

Chondrichthyan fishes collected during «Valdivia I» cruise to the Valdivia Bank and Namibian Slope

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Key words: Chondrichthyes, faunistics, Valdivia Bank, Namibia, SE Atlantic.
Palabras clave: Condrictios, faunística, Banco Valdivia, Namibia, Atlántico SE.

SUMMARY: During May of 1982, 15 hauls with a bottom trawl were done in the area of the Valdivia Bank (24°S and 27°S - 5°E and 7°E) and 14 on the slope of the Namibian coast in order to explore the fishery resources of both areas. In this work the study of the specimens of the different species of Chondrichthyan fishes captured during this expedition is presented.

RESUMEN: PECES CONDRICTIOS RECOLECTADOS EN LA EXPEDICIÓN «VALDIVIA I» AL BANCO DE VALDIVIA Y TALUD DE NAMIBIA. — Durante el mes de mayo de 1982 se hicieron 15 pescas con arrastre de fondo en el área del Banco Valdivia (24°S y 27°S - 5°E y 7°E) y 14 en el talud continental de la costa de Namibia con el fin de explorar los recursos pesqueros de ambas zonas. En el presente trabajo se estudian diversos ejemplares de las especies de Condrictios capturados durante la expedición Valdivia I.

INTRODUCTION

The fish stocks of the continental shelf off Namibia are fully exploited by the fishing fleets of several countries, including Spain. The analyses for the management of these stocks made within the framework of ICSEAF (International Commission for the Southeast Atlantic Fisheries) showed that the level of effort on these grounds should not be subsequently increased. In order to look for alternative resources in the neighbouring areas, an exploratory cruise to the Namibian slope and the Valdivia Bank was conducted.

Unfortunately, there is, as far as we know, no general information published about the Valdivia Bank except for that of A. BRAUER (1906), reporting the "Valdivia" expedition.

No charting was done during this expedition on the bank and in the systematic part of the work mentioned above there is no reference to Chondrichthyan fishes of the Valdivia Bank. From this we have to suppose that no specimens of this group were captured.

As far as we know, the only information exclusively concerning the Bank of Valdivia comes from an unpublished report written by MACPHERSON (1982).

The Bank of Valdivia belongs to the Walvis ridge and it is located between

latitudes 24° S and 27° S, longitudes 5° $30'$ E and 6° $40'$ E, and about 400 miles off the Namibian coast. It has two main plains, the smaller one of around 100 square miles and the larger with around 300 square miles. The average depth of the Bank is 900-1000 meters (Fig. 1).

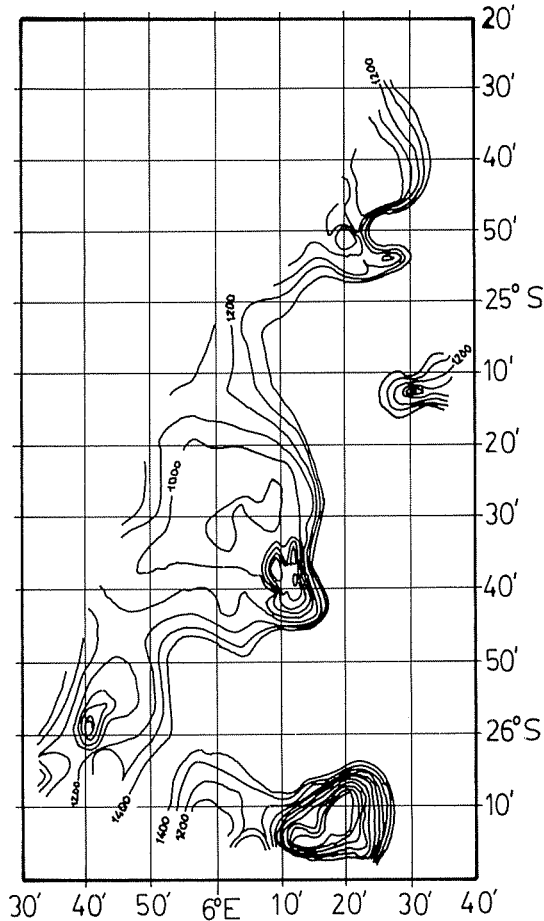


FIG. 1.— Isobathic map of the Valdivia Bank. Redrawn from MACPHERSON (1982).
Depths in meters.

MATERIALS AND METHODS

The cruise was done onboard the freezer vessel "Chicha Touza" during May 1982.

A total number of 14 hauls were carried out on the slope of the Namibian

coast and 15 on the Valdivia Bank, within a similar range of depths in both areas.

The net used for fishing was a bottom trawl with an opening of two meters of vertical height. Due to the great depths in which the hauls were done, the speed was never faster than two knots. More detail of this cruise are reported in MACPHERSON (1982).

