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CERATIOIDEA

By Albert Eide Parr

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SCIENTIFIC RESULTS OF THE THIRD OCEANOGRAPHIC EXPEDITION OF THE "PAWNEE"
1927.

CERATIOIDEA

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INTRODUCTION

On the third oceanographic expedition of the yacht PAWNEE under the direction of Harry Payne Bingham, eighteen species of Ceratioidea altogether represented by 32 specimens, were collected.

It is rather surprising to find that eleven, or in other words more than half of the species caught are still new to science. This very plainly shows the vast amount of collecting and purely descriptive treatment of forms which must still be done before sufficient facts have been accumulated to allow of any general deductions about the distribution and other biological relations of this group.

With the scattered material and descriptions, and the worldwide distribution of many species it becomes an issue of main importance in deep sea ichthyology to try to establish as soon as possible, in the different groups, the relative values, as diagnostic characters of the different features exhibited by the specimens. To this end the author has recorded a number of different measurements, also of already described species, and even when the present material is not in itself sufficient to make any final conclusions possible, merely as contributions for comparison with other collections. A few indications may however be found already by a comparison of the material now at hand with former records, and in the case of Melanocetus murrayi a rather good series of different sizes was found in the present collection.

It will appear from the table, p. 27, that the largest specimen of Melanocetus murrayi shows quite considerable differences from the rest of the series as far as all dimensions of the head and the length of the pectorals are concerned. The relative length of lower jaw, the relative interorbital and postorbital widths and the relative length
of the pectorals are considerably smaller than in any other specimen and the relative length of the illicium is also below the average.

Concerning the dimensions of the illicium Regan 1926 observes that in a series of nine specimens of Dolopichthys allector Garman its length in the smaller specimens (20–30 mm.) was only one-fourth of the length without caudal, while in the larger ones (48 mm. and Garmans of 72 mm.) it equals one-third to one-half of the same measure. A similar relation might be indicated by the present specimens of Melanocetus murrayi from 17 to 60 mm. length if this possibility was not disproved by the small illicium of the largest specimen on one hand and by the long illiciums of the two smallest ones on the other. It does, however, seem rather improbable that the relative growth of these entirely homologous and analogous organs should not be essentially the same in all species, either resulting in an increase or in a decrease of the relative lengths of the organs considered with age. The series so far examined in this respect are, however, not sufficient to decide what is really the normal change of the proportions in question during growth. We are therefore not yet able to determine the systematic significance of differences between the relative lengths of the illicium in specimens of different size. As far as the genus Melanocetus is concerned the changes and individual variations observed in M. murrayi are not sufficient to efface the value of the proportions in question as diagnostic characters of the different species. The great changes in the relative length of the illicium of Dolopichthys allector reported by Regan, however, warn us to be very cautious when comparing specimens of different sizes in groups where the variability and the regular changes of this character have not been made out already. Still the length of the illicium undoubtedly gives valuable hints to the identity of the specimens and its use as a diagnostic character is very helpful when other characters concur in proving the existence of a separate species.

A satisfactory measurement for the length of the head, corresponding to this measurement in other fishes, cannot be found in the Ceratioidea as the distance from the snout to the gill openings, by the lack of firm skeletal margins around the latter, is too dependent upon quite accidental contractions, the state of preservation and so on. The most reliable expression for the size of the head is

probably found in the relative length of the lower jaw, which in the examined series of *Melanocetus murrayi* varies between $\frac{2}{3}$ and about $\frac{1}{2}$ of the length without caudal, without any apparent relation to the size of the specimens, except in the case of the largest one which has the relatively shortest lower jaw. The size of the head can of course be represented by the length of the lower jaw only by comparisons within narrow systematic limits, where the proportion between head and mouth is fairly uniform.

In *Melanocetus murrayi* the length of the longest dorsal ray exhibits a surprisingly constant ratio to the total length without caudal, while the relative length of the caudal fin is distinctly decreasing with age. The variations of the pectoral fin are less regular but this fin also seems to become relatively smaller in the larger specimens.

As *Melanocetus* has no barbel and no appendages on the illicium, the above discussed series cannot tell us anything about the systematic value of the structure and proportions of these parts.

A comparison between the present specimen of *Linophryne arborifer* Regan 1925 and the description of the larger type specimen reveals some very striking differences in the proportions of the barbel and of the endfilament on the bulb, the relative dimensions of both parts being in the smaller specimen (30 mm. length without caudal) only about one-third of what they are in the larger one (50 mm. length without caudal) see p. 11. It thus seems that in this instance at least the barbel and the appendage on the illicium must be very late to develop, their relative lengths therefore being of no value at all for diagnostic purposes. It must, however, be mentioned that the barbel of *Linophryne arborifer* is entirely filamentous and possibly homologous with the terminal appendages only on the barbels of other species, in which an undivided proximal stem is found. It is therefore still to be determined whether the length of this stem may not prove to be a more reliable character, the stem of the barbel perhaps being in a similar relation to the terminal filaments as the illicium itself to its appendages.

Even if the relative lengths of the parts considered thus appear to be entirely unreliable as diagnostic characters, this does not necessarily imply that the same must also be said about their structural designs, as is clearly shown by the terminal filaments on the bulbs of the two specimens of *Linophryne arborifer* above compared. The small appendage of the smaller specimen is in its trifid structure exactly
identical with the relatively much larger appendage of the greater specimen. Other examples for comparison are difficult to find as the details of these appendages have scarcely been considered at all in most descriptions. In the present material of Chaenophryne longiceps Regan two distinct types of terminal filaments are found, but owing to our lack of knowledge about the variability of these parts it is impossible to give a definite systematic valuation of the differences observed. It is, therefore, for a more accurate identification of the different forms, very desirable that the individual variations in the structure of the filaments and appendages on bulbs and barbels, which in many cases are highly characteristic of the species, should be more closely examined.

There can be no doubt that our present knowledge of individual variability among the Ceratioidea and most of the other groups of deep-sea fishes is very unsatisfactory as a basis for identification and separation of species with an, in many cases, world wide distribution. All problems of distribution, which means the problems of the entire relation between the organisms and their physical environment, of course hinge upon our ability for discerning and identifying the species. Even when fully realizing that taxonomy is only a tool for science, one must therefore not forget that modern science needs very accurate tools.

**LIST OF NEW SPECIES**

**Linophrynidae**

*Linophryne* Collet 1886
- *L. brevibarbis* n. sp.
- *L. bicornis* n. sp.
- *L. coronata* n. sp.

**Oneiroidae**

*Dolopichthys* Garman 1899
- *D. obtusus* n. sp.
- *D. analogous* n. sp.
- *D. longicornis* n. sp.

**Thaumaticthys** Smith a. Radcliffe 1912
- *T. binghami* n. sp.

**Melanocetidae**

*Melanocetus* Günther 1864
- *M. tumidus* n. sp.

**Acerahtidae**

*Rhynchoceratias* Regan 1925
- *R. acanthirostris* n. sp.
- *R. latirhinus* n. sp.

*Laevoceeras* n. gen.
- *L. liparis* n. sp.
LIST OF STATIONS

1927

STATION 11. 2/3 1927, 23° 55' N. 77° 26' W. 7000 feet wire
   1 Melanocetus murrayi Günther 1887
   1 Melanocetus tumidus n. sp.

