
FISHES FROM BERING SEA AND KAMCHATKA



By Charles Henry Gilbert and Charles Victor Burke

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In the summer of 1906 the United States Fisheries steamer *Albatross* carried on investigations in the northwestern Pacific, especially in the vicinity of Japan. On the outward voyage the vessel passed along the Aleutian chain, touching at Unalaska, Atka, Agattu, and Attu Islands, visited Medni and Bering Islands of the Commander Group, and spent three days at Petropavlovsk, Kamchatka. Shore collecting was carried on in these localities, and some 37 hauls of intermediate net or dredge were made along the route, several of these hauls being highly successful. Rich ground, which would repay thorough investigation, was found on Petrel Bank (north and east of Semisopochnoi Island), in the vicinity of Attu and Agattu Islands, on the submerged plateau about the Commander Islands and on both coasts of Kamchatka. On the western coast of Kamchatka (latitude $51^{\circ}+$) lie valuable codfish banks to which American vessels resort. A detailed comparison of these banks with those in eastern Bering Sea is very highly desirable. The *Albatross* spent but two hours in this locality, at a time when conditions were not favorable for dredging.

The present paper deals with the fishes collected on the northern portion of the cruise as here outlined, and serves again to emphasize the bewildering richness of the northern Pacific in cottoid and liparid forms. Genera like *Triglops*, *Icelus*, *Artediellus*, and *Gymnocanthus*, which are represented in the north Atlantic by one, or at most two, species, contain in the northwestern Pacific numerous forms, some of which may be widely divergent. Such facts are usually accepted as conclusive evidence of the original home and the center of dispersal of the group thus richly represented.

On the basis of the hasty reconnoissance which the *Albatross* was able to make in passing, no sharply defined faunal lines are indicated in the region here considered. In passing from the eastern end of the Aleutian chain westward to Attu and Agattu only minor changes seem to occur. There is no perceptible break between the Aleutians and the Commander Group. The best defined division appears to coincide with the deep channel which separates the Commander Islands from Kamchatka. This is indicated by the failure of certain species to cross this barrier, and by the presence on the two sides of incipient species—representative forms which have only slightly diverged, as though under the influence of prolonged isolation.

The following forms are here described as new:

Archaulus, new genus (Cottidæ).	Careproctus mollis.
Archaulus biseriatus.	Careproctus candidus.
Icelus uncinialis.	Careproctus opisthotremus.
Icelus spatula.	Careproctus attenuatus.
Thyriscus, new genus (Cottidæ).	Careproctus furcellus.
Thyriscus anoplus.	Elassodiscus, new genus (Cyclogasteridæ).
Artediellus ochotensis.	Elassodiscus tremebundus.
Artediellus camchaticus.	Nectoliparis, new genus (Cyclogasteridæ).
Artediellus miacanthus.	Nectoliparis pelagicus.
Triglops metopias.	Acantholiparis, new genus (Cyclogasteridæ).
Stelgistrum beringianum.	Acantholiparis opercularis.
Hemilepidotus zapus.	Bathymaster cæruleofasciatus.
Myoxocephalus batrachoides.	Gymnoclinus, new genus (Blenniidæ).
Myoxocephalus parvulus.	Gymnoclinus cristulatus.
Gymnocanthus detrisus.	Alectridium aurantiacum.
Eurymen, new genus (Cottidæ).	Anoplarchus insignis.
Eurymen gyrinus.	Xiphistes versicolor.
Eumicrotremus phrynoides.	Lycodes camchaticus.
Cyclogaster (Neoliparis) micraspidophorus.	Chalinura spinulosa.
Cyclogaster beringianus.	Ateleobranchium, new genus (Macrouridæ).
Crystallichthys cyclospilus.	Ateleobranchium pterotum.
Careproctus bowersianus.	

CLUPEIDÆ.

Clupea pallasi Cuvier & Valenciennes.
Avatcha Bay, Kamchatka.

SALMONIDÆ.

Salvelinus malma (Walbaum).
Unalaska, Atka, Agattu, Attu, and Medni Islands, and in Avatcha Bay, Kamchatka.

Salvelinus kundscha (Pallas).
Avatcha Bay.

ARGENTINIDÆ.

Mallotus villosus (Müller).
Petropavlovsk.

Mesopus olidus (Pallas).
Petropavlovsk.

Leuroglossus stilbius Gilbert.
A small specimen taken in an intermediate net which descended to 300 fathoms, station 4767, Bowers Bank, Bering Sea.

MICROSTOMIDÆ.

Bathylagus borealis Gilbert.
One specimen from station 4767, Bowers Bank; depth intermediate, 300 fathoms. Length 1.2 inches.

Bathylagus milleri Jordan & Gilbert.
Two specimens from stations 4758 and 4759, west of the Queen Charlotte Islands; depth intermediate, 300 fathoms. Length, 37 and 51 mm.
These specimens differ from the description of *B. milleri* in the character of the interorbital ridge and the position of the dorsal fins.

Interorbital deeply grooved, with a faint median ridge which extends backward upon the occiput; occipital region slightly swollen, flat; length of snout about equal to diameter of pupil; fine teeth on lower jaw and vomer. Scales large, about 25 in number, judging from the scars. Dorsal inserted above ventrals; distance from origin of dorsal to adipose fin equal to distance from origin of dorsal to edge of preopercle; origin of dorsal nearer tip of snout than base of caudal by the diameter of the pupil. Anal long, its base $1\frac{1}{2}$ in head. Vent midway between posterior edge of opercle and base of caudal.

Head 3.6; depth 5.75. Dorsal 8; anal 27; pectoral 14; ventral 8. Eye 2.5 in head.

CHAULIODONTIDÆ.

Cyclothone microdon (Günther).

One specimen from station 4764, off Yunaska Island, Aleutian chain; depth 1,130 fathoms, but the specimen probably taken at intermediate depth. A careful revision of this group will probably result in a subdivision into a number of local forms.

Chauliodus macouni Bean.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4759.....	53	05	N.	138	31	W.	Fathoms. Int. 300
4781.....	52	14	30 N.	174	13	E.	Int. 300
4785.....	53	20	N.	170	33	E.	Int. 300
4793.....	54	48	N.	164	54	E.	Int. 300
4797.....	52	37	30 N.	158	50	E.	Int. 300

AMMODYTIDÆ.

Ammodytes personatus Girard.

Numerous specimens were taken at Unalaska.

GASTEROSTEIDÆ.

Gasterosteus cataphractus (Pallas).

Taken at Unalaska, Attu, and Bering Islands and in Avatcha Bay, Kamchatka.

Gasterosteus microcephalus Girard.

In a small stream on Attu Island were taken numerous examples of this species, which show no transition to *G. cataphractus*.

Pygosteus pungitius (Linnæus).

Taken at Bering Island and in Avatcha Bay, Kamchatka.

Of the 9 specimens collected at Bering Island, 5 have 10 spines in the dorsal, 4 have 11 spines. Forty-two specimens were collected in Avatcha Bay; of these, 4 have 9 spines in the dorsal, 28 have 10 spines, 9 have 11 spines, and 1 has 12 spines.

SCORPÆNIDÆ.

Sebastolobus alascanus Bean.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4781.....	52	14	30 N.	174	13	E.	482
4784.....	52	55	40 N.	173	26	E.	135

Vicinity of Attu Island.

Sebastodes alutus (Gilbert).

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4782.....	52	55	N.	173	27	E.	Fathoms. 57-59
4784.....	52	55	40 N.	173	26	E.	135
4789.....	54	49	45 N.	167	12	30 E.	56
4791.....	54	36	15 N.	166	58	15 E.	72-76

Vicinity of Attu Island; the Komandorski Plateau.

Sebastodes glaucus (Hilgendorf).

One specimen, 445 mm. long, was taken with hook and line in Preobrazhenskoi Bay, Medni Island.

Dorsal xiv-15; anal iii, 8. Lateral line with 52 tubes. Gill rakers 9+27, the longest three-fourths diameter of eye. Color in life pale brassy, darker on all the fins, especially the caudal; below white, the large ventral scales pearly, marbled and clouded with dusky; sides with 6 vertical bars, the anterior one above the pectoral; head with indistinct dusky bars radiating from eye; snout and chin blackish.

HEXAGRAMMIDÆ.

Hexagrammos octogrammus (Pallas).

Unalaska, Atka, Attu, Medni, and Bering Islands, and Avatcha Bay, Kamchatka.

Hexagrammos stelleri Tilesius.

Avatcha Bay, Kamchatka.

Hexagrammos superciliosus (Pallas).

Atka, Agattu, and Attu Islands.

COTTIDÆ.

Icelinus borealis Gilbert.

Stations 4777 and 4779, Petrel Bank; 4782 and 4784, near Attu Island, Bering Sea; depths 43 to 135 fathoms.

Icelinus (including *Tarandichthys*) differs from all other North American cottoids in having only two articulated rays in the ventral fins. In this respect it agrees with certain Japanese genera (*Silengis*, *Schmidtina*, *Daruma*, *Ricuzenius*), among which must be sought its nearest allies.

Astrolytes fenestralis (Jordan & Gilbert).

A single specimen from tide pools at Unalaska.

ARCHAULUS, new genus.

Head and body compressed. A series of spinous plates along the lateral line; a double series of plates along the base of the dorsals, widening anteriorly into a band and uniting with its fellow of the opposite side in front of the dorsal fin; head naked. Gill membranes united, free from the isthmus. No pore behind the last gill arch. Teeth on jaws, vomer, and palatines. Preopercle with four simple spines. Ventral fins with one spine and three rays.

Closely allied to *Archistes*, but with the dorsal row of plates double, the anterior widened portion filling entire space between base of dorsal and lateral line and continuous with its fellow across nape, which is entirely invested; and with four distinct preopercular spines.

Archaulus, Gilbert and Burke, new genus of Cottidæ; type *Archaulus biseriatus*, new species.

Archaulus biseriatus, new species. (Fig. 1.)

Type a male, 154 mm. long, from station 4778, Petrel Bank, Bering Sea; depth 43 fathoms.

Head 27 hundredths of total length to base of caudal; depth 27; length of snout 9.5; length of maxillary 9.5; diameter of orbit 7.1; interorbital width 4; least depth of caudal peduncle 7; greatest width of head 16.5; longest dorsal spine 20; length of dorsal base 71; length of anal base 47; length of

pectoral 32.5; length of ventral 14; length of caudal 21; chord of arch of lateral line 47. Dorsal ix, 28; anal 23; pectoral 16; ventral 1, 3. Plates in lateral line 47.

Head and body compressed, deeper than wide; head narrow above, the sides nearly vertical; supraocular rim much elevated, forming a narrow deep interocular groove; interorbital width 1.8 in orbit; occiput flattened, without spines or ridges; snout blunt, the anterior profile steep; mouth small, slightly oblique, the maxillary reaching vertical from front of orbit; jaws equal; teeth bluntly conic, in wide bands on the jaws, the vomer and the anterior half of the palatines; preopercle with 4 short simple spines; upper spine with strongly striate base, strong, sharp, directed backward and upward, straight or with a scarcely perceptible upward curve; second spine shorter, directed vertically downward; third and fourth spines concealed beneath the integument, directed downward and forward; nasal spines strong. A pair of large supraocular flaps, with narrowly fringed margins, their length equaling the distance between the middle of their bases; a pair of cleft flaps at middle of sides of occiput, and a similar pair more widely separated at the posterior edge of occiput; a delicate nasal filament, two filaments at anterior margin of preorbital, one near tip of maxillary, one on the suborbital stay, a divided filament near the angle of the opercle, a series along the edge of the preopercle, and a few scattered filaments on the plates of the lateral line; both nostrils in short tubes.

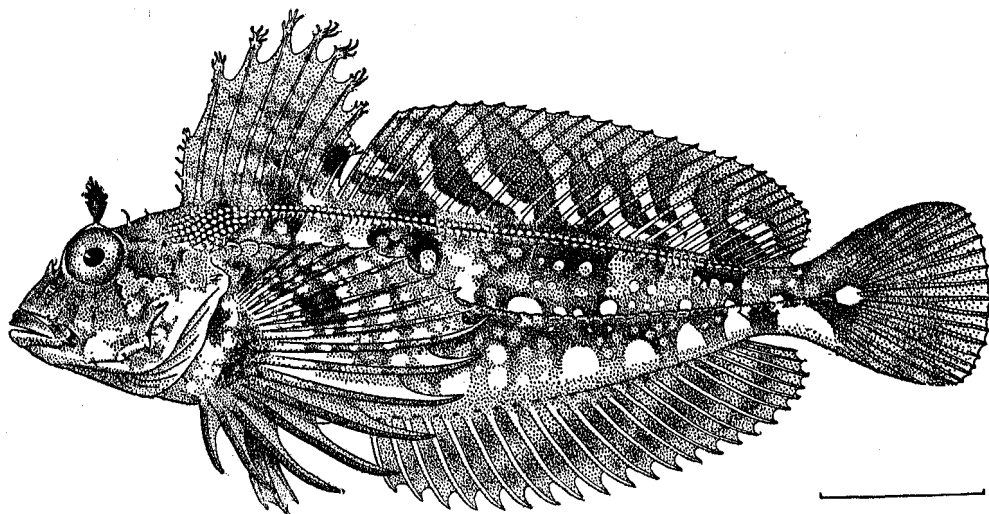


FIG. 1.—*Archaulus biserialatus*, new species. Type.

Anterior half of the lateral line forming a low flat-topped arch, which rises obliquely toward the head; plates along the lateral line 47, greatly diminishing in size posteriorly, but their upper edges free and finely spinous throughout the series; two rows of similar plates along base of dorsals, smaller but more strongly spinous than those of lateral line; the lower series contains 80 to 84 scales, counting forward to the head, and extends on back of caudal peduncle but not to base of fin; its scales are higher than long, attached at lower edge, the free margin sharply convex, the axis of scale directed upward and slightly backward; the upper series consists of much smaller rounded scales, the free spinous margin directed more posteriorly, but not downward as in *Icelinus*, the series ceasing under last rays of dorsal fin, the scales 84 to 88 in number, counting forward to head; these two rows of plates are closely apposed and form a narrow band which becomes abruptly widened under anterior part of spinous dorsal, where it covers the entire area between the spinous dorsal and the lateral line and extends around the front of the dorsal fin to join its fellow of the opposite side, and invests the entire width of the nape; a well-defined patch of small scales immediately behind the lower half of

pectorals, and above and behind it a band of larger scales filling the area subtended by the posterior half of the curved portion of the lateral line, all of these scales arranged in more or less definite series, those of the posterior band in regular rows extending obliquely downward and backward from the scales of the lateral line; body elsewhere naked; head naked; scattered pores on top of head, preopercle and preorbital; a series of 4 on mandible, the anterior near symphysis, but distinct from its fellow.

Dorsals narrowly joined at base, the last spine less than half the height of the first ray and about one-third the longest spine, the membrane joining first ray of second dorsal immediately above the base; dorsal spines slender and greatly elevated, with deeply incised membranes, the tips in both males and females provided each with a cleft membranous flap; third and fourth spines longest, 1.5 in head (in females 2.2); dorsal rays long and slender, the longest 1.6 in head; anal rays thickened, the membrane incised; pectoral reaching to below ninth dorsal ray, the rays all simple, the lower 8 thickened, their membranes deeply incised; ventrals reaching to front of anal, or in females little more than halfway to anal; caudal gently rounded; anal papilla long, reaching nearly to front of anal, the vent immediately behind the base of the ventral fins.

Color in life: Light olive above, tinged with salmon or pinkish; five or six crossbars downward from back, somewhat irregular in size and shape, but usually narrowest at dorsal base, widening downward to become confluent with their fellows, and then more or less broken and interrupted to form marblings along the sides of the body; the first dark bar is under the spinous dorsal, the remainder under the soft dorsal; the darker area comes frequently to bound roundish spots of the ground color along dorsal outline, these spots extending less than half way to lateral line; dark bars most intense immediately below the dorsal band of plates; both dark and light areas above lateral line marked with light blue spots and streaks of various shapes and sizes, some of these at times forming a line separating the dark and light crossbars on back; below lateral line are about 7 narrow vertical streaks of brownish or yellowish brown, which narrow downward and reach almost to base of anal; they are very irregular in size, number, and position, and may inclose round spots of light blue; under side of breast and belly white; a dark bar vertically downward from eye and a number of narrower radiating streaks of light blue bordered with darker; a dark blotch on the membranes between the last two dorsal spines, wanting in females; spinous dorsal translucent, the distal portions of spines yellowish or brownish, the fin with many bright carmine spots or streaks; soft dorsal with 9 broad oblique bars of brownish yellow or brownish green with light blue intervals; anal fin dusky or bluish at base, becoming light yellow toward margin; caudal with orange crossbars becoming light yellow toward tips of rays; ventrals whitish in females, blue-black in males; pectoral with a wide pinkish or orange blotch on basal portion of upper half or two-thirds of fin; in males, the lower thickened rays are largely dark blue, the distal portion of upper ray with two or more irregular cross series of brown spots; in the largest male (the type of the species), the lower pectoral rays, the ventral, the anal, and the lower part of the caudal fin very dark, almost black.

Specimens were taken at stations 4777, 4778, and 4779, on Petrel Bank, Bering Sea, at depths of 43 to 54 fathoms.

In 10 specimens, including the type, 5 have dorsal IX, 28, anal 22; 2 have dorsal IX, 28, anal 23; 2 have dorsal IX, 29, anal 23; 1 has dorsal X, 28, anal 23. All have 16 rays in the pectoral fin.

Rastrinus scutiger (Bean).

Taken at stations 4784, off Attu Island, 135 fathoms, and 4790, off Bering Island, 64 fathoms.

In well-preserved specimens it can be seen that delicate folds of the integument pass downward from the posterior margins of the plates of lateral line, and usually disappear among the scales; a few may reach the belly and join their fellows on the median line, and a few others may reach base of anal fin.

In our material the head is 25 to 27 hundredths of the length, the snout 8 to 9, and the orbit 11 to 12 hundredths. The proportions are the same in material previously reported on (Gilbert, Report U. S. Fish Commission, 1893, p. 415) from station 3339, south of the Alaskan Peninsula. In the type the eye is said to be twice as long as snout and two-fifths the length of the head.

The intromittent organ in the male is slender, gently tapering, and ending in a slender curved point. In typical *Icelus* (*bicornis* and *spiniger*) the intromittent organ becomes widened and bilobed distally, and the short terminal cirrus springs from the dorsal side.

Icelus spiniger Gilbert.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4777.....	52	11	N.	179	49	E.	43-52
4784.....	52	55	40 N.	173	26	E.	135
4786.....	54	51	30 N.	167	14	E.	54
4787.....	54	50	50 N.	167	13	30 E.	54-57
4788.....	55	50	24 N.	167	13	E.	56-57
4789.....	54	49	45 N.	167	12	30 E.	56
4791.....	54	36	15 N.	166	58	15 E.	72-76
4792.....	54	36	15 N.	166	57	15 E.	72

These localities are from Petrel Bank, Bering Sea, to the extensive plateau from which arise the Commander Islands.

The following table exhibits range of variation in fin rays in 25 specimens from all the above localities:

	Spinous dorsal.			Soft dorsal.			Anal.		
	VIII	IX	X	19	20	21	16	17	18
Fin rays.....									
Number of specimens.....	2	21	2	3	10	12	6	15	4

Icelus uncinalis, new species. (Fig. 2 and 2a.)

Type, a male, 97 mm. long, from station 4784, near Attu Island; depth, 135 fathoms.

Measurements in hundredths of length without caudal: Head 38; snout 11.5; orbit 11.8; interorbital width 2.2; width of head 19; depth at occiput 24; maxillary 18; greatest depth 26; depth of caudal peduncle 5; longest dorsal spine 14; longest dorsal ray 15; caudal 22; pectoral 32; ventral 18; anal papilla 13.

Dorsal 19-19; anal 16; pectoral 18. 41 plates in the lateral line; 35 plates in the dorsal series.

The following table gives range in fin rays among the 12 specimens of *uncinialis* which were obtained:

	First dorsal.		Second dorsal.			Anal.			Pectoral.	
	IX	18	19	20	14	15	16	17	18	
Fin rays.....										
Number of specimens.....	12	2	6	4	2	7	3	7	17	

Head and body robust, compressed, cheeks vertical; interorbital width less than diameter of pupil, shallowly concave; occiput depressed well below the raised interocular region, bounded on each side by a low ridge which bears 2 tubercles, each terminating in a short sharp spine; nasal spines short and sharp; numerous minute scattered pores on top and sides of head; a pair of supraocular tentacles widening upward from a narrow base, the margin multifid; nasal tubes short, the anterior the longer; mouth large, slightly oblique, the mandible included, the maxillary reaching vertical a little behind middle of pupil; teeth minutely villiform, in broad bands in jaws and narrower patches on vomer and palatines; gill membranes wholly free; no pore or slit behind last gill arch.

Dorsals wholly separate, the interspace between base of last spine and origin of second dorsal equaling two-fifths diameter of orbit; origin of anal under third dorsal ray, the last anal ray under the third from the last of the dorsal; caudal truncate or gently rounded; pectoral rays all simple, some of the uppermost of the thickened rays the longest in the fin, extending to base of fourth anal ray; ventrals reaching base of anal papilla.

Anal papilla very large, of nearly uniform width from base to apex, provided at the abruptly rounded tip with a short curved uncinatè process which springs from the posterior (dorsal) side and

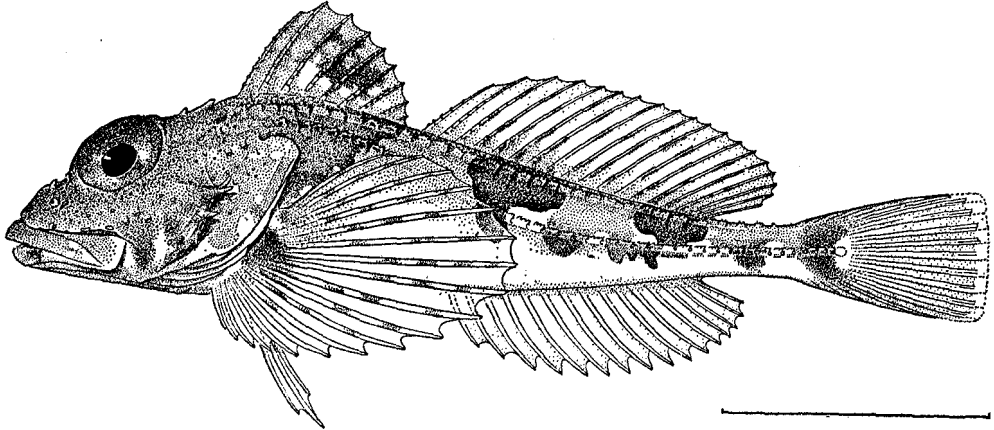
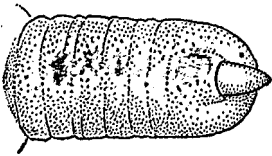


FIG. 2.—*Icelus uncinalis*, new species. Type.

extends a very short distance beyond the tip of the basal portion. This is strikingly different from the shape in the Atlantic *Icelus bicornis*, in which the basal segment is comparatively short and is terminated by a long, gently tapering process, about as long as the basal portion, from the summit of which it springs.

Top and sides of head covered more or less completely with very fine prickles; a band of similar prickles along back, just dorsad of the series of spinous plates; plates of the lateral line with the upper posterior margin free and spinous, some of the middle spines often produced, dividing the margin of the plate into an upper horizontal and a posterior vertical portion; plates of dorsal series similar but usually larger, the spinous margin more rounded; a few spinous scales behind upper part of pectoral, distant from one another, but arranged rather definitely in series running downward and backward; lateral line always complete; dorsal series of scales commonly terminating on middle of back of caudal peduncle.



$\frac{1}{4}$ in.

FIG. 2a.—*Icelus uncinalis*, anal papilla, posterior view.

Color in spirits: Olive-gray, with four well-defined dark bars on back, little or not at all broken up by lighter lines, and preserving a characteristic form; anterior bar springing from posterior half of base of spinous dorsal running downward and forward to gill slit above base of pectoral, its anterior margin less sharply defined than the posterior margin; second bar under fifth to ninth rays of second dorsal, the anterior margin nearly vertical, the posterior passing downward and forward usually with a double curve, the bar terminating in a narrow V-shaped process below lateral line; third bar under last 5 or 6 dorsal rays, forming a short sharply defined saddle-shaped blotch which usually fails to reach the lateral line; fourth bar on base of tail, not appearing either above or below on caudal peduncle; there may be fainter dusky marks between the bars and sometimes a series of irregular dark spots or blotches below the lateral line; top and sides of head somewhat darker than the trunk,

in strongly marked individuals a faint dark bar on occiput with a light spot anteriorly at the center of the occipital depression; a faint dark bar from eye forward across preorbital and both lips, a second from eye downward across cheeks; spinous dorsal with a narrow black bar confined largely to one or two spines, running upward from the front of the dark dorsal bar; soft dorsal, caudal, and upper pectoral rays faintly barred, a dark blotch at base of middle pectoral rays; under parts white, the ventrals and anal unmarked.

This species is closely related to *Icelus bicornis* from the Atlantic, but differs widely in the form of the anal papilla; the lateral line presents always a continuous and complete series of plates to the base of the caudal fin, whereas in *bicornis* the plates are usually interrupted on caudal peduncle; the space between the lateral line and the dorsal series of scutes is naked, without plates or prickles in *uncinalis*, and a series of plates is never present immediately above base of anal fin.

Icelus uncinialis has not been obtained by previous expeditions, and its occurrence is known only from Petrel Bank, Bering Sea, to the vicinity of the Commander Islands. In eastern Bering Sea it is replaced by an undescribed species which heretofore has been identified doubtfully with *Icelus bicornis*, a species which extends its range southward at least to the coast of Oregon. To the eastward, along the coast of Kamchatka, *Icelus uncinialis* is replaced by another closely allied species, *Icelus spatula*.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth. Fathoms.
	°	'	"	°	'	"	
4777.....	52	11	N.	179	49	E.	43-52
4779.....	52	11	N.	179	57	W.	54-56
4784.....	52	55	40 N.	173	26	E.	135
4790.....	54	38	45 N.	167	11	45 E.	64
4791.....	54	36	15 N.	166	58	15 E.	72-76
4792.....	54	36	15 N.	166	57	15 E.	72

Icelus spatula, new species. (Fig. 3 and 3a.)

Type, a male specimen, 69 mm. long, from station 4794, off Avatcha Bay, Kamchatka; depth 58 fathoms.

Measurements in hundredths of length without caudal: Head 37.5; snout 10.5; orbit 12; interorbital width 3; width of head 19; depth at occiput 22; maxillary 18; greatest depth 25; depth of caudal peduncle 4.2; longest dorsal spine 11; longest dorsal ray 16; caudal 22; pectoral 30; ventral 18; anal papilla 13.

Dorsal 1x-20; anal 16; pectoral 18. Plates in lateral line 41; plates in dorsal series 32.

