FURTHER ADDITIONS TO THE PREVIOUSLY REVISED FAMILY SEARSIDAE

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INTRODUCTION

Since 1954, when a large searsid referred to *Holtbyrnia (Mentodus) polycoeca* (Parr) was reported upon in article 18 of this bulletin, a fair number of specimens belonging to this family have been collected by us. Among this material, all taken from stomachs of *Aphanopus carbo* and largely consisting of *Searsia koefoedi*, at least 5 specimens could be determined as belonging to species not previously reported from here. Two of these were attributed to Parr's genus *Holtbyrnia* and, after careful comparison with species most closely related (Table I.), were found to be new to science. Another was referred to Roule & Angel's *Bathytroctes curvifrons*, now ranged by Parr (1951) in his genus *Barbantus*. Of the remaining two, one was in too poor a condition to be described and the other came to hand too late to prepare figures for inclusion in this article. It will therefore be reported upon in some future paper, the present paper dealing only with the two species of *Holtbyrnia* and with the one belonging to *Barbantus curvifrons*.

The horizontal lateral measurements used in this article for percentages and other proportional expressions are the shortest distances between perpendiculars through the points in question.

To make the colourless rays of the fins and bones of the head, as well as the scales, more visible the specimens were lightly stained by bathing them for a few minutes in an alizarin solution with only a trace of Potassium hydroxyde KOH. Considering their fragile state, they were immediately afterwards returned to their formalin solution, in which the staining process continued for some time, due to the alizarin absorbed by the tissues surrounding the rays and bones.

In order to avoid the introduction of new denominations for the light organs as far as possible, those established by Krefft (1951) have been used. This author has given us the most complete account so far published, but 8 additional organs enter into the discussion in this paper. The latter have been brought to the author's notice by Parr *(in litt.)*, and their presence or absence may constitute a character of significance for specific identification or may even turn out to be useful for classification. In the following a full list of Krefft's expressions and those used here is given, with explanations only for those whose position is not obvious:

KREFFT'S EXPRESSIONS	EXPRESSIONS USED HERE
	Anal Short distance before anus
Branchiostegal (BRO)	Branchiostegal
	Caudal Lateral, about in middle of caudal peduncle
	Infraorbital Below eye
	Infrapectoral On lower edge of pectoral peduncle
	Interventral Between bases of ventrals
Organ im Auge (OO)	Orbital On iris
Pectoral (PO)	Pectoral On lower pectoral rays
Postanal (PAO)	Postanal Slightly above posterior end of anal base
	Postorbital
Postventral (PVO)	Postventral Between bases of ventrals
	Prejugular Near conjunction of the shoulder girdles
Subcaudal (SCO)	Subcaudal
Submental (SMO)	Submental
Subventral (SVO)	Subventral Short distance before ventrals
Supraanal (SAO)	Supra-anal Above anus
	Suprapectoral Above pectorals, on clavicular organ
Supraventral (SpVO)	Supraventral Above but usually slightly in advance of ventral bases
Thorakal (ThO1)	Thoracic 1 More or less between pectoral bases
Thorakal (ThO2)	Thoracic 2 About in middle between bases of pectorals and ventrals

My grateful thanks are due to Prof. Albert Eide Parr for his generous help and for letting me see excerpts of his manuscript which I understand is to be published shortly.

FAMILY SEARSIDAE

Genus Holtbyrnia Parr, 1937

There seems little doubt that the two specimens covered by Reg. Nos. 6316 and 5969 belong to the same genus. One is led to this conclusion by the following important characters they have in common: presence of enlarged modified lateral-line scales; luminous organs of similar arrangement and shapes; a separate series of teeth on the external lateral surface of the lower jaw; the form of the stomach and type and number of pyloric coeca; the similarity of the bone structure of the head.

A great difficulty in deciding as to which of the known genera they should be attributed is created by the larger of the two specimens. For whilst all aforementioned characters can easily be fitted into the *Holtbyrnia* group as defined by Parr (1951) in his key to the genera and species of the subfamily Searsinae, the head proportion of the said specimen is quite outside the limits for this group as established by Parr, but is, on the other hand, in conformity with the proportions given for another group which *inter alia* contains *Searsia koefoedi.*

In an attempt to find other suitable characters for establishing the relationship of the two species in question a certain amount of care has been taken with the examination of the formation of the bones of the top of the head. Alas, no conclusions could be reached on this basis, rather to the contrary, the problem seems more complex than ever. For in the 4 searsids with similar arrangements of a luminous system I was able to examine, it was

