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NEW SHARKS FROM THE WESTERN
NORTH ATLANTIC¹

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Genus APRISTURUS Garman, 1913

THESE little sharks, of deep water, are known from very few specimens, but the named 'species' (thirteen in number, from widely separated seas) appear separable by sufficiently precise differences, though they resemble one another closely. Fowler³ has even distributed them among three subgenera (Parapristurus, Pentanchus, and Apristurus), according to the degree of cirrus-like development of the margins of the nostrils. But the differences in this respect are not sharp enough for generic separation. The several species do, however, fall into two sharply contrasting groups, as regards the gill openings, for while, in the one group, typified by *A. brunneus* Gilbert, 1891, from the west coast of North America, these are of the ordinary type, in other species they are close together above and below, but so deeply concave anteriorly, at the mid-level, that the tips of the gill filaments are exposed. It is astonishing that atten-

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²Contribution, no. 333, of the Woods Hole Oceanographic Institution.

³1941, Bull. 100, U. S. Nat. Mus. 13, p. 53.

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length, as against only about one fourth of total length in *profundorum*), also in the fact that its anal is noticeably different in shape (*cf.* pl. VII with fig. 1). Neither can it be referred to the South African *soldhana* Barnard, 1925, the

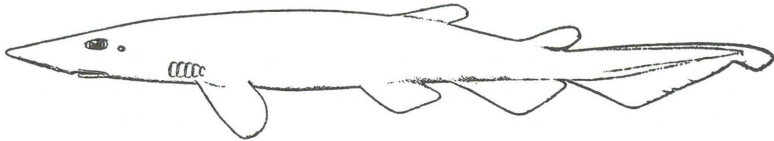


Fig. 1. *Apristurus profundorum*, type specimen, 510 mm. long, U. S. Nat. Mus., no. 35,646.

interspace between its two dorsal fins being relatively much shorter, nor to *microps* Gilchrist, 1922 (also from South Africa), its gill openings being much larger relatively than those of the latter, the interspace between its pectorals and pelvics much longer, and that between its first and second dorsals also considerably longer, relative to the length of the snout. It also differs in various respects from the several 'species' that have been named from the Indo-Pacific.

We therefore propose for it the new specific name *riveri*, after Dr. Luis Howell Rivero, in recognition of his contributions to knowledge of Cuban ichthyology.

***Apristurus riveri* new species**

Plate VII

Study material: The type specimen, a female, 407 mm. long, trawled by the research ship 'Atlantis' of the Woods Hole Oceanographic Institution at Sta. 2993, off the north coast of Cuba, Lat. 23°, 24' N., Long. 80°, 44' W., March 15, 1938, in 580 fathoms, M.C.Z. no. 36,092.

Proportional dimensions, in percentages of total length of type specimen: Breadth of trunk at origin of pectoral, 10.1; height at

origin of pectoral, 11.8; interorbital breadth of head, 6.6; snout to mouth, 9.3; to origin of first dorsal, 47.8; to origin of second dorsal, 57.7; to origin of upper caudal, 67.0; to origin of pectoral, 23.9; to origin of pelvics, 40.2; to origin of anal, 52.2; horizontal diameter of eye, 2.7; breadth of mouth, 6.1; height of mouth, 2.2; breadth between nostrils, 3.9; length of upper labial furrow, 2.1; of lower labial furrow, 2.5; length of first gill opening, 3.3; of second gill opening, 3.4; of third gill opening, 3.2; of fourth gill opening, 3.0; of fifth gill opening, 2.1; vertical height of first dorsal, 2.9; of second dorsal, 4.2; of anal, 3.7; length of base of first dorsal, 4.4; of second dorsal, 6.1; of anal, 13.7; interspace between first dorsal and second dorsal, 7.0; between second dorsal and caudal, 2.7; between anal and caudal, 0; length of upper margin of caudal, 33.0; of lower anterior margin of caudal, 10.1; pectoral outer margin, 10.1; inner margin, 4.9; distal margin, 7.7; distance from origin of pectoral to origin of pelvics, 18.5; from origin of pelvics to origin of anal, 12.5.