STATION 16. 9/3 1927, 23° 49' N. 76° 58' W. 7000 feet wire
   3 Melanocetus murrayi Günther 1887

STATION 18. 10/3, 1927, 23° 42' N. 76° 43' W. 7000 feet wire.
   1 Melanocetus murrayi Günther 1887

STATION 22. 12/3, 1927, 23° 37' N. 77° 15' W. 7000 feet wire.
   1 Melanocetus murrayi Günther 1887
   1 Rhynchoceratias acanthirostris n. sp.

STATION 23. 14/3, 1927, 24° 29' N. 77° 29' W. 8000 feet wire.
   1 Cryptosparas couesii Gill 1883

STATION 25. 17/3, 1927, 24° 51' N. 76° 37' W. 8000 feet wire.
   1 Melanocetus niger Regan 1925
   1 Cryptosparas couesii Gill 1883
   1 Thaumatichthys binghami n. sp.

STATION 33. 22/3, 1927, 24° 11' N. 75° 37' W. 8000 feet wire.
   1 Melanocetus murrayi Günther 1887
   1 Rhynchoceratias latirhinus n. sp.
   1 Laevoceratias liparis n. gen. et n. sp.

STATION 39. 29/3, 1927, 22° 43' N. 74° 23' W. 8000 feet wire.
   1 Linophryne coronata n. sp.
   2 Melanocetus murrayi Günther 1887
   1 Mancalías uranoscopus Murray 1878

STATION 46. 4/4, 1927, 21° 46' N. 72° 49' W. 10,000 feet wire.
   1 Dolophichthys longicornis n. sp.

STATION 48. 6/4, 1927, 21° 44' N. 72° 43' W., 7000 feet wire.
   1 Chaenophryne longiceps Regan 1925

STATION 52. 11/4, 1927, 21° 30' N. 71° 11' W., 8000 feet wire.
   1 Melanocetus johnsoni Günther 1864

STATION 56, 13/4, 1927, 21° 20' N. 71° 13' W. 6500 feet wire.
   1 Melanocetus niger Regan 1925.

STATION 58. 20/4, 1927, 32° 24' N. 64° 29' W., 10,000 feet wire.
   1 Linophryne brevisbarbis n. sp.
   1 Melanocetus murrayi Günther 1887
   1 Dolophichthys analogus n. sp.
   2 Chaenophryne longiceps Regan 1925

STATION 59. 21/4, 1927, 32° 19' N. 64° 32' W., 8000 feet wire.
   1 Linophryne arborifer Regan 1925
   1 Linophryne bicornis n. sp.
   1 Dolophichthys obtusus n. sp.
   1 Chaenophryne longiceps Regan 1925.
SYSTEMATIC ACCOUNT

LINOPHYRNYE Collet 1886

Præopercular and sphenotic spines strong. Hyoid barbel well developed. Illicium suprarosstral, bulb with appendages. Head large. Dentition strong.

Key to the species.

I. Bulb on illicium with appendages on both sides, not only at the distal end or in the median.

A. Bulb with two series of rather strong, partly branching filaments on each side, and with a small terminal filament. Barbel small and thin, with a proximal undivided part equaling 2/5 of its total length, then giving rise to two thin branches and ending in a thin filament.

L. brevibarbis n. sp.

B. Bulb with only one series of filaments on each side. Barbel “with about 16 equal, slender branches arising together from the very short basal part.”

L. polygon Regan 1925.

C. Bulb with a simple, rather thick, hornlike filament on each side.

L. bicornis n. sp.

II. Appendages only at the distal end or in the median of the bulb on illicium.

A. Barbel branching directly from the base, all branches white. Dorsal, caudal, and anal fins entirely white. Only a single trifid terminal filament at the distal end of the bulb on illicium.

L. arborifer Regan 1925.

B. Barbel with a longer or shorter, proximal, undivided and unbranched, black stem. Dorsal, caudal and anal finrays covered by black pigment.

1. Bulb on illicium surmounted by a broad median ridge, posteriorly carrying a short, thick pair of filaments and anteriorly produced into a thick tubercle carrying a similar, backwardly directed pair of filaments at its end. Undivided stem of barbel very long and thin, ending in a cluster of very small filaments.

L. coronata n. sp.

2. Bulb on illicium “ends in a pair of exceedingly short and slender threads” with “small papilla-shaped bodies on one side.”

Barbel with a very long undivided stem, equaling 3/4 of its total


3 The black pigmentation on these parts is developed in all specimens which have been figured or described in this respect, it may however possibly be absent in very young individuals.

length, dividing itself at the end into two equal, short, pointed blades which carry tubercles along their anterior margin, but no filaments. \( \ldots \) \( L. \) lucifer \( \ldots \) Collet 1886.

3. Bulb on illicium with a terminal filament. The undivided stem of the barbel less than half of its total length. \( \ldots \) Barbel bearing a lateral branch before it bifurcates, "each terminal branch dividing into two long filaments, each of which bears shorter ones." \( \ldots \) \( L. \) macrodon \( \ldots \) Regan 1925

\( \text{Linophryne brevibarbis} \) n. sp.

1 specimen, No. 2001 B. O. C. Station 58, 20/4, 1927.

32° 24' N. 64° 29' W., 10,000 feet wire.

Total length 34 mm. Length without caudal 25 mm. Length of lower jaw 11 mm. Distance from the snout to the base of the praeopercular spine 12.5 mm. Stem of illicium 4.5 mm., bulb 2.5 mm, altogether 7 mm, longest lateral appendage on bulb 2.5 mm. Width between the bases of the sphenotic spines 7 mm. Stem of the barbel to the base of the first branch 4 mm., total length of the barbel 10 mm. Diameter of the eye 2 mm. Length of praeopercular spine 3 mm.

The head is of medium size, the length of the lower jaw being a little more than 2/5 of the total length without caudal, the distance from the snout to the base of the praeopercular spine equaling half of the same measure.

The sphenotic and praeopercular spines are equal, very long and slender. The spine at the lower, posterior angle of the lower jaw is small, but very sharp and rather prominent.

The bulb on the illicium is slightly more than half the length of the stem. There are two series of appendages on each side of the bulb, see fig. 1. The anterior series starts with a minute tubercle near the base of the bulb, then follows a filament with a short anterior branch and above this the longest appendage of this series with one or two short anterior branches and one posterior branch near its base. In the posterior series there is one unbranched filament opposite the interspace between the tubercle and the first filament of the anterior series, and one larger, branched appendage opposite the interspace between the two upper filaments of the same. The upper filament of the posterior series is the largest of all the appendages on the bulb and carries two sets of small branches at a distance above each other, each set consisting of one anterior and one posterior branch, the upper set being very small. At the distal end of the bulb there is a small, simple, central, conically elongate filament. The free ends of the central filament and of the upper filaments of both series on each side all terminate at the same level.

After an undivided stem equaling 2/5 of the entire length of the barbel a

\( \ldots \) According to figure 2, plate II, Regan 1926, loc. cit.

\( \ldots \) Regan 1926, loc. cit. p. 24.
Fig. 1. *Linophryne bretbarbis* n. s. Lateral view of the fish and enlarged, detailed drawing of the left side of the illicium. In the figure of the entire fish the illicium has been twisted, showing the frontal view of the bulb. Drawn by W. S. Bronson.
branch arises from its posterior surface, and about 3/4 of a millimeter farther
down a somewhat smaller anterior branch originates. See fig. 1. The distal
ends of the two branches are reaching to the same level, their proximal parts are
of the same nature as the corresponding parts of the main stem, which reaches
about 3 mm. beyond their ends. Both branches and the terminal filament of the
main stem carry a number of sessile tubercles on their anterior surface, the
proximal tubercle on the terminal filament being, however, itself produced
into a minute filament.