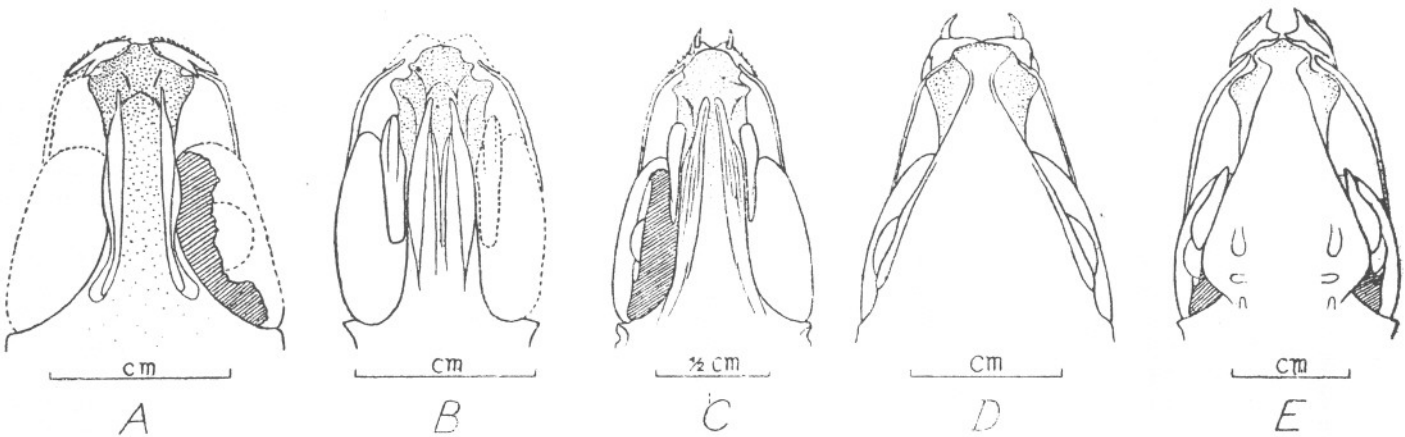

FIG. 1. – Interorbital region and snout seen from above. **A** *Barbantus curvifrons* (Roule & Angel), Reg.No. 9905. **B** *Holtbyrnia* sp., Reg.No.5969. **C** *Holtbynia macrops* sp.n., Type. **D** *Searsia koefoedi* Parr, from specimen 146mm. S.L., Reg.No. 3770. **E** *Holtbyrnia (Mentodus) polycoeca* Parr, specimen described in Bol. VII, Art. 16, p. 41, 148mm. S.L., Reg.No. 4054.

TABLE I. — *Comparisons of* Searsia schnakenbecki *Krefft,* 1953, Searsia polycoeca *Parr,* 1937, Holtbyrnia macrops *sp. n. and* Holtbyrnia *sp., Reg.No. 5969**

	S. schnakenbecki (Type)	*H.* sp. (Reg. No. 5969)	*S. polycoeca* (Type)	*H. macrops* sp. n. (Type)
Standard length mm.	102.0	101**	48	63.5
Percentages of S.L.:				
Head	29.0	29.6	37.0	35.5
Snout	5.7	7.3	9.4	7.9
Orbit	8.5	8.6	10.4	12.0
Upper jaw***	15.5	18.6		20.9
Lower jaw****		19.1		22.9
Interorbital	4.4	3.8		4.9
Width of skull		12.2		14.2
Snout to pectorals		30.1		36.0
Snout to ventrals	53.4	55.9	55.0	58.9
Snout to dorsal	63.4	61.1	64.5	65.2
Base of dorsal	17.3	18.3	17.7	16.4
Snout to anal		71.3		73.5
Base of anal	14.4	12.8	15.6	12.4
Greatest depth	15.5	15.8	19.0	19.2
Least depth of caudal peduncle		7.3		9.0
Longest gill-raker	4-5	4.7	4.7	5.7
Snout to thoracic 1		less than 29.9		36.7
Snout to thoracic 2		more than 38.9		44.5
Snout to subventral organ		53.5		56.1
Snout to supraventral organ		51·9		55.5
Snout to supra-anal organ		68·1		71.0
Snout to postanal organ		80.2		82.5
Radial formulae:				
Dorsal	18	21	20	20
Anal	15	17	17	16
Pectorals	17	abt. 18	22-23	18 +
Branchiostegals	7	8		7

Gill-rakers	29	28	22	25
Scales	89*****	abt. 110	probably absent	abt. 105
Lateral-line scales		48	» »	abt. 47
Luminous organs:				
Orbital	1 upper	1 upper		Absent
Infraorbital		?		»
Submental	Present	?		Present
Branchiostegal	7	?		»
Thoracic 1	Present (pointed anteriorly)	?		Present (pointed anteriorly)
Infraorbital		?		Absent
Thoracic 2	Linear	?	Linear	Angularly linear
Subventral	Short transverse	Short transverse		» »
Supraventral	Well developed	Well developed	Well developed	Well developed
Postventral	1 median	1 median		1 median
Pectoral	Present	?		?
Supra-anal	»	Present	Present	Present
Postanal	»	»	»	»
Subcaudal	Heart-shaped	1 double, heart-shaped	1 pair	1 single
Prejugular		?		Absent
Suprapectoral		Absent		»
Anal		»		»
Caudal		»		»
Postorbital		»		»
Lateral horizontal teeth in lower jaw	Absent	Present	Absent	Present

* Blanks are for characters not mentioned in the original descriptions. Question marks are for characters that cannot be determined on account of damage on the specimens.

** Distance from tip of ethmoid to end of hypural plus 1mm. The point of the snout has been fixed at 1mm. before the extreme forward point of the ethmoid for all measurements taken from the "snout".