It has to be mentioned here that in this kind of cruise only the species of commercial importance were studied on board or were preserved when numbers were of important amounts, for further studies in the laboratory. Thus, as Chondrichthyan fishes have no commercial importance in Spain, only few specimens are kept during the scientific cruises for possible studies. This is the reason why, although a great number of specimens of this group were caught during this expedition, only a few were preserved for later work and these are the subject of this study.

ACCOUNT OF SPECIES

All the specimens presented in this part belong to the fish collection of the Instituto de Investigaciones Pesqueras de Barcelona. Those with the label IIPB are kept in the collection mentioned above and the others with the label SQ are kept for further exchange.

No descriptions of the species presented here are given because they agree with the descriptions already published by several authors. The slight differences among the proportional dimensions in some of the species might be due to the environmental conditions but these are, from our point of view, not enough as to consider any particular species in a lower taxon or even as a different species.

The measurements are expressed as % of the total length for the shark species, of the disc length for skates and of caudal length for the Holocephali.

Subclass: Elasmobranchii

Family: Squalidae

Subfamily: Somniosinae

Centroscymnus coelolepis Bocage & Capello, 1864

A total number of five specimens of this species were preserved for study. All were taken in the Namibian slope in the following hauls:

Coll. no.: SQ-2: haul 16; 26.V.1982; 1 28° 12.0' S - L 014° 21.0' E; depth: 739-805 m.

Coll. no.: IIPB 11/1984: haul 22; 28.V.1982; 1 26° 35.5' S - 013° 35.4' E; depth: 761-768 m.

Coll. nos.: IIPB 12/1984; IIPB 13/1984; IIPB 14/1984: haul 18; 26.V.1982; 1 28° 19.0' S - L 014° 18.6' E; depth: 754-764 m.

The measurements are presente in Table I.

Family: Squalidae
Subfamily: Etmopterinae

Etmopterus lucifer Jordan and Snyder, 1902

A total number of six specimens were preserved for study. These were captured on the Valdivia Bank in the following hauls:

TABLE I
Body proportions measured as % of total length in five specimens
of *Centroscyrnus coelolepis*

<i>Catalogue number</i>	<i>IIPB</i> <i>11/1984</i>	<i>IIPB</i> <i>12/1984</i>	<i>IIPB</i> <i>13/1984</i>	<i>IIPB</i> <i>14/1984</i>	<i>SQ-2</i>
Total length (mm)	480.0	360.0	500.0	390.0	460.0
Body length	63.5	61.1	62.0	59.0	65.2
Head length	21.9	21.1	22.0	22.3	22.8
Distance from snout to:					
nostrils	1.7	1.6	1.6	1.5	2.0
mouth	9.4	9.4	9.0	8.7	10.0
eye	5.6	4.2	6.4	4.6	6.5
1st gill slit	19.8	16.4	18.8	17.7	20.0
pectoral origin	22.3	20.3	22.0	23.6	23.9
origin D1	36.5	33.9	33.0	37.7	35.9
spiracle	12.9	12.5	13.2	12.3	13.5
Horizontal diameter eye	5.1	3.9	5.0	4.9	5.4
Spiracle length	1.5	1.8	1.6	1.7	2.0
Inter-spiracular	7.1	7.2	7.2	6.9	7.2
Nostril length	2.1	1.9	1.7	2.2	2.2
Inter-nasal minimum	3.3	4.2	4.0	4.1	3.7
Inter-nasal maximum	7.1	7.4	7.0	7.7	7.4
Mouth breath	7.9	8.6	9.0	9.5	8.7
Gill openings:					
1st	1.6	2.5	1.8	1.9	2.8
3rd	1.5	1.9	1.6	1.9	2.4
5th	1.5	1.9	1.5	1.7	2.2
distance 1st-5th	2.3	3.3	4.6	4.4	4.1
First dorsal fin:					
vertical heigth	2.5	2.8	2.4	2.6	2.6
length of base	4.6	4.4	4.8	4.1	5.4
length of spine	1.0	1.0	1.6	0.9	1.3
Caudal fin:					
upper margin	22.9	21.9	22.0	24.4	25.0
lower anterior margin	11.5	11.9	11.4	13.3	13.0
Pectoral fin:					
anterior margin	13.1	11.9	13.0	14.1	13.0
posterior margin	6.3	7.8	7.8	5.6	7.5
Pelvic fin:					
length	9.0	10.6	10.4	9.1	9.9
length of clasper	—	3.1	3.6	—	—
Distance between D1-D2	24.4	23.9	22.4	26.4	21.7
Distance D2-caudal orig.	8.1	7.4	10.6	9.9	7.8

Coll. no.: SQ6: haul 02; 17.V.1982; 1 25° 27.9' S-L 006° 02.6' E; depth: 908 m.

