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ON THE GENUS *CETOMIMUS* (CETOMIMIDAE) WITH THE DESCRIPTION OF A NEW SPECIES

By G. E. Maul [1]

Fig. 1, tables I & II

SYNOPSIS

The treatment of all the known species of *Cetomimus* previously described by several authors is briefly discussed, and a key to the species belonging to the subgenus *Cetomimus* is given. This key includes the new species described here, and in a table a comparison is made of the proportional dimensions and meristics, partly from original descriptions or consequent redescriptions and partly from direct observations made, of 11 specimens represented by 8 species. A further comparison is given of details of the dentition of the 6 specimens where this character has been observed in detail.

INTRODUCTION

Cetomimids or Whale-Fishes are still rare in collections, and most species have been described from single specimens. Their flesh and skin is of extremely soft and flabby consistency, and some of the species are externally so much alike that only a detailed study of a large amount of characters allows us to distinguish them from each other. The fact that the below described new species is represented by two specimens almost identical in practically all the characters utilized to describe them has helped to dissipate a doubt in the author's mind that some of the species

1) Museu Municipal do Funchal, Madeira

types of the genus *Cetomimus* were not simply strongly polymorphous exemples of one and the same species. We know practically nothing of the range of individual variation these fishes may present and it is, therefore, most desirable that any additional material finding its way into collections of the world be studied and the results be made known in publications.

Harry (1952) separated within the genus *Cetomimus* Goode & Bean the narrow-headed *C. kerdops* Parr from the others with broad heads. The latter he grouped into the subgenus *Cetomimus*, with four species two of which new to science, and for the former he erected the new subgenus *Psapharocetus*. Since the publication of that paper he described a further new species of the genus *Cetomimus* (Rofen, 1959) which he found to belong in his previously erected subgenus *Psapharocetus*, and which he named *Cetomimus indagator*. In 1965 Abe et al. described one more new species (*C. compunctus*) of the broad-headed group, to which group also the present new species belongs. Through the discovery of *C. indagator* Harry's diagnosis (1952, p. 58) of the subgenus *Psapharocetus* becomes narrowed down to the strongly compressed head, whose breadth is said to be equal to that of the body, whereas in the subgenus *Cetomimus* it is about twice as broad. The paucity of rows of teeth in the jaws and large number of the lateral-line pores, as well as the comparatively large size of the eye, can no longer stand as diagnostic characters for the subgenus, as *C. indagator* is said to have «many irregular series (of teeth) on both jaws», only possesses 12 lateral-line pores, and its eyes are 1.5% of the standard length, which is nearly to exactly the same as what we find in species of the subgenus *Cetomimus*.

Including the below described new species, the genus *Cetomimus* comprises at the present time 8 species, two of which, *Cetomimus kerdops* Parr 1934 and *C. indagator* Rofen 1959, belong to the subgenus *Psapharocetus*. The remaining 6, of the subgenus *Cetomimus*, being *C. gillii* Goode and Bean 1894, *C. picklei* (Gilchrist 1922), *C. teevani* Harry 1952, *C. craneae* Harry 1952, *C. compunctus* Abe, Marumo and Kawaguchi 1965, and *C. hempeli* sp.n.

The new species can easily be distinguished from the five belonging to the subgenus *Cetomimus* as shown in the following key:

I. Approximately 10 large pores in lateral line on body . . . . *C. picklei*

II. Seventeen or more large pores in lateral line on body

A. Pectoral fin rays approximately 16; no cavernous tissue around origin of dorsal fin . . . . . *C. gillii*

B. Posterior lateral-line pores sometimes with large lappets; pectoral fin rays 20-23; cavernous tissue around dorsal fin rays present

1. Three gill arches without slit behind last, conspicuous well-developed lappets on posterior lateral-line pores present

a. Posterior lateral-line pores small, less than half the width of the lateral-line tube, their lappets twice the diameter of the pores, least depth of caudal peduncle equal to its length. . . . . *C. teevani*

b. Posterior lateral-line pores large, equal to the width of the lateral-line tube, their lappets less than the diameter of the pores, caudal peduncle about twice as long as deep *C. craneae*

2. Three and a half gill arches, with distinct slit behind the third arch lappets on posterior lateral-line pores absent or very inconspicuously developed

a. Base of dorsal equal in length to upper jaw, end of upper jaw far from end of head, head much more than half the length from tip of snout to origin of dorsal . . . . *C. compunctus*

b. Base of dorsal half the length of the upper jaw, upper jaw ending near end of head, head much less than half the length from tip of snout to origin of dorsal . . . . . *C. hempeli* sp.n.

