

No. 4.— *New Species of Apodal Fishes.*

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RECENTLY while preparing a catalogue of the apodal fishes in the Museum of Comparative Zoölogy it was my privilege to critically study, measure, and tabulate the proportions of more than one thousand apodal fishes.

Among this series were 459 specimens of *Anguilla* from all parts of the known range of the Anguillidae. A study of the measurements of these eels revealed the fact that certain ones, M. C. Z. 9162 from the West Indies and M. C. Z. 22,440 (four specimens) from Panama, did not differ in the slightest degree from *Anguilla vulgaris* Turton of Europe, while all other American specimens were undoubted *Anguilla rostratus* Lesueur. This would indicate that the European and the American species of *Anguilla* intermingle, and perhaps interbreed on their southern range.

Descriptions of sixteen new species and one new genus are herewith presented.

MYRIDAE.

MURAENICHTHYS LABIALIS, sp. nov.

There are two specimens of *Muraenichthys* M. C. Z. 29,500 (A) and (B) from the Marshall Islands which were identified as *M. macropterus* Bleeker by Kendall and Goldsborough (Mem. M. C. Z., 1911, 26, p. 245). But in Bleeker's type of *M. macropterus*, the jaws are of equal length, the anterior nostrils are not abnormally large, and the origin of the dorsal fin much nearer the anal than to the tip of the snout, while in these specimens, the lower jaw is only about half as long as the upper, the snout being prolonged, and the nostrils abnormally large resembling two large curved fangs hanging down from the upper lips. The origin of the dorsal is more than a third nearer the tip of the snout than to the origin of the anal.

A detailed description of the largest of these specimens M. C. Z. 29,500 (A), the type of *M. labialis*, is as follows:— Body slim, more or



less worm-like; head rather large, pointed, the snout projecting; tail uniformly compressed from middle of body to tip; dorsal and anal confluent around tail; length of the head and trunk about one third less than length of tail; width of head almost equal to its depth; its length 11 in total; 3 in trunk. Mouth of moderate size; the upper jaw 3 in head; lower jaw 4.5 in head; the mouth closing fully. Teeth uniserial in jaws and vomer; sharp pointed and directed backwards in jaws; snout pointed 4 in head; anterior nostril a large cone-shaped tube directed downward on the upper lip just anterior to tip of lower jaw, posterior nostril a slit in upper lip mid-way between anterior nostril and eye; eye located on a line with angle of jaws; its length 2 in snout; gill-openings of moderate size lateral, being considerably smaller than the distance apart. No pectoral fin. Origin of dorsal about the length of head posterior to gill-openings; anal distinct. Total length 100 m.; length to origin of anal 40 m.; length of head 10 m.; length of origin of dorsal 20 m.

*Type*.—M. C. Z. 29,500. Arhno Atoll, Marshall Islands. ALBATROSS Tropical Pacific Expedition.

#### GARMANICHTHYS, gen. nov.

A genus of the Myridae, characterized by absence of pectorals, the high and distinct dorsal and anal with origin of dorsal near, but slightly posterior to gill-openings, the vomerine teeth in a widely separated series. Dorsal and anal united around tip of tail, nostrils on upper lip, the anterior in tubules the posterior an orifice opening downwards.

#### GARMANICHTHYS DENTATUS, sp. nov.

Body elongate-cylindrical compressed, head moderately pointed the jaws equal; tail gradually compressed from center of body; dorsal and anal fins continuous around tail.

Head 7.7 in total length; head in trunk 1.5. Total length 100 m.; length from tip of snout to origin of anal 31; length of tail 69, the tail therefore a little more than twice the length of head and trunk; head almost as wide as deep, a wide groove from occiput to tip of the rather wide snout. Mouth large, the lower jaw straight; distance from tip of snout to gape 2.3 in head; anterior nostril is a rather wide tube near



tip of snout; posterior nostril a distinct orifice, opening downward in upper lip mid-way of length of upper jaw. Teeth all sharp pointed, conical. Maxillary teeth biserial, 35 in each row, the outer row of smaller teeth, the inner row of larger depressible teeth; premaxillary teeth biserial about ten in number; the inner row enlarged curved canines. Vomer with one large fang-like tooth in the median line anteriorly, plus ten widely separated rows of teeth on each side of the shaft of the vomer which extend from anterior of vomer to a line with angle of mouth; each of these rows consist of about twenty-three moderately sharp teeth which are hooked at tip and directed backwards; these teeth are larger than those of outer maxillary row. Mandibular teeth biserial on sides, triserial in front, the anterior row of several enlarged canines.

