

SMITHSONIAN MISCELLANEOUS COLLECTIONS

VOLUME 91, NUMBER 15

Johnson Fund

REPORTS ON THE COLLECTIONS OBTAINED BY THE FIRST
JOHNSON-SMITHSONIAN DEEP-SEA EXPEDITION
TO THE PUERTO RICAN DEEP

TWO NEW CONGRID EELS AND A NEW FLATFISH

(WITH ONE PLATE)

BY

EARL D. REID

Aid, Division of Fishes, U.S. National Museum



(PUBLICATION 3251)

CITY OF WASHINGTON
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The Lord Baltimore Press
BALTIMORE, MD., U. S. A.

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TWO NEW CONGRID EELS AND A NEW FLATFISH

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(WITH ONE PLATE)

Examination of the fishes of the families Congridae and Pleuronectidae obtained by the First Johnson-Smithsonian Deep-Sea Expedition reveals three undescribed forms, two of which belong to the former and one to the latter group.

Family CONGRIDAE

Comparison of the present congrids with material in the National Museum and examination of the literature leads to uncertainty as to the proper generic assignment of these specimens. It would seem that the confusion regarding the generic relationship of the congrid eels is due, at least in part, to the flexibility of the characters upon which several of the genera are based. Parr,¹ in his discussion of *Ariosoma* and related genera, points out the unreliability of the definition of tooth characters as construed by various authors, showing that interpretation of the definitions as well as of the tooth characters themselves is more or less a matter of individual notion. The genus *Ariosoma*, as now understood, embraces several closely related groups, the ultimate separation of which must be accomplished before we can hope for an understandable taxonomic arrangement of the congrids. These groups can be worked out and properly classified only when studied on a cosmopolitan basis, as there can be no doubt that generic relationship among the congrid eels is distributed over widely separated areas. As pointed out above, tooth character alone has very little value, since the variations are so extensive that intergradations are found throughout the group almost without exception. However, the shape and position of the dental plates, spacing of the groups, and width of the bands of teeth seem to be the most reliable dental characters for purposes of generic distinction.

¹ Bull. Bingham Oceanogr. Coll., vol. 3, art. 5, pp. 19-31, 1932.

P. Bleeker² described and figured the peculiar bonelike supports of the upper lip in *Uroconger lepturus* (Richardson), and in a recent paper P. J. Schmidt³ describes and figures the labial elements and throws further light upon their structure and function. Schmidt erred in his structural description of these bony rays in denying their connection or articulation with other bones of the head, stating that they were free elements of the lip and not connected with any facial bones. This author also refers to the porelike slits in the lip as pocketlike invaginations between the labial bones, which facilitate the stretching out of the membrane, and says they are not muciferous pores as was generally supposed.

Examination of the congrid material in the National Museum reveals the presence of these labial elements in various degrees of development throughout the entire group of congrids. The bones are present and can be detected with the aid of a pointed instrument in genera with a free superior margin to the upper lip (example *Ariosoma*), though the development is comparatively rudimentary in eels of this type. In *Uroconger lepturus* the bony rays reach their peak of development and are useful as distendable supports of the labial membrane. Partial dissection of a paratype of one of the new forms reveals a longitudinal bony muciferous canal extending from near the base of the anterior nostril, laterally just above the lip, to the posterior border of the orbital rim, where it bends upward following the curvature of the eye. The interior, superior, and inferior walls of the tube are bony. The exterior is open the entire length and covered only by the skin. There are three small processes along the inferior flange of the tube projecting into the labial membrane and appearing as minute subdermal points on the oral edge of the lip. Examination of *U. lepturus* reveals the same basic principle of development of the labial bones. In genera in which the upper lip is without a free superior margin (example *Congrina*) the labial bones reach the extreme margin of the lip and in some instances project prominently beyond the margin. The muciferous pores of the lip in this type of eel communicate with the facial muciferous canal by very short tubes, it being possible to insert a bristle in one slit and extract it from another. The writer, in one of his new forms, inserted a bristle in the anterior pore and passed it along the tube to a point opposite the posterior border of the eye, showing that these slitlike openings are vents of the muciferous channel and not pocketlike pits for facilitating expansion of the labial membrane, as contended by Schmidt.