Family ***Cetomimidae***

Cetomimus (Cetomimus) hempeli sp.n.

Holotype: Standard length 78 mm., 27°50'N, 14°01'W, «Meteor» Seamounts-Cruises in the Northeast Atlantic 1967, leg 6, voyage 9c, station 1; 15.VI.1967, time 1230; 1KMT, 1000-0 m.; from bucket 1, operating from 1000-700 m. MMF Reg No. 22568.

Paratype: Standard length 70 mm.; from stomach of *Aphanopus carbo* Funchal fish market, 19.XII.1956; MMF Reg. No. 10474.

Description of holotype: (Harry's method of his excellent and detailed descriptions of *C. teevani* and *C. craneae* has largely been followed. The manner of measuring used by him is the same and where necessary partial dissection and staining with alizarin has been made).

The specimen is in very good condition and well preserved. Only the right and left maxillaries and the left lower jaw are broken in two more or less in the middle of their lengths.

Body more or less oval in cross section just behind the head, much

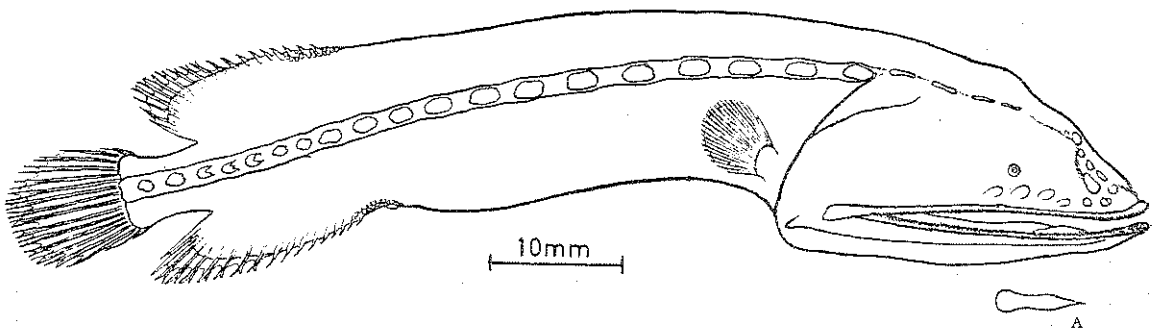

Fig. 1. — *Cetomimus (Cetomimus) hempeli* sp. n. (Holotype — MMF Reg. No. 22568)
A. — Copular patch of teeth.

less deep than head. Anus immediately before anal fin, surrounded by cavernous tissue.

Head deeper than broad. Both nostrils circular, equal in size, smaller than eyes, close to premaxillaries, much nearer tip of snout than eyes, interval between them about equal to their diameter, front one with slightly raised anterior rim. Eyes small, nearer jaws than upper profile of head. Interorbital broad and convex. Mouth large, very slightly oblique. Premaxillaries very slightly concave in middle, convex near tip of snout. Mandible with distinct lateral process just behind tip of upper jaw, and the angular is more or less sharply produced posteriorly. Teeth in several series along edges of upper and lower jaws. Individual teeth of all parts short, pointed and broad-based. In middle series along premaxillaries about 110 teeth, about 100 in the middle series along mandible. Vomer with circular dome-shaped patch. There are 8 teeth across and 10 along the length of the vomer. Palatine series divided into two patches on each side. The anterior patch with 29 teeth in the longest row, the posterior one with 90 and 3 across its width. Teeth on copula in an awl-shaped patch, with drawn out anterior point. Length of copular patch 1.75 in length of snout, with 30 rows of teeth along its length; at widest point 12 series of teeth. Three entire gill arches present, with a distinct slit behind the last, followed by a short movable arch with a few minute vestiges of holobranchs and without slit behind. Holobranchs on the 3 anterior arches well developed, their length about twice the width of the boney gill arch. Gill teeth granular, on hypobranchial of first arch in several widely separated oval patches with 4 longitudinal series of teeth each. Teeth on ceratobranchial of first arch in a single long patch of irregular ontline; there are approximately 60 teeth in a longitudinal series and 5 across the bone. Teeth in epibranchial in one patch; in the angle formed by epibranchial and ceratobranchial a very small patch of 3 teeth in width; the long patch on the epibranchial itself with about 25 teeth along its length and 3 across its width. Pharyngobranchial teeth in two cone-shaped patches on each side. Posterior pharyngobranchial patch with 18 teeth in length and 9 in width. Anterior patch 13 teeth in length and 8 in width.