Snout 3.5 in head; eye with its posterior border on a line with angle of jaws; its length 2 in snout; gill-openings round orifices about size of eye and located above lateral line.

No pectorals; dorsal and anal fins distinct and united around tail. Origin of dorsal posterior to gill-openings by a distance about equal to snout.

*Color in alcohol*.—light yellowish brown thickly banded with reddish brown, these bands extending into the fins where they are very distinct; head and belly with large, round, reddish brown spots and blotches; a whitish band from just back of angle of jaws over the nuchal region, tip of snout somewhat lighter. Length 100 m.

*Type*.—M. C. Z. 28,095. Off Barbados, 69 fathoms.

## OPHICHTHYIDAE.

### BASCANICHTHYS PUSILLUS, sp. nov.

Body slim cylindrical, almost round in a middle section, head slightly larger owing to distention of the branchial chambers; width of head 1.2 in its depth; snout projecting, pointed. Tail tapering evenly from the posterior third of body, the tip bare; depth of body at anal pore 3.75 in head. The trunk and tail are about equal in length.

Length of head in trunk 8.50; in total length 14.8.

Mouth small, both the upper and lower jaw somewhat curved; mouth not closing fully; lower jaw almost a fourth shorter than the upper; length of upper jaw, from tip of snout to angle, 3.1 in head.



Maxillary teeth biserial, the outer row of about twenty sharp cylindrical teeth, directed backwards; inner row of about sixteen similar teeth. Premaxillary probably 3 in each side (in the type all but two of these teeth have been destroyed). Vomer with eighteen sharp teeth on the median line, these are distinctly biserial; mandibular in a single series, similar to maxillary teeth and directed backward.

Snout pointed, short, its length 7 in head; anterior nostril in tube on upper lip, even with extremity of lower jaw; posterior nostril on upper lip opening downward by a rounded aperture below the anterior margin of eye; eye small 2 in snout, its center about mid-way between tip of snout and angle of jaws.

Gill-openings rather wide slits below the median line, the width slightly greater than their distance apart on the ventral ends. Lateral line curved, the pores not prominent.

Pectoral fins very minute but present and rays can be seen with a lens; length about equal to eye; dorsal and anal well developed, terminating very near tip of the tail; origin of pectorals on nuchal region, far in front of gill-openings, its origin, in fact mid-way of the length of the head.

*Color in alcohol*:—uniform yellowish light brown, slightly darker above; fins uniform, but there is a shaded area along each side of the anal posteriorly on body. Length 450 m.

Total length 540 m.; head and trunk 250 m.; head 30 m.; to origin of dorsal 15 m.

Differs from *O. filaria* in the biserial maxillary and vomerine teeth.

*Type*.—M. C. Z. 25,147. Fiji Island. Museum Godeffroy, Hamburg.

#### QUASSIREMUS PRODUCTUS, sp. nov.

Cylindrical, elongate, the head conical, the snout projecting; upper jaw the longer; tail tapering uniformly from the anal pore, to an acute point, the tip naked; depth at anal pore 2.1 in head, tail about equal to trunk without head.

Head conical; its greatest width 1.1 in its greatest depth; it is contained 11.5 in total length and 5.4 in trunk.

Mouth moderate, closing completely; distance between tip of snout and angle of jaws 2.3 in head; maxillary teeth uniserial, of sixteen slightly curved conical teeth directly backwards. Premaxillary with two slightly large curved teeth near end of snout; vomer with a single



series of graduated teeth extending back on the shaft. Mandibular teeth uniserial, of about fourteen conical teeth of moderate size.

Snout 4.9 in head; anterior nostril in tube slightly anterior to tip of lower jaw; posterior nostril a slit on under side of upper lip, on a line with anterior margin of eye; the eye is mid-way between tip of snout and angle of jaws, its length 1.7 in snout.