Description: Trunk highest and broadest opposite axil of pectoral, narrowing evenly rearward; caudal peduncle strongly compressed laterally, about one half as thick as deep; body sector (snout to cloaca) about as long as tail sector; dermal denticles moderately erect, with short pedicel, their blades with weak median crest and tridentate free margin, the median tooth much the longest; denticles slightly largest, relatively narrowest, and most closely spaced along upper sides of caudal. Head strongly flattened anteriorly and contracted laterally just anterior to outer end of nostrils, its dorsal outline noticeably concave, with a triangular belt of about one hundred and ten very prominent pores along the mid-zone anterior to eyes; snout thin, broadly rounded at tip, its length in front of mouth slightly less than half as great as distance from its tip to fifth gill opening, its lower surface with a belt of conspicuous pores in four rows along the mid-line. Eye oval, its horizontal diameter about twice its vertical, and nearly as long as distance between nostrils, its mid-point about opposite corner of mouth. Spiracle round, about one fifth as large as horizontal diameter of eye, situated close behind latter. Gill openings with their anterior margins so deeply concave in outline that the tips of the gill filaments on the first to fourth arches are exposed, but with the dorsal and ventral ends so close together that the successive margins form an apparent frame around the gill area as a whole; first to fourth gill openings slightly longer than horizontal diameter of the eye, or about four times as long as from posterior margin of eye to spiracle; fifth gill opening considerably shortest; fifth close in front of origin of pectoral. Nostrils moderately oblique and far apart, their inner corners about three times as far from tip of snout as from symphysis of upper jaw,

their outer corners at outer edge of snout; the anterior margin obtusely triangular in outline with its inner edge expanded as a short finger-like process, directed inward, into the nasal cavity, and entirely concealed unless the nostril be spread open; posterior margin also expanded, in outline shown in pl. VII, fig. C. Mouth obtusely ovate, nearly three times as broad as high, its breadth about two thirds as great as length of snout in front of mouth, occupying only about one half the breadth of the head. Labial furrows very prominent, forming approximately a right angle at corner of mouth, when the latter is closed, the upper extending forward about one third the distance toward outer end of nostril, the lower (slightly the longer) reaching only a short distance past corner of the mouth (pl. VII, fig. A);

teeth about $\frac{26-0-26}{25-0-25}$, uppers with three cusps, the median erect and much the longest, except toward corners of mouth where there may be as many as five cusps, with the median cusp curving outward; lowers similar to uppers in center of mouth, but usually with five cusps along sides of mouth, and with the median cusp only a little larger than the others; no teeth at symphysis in either jaw, but tooth next the symphysis in lower very small; mostly three rows functional in upper jaw, but two to four rows functional over short sectors; four rows functional in lower jaw, arranged in quincunx.

First dorsal very small, its base a little longer than horizontal diameter of eye, brush-shaped, with convex anterior margin and rounded tip, its origin over rear end of bases of pelvics. Second dorsal similar to first but nearly one and one half times as long at the base and slightly higher vertically, its origin about over mid-point of base of anal, interspace between second dorsal and caudal a little less than half as long as base of former. Caudal about one third of total length, with brush-shaped tip, well-marked subterminal notch, its lower anterior corner more obtuse than a right angle, its axis only very slightly raised, if at all. No measurable interspace between caudal and anal. Anal subquadrate, with rounded outer and angular rear corner, its base slightly more than twice as long as base of second dorsal. Pelvics a little less than half as long at base as anal, with rounded anterior and angular rear corner, their inner margins in female very short and entirely separate, one from the other, behind the cloaca. Interspace between pelvics and anal about two thirds as long as base of former. Pectorals a little more than one third as long as head, nearly as broad at base as at tip, with slightly convex anterior margin, nearly straight distal and inner margins, and rounded corners.

Colors (In alcohol): Uniform chocolate brown above and below; the tongue and lining of the mouth blackish.

Developmental stages: Not known.

Size: No information is available as to the length to which this species may grow. The specimen at hand does not contain eggs.

Range: Known only from specimen recorded above, taken off the north coast of Cuba. The depth of capture, combined with the uniformly dark coloration, suggests that this is a deep-water species.

Genus TRIAKIS Müller and Henle, 1838

Up to the present, this genus has been known only from the Indian Ocean (including the Red and Arabian Seas), from Malaysia and Polynesia, from the western North Pacific, and from the Pacific coasts of America, North and South.

In March, 1938, however, and again in May, 1939, the research ship 'Atlantis' of the Woods Hole Oceanographic Institution collected 38 specimens, clearly falling in this genus, but separated from all previous known members of it by the combined facts that the origin of its second dorsal fin is over the origin of the anal, instead of anterior to the latter, (in which it agrees with *venusta* Tanaka, 1912) and that the anterior marginal expansion of the nostril is far in advance of the front of the mouth. It is also characterized by very short labial furrows and strongly tridentate dermal denticles.

This find is of great interest from the zoö-geographical standpoint, for it adds one more to the list—already considerable—of animals that occur both on the Pacific coast of America on the one hand, and in the Carribean-West Indian region on the other, but are not known elsewhere in the Atlantic.

We name this new shark *barbouri*, after our friend and colleague, Dr. Thomas Barbour, in recognition of the constant assistance he has given us in our labors on sharks of the western North Atlantic.