Lateral line a broad tube with 20 large pores, the last three but two anteriorly with minute ill-defined flaps. Small scattered mucus-tubes on tail and head and other parts of body. Lateral-line pores continued for-

TABLE I. — Mensural and Meristic Data for *Cetomimus* ssp.

	Cetomimus (Cetomimus)								*Cetomimus (Psapharocetus)*		
	hempeli sp. n. holotype	*hempeli* sp. n. paratype	*teevani* Harry 1952	*craneae* Harry 1952	*gillii* Good & Bean 1894	*gillii* Goode and Bean (Brauer 1906) [4]	*picklei* (Gilchrist 1922) [5]	*compunctus* Abe, M. & K. 1965	*kerdops* Parr 1934	*indagator* Rofen 1959	sp. MMF958
Standard length (mm.)	78	70	98.5	82 4	—	41	66	142	47.2	120.2	106
PROPORTIONAL DIMENSIONS IN PER CENT OF S. L.											
Depth (at P.)	17.9	18.6	21.5	20.9	—	25 6	14.3	25.4	18.7	22.9	19.8
Caudal ped. (length)	8	10.7	7.81	10.6	—	14.6	—	11.6	—	24.5	9.4
Caudal ped. (depth)	5.8	6.4	7.81	5.7	—	8.5	—	6.0	5.9	8.5	—
Head	35.3	34.3	37.8	36.7	36.4 [1]	35.4	30.3	35.2	31.6	32.9	28.3
Snout	13.5	11.7	14.1	12.5	—	14.6	12.7	9 9	12.6	11.5	—
Upper jaw	32.7	27.9	30.1	28.9	—	31.7	12.3 [6]	20.8	28.2	22.8	25.0
Eye	1.3	1.4	1.32	0.85	—	2.0	—	0.5	2	1.5	—
Interorbital	13.7	11.4	12.1	14.9	13.4 [1]	—	12.7	13.0	ca. 11	13.1	11.3
Width of head	20.5	15 7	17.9	23 8	abt. 15 [2]	26.8	—	15.8	—	15.6	13.2
Snout to D.	78.2	75.0	77.6	76.7	—	76.8	76.9	59.9	71.1	69.7	75.5
Base of D.	15.6	14.3	19.9	18.6	—	22.4	—	20.4	—	11.8	14.2
Snout to anus	73.7	—	76.5	70.8	—	—	—	ca. 59.5	—	61.6	—
Base of A.	15.4	14.3	18.0	18.4	—	22.0	—	19.7	—	7.16	—
Length of P.	8	7.1	9.55	8.86	—	9.8	—	7.0	—	8.7	—
Length of C.	12.8	10.7	12.7	10.2	—	13 4	—	9.9	—	19.0	—
MERISTICS											
Dorsal rays	19(9,VII,3)	17(7,VII,3)	16(7,VIII,1)	19(7,IX,1)	16 [2]	19(19)	16	19(7,XI,1)	16	14(14)	16
Anal rays	18(9,VII,2)	18(7,VII,4)	17(7,VIII,2)	19(7,IX,1)	16 [2]	19(5,IX,5)	16	19(7,X,1)	17	13(13)	17
Pectoral rays	23	22	20	23	16 [2]	21/21	18	ca. 24/23	ca. 19	18	17
Lateral-line pores	20	20	19	22	17(+) [3]	abt. 19	10	24/ca. 26	25	12	—
Gill arches	3 1/2	3 1/2	3	3	—	3 1/2	—	3 1/2	—	4	3 1/2