Gill-openings large, slit-like located low on the sides, their openings but little less than their distance apart. Lateral line is distinct, but pores not obvious. Dorsal and anal fins low but distinct; the pectoral is microscopic, easily overlooked, its length less than eye, represented by a small membraneous flap; origin of dorsal posterior to gill-opening by a distance contained 4 times into head. The dorsal and anal end very near the tip of the tail.

*Color in alcohol*:— body grayish with nineteen or twenty wide black bands over the back extending down to the lateral line; the bands as wide as the interspaces and alternating with large round black spots on the sides below the lateral line. A black bar over the head and through the eyes like a mask, a yellowish space in front and behind this mask; cheeks and top of head with large black spots ocellated with whitish; lower jaw with fine black specks, nuchal region with the first black bar. A few black dots on upper lip and on tip of snout; ventral surface and fins uniform.

Total length 595 m.; length to origin of anal fin 327 m.; to origin of dorsal 58 m.; length of head 53 m.

*Type*.— M. C. Z. 9150. Nassau, Bahamas, 10 November, 1861. J. D. Sargent.

#### QUASSIREMUS PARVIPINNA, sp. nov.

This species has distinct, but low dorsal and anal fins. The anterior nostril is in a tube near the end of the snout. Teeth all pointed; maxillary teeth uniserial, twenty-one, sharp, pointed, compressed, becoming smaller posteriorly; premaxillaries uniserial, consisting of five backwardly directed, conical, sharp, curved teeth, the largest of the upper jaw. Vomer with a cluster of four large sharp teeth anteriorly, plus a single series of fine small rounded teeth on the shaft. Lower jaw uniserial with about twenty-one curved conical teeth of moderate size. Origin of dorsal posterior to gill-openings. The pectoral fin is reduced to a small flap about equal to  $\frac{1}{2}$  length of eye. Gill-openings lateral. Head in total length 12.1; head in trunk 5.



Origin of dorsal posterior to gill-openings by a distance equal to lower jaw, or by a distance equal to seven times the length of the pectorals; eye 2.5 in snout, its location mid-way between tip of snout and angle of jaws; angle of jaws mid-way between tip of snout and gill-openings; gill-openings rather wide, their location lateral. Caudal tip without fins, but with the dorsal end anal, coming very near to the tip. The pectoral is microscopic being one half the length of the eye.

*Color in alcohol*:—dull yellowish, the body everywhere blotched and spotted with dark brown, the spots on body usually larger than eye, some as large as length of snout; these show a decided tendency to form indistinct brown bands on the body in which the smaller dark spots show rather distinctly; snout and lower jaw black; head covered with spots smaller than the eye; some scattered spots on ventral surface; fins colored similar to body.

Total length 580 m.; head 42 m.; to anal pore 277 m.; to origin of dorsal 63 m.; length of pectoral 2.5 m.; length of eye 5 m.; width of gill-openings 6 m.; length of snout 10 m.

Related to *Q. evionthos* (Jordan & Bollman) but in this species the origin of the dorsal is but one length of the pectorals from tip of pectorals. The eye is nearer tip of snout in *Q. parvipinna*, the head is shorter, and the pectorals much shorter.

*Type*.—M. C. Z. 9205. Acapulco, Mexico, August, 1872. Hassler Expedition.

#### OPHICHTHYS SERPENTINUS, sp. nov.

Body elongate, cylindrical, almost round in the middle section, tapering somewhat to the small pointed head; the upper jaw projecting; tail tapering evenly from near the center to the acute bare tip; depth at anal pore 2.1 in head; tail almost twice the length of trunk, *i. e.* lacking only one half length of head of being twice as long as trunk.

Head small, conical; its width being 1.5 in height; its length 4.8 in trunk, and 15.3 in total length. Mouth rather small, the length from tip of snout to angle of jaws 2.75 in head; the mouth closing fully.

