BOCAGIANA

Museu Municipal do Funchal

Madeira 8. VI. 1972 No. 31

ON A NEW SPECIES OF EEL OF THE GENUS *GNATHOPHIS* (APODES, CONGRIDAE) FROM THE METEOR SEAMOUNT

By G. E. Maul*

With 7 figures

Three of the 5 congrid eels of the genus *Gnathophis* taken by the research vessel «Meteor» during the 1967 Seamonts Cruises in the Northeast Atlantic were not identifiable with either of the two species known from the Atlantic or Mediterranean and are herewith described as new to science.

Gnathophis codoniphorus sp. n.

Holotype. Well preserved young but fully developed specimen. MMF Reg. No. 22876, T. L. 111 mm., «Meteor» St. 171 b, 22.7.67, 29°50.2'N., 28°23.8'W., Agassiz Trawl, 300-304 metres.

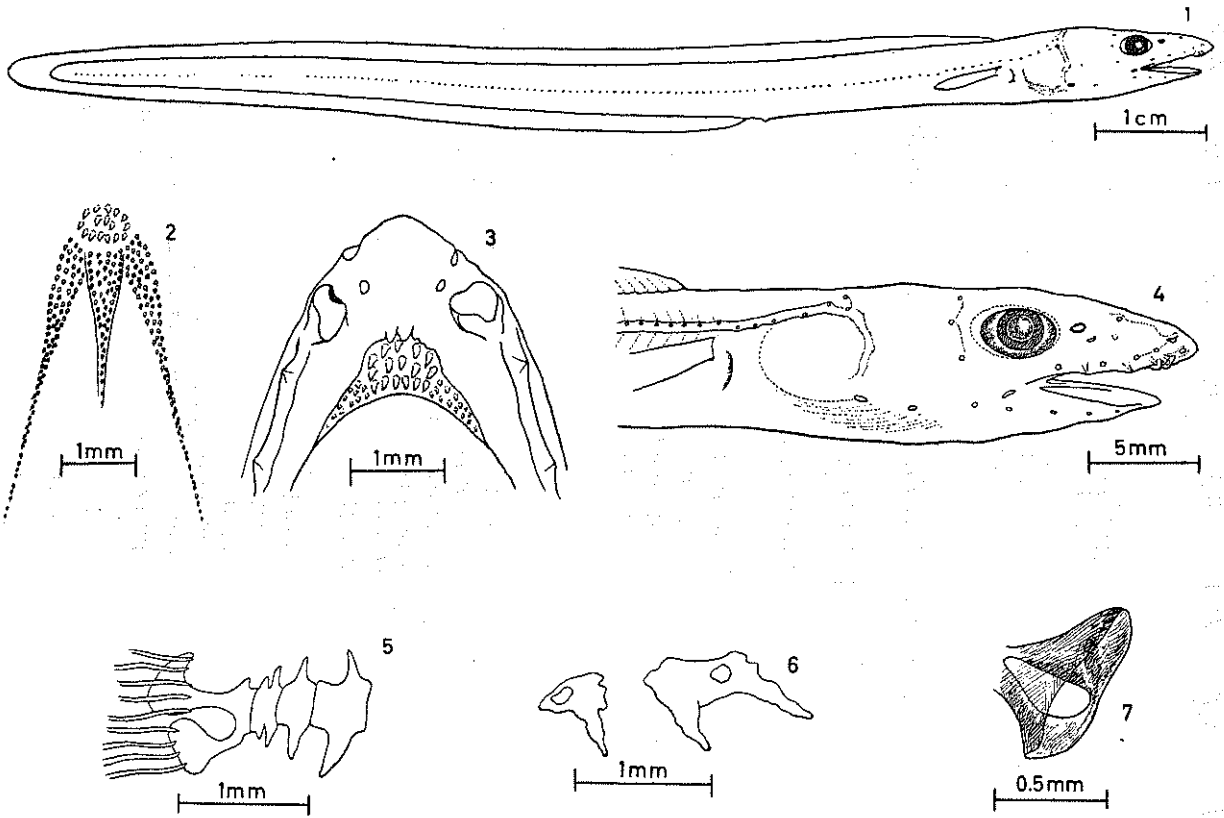
Paratypes. Two well preserved postlarval specimens, both MMF Reg. No. 22545, T. L. 97 mm. (cleared and stained) and 86 mm., «Meteor» St. 184, 25.7.67, 30°03.0'N., 28°40.0'W., Agassiz Trawl, 490-450 metres.