The following table gives range in fin rays among 12 cotypes of this species:

	First dorsal.		Second dorsal.		Anal.		Pectoral.	
	IX	20	21	15	16	17	18	
Fin rays.....	IX	20	21	15	16	17	18	
Number of specimens.....	12	9	3	2	10	9	15	

Occipital crests and spines higher, the occipital depression deeper than in other species of the *bicornis* group, this being markedly so in comparison with *Icelus uncinialis*, to which it stands most nearly related. A simple slender filament on the summit of each of the anterior occipital tubercles; a longer simple slender supraocular filament, which like the preceding is readily detached and often wanting; no other filaments present. Nasal spines pungent; preopercular spines much larger and stronger than in *uncinalis*, the upper deeply cleft, the second long and slender, directed backward,

the third and fourth shorter and more robust, directed downward and forward; the upper two preopercular spines reaching to or almost to edge of opercle; numerous small pores scattered on top and sides of head; pair of symphyseal pores directed mesad, opening separately into a common pit or depression which lies between them; gill membranes wholly free from isthmus; no pore behind last gill arch; mandible well included; broad bands of minute villiform teeth in both jaws, very narrow bands on vomer and palatines; maxillary reaching vertical from middle of eye. Preorbital narrowed posteriorly through the upcurving of the lower margin, narrower than in *Icelus uncinalis*.

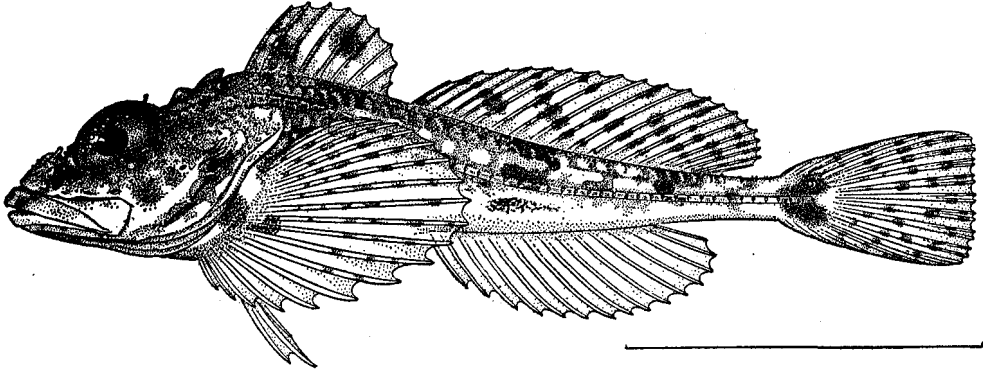


FIG. 3.—*Icelus spatula*, new species. Type.

Dorsal series of plates usually incomplete anteriorly, greatly diminished in size or disappearing under the anterior half of spinous dorsal; it is variable in extent posteriorly, but typically reaches middle of caudal peduncle; a well-defined band of prickles accompanies the dorsal series of plates, leaving a naked strip along base of the dorsal fins; lateral line always complete, the area between it and the dorsal series of plates naked, without prickles or scattered plates; a few large spinous plates behind the pectoral fin; top and sides of head, as far down as preorbital and suborbital stay, covered with minute prickles, which are a trifle coarser and less numerous than in *Icelus uncinalis*.

Dorsal fins separated; spinous dorsal low, not elevated in males, much lower than second dorsal; caudal emarginate when folded, truncate or gently rounded when spread; pectoral reaching base of fourth anal ray; ventrals reaching vent. The dorsal spines and a few of the anterior dorsal rays are accompanied by series of small prickles.

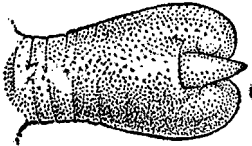


FIG. 3a.—*Icelus spatula*, anal papilla, posterior view.

Color in spirits: Less definitely marked than *Icelus uncinalis*, the dorsal bands usually less evident, more broken up by longitudinal wavy lines of the ground color, the effect being often of fine mottlings or reticulations of light and dark, in which the four bars are faintly discernible; usually two narrow dark blotches on spinous dorsal, the soft dorsal and caudal being barred; anal and ventrals unmarked; pectoral with a small dark blotch at base of median rays, the distal and upper parts of fin rather faintly barred; head mottled like the back, with a dark bar before and one below the eye.

The species is most closely related to *Icelus uncinalis*, from which it seems geographically to be separated by the deep channel between Kamchatka and the Commander Islands. In addition to the difference in coloration, the higher occipital crests, the larger preopercular spines, and the slightly increased number of rays in second dorsal and anal, the species is distinguished by the form of the anal papilla in the male. This is distinctly spatular in shape, widening from base to the end of the basal segment, which is broad, rounded at tip and emarginate on the middle line, the terminal segment being extremely short, curved like a claw, springing from the dorsal (posterior) side of the basal portion and not extending beyond it.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth. Fathoms.
	°	'	"	°	'	"	
4794.....	52	47	20 N.	158	44	30 E.	58-69
4795.....	52	46	50 N.	158	44	30 E.	48-69
4796.....	52	47	N.	158	43	E.	48

THYRISCUS, new genus (Cottidæ).

Head and body rather deep, compressed; lateral line with a series of plates which have their upper posterior border free and serrate; an axillary patch of spinous scales; skin otherwise smooth and naked. Gill membranes broadly united, wholly free from the isthmus; a short slit behind last gill; top of head without spines or tubercles; preopercle with 4 small simple acute spines. Teeth on jaws and on vomer and palatines. Ventrals 1, 3.

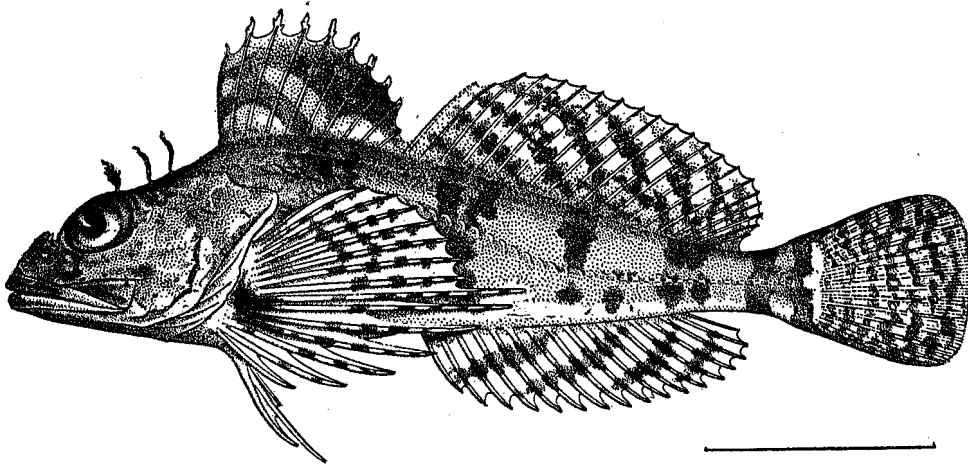


FIG. 4.—*Thyrisicus anoplus*, new species. Type.

Nearest *Icelus*, but differing widely in the absence of the dorsal series of plates, the presence of a slit behind the last gill-arch, and the greatly specialized lower pectoral rays.

Type *Thyrisicus anoplus*, new species.

Thyrisicus anoplus, new species. (Fig. 4.)

Type, a female, 109 mm. long, from station 4782, off Attu Island, Bering Sea; depth, 57 fathoms.

Measurements in hundredths of length without caudal: Head 37; diameter of orbit 10.5; interorbital width 2.3; snout 10.5; maxillary 19.5; width of head 17; depth at occiput 21; greatest depth 26; depth of caudal peduncle 7; length of curved part of lateral line 39; of straight part (to base of caudal) 35; longest dorsal spine 14; longest dorsal ray 19; length of caudal 24; length of upper part of pectoral 25; longest pectoral ray 37; ventrals 19.

Dorsal x-21; anal 17; pectorals 15. Plates along lateral line 42.

Body compressed, especially along base of spinous dorsal; head deeper than wide; interorbital space narrow, flat, with a low median ridge; occiput slightly concave but without distinct ridges or tubercles; no spines or tubercles on supraocular rim; nasal spines small, slender, and pungent, a deep cross-groove behind them; posterior nostril tube very low, anterior tube much longer. Mouth large, horizontal, the maxillary broad, reaching vertical from posterior rim of orbit; lower jaw included, the symphysis slightly produced; teeth minute, in broad bands on the jaws; vomer with an irregular single series; palatine teeth in a short narrow lenticular patch. Preopercular spines very short, slender, acute,

the upper scarcely longer than the others, less than half diameter of pupil, directed almost vertically upward; the second spine is directed backward, the third downward, the fourth downward and forward. A broad supraorbital flap with the outer margin fringed; behind this on occiput two long slender filaments, one at posterior edge of occiput, the other in advance; the occipital filaments of the right side are both lacking in the type; a minute filament near end of maxillary and one near opercular tip. Top and sides of head with rather numerous pores, some of which are distributed around the margins of wide outpushings of the sensory canals.

Lateral line with its anterior portion in a wide ascending curve, the middle of which is slightly depressed; the curved portion is a little longer than the straight part, which begins under middle of soft dorsal and runs thence along middle of sides. Plates of lateral line small, those anteriorly larger than the others; the upper posterior margin free and very minutely serrulate; lateral line opening by a single pore under the posterior margin of each plate and directed upward and backward; numerous scattered spinous scales behind the pectorals, the patch extending back below the middle of the curve of the lateral line. Skin otherwise smooth.

Dorsals joined at base, the first dorsal of very slender weak spines; caudal fin slightly rounded; pectoral rays all simple, the lower thickened rays produced and exerted, the longest (upper) of these produced well beyond the rest of the fin and reaching the base of the seventh anal ray. Ventrals very slender, composed of 1 spine and 3 very delicate rays, the inner much shortened.

Color in spirits: Light olive-brown above, light below, the head much darker than the body; back with five darker brown bars, all but the second narrow, the first under middle of spinous dorsal, ceasing at the lateral line, the second a wide double bar under front of soft dorsal, extending to below middle of sides, the third and fourth under middle and end of soft dorsal, and the fifth posteriorly on caudal peduncle, where it joins a bar across base of tail; a series of irregular more or less united brown spots below lateral line, some of which may be connected with the bars; spinous dorsal dusky, with two small pale areas at base and a black blotch in front and behind; soft dorsal and caudal with fine brown crossbars which are oblique on the dorsal; anal with five broad oblique bars of blackish brown; distal portion of pectoral with fine brown crossbars, the basal part white, traversed by a broad brown streak, which extends downward and backward from the middle of base; ventrals unmarked; a dark streak running forward across lips from front of eye.

Only the type known.

Artediellus ochotensis, new species. (Fig. 5.)

Type, a male specimen, 94 mm. long, from station 4798, off the west coast of Kamchatka (latitude $51^{\circ} 37' N.$); depth 25 fathoms.

Most nearly allied to *Artediellus pacificus*, from which it differs in color, in the simple maxillary barbel, the distinctly separate anterior pair of mandibular pores, the slightly longer dorsals and anal, the less numerous pectoral rays and the more numerous pores in the lateral line.

Measurements in hundredths of length without caudal: Length of head 39.7; length of snout 11; length of maxillary 18; diameter of orbit 9.5; interorbital width 2; greatest width of head 29; greatest depth of body 22; least depth of caudal peduncle 7; distance from tip of snout to hinder edge of gill membrane on median line 23; length of base of dorsal fin 55; of anal fin 33; longest pectoral ray 33; longest ventral ray 19; longest caudal ray 28.

Dorsal VIII-14; anal 12; pectoral 22 (9 forked); caudal with 17 rays, 9 of which are forked. Lateral line with 29 pores, including the pore at point of attachment of opercular membrane.

In 8 specimens, comprising 6 cotypes from the type locality (station 4798) and 2 specimens from station 3647 (near Robben Island, Okhotsk Sea), the pores and fin rays are as follows:

	Dorsal spines.		Dorsal rays.		Anal rays.		Pectoral rays.			Pores in lateral line.					
	VII	VIII	13	14	12	13	21	22	23	28	29	30	31	32	33
Fin rays and pores.....															
Number of specimens.....	1	7	2	6	1	7	3	11	2	1	2	7	5	0	1

Mouth more oblique than in *Artediellus pacificus*, the maxillary scarcely reaching vertical from middle of pupil. Teeth as in other species, the outer series in the upper jaw and the inner series in the lower jaw slightly enlarged; a single series on front of vomer, and a small elliptical patch on front of palatines. Upper and lower preopercular spines developed as usual, the upper comparatively small, sharply curved, its tip usually a little below level of upper end of pectoral base; in a young specimen, 43 mm. long, a well-marked denticle is present on the inner margin of the curve; in older specimens, traces of a denticle may persist, or it may entirely disappear; the lower preopercular spine is short, directed downward and forward; between the two spines are 2 small rounded prominences, the upper of which is directly below base of upper spine. Nasal spine present, but minute, less developed than in *pacificus*. Occiput depressed, without trace of ridges or prominences. Anterior nasal tubes long, the posterior short or obsolete. Filaments all simple, unusually well developed and numerous; supraocular pair largest; a series of short filaments or papillæ along upper edge of pupil, with occasional scattered ones on upper part of eyeball; a single pair on occiput, 1 to 3 along anterior border of preorbital, usually 2 long filaments on cheeks in front of base of preopercular spine, 1 to 3 short ones on middle of cheeks, a long one on opercle, and several forming a series above anterior portion of lateral line. Pores on mandible and preorbital large, the anterior mandibular pores facing each other but well separated and distinct. A pair of pores on anterior part of interorbital space, a

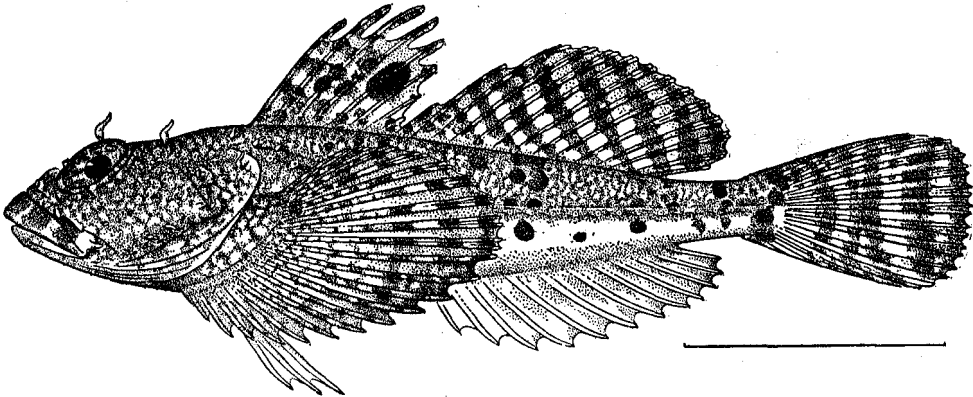


FIG. 5.—*Artediellus ochotensis*, new species. Type.

median pore usually on middle of interorbital space, and a transverse row of 3 just behind orbits. Anterior pores of lateral line frequently accompanied each by 3 small imperforate papillæ, 1 below the canal and immediately in advance of the pore, the other 2 above the canal and opposite the pore and the lower papilla; although imperforate, the papillæ may be cupped at the apex and are doubtless obsolete pores. Gill membranes with a free fold, the width of which varies; in the type, the fold is very narrow, less than half the diameter of the pupil.

In males the dorsal fins are contiguous and may even be slightly joined at base, but they are well separated in females; spinous dorsal in males moderately elevated, the first 4 spines with membranes incised one-third their height; ventrals unusually long, reaching nearly to vent in both sexes; the upper 8 or 9 pectoral rays forked and longer than the succeeding rays.

Lateral pores very small, in a series along lower margin of the main canal, which opens by a large pore at base of caudal.

Colors in life: Top of head and dorsal region finely vermiculated with light reddish brown; small round dark spots frequently are grouped to outline a bar under spinous dorsal, a second under soft dorsal and a third on caudal peduncle; below lateral line, an irregular series of larger round dark reddish spots; dorsal and caudal coarsely barred with dark reddish brown, the bars breaking up below and merging in the general dusky coloration of that portion of the fin; in females, the pectorals are

crossed by very narrow bars formed by series of small dark spots on the rays; usually a small dark blotch on upper part of base and a larger one below; ventrals dusky in males, white in females; in males, the anal is bright chrome-yellow, without bars.

The species is represented in the present collection by the type and 6 cotypes from the Okhotsk Sea, to the westward of Kamchatka. It had been taken previously by the *Albatross* in 1896 off Robben Island in the Okhotsk Sea, and had been confused with *Artdiellus pacificus* (Jordan and Gilbert, The Fishes of Bering Sea, Report Fur-Seal Investigations, pt. 3, 1899; stations 3647 and 3648, depth 40 fathoms).

***Artdiellus camchaticus*, new species. (Fig. 6.)**

Type, a male specimen, 117 mm. long, from station 4795, off the east coast of Kamchatka (latitude $52^{\circ} 46' 50''$ N.); depth 48 to 69 fathoms.

Larger than any species of *Artdiellus* heretofore known, with developed nasal spine, the mandibular pores of the symphyseal pair distinct, the maxillary barbel simple, all other cephalic filaments reduced or obsolete, the anal fin without crossbars, and the pores of the lateral line very numerous.

Measurements in hundredths of length to base of caudal: Length of head 34.5; length of snout 10.5; length of maxillary 14; diameter of orbit 9; interorbital width 2; greatest width of head 27;

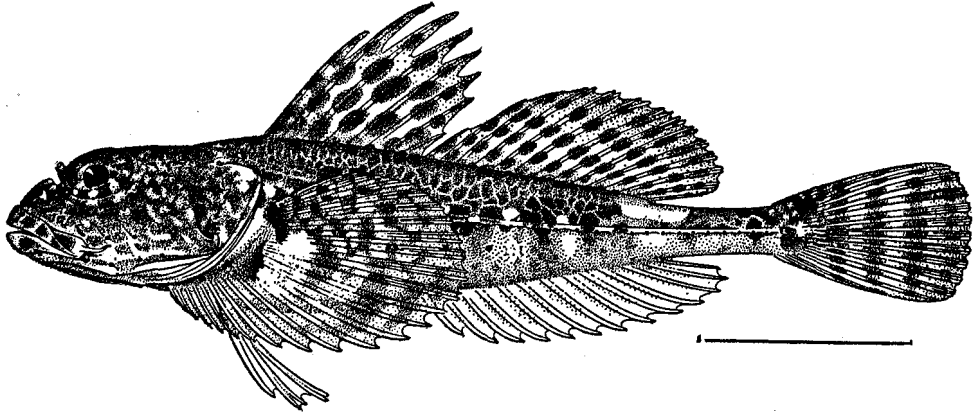


FIG. 6.—*Artdiellus camchaticus*, new species. Type.

greatest depth of body 21; least depth of caudal peduncle 6; distance from tip of snout to hinder edge of gill membrane on median line 19; distance from tip of snout to front of anal 54; from last anal ray to last pore of lateral line 19.5; from last dorsal ray to last pore of lateral line 21.2; length of base of dorsal fin 48; of anal fin 30; longest pectoral ray 26; longest ventral ray 18; longest caudal ray 22.5.

Dorsal VIII, 14; anal 13; pectoral 24; ventrals 1, 3. Lateral line with 33 pores, including the one at upper attachment of opercular membrane and the terminal pore at base of caudal.

In 25 cotypes, the formulæ are as follows:

	Dorsal spines.			Dorsal rays.			Anal rays.			Pectoral rays.			Pores in lateral line.			
	VII	VIII	IX	12	13	14	12	13	14	23	24	25	31	32	33	34
Fin rays and pores.....																
Number of specimens.....	3	21	1	1	14	10	7	15	3	5	28	17	2	21	19	8

The pectoral rays are in equal number on the two sides in 23 of the 25 specimens examined, the other 2 showing each a difference of 1 ray between the right and left sides. In 17 specimens, the pores of lateral line are in equal number on the 2 sides, while in 8 specimens, a difference of 1 or 2 is found.

Mouth smaller than in other species, but little oblique, the maxillary not reaching vertical from middle of orbit. Anterior series of premaxillary teeth slightly enlarged, as are also a few of the anterior mandibular teeth near symphysis; vomerine teeth in a single curved series; palatines with an elliptical patch. Upper preopercular spine long, only moderately hooked, placed low, its tip well below the level of upper pectoral ray, its posterior margin extending beyond edge of opercle; in the smallest of the cotypes, a slight prominence can be detected on inner side of hook, corresponding to the denticle in *Cottiusculus*; in one specimen, a strong straight spine is present on each preopercle above the hooked spine, its direction parallel with the preopercular margin, directed downwards and backwards; lower preopercular spine small, directed downwards and forwards, the margin of the bone above it with 2 rounded prominences.

Nasal spines small, often concealed beneath thick integument. Occipital region depressed, gently concave, without trace of ridges or prominences. Maxillary barbel simple, slender. Occipital filament minute; all others obsolete, or represented by inconspicuous tubercles; none present on preopercle or on sides of body above base of pectoral. Pores on mandible and preorbital comparatively small; anterior mandibular pair distinct and widely separated, though obliquely facing each other. A pair of pores on anterior part of interorbital space, a median pore on middle of space, and 1 behind orbits, the latter forming the apex of a \wedge -shaped row on occiput. Gill membranes with a free margin mesially, the width variable, about three-fourths diameter of the pupil in the type.

Dorsal fins contiguous in males, usually well separated in females. Spinous dorsal elevated in males, the fin when declined reaching base of fourth or fifth ray of second dorsal; the membranes of the first 4 or 5 spines incised, but for less than half their height. Last anal ray slightly behind last dorsal ray, the anal fin longer than soft dorsal. Ventrals longer in males, but failing to reach the vent. The lower 14 or 15 pectoral rays simple, the branched rays the longest.

Color in spirits: Above brownish, everywhere with narrow sometimes reticulating lighter lines, and small light spots; 4 rather indistinct darker bars; 1 on occiput, 1 below middle of spinous dorsal, 1 below posterior half of soft dorsal, and 1 on caudal peduncle; the bars more or less invaded by lighter reticulating lines and small spots. Branchiostegal membranes dusky in males, pale in females, the lower parts generally colorless. Spinous dorsal in the male usually with large roundish brown spots, which are often irregular in size and arrangement, and may be so placed as to form lengthwise streaks; soft dorsal with 5 oblique dark bars; caudal with 3 or 4 dark crossbars, usually wider than the interspaces, often concave on distal side; anal unmarked; ventrals somewhat dusky in males, unmarked in females; pectorals with a large round white or yellowish white spot on basal portion of the middle rays, the upper rays with faint dusky crossbars, the lower blackish with white tips in males, colorless in females; in males, the ventrals and the lower part of pectorals are sometimes dusted sparsely with fine black specks. There is often a broad light V-shaped bar behind occiput, and sometimes in addition a broad light crossbar under end of soft dorsal. Sometimes in males these marks are bright white, as may be also an irregular spot on opercle and 1 or 2 on lateral line.

Numerous specimens were obtained at the following stations off Avatcha Bay, Kamchatka:

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.		
	°	'	"	°	'	"			
4794.....	52	47	20	N.	158	44	30	E.	Fathoms. 58-69
4795.....	52	46	50	N.	158	44	30	E.	69-48
4796.....	52	47		N.	158	43		E.	48

Artediellus miacanthus, new species. (Fig. 7.)

Type, a male specimen, 66 mm. long, from station 4795, off the east coast of Kamchatka (latitude $52^{\circ} 46' 50''$ N.); depth 48 to 69 fathoms.

Resembling *Artediellus pacificus*, but differing in color, in the fewer pores of the lateral line, the obsolete nasal spines, and the simple maxillary barbel.

Measurements, in hundredths of total length, without caudal; Length of head 37; of snout 10; diameter of orbit 11; interorbital width 3; greatest width of head 24; greatest depth of body 23; least depth of caudal peduncle 7; distance from tip of snout to hinder edge of gill membrane on median line 22; length of base of dorsal 52; of anal 28; longest pectoral ray 30; longest ventral ray 16; longest caudal ray 26.

Dorsal VIII, 14; anal 11; pectoral 22 or 23; caudal 17 (9 rays forked); ventral 1, 3. Lateral line with 19 or 20 pores, including the one at upper attachment of opercular membrane; large terminal pore at base of caudal fin. In 25 specimens, including the type and 4 cotypes, and 20 specimens from station 5025, off the east coast of Sakhalin Island (depth 52 fathoms), the fin and pore formulæ are as follows:

Fin rays and pores.....	Dorsal spines.		Dorsal rays.			Anal rays.		Pectoral rays.			Pores in lateral line.						
	VII	VIII	12	13	14	11	12	22	23	24	18	19	20	21	22	23	24
Number of specimens.....	12	13	1	12	12	15	10	14	28	8	4	8	12	13	7	4	2

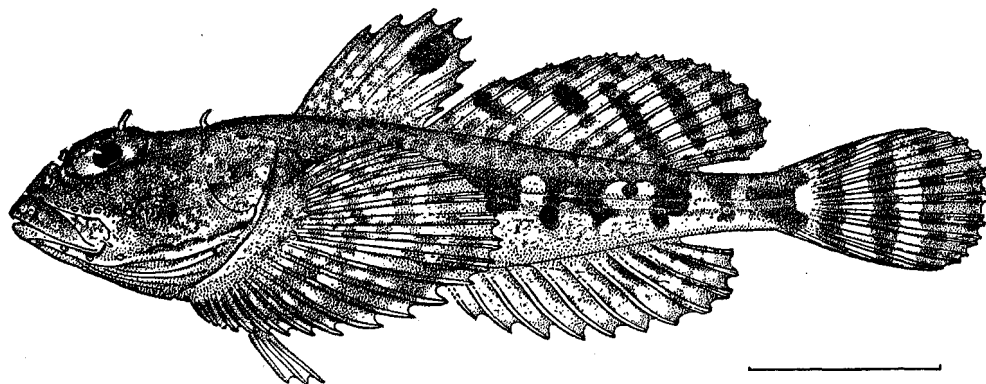


FIG. 7.—*Artediellus miacanthus*, new species. Type.

Lower jaw included, maxillary scarcely reaching margin of pupil; teeth on premaxillaries anteriorly in a wide band which tapers laterally and consists of a rather close-set posterior series curved downward and backward, a slightly enlarged anterior row, and scattered teeth between; mandibular band narrow, mostly of two somewhat irregular series, the posterior series enlarged; vomerine teeth in a single curved row; a small lenticular patch on anterior portion of palatine. Upper preopercular spine comparatively small and slender, strongly curved, the tip often directed upward and forward, on a level with upper pectoral ray; usually no trace of a denticle or cusp on inner edge of spine, but a minute prominence represents such cusp in a few individuals; the lower preopercular spine is strong, directed as usual downward and forward; the space between the upper and lower spines is without any developed spine or marked prominence. Nasal spine wholly obsolete, the nasal bone much reduced and bearing no denticle. Both nostrils bear short tubes. No occipital prominence. Barbels moderately developed, a supraocular pair and a pair at posterior edge of occiput; one or often two or three in a series at upper edge of pupil, and sometimes a few others scattered on upper part of eyeball; a simple barbel on maxillary, usually a small one on cheeks near base of upper preopercular spine, and a small one on opercle; no barbels on preorbital, on margin of preopercle, on nape, or along lateral line. Pores on head noticeably larger than in *Artediellus pacificus*, the anterior mandibular pair never coalescent, though this is always the case in *A. pacificus*. A pair of pores, opposite or nearly so, on anterior part of interorbital space; three in a cross series immediately behind the orbits, the middle one sometimes a little advanced. Gill membranes with a wide free posterior margin.