Teeth rather small, in single series in both jaws, 3 fangs and about 4 smaller
ones in each half of lower jaw and about 6 teeth on each side in upper.

The rays of the dorsal, anal and pectoral fins are covered by a not very dense
black pigment. Pigment-covering of caudal rays rather scanty, the stripes
constricted but not quite disappearing at the base and fading away on the
distal part of the fin. Stem of illicium appearing white to the eye, a very
scattered pigment only visible under a lens. Black pigment on the barbel
covering the proximal parts of the two branches and the stem itself to slightly
beyond the origin of the second branch.


Linophryne bicornis n. sp.

1 specimen. No. 2030, B. O. C., Station 59.21/4. 1927.

32° 19' N. 64° 32' W. 8000 feet wire.

Length without caudal fin 27 mm. Length of lower jaw 11 mm. Distance
from the snout to the base of the praeopercular spine 13 mm. Stem of illicium
4 mm., lateral filament on the bulb 2.5 mm. Diameter of the eye 2.5 mm.
Length of the praeopercular spine 3 mm.

Fig. 2. Frontal view of the illicium of Linophryne bicornis.
The only specimen caught is in a deplorably bad condition, the barbel being torn off near the base, the distal half of the caudal fin missing, and the bulb on the illicium being torn at the end. Still what is left very distinctly separates the specimen from any formerly described species.

The head is of medium size for the genus, the length of the lower jaw being, about 2/5, and the distance from the snout to the base of the praeopercular spine scarcely half of the total length without caudal fin.

The sphenotic spine is slightly longer than the praeopercular spine.

Apparently about or below the middle of the bulb on the illicium arises on each side one comparatively very strong tapering filament, directed outwards and upwards in a slight curve, see Fig. 2. Below this appendage a minute, conical, dermal protuberance may be seen. Other filaments on the bulb cannot be found on the present specimen. As the distal end of the organ is lacking, however, nothing can be said about the possible median appendages.

Of the barbel there is only a short basal stump left.

The teeth are of medium size, without regular arrangement in separate series. Only three fangs in each side of the lower jaw and about four smaller teeth. Upper jaws with 8 or 9 teeth on each side. A pair of small teeth on the vomer.

Pectoral, dorsal, anal and caudal rays beyond their basal parts covered with black pigment. Pigmentation interrupted by an unpigmented vertical region at the basis of the caudal fin. Stem of illicium and the stump of the barbel black.


Linophryne arborifer Regan 1925.

1 specimen, No. 2029, B. O. C., Station 59.21/4. 1927. 32° 19' N. 64/32; W., 8000 feet wire.

Total length 42 mm. Length without caudal 30 mm. The length of lower jaw 16 mm. Distance from the snout to the base of the praeopercular spine 18 mm. Width between the bases of the sphenotic spines 10 mm. Stem of illicium 3 mm, bulb 3 mm, terminal filament 2 mm, altogether 8 mm. Diameter of eye 3 mm. Length of praeopercular spine 4 mm, of sphenotic spine 3.5 mm. Length of the barbel 11 mm.

As far as can be made out from the very short description of the type the present specimen does not exhibit any differences whatsoever in structural designs and according to the figure both specimens agree in the complete lack of pigmentation on the rays of the vertical fins. The author has, therefore, no hesitation in identifying the two as belonging to the same species. The considerable differences found in the dimensions of the barbels and of the terminal filaments on the bulbs then become of interest as indicating a very late development or slow growth of these parts. This conclusion of course greatly influences the systematic value of the proportions of these organs, as already made out

Regan 1926 loc. cit. plate III, fig. 1.
on p. 3. In Regan's specimen, with a total length without caudal of 50 mm., the barbel is "as long as fish" and the trifid terminal appendage on the bulb is longer than bulb and stem together. In the present, smaller specimen the barbel is only slightly more than one-third of the total length without caudal, and the terminal filament on the bulb is only one-third of stem and bulb together. According to the figure the spines on the head are, on the other hand, somewhat smaller in the larger specimen. In the specimen now at hand the spines are very long and slender, the praepercular spine measuring (to its base below the skin) one-fourth of the length of the lower jaw, the sphenotic spine is a little shorter.

The enormous size of the head is probably a good character of the species, the length of the lower jaw being slightly more than half of the total length without caudal, the distance from the mouth to the base of the praepercular spine being 3/5 of the same measure.

The terminal appendage on the bulb arises in the center of its distal end as a short peduncle carrying two short and thick lateral lobes and a central tapering filament which is several times as long as the former.

The barbel gives rise to a symmetrical pair of lateral branches directly from the base. These branches bifurcate, the inner (medial) limb being the longest. Each limb ends with a pair of small, stalked or sessile tubercles but carries no other appendages. Between and immediately below these lateral branches an anterior median branch originates carrying a great number of smaller branches of different order along its anterior surface only. The main barbel (longest branch) also carrying a profusion of smaller branches on its anterior surface only, follows close behind the just described median branch. See fig. 3. Some of the branches on the main barbel carry still smaller lateral branches, but most of the branches of higher orders both on the main barbel and on the anterior branch are median. The ultimate ends of all branches carry minute tubercles. All branches entirely white.
Fig. 4. *Linophryne coronata* n. sp. A. Lateral view. B. Illicium. C. The end of the barbel. Drawn by W. S. Bronson.
Teeth in the lower jaw in two distinct series, three long, depressible ones in the inner series on each side and about five smaller ones in the outer. Where the two series meet in front there is one long fang on each side of the symphysis. About 8 teeth in two irregular series on each side in the upper jaw.

D. 3. A. 3. C. 2 simple rays above + 4 bifid rays + 3 simple rays below (only two in Regans specimen).

*Linophryne coronata* n. sp.


22° 42' N. 74° 23' W. 8000 feet wire.

Total length 48 mm. Length without caudal 37 mm. Length of lower jaw 13 mm. Distance from the snout to the base of the praepercular spine 16 mm. Width between the bases of the sphenotic spines 10 mm. Stem of illicium 3.5 mm., bulb 3.5 mm., terminal appendages 2.5 mm. altogether 9.5 mm. Diameter of eye 2 mm. Length of the praepercular spine 3 mm. Length of the undivided stem of the barbel 29 mm. Length from the base of the first appendage to the end of the terminal filament of the barbel 5 mm.

This species is characterized by the small dimensions of the head, the structure of the appendages on the bulb, the long undivided stem of the barbel and by the distribution of the black pigment.

The head is altogether very small compared with other species of the same genus, this being numerically expressed by the length of the lower jaw, which is only about one-third of the total length without caudal, and by the distance between the snout and the base of the praepercular spine equaling only about 4/9 of the same measure.

The bulb on the illicium is at its distal end surmounted by a thick and low median ridge, which is anteriorly produced into a short and thick tubercle carrying a pair of very short, conical, obliquely upwards and backwards directed appendages at its end. Posteriorly the ridge carries a pair of short thick filaments, one on each side, similar to the appendages on the anterior tubercle but curving outwards and upwards. Behind and below the thick ridge there is a very small and thin, pointed, triangular, median wing not reaching above the bulb itself. See fig. 4, B.