Triakis barbouri new species

Plate VIII

Study material: 38 specimens, male and female, 225 to 338 mm. in total length, collected off the north coast of Cuba, March, 1938, and May, 1939, by the research ship 'Atlantis.' As the type, we have selected a male of 283 mm.¹

Proportional dimensions of type, in percentages of total length: Breadth of trunk at origin of pectoral, 9.5; height at origin of pectoral, 8.8; length of snout in front of mouth, 5.6; in front of outer nostrils, 3.5; snout to origin of first dorsal, 31.4; to origin of second dorsal, 56.5; to origin of upper caudal, 73.2; to origin of pectoral, 20.4; to origin of pelvics, 39.2; to origin of anal, 57.8; horizontal diameter of eye, 3.9; breadth of mouth, 7.1; height of mouth, 3.5; distance between inner ends of nostrils, 2.9; length of upper labial furrow, 0.5; of lower labial furrow, 0.5; length of first gill opening, 1.8; of second gill opening, 1.8; of third gill opening, 1.8; of fourth gill opening, 1.8; of fifth gill opening, 1.4; vertical height of first dorsal, 4.9; of second dorsal, 4.2; of anal, 2.9; length of base of first dorsal, 6.9; of second dorsal, 8.8; of anal, 8.1; interspace between first dorsal and second dorsal, 16.9; between second dorsal and caudal, 7.6; between anal and caudal, 7.4; length of upper margin of caudal, 26.8; of lower anterior margin of caudal, 9.9; pectoral outer margin, 13.0; inner margin, 8.1; distal margin, 9.5; distance from origin of pectoral to origin of pelvics, 22.2; from origin of pelvics to origin of anal, 16.9.

Description: Trunk slender, its height abreast origin of first dorsal only about one seventh of its length to origin of caudal, its dorsal profile only slightly arched, its ventral profile nearly straight except in gravid females; tail sector (anus to tip of caudal) about one sixth longer than body sector; caudal peduncle laterally compressed, about twice as high as broad at origin of caudal, without lateral keels or precaudal pit above or below. Dermal denticles close-spaced and usually overlapping with short pedicels and horizontal blades, the latter regularly tridentate in outline, the median tooth narrow, and much the longest, with three ridges, the median ridge flat-topped distally but rounded proximally. Head (to fifth gill opening) about one fifth of total length, flattened above, its dorsal

¹ Mus. Comp. Zool., no. 36,099.

profile sloping steeply downward. Snout short, its length in front of mouth about one third of length of head to origin of pectoral, or a little less, its tip thin and broadly ovate. Eye oval, about three times as long as high, and noticeably large, its horizontal diameter about two thirds as long as snout in front of mouth; the larger specimens with a well-marked subocular fold, separated, however, from the margin of the lower eyelid at both ends when the latter is drawn down, but only faintly indicated when lower eyelid is drawn up over eyeball, or in small specimens even when the eye is wide open. Spiracle oval, its longest diameter only about one fifth to one sixth as long as horizontal diameter of eye, situated slightly below level of center of latter and behind it by a distance slightly less than half its own length. Gill openings very short, their outlines deeply concave anteriorly, the fourth-fifth over the origin of the pectoral, the first (longest) about half as long as the horizontal diameter of the eye, the second, third and fourth slightly shorter, the fifth considerably so and situated noticeably higher on the sides than the first four; interspaces between gill openings about one half to two thirds as wide as lengths of latter. Nostril moderately oblique, its inner corner a little less than one third as far from front of mouth as from tip of snout, its anterior margin expanded as a low, subquadrate lobe. Mouth ovate, occupying about three fourths of breadth of head, and a little more than half as high as broad, corner of mouth, with a very short labial furrow on each jaw. Teeth $\frac{62}{62}$, closely crowded,

with those of successive rows overlapping; three (locally four) rows functional in front of upper jaw, but only two to three rows near corners, three to four rows functional in front of lower jaw, and five to six rows toward the angles where the serial arrangement is increasingly oblique; upper teeth with three cusps, the axial erect or slightly curved, and much the longest, but with blunt tip, and marked with irregular longitudinal striae basally; those toward corners of mouth somewhat smaller with relatively shorter median cusp and broader base than those in front of mouth; lowers similar to uppers toward center of mouth, except that the outer lateral cusp may be minute or lacking, but those along sides of jaw with (usually) two or three basal cusps on the inner side and none on the outer side, the cusp that is primarily median thus being at the outer edge of the tooth.

