. Mus., XXIV, 1902, p. 379.

Station 3719, off Ose Point, Suruga Bay, in 70 to 100 fathoms.



Malthopsis tiarella Jordan.

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Fig. 2. *Microstomus kitaharæ* Jordan and Starks, new species. Drawing by Sekko Shimada from type specimen 18 cm. long, taken at station 3770, Matsushima Bay.
Pl. 8, Fig. 1. *Engyprosopon tijimæ* Jordan and Starks, new species. Drawing by Sekko Shimada from type specimen 65 mm. long, taken at station 3713, Suruga Bay.
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Bull. U. S. F. C. 1902. (To face page 630.)

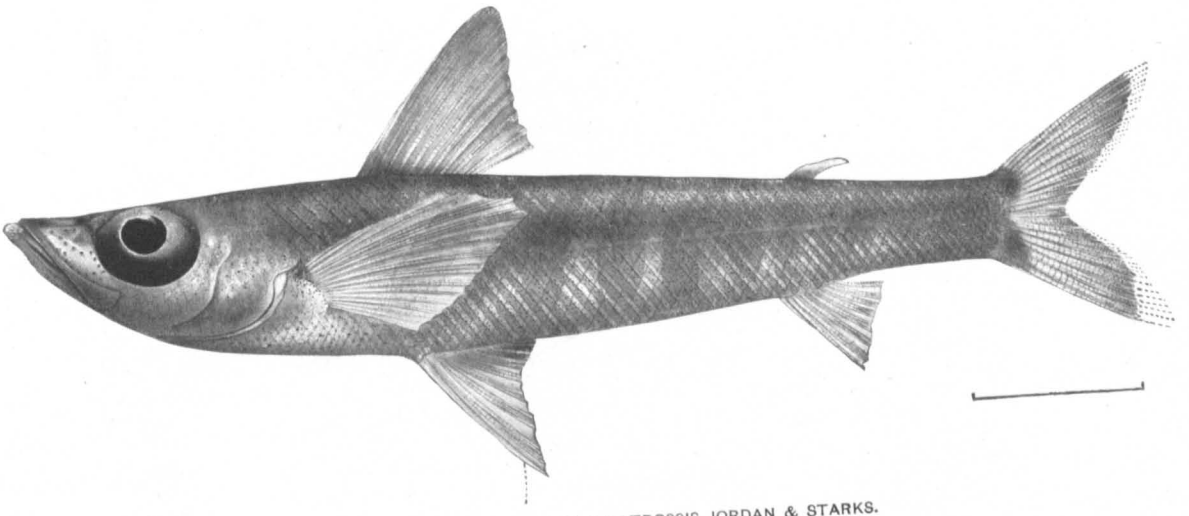


FIG. 1. CHLOROPHTHALMUS ALBATROSSIS JORDAN & STARKS.