Maxillary teeth biserial, the outer row of about twenty-three small, rounded, pointed teeth; the inner row of about twenty larger, cylindrical, pointed teeth that are fixed and nondepressible; premaxillary teeth far forward, uniserial, three in each side. Vomer with six



teeth anteriorly, arranged in an irregular double row, plus a single series of eight sharp graduated teeth on the shaft. Mandibular teeth in a single series of about twenty-one conical, sharp, pointed teeth; without large canines anteriorly. Snout 4.8 in head; pointed, the lower jaw the shorter, anterior nostril in a short wide tube situated on upper lip on a line with tip of lower jaw; posterior nostril a wide slit in the upper jaw, covered by a broad, rounded epidermal flap on the upper side of the openings, which is located anterior to eye and slightly nearer the eye than to the anterior nostril; eye is nearer angle of jaws by almost a third than to the tip of the snout, its length is 2.1 in snout. The gill-openings are wide slits below the median line, their length 1.5 in snout. They are slightly less than this distance apart on their ventral margins; lateral line distinct, the pores rather wide apart, about fifty-three between head and anal pore, several distinct pores on sides of head, upper jaw, and snout; these pores are not in white spots.

The pectoral fins are small but well developed, their length slightly greater than snout; dorsal and anal low but distinct, ending about length of snout from tip of tail; origin of dorsal posterior to gill-openings by a distance equal to head.

*Color in alcohol*: — uniform seal-brown.

Total length 495 m.; length to anal pore 192 m.; length of tail 303 m.; length of head 33 m.; length of origin of dorsal 63 m.

*Type*.—M. C. Z. 9200. Cape of Good Hope, July, 1860. L. Layard.

#### OPHICHTHYS UNISERIALIS, sp. nov.

Elongate cylindrical; the head pointed, conical, the upper jaw projecting; tail moderately compressed from the anal pore, and with a short acute point in the vertical plane; depth of anal 3 in head; length of head and trunk about equal to tail.

Head, somewhat compressed, rounded, and pointed; greatest width 1.50 into its greatest depth, length 11 in total length and 4.5 in trunk.

The mouth rather small, closing completely, the under jaw much the shorter; the distance between tip of snout and angle of jaws 3.25 in head. Maxillary teeth uniserial, eighteen in number, conical and pointed, of about equal size. Premaxillaries consisting of a clump of three conical backward directed teeth on each side, near the tip



of snout and separated from the other teeth by an interspace. Vomerine teeth in a single series of twenty with the two anterior teeth rather small, those on the shaft large anteriorly but graduating posteriorly to very small teeth. Mandibular series uniserial except at tip, there being about twenty-one curved conical pointed teeth, moderately directed back in the jaw, besides two to three small curved teeth in the front.

Snout pointed; length 5.5 in head. Anterior nostril with a short wide tube just above tip of lower jaw; posterior nostril with a large fringed slit opening on upper lip; it also has an external opening in a small tube just posterior to the anterior nostril.

The center of eye is considerably nearer the angle of jaws than to tip of snout, length of eye 2.3 in snout. The pectoral, dorsal, and anal fins are distinctly developed, but the tip of the tail is bare. The pectorals are located at upper posterior margin of gill-openings, their length 4.7 in head; origin of the dorsal is posterior to the tip of pectorals by a distance equal to the eye; dorsal and anal very low, but wider near tip of tail where their terminal angle begins; they extend almost to tip of tail, the bare portion being but little longer than eye.

*Color in alcohol*.—drab, yellowish on belly and throat. The back and down to the lateral line has patches or mottlings of darker brown which are very irregular. The head has the mucous pores ending in black dots, four on the upper jaw, two behind the eye, and a row of four from above the eye to tip of snout; also a row of eight on under jaw extending posteriorly to gape.

Length 725 m.

*Type*.—M. C. Z. 25,957. China. J. D. Dana.

#### OPHICHTHYS EXILIS, sp. nov.

Body elongate, cylindrical, almost round in cross section; head conically pointed; upper jaw somewhat projecting. The tail is evenly compressed from the anal pore to the acute tip, which is bare; depth at anal pore 2.4 in head, the length of the tail a little more than twice the length of the trunk, without the head.

Head moderately compressed, its greatest width 1.5 in its greatest depth; its length 2.3 in trunk, and 8 in total length. Mouth of moderate size, the angle of jaws from tip of snout 2.5 in head; under jaw straight the mouth closing fully.