Origin of first dorsal a little behind inner corner of pectoral, its base about as long as from center of eye to first gill opening, its anterior margin very slightly convex, apex rounded, posterior margin slightly concave, its rear corner triangular, the free rear corner a little more than half as long as its base, rear end of base a little anterior to origin of pelvics. Second dorsal similar to first, and about

as high, but about one and one half times as long at base, its origin about over that of anal, and slightly closer to origin of caudal than to rear tip of first dorsal. Caudal between one fourth and one third of total length, obliquely truncate at tip, with well-marked subterminal notch, and noticeably narrow, its lower contour obtusely triangular, with rounded lower anterior corner, the latter not exposed as a distinct lobe. Anal similar to second dorsal in shape and about as long at base, but only about two thirds as high; interspace between anal and caudal a little shorter than base of anal; that between anal and tips of pelvics a little more than half as long as base of anal. Pelvics subquadrate, with nearly straight anterior and distal margin, but slightly concave inner margin, and broadly rounded outer corners, their inner corners narrowly elongate in both sexes, with pointed tips. Pectoral about two thirds as broad as long, between two and three times as large in area as first dorsal, with slightly convex anterior and inner margins, very weakly concave distal margin, and narrowly rounded corners.

Color: Upper parts of trunk, caudal, dorsals and upper surfaces of pectorals pale gray, lower surface grayish white. In some specimens, at least, the anterior edges of the dorsals and of the caudal, midway of its length, are marked with faintly defined smoky blotches, reminiscent of the color pattern of the embryo, which (just before birth) shows more extensive blotches in these same general regions, besides a similar blotch on the upper side of the caudal peduncle, one on the back midway between the two dorsals, one on the side, just posterior to the pectoral; also a sooty area, irregular in outline, extending upward obliquely from the region of the gill openings to the dorsal surface of the nape.

Developmental stages: Two embryos, 90 to 100 mm. long, and nearly ready for birth, contained in a female 303 mm. long, resemble the parent, except that the caudal is relatively longer with slightly convex lower margin, the origin of the first dorsal relatively somewhat farther back, the dorsals more broadly rounded, the tips of the pelvics relatively much shorter, and the eyes relatively much larger (embryonic characters to be expected), and the color pattern not only more pronounced but more extensive, as noted above. There is no placental attachment between embryo and mother.

Size: Evidently this is one of the smallest of sharks. The facts that a female of only 303 mm. contained two large embryos, and that the claspers in a male of 338 mm. are very large, extending rearward as far as the origin of the anal suggests a maximum length perhaps not greater than about 350 to 400 mm. or about one foot, 2 to 4 inches.

Habits: The recorded depths of capture of this little shark range

only between 235 and 335 fathoms (six stations), but since the trawls that yielded them were hauled up open, to the surface, they may have been swimming at some mid-depth, not on the bottom. Nothing more is known of their habits.

Range: So far known only off the north coast of Cuba, in the offing of the province of Santa Clara, where it must be tolerably plentiful, judging from the number of specimens taken.

Genus EULAMIA Gill, 1861

Eulamia springeri new species¹

Study material: Type specimen, female, 805 mm. in total length, Cozumel, Yucatan, U. S. Nat. Mus. no. 37,141; also probably of this species is a somewhat shrivelled skin, with head, also female, about 1390 mm. in total length, Englewood, Florida, Mus. Comp. Zool., no. 35,900.

Proportional dimensions of type specimen, in percentages of total length: Breadth of trunk at origin of pectoral, 12.0; height at origin of pectoral, 11.4; length of snout in front of mouth, 6.6; in front of outer nostrils, 3.1; snout to origin of first dorsal, 30.7; to origin of second dorsal, 58.8; to origin of upper caudal, 70.2; to origin of pectoral, 20.5; to origin of pelvics, 47.9; to origin of anal, 58.8; horizontal diameter of eye, 2.1; breadth of mouth, 8.9; height of mouth, 5.7; distance between inner ends of nostrils, 6.5; length of upper labial furrow, 0.6; length of first gill opening, 2.3; of second gill opening, 2.6; of third gill opening, 2.7; of fourth gill opening, 2.6; of fifth gill opening, 2.2; vertical height of first dorsal, 10.7; of second dorsal, 3.3; of anal, 3.9; length of base of first dorsal, 9.9; of second dorsal, 4.5; of anal, 4.9; interspace between first dorsal and second dorsal, 20.7; between second dorsal and caudal, 7.7; between anal and caudal, 6.1; length of upper margin of caudal, 29.8; of lower anterior margin of caudal, 14.2; pectoral outer margin, 19.9; inner margin, 5.2; distal margin, 15.6; distance from origin of pectoral to origin of pelvics, 27.2; from origin of pelvics to origin of anal, 11.0.

¹ So named in recognition of the fact that it was Mr. Stewart Springer who first recognized that the type specimen represented a species not previously described.