Dorsals usually closely contiguous in males, more widely separated in females; spinous dorsal less elevated in males than in other species, and the membrane less deeply incised, the first 4 spines only having the tips well exerted. All the dorsal rays and a few of the posterior anal rays are branched toward their tips; the upper 9 pectoral rays are branched and are longer than any of the simple rays, which are rapidly shortened downward and forward; ventral rays all simple.

Lateral line with a single series of small pores along its lower edge, terminating in a much larger pore at base of caudal.

Color in spirits: Grayish, coarsely mottled and blotched above with brownish, the occiput and sides of head often with darker blotches; the dark markings may be intensified under spinous dorsal, under soft dorsal, and on caudal peduncle to form faint bars; often a very few conspicuous irregular blotches below lateral line. Anal fin unmarked in males as in females; spinous dorsal with black margin and a roundish black blotch faintly ocellated with lighter on distal half of posterior rays; soft dorsal with about 5 oblique dark bars; caudal with 4 crossbars not so wide as the light ground; in males the upper part of pectoral light, with faint narrow crossbars, the distal part of all the simple rays black, with a narrow white margin; in females the upper part of pectorals more distinctly crossbarred, the lower portion white; ventrals white in females, slightly dusky in males.

The species is known from the type and 8 cotypes from stations 4794 and 4795 and from numerous specimens from station 5025, as below:

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4794.....	52	47	20 N.	158	44	30 E.	<i>Fathoms.</i> 58-69
4795.....	52	46	50 N.	158	44	30 E.	69-48
5025.....	48	43	30 N.	144	56	45 E.	52

Triglops beani Gilbert.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4794.....	52	47	20 N.	158	44	30 E.	<i>Fathoms.</i> 58-69
4795.....	52	46	50 N.	158	44	30 E.	48-69
4796.....	52	47	N.	158	43	E.	48

These specimens, taken off Petropavlovsk, are somewhat duller in color than in specimens from eastern Bering Sea, and have the lateral black stripe of the male more interrupted and broken. The eye averages a trifle smaller and the caudal peduncle more slender. These differences would doubtless disappear in a large series of specimens.

Triglops scepticus Gilbert.

Known hitherto from the vicinity of Unalaska and the region south of the Alaska Peninsula; here recorded to the westward from near Attu and the Commander Islands.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4784.....	52	55	40 N.	170	26	E.	<i>Fathoms.</i> 135
4789.....	54	49	45 N.	167	12	30 E.	56
4791.....	54	36	15 N.	166	58	15 E.	72-76
4792.....	54	36	15 N.	166	57	15 E.	72

Triglops metopias, new species. (Fig. 8.)

Type 144 mm. long, from station 4777, Petrel Bank, Bering Sea; depth 52 fathoms.

Length of head 27 hundredths of total length to base of caudal; depth of body 16.5; diameter of eye 8; length of snout 7.6; interorbital width 4.2; length of maxillary 11.8; width of head 12; distance from tip of snout to edge of branchiostegal membrane 17.9; distance from tip of snout to front of dorsal 26.5; from front of spinous to front of soft dorsal 20; length of base of soft dorsal 43.5; distance from snout to base of ventrals 29; from axil of ventrals to anus 7.6; from anus to front of anal fin 8.2; length of anal base 42.7; length of caudal peduncle 10; longest pectoral ray 23; longest ventral ray 16; longest caudal ray 18.5; middle caudal ray 12.

Dorsal XI-26; anal 27; pectoral 20; ventral 1, 3; scutes along lateral line 50. Of the 8 specimens in the collection, 1 has dorsal XI-25, anal 26; 2 have dorsal XI-26, anal 26; 3 have dorsal XI-26, anal 27; 1 has dorsal XI-27, anal 27; 1 has dorsal XI-28, anal 28.

Body heavy at the shoulders, not so elongate as in *Triglops forficata*; occiput broad, gently convex, the sides nearly vertical; interorbital space wide, shallowly concave, abruptly narrowed above middle of orbits as in *Triglops forficata* by the incurving orbital rims; anterior portion of orbital rim forming a convex prominence over front of orbit; a shallow groove behind nasal spines and one behind orbits; snout deeper, shorter, tapering more rapidly than in *Triglops jordani*; mouth slightly oblique, maxillary nearly reaching vertical from middle of pupil; jaws equal in front, sides

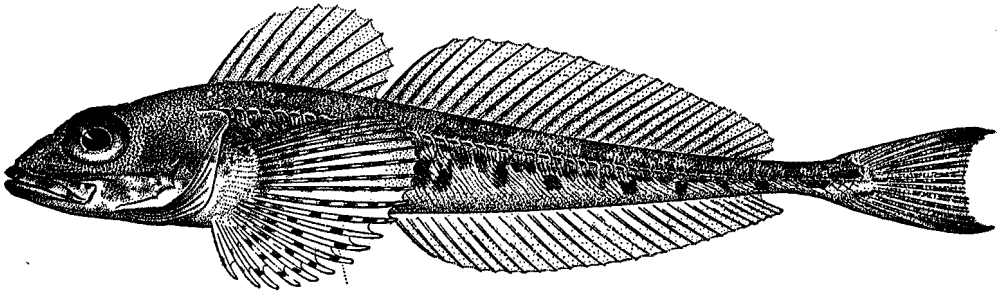


FIG. 8.—*Triglops metopias*, new species. Type.

of mandible included; teeth in narrow bands on jaws and vomer, none on palatines; nasal spines minute; preopercle with 4 small spines, the upper sharp, directed backward, with a slight upward curve, the second backward and downward, the third downward, the fourth forward; the second, third, and fourth are blunt and flattened, the third wider than the second, the fourth still wider, all with stronger ribs which may terminate at the margin in blunt prominences; gill membranes widely joined, free from the isthmus, the posterior margin V-shaped, deeply indented, leaving much of breast before pectorals uncovered.

Upper part of head and body covered with minute plates, each bearing a rosette of spinelets on its posterior margin. This prickly area extends on the body from base of dorsal to lateral line, and covers the head down to the suborbital ring and the suborbital stay, leaving only a narrow lower margin of these naked; maxillary, lower portion of cheeks and subopercle and lower side of head naked; a series of slightly enlarged dorsal scutes, as in *Triglops forficata*, not quite reaching the middle of the soft dorsal, 26 or 27 in number in the type; lateral folds numerous, very irregular, the primary folds ceasing and new ones beginning at any level; in addition to the principal fold descending from the posterior margin of each scute, there are two or sometimes three secondary folds intercalated; the lateral folds fail to reach base of anal fin and do not encircle caudal peduncle below; crossfolds on the breast reduced, only two present in the type, varying from 3 to 6 in co-types, one specimen wholly without folds; a series of pores on lower part of suborbital ring below the prickles; the usual series of pores on the mandible; vent slightly nearer base of inner ventral ray than front of anal.

Dorsals wholly separate; spines very slender, the fifth spine longest, 2.5 in head; pectoral reaching to fourth anal ray, its lower 7 or 8 rays thickened, the membranes incised, but not deeply; ventrals reaching nearly to front of anal, the spine and outer ray closely joined, thickened, bordered with a membranous flap; caudal forked, but not so deeply as in *Triglops forficata*, the middle rays about four-fifths the outer. Series of spinous scales on basal portion of upper pectoral and upper caudal rays; very fine scales on rays of dorsal fin.

Color above brownish gray, below white; breast and abdomen silvery; back crossed with 5 saddle-shaped dark bars which extend down to the lateral line, the first under the first to the ninth dorsal spines, the second under the fifth to the eleventh dorsal rays, the third and fourth equally spaced under the remainder of the soft dorsal, the fifth on the caudal peduncle; an irregular indistinct more or less wavy dark streak below the lateral line, and projecting from its lower margin a series of short dark bars or blotches, one or more of them often double, with their lower ends joined by a horizontal line, thus forming a dusky rectangle with a light central area, the spaces between these blotches silvery; a dark streak runs forward and downward from the base of the upper caudal lobes, a small blotch often at the base of the lower lobe; a dark blotch near the tips of the outer caudal rays (absent in females); a dusky bar extending downward and backward from the eye; a dusky streak on the lower half of the preorbital, extending to the edge of the snout; three blotches on premaxillary, the posterior one continued on maxillary; lower lip dusky; dorsals faintly crossbarred; distal half of anal rays dusky; ventrals pale; branchiostegals without dark bar.

This species differs from *Triglops forficata* in the shorter body, the smaller number of dorsal and anal rays, the less widely forked caudal and in a number of minor characters. From *Triglops jordani*, from Japan, it differs, among other details, in the presence of a distinct series of dorsal scutes, in the incised branchiostegal membranes (these having the posterior border a straight transverse line on *jordani*) and in the presence of wider naked strips along base of anal fin and on lower median line of caudal peduncle.

Seven specimens besides the type were taken at stations 4777 and 4779, Petrel Bank, Bering Sea; depth 52 to 54 fathoms.

Triglops forficata (Gilbert).

Two specimens were taken at station 4779, on Petrel Bank, and numerous specimens at stations 4788, 4789, and 4792, between Medni and Bering Islands, Bering Sea; depths, 54 to 72 fathoms.

The genus *Elanura*, based on the present species, was characterized by the widely forked caudal fin, the elongate body, and the lengthened dorsal and anal fins. Two species more recently discovered, *Elanura jordani* from Japan and *Triglops metopias* of this paper, are intermediate between *Elanura* and typical *Triglops*, for the body is scarcely more elongate than in *Triglops beani*, the dorsal and anal fins are but little lengthened, and the caudal fin, though usually sharply forked, is less widely cleft than in *forficata* and may be only deeply emarginate, as is usually the case in *T. beani*.

Closely related to the *Elanura* group is *Prionistius (macellus)*, differing in no important respect save the absence of cross folds on the breast. But as these are reduced in *Triglops metopias*, and may even be wholly absent, *Prionistius* can not be retained. The row of dorsal scutes is subject to progressive reduction among these species, *forficata* and *metopias* having them distinct but very small, *jordani* having the series so reduced that the scutes are distinguished with difficulty (the species having been described as without scutes), and *macellus* lacking any trace of them. Different as are the extremes of the series, it seems impracticable to draw a line separating them, and the genus *Elanura* is here withdrawn.

In *Triglops forficata* the caudal fin is much more deeply forked in males than in females, the shape of the caudal in females being similar to the more deeply cleft fins in *jordani* and *macellus*. The cross folds on breast are subject to variation in *forficata*, being usually present in small number, frequently reduced to but one or two and occasionally wholly wanting.

***Sternias xenostethus* (Gilbert).**

Knowledge of this species hitherto has been based on a single male specimen, the type, dredged north of Unalaska Island. It was found very abundant on Petrel Bank, where numerous specimens of both sexes were obtained. The following additional notes are here presented:

Measurements, in hundredths of length without caudal, of a male 90 mm. long: Length of head 27; length of snout 7.5; diameter of eye 8; interorbital width 2; distance from tip of snout to end of maxillary 11; depth of body at nape 16; least depth of caudal peduncle 3; length of pectoral 23; length of ventral 13.

In 10 specimens the fin rays are as follows:

	Dorsal spines.		Dorsal rays.			Anal rays.			Pectoral rays.	
	X	XI	22	23	24	22	23	24	17	18
Fin rays	X	XI	22	23	24	22	23	24	17	18
Number of specimens.....	1	9	1	6	3	1	7	2	13	7

In young individuals, 30 mm. long, the lateral folds equal in number the scutes of the lateral line; with increasing size additional folds are intercalated, one or two of these below each scute. The dense mass of prickly scales on sides of abdomen in males is formed of accessory folds, which arise on the level of the lower axillary region and extend irregularly downward and backward, sometimes reaching median line of belly. This structure is not present in females, which do not produce accessory folds in this region. In females the patch of prickly scales on breast is always reduced in size, and may rarely be almost or wholly wanting. In adult males the mandible protrudes strikingly beyond the premaxillaries and terminates in a strong symphyseal knob. In females the mandible is included within the upper jaw.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° /	° /	Fathoms.
4777.....	52 11 N.	179 49 E.	43-52
4778.....	52 12 N.	179 52 E.	33-43
4779.....	52 11 N.	179 57 W.	54-56

***Stelgistrum beringianum*, new species. (Fig. 9.)**

Type 44 mm. long, from station 4777, Petrel Bank, Aleutian Group; depth 43 to 52 fathoms.

Differing from *Stelgistrum stejnegeri* in having the snout, cheeks, and opercles naked instead of densely covered with minute scales, and in having the large plates of the dorsal band terminating at the end of the dorsal fin instead of reaching to or nearly to base of caudal; the smaller plates of the band terminate just before end of dorsal.

Measurements in hundredths of length without caudal fin: Length of head 39; length of snout 12; diameter of eye 11.5; length of maxillary 17; greatest depth of body 26; depth at front of anal 17; least depth of caudal peduncle 7.

Dorsal 1X, 18; anal 12; pectoral 16; ventral 1, 3. Plates in lateral line 38.

A minute simple filament on maxillary and a few on plates of lateral line; none others have been detected, perhaps because of the small size of the specimens. Maxillary short, not extending beyond middle of eye. A deep transverse groove behind nasal spines; interorbital gently concave; no marked ridges or prominences on occiput, its center a trifle depressed. Preopercular spines four, the upper short, simple, directed upward and backward, the lower downward and forward, the other two very short, directed downward and backward.

Body with four very conspicuous black bars; one from below middle of spinous dorsal downward and forward to axil of pectorals, tapering rapidly, and ending behind upper pectoral rays; one under anterior third of soft dorsal, tapering downward and slightly forward to lateral line, thence expanding

forward and downward in a large irregular blotch; one under posterior third of soft dorsal divided below lateral line into two or three diverging branches; one on back of caudal peduncle, with two or more diverging branches below lateral line, the posterior of which nearly or quite encircles tail; head dusky anteriorly, without defined markings; under side of head punctate with black, sometimes with faint bars on lips and concentrations of the black dots about the sensory pores. Soft dorsal and caudal very faintly and finely barred, the bars sometimes irregular and ill defined; spinous dorsal irregularly blotched with black; a black blotch on base of pectorals, widest below; terminal half of pectorals finely barred, a basal portion unmarked; the anal may be unmarked, or the membranes may be blotched with black.

A single cotype, from the same station as the type, is apparently a male, with darker coloration, including irregular black markings on the anal fin. It has also a broad cleft cirrus above posterior part of orbit, not distinguishable in the type.

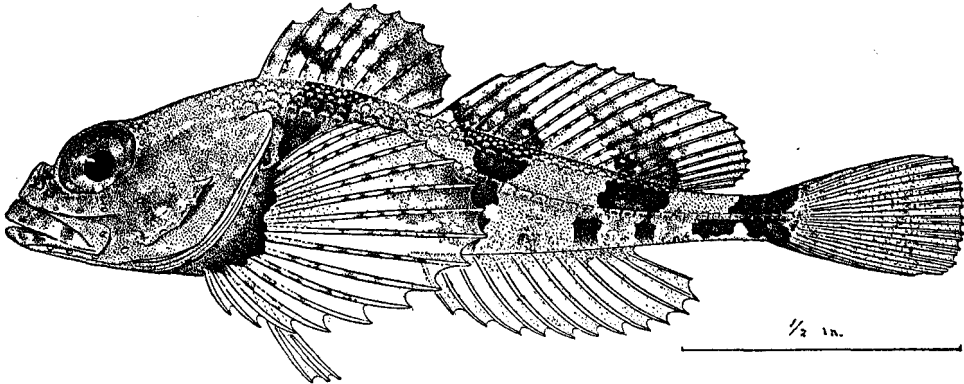


FIG. 9.—*Stelgistrum beringianum*, new species. Type.

Hemilepidotus hemilepidotus (Tilesius).

In this species the lower band of scales is closely approximated to the lateral line throughout its course, the interspace where widest not exceeding the width of one scale. In other species the interspace widens rapidly anteriorly and may equal the width of half the band.

In 21 specimens fin rays are as follows, the terminal split ray of dorsal and anal being counted as one:

	Dorsal spines.	Dorsal rays.			Anal rays.			Pectoral rays.		
Fin rays.....	III, VIII	18	19	20	14	15	16	15	16	17
Number of specimens.....	21	3	15	3	3	15	3	6	33	3

Not taken in the dredge, but found abundantly in shallow water at Unalaska, Agattu, Attu, and Medni Islands. Young were found in tide pools.

Hemilepidotus jordani Bean.

In 29 specimens the fin rays vary as follows:

	Dorsal spines.		Dorsal rays.		Anal rays.			Pectoral.		
Fin rays.....	III, VII	III, VIII	20	21	16	17	18	17	18	19
Number of specimens.....	1	28	8	21	8	20	1	5	48	5

The last split ray of dorsal and anal are counted each as a single ray.

The species is abundant throughout eastern Bering Sea, extending as far west as the Commander Islands. It is taken in shallow water with hook and line and has been dredged to a depth of 54 fathoms.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° /	° /	Fathoms.
4777.....	52 11 N.	179 49 E.	43-52
4778.....	52 12 N.	179 52 E.	33-43
4779.....	52 11 N.	179 57 W.	54-56

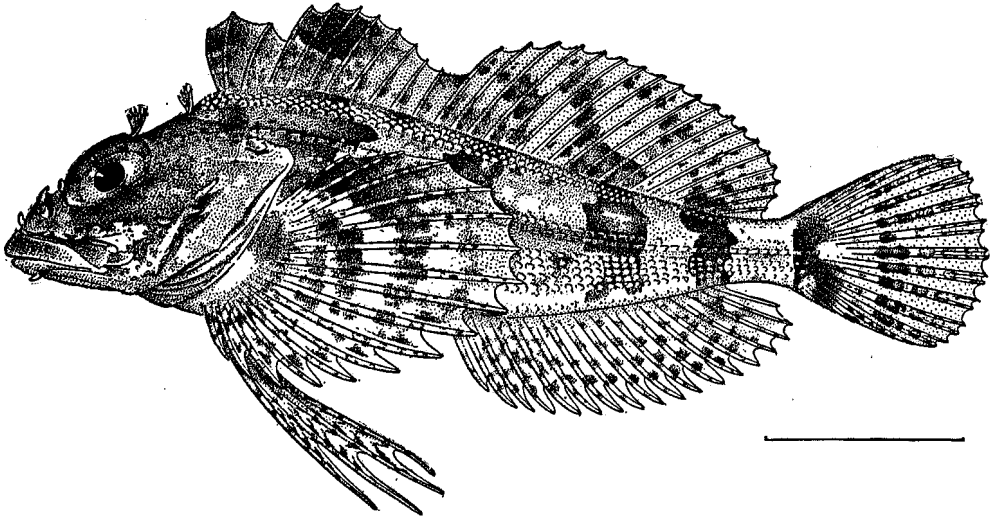


FIG. 10.—*Hemilepidotus zapus*, new species. Type.

***Hemilepidotus zapus*, new species.** (Fig. 10 and 10a.)

Type, a male, 127 mm. long, from station 4782, near Attu Island; depth 57 to 59 fathoms.

Closely related to *Hemilepidotus gilberti* from Japan, agreeing with that species in the ventral fins of the male which are greatly produced and with exerted rays bearing series of elevated papillæ on the inferior surface. It differs from *Hemilepidotus gilberti* in the narrower interorbital and in the reduction in the number of pores in the lateral line and in the rays of dorsal, anal, and pectoral fins.

Measurements in hundredths of length without caudal: Length of head 39; length of snout 11.5; diameter of orbit 12; interorbital width 4; distance from tip of snout to end of maxillary 18; greatest depth of body 30; least depth of caudal peduncle 7.5; length of second dorsal spine 10; third spine 8; membrane at anterior base of fourth spine 4; fourth spine 12; highest (fifth and sixth) spines 13; last spine 7; highest dorsal ray 17; caudal fin 23; ventrals 40; pectorals 34.

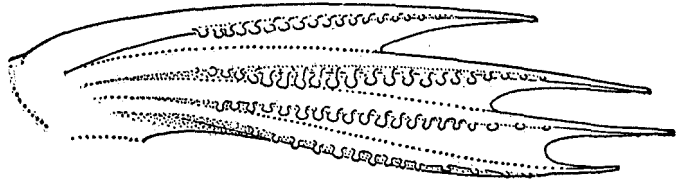
Dorsal III, VIII, 20; anal 17; pectoral 16; pores in lateral line (including those on base of caudal fin) 51 and 53. The last ray of dorsal and anal fins is cleft to the base, the halves sometimes separated at base. They are here always enumerated as one ray. The following table gives variation in lateral line pores and fin rays in 15 specimens of the species:

Fin rays and pores.....	Dorsal spines.		Dorsal rays.		Anal rays.		Pectoral rays.		Pores in lateral line.									
	III, VII	III, VIII	20	21	16	17	16	17	48	49	50	51	53	54	55	56	57	58
Number of specimens.....	4	11	7	8	1	14	28	2	1	2	3	7	4	5	3	2	2	1

Interorbital space narrow, less than width of pupil, very shallowly concave, with an inconspicuous pair of longitudinal ridges. Occiput shallowly concave, with rather coarse ridges radiating from a point behind the orbital tentacle; a few of the ridges may meet mesially, others are directed forward on posterior part of interorbital space. The head undoubtedly becomes much rougher with increasing age, but the roughened area is apparently confined to the occiput and the postocular region above the opercles.

A pair of broad cutaneous flaps with narrow base and deeply cleft margin on posterior edge of occiput; a second similar pair on upper posterior rim of orbit, and a third near upper angle of opercle; a slender pair sometimes present near median line between the pair last mentioned; a slender pair on nasal spines twice or thrice cleft nearly to base; a short pair in front of nasal spines immediately behind upper lip; a line of five short tentacles along margin of preorbital and posteriorly on cheek, a sixth broader one in advance

of the interspace between second and third preopercular spine; a broad flap near tip of maxillary, a minute tubercle above the flap; median pair of mandibular pores with a short tentacle on outer side of each; a minute tentacle near middle of lateral margin of lower lip; a few scattered tentacles along sides of lateral line. Top and sides of head with very numerous minute pores, those on suborbital region arranged in three longitudinal series. Posterior nostrils in a very short tube, the anterior tube longer. Preopercular spines shorter than in *Hemilepidotus gilberti*; two very short, spinous points developed on margin of subopercle. Upper band of plates four rows deep anteriorly diminished to two rows on each side of back of caudal peduncle, the band composed of 68 transverse rows. An accessory series of plates above a portion of the lateral line. Lower band of plates anteriorly with six series, posteriorly with two; on caudal peduncle it is separated from plates of lateral line by about half the width of a plate, but this distance increases anteriorly to the width of two plates or more; in advance of the definite band, which ceases at vertical of vent, the anterior portion of sides below the curve of the lateral line is covered with widely spaced plates more or less definitely arranged in oblique series; behind the upper portion of the pectoral a dense axillary patch; a single series of minute plates above base of anal fin, the two series meeting in a patch about the vent and sending a narrow band forward on middle of abdomen.



1/2 in.

FIG. 10a.—*Hemilepidotus zapus*, ventral fin, anterior face.

Dorsal spines rather low and strong, the vertical fins in general not elevated. The ventral fins in the male extend beyond tips of pectorals, with tips exerted for about one-third their length; on its lower face each ray bears a single dense series of stalked, club-shaped papillae.

Color in life: Entire dorsal region of head and trunk light reddish or pinkish, crossed by four dark bars, which are usually much narrower than the interspaces, and are continued upward on the dorsal fins, forming a conspicuous black blotch on the spinous dorsal; belly and lower side of head immaculate in both sexes; pectorals with indistinctly marked dark bars, one of which is intensified to form a black blotch on upper rays; axil of pectorals in males white, outlined by a curved black bar above and parallel

Color in life: Entire dorsal region of head and trunk light reddish or pinkish, crossed by four dark bars, which are usually much narrower than the interspaces, and are continued upward on the dorsal fins, forming a conspicuous black blotch on the spinous dorsal; belly and lower side of head immaculate in both sexes; pectorals with indistinctly marked dark bars, one of which is intensified to form a black blotch on upper rays; axil of pectorals in males white, outlined by a curved black bar above and parallel

with the base of the fin, and a broader horizontal black blotch below; two oblique broken black lines across middle of axil; ventral rays in male unspotted, the membranes marked with numerous parallel irregular, V-shaped black lines; caudal with a broad dark bar at base, and one or more irregular bars posteriorly, the latter frequently broken up into finer markings.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° /	° /	Fms.
4778.....	52 12 N.	179 52 E.	33-43
4779.....	52 11 N.	179 57 W.	54-56
4782.....	52 55 N.	173 27 E.	57-59

Specimens from stations 4778 and 4779 differ from the type in the somewhat smaller eye and the noticeably wider, deeper interorbital space. But as they agree in all other respects, we have considered them as cotypes, as well as the second specimen from the type locality.

The figure of *Hemilepidotus gilberti* (Proceedings U. S. National Museum, vol. xxvii, 1904, p. 255) is from the cotype, and not the type. Two additional specimens from Hakodate are in the Stanford University collection. One of these is a male with greatly produced ventral fins. As in the cotype, the ventral rays are conspicuously barred with black, while the membranes are mostly unmarked, and the abdomen is white, with a few faint dusky spots; in females the abdomen is unmarked. In the original description of *Hemilepidotus gilberti* the last divided ray in dorsal and anal has been counted as two rays. In the three specimens before us two have 21 rays in dorsal, one has 22 rays; two have 18 rays in the anal, one has 17; all have 17 pectoral rays. The pores in lateral line range from 55 to 65. The interorbital is broad and shallow, its width about two-thirds the diameter of the large eye. In neither *Hemilepidotus hemilepidotus* nor *H. jordani* are the ventral fins produced and papillated in the male.

Enophrys claviger (Cuvier & Valenciennes).

Three specimens were secured, ranging from 48 to 57 mm. long, with fin rays as follows: Dorsal, VIII-14; anal, 11 or 12; pectoral, normally 18, occasionally 17. It will be noted that the original type and the five additional specimens subsequently reported on (including the three here mentioned) have been of approximately equal size. No specimen of *Ceratocottus diceraus* as small as these has yet been encountered, but a specimen of *Ceratocottus diceraus* 114 mm. long has developed all the characters of the adult. While it is highly probable that *Enophrys claviger* is a distinct species, it is very desirable that the young of *Ceratocottus diceraus* be obtained for comparison.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° /	° /	Fms.
4777.....	52 11 N.	179 49 E.	43-52
4778.....	52 12 N.	179 52 E.	33-43

Ceratocottus diceraus (Pallas).