Teeth of maxillary biserial, twenty conical, pointed teeth in outer series and about sixteen in inner row. There are a few additional small teeth at angle of jaws in irregular formation; premaxillary uniserial consisting of three large canine-like teeth at the tip of upper jaw. Vomer has an irregular cluster of three large curved teeth on the median line anteriorly plus a single series extending back in a graduated manner on the shaft for twelve to fourteen sharp teeth. Lower jaw biserial, with about twenty-two conical, moderately pointed teeth of much larger size in the outer row; the inner row of smaller sharp teeth seventeen in number plus three large canine teeth at the snout 5.5 in head.

Anterior nostril in a tube on the upper lip just posterior to tip of lower jaw; posterior nostril opening a tube but little less in size than the anterior nostril and its location on upper lip about mid-way between eye and anterior nostril; eye 9.5 in head; 1.5 in snout; its center slightly nearer angle of jaws than to tip of snout (in smaller specimens almost equal).

Gill-openings very large, lateral, but almost entirely below the median line; their width equal to snout.

The fins are low but distinct, the origin of the dorsal is posterior to tip of the pectorals, by a distance equal to the eye (in small specimens this distance is equal to distance between eye and anterior nostril); pectorals 2.7 in head; dorsal and anal ending a distance from tip of tail about equal to eye.

Color uniform dark brown, lighter on chin and throat; small specimen lighter on under surface.

Pores distinct, about 45 on lateral line between anal pore and origin of dorsal; a distinct row of seventeen pores over nuchal region, and some less distinct, in snout and cheek.

	<i>Type</i>	<i>Cotype</i>
Total length	506 m.	423 m.
Length to anal pore	200	175
Length of head	60	55
Length to origin of dorsal	93	80
Length of trunk	136	115
Length of tail	310	253

*Type*.—M. C. Z. 28,401. Santiago, Chile, April 1, 1897. F. Latasti.



## MURAENIDAE.

## MURAENA VAGRANS, sp. nov.

Body elongate, cylindrical, slightly compressed anteriorly, ending in the conical snout; lower jaw the longer. Posteriorly the body is evenly compressed from the anal fin to tip of tail; fins united around tip of tail; depth of body at anal about 2 in head; the tail longer than head in trunk by a distance less than length of head.

Head thick and strong its greatest width 1.4 in its depth; its length 2.75 in trunk (without head) and 8 in total length; mouth of moderate size and closing completely; the length from tip of snout to angle of jaws 2.2 in head; lower jaw projecting.

Teeth acute, compressed, biserial; maxillary with fourteen sharp teeth in outer row and seven larger curved, conical, depressible teeth on inner row; premaxillary with an outer row of nine or ten small teeth and an inner row of five large canines. Vomer with three large teeth anteriorly plus two series of short rounded teeth on the shaft, each series of eight teeth; mandibular teeth in a single row of twenty-one sides of jaw, plus two series in the front of eight teeth.

Snout rather short and high, its length 4.7 in head, its height 1.5 in its length; anterior nostril in a short tube above the upper lip near tip of snout; posterior nostril in a tube fully as large and located on a line with anterior margin of eye; eye slightly nearer angle of jaws than to tip of snout, its length 3 in snout. Gill-openings small, about equal to eye, the aperture distinctly tubular and located below the lateral line.

No pectoral fin, dorsal and anal distinct, and united around tail; origin of dorsal on nuchal region, far in advance of gill-openings.

*Color in alcohol*:—uniform black.

Total length 555 mm.; length to anal 260 mm.; length of tail 295 mm.; head 70 mm.

*Type*.—M. C. Z. 2532 B. South America?

## MURAENA VIRIDIPINNA, sp. nov.

Body cylindrical, elongate, compressed; head conical, the lower jaw slightly the longer; tail evenly compressed from anal pore;



depth at anal pore 2.5 in head; the tail is but little longer than head and trunk.

Head moderately pointed, its length in total 9.3; in trunk 4; mouth rather wide, the lower jaw somewhat curved, so that probably in life, the jaws do not close completely; length from tip of snout to angle of jaws 2.1 in head.