Description of type: General form moderately stout, the trunk about one fifth as high at origin of first dorsal (where highest) as long to origin of caudal; body sector (to cloaca) a little longer than tail sector; mid-line of back with a low but unmistakable dermal ridge between dorsals. In the preserved state, there is also a similar ridge between the second dorsal and caudal. Since, however, this lies along the bottom of a groove of muscular contraction, we question whether it is a normal feature. Upper precaudal pit strongly marked, sub-angular in outline; lower pit less distant than upper, but similar to it in form. Dermal denticles closely and regularly overlapping, broader than long, with five (sometimes seven) short, marginal teeth, and an equal number of low ridges. In the larger specimen, probably of this species, the denticles usually have seven ridges, and teeth. Head (to origin of pectoral) a little less than one third of length to origin of caudal, moderately flattened above. Snout broadly rounded, its length, anterior to a line connecting outer ends of nostrils, a little less than half as great as length in front of mouth, and length in front of mouth nearly three fourths (74%) as great as breadth of mouth, or about one third of length of head to origins of pectorals. Eye approximately circular, its diameter a little more than one third as long as distance between nostrils and about as long as first gill opening. Third gill opening (a little the longest) a little more than two fifths (42%) as long as distance between nostrils; fifth about four fifths as long as third, and more oblique than the others; third gill opening above origin of pectoral. Nostril strongly oblique, its inner corner nearer to the mouth than to the tip of the snout by a distance a little longer than its own length, or than the diameter of the eye, its anterior margin expanded toward the inner end as a distinct, though low, subtriangular lobe. Mouth broad-ovate, a little less than two thirds (about 62%-63%) as high as wide. Teeth $\frac{12-1-13}{12-1-13}$; upper teeth triangular, first and second erect and nearly symmetrical, with concave margins and expanded bases, but subsequent teeth unvaryingly oblique, toward corners of mouth, their inner margins nearly straight, but their outer margins more and more deeply concave, in subangular contour, the outermost strongly so; margins regularly serrate, tip to base, and much the most strongly so outwardly, on basal sector. Lower teeth nearly erect, except for the outermost three or four, which are moderately oblique, their cusps much more slender than those of uppers, on broadly expanded bases, their margins much more finely serrate than those of uppers. One small symmetrical tooth at symphysis, and outermost three to five successively smaller, in each jaw. Origin of first dorsal, a little anterior to inner corner of

pectoral, its base nearly as long as from posterior edge of eye to first gill opening, its vertical height about equal to its base, its anterior margin only weakly convex toward the apex, posterior margin only weakly concave (less so than in *obscurus*), apex narrowly rounded; free rear corner only about one third to one fourth as long as the base, (thus relatively shorter than in *obscurus*); mid-point of base about 1.7, as far from origin of pelvics as from axil of pectoral. Second dorsal between one half and one third as long at base as first, relatively lower, its vertical height about two thirds as great as its length at base, its free rear corner a little shorter than its base, its posterior margin weakly concave; its extreme length, origin to rear tip, about 2.5 as great as the vertical height, thus considerably shorter relative to its height than in *obscurus*, its origin a very little anterior to that of anal. Caudal between one third and one fourth (30%) of total length; its terminal sector about one fourth the total length of the fin, slender, with narrowly rounded tip and weakly concave lower posterior outline; lower lobe, (expanded lower anterior corner) only a little less than half (about 47%) as long as upper, each measured from the respective precaudal pit, thus somewhat longer, relatively, than in *obscurus*, with weakly convex anterior margin, nearly straight posterior margin, and narrowly rounded tip; reëntrant corner, included by the two lobes, well rounded. Distance from origin of caudal to tip of anal about two thirds as long as base of latter. Anal a little longer at base than second dorsal, and a very little higher, vertically, its posterior margin much more deeply concave; free rear corner about two thirds as long as the base. Distance from origin of anal to tips of pelvics only about three fourths as long as base of anal. Pelvics about as long at base as base of anal, or a little longer, their outer corners approximately a right angle (less obtuse than in *obscurus*). Pectoral about four fifths as long as head, a little less than half as broad as long, with narrowly rounded tip and inner corner, weakly and evenly convex anterior margin, and distal margin deeply concave proximally.

Color: After preservation, the type specimen is olive gray above, and of a paler shade of yellowish olive below, without conspicuous fin markings, either dark or light.

Size: The fact that the type specimen still shows the umbilical scar, although 805 mm. long, suggests that this is one of the larger members of its genus.