The barbel is very long and slender with only a very small cluster of filamentous appendages at the distal end. The proximal, unbranched stem equals about 4/5 of the total length without caudal, while the distance from the base of the first appendage to the end of terminal filament is only about one-sixth of the length of the stem. The appendages start with an anterior and a posterior pair of quite similar filaments. See fig. 4, C. The filaments of each pair diverge from each other in a horse-shoe fashion and carry a single series of small, stalked tubercles on the side which is turned away from the stem of the barbel. Then follow two short median, probably anterior, branches after each other, each ending in a rather big tubercle and carrying smaller, stalked tubercles on the
lower half of their anterior surface. The terminal filament is longer and more slender than the others and only carries a few very small tubercles at the base.

The teeth are not in distinct series in any of the jaws. Only three big fangs and three to four smaller teeth in each side of the lower jaw. Upper jaw with 7 to 8, all rather small teeth on each side. One pair of teeth on vomer.

The stem of the illicium and the rays of the dorsal and anal fins are covered with black pigment. Pigmentation interrupted by an entirely uncolored vertical region at the base of the caudal fin. The distal, and by far the largest part of the caudal rays however covered by black pigment. The stem of the barbel is black, but gradually fading so that it becomes entirely white where the appendages begin.

A soft dermal protuberance above the symphysis of the lower jaw.


**ONEIRODIDAE**

**DOLOPICHTHYS** Garman 1899

Sphenotic spines present, no praepercular spines. A set of articular spines, one on the quadrate and one on the lower jaw, usually well developed. Illicium suprarostral, bulb with appendages. No barbel. No isolated ray on the back.

Key to the species.

I. Illicium 2/3, its fully exserted basal bone more than half of the total length without caudal. Illicium with two small bulbs (according to the figure of the type-specimen). Articular spines well developed. Lower jaw about 1/3 of length without caudal. 

* D. danae Regan 1926.

II. Illicium only about half or less of the total length without caudal fin. Only one single, simple bulb.

A. Bulb on illicium surmounted by many short, finger like filaments.

* D. (Dermatias) platynogaster Radeliffe 1912

B. Bulb projecting beyond the bases of its appendages.

1. Mandibular spine longer than that of the quadrate, both long and slender. Illicium 1/5 to 1/4 of total length without caudal.

* D. gracilispinis Regan 1925.

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Oneirodes cornutus Gilchrist and Bonde 1924, probably belonging to the genus Dolopichthys (see Regan 1926), is characterized by the complete lack of anal fin.

9 Regan 1926, loc. cit. plate IV, fig. 1. This peculiar character is not mentioned at all in the very short description of the species.
2. Mandibular spine not longer than that of the quadrate.
   a. "Bulb with an anterior tentacle-like and a posterior curved and compressed appendage, and with a broad anterior and a slender lateral pair of fringed flaps." Length of lower jaw 2/5 to half of total length without caudal.
   
   D. luetkeni Regan 1925.
   syn. D. heteracanthus Regan 1925.11
   
   b. Bulb not as above, with appendages only in or along its median.
      o. Only about 10 to 15 (20?) teeth in each half of the lower jaw.12

      x. Bulb "laterally compressed, provided anteriorly with a lappet or cirrus and posteriorly with a short fleshy process."13
   
   D. (Monoceratias) acanthias Gilbert 1915.
   xx. Bulb "bears on its upper edge anteriorly a short digitiform limb with several short branches, behind this a tuft of very slender filaments," "and posteriorly a rather stout filament."14
   
   D. megaceros Holt and Byrne 1912.
   xxx. Bulb with a long, thin, tentacle-like filament

10 Regan 1926, loc. cit. p. 27.

11 According to Regan's descriptions and figures (Regan 1926 loc. cit.) the only differences between the two species described by him seem to be that the articular spines are "very small" and the illicium only 1/7 of the total length without caudal in D. luetkeni, while in D. heteracanthus the spines are "well developed" and the length of the illicium 1/6 to 1/5 of the length without caudal. As the specimen of D. luetkeni, on which the description is probably mainly based, is not far from twice as long (160 mm.) as the largest specimen (90 mm.) of D. heteracanthus, these differences seem rather insignificant, especially as a reduction of the osseous spines is a not uncommon feature of old (large) specimens (compare for instance with the discussed specimens of Linophryne arborifer p. 11). In view of the fact that the, in this case, very complicated structures of the appendages on the bulb (see description above) are said to be identical in the two, the author can therefore not see any reasons for regarding them as separate species. The largest specimen may be an entirely normal old individual, the smaller specimen described as D. luetkeni perhaps being a slightly abnormal one, as it would not be surprising at all to find among altogether 24 specimens.

12 D. megaceros having 15 to 20 teeth in upper jaw will scarcely have more than 12 to 15 in lower, even if the upper teeth are "nearly as strong as" the lower.


arising anteriorly near its base. Posteriorly with a pair of downwards directed appendages carrying minute filaments along their posterior edge and originating close together at the median. Behind and below the pair a long and thick tubercle carrying a number of small terminal filaments....... *D. obtusus* n. sp.

oo. About 25 or more teeth in each half of the lower jaw.

x. Illicium only about 1/8 or less of the total length without caudal.

v. Only about 35 teeth in each side of upper jaw. Bulb with a median, swollen, crest-like appendage posteriorly, but with no other filaments. Illicium 1/9 to 1/8 of total length without caudal, lower jaw about 1/3 of the same measure.

*D. analognus* n. sp.

vv. About 60 teeth in each side of upper jaw. Illicium less than 1/10 of the total length without caudal.\textsuperscript{15}^\textsuperscript{\textdagger}

* D. microlophus* Regan 1925.

xx. Illicium about 1/4 or more of the total length without caudal.

v. Bulb with an anterior tentacle-like appendage. Lower jaw only about 1/3 of length without caudal.

* D. allector* Garman 1899.

vv. Bulb with a posterior, median, crest-like appendage but no other filaments. Lower jaw nearly half (4/9) of length without caudal.............. *D. longicornis* n. sp.

*Dolopichthys obtusus* n. sp.

1 specimen No. 2028 B. O. C. Station 59. 21/4. 1927.

32° 19' N. 64° 32' W. 8000 feet wire.

Total length 19 mm. Total length without caudal 13 mm. Length of

\textsuperscript{15} According to the proportion between illicium and lower jaw in the illustration (Regan 1926, loc. cit. fig. 18) the latter should scarcely be one-third of the total length without caudal, the length of illicium being less than 1/10 of the same measure. If, however, the dimension of the lower jaw is included in the “other characters like *D. heteracanthus*” (Regan loc. cit. p. 29) its length should be 2/5 to 1/2 of the length without caudal, in which case this would contribute another distinguishing difference between *D. microlophus* and *D. analognus*. 
Fig. 5. *Dolopichthys obtusus* n. sp. Lateral view of the fish and enlarged, detailed drawing of the left lateral view of the illicium. Drawn by W. S. Bronson.
maxillary 5.5 mm. Length of lower jaw 6 mm. Illicium 3.5 mm. Basal bone of illicium 4 mm. Distance between the bases of the sphenotic spines 3.75 mm. Length of caudal fin 6 mm.