1) From Parr 1934, pp. 24-25 (from type)
2) From Good & Bean 1895, p. 69 (type)
3) From Harry 1952, p. 59 (2b. in key)
4) Parr 1934, p. 24 suggests that the Valdivia *Cetomimus* speciman referred to *C. gillii* by Brauer may belong to his *kerdops* on account of the head proportions. It must, however, be pointe out that Parr mistook this author's ill-chosen expression and choice for measurement of «Körperlänge» for standard length, wher eas, in reality, Brauer used it for total length. The dat given here are from Brauer's actual specimen.
5) All data from Smith 1934, pp. 180 & 181.
6) «Mouthcleft»

TABLE II. — Number of Teeth Along and Across Patches in Mouth

	C. hempeli sp. n. hototype	*C. hempeli* sp. n. paratype	*C. teevani*	*C. craneae*	*C. gillii.* Valdivia specimen ZMB 17627	C. sp. MMF 9587
Premaxillary (along)	110	110	—	140	75	140
Lower jaw (along)	100	100	120	120	abt. 75	135
Vomer (along)	10	10	11	14	7	13
Vomer (across)	8	9	10	12	9	8
Palatines (number of patches)	2	2	2	2	1	2
Palatines (along anterior patch)	29	26	40	40	*	25
Palatines (across anterior patch)	4-5	5	5	12	*	3
Palatines (along posterior patch)	90	80	95	100	*	100
Palatines (across posterior patch)	3	4-5	5-6	10	2	2-3
Patch of copula (shape)	awl-shaped	awl-shaped	dumb-bell shaped	dumb-bell shaped	elongate	broadly awl-shaped
Patch of copula (along)	30	25	34	28	27	40
Patch of copula (across)	12	13	14	17	7	18
Hypobranchial (number of patches)	3-5	2	1	1	5	2
Hypobranchial patches (across)	4	5	5	6	4	3-6
Ceratobranchial (number of patches)	1	1	1	1	1	1
Ceratobranchial (along)	60	55	95	90	60	70
Ceratobranchial (across)	5	5	5-6	10	6	4
Epibranchial (number of patches)	1	1	2	2	3	1
In angle (across)	3	0	15	10	3	4
Epibranchial (along)	25	25	40	28	17	30
Epibranchial (across)	3	4	4	6	4	3
Posterior pharyngeal patch (along)	18	20	30	24	10	16
Posterior pharyngeal patch (across)	9	8	9	15	10	5
Anterior pharyngeal patch (along)	13	10	24	23	14	13
Anterior pharyngeal patch (across)	8	8	10	12	6	6

* There are 65 teeth along and 4-5 across the single palatine patch.

ward on head. Numerous large pores scattered on head. Skin loose and flabby, completely without scales or spicules. Cavernous tissue developed around origins of dorsal and anal fins and on the base of the first 3 dorsal rays and the first anal ray; also around anus.

Dorsal and anal fins far back on body, their bases opposite each other. Dorsal fin with 9 short simple rays followed by 7 branched and 3 simple rays. Anal fin with 9 simple rays followed by 7 branched and 2 simple rays. Pectoral fin short, low, outline rounded. Pectoral rays 23, counted by dissecting fin base. Ventralys absent. Caudal short, rounded in outline; principal rays 14.

Coloration (in formalin).—Uniform brown with abdominal region deep blackish brown. Inside of mouth and gill cavity dirty white.

Measurements in per cent of standard length.—Body depth at pectorals 17.9. Caudal peduncle length, from end of anal base to mid-base of caudal, 8. Least depth of caudal peduncle 5.8. Head 35.3. Snout 13.5. Upper jaw length, to posteriormost point of premaxillary, 32.7. Eyes 1.3. Interorbital, fleshy width, 13.7. Greatest head width, widest part between maxillaries on freely floating specimen, 20.5. Predorsal length 78.2. Base of dorsal 15.6. Snout to anus 73.7. Base of anal 15.4 Length of pectorals 8. Length of caudal 12.8.