The holotype, though undoubtedly a young specimen, is morphologically fully developed as regards adult characters. There is, however, no sign of pigmentation, which, in larger specimens is likely to exist.

To bring out the outline of pores and other cutaneous appendages the left side of the head and body was lightly stained by brushing over with a solution of 2% permanganate of potassium and 0.3% sulphuric acid.

All measurements given are direct distances between the ends relevant to the characters in question. Thus the head is the distance

* Museu Municipal do Funchal, Madeira, Portugal.



Gnathophis codoniphorus sp. n. (Figs. 1-4 & 7 of holotype, 5 & 6 of cleared paratype): *1* Profile of left side; *2* Dentition of upper jaw; *3* Underside of snout; *4* Head showing arrangement of its pores and those on anterior part of lateral line; *5* The 3 last vertebrae and hypurals with rays of caudal fin; *6* Right preorbital bones; 7 Rigth anterior nostril.

between the tip of the snout and the nearest point of the gill slit, the snout between its tip and the nearest point of the orbit, the orbit is the longest diameter, the mouth is measured from tip of snout to rictus, the postorbital length is the shortest distance between the orbit and the gill slit.

Body subcylindrical, tail compressed. Head pointed, with the lower jaw distinctly short of the tip of the snout. For arrangements of pores see fig. 4. Front nostrils on both sides of underside of snout at a level with the anterior end of the lower jaw. Their borders are strongly elevated and expanded, thus taking on the shape of downward directed bells. The hind nostrils are oval orifices with papillae along their borders and are situated near the formost point of the orbit. The eyes are much longer than deep; their centre is more or less level with the top of the snout and about 5/6 of their length are situated behind a vertical through the rictus of the mouth. Stretching from below front eye-edge to the front nostril there is a labial flanch supported by the 3 prong-like inferior prolongations of the preorbital ossicles (see figs. 4 & 6).

Dorsal and anal low. Origin of dorsal a short distance behind head. Origin of anal before middle of total length. Head 6.2 in total length, snout to dorsal 5.8, snout to anal 2.6, depth at origin of anal 23.6. Orbit 5.9 in head, snout 3.3, mouth 2.7, postorbital distance 1.8, gill slit nearly 10. Lateral line conspicuous broad ridge with simple close-set pores, 36 of which before anus.

Teeth small, in broad posteriorly tapering bands along borders of upper and lower jaw and along vomer. Premaxillary-ethmoid teeth in an oval patch which is broader than long. Vomerine patch triangular, about half as long as maxillary patches. Teeth of premaxillary-ethmoid patch distinctly larger and more widely set than all others.

Dorsal 237, to origin of anal 65; anal 178; pectorals 12/12; caudal 9 (5+4); myomeres 144; Lateral-line pores from head to anus 36.

The paratypes are postlarvae which have attained the general shape of adult gnathophoid eels but have obviously not reached their final stage of ontogenetic development. The myomeres are all distinctly visible in both, but no trace of the lateral line and its pores can be distinguished, even after staining with pemanganate. In the smaller specimen the eyes are still deeper than long, as in larval forms, and in the larger one they are only slightly longer than deep. Nearly all horizontal measurements of parts in advance of the middle of length are smaller than in the holotype when compared to the total length. The fin rays of the smaller paratype could not be counted with accuracy, whereas clearing and staining the larger one enabled us to give precise counts of these parts as well as of the vertebrae and details of some other osseous structures. Thus the dentition shows that it is still in a transitory stage of development, in which the patches as described for

the holotype are not properly defined and the vomerine patch has not developed yet at all. The following table shows the extent to which the 3 specimens differ proportionally from one another.