This species is very close to *D. acanthias* Gilbert and *D. megaceros* Holt and Byrne, is however easily distinguished by the peculiar and characteristic structures of the appendages on the bulb, which seems to contribute the main differences between all the three species. As far as the present specimen is concerned it is also remarkable for the largeness of the head and the great length of its caudal fin, these characters may, however, especially in the case of the caudal fin (see p. 3), have some relation to the very small size (the youth) of the specimen and can therefore not be considered as being of diagnostic value until larger specimens have been caught and examined.

In the type-specimen the length of the lower jaw equals nearly half (between 4/9 and 1/2) of the total length without caudal, and the length of the maxillary about 2/5 of the same measure.\(^{16}\)

The length of the caudal fin is very nearly 1/3 of the total length of the fish.

The length of the illicium equals slightly more than 1/4 of the length without caudal. One long, thin filament arises anteriorly near the base of the bulb. Posteriorly a pair of appendages originate close together by the median on the upper half of the bulb. The appendages are directed obliquely downwards and backwards and carry a single series of very short filaments in a comb-like arrangement on their posterior edge. Below this pair a median, long and very thick, evidently quite rigid tubercle protrudes backwards from the middle of the bulb at about right angles with the axis of the illicium. This tubercle carries a finger-like arrangement of very small filaments at its end. There is no external black pigmentation on the bulb except at the point of the small, central elevation at its distal end. Bulb and stem of illicium of about the same lengths.

There are only about 14 to 15 teeth in each half of the lower jaw, some more but much smaller ones in the upper. Two teeth beside each other on each side of the vomer.

The sphenotic as well as the articular spines are short, that of the quadrate slightly longer than the mandibular one.

D. 6 A. 4 P about 16. C. 2 simple rays above + 4 bifid rays + 2 simple rays below.

*Dolopichthys longicornis* n. sp.


21° 46' N. 72° 49' W. 10,000 feet wire.

Total length 27 mm. Total length without caudal 20 mm. Length of lower

\(^{16}\) In *D. megaceros* the length of the lower jaw is given as about 1/3 of the total length without caudal and the same proportion is recorded for the maxillary in *D. acanthias.*
Fig. 6. *Dolichothyla longicornis* n. sp. Drawn by W. S. Bronson.
jaw 8.5 mm. Illicium 6 mm., thereof bulb 1.5 mm. Basal bone of illicium 5 mm. Width between bases of sphenotic spines 5 mm. Snout to sphenotic spine 8 mm. Length of sphenotic spine 2 mm. Quadrate spine 1.5 mm.

This and the following species (D. analogus) are forming a separate group (possibly including also some others as for instance D. microlophus Regan 1925 the descriptions of which are incomplete) characterized by the features of the bulb on the illicium, which has only one single appendage, a median, posterior crest-like organ with a more or less drawn out and pointed upper angle. D. longicornis is, however, well distinguished from the other species of the group by the proportions of the illicium and of the head and by the development of its spines.

The head is rather long but not broad. The length of the lower jaw slightly more than 2/5 of the total length without caudal.

The length of the caudal fin is only about 1/4 of the total length of the fish.

The bulb only occupies one-fourth of the length of the illicium which equals about 2/7 of the total length without caudal. The upper angle of the posterior median crest on the bulb is more produced and pointed than in D. analogus. The bulb bears no other appendages but has a slightly elevated median ridge running from its distal end towards its anterior outline, gradually disappearing before reaching the latter. There is no external pigmentation at all on the distal part of the bulb.

There are about 40 teeth, on each side in the lower jaw, some more in the upper, all rather small, those of the upper jaw being the smallest ones. 3 small teeth close behind each other on each side of the vomer.

The sphenotic and quadrate spines are very long and slender (see the measurements above), the latter is very prominent, protruding at about right angles to the axis of the body. The mandibular spine is, on the other hand, nearly vestigial, entirely hidden below the skin.


Dolopichthys analogus n. sp.

1 specimen No. 2010 B. O. C. Station 58, 20/4, 1927. 32° 24’ N. 64° 29’ W. 10,000 feet wire.

Total length 22 mm. Length without caudal fin 17 mm. Length of lower jaw 5.5 mm. Illicium 2 mm. Width between the bases of the sphenotic spines 4 mm.

The most characteristic features of this species are contributed by the shape and the pigmentation of the distal part of the bulb, by the size of the illicium,

17 Whether the difference between the transverse (D. obtusus and analogus) and the longitudinal (D. longicornis) arrangement of the teeth on the vomer is of any diagnostic value or not cannot be definitely decided until more material shows the stability or variability of these characters.
by the numbers of teeth and by the slight development of the spines on the head. The species is apparently closest to *D. microlophus* Regan, from which it is, however, well distinguished by the smaller number of teeth and by the larger illicium. The latter difference becomes doubly significant if the increase of the relative length of the illicium during growth, recorded by Regan from *Dolopichthys allector* Garman is a general, developmental feature of the genus, as the type specimen of *D. analogus* is considerably smaller than that of *D. microlophus* Regan (total length 34 mm.) It also seems probable that a more complete description of the latter would reveal further distinguishing differences between the two species.

The head is rather small, the length of the lower jaw being not quite one-third of the total length without caudal.

**Fig. 7.** Dorsal (A) and left lateral (B) view of the bulb of *Dolopichthys analogus* n. sp.

The length of the caudal fin is somewhat less than 1/4 of the total length of the fish.

The bulb occupies more than half of the entire length of illicium which is only 1/9 to 1/8 of the total length without caudal. The posterior, median crest is swollen, shorter and blunter than in *D. longicornis*. The upper, anterior outline of the bulb is not gradually curved but forming a rounded angle (see fig. 7). The clavate, tubercle-like elevation at the distal end of the bulb is very distinct with black tip and a black anterior median line. There is a broadly club-shaped region of external black pigmentation on the upper anterior surface of the bulb, beginning at the base of the distal tubercle and broadening towards the anterior rounded angle at which it ends.

There are about 25 teeth in each half of the lower jaw, about 35 on each side in the upper. Two strong teeth beside each other and well apart on each side of the vomer.
Both sphenotic and articular spines are very small, scarcely perceptible at all through the skin. Articular spines nearly equal.

D. 7 (one vestigial) A. 5, P. about 18. C. 1 simple ray above + 4 bifid rays + 3 simple rays below.

**CHAENOPHRYNE** Regan 1925

No sphenotic or praeopercular spines. Illicium suprarostral. No isolated ray on back. No barbel. Teeth fewer in upper than in lower jaw.

Only one species.

*Chaenophryne longiceps* Regan 1925.

1 specimen No. 2006 B. O. C. Station 48, 6/4, 1927.

21° 44' N. 72° 43' W., 7000 feet wire.

*var. quadrifilis* n. var.

1 specimen No. 2007, B. O. C. Station 58. 20/4. 1927.

32° 24' N. 64° 29' W., 10,000 feet wire.

1 specimen No. 2027 B. O. C. Station 59. 21/4. 1927.

32° 19' N. 64° 32' W., 8,000 feet wire.

*var. quadrifilis*?

1 specimen No. 2009 B. O. C. Station 58, 1927. See above.

It is characteristic of all the above recorded specimens that the teeth of the upper jaw are fewer and farther between than are those of the lower jaw. As this is in striking contrast with what seems to be the usual relation in the family Oneirodidae the feature may be added to the diagnosis of the genus.