The paratype is less well preserved but practically all characters used to describe the holotype, except the upper cavernous tissue, can be verified. The only two proportional differences of importance are those of the upper jaw and the width of the head. The latter, which shows the head to be much narrower than in the holotype, may easily be due to deformation caused by pressure in the stomach of its predator. The shortness of the upper jaw must be accepted as a strong individual variant. All other characters utilized in the description are in good agreement with those of the type, as can be seen in tables I and II.

DISCUSSION

Tables I and II contain proportional and meristic data of the holotype and paratype of the new species as well as data that could be found in the literature of all other species of *Cetomimus* so far described. They also contain data of a further Cetomimid of our collection, taken from the stomach of *Aphanopus carbo* on 19.IX.1965, MMF Reg. No. 9587. This specimen, though certainly representing an as yet undescribed species, is

too poorly preserved to be set up as a holotype. Enough characters are, however, well preserved to easily recognize it when better material will come to hand. It is of comparatively firm consistency and its head proportions clearly range it in the subgenus *Psapharocetus*. On its mandible it has the lateral and posterior processes of most other species and on the anterior one half of the anal basis, the side on which the skin is still preserved, it shows large masses of cavernous tissue.

Finally, counts and proportions of the specimen identified as *C. gillii* by Brauer (1906, p.251) are included. The author is grateful to Dr. C. Karrer for kindly sending this specimen for re-examination. To do this was particularly desirable, as Brauer's «Körperlänge» is *total length*, whereas proportion of all other Cetomimid material is based on standard length, a measurement Brauer does unfortunately not include in his lists of dimensions. Apart from rendering the measurements needed for reliable comparison, a careful examination of this specimen revealed that Brauer's numbers given for fin rays are wrong, as can be seen in table I. All measurements, on the other hand, were found to be almost exactly the same as now.

Brauer failed to mention an outstanding character, which, apart from other possible divergencies, may prove his specimen to belong to a species distinct from *C. gillii*. Along the upper and lower edge of the lateral-line tube, at more or less equal intervals and approximately one above the other, there are small but conspicuous papillae. They are oval in shape and are distally white. Their aspect is conspicuously that of light organs.

Goode and Bean give the colour of *C. gillii* as being blue-black. Brauer's specimen, described as having been «blauschwarz», is even now, after more than 60 years in alcohol almost black on all untubbed parts. This and the complete absence of cavernous tissues are important characters shared by Brauer's specimen and the type of *C. gillii* and which, on the other hand, distinguish them from all other *Cetomimus* spp. so far described. Whether the two are really identical can, however, only be told on re-examining the type, particularly with regard to presence or absence of papillary light organs along the lateral line. It is hoped that the corrections and additional characters noted here for Brauer's specimen will eventually make it possible to reach an ultimate conclusion.

If only comparing external meristic and proportional characters of the above described new species, with those of the 6 species so far known,

it forms a separate group with C. *teevani* and C. *craneae* which stands well apart from the remaining 4. In fact, the differences we find could be accepted as individual variations within the same species. To conclusively distinguish his two species from each other Harry (1952) used such characters as outline of upper jaw, cavernous tissue on dorsal, size of posterior lateral-line pores, and lappets on pores. He furthermore made a detailed examination of the dentition, where he found more evidence to substanciate his conclusion that the two specimens he had at his disposal were specifically distinct.

For a comparison of the proportional and meristic characters of all the species of the genus *Cetomimus* so far described and a comparison of the dentition of the new species and C. *teevani* and C. *craneae*, as well as the specimen described and identified as C. *gillii* see tables I and II. The closeness of the holotype and paratype of the new species on one hand and their marked difference from all other so far described members of the genus *Cetomimus* stand out well.

The new species *hempeli* is named after Prof. Dr. G. Hempel, the leader of leg 6, voyage 9c of the «Meteor» Seamounts-Cruises in the Northeast Atlantic 1967.

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