² Atlas Ichth. Ind. Neerl., vol. 4, p. 29, pl. 149, fig. 1, 1864.

³ C.R. Acad. Sci. U.R.S.S., 1929, pp. 189-193, figs. a-d.

Parr⁴ has given a useful discussion of the congridrids related to *Ariosoma*, in which he synonymizes a large number of genera and shows that Jordan and Hubbs' revision of the Japanese genera⁵ (the only recent revisional attempt of any great scope) cannot be accepted without modification. No one seems to have utilized the labial bones in defining genera, save in the case of *Uroconger* (Bleeker, Schmidt), although these structures seem to be important.

The writer has studied a number of species of congridrids from both the Atlantic and the Indo-Pacific and finds that most of them fall into apparently well-defined genera, based on the formation of the labial bones, the presence or absence of a free upturned upper lip, and the form of the vomerine patch of teeth. Of *Ariosoma* and related groups, the following have been studied: *A. selenops* Reid, *A. balaerica* (de la Roche),⁶ *A. gilberti* (Ogilby), and several Japanese forms, which may (according to Jordan and Hubbs) be referable to distinct genera. Of *Promyllantor*, two species, *P. alcocki* Gilbert and Cramer and *P. perturbator* (Parr), have been examined. The type specimens of the type species of all the genera referred below to the synonymy of *Congrina* (save *Pseudoxenomystax dubius* Breder) have been studied, as well as examples of *Bathyroconger braueri* (Weber and de Beaufort) and of *Uroconger lepturus* (Richardson). The writer cannot see that *Uranconger* Fowler and *Microcephalocongrus* Fowler differ from the species of *Congrina* in anything but relatively unimportant specific differences.

The key given is entirely provisional, since many more species and genera will have to be examined to determine their exact relationships, but it is felt that the groupings adopted are more natural than any hitherto proposed.

KEY TO GENERA OF CONGRIDAE DISCUSSED IN THIS PAPER

- 1a. Upper lip turned upward into a flange; bones of the facial canal not sending pointed processes into the upturned lip-flange.
Ariosoma Swainson (and related genera).
- 1b. Upper lip without flange; bones of facial canal sending pointed processes to edge of lip.
 - 2a. Teeth of vomer not extending far back on the shaft in a single series; inner bony casing of facial canal sending 2 or 3 short processes downward to edge of the moderately extensible upper lip.

⁴ Bull. Bingham Oceanogr. Coll., vol. 3, art. 5, pp. 19-31, 1932.

⁵ Mem. Carnegie Mus., vol. 10, no. 2, pp. 191-197, 1925.

⁶ American specimens; Norman (Ann. Mag. Nat. Hist., ser. 9, vol. 15, p. 314, 1925) gives data to show that the American *Ariosoma opisthophthalma* (Ranzani) differs from *A. balaerica*.

- 3a. Teeth very short, the patches almost pavementlike in appearance; vomerine patch of teeth widened posteriorly, covering much of roof of fore part of mouth, and confluent with the premaxillary patch; top of snout swollen.....*Promyllantor* Alcock.
- 3b. Teeth longer, the patches never with the appearance of being pavementlike, vomerine patch never widened but always narrowed posteriorly and distinctly separated from the premaxillary patch; top of snout little or not at all swollen.
- 4a. Snout considerably projecting, all of the premaxillary teeth visible from directly below with mouth tightly closed; dentition normal, the teeth not greatly enlarged; color not blackish.
Congrina Jordan and Hubbs.
- 4b. Snout scarcely longer than lower jaw, nearly all the premaxillary teeth hidden when viewed from directly below with mouth closed; dentition very strong, teeth of premaxillary, front of vomer, and front of lower jaw greatly enlarged canines; blackish eels from deep water.....*Bathyyuroconger* Fowler.
- 2b. Teeth of vomer extending backward in a single series to below middle of eye; bony casing of facial canal sending 2 or 3 long slender processes far backward and downward to support the very extensible upper lip.
Uroconger Kaup.