The numbers of teeth are altogether very small, there being only about 6 to 8 in each side of upper, and about 10 to 11 in each half of lower jaw. The teeth of the lower jaw are long and slender, those of the upper much smaller. There are two teeth behind each other on each side of the vomer.

The following table gives a few measurements of the specimens in millimeters:

<table>
<thead>
<tr>
<th></th>
<th>No. 2006</th>
<th>No. 2007</th>
<th>No. 2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length</td>
<td>29</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Length without caudal</td>
<td>24</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Length of lower jaw</td>
<td>11</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Width of head at sphenatics</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Length of illicium</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

This quite agrees with the figure of the type-specimen (Regan 1926 loc. cit. plate VI, fig. 2) showing 8 teeth in upper and 11 teeth in lower jaw. The dentition of the jaws is, however, not mentioned in the description.
The bulb bears a posterior, median, crest-like appendage quite corresponding to the similar development in the *analogus-longicornis* group of the genus *Dolopichthys* (see p. 20). The upper end of the crest is however not pointed but evenly rounded. The clavate distal tubercle is rather produced and pointed and somewhat anterior to the middle of the bulb. Between this tubercle and the crest a single median filament is found.

By the structure of the just mentioned filament on the bulb two different types of the species can easily be distinguished in the material now at hand. In the specimen from Station 48 (No. 2006 B. O. C.) the filament is undivided till considerably above the highest point of the posterior median crest, and then divides into two simple, not bifurcating terminal filaments which are only about half as long as the thick, undivided basal part. In two other specimens (Nos. 2007 and 2027 B. O. C.) the filament bifurcates after a very short undivided part, each branch again bifurcating so that four equal, thin, tapering filaments are found. All bifurcations in these specimens take place well below the upper end of the posterior crest, and the terminal filaments are two to three times as long as the undivided part of the appendage. The fourth specimen (No. 2009 B. O. C.) from the same station as No. 2007 has unfortunately lost its entire illicium. As there are no structural indications of gradual variations from one type to another, it is not improbable that they may even be classified as separate species, the material so far examined in this respect is, however, not sufficient to justify this step without further confirmation of the stability of the characters in question.

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Fig. 8. Distal end of the bulb of *Chaenophyne longiceps* var. *quadrijilis* (A), and *forma typica* (B).
As Regan in his description only mentions "bulb with a filament" the specimen No. 2006 B. O. C. with the long undivided basal part and the two short terminal filaments can probably be identified with his type-specimens, while the specimens Nos. 2007 and 2027 B. O. C. with four long terminal filaments and a short basal part of the appendage must be described as a new variety—var. quadrifilis.

In addition to the special structure of the terminal filament on the bulb, there also seems to be a characteristic tendency towards fewer rays in the dorsal and anal fins in var. quadrifilis than in the typical form, only five rays being counted in the dorsal and four to five rays in the anal of the former, which six to seven and five to six rays are found in the latter.

**THAUMATICHTHYS** Smith and Radcliffe 1912.

Praemaxillaries extending far beyond the lower jaw in front and on the sides, attached to the head by a wide membrane. Eyes close to the angles of the mouth. Lateral line present. No sphenotic, praeopercular or articular spine. Lower part of the body with dermal spines. Illicium projecting from the lower side of the anterior membranous connection between the extended praemaxillaries. Bulb with a small tooth-bearing dermal bone.

This very peculiar genus was originally contributed to a separate family but has later (Regan 1925) been brought into connection with the family Oneirodidae through the recently discovered genus *Lasiognathus* Regan 1925, which agrees with Thaumatichthys in the structure of the mouth and in having osseous denticles connected with the bulb, but has the eyes in normal position, well developed sphenotic and articular spines but no spines on the skin, and has a suprarostral illicium on a long, exserted basal bone.

Key to the species

A. A pair of long, hinged, movable teeth inserted near the anterior end of each praemaxillary, lying closely applied to the roof of the mouth when depressed. Other teeth on praemaxillaries long and cardiform, several or many times as long as the diameter of the eye. Throat with dermal spines. Eye 20 in head. D. 6.

*T. pagidostomus* Smith and Radcliffe.

B. No long, specially developed, hinged teeth in praemaxillaries. Longest teeth scarcely equal to the diameter of the eyes. Throat without spines. Eye 8 to 9 in head. D. 4. 

*T. binghami* n. sp.

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19 Regan 1926, loc. cit. p. 31. The posterior crest on the bulb is not mentioned at all, it is, however, roughly indicated in the figure, plate VI, fig. 2.


21 Measured to the margin of the gill-slits.
Thaumatichthys binghami n. sp.

1 specimen No. 2015 B. O. C. Station 25, 17/3, 1927.

24° 51' N. 76° 37' W. 8000 feet wire.

Total length 52 mm. Length without caudal 39 mm. Width of head 11 mm. Height of head 7 mm. Length of lower jaw 8 mm. Point of lower jaw to the edge of the projecting snout 3 mm. Length of the head to the gillslit 17 mm. Diameter of the eye 2 mm. Length of the illicium 3 mm.

The head is broad and depressed, of about the same size as in T. pagidostomus when measured to the margin of the gillslit. The lower jaw is rather short, contained nearly five times in the total length without caudal. The eyes are comparatively large, equaling one-ninth to one-eighth of the length of the head.

Illicium is very short, projecting straight forward from the ventral side of the anterior membranous connection between the praemaxillaries. The anterior view of the bulb shows a ventral, transverse dermal keel with the lower lateral angles drawn out into a pair of short, downwards directed tentacles, one on each side. Above the ventral transverse keel follows on each side one simple, wing-like, vertical, lateral crest. In the median of the bulb two small tubercles are found close above each other on the upper half of its anterior surface. On the lower posterior surface of the transverse ventral keel a strongly curved median bone is imbedded in the skin, starting on the lower surface of the bulb itself, then curving down in the posterior surface of ventral keel ending near the margin of the latter with a short, strong, downwardly and backwardly directed denticle.

The ventral and posterior parts of the fish are furnished with minute dermal spines, there are, however, none on the throat before the bases of the pectorals. According to the figures of T. pagidostomus the dermal spines are much smaller in T. binghami than in the former.

There is a distinct lateral line consisting of small pores connected by a narrow groove, appearing as a very thin line with slight extensions at the pores. The lateral line commences above the eye and runs on the upper part of the body to somewhat in front of the anus, then curves down and runs along the middle of the tail to the base of the caudal fin, where it ends. There are about 35 to 40 pores from above the base of the pectoral fin to the end of the line.

D. 4, A. 4, P. about 18. C. 2 simple rays above + 4 bifid rays + 3 simple rays below.

Melanocetidae

Melanocetus Günther 1864.

It appears from the present material that the pigmentation covering the finrays is the last to develop during the growth of the individuals. In the smaller specimens of all species we find entirely colorless fins, while the body is already densely pigmented. It further seems that the stage (size) at which the pigment starts developing on the fins is sufficiently different in the different species to
Fig. 9. *Thaumatichthys binghami* n. sp. Ventral and lateral view of the fish and frontal view of the bulb. Drawn by W. S. Bronson.
be a valuable help in determining young individuals. In *M. niger* Regan 1925 the caudal rays are already entirely black at a total length of 19 mm. In *M. murrayii* Günther 1887, the caudal finrays have only a little pigment at their base, the fin still being practically entirely white at a total length of 23 mm. At a total length of 30 mm the caudal rays of this species are also entirely black while a specimen of *M. Johnsoni* Günther 1864, 35 mm. long, has no pigmentation at all on the fins.