Distinctive characters: *E. springeri* most nearly resembles *E. obscurus*, with which it agrees in general, so far as relative sizes and positions of fins are concerned, and in the presence

of a mid-dorsal ridge. But it differs in a number of features (in combination) from specimens of *obscurus* of approximately the same size, with which we have compared it: (a) its eye is considerably larger, relative to the lengths of the gill openings; (b) the anterior margin of its nostril is expanded as a low, triangular lobe (not lobed in *obscurus*); (c) its first dorsal is relatively larger and more erect, but with its free rear corner relatively shorter and the posterior margin less deeply concave; (d) its second dorsal is larger in area, but shorter—origin to rear tip—relative to its vertical height; (e) the distance from the tips of its pelvics to the origin of its anal is considerably shorter (about 0.7 the anal base in *springeri*, but 1.3 the anal base in *obscurus*); (f) the outer corners of its pelvics are only about a right angle (about 115° in *obscurus*); (g) its denticles have a larger number of marginal teeth and of ridges in specimens of equal size; and (h) its upper teeth are more strongly oblique, more deeply incised, outwardly, and more coarsely serrate basally than those of *obscurus*.

Among Eulamias of the west coast of America, *springeri* resembles most nearly *platyrhynchus* Gilbert, 1891, in its teeth, and in its fins. But the length of its snout (in front of mouth) is considerably less than the breadth of the mouth (a little longer than the breadth of the mouth in a specimen of *platyrhynchus*, with which we have compared it); and its fins show no trace of the white edgings that are so conspicuous in *platyrhynchus*, differences that seem sufficient to demand recognition in nomenclature, and especially so in view of the geographic discontinuity between the areas of occurrence of the two sharks in question.

Springeri is sharply separated from *galapagoensis* Snodgrass and Heller, 1905, the teeth and snout of which are similar, by the shapes of the first dorsal and pectoral fins, by its much larger eye (relative to the lengths of the gill openings), and by the fact that its second dorsal is only very little smaller than its anal, in area.

Genus SOMNIOSUS Lesueur, 1818

It seems sufficiently established that the 'Greenland' sharks of the subarctic province of the two sides of the North Atlantic belong to a single species, *S. microcephalus* Bloch and Schneider, 1801. But it is still an open question, just what the relationship is between it, and the very much smaller form that has been reported repeatedly from the Mediterranean and from the coast of Portugal, as *rostratus* Risso, 1826. If, however, the more recent of the illustrations of the latter can be accepted as reliable, it differs from *microcephalus* in a relatively much shorter interspace between the tip of the second dorsal and the caudal, in its relatively larger fins, in its smaller dermal denticles, in the presence of strongly developed luminous organs, and in various skeletal characters, as well as in attaining maturity at a much smaller size, and—most important of all—in the fact that it is ovoviviparous.

The North Pacific representative of the genus has usually been thought identical with the North Atlantic *microcephalus*. However, the first dorsal stands considerably farther rearward in a Japanese specimen that we have examined,¹ than is ordinarily the case in North Atlantic specimens. The lower anterior and upper posterior margins of the caudal are much more strongly convex, the distance from the tip of the second dorsal to the origin of the caudal much shorter relatively, upper teeth considerably broader, and the basal outline of the lower teeth more deeply incised in the Pacific than those in the North Atlantic.

These differences seem sufficient for recognition in nomenclature, and to do so, a new specific designation for the Pacific form appears necessary, because every previous

¹ This is the specimen illustrated by Garman, 1913, Mem. Mus. Comp. Zoöl. 36, pl. 14, figs. 1-3, as "*brevipinna*."

mention of it, in scientific literature has been under one or another of the names that actually belong to the North Atlantic species. To remedy this deficiency, we propose for it, the new specific name *pacificus*.

The differences between the Atlantic and Pacific species may be summarized as follows:

A. Origin of first dorsal, about as far from axil of pectoral as from origin of pelvics; distance from tip of second dorsal to origin of caudal only about half as long as base of second dorsal. Caudal with posterior margin of terminal sector moderately convex, and lower anterior margin strongly so; cusps of upper teeth nearly as broad, basally, as they are long; lower teeth very deeply incised, basally.