ARIOSOMA Swainson

ARIOSOMA SELENOPS, n. sp.

Text-fig. 1

Holotype.—U.S.N.M. no. 93310 (Field no. 653), 475 mm standard length; *Caroline* station 101, due north of Tobago Island, latitude $18^{\circ}40'30''$ N., longitude $64^{\circ}50'00''$ W., to latitude $18^{\circ}45'40''$ N., longitude $64^{\circ}48'00''$ W., March 4, 1933, otter trawl, 190 to 300 fathoms.

Paratypes.—U.S.N.M. nos. 93311-93312 (Field nos. 638-639), two specimens, 343 to 414 mm standard length; from *Caroline* station 100, due north of Tobago Island, latitude $18^{\circ}38'45''$ N., longitude $64^{\circ}52'45''$ W., to latitude $18^{\circ}40'15''$ N., longitude $64^{\circ}50'15''$ W., March 4, 1933, otter trawl, 100 to 300 fathoms.

Body elongate, scaleless, the caudal portion compressed posteriorly. Head 5.9 in total length; snout to vent 2.3; tail 1.6; tip of snout to dorsal origin 6.1; isthmus to vent 3.9. Snout 5 in head; maxillary 3.7; mandible 4; pectoral fin 2.8; longitudinal diameter of orbit (including adipose membrane) 5.2; vertical diameter 8, equal to inter-orbital; depth of head at end of second third 2.7; body at vent 3.2. Width of isthmus unusually narrow, 13.3 in length of head or about equal to base of pectoral. Width of head at end of second third 3.4; body at vent 4.6. Teeth small, sharp, conical, in bands on the jaws. Premaxillary and vomerine groups not separated by an interspace but forming a continuous patch anteriorly, extending back on

the shaft of the vomer in an oblong patch of more or less bluntish teeth to opposite the anterior edge of eye. Lateral teeth in four irregular rows becoming broader anteriorly, all of nearly uniform size and loosely attached, being depressible backward. A few teeth in the premaxillary group slightly enlarged and caninelike. Tongue free anteriorly and laterally, narrow and acutely pointed. Snout projecting slightly beyond tip of mandible so that the foremost teeth of the premaxillary group are visible when viewed from beneath. Anterior nostril in a short tube near tip of snout; posterior one in a small pore-like opening well before eye. Eyes large, about equaling snout, with

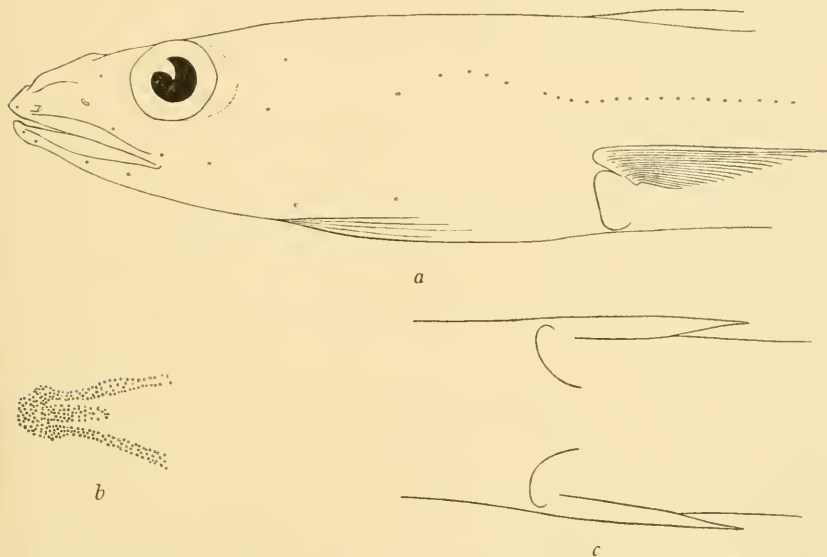


FIG. 1.—*Ariosoma selenops*. Holotype, U.S.N.M. 93310. *a*, Side view of head; *b*, upper dentition; *c*, isthmus. Natural size. Drawings by Mary Wallace.