*** Distance from snout tip (at centre, without teeth directed forward) to end of maxillary.

**** Distance from extreme forward point to the pointed corner of the angular.

***** "Schuppen in der Seitenlinie".

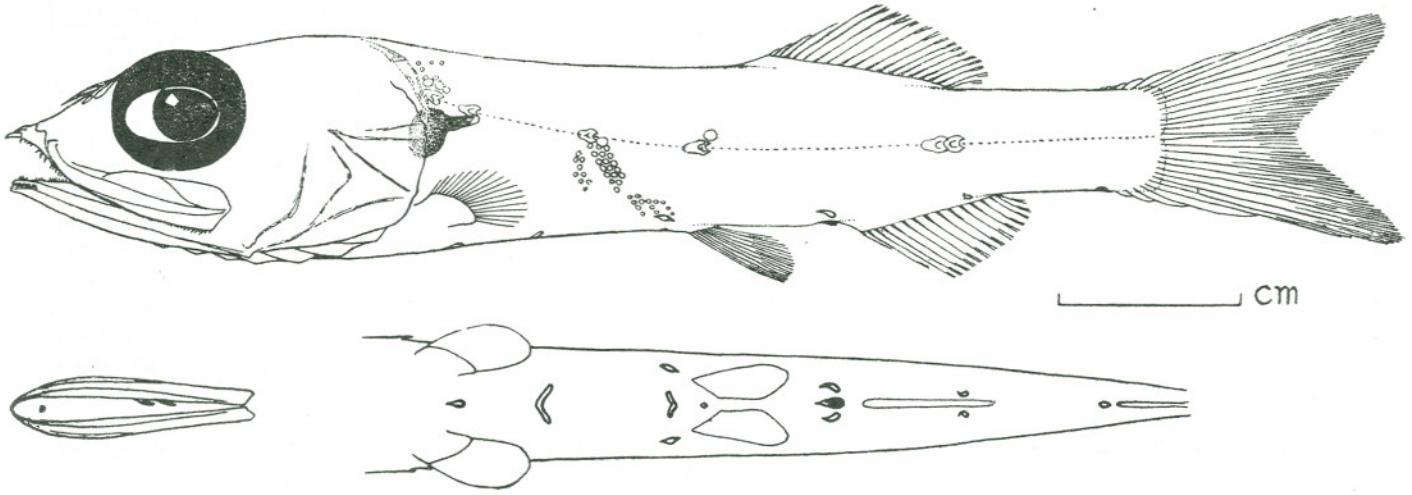

FIG. 2. – *Holtbyrnia macrops* sp. n. (Type)

found that two (the two new species here considered) approach each other in the structure of the head both in the shape and the presence of articulating prefrontals, while they differ strongly from each other in the proportions of their heads relative to S.L. What happens when we now compare this cranium formation with that of *Searsia koefoedi* and *Holtbyrnia polycoeca* (Parr), Maul, 1954? In the general shape of the roof of the head they differ strongly from both; articulating prefrontals they have in common with *H. polycoeca*; whereas *S. koefoedi* has long narrow prefrontals firmly welded together with the cranium. The two latter have the interorbital part of the roof of the head very broad posteriorly, diminishing in width evenly but rapidly towards the snout; the former two have this part narrow throughout with the sides more or less parallel. Each pair contains one large-headed and one small-headed species. Both species of one pair possess enlarged lateral-line scales, while the two of the other pair have all the scales of equal size. In short, instead of finding any correlations, a most stubbornly contradictory ensemble of characters opposes us wherever we try and hope to find a link of relationship.

On the other hand, the study of this part of the head has revealed that the great differences that exist in the proportions, in the shape, and in the presence or absence of articulating prefrontals, as well as their position and individual shape when present, constitute a practical key for identification of the five species shown in Fig. 1. A fairly detailed description with accurate figures of this part of the head seems most desirable in all species, as what stands for the 5 species at hand is also likely to stand for all others. It is useful particularly as, owing to the extreme fragility of these fishes, many of the characters connected with the soft tissues are damaged or missing.

It would of course be quite out of place at this stage to make far-reaching comments on the taxonomy of this complicated group on the basis of the above mentioned revelations. These merely resulted from an attempt to give a solution to the difficulties which arose with regard to the small-headed one of the two specimens here discussed (the same difficulty was already noted and commented on by Krefft, 1953). We know that before long we can expect to have Parr's revision of the Searsidae, where a good many, if not all, of the problems are likely to be solved.

The author prefers, therefore, regardless of this discrepancy, to refer both specimens to the genus *Holtbyrnia*, in abeyance of the solution that will probably soon be provided.

Holtbyrnia macrops *sp. n.*

Figs. 1C, 2 & 3.

One specimen, in fair condition. Except for a large amount of scales, no essential parts are missing. From stomach of *Aphanopus carbo*. 63.3 mm. S.L. Reg. No. 6313. 17.IX.1955.

DESCRIPTION

Head large, with large eyes. End of maxillary nearly reaches hind border of eye, corner of angular reaches slightly beyond. Posterior supramaxillary fragile, slightly less than half the length of the maxillary. Widest part of maxillary about 1/10 its length. Premaxillary 3.3 times in length of maxillary. Eye longer than high, 3 times in head. Its pupil distinctly elongate, nearer front border of eye. Diameter of lens distinctly greater than vertical diameter of pupil, but smaller than horizontal diameter. Interobital narrow, the frontals being narrow and separated from each other by a cartilaginous part about as broad as they themselves. Their inner edges approximate each other towards the front in a sinuous curve. The prefrontals articulate loosely with the frontals, their posterior end being distinctly in advance of middle of eyes and their anterior ends short of the end of the frontals by 1/5 their own length. Posteriorly they are slightly pointed and anteriorly they are broadly truncate. The front border of the eye is nearer the middle of the length of the prefrontals. Seen from above the snout is bluntly tapering.