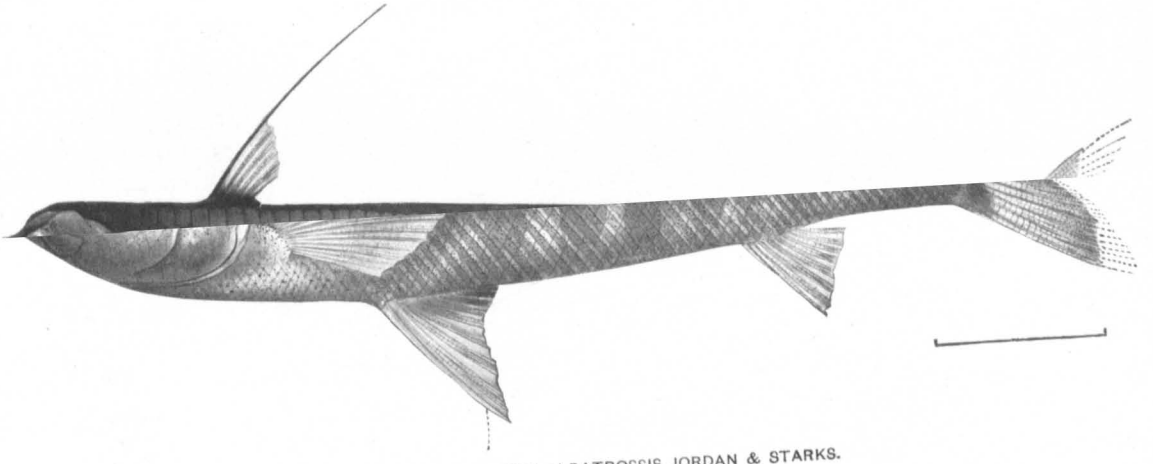
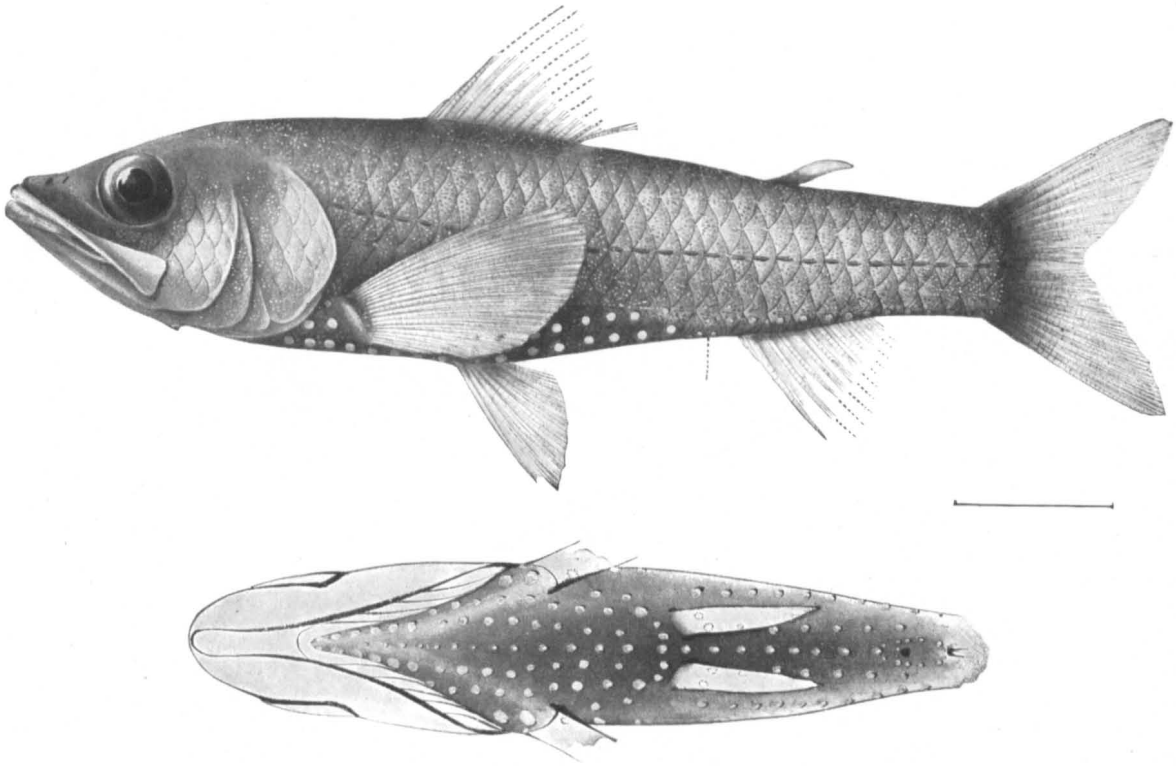
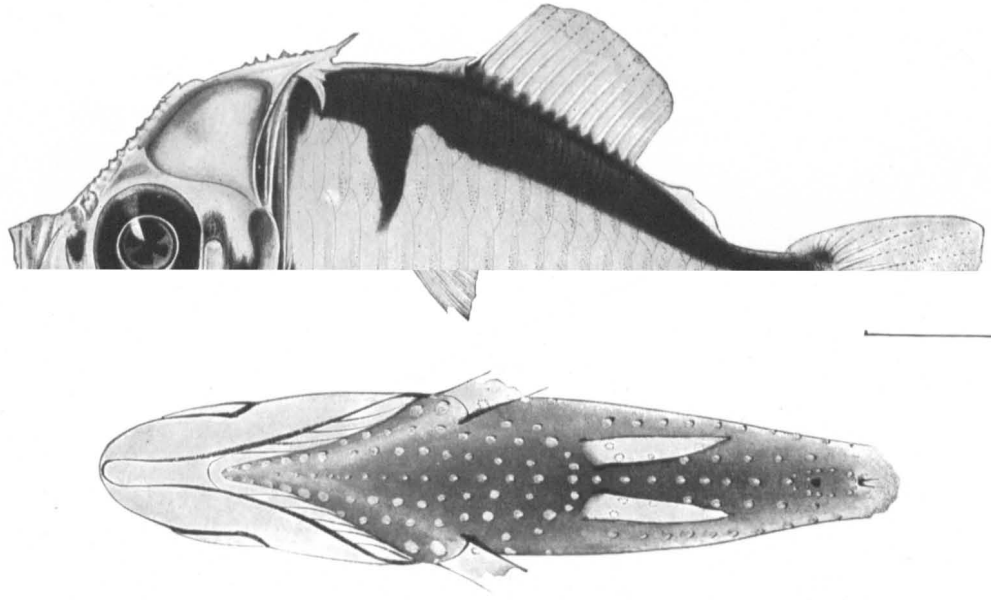


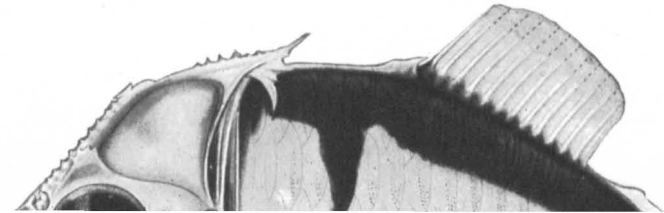
FIG. 1. CHLOROPHTHALMUS ALBATROSSIS JORDAN & STARKS.