conspicuous adipose membrane partly concealing the orbital rim. Gill-openings large, vertical, extending from upper third of pectoral base to ventral surface, where they are separated by a narrow isthmus about equal to pupil diameter. Gape moderate, about reaching opposite the anterior edge of pupil. Lips forming a thin flange with a free superior border, the basal portion behind the outer fold concealing small bony supports similar to those found in *Uroconger lepturus* Richardson. Though distinctly present, they are much smaller than those found in the above-mentioned species and are probably not functional as distensible supports of the lip. Pores of the head small, few in number and not especially noticeable, one at the base of the nostril tube pos-

teriorly, one above the upper lip at a point midway in the length of the gape, one below the eye, and two behind the orbit. There is a linear series of six small pores on the mandible below the lower lip, followed by two on the subbranchial region. The lateral line originates midway between the eye and gill-opening and continues to the hypural. There are 166 pores in its course, the last 6 or 7 without external openings. The eleventh above the pectoral base, twentieth above tip of pectoral, and fifty-seventh above the vent. Vertical fins of medium height confluent around the caudal. Color faded in alcohol to a light brownish, the ventral surface lighter. Dorsal fin with a black margin, anal with a black border posteriorly, pectoral pale. Surface of head and body sprinkled with fine dark points, most noticeable on the branchial region, about the eye, and at the corner of the mouth, where they form dark shades.

This species is very closely related to *Congromuraena mellissii* Günther,⁷ agreeing perfectly with Günther's brief diagnosis of his St. Helena specimen. However, a second example recorded and figured from the type locality by Cunningham⁸ shows that our fish disagrees with that species in having a longer snout, smaller mouth, lower fins, and a very different gill-opening. It differs from *Ariosoma balaerica* (Delaroché)⁹ in the more anterior insertion of the dorsal fin, longer tail, and in the much narrower isthmus, which in our specimen is much narrower than in any other congrid eel the writer has seen.

Measurements of the three specimens in millimeters are given below. Under each measurement three figures are given, referring, in order, to the three specimens.

Total length 475, 414, 345; head 80, 74, 62; snout to vent 202, 177, 145; vent to end of tail 274, 236, 195; orbit length including adipose eyelid 15.5, 15, 12; snout 16, 15, 12; maxillary 21.5, 19, 18; mandible 20, 17.5, 16.5; pectoral fin 28, 23, 20; branchial opening 13, 11, 9; tip of snout to dorsal origin 78, 73, 62; isthmus to vent 120, 104, 85; depth of head at end of its second third 30, 27, 22; width of head at same point 23.7, 22, 18; depth of body at vent 25, 22, 18; width of body at vent 17.5, 16, 13; width of isthmus 6.5, 5, 4.7; width of interorbital 10, 9, 7.3; eye, vertical diameter 10, 9, 8.5; height dorsal fin 7, 6, 4; longest ray of dorsal fin 11, 10, 8; height anal fin 5, 4, 4; pores in lateral line 160+6, 160+8, 160+7.

⁷ Cat. Fish. British Mus., vol. 8, p. 42, 1870.

⁸ Proc. Zool. Soc. London, 1910, p. 93, pl. 4, fig. 1.

⁹ See Norman (Ann. Mag. Nat. Hist., ser. 9, vol. 15, p. 314, 1925), for probable differences between *balaerica* and the American *opisthophthalma*.

CONGRINA Jordan and Hubbs

- Congrina* Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, no. 2, p. 196, 1925 (genotype *Congermuraena aequorca* Gilbert and Cramer).
Hildebrandia Jordan and Evermann, Proc. California Acad. Sci., ser. 4, vol. 16, no. 15, p. 502, 1927 (genotype *Congermuraena flava* Goode and Bean).
Pseudoxenomystax Breder, Bull. Bingham Oceanogr. Coll., vol. 1, no. 1, p. 6, 1927 (genotype *P. dubius* Breder).
Microcephalocongrus Fowler, Proc. Acad. Nat. Sci. Philadelphia, vol. 85, p. 270, 1934 (genotype *Bathycongrus megalops* Fowler).
Uranoconger Fowler, tom. cit., p. 274, 1934 (genotype *U. odontostomus* Fowler).