	Holotype	Paratypes	
T. L. (mm.)	111	97	86
PERCENT OF T. L.			
Head	16.1	12.4	11.2
Snout	4.9	3.6	3.5
Eye	2.7	2.1	2
Mouth (Snout to rictus)	6	4.4	4.5
Postorbital distance	9	6.5	6.2
Gill slit	1.6	1.3	1.4
Snout to dorsal	17.2	14.6	15.1
Snout to anal	38.5	33.0	—
Depth at origin of anal	4.2	4.3	4.1
Dorsal (total)	237	250	—
Dorsal (to origin of anal)	65	55	—
Anal	178	178	—
Pectorals	12/12	12/12	—
Caudal	5+4	5+4	5+4
Myomeres	144	144	144
Vertebrae (Hypurals included)	—	144	—
L. l. pores (to anus)	36	—	—

AFFINITY

In its proportions *Gnathophis codoniphorus* resembles both *G. mystax* and *G. capensis* the only other species known from the Atlantic Ocean. The table of measurements of the holotype and the two paratypes shows that the latter have not yet reached their final proportions of ontogenetic development, and the same may be true, even if to a lesser extent, of the holotype, to which fact a decidedly smaller predorsal length may, therefore, be due. A difference of importance lies in the number of myomeres. Numbers of body sections quite reliably of *G. mystax,* we have in the from of vertebral counts (including hypurals), made on eleven adult specimens from the Mediterranean, Portugal and Madeira, by Saldanha (1967), and two further ripe females in our collection, one from Portugal and one from the Josephine Seamount («Meteor» stations 90d and 123a, 1967). Saldanha's counts resulted in a range of 134-141, within which lie the values of 138 and 139 of our additional material. This agrees with Grassi's findings for Mediterranean material

(1913:46), who gives a range of ca. 133 to ca. 139 myomeres for larvae of *G. mystax,* with an average of 35, and an average vertebral count of 136 in the adult, and «ca. 138» given by Schmidt (1912). Admittedly, there is the greater range of 132-147 myomeres obtained be Lea (1913) based on 21 Atlantic Larvae. We can, however, not be sure if his material did not contain more than one species. Particularly so as the high value of 147 stands alone at the upper extreme, jumping 4 void variants in the successive scale of numerical arrangement of the entire material. [1]) Consequently, we must consider the count of 144 myomeres in our type material 3 times repeated in the only specimens available, highly significant as a character that distinguishes the new species from *G. mystax.* We have no data for vertebral counts of adult material of *G. capensis* available, but Castle (1968) gives us a range of 132-140 myomeres obtained from 25 larval specimens. Judging from these results, *G. capensis* and *G. mystax* do not differ from each other in this character, and what has been said of the new species with regard to *G. mystax* also holds good for G. capensis.

While the above stated may still be open to argument, this is not the case regarding the character of the front nostril, which differs completely in shape from that of *G. mystax.* This organ is clearly scroll-shaped in the latter as compared to a broadly bell-like shape in the new species.

Curiously, both the vertebral or myomere count and the shape of the anterior nostril of the new species are in good agreement with these characters in the Australasian species *G. incognitus* Castle 1963, the former does, however, differ from the latter by the strongly oval eyes and the triangular shape of the vomerine patch of teeth. Conspecificity with this geographically so far removed species would at any rate be very unlikely.

REMARKS

Young as the specimens here described may be, we feel that the holotype is so near its final stage of morphological development that any further more adult material of the same species can be identified without difficulty, and it is hoped that the new vertebral value will help sort out the large amount of Atlantic larvae that exist in the collections of several institutions and are believed to be referable to the genus *Gnathophis* or other congrid eels.

A number of data, as we have seen, point to a fairly restricted range of variation in the vertebral count in the geographically closest

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1) Blache (1963) gives a range of 131-145 for his 1-asterisked form of group 5c of larvae he refers to *G. mystax.* Unfortunately no frequencies are given.

species of *Gnathophis*. This finds further support in a series of 14 Leptocephali in our collection taken SE of Madeira («Discovery II» St. 4743, 32°34 1/2'N., 16°45'W. to 32°28'N., 16°54'W.). In total length they range from 57 to 117 mm. A number of characters leave little doubt that they should be referred to *G. mystax*. All have the row of very close-set small melanophores along the alimentary canal, and some 2 or 3 larger ones on the throat. The eye has the black patch below the ventral margin of the iris, characteristic of *Gnathophis* larvae. Except for the smallest specimen of 57 mm., where the formula of teeth in the upper jaw is 1+IV+11, the range of variation in the remaining counts of larger ones, beginning with 79 mm., is 1+VI-VIII+18-23, the count of 1+VII+23 occurring 5 times in the total of 12 specimens counted. The myomeres counted in all 14 resulted in the restricted range of 134-138, the greatest frequency being 135.

The name *codoniphorus* = bell-bearing, because of the bell-shaped form of the nostrils.

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