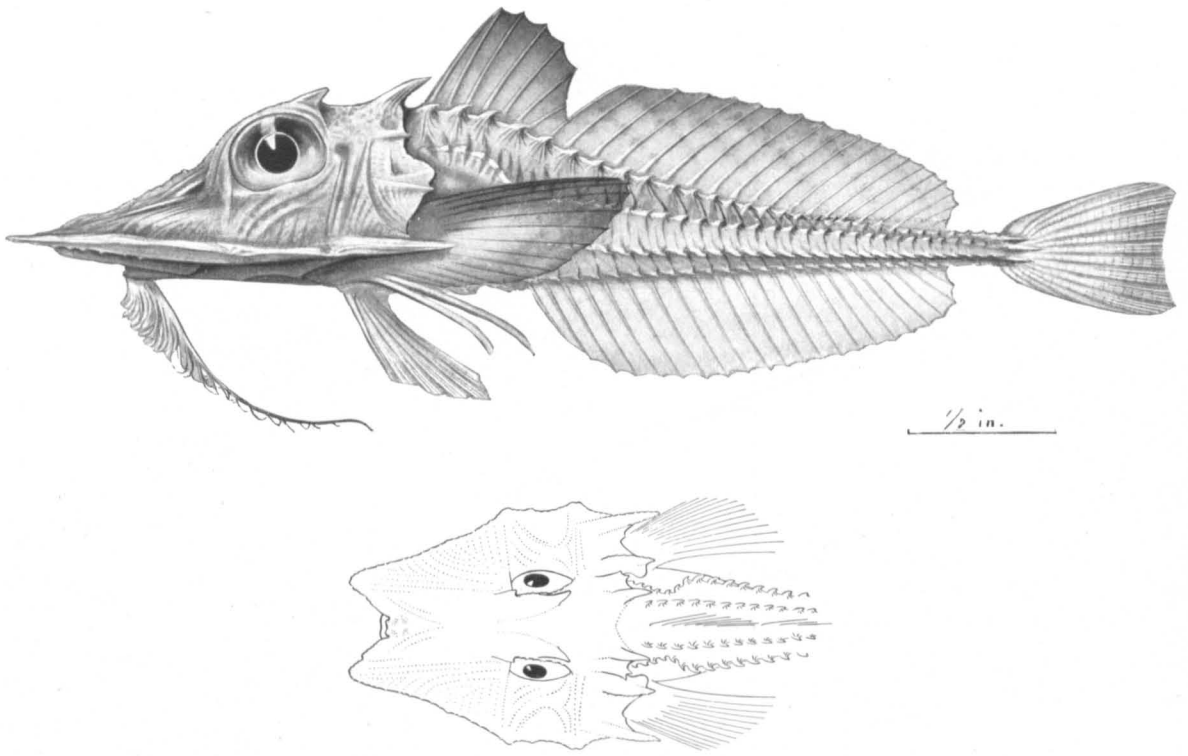


FIGS. 1, 2. NEOSCOPELUS ALCOCKI JORDAN & STARKS.

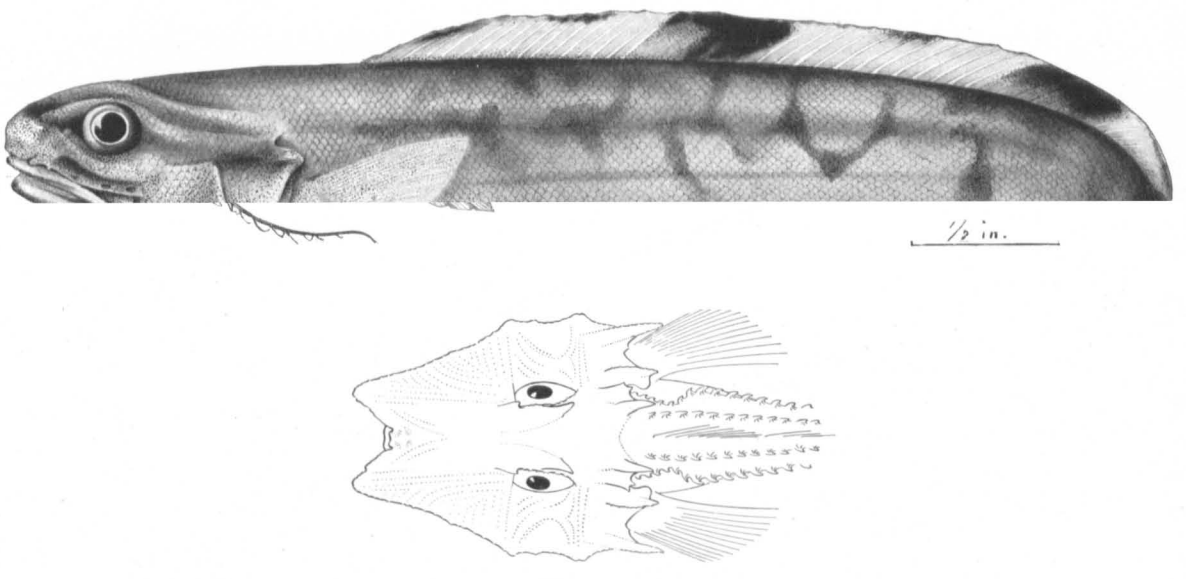


FIGS. 1, 2. NEOSCOPELUS ALCOCKI JORDAN & STARKS.





FIGS. 1, 2. PERISTEDION AMISCUS JORDAN & STARKS.