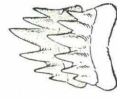
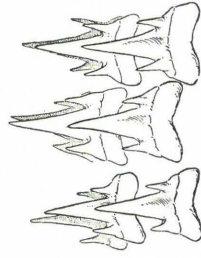
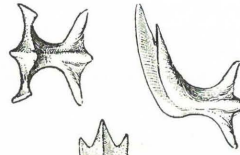
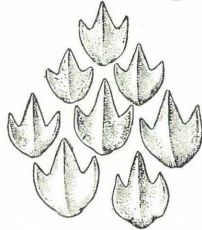
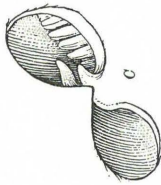
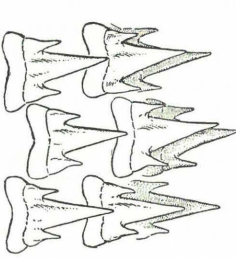
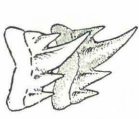
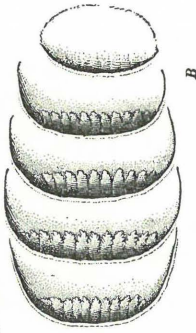
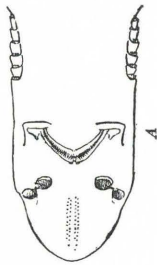
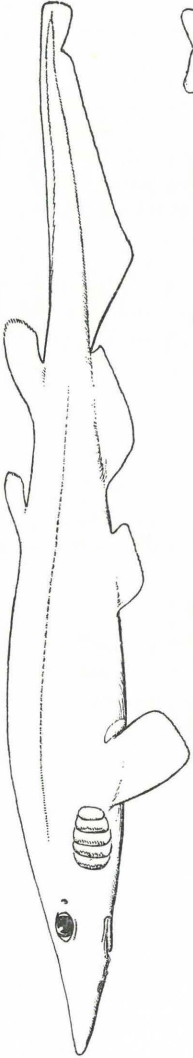
pacificus, n. sp.

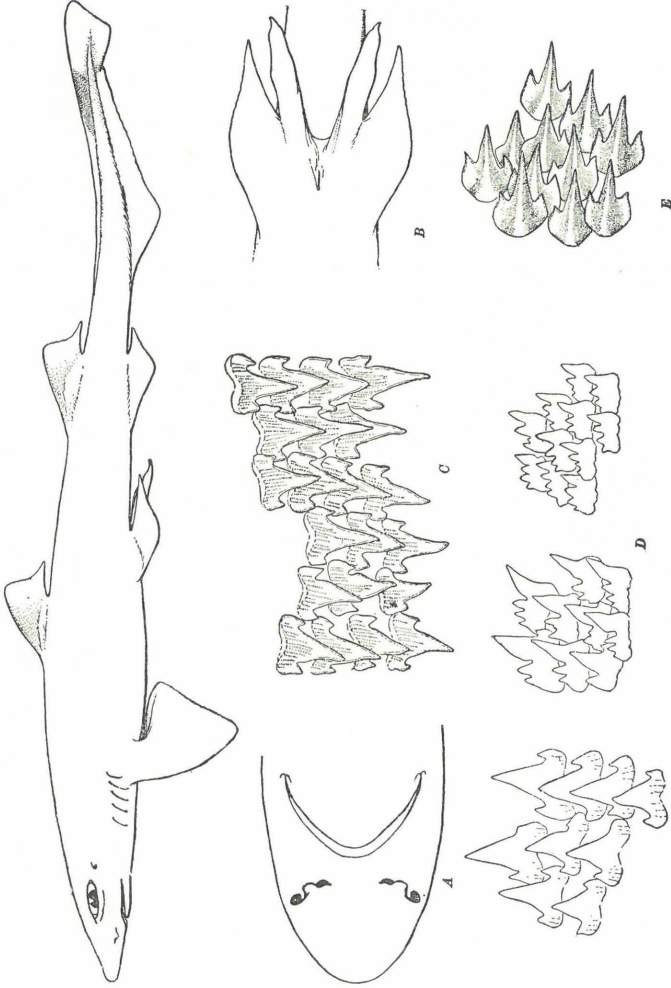
B. Origin of first dorsal not more than half as far from axil of pectoral as from origin of pelvics; distance from tip of second dorsal to origin of caudal nearly or quite as long as base of second dorsal. Caudal with posterior margin of terminal sector nearly straight, and lower anterior margin only moderately convex; cusps of upper teeth much narrower than long; lower teeth not deeply incised basally.