The following species are referred to *Congrina*: *C. aequorea* (Gilbert and Cramer), *C. retrotincta* (Jordan and Snyder) *C. stimpsoni* (Fowler), *C. megalops* (Fowler), *C. odontostomus* (Fowler), *C. flava* (Goode and Bean), *C. roosendaali* (Weber and De Beaufort), *C. nitens* (Jordan and Bollman), and *C. dubia* (Breder). The figure and description of *Pseudoxenomystax* are so similar to my new species (especially in view of Parr's remarks) that I believe it belongs here. The new species differs from all these in various proportional measurements. It is especially close to *C. retrotincta* but differs in the shorter preoral length of the snout and in having a distinct black margin the full length of the vertical fins. From *C. dubia* it is distinguished by the longer trunk, more attenuated tail, and by the shape of the vomerine patch of teeth.

CONGRINA THYSANOCHILA, n. sp.

Text-fig. 2

Holotype.—U.S.N.M. no. 93434 (Field no. 137); 250 mm standard length; from *Caroline* station 23, off Punta Cerro Gordo, north coast of Puerto Rico, latitude $18^{\circ}32'15''$ N., longitude $66^{\circ}17'45''$ W., to latitude $18^{\circ}32'00''$ N., longitude $66^{\circ}21'15''$ W., February 4, 1933, otter trawl, 260 to 360 fathoms.

Paratype.—U.S.N.M. no. 93466 (Field no. 640); 225 mm standard length; from *Caroline* station 100, due north of Tobago Island, latitude $18^{\circ}38'45''$ N., longitude $64^{\circ}52'45''$ W., to latitude $18^{\circ}40'15''$ N., longitude $64^{\circ}50'15''$ W., March 4, 1933, otter trawl, 100 to 300 fathoms.

Body elongate, compressed posteriorly, with the caudal region attenuated, though the fin distinct. Head 6.4 in the standard length; tip of snout to dorsal origin 5.6; to vent 2.7; isthmus to vent 4.3. Eye 5 in head; snout 4; maxillary 2.6; mandible 3.2; pectoral fin 3.6; depth of head at end of second third 2.6; width at same point 3.1. Gill-openings extending downward and forward, about equal to interorbital or