A good synopsis of the species is given by Regan 1926, loc. cit. p. 32. The new species of the Bingham Oceanographic Collection, *M. tumidus*, is characterized by a lower jaw which is less than half of the total length without caudal, by a very short illicium only equaling about 1/6 of the same measure and by the very small teeth, the longest of which are only 1/5 to 1/4 of an eye-diameter, while in all other species the longest teeth (in the lower jaw) are longer than the diameter of the eyes. In the identification of the species *M. Murrayii* Günther and *M. Johnsoni* Günther, Regan’s descriptions (1926) have been followed.

**Melanocetus Murrayii** Günther 1887

1 specimen No. 2023 B. O. C. Station 11, 2/3, 1927.
23° 58’ N. 77° 26’ W. 7000 feet wire.

23° 49’ N. 76° 58’ W. 7000 feet wire.

1 specimen No. 2014 B. O. C. Station 18, 10/3, 1927.
23° 42’ N. 76° 43’ W. 7000 feet wire.

1 specimen No. 2018 B. O. C. Station 22, 12/3, 1927.
23° 37’ N. 77° 15’ W. 7000 feet wire.

1 specimen No. 2019 B. O. C. Station 33, 22/3, 1927.
24° 11’ N. 75° 37’ W. 8000 feet wire.

22° 43’ N. 74° 23’ W. 8000 feet wire.

1 specimen No. 2020 B. O. C. Station 58, 20/4, 1927.
32° 24’ N. 64° 29’ W. 10,000 feet wire.

The following table gives some of the proportions measured in the present material of this species:

<table>
<thead>
<tr>
<th>Length without caudal jaw mm.</th>
<th>Lower jaw width</th>
<th>Illium width</th>
<th>Interorbital width</th>
<th>Orbital width</th>
<th>Post C. of P. orbital width</th>
<th>D.</th>
<th>Longest ray of D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 2019 B. O. C. 115</td>
<td>40</td>
<td>23</td>
<td>10</td>
<td>23</td>
<td>27</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>No. 2014 B. O. C. 60</td>
<td>50</td>
<td>30</td>
<td>15</td>
<td>28</td>
<td>28</td>
<td>13</td>
<td>20</td>
</tr>
</tbody>
</table>

21 Between edges of frontals.
22 Between edges of sphenotics.
Length Lower Illicium Inter-postorbital postorbital orbital width\(^2\) width\(^2\) Post Length Length Longest

<table>
<thead>
<tr>
<th>No.</th>
<th>2017 B. O. C.</th>
<th>47</th>
<th>47</th>
<th>30</th>
<th>15</th>
<th>30</th>
<th>28</th>
<th>17</th>
<th>19</th>
<th>mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018 B. O. C.</td>
<td>44</td>
<td>50</td>
<td>30</td>
<td>15</td>
<td>31</td>
<td>30</td>
<td>—</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2020 B. O. C.</td>
<td>25</td>
<td>48</td>
<td>30</td>
<td>15</td>
<td>35</td>
<td>35</td>
<td>16</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2021 B. O. C.</td>
<td>23</td>
<td>44</td>
<td>26</td>
<td>15</td>
<td>30</td>
<td>32</td>
<td>16</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2016 B. O. C.</td>
<td>17</td>
<td>47</td>
<td>23</td>
<td>—</td>
<td>—</td>
<td>35</td>
<td>15</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2023 B. O. C.</td>
<td>15</td>
<td>53</td>
<td>30</td>
<td>—</td>
<td>—</td>
<td>37</td>
<td>—</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2016 B. O. C.</td>
<td>12</td>
<td>50</td>
<td>29</td>
<td>—</td>
<td>—</td>
<td>42</td>
<td>—</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

In the two smallest specimens (total lengths 17 and 20 mm.) the fins are still uncolored, in the biggest of the two a black pigment has, however, started to develop at the base of the caudal rays. In all the larger specimens the caudal finrays are entirely black.

*Melanocetus tumidus* n. sp.

1 specimen No. 2022 B. O. C. Station 11, 2/3, 1927.

23° 58' N. 77° 26' W. 7000 feet wire.

Total length 21 mm. Length without caudal 15 mm. Lower jaw 6 mm. Illicium 2.5 mm. Eye about 1.25 mm. Width of head between edges of sphenotics 4.5 mm.

The width between the edges of the frontals is about half of the postorbital width between the edges of the sphenotics. The mouth is rather small, lower jaw 2.5 in length without caudal.

Illicium very short, only 1/6 of the length without caudal. Bulb small, occupying about one-third of the total length of the illicium.
There are no enlarged fangs. All the teeth are very small, the longest ones only attaining a length of about 1/5 to 1/4 of the diameter of the eye. One tooth on each side on the vomer.

The vertical fins and the stem of illicium white, there are, however, already a few dots of black pigment on the rays of the caudal fin, visible under a lens.


*Melanocetus johnsoni* Günther 1864

1 specimen No. 2024, B. O. C. Station 52, 11/4, 1927.
21° 30' N. 71° 11' W., 8000 feet wire.
Total length 35 mm. Length without caudal 25 mm. Lower jaw 14 mm. Illicium 10 mm. Width between edges of frontals 5 mm. Postorbital width between the edges of the sphenotics 8 mm. Length of pectoral rays 5 mm. Longest ray of dorsal fin 6 mm. Caudal fin 10 mm.

In addition to the other differences between *M. murrayii* and *M. johnsoni*, the latter also seems to be distinguished by considerably longer fins than the former. In the present specimen of *M. johnsoni* the length of the caudal is 40 percent, the pectoral 20 percent, and the longest ray of the dorsal fin 24 percent of the total length without caudal (compare with the measurements of *M. murrayii* p. 27–28).

All fins and the stem of the illicium are still entirely colorless.

*Melanocetus niger* Regan 1925.

1 specimen No. 2025 B. O. C. Station 25, 17/3, 1927.
24° 51' N. 76° 33' W. 8000 feet wire.

1 specimen No. 2026 B. O. C. Station 56, 13/4, 1927.
21° 20' N. 71° 13' W., 6500 feet wire.

In the smallest specimen (No. 2026 B. O. C.) which is only 16 mm. long (total length) the dorsal and anal fin is still white, but several of the caudal rays are already covered by black pigmentation for nearly half their length. In the other specimen, which is a little larger, measuring 19 mm. total length, the caudal rays are entirely black and the pigment is starting to develop from the bases of the dorsal and anal rays.

*Ceratiidae*

*Cryptosparas couesii* Gill 1883.

1 specimen No. 2002 B. O. C. Station 23, 14/3, 1927
24° 29' N. 77° 29' W., 8000 feet wire
Total length 38 mm.

1 specimen No. 2003 B. O. C., Station 25, 17/3, 1927.
24° 51' N. 76° 38' W. 8000 feet wire.
Total length 34 mm.
Mancalias uranoscopus Murray 1878.
1 specimen No. 2004 B. O. C., Station 39, 29/3, 1927.
22° 43’ N. 74° 23’ W. 8000 feet wire.
Total length 49 mm.