Two specimens, 114 and 155 mm. long were taken with the seine in Avatcha Bay, Kamchatka. This is the type locality for the species, and all specimens which have been described from here lack the bony cross-ridge at posterior border of occiput, which is so strikingly developed in specimens from eastern Bering Sea. This may prove a basis for specific division, but we do not venture upon it until more material is available.

Ceratocottus lucasi has been recently identified as the young of *diceraus* by Evermann and Goldsborough (Bulletin Bureau of Fisheries, vol. xxvi, 1907, p. 305), but we are unable to accept this decision.

The type of *lucasi* is 135 mm. long, hence larger than the smaller specimen of *dicercaus* here reported on, and but 20 mm. smaller than the larger one, yet the distinctive features of *lucasi* are maintained.

The preopercular spine in *lucasi* is much shorter and much more slender, and bears but 2 or 3 large distant hooked teeth; the supraorbital rim is sharp and thin, not massive and heavy, as in *dicercaus*, and the interorbital space is narrower and more shallowly concave (not deeper, as stated in the original description); the occipital ridges are lower, and the posterior (nuchal) processes shorter and lower; the anterior process of the preorbital entirely conceals and extends beyond the portion of the maxillary over which it projects, and bears two very short spinous points totally unlike the pair of strong spines present in *dicercaus*; in advance of the two spinous points the preorbital develops a rounded lobe, which also completely conceals a portion of the maxillary and has no representative in *dicercaus*, although it is present in the Japanese species *Ceratocottus namiyei*. The fin rays of the type and cotype of *lucasi* are difficult to determine, because of the mutilated condition of the specimens, and have been incorrectly given; in both specimens they are as follows: Dorsal, VIII-14; anal, 12; pectoral, 18 on each side.

The following comparative measurements in hundredths of length without caudal will indicate some of the differences between the species:

	C. dice- raus, Kam- chatka.	C. dice- raus, Kam- chatka.	C. diceraus, Kamchatka (48859 U.S.N.M.).	C. lucasi, type.	C. lucasi, cotype.
Length of preopercular spine.....	20	21	21	15	14
Length of nuchal process.....	6.2	6	6.5	4.5	4
Distance from eye to tip nuchal process.....	21	22	21	19	17.5
Width interorbital space.....	8	7.1	7.5	5.5	5
Length in millimeters to base caudal.....	126	93	97	121	110

Through the courtesy of the authorities of the United States National Museum, we have had the privilege of reexamining the cotype of *C. lucasi* (no. 48235, U. S. National Museum) and also the specimen from Avatcha Bay, Kamchatka, which was identified by Jordan and Gilbert with *C. lucasi*, and from which the color description was taken (Fishes of Bering Sea, p. 459). The cotype agrees with the type in all the characters above given by which the species may be distinguished. The preopercular spine is short and bears distally on its inner edge three large hooked spines, of nearly equal size and curved like the hooked spines of brambles; no smaller spines are interspersed, nor are there any on the basal two-fifths of the spine. The interorbital area is narrow and shallowly concave, the orbital rims not massive. A very wide process of the preorbital conceals the proximal portion of the maxillary, its anterior free margin a rounded lobe, its posterior portion bearing a pair of short triangular projections, corresponding to the two very pronounced preorbital spines in *C. diceraus*. The specimen from Kamchatka (no. 48859, U. S. National Museum), which has been heretofore associated with *C. lucasi*, differs widely from that species and is in fact a typical young *dicercaus*. Its measurements are given in the third column of the above table.

***Myoxocephalus polyacanthocephalus* (Pallas).**

Unalaska, Atka, Agattu, and Attu Islands.

***Myoxocephalus jaok* (Cuvier & Valenciennes).**

Avatcha Bay, Kamchatka.

***Myoxocephalus stelleri* Tilesius.**

Medni and Bering Islands, and Avatcha Bay, Kamchatka.

***Myoxocephalus niger* (Bean).**

Agattu, Attu, Medni, and Bering Islands.

***Myoxocephalus batrachoides*, new species. (Fig. 11.)**

Type 66 cm. long, from station 4798, latitude $51^{\circ} 37' N.$, longitude $156^{\circ} 21' E.$; on the codfish banks west of southern part of Kamchatka; depth, 25 fathoms.

Measurements in hundredths of length to base of caudal: Head 41; depth 17; least depth caudal peduncle 6; snout 11.5; longitudinal diameter orbit 7; exposed part of eye 4.5; maxillary 22; interorbital width 6.7; distance between occipital tubercles 6; width of head 32; length of upper preopercular spine 4; highest dorsal spine 11; distance between dorsals 3; longest dorsal ray 17; longest anal ray 14; length of caudal 18; ventrals 16; pectorals 24.

Dorsal X-15; anal 12; pectoral 18; lateral line 41.

Head and body greatly depressed, the head broad, the interorbital space wide, shallowly concave, with a very low median ridge anteriorly; maxillary reaching vertical from posterior border of exposed part of eye; teeth small, in moderate bands on jaws and vomer; nasal spines short, concealed; posterior nostril in a short papilla-like tube, the anterior tube thinner and slightly higher; no filaments on head or body; a strong supraorbital tubercle; occipital ridges low, converging in a curve, terminating posteriorly in an inconspicuous narrow ridge which does not bear a spine; preopercular spines very short, the upper directed slightly upward, not nearly reaching opercular margin; second spine about one-half length of upper, the third a low concealed tubercle, the fourth directed downward and forward as

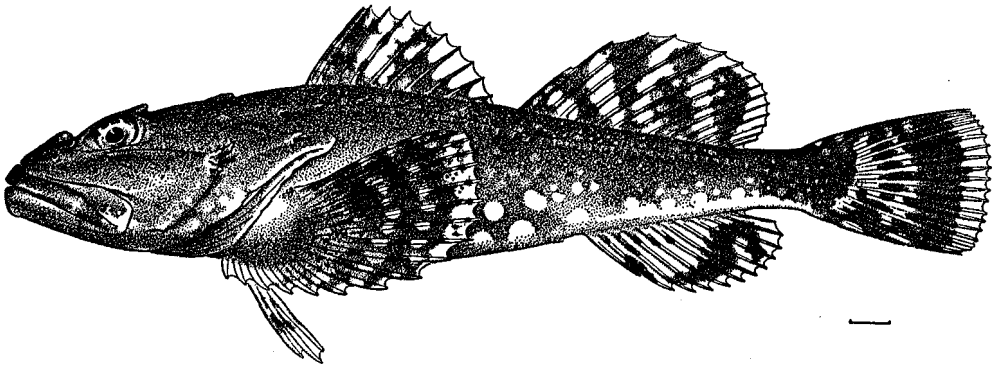


FIG. 11.—*Myoxocephalus batrachoides*, new species. Type.

usual; posttemporal spine strong; opercular spine well developed; a short strong spine on lower angle of subopercle, directed downward and backward; top of head, nape, snout, cheeks, and upper part of opercles with numerous wart-like projections, in which are usually found minute pores of the sensory system of canals; the warts on occiput, nape, and parietal region are the largest; a similar series of warts on sides of trunk, most numerous under second dorsal.

First 4 dorsal spines of nearly equal height, the fin thence rapidly lowering, the last spine short, about one-seventh the length of the first spine; when the fin is depressed, none of the preceding spines reach the tip of the last spine; dorsals well separated, the distance from tip of last spine to base of first ray equaling nearly twice the length of the last ray. Lateral line with a series of concealed plates, opening by a small pore above and below each plate. No spinous plates on body, but a number of scattered long, narrow, spine-like scales concealed in the skin.

Color brownish above, mottled with light olive, traces of a dark bar under spinous dorsal, two under soft dorsal, and one at base of tail; under parts white; a number of white round spots as large as pupil on sides behind base of pectorals, those forward near the axillary region smaller; spinous dorsal with two very irregular dark bars; soft dorsal with four broad oblique bars alternating with narrower white bars, trace of a small fifth bar at base of anterior rays; caudal with a very conspicuous broad dark bar on distal half with a narrower white bar behind it, the basal half of fin largely white, with an incomplete dark bar across it; pectoral black above, axil white, two irregular series of round white spots on the rays forming bars, and a submarginal series of even more irregular white blotches; lower pectoral rays

white; ventrals white; anal largely white, with a conspicuous wide curved or V-shaped black bar on posterior half of fin.

Only the type taken.

This species is not to be confounded with any other. In coloration, in the character of the spine-like scales, the short preopercular spine, the wide interspace between dorsals, the presence of supraocular tubercles, the absence of filaments and the fin rays, it is unlike other species.

***Myoxocephalus parvulus*, new species.** (Fig. 12.)

Type 65 mm. long, from tide pool at Preobrazhenskoi Bay, Medni Island.

Measurements in hundredths of length to base of caudal: Head 36; snout 8.8; diameter of eye 7; interorbital width 4; maxillary 14; width of head 27; distance between posterior ends of occipital ridges 5; depth of body 25; least depth of caudal peduncle 5.8; longest dorsal spine 13; longest dorsal ray 16; length of caudal 23; length of ventrals 25; of pectorals 34.

Dorsal IX-14; anal 12; pectoral 17; 35 pairs of pores in lateral line to base of caudal, an additional pair on base of caudal, and an unpaired terminal pore.

A blunt tubercle bearing a small papilla at upper posterior border of orbit, with an indistinct smaller tubercle before it on supraocular ridge; interorbital space narrow, rather deeply grooved, the sides of

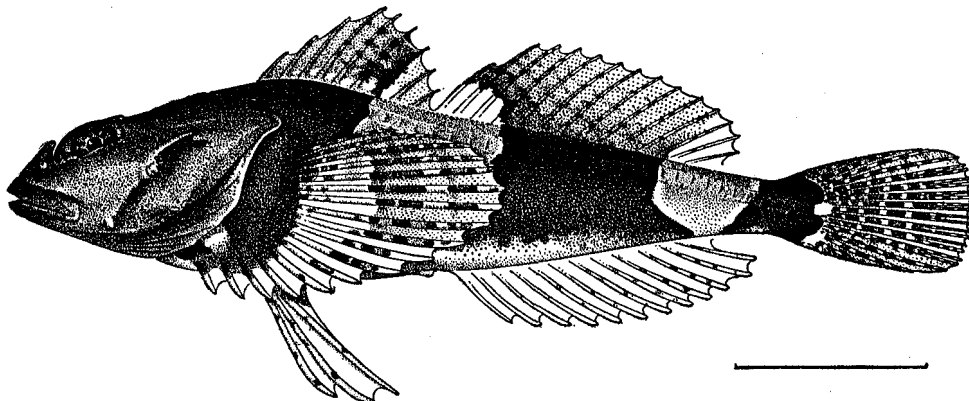


FIG. 12.—*Myoxocephalus parvulus*, new species. Type.

groove forming on median line a sharp angle, which lies between a pair of concealed low ridges; occipital region depressed, especially anteriorly, where it forms a pit-like concavity, the floor of which is below the bottom of the interorbital groove; the occipital ridges converge backward, each terminating in a small tubercle bearing a low papilla; the ridge is frequently interrupted by depressions, thus forming two or three tubercles; no filaments on head, but the maxillary with a low papilla; nasal spines weak, but not concealed; anterior nostril tube longer than the posterior; maxillary extending nearly to vertical from posterior border of pupil; teeth on vomer in a single irregular row, the bands on jaws narrow, the inner series slightly enlarged. Upper preopercular spine short, directed obliquely upward and gently curved, reaching half way from its base to tip of opercular spine; second spine about one-half the length of the first, inclined downward and backward; third spine represented by a small concealed tubercle; the fourth directed downward and forward; a short sharp spine on lower angle of subopercle, and a shorter, blunter one on adjacent angle of interopercle; post-temporal and humeral spines blunt.

Dorsals contiguous; head and body without spines, tubercles, or warts; lateral line opening in two series of pores, one above the other below the plates.

Color dark bluish above, white below, the back crossed by two broad conspicuous bands of gray; the first band includes the last three spines and the first three rays of the dorsals and extends first vertically downward then forward and downward until it joins the white of the abdomen; the second includes the last two rays of the dorsal and about half the caudal peduncle and extends downward in a

broad V-shaped blotch, the apex of which nearly reaches base of anal; the ground color is intensified along the margins of the bars which are often narrowly white; a conspicuous small, narrow, white blotch at base of caudal; head unmarked, nearly as dark below as above; dorsals dusky, the rays with faint alternating lighter and darker bars; caudal irregularly barred with light and dark; anterior base of pectoral and prepectoral area blackish, the latter in its lower part with a horizontal whitish blotch, which is concealed by the opercle; distal half of pectoral barred with light and dark, a broad white bar between these and the dark basal area; axil of pectorals dusky, with two conspicuous white spots, an upper small round spot about the size of pupil at base of second, third, and fourth pectoral rays, and a larger, less intensely white, and more nearly quadrate spot below the middle of the axil; ventrals white with a few dark spots, a pair of which near tips of fins may be well marked; anal white with faint dark crossbars.

Most nearly allied to *Myoxocephalus (Porocottus) sellaris* and *quadratus*, differing in the color, the smaller size of eye, the absence of prickles behind the pectoral and of pores above the anal fin, and in the greater number of dorsal spines.

Two cotypes were taken in tide pools at Nikolski, Bering Island. The fin rays are the same as in the type. In one specimen, the dark ground color is mottled with lighter, the lower side of head is much lighter than in the type, there are light roundish spots included in the dark ground color above base of anal fin and some additional light markings in axil of pectorals.

Myoxocephalus mednius Bean.

Taken at Agattu, Attu, Medni, and Bering Island.

This species is closely related to *Myoxocephalus (Porocottus) bradfordi*; it averages one less spine in the first dorsal and one more ray in the second dorsal and anal, the light spots behind the pectoral in the male are more numerous and do not tend to coalesce as in *M. bradfordi*, and the multifid tentacles on the head are much shorter and less numerous.

	<i>M. mednius.</i>				<i>M. bradfordi.</i>			
	7	8	9	.....	8	9	10	.....
Number of dorsal spines	7	8	9	.....	8	9	10	.....
Number of specimens.....	1	16	5	.....	1	18	3	.....
Number of dorsal rays.....	16	17	18	19	14	15	16	17
Number of specimens.....	4	14	3	1	1	7	12	2
Number of anal rays.....	12	13	14	.....	11	12	13	.....
Number of specimens.....	8	12	2	.....	2	17	3	.....

Megalocottus platycephalus (Pallas).

Avatcha Bay, Kamchatka.

This species differs from *M. laticeps* from eastern Bering Sea in the narrower deeper interorbital space, the higher occipital ridges which converge backwards much less than in *laticeps*, the more prominent tubercles, the obsolescence of filaments, the much larger plates on sides, and the darker coloration.

The accompanying table gives measurements in hundredths of length without caudal in both species:

	<i>M. platycephalus</i> , Kam- chatka.	<i>M. laticeps</i> , Nushagak, Alaska.
Length of head.....	37	37
Length of snout.....	9	9
Interorbital width.....	7	8.5
Distance between anterior ends of occipital ridges.....	7	9
Distance between posterior ends of occipital ridges.....	5	5
Diameter of eye.....	6	6
Length of maxillary.....	16	18
Greatest width of head.....	27	30
Depth of caudal peduncle.....	5	6

Zesticelus profundorum (Gilbert).

One specimen from station 4781, between Petrel Bank and Agattu Island; depth, 482 fathoms.

Dorsal 7-12; anal 10; pectoral 20; pores in lateral line 17. Upper preopercular spine reaching margin of opercular flap. Lateral line with two series of pores anteriorly. In this specimen there are 3 ventral rays on one side, 2 on the other.

Malacocottus zonurus Bean.

In a specimen 12 cm. long, the stellate granulations are distributed over the top and sides of the head and extend in a band along the back and well up on the soft dorsal.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4781.....	52 14 30 N.	174 13 E.	482
4784.....	52 55 40 N.	173 26 E.	135

This extends the known range of the species to Attu Island, the westernmost of the Aleutian chain.

Gymnocanthus pistilliger (Pallas).

Avatcha Bay, Kamchatka.

As has been previously noted (Jordan and Gilbert, Fishes of Bering Sea, Report of Fur-Seal Investigations, pt. 3, 1899, p. 460), typical representatives of this species differ from those obtained from eastern Bering Sea in several respects. The top of the head is more largely covered with rough plates, which always invest the occiput and usually cover a part of the interorbital space; in many specimens from eastern Bering Sea the top of head is bare, or with only two or three scattered plates; in several the occiput is largely covered, but in only one are there any plates on interorbital space.

Among the specimens recently acquired from Kamchatka is one adult male, in which the ventral rays are greatly produced, though less so than in eastern specimens, and the spinous dorsal and the abdomen have much less dark pigment in the areas around the spots.

The fin rays of the new Kamchatkan material are as follows:

	Dorsal spines.		Dorsal rays.		Anal rays.		Pectoral rays.	
	x	xi	14	15	16	17	18	19
Fin rays.....							18	19
							18	19
Number of specimens.....	11	1	5	7	3	9	5	7

Lateral line with 39 pores to base of caudal.

Both lots of Kamchatkan specimens have more frequently 17 anal rays, while 16 is the most common in eastern specimens. We do not venture at present to distinguish these two forms.

Gymnocanthus detrisus, new species. (Fig. 13.)

Type, a female 175 mm. long, from station 4798, off the west coast of Kamchatka; depth 25 fathoms.

Measurements in hundredths of total length without caudal: Head 36; diameter of orbit 9; least interorbital width 5; width across supraorbital tubercles 9; distance between anterior ends of occipital ridges 7; between posterior ends 6; length of snout 10; of maxillary 14; length of upper preopercular spine 7; greatest width of head 21; depth of body 20; depth of caudal peduncle 4.5; longest dorsal spine 16; longest dorsal ray 15; interspace between dorsals from tip of last spine to base of first ray 1; longest caudal ray 19.5; longest pectoral ray 26; longest ventral ray 18.

Dorsal XI-17; anal 18; pectoral 20. Pores in lateral line 42 to base of caudal, 2 or 3 additional pores beyond this point.

Body about as deep as wide at the shoulders; interorbital space very broad, shallowly and evenly concave, curved equally and continuously with the portion of the occiput within the occipital ridges; a small blunt tubercle on posterior border of supraorbital ridge, a sharp constriction behind it; occipital ridges well marked, more or less broken, converging backward to the little marked occipital tubercles; nasal spines large and pungent, both nostrils in short tubes, the anterior the longest. No filaments or papillæ on head.

Maxillary reaching a vertical slightly behind middle of eye; teeth cardiform, anteriorly in broad bands in both jaws, posteriorly narrowed; the teeth are directed obliquely backward and are depressible in that direction; the lateral teeth in the mandible a little enlarged.

Preopercular spine slender, the tip extending nearly to opercular margin, slightly forked; two strong curved cusps above, the anterior much the larger; the 3 lower preopercular spines short, nearly equal in length, the upper one slightly curved, directed downward, the middle one vertically downward, the lower downward and forward; humeral spine short.

Rough plates cover the nape as far back as the dorsal fin and extend forward over interorbital space and to base of nasal spines; a line of plates extends vertically downward along posterior orbital

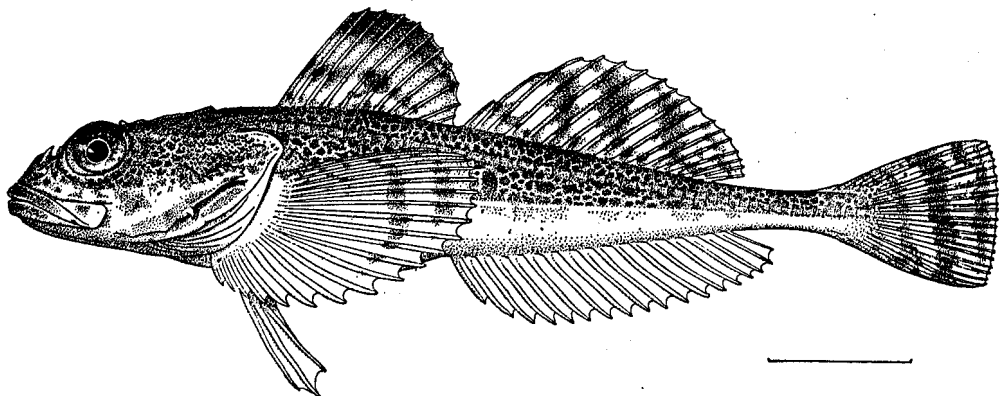


FIG. 13.—*Gymnocanthus detrisus*, new species. Type.

border to suborbital stay, and another along preopercular margin nearly to base of upper spine; the opercular rib is largely plated; a few scattered rough plates behind pectoral, extending along sides two-thirds distance to tip of fin.

Dorsals separate; fourth spine longest; pectoral reaching third anal ray; ventrals not reaching vent; caudal convex, truncate when widely spread.

Color brownish above, with very fine vermiculating lines of olive; lower parts white, with more or less silvery luster; very faint crossbars on back, one at origin and one at middle of spinous dorsal, one between dorsals, two under base of soft dorsal, and one on caudal peduncle; these bars are formed by the darker markings becoming coarser and more intense, but the lighter vermiculating lines are present; front of upper lip colored like top of head; a dark bar across maxillary near its middle; a dusky bar across lower lip on each side symphysis; a broad dark brown margin on spinous dorsal and an irregular dark bar on middle of fin parallel with the margin; 5 bars of reddish brown on soft dorsal running downward and backward; 3 reddish brown bars on the caudal, running a little obliquely downward and backward; 2 broad bars on pectoral, with sometimes a faint third bar nearer base; ventrals and anal plain.

The species is most closely related to *G. herzensteini* Jordan and Starks, and differs in the much wider interorbital, the larger eye, the smaller mouth, the longer preopercular spine, the coloration, and in numerous other details.

In four cotypes from the same station the dorsal has in each case 10 spines and either 16 or 17 rays, anal 18 in each case, pectoral 20. The interorbital space varies in width and in depth of curve, its width in the four cotypes being, respectively, 3.5, 4.2, 4.5, and 5 hundredths of the length.

Sigmistes caulias Rutter.

Three specimens of this little known and apparently rare species were obtained in the tide pools of Agattu Island. It had been known hitherto only from the type locality, Karluk, Kodiak Island.

Two of our specimens are very young, the smallest but 20 mm. long; the adult is 60 mm. long.

Oxycottus acuticeps (Gilbert).

Union Bay, Vancouver Island, and Unalaska, Atka, Agattu, and Attu Islands; found very abundant in the tide pools at the north.

This species differs from all its relatives in the structure of the anal papilla of the male, which instead of tapering uniformly to a slender tip, maintains its width throughout and bears at its end a pair of short lateral horns anteriorly and a median horn behind them. This should serve as generic distinction between *acuticeps* (the type of *Oxycottus*) and *embryum*, which has been associated with it. In the structure of the anal papilla, *embryum* agrees with the species of *Blennicottus*, and is placed in that genus. It differs widely, however, in the physiognomy, the snout and mouth parts, and may merit further separation.

Blennicottus embryum (Jordan & Starks).

Abundant in the tide pools at Unalaska and Attu Islands. Two of our specimens have 16, and one 17 dorsal rays, two have 11 anal rays, and one has 10 dorsal spines.

Blepsias cirrhosus (Pallas).

Unalaska and Attu Islands and Avatcha Bay, Kamchatka.

Numerous young from Kamchatka, 25 to 30 mm. in length. The body is conspicuously banded with blackish, the bands frequently united along middle of sides and occasionally in a line just above base of anal; the bands run out on the dorsal fins, where they can usually be distinguished in adults. The trunk is naked except for 5 distinct lengthwise series of prickles; a double series along lateral line; a series near base of dorsal, terminating under soft dorsal near its posterior end; a similar series above base of anal, which broadens anteriorly at sides of vent; two series on posterior half of trunk midway between lateral line and the series already mentioned above and below it. The breast may be naked or covered with prickles at this age. The barbels on snout and mandible very short.

Nautichthys pribilovius (Jordan & Gilbert).

Dorsal VIII or IX-23 to 26, usually with 24 or 25 rays; anal 17 to 19; pectoral 15 or 16. Cirri present on edge of preopercle and on suborbital stay; a pair of short thick tentacles near tip of snout, and 3 somewhat larger on margin of preorbital; in addition to the broad orbital flap are several delicate filaments on upper posterior portion of eye; a very long slender cirrus surmounts the supraorbital tubercle; similar but shorter ones on occipital crests.

The area immediately behind the pectorals is smooth and without prickles, as in *Nautichthys oculo-fasciatus*; prickles invest the rays of all fins except anal and ventrals and may sometimes occur on these.

The spinous dorsal is higher and rises more abruptly from the depressed nape than was true of the type of the species; in adults its height frequently equals the length of the head. The principal differences alleged to separate *Nautiscus* from *Nautichthys* are the slightly shallower occipital pit, the lower spinous dorsal (sometimes twice the length of head in *Nautichthys oculo-fasciatus*) and the slightly shorter dorsal and anal. These differences do not warrant generic distinction.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4777.....	52	11	N.	179	49	E.	Fathoms. 43-52
4778.....	52	12	N.	179	52	E.	33-43
4779.....	52	11	N.	179	57	W.	54-56
4794.....	52	47	20 N.	158	44	30 E.	58-69
4795.....	52	46	50 N.	158	44	30 E.	48-69
4796.....	52	47	N.	158	43	E.	48

***Psychrolutes paradoxus* Günther.**

Station 4796, off Avatcha Bay, Kamchatka; depth 48 fathoms.

EURYMEN, new genus (Cottidæ).

Tadpole shaped; skin lax, naked; head smooth, without spines or tubercles, the nasal, preopercular and opercular spines wholly wanting; vomer and palatines toothless; gill membranes broadly united, joined basally to the isthmus, the marginal portion forming a free fold; no pore or slit behind last gill; dorsal fins continuous, notched, the spinous dorsal evident, the spines with free tips; ventrals 1, 3.

Closely related to *Gilbertidia*, from which it differs in the wide free fold to the gill membrane, and in the greatly increased number of rays in the pectoral fin.

Type species, *Eurymen gyrinus*, new species.

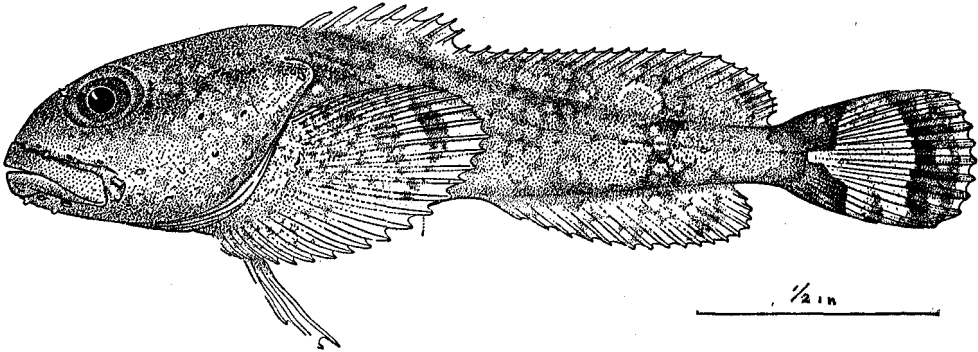


FIG. 14.—*Eurymen gyrinus*, new species. Type.