Coll. nos.: SQ-7; SQ-8; SQ-9; SQ-10; SQ-11: haul 10; 21.V.1982; 1 25° 29.2' S-L 006° 07.4' E; depth: 900-915 m.

The measurements are presented in Table II.

TABLE II
Body proportions measured as % of total length in six specimens
of *Etmopterus lucifer*

Catalogue number	SQ-6	SQ-7	SQ-8	SQ-9	SQ-10	SQ-11
Total length (mm)	410.0	330.0	310.0	290.0	280.0	180.0
Body length	56.1	54.5	48.4	51.7	51.8	55.6
Head length	23.2	21.8	22.9	21.6	21.8	23.3
Distance from snout to:						
nostrils	2.4	3.3	2.6	2.6	3.2	3.1
mouth	11.0	10.9	10.6	11.0	11.4	12.2
eye	6.6	6.7	7.1	6.9	7.0	7.2
1st gill slit	18.5	18.8	18.8	18.6	17.5	19.4
pectoral origin	23.7	21.8	23.2	22.1	22.5	23.3
origin D1	31.7	32.1	31.9	31.0	32.1	33.3
spiracle	12.7	13.0	13.2	14.4	14.3	15.0
Horizontal diameter eye	6.1	4.2	5.8	5.5	5.0	5.6
Spiracle length	2.7	1.8	1.9	1.4	1.8	1.7
Inter-spiracular	6.3	6.1	6.1	6.9	4.6	7.2
Nostril length	2.6	3.0	2.9	2.8	3.0	2.8
Inter-nasal minimum	4.1	2.7	3.1	2.8	3.2	3.6
Inter-nasal maximum	7.3	6.5	7.7	7.4	8.2	7.8
Mouth breadth	7.8	7.5	8.4	7.2	8.2	8.9
Gill openings:						
1st	2.0	2.7	2.3	2.1	2.1	2.3
3rd	1.7	2.1	2.1	1.9	2.1	2.6
5th	1.5	1.7	1.6	1.6	1.8	2.1
distance 1st-5th	4.6	3.4	4.2	5.3	5.4	4.4
First dorsal fin:						
vertical height	3.5	3.0	2.6	2.4	2.5	2.8
length of base	4.9	4.1	3.7	4.5	4.6	4.7
length of spine	lost	1.5	2.1	2.1	3.6	2.8
Second dorsal fin:						
vertical height	4.9	3.6	4.2	5.2	4.5	4.4
length of base	7.8	7.1	5.5	6.7	6.6	7.5
length of spine	4.4	4.4	4.5	4.0	4.6	4.4
Caudal fin:						
upper margin	20.5	22.3	22.9	23.4	23.9	26.1
lower anterior margin	10.5	9.1	10.0	10.7	10.7	9.4
Pectoral fin:						
anterior margin	8.9	9.7	8.4	10.0	9.6	8.3
posterior margin	5.9	4.2	5.3	4.5	5.2	4.2
Pelvic fin:						
length	10.6	9.1	10.3	9.0	10.2	9.2
length of clasper	7.8	4.2	4.7	3.8	—	3.6
Distance between D1-D2	24.4	20.9	20.8	19.7	16.1	17.5
Distance D2-caudal origin	12.4	12.9	12.3	13.4	13.8	13.3

The specimens obtained during this cruise are in agreement with the description of the species given by several authors. Nevertheless, by comparing the measurements of our specimens with those cited by KREFFT (1968, p. 14) for the same species, slightly higher values can be noted for the specimens of this work.

Family: Rajidae

Subgenus: Raja

Raja (Raja) clavata Linnaeus, 1758

Only one specimen of this species was collected and it is preserved with the collection no. IIPB 533/1983. It was caught in the Namibian slope in haul 27: 30.V.1982; 1 23° 31.7' S - L 012° 58.5' E; depth: 761-765 m.

The measurements are presented in Table III.

Nothing has to be said here about this species which is easily identified except for this extreme variation in colour pattern. Nevertheless, as far as we know, this is the deepest record in the world for this species and particularly, in the CLOFETA area it is only known to be found up to 300 meters (STEHMANN, pers. comm.).

Family: Rajidae

Subgenus: Rajella

Raja (Rajella) sp. cf. leopardus

Again only one specimen was collected and preserved with the collection no.: IIPB 532/1983. It was captured in the Namibian slope in haul 16: 26.V.1982; 1 28° 12.0' S - L 014° 21.0' E; depth: 739-805 m.

This specimen could not be assigned to any of the known species of the subgenus *Rajella* using the papers of HULLEY (1970, 1972) and STEHMANN (1970). Nevertheless, at the present moment it is under study by the author and other colleagues.

Subclass: Holocephali

Family: Chimaeridae

Hydrolagus africanus (Gilchrist, 1922)

A total number of two specimens of this species were preserved for study. In this case both were captured in the Valdivia Bank in haul 14: 23.V.1982; 1 25° 30.7' S - L 005° 58.3' E. Depth: 915 m, and with the collection nos.: IIPB 530/1983 and IIPB 531/1983.

