BIOGEOGRAPHY OF THE MACARONESIAN ICHTHYOFAUNA

(THE AZORES, MADEIRA, THE CANARY ISLANDS, CAPE VERDE AND THE AFRICAN ENCLAVE)

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With 8 Figures and 3 Tables

RESUMEN: Biogeografía de la ictiofauna Macaronésica.- Se ha efectuado el inventario de las especies de peces capturadas en el área de la Macaronésia (archipiélagos : Azores, Madeira, Canarias, Cabo Verde y una porción de la costa continental denominada Enclave Africano). La información procede de la literatura disponible y de diversas colecciones. La lista está compuesta por 913 especies. En el presente estudio se analizan las relaciones ictiofaunísticas entre las unidades geográficas incluídas en la Macaronésia y se discuten diversos criterios de ámbito biogeográfico. Igualmente se aporta una nueva interpretación del poblamiento de dichas islas y se detallan algunas características de los diversos grupos de peces con interés biogeográfico.

SUMMARY: The inventory list of fish species of the Macaronesian area is composed of 913 species. The area covers the Azores, Madeira, the Canaries and Cape Verde Islands and a coastal segment of the continent named African Site. The information was gathered from the available literature and fish collections, mainly in Europe. The ichthyofaunistical relationships among the geographic unit and some biogeographic aspects are discussed, showing a new approach to the interpretation of the historical distribution of the species in the area. Species of biogeographic interest are treated in detail.

FOREWORD

The study of the fauna and flora of the Macaronesian Islands has attracted zoologists and botanists since long ago. Both disciplines have generated some publications which, most of which devoted to the elaboration of catalogues or to the

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clarification of the historical process of their colonisation.

These last subjects have revealed certain disparities in the criteria adopted on the supposed biogeographical unity of the Macaronesia.

Certainly, for botanists, the group of Macaronesian Islands has been considered a "region" with a certain phytogeographic entity, characterised by its relict vegetation of the laurisilva (GOOD, 1953).

On the other hand, for zoologists, this group of archipelagos would only reach the rank of "subregion" or "province", included in a wider biogeographical area named "Atlanto-Mediterranean Region". In particular, it must be outlined that, in ichthyology, the term Macaronesia is only accepted in informal terms, without excessive precission about its rank and explicit bibliographic references are scarce (BRITO, 1984; MILLER, 1984).

The confusion increases due to the disparity of criteria confluent in the area, such as the traditional division in three provinces (Lusitanian, Mediterranean and Mauritanian) has been altered after the considerations of MAURIN (1968a and 1968b), BRIGGS (1974) and CASANOVA (1977).

This situation must not look unfamiliar as a faunistical study, in any case, it is always accompanied by considerations which often can be arbitrary. These opinions are subjective, mostly when they try to justify the dynamics of the geographical distribution of the species by means of catalogues.

The problem to resolve the case becomes even more complex when those biogeographical studies are prepared taking into account the possibilities of presence or absence of marine organisms with different biological phases, *i. e.*, with active movements (adults) or passive ones (eggs). These phases are developed in a wide geographical frame with some of more than 3.200.000 km^2, with a maximum distance between islands (Corvo in the Azores and Brava in Cape Verde) of about 2.700 km. The minimum distance to the African continent is found in the Canaries with 111km.

Nevertheless, it must be mentioned that the whole process to be studied is not of difficult approach or of inaccessible magnitude, as the accomplished results present an amphibiological aspect suitable to stimulate and satisfy conjectures permitting a wide diversity of hypotheses.

In its essence, the present study analyses not only the ichthyo-adjacent coasts, but also discusses the different biogeographical criteria adopted through the times. A new interpretation of the settling of those islands is given, and also some features of the diverse groups of fishes of interest in this topic are detailed.

At any rate, it must be mentioned that a new proposal need not be better or worse than the preceeding ones. Only its application will give priority to those modelling better a highly dynamic situation such as the present one.

MATERIALS AND METHODS

This study has been developed within the geographical framework provided by BAEZ (1983, *in* BRITO, 1984), for the pool of Macaronesian archipelagos which is bounded, on one side, between the latitudes of 39° 45' N and 14° 49' N, *i. e.*, in the north - south direction between the islands of Corvo (the northernmost island of the Azores) and Brava (the southernmost island of Cape Verde). In the West - East direction, the boundaries are the westernmost island of the Azores (Flores, 31° 17' W) and the easternmost island of the Canaries (Lanzarote, 13° 20' W). From a biogeographical point of view a small site at the west African coast, placed in front of the Canary Islands has to be added (fig. 1).

The material studied, composed of 913 fish species (Appendix), belongs to several collections (BMNH, MNHN, MMF, IIPB, ISH, USNM). The systematic revision is based on bibliographic references including the species found in the area (MAUL, 1949; FRANCA & VASCONCELOS, 1962; HUREAU & MONOD, 1973 and supplement of TORTONESE & HUREAU, 1979; LLORIS & RUCABADO, 1979; FISCHER *et al.*, 1981; COMPAGNO, 1984; DOOLEY *et al.*, 1985 and WHITEHEAD *et al.*, 1984 - 1986, among others). The above mentioned authors have compiled older literature and, although this has been revised, it would be too extensive to mention it in detail here.

Moreover, to elaborate the simmilarity models at the species level, all those species (123) which, though being cited, were related with oceanic references were excluded and, for that reason, independent of any of the localities studied (Azores, Madeira, Canaries, African Site, Cape Verde). Thus, the study itself has been done on 790 species which corresponds to the 86.6% of the total number cited in these waters.

The classification adopted, for taxa above the species level, is that proposed by NELSON (1984). Nevertheless, for the comparison of the different taxonomic ranks with neighbouring geographical areas (Table 1) *sensu* FREDJ & MAURIN (1987), the taxa were translated to the classification proposed by HUREAU & MONOD (1973).

The method followed for the analyses of statistical simmilarities, used later in the assumption of faunistic clustering criteria, is the index of JACCARD (1908, *in*: SOKAL & SNEATH, 1973), which, as DICE (1945, *in*: SOKAL & SNEATH, 1973), does not consider the double absence and differing from the last, gives no higher weight to common presence.

The classifications obtained after the analysis being done with the above mentioned indices and others tried, were simmilar. Nevertheless, we chose the JACCARD index essentially because its complement (1-s) is metric (GOWER & LEGENDRE, 1986), *i. e.*, apart from accomplishing the conditions of simmilarity it fulfils the triangular dissimilarity:

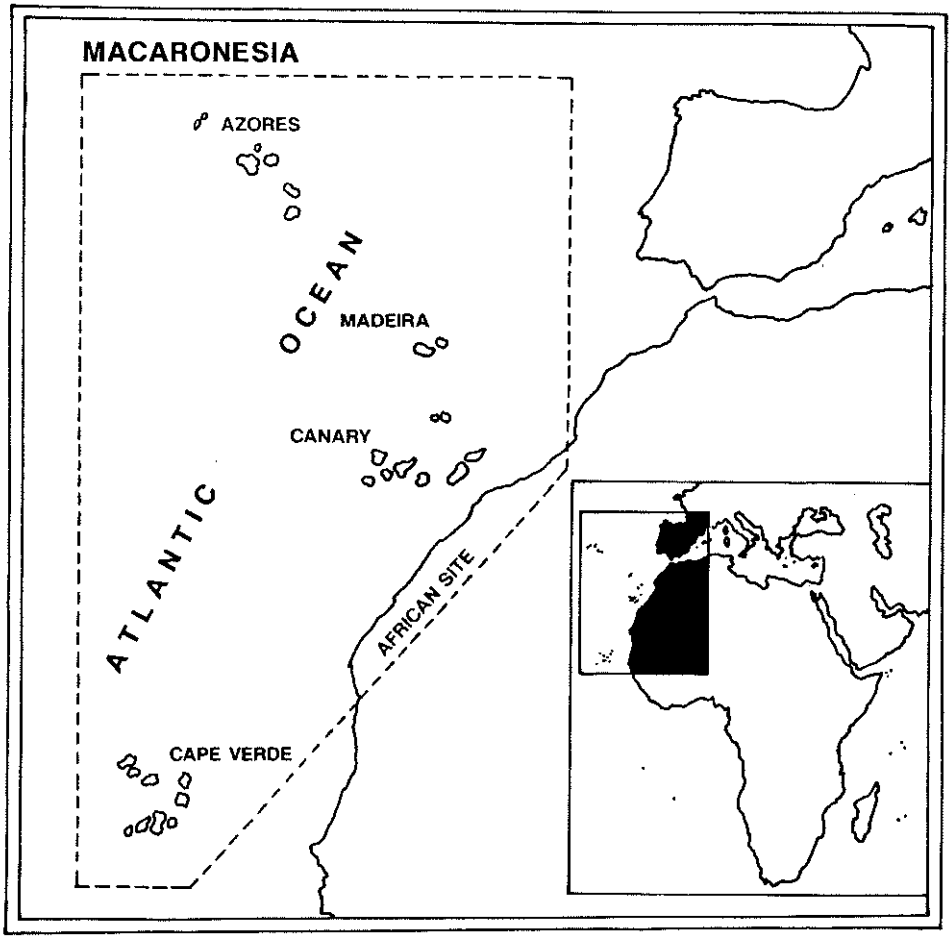

Fig. 1.- Macaronesia geographic area including Azores, Madeira, Canarias and Cabo Verde Islands and a segment of the continental coast named "African Site".

$$d_{ij} + d_{jk} > d_{ik}, \quad \text{where} \quad d_{ij} = 1 - s_{ij}$$

which is not accomplished by the index of DICE. In addition,

$$d_{ij}$$

carries directly to the condition of euclidean matrix and positive semidefined. This permits to insure the success of any analysis focused to obtain well defined eigen vectors and eigen values (and even single) as those used in metric scaling for ordination purposes. An example of this is the Principal Components Analysis.