***Eurymen gyrinus*, new species. (Fig. 14.)**

Type 50 mm. long, from station 4795, off Avatcha Bay, east coast of Kamchatka; depth 69 fathoms.

Measurements in hundredths of length without caudal: Head 44; width of head 30; depth of head 24; interocular width 9; diameter of eye 10; length of snout 13; length of maxillary 21; greatest depth 26; depth of caudal peduncle 8; snout to front of dorsal 43; base of dorsal 64; base of anal 32; base of pectoral 20; length of pectoral 28; length of ventrals 22; length of caudal 23.

Dorsal VIII-23; anal 17; pectoral 26. Pores in lateral line 17.

Head cuboid, a little depressed, with vertical cheeks and depressed broadly rounded snout; interocular space nearly flat, its width nearly equaling diameter of eye; occiput transversely rounded, not ridged; pores scattered on top and sides of head, a series of six on lower edge of suborbitals and preorbital, four on mandible; a short blunt papilla between each two pores on preorbital and mandible; a small

cirrus near end of maxillary, one near end of opercular flap, a few scattered on top of head; both pairs of nostrils in tubes, the posterior the longer; mouth wide, oblique, lower jaw included, maxillary reaching vertical behind pupil; teeth in villiform bands on jaws, none on vomer or palatines.

Spinous dorsal beginning over opercular flap, continuous with soft dorsal, a notch between them; the tips of spines protrude, projecting freely from the membrane; short dorsal and anal long, the free portion of caudal peduncle very short; pectoral with broad procurent base, all the rays simple, the lower slightly thickened and with protruding tips; ventrals nearly reaching vent; caudal rounded.

Color in spirits: Light gray, the head and body thickly sown with minute black pigment specks; a faint dusky bar below spinous dorsal, two below soft dorsal, the posterior most distinct, and one on caudal peduncle and base of caudal fin; the margin of soft dorsal is translucent, unmarked, this border increasing in width posteriorly where it is dark edged below; central part of caudal clear, with a dark bar on lower rays, the terminal part with one bar or two confluent bars, the posterior margin clear; pectorals with faint dusky reticulations, the margin translucent; ventrals unmarked.

Only the type known.

AGONIDÆ.

Percis japonicus (Pallas).

A specimen $2\frac{1}{2}$ inches long from station 4794, off Avatcha Bay, Kamchatka; depth 58 fathoms.

Hypsogonus quadricornis (Cuvier & Valenciennes).

Taken at the following localities, on Petrel Bank and the Komandorski Plateau:

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	Fathoms.
4777.....	52	11	N.	179	49	E.	43-52
4778.....	52	12	N.	179	52	E.	33-43
4779.....	52	11	N.	179	57	W.	54-56
4788.....	54	50	24 N.	167	13	E.	56-57
4789.....	54	49	45 N.	167	12	30 E.	56

Pallasina barbata (Steindachner).

Of this widely varying group, the present collection contains numerous specimens from Unalaska and others from Petropavlovsk. For purposes of comparison, we have examined also all the material in the United States National Museum and the Stanford University collections. In general form and proportions of parts and in the arrangement and sculpture of the plates we find no characters of value for distinction of forms. The variable features are the length of the mental barbel, the numbers of dorsal, anal, and pectoral fin rays, and the number of unpaired median plates on the breast. Each of these characters is subject to a certain amount of variation in any one locality, less, however, than the total variation exhibited by the species. In this respect *Pallasina* differs from the majority of marine fishes, and resembles fresh-water forms, in which isolated colonies take on slightly distinctive combinations of characters. In *Pallasina* certain groups of contiguous localities are marked by fairly distinguishable strains, which seem to intergrade to a degree in orderly geographic sequence. The limited material at our disposal does not permit the determination of the boundaries of these minor groups, nor indeed the question as to their recognition in taxonomy.

The type of *Pallasina barbata* came from the Arctic just north of Bering Strait. The only other available name is *P. aix*, described from Puget Sound. As the form characteristic of Puget Sound and the coasts immediately to the north is one of the best distinguished of the minor groups, we suggest that *aix* be reduced to subspecific rank and used to denote it. The form is characterized by the prevalence of 2 unpaired plates on median line of breast, of 11 anal and 11 pectoral rays, and by the very short

mental barbel. The variation is exhibited in the following table, based on 25 specimens from Port Ludlow, the type locality of *aix*, and 6 from San Juan Island. Both pectorals are listed in each specimen.

	Dorsal spines.				Dorsal rays.			Anal rays.			Pectoral rays.			Plates.	
	VI	VII	VIII	IX	6	7	8	10	11	12	10	11	12	2	3
Fin rays and plates.....															
Number of specimens.....	4	17	12	1	2	23	9	5	26	3	1	64	3	29	5

Nine specimens from Sitka show a tendency to 8 dorsal and 12 anal rays, but do not otherwise differ from typical *aix*:

	Dorsal spines.				Dorsal rays.		Anal rays.		Pectoral rays.		Plates.	
	V	VI	VII	VIII	7	8	11	12	11	12	2	3
Fin rays and plates.....												
Number of specimens.....	1	2	5	1	3	6	1	8	15	3	7	2

From Funter Bay, Lynn Canal, and from the southern shore of the Alaska Peninsula, our material agrees in having almost equally 11 or 12 anal rays, in having almost exclusively 12 pectoral rays, and in the decided tendency to 3 instead of 2 median plates on breast. The barbel is still short. The following table includes 12 specimens from Funter Bay, 9 from Yakutat Bay, 2 from Chignik Bay, and 1 from Sannak Island. As their range of variation and prevailing mode is the same, they are not given separately.

	Dorsal spines.				Dorsal rays.			Anal rays.			Pectoral rays.		Plates.	
	VI	VII	VIII	IX	6	7	8	11	12	13	11	12	2	3
Fin rays and plates.....														
Number of specimens.....	4	12	8	1	15	8	14	9	1	3	45	8	16	

Unalaska material retains the short barbel and has the unpaired median plates on breast prevailingly 2 in number, as in *aix* generally. The fin rays are more numerous than in any form yet considered, and as the tendency in the *aix* series is toward increase in fin rays to the north, the Unalaska form may be considered an extreme in that series. The following table gives the variation in 20 specimens obtained at Unalaska May 26, 1906:

	Dorsal spines.				Dorsal rays.			Anal rays.				Pectoral rays.			Plates.		
	VI	VII	VIII	IX	7	8	9	11	12	13	14	11	12	13	2	3	4
Fin rays and plates.....																	
Number of specimens.....	4	9	6	1	6	11	3	6	10	3	1	1	29	10	15	4	1

The shores of Bristol Bay and northward to Bering Strait are occupied by typical *barbata*, which has a comparatively long slender barbel, usually 3 plates in the median series on the breast, 12 rays in the pectoral and a reduced number in the dorsal and anal fins. In this series the greatest reduction in the number of rays in the vertical fins takes place at the extreme northern limit of its range, the reverse being the case in the *aix* series. The type of *barbata* had the following characters:

Dorsal VI-7, anal 9; pectoral 12; plates 3.

With this may be compared 14 specimens from Point Clarence, Alaska, immediately south of Bering Strait:

	Dorsal spines.				Dorsal rays.			Anal rays.		Pectoral rays.			Plates.	
	V	VI	VII	VIII	6	7	8	9	10	11	12	13	2	3
Fin rays and plates.....														
Number of specimens.....	4	6	2	2	3	10	1	4	10	1	23	4	2	12

Thirteen specimens from three distinct stations in the northeastern part of Bristol Bay agree with the above except in the wider range (but not the prevailing number) in the anal fin, and the occasional presence of 4 plates.

	Dorsal spines.			Dorsal rays.			Anal rays.				Pectoral rays.		Plates.	
	VI	VII	VIII	6	7	8	9	10	11	12	11	12	3	4
Fin rays and plates.....														
Number of specimens.....	3	7	3	2	8	3	2	7	3	1	1	25	8	5

There agree with the above also two specimens from Herendeen Bay, midway of the northern shore of the Alaska Peninsula, as both possess the following formula:

Dorsal VII-7; anal 10; pectoral 12-12; plates 3.

All of the above, from Bering Strait south to Herendeen Bay, can be distinguished at sight from any member of the *aix* group by the longer slender mental barbel, as figured by Steindachner in the type of *barbata*. (Ichthyologische Beiträge, vol. v, pl. 5.)

There remain for consideration numerous specimens from Kamchatka, largely from the vicinity of Petropavlovsk. These agree essentially in fin formula and number of plates with typical *barbata*, and are widely different from the Unalaska material, which is here considered the northern representative of the *aix* series. The Kamchatkan form differs from typical *barbata* only in the shortening of the mental barbel, which is, however, slender and movable, and thus of the *barbata* type. The table below gives data in the case of 46 Kamchatkan specimens:

	Dorsal spines.				Dorsal rays.			Anal rays.				Pectoral rays.			Plates.		
	V	VI	VII	VIII	6	7	8	9	10	11	12	11	12	13	2	3	4
Fin rays and plates.....																	
Number of specimens.....	4	20	17	5	4	25	17	4	11	24	7	5	81	6	2	40	4

Additional complexity is occasioned by considering representatives from the Kurile Islands and northern Japan, but these have not yet received a thorough examination.

Sarritor frenatus (Gilbert).

LIST OF STATIONS.

Stations	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4777.....	52 11 N.	179 49 E.	43-52
4779.....	52 11 N.	179 57 W.	54-56
4792.....	54 36 15 N.	166 57 15 E.	72

The above localities on Petrel Bank and the Komandorski Plateau.

Sarritor leptorhynchus (Gilbert).

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4786.....	54 51 30 N.	167 14 E.	54
4798.....	51 37 N.	156 21 E.	25

The Komandorski Plateau and the codfish banks west of southern Kamchatka.

BathYGONUS nigripinnis Gilbert.

One specimen from station 4797, off Avatcha Bay, east coast of Kamchatka, depth 682 fathoms.

Aspidophoroides bartoni Gilbert.

From Petrel Bank, Komandorski Plateau, off Avatcha Bay, east coast Kamchatka, and off mouth of the Aangan River, west coast Kamchatka, as follows:

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4779.....	52 11 N.	179 57 W.	54-56
4787.....	54 50 50 N.	167 13 30 E.	54-57
4789.....	54 49 45 N.	167 12 30 W.	56
4791.....	54 36 15 N.	166 58 15 W.	72-76
4792.....	54 36 15 N.	166 57 15 W.	72
4794.....	52 47 20 N.	158 44 30 W.	58-69
4795.....	52 46 50 N.	158 44 30 W.	48-69
4798.....	51 37 N.	156 21 W.	25

Anoplagonus inermis Günther.

Stations 4777 and 4779, on Petrel Bank; depths 52 and 54 fathoms.

CYCLOPTERIDÆ.

Eumicrotremus orbis (Günther).

Lethotremus vinolentus Jordan and Starks, Proceedings California Academy of Sciences, 1895, p. 827, pl.

This species is so closely allied to *E. spinosus* of the north Atlantic that Collett, after a comparison of specimens from both oceans, has called the two identical. There exist, however, certain evident differences in the distribution of the plates which enable us to distinguish the species at any age after the plates have begun to develop.

In *E. spinosus* the interorbital area has 4 longitudinal series of plates which continue without interruption along the back as far as the interval between the dorsals. The inner two interorbital series are continuous with the series along either side of base of spinous dorsal; the plates increase in size regularly backward, those along base of spinous dorsal being as large, or nearly as large, as the largest on sides of body, and reduced to 3 pairs, of which the first pair are partly in advance of the fin and partly under the first spines, the second is under the middle and posterior part of the fin, and the third largely under the interval between the dorsals.

In *E. orbis* there are also 4 interorbital series, but neither the outer (supraocular) nor the inner pairs are definitely continued posteriorly. The two inner series usually diverge from each other on the posterior part of the head and may leave an interval in which either a short median series or a patch of irregular plates develop; they are not posteriorly in line with the base of the dorsal, the last plates diminish in size, and the series terminates opposite the front of the dorsal. The plates along the base of the dorsal are much smaller than the larger plates along the flanks, and are more numerous than in *E. spinosus*; 1 pair is immediately in front of the origin of the fin, 3 small pairs are under the

fin, and a much larger pair opposite the interval between first and second dorsals. The supraocular series contains 4 plates increasing in size posteriorly and often 2 or 3 behind the line of the head, diminishing rapidly in size; the line quickly loses its identity at or in advance of the middle of the length.

In *E. orbis* the throat contains several series and is usually wholly invested with spinous plates, and the spinous dorsal is covered with scattered plates for its entire extent. In *E. spinosus* the throat is covered with soft rounded papillæ, with few or no plates, and the spinous dorsal has but a single series of spinous plates near and parallel to its margin.

Several young specimens of *E. orbis* were taken on Petrel Bank, Bering Sea, at stations 4777 and 4779; depths 52 and 54 fathoms.

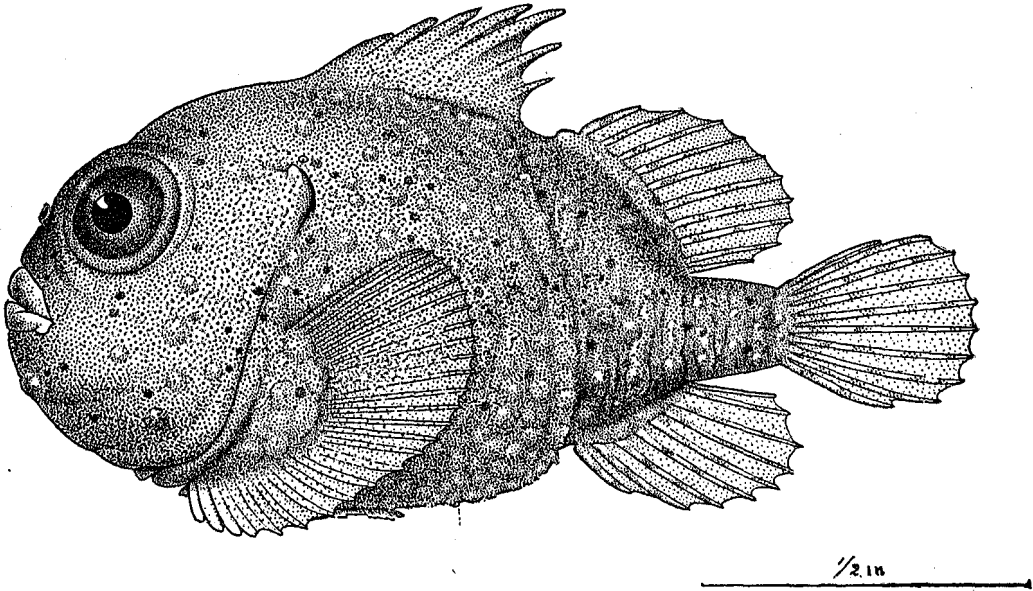


FIG. 15.—*Eumicrotremus phrynoides*, new species. Type.

***Eumicrotremus phrynoides*, new species. (Fig. 15.)**

Type 38 mm. long, from station 4779, on Petrel Bank, Bering Sea; depth 54 to 56 fathoms.

Measurements in hundredths of length to base of caudal: Head 49; eye 20; interocular width 28; distance from anterior to posterior nostril 7; distance between outer angles of mouth 34; width of gill-slit 9; greatest width of body 55, equaling the greatest depth; base of soft dorsal 22; base of anal 18; length of caudal 25; diameter of ventral disk 32.

Dorsal VII-10; anal 9; pectoral 26.

Body tadpole shaped, not greatly compressed anteriorly, its depth and width equal, abruptly compressed behind the spinous dorsal; cheeks nearly vertical; interorbital space wide, gently concave; eyes large, prominent, the upper rim entering the profile; the anterior profile along middle of top of head descends in an almost straight oblique line from occiput to snout; anterior nostril on level of middle of eye, the upper margin of upper lip on level of lower margin of pupil; snout extremely short, the mouth with little lateral cleft; anterior nostril in a short wide tube; posterior nostril tube shorter and much narrower than the anterior, in this respect differing strikingly from *E. orbis* and *E. spinosus*, in which the long slender posterior nostril tube resembles a supraorbital tentacle; teeth small, conical, arranged within the bands in curved series, as in *Cyclogaster*, the outer series along the margin of the jaw laterally, but not reaching the medial line, successive series becoming more and more oblique to the

jaw, until the short medial series are nearly transverse to the jaw. In this species there are 7 series in the mandible, a few of the lateral or posterior teeth in each series enlarged.

Tubercles all small and inconspicuous, largely concealed beneath the thick integument, only the rosettes of short spines a little protruding; no definite arrangement of plates is evident, nor are any enlarged; this is true also of the interorbital region, where groups of short spines are scattered irregularly; chin and throat and the caudal peduncle apparently smooth and naked. The lack of development of the spinous tubercles can not be due to small size, for in the young of *E. spinosus* and *E. orbis*, the plates are perfectly formed when much smaller than is the type of *E. phrynoides*.

A single pore at the origin of the lateral line opening at the tip of a short tube; no other pores present, but an irregular series of imperforate papillæ follow approximately the course of the lateral line. This is also the condition in *E. spinosus* and in *E. orbis*. A most careful examination of a large number of specimens in perfect preservation has failed to demonstrate the existence of the full series of lateral line pores which Collett ascribes to *E. spinosus* (Fishes Norwegian North Atlantic Expedition, p. 49). Open pores are present on the head; one immediately behind the lower part of orbit, one beneath the anterior part of orbit, and three pairs on mandible, the anterior pair well separated, at symphysis, immediately behind lower lip. In *E. spinosus* and in *E. orbis* the mandibular pores open through tubes, but in *E. phrynoides* no tubes are present.

Origin of spinous dorsal over gill opening, the fin barely reaching base of second dorsal when depressed; outline of fin angular, the spines gradually increasing in length to the fifth, the sixth and seventh abruptly shortened; the spines are short, enveloped in thick membrane, with numerous soft papillæ, some of which may contain spinous points; second dorsal and anal with thin translucent membrane, the last rays slightly overlapping base of caudal. Disk large, its middle under upper part of base of pectoral. Vent a little nearer disk than anal fin.

Color pale olive, lighter below, a few dark spots scattered over head and body.

The species is not closely allied with any described form. *E. brashnikowi* Schmidt agrees in the poor development of spinous tubercles, but is a compressed form of wholly different shape, with wide lateral cleft to the mouth.

Only the type taken.

Lethotremus muticus Gilbert.

Two young specimens from Petrel Bank, Bering Sea, station 4779; depth 54 fathoms.

The species differs widely from *L. awæ* from Japan, in the broader snout and interorbital, the larger eye, the wider transverse mouth with less lateral cleft, the longer fins, and the total absence of filaments on the head. *Lethotremus vinolentus* Jordan and Starks, based on a specimen 13 mm. long from Puget Sound, is the young of *Eumicrotremus orbis*, in which the larger spinous plates are already in evidence. Owing to the very small size of the type of *vinolentus*, the fin rays were erroneously given; there are at least 9 dorsal and 8 anal rays. *L. muticus* has a single pore in a tube at origin of lateral line, but neither pores nor a series of papillæ indicating the further course of the line; three pairs of mandibular pores without tubes, and one below and one behind eye are evident, and arranged as in *Eumicrotremus*. As we are unable to demonstrate the presence of a lateral line in *Eumicrotremus*, the only character remaining to distinguish *Lethotremus* is the total absence of spinous tubercles.

Cyclopterichthys ventricosus (Pallas).

Adults of this species in an injured and often dying condition were found in abundance in the tide pools on Medni Island. Others were seen at Nikolski, on Bering Island, where groups of their eggs were found fastened to kelp in the tide pools.

CYCLOGASTERIDÆ.

Cyclogaster (Neoliparis) rutteri (Gilbert & Snyder).

A single specimen was collected in the tide pools on Agattu Island. Length 2.5 inches. This specimen appears to be a male, but differs from the description of the type in having the dorsal spines low and bound together with a thick skin.

Head 29 hundredths of length of body without caudal; depth 23; disk 20; eye 4.5; snout 11; gill opening 5.5; maxillary 11. Dorsal v-26; anal 25; pectoral 31.

Body robust anteriorly; deepest in front of first dorsal. Head deep and wide; width a little greater than depth; occiput swollen; profile rising rapidly from the eyes; snout short, rounded; mouth narrow, almost entirely transverse; maxillary reaching vertical from front of eye. Teeth strongly trilobed, arranged in about 8 oblique rows in the half of each jaw. Anterior nostril in a tube; posterior nostril with a raised rim. Gill opening entirely above the base of the pectoral fin.

First dorsal low, separated from the soft dorsal by a shallow notch; anal similar to second dorsal; dorsal and anal slightly joined to caudal; caudal composed of 12 rays; pectoral with a shallow notch separating the two lobes. Disk large, its anterior edge under posterior margin of orbit; distance from tip of lower jaw to disk two-thirds diameter of disk, $2\frac{1}{2}$ in head. Vent nearer disk than origin of anal; distance from disk to vent 4.66 in head.

Color dark slate, paler on the sides of the body; a light bar across base of caudal and posterior edge of dorsal and anal.

Cyclogaster (Neoliparis) callyodon (Pallas).

This species is common among the Aleutian Islands. Collected in the tide pools on Unalaska, Atka, Agattu, Attu, and Bering Islands.

Specimens are usually spotted with fine black specks and have the fins barred, even in the young; they are slender, have the anal fin not continued beyond base of lower caudal ray, the anus is nearer disk than front of anal, and the dorsals are always distinct. In two specimens fin rays are as follows: Dorsal v-28, anal 26, pectoral 29; dorsal v-28, anal 25, pectoral 30. In none of our specimens is there present the silvery streak on side of head described by Pallas.

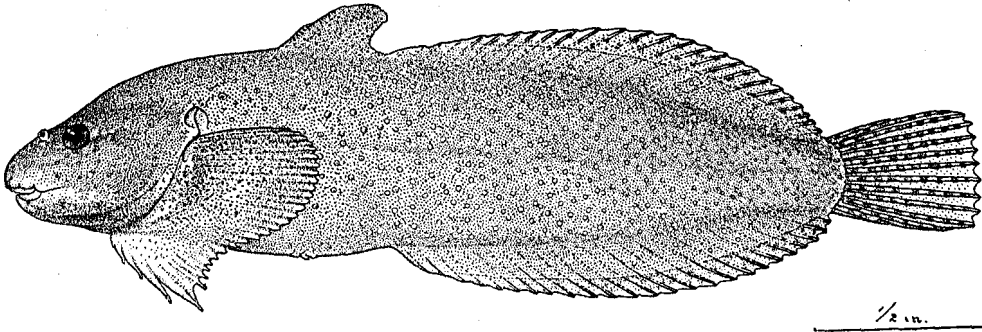


FIG. 16.—*Cyclogaster (Neoliparis) micraspidophorus*, new species. Type.

Cyclogaster (Neoliparis) micraspidophorus, new species. (Fig. 16.)

Type, a male, 73 mm. long, from Nikolski, Bering Island.

A tide-pool species, known only from Agattu and Bering Islands. On account of the character of the gill opening, this species is apt to be confused with *N. mucosus* (= *N. flora*). It differs from the latter species in the shape of the body, greater depth, more swollen cheeks, slightly larger disk, and the coloration.

Dorsal vi-25; anal 25; pectoral 31. Head 27 hundredths of length without caudal; depth 24; ventral disk 17; eye 3.7; snout 11; gill slit 6.5; maxillary 9.

Body deepest at front of first dorsal; dorsal outline sloping gradually to middle of second dorsal, whence it slopes more rapidly to the caudal. Head rather heavy; occiput swollen; profile depressed over eyes; cheeks swollen. Mouth terminal. Teeth trilobed, arranged in about 8 oblique rows in the half of each jaw. Snout depressed, evenly rounded. Eye small. Posterior nostril with a low flap in front. Gill slit extending down in front of about 5 pectoral rays. Body and fins with scattered "thumb-tack" prickles, these absent on the lower surfaces and the snout.

First 6 dorsal rays set off by a deep notch; caudal truncate; dorsal and anal not distinctly joined to base of caudal, the dorsal connection equal to the skin-covered base, the anal connection a little greater; pectoral notched, the lower lobe of 6 rays, reaching nearly to margin of disk. Disk large, 1.7 in head. Vent separated from disk by less than one-half the diameter of the disk.

Slate colored above, paler below; vertical fins indistinctly speckled and barred; upper half of pectoral speckled.

The swollen occiput is not so noticeable in the cotype, and the color varies to an olive gray, somewhat resembling the typical coloration of *N. callyodon*. The lower lobe of the pectoral appears shorter than in *N. floræ*.

Three cotypes are in the collection, 1 from Nikolski, Bering Island, 2 from Agattu Island.

Cyclogaster (Neoliparis) beringianus, new species. (Fig. 17.)

Type 64 mm. long, from Nikolski, Bering Island.

Head 31 hundredths of length without caudal; depth 24; eye 4; snout 12; gill opening 6.2; ventral disk 13; interorbital width 13; maxillary 12.5. Dorsal v-33; anal 31; pectoral 36.

Body deepest at origin of dorsal, compressed posteriorly. Occiput not swollen; profile descending gradually, the interorbital region not depressed; snout not deep, transversely blunt and rounded; jaws equal; maxillary reaching vertical from front of eye. Teeth strongly trilobed in the young, weakly so in the adult, arranged in narrow bands, 7 oblique rows in the half of each jaw; superior pharyngeal teeth

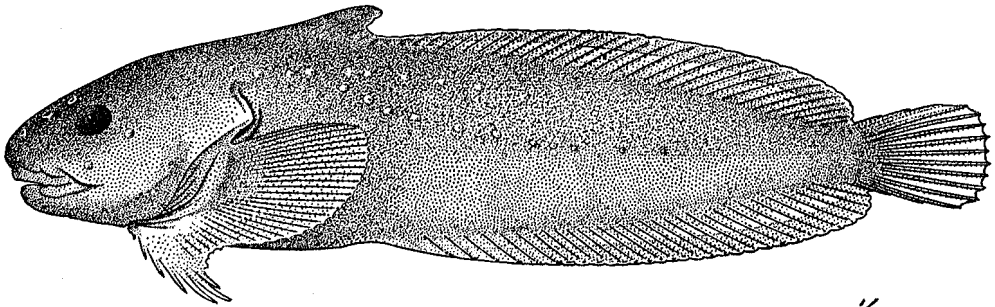


FIG. 17.—*Cyclogaster (Neoliparis) beringianus*, new species. Type.

few and scattered, not closely bunched together, as in *C. greeni*. Anterior nostril in a short tube, the posterior a transverse slit without raised margins. Gill opening extending upward from the edge of the upper pectoral ray. Anterior part of lateral line marked by a series of papillæ which seem minutely perforate, the line narrowly arched above base of pectorals, a few scattered papillæ above the anterior half of the lateral line and on the sides and top of head: the pores have slightly raised rims, which are sometimes divided, forming lips. A series of larger open pores without papillæ on mandible, and one above and behind orbit.