Premaxillary of right side with large downward directed tooth below base of tusk, that of the left side with two tusks directed forward, the base of the upper being above and behind that of the lower one. Following the tusks there are 7 small curved teeth. Premaxillary 1/4 of free margin of upper jaw. Left maxillary with 42 small teeth in one row. Left lower jaw with upward directed row of 40 minute teeth and, anteriorly, a separate outer

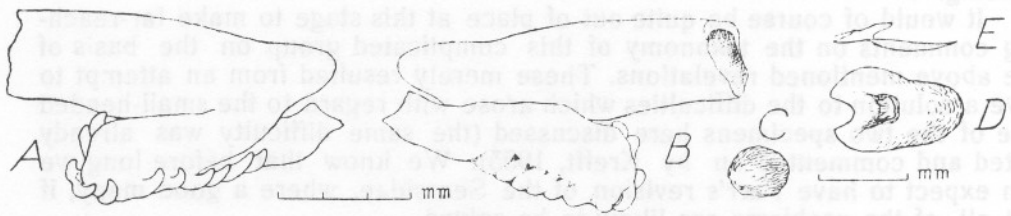

FIG. 3. — **A** & **B** Left and right view of stomach and pyloric coeca. **C** Scale from central region of side. **D** & **E** Lateral-line scale.

one consisting of 9, arranged in pairs. Two teeth on vomer and a pair of teeth anteriorly on each palatine. About 12 pointed, more or less wide-set teeth on tongue. Maxillary slightly short of posterior margin of orbit.

Dorsal 20; anal 16; pectorals 18+; ventrals 9. Gill-rakers on first left gill-arch 8/17. Branchiostegal rays 7. There are 10 short pyloric coeca (Figs. 3A & B), one of which branches off into two ends near its base.

Scales (Fig. 3C) almost all lost, but a small patch between supraventral organ and lateral line, ascending obliquely forward, is well preserved. These scales are minute, about 0.5 per cent of standard length. Scales of lateral line (Figs. 3D & E) large, round anteriorly and deeply emarginate posteriorly, with a flap directed forward, under which passes the lateral canal. Anterior

half of each scale distinctly narrower than posterior half, length about 2.4 per cent of standard length. Immediately next to or partly on the lateral-line scales are some distinctly larger than the small ones of the sides, the latter being about half the size of the former. On the right side there are 5 well defined marks in a row, showing the size and position of as many lost lateral-line scales. The distance between the ends of the first and last of these 5 marks is contained 9.5 times in the entire course of the well marked lateral line. As the widely dispersed lateral-line scales still existing (both on right and left side) are all of approximately equal size we may assume that the total number was more or less 47. A similar calculation for the oblique rows of small scales between the head and the caudal gives us an approximate count of 100-110, based on the assumption that, similarly to other searsids, there is only a small decrease in size towards the tail.

Proportions in per cent of standard length: length of the head 35.5; snout 7.9; orbit 12.0; overall length of upper jaws 20.9; lower jaw 22.9; interorbital (boney part, at middle of orbits) 4.9; width of skull 14.2.

Snout to pectoral fin 36.0; snout to ventrals 58.9; snout to dorsal fin 65.2; snout to anal fin 73.5; base of dorsal fin 6.4; base of anal fin 12.4; greatest depth of body 19.2; least depth of caudal peduncle 9.0; longes gill-raker 5.7.

Snout to thoracic[1] 36.7; snout to thoracic[2] 44.5; snout to subventral organ 56.1; snout to supraventral organ 55.5; snout to supra-anal organ 71.0; snout to postanal organ 82.3.

One small submental photophore. One on basal part of first, and one on second, left branchiostegal ray. Two conspicuous thoracic organs, anterior one pear-shaped and situated between the free inner sides of pectoral peduncles, the posterior one narrow, transverse and slightly bent, with the angle towards the head; much nearer pectorals than ventrals. Distance between it and bases of pectorals more than twice in distance between it and bases of ventrals. Subventral organ similar to posterior thoracic organ, but slightly smaller and the angle pointing in the opposite direction, the middle of its width opposite middle of supraventrals. One small postventral, situated between middle of ventral bases. One supra-anal on each side above vent. One on each side above 5th anal pterygiophore counted from behind. One single central one near the anterior end of the subcaudal series of procurrent caudal spines.

Definitely absent are orbital organs, infraorbital organs, infrapectoral organs, prejugular organ, suprapectoral organ, anal organ, caudal organ, and postorbital organ.

The pectoral fins are rather badly rubbed and luminous organs may have existed there.

This new species seems closest to *Searsia polycoeca* Parr, 1937, but can easily be distinguished from it by the larger eye, which is 12 per cent of standard length as compared to 10.4 per cent in the appreciably smaller type of Parr's species, and 34.1 per cent of the length of the head as compared to 27.5 per cent. It is further distinguished by the smaller head, by having only one single subcaudal luminous organ, and by the presence of a separate horizontal series of teeth in the lower jaw. The absence of scales in the type

of *S. polycoeca* may be due to its small size or, as Parr suggests, to damage.

From *Bathytroctes melanocephalus* Vaillant it differs strongly by the much smaller head and snout, from *Bathytroctes rostratus* Günther, among other characters, by the presence of luminous organs, and from all other searsids mainly by the much larger head, presence of a separate series of horizontal teeth in the lower jaw and the presence of large modified lateral-line scales.

Holtbyrnia *sp.*

Figs. 1 B & 4.