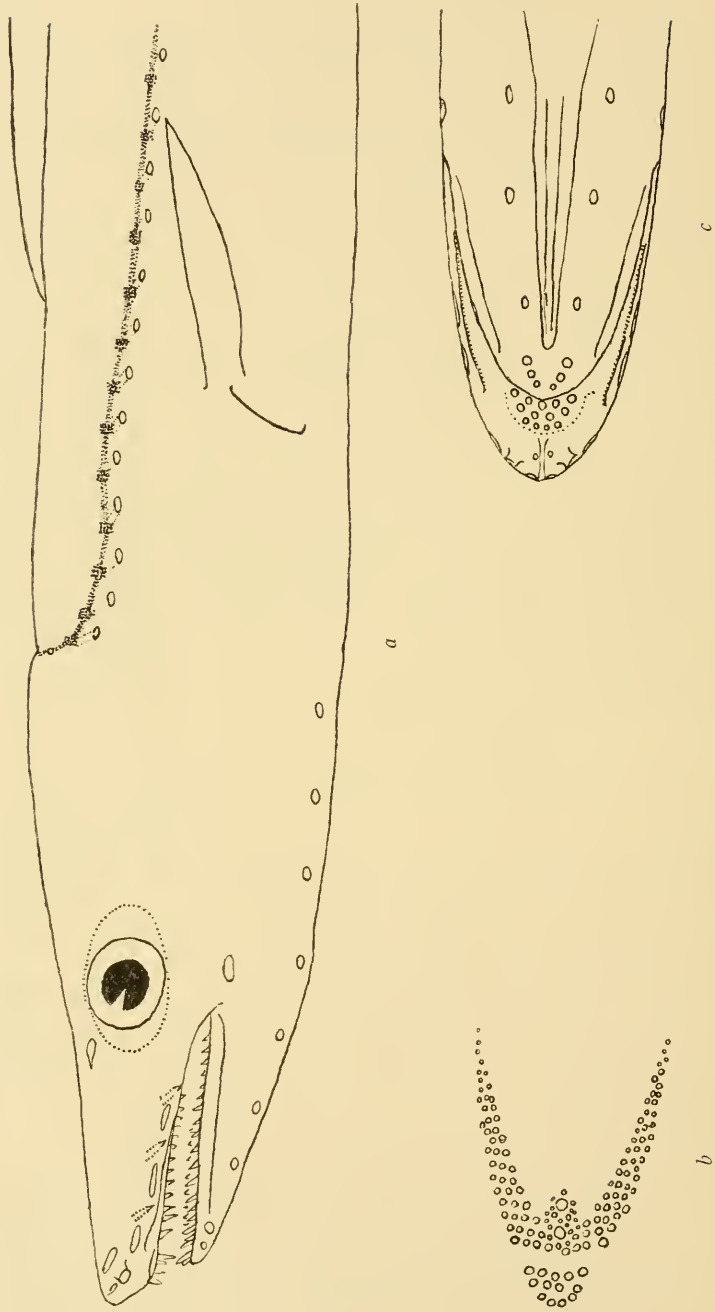


FIG. 2.—*Congrina thysanochila*. Holotype, U.S.N.M. 93434. *a*, Side view of head;
b, upper dentition; *c*, under view of head. $\times 3$. Drawings by the author.

half longitudinal diameter of orbit. Depth of body at vent equal to length of lower jaw, width at same point equal to length of snout. Isthmus much broader than depth of branchial opening, nearly equal to longitudinal diameter of the eye. Gape moderate, reaching opposite posterior edge of pupil. Upper jaw longer than lower, the preoral length about equal to pupil diameter. Anterior nostril in a short tube close to rostral pit. Posterior nostril in a longitudinal slit at upper front edge of eye with flanged edges folding over the opening anteriorly. There are five large slitlike pores or pits on the side of the snout, two between the anterior nostrils, an oblong one just above the base of and one just behind the nostril, and two in the upper lip. There are three pairs of pores just below the tip of the mandible, the posterior pair largest, followed by a linear series of seven along the lower jaw and throat. There is a large pore behind the corner of the mouth below the posterior edge of the pupil. Eyes covered by a pronounced adipose membrane concealing the orbital rim. Lip extending forward to opposite the hindmost premaxillary teeth, where it is joined by an inner lip provided with a finely fringed edge and extending longitudinally between the outer lip and the maxillary band of teeth. The upper lip is provided with small bony stays similar to those found in *Uroconger lepturus* (Richardson). Teeth small, sharp, conical, in bands on the maxillary and mandible, in five irregular rows, the width anteriorly tapering to one or two series near the posterior end. Premaxillary teeth in an oval patch, a few of which are small canines, even the hindmost visible from directly beneath when the mouth is closed. There are about 15 teeth in the premaxillary group. There are 14 teeth in a more or less diamond-shaped patch on the vomer, 2 on the median line in the center of the group enlarged and caninelike. The actual shape of the vomerine patch is obscured by confluence with the maxillary bands. All of the larger teeth in the mouth are depressible posteriorly. The maxillary band of teeth does not extend around the head of the vomer but ceases laterally, leaving a naked area between the premaxillary and vomerine groups, against which the tip of the mandible closes. The lateral line originates in a white pore on the median line at the occiput and descends to the side of the nape, bending backward at a sharp angle, and rises slightly over the branchial region and gradually descends to the side. It is situated in a groove marked out by rectangular dark spots. A subline of white pores follow the course of the dark spots in an alternating manner, and each pore appears to be connected with a dark area by a tube running obliquely upward and forward. The two lines are well separated anteriorly, gradually fusing to a single line on the posterior part of the body. There are 31 pores in its course

to a point opposite the vent. Dorsal origin above the third seventh of the pectoral length, opposite the eighth pore in the lateral line. Color light brownish-gray above, lighter below, the color well contrasted on the side of the head. Vertical fins with a conspicuous narrow black margin becoming more pronounced posteriorly but not involving the median caudal rays. Pectorals slightly shaded distally.