Origin of spinous dorsal over middle of upper pectoral ray, wholly separated from soft dorsal by a deep notch; the spines progressively lengthened and bound together by a thick skin; dorsal and anal slightly connected with the caudal; pectoral notched, the lower lobe composed of 7 rays and reaching slightly beyond the ventral disk. Disk moderate; distance from tip of lower jaw to disk 2 in head. Vent nearer anal than disk.

Color in life: Uniform pale pea-green, without spots or other distinctive markings on body or fins.

This species is closely related to *C. greeni*, but differs in the more reduced gill opening and the fewer superior pharyngeal teeth. It is found in the tide pools with *C. callyodon*, but can be distinguished from the latter by the greater number of fin rays, the coloration, the deeper body, smaller disk, more posterior anus, and in the wider union between anal fin and caudal.

This species was found to be common at Nikolski; numerous cotypes were also taken at Unalaska, Agattu, and Medni Islands. In a specimen from Unalaska the fin rays are: Dorsal v-36; anal 32, pectoral 36.

Cyclogaster (?) cyclopus (Günther).

Two small specimens were taken at Petropavlovsk. Length 30 to 60 mm.

We have compared these specimens with three specimens of *C. cyclopus* from Puget Sound and station 3230, Bering Sea. They differ from the latter in having the profile evenly rounded instead of concave, the interorbital rounded instead of flattened, the snout evenly rounded instead of truncate, the gill opening extending down in front of 3 pectoral rays instead of 5 or more, and the dorsal consisting of 37 instead of 35 rays.

The following characters are from the larger specimen: Head 4 in length; depth 4.66. Dorsal 37 anal 30; pectoral 32. Snout 3 in head; disk 2; gill opening 4.25; maxillary 2.5.

These specimens may well belong to an undescribed species, but our material is not adequate to decide this point.

Cyclogaster cyclostigma (Gilbert). (Fig. 18.)

Head 32 hundredths of length without caudal; depth 30; eye 6; snout 12; gill slit 13; ventral disk 14.5; interorbital width 12; maxillary 15; distance vent from disk 11.5; from anal fin 8.5. Dorsal 39; anal 34; pectoral 40.

Body much compressed posteriorly; greatest depth at origin of dorsal. Head wide; nape prominent; interorbital and snout depressed; snout overlapping the broad mouth; maxillary reaching vertical

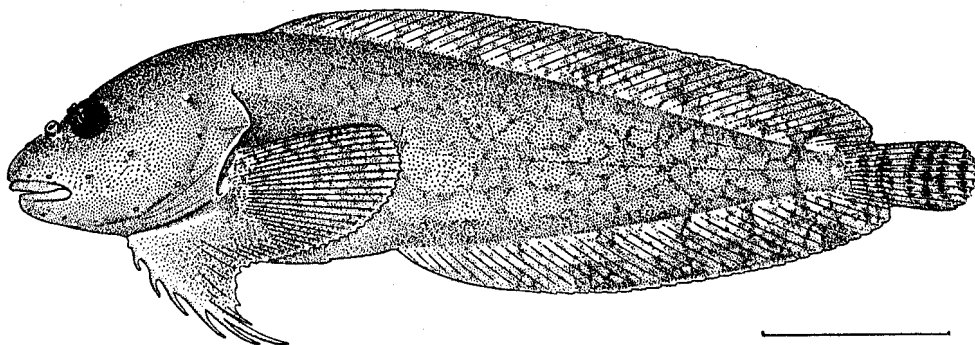


FIG. 18.—*Cyclogaster cyclostigma* (Gilbert). From Albatross station 4777, Petrel Bank, Bering Sea, depth 52 fathoms.

from slightly behind pupil; pupil oval, vertical. Teeth strongly trilobed, 14 or 15 oblique series in the half of each jaw; superior pharyngeal teeth with small lobes. Anterior nostril in a prominent tube, which is 2.5 in eye; posterior nostril with a raised rim. Gill opening large, extending down in front of the upper 14 pectoral rays. Pyloric caeca 30 (from cotypes).

Origin of dorsal distinctly behind base of pectoral; last ray slightly shortened, connecting with 0.2 of the caudal; anal similar to dorsal, connecting with 0.4 of the caudal; caudal rounded, 1.83 in head; pectoral broad, the upper lobe reaching anal, lower lobe composed of 8 rays and reaching nearly to vent. Ventral disk large; distance from tip of lower jaw to disk 2.5 in head, from disk to anal 1.8. Vent slightly nearer anal than disk.

Skin thin and flabby; one or two pores in short tubes near origin of lateral line; no other trace of lateral line in the type, but in the smaller cotypes a series of papillae not certainly perforate but with depressed centers.

Color in life red on head and body, slightly clouded with darker, white on lower side of head and on belly; on opercular flap a black intramarginal line; fins all red, clouded or mottled with blackish, the color darkest on anal and on posterior part of dorsal; on caudal, the dark markings take the form of irregular crossbars; pectoral dusky toward the margin.

This species is closely related to *C. dennyi*; it can be distinguished from the latter by the broad, depressed snout and the larger, more prominent eye; it has a longer nostril tube, the snout projects farther and the disk has a broader marginal flap. It differs from *C. ochotensis* (Schmidt) in the larger

disk and eye, the shorter connection between the dorsal and caudal and in minor characters. Its relationship with *C. gibbus* (Bean) is even closer, but the two are provisionally maintained as distinct. For discussion of synonymy, see *Crystallichthys cyclospilus*.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4777.....	52	11	N.	179	49	E.	Fathoms. 43-52
4779.....	52	11	N.	179	57	W.	54-56
4789.....	54	49	45 N.	167	12	30 E.	56
4795.....	52	46	50 N.	158	44	30 E.	48-69
4796.....	52	47	N.	158	43	E.	48

The above localities extend from Petrel Bank, Bering Sea, to the vicinity of Avatcha Bay, Kamchatka.

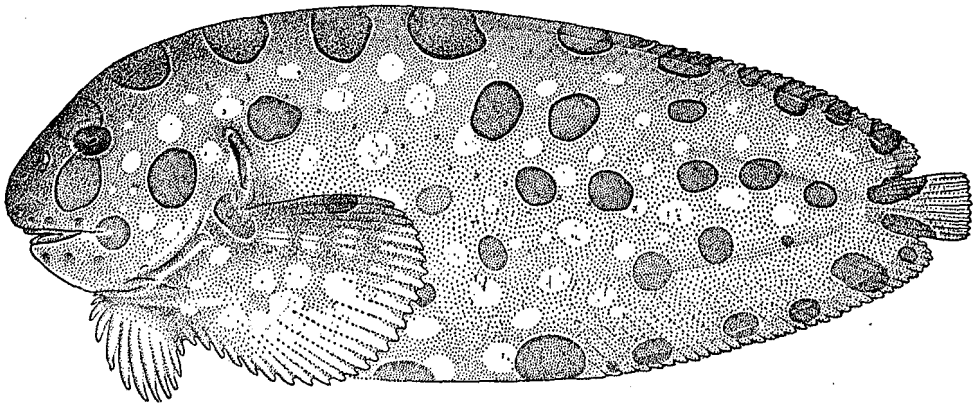


FIG. 19.—*Crystallichthys cyclospilus*, new species. Type.

***Crystallichthys cyclospilus*, new species. (Fig. 19.)**

Liparis cyclostigma Jordan and Gilbert, Fishes of Bering Sea, Report Fur-Seal Investigations, 1899, pt. 3, p. 476, pl. LXXIII; not of Gilbert. Evermann and Goldsborough, Fishes of Alaska, Bulletin United States Bureau of Fisheries, vol. XXVI, 1906 (1907), p. 333, pl. XIX.

Crystallichthys mirabilis Jordan and Gilbert, op. cit., p. 476, pl. LXXVI; in part only.

Type 202 mm. long, from station 4779, Petrel Bank, Bering Sea; depth 54 to 56 fathoms.

Measurements in hundredths of length without caudal: Head 29; eye 4; interorbital width 14; snout 14; width of head 16; depth of head 33; maxillary 11.5; distance from eye to base of nostril tube 4; greatest depth 39; length of gill slit 7; diameter of disk 13; distance from anus to disk 3; to front of anal fin 17; upper pectoral rays 19; width of base of pectoral 22; longest ray of lower pectoral lobe 14; distance from tip of lower jaw to disk 9. Dorsal 50; anal 42; pectoral 34; fins counted in dissected cotype from same station.

Body deep, compressed, the cheeks vertical, the greatest depth of head twice its greatest width; eye small, the pupil elliptical, with its long axis horizontal; nostril single, in a prominent tube; mouth nearly terminal, the premaxillaries not greatly overlapped by the short rounded snout; snout evenly convex transversely, without the lengthwise median groove of *Crystallichthys mirabilis*; bands of teeth very wide, with nine oblique series in the half of each jaw; the anterior teeth of each series minute, barely perceptible, those in the posterior two-thirds of the band large and distinctly trilobed. Gill opening small, wholly above base of pectoral. Disk large, its anterior margin under middle of eye,

the anus close behind it. Origin of dorsal over the gill slit, its anterior portion wholly concealed in a thick covering of gelatinous material beneath the lax skin; the rays increase regularly in length from the origin, there being apparently no differentiated spinous part; the last rays are slightly shortened, giving a rounded contour to fin, which joins the basal half of the caudal. Anal similar to dorsal, joining basal 0.6 or 0.66 of caudal. The lower pectoral lobe consists of 11 thick rays with exerted tips, the longest reaching the vent.

Skin extremely lax, with much soft gelatinous tissue intervening between it and the muscular mass; small open pores along margin of snout and across cheek and on mandible. An obscure series of slit-like pits, apparently not perforate, mark the anterior portion of the lateral line and exhibit the usual short curve above base of pectorals; no papillæ are present.

Color in life: Varying in different specimens from light rose red to light lemon yellow; the spots accord with the ground color, and are either reddish brown or yellowish brown, usually darker at or toward the margins, the darker portion often forming a distinct brownish red ring, most conspicuous in specimens with a yellow ground color. Surrounding all is a light pearly gray ring, which often spreads over the adjoining parts as a suffusion and seems to cover the ground color. The spots are large and roundish, varying in size, shape, and position; usually a conspicuous median series along anterior part of dorsal profile, either a single one or a pair on occiput, one above and an elongate one below and in front of each eye.

This is the species with which the name *Liparis cyclostigma* Gilbert has usually been associated, and is the species to which it was intended to apply that name. Through an unfortunate clerical error, the name *cyclostigma* became attached to a very different species in no way resembling the one here described, and wholly without strikingly distinctive color marks. As the body of the original description of *cyclostigma*, and also the type as designated, concern the unadorned species, it will be necessary to use the name as a palpable *nomen ineptum*. As a further source of confusion, a color description applying to the present species was added to the diagnosis of *cyclostigma* as the latter was passing through the press.

An examination of the type of *cyclostigma* (no. 48621, U. S. National Museum) shows it to be a true *Cyclogaster*, with two well-defined nostrils, but without anterior or posterior tube. It is a rather elongate form, with broad depressed head, about as wide as deep, and a very broad heavy snout. The color was apparently grayish, vermiculated or reticulated with darker; the vertical fins are mostly black, the dorsal with lighter base, all the rays with whitish tips, the black of the fins more or less variegated with lighter mottlings; pectorals similarly marked, darker on inner margin, the course of the rays externally lined with lighter. The lighter markings on the fins may have been yellowish or greenish in life. Inside of mouth and gill cavity and the peritoneum white.

We append a table of measurements of the type of *C. cyclostigma* given in hundredths of length without caudal: Head 27.8; exposed portion of eye 3.3; orbit 5.9; snout 10.4; maxillary 14; cleft of mouth 11; interocular width 11; depth at occiput 21.5; width of snout 22; greatest depth 25; length of disk 12.9; distance from disk to tip of mandible 17; to vent 12.9; vent to first anal ray 7; snout to dorsal 30.6; length of gill opening 11; width of pectoral base 19; longest pectoral ray 25; longest caudal ray 18; longest ray of lower pectoral lobe 18.5.

In the type description of *Crystallichthys mirabilis* Jordan and Gilbert, it is to be noted that the smaller of the two specimens, taken near St. Paul Island at station 3638, and figured on plate LXXVI, does not belong to *C. mirabilis*, but is the young of *C. cyclospilus*. The specimen of *C. cyclospilus* which has been heretofore erroneously figured as *Liparis* (or *Crystallichthys*) *cyclostigma* (see synonymy) is now in such poor condition that it has been thought advisable to select another specimen as the type of *cyclospilus*.

Crystallichthys mirabilis Jordan & Gilbert.

A single specimen 87 mm. long, from station 4794, off the southern coast of Kamchatka; depth, 58 fathoms. This is the only locality from which the species is known, and is the second specimen to be placed on record. The young specimen from station 3638, near St. Paul Island, Bering Sea, mentioned in the original description, was incorrectly identified and belongs to *C. cyclospilus*.

The young individual here reported on is much more slender than the type; the depth contained 3.6 (instead of 2.5) in the length without caudal. The dorsal contains 53 rays, the anal 44 rays, and the pectoral 37 rays. Teeth are apparently arranged in but 7 oblique rows. Disk moderate, its diameter about one-third length of head, its distance from tip of lower jaw two-sevenths length of head. Snout with a shallow open median groove with vertical sides and horizontal floor; no thin median ridge within the groove, as in the type. Pupil minute, elliptical, with horizontal axis. The dorsal fin is much more widely joined to caudal, attached to the basal half of the fin, while the anal is a trifle more widely joined.

In spirits, colored much as *C. cyclospilus*, but the spots smaller, less conspicuous, and those along base of anal are elongate, and obliquely placed. In life, light translucent olive-gray, slightly flushed with reddish; the spots are red rings of various shape surrounding areas of the ground color.

The species differs from *C. cyclospilus* in the presence of the rostral groove, in the long conical overhanging snout, the large size of the pores on snout and mandible, the color, and in many minor characters.

The principal character on which the genus *Crystallichthys* was founded, the single nostril, is shared also with *Careproctus*, with which its two species, *mirabilis* and *cyclospilus*, are most closely allied. The genus may be provisionally retained, distinguished by the compressed head and body, the inferior mouth overlapped by the conical snout, the highly translucent gelatinous texture, and the peculiar style of coloration.

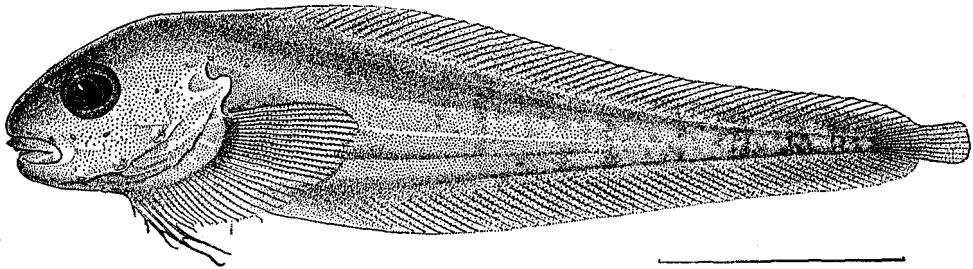


FIG. 20.—*Careproctus bowersianus*, new species. Type.

***Careproctus bowersianus*, new species. (Fig. 20.)**

Type 100 mm. long, from station 4772, on Bowers Bank, Bering Sea; depth 344 fathoms.

Head 28 hundredths of length without caudal; depth 23; eye 7; snout 9; maxillary 9.5; gill opening 6.5; interocular width 10.5; disk 5.2; distance disk to tip of mandible 15; to vent 4; to front of anal 16. Dorsal 53; anal 46; pectoral 37; caudal 9.

Head large, flat above the eyes, cuboid, its width equaling the depth just behind eyes; occiput swollen; snout blunt, slightly overlapping the mouth. Mouth small; the lower jaw included; maxillary reaching vertical from just behind front of pupil; teeth tricuspid, in bands in each jaw; about 10 oblique series in each half of the upper jaw, 12 in the lower; eye large, shorter than snout; pupil large, round; nostril single, in a short tube. Disk small, about 0.75 eye, situated just in front of vertical from gill slit. Gill opening extending down in front of upper two pectoral rays. Vent under origin of dorsal.

Dorsal beginning over tip of opercular flap; distance from tip of snout to origin of dorsal 3.33 in length of body. Origin of anal fin under seventh dorsal ray. Dorsal connected with the caudal for 0.5 the length of the caudal; anal connected with the caudal for 0.4 its length; caudal 2.33 in head. Pectoral 1.66 in head; the upper lobe composed of 32 rays, the lower lobe of 5 rays; upper rays of lower lobe reaching beyond vent.

One or two distinct pores near origin of lateral line; no further evidence of tube or pores.

Color in life: Uniform light rose, the cotype a little dusky posteriorly.

Besides the types a single cotype was taken at station 4771 on Bowers Bank, Bering Sea; depth 426 fathoms.

Careproctus mollis, new species. (Fig. 21.)

Type 84 mm. long, from station 4784, off East Cape, Attu Island, Bering Sea; depth 135 fathoms.

Head 30 hundredths of length to base of caudal; depth 28; eye 5; snout 11; interocular width 12; maxillary 12.5; gill opening 6; disk 8; distance from disk to tip of mandible 15; to front of anal 22. Dorsal 51; anal 47; pectoral 35; caudal 12.

Body thickest and deepest in the region of the gill opening, tapering rapidly backward; head swollen at occiput; profile slightly concave over eyes; snout short, blunt, not projecting over mouth, its length greater than diameter of eye; nostril single, with a well developed tube; mouth terminal; jaws subequal; maxillary reaching vertical from just behind pupil; teeth tricuspid, forming narrow bands in each jaw, arranged in oblique rows; eye medium, about equal to bony interorbital space; pupil small, round; gill opening extending down to fourth pectoral ray; opercular flap forming a sharp angle. Disk larger than eye, its anterior edge under posterior edge of orbit; width of disk greater than length. Vent close behind disk, in front of origin of dorsal.

Dorsal beginning far back; distance from tip of snout to origin of dorsal 3 in length of body; origin of anal under seventh dorsal ray; dorsal and anal rays becoming very slender posteriorly, connected to the caudal for more than half its length; caudal narrow, composed of 12 rays; upper edge of pectoral on

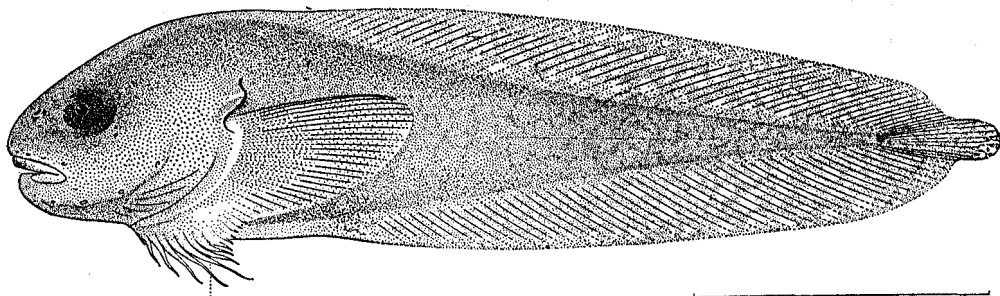


FIG. 21.—*Careproctus mollis*, new species. Type.

a level with the eye; upper lobe of pectoral composed of 30 rays, reaching to anal; lower lobe composed of 5 rays, the upper 3 exerted and extending slightly past vent. Skin nearly all gone; body flesh colored; fins pale.

This species, from the size of disk and gill opening, appears to be related to *C. simus*, but it differs in the shape of the snout, the presence of a nostril tube, and in the smaller eye, gill slit, and ventral disk.

Two small specimens 31 to 45 mm. in length, were taken at station 4781, one in an intermediate haul of 300 fathoms, the other was taken by the dredge in 482 fathoms. In these specimens the skin is present and is dusky along the back and the base of the anal fin.

Careproctus candidus, new species. (Fig. 22.)

Type 73 mm. long, from station 4784, off East Cape, Attu Island, Bering Sea; depth 135 fathoms.

Head 28 hundredths of length without caudal; depth 29; eye 8; snout 12; maxillary 12; gill opening 4.8; disk 9.5; pectoral 25; caudal 14; distance from disk to tip of mandible 10; to front of anal 16. Dorsal 47; anal 39; pectoral 35; caudal 10.

Body deepest at origin of dorsal, tapering rapidly backward. Head short, its profile descending rapidly from occiput to front of eye, then dropping almost vertically to snout; snout very short and deep; nostril single, in a short tube in front of eye; eye large and prominent; pupil elliptical, the long axis nearly horizontal, directed forward and a little downward; mouth small, terminal; maxillary reaching vertical from front of pupil; teeth strongly trilobed, in 8 or 9 oblique series in the half of each jaw. Gill slit small, little more than 0.5 eye, entirely above base of pectoral.

Origin of dorsal above gill slit; fifth, sixth, and seventh spines weak and shortened, forming a notch which separates off the first 5 spines; dorsal and anal joined to caudal for 0.4 its length; caudal

very slender, rounded; upper edge of pectoral on a level with middle of eye; the upper lobe composed of 29 rays and reaching to fourth anal ray; lower lobe composed of 6 rays, these rays thickened and partly free, the upper exserted and reaching a point half way between vent and anal fin. Ventral disk nearly as large as eye, the anterior edge under pupil. Vent close behind disk, the distance between disk and vent 6 in head.

Skin thin and transparent, covered with fine dark points; in life, uniform light reddish above, whitish below, the reddish very thin, appearing a little mottled with lighter.

A well-marked species, distinguished by the notch in the dorsal and the large prominent eye.

Three specimens besides the type were taken at station 4784.

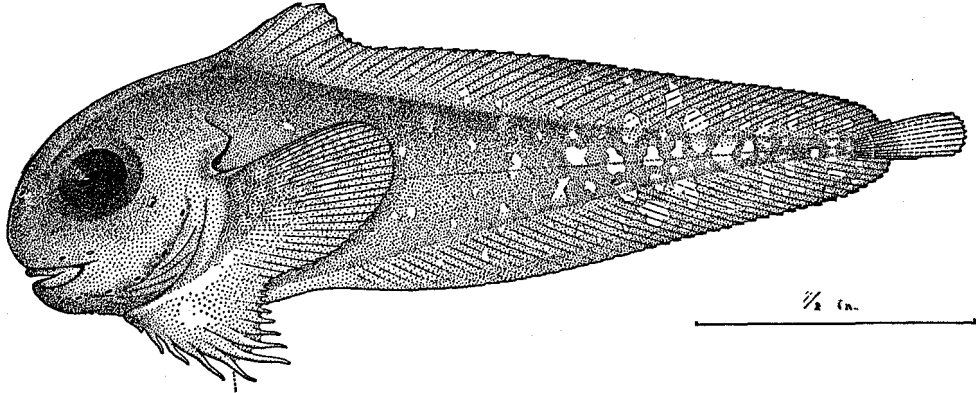


FIG. 22.—*Careproctus candidus*, new species. Type.

Careproctus spectrum Bean.

A single specimen, 50 mm. long, was taken at station 4781 near Agattu Island, in an intermediate haul of 300 fathoms. It may have been taken from the bottom, however, as the net struck during the haul. It differs from the types of *C. spectrum* in having the eye smaller, 4 instead of 3 in head, and the gill opening 2.66 instead of 2.

Head 30 hundredths of length without caudal; depth 24; eye 6.5; snout 9; gill slit 10; maxillary 16; disk 3; distance from disk to tip of mandible 15; to front of anal 19; dorsal 51; anal 48; pectoral 33.

Head large, flat above, contour from occiput almost to end of snout forming a straight line. Snout short, blunt, not overlapping the mouth; mouth large; maxillary 2 in head, reaching vertical from posterior margin of eye. Teeth lanceolate, in narrow bands in each jaw, the inner teeth enlarged and prominent. Gill opening large, extending down to the fifteenth pectoral ray. Eye of medium size; pupil small, circular. Nostril single, without tube or raised rim.

Dorsal beginning above base of pectoral; dorsal and anal joined to caudal for 0.25 its length; caudal slender of 8 rays; upper lobe of pectoral composed of 26 rays, lower lobe of 7 rays, the 4 upper rays of lower lobe exserted, reaching vertical from a short distance behind gill slit. Disk small, under posterior margin of eye. Vent close behind disk.

Body and head stippled with dark brown angular dots; abdomen dark; in life faintly tinged with light red.

Careproctus opisthotremus, new species. (Fig. 23.)

Type 50 mm. long, from station 4780 between Petrel Bank and Agattu Island, Bering Sea; depth 1,046 fathoms.

Head 30 hundredths of length without caudal; depth 17.5; eye 5; snout 8; maxillary 13; gill opening 9; interocular width 9; width of head 16; depth of head 16; disk 8; distance disk to tip of mandible 15; to vent 12; to front of anal 20.

Head depressed, broad, flat above; cheeks vertical; occiput not elevated; snout short, depressed, and blunt, not projecting beyond mouth; mouth large, maxillary reaching vertical from behind posterior margin of pupil; teeth simple, short, and strong; eye small, a little shorter than snout; gill slit extending down in front of 6 pectoral rays; nostril single, in a short tube in front of eye.

Dorsal beginning above opercular flap; anal beginning under tenth dorsal ray; dorsal and anal joined to caudal for nearly 0.33 its length; pectoral inserted very low, its upper ray well below level of eye; upper lobe of pectoral reaching anal, lower lobe composed of 5 rays and reaching midway

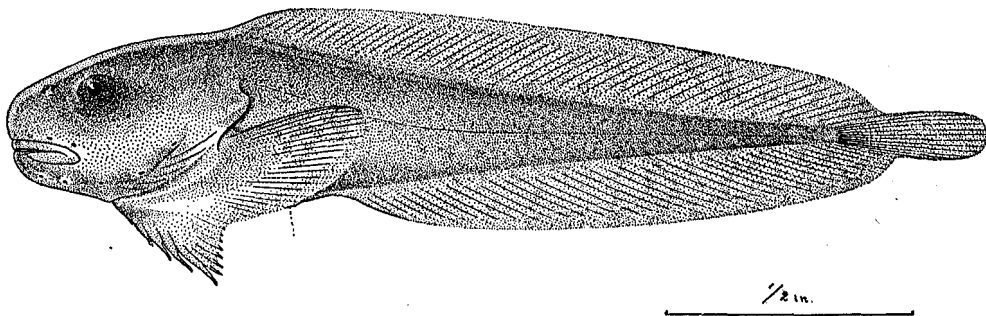


FIG. 23.—*Careproctus opisthotremus*, new species. Type.

between disk and vent. Disk well developed, about equal to snout; distance from tip of lower jaw to disk 2 in head, from disk to anal fin $1\frac{1}{2}$. Vent far back, nearer anal fin than ventral disk.

Integument gone; body apparently flesh colored in life.