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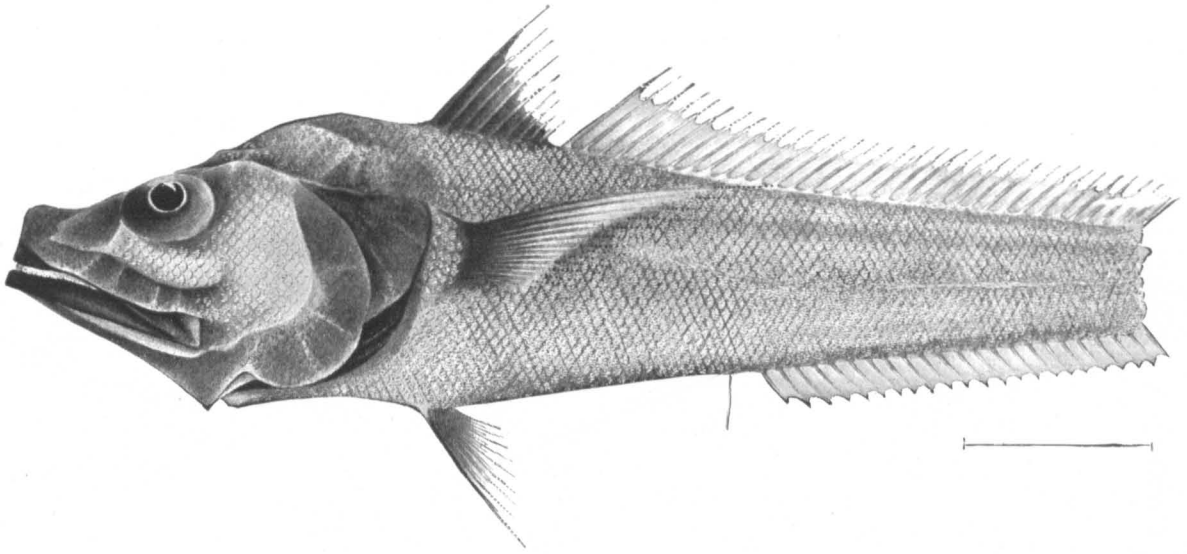
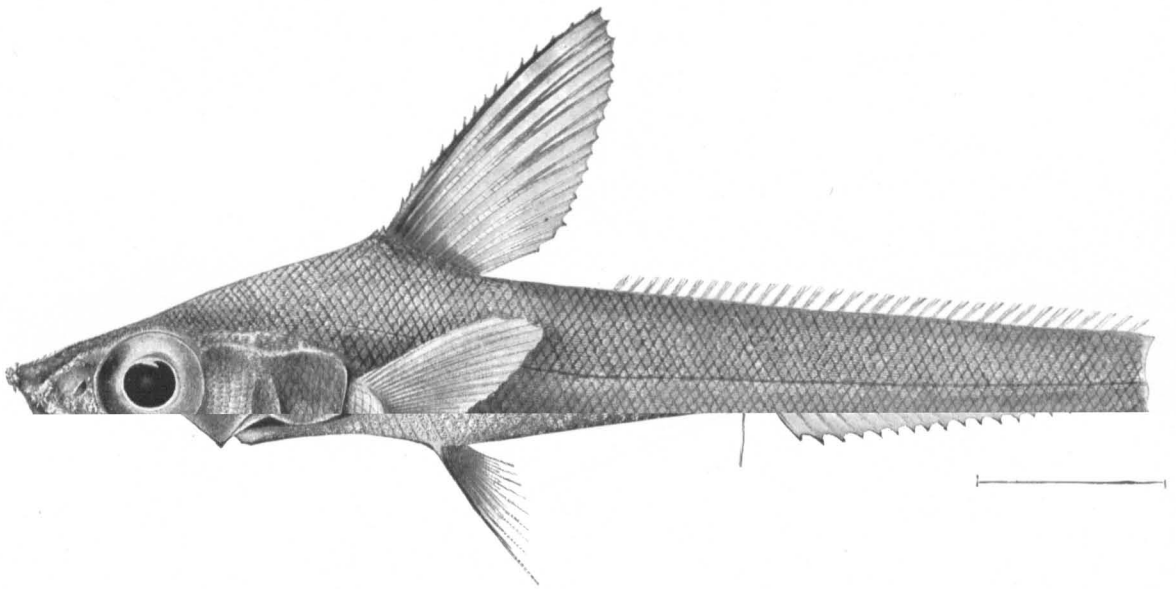


FIG. 1. MELANOBRANCHUS ANTRODES JORDAN & GILBERT.



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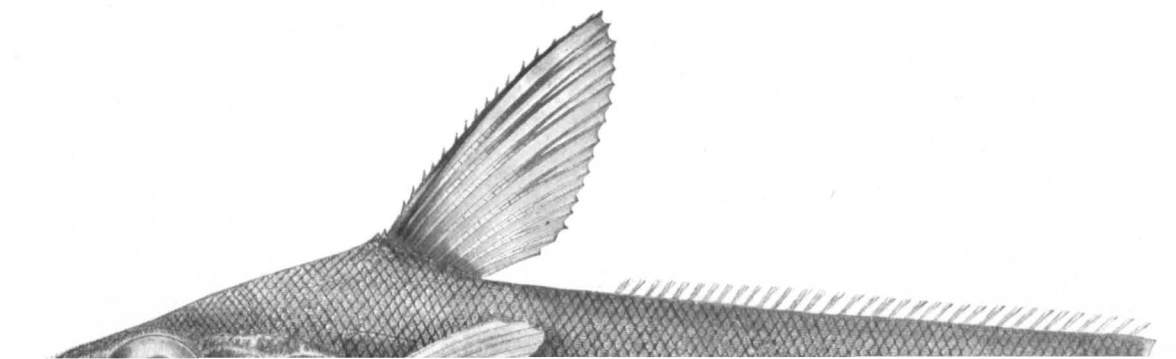