One specimen. In the ventral region there is a hole between the pectorals and the ventrals, and a short distance before the pectorals the skin of a small area is missing. On the head the premaxillaries and the lenses of the eyes were lost. The shape of the pupils can no longer be determined as the irises of both eyes are partly destroyed. The part of the branchiostegal membranes situated between the branches of the lower jaw are damaged. On the right side the operculum and the subopercuIum are missing, and on the left side the subopercuIum is damaged. The specimen was taken from the stomach of *Aphanopus carbo*. About 101mm. S.L. Reg. No. 5969. 2. VIII. 1955.

DESCRIPTION

Head moderate, with moderate eyes. End of maxillaries slightly behind hind border of eye, pointed corner of angular slightly in advance. Posterior supramaxillary narrow and long, slightly less than half the length of the maxillary. Widest part of the maxillary 1/8 its length. Premaxillaries lost. Eye slightly longer than high, inner border of pupil torn, lenses lost. Interorbital narrow, the boney frontals broad and lying close together, only their anterior much narrower ends apart from each other. Their inner borders are strongly arched. The prefrontals are large and articulate loosely with the frontals. They are slipper-shaped, truncate posterioly and lightly pointed anteriorly. Their posterior ends are distinctly behind middle of eyes and their anterior ends are short of the end of the frontals by about 1/7 of their own length. The anterior border of the eyes is near anterior end of the prefrontals. Seen from above the snout is broad.

Left maxillary with 50 small teeth in one row. Left lower jaw with upward directed row of 44 teeth, generally in pairs, anteriorly a separate outer row of 8. Two teeth on vomer and a pair on each palatine. Five very small teeth on tongue. Maxillary reaching slightly beyond posterior margin of orbit.

Dorsal 21; anal 17; pectorals about 18; ventrals 9. Gill-rakers on first left gill-arch 8/1/19. Branchiostegal rays 8. There are 11 pyloric coeca (Fig. 4 D), 3 of which divide near their ends, and one nearer the proximal end.

The scales (Fig. 4 C) are well preserved in several fairly large patches, and where they are missing their position is well marked by the easily visible

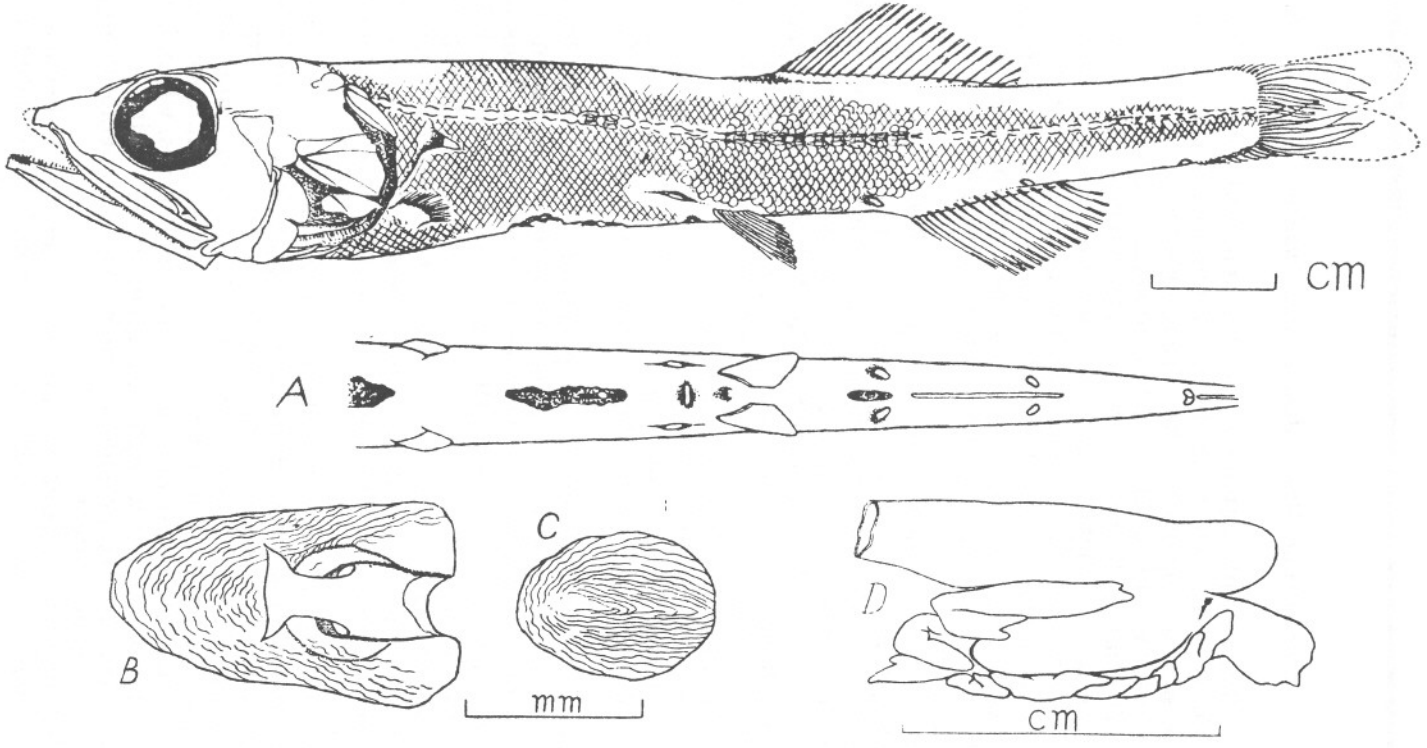

FIG. 4. – *Holtbyrnia* sp., Reg.No. 5969. **A** Abdominal view showing arrangement of luminous organs. **B** Lateral-line scale. **C** Scale from central region of side. **D** Stomach with pyloric coeca.