Teeth in maxillary biserial, the outer row of twenty sharp compressed teeth directed backwards, the inner row of four larger conical teeth; premaxillary with six large canines plus four or five small teeth pushing up among them. Vomer with large canines anteriorly, plus a single series of six short, thick, but pointed teeth on the shaft; mandible with teeth in a single series of fourteen acute teeth on sides, plus two interior canines forming the inner series in front. Snout at its posterior base about as wide as high; its length 5.5 in head.

Anterior nostrils in short tube near tip of snout; these are scarcely equal to length of pupil; posterior nostrils with a short tube or rim, distinct, but might be easily overlooked without a lens. The nostril is located above the anterior margin of eye. The eye is 1.5 in snout and is located mid-way between angle of jaws and tip of snout.

Lateral line and mucous pores not distinct.

Gill-openings slightly larger than eye and located on middle of sides.

No pectoral fin; dorsal and anal fins distinct but not especially elevated, they meet around the end of tail; origin of dorsal directly above the gill-openings.

*Color in alcohol*.—uniform seal-brown, fins darker, without any white margins; black at angle of jaws and at gill-openings; the fins when the specimen was first received, according to a note, were green.

Total length 211 m.; to anal pore 93 m.; length of tail 118 m.; length of head 23 m.

*Type*.—M. C. Z. 6146. Mauritius. Nicholas Pike.

#### MAURAENA ACUTIS, sp. nov.

Body elongate, cylindrical, somewhat compressed, the head rather sharp pointed, the jaws of equal length, tail evenly compressed from the anal pore to tip; dorsal and anal confluent. The length of the head and trunk slightly greater than tail; head 2.75 in trunk and 7 into total length. Mouth of moderate size and closing completely; the under jaw being strongly curved; length from tip of snout to angle of jaws 3 in head.



Teeth of maxillary biserial, the outer row of fourteen rather short, pointed teeth; the inner row of six or seven large conical teeth the pointed tips directed backwards; premaxillary with six or seven large, pointed teeth set in a semicircle. Vomer with three large depressible teeth anteriorly plus a biserial series on the shaft; each row consisting of about seven short, rounded teeth; lower jaw with twenty-two sharp teeth on sides plus three large anterior canines on each side.

Snout rather high and pointed, its height a third more than its width; length of snout 5.5 in head; anterior nostrils in tubes near tip of snout; posterior nostrils also tubular, but shorter, located directly above the anterior margin of eye. Gill-openings of moderate size. Eye nearer to angle of jaws than to tip of snout; its length 1.75 in snout.

No pectoral fin; dorsal and anal well developed and meeting around tip of tail; origin of dorsal on nape considerably in advance of gill-openings.

*Color in alcohol*:—cherry-brown with few scattered white specks, size of a pin-point, a few on anterior of body slightly larger, as large as head of pin, but none so large as pupil of eye.

Total length 281 mm.; length to anal pore 150 mm.; length of tail 130 mm.; length of head 40 mm.

*Type*.—M. C. Z. 3960. Pearl Island, Gulf of Panama. Alexander Agassiz.

#### GYMNOTHORAX PIKEI, sp. nov.<sup>1</sup>

Body cylindrical, elongate; head moderately pointed, the jaws equal; tail evenly compressed from the anal pore, its length slightly greater than head and trunk; depth at anal pore 2.50 in head.

Head 7.5 in total length; 2.7 in trunk. Mouth rather large, not closing completely; the under jaw being curved; length from tip of snout to angle of jaws 2.1 in head.

Teeth uniserial, the maxillary with about twelve acute teeth; premaxillary teeth five on each side. Vomer with two large fange-like, depressible teeth anteriorly, plus a single row of fourteen sharp teeth on the shaft; mandibular teeth about twenty-one; some of the teeth

<sup>1</sup> In 1882 Dr. Franz Steindachner studied the fishes in the Museum of Comparative Zoölogy. During that time he labeled three jars *G. pikei* Steind.; *G. insignis* Steind.; *G. elegans* Steind. So far as I can ascertain no descriptions were ever published; as these seem to be valid new species I have described them, using the names of that eminent ichthyologist.



serrate. (The mouth has been badly broken and many teeth lost). Snout 4.5 in head, its width at center greater than its depth; anterior nostrils in small tubes near end of snout; posterior nostril without tubes and located above the anterior portion of the eye. The eye is about mid-way between tip of snout and angle of jaw.