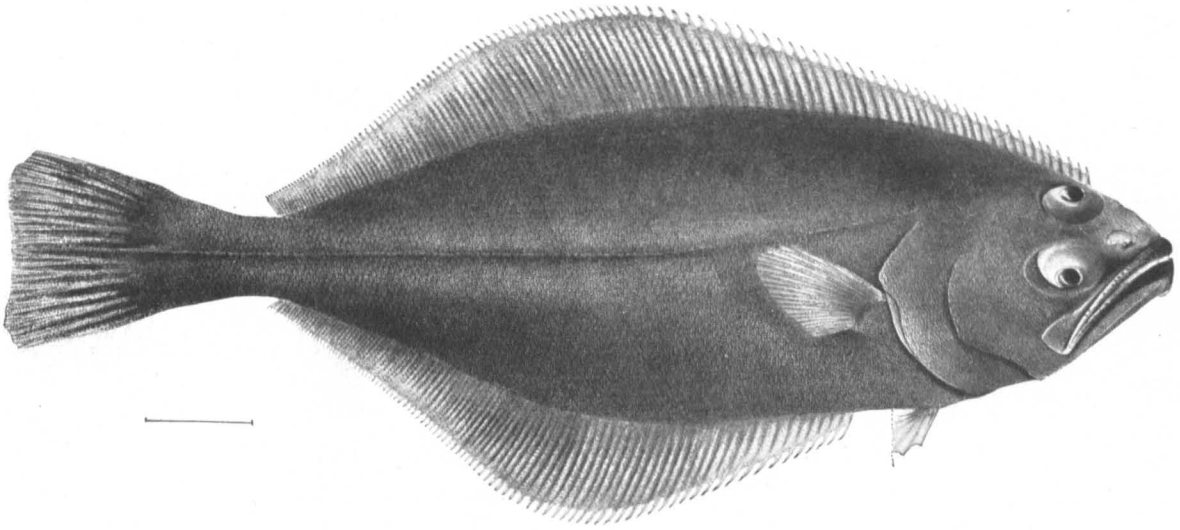


FIG. 1. ATHERESTHES EVERMANNI JORDAN & STARKS.

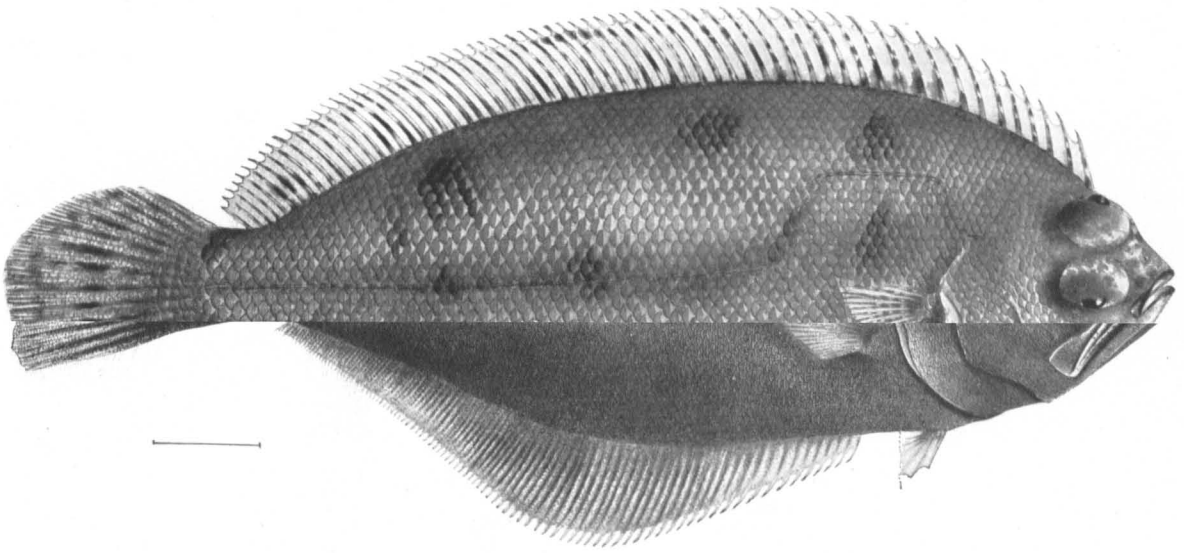
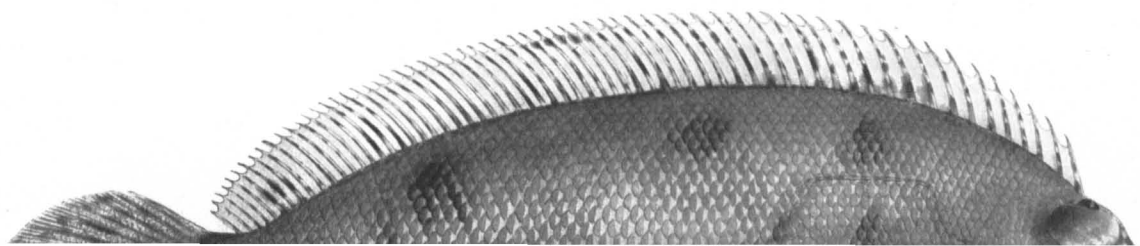


FIG. 1. ATHERESTHES EVERMANNI JORDAN & STARKS.