scale pockets. Their length is about 1% of the standard length. The scales of the lateral line (Fig. 4B) are about twice as long and one and a half times as broad as the surrounding ones. They are rounded anteriorly and narrowly emarginate posteriorly, with a flap directed forward, under which passes the lateral canal. The flap ends in two laterally drawn out points. The anterior half of each scale is only slightly narrower than the posterior end. Where the lateral-line scales are missing their position can easily be seen by the dark rims of the skin that surrounded them. Their total number can thus be determined as 48. The count of the scales and scale pockets gives us 111 along the edges of the lateral line and 10 more superiorly on part forward as far as end of cranium.

In none of the known Searsids does the premaxillary reach much beyond the ethmoid, in fact, the portion which does reach beyond is not likely to measure more than about 3 or 4 per cent of the head length, measurements have therefore been taken from an imaginary point fixed at 1mm. in advance of the point of the ethmoid. This results in the following percentages of the standard length: length of head 29.6; snout 7.5; orbit 8.6; overall length of the upper jaws 18.6; lower jaw 19.1; interorbital 3.8 without and 6.1 with the articulating prefrontals; width of skull 12.2.

Snout * to pectoral fin 30.1; snout to ventral fins 55.9; snout to dorsal fin 61.1; base of dorsal fin 18.3; snout to anal fin 71.5; base of anal fin 12.8; greatest depth of body 15.9; least depth of caudal peduncle 7.3; longest gill-raker 4.7.

The areas where the anterior and the posterior thoracic must have been placed are unfortunately damaged, but the extent of the damaged areas at least determines the limits whithin which they must have been. Thus we may say for snout to thoracic[1] less than 29.9 and for snout to thoracic[2] more than 38.9. Others are: snout to subventral organ 53.5; snout to supraventral organ 51.9; snout to supra-anal organ 68.1; snout to postanal organ 80.2.

Distance from snout to dorsal fin minus distance from snout to ventral fin 33.0 per cent of distance from snout to anal fin minus distance from snout to ventral fin.

The subventral organ is narrow and more or less straight. Supraventrals elongate oval, yellow luminous central part slightly anterior to subventral organs. Small interventrals, situated between middle of ventral bases. One supra-anal organ on each side above vent. One on each side above 5th anal pterygiophore counted from behind. One double organ near the anterior end of the subcaudal series of procurrent caudal spines, which is divided only by a thin line. One narrow organ on upper border of iris.

Definitely absent are the prejugular organ, the suprapectoral organ, the anal organ and the caudal organ.

Organs that may have existed but are no longer visible because of the state of preservation of the areas where they should be situated are: the

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* Snout as understood in these measurements is 1mm. in advance of the tip of the ethmoid.

pectoral; the thoracic[1]; the thoracic[2]; the infrapectoral; the branchiostegals; the infraorbital; the postorbital.

Some yellow tissues in the gular region are likely to be rests of the anterior thoracic organ.

The specimen seems very near to *Searsia schnakenbecki* Krefft, 1953. Indeed, for a long time I hesitated about whether it should be referred to this species or not. However there are several characters of importance that decided me against it. In the first place there is a row of separate lateral teeth in the lower jaw. Krefft points out that these are not present in *S. schnakenbecki*, and his series ranged from 87.1 to 148.1mm. S.L., the type specimen only differing by 1mm. from the present one*. Another important difference is that in the present species the interorbital width is only 3.8% of S.L. whereas in *S. schnakenbecki* it is 4.4%. The high count of 21 dorsal rays in this form is 3 above the highest variant of 9 specimens in Krefft's species. Lastly the position of the ventrals is farther back, whereas that of the origin of the dorsal is more forward. This causes an important relative displacement of the origin of the ventrals, dorsal and anal. Thus in *S. schnakenbecki* the distance from snout to dorsal minus the distance from snout to ventrals is 57.9 per cent of the distance from snout to anal minus the distance from snout to ventrals**, whereas in our specimen the same comparison results in 33.0 per cent. At a glance we note that the origin of the dorsal is distinctly nearer the origin of the anal in one, whereas in the other it is relatively near the origin of the ventrals.

The reasons for my refraining from naming this specimen are mainly because it lacks through damage two important luminous organs, the thoracic[1] and the thoracic[2]. And to a lesser extent because it lacks the premaxillaries and is rather badly rubbed in areas where other luminous organs might have existed. It is hoped, however, that the details given in the description of the parts that are intact may make it possible to recognize it if a better specimen, worthy of being made the type of a new species, comes to hand, here or in any other collection. The external structure of the roof of the head in general and the size, shape and position of the articulating prefrontals in particular may help a lot here. The latter may eventually prove a convenient character by which species can be distinguished, that is, once we have established to what extent the shape and size of this bone is bound to the stage of the development of the fish. Its characteristics are certainly easier to determine, without causing any damage to the specimen, than those of most other externally visible bones of the head.

Genus Barbantus Parr, 1951

Barbantus Parr, 1951. Am. Mus. Novitates, No. 1531, p. 18.