The measurements are presented in Table IV.

TABLE III

Body proportions measured as % of length of disc in a female specimen of *Raja (Raja) clavata*

<i>Catalogue number</i>	<i>IIPB</i> <i>533/1983</i>
Length of Disc	592.0 mm
Total Length	137.0
Width of Disc	75.9
Preorbital Length	17.4
Longitudinal Diameter of Orbit	4.6
Interorbital Distance	7.9
Length of Spiracle	4.4
Interspiracular Distance	10.4
Orbit + Spiracle	7.1
D1:	
Height	3.9
Base Length	8.8
D2:	
Height	4.2
Base Length	9.0
Tail Length behind 2nd Dorsal	6.9
Distance D1-D2 between bases	2.1
Base Length of Caudal Fin	6.9
Tail Height at tip of posterior Pelvic Lobes	4.9
Tail Width at tip of posterior Pelvic Lobes	8.6
Tail Height in front of First Dorsal Fin	2.5
Tail Width in front of First Dorsal Fin	3.7
Length of Lateral Tail Folds (left/righth)	52.3/52.8
Preoral Length	16.1
Prenasal Length	15.3
Head Length	38.0
Width of mouth	11.9
Internasal Length	15.0
Length of Nasal Curtain	6.7
Width of Nasal Curtain Lobe	3.0
Distance between Nasal Curtain Lobes	7.4
Length of Gill Slits:	
1st	3.2
3rd	3.2
5th	2.5
Distance between Firsts Gill Slits	23.8
Distance between Fifths Gill Slits	12.0
Length of margin of anterior pelvic Lobe	15.0
Distance from tip of Snout to anus	63.7
Distance from anus to:	
Origin of D1	40.7
Origin of D2	50.9
Tip of Tail	68.3
Distance from tip of Snout to max. Disc Width	44.0
Snout angle in front of Spiracles	101.0 degrees
Tooth rows: upper/lower jaw	45/40
Pseudobranchial Folds: left/righth Spiracle	14/15

TABLE IV

Body proportions measured as % of caudal length in two specimens of *Hydrolagus africanus*. The Tail Length means the distance from the vent until the end of the tail. The Caudal Length represents the distance between the vent and the end of the second dorsal fin.

Collection numbers	530/1983 IIPB	531/1983 IIPB
Caudal length	182.0 mm	165.0 mm
Head length	38.5	33.9
Total length	303.3	233.9
Tail length	169.2	163.6
D1: base length	30.8	22.4
length of spine	35.2	20.0
D2: base length	123.6	83.6
Pectoral fin: base length	76.4	46.1
Anal fin: base length	24.2	21.8
Ventral fin: base length	32.4	16.4
Preorbital length	15.9	17.0
Eye diameter	12.6	9.7
Postorbital length	11.0	9.1
Body height	37.9	27.3
Mouth breadth	14.8	10.3
	Female	Female

DISCUSSION

This work has no other objective than give the list of species found in Valdivia Bank and Namibian Slope and their measurement tables which can be useful for further studies of other scientists and also increase the knowledge about the distribution of some species as in *Raja (Raja) clavata* Linnaeus, 1758, which can be considered, after our observations, as a deep water species.

One of the papers we have used for the classification of the shark species has been that of COMPAGNO (1981) which has proved to be very useful. Nevertheless, *Centroscyrnus coelolepis* Bocage & Capello, 1864, has during juvenile stages a high dissimilar morphology of the dermal denticles compared with the adult specimens. This character is perfectly explained and illustrated in BIGELOW & SCHROEDER (1954, p. 48) and other authors that show the evolution of the shape of the dermal denticles of this species from early juveniles until the adults.

In connection with *Raja (Rajella) sp. cf. leopardus*, as has been said in the ACCOUNT OF SPECIES, is being studied and so it has to be considered as a *species inquirenda* until definitively clarifying its taxonomic status. GOLOVAN (STEHMANN, pers. comm.), however, found several *Rajella* species to which he gave no name and it is likely that our specimen may fit in some of his descriptions.

Nothing has to be mentioned about *Etmopterus lucifer* and *Hydrolagus africanus* than enlarge their distribution with their finding in the Bank of Valdivia.

ACKNOWLEDGEMENTS

We wish to thank all the participants of the cruise and particularly Dr. E. MACPHERSON, Project and Cruise Leader, for allowing us to study the specimens collected.

We are also indebted with: Dr. C. BAS, director of the IIPB, for his encouragement in this kind of ichthyological research; Dr. D. L. BÜRKEL, for the revision of the English version. Also Mr. J. RUCABADO, Mr. D. LLORIS and Mrs. F. PORTAS, for their critical revision of the manuscript.

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