This species has the flat, depressed head of *C. melanurus*, but it differs from the latter in the large gill slit, the position of the vent, and in minor characters. Only the type known.

Careproctus attenuatus, new species. (Fig. 24.)

Type 37 mm. long to base of caudal, from station 4781 between Petrel Bank and Agattu Island; depth 482 fathoms.

Head 26 hundredths of length without caudal; depth 17.5; eye 5; snout 7; interocular width 6; gill opening 4; maxillary 11.5; ventral disk 7; distance disk to tip of mandible 14; to vent 7; to front of anal 15. Dorsal about 48; anal 40; pectoral injured, with 30 or more rays.

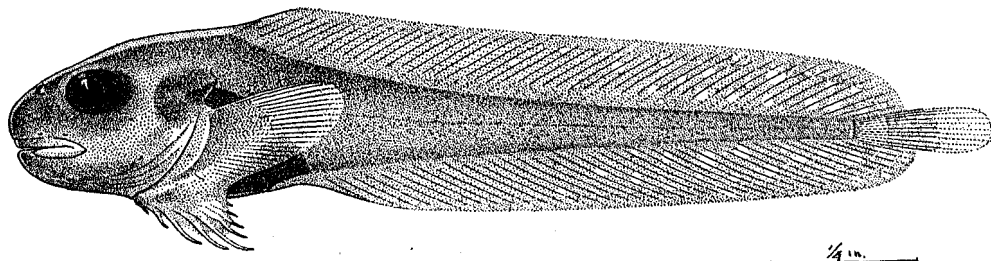


FIG. 24.—*Careproctus attenuatus*, new species. Type.

Body slender; head depressed, broad; width of head equal to depth of head; top of head flat, sloping gradually to the deep truncate snout; snout not overlapping the mouth; cheeks vertical; mouth horizontal; maxillary reaching vertical from front of pupil; teeth trilobed, in 7 oblique rows in the half of each jaw; nostril single, in a short tube in front of eye; gill opening above base of pectoral, 0.6 diameter of eye; opercle extending in a narrow process over middle of gill slit.

Origin of dorsal above tip of opercular flap; dorsal rays slender; anal similar to dorsal; last rays of dorsal and anal joined to caudal for about 0.33 its length, the caudal injured; pectoral notched, the

lower lobe composed of 6 rays and reaching vent, the upper ray inserted immediately below level of pupil. Disk small, situated midway between tip of lower jaw and origin of anal fin. Vent midway between disk and anal. Body uniform pale color; abdomen and gill cavity black; tinged with light red in life.

In character of teeth and gill opening this species resembles *C. ectenes*; it is readily distinguished from the latter by the shape of the head and snout and the black peritoneum.

Only the type taken.

Careproctus cypselurus (Jordan & Gilbert).

One specimen, 186 mm. long, from station 4797, off the southern coast of Kamchatka; depth 682 fathoms.

Head 23.5 hundredths of total length without caudal; depth 23; exposed portion of eye 4.5; interocular width 13; snout 8.5; width of cleft of mouth 14; maxillary 12; width of head 16; depth of head over center of disk 17.5; length of gill slit 7.7; diameter of disk 5, distance from disk to tip of mandible 7.5; to front of anal 21; length of caudal 14. Dorsal 59; anal 55; pectoral 33. Vent at posterior edge of disk. Teeth acute, a few with small cusps; arranged in very numerous short oblique rows.

The genus *Prognurus* Jordan and Gilbert, based on the present species, is distinguished from *Careproctus* solely by the cleft caudal fin. But in species discovered by the *Albatross* in the northwest Pacific in 1906, this condition passes insensibly into the ordinary truncate and rounded form. The group seems not to be tenable, and the name is here withdrawn.

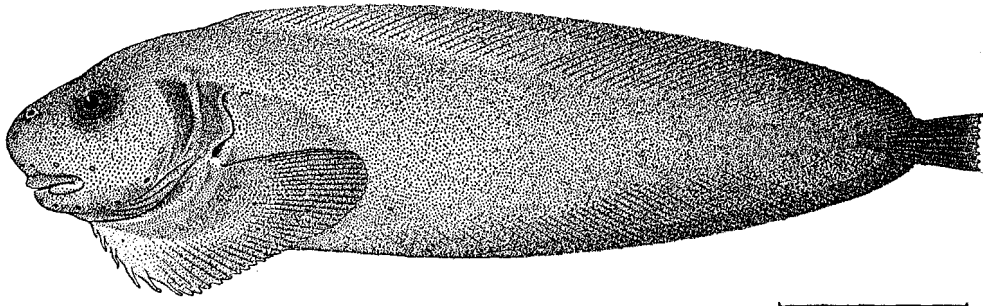


FIG. 25.—*Careproctus furcellus*, new species. Type.

Careproctus furcellus, new species. (Fig. 25.)

Type 130 mm. long, from station 4781, between Petrel Bank and Agattu Island, Bering Sea; depth 482 fathoms.

Head 27.5 hundredths of length without caudal; depth 27; exposed portion of eye 6.2; interorbital width 14; length of snout 8.5; width of cleft of mouth 14; maxillary 12.5; width of head 17; depth of head over center of disk 20; gill slit 9; disk 6; distance disk to tip of mandible 8; to front of anal 24. Dorsal 62; anal 57; pectoral 36.

Body shorter than in *C. cypselurus*. Head broad and flat between the eyes; snout deep, bluntly rounded, projecting slightly over mouth; mouth broad; maxillary extending to vertical from middle of pupil, $2\frac{1}{2}$ in head; teeth in short very oblique series, slender, some with small cusps which give them an arrow-shaped appearance; about 25 series in half of upper jaw; gill opening entirely above base of pectorals, a little larger than eye; eye moderate, pupil oval; nostril in a short tube in front of eye.

Dorsal beginning above tip of opercular flap; dorsal and anal joined to caudal for 0.4 its length; caudal emarginate, nearly truncate when spread, less forked than in *C. cypselurus*; lower pectoral lobe little marked, the lower 6 or 7 rays thickest and with exserted tips, but the longest protruding but little beyond the tips of the rays above them. Disk moderate, its anterior edge under pupil. Vent close behind disk.

Color in life: Rose-red, lighter on belly and under side of head; skin everywhere dusted with fine dark points; gill cavity, abdomen, and pectorals dusky; posterior part of the body, dorsal, anal, and the caudal black.

This species differs from *C. cypselurus* in the length of body, size of eye, ventral disk, and gill opening, and in the much shallower caudal fork.

A second specimen, the cotype, was taken at station 4781.

ELASSODISCUS, new genus (Cyclogasteridæ).

Closely allied to *Careproctus* but differing in the greatly reduced and imperfect condition of the ventral disk, in which character it represents a further step toward the total loss of the ventral fins. Teeth tricuspid, in oblique series. Pseudobranchiæ absent. Branchiostegals 6. Pectoral fin notched. Nostril single. Ventral disk rudimentary, the rays absent, the disk represented by a very small semicircular fold of skin hidden within a pit, one end of the fold protruding papilla-like from the pit; the fold is free from the pelvic girdle but connected with it by strands of connective tissue; pelvic girdle wholly concealed, consisting of two vertical cartilaginous plates. Gills $3\frac{1}{2}$, no slit behind fourth arch, the other slits contracted, with only a portion of the horizontal limb free. Pyloric cæca short, in a single series, 12 in number. Vertebrae 75.

Type *Elassodiscus tremebundus*, new species.

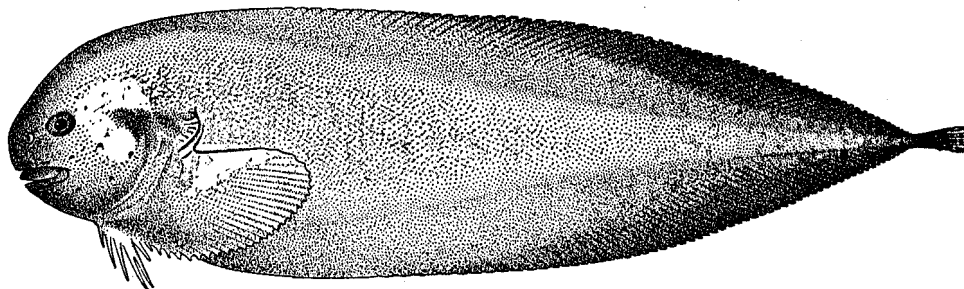


FIG. 26.—*Elassodiscus tremebundus*, new species. Type.

***Elassodiscus tremebundus*, new species. (Fig. 26.)**

Type 215 mm. long, from station 4797, off Avatcha Bay, Kamchatka; depth 682 fathoms.

Head 23 hundredths of length without caudal; depth 26; eye 3.7; interocular space 11; width of head 16.5; depth of head at occiput 21; snout 7; gill opening 7; distance from ventral pit to tip of mandible 10; to vent 4; to front of anal 18. Dorsal 63 to 65; anal 58 to 60; pectoral 32 to 34; fins counted in dissected cotypes.

Body compressed, deep. Head wide and deep; occiput swollen; interorbital space flat and broad; snout short and deep, slightly projecting; mouth broad, the width between angles more than half head; maxillary extending to vertical from posterior margin of eye, $2\frac{1}{2}$ in head; teeth strong, broad, and triangular, evidently but weakly trilobed, arranged in about 10 or 11 oblique series in the half of each jaw; nostril single, in a prominent tube in front of eye; pupil large, round. Gill slit extending down to the upper pectoral ray.

Origin of dorsal over base of pectoral; origin of anal under eighth dorsal ray; anteriorly the dorsal and anal fins are enveloped in a thick gelatinous tissue; both are high, the longest ray in each fin equal to distance from tip of lower jaw to vent, 1.66 in head; dorsal and anal joined to caudal for 0.25 its length. Caudal broad, truncate, sometimes slightly concave, of 8 rays. Upper ray of pectoral on a level with the lower edge of eye, notched, the upper lobe composed of 27 rays, reaching slightly past front of anal, 1.5 in head; lower lobe of 5 rays, reaching a short distance past vent. Ventral disk as described for the genus.

Skin thick, opaque, a single pore near upper end of gill slit, the lateral line otherwise absent.

Color in life translucent, thinly flushed with rose-red, the red due in part at least to blood vessels; lips and gill cavity dusky, the marginal half of the dorsal and anal fins posteriorly and the caudal black; the basal parts of dorsal and anal more translucent beneath the black.

A fine large species, reaching a length of 9 inches. Numerous cotypes were taken with the type at station 4797, off Avatcha Bay, Kamchatka; depth 682 fathoms.

***Paraliparis dactylosus* Gilbert.**

One specimen 94 mm. long, from station 4781, between Petrel Bank and Agattu Island; depth 482 fathoms; the species hitherto known only from the type taken in Monterey Bay.

Head 21.5 hundredths of length without caudal; depth 17; interocular width 8; depth of head 17; width of head 13; eye 5.2; snout 6; gill opening 5; maxillary 9.5; distance from tip of lower jaw to vent 12; from vent to anal fin 17; upper lobe of pectoral 14; lower lobe of pectoral 15; caudal 8.

Maxillary reaching vertical from posterior edge of pupil. Gill opening extending down to fourth pectoral ray. Teeth in narrow bands, weakly trilobed. Vent under posterior edge of preopercle.

Upper edge of pectoral on a level with the lower margin of the orbit; pectoral deeply notched; upper lobe composed of 20 rays and reaching past front of anal fin; lower lobe composed of 6 exserted rays, slightly longer than upper lobe; the two lobes connected by 7 widely spaced rays. Dorsal and anal connected with the narrow caudal for nearly 0.33 its length.

In this specimen and in the type of *dactylosus* the teeth are in moderate bands, the outer teeth smaller, in about 7 or 8 oblique rows in the half of each jaw. Pyloric cæca 18, short, about 0.5 eye.

In life red, the vertical fins posteriorly black.

NECTOLIPARIS, new genus (Cyclogasteridæ).

Ventral disk absent. Vent far forward under the head, in front of pectoral. Pectoral divided. Teeth simple, in narrow bands in each jaw. Pseudobranchiæ absent. Branchiostegals 5. Gill opening restricted to a small slit in front of pectoral. A pelagic genus related to *Paraliparis* but differing from it and the other genera of the family in having 5 branchiostegals and the gill slit restricted to the front of the pectoral.

Type *Nectoliparis pelagicus*, new species.

***Nectoliparis pelagicus*, new species. (Fig. 27.)**

Type 34 mm. long, from station 4785, between Attu and Medni Islands; at an intermediate depth of 300 fathoms.

Head 25 hundredths of length without caudal; depth 22; eye 7.5; snout 6; pectoral 12; caudal 13; distance from tip of lower jaw to vent 13. Dorsal 53; anal 48; pectoral 19; caudal 6. Fin counts are from cotypes.

Head moderate; occiput not swollen, snout short, blunt, not overlapping the mouth; jaws equal; maxillary reaching vertical from front of pupil. Nostril single, in a short tube in front of eye. Teeth small, conical, in narrow bands composed of two or three rows of irregularly placed teeth. Opercular flap bound down and hidden beneath the skin; gill opening a small slit in front of the upper 14 pectoral rays.

Origin of dorsal slightly behind base of pectoral; dorsal and anal joined to caudal for nearly 0.5 its length; pectoral divided into 2 wholly distinct lobes, which are not even joined by free membrane; upper lobe reaching nearly to anal fin, composed of 13 or 14 well-developed rays and 2 or 3 rudimentary rays widely spaced but not quite bridging the gap between the two lobes; lower lobe composed of 3 or 4 rays, short, variable in length in the cotypes, sometimes as long as the upper lobe. Vent far forward at the throat, well in advance of lower pectoral lobe and immediately behind edge of gill membrane; it is directed forward and concealed beneath a projecting ridge.

Body pale, covered with small, irregular-shaped dark spots; epidermis on head and posterior 0.66 of body with the same kind of spots; caudal unmarked; abdomen, gill cavity, and mouth black.

This species appears to be common in the intermediate depths of Bering Sea and the northern part of the Okhotsk Sea.

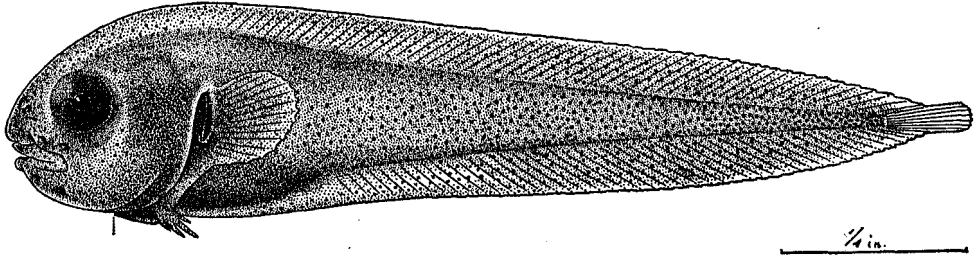


FIG. 27.—*Nectoliparis pelagicus*, new species. Type.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4765.....	53	12	N.	171	37	W.	Fathoms. Int. 300
4767.....	54	12	N.	179	7	30 E.	Int. 300
4781.....	52	14	30 N.	174	13	E.	Int. 300
4785.....	53	20	N.	179	33	E.	Int. 300
4800.....	49	06	N.	153	06	E.	Int. 300

ACANTHOLIPARIS, new genus (Cyclogasteridæ).

Ventral disk absent. Pectoral fin broad, not notched. Nostril single. Teeth simple. Pseudo-branchiæ absent. Branchiostegals 6. Operculum with its ventral and posterior arms developed as strongly projecting spines. Gill flap supported by the posterior arm of the suboperculum, developed as a slender bony rod crossing the flap at its middle. A deep-sea genus, differing from all other genera of the family in the spinous condition of the opercle.

Type *Acantholiparis opercularis*, new species.

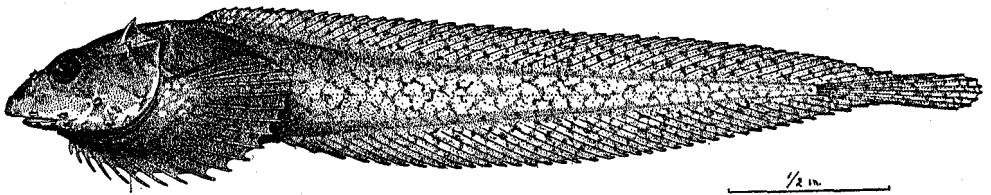


FIG. 28.—*Acantholiparis opercularis*, new species. Type.

Acantholiparis opercularis, new species. (Fig. 28.)

Type 76 mm. long, from station 4797, off Staritschkof Island, east coast Kamchatka; depth 682 fathoms.

Head 23 hundredths of length to base of caudal; depth 14; eye 4.5; snout 7; interocular width 9; width of head 18; depth of head 13; distance vent to tip of mandible 17; to front of anal 15; length of pectoral 17. Dorsal 45; anal 39; pectoral 26.

Body slender; head broad, depressed, flat above; snout flat, projecting a little over the broad mouth; lower jaw included; maxillary reaching vertical from posterior margin of pupil; nostril single, in a slender tube; teeth fine, conical in narrow bands in each jaw; gill opening small, restricted to the area above the pectoral fin.

Dorsal beginning a short distance behind pectoral; anal beginning under sixth dorsal ray; dorsal and anal joined to caudal for 0.25 its length; caudal slender, 1.2 in head, composed of 10 rays. Pectoral broad, not notched, the rays progressively shortened, the anterior rays free nearly to base; longest pectoral rays reaching to opposite origin of anal. Vent about midway between tip of lower jaw and anal fin.

Color dusky, paler posteriorly; abdomen, pectorals, interorbital space, snout, and the lower part of the head darker; in life dusky reddish throughout.

Three specimens were taken, one from station 4761, off the Shumagin Islands, depth 1,973 fathoms; the other two from station 4797, off Staritschkof Island, Kamchatka, depth 682 fathoms.

BATHYMASTERIDÆ.

Bathymaster signatus Cope.

Many specimens were examined, averaging about 30 cm. long. All were similarly colored in life, as follows: Light olive-brown, becoming whitish on belly and posterior part of mandibles; a narrow yellow streak on anterior orbital rim, a second along entire preorbital border, a third along edge of gill membrane; mucous pores on head bright scarlet, including the series along preorbital border, 3 or 4 on preopercle and 3 on opercle in a horizontal series on level of eye; gill membranes mesially blackish blue; dorsal brownish on basal part, light straw-yellow on marginal portion, a black blotch always present on anterior rays; caudal colored like dorsal; ventrals, anal, and lower pectoral rays blackish blue; upper pectoral rays with the distal half light yellow.

In a specimen 248 mm. long to base of caudal, the head is 29.5 hundredths of the length; diameter of eye 7.5; interocular width 5; length of maxillary 14; distance from nape to front of dorsal 5; length of gill-raker 2; depth of caudal peduncle 7; length of caudal 16.5.

Series of canines in jaws very strong, the symphyseal band narrow.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4779.....	52 11 N.	179 57 W.	54-56
4792.....	54 36 15 N.	166 57 15 E.	72

Specimens taken as above on Petrel Bank and the Komandorski Plateau.

Bathymaster cæruleofasciatus, new species. (Fig. 29.)

Type 235 mm. long, from Agattu Island, Aleutian chain.

Differing from *B. signatus* in the coloration, the shorter, less numerous gill-rakers, the fewer pectoral rays, the smaller head with maxillary longer in proportion, the smaller eye, smaller teeth, deeper caudal peduncle, and more anteriorly inserted dorsal fin.

Measurements of type in hundredths of length without caudal: Length to base of caudal 209 mm.; length of head 28 hundredths; length of snout 7; diameter of eye 6; length of gill-raker 1; width of head 14.5; interocular width 4; length of maxillary 15; distance from nape to front of dorsal 6.3; from snout to front of dorsal 23.5; from snout to ventrals 23.5; from snout to anal 45; depth of body 19; depth of caudal peduncle 8.5; length of pectoral 20; length of ventral 12.5; length of caudal 13; longest dorsal ray 12; longest anal ray 8.5.

Dorsal 49; anal 36; pectoral 18; pores in lateral line 98.

Interorbital space narrow, gently rounded; snout sharp, the jaws equal, the lips thick; mouth gently oblique, the maxillary extending beyond vertical from posterior rim of orbit for a distance equaling about half the diameter of the pupil; upper edge of maxillary received within a groove below the preorbital, with the exception of the posterior part, which is free; symphysis of mandible with a broad band of villiform teeth which is bordered in front and behind by a series of strong canine-like teeth; the band rapidly narrows laterally, the anterior series disappears, and the posterior series of enlarged teeth is continued laterally, at first accompanied by a single row of minute teeth, and finally alone; upper jaw anteriorly with a broad band of villiform teeth, with an anterior series of well-spaced canines and a few slightly enlarged teeth mesially in the posterior row; the villiform band is narrowed laterally, but accompanies the series of canines throughout. Vomerine and palatine teeth in broad bands, none of them specialized. All the teeth show a tendency to form one or two minute cusps midway of the length, but these are never well developed.

Pores in head numerous, small, arranged as in *B. signatus*. Anterior nostril in a short tube; the posterior a short slit above front of eye. Gill-rakers very short, 5 above angle and 12 below on outer arch, the longest when depressed covering little more than one interspace.

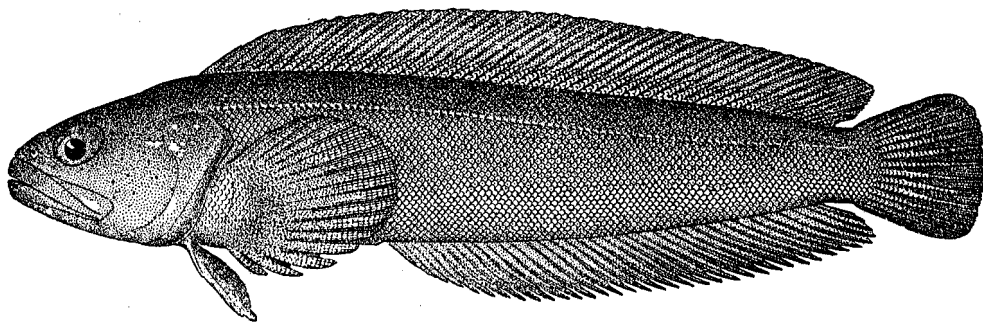


FIG. 29.—*Bathymaster caruleofasciatus*, new species. Type.

Scales strongly ctenoid, much rougher than in *B. signatus*, covering the entire body with the exception of a narrow streak on median line of nape; series of smaller scales accompany basal portions of dorsal, caudal, and pectoral rays, those on caudal extending beyond middle of fin; ventrals and anal scaleless. Distance of lateral line from dorsal profile less than two-fifths its distance from lower profile; it ceases on middle of length of caudal peduncle.

First two dorsal rays simple and not articulated, the succeeding rays branched finely on distal fourth; anal rays similar to dorsal, but thicker, the membranes cleft, leaving the distal one-third to one-half of each ray free; caudal broad and short, the margin but little convex; the first 3 ventral rays profusely branched and closely connected, forming a thickened lobe in which the outlines of the spine and the 3 rays are not externally apparent; the third ray is the longest, the fourth and fifth shorter, distinct; lower pectoral rays thickened at tips.

Color in life: Warm brown, the sides with irregular deep blue bars with cross-blotches of blue in coarse pattern; vertical fins largely blue, the anal with brownish markings, but without distinct pattern. No yellow or scarlet on head. In spirits, adults appear dark brown on body and fins, much darker in tint than *B. signatus*; young specimens are pale in color, the sides crossed by about 10 broad dark bars which extend on dorsal and anal fins; a dark blotch occurs on anterior dorsal rays in the young, but this invariably disappears, while in *signatus* it persists in adults; in later stages the whole body becomes first an olive-brown, the bars persisting longest along base of dorsal, where they appear as dark spots.

Some individuals retain the coloring of the young longer than others; in our material, those from the tide pools assume the adult coloration sooner than those of equal size from greater depths.

The type was secured with hand line at Agattu Island. Others were obtained at Agattu, Medni, and Bering Islands, and at the following stations on Petrel Bank:

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4777.....	52 10 N.	179 49 E.	43-52
4778.....	52 12 N.	179 52 E.	33-43

BLENNIIDÆ.

GYMNOCLINUS, new genus.

Body moderately elongate, compressed, naked. Teeth on jaws and vomer, none on palatines. No lateral line. From 1 to 3 fleshy tubercles on median line of interorbital area and snout. Gill membranes connected, free from the isthmus; branchiostegals 6. Dorsal fin of flexible spines anteriorly, of stiff spines posteriorly; no anal spines; ventral jugular, consisting of a single ray, no spine; pectorals large, rounded, more than half as long as head. Apparently belonging to the *Bryostemma* group of genera, but with no close relationships.

Type *Gymnoclinus cristulatus*, new species.

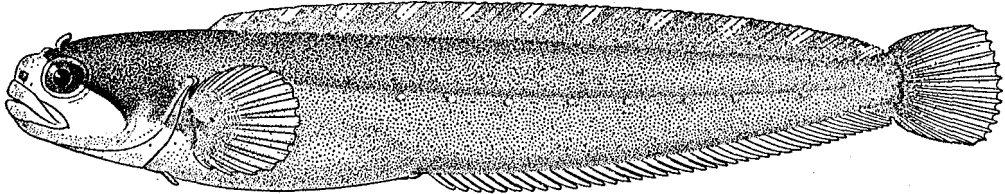


FIG. 30.—*Gymnoclinus cristulatus*, new species. Type.

Gymnoclinus cristulatus, new species. (Fig. 30.)

Type 37 mm. long, from Nikolski, Bering Island.

Head 25 hundredths of length to base of caudal; depth 19; eye 5.5; maxillary 11; snout 5.5; pectoral 15. Dorsal LXI; anal 43; pectoral 14.

Body compressed; head short; snout deep, abruptly decurved; mouth oblique, maxillary reaching vertical beyond posterior margin of pupil; a single series of widely spaced, conical teeth on jaws and vomer, none on palatines; a fleshy papilla midway between eyes, its height equal to diameter of pupil, preceded by one or two smaller ones. Nostril in a slender tube.

Origin of dorsal above base of pectoral; origin of anal nearer tip of snout than base of caudal by a distance equal to the diameter of the eye; dorsal and anal joined to base of caudal; caudal slightly rounded; pectoral large, rounded; ventrals of a single ray. Vent immediately in front of anal fin.

Color light olive, pale on snout, lower half of head, and abdomen; dorsal with 11 vertical pale bars, which extend a short distance on body; a series of 9 small pale spots along the middle of the sides,

the ground color intensified in front of each spot; a dusky spot on the middle of the base of the pectoral; a dark streak running obliquely across the cheek from the edge of the preopercle through the eye and thence nearly vertically across top of head at front of eyes, separating the paler portion of the head from the ground color above. Rare in the tide pools of Bering and Medni Islands.

Pholis dolichogaster (Pallas).

Taken at Medni and Bering Islands and at Petropavlovsk, Kamchatka; not abundant.

Pholis ornatus (Girard).