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* The separate lateral teeth are placed at an appreciable distance from the teeth that grow along the upper border of the jaw bone, and they are quite distinctly directed horizontally. They must, therefore, not be confused with second outer rows also described for several species of searsids. This becomes quite clear from the fact that Parr (1937) describes for *Searsia koefoedi* "numerous minute teeth in a single series except at the anterior end where a short external series also occurs" and later (1951) uses the lack of "lateral horizontal teeth in the lower jaw" in *S. koefoedi* as a distinguishing character against the possession of "a short, separate series of teeth on the external lateral surface of the lower jaw near the symphysis" in species of the *Holtbyrnia* group. Likewise, Krefft (1953), when describing the dentition of the lower jaw, says in his description of the type of *Searsia schnakenbecki* "Zähne zahlreich und einreihig, mit Ausnahme des vordersten Kiefervierteils, in dessen Bereich eine zweite äussere Reihe von jeweils drei erhaltenen und einigen abgebrochenen Zähnen vorhanden ist", and later, in the discussion, where he enumerates characters that distinguish his species and *Searsia koefoedi* from *Holtbyrnia (M.) polycoeca* he says "beiden fehlen seitliche Horizontalzähne im Unterkiefer".

A series of well preserved specimens of *S. koefoedi* ranging from about 76-145 mm. S.L. show no trace of these teeth, neither does the specimen referred by the author (1954) to *Holtbyrnia (M.) polycoeca*. While these teeth may be an ontogenetic character, this material, consisting in two cases of fairly good size series, shows that in some species they are most likely to be definitely absent.

** As Krefft does not give the distance from snout to anal the proportions were worked out from measurements taken from the figure of his type specimen.

Barbantus curvifrons *(Roule & Angel)*

Figs. 1 A & 5.

Bathytroctes curvifrons Roule & Angel, 1931, Bull. l'Inst. Océ. Monaco, No. 581, p. 6; 1933, Rés. Camp. Sci., Monaco, Fasc. LXXXVI, p. 6, Pl. 1, Fig. 2.

One specimen, in fair condition. On the left side all the scales are missing and the scale pockets are no longer recognizable. On the right side a large amount of the scales are well preserved in two large patches, and as far as just behind the end of the anal base their number can be ascertained with accuracy All the fins are intact. Lenses of both eyes lost, and the border of the pupils is torn. All the viscera of the abdominal cavity were lost, apparently through a large hole on the left side of the abdomen. The specimen was taken from the stomach of *Aphanopus carbo*. 118.5 mm. S. L. Reg. No. 9905. 15.X.1956.

DESCRIPTION

Head small, eye large. End of maxillary and pointed corner of the angular under middle of eye. Posterior supramaxillary sturdy, somewhat longer than half the length of the maxillary. Widest part of maxillary about 1/5 its length. Premaxillary 2.5 times in length of maxillary. Eye round, about 3 in head. Interorbital narrow, the frontals being narrow and widely separated by a cartilaginous part. Their inner edges run parallel with each other. There are no articulating prefrontals. Seen from above the snout appears very broad and blunt. (Fig. 1 A).

Premaxillary dentition of right side consisting of 20 small, strongly inwardly curved, pointed teeth of equal size, evenly distributed over the whole edge. Right maxillary with 26 small, pointed, broad-based, straight teeth. As about 3 are broken off, the total must have been 29. On the left side the numbers are almost the same. On the lower jaw the teeth are thin, pointed and inwardly curved. They consist of a row of 8 in the posterior part of the right side and after an interval about as long as this row, of another row of 8, in the anterior part. The disposition is the same on the left side, except that the posterior row consists of 9 instead of 8 teeth. The teeth of the tongue, vomer and palatines are of the size of the large maxillary ones but sturdier, being pointed and curved backwards. There are 2 on vomer, 1 anteriorly on each palatine, and 1 on tongue. The symphyseal knob is well developed, and laterally there projects a long horizontal spine on each side. (Fig. 5 A).

Dorsal 21; anal 17; pectoral (right) 23; ventrals 9. Gill-rakers (Fig. 5 C) on first right gill-arch 5/1/12. As the tissues of the head are extremely fragile I have abstained from counting the branchiostegal rays, as an attempt to do so would necessitate rather drastic forcing apart of the hind ends of the lower jaw and other parts of the side of the head, which would almost certainly cause considerable damage to the head.