ACERATIDAE
Key to the Genera

A. No rostral denticles. Praemaxillaries meeting dentaries when mouth is closed................... LIPACTIS Regan 1925.
B. A group of rostral denticles in front of the praemaxillaries meeting the anterior teeth of the lower jaw.
   I. Eyes telescopic.......................... ACERATIAS Brauer 1902.
   II. Eyes not telescopic.
      a. Snout compressed and pointed in vertical view Nostrils lateral, nasal laminae longitudinal. Mouth longitudinal.
         RHYNCHOCERATIAS Regan 1925.
      b. Snout and head very broad, somewhat depressed. Nostrils dorsal, nasal laminae transversal. Mouth transversal.
         LAEVOCERATIAS n. gen.

RHYNCHOCERATIAS Regan 1925.
Characters as above described. As the figures of two of Regan’s four species (viz: R. oncorhynchus and R. rostratus, figs. 3 and 4, plate XIII, Regan 1926, loc. cit.) plainly indicate the presence also in these species of spines along the dorsal profile of the snout similar to those found in both species of the present collection, it seems possible that this feature upon a closer examination will appear to be a common character of the genus. The spines are, however, not mentioned in any of the descriptions given by Regan.

Key to the species


II. Anterior nostrils not at the end of the snout.

A. Nostrils moderate, the posterior well separated from and smaller than the eyes. D. 4–5, A. 4.
   1. Rostral projection short, with denticles in a single series. Depth of body about 2½ in length ....... R. brevirostris Regan 1925.
   2. Rostral projection long, with denticles in a group. Depth of body about 3½ in length ....... R. oncorhynchus Regan 1925.

24 Representing the synopsis given by Regan 1926 loc. cit. p. 43, adapted to embrace also the new genus Laevoceratias.

25 The swollen nasal bulbs being left out of consideration.
B. Nostrils large, the posterior near or contiguous to the eyes and about equal to or larger than the eyes in vertical diameter.


2. About 8 or more rays in the dorsal fin.
   a. Profile of the snout descending in an equal curve. Rostral denticles in an outer, marginal and an inner transverse series..................R. acanthrostris n. sp.
   b. Snout very high, anterior profile nearly vertical, joining the upper profile at a rounded angle which is higher than the profile of the interorbital space. Rostral denticles in an irregular group..................R. latirhinus n. sp.

Rhynchoceratias acanthrostris n. sp.

1 specimen No. 2011 B. O. C. Station 22, 12/3, 1927.

23° 37' N. 77° 15' W. 7000 feet wire.

Total length 28 mm. Length without caudal 20 mm. Greatest height 5.5 mm. Height of head 5 mm. Width of head 4.5 mm. Snout to gill opening 9 mm. Snout to eye 3 mm. Length of mouth cleft ab. 2.5 mm. Diameter of eye ab. 1.5 mm.

Length of head to gill opening nearly half of the total length without caudal. The upper profile of the head is gradually descending towards the equally curved outline of the snout. The length of the snout from the eyes equals about two eye-diameters.

There is a median series of 4 small, but sharp and strong spines along the dorsal ridge of the snout, directed downwards and forwards. A fifth smaller spine belonging to the same series is found in an erect position just above the bases of the rostral denticles.

The rostral denticles are arranged in an outer series around the margin, with about four teeth on each side, and an inner, transverse series with four small denticles altogether.

The nostrils are very large, the posterior about twice as big as the anterior, contiguous to and somewhat larger than the eyes in vertical diameter. The distance from the end of the snout to the anterior nostrils is somewhat longer than the diameter of the eyes. The region between the nostrils is uncolored.

The length of the caudal fin is contained 2.5 times in the length of the fish without caudal, and is slightly shorter than the distance from the snout to the gill openings.

D. 2 vestigeal + 8 normal rays. A. 3 normal + 1 vestigeal ray. P. 16.
C. 2 simple rays above + 5 bifid rays + 1 simple ray below.

Rhynchoceratis latirhinus n. sp.

1 specimen No. 2012 B. O. C. Station 33. 22/3. 1927.

24° 11' N. 75° 37' W. 8000 feet wire.
Fig. 11. *Rhyncho ceratias acanthirostris* n. sp. Lateral view of the entire fish and dorsal view of the snout. Drawn by W. S. Bronson.

Fig. 12. *Rhyncho ceratias latirhinus* n. sp. Lateral view of the entire fish and dorsal view of the snout. Drawn by W. S. Bronson.
Total length 22 mm. Length without caudal 15 mm. Greatest height 4.5 mm. Height of head 4.5 mm. Width of head 3.5 mm. Snout to gill opening 8 mm. Snout to eye 3 mm. Cleft of mouth 2 mm. Diameter of eye 1.5 mm.

Length of the head to the gill opening slightly more than half of the total length without caudal. Head rather narrow, its upper profile deeply concave, ascending again towards the very high snout, the anterior profile of which is nearly vertical.

The upper 3/5 of the anterior edge of the snout with a median series of 5 small nearly erect spines, lower 2/5 smooth.

The rostral denticles in an irregular group.

The nostrils are very large, the posterior twice as large as the anterior, contiguous to the eyes and of about the same size in vertical diameter. The anterior nostrils are well separated from the anterior edge of the snout.

Lower jaw with a transverse ridge just behind the teeth fitting into a transverse groove behind the rostral denticles. Rostrum slightly prominent.

Black pigment scanty on the fins. The region between the nostrils is uncolored (white).

D. 10. A. 3. P. 17, C. 1 simple ray above + 6 bifid rays + 2 simple rays below. The seven posterior rays of the dorsal fin are normal, anteriorly the fin is somewhat damaged and three articulated rays of the same thickness as the others, but shorter and peculiarly curved forwards, protrude through the opening in the skin. These short rays probably are remnants of normal rays which have been torn, it is, however, not quite impossible that they may be specially differentiated in this species.

LAEVOCERATIAS n. gen.

A group of rostral denticles at the end of the snout, which is, however, not produced or compressed but very broad and short. Head very broad, broader than high and much broader than the body. Nostrils moderate, not lateral but dorsal, with transverse nasal laminae. Nasal region not swollen. Eyes normal.

One species.

Laevocertas liparis n. sp.

1 specimen No. 2013 B. O. C. Station 33, 22/3, 1927.
24° 11' N. 75° 37' W. 8000 feet wire.

Total length 23 mm. Length without caudal 17 mm. Snout to gill opening 7.5 mm. External width of head 7 mm. Width of skull about 5 mm. Height of the head (greatest height of fish) 5 mm. Width of mouth-opening 2.5 mm.

The head is very broad, nearly circular in vertical view, somewhat depressed with a nearly flat dorsal surface. The mouth is small and transversal, nearly straight, at the end of the snout. The snout is not produced, narrowed or compressed, but short and very broad, evenly rounded.

There are three long, thin, curved and depressible rostral denticles, opposed
to four similar teeth at the end of the lower jaws. Each of these denticles, both on rostrum and in lower jaw, protrude from a small, separate, white, warts-like elevation of the skin. The arrangement of these white warts gives the end of the snout a conspicuous and characteristic appearance.

The nostrils are moderate, placed beside (not in front of) each other on the upper horizontal surface of the head. The nasal laminae are transversal, the nasal region not swollen.

D. 5. A. 4. C. from above: 1 bifid + 1 simple + 4 bifid + 2 simple rays.