Vancouver Island (Union Bay), Unalaska, Atka, Agattu, Attu, Medni, and Bering Islands; abundant at all shore stations as far west as the Commander Islands; not known from Kamchatka or the Kuriles.

Alectrias alectrolophus (Pallas).

Specimens were taken at Unalaska, Attu, Medni, and Bering Islands, Petropavlovsk, and at stations 4777 and 4778 on Petrel Bank; depth 52 and 43 fathoms.

The interorbital crest does not develop uniformly in this species, in a specimen 85 mm. long from Unalaska the crest is undeveloped; normally the crest is fully developed in specimens of this length.

ALECTRIDIDIUM, new genus (Blenniidae).

Body compressed, with embedded scales posteriorly; lateral line absent. Teeth on jaws, vomer, and palatines; the teeth near the tip of the jaws somewhat enlarged but scarcely canineline. Gill membranes united, slightly connected with the isthmus, with a broad free fold behind; branchiostegals 5. Dorsal fin composed of flexible spines anteriorly, of rigid spines posteriorly; no anal spines; no ventral fins. Closely related to *Alectrias* but differing in the absence of the lateral line.

Type *Alectridium aurantiacum*, new species.

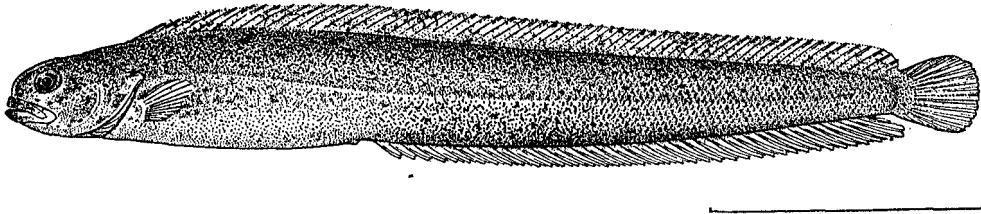


FIG. 31.—*Alectridium aurantiacum*, new species. Type.

***Alectridium aurantiacum*, new species. (Fig. 31.)**

Type 83 mm. long, from Nikolski, Bering Island.

Head 15.5 hundredths of length without caudal; depth 13.5; eye 3; maxillary 6.2, snout 3.2; pectoral 5; caudal 10. Dorsal LXII; anal 43; pectoral II.

Head and body compressed; interorbital and occipital region compressed, forming a sharp ridge; the ridge represented on the anterior part of the interorbital and the snout by a fold of skin or crest; mouth slightly oblique; lips thin; maxillary extending to vertical from posterior margin of eye. Scales small, present only on the posterior half of the body, embedded in the skin; lateral line absent; a series of pores around eye, extending backward to above opercular flap; another series along edge of preopercle; a few on top of head.

Origin of dorsal above base of pectoral; last spine shortened, connected to caudal; origin of anal nearer tip of snout than base of caudal by a distance equal to head and pectoral, the last ray connected for half its length to base of caudal; caudal rounded.

Color in life, orange chrome above, saturn red below; in alcohol, ochraceous, finely speckled with dark brown; a narrow black line sharply contrasted along edge of opercle and branchiostegal membrane. Only the type taken.

Anoplarchus atropurpureus (Kittlitz).

Unalaska, Atka, Agattu, and Attu Islands; abundant.

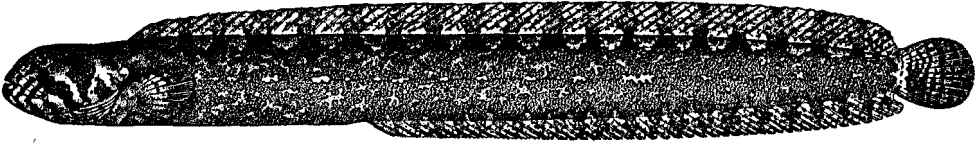


FIG. 32.—*Anoplarchus insignis*, new species. Type.

Anoplarchus insignis, new species. (Fig. 32.)

Type 102 mm. long, from Attu Island.

Head 14.3 hundredths of length without caudal; depth 10.5; eye 2.7; maxillary 5.5; pectoral 6.2. Dorsal LXI; anal 45.

Body slender; head with a low crest; jaws equal; maxillary extending to vertical from posterior margin of pupil; teeth in narrow bands on the jaws, vomer, and palatines, the outer series on the jaws enlarged, largest anteriorly.

Origin of dorsal above base of pectoral; origin of anal nearer tip of lower jaw than base of caudal by a distance equal to the head and 0.5 pectoral; dorsal and anal only slightly connected to the caudal; caudal rounded; pectoral acute, of 9 rays.

Posterior half of body with circular embedded scarcely imbricated scales; pores of lateral line minute, but distinct throughout its course.

Color olive-brown, lighter below; a series of 19 irregular V-shaped grayish spots on the back along the base of the dorsal fin; a series of irregular pale spots along middle of sides; a dark spot at origin



FIG. 33.—*Xiphistes versicolor*, new species. Type.

of dorsal; dorsal and anal pale, spotted, and variegated with brown; caudal finely crossbarred; pectoral pale; cheeks, lips, and chin crossbarred; a narrow black line along edge of gill flap.

This species differs from *A. atropurpureus* in the more numerous dorsal spines and anal rays, in the origin of the anal fin, and in the more variegated coloration.

Seventeen specimens besides the type were taken at Attu Island.

Xiphistes versicolor, new species. (Fig. 33.)

Type 175 mm. long, from Attu Island, Bering Sea.

Head 11 hundredths of length without caudal; depth 9.8; eye 1.7; snout 2; maxillary 3.7; distance snout to dorsal 11.5; length of pectoral 2.7. Dorsal LXXV; anal II, 49. In five cotypes the fin rays are as follows: Dorsal LXXVII, LXXVI, LXXV, LXXV, LXXIV; anal II-51, II-50, II-50, II-50, II-49.

Body eel-shaped; head short, slender; mouth very oblique; maxillary extending to vertical from pupil; teeth strong, conical, the outer series enlarged. Lateral lines as in *Xiphistes ulvæ*, the upper branches of the upper lateral line extending upon the dorsal membrane, the lower line on sides not connected with the abdominal line; 5 lines diverge downward and backward from lower border of orbit.

Color in life extremely variable; one specimen dark brownish olive above, dull olive on under parts, no mottlings; a series of light spots at base of dorsal posteriorly, and a series of 8 or 9 small white spots along middle of sides posteriorly, each with a small dark spot before and one behind it; anal marked posteriorly with reddish brown and yellowish bars; a narrow dark streak from tip of snout through eye and a short distance beyond. A second specimen is uniform brownish orange above, orange below, without darker mottlings or light areas at base of dorsal; the bars of light and of reddish orange on posterior part of anal are conspicuous, as are the ocellated spots on lateral line. A small specimen is finely mottled above and on sides with blackish and light yellowish, the lower part of sides clear yellow; dorsal fin mottled like the back; anal anteriorly yellow like the belly, posteriorly with faint reddish and yellowish bars; caudal with a narrow basal bar, distally more or less mottled; pectoral yellow; cheeks yellow, with two or three small dark spots; a rather poorly defined dark streak forward from eye to tip of snout, and one horizontally backward from eye.

This species resembles *Xiphistes ulvæ* but differs in having 2 anal spines and a shorter head; it differs from *Xiphistes chirus* in the number of dorsal spines and the character of the lateral lines.

Nine specimens from Agattu, 8 from Attu.

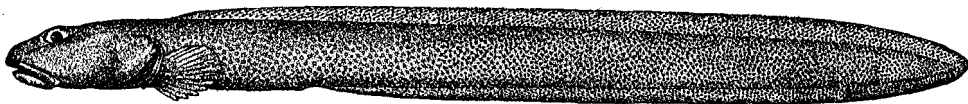


FIG. 34.—*Lycodes camchaticus*, new species. Type.

***Opisthocentrus ocellatus* (Tilesius).**

Very abundant at Petropalovsk.

The spots on dorsal fin are never set off very sharply and conspicuously; at the upper edge of each spot is a crescent-shaped light area which is bright orange in life. In adults the light areas on sides are yellow or orange yellow in life, the pectorals and caudal yellow, the anal yellow or dusky yellow, with a white margin and an orange intramarginal line.

SCYTALINIDÆ.

***Scytalina cerdale* Jordan & Gilbert.**

One specimen from Agattu Island. Length 53 mm.

The only other locality from which this species is recorded is Neah Bay, Wash., where it was found to be common.

ZOARCIDÆ.

***Lycodes camchaticus*, new species. (Fig. 34.)**

Type 246 mm. long, from station 4797, off Avatcha Bay, east coast of Kamchatka; depth 682 fathoms.

Measurements in hundredths of total length: Length of head 16.5; depth of body 7; width of head at cheeks 9.5; width at opercles 6; interocular width 1.5; longitudinal diameter of eye 3.2; length of snout 4.8; length of maxillary (measured from tip of snout) 7; distance from tip of snout to nape 11.3; from nape to front of dorsal 7.2; from tip of snout to ventrals 13; to front of anal 32.5; length of ventrals 2; length of pectorals 7; height of gill slit 6.

Slender, of nearly uniform depth throughout, the body everywhere a little compressed; opercular region compressed, like the body, the occiput depressed and flat, the cheeks greatly swollen, the snout depressed, wider than deep. Mouth slightly oblique, the maxillary reaching the vertical from posterior border of orbit; teeth small, conical, none of them enlarged; those on premaxillaries in a single irregular series, within which near the median line, one or two supplementary teeth; those on mandible in a very short broad band; one or two teeth on head of vomer; a short single series on palatines, the premaxillary series shuts outside the mandibular band and also extends beyond it laterally. A series of wide slitlike pores on preorbital and mandible. The gill opening begins on the level of the eye and reaches a point in front of lower pectoral ray.

Scales small, without definite arrangement, continued on vertical fins and on basal half of posterior face of pectorals; they are more crowded on abdomen, and become reduced in size on nape and on upper half of opercle, the rest of head being naked.

Origin of dorsal above middle of pectoral; posterior line of occiput midway between front of eye and origin of dorsal. Ventrals very small, not reaching the line joining lower pectoral rays, this line midway between tip of snout and vent.

Color olive-brown, in life with greenish gilt in varying amount on top and sides of head and front face of pectorals; lower parts darker.

Three cotypes were taken at station 4797, with the type.

Bothrocara mollis Bean.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	<i>Fathoms.</i>
4775.....	54 33 30 N.	178 44 E.	584
4797.....	52 37 30 N.	158 50 E.	682

Bowers Bank, Bering Sea, and the vicinity of Avatcha Bay, east coast of Kamchatka.

GADIDÆ.

Eleginus navaga (Kölreuter).

Petropavlovsk.

Gadus macrocephalus Tilesius.

Unalaska.

Antimora microlepis Bean.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	<i>Fathoms.</i>
4771.....	54 30 N.	179 17 E.	426
4781.....	52 14 30 N.	174 13 E.	482
4797.....	52 37 30 N.	158 50 E.	682

Bowers Bank, Bering Sea, and the vicinity of Avatcha Bay, Kamchatka.

MACROURIDÆ.

Macrourus acrolepis Bean.

LIST OF STATIONS.

Stations.	Latitude.			Longitude.			Depth.
	°	'	"	°	'	"	
4765.....	53	12	N.	171	37	W.	Fathoms. 1,217
4767.....	54	12	N.	179	07	30 E.	771
4768.....	54	20	30 N.	179	09	30 E.	764
4771.....	54	30	N.	179	17	E.	426
4772.....	54	30	30 N.	179	14	E.	344-372
4774.....	54	33	N.	178	45	E.	557-584
4775.....	54	33	30 N.	178	44	E.	584
4797.....	52	37	30 N.	158	50	E.	682

Found abundant at suitable depths along the northern side of the Aleutian Islands and the east side of Kamchatka.

The first dorsal is unusually short in this species, 11,9 and 11,10 being the formulas most frequently met, 11, 11 more rarely found.

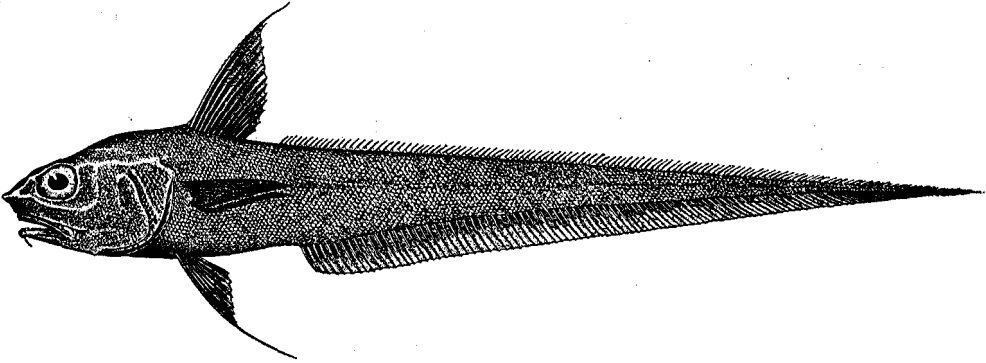


FIG. 35.—*Macrourus lepturus* Gill & Townsend. Type, from Albatross station 3004, south of the Pribilof Islands, depth 1401 fathoms.

***Macrourus lepturus* Gill & Townsend. (Fig. 35.)**

The species is most closely related to *M. acrolepis*, but is unquestionably distinct. It differs from *acrolepis* in the smaller eye, wider interorbital, longer maxillary, longer ventrals, more numerous rays in the first dorsal, the more posterior position of the vent, and the thinner scales with lower less divergent ridges and lower spines.

First dorsal 11, 12; pectoral 22; ventral 9. Orbit 4 to 4.33 in head; snout 3.66; interorbital width 4.5; length of maxillary 2.75; length of ventral 1 to 1.25; length of pectoral 1.75; length of second dorsal spine 1.33.

Teeth small, in narrow bands, none of them strongly specialized, the outer series in upper jaw very slightly enlarged.

Base of ventrals nearly midway between orbit and vent, the latter directly in advance of origin of anal. First dorsal inserted over base of pectoral; interval between dorsals equaling two-thirds base of first dorsal; second dorsal spine long, filamentous at tip, with 26 prickles, which begin a short distance above the base and become stronger distally.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° /	° /	Fathoms.
4764.....	53 20 N.	171 W.	1, 130
4765.....	53 12 N.	171 37 W.	1, 217

Two specimens 375 and 550 mm. long, off Yunaska Island, Aleutian chain.

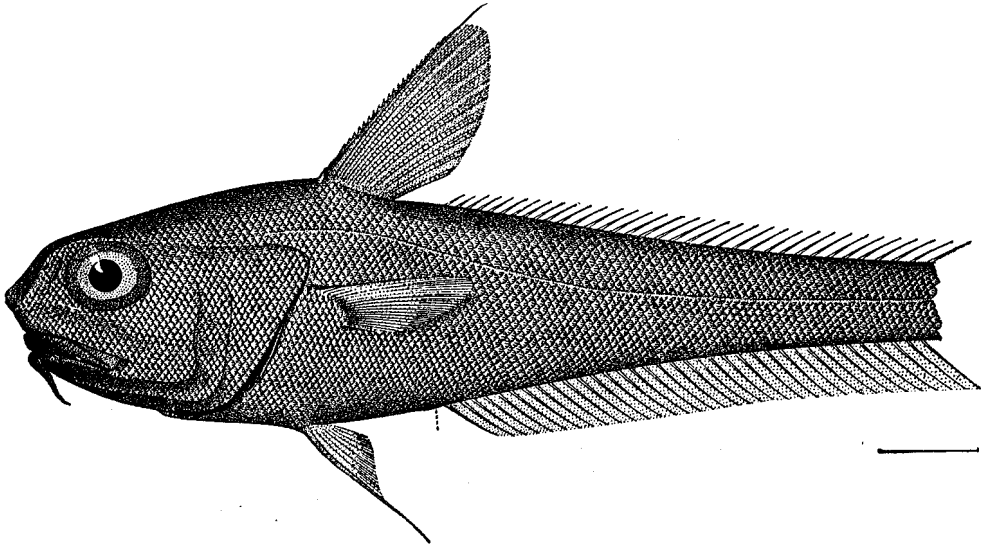


FIG. 36.—*Chalinura spinulosa*, new species. Type.

Macrourus cinereus Gilbert.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° / "	° / "	Fathoms.
4767.....	54 12 N.	179 07 30 E.	771
4768.....	54 20 30 N.	179 09 30 E.	764
4771.....	54 30 N.	179 17 E.	426
4772.....	54 30 30 N.	179 14 E.	344-372
4774.....	54 33 N.	178 45 E.	557-584
4775.....	54 33 30 N.	178 44 E.	584
4797.....	52 37 30 N.	158 50 E.	682

Found at the same depths and in the same localities in Bering Sea with *M. acrolepis*, and even more abundant.

Chalinura spinulosa, new species. (Fig. 36 and 36a.)

Type 41 cm. long, from station 4797, off Avatcha Bay, east coast of Kamchatka; depth 682 fathoms.

Differing from all described species in having a very large eye, the diameter of which greatly exceeds interorbital width or the length of the short rounded snout.

Measurements in hundredths of body length, from tip of snout to anus: Length of body anterior to anus 115 mm.; length of head 70 hundredths; length of snout 18; length of maxillary 27; diameter of orbit 21; interorbital width 15; distance from orbit to angle of interior preopercular crest 22.5; depth at front of dorsal 56; length of barbel 12; distance from tip of snout to front of dorsal 78; length of base of first dorsal 17.5; length of interval between dorsals 9; distance from tip of snout to base of ventrals 75; length of second dorsal spine 56; longest pectoral ray 37; length of filamentous ventral ray 35.

First dorsal 11, 9; pectoral 19; ventral 8; branchiostegals 6.

Head high, compressed, with vertical cheeks which bear no keels or ridges; snout short and high, nearly truncate, protruding but little beyond mouth; no ridge on preorbital, no projecting angles bearing rosettes of spines; mouth large, with lateral cleft, the maxillary extending slightly beyond vertical from posterior edge of pupil; teeth in premaxillaries in a moderate cardiform band, widest at symphysis, the outer series anteriorly of enlarged canines, these decreasing in size laterally and disappearing at middle of length of mouth; mandibular teeth cardiform, anteriorly in a narrow band with the inner series a little enlarged, laterally narrowing to a single irregular series. Gill rakers represented by 6 blunt tubercles on anterior arch. Preopercular margin nearly vertical, the angle only very slightly produced. Branchiostegals strong; 6 in number.

First dorsal inserted above base of pectoral; interval between dorsals very short, a trifle more than half length of base of first dorsal; second dorsal spine with a short filamentous tip, its anterior margin with rather coarse appressed spinelets, except a short distance at base and the filamentous tip; pectoral short, reaching slightly beyond front of anal fin; outer filamentous ventral ray reaching base of third or fourth anal ray; vent immediately in front of first anal ray.

Scales firm, adherent, those on middle of trunk with 5 strong diverging ridges bearing recumbent spines. About 8 scales in an oblique series between lateral line and base of first dorsal fin; lateral line forming a strong arch anteriorly.

Color dark brown, darker below; gill membranes, gill cavity, and mouth black.

Only the type taken.

The species is closely related to *C. altipinnis* Günther, taken by the *Challenger* at great depths off the coast of Japan. Günther assigns *altipinnis* to the genus *Coryphaenoides*, despite the outer series of stronger teeth in the premaxillaries, and the fact that the heterodont dentition of *Chalinura* forms the only distinguishing characteristic of the genus.

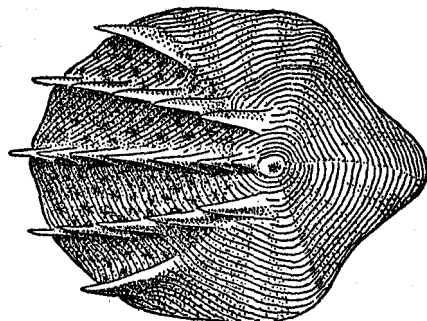


FIG. 36a.—*Chalinura spinulosa*, scale from above lateral line.

Nematonurus clarki Jordan & Gilbert.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4768.....	54 20 30 N.	179 09 30 E.	764
4774.....	54 33 N.	178 45 E.	557-584
4775.....	54 33 30 N.	178 44 E.	584

Numerous specimens taken as above on Bowers Bank in Bering Sea.

The length of the interval between the dorsal fins is less in *Bogoslovius (clarki)* than in the type of *Nematonurus*; but this is a most variable character among closely related species throughout this group and can not be accorded generic value. In no other respect does *Bogoslovius* differ from *Nematonurus*.

ATELEBRACHIUM, new genus (Macrouridæ).

A remarkable pelagic form, distinguished by the strikingly pedunculated pectoral fins, and the filamentous first dorsal and ventral fins.

Body shaped like *Macrourus*, but short and deep. Barbel present, minute. Fine teeth in narrow bands in jaws, none on vomer or palatines. First branchial arch with a membranous fold; a wide slit behind fourth arch; gill rakers tuberclelike. Second dorsal spine and the succeeding rays elongate, filamentous, the last 3 shortened. Ventrals widely separated, of filamentous rays, the outer ray apparently detached. Pectoral inserted at the end of a long movable stalk, the base of which is slender, the tip widening into a kidney-shaped lobe, around the posterior margin of which the short rays are inserted.

Type, *Atelebrachium pterotum*, new species. (Fig. 37.)

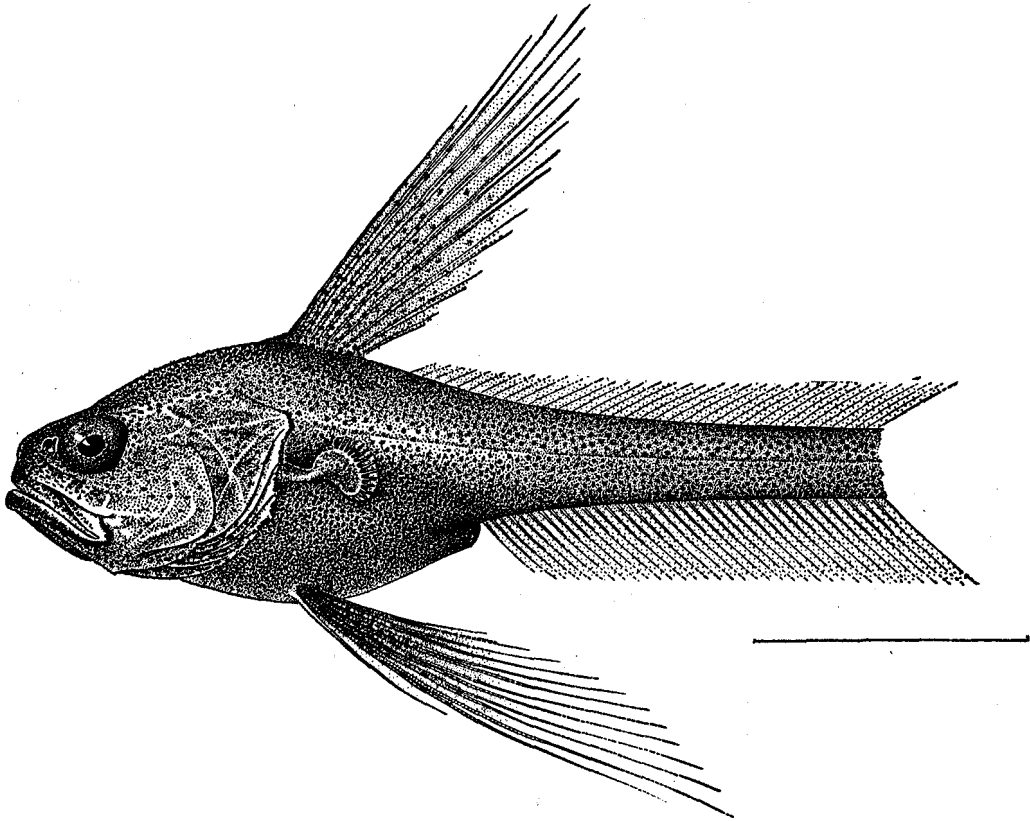


FIG. 37.—*Atelebrachium pterotum*, new species. Type.

***Atelebrachium pterotum*, new species.**

Type about 90 mm. long, from station 4797, off Avatcha Bay, east coast of Kamchatka; taken with intermediate net hauled at 300 fathoms.

Measurements in hundredths of length from tip of snout to vent (22 mm.): Length of head 59; length of snout 12; diameter of eye 16; interorbital width 15; length of maxillary 28; depth at origin of dorsal 56; width of head 34; distance from tip of snout to front of dorsal 64; length of first dorsal base 19; interval between dorsals 7; distance from tip of snout to base of ventrals 70; length of brachial peduncle 21.

Head compressed, the nape high, cheeks vertical without projecting lateral ridges; mouth large, the maxillary reaching vertical from posterior margin of pupil. Opercle without evident spine. Barbel small.

First dorsal ray short, the following 6 rays produced and filamentous, their tips reaching middle of tail. Ventrals inserted slightly behind base of pectorals, the rays all filamentous, the longest nearly twice as long as the head. Pectoral rays short, equal, inserted along the strongly convex margin of the kidney-shaped lobe which terminates the stalk.

Color dark brown on the back, lighter on the sides; abdomen black.

Only the type taken.

PLEURONECTIDÆ.

Hippoglossoides elassodon Jordan & Gilbert.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4786.....	54 51 30 N.	167 14 E.	54
4787.....	54 50 50 N.	167 13 30 E.	54-57
4795.....	52 46 50 N.	158 44 30 E.	48-69
4796.....	52 47 N.	158 43 E.	48

About the Komandorski Islands and off the east coast of Kamchatka.

Lepidopsetta bilineata (Ayres).

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4778.....	52 12 N.	179 52 E.	33-43
4786.....	54 51 30 N.	167 14 E.	54

Dredged on Petrel Bank and the Komandorski Plateau; taken with the seine at Unalaska, Nazan Bay, Atka Island, and in Avatcha Bay, Kamchatka.

Limanda aspera (Pallas).

Avatcha Bay, Kamchatka, and at station 4798, on the codfish banks on the west coast of Kamchatka (51° 37' N.; 156° 21' E.); depth, 25 fathoms.

Pleuronectes quadrituberculatus Pallas.

LIST OF STATIONS.

Stations.	Latitude.	Longitude.	Depth.
	° ' "	° ' "	Fathoms.
4795.....	52 46 50 N.	158 44 30 E.	48-69
4796.....	52 47 N.	158 43 E.	48

Seined in Avatcha Bay, Kamchatka, and dredged in shallow water outside the bay.

***Liopsetta glacialis* (Pallas).**

Abundant in Avatcha Bay, Kamchatka.

Twenty-seven specimens were preserved, of which the majority are males, with the interorbital space covered with rough ctenoid scales, though these may be reduced in number; females have the interorbital naked, or with a few hidden cycloid scales. Pectoral fin in the male about two-thirds length of head; in females, half head.

***Platichthys stellatus* (Pallas).**

Nazan Bay, Atka Island, and Avatcha Bay, Kamchatka.