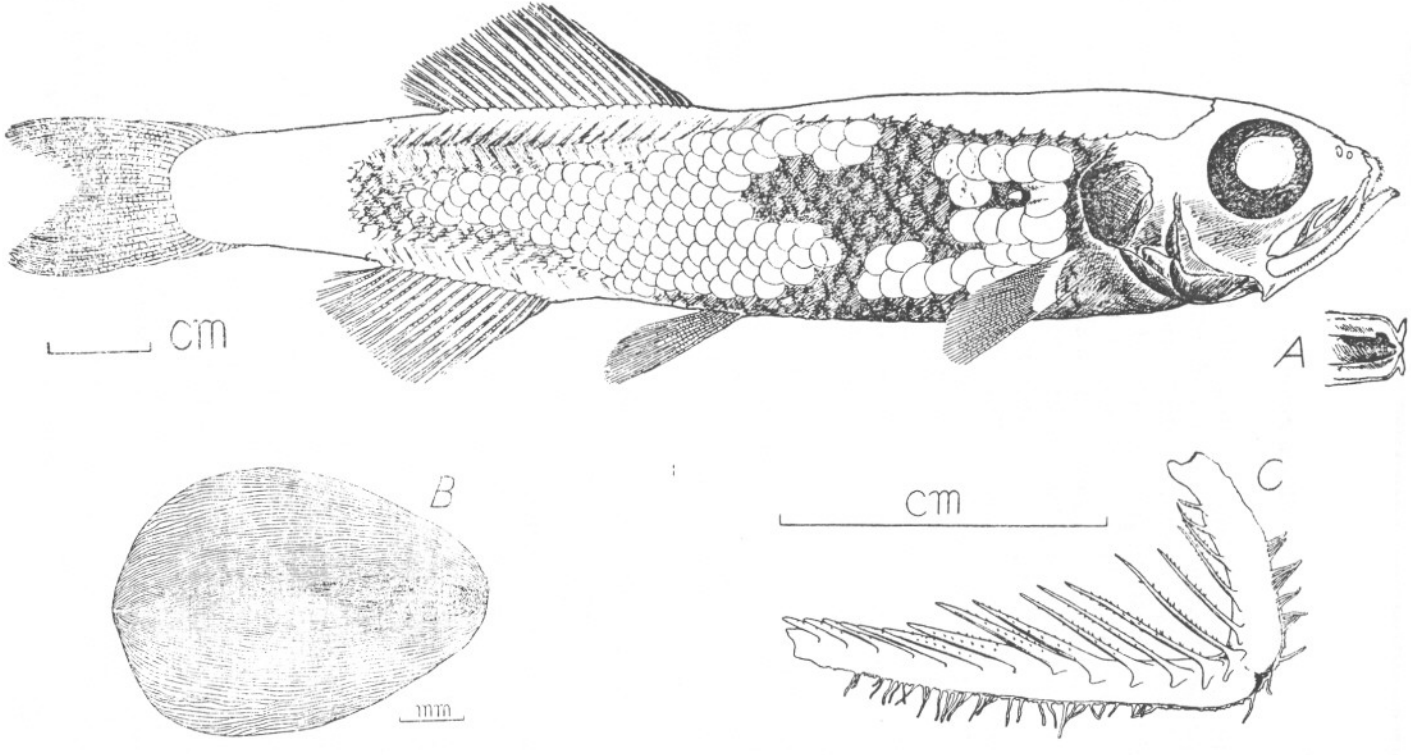

FIG. 5. — *Barbantus curvifrons* (Roule & Angel). **A** Tip of lower jaw seen from below. **B** Scale from central region of side. **C** Left first gill-arch.

Scales (Fig. 5 B) large and cycloid, with numerous circuli, most of which run off the posterior edge of the scale. A scale from middle of area between pectorals and ventrals has about 100 fine ridges counted from side to side. Only about 40 of these ridges are part of the 20 inner continuous circuli. The length of the scale is 5.1 per cent of the standard length. There are no specialized lateral-line scales. The scale overlying the shoulder organ is strongly arched along its longitudinal axis to accommodate the tubular part of this organ leading to the exterior. As far back as the end of the anal base either scales or scale pockets are well preserved and easily distinguishable. The number of oblique rows of scales between the head and the perpendicular through the end of the anal base is 32. To the end of the caudal peduncle (based on some faint traces of scale pockets and some calculation) the number must have been about 46. In the part of the body between the pectorals and the ventrals 13 longitudinal rows of scales can be counted.

Proportions in per cent of standard length: length of head 25.1; eye 8.7; maxillary 11.8; snout 5.9; overall length of upper jaw 12.7; length of lower jaw 14.3; snout to dorsal 56.9; snout to ventrals 53.8; snout to anal 69.0; dorsal base 20.6; anal base 14.6; gill-rakers 4.2; right symphyseal horizontal spine 5.1; interorbital (boney part, at middle of eyes) 3.4; width of skull 12.3.

No photophores. Colour on fresh specimen brownish mauve, rather dark on head and anterior part of body, gradually getting lighter towards tail. Iris, inside of mouth and gill cavity, as well as the branchiostegal membranes blackish. Rays of fins very light.

The present specimen differs in a number of characters so greatly from the type as described by Roule & Angel that I found it at first difficult to identify it with their species. The position of the insertion of the ventrals is said by these authors to be slightly in advance of the middle of the standard length, whereas here it is well behind. The snout length is said to be 4.2 per cent of the standard length as compared to 5.9 here, and the greatest depth only 15.6 as compared to 18.6. The most striking difference is to be found in the count of the dorsal rays, which is 15 in the type and 21 in our specimen.

Re-examinations of the type, however, showed that not too much importance can be attached to the proportions. Mr. R. Motais of the Institut Océanographique de Monaco kindly had the type specimen remeasured for me and the results were very near those obtained by Roule & Angel. On the other hand Parr, who has measured the type on two separate occasions, obtained results quite close to mine.

It seems clear that the difference in these results are due to the difference in the method adopted for taking the length measurements, and, furthermore, we must also bear in mind that the standard length in species that have part of the proximal ends of the caudal rays covered with scales and opaque tissues is somewhat arbitrary, unless we partially dissect the caudal peduncle and state the exact point to where the measurement was taken on the skeletal part.

Regarding the extremely high count for the dorsal fin, Professor Parr has kindly communicated to me a fair number of counts made on material examined by him. These show such great variations that evidently no specific significance can be attached to the count found here.

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