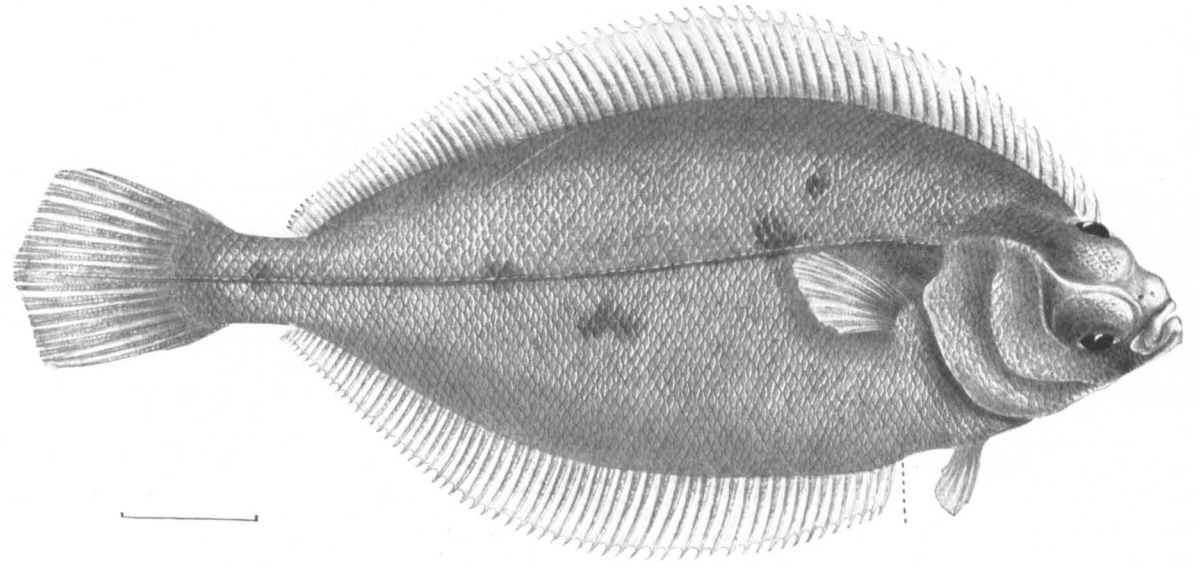


FIG. 1. DEXISTES RIKUZENIUS JORDAN & STARKS.

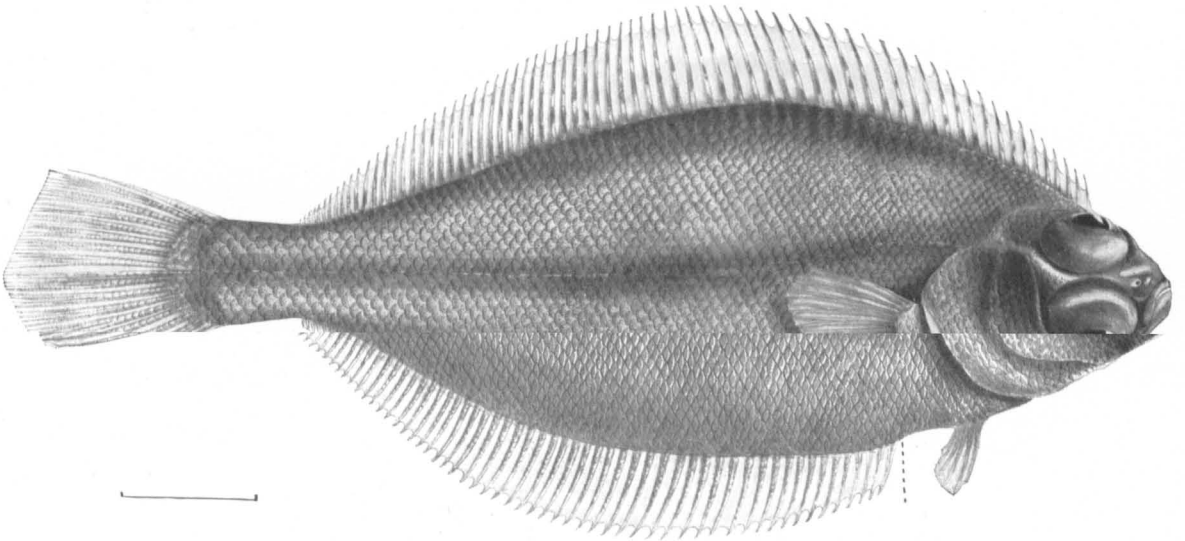
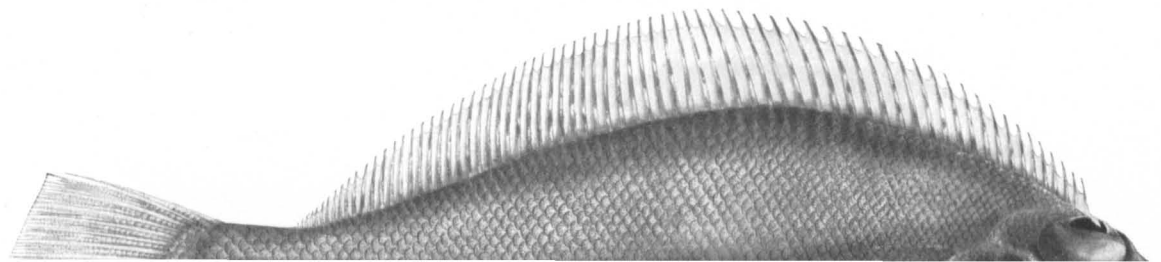


FIG. 1. DEXISTES RIKUZENIUS JORDAN & STARKS.