The collection contains two examples of this eel, the larger a female with well-developed ova.

Family PLEURONECTIDAE

POECILOPSETTA Günther

POECILOPSETTA ALBOMARGINATA, n. sp.

Plate 1

Holotype.—U.S.N.M. no. 93303 (Field no. 626); 98 mm standard length; from *Caroline* station 100, due north of Tobago Island, latitude $18^{\circ}38'45''$ N., longitude $64^{\circ}52'45''$ W., to latitude $18^{\circ}40'15''$ N., longitude $64^{\circ}50'15''$ W., March 4, 1933, otter trawl, 100 to 300 fathoms.

Paratypes.—U.S.N.M. no. 93304 (Field nos. 624, 625, and 627); three specimens, 105 to 116 mm standard length; same data as holotype.

Head 4.5, depth 2.4 in standard length. Upper eye 2.4 in head, its upper anterior rim impinging upon the dorsal profile, forming a deep notch before eye. Snout 3.1 in head. Dorsal 59 to 64. Anal 51 to 53. Both fins of equal height, 1.7 in head. Right pectoral with 9 rays, its length 2 in head, that of left side slightly longer. Ventrals symmetrical, their tips about reaching third anal ray. Caudal rounded-acuminate, the middle rays greater than length of head, 4.2 in standard length. Depth of caudal peduncle nearly twice its length, 1.5 in head. Scales 19-64-26, rather deciduous, ctenoid on eyed (right) side, cycloid on blind side. Eight rows on cheek. No scales on snout, interorbital, or maxillary. Lateral line forming a high curve anteriorly, which is somewhat flattened on the top, and from there descending almost perpendicularly to the midsides, where it meets the straight part at a right angle. There are 71 to 74 pores in its course to base of caudal. Eyes closely approximated, the upper slightly the larger, the lower usually slightly in advance of the upper. Maxillary little curved, 3.7 in head. Mouth small, oblique. Lower jaw projecting, the mandible with a small knob. Teeth irregularly uniserial on the jaws, slightly larger and more numerous on the blind side. No teeth on vomer or palatines. Gill rakers 10 short points, about 4 in pupil. Interorbital very narrow, naked, cov-

ered with loose skin. Origin of dorsal on left side above pupil, tips of the anterior rays free for over half their length but not elevated. Color pale yellowish-gray; membranous edge of scale pockets dark. Dorsal, anal, and right ventral blackish, with a narrow pale base and a fine milk-white border. Caudal pale grayish with a fine white border, the middle rays darker distally. A black spot with indefinite boundaries large as eye, on upper and lower outer rays of caudal at about the middle of its length. Pectoral blackish. Viscera showing through on right side as a dark blotch. Left (blind) side without markings of any kind.

Norman¹⁰ has revised the species of *Poecilopsetta*. Only two species have been known from the New World, *P. beanii* (Goode) and *P. inermis* (Breder). *P. albomarginata*, which has been compared directly with the type and other material of *P. beanii*, differs from this species in the deeper body, the larger scales, the coloration, and other respects. It appears to differ strikingly from *P. inermis*¹¹ in the milk-white fin edging, the absence of any trace of color pattern on the blind side, and especially in the strongly ctenoid scales of the eyed side.

¹⁰ Treubia, vol. 13, livr. 3-4, pp. 423-426, 1931.

¹¹ Breder, C. M., Bull. Bingham Oceanogr. Coll., vol. 1, art. 1, p. 87, fig. 36, 1925.



POECILOPSETTA ALBOMARGINATA
Holotype, U.S.N.M. 93303. Natural size.