Gill-openings the size of eye, and located on middle of sides.

No pectoral fin. Anal and dorsal distinct, and uniting around tip of tail; origin of dorsal anterior to gill-openings at the beginning of nuchal region.

Color grayish white, with narrow black bands, about as wide as eye and much less than interspaces; fifteen of these on head and trunk. There seemed to have been about twenty-one additional bands on the tail as they show distinctly in both the anal and dorsal fins, but on the sides of the tail, the lower portion of these bands seems somewhat broken up into spots.

The anterior band is on tip of snout, the second through the eye; the third through the angle of jaws; there are two more distinct bands between the angle of mouth and the gill-openings. The gill-openings fall mid-way between the dark bands and are located in a distinct brown spot. Fins colored like body.

Total length 905 m.; length to anal pore 430 m.; length of tail 475 m.; length of head 120 m.

*Type*.—M. C. Z. 6145. Mauritius. Nicholas Pike.

#### ✓ GYMNOTHORAX ELEGANS, sp. nov.

Body elongate, cylindrical, compressed; head moderately pointed, mouth large, the lower jaw slightly the longer; tail evenly compressed from the anal pore 1.8 in head. The head 9.60; into trunk 3.1.

Mouth rather large; length from tip of snout to angle of jaws 2.2; jaws not closing fully. Teeth uniserial; maxillary with eleven acute, compressed teeth which decrease in size posteriorly; premaxillary with six sharp teeth. Vomer with one large depressible fange anteriorly, plus a single series of three small short teeth on the shaft; mandibular teeth twenty on each side acute, compressed, becoming smaller posteriorly. Snout rather short and high, its length 5.1 in head, its depth at eye about equal to its width; anterior nostrils in tubes about half as long as eye; posterior nostril without tube and located on a line above anterior margin of eye; the eye is small 2.1 in snout and located



somewhat nearer tip of snout than to angle of mouth. Gill-opening about one third larger than eye and located on middle of sides.

No pectoral fins, but dorsal and anal are distinct, and unite around tail; origin of the dorsal on the nape of head far in advance of gill-openings.

*Color in alcohol*.—yellowish brown the anterior two thirds of body with narrow lines of dark brown which mark off the ground color in round or hexagonal yellowish white spots; these are small on the head, but from the gill-openings posteriorly they are chiefly larger than eye and of much greater width than the dark brown wavy bands on the posterior third of the body; these wavy bands are almost equal to the interspaces and extend far into the dorsal, but not into the anal; there is a dark stripe along the base of anal and extending more or less interruptedly across the belly to chin; otherwise the anal is white; the gill-openings are black.

Total length 645 m.; length to anal pore 275 m.; length of tail 370 m.; length of head 67 m.

This specimen somewhat resembles *G. insignis*, but has a larger mouth, longer snout, and is differently marked.

*Type*.—M. C. Z. 5954. Mauritius. Nicholas Pike.

#### GYMNOTHORAX DORSALIS, sp. nov.

Body elongate, compressed, cylindrical, the snout not particularly sharp pointed, the tail even compressed on the lateral plane in the posterior third of length, but not so strongly compressed on the vertical plane; depth at anal pore 3.50 in head; length of tail only one half length of head greater than head and trunk.

Head 8.2 in total length; 2.8 in trunk without head; width of head but little more than its depth; mouth rather large, closing completely; length from tip of snout to angle of mouth 3 in head, the upper jaw just a trifle the longer.

Teeth of maxillary biserial, sharp, compressed, conical, about twenty in outer series and four large depressible canines in the inner maxillary series; premaxillary uniserial, of seven strong teeth; inner with three large depressible canines anteriorly, plus a single series of three strong sharp teeth on the shift; mandibular teeth in a single row of twenty-four on the sides, plus an inner row anteriorly of four canines.