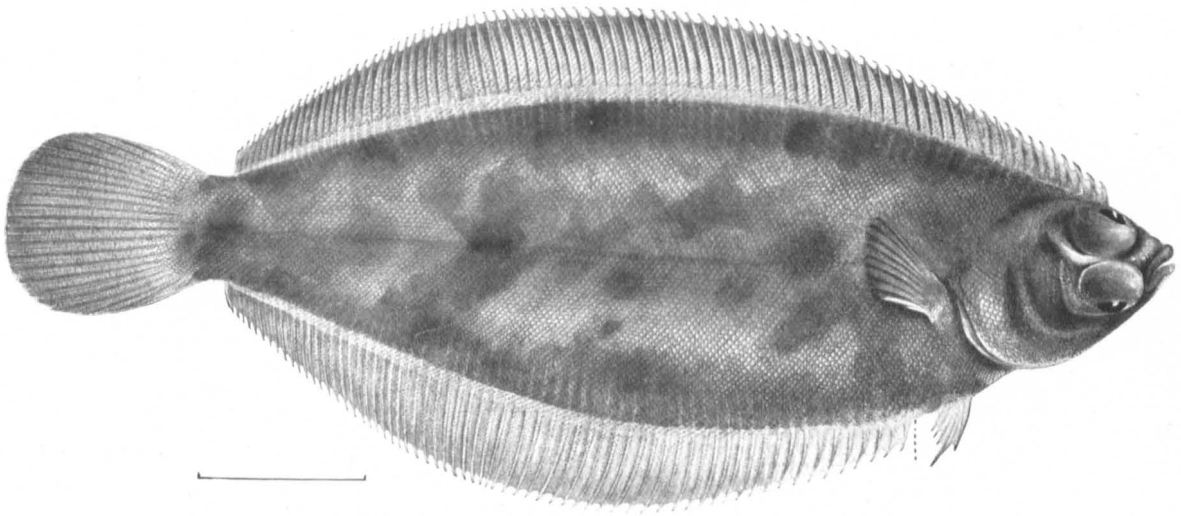


FIG. 1. VERÆGUA ACHNE JORDAN & STARKS.

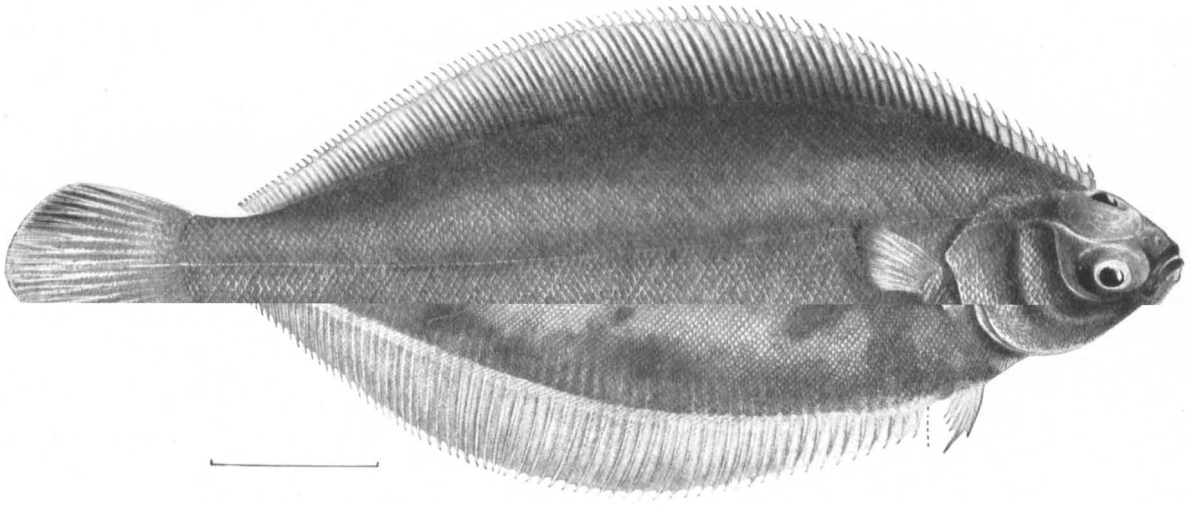
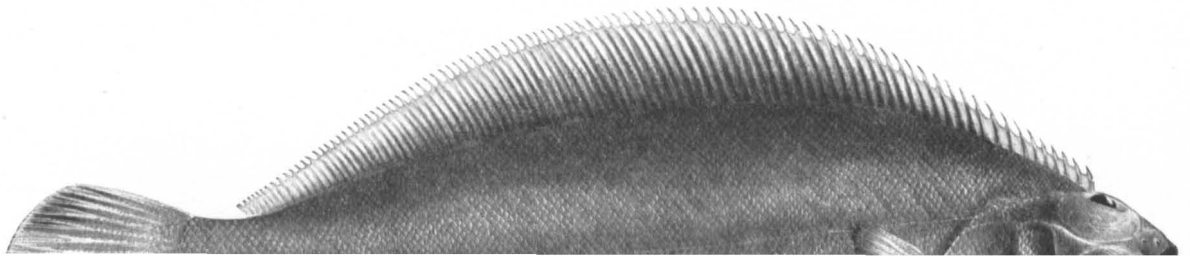


FIG. 1. VERÆGUA ACHNE JORDAN & STARKS.