The computation of the indices was done with the program BINARIO (developed by FIGUEROA, 1990, unpublished). The dendrograms, principal components and graphics were done with the program NTSYS-pc version 1.5 (ROHLF, 1989).

RESULTS

Following the classification criteria adopted (NELSON, 1984; HUREAU & MONOD, 1973), a total number of 30 Orders (5 referred to Chondrichthyes and 25 to Osteichthyes) have been encountered. These have been included in 187 Families (20 of Chondrichthyes and 167 of Osteichthyes) which again include 530 genera (54 belonging to Chondrichthyes and 476 to Osteichthyes).

Once this level reached, and with the intention of guaranteeing the potential results, the species contained in the rank of genera were discriminated, resulting in a total of 913, of which there 102 were belonging to Chondrichthyes and the rest (811) to Osteichthyes.

ICHTHYOFAUNISTIC AFFINITIES AMONG ISLANDS

The similarity analysis between archipelagos (Table 2 and fig. 2), Azores (AZO), Madeira (MAD), Canaries (CAN), African Site (AFR) and Cape Verde Islands (CAV), for the 790 species with own locality, gives the following considerations:

a) The greater affinity, in shared species, is given in the group CAN-AFR, with 60 forms (7.6%), followed by MAD-CAN with 47 (5.9%) and, finally, by the cluster AZO-MAD-CAN-AFR with 41 shared species (5.2%). The incidence of this last group, with an apparent North to South component, could misquote the results. This might happen because as of the 41 species registered, 19 (46.3%) are of the equato-guinean origin, and the rest (22 forms) are Atlanto-Medi-

	Macarones.		Lusitanian		Mediterr.		Mauritanian		Senegal		Boreal		Circ. Atl.	
ORDERS	N.E.	%	N.E.	%	N.E.	%	N.E.	%	N.E.	%	N.E.	%	N.E.	%
AGNATHA	0	-	3	100.0	3	100.0	1	100.0	0	-	3	100.0	2	100.0
Petromyzoniformes	0	-	2	66.7	2	66.7	1	100.0	0	-	2	66.7	1	50.0
Myxiniformes	0	-	1	33.3	1	33.3	0	-	0	-	1	33.3	1	50.0
CHONDRICHTHYES	102	100.0	64	100.0	83	100.0	66	100.0	51	100.0	46	100.0	30	100.0
Pleurotremata	66	67.4	35	54.6	46	55.4	39	59.1	31	60.7	24	52.2	25	83.3
Hypotremata	34	33.3	28	43.7	36	43.4	26	39.4	19	37.3	21	45.7	5	16.7
Chimaeriformes	2	2.0	1	1.5	1	1.2	1	1.5	1	2.0	1	2.1	0	-
OSTEICHTHYES	811	100.0	338	100.0	552	100.0	434	100.0	226	100.0	192	100.0	102	100.0
Acipenseriformes	0	-	1	0.2	6	1.0	1	0.2	0	-	0	-	0	-
Elopiformes	2	0.2	0	-	0	-	0	-	0	-	0	-	0	-
Cetomimiformes	6	0.7	0	-	0	-	0	-	0	-	0	-	0	-
Saccopharyngiformes	6	0.7	0	-	0	-	0	-	0	-	0	-	0	-
Anguilliformes	51	6.3	14	4.1	23	4.1	19	5.5	11	4.9	4	2.1	4	3.9
Notachantiformes	9	1.1	3	0.8	3	0.5	2	0.5	1	0.4	1	0.5	1	1.0
Clupeiformes	133	16.4	20	5.9	39	7.0	22	6.4	12	5.3	11	5.7	12	11.8
Scopeliformes	98	12.1	27	7.9	33	5.9	25	7.2	15	6.6	15	7.8	11	10.8
Siluriformes	1	0.1	0	-	1	0.1	0	-	0	-	0	-	0	-
Batrachoidiformes	1	0.1	1	0.2	1	0.1	1	0.2	1	0.4	1	0.5	0	-
Gobiesociformes	6	0.7	5	1.4	9	1.6	4	1.1	2	0.9	4	2.1	0	-
Lophiiformes	31	3.8	2	0.5	2	0.3	2	0.5	2	0.9	2	1.0	1	1.0
Gadiformes	52	6.4	23	6.8	37	6.7	23	6.7	14	6.2	19	9.9	11	10.8
Beloniformes	19	2.3	9	2.6	15	2.7	7	2.0	7	3.1	4	2.1	3	2.9
Cyprinodontiformes	0	-	0	-	3	0.5	0	-	0	-	0	-	0	-
Atheriniformes	4	0.5	3	0.8	4	0.7	3	0.8	2	0.9	2	1.0	0	-
Beryciformes	29	3.6	2	0.5	4	0.7	3	0.8	1	0.4	2	1.0	1	1.0
Zeiformes	7	0.9	2	0.5	2	0.3	2	0.5	2	0.9	2	1.0	0	-
Lampridiformes	7	0.9	4	1.1	5	0.9	5	1.4	4	1.8	2	1.0	2	2.0
Gasterosteiformes	1	10.1	0	-	2	0.3	0	-	0	-	1	0.5	1	1.0
Syngnathiformes	10	1.2	10	2.9	13	2.3	8	2.3	4	1.8	6	3.1	2	2.0
Scorpaeniformes	27	3.3	18	5.3	25	4.5	18	5.2	12	5.3	10	5.2	2	2.0
Dactylopteriformes	1	0.1	1	0.2	1	0.1	1	0.2	1	0.4	1	0.5	1	1.0
Perciformes	257	31.7	155	45.9	272	49.3	159	46.4	109	48.2	78	40.6	41	40.2
Pleuronectiformes	33	4.1	26	7.6	36	6.5	26	7.5	15	6.6	17	8.9	0	-
Echeneiformes	5	0.6	5	1.4	4	0.7	5	1.4	5	2.2	5	2.6	5	4.9
Tetraodontiformes	16	2.0	7	2.0	11	1.9	7	2.0	6	2.7	4	2.1	3	2..9
TOTAL	**913**	**100.0**	**405**	**100.0**	**638**	**100.0**	**410**	**100.0**	**227**	**100.0**	**241**	**100.0**	**134**	**100.0**

Table 1. - Comparison of number (N.E.) and percentages (%) of species within an Order for the Macaronesian ichthyofauna contrasted with the neighbouring biogeographical provinces as defined by FREDJ & MAURIN (1987). Orders and Families adapted to the classification used by these authors.

terranean species (8), Circumglobal (6), Amphiatlantic (5) and Cosmopolitan (3). Nevertheless, the cluster MAD-CAN-CAV-AFR, with a South - North direction, and including 25 forms, is also of equato-guinean origin as the 64.0% (16 species) dominates over the rest.

b) The minimal affinity is found among the groups AZO-CAV-AFR and AZO--CAV, which share not a single species. Both clusters represent the maximum distance between localities.

c) The most representative archipelago, referred to not shared species, seems to be MAD with 124 forms (15.7%), followed by AFR with 121 forms (15.3%), CAV with 41 forms (5.2%), AZO with 37 (4.7%) and, finally, CAN with 28 forms (3.5%).

Likewise, the statistical similarities in families, genera and species among archipelagos were analysed. The result obtained drawn as a phenogram (figs. 3 to 5), yields the following balance:

Families

The 20 families of Chondrichthyes and the 167 of Osteichthyes independently analysed, attested the resulting similarities and did not significantly differ from those done with the total number of families (187).

In fact, in all the cases the constant of three groups was kept: AZO-MAD with a similarity index of 0.6; CAN-AFR slightly less than 0.7 (both with a similarity index greater than 0.5) and, finally, the third group produced by the CAV archipelago, highly distanced from the other two, with an index somewhat smaller than 0.4 (fig. 3).

Genera

The pattern of clustering in genera, either in the analysis of Chondrichthyes (54) as well as in Osteichthyes (476), does not produce substantial differences from the global analysis (530). However, the results obtained with the analysis of genera, were better discriminant than that with families.

So, the higher index (0.5) is found in the group MAD-CAN, closely followed by AFR with an index of 0.45. Although AZO is connected with these, it is separated because the index is less than 0.38. The islands included in CAV, far away from the above mentioned, keep their similarity with an index of somewhat more than 0.22 (figs. 4A to 4C).

	Mad Afr	Mad Cav Afr	Mad Cav	Mad Can Cav	Mad Can	Mad Can Cav Afr	Azo	Mad Can Afr	Can Cav Afr	Can Cav	Can Afr	Mad	Cav Afr	Can	Afr	Cav
AZO	1 (0.1	4 (0.5	5 (0.6)	7 (0.9)	17 (2.1)	32 (4.0)	37 (4.7)	41 (5.2)	1 (0.1)	3 (0.4)	8 (1.0)	37 (4.7)	0	4 (0.5)	7 (0.9)	0
MAD	-	-	-	-	-	-	-	-	25 (3.2)	3 (0.4)	36 (4.6)	124 (15.7)	4 (0.5)	47 (5.9)	37 (4.7)	2 (0.3)
CAN	-	-	-	-	-	-	-	-	-	-	-	-	13 (1.6)	28 (3.5)	60 (7.6)	7 (0.9)
AFR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	121 (15.3)	17 (2.1)
CAV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41 (5.2)

Table 2

Number and percentages (in brackets) of restricted and shared species of and among every geographical locality of the Macaronesian area. (AZO = Azores Islands; MAD = Madeira Islands; CAN = Canary Islands; ; AFR = African Site and CAV = Cape Verde Islands). The percentages have been rounded and obtained from the 790 selected species (913 species minus 123 without concrete locality).

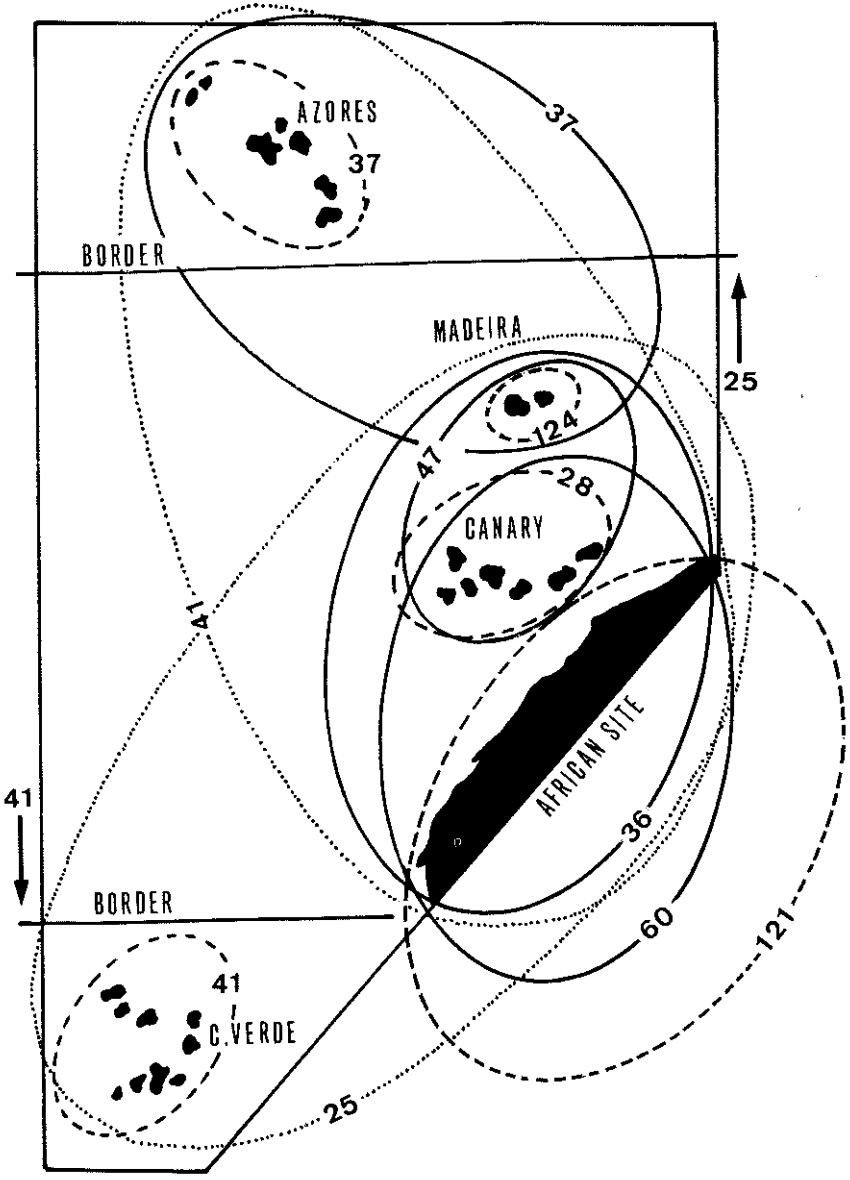

Fig. 2.- Exclusive and most relevant common species groups of and between the different Macaronesian geographic units. In the text an extensive criticism about. However, note that the "northern" species group (41 species common to all localities except Cabo Verde islands) is composed mainly by equatorial species (46 %).

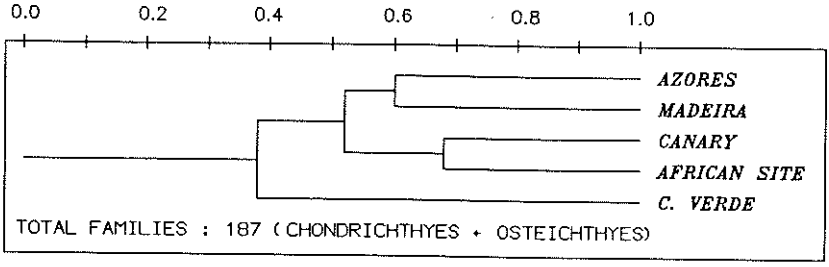

Fig. 3.- Similirity phenogram of total Families (Chondrichthyes plus Osteichthyes).

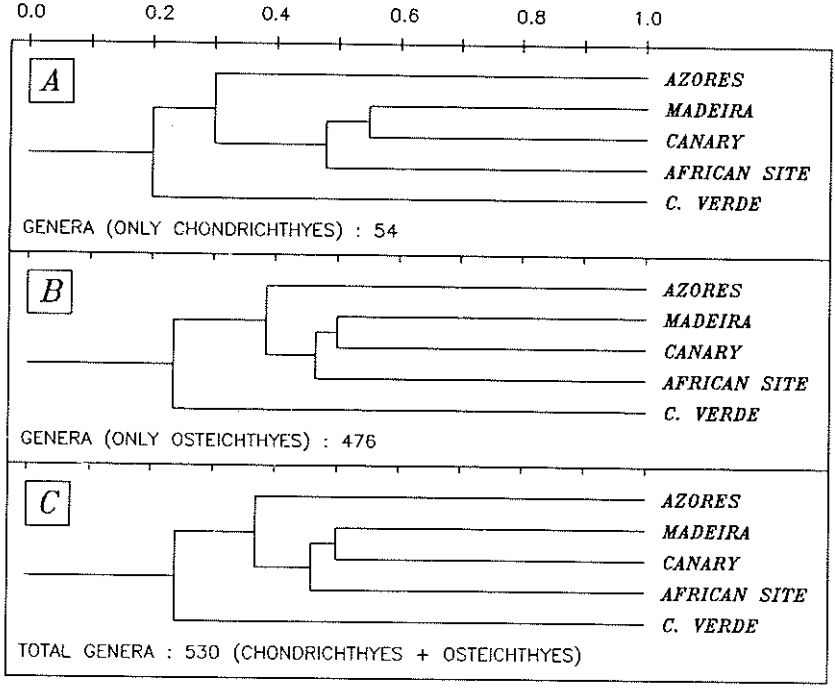

Fig. 4.- Similarity phenogram between genera. A: only Chondrichthye B: only Osteicthyes; and C : total genera (Chodrichthyes plus Osteichthyes)

Species

For this case we have obtained three phenograms: Chondrichthyes, with 97 selected species, Osteichthyes, with 694 species, and the total amount result of the linkage of both groups. The analyses indicate slight differences.

In the particular case of Chondrichthyes, the phenogram (fig. 5A) shows a similarity index of 0.45 among MAD and AFR, followed with some less than 0.4 by CAN. The islands of CAV, though being rather far (around 0.2), are the third group in importance. Clearly far from the cluster are AZO with an index of 0.15.

The singularity displayed by this analysis is concluding, as it indicates the southern origin of the Chondrichthyan populations for those islands closer to the African coast, which is the triangle composed of MAD-AFR-CAN.

On the opposite, the phenogram (fig. 5B) in which the solution to the analysis of Osteichthyes is given three groups are displayed: CAN-AFR linked with an index slightly higher than 0.4, followed by the cluster composed of AZO-MAD with an index over 0.3. Both initiate a scaling process resulting in the discrimination of the third component, CAV, distant from the above mentioned by an index lower than 0.2, shows the different sources in the macaronesican settlement.

Finally, and from the cluster of Chondrichthyes and Osteichthyes, arises the general similarity phenogram (fig. 5C), where the group CAN-AFR has the greater index (somewhat more than 0.4), scaled with MAD with 0.35, and followed by AZO which is slightly under 0.3 and displacing the CAV archipelago with an index of 0.2.

PRECISSIONS TO THE MACARONESIAN ICHTHYOFAUNA

Atlanto-Mediterranean Species

Of the total bulk of 913 catalogued species, 150 (16.4%) are considered Atlanto-Mediterranean (Table 3). The rest, 763 (83.6%) conforms species of diverse distribution (endemic, amphiatlantic, cosmopolitan, boreal or circumglobal).

These species are typical of the Mediterranean Region or, in their majority, belong to the Atlantic European coast. The composition is varied, with inhabitants of all the dominions (benthonic and pelagic), rising, in the case of Osteichthyes (127 forms), the Order Perciformes, to 65 species (51.2%).

Endemic Species

None of the Macaronesian Archipelagos, except for Madeira perhaps, have a high degree of endemisms, but the global area affords a total amount of 25 families,

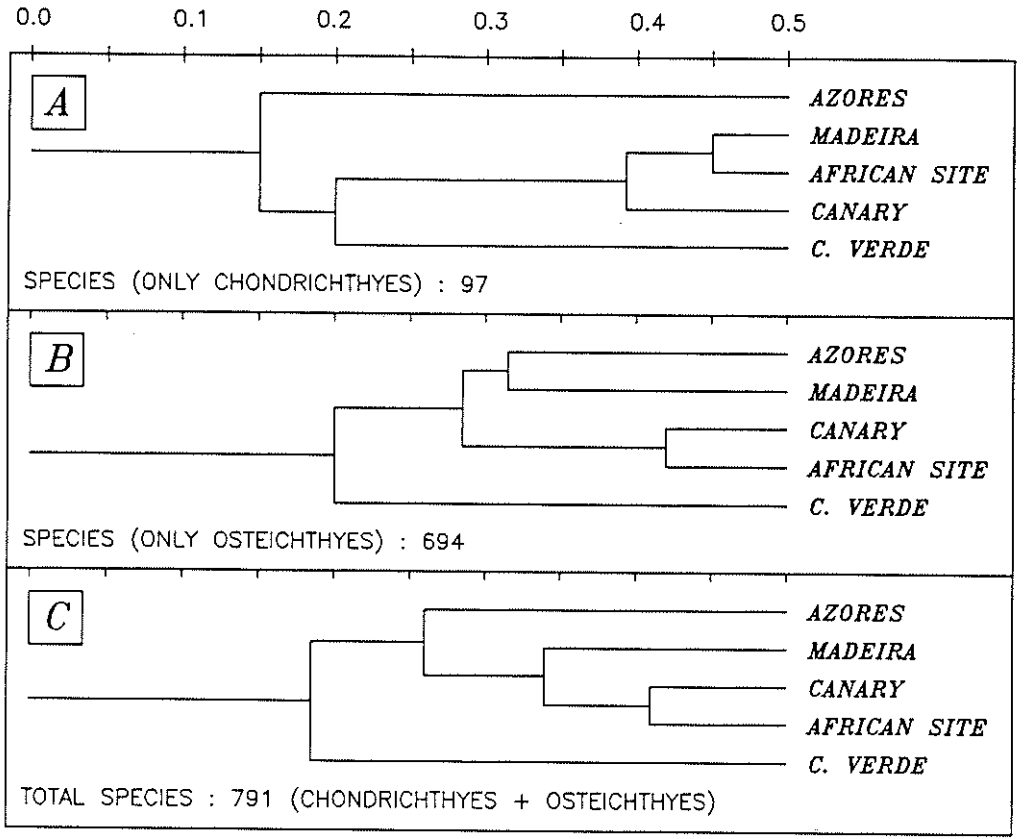

Fig. 5.- Similarity phenogram between Species. A: only Chondrichthyes B: only Osteicthyes; and C: total genera (Chodrichthyes plus Osteichthyes)

ORDERS	Endemic N.E.	Endemic %	Atlan-Med. N.E.	Atlan-Med. %	Amphiatlant. N.E.	Amphiatlant. %	Cosmopol. N.E.	Cosmopol. %	Boreal N.E.	Boreal %	Equato-Guin. N.E.	Equato-Guin. %	Circungl. N.E.	Circungl. %	TOTAL SPEC.	%
CHONDRICHTHYES	3	100.0	23	100.0	10	100.0	10	100.0	10	100.0	23	100.0	23	100.0	102	100.0
Pleurotremata	2	66.7	10	43.5	6	60.0	10	100.0	7	70.0	9	39.1	22	95.7	66	64.7
Hypotremata	1	33.3	12	52.2	3	30.0	0	-	3	30.0	14	60.9	1	4.3	34	33.3
Chimaeriformes	0	-	1	4.3	1	10.0	0	-	0	-	0	-	0	-	2	2.0
OSTEICHTHYES	34	2.0	127	100.0	99	100.0	57	100.0	52	100.0	244	100.0	198	100.0	811	100.0
Elopiformes	0	-	0	-	0	-	0	-	0	-	2	0.8	0	-	2	0.2
Cetomimiformes	1	2.9	0	-	0	-	1	1.8	0	-	2	0.8	2	1.0	6	0.7
Saccopharyngiformes	1	2.9	0	-	0	-	0	-	3	5.8	1	0.4	1	0.5	6	0.7
Anguilliformes	3	8.8	6	4.7	9	9.1	2	3.5	6	11.5	21	8.6	4	2.0	51	6.3
Notacantiformes	0	-	1	0.8	1	1.0	0	-	0		1	0.4	6	3.0	9	1.1
Clupeiformes	0	-	12	9.4	15	15.2	5	8.8	17	32.7	16	6.6	68	34.3	133	16.4
Scopeliformes	2	5.9	6	4.7	14	14.1	2	3.5	6	11.5	5	2.0	68	31.8	98	12.1
Siluriformes	0	-	0	-	0	-	0	-	0	-	1	0.4	0	-	1	0.1
Batrachoidiformes	0	-	0	-	0	-	0	-	0	-	1	0.4	0	-	1	0.1
Gobiesociformes	2	5.9	2	1.6	0	-	0	-	0	-	2	0.8	0	-	6	0.7
Lophiiformes	5	14.7	1	0.8	5	5.1	6	10.5	6	11.5	5	2.0	3	1.5	31	3.8
Gadiformes	6	17.6	9	7.1	16	16.2	2	3.5	2	3.8	13	5.3	4	2.0	52	6.4
Beloniformes	0	-	2	1.6	4	4.0	2	3.5	1	1.9	7	2.9	3	1.5	19	2.3
Atheriniformes	0	-	3	2.4	0	-	0	-	0	-	1	0.4	0		4	0.5
Beryciformes	2	5.9	0	-	2	2.0	5	8.8	3	5.8	6	2.5	10	5.1	28	3.5
Zeiformes	0	-	3	2.4	0	-	1	1.8	1	1.9	0	-	2	1.0	7	0.9
Lampridiformes	0	-	1	0.8	0	-	4	7.0	1	1.9	1	0.4	0	-	7	0.9
Gasterosteiformes	0	-	0	-	0	-	0	-	0	-	1	0.4	0	-	1	0.1
Syngnathiformes	0	-	2	1.6	0	-	1	1.8	1	1.9	6	2.5	0	-	10	1.2
Scorpaeniformes	2	5.9	9	7.1	1	1.0	1	1.8	0	-	14	5.7	0	-	27	3.3
Dactylopteriformes	0	-	0	-	1	1.0	0	-	0	-	0	-	0	-	1	0.1
Perciformes	8	23.5	65	51.2	23	23.2	20	35.1	5	9.6	110	45.1	26	13.1	257	31.7
Pleuronectiformes	1	2.9	5	3.9	0	-	0	-	0	-	27	11.1	0	-	33	4.1
Echeneiformes	0	-	0	-	0	-	2	3.5	0	-	0	-	3	1.5	5	0.6
Tetraodontiformes	0	-	0	-	8	8.1	3	3.5	0	-	2	0.8	3	1.5	16	2.0
TOTAL	**36**	**3.9**	**150**	**16.4**	**109**	**11.9**	**67**	**7.3**	**62**	**6.8**	**268**	**29.4**	**221**	**24.2**	**913**	**100.0**

Table 3. - Comparison of number (N.E.) and percentages (%) of species within an Order for the Macaronesian ichthyofauna according to their geographical distribution pattern. The Orders and Families have been adapted to the classification followed by FREDJ & MAURIN (1987).

which means the 13.4% of the 187 species found.

At the level of species and subspecies, their number is 36 (3.9%) and, even so, some doubts in taxonomy and distribution should be taken into account, and most likely the number could be strongly reduced, passing the rest to increase other catalogues (Table 3).

CHONDRICHTHYES (Pleurotremata)

Odontaspis noronhai (MAUL, 1955), belonging to the family Odontaspididae, is cited by QUERO (1984) as exclusive of Madeira. However, SADOWSKY *et al.* (1984) recorded in their well documented paper the capture in 1981 of 9 large specimens from off the south-eastern coast of Brazil, and COMPAGNO (1984) questionably also mentions its occurrence in the Seychelles. According to this, this species would no longer represent an endemic to the macaronisian region but would be amphiatlantic or would poddibly even have a wider distribution.

Centrophorus machiquensis Maul, 1955, belonging to the family Squalidae, is another one of the species considered an endemic of Madeira. However several authors (McEACHRAN & BRANSTETTER, 1984; COMPAGNO, 1984 and MUÑOZ-CHAPULI & RAMOS, 1989), cite this species as possibly synonymous with *Centrophorus granulosus* (SCHNEIDER, 1801), which, if so would extend its distribution from north-western Portugal to the coast of South Africa and the western Indian Ocean. MAUL & BISCOITO pers. comm.), however, and after examining a specimen of *C. granulosus* of the same size and sex as the type of *machiquensis* and other material, point out their conviction that it really is a different species from *C. machiquensis*. This latter seems closer to *C. scalpratus* McCULLOCH, 1915 and *C. harrisoni* McCULLOCH, 1915, common in Australian waters.

CHONDRICHTHYES (Hypotremata)

Raja (Raja) maderensis LOWE, 1839, family Rajidae, has only been cited for Madeira and so, its endemic nature is accepted. Its distributional area could be enlarged to the Azores and the African Site, although this latter possibility (STEHMANN & BÜRKEL, 1984) has not been confirmed because of the existing confusion of this species with *R. clavata* LINNAEUS, 1758 and *R. straeleni* POLL, 1951.

OSTEICHTHYES (Cetomimiformes)

For the Madeira and Canaries endemism, the family Cetomimidae provides

Cetomimus hempeli MAUL, 1969, considered rare because the species is only known from two specimens, one from each of the above mentioned localities.

OSTEICHTHYES (Saccopharyngiformes)

The same as in the previous family, Saccopharyngidae is represented by *Saccopharynx paucovertebratis* NIELSEN & BERTELSEN, 1985, cited only for Madeira (BERTELSEN & NIELSEN, 1986).

OSTEICHTHYES (Anguilliformes)

Muraenidae provide a single species *Gymnothorax maderensis* (JOHNSON, 1862) cited for the Madeira and Canaries ichthyofauna. This is one of the controversal species because of the capture of a leptocephalic form near the coast of the Gulf of Guinea recorded by BLACHE (1977).

The family Congridae contributes with two species: *Gnathophis codoniphorus* MAUL, 1972 and *Paraconger macrops* (GÜNTHER, 1870). In the case of the former species (*G. codoniphorus*), it has been cited by MAUL (1972) for the surroundings of the Azores and Madeira. The situation is similar to the above comments as BAUCHOT & SALDANHA (1986) presume that this is a juvenile form of *Gnathophis mystax* (DELAROCHE, 1809). In which case, this species would lose its endemic nature.

For the second species (*P. macrops*) imprecisely cited by GÜNTHER (1870) for Madeira, there seems to be no doubt of its endemic identity and its presence in the Azores may soon beconfirmed (BISCOITO, pers. comm.). (see Addendum).

OSTEICHTHYES (Scopeliformes)

The family Paralepididae is present with two endemic forms: *Macroparalepis nigra* (MAUL, 1965), cited for Madeira and surrounding of the Canaries, and *Paralepis harryi* MAUL, 1954, cited only for Madeira. (see Addendum).

OSTEICHTHYES (Gobiesociformes)

The family Gobiesocidae has two representatives: *Diplecogaster bimaculatta pectoralis* BRIGGS, 1955 (common in the Azores, Canary and Cape Verde Islands) and *Lepadogaster zebrina* (LOWE, 1839), endemic of Madeira and Canaries, though FRANÇA

& VASCONCELOS (1982) cited also this species for Cape Verde Islands.

OSTEICHTHYES (Lophiiformes)

This Order is represented by three families (Himantolophidae, Oneiroididae and Lynophrynidae) including five species: *Himantolophus albinares* MAUL, 1961 (description of two specimens) confirmed by BERTELSEN & KREFFT (1988); *Penth-erichthys venustus* REGAN & TREWAVAS, 1932 (larvae); *Linophryne maderensis* MAUL, 1961, kown only from three females; *Linophryne polypogon* REGAN, 1925 (a single female specimen) and *Linophryne sexfilis* BERTELSEN, 1973 (a single female). All these have been cited for Madeira.

OSTEICHTHYES (Gadiformes)

To the Macaronesian endemism, the family Macrouridae affords two species: *Coryphaenoides thelestomus* MAUL, 1951, for the islands of Madeira, and *Sphagemacrurus hirundo* (COLLETT, 1896), for the islands of Azores, Madeira, African Site coasts and possibly reaching the CapeVerde Islands (GEISTDOERFER, 1986).

The same occurs with the species of the family Gadidae in the treated frame-work: *Gaidropsarus granti* (REGAN, 1903) and *Gaidropsarus guttatus* (COLLETT, 1890). The former has been cited for the Azores and Canary Islands and the latter for the Azores, Madeira and Canary Islands.

The family Bregmacerotidae shows an interesting case with two specimens of the same species collected in the waters of Madeira, still pending of proper iden-tification and cited as *Bregmaceros* sp. (MAUL, 1952).

Finally, among the endemic species of this Order we must take into account *Laemonema robustum* JOHNSON, 1862, belonging to the Moridae. COHEN (1986) verified the findings of this species for Madeira resolving that the references of the African Coast apparently are of different species.

OSTEICHTHYES (Beryciformes)

Caristius maderensis MAUL, 1949, is the only representative of the family Car-istiidae cited for the waters of Madeira. This particular case shows certain uncer-tainties. NIELSEN (1973), refers to the specimen captured in Madeira, but under the section of the "geographical distribution" this author includes the "south west of Europe", what we belive is an imprecise distribution because of its wide extension. Later (POST, 1986) considers the citation by NIELSEN but adduces the possibility of

an uncertain identification referred to the distribution, remarking the type locality for Madeira.

The Melampheidae provide for the Azorean area, five juveniles of *Scopeloberyx rudiventer* (KOEFOED, 1953). However, MAUL (1986) considers this identification doubtful.

OSTEICHTHYES (Scorpaeniformes)

Scorpaena azorica ESCHMEYER, 1969, belonging to the family Scorpaenidae, is only known from a single locality (Azores).

Likewise, *Paraliparis edwardsi* (VAILLANT, 1888), family Liparididae, is known only from a single specimen collected in the African Site.

OSTEICHTHYES (Perciformes)

The species *Abudefduf luridus* (CUVIER, 1830), is the only representative of the family Pomacentridae cited for the Macaronesian group (Azores, Madeira, Canary and Cape Verde Islands). However, EMERY (1981), confers an uncertain status to this species.

The family Labridae also includes a single species, common in Madeira, Canaries, African area and Cape Verde archipelago. This species is *Pseudolepidaplois scrofa* (VALENCIENNES, 1839).

Lesueurigobius heterofasciatus MAUL, 1971and *Mauligobius maderensis* (VALENCIENNES, 1837) are two species of the family Gobiidae typical for Madeira, the Canaries the and African area.

A single species, *Protogrammus sousai* (MAUL, 1972), recorded from the "Great Meteor Bank" (south of the Azores and west of Madeira), is the only contribution of the family Callionymidae.

The contribution of the Blenniidae represented by the species *Parablennius ruber* (VALENCIENNES, 1836), quoted for the Azores and Madeira.

The family Carapidae includes two conflictive species for the endemism of Madeira and, extensively, to the Macaronesian system: *Carapus birpex* ARNOLD, 1956 and *Carapus cuspis* ARNOLD, 1956. In fact, TROTT & OLNEY (1986), though considering both citations are aware of their validity, indicating the possible synonymy among those binomens and *C. acus* (BRÜNNICH, 1768). (see Addendum).

OSTEICHTHYES (Pleuronectiformes)

The only endemic subspecies of this order is *Bothus podas maderensis* (LOWE, 1834), family Bothidae, and has been cited for Madeira and Canaries.

Amphiatlantic Species

Have been considered amphiatlantic, all those species found on both sides of the Atlantic (eastern American coast and western coasts of Europe and/or Africa) permanently or ocassionally found on one or the other side.

Their number is certainly important (109), though they only represent the 11.9% of the total number of species referred to in the studied area. Most of these species are specimens coming from the Gulf of Mexico and the Caribbean, although also those coming from the South American continent can be found and, usually, are migratory or deep water species. The more abundant Order is that of Perciformes with 23 species (23.2%) of the 99 catalogued Osteichthyes (Table 3).

Cosmopolitan Species

The presence of 67 species (7.3% of the total) has been detected. Generally they are Elasmobranchs and species belonging to Perciformes. Their presence in the world oceans and seas, are generally relatively constant but are found as isolated individuals of erratic behaviour (Table 3).

Boreal Species

Except for the endemic species, the boreal species are the least represented species in the Macaronesian group, including 62 forms (6.8% of the total). Most of these are present in the Azorean Archipelago. Usually they are Elasmobranchs and species of the Order Clupeiformes (Table 3).

Equato-Guinean Species

This section is referred to all those species which, though being more abundant in latitudes lower than Macaronesia, are present in the study area.

Their number is volumous, as 268 species (29.4% of the total) are comprised. Most of them show a coastal distribution, characteristic of the continental shelf. Fewer in number are the deep water species (meso, bathypelagic and bathybenthonic) and also are found a small number of pelagic forms are found.

The most abundantly represented taxa are, among Chondrichthyes, the Hypot-

remata and, among Osteichthyes, the Perciformes, Anguilliformes, Clupeiformes and Gadiformes (Table 3).

Circumglobal Species

This is the wider group following the species of Equato-Guinean distribution. It holds 221 species (24.2%). Most of the taxa of this cluster are pelagic, mesopelagic and inhabitants of great depths where the environmental conditions display some uniformity. The most abundantly represented forms are the Clupeiformes and Scopeliformes, followed closely by Elasmobrachs (Table 3).

DISCUSSION

From the results obtained in previous analyses can be deduced, from the ichthyological point of view, a common settlement model of faunistic crossroad but not that of an area with its own features which spreads its organisation to immediate systems more or less successfully.

Focused in the modelling of the Macaronesian structure, a highly significative aspect has to be taken into account. This is the abundance of forms (amphiatlantic, circumglobal and cosmopolitan) which diffuse the Macaronesian framework.

In fact, the hydrographical dynamic with marine currents of constant circulation permanent in the area and surroundings (Canary Current, North-Equatorial Current), together with other circuits (Gulf Stream, South-Equatorial C., Brasil C. added to the Antillan C.) make the Atlantic barrier permeable, which helps the dispersion of certain species. Most of these find in the islands productive culminations that, like a relief, permit their settlement or sporadically show their presence (LLORIS, 1986).

Thus, the 109 amphiatlantic species (11.9%), reaching ocassionally or frequently the diverse archipelagos, contribute with the 221 circumglobal species (24.2%) and 67 cosmopolitan species (7.3%), to shade the constant and dominant factors.

In this sense, merging the components of septentrional origin, (Atlanto-Mediterranean and Boreal ichthyofauna) a total number of 212 species (23.2%) can be obtained which, together with the species considered endemic, yield a cluster of 248 forms (27.2%). This group like the Equato-Guinean ichthyofauna with a southern origin and affording 268 species (29.4%), give to the study area a regular and predominant character.

As said before, the Atlanto-Mediterranean Region has usually been split in three Provinces: Lusitanian, Mediterranean and Mauritanian (EKMAN, 1953), though BRIGGS (1974) considers it a single Province, the Lusitanianone, embracing all the others (fig. 6).

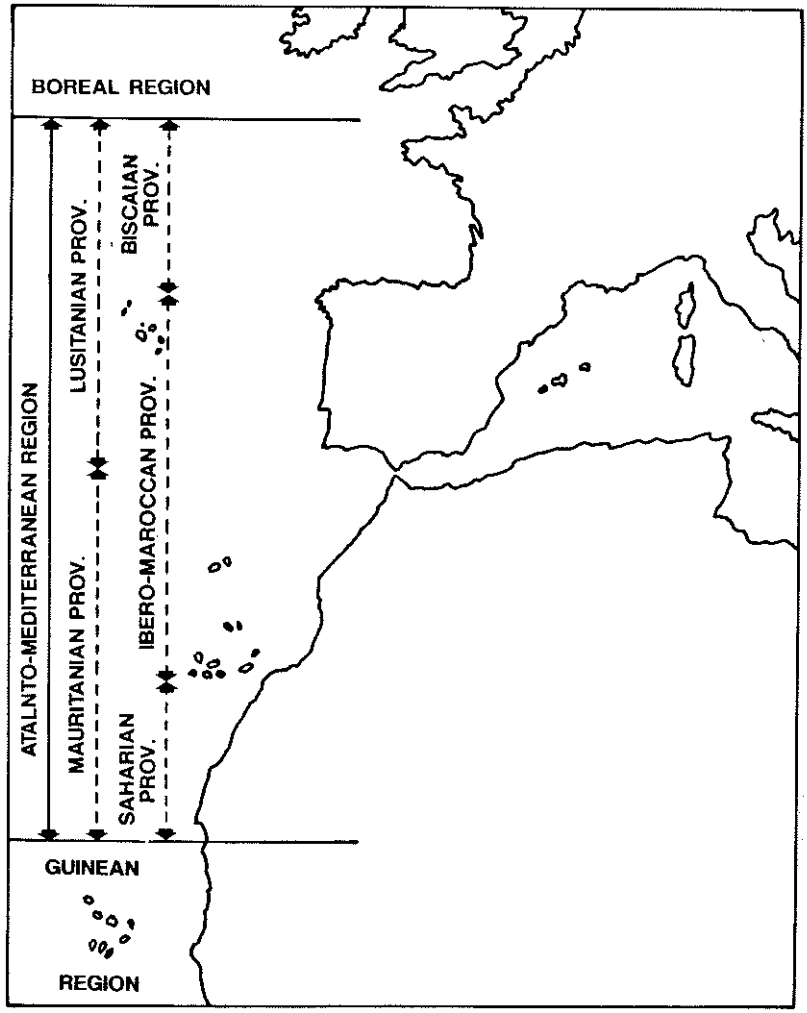

Fig. 6.- Accepted ichthyo-biogeographical boundaries of the Atlantic- Mediterranean region. Adapted and modified from Casanova (1977).

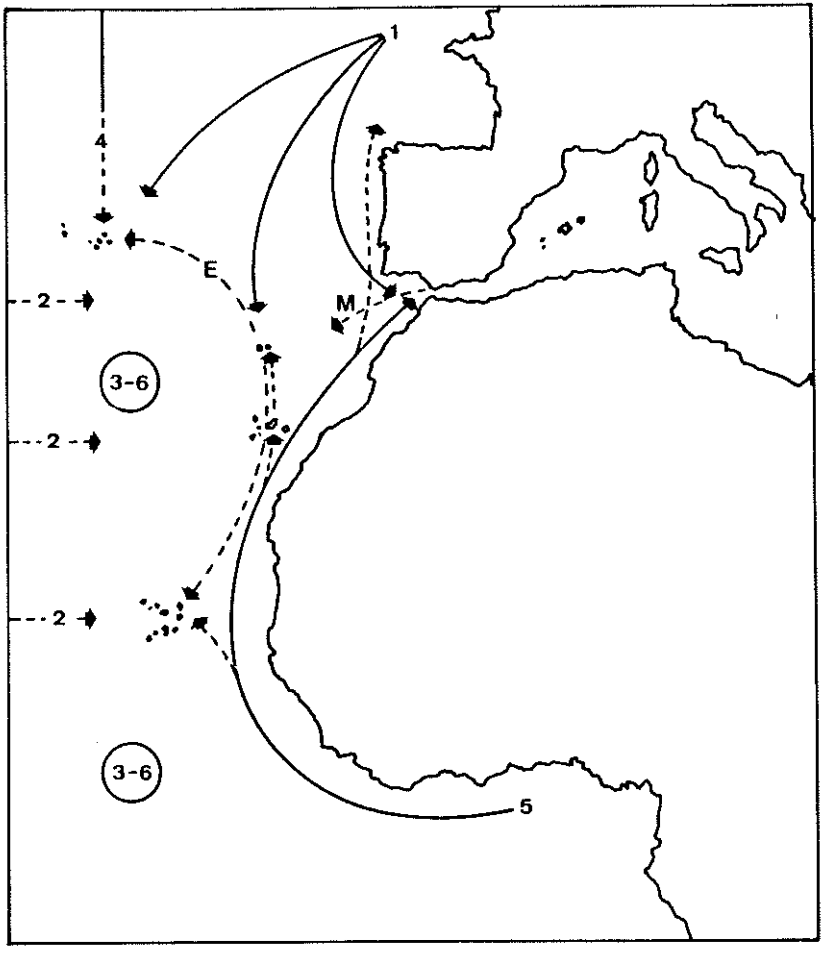

Fig. 7.- Distribution model for the species inhabiting in the ichthyofaunistic transition area known as Macaronesia. Origin faunae: 1 and M) Atlanto-Mediterranean; 2) Amphiatlantic; 3-6) Circumglobal and Cosmopolite; 4) Boreal; 5) Equato-Guinean; E) Endemic. Continuous trace is used for dominant faunae.

MAURIN (1968a and b) and CASANOVA (1977) suggest four: the Biscaian, comprising the area of the Bay of Biscay with a dominant settlement of boreal nature; the Ibero-Moroccan, including the domain between the former and the Canary Islands and where part of the Macaronesian unit would be included, dominated by subtropical populations; the Saharian, bounded by Cape Juby and Cape Blanco off the African coast, with a mixture of amphiatlantic, tropical and some reduct boreal species and, finally, the Mediterranean Province, comprising the entire Mediterranean Sea, with Atlantic settlements, endemisms and Lessepsian species. Left apart are the Cape Verde Islands, which should be placed in what would be the Guinean Region.

Of all the existing proposals, that of EKMAN (1953) is the closest to the obtained results, although, as this author accepts only the Lusitanian and Mauritanian Provinces, he ignores some of the peculiarities proposed before (north and south limits not well defined, mediterranean implications, etc.).

The proposal by BRIGGS (1974) is to be immediately refused because it considers the whole settlement in a single Province, the Lusitanian one, which, although being of relative importance, it does not consider the ichthyofauna spread from southern latitudes.

The model provided by MAURIN (*op. cit.* and CASANOVA (*op. cit.*), is the one which fits the results of the analysis of the present study best. The divisions imposed, however, having the same hierarchical rank (Saharian, Ibero-Moroccan, and Biscaian Provinces), conform, in fact, the "branches" formed by littoral species associated to the continental shelf, to species of open waters (pelagic) or to deep water species, where organisms of Atlantic or Indopacific origin can be present, but having no influence in the importance provided by the ichthyofaunas of northern latitudes or of southern origin.

Finally, from the ichthyological point of view it can be inferred that the cluster of Macaronesian archipelagos does not constitute a biogeographical unit *sensu stricto*, and consequently it could never reach the rank of Region, Subregion or Province.

It is, in fact, a segment or faunistic transition zone where organisms of diverse source meet (amphiatlantic, cosmopolitan, circumglobal), having a clear component of durable species of northern origin (Atlanto-Mediterranean) and others of meridional origin (Equato-Guinean) (fig. 7), which leads to the suggestion and conclusion, for the Atlantic ocean, to accept the hierarchic ranking indicated in figure 8.

According to De LATTIN (1967), for the higher hierarchy level the denomination of Septentrional (Northern) Kingdom has been used, as general container of the species present in the northern Hemisphere.

This division agrees, in part, with the distribution or kingdom proposed by ILLIES (1971, in: MULLER, 1979), Holarctic, with Amphinotic influences (species of Indopacific origin), o with that of MULLER (1973, *in*: MULLER, 1979), Holarctic, with Neotropi-

cal affording (Amphiatlantic species).

The Atlanto-Boreal Region delimits the North-Atlantic part which contributes with part of the individuals included in the Macaronesian complex (62). It contains the continental shelf species of the Northeast Atlantic which belong to the following higher level, the Atlanto-Mediterranean Province, which again includes those individuals entering in the Mediterranean Sea or spreading from it, providing globally a total number of 248 forms (27.2%) together with the species supposedly endemics.

This populational cluster, side by side with that of Equato-Guinean origin, incises mainly in the Madeira archipelago, with a total number of 124 species (15.7%) not shared with the rest of the islands. This fact characterises the area as insular geographical centre of lower rank (Madeiran District) involving, mainly Madeira and the Canaries, and partly the Azores. We decided not to name this District Macaronesian in order to avoid misunderstanding when referring to the global group of the islands and African Site.

The littoral or shelf fraction of the African Site has the same conditions with 121 species (15.3%), and has been lowered of rank (from Province to District), but the old known term has been kept (Saharian District).

BLACHE (1962), leaving apart the supposed local districts, places the southern limit for the Equato-Guinean Province in Moçamedes (15° S). The species found in the Macaronesian framework forming the northern littoral limit of this Province are 268 (29.4%) of a total number of 913. Nevertheless, LLORIS (1986) places the southern fluctuacting boundary of this Province between the parallels 20° and 24° S, where the Benguela Province commences with a clearly differenciated ichthyofauna. Thus, the species above mentioned come from a more southern area than indicated by BLACHE (1962).

Finally, the Cape Verde archipelago conforms another "branch" of the Equato-Guinean Province, with some connection with the Madeira District. However, its identity is either included in a district associated to the fauna of the neighbouring continental shelf or assume a new one with own characters.

ADDENDUM

Since the termination of the present work, fresh information has come to hand which, though not so relevant as to affect or modify its conclusions, has to be taken into account mainly to help in the completion of the catalogue of the species inhabiting the studied region.

SMITH (1990) included the binomen *Paraconger macrops* (GÜNTHER, 1870) as a synonym of *Paraconger notialis* KANAZAWA, 1961, giving as geographical distribution for this species the coast of Africa, from Senegal to Angola.

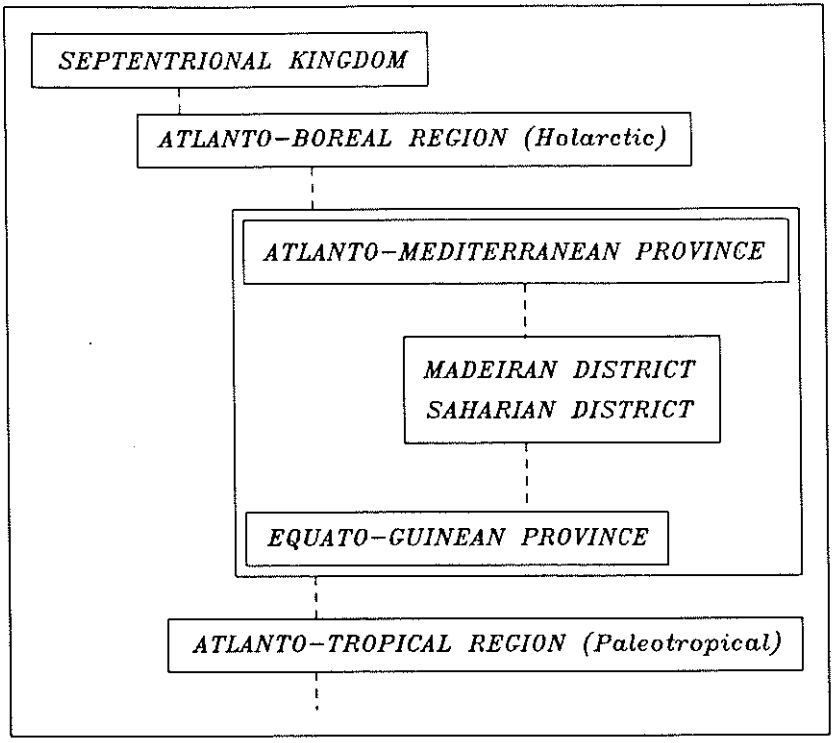

Fig. 8.-New hierarchical proposal of biogeographic levels for the studied area.

The species *Paralepsis harryi* MAUL, 1954 was a misidentification (POST, 1987) and turned out to be the adult, sexually ripe of *Paralepsis brevirostris* (PARR, 1928).

Thus, *Himantolophus mauli*, a species with amphiatlantic features, described by BERTELSEN & KREFFT (1988) has to be added to the final list (Apendix). *Laemonema curtipes*, only cited for the Seine Bank (BISCOITO & MAUL, 1989), is another species not listed which has to be included. The same happens with *Symphurus reticulatus*, cited by MUNROE (1990), from Madeira to Saint Helena.

The question stablished for *Caranx birpex* and *Carapus cuspis*, considered as endemic, seems to be solved with the study of MARKLE & OLNEY (1990), which confirm its synonymy with the binomen *Carapus acus*.

Likewise, we could find out that Dr. PETER WIRTZ is finishing a list of fishes of the Azores which, together with that being prepared by BISCOITO & MAUL for Madeira, would probably upgrade or concretize the actual knowledge on the ichthyofauna of both archipelagos.

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APPENDIX

General list, in alphabetical order, of all the species cited in the geographical framework of the Macaronesia. The name localities columns are abreviated: AZO = Azores Islands; MAD = Madeira Islands; CAN = Canary Islands; AFR = African Site; CAV = Cape Verde Islands; 000 is used as species not cited in the column locality; "In the area" is used for species quoted without precise locality. On the most right edge are shown some extra indications: E = Endemic for the area; CP = Chondrichthyes Pleurotremata; CH = Chondrichthyes Hypotremata; C = Chondrichthyes Holocephali; the figures in that rightmost column refer only to the species "in the area".

SPECIES	LOCALITIES					
001 *Ablennes hians*	000	000	000	CAV	000	
002 *Abudefduf luridus*	AZO	MAD	CAN	CAV	000	E
003 *Acanthochaenus lutkeni*	AZO	000	000	000	000	
004 *Acanthocybium solandri*	AZO	MAD	000	CAV	000	
005 *Acantholabrus palloni*	AZO	MAD	CAN	000	000	
006 *Acanthostracion notacanthus*	AZO	000	000	000	000	
007 *Acanthurus monroviae*	000	000	000	CAV	AFR	
008 *Aetobatus narinari*	000	000	000	CAV	000	CH
009 *Ahliesaurus berryi*	In the area ----------					1
010 *Aldrovandia affinis*	000	MAD	CAN	000	000	
011 *Aldrovandia phalacra*	AZO	000	CAN	CAV	000	
012 *Alectis alexandrinus*	000	000	000	000	AFR	
013 *Alepisaurus ferox*	AZO	MAD	CAN	000	000	
014 *Alepocephalus australis*	000	000	CAN	000	AFR	
015 *Alepocephalus bairdii*	000	MAD	000	000	AFR	
016 *Alepocephalus rostratus*	000	000	000	CAV	AFR	
017 *Alopias superciliosus*	000	MAD	000	000	AFR	CP
018 *Alosa alosa*	000	000	CAN	000	AFR	
019 *Aluterus scriptus*	000	000	CAN	000	000	
020 *Anarchias euryurus*	AZO	MAD	000	CAV	000	
021 *Anguilla anguilla*	AZO	MAD	CAN	000	AFR	
022 *Anoplogaster cornuta*	000	MAD	000	000	000	
023 *Anotopterus pharao*	In the area ----------					2
024 *Antennarius nummifer*	AZO	MAD	CAN	000	000	
025 *Antennarius radiosus*	000	MAD	000	000	000	
026 *Antennarius senegalensis*	000	000	000	000	AFR	
027 *Anthias anthias*	AZO	MAD	CAN	000	AFR	
028 *Antigonia capros*	AZO	MAD	CAN	000	AFR	
029 *Antonogadus megalokynodon*	000	MAD	000	000	AFR	

030 *Aphanopus carbo*	AZO	MAD	CAN	CAV	000	
031 *Aphyonus gelatinosus*	AZO	000	000	000	000	
032 *Apletodon pellegrini*	000	MAD	CAN	CAV	000	
033 *Apogon imberbis*	AZO	MAD	CAN	000	AFR	
034 *Apristurus laurussonii*	000	000	CAN	000	000	CP
035 *Apristurus maderensis*	000	MAD	000	000	000	CP
036 *Apterichthus anguiformis*	000	000	000	CAV	AFR	
037 *Apterichthus caecus*	AZO	000	000	000	AFR	
038 *Argentina sphyraena*	000	000	000	000	AFR	
039 *Argyripnus atlanticus*	000	MAD	CAN	000	000	
040 *Argyropelecus aculeatus*	AZO	MAD	000	000	000	
041 *Argyropelecus affinis*	AZO	MAD	000	000	000	
042 *Argyropelecus gigas*	In the area ----------					3
043 *Argyropelecus hemigymnus*	000	000	000	000	AFR	
044 *Argyropelecus olfersi*	In the area ----------					4
045 *Argyrosomus regius*	000	000	CAN	000	AFR	
046 *Ariosoma balearicum*	In the area ----------					5
047 *Aristostomias grimaldii*	In the area ----------					6
048 *Aristostomias lunifer*	000	MAD	CAN	000	000	
049 *Aristostomias tittmanni*	AZO	000	000	000	000	
050 *Arius heudeloti*	000	000	000	000	AFR	
051 *Arnoglossus blachei*	000	000	000	000	AFR	
052 *Arnoglossus laterna*	000	000	000	000	AFR	
053 *Arnoglossus imperialis*	AZO	MAD	CAN	000	AFR	
054 *Arnoglossus rueppelli*	000	000	000	000	AFR	
055 *Arnoglossus thori*	000	000	CAN	000	AFR	
056 *Aspitrigla cuculus*	AZO	MAD	000	000	AFR	
057 *Aspitrigla obscura*	AZO	MAD	CAN	000	AFR	
058 *Astronesthes cyclophotus*	000	MAD	CAN	000	000	
059 *Astronesthes gemmifer*	AZO	MAD	CAN	000	000	
060 *Astronesthes indicus*	000	MAD	CAN	000	000	
061 *Astronesthes leucopogon*	000	MAD	CAN	000	000	
062 *Astronesthes macropogon*	000	MAD	000	000	000	
063 *Astronesthes micropogon*	000	MAD	CAN	000	000	
064 *Astronesthes neopogon*	000	MAD	CAN	000	000	
065 *Astronesthes niger*	AZO	000	000	000	000	
066 *Atherina boyeri*	000	MAD	CAN	000	AFR	
067 *Atherina hepsetus*	000	MAD	CAN	000	AFR	
068 *Atherina lopeziana*	000	000	CAN	000	000	
069 *Atherina presbyter*	000	MAD	CAN	000	AFR	
070 *Atractoscion aequidens*	000	000	CAN	000	000	
071 *Aulopus filamentosus*	000	MAD	CAN	CAV	AFR	
072 *Aulostomus strigosus*	000	MAD	CAN	000	000	

073 *Auxis rochei*	AZO	MAD	CAN	000	AFR
074 *Avocettina infans*	In the area ---------- 7				
075 *Bajacalifornia megalops*	AZO	000	000	000	000
076 *Balistes carolinensis*	AZO	MAD	CAN	CAV	AFR
077 *Balistes punctatus*	000	MAD	CAN	CAV	AFR
078 *Balistes vetula*	AZO	000	000	000	000
079 *Barathrites iris*	In the area ---------- 8				
080 *Barbantus curvifrons*	000	MAD	000	000	000
081 *Bathophilus digitatus*	000	MAD	000	000	000
082 *Bathophilus vaillanti*	AZO	MAD	000	000	AFR
083 *Bathygadus favosus*	000	MAD	000	000	AFR
084 *Bathygadus melanobranchus*	In the area ---------- 9				
085 *Bathylaco nigricans*	AZO	MAD	000	000	000
086 *Bathylagus berycoides*	000	MAD	CAN	000	000
087 *Bathylagus greyae*	000	MAD	000	000	000
088 *Bathylagus longirostris*	000	MAD	000	000	000
089 *Bathylychnops exilis*	In the area ---------- 10				
090 *Bathymicrops regis*	000	MAD	000	000	000
091 *Bathyonus laticeps*	000	MAD	000	CAV	000
092 *Bathyprion danae*	000	MAD	000	000	000
093 *Bathypterois dubius*	In the area ---------- 11				
094 *Bathypterois phenax*	In the area ---------- 12				
095 *Bathypterois grallator*	In the area ---------- 13				
096 *Bathypterois longipes*	AZO	MAD	000	000	000
097 *Bathysaurus ferox*	AZO	000	000	000	000
098 *Bathysaurus mollis*	AZO	MAD	000	CAV	000
099 *Bathysolea profundicola*	000	000	000	000	AFR
100 *Bathytroctes microlepis*	AZO	MAD	000	000	AFR
101 *Bathytyphlops sewelli*	AZO	000	CAN	000	000
102 *Bellocia koefoedi*	000	000	000	000	AFR
103 *Bellottia apoda*	000	MAD	000	000	000
104 *Belone belone gracilis*	AZO	MAD	CAN	000	AFR
105 *Benthalbella infans*	In the area ---------- 14				
106 *Benthocometes robustus*	000	000	000	000	AFR
107 *Benthodesmus elongatus s.*	000	MAD	CAN	000	000
108 *Benthosema glaciale*	000	000	000	CAV	AFR
109 *Benthosema suborbitale*	000	MAD	000	000	AFR
110 *Beryx decadactylus*	AZO	MAD	000	000	AFR
111 *Beryx splendens*	AZO	MAD	CAN	000	AFR
112 *Blennius normanni*	000	000	000	000	AFR
113 *Bodianus speciosus*	000	MAD	CAN	CAV	AFR
114 *Bolinichthys indicus*	000	MAD	CAN	000	000
115 *Bonapartia pedaliota*	AZO	MAD	000	000	000

116 *Boops boops*	AZO	MAD	CAN	CAV	AFR	
117 *Borostomias elucens*	000	MAD	000	000	000	
118 *Borostomias mononema*	000	MAD	CAN	000	000	
119 *Bothus podas maderensis*	000	MAD	CAN	000	000	E
120 *Bothus podas podas*	000	000	000	000	AFR	
121 *Brachydeuterus auritus*	000	000	000	000	AFR	
122 *Brama brama*	AZO	MAD	CAN	CAV	AFR	
123 Bregmaceros sp.	000	MAD	000	000	000	E
124 *Brotulotaenia crassa*	000	MAD	000	CAV	000	
125 *Brotulotaenia nigra*	000	MAD	000	000	000	
126 *Callanthias ruber*	AZO	MAD	CAN	000	AFR	
127 *Callionymus lyra*	AZO	000	CAN	000	AFR	
128 *Callionymus maculatus*	000	000	000	000	AFR	
129 *Campogramma glaycos*	000	MAD	CAN	000	AFR	
130 *Canthigaster rostrata*	000	MAD	CAN	000	000	