Snout short and wide, its length 2.5 in upper jaw, its width 3 into same distance; anterior nostril a distinct tube at tip of snout, posterior nostril a round opening without rim or tube, on a line with end above anterior margin of eye. The eye is distinctly nearer the tip of snout than to angle of jaws; its length 2.2 in snout; gill-openings round considerably larger than eye, and located below the lateral line.

No pectoral fin; dorsal and anal distinct and united around tip of tail. The dorsal is very low anteriorly and hidden in the skin, but dissection shows its origin to be anterior to gill-openings; anal fin is also very low.

*Color in alcohol*:—uniform yellowish brown, the dorsal and anal fins posterior are distinctly margined with black.

Type length 822 mm. Head and trunk 390; head 100; tail 432. Cotype (A) length 750; head and trunk 320; tail 430; head 80.

*Type*.—M. C. Z. 31,060 (A). *Cotype*.—M. C. Z. 31,061. Hong Kong.

#### GYMNOTHORAX INSIGNIS, sp. nov.

Body cylindrical, elongate, slightly compressed; head not strongly pointed, jaws equal; tail evenly compressed from anal pore; tail but little longer than head and trunk.

Head 8.9 in total length; 3.4 in trunk without head; lower jaw somewhat curved probably the mouth not closing fully; length from tip of snout to angle of jaws 2.2 in head.

Teeth uniserial; twelve compressed sharp teeth in maxillary, these teeth becoming smaller posteriorly; premaxillary with six sharp teeth; inner with one large tooth anteriorly (probably two as there is a tooth-scar) plus a single row of but two pointed teeth on the shaft. Mandible with twenty-two sharp compressed teeth which graduate smaller posteriorly; snout short 5.5 in head, its depth at eye equal to its length, its width at its posterior portion less than its depth; anterior nostrils in short tube, much less than eye; posterior nostril not in tube and located above anterior portion of eye.

The eye small 2.75 in snout, and located considerably nearer to tip of snout than to angle of jaws.

Gill-openings large, more than twice as large as eye and located on middle of sides. No pectoral fin, dorsal and anal distinct and united around tail; origin of dorsal on nuchal region.

*Color in alcohol*:—pale yellowish brown anteriorly, gradually becom-



ing a darker brown posteriorly. Fins and entire body covered with round white spots, which are very fine, the size of a pin-head on snout and very close together, but gradually becoming larger and farther apart posteriorly so that over the tail they are as large as the eye and the interspace between them is usually twice the width of the spot. The gill-opening is black, no black at angle of jaws.

Total length 775 m.; length to anal pore 375 m.; length of tail 400 m.; head 85 m.

*Type*.—M. C. Z. 5912. Mauritius. Nicholas Pike.

SCUTICARIA UNICOLOR, sp. nov.

Body elongate, cylindrical, compressed, anterior portion of head conical; jaws equal. The tail not tapering gradually from the middle of body, but is rather abruptly compressed in the last fourth of the length. No fins; depth at anal pore 2.5 in head; the tail but little more than one third the total length; head 13.8 in length; 8 in trunk.

Mouth of moderate size, closing fully; length from tip of snout to angle of jaws 2.7 in head. Teeth of about uniform size; sharp, pointed, conical, biserial in jaws, and uniserial on vomer. Maxillary with thirteen teeth in outer series and ten in inner series. The inner series depressible. Premaxillary teeth five in outer series and three in inner. Vomer with two large depressible teeth anteriorly plus five sharp, fixed teeth in the shaft; mandible with twenty in outer series and seven in inner; snout short, six in head; nostrils all tubular, the posterior tubes about one third shorter than the anterior ones. The eye distinctly nearer to tip of snout than to angle of jaws; its width 2 in snout. Gill-openings small, about equal to eye, located above the lateral line. Fins none.

*Color in alcohol*.—uniform yellowish brown without markings.

Type length 620 m.; length to anal pore 405 m.; length of head 45 m.; length of tail 215 m. Cotype (A) length 552 m.; length to anal pore 370 m.; length of tail 182 m.; length of head 40 m.

*Type*.—M. C. Z. 9188. *Cotype*.—M. C. Z. 9188 (A). Society Islands. Andrew Garrett.





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