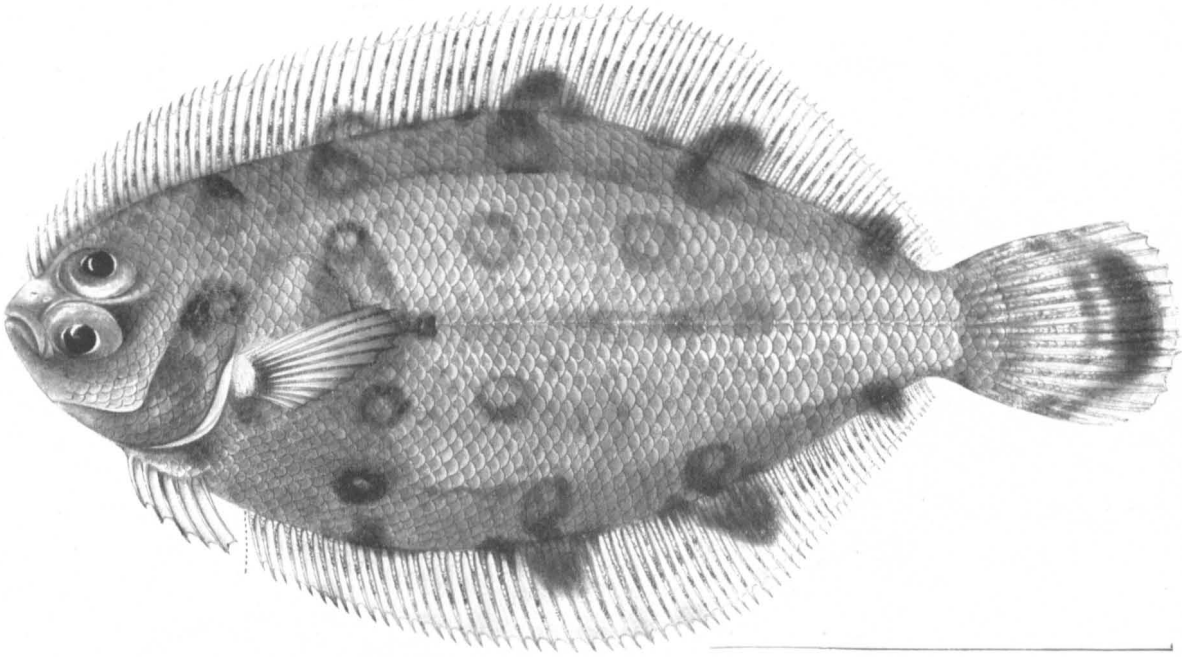


FIG. 1. ENGYPROSOPON IIJIMÆ JORDAN & STARKS.

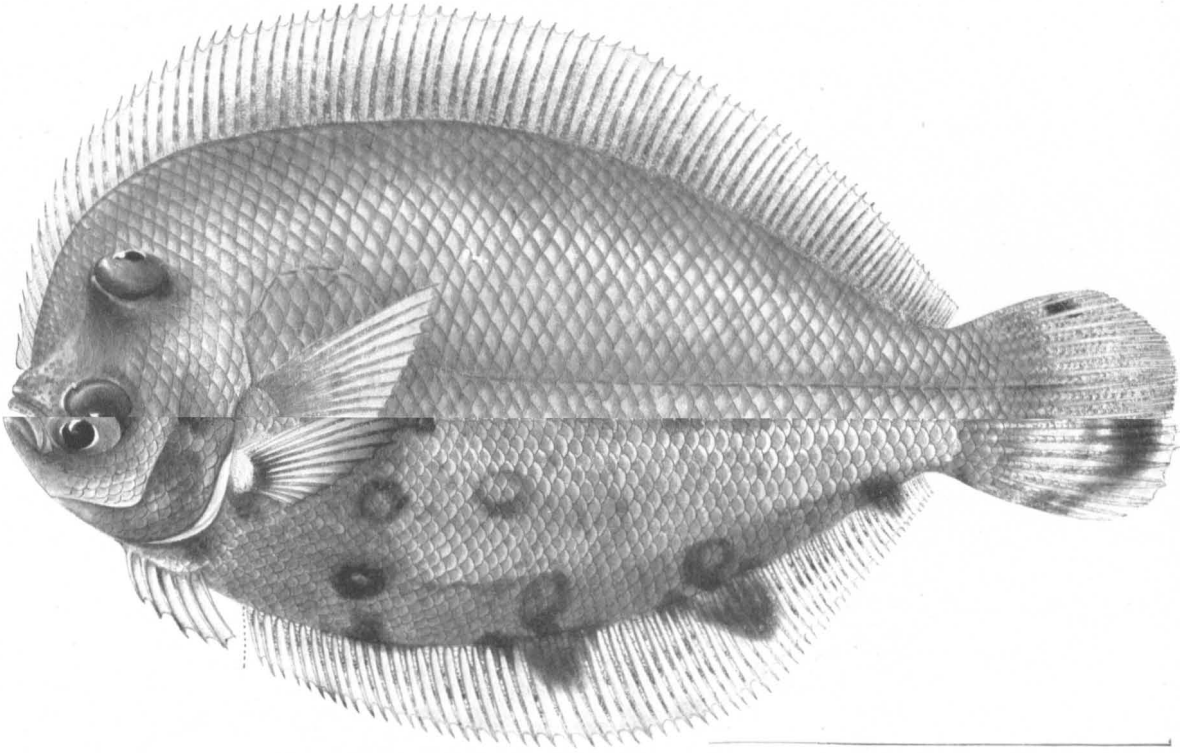


FIG. 1. ENGYPROSOPON IIJIMÆ JORDAN & STARKS.