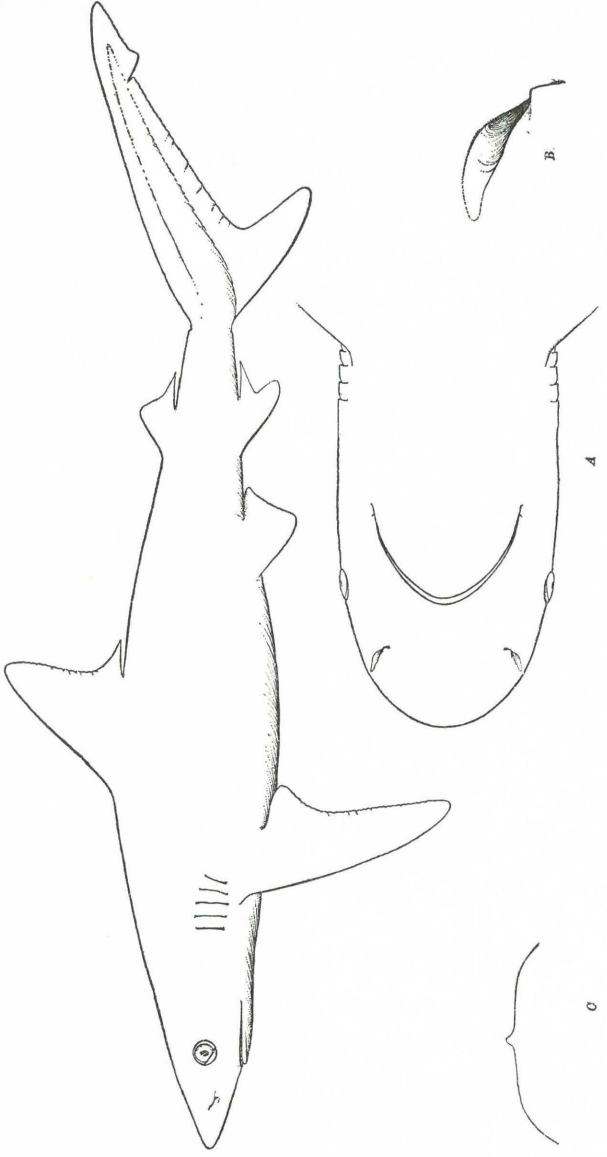
microcephalus Bloch and Schneider, 1801.

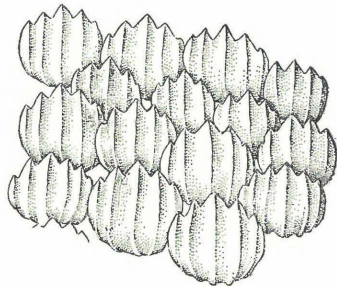
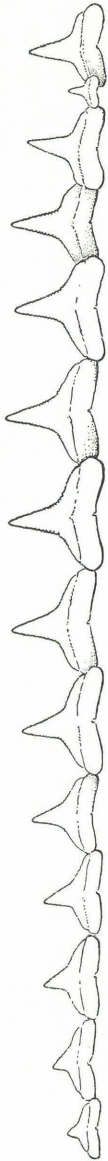
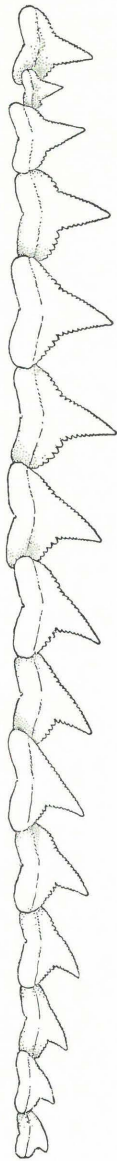
EXPLANATION OF PLATES

- Plate VII. *Apristurus riveri*, type specimen, 407 mm. long; (A) lower side of head; (B) gill openings, enlarged; (C) right-hand nostril, enlarged; (D) dermal denticles; (E) teeth, upper and lower, three rows from center and one row from outer part of jaws, \times about 10.
- Plate VIII. *Triakis barboursi*, type specimen, 285 mm. long; (A) lower side of head; (B) pelvic fins and claspers; (C) upper teeth from side of jaw, \times about 15; (D) lower teeth from center of jaw, from side of jaw, and from outer part of jaw, left to right, \times about 10; (E) dermal denticles.
- Plate IX. *Eulamia springeri*, type specimen, 805 mm. long; (A) under side of head; (B) nostril \times about 1.5; (C) cross section of back between first and second dorsal fins, to show dermal ridges.
- Plate X. *Eulamia springeri*, (A) upper and lower teeth, \times about 2; (B) fourth and eighth upper teeth, and third and ninth lower teeth, counted from symphysis, more enlarged; (C) dermal denticles \times about 30.

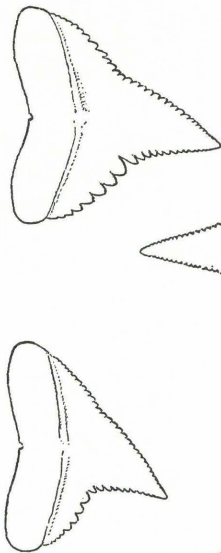




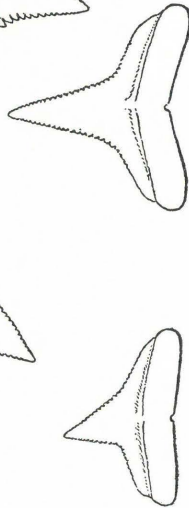




A



C



B

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