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G. A. Golovan

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RARE AND NEWLY RECORDED CHONDRICHTHYIAN AND TELEOSTEAN  
FISHES OF THE CONTINENTAL SLOPE OF WEST AFRICA

by

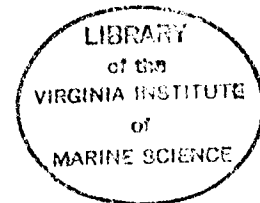
G. A. Golovan

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Translated by: James A. Colvocoresses

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## TRANSLATORS PREFACE

This paper is composed primarily of species descriptions and accounts, and as such contains a very large number of abbreviations and numerals in the text. Inasmuch as the material presented in this form is central to the content of the paper, very great care was taken in transposing and checking this information between this translation and the original Russian version. A sizeable number of inconsistencies and obvious errors appear in the original text. Typographical and spelling errors in the English portions were corrected. No alterations were made to the numeric portions, but obvious errors or missing information are annotated with (sic). Less obvious errors and inconsistencies in the Russian portion of the paper have been fully annotated in the text.

There is a major inconsistency in the handling of the shark species, with a portion of the species having their measurements expressed as percentages of total length (% TL) and the remainder referring to standard length (% SL). The author's introductory remarks, the customarily reported information for these species and examination of the data itself all strongly suggest that total length was used in all these cases, and that the (% SL) designations are in error. They have been left in the text, however, in order to alert the reader to possible confusion in the reporting of this information. Pagination of the original text has been provided in the left-hand margin.

I would like to thank Ken Sulak for suggesting this paper for translation and also for his careful editing of the manuscript. Dr. Anne Netick of the Department of Modern Languages of the College of William and Mary verified the accuracy of translation, and to her I also extend my appreciation, as well as to Drs. Jack Musick and John Merriner of VIMS who also provided helpful editorial comment.

This is an unofficial translation provided simply as an aid to interested researchers. The original author has neither reviewed or approved this work.

RARE AND NEWLY RECORDED CHONDRICHTHYIAN AND TELEOSTEAN  
FISHES OF THE CONTINENTAL SLOPE OF WEST AFRICA

G. A. Golovan

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It is customary to assume that the period of faunistic exploration in the world oceans is to a large extent finished, and also to assume that the period of discovery and study of its biological resources is completed. However, this assertion is reasonable only for the continental shelf zone, which comprises only 7% of the area of the world's oceans. In this connection special interest is drawn to the bathyal zone, i.e. the continental slope and the deep waters over it. The bathyal zone is inhabited by a unique fauna constituting a separate biocenosis, detailed knowledge of which has only begun to be acquired.

In recent years a new stage of biological research has begun in oceanology in connection with the use of modern commercial fishing gear for capturing deepwater nekton (bottom and discrete depth pelagic trawls, whose vertical and horizontal gapes reach several tens of meters). Very interesting data has already been obtained on the composition, biomass, and geographical and vertical distribution of the bathyal nekton at depths of 500-2000 m off the coast of West Africa (Golovan, 1974a, b), and a separate bathypelagic fish community has been defined (Parin & Golovan, 1976).

The waters off the coast of West Africa present a very interesting opportunity for the understanding of processes occurring on the continental slope. Off the coasts of northwestern and southwestern Africa are situated two major zones of deep water upwelling and consequently, sharply increased biological productivity in the surface layers.

In recent years significant concentrations of the slickhead, Alepocephalus bairdi, have been discovered along the coast of northwestern Africa at depths of 1300-1600 m, while at depths of 700-900 m an increase in the nektonic biomass was noted, occasioned by Deania calcea, Trachirhynchus trachirhynchus and Hoplostethus mediterraneus (Golovan, 1974a). Off the coast of southwestern Africa were found concentrations of the deepwater fishes Allocyttus verrucosus and Hoplostethus atlanticus, also at depths of 700-900 m (Golovan, 1974b).

The formation of such concentrations may be explained as the result of the interaction of two processes: horizontal transport of oxygen-rich arctic bottom water and vertical transport of organic substances, creating increased biological productivity in the surface zone. Investigations have shown vertical stratification in the distribution of oxygen in both the intermediate and bottom layers. Thus, according to data from the vessels "Star of Crimea" and "Hercules", there is a significant increase in the dissolved oxygen content on the continental slope at about 22-23°N. lat. (at a depth of

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100 m -80-87%, at 500 m -33-37%, at 1000 m -42-46%, and at 1400 m about 61%) (trans. note - units not given but probably refers to percent saturation). Significant concentrations of macroplankton (Pyrosoma, jellyfish, shrimp, small fishes), which serve as food for larger nekton (particularly for the slickhead fishes of the family Alepocephalidae), are found to occur in such oxygen enriched layers. In this manner, even the deep layers of the ocean possess significant concentrations of nekton, comparable in biomass to the productive waters in littoral regions. Hourly trawl catch rates are of similar quantity.

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Two cruises, carried out on the vessels "Poltava" and "Star of Crimea" (October 1969 - March 1970 and November 1972 - April 1973) on the continental slope of West Africa (Fig. 1), resulted in the gathering of a large collection of fishes, including about 300 species of bathypelagic, demersal, and benthic fish from depths of 500-2000 m. Processing of these collections resulted in the discovery of several species new to science, and a considerable number of species which were previously unrecorded for West Africa.

In describing the material the following abbreviations are used for vessel names: P - "Poltava," S - "Star of Crimea," first voyage; Sa - "Star of Crimea," third voyage; A - "Andromeda;" V - "Violent." The figures after the abbreviated vessel names signify the trawl number, the number of specimens preserved and (in parentheses) their length (in mm). Total length (TL) is given for sharks and chimaeras; standard length (SL) is given for the remaining fish.

During processing of the material necessary measurements and counts of meristic characters were carried out for most rare species.

Morphometric characters for cartilaginous fishes are designated in the text by the following abbreviations: distance from the tip of the snout to : mouth - ar, anterior edge of nostril - an, origin of the base of the 1st and 2nd dorsal - aD<sub>1</sub> and aD<sub>2</sub>, origin of the upper and lower lobe of the caudal fin - aC<sub>s</sub> and aC<sub>i</sub>, base of the pectoral fins - aP, base of the pelvic fins - aV; o - horizontal diameter of the eye, oo - vertical diameter of the eye, lr - width of the mouth, hr - height of the mouth, nn - distance between the inner edges of the nostrils, hD<sub>1</sub> - height of the first dorsal fin, lD<sub>1</sub> - length of the base of the dorsal fin, hD<sub>2</sub> - height of the 2nd dorsal fin, lD<sub>2</sub> - length of the base of the second dorsal fin, lC<sub>s</sub> - length upper lobe of the caudal fin, lC<sub>i</sub> - length of the lower lobe of the caudal fin, lP - length pectoral fins, lA - length of the base of the anal fin; distance between: bases of the dorsal fins - D<sub>1</sub>D<sub>2</sub>, posterior edge of the 2nd dorsal fin and the upper lobe of the caudal fin - D<sub>2</sub>C<sub>s</sub>, origin of the bases of the pectoral and pelvic fins - PV, origin of the base of the pelvic and origin of the lower lobe of the caudal fin - VC<sub>i</sub>, posterior edge of the base of the pelvic and origin of the lower lobe of the caudal fin - VpC<sub>i</sub>; posterior edge of the base of the anal fin and the origin of the lower lobe of the caudal fin - AC<sub>i</sub>.

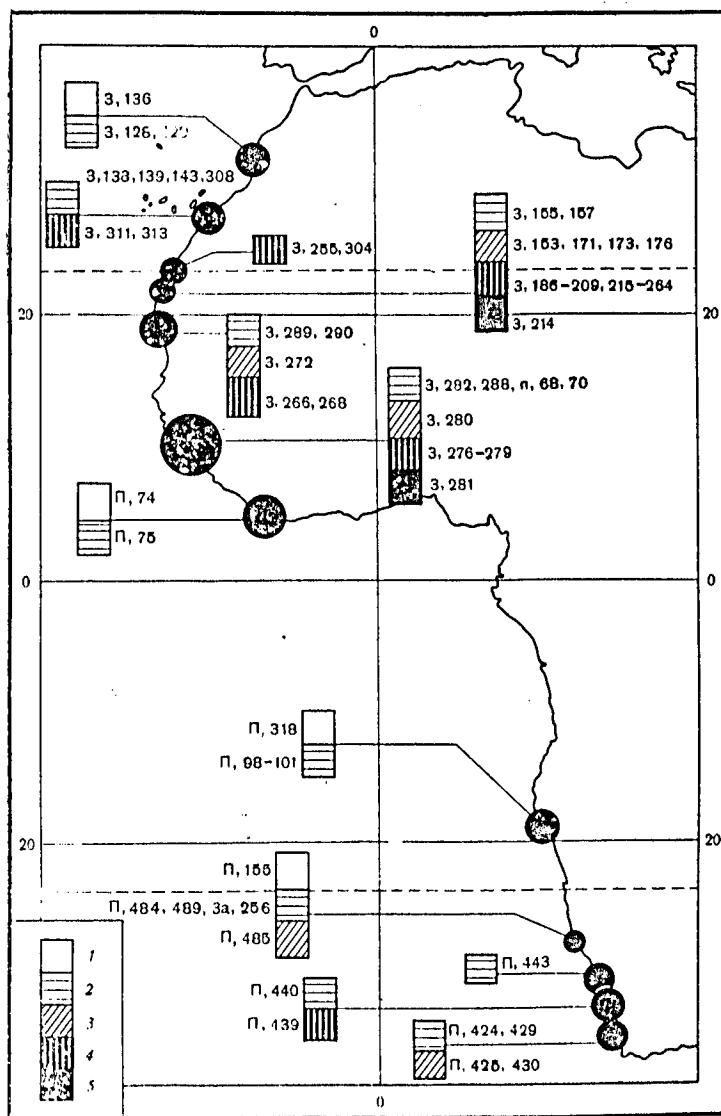


Fig. 1. Locations and depths of trawls from the vessels 'Star of Crimea' (3) and 'Poltava' (II)  
 1=200-500 m, 2=500-1000 m, 3=1000-1200 m, 4=1300-1600 m, 5=1700-1900 m

In describing bony fishes the following abbreviations are used: c - length of the head to the posterior edge of the operculum, o - horizontal width of the orbit, io - intraorbital distance, ao - length of the snout,  $l_{mx}$  - length upper jaw,  $l_{md}$  - length of the lower jaw; distance from the tip of the snout to: origin of the base of the dorsal fin aD, origin of the base of the pectoral fin aP; lo - length of the base of the dorsal fin, lA - length of the base of the anal fin, H - greatest height of the body, h - height of the caudal peduncle, lP - length of the longest ray of the pectoral fin, lV - length of the pelvic fin, R.br. - number of branchiostegal rays, sp.br. - number of gill rakers on the first gill arch, p.c. - number of pyloric caeca, ll - number of scales in lateral line, Sg - greatest number of scale rows from the head to the end of the scales directly covering the lateral line.

This paper reports data for 59 species of fishes belonging to 22 families.

#### FAMILY CHLAMYDOSELACHIDAE

##### Chlamydoselachus anguineus Garman

Chlamydoselachus anguineus Garman, 1884:47-52 (Japan).

S, 226-1 (F, 615), 258-1 (M, 835); P, 98-1 (M, 960).

280 COMPARATIVE OBSERVATIONS. C. anguineus was described from material from the waters of Japan (Garman, 1884). Accounts of this species can also be found in a series of more recent works (Bigelow & Schroeder 1948; Smith 1967; Wheller 1962). Our specimens agree well with the descriptions with regard to all systematically important characters.

Various measurements of our specimens of lengths 615, 835 and 960 mm (%TL) are as follows: o 1.8, 1.6, 1.5; nn 4.4, 4.3, 4.7; lCs 3.1, 4.5, 2.7; aD 58.2, 62.8, 64.5; aA 57.0, 59.8, 64.8; aC 68.9, 74.8, 74.9; aP 16.3, 15.7, 18.2; aV 45.3, 47.9, 44.8; pV 29.7, 32.3, 31.3.

DISTRIBUTION. C. anguineus is known from the waters of Japan and Australia, as well as from the eastern part of the Atlantic Ocean from South Africa and from Madiera and Morocco to Narangerenfjord at depths of 120-1100 m (Gudger & Smith 1933, Whitley 1940; Bigelow & Schroeder 1948; Stead 1963; Smith 1967, Trunov 1968a).

The two specimens 615 and 835 mm long were taken from depths of 1340-1570 m in the region of Cape Blanc, while the third specimen was taken near the coast of southwestern Africa (19°12' S, 11°28' E) at a depth of 500 m. C. anguineus apparently has a bipolar distribution.

FAMILY SCYLIORHYNIDAE  
Apristurus indicus Brauer<sup>1</sup>

Scylliorhynchus indicus Brauer, 1906: 8 (Indian Ocean - Somalia and the Gulf of Aden).

P, 425 - 1 (F, 370), 489 - 1 (F, 320), 440 - 1 (M, 465).

COMPARATIVE OBSERVATIONS. Descriptions of A. indicus can be found in many works (Brauer, 1906; Garman, 1913; Norman, 1935; Bigelow & Schroeder, 1948; Springer, in press). Our specimens fit these descriptions well with respect to all characters.

Various measurements of the 3 specimens 320, 370 and 465 mm in length (% TL) are as follows: height of the body at the base of the pectoral fins 11.5, 10.8, 11.6; width of the body at the base of the pectoral fins 11.5, 11.9, 11.6; ar 9.1, 8.9, 9.9; ao 11.2, 11.1, 10.1; an 5.0, 4.9, 4.7; o 2.2, 2.4, 2.3; lr 10.3, 11.9, 11.6; hr 3.1, 3.2, 3.2; nn 5.3, 4.9, 4.3; 1D<sub>1</sub>, 6.2, 5.7, 5.4; 1D<sub>2</sub> 6.9, 6.1, 5.6; 1A 15.9, 14.9, 14.7; 1Gs 30.2, 26.3, 27.2; 1P 9.4, 10.0, 10.7; 1st aD<sub>1</sub>, 48.8, 52.5, 52.5; aD<sub>2</sub> 57.8, 65.5, 65.5; aCs 68.5, 74.2, 75.0; aP 22.8, 23.5, 24.2; aV 43.3, 45.8, 46.4; aA 54.5, 55.3, 58.1; D<sub>1</sub>D<sub>2</sub> 8.6, 8.2, 8.6; D<sub>2</sub> Cs 1.1, 1.3, 1.3; AC<sub>1</sub> less than 0.4 (in all specimens); PV 12.3, 15.0, 14.0.

DISTRIBUTION. A. indicus is known from the western part of the Indian Ocean, from the Gulf of Aden to the Cape of Good Hope, and from the Gulf of Mexico and the Caribbean Sea from depths of 548-1840 m (Springer, in press). Our specimens were taken near the coast of southwestern Africa (26°00'-33°44' S) from depths of 800-1000 m. A. indicus was not previously known from the coast to West Africa.

Apristurus nasutus (?) DeBuen

Apristurus nasutus DeBuen, 1959:176 (Chile).

S, 128-1 (M, 700).

COMPARATIVE OBSERVATIONS. According to the key for the genus Apristurus (Springer, in press), our specimen was identified as A. nasutus, which was described from the coast of Chile (DeBuen, 1959). In regard to body proportions and tooth and denticle structure, our specimen agrees well with the original description and that of Springer. However, minor differences were observed in coloration (in our specimen the body was brown in color, with a dark stripe and a absence of denticles along the posterior margins of the gill slits, dorsal, pectoral and pelvic fins and tail), making our identification provisional.

Body measurements: ar 7.1; ao 7.8; distance from tip of the snout to: spiracle 11.6, 1st gill slit 16.3, 5th gill slit 20.0, anus 45.7; aP 19.3; aD<sub>1</sub> 52.5; aV 42.8; aD<sub>2</sub> 67.3; aA 55.0; aC<sub>1</sub> 68.5; aCs

<sup>1</sup> Identification of species of the genus Apristurus was possible thanks to the kindness of Dr. Stewart Springer, who sent a manuscript of this unpublished revision of this genus. I express to him my sincere gratitude.



74.8; o 3.1; spiracle diameter 0.4; distance from the eye to the spiracle 0.5; lr 7.3; nn 3.1; height of the 1st gill slit 1.4; height of the 5th gill slit 2.0; 1st 1D<sub>1</sub> 4.4; hD<sub>2</sub> 3.7; anterior margin of the 1st dorsal fin 8.4; 1D<sub>2</sub> 6.1; hD<sub>2</sub> 4.0; anterior margin of the 2nd dorsal fin 9.1; eA 13.8; hA 5.0; 1P 9.2; 1Cs 24.3; D<sub>1</sub>D<sub>2</sub> 10.0; PV 12.8; D<sub>1</sub>D<sub>2</sub> 4.3; D<sub>1</sub> C<sub>s</sub> 3.1 (trans. note - two D<sub>1</sub>D<sub>2</sub> values in orig. text).

DISTRIBUTION. A. nasutus is known from the eastern Pacific from the Gulf of Panama to Chile (35°26' S) at depths of 980-925 m. (sic). Our specimen was taken at 31°45' N from a depth of between 350-1100 m. This is the first record of A. nasutus, or possibly a very closely related species, in the Atlantic Ocean.

Apristurus profundorum (Goode and Bean)

Scylliorhynchus profundorum Goode and Bean, 1895:17 (Delaware Bay (sic)).

S, 187-1 (F, 243), 191-1 (M, 280), 197-1 (F, 570), 219-1 (M, 303), 252-1 (M, 290).

COMPARATIVE OBSERVATIONS. A. profundorum was described from the northwestern Atlantic from a depth of 1492 m (Goode & Bean, 1895). Accounts of this species are given in more recent works (Garman, 1913; Bigelow & Schroeder, 1948). The diagnosis and systematic position of A. profundorum is discussed in Springer (in press). Our specimens are completely in agreement with the given descriptions.

Various measurements (% SL) (see translators preface) of our specimens 243, 280, 290 and 570 mm long are as follows: ar 8.6, 8.6, 10.2, 8.9; ao 9.1, 9.9, 11.1, 9.6; to the 1st gill slit (for the specimen 280 mm long) 17.5; to the 5th gill slit (for the specimen 280 mm long) 21.3; aD<sub>1</sub> 44.8, 47.8, 48.0, 52.6; aD<sub>2</sub> 59.5, 61.5, 62.1, 67.9; aA 55.2, 53.0, 52.7, 58.0; aV 39.7, 40.2, 41.5, 43.9; aCs 71.2, 70.5, 72.5, 73.5; o 3.1, 3.4, 3.2 (sic); nn 4.5, 4.2, 4.8, 3.8; lr 10.2, 9.4, 9.6, 8.5; hr 2.5, 2.5, 2.9, 2.8; 1D<sub>1</sub> 5.5; 4.7, 5.5, 4.5; 1D<sub>2</sub> 5.5, 5.6, 5.8, 4.9; 1A 13.6, 14.5, 14.8, 14.7; 1P 11.0, 10.1, 10.2, 12.6; D<sub>1</sub>D<sub>2</sub> 9.4, 9.7, 9.8, 10.8.

Fins greyish-brown; the dorsals, pectorals, pelvics and caudals bordered along the posterior margin with a narrow band of reduced denticles and pigmentation of a darker color.

DISTRIBUTION. A. profundorum was previously known only from the northwestern Atlantic (Delaware Bay (sic), New England, the southern part of Georges Bank, Nova Scotia) from depths of 686-1492 m (Bigelow et al., Bigelow & Schroeder, 1954). Our specimens were taken between 22°30'-22°50' N from depths of 1200-1500 m. This is the first record of this species in the eastern Atlantic.

Apristurus saldanha (Barnard)Schylliorhynchus saldanha Barnard, 1925:44 (Saldanha Bay).

P, 429-1 (M, 560).

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COMPARATIVE OBSERVATIONS. A. saldanha was described from material from South Africa (Barnard, 1925). A description of this species is also found in Norman (1935), and its systematic position is discussed in Springer's unpublished manuscript. Our specimen agrees well with these descriptions with regard to all diagnostic characters (posterior margin of the base of the second dorsal fin over the tip of the base of the anal fin; distance between the bases of the dorsal fins equal to the distance from the snout to the spiracle).

DISTRIBUTION. A. saldanha is a South African species, known from Saldanha Bay and from the Cape of Good Hope (Barnard, 1925; Norman, 1935). Our specimen was taken from 33°44' S from a depth of 900 m.

## FAMILY SQUALIDAE

Lepidorhinus squamosus (Bonnaterre)Squalus squamosus Bonnaterre 1788:12 (Portugal)Centrophorus foliaceus Gunther, 1877:436.Centroscymnus fuscus Gilchrist, von Bonde, 1924:2.Centrophorus nilsoni Thompson, 1930:277.

S, 155-2 (MM 420, 515); 289-3 (FF 435,475).

COMPARATIVE OBSERVATIONS. According to the key for the genus Lepidorhinus (=Centrophorus) (Bigelow & Schroeder, 1957) our specimens were identified as C. foliaceus Gunther. However, Garrick (1959) established that C. foliaceus was a synonym of C. squamosus; later it was demonstrated that the name C. fuscus also referred to this species (Hulley, 1971). Our specimens agree well with the previous descriptions with regard to all systematic characters.

Various measurements (% SL) (see translators preface) for our specimens 420, 435, 445, 475 and 515 mm long are as follows: ar 12.0, 11.7, 11.3, 11.3, 11.6; o 5.7, 5.7, 5.8, 6.1, 5.6; hD<sub>1</sub> 5.0, 5.3, 5.6, 5.7, 5.6; lD<sub>1</sub> 9.1, 7.8, 8.1, 8.8, 8.2; hD<sub>2</sub> 5.3, 5.1, 5.4, 5.6, 5.5; lD<sub>2</sub> 6.4, 6.3, 6.3, 6.5, 7.6; lCs 20.2, 19.0, 19.6, 20.0, 20.0; lC<sub>1</sub> 13.0, 10.6, 11.3, 12.6, 12.3; aD<sub>1</sub> 37.0, 37.2, 36.3, 36.6, 36.8; aD<sub>2</sub> 69.0, 69.1, 67.5, 70.1, 68.0; aCs 80.2, 83.0, 81.0, 82.1, 81.9; aP 22.7, 24.7, 24.3, 26.5, 23.7; aV 60.5, 59.7, 59.5, 57.8, 60.2; D<sub>1</sub>D<sub>2</sub> 25.0, 21.0, 23.8, 24.7, 24.2; D<sub>2</sub>C<sub>S</sub> 7.4, 7.0, 6.5, 6.2, 5.8; VC<sub>i</sub> 16.0, 15.4, 13.2, 14.7, 14.8.

The specimens were dark grey in color. The margins of the gill openings and the dorsal and caudal fins bordered with a dark band. The labial furrow and lower lip also darker. The shape of the

pectoral fins corresponds well with that in the drawing accompanying Bigelow and Schroeder (1957; Fig. 8A).

DISTRIBUTION. L. squamosus is known from the waters of Japan and New Zealand (Garrick, 1959), the eastern part of the Atlantic Ocean from Iceland to Senegal, the Faroe and Azores Islands, Madeira (Kreffft, Tortonese, 1973) and from the waters of South Africa (Hulley, 1971). In our catches L. squamosus was encountered off the coast of northwestern Africa from 28° to 17° N at depths of 550-1000 m.

This shark was usually present in the catches and in places occurred in considerable quantities together with Deania calcea.

Centroscyllium fabricii (Reinhardt)

Spinax fabricii (Reinhardt), 1825:3 (western Greenland).

P, 425-2 (FF 165, 220), 430-1 (F 470), 489-1 (F 187). S, 190-2 (F 198, M 200), 191-1 (M 530), 196-1 (131), 215-1 (M 490), 219-1 (M 270), 247-2 (M 165, F 185), 258-1 (F 520), 268-2 (F 590, M 405), 276-2 (M 305, F 605).

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COMPARATIVE OBSERVATIONS. C. fabricii was first described from the waters of western Greenland (Reinhardt, 1925). Original descriptions of this species are also given in a series of other works (Vaillant, 1888; Goode & Bean, 1895; Garman, 1913; Jensen, 1948; Bigelow & Schroeder, 1948, 1954, 1957). The presence of males and females of various sizes in our material allows for a discussion of the ontogenetic variation in denticle arrangement and color.

The denticles of C. fabricii are small, conical, and sometimes slightly folded. They are arranged loosely enough so that the skin can be seen between them. These denticles are present only on individuals longer than 200 mm; smaller specimens have smooth skin. On the specimen 200 mm long, denticles cover only the upper part of the body above the pectoral fins, and are absent on the head. On the specimen 270 mm long they have also emerged on the area between the eyes. On the remaining specimens development of the denticles is normal.

A comment on the color of our specimens is necessary, inasmuch as the presence or absence of strips on the fins has systematic importance. On most of the smaller individuals the lower part of the body and sides were blackish-brown, the dorsal part of the body and top of the head were lighter and the fins were darker with light stripes or spots along the margins on some individuals. For example, on the specimen 165 mm long (spec. no. 2 in Table 1) all of the fins except the caudal have light stripes. On the other specimen of the same length (no. 3) only the dorsal and pelvic fins possess light stripes; on the specimens 185 and 187 mm long there are light stripes on the dorsal, pectoral and pelvic fins; and on the specimens 200, 220 and 270 mm long they occur only on the dorsal fins. None of the larger individuals have light stripes on the fins.

284 Measurements of our specimens are presented in the table. Significant changes in body proportions were observed with growth: with increased body size there is a (relative) reduction in the horizontal eye diameter, pre-oral snout length and distance from the snout to the base of the pectoral fins; there is an increase in the distance from the posterior margin of the base of the first dorsal fin to the spine of the second dorsal fin and from the origin of the base of the pectoral fins to the origin of the base of the pelvic fins.

DISTRIBUTION (Fig. 3). C. fabricii is known from the Western Atlantic (Davis Straits, western Greenland, the Greater Newfoundland Bank and Georges Bank) from depths of 250-1300 m (Bigelow & Schroeder, 1948). Valliant (1888) reported the capture of this species off northwestern Africa; however, Bigelow and Schroeder (1948) express doubt as to the correctness of this identification. The finding of this or a related species off the coast of southwestern Africa is noted in Pinchuk and Permitin (1970).

285 In our catches C. fabricii was encountered between 32° and 17° N at depths of 1200-1480 m and between 26° and 33°36' S at depths of 800-1225 m. Therefore this species appears to be distributed along almost all of the eastern coast of the Atlantic Ocean from Iceland and from Capetown, but is seemingly absent from tropical waters.

#### Centroscymnus coelolepis Bocage and Capello

Centroscymnus coelolepis Bocage & Capello, 1864:263 (Portugal).  
Scymnodon melas Bigelow, Schroeder & Springer, 1953:233-237.

S, 191-1 (F 310), 214-1 (F 315), 222-1 (M 650), 276-2 (FF 425, 480). P, 430-1 (F 370), 443-1 (F 640).

COMPARATIVE OBSERVATIONS. C. coelolepis was described from material from the northwestern Atlantic (Bocage & Capello, 1864), and accounts of it may be found in a series of more recent works (Vaillant, 1888; Goode & Bean, 1896; Garman, 1913; Fowler, 1936; Tortonese, 1952; Bigelow & Schroeder, 1948, 1954).

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Table 1. Measurements of Centrosyllium fabricii (% TL)

Character	Specimen Number																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>TL, mm</i>	131	165	165	185	187	198	200	220	270	305	405	440	490	520	530	590	605
<i>Sex</i>	—	♀	♂	♀	♂	♀	♂	♀	♂	♂	♂	♀	♂	♀	♂	♀	♀
<i>ar</i>	11,4	10,1	10,3	10,2	10,7	10,7	10,5	10,5	9,7	7,2	8,6	8,2	7,3	8,3	7,5	7,6	7,6
<i>an</i>	1,9	1,6	1,5	1,6	1,6	1,5	1,5	1,5	1,4	1,8	1,9	1,5	1,7	1,7	1,7	1,6	1,6
<i>o</i>	6,1	6,1	6,1	6,5	5,8	6,8	6,4	6,8	5,6	5,9	4,9	4,7	5,1	4,4	4,7	4,4	4,5
<i>ao</i>	7,9	8,5	10,0	10,6	10,2	10,8	10,5	10,0	10,0	10,8	9,8	9,8	11,2	10,2	8,8	10,2	10,7
<i>nn</i>	3,4	5,3	4,8	4,8	5,3	5,7	5,5	5,2	4,6	4,8	4,8	4,7	4,7	4,3	4,4	4,4	4,1
<i>hD<sub>1</sub></i>	3,8	4,6	4,3	4,8	5,2	3,6	4,5	3,7	4,1	3,8	3,8	3,7	4,1	3,8	3,6	4,2	3,6
<i>ID<sub>1</sub></i>	4,8	7,4	6,9	7,6	7,2	6,8	6,8	6,2	7,6	5,1	5,4	7,4	5,9	5,4	5,5	5,4	5,9
<i>hD<sub>2</sub></i>	4,6	5,2	5,8	5,9	5,9	6,8	5,9	4,7	4,4	5,9	4,8	4,9	5,2	4,9	5,2	5,9	5,9
<i>ID<sub>2</sub></i>	5,3	7,5	7,8	7,5	7,8	7,6	6,9	7,8	5,6	5,9	5,9	5,9	5,9	5,9	5,3	5,9	5,9
<i>Cs</i>	24,6	23,9	24,3	24,8	26,8	25,6	26,5	25,9	26,6	25,2	23,5	23,7	23,2	22,7	24,1	23,2	23,8
<i>Ci</i>	10,3	10,5	12,2	12,4	12,3	12,9	13,2	11,4	11,5	12,5	12,4	11,7	11,6	11,9	10,9	12,3	11,5
<i>aD<sub>1</sub></i>	36,4	32,2	32,1	31,3	34,0	34,3	30,5	32,3	31,7	30,8	32,8	31,2	33,8	32,7	30,2	32,6	34,6
<i>aD<sub>2</sub></i>	60,5	58,0	56,7	53,8	57,1	60,5	58,0	61,0	53,3	57,3	60,5	62,5	62,3	71,7	61,0	63,5	67,5
<i>aC</i>	75,5	74,0	75,6	75,5	72,6	76,1	74,5	75,9	75,9	71,3	75,1	75,2	77,5	76,0	77,3	76,3	81,5
<i>aP</i>	25,3	23,8	23,7	24,8	25,2	25,5	23,0	25,2	24,9	20,7	21,8	21,7	20,8	20,7	20,7	20,3	20,6
<i>aV</i>	52,0	51,0	51,5	55,5	49,2	55,1	52,3	55,8	49,9	55,1	53,3	55,1	55,1	52,4	53,8	54,3	58,0
<i>D<sub>1</sub>D<sub>2</sub></i>	20,6	19,8	19,8	19,5	18,8	20,2	19,0	20,1	18,9	21,7	22,7	22,3	22,3	23,4	22,4	24,5	25,5
<i>D<sub>2</sub>C</i>	8,7	10,0	10,0	8,9	9,8	9,4	10,0	8,6	8,5	9,2	8,5	8,0	9,5	8,3	9,2	9,3	9,8
<i>PV</i>	28,3	29,7	29,7	27,8	27,3	26,8	30,0	27,8	31,4	30,6	30,8	32,8	33,7	33,7	32,0	32,3	34,6
<i>VC</i>	20,6	17,9	18,2	19,5	18,7	17,1	20,0	18,6	19,6	20,4	20,9	18,9	20,7	20,3	21,7	20,0	21,8
<i>IP</i>	9,9	9,2	10,0	10,8	11,2	10,7	10,9	10,9	11,0	8,7	9,8	10,5	10,6	10,0	10,4	10,2	10,1

Table 1. Measurements of Centrosyllium fabricii (% TL)

Character	Specimen Number																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>TL, mm</i>	131	165	165	185	187	198	200	220	270	305	405	440	490	520	530	590	605
<i>Sex</i>	—	♀	♂	♀	♂	♀	♂	♀	♂	♂	♂	♀	♂	♀	♂	♀	♀
<i>ar</i>	11,4	10,1	10,3	10,2	10,7	10,7	10,5	10,5	9,7	7,2	8,6	8,2	7,3	8,3	7,5	7,6	7,6
<i>an</i>	1,9	1,6	1,5	1,6	1,6	1,5	1,5	1,5	1,4	1,8	1,9	1,5	1,7	1,7	1,7	1,6	1,6
<i>o</i>	6,1	6,1	6,1	6,5	5,8	6,8	6,4	6,8	5,6	5,9	4,9	4,7	5,1	4,4	4,7	4,4	4,5
<i>ao</i>	7,9	8,5	10,0	10,6	10,2	10,8	10,5	10,0	10,0	10,8	9,8	9,8	11,2	10,2	8,8	10,2	10,7
<i>nn</i>	3,4	5,3	4,8	4,8	5,3	5,7	5,5	5,2	4,6	4,8	4,8	4,7	4,7	4,3	4,4	4,4	4,1
<i>hD<sub>1</sub></i>	3,8	4,6	4,3	4,8	5,2	3,6	4,5	3,7	4,1	3,8	3,8	3,7	4,1	3,8	3,6	4,2	3,6
<i>lD<sub>1</sub></i>	4,8	7,4	6,9	7,6	7,2	6,8	6,8	6,2	7,6	5,1	5,4	7,4	5,9	5,4	5,5	5,4	5,9
<i>hD<sub>2</sub></i>	4,6	5,2	5,8	5,9	5,9	6,8	5,9	4,7	4,4	5,9	4,8	4,9	5,2	4,9	5,2	5,9	5,9
<i>lD<sub>2</sub></i>	5,3	7,5	7,8	7,5	7,8	7,6	6,9	7,8	5,6	5,9	5,9	5,9	5,9	5,9	5,3	5,9	5,9
<i>Cs</i>	24,6	23,9	24,3	24,8	26,8	25,6	26,5	25,9	26,6	25,2	23,5	23,7	23,2	22,7	24,1	23,2	23,8
<i>Ci</i>	10,3	10,5	12,2	12,4	12,3	12,9	13,2	11,4	11,5	12,5	12,4	11,7	11,6	11,9	10,9	12,3	11,5
<i>aD<sub>1</sub></i>	36,4	32,2	32,1	31,3	34,0	34,3	30,5	32,3	31,7	30,8	32,8	31,2	33,8	32,7	30,2	32,6	34,6
<i>aD<sub>2</sub></i>	60,5	58,0	56,7	53,8	57,1	60,5	58,0	61,0	59,3	57,3	60,5	62,5	62,3	71,7	61,0	63,5	67,5
<i>aC</i>	75,5	74,0	75,6	75,5	72,6	76,1	74,5	75,9	75,9	74,3	75,1	75,2	77,5	76,0	77,3	76,3	81,5
<i>aP</i>	25,3	23,8	23,7	24,8	25,2	25,5	23,0	25,2	24,9	20,7	21,8	21,7	20,8	20,7	20,7	20,3	20,6
<i>aV</i>	52,0	54,0	54,5	55,5	49,2	55,1	52,3	55,8	49,9	55,1	53,3	55,1	55,1	52,4	53,8	54,3	58,0
<i>D<sub>1</sub>D<sub>2</sub></i>	20,6	19,8	19,8	19,5	18,8	20,2	19,0	20,1	18,9	21,7	22,7	22,3	22,3	23,4	22,4	24,5	25,5
<i>D<sub>2</sub>C</i>	8,7	10,0	10,0	8,9	9,8	9,4	10,0	8,6	8,5	9,2	8,5	8,0	9,5	8,3	9,2	9,3	9,8
<i>PV</i>	28,3	23,7	23,7	27,8	27,3	26,8	30,0	27,8	31,4	30,6	30,8	32,8	33,7	33,7	32,0	32,3	34,6
<i>VC</i>	20,6	17,9	18,2	19,5	18,7	17,1	20,0	18,6	19,6	20,4	20,9	18,9	20,7	20,3	21,7	20,0	21,8
<i>lP</i>	9,9	9,2	10,0	10,8	11,2	10,7	10,9	10,9	11,0	8,7	9,8	10,5	10,6	10,0	10,4	10,2	10,1

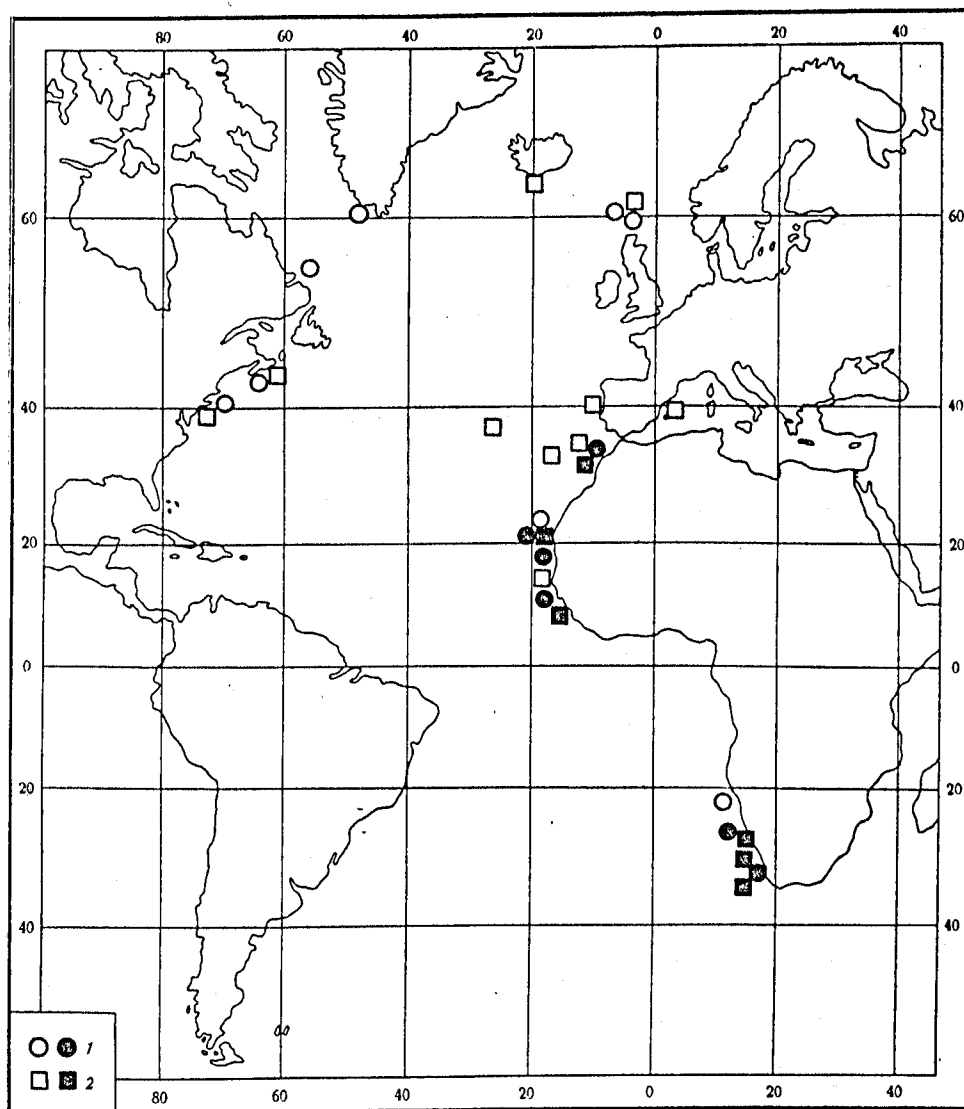


Fig. 3. Capture sites of *Centroscyllium fabricii* (1) and *Centroscymnus coelolepis* (2)  
Black symbols- our material, blank- data from the literature

Our specimens agree fairly well with the previous descriptions with respect to all taxonomically important characters. Several measurements (% SL) (see translators preface) of our 7 specimens 310, 315, 370, 425, 480, 640 and 650 mm long are as follows: ar 9.1, 9.2, 8.9, 8.3, 8.5, 8.1, 7.8; o 4.5, 4.4, 4.6, 4.7, 4.4, 5.5, 4.2; nn 3.9, 4.1, 4.1, 3.8, 3.5, 3.1, 3.4; 1D<sub>1</sub> 5.0, 4.9, 4.2, 5.3, 5.3, 5.1, 4.2; 1D<sub>2</sub> 5.5, 5.1, 3.8, 4.0, 3.8, 3.9, 5.2; LC<sub>s</sub> 23.8, 23.2, 23.8, 22.3, 22.8, 18.7, 21.7; aD<sub>1</sub> 36.3, 36.2, 35.4, 35.8, 36.0, 35.2, 34.8; aD<sub>2</sub> 62.5, 62.5, 65.0, 66.2, 61.2, 66.5, 66.2; aP 22.3, 21.7, 21.8, 23.7, 22.8, 21.2, 23.2; aV 58.2, 56.9, 58.1, 60.0, 62.8 (sic); aC<sub>s</sub> 75.5, 76.2, 79.0, 80.3, 79.1, 78.6, 79.6; D<sub>1</sub>D<sub>2</sub> 23.2, 24.2, 25.7, 27.1, 26.7, 29.2, 27.6; PV 35.2, 35.2, 37.3, 35.3, 37.2, 39.2, 36.2; VCi 18.2, 18.2, 15.7, 17.9, 17.7, 17.3, 17.4.

DISTRIBUTION (see Fig. 3). C. coelolepis was previously known from the northwestern Atlantic from Nantucket Sound to the Great Newfoundland Bank, the northeastern Atlantic from Iceland to Madiera, the Azores Islands and Senegal (Cape Verde), as well as from the western part of the Mediterranean Sea from depths of 329-2718 m (Vaillant, 1888; Goode & Bean, 1895; Bigelow & Schroeder, 1948, 1957; Krefft & Tortonese, 1973).

In our catches C. coelolepis was encountered off the coast of northwestern Africa from 32° to 10° N at depths of 1200-1920 m, being particularly numerous at 12°-10° N at depths of 1400-1920 m (sometimes as much as 80% of the total quantity). In February 1973 many females with embryos were taken.

Off the coast of southwestern Africa, where this species was discovered for the first time, C. coelolepis was encountered between 30° and 34° S at depths of 550-1000 m.

Etmopterus polli Bigelow, Schroeder and Springer

Etmopterus polli Bigelow, Schroeder & Springer, 1953; 241-246 (tropical West Africa).

P, 75-1 (F 180), 70-1 (M 250). S, 282-1 (F 305).

COMPARATIVE OBSERVATIONS. E. polli was described from West Africa (the type was taken at 6°08' S, 11°24' E) from a depth of 350-380 m (Bigelow et al., 1953). Our specimens, according to those characters having diagnostic importance, agree well with the diagnosis of the species. Various measurements (% SL) (see translators preface) of our specimens 180, 250 and 305 mm long are as follows: o 5.1, 5.0, 4.9; 1D<sub>1</sub> 4.7, 5.2, 5.6; 1D<sub>2</sub> 6.7, 6.8, 6.0; 1C<sub>s</sub> 24.9, 21.6, 21.3; 1C<sub>1</sub> 11.2, 10.1, 12.3; ar 8.9, 8.4, 8.7; aD<sub>1</sub> 32.3, 32.8, 35.0; aD<sub>2</sub> 56.5, 58.5, 58.5; aC<sub>s</sub> 76.1, 78.6, 78.3; aP 23.3, 24.0, 22.1; aV 48.3, 48.0, 51.6; D<sub>1</sub>D<sub>2</sub> 16.9, 22.1, 17.9; D<sub>2</sub>C<sub>s</sub> 13.3, 13.2, 11.5; PV 26.6, 28.0, 2.6 (sic); VpCi 23.9, 26.3, 25.7.



DISTRIBUTION (Fig. 2). E. polli is known from the waters of equatorial West Africa (5°39'–11°53' S) from depths of 300–510 m (Bigelow et al., 1953). In our catches it was encountered fairly often at depths of 510–800 m (between 12°00' and 4°40' N).

Etmopterus princeps Collett

Etmopterus princeps Collett, 1904:3–4 (Faroe Channel).

S, 191–2 (M 565, F 580), 215–1 (F 485), 219–1 (M 288), 260–2 (FF 190, 215).

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COMPARATIVE OBSERVATIONS. Descriptions of E. princeps may be found in a series of works (Collett, 1904, 1905; Garman, 1913; Bigelow et al., 1953; Bigelow & Schroeder, 1954). Our specimens agree completely with these descriptions.

Various measurements (% SL) (see translators preface) of our 6 specimens 190, 215, 283 (sic), 485, 565 and 580 mm long are as follows: ar 10.0, 9.3, 10.6, 10.5, 9.2, 9.2; o 5.3, 4.7, 5.2, 4.8, 4.5 (sic); hD<sub>1</sub> 3.7, 3.3, 3.2, 3.5 (sic); lD<sub>1</sub> 5.0, 4.9, 4.7, 4.7, 4.9 (sic); hD<sub>2</sub> 2.9, –, 5.0, 4.3, 3.9, 5.0; lD<sub>2</sub> 6.8, 6.5, 6.9, 5.6, 5.4, 6.7; lCs 24.2, 23.8, 22.6, 20.6, 20.4, 22.8; lCi 11.5, 11.8, 12.1, 10.3, 12.8, 12.6; aD<sub>1</sub> 30.1, 32.6, 34.6, 37.2, 33.8, 36.2; aD<sub>2</sub> 63.2, 58.2, 60.5, 66.7, 64.5, 65.2; aCs 73.5, 75.3, 79.0, 78.5, 79.5, 81.0; aP 22.2, 22.3, 25.1, 23.7, 23.0, 23.3, aV 47.3, 48.8, 57.3, 57.6, 56.8, 59.2; D<sub>1</sub>D<sub>2</sub> 19.5, 21.4, 20.5, 24.8, 25.7, 25.8; D<sub>2</sub>C<sub>s</sub> 10.5, 10.0, 10.4, 8.8, 10.2, 8.9; PV 24.2, 28.8, 32.7, 33.0, 30.9, 33.2; VpC<sub>1</sub> 17.4, 17.6, 14.6, 13.6, 14.9, 12.2.

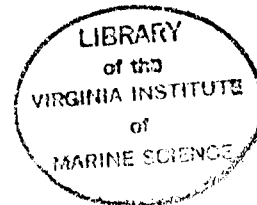
The back and sides of the body dark brown, the sides and caudal peduncle with no distinct pattern of pigmentation, luminous organs absent; denticles short, conical. Head compressed dorsoventrally, and slightly narrower at the level of the eyes.

DISTRIBUTION (see Fig. 2). E. princeps was previously known from both sides of the North Atlantic (from southwestern Iceland, the Faroe and Herbridies Islands to Gibraltar, and from the southern tip of Nova Scotia to New England) from depths of 567–2055 m (Bigelow et al., 1953; Bigelow & Schroeder, 1957; Krefft, 1965; Wheeler, 1969). Our specimens were obtained from depths of 1200–1600 m in the region of 32°–17° N. These captures significantly extend the known range of E. princeps and document the presence of this species in tropical regions. It is possible that this species shifts to greater depths in more southern regions.

Scymnodon ringens Bocage and Capello

Scymnodon ringens Bocage & Capello, 1864:263 (Portugal).

S, 155–1 (M 670), 208–2 (M 580, F 610).



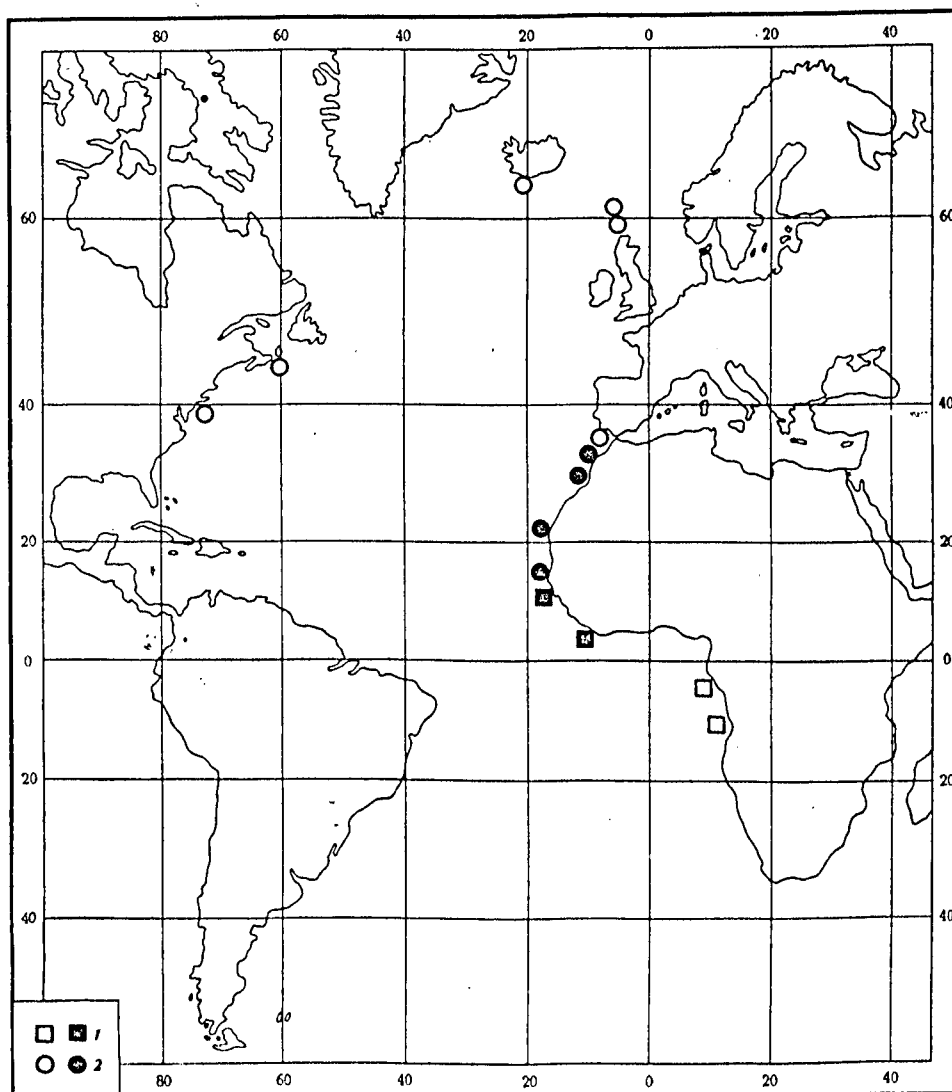


Fig. 2. Capture sites of *Etmopterus polli* (1) and *E. princeps* (2)  
 Black symbols- our material, blank- data from the literature

COMPARATIVE OBSERVATIONS. S. ringens was first described from material from the vicinity of Portugal (Bocage & Capello, 1864). Accounts of this species can be found in more recent works (Goode & Bean, 1895; Fowler, 1936; Bigelow & Schroeder, 1957; Blacker, 1962).

Various measurements (% SL) (see translators preface) of our 3 specimens 580, 610 and 670 mm long are as follows: ar 8.3, 8.2, 8.2; o 3.6, 3.8, 3.7; nn 3.6, 3.6, 3.6; 1D<sub>1</sub> 4.0, 3.9, 4.3; 1D<sub>2</sub> 6.2, 6.1, 6.4; 1l<sub>s</sub> 20>2, 21.3 22.9; 1Ci 13.6, 13.0, 13.4; aD<sub>1</sub> 40.5, 39.5, 40.2; aD<sub>2</sub> 65.5, 63.0, 61.2; aCs 81.8, 77.2, 77.5; aP 23.7, 25.3 23.8; aV 61.2, 59.2, 58.2; D<sub>1</sub>D<sub>2</sub> 24.2, 22.3 22.3; D<sub>2</sub>C<sub>s</sub> 7.6, 7.2 6.8; VCi 16.4, 16.4, 16.5.

DISTRIBUTION. S. ringens is known from the eastern Atlantic from Scotland and Porcupine Bank to the island of Madiera and Senegal from depths of 200-700 m (Kreffft, 1973). In our catches this species was encountered off the northwestern coast of Africa from 28° to 21° N at depths of 760-1000 m.

#### FAMILY CHIMAERIDAE

##### Chimaera jordani Tanaka

Chimaera jordani Tanaka, 1905:2 (Sagami Bay).

S, 209-1 (F 645), 280-1 (F 680).

COMPARATIVE OBSERVATIONS. According to the key for the identification of species of the genus Chimaera (Bigelow & Schroeder, 1953) our specimens were identified as C. jordani (caudal fin with a long filament, tip of the anal fin reaching to the posterior edge of the base of the second dorsal fin; height of the rays of the posterior portion of the caudal fin almost equal to the height of the rays of the second dorsal fin; 5 radial ridges on the upper dental plate; height of the rays of the first dorsal fin equal to 75-77% of body length from the tip of the snout to the gill slit; body color dark brown, pectoral fins with a violet iridescence).

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Measurements of the 2 specimens (percent of body length from the snout to the origin of the upper lobe of the caudal fin; 490 and 483 mm) are as follows: ar 11.2, 10.1; ao 11.0, 9.3; o 7.2, 6.1; oo 5.5, 5.4; 1D<sub>1</sub> 12.2, 12.4; 1D<sub>2</sub> 61.1, 62.8; 1P 31.4, 29.2; aD<sub>1</sub> 24.3, 22.3; aD<sub>2</sub> 38.3, 36.8; aP 22.4, 21.2; aV 49.0, 47.8; PV 27.2, 28.2; VCi 49.6, 49.7; height of the spine of the first dorsal fin 17.7; 17.4.

DISTRIBUTION. C. jordani was previously known only from the waters of Japan (Tanaka, 1905; Bigelow & Schroeder, 1953). In our catches this chimaera was encountered solely between 23° and 10°20' N at depths 1200-1600 m. This was the first discovery of this species on the coast of northwestern Africa.

Hydrolagus alberti Bigelow and Schroeder

Hydrolagus alberti Bigelow & Schroeder, 1951:390 (quoted from Bigelow & Schroeder, 1953; Pensacola, Florida).

S, 190-1 (F 175).

COMPARATIVE OBSERVATIONS. H. alberti was previously known only from the region of Florida (Bigelow & Schroeder, 1951, 1953). According to Bigelow and Schroeder's (1953) key, our specimen was fairly confidently identified as H. alberti. Various measurements of this specimen (percent of body length to the origin of the upper lobe of the caudal fin; 102 mm) are as follows: ar 9.7; ao 10.4; o 8.5; oo 5.8; 1D<sub>1</sub> 56.5; 1D<sub>2</sub> 15.7; 1P 36.2; aD<sub>1</sub> 26.3; aD<sub>2</sub> 39.3; aP 22.6; aV 36.2, 48.2 (sic); PV 27.8; height of the spine of the first dorsal fin 7.6.

DISTRIBUTION. H. alberti, previously known from the coast of Florida (from a depth of 575 m) (Bigelow & Schroeder, 1953), has been obtained for the first time from the northwestern coast of Africa (22°33' N, 17°29' W) from a depth of 1360-1470 m.

FAMILY RHINOCHEMAERIDAE

Neoharriotta pinnata (Schnakenbeck)

Harriotta pinnata Schnakenbeck, 1929:40 (Walvis Bay, southwestern Africa).

P, 68-1 (F 488)

COMPARATIVE OBSERVATIONS. N. pinnata was described from material from southwestern Africa (Schnakenbeck, 1929). Accounts of this species are found also in the works of Fowler (1936, 1941). Our specimen was readily identified by the species key for the family RhinocHEMAERIDAE (Bullis & Carpenter, 1966) and agrees well with the given description.

Various measurements (percent of body length to the origin of the upper lobe of the caudal fin; 275 mm) are as follows: ar 19.3; ao 21.8; o 5.4; oo 4.0; 1D<sub>1</sub> 14.2; 1D<sub>2</sub> 39.7; 1P 25.5; aD<sub>1</sub> 36.3; aD<sub>2</sub> 56.7; aP 35.8; aV 58.8; PV 23.3; VCI 29.9; height of the spine of the first dorsal fin 14.5.

DISTRIBUTION. N. pinnata is known off western Africa from Cape Blanc to Walvis Bay from depths of 175-850 m (Poll, 1951; Bullis & Carpenter, 1968; Krefft, 1968; Rodrigues-Roda, 1975). Our specimen was obtained at 10°09' N and 17°17' W from a depth of 500-600 m.

Harriotta raleighana Goode and Bean

Harriotta raleighana Goode & Bean, 1895:472 (northwestern Atlantic).

Harriotta curtissjamesi Townsend & Nichols, 1925:6.

Anteliochimaera chaetirhamphus Tanaka, 1909:7.

S, 191-1 (M 650), 260-3 (MM 276, 380, F 210).

COMPARATIVE OBSERVATIONS. Descriptions of H. raleighana are given in many works (Goode & Bean, 1895; Bigelow & Schroeder, 1953; Garrick, 1971; Karrer, 1972).

Our specimens agree well with the previous descriptions with regard to all diagnostically important characters. Various measurements of the four specimens (percent of body length to the origin of the upper lobe of the caudal fin; 525, 225, 173 and 135 mm) are as follows: ar 28.7, 29.3, 29.4, 27.3; ao 31.3, 31.2, 30.7, 29.7; o 5.3, 6.2, 5.8, 6.6; oo 4.0, 4.4, 3.7, 3.0; 1D<sub>1</sub> 11.1, 11.9, 10.9, 10.4; 1D<sub>2</sub> 30.8, 32.0, 31.8, 31.2; 1P 25.3, 34.2, 31.8, 32.6; aD<sub>1</sub> 42.8, 46.7, 44.7, 44.3; aD<sub>2</sub> 58.2, 59.9, 59.5, 57.8; aP 40.2, 44.4, 42.3, 42.2; aV 65.5, 70.0, 64.3, 66.6; PV 31.3, 28.4, 26.7, 23.0; VCi 26.7, 27.2, 25.8, 25.2; height of the spine of the first dorsal fin 17.1, 15.9, 15.1, 16.4.

DISTRIBUTION. H. raleighana is known from both sides of the North Atlantic; from Chesapeake Bay to Nova Scotia and from southwestern Iceland to the Canary Islands. This species has also been found in the Pacific Ocean (Japan, California, New Zealand) at depths of 366-2000 m (Bigelow & Schroeder, 1953, 1954; Garrick, 1971; Karrer, 1972). In our catches H. raleighana was encountered solely between 32° and 17° N at depths of 1200-1700 m.

Rhinochimaera atlantica Holt and Byrne

Rhinochimaera atlantica Holt & Byrne, 1909:279 (northwestern Atlantic: 50°1' N, 11°31' W).

S, 256-2 (F 255, M 295), 258-1 (F 830).

COMPARATIVE OBSERVATIONS. Our specimens closely approach previous descriptions of the species (Holt & Byrne, 1909, 1910; Koefoed, 1927; Bigelow & Schroeder, 1954) with regard to all systematically important characters. Various measurements of the 3 specimens (percent of body length to the origin of the upper lobe of the caudal fin; 620, 208 and 185 mm) are as follows: ar 34.8, 38.3, 38.9; ao 36.2, 45.7, 43.2; o 4.0, 4.8, 4.5; oo 2.7, 3.3, 3.1; 1D<sub>1</sub> 13.2, 12.0, 11.6; 1D<sub>2</sub> 27.8, 22.8, 17.7; 1P 24.7, 22.7, 25.3; aD<sub>1</sub> 53.2, 57.3, 55.3; aD<sub>2</sub> 90.1, 71.4, 71.4; aP 49.9, 52.5, 52.8; aV 74.3, 72.5, 80.1; PV 23.7, 21.5, 22.7; VCi 16.1, 17.7, 19.3; height of the spine of the first dorsal fin 10.5, 10.9, 10.8.

DISTRIBUTION. R. atlantica is known from the northwestern Atlantic (Nova Scotia and New England), the northeastern Atlantic (southwestern Iceland, the European coast) and northwestern and southern Africa from depths of 520-1463 m (Bigelow & Schroeder, 1953; 1954; Karrer, 1972). In our catches it was encountered from 27° to 17° N at depths of 1200-1700 m. Only one adult individual was taken in the catches. In the region of Cape Blanc, however, we caught large quantities of young 242-295 mm long at depths of 1200-1600 m.

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## FAMILY BATHYLACONIDAE

Herwigia kreffti (Nielsen and Larsen)

Bathylaco kreffti Nielsen & Larsen, 1970:35-38 (southwestern Atlantic).

S, 276-1 (316), 279-2 (308, 350).

COMPARATIVE OBSERVATIONS. H. kreffti was described from two specimens from the southwestern Atlantic (the holotype) and northwestern Africa (the paratype) (Nielsen, Larsen, 1970). Later (Nielsen, 1972) the description of the new genus Herwigia was based on this material. Our specimens agree well with the original description with respect to all diagnostically important characters. Meristic and morphometric characters of our specimens are as follows: D 16-17, A 14, P 17-18, V 8; sp. br. 21-22 (of them 15-16 on the lower part); R. br. 7; p. c. 9; ll 40-45. Measurements (% SL): c 26.3-29.2;  $l_{mx}$  14.9-15.2;  $l_{md}$  16.1-17.4; o 5.7-6.0; io 6.1-7.7; aD 61.5-63.9; aA 71.5-73.7; aV 54.2-60.0; lD 16.2-18.6; lA 11.2-12.8; distance from snout to the posterior edge of the stomach 34.4 - 36.1; distance from posterior edge of the orbit to the posterior edge of the upper jaw (%  $l_{mx}$ ) 41.3-47.2; width of the lower jaw (measured as the shortest distance from the corner of the mouth to the ventral edge of the lower jaw, %  $l_{mx}$ ) 26.4-27.5; h 7.8-9.3.

DISTRIBUTION. H. kreffti is known from the waters of northwestern Africa (29°23' N) and the southwestern Atlantic (34°01' S) from depths of about 2000 m (Nielsen & Larsen, 1970; Kreffft, 1974). Our specimens were obtained in the region of 12°00'-10°36' N from depths of 1300-1500 m.

## FAMILY ALEPOCEPHALIDAE

Asquamiceps hjorti (Koefoed)

Alepocephalus hjorti (Koefoed), 1927:43-44 (Azores Islands).

S, 190-4 (196-240).

COMPARATIVE OBSERVATIONS. In accordance with a recent revision of the genus Asquamiceps (Parr, 1954), our specimens were identified as A. hjorti, which was described from the vicinity of the Azores

Islands (Koefoed, 1927). They agree well with the description of the species. Meristic and morphometric characters of our specimens (data for the holotype 202 mm long (Koefoed, 1927) is given in parentheses) are as follows: D 19 (19), A 18-19 (20), P 16 (18), V 6 (6); sp. br. 7-8+1+14-17 (-); p. c. 10 (-); ll about 45 (49); scales between anal aperture and lateral line 19 (18); scales between lateral line and dorsum at the level of the anal aperture 16 (16). Measurements (% SL): c 45.6 (45.7); ao 8.7-10.2 (9.5); o 6.3-7.4 (6.7); io 8.5-10.2 (11.4);  $l_{mx}$  16.3-18.6 (-),  $l_{md}$  20.0-20.8 (-); aD 68.8-70.5 (69.5); aP 36.3-39.3 (-); aA 67.3-70.8 (71.8); aV 58.4-59.6 (57.0); lD 18.3-20.8 (18.8); lA 17.2-19.6 (18.3); h 6.2-6.8 (7.5); length of the longest gill raker 6.1-7.0 (-).

DISTRIBUTION. A. hjorti was previously known from the Azores Islands from a depth of 2600 m. Our specimens were obtained at depths of 1360-1470 m from 22°33' N and 17°29' W.

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Bajacalifornia calcaratus (Weber)

Bathytroctes calcaratus Weber, 1913:11-12 (Makassar Strait, Ceram Sea).

S, 282-20 (245-352). P 68-12 (164-326), 70-19 (155-250)

COMPARATIVE OBSERVATIONS. For identification of species of Bajacalifornia we used the key given by Parr (1952a). Our specimens agree well with his description of B. calcaratus with respect to all characters.

Meristic and morphometric characters for our 51 specimens 155-352 mm long (data for the holotype and paratype 265 and 152 mm long (Weber, 1913) is given in parentheses) are as follows: D 16-18 (17), A 13-15 (17), P 12-13 (13), V 8-9 (9), ll 60-62 (about 55) and scales between base of the dorsal fin and lateral line 7 (-); p. c. 14-20 (-); sp. br. 22-25 (-), (of them 16-18 on the lower part); R. br. 6 (-). Measurements (% SL): c 23.2-25.6 (23.2-26.3), ao 7.1-8.3 (7.9-9.2); o 3.7-4.6 (4.2-5.2);  $l_{md}$  13.3-15.5 (-); aD 59.0-61.0 (-); aA 68.5-70.5 (-); aP 22.7-26.2 (-); aV 49.3-52.5 (-); h 7.1-8.1 (-).

DISTRIBUTION (Fig. 4). B. calcaratus was first described from the inner seas of Indonesia (0°36' (?), 119°29' E, depth of 724 m; 3°27' S, 131°05' E, depth of 567 m, Weber, 1913). Later this species was found in the Gulf of Aden at a depth of 1061-1080 m (Norman, 1939) and off the coast of Baja California at a depth of 1106 m (Parr, 1952a, under the name B. burragei). We took this species along the northwestern coast of tropical Africa between 10°09' and 4°40' N at depths of 500-700 m, from where it had not previously been reported.

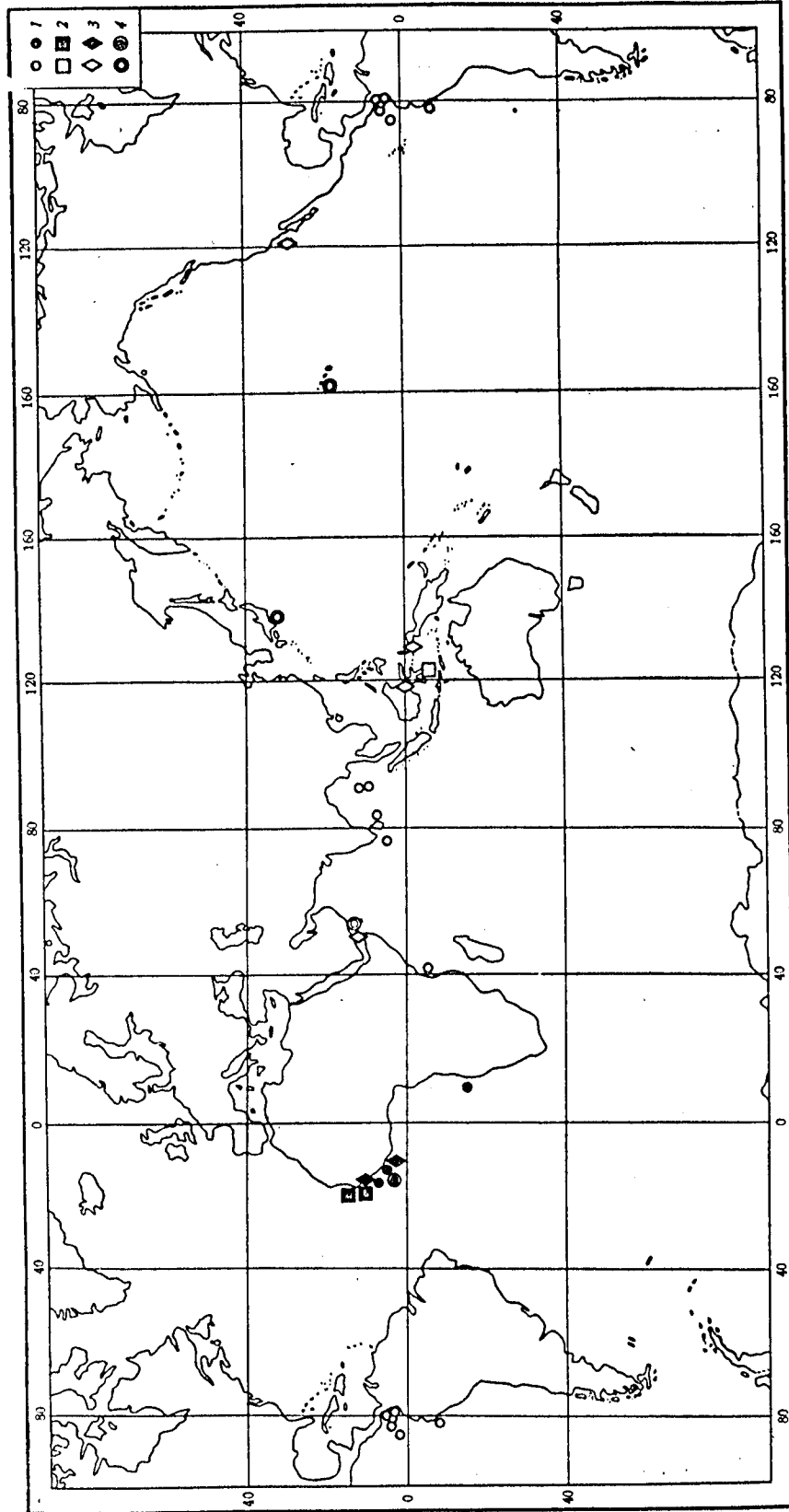


Fig. 4. Capture sites of Lampyrogrammus niger (1), L. macropterus (2), Bajacalifornia calcaratus (3) and Bathypteroids antennatus (4)  
Black symbols- our material, blank- data from the literature



Binghamichthys microphos (Parr)

Binghamichthys microphos Parr, 1937:22-24 (Bahama Islands).

S, 128-1 (130), 143-8 (124-146), 263-3 (121-129), 280-3 (128-130), 313-3 (137-142).

COMPARATIVE OBSERVATIONS. Most of the characters of our specimens agree fairly well with the description given by Parr (1937). They have, however, several more gill rakers on the first gill arch, and lack the luminous organs noted in the original description. Possibly these organs are developed only in the young; all our fish were adults with ripe gonads.

Various counts and measurements of our 18 specimens 121-146 mm long (in parentheses for comparison are shown the same data for the holotype 44.5 mm long and the 29 mm specimen described by Bussing (1965)) are as follows: D 19-20 (20, 19); A 20-21 (21, 22); P 16 (16, 13); V 8 (-,-); sp. br. 6-7+1+21-22 (7+1+19, 4+1+15); R. br. 7 (-, 6); 11 43-44 (40, 45); scales between base of the dorsal fin and lateral line 6(-,-); p. c. 9-10 (9,-). Body measurements (% SL): c 29.0-31.5 (34.0, 33.4); ao 8.4-8.8 (9.5, 9.7); o 8.9-9.3 (11.2, 11.0); io 3.7-4.4 (3.8, 4.1); maximum width of the head 10.8-11.4 (13.0,-);  $l_{mx}$  10.6-11.9 (12.5, 10.3);  $l_{md}$  12.4-13.1 (-,-); H 16.1-18.5 (18.0, 17.9); h 7.7-8.3 (8.5, 8.6); aD 61.0-63.7 (66.0, 65.6); aA 62.2-65.0 (-, 66.9); aV 43.8-47.3 (52.0, -); 1D 17.8-19.0 (19.5, 17.2); 1A 18.5-19.9 (-,-).

DISTRIBUTION (Fig. 5). Until recently B. microphos was known only from three immature specimens 29-45 mm long, caught in the vicinity of the Bahama Islands (23°37' N, 77°15' W, depth of 2100 m), the southeastern part of the Pacific Ocean and in the southern part of the Caribbean Sea (Parr, 1937; Bussing 1965; Bekker et. al., 1975). In our catches this species was encountered from 31°45' to 10°20' N at depths of 900-1460 m. This species has also been discovered in the southwestern Atlantic (Pakorukov, 1976).

Grimatrocetes microlepis (Gunther)

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Bathytrocetes microlepis Gunther, 1878:249 (Portugal).

S, 278-1 (260).

COMPARATIVE OBSERVATIONS. G. microlepis was identified according to the key compiled by Parr (1952a). Accounts of this species are also given in the works of Gunther (1878, 1887) and Goode and Bean (1895).

Our specimen agrees well with the previous descriptions with regard to all taxonomically important characters. Meristic and morphometric characters are as follows: D 14, A 14, P 11, V 8; R. br.

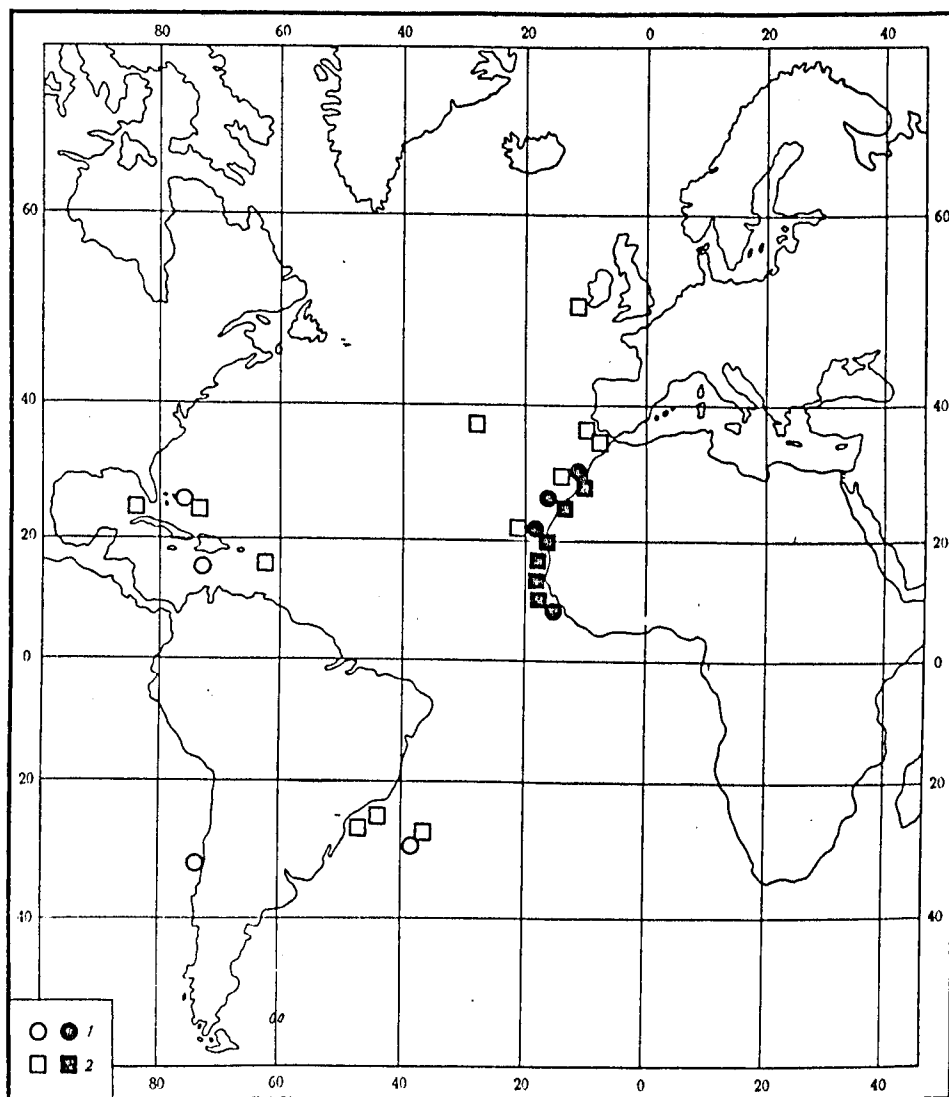


Fig. 5. Capture sites of *Binghamichthys microphos* (1) and *Concara macroptera* (2)  
 Black symbols- our material, blank- data from the literature

7; sp. br. 35 (of them 24 on the lower part); p. c. 12; ll 73; scales between the base of the dorsal fin and the lateral line 10. Measurements (% SL): c 28.2; ao 7.1; o 8.8;  $l_{mx}$  13.8;  $l_{md}$  13.8; aD 60.2; aA 71.8; aP 28.8; aV 10.0, h 9.6.

- 294 DISTRIBUTION. G. microlepis was known only from the eastern part of the Atlantic Ocean from Portugal (type found at 35° N, 8° W) to Madiera at depths up to 1921 m and from the Andaman Sea at a depth of 914 m (Grey, 1956; Krefft, 1973). Our specimen was obtained at 11°30' N and 13°35' W at a depth of 1310-1600 m.

Talismania longifilis (Brauer)

Bathytroctes longifilis Brauer, 1902:277 (Gulf of Aden).

S, 265-1 (251), 279-9 (300-410). P, 70-8 (134-183).

- 295 COMPARATIVE OBSERVATIONS. Our specimens of T. longifilis agree well with the previous descriptions (Brauer, 1902, 1906; Sulak, 1975) with regard to all systematically important characters. Meristic and morphometric characters, with data for the type specimen 116 mm long given in parentheses, are as follows: D 20-23 (21), A 19-23 (22), P 11-13 (10), V 6-7 (-); R. br. 7-8 (7); sp. br. 6-8 + 1 + 14-17 (-); p. c. 8-10 (-); ll 50-53 (-); Sq. 110-115 (about 100); scales between the base of the dorsal fin and lateral line 15-17 (-); scales between the lateral line and base of the anal fin 20-21 (-). Measurements (% SL); c 34.6-38.4 (39.2); ao 11.1-13.1 (11.9); o 4.3-7.6 (8.5); ia 5.6-7.2 (8.5);  $l_{mx}$  19.1-22.1 (-);  $l_{md}$  19.9-22.6 (-); aD 61.2-65.5 (65.6); aV 63.0-67.1 (-); aP 32.8-38.3 (-); aV (sic) 48.2-54.6 (52.8); lD 17.7-20.3 (17.9); lA 16.5-21.2 (17.1); H 17.3-21.2 (20.2); h 6.7-8.0 (8.2); length of the longest pyloric caecum 4.0-7.8 (-); length of the longest gill raker 2.0-4.3 (-); lP about 46.0 (-); length of the ultimate ray of the caudal fin 20.2-24.8 (-).

DISTRIBUTION (Fig 6). Until recently T. longifilis was known only from the Gulf of Aden (10°02' N, 46°41' E) from a depth of 1469 m (Brauer, 1906). Recently it was discovered in the Gulf of Guinea (3°34' S, 9°58' E, depth of 823 m (Sulak, 1975). In our catches this species was encountered off the coast of northwestern Africa (12°00'-04°55' S) at depths of 750-1550 m.

Talismania mekistonema (Sulak)

(Fig. 7)

Talismania mekistonema Sulak, 1975: 88-93 (23°53' N, 77° 02' W).

S, 192-1 (172), 219-3 (175-195), 276-4 (189-220), 279-2 (211, 215), 289-2 (168, 190).

COMPARATIVE OBSERVATIONS. T. mekistonema is clearly distinguishable from other members of the genus Talismania, and we

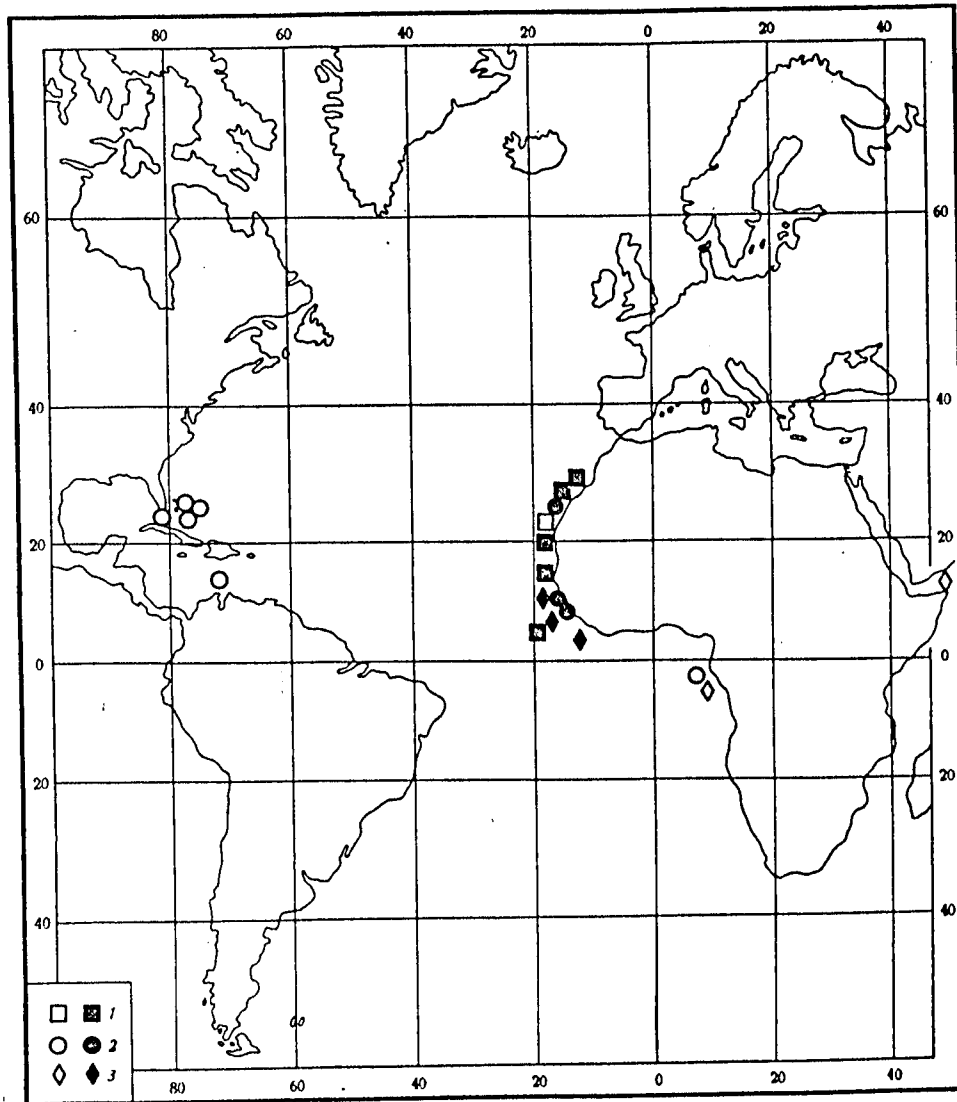


Fig. 6. Capture sites of species of the genus Talismania  
 1- T. homoptera; 2- T. mekistonema; 3- T. longifilis  
 Black symbols- our material, blank- data from the  
 literature

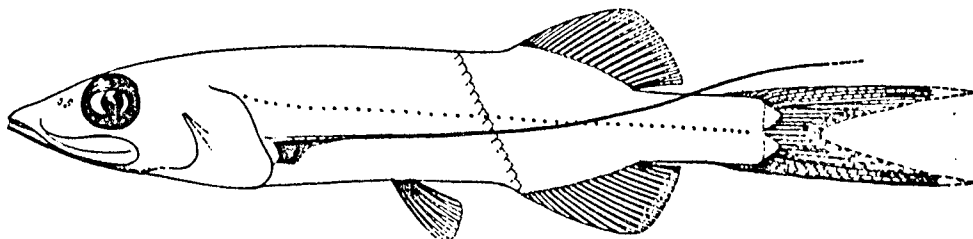


Fig. 7. Talismania mekistonema Sulak. Specimen 175mm long;  
 'Star of Crimea', trawl 219.  
 Drawing by G.N. Pokilsk

proposed to define it as a new species, but Sulak's (1975) description anticipated our intentions.

Meristic and morphometric characters of our specimens are as follows: D 19-20, A 19-21, P 11, V 7: R. br. 7; sp. br. 6-7 + 1 + 16 - 20 = 23-28; p.c. 6-8; Sq. 48-50; scales between the base of the dorsal fin and lateral line 7; scales between base of the anal fin and lateral line 7-8. Measurements (% SL): c 29.7-33.7; ao 8.1-10.0; o 7.4-8.3; io 3.9-4.6;  $l_{mx}$  13.9-16.5;  $l_{md}$  14.5-17.1; aD 60.8-66.0; aA 64.3-69.5; aP 30.7-33.7; aV 46.5-48.7; lD 15.0-19.5; lA 16.6-19.5; H 17.1-18.9; h 7.2-9.7; length of the longest gill raker 3.9-5.1; length of the longest pyloric caecum 5.2-7.1; length of the uppermost ray of the pectoral fin about 78.1; length of the ultimate ray of the caudal fin 25.7-39.0.

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DISTRIBUTION (see fig. 6). T. mekistonema is known from the Gulf of Guinea (3°05' S, depth of 604 m), from the Coast of Venezuela and the southern part of the Caribbean Sea at depths of 1152-1680 m (Sulak, 1975). In our catches this species was encountered from 22°40' to 10°36' N at depths of 1300-1550 m (with the exception of trawl at a depth of 550-700 m at 17°43' N). This was the first find of T. mekistonema in the northern hemisphere (trans. note - "off Africa" would appear to be implied here, as obviously the Caribbean catches are from N. lat.).

Talismania homoptera (Vaillant)

Bathytroctes homopterus Vaillant, 1888; 153 (Arguin Bank).

S, 155-2 (112, 130), 172-1 (174), 176-3 (191-202), 190-3 (166-178), 191-3 (162-208), 192-1(161), 219-1 (193), 256-1 (194), 264-2 (205, 210), 268-7 (149-215), 279-1 (207). V, 4-1 (146).

COMPARATIVE OBSERVATIONS. It appears probable that T. homoptera is a synonym of T. oregoni, described by Parr (1952b) and known from the Gulf of Guinea, the Caribbean Sea and the Bahama Islands (Sulak, 1975).

DISTRIBUTION (see Fig. 6). T. homoptera was described from a single specimen, caught on the Arguin Bank at a depth of 1113 m (Vaillant, 1888). In our catches this species was encountered from 27°30' to 10°36' N at depths of 1000-1600 m.

Alepocephalus agassizii (Goode and Bean)

Alepocephalus agassizii Goode & Bean, 1883: 218 (38°19' N, 73°18' W).

S, 173-1 (245), 214 1(342), 228-2 (252, 276), 264-2 (226, 282).

COMPARATIVE OBSERVATIONS. A. agassizii was described from material from the northwestern Atlantic (Goode & Bean, 1883). Accounts of the species are given in a series of more recent works (Goode & Bean, 1895; Koefoed, 1927). Our specimens agree well with the previous descriptions with regard to systematically important characters. Various meristic and morphometric characters of our specimens are as follows: D 16, A 17-18, P 11, V 7; p.c. 16-20; R. br. 6; Sp. br. 7-8 + 1 + 14-16 = 22-25; Sq. more than 80; scales between the base of the dorsal fin and lateral line 11-12. Measurements (% SL): c 33.7-37.2; ao 8.1-8.7; o 9.7-10.0;  $l_{mx}$  13.2-.13.5;  $l_{md}$  16.1-16.6; io 4.0-4.2; aD 69.2-72.5; aA 70.0-73.5; aV 54.8-55.8; distance from snout to anus 67.3-68.0; distance from the origin of the pelvic fin to the origin of the anal fin 15.9-17.1; h 6.9-7.3; width of the head behind the orbits 11.0-12.6.

DISTRIBUTION (Fig. 8). A. agassizii is known from the northwestern (from Davis Straits to 15° N) and northeastern (between northwestern Iceland and Ireland) Atlantic from depths of 1000-2300 m (Karrer, 1973; Krefft, 1973). In our catches this species was encountered from 22°30'-21°05' N at depths of 1300-1700 m. This is the first report of this species off the coast of northwestern Africa.

Alepocephalus productus (Gill)

Alepocephalus productus Gill, 1883; 256-257 (39°26' N, 70° W).

S, 214-5 (432-510), 264-3 (155-227), 268-1 (300).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions of A. productus with regard to all systematically important characters (Gill, 1883; Koefoed, 1927; Grey, 1958). Various counts and morphometrics of our specimens are as follows: D 16, A 16-18, P 11, V 7; P.C. 12-16; sp. br. 7-8 + 1 + 16-18 = 24-25; R br. 6; Sq. about 70; ll 54-57; scales between the dorsal fin and lateral line 9-11. Measurements (% SL): c 31.7-38.7; ao 6.9-9.3; o 8.6-11.5; io 4.3-5.3;  $l_{mx}$  13.1-14.2;  $l_{md}$  15.3-16.7; aD 66.8-70.1; aA 67.1-72.5; aV 50.5-53.8; distance from snout to anus 64.6-67.5; distance from the base of pelvic fins to anus 12.7-14.0; width of the skull behind orbits 11.7-13.8; lD 10.2-12.8; lA 11.8-13.4.

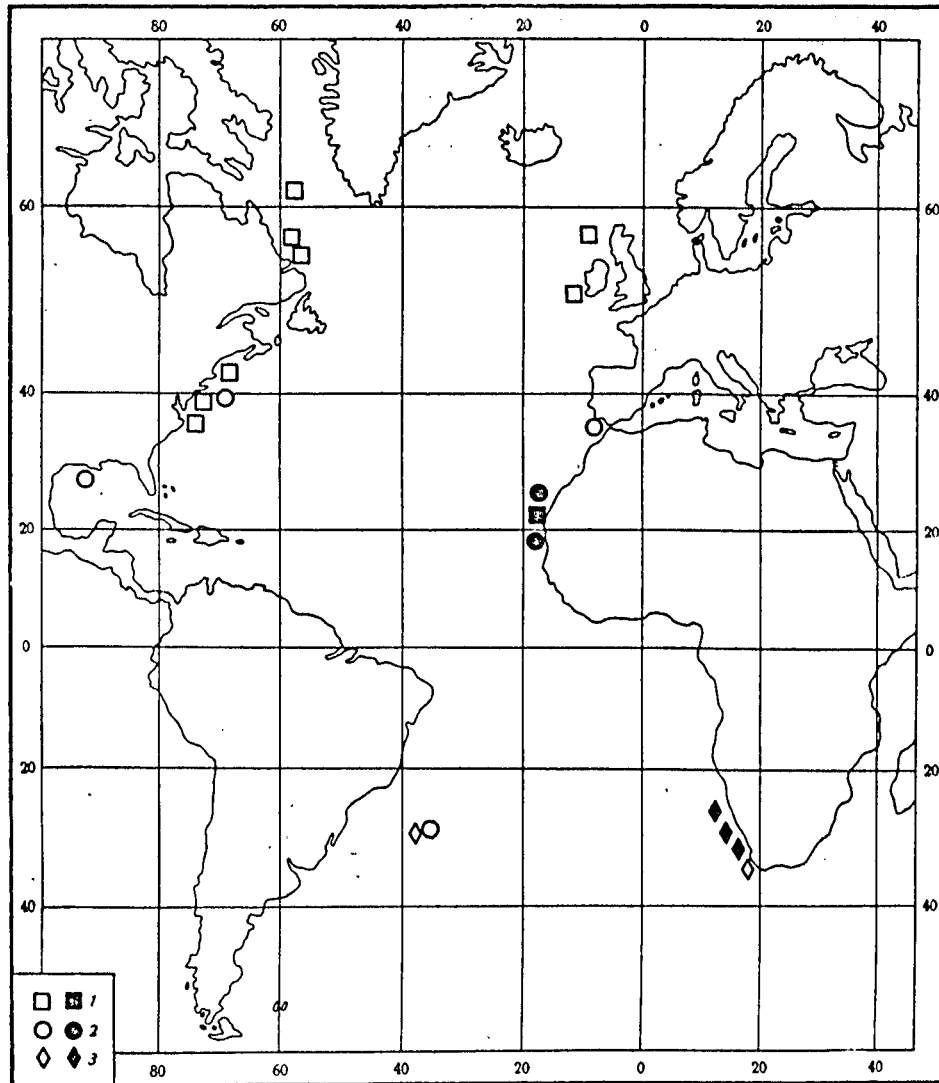


Fig. 8. Capture sites of species of the genus *Alepocephalus*  
 1- *A. agassizi*, 2- *A. productus*, 3- *A. australis*  
 Black symbols- our material, blank- data from the literature

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DISTRIBUTION (see Fig. 8). A. productus is known from 3 specimens from the northwestern Atlantic (39° N, 70° W, depth of 2491 m), the Gulf of Mexico (28°47' N, 87°50' W, depth of 2104-2194 m) and the East Atlantic (35° N, 8° W depth of 2055 m) (Grey, 1956, 1958; Koefoed, 1927). In our catches it was encountered from 22°20'-18°59' N at depths of 1300-1720 m; Pakorukov (1976) reported it from the Rio-Grande Rise.

Alepocephalus australis (Barnard)

Alepocephalus australis Barnard, 1923: 440 (South Africa).  
Alepocephalus australis barnardi Norman, 1930: 270 (South Africa).

P, 425-1 (405), 429-1 (300), 430-7 (188-314), 489-1 (292).

COMPARATIVE OBSERVATIONS. A. australis was described from material from the Cape of Good Hope (Barnard, 1923). Our specimens agree well with his description. D 15-16, A 15-17, P 9-10, V 7-8; P.C. 12-17; sp. br. 6 + 1 + 12 - 13 = 29-30; R. br. 6; ll about 50; scales between base of dorsal fin and lateral line 5. Measurements (% SL): c 33.3-34.0; ao 8.7-9.1; o 9.9-9.6; io 5.2-5.7, aD 68.0-71.5; aA 70.0-73.5; aV 52.3-54.6; distance from snout to anus 65.5-66.8; h 6.4-7.5; l<sub>mx</sub> 1.27-13.7; l<sub>md</sub> 15.7-17.2; distance from base of the pelvic fins to anus 12.2-14.1, width of the head behind the orbits 11.8-12.3.

DISTRIBUTION (see Fig. 8). A. australis is known from South Africa, Brazil, the Rio-Grande Rise, the Canary Islands and northwestern Ireland (Grey, 1956; Krefft 1973; Pakorukov, 1976). Grey, however, expresses doubt concerning the accuracy of Koefoed's (1927) identification of the specimen from the northeastern Atlantic. In our catches A. australis was only encountered in the southern hemisphere from 26° to 33°36' S at depths of 800-1200 m.

Conocara macroptera (Vaillant)

Alepocephalus macropterus Vaillant, 1888: 150-153 (Morocco).  
Conocara macdonaldi Goode & Bean, 1896: 39.

S, 191-43 (153-283), 205-3 (290-327), 258-4 (162-341), 262-2 (440-483), 268-1 (241), 279-7 (290-354).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions (Vaillant, 1888; Murray & Hjort, 1912; Nybelin, 1948) with regard to characters having systematic importance (D 18-20, A 37-41, pyloric caeca 5-8). In our material, however, are 3 specimens (162, 440, and 483 mm) whose anal fins have 32-34 rays, as in C. wernerii Nybelin, but with significantly less body height than that species (about 5 times in SL).

DISTRIBUTION (see Fig. 5). C. macroptera is known from the northwestern Atlantic (Gulf of Mexico, the Bahamas and Antilles



Islands), the East Atlantic (from 28° to 51° N), the coast of Brazil (between 24°-25° S) and from the Rio-Grande Rise from depths of 865-2115 m (Grey, 1956; Krefft, 1973; Pakorukov, 1976). This species was usually present in our catches. It was encountered from 27°30' to 10°36' N at depths of 1300-1700 m.

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## FAMILY SEARSIIDAE

Searsia koefoedi Parr

Searsia koefoedi Parr, 1936: 12, 15-19 (23°39' N, 76°41' W).

Searsia koefoedi koefoedi Parr, 1960: 60-61.

Searsia koefoedi primicrops Parr, 1960: 61-62.

S, 192-9 (98-130), 129-1 (130).

COMPARATIVE OBSERVATIONS. S. koefoedi was described from material from the Bahama Islands (Parr, 1937). Our specimens agree well with the previous descriptions of S. koefoedi (Koefoed, 1927; Parr 1937, 1960; Maul 1948; Quero, 1970) with regard to systematically important characters.

DISTRIBUTION. S. koefoedi has a wide distribution. This species has been noted in the northwestern (Bermuda and the Bahama Islands), Central and East (from southwestern Ireland and the Bay of Biscay to approximately 30° N) Atlantic, and also in the Indo-Australian seas and the eastern part of the Pacific Ocean from depths of 450-1500 m (Krefft, 1973; Parin et. al., 1973). Our specimens were obtained from 22°30'-22°40' N at depths of 1300-1500 m.

Barbantus curvifrons (Roule and Angel)

Bathytroctes curvifrons Roule & Angel, 1931: 61 (Bay of Biscay).

S, 192-1 (120).

COMPARATIVE OBSERVATIONS. Descriptions of this species are given in series of works (Roule & Angel, 1933; Maul, 1957; Quero, 1970). Our specimen agrees well with the previous descriptions with regard to systematically important characters (D 18, A 14, P 24, V 9, R. br. 7, sp. br. 5 + 1 + 13, 11 with about 57 scales; p.c. 4; synthesis of the lower jaw with bony projections that are absent on the premaxillaries; photophores are absent, but a stripe is present on the belly which may possibly function as a light organ.

DISTRIBUTION. B. curvifrons is known from a few specimens from the Bay of Biscay, Madiera, the northeastern and central Atlantic (between 28°11' N and 9° S), and from the Indian and Pacific Oceans from depths probably greater than 1000 m (Krefft, 1973; Parin et. al., 1973). Our specimen was obtained from 22°30' N from a depth of 1300-1500 m.

Holtbyrnia melanocephala (Vaillant)

Bathytroctes melanocephala Vaillant, 1888: 155 (from northwestern Africa).

S, 246-1 (130).

COMPARATIVE OBSERVATIONS. Our specimen agrees well with descriptions of H. melanocephala (Vaillant, 1888; Parr, 1960). D 20, A 17, P 14, V 8, R. br. 8/7; sp. br. 8+1+18; ll with 47 scales; Sq. about 105; p.c. 8/14, about five external lateral teeth on each side of the dentary; photophores (Go<sub>post</sub>, BrO, PO, THO, SVO, MVO, PAO, ICO) present, but weakly developed. Measurements (% SL): aV 59.2; ventrocaudal distance 44.6; distance from snout to photophore THO 48.5; c 35.8; ao 10.4; o 9.2; l<sub>mx</sub> 24.2; l<sub>md</sub> 22.7.

DISTRIBUTION. H. melanocephala was previously known from one specimen from northwestern Africa (Arguin Bank). Our specimen was obtained from 22°50' N from a depth of 1450-1480 m.

Holtbyrnia ophiocephala Sazonov and Golovan

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Holtbyrnia ophiocephala Sazonov, Golovan, 1976:8-9.

P, 71-1 (218).

COMPARATIVE OBSERVATIONS. This specimen did not fit the description of any known species of the genus Holtbyrnia. It is apparently the holotype for a new species H. ophiocephala (Sazonov & Golovan, 1976).

DISTRIBUTION. The specimen was obtained from 9°04' N 17°36' W from a depth of 980 m.

Paraholtbyrnia cyanocephala Krefft

Paraholtbyrnia cyanocephala Krefft, 1967:2-11 (from the Canary Islands).

P, 70-1 (221).

COMPARATIVE OBSERVATIONS. Our specimen agrees well with the original description of P. cyanocephala (Krefft, 1967) with regard to the systematically important characters: D 22, A 18, P 20/21, V 9; R. br. 8, ll 59 scales, Sq. about 100; no external lateral teeth, possessing the following photophores: GO<sub>ant</sub>, GO<sub>post</sub>, IOO, POO, OPO, BRO, IO (composed of several elements), PO, THO, SVO, MVO, VO, AO, SAO, PAO, ICO. Measurements (% SL): aV 53.0, ventrocaudal distance 50.3, H 14.0; c about 25.4; ao 5.9; 04.5; l<sub>mx</sub> 12.9; l<sub>md</sub> 12.7; distance from snout to photophore; THO 39.4; posterior edge of photophore MVO 50.5; 29.4 (sic); photophore AO 64.7. Sazonov (1976) refers this species to the genus Holtbyrnia.

DISTRIBUTION. P. cyanocephala was noted from five stations in the central Atlantic (from 23°50' to 2°44' N) from the 460-120 m (sic) level over depths of 3500-5300 m (Krefft, 1967). Our specimen was obtained from 9°55'N at a depth of 750-780 m.

Maulisia mauli Parr

Maulisia mauli Parr, 1960:82-86 (Madiera).

S, 191-1 (199), 192-1 (170).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the description of Parr (1960) with regard to characters having systematic importance. D 21, 20; A 18, 16; P 18/17, 17/17, V 8; R. br. 8; sp. br. 8+1+16, 8+1+18; p.c. 5/8, 5/6; Sq. about 85, 97. Measurements (% SL): aV 51.2, 53.5; ventrocaudal distance 48.7, 47.5; H 23.1, 21.8; c 31.6; 33.6; ao 7.5, 8.8; o 7.3, 7.7; l<sub>mx</sub> 18.8; l<sub>md</sub> 20.4; 20.0; both specimens possessing photophores: GO<sub>ant</sub>, GO<sub>post</sub>?, BRO, THO, SVO, MVO, SAO, PAO, ICO.

DISTRIBUTION. M. mauli is known from the eastern Atlantic (southern Ireland, Bay of Biscay, Madiera, tropical Atlantic between 4-19° N and 15-36° W) from depths of 400-1000 m, and also from the region of Peru (Bussing, 1965; Krefft, 1973). Our specimens were obtained from 22°30' N at depths of 1200-1500 m.

Maulisia microlepis Sazonov and Golovan

Maulisia microlepis Sazonov & Golovan, 1976:10-11.

P, 485-1 (235), 486-1 (242).

COMPARATIVE OBSERVATIONS. Our specimens were distinguishable from M. mauli by the presence of a well developed trunk canal with tubular scales, a larger number of transverse scales, a larger number of gill rakers and other characters that distinguish the species (Sazonov & Golovan, 1976).

DISTRIBUTION. The fish were obtained off southwestern Africa from 27°12'-27°28' S from depths of 1020-1150 m.

Mentodus rostratus (Gunther)

Bathytroctes rostratus Gunther, 1878:250 (8°33' S, 34°30' W).

S, 279-1 (322).

COMPARATIVE OBSERVATIONS. Descriptions of this species are found in a series of works (Gunther, 1878, 1887; Parr, 1960), and our specimen agrees well with these descriptions. D 21, A 18, P 17/18, V 8/10; R. br. 8; sp. br. 8+1+18; ll with about 50-52 scales, Sq. 140; p.c. 6/14, about 5-7 external lateral teeth on each side of the

dentary; photophores undeveloped. Measurements (% SL): aV 51.9; ventrocaudal distance 48.8; c 30.1; ao 7.5; o 7.5; l<sub>mx</sub> 17.4; l<sub>md</sub> 17.1.

DISTRIBUTION. M. rostratus is known from several specimens from the tropical western Atlantic (8°33' S, 34°30' W; 12°07' N, 23°08' W) and from the Denmark Strait, where it was discovered in the stomach of a cod (Krefft, 1973). Our specimen was obtained from 10°36' N from a depth of 1450-1550 m.

Normichthys operosus Parr

Normichthys operosa Parr, 1951:17-19 (18°22' N, 18°14' W).

Normichthys operosa Parr, 1960:93-94.

Normichthys operosa islandica, Parr, 1960:94.

P, 68-1 (127), 70-2 (138, 144), 430-1 (144), S, 173-1 (100).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the species description (Parr, 1951). Several characters of the specimens are as follows: D 18-20, A 16-18, P 16-18, V 7, R. br. 7; sp. br. 7-9+1+18-22, Sq. 94-97; p.c. 4-6/5-8; measurements (% SL): aV 52.2 - 57.0; ventrocaudal distance 45.8 - 48.5; H 23.3-25.2; c 28.8-32.2; snout 6.3-9.3; o 8.3-10.9; l<sub>mx</sub> 13.9-17.6; l<sub>md</sub> 15.0-18.5.

DISTRIBUTION. N. operosus is known from the eastern Atlantic from the Bay of Biscay, Denmark Strait, and from 18°22' N to 15°55' S (Krefft, 1973). Of our specimens, four were obtained between 22°40'-9°55' N from depths of 500-1200 m and one from 33°36' S at a depth of 1200-1225 m.

Pellisolus longirostris Sazonov and Golovan

Pellisolus longirostris Sazonov & Golovan, 1976:9-10.

S, 279-1 (193).

COMPARATIVE OBSERVATIONS. According to many systematically important characters our specimen is clearly distinguishable from the known species of Pellisolus (D 7, A 15, P 15/16, V 8, R. br. 8, sp. br. 8+1+20) and was described as the holotype of a new species (Sazonov & Golovan, 1976).

DISTRIBUTION. The specimen was obtained from 12° N from a depth of 1300-1400 m.

Platytrectes apus Gunther

Platytrectes apus Gunther, 1878:249 (1° N, 26° W).

Platytrectes procerus Brauer, 1906:23-24.

S, 279-4 (151-176), 281-2 (134, 138), 311-1 (113), 313-5 (135-164).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions (Gunther, 1887; Parr 1960): D 17-20, A 15-18, P 20-23, R. br. 6-7/6; sp. br. 8-11+1+24-30; body high, leaf-shaped with abdominal and anal keels; scales with well developed crests.

DISTRIBUTION. P. apus is known in the eastern part of the Atlantic from Portugal and Denmark Strait; it is also listed for the tropical parts of the world's oceans (eastern and central Atlantic, the Pacific coast of Panama, the waters of the Phillipine Islands, Java and Arabian Seas) (Kreffft, 1973). Our specimens were obtained from 27°36'-9°25' N from depths of 1350-1920 m.

#### FAMILY BATHYSAURIDAE

##### Bathysaurus agassizi Goode and Bean

Bathysaurus agassizi Goode & Bean, 1883:215 (northwestern Atlantic).  
S, 248-1 (253), 286-1 (456), 313-1 (216). P, 425-2 (458, 463), 430-2 (310, 530).

COMPARATIVE OBSERVATIONS. On the basis of agreement with the characters given in the available descriptions (Goode & Bean, 1883, 1887; Koefoed, 1927; Mead, 1960 a), our specimens are B. agassizi. An adipose fin is absent, the lateral line reaches the end of the middle ray of the caudal fin, 14-17 scales are present between the lateral line and the origin of the base of the anal fin.

Meristic and morphometric characters for our specimens 216-530 mm long, with data for specimens 522-558 mm long taken from the work of Mead (1966) in parentheses, are as follows: D 15-19 (17), A 11-14 (12-13), P 14-15 (15), V 8(8); 11 69-72 (about 70); scales between the base of the anal fin and lateral line 14-17 (about 14); sp. br. 5-6+16 (5+18). Measurements (% SL): c 23.7 - 26.3 (27.6-27.3 [sic]), head width 10.6-13.3 (14.0-15.2); ao 7.5-9.2 (8.8), o 2.8-3.9 (3.6-3.3) [sic], oo 2.3-3.3 (2.7-2.2 [sic]), io 4.1-5.0 (5.1-5.1 [sic]),  $l_{mx}$  14.8-17.8 (18.4-17.5 [sic]), 1D 27.7-34.2 (30.6-31.6), 1A 15.3-17.2 (15.0-14.4), 1V 11.5-15.1 (13.5-15.5), 1P 16.4-25.0 (25.2-25.7), aD 31.7-34.8 (37.2-34.7), aA 67.8-70.5 (72.2-71.0), aV 29.2-33.5 (34.3-34.4), aP 25.2-28.5 (28.0-29.0).

DISTRIBUTION (Fig. 9). B. agassizi is known from the sub-tropical region of the North Atlantic from depths as great as 2000 m (Nielsen, 1973). In our catches this species was encountered from 27°37' to 10°00' N at depths of 1200-1900 m and from 30°00' to 34°00' S at depths over 1000 m. This fish was encountered continually in the catches, but in insignificant quantities (not more than 10 specimens per trawl). Another species of Bathysaurus listed for southwestern Africa, B. ferox (Smith, 1961), was not encountered in our catches  
B. agassizi has also been discovered on the Rio Grande Rise (Pakorukov, 1976).

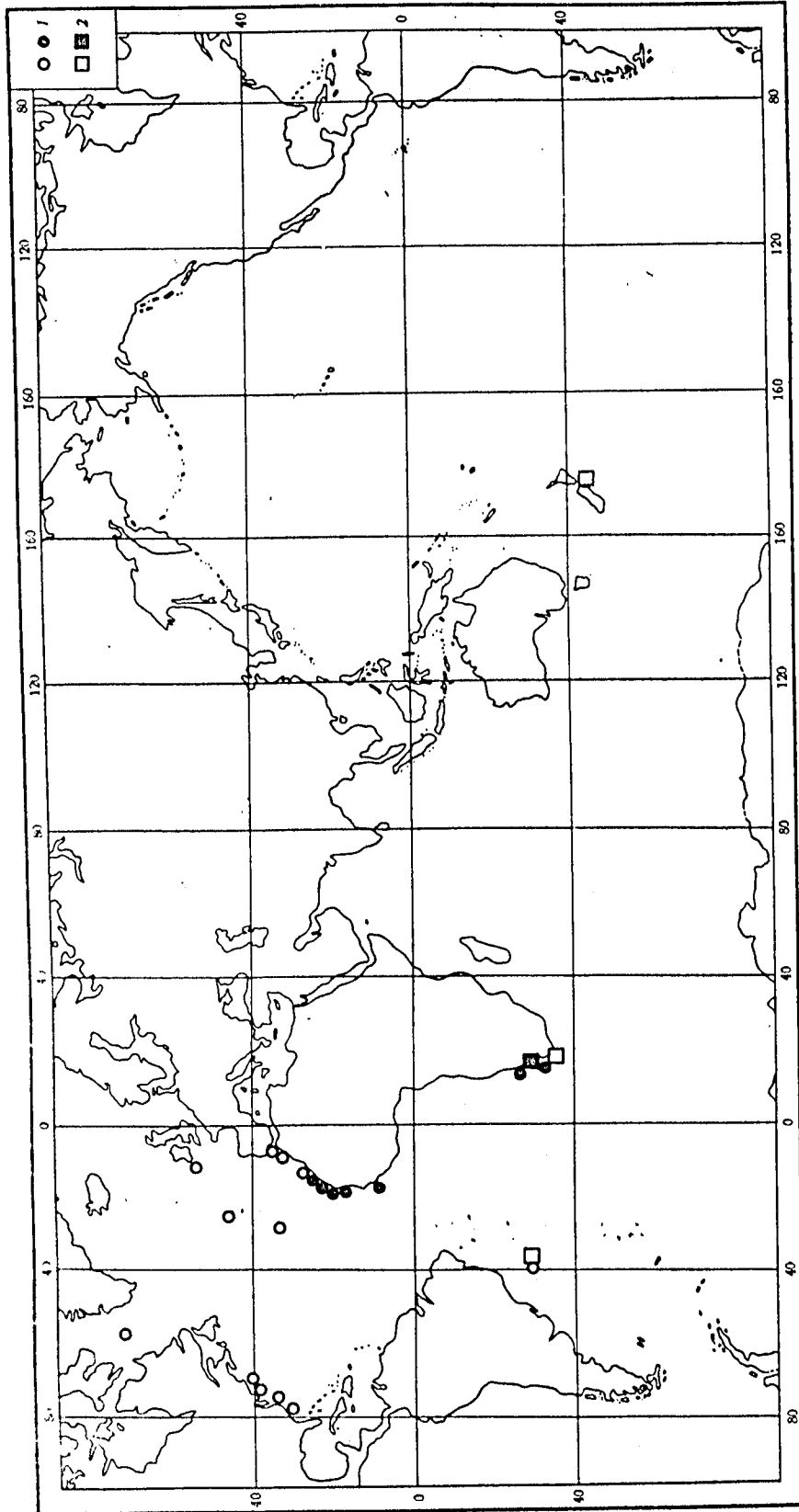


Fig. 9. Capture sites of Bathysaurus agassizi (1) and Bathysauropsis gracilis (2)  
Black symbols- our material, blank- data from the literature

## FAMILY CHLOROPHTHALMIDAE

Bathysauropsis gracilis (Gunther)

Chloropthalmus gracilis Gunther, 1878:182 (South Africa).

P, 425-3 (200-250), 430-6 (176-257).

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COMPARATIVE OBSERVATIONS. Descriptions of B. gracilis are contained in several works (Gunther, 1878, 1887; Goode & Bean, 1895; Barnard, 1925). Remarks about the systematic position of the genus Bathysauropsis and the interrelationships of its species can be found in the work of Mead (1966a). Our specimens agree well with the available descriptions with regard to the major systematically important characters but differ in having a greater number of rays on the pelvic fins.

D 10, A 10-11, P 20-23, V 9, R. br. 11; sp. br. 5-6+1+17-20 = 23-27; 11 58-59; scales between the base of the dorsal fin and the lateral line 6; scales between the lateral line and the base of the anal fin 7. Measurements (% SL): c 25.7-27.2; ao 5.9-6.6; io 3.9-4.4; o 6.8-7.5;  $l_{mx}$  14.5-15.5;  $l_{md}$  17.1-18.5; aD 37.7-41.3; aA 61.8-67.8; aP 26.2-27.5; aV 36.1-38.0; H 11.2-12.8; h 5.1-5.6.

DISTRIBUTION (see Fig. 9). B. gracilis is known from the South Atlantic (32°00' S, 13°00' W, depth of 2606 m), from South Africa (depths of 869-1802 m) and New Zealand (depth of 2012 m) (Grey, 1956). Recently it has been found on the Rio Grande Rise (Pakorukov, 1976). Our specimens were obtained near southwestern Africa (33°04'-33°36' S from depths of 1000-1225 m).

## FAMILY BATHYPTEROIDAE

Bathypterois dubius Vaillant

Bathypterois dubius Vaillant, 1888:124-134 (northwestern Africa).

S, 129-1 (143), 153-4 (182-193), 172-7 (164-183), 176-1 (162), 190-1 (166), 191-2 (182-183), 256-2 (189-191), 279-1 (109).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions of B. dubius (Vaillant, 1888; Bauchot, 1962; Mead 1966c) with regard to all taxonomically important characters.

Meristic and morphometric characters of our specimens 109-193 mm long are as follows: D 16-15 (sic), A 8-9, P 2+10-13, V 8, 11 59-60, scales between the base of the dorsal fin and lateral line 7-8, R. br. 12. Measurements (% SL): c 17.8-18.7; ao 5.7-6.3; io 7.1-7.0 (sic); o 1.9-2.0; H 14.7-16.5; h 8.0-8.6; 1D 13.1-15.4; 1A 7.7-7.8; aD 42.6-43.1; aP 15.6-17.0; aV 39.0-40.1, aA 61.5-67.6.

DISTRIBUTION (Fig. 10). B. dubius is known from the northwestern Atlantic (southwestern slope of the Great Newfoundland Bank), and the eastern Atlantic (southwestern Ireland, the Mediterranean Sea, the

coast of southwestern Africa and Portugal) from depths of 1300-2000 m (Mead, 1966a, Nielsen, 1973). In our catches this species was noted from 31°45' to 10°36' N at depths over 1100 m.

Bathypterois antennatus Gilbert

Bathypterois antennatus Gilbert, 1905; 590 (Hawaiian Islands).  
Bathypterois atricolor indicus Brauer, 1906:144.

S, 279-1 (164).

COMPARATIVE OBSERVATIONS. This specimen was identified as B. antennatus according to the key the genus Bathypterois given by Bauchot (1962) (origin of the anal fin under the base of the dorsal fin; lower lobe of the caudal longer than the upper; head less than 5 times in body length; V 9; P 2+10, 11 55) and it agrees well with the species description. Several other characters of our specimen are as follows: D 15, A 9, P 1+18+4, R. br. 12, sp. br. 13+1+31, scales between the base of the dorsal fin and the lateral line 6.

305 Measurements (% SL): H 15.1; height of the body at anal fin 11.9; body width 9.8; h 8.3; c 23.4; snout 7.4; o 1.9; io 8.3; aD 43.3; aA 61.5; aV 38.2; aP (to upper pectoral ray) 19.7; 1D 16.7; 1A 8.8; distance from last ray of the dorsal fin to adipose fin 17.3; distance from origin of pelvic fin to origin of anal fin 22.7; distance from anus to pelvic fin 11.6; distance from anus to anal fin 12.2.

DISTRIBUTION (see Fig. 4). B. antennatus is known from two specimens from the Hawaiian Islands (1829-2403 and 571-1463 m), and also from Japan (258 m) and northeastern Africa (1644 m) (Brauer, 1906; Grey 1956). Our specimen was obtained from 10°36' N from a depth of 1450-1550 m. This is the first record of this species in the Atlantic Ocean.

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FAMILY IPNOPIDAE

Bathytyphlops marionae Mead

Bathytyphlops marionae Mead, 1958:370-372 (Caribbean Sea, Gulf of Mexico).

S, 281-7 (302-353).

COMPARATIVE OBSERVATIONS. Our specimens of B. marionae agree well with the descriptions of this species (Mead, 1958, 1966b; Nielsen, 1966). D 12-13, A 12-14, P 13-14, V 8, C 3-4+18-20+2-5, 11 65-66, scales between the lateral line and the base of the dorsal fin 8; scales between the lateral line and the base of the anal fin 6, R. br. 15, sp. br. 6-7+1+12-14 (all except one rudimentary). Measurements (% SL): c 19.5-20.8; ao 6.3-6.8; o 0.6-0.7; io 6.3-6.9;  $l_{mx}$  13.7-14.8; H 14.5-17.6; body height at base of the anal fin 9.9-10.3; h 6.8-7.8; aD 37.7-38.8; aA 67.5-70.9; aV 34.0-37.7; aP 19.0-20.2; distance from origin of the base of the pelvic fin to origin of the base of the anal fin 29.7-33.5; distance from anus to the origin of the base of the anal fin, 23.2-26.5; 1D 11.9-14.2; 1A



11.9-15.1; 1P 14.7-18.7; 1V 13.1-15.3; length of the longest gill raker 3.6-4.2.

DISTRIBUTION (see Fig. 10). Until recently there were only three known specimens of B. marionae. These were obtained from the Caribbean Sea (holotype; 16°48' N, 82°33' W) at a depth of 1020 m, from the Straits of Florida (23°21' N, 80°23' W) at a depth of 875 m and off the eastern coast of Africa (21° 18' N, 36°18' E) at a depth of 1510-1600 m (Mead, 1958; Nielsen, 1966). Our specimens were obtained from 9°25' N and 17°36' W at a depth of 1740-1920 m.

#### FAMILY ATELEOPIDAE

##### Guntherus altivela Osorio

Guntherus altivela Osorio, 1917:117 (Senegal).  
Anodontous mauritanicus Cervigon, 1961:119.

P, 318-1 (217), S, 288-1 (705), 289-1 (500).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions of G. altivela (Osorio, 1917; Barnard, 1948; Cadenat, 1960; Trunov & Isarev, 1971) with regard to systematically important characters. Meristic and morphometric characters are as follows: D 12, A 74-75, P 13, V 1+1+1+17, C 10-11, sp. br. 6+1+17-18, R. br. 7-8. Measurements (% SL): c 28.0-34.2; o 6.8-9.9;  $l_{mx}$  12.6-15.7;  $l_{md}$  13.6-17.2; aD 39.0-42.6; aA 56.1-62.5; aP 30.0-33.3.

The specimen obtained at sta. 288 appears to be the largest thus far known (absolute body length amounted to 750 mm).

DISTRIBUTION. G. altivela is known from the waters of the eastern Atlantic from Senegal (Osorio, 1917; Cadenat, 1960) to south Africa (western Saldana Bay and Walvis Bay) from depths of 255-549 m (Trunov & Isarev, 1971; Karrer, 1973). Our two large specimens were obtained off the coast of northwestern Africa from 12°00' and 17°43' N from depths of 500-700 m, and the individual 217 mm from off the coast of southwestern Africa from 19°15' S and 11°38' E from a depth of 180 m.

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#### FAMILY SYNAPHOBRANCHIDAE

##### Diastrobranchus capensis Barnard

Diastrobranchus capensis Barnard, 1923:441 (South Africa).

P, 424-1 (760).

COMPARATIVE OBSERVATIONS. In our specimen the gill slit isthmus is situated forward of and slightly below the pectoral fins; 2 large teeth are present on the anterior part of the vomer, a row of much smaller teeth are situated on the posterior part; the dorsal fin originates behind the anal aperture; and the pectoral fins are long, all of which agrees well with the species diagnosis (Castle, 1964).

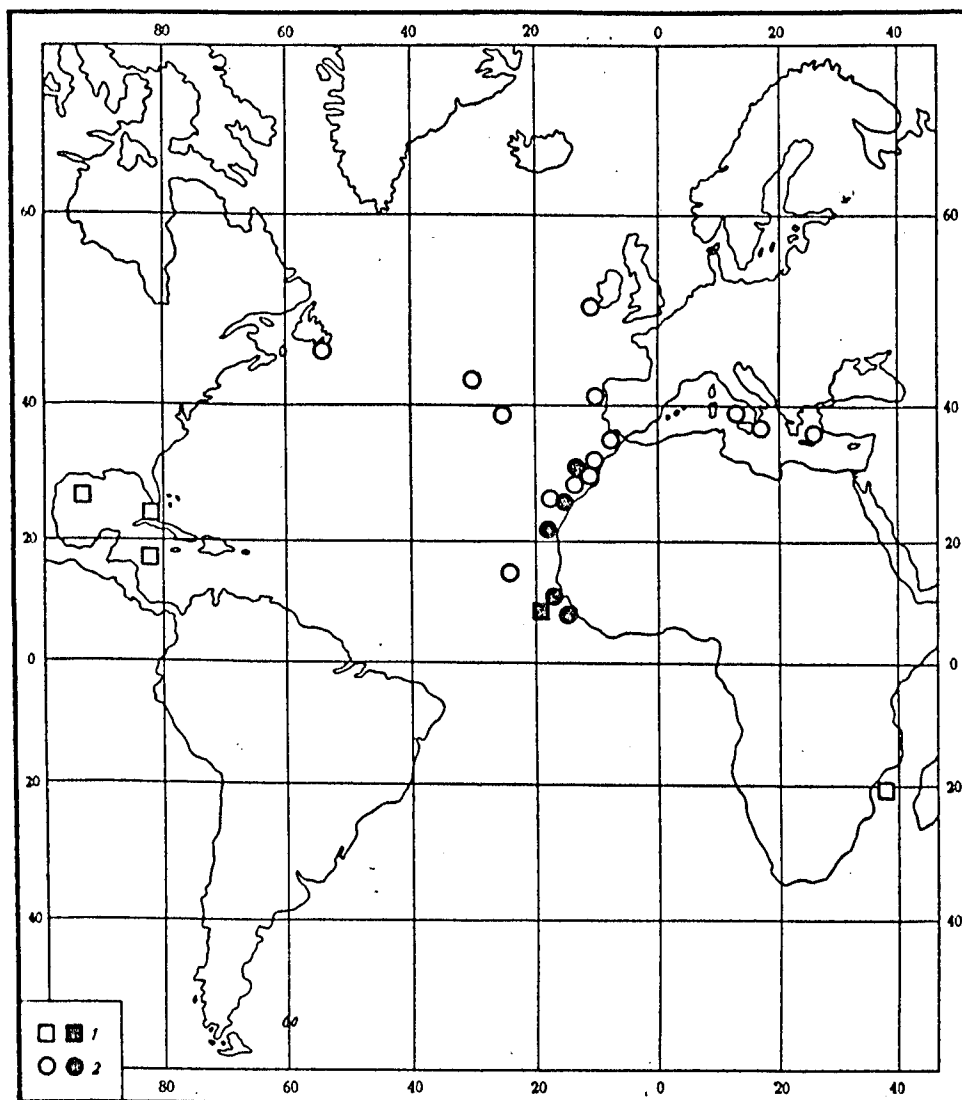


Fig. 10. Capture sites of *Bathytyphlops marionae* (1) and *Bathyterois dubius*  
 Black symbols- our material, blank- data from the literature

Various characters are as follows: P 16; 11 more than 158 (the caudal portion of the fish was torn off, therefore an exact count of the number of pores was impossible); number of pores to the level of the anal aperture 27; measurements (% SL): c (to the posterior edge of the gill slit) 12.9, ao 3.9; o 2.2; io 2.5;  $l_{mx}$  10.0; postorbital length (measured from the posterior edge of the eye to the pectoral fin) 7.1; length of the gill slit 2.0; distance between the posterior tips of the gill slits 3.9; 1P 8.7; distance from snout to anal aperture 20.5; aA 22.5; aD 30.6; height of the body at the level of the anal aperture 6.1.

DISTRIBUTION. D. capensis is known from New Zealand, Tasmania, South Africa (Castle, 1964) and was recently captured on the Rio-Grande Rise (Pakorukov, 1976). In our catches this species was encountered from 33°07'-33°36' S at depths of 800-1200 m.

#### FAMILY HALOSAURIDAE

##### Halosaurus ovenii Johnson

Halosaurus ovenii Johnson, 1863:406-408 (Madiëra).

P, 70-1 (243), 71-9 (323-417), 484-2 (415-424), 485-2 (340-372).  
S, 138-1 (310), 139-2 (292-294), 148-4 (305-555), 153-1 (297),  
157-1 (304), 171-5 (460-557), 173-3 (205-290), 176-1 (293), 187-1  
(370), 254-2 (290-366), 268-1 (362), 290-2 (335-404).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions of H. ovenii (Johnson, 1863; Gunther, 1887; Vaillant, 1888; Goode & Bean, 1895; Barnard, 1925; Poll, 1953) with regard to all systematically important characters (D 9-11, P 11-13, V 9-10, length from snout to mouth amounting to 40.2-52.5 % of the length from the tip of the snout to eye; o 27.7-52.5 % of postorbital length; io 21.3-45.6 % of eye diameter; H 40.8-54.2 % of head length or 5.0-6.8 % of total body length).

DISTRIBUTION. H. ovenii is known from the northeastern Atlantic (Azores Islands, Madiëra, Gulf of Cadiz) as well as the coast of central and southern Africa (from depths of 500-1500 m) (Gilchrist & von Bonde, 1924; Barnard, 1925; Poll, 1953; Harrison, 1972). In our catches H. ovenii was encountered frequently (up to several tens of specimens per trawl) between 31°45' and 9°40' N at depths of 700-1700 m and from 26°00' to 28°00' S at depths of 900-1050 m.

##### Halosauropsis machochir (Gunther)

Halosaurus macrochir Gunther, 1878:250 (eastern Atlantic near Gibraltar).

Halosaurus niger Gilchrist, 1906:170.

S, 258-1 (724), 304-3 (716-728), 313-1 (610).

COMPARATIVE OBSERVATIONS. H. macrochir was described from the eastern Atlantic (Gunther, 1878); accounts of this species can be found in a series of more recent works (Gunther, 1887; Vaillant, 1888, Goode & Bean, 1895).

Our specimens agree well with the previous descriptions with regard to all systematically important characters: D 12-13, P 10-13, V 9-10, upper part of head without scales, lateral line scales enlarged, 25-26 scales to the level of the anal aperture, snout elongated, prebuccal portion comprising 26.8-34.2 % of preorbital length, o 44.6-57.0 % interorbital distance.

DISTRIBUTION. H. macrochir is known from the northeastern Atlantic from around 50° N (Koefoed, 1927) and from South Africa (Barnard, 1925). In our catches it was only very rarely encountered between 27°36' and 22°20' N at depths of 1445-1570 m.

Aldrovandia phalacra Vaillant

Halosaurus phalacrus Vaillant, 1888:185-187 (Azores Islands).

P, 71-1 (152), S, 191- (280-404), 226-2 (266-346), 268-1 (328).  
(trans. note: number of specimens at sta. 191 missing in original text).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions (Vaillant, 1888; Goode & Bean, 1895; Brauer, 1906; Zugmayer, 1911; Fowler, 1936) with regard to all systematically important characters. D 10, P 8, V 7-8; upper part of the head without scales, snout moderately elongated, prebuccal length comprising 32.3-39.0% of snout length, eye diameter equal to interorbital distance.

DISTRIBUTION. A. phalacra is known from the northeastern Atlantic (Azores and Canary Islands and Cape Verde Island) from depths of 1000-2300 m (Harrison, 1972). Our specimens were caught from 22°30'-9°40' N at depths of 950-1700 m.

## FAMILY BROTULIDAE

Xyelacyba myersi Cohen

Xyelacyba myersi Cohen, 1961:288-292 (Gulf of Mexico).

S, 276-1 (570), 281-1 (495).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the description of X. myersi (Cohen, 1961) with respect to all systematically important characters. Meristic and morphometric characters for our specimens and (in parentheses) the same data for the holotype are as follows: D 87,87 (87), A 70, 71 (71), P 19, 19 (19), V 2, 2, (2), C 9, 9 (9), sp. br. 4+1+14+4, 4+1+15+4 (4+1+15+4); R. br. 8, 8 (-), measurements (% SL): H 28.4, 24.8 (29.2); body height at the level of the anus 25.3, 22.3 (27.2), aA 43.8, 39.2 (44.8); aV 13.2 13.9 (12.4); 1P 11.6, 12.1 (12.7); 1V 24.8, 27.7 (24.7); width of the base of the pectoral fin 7.9, 7.1 (7.9); c 23.2, 21.7 (22.3); ao 6.1, 6.2 (6.1); o 2.9, 2.7 (2.8); distance from tip of snout to posterior edge of maxillary 13.4, 12.8 (11.0); maximum height of the maxillary 5.3, 5.8 (5.8). Both of our specimens were males and the larger possessed mature gonads.

DISTRIBUTION. X. myersi was previously known from two specimens from the Gulf of Mexico (27°48' N, 88°45' W) at depths of 1530-1980 m (Cohen, 1961). Our specimens were obtained from 12°00' and 9°25' N from depths of 1300-1920 m.

Lamprogrammus niger Alcock

Lamprogrammus niger Alcock, 1891:33 (Bay of Bengal and the Adaman Sea).

Lamprogrammus illustris Garman, 1899:174-177.

P, 70-3 (255-285), 71-2 (245-550), 101-1 (285).

309 COMPARATIVE OBSERVATIONS. Descriptions of this species are contained in many works (Alcock, 1891, 1899; Goode & Bean, 1895; Brauer, 1906; Weber, 1913; Norman, 1939). The systematic position and bathymetric and geographic distribution of L. niger are discussed in detail in the work of Nybelin (1957), which also gives a key to the species of the genus Lamprogrammus.

Our specimens agree well with the previous descriptions: gill rakers on the first arch 19-21, the longest of them equal (in length) to the eye diameter, free edge of the preopercular serrated, but without spines, interorbital distance 2.4-2.6 times in length of the head from snout to opercular spine, P 17-18.

DISTRIBUTION (see Fig. 7). L. niger is known from the Indian Ocean (Bay of Bengal, Andaman Sea, vicinity of Ceylon, Zanzibar and the Maldive Islands), from the Gulf of Panama and the adjoining part

of the Pacific Ocean (southward to 8° S) from depths of 741-2000 m (Nybelin, 1957; Parin et. al., 1973). In our catches this species was encountered off northwestern Africa (9°55'-4°04' N) at depths of 750-980 m and off southwestern Africa (about 28° S) from a depth of 700 m. Judging by the present data, L. niger is a circumtropical species.

Lamprogrammus macropterus Smith and Radcliffe

Lamprogrammus macropterus Smith & Radcliffe, 1913:163-164 (Buton Strait).

S, 272-1 (280), 276-2 (450-695).

COMPARATIVE OBSERVATIONS. According to the key for the genus Lamprogrammus (Nybelin, 1957) our specimens were identified as L. macropterus: sp. br. 17-18, longest of them slightly shorter than the eye diameter; free edge of the preopercular slightly serrated but without spines; interorbital distance 3.3 times in length of head from snout to tip of the opercular spine; P 21.

DISTRIBUTION. L. macropterus is known from Buton (southernmost island of the Celebes) Strait. In our catches this species was common from 17°30' to 12°00' N at depths of 1100-1800 m. The largest of the specimens captured had attained a length of 1100 m.

FAMILY MACROURIDAE

Lynconus brachycolus Holt and Byrne<sup>1</sup>

Lynconus brachycolus Holt & Byrne, 1906:424-426 (southwestern Ireland).

P, 100-1 (160), 101-7 (173).

COMPARATIVE OBSERVATIONS. L. brachycolus was described from material from the waters of southwestern Ireland (Holt & Byrne, 1906). An account of this species and a comparison of it with the only other species of this genus, L. pinnatus Gunther, is given in the work of Farran (1924). Our specimens may be unequivocally referred to L. brachycolus on the basis of the systematically important characters (0 5.5-5.5 (sic) times in body length; aA 2.1-2.4 times in body length; pectoral fin shorter than head). Meristic and morphometric characters of our specimens 160, 173 and 558 mm long and (in parentheses) counts and measurements of an L. brachycolus 232 mm long and an L. pinnatus 120 mm long taken from the work of Farran are as follows: P 13, 13, 15 (13, 13); V 8, 9, 9 (9, 10); measurements (% SL): c 20.3, 18.2 (18.0, 12.5); aD 21.3, 22.8 (19.0, 12.5); aA 42.5, 44.5 (40.0, 32.5); body height at the base of the pectoral fin 15.0, 15.0 (14.0, 9.0); body height at anus 10.0, 10.0 (9.0, 6.0); measurements (% head length): ao 25.7, 28.3 (29.0, 23.0); io 32.7, 33.7 (31.0, 20.0); o 25.7, 27.8 (25.0, 33.0); body width at the base of the pectoral fin 36.7, 43.0 (27.0 (sic)); body width at anus 27.6, -, - (27.0, 20.0); 1P 76.5, 78.0, - (62.0, 107.0); 1V 42.8, 44.0 (41.0, 23.0 (sic))

<sup>1</sup>The systematic position of the genus Lynconus is at this time unclear: one author (Svetovidov, 1973) puts it in the family Merlucciidae, others (Marshall, 1966; Marshall & Cohen, 1973) in the family Macrouridae.

(trans. note - only two values given for measurements, despite there being meristics for all three specimens).

The character of the tooth arrangement on the jaws and vomer is close to that described for L. brachycolus. In the specimens 160 and 173 mm long there is one canine on the upper jaw, situated at some distance from the articulation, and 12 much smaller teeth, arranged in a single row. There are one or two small teeth on the lower jaw and symphysis, then an arrangement of 2-4 canines and several very small teeth. The vomer has three teeth on each side. The two specimens 160 and 173 mm long have bodies with juvenile pigmentation in the form of small, dark spots. Scales are absent.

DISTRIBUTION. L. brachycolus was previously known only from the waters of southwestern Ireland (50°21' N, 11°39' W) from a depth of 1350 m (Farran, 1924). Our specimens were obtained at 18° 53' and 19° 01' S at depths of 600-700 m. This discovery significantly changes ideas about the geographic distribution of this species.

#### FAMILY MERLUCCIIDAE

##### Macruronus caninus Maul

Macruronus caninus Maul, 1951:45-49 (Madiera).

S, 255-1 (558).

COMPARATIVE OBSERVATIONS. M. caninus was described from three specimens 55-136 mm long, obtained off southeastern Madiera (Maul, 1951). Our specimen agrees well with the species description with regard to tooth structure, scale arrangement, morphometrics and counts of characters. Various characters are as follows: D<sub>1</sub> 9, D<sub>2</sub> 102, V 9, P 14, A 84. Body measurements (% SL) - c 14.3; ao 4.5; o 3.0; io 4.5; aD<sub>1</sub> 16.7; aD<sub>2</sub> 22.7; aA 43.0; aP 14.6; aV 17.6; body height at base of the first dorsal fin 11.8; body height at the base of the anal fin 12.0; lV 7.8. Head completely covered with scales.

DISTRIBUTION. M. caninus was previously known only from Madiera. Our specimen was obtained at 23°10' N at a depth of 1350-1440 m.

#### FAMILY OREOSOMATIDAE

##### Allocttus verrucosus (Gilchrist)

Cyttosoma verrucosus Gilchrist, 1906:40-45 (Walvis Bay).

S, 186-1 (275), 256-1 (260). Sa - 256-4 (186-220). P 424 -1 (94), 485 - 1 (90).

COMPARATIVE OBSERVATIONS. A. verrucosus was described from southwestern Africa (Gilchrist, 1906). All of our specimens agreed well with the species description with regard to systematically

important characters. Various characters of our specimens 90-275 mm long are as follows: D VI-VII 28-32 (two specimens with VII spines), A III 28-30, P 17-19, V I 6, C II-III+13+II-III; R. br. 7; sp. br. 20-24; measurements (% SL) (varying data for the two specimens 90 and 94 mm long is given in parentheses): head 37.3-41.4; snout 9.5-12.4; o 16.0-19.4; io (14.7, 15.4) 10.2-11.7;  $l_{md}$  21.3-25.0;  $l_{mx}$  15.4-19.5; body height at the base of the first dorsal fin (71.8, 70.1) 51.5-62.5; h 5.9-7.3; aD 52.7-57.5; aA (77.5, 75.5) 66.0-69.2; aP 38.7-43.3; aV (55.5, 52.3) 44.3-49.0.

311 Reduction of the data revealed no important differences between specimens from southern ("Poltava" collections) and northern Africa.

DISTRIBUTION. A. verrucosus is known from the southwestern Atlantic (Kreffft, 1968), South Africa between Walvis Bay and Natal (Trunov, 1968 b; Karrer, 1973) and from Australia (Barnard, 1927). In our catches this species was encountered from 28°00' to 20°11' N at depths of 700-1300 m and from 21°00' to 33°40' S at depths of 600-1000 m. In the region of 26-28° S at depths of 700-900 m A. verrucosus formed large concentrations with catches of up to 30 centners (3000 kg.) per hour of trawling. In the catches were fish 13-25 cm long ( $\bar{X} + s = 19.74 + 0.22$ ). The fish in the intense concentrations had been feeding on shrimp.

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#### FAMILY CARAPIDAE

##### Snyderidia bothrops Robins and Nielsen

Snyderidia bothrops Robins & Nielsen 1970:285-293 (Gulf of Guinea).

P, 68-2 (195-208), 75-1 (195).

COMPARATIVE OBSERVATIONS. S. bothrops was described from material from the Gulf of Guinea (Robins & Nielsen, 1970). Our specimens agree well with the species description: body elongated, bare; color brownish with numerous dark dots; pectoral fins long, containing 25 rays; pelvic fins absent; lower jaw projecting; teeth powerful, with a large canine on the vomer; 2-3 rudimentary gill rakers on the upper arch, 3 well developed gill rakers on the corner, and 6-8 rudimentary ones on the lower arch.

DISTRIBUTION (Fig. 11). S. bothrops is known from a few specimens from the Gulf of Guinea (depths of 260-1500 m), from the island of St. Helena (depth of 4-9 m) and from the southern part of the Carribean Sea (depth of 460 m) (Robins & Nielsen, 1970). Our specimens were obtained off northwestern Africa (10°09'-4°40' N) at depths between 500-600 m.



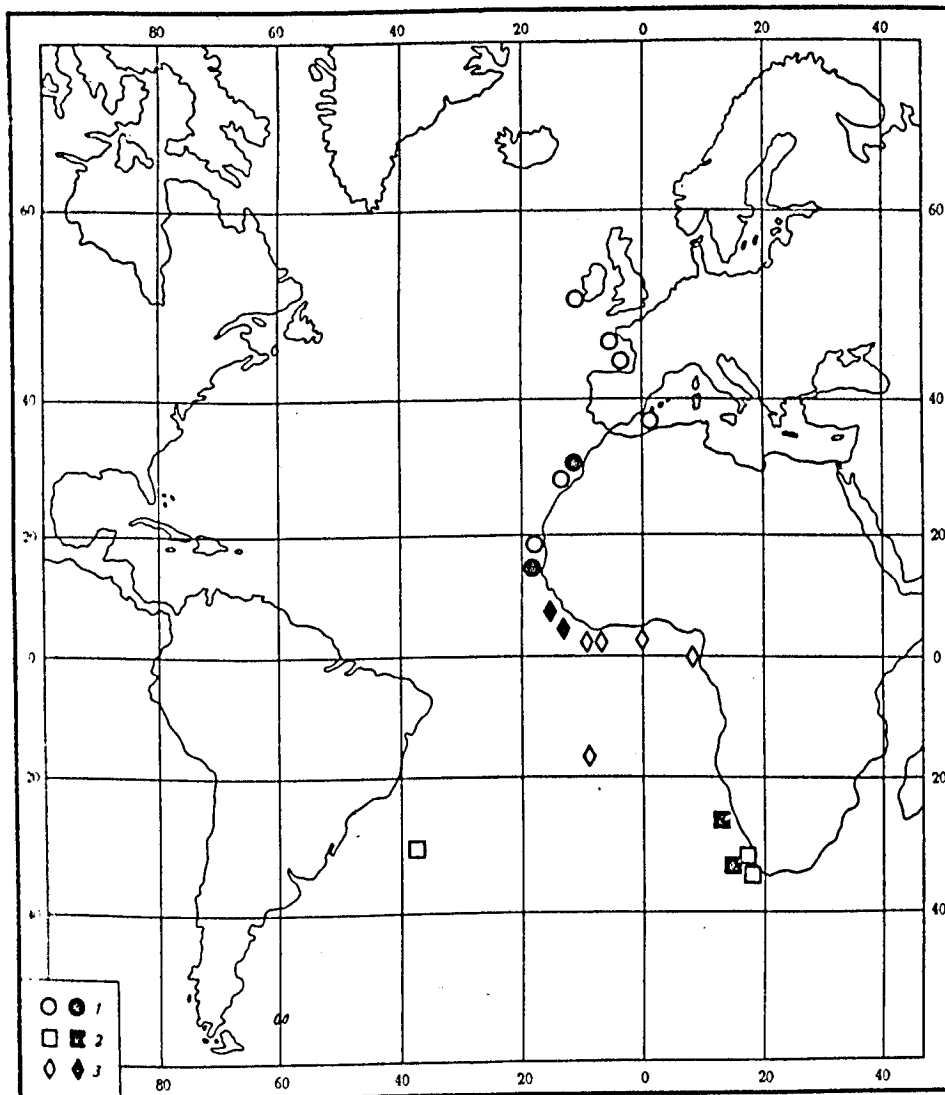


Fig. 11. Capture sites of *Trachyscopria cristulata echinata* (1), *T. capensis* (2) and *Snyderidia bothrops* (3) Black symbols- our material, blank- data from the literature

## FAMILY SCORPAENIDAE

Trachyscorpia capensis (Gilchrist and von Bonde)

Scorpaena capensis Gilchrist & von Bonde, 1924:18-19  
(southwestern Africa).

Sebastosemus capensis Barnard, 1927:909-911.

P, 429-1 (266). Sa, 256-1 (251).

COMPARATIVE OBSERVATIONS. T. capensis was described from material from South Africa (Gilchrist & von Bonde, 1924). Our specimens agree well with original description and other works (Barnard, 1927; Eschmeyer, 1969) with regard to taxonomically important characters.

Various characters of our specimens are as follows: D XIII 9, A III 5, P 20, V I 5, sp. br. 6+14, 5+13; measurements (% SL): c 41.3, 42.7; ao 24.0, 23.5; o 13.4, 13.2; io 2.9, 3.0; aD 39.2, 38.7; aA 68.0, 68.0; aP 40.0 38.7; aA 68.0, 68.0; aV 38.7, 39.7; h 10.3, 9.2. The first upper and the 6-8 lowest rays of the pectoral fins are simple; the remaining are branched.

DISTRIBUTION (see Fig. 11). T. capensis is known from South Africa at depths of 360-990 m (Eschmeyer, 1969) and from the Rio-Grande Rise (Pakorukov, 1976). In our catches this species was encountered in insignificant quantities from 27-34° S at depths of 600-1050 m.

Trachioscorpia cristulata echinata (Koehler)

Scorpaena echinata Koehler, 1896:478 (Bay of Biscay).

S, 143-1 (157), 157-1 (305).

COMPARATIVE OBSERVATIONS. Our specimens agree well with the previous descriptions (Holt & Byrne, 1908; Eschmeyer, 1969) with regard to the systematically important characters. Various characters of our specimens 157 and 305 mm long are as follows: D XII 9, A III 5, P 21, V I 5, sp. br. 7+12, 7+13. Measurements (% SL): c 44.6, 44.3; ao 10.4, 9.8; o 14.9, 12.0; io 4.6, 4.5; aD 42.7, 38.7; aA 70.0, 71.5; aP 44.0 40.3; aV 41.1, 40.3; h 10.2, 9.8.

DISTRIBUTION (see Fig. 11). T. crustulata cristulata is known from the eastern Atlantic from southwestern Ireland to Mauritania and from the Mediterranean Sea at depths of 100-2000 m (Eschmeyer, 1969). In our catches it was encountered from 32° to 17°20' N at depths of 500-1200 m.

## FAMILY BOTHIDAE

Chascanopsetta lugubris Alcock

Chascanopsetta lugubris Alcock, 1894:128 (India).

Chascanopsetta gilchristi von Bonde, 1922:7.

Chascanopsetta maculata von Bonde, 1922:8.

P, 68-7 (115-127), 74-7 (114-265), 75-1 (233). A, 420-2 (153-206).

COMPARATIVE OBSERVATIONS. The description of C. lugubris, as well as a key to the species of the genus Chascanopsetta, is given in the work of Nielsen (1961). Our specimens agree well with the given description with regard to all systematically important characters ( $l_{mx}$  less than 80% of head length; body height 26-32% of body length; D 114-115, A about 85).

DISTRIBUTION. C. lugubris is known from the continental slope of western Africa from 11° N to 12° S from depths of 235-650 m and also from the Indian and Pacific Ocean (Nielsen, 1961). There is also a report of young of this species captured off the coast of Florida at depths of 329-402 m (Deubler & Rathyjen, 1958).

In our catches C. lugubris was encountered in the region between 12°00' and 4°40' N at depths of 400-600 m, and also on the bank off the island of St. Helena (12°54' S, 5°45' W), at a depth of 135 m.

## LITERATURE CITED

- Bekker, B. E., Y. N. Shcherbachev, and C. M. Chuvasov. 1975. Deepwater pelagic fishes of the Caribbean Sea, Gulf of Mexico and the region of the Puerto Rican Trench. Proc. Inst. Oceanol., Vol. 100.
- Golovan, G. A. 1974a. Preliminary data on the composition and distribution of the ichthyofauna of the Cape Blanc region. Oceanology, Vol. 14(2).
- Golovan, G. A. 1974b. Commercial-biological characterization of the hake Merluccius merluccius (L.) in the southeastern Atlantic during the period of October 1969 to January 1970. Probl. Ichthyol., Vol. 14(4):87.
- Pakorukov, N. P. 1976. Preliminary list of bathyal fishes of Rio-Grande Rise. Proc. Inst. Oceanol., Vol. 104.
- Parin, N. B., and G. A. Golovan. 1976. Pelagic deepwater fishes from families characteristic of the open ocean on the continental slope of West Africa. Proc. Inst. Oceanol., Vol. 104.
- Parin, N. B., B. E. Bekker, O. D. Borodulina, and V. M. Chuvasov. 1973. Deepwater pelagic fishes of the southeastern Pacific Ocean and adjoining waters. Proc. Inst. Oceanol., Vol. 94.
- Pinchuk, V. I., and Y. E. Permitin. 1970. New data on sharks of the family Squalidae in the Southeast Atlantic. Probl. Ichthyol., Vol. 10(3):62.
- Sazonov, Y. I. 1976. Material on the systematics and distribution of the fish family Alepocephalidae (Salmoniformes, Alepocephaloidei). Proc. Inst. Oceanol., Vol. 100.
- Sazonov, Y. I., and G. A. Golovan. 1976. New species of the bathypelagic fish family Searsiiidae (Salmoniformes, Alepocephaloidei) from the East Atlantic. Proc. Inst. Oceanol. Vol. 104.
- Trunov, I. A. 1968a. The barbourisia (Barbourisia rula, family Barbourisiidae) and the frill shark (Chlamydoselachus anguineus, family Chlamydoselachidae) from the littoral waters of southwestern Africa. Probl. Ichthyol., Vol. 8(1):48.
- Trunov, I. A. 1968b. Preliminary data on the composition and distribution of several fish from the southeastern Atlantic. Probl. Ichthyol., Vol. 8(5):52.
- Trunov, I. A., and A. T. Isarev. 1971. Guntherus altivela Osorio 1917 (family Ateleopidae) from the Southeast Atlantic. Probl. Ichthyol., Vol. 11(1):66.

- Alcock A.* 1891. On the deep-sea fishes collected by the «Investigator» in 1890—91.—Ann. Mag. Natur. Hist., 6, ser. 8.
- Alcock A.* 1894. An account of a recent collection of bythyal fishes from the Bay of Bengal and from the Laccadive Sea.—J. Asiatic Soc. Bengal, v. 63.
- Alcock A.* 1899. A descriptive catalogue of the deep sea fishes in the Indian Museum. Calcutta.
- Barnard K. H.* 1923. New fishes from South African.—Ann. South. Afric. Mus., v. 13.
- Barnard K. H.* 1925—1927. A monograph of the marine fishes of South Africa. Part I—II.—Ann. South. Afric. Mus., v. 21.
- Barnard K. H.* 1948. Further notes on south African marine fishes.—Ann. South. Afric. Mus., v. 36.
- Bauchot M. L.* 1962. Description d'un nouveau *Bathypterois* méditerranéenne (Poisson Clupeiforme de la famille des Bathypteroidae). Affinités et remarques sur plusieurs espèces du genre.—Vie et milieu, t. 13, N 4.
- Bigelow H. B., Schroeder W. C.* 1948. Sharks.—In: Fishes of the Western North Atlantic, pt 1.—Mem. Sears Found. Marine Res., N 1.
- Bigelow H. B., Schroeder W. C.* 1953. Chimaeroids.—In: Fishes of the Western North Atlantic, pt. 2.—Mem. Sears Found. Marine Res. N 1.
- Bigelow H. B., Schroeder W. C.* 1954. Deep water Elasmobranchs and chimaeroids from the North Western Atlantic Slope.—Bull. Mus. Compar. Zool. Harvard Coll., v. 112, N 2.
- Bigelow H. B., Schroeder W. C.* 1957. A study of the sharks of the suborder Squaloidea.—Bull. Mus. Compar. Zool. Harvard Coll., v. 117, N 1.
- Bigelow H. B., Schroeder W. C., Springer S.* 1953. New and little known sharks from the Atlantic and from the Gulf of Mexico.—Bull. Mus. Compar. Zool. Harvard Coll., v. 109, N 3.
- Blacker R. W.* 1962. Rare fishes from the Atlantic slope fishing grounds.—Ann. and Mag. Natur. Hist., ser. 13, v. 5.
- Bocage J. V. B., Capello F. de* 1864. Sur quelques espèces inédites de Squalidae de la tribu Acanthiana, Gray, qui fréquentent les côtes du Portugal.—Proc. Zool. Soc. London.
- Bonnaterre J. P.* 1788. Ichthyologie. Tableau encyclopédique et méthodique des trois règnes de la nature. Paris.
- Bonde C. V. von.* 1928. List of fishes, etc., procured by the S. S. «Pickle» during the period July 1, 1925, to May 25 1927.—Rept. Fish Marine Biol. Survey, v. 5, N 16.
- Brauer A.* 1902. Diagnosen von neuen Tiefseefischen welche von der Valdivia-Expedition gesammelt sind.—Zool. Anz., Leipzig, 25.
- Brauer A.* 1906. Die Tiefseefische. I. Systematischer Teil.—Wiss. Ergebn. Dtsch. Tiefsee-Exped. «Valdivia», Jena, 15, H. 1.
- Buen F., de.* 1959. Notas sobre Ictiología chilena con descripción de los especies nuevas.—Rev. Biol. Mar. Valparaiso, t. 9, N 1—3.
- Bullis H. R., Carpenter J. S.* 1966. *Necharriotta carri*. A new species of Rhinochimaeridae from the Southern Caribbean Sea.—Copeia, N 3.
- Bussing W. A.* 1965. Studies of the midwater fishes of the Peru—Chile Trench.—In: Biology of the Antarctic Seas, II.—Antarct. Res. Ser., v. 5.
- Cadenat J.* 1960. Notes d'Ichthyologie ouest-africaine XXXI.—Sur la présence d'un Atelepidae, *Melanogloea ventralis* Barnard 1941 sur les côtes du Senegal.—Bull. Inst. franç. Afrique Noire, ser. A, t. 22, N 4.
- Castle R. H. J.* 1964. Deep-sea eels: family Synphobranchidae.—Galathea Rept., v. 7.
- Cervigon F.* 1960. Peces recogidos en el curso de las campanas realizadas a bordo del «Costa Canario» desde Cado Bojador a Quinea Portuguesa (Africa occidental) y consideraciones sobre su distribución.—Invest. Pesq., t. 17.
- Cohen D. M.* 1961. A new genus and species of deepwater Ophidioid fish from the Gulf of Mexico.—Copeia, N 3.
- Collett R.* 1904. Diagnosis of four hitherto undescribed fishes from the depths south of the Faroe Islands.—Vidensk. Selskabs Forh. Christiania, v. 9.
- Collett R.* 1905. Meddelelser om Norges Fiske i Aarena 1884—1901 (3 die Hoved—Supplement til «Norges Fiske», III Slutning).—Forh. Vidensk. Selsk. Krist., v. 7.
- Eschmeyer W. N.* 1969. A systematic review of the scorpionfishes of the Atlantic Ocean (Pisces: Scorpaenidae).—Occass. Papers Calif. Acad. Sci., v. 79.
- Farran G. P.* 1924. Seventh report on the fishes of the Irish Atlantic Slope. The Macrurid fishes (Coryphaenoididae).—Proc. Irish Acad., v. 36, N 8.
- Fowler H. W.* 1936. The marine fishes of West Africa, based on the collection of the American Museum Congo Expedition 1909—15.—Bull. Amer. Mus. Natur. Hist., v. 70, pt. 1.
- Fowler H. W.* 1941. Contributions to the biology of the Philippine Archipelago and adjacent regions.—Bull. U. S. Nat. Mus., v. 100, N 13.
- Garman S.* 1884. An extraordinary shark.—Bull. Essex Inst., v. 16.

- Garman S. 1899. The fishes. Repts. Explor. off the west coast of Mexico in charge of Alexander Agassiz.—Mem. Mus. Compar. Zool., v. 24.
- Garman S. 1913. The Plagiostoma.—Mem. Mus. Compar. Zool., v. 36.
- Garrick J. A. F. 1959. Studies on New Zealand Elasmobranchii. Pt. VII.—The identity of specimens of *Centrophorus* from New Zealand.—Trans. Roy. Soc. N. Z., v. 87, pt. 1—2.
- Garrick J. 1971. *Harriotta raleighana*, a long-rosed chimaera (family Rhinochimaeridae) in New Zealand waters.—J. Roy. Soc. N. Z., v. 1, N 3—4.
- Gilbert C. H. 1905. Aquatic resources of the Hawaiian Islands. Section II. The deep sea fishes.—Bull. U. S. Fish. Commiss., v. 23, pt. 2.
- Gilchrist J. D. F. 1906. Description of fifteen new South African with notes on other species.—Marine Invest. S. Africa, 4.
- Gilchrist J. D. F., Bonde C. von. 1924. Deep-sea fishes procured by the S. S. «Pickle».—Rept Fish. Marine Biol. Surv. S. Africa, v. 3, N 7.
- Gill T. N. 1883. Diagnoses of new genera and species of deep-sea fish-like vertebrates.—Proc. U. S. Nat. Mus., v. 6.
- Goode G. B., Bean T. H. 1883. Reports on the results of dredging under the supervision of Alexander Agassiz on the east coast of the United States, during the summer of 1880, by the U. S. coast survey steamer «Blake», commander J. R. Bartlett, U. S. N., commanding. Report on the fishes.—Bull. Mus. Compar. Zool. Harvard Coll. v. 10, N 5.
- Goode G. B., Bean T. H. 1895. Oceanic ichthyology.—Spec. Bull. Smithsonian Inst. U. S. Nat. Mus.
- Grey M. 1956. The distribution of fishes found below a depth of 2000 m.—Fieldiana, Zool., v. 36, N 2.
- Grey M. 1958. Descriptions of abyssal benthic fishes from the Gulf of Mexico.—Fieldiana, Zool., v. 39, N 16.
- Gudger E. W., Smith B. G. 1933. The natural history of the frilled shark *Chlamydoselachus anguineus*.—Bashford Dean Memorial Vol. Archaic Fishes, N 5.
- Günther A. 1877. Preliminary notes on new fishes collected in Japan during the expedition of H. M. S. «Challenger».—Ann. and Mag. Natur. Hist., ser. 4, v. 20.
- Günther A. 1878. Preliminary notices of deep-sea fishes collected during the voyage of H. M. S. «Challenger».—Ann. Mag. Natur. Hist., ser. 5, v. 2.
- Günther A. 1887. Report on the deep sea fishes.—«Challenger» Rept, Zool., v. 22.
- Harrison C. M. H. 1972. Halosauridae of the North Eastern Atlantic (Pisces, Teleostei, Notacanthiformes).—Bull. Mus. hist. natur. Paris, ser. 3, t. 54.
- Harrison C. M. H. 1973. Halosauridae.—In: Check-list of the fishes of the North-east Atlantic and the Mediterranean.—Paris, UNESCO.
- Holt E. W. L., Byrne L. W. 1906. On a new species of *Lyconus* from the northeast Atlantic.—Ann. Mag. Natur. Hist., ser., 7, v. 18.
- Holt E. W., Byrne L. W. 1908. Second report on the fishes of the Irish Atlantic slope.—Fish. Ireland Scient. Invest, v. 5.
- Holt E. W. L., Byrne L. W. 1909. On some fishes from the Irish Atlantic slope. XXXV. Preliminary note on some fishes from the Irish Atlantic slope.—Ann. Mag. Natur. Hist., ser. 8, v. 3.
- Holt E. W., Byrne L. W. 1910. Third report on the fishes of the Irish Atlantic slope. The Holocephali or Chimaeras.—Fish. Irel. Scient. Invest., v. 4.
- Hulley P. A. 1971. *Centrophorus squamosus* (Bonnatere) (Shondrichthyes, Squalidae) in the Eastern South Atlantic.—Ann. S. Afric. Mus., v. 57, N 2.
- Jensen A. S. 1948. Contribution to the ichthyofauna of Greenland 8—24.—Spolia Zool. Mus. Haun., v. 9.
- Johnson J. G. 1863. Descriptions of three new genera of marine fishes obtained at Madeira.—Proc. Zool. Soc. London.
- Karrer C. 1972. Die Gattung *Harriotta* Goode and Bean, 1895 (Chondrichthyes, Chimaeriformes, Rhinochimaeridae) mit Beschreibung einer neuen Art aus dem Nordatlantik.—Mitt. Zool. Mus. Berlin, Bd. 48, N 203.
- Karrer C. 1973. Über das Vorkommen von Fischarten im Nordwestatlantik (Neufundland-Baffinland).—Fisch. Forsch. wiss. Schriftenreihe, Bd. 11, H. 1.
- Karrer C. 1973. Über Fische aus dem Sudostatlantik.—Mitt. Zool. Mus., Bd. 49, H. 1.
- Koeljed E. 1927. Fishes from the sea-bottom.—Rept Sci. Res. Michael Sars N. Atlant. Deep Sea Exped., v. 4, N 1.
- Koehler R. 1896. Resultats scientifiques de la campagne du «Caudan» dans le Golfe de Gascogne. Poissons.—Ann. Univ. Lyon, t. 3.
- Krefft G. 1965. Rare fish. Germany.—Ann. biol. Copenhagen, v. 20.
- Krefft G. 1967. *Paraholtbyrnia cyanocephala* gen. nov., spec. nov. (Pisces, Salmoniformes, Alepcephaloidei), ein neuer Searside aus dem tropischen Atlantic.—Arch. Fischereiwiss., Bd. 17, H. 1.
- Krefft G. 1968. Knorpelfische (Chondrichthyes) aus dem tropischen Ostatlantik.—Atlantide Rept, v. 10.

- Krefft G.* 1973. Alepocephalidae.—In: Check-list of the fishes of the North—eastern Atlantic and the Mediterranean. Paris, UNESCO.
- Krefft G.* 1974. Investigations on midwater fish in the Atlantic Ocean.—Ber. Dtsch. Wiss. Kommiss. Meeresforsch., Bd. 23.
- Krefft G., Tortonese E.* 1973. Squalidae.—In: Check-list of the fishes of the North—eastern Atlantic and the Mediterranean. Paris, UNESCO.
- Marshall N. B.* 1966. The relationships of the Anacanthine fishes *Macruronus*, *Lyconus* and *Steindachneria*.—Copeia, N 2.
- Marshall N. B., Cohen D.* 1973. Order Anacanthini (Gadiformes): characters and synopsis of families.—Mem. Sears Found. Marine Res., v. 1, N 6.
- Maul G. E.* 1948. Monografia dos Peixes do Museu Municipal do Funchal. Ordem Isospondyli.—Bol. Mus. Municipal Funchal, v. 3, N 5.
- Maul G. E.* 1951. Familia Macrouridae e Merluccidae.—Bol. Mus. Munic Funchal, v. 5, N 12.
- Maul G. E.* 1957. Further additions to the Previously revised family Searsidae.—Bolm. Mus. Municipal Funchal, v. 10, N 25.
- Mead G. W.* 1958. A new species of iniomous fish.—J. Wash. Acad. Sci., v. 48, N 5.
- Mead G. W.* 1966a. Family Bathysauridae.—In: Fishes of the Western North Atlantic, pt 5.—Mem. Sears Found. Marine Res., N 1.
- Mead G. W.* 1966b. Family Ipnopidae.—In: Fishes of the Western North Atlantic, pt. 5.—Mem. Sears Found Marine Res., N 1.
- Mead G. W.* 1966c. Family Bathypteroidae.—In: Fishes of the Western North Atlantic, pt. 5.—Mem. Sears Found. Marine Res., N 1.
- Murray J., Hjort J.* 1912. The depths of the ocean.—London.
- Nielsen J. G.* 1961. Psittodoidea and Pleuronectoidea (Pisces, Heterosomata).—Atlantide Rept, N 6.
- Nielsen J. G.* 1966. Synopsis of the Ipnopidae (Pisces, Iniomi) with description of two new abyssal species.—Galatea Rept, v. 8.
- Nielsen J. G.* 1972. Additional notes on Atlantic Bathylaconidae (Pisces, Isospondyli) with a new genus.—Arch. Fischereiwiss., Bd. 23, H. 1.
- Nielsen J. G.* 1973. Bathysauridae.—In: Cheik-list of the fishes of the north-east Atlantic and Mediterranean. Paris, UNESCO.
- Nielsen J. G., Larsen V.* 1970. Notes on the Bathylaconidae (Pisces, Isospondyli) with a new species from the Atlantic Ocean.—Arch. Fischereiwiss., Bd. 21, H. 1.
- Norman J. R.* 1930. Oceanic fishes and flatfishes collected in 1925—1927.—Discovery Rept, v. 2.
- Norman J. R.* 1935. Coast fishes. Pt. I. The South Atlantic.—Discovery Rept, v. 12.
- Norman J. R.* 1939. Fishes.—Scient. Repts John Murray Exped. 1933—34, v. 8, N 1.
- Nybelin O.* 1948. Fishes collected by the Skagerak Expedition in the Eastern Atlantic 1946.—Goteborgs K. Vetensk.—O. Vittersamh. Handl., ser B, v. 5, N 16.
- Nybelin O.* 1957. Deep-sea bottom-fishes.—Rept. Swed. Deep-sea Exped, v. 2, Zool. (20).
- Osorio B.* 1917. Nota sobre algumas especies de peixes que vivem no Atlantico Occidental. Archos Mus. Bocage, l. 4.
- Parr A. E.* 1937. Concluding report on fishes with species index for articles 1—7. (Fishes of third oceanographic expedition of the «Pawnee»):—Bull. Bingham Oceanogr. Collect., v. 3, art. 7.
- Parr A. E.* 1951. Preliminary revision of the Alepocephalidae, with the introduction of a new family, Searsidae.—Amer. Mus. Novitates, N 1531.
- Parr A. E.* 1952a. Revision of the species currently referred to *Alepocephalus*, *Halisauriceps*, *Bathytroctes* and *Bajacalifornia* with introduction of two new genera.—Bull. Mus. Compar. Zool., Harvard Coll., v. 107, N 4.
- Parr A. E.* 1952b. Revision of the genus *Talismania*, with description of a new species from the Gulf of Mexico.—J. Wash. Acad. Sci., v. 42, N 8.
- Parr A. E.* 1954. Review of the deep-sea fishes of the genus *Asquamiceps* Zugmayer, with descriptions of two new species.—Amer. Mus. Novitates, N 1655.
- Parr A. E.* 1960. The fishes of the family Searsidae.—Dana-Rept, v. 51.
- Poll M.* 1951. Poissons. I. Generalitis. 2. Selaciens et chimeres.—Result scient Exped. Belge Eaux. Cotes Afrique Atlant. Sud., t. 4, N 1.
- Poll M.* 1953. Poissons. III. Téléostéens Malacoptérygiens.—Résult. Scient. Expéd. Oceanogr. Belge Eaux Côt. Arf. Atlant. Sud. (1948—49), v. 4, N 2.
- Quero J. C.* 1970. Les poissons de la famille des Searsides captures dans l'Atlantique nord-est. Campagnes du «President-Theodore-Tissier» et de la «Thalassa».—Rev. trav. Inst. peches maritimes, t. 34, N 3.
- Radcliffe L.* 1913. Descriptions of seven new genera and thirty one new species of fishes of the families Brotulidae and Carapidae from Philippine Islands and the Dutch East Indies.—Proc. U. S. Nat. Mus., v. 44.
- Reinhardt J. C. H.* 1825. [(Ichthyologische bidrag)...]: 2—3.—In: H. C. Ørsted. Overs. K. danske Vidensk. Selsk. Forh. (1824—1825).

- Robins R., Nielsen J. G. 1970. *Snyderidia bothrops*, a new tropical, amphiatlantic species (Pisces, Carapidae).— *Studies Trop. Oceanogr.*, v. 4, N 2.
- Rodrigues-Roda J. 1975. Nota sobre un *Neoharriotta pinnata* Schnakenbeck, 1931, citado anteriormente como *Harriotta raleighava* Goode e Bean, 1894.— *Inves. Pesq.*, t. 39, N 1.
- Roule L., Angel F. 1931. Observations et rectifications concernant divers poissons recueillis par S. A. S. le Prince Albert I de Monaco au cours des campagnes de 1911 à 1914.— *Bull. Inst. océanogr. Monaco*, N 581.
- Roule L., Angel F. 1933. Poissons provenant des campagnes du Prince Albert I de Monaco.— *Résult. Campagne Scient. Prince Albert I*, v. 86.
- Schnakenbeck W. 1929. Über einige Meeresfische aus Sudwestafrika.— *Mitt. Hamburg Zool. Mus. Inst.*, Bd. 44.
- Smith J. L. B. 1961. The Seas fishes of Southern Africa. Cape Town.
- Smith J. L. B. 1967. The lizard shark *Chlamydoselachus angulneus* Garman, in South Africa.— *Occass. Papers Dept Ichthyol. Rhodes Univ.*, v. 10.
- Stead D. G. 1963. Sharks and rays of Australian seas. Sydney.
- Sulak K. 1975. *Talismania mekistonema*, a new Atlantic species of the family Alepocephalidae (Pisces; Salmoniformes).— *Bull. Marine Sci.*, v. 25, N 1.
- Templeman W. 1965. A record of *Bathypterois dubius* Vaillant from the Western North Atlantic, and review of status of the species.— *J. Fish. Res. Board. Canada*, v. 23, N 5.
- Thompson E. F. 1930. New records of the genera *Centrophorus* and *Hoplichthys* in New Zealand.— *Rec. Canterbury Mus.*, v. 3, N 4.
- Tanaka S. 1905. On two new species of *Chimaera*.— *J. Col. Sci. Tokyo*, v. 20, N 2.
- Tanaka S. 1909. Descriptions of a new genus and ten new species of Japanese fishes.— *Tokyo J. Coll. Sci.*, v. 27, N 8.
- Tortonese E. 1952. Studi sui Plagiostomi. VI. Osservazioni critiche su alcune specie mediterranea.— *Arch. Zool. ital.*, t. 37.
- Townsend C. H., Nichols J. T. 1925. Deep-sea fishes of the Albatros Lower California Expedition.— *Bull. Amer. Mus. Natur. Hist.*, v. 52.
- Vaillant L. 1888. Poissons in expeditions scientifiques du «Travailler» et du «Talisman» pendant les années 1880—83.— Paris.
- Weber M. 1913. Die Fische der Siboga-Expedition.— *Siboga Rept*, Bd. 57.
- Wheeler A. 1962. New records for distribution of the frilled shark.— *Nature*, N 196.
- Whitley G. P. 1940. The fishes of Australia. Part I. The sharks, ray, devil-fish and other primitive fishes of Australia and New Zealand.— *Zool. Handbook. Roy. Zool. Soc. N. S., Wales, Austral.*
- Zugmayer E. 1911. Poissons provenant des campagnes du yacht «Princesse Alice».— *Result campagne scient Prince Albert, I*, t. 35.

RARE AND FIRSTLY RECORDED CHONDROSTEAN  
AND TELEOSTEAN FISHES  
OF THE CONTINENTAL SLOPE OF WEST AFRICA

G. A. Golovan

Summary

A collection of fishes caught with the commercial otter-trawl off the coasts of Mauritania, Spanish Sahara, Namibia and South Africa at the depths of 500—2000 m was studied. The brief descriptions and data on distribution of 59 rare species of the families Chlamydoselachidae, Scyliorhynidae, Squalidae, Chimaeridae, Rhinochimaeridae, Bathylaconidae, Alepocephalidae, Searsidae, Bathysauridae, Chlorophthalmidae, Bathypteroidae, Ipnopidae, Ateleopidae, Synphobranchidae, Halosauridae, Brotulidae, Macrouridae, Oreosomatidae, Carapidae, Scorpaenidae and Bothidae are presented. There are 26 species new for the area investigated including *Apristurus indicus*, *A. nasutus* (or an allied undescribed species), *A. prophundorum*, *Etmopterus princeps*, *Chimera jordani*, *Hydrolagus alberti*, *Bajacalifornia calcaratus*, *Binghamichthys microphos*, *Alepocephalus agassizi*, *A. productus*, *Bathytyphlops marionae*, *Xylocopa myersi*, *Lamprogrammus niger*, *L. macropterus*, *Lyconus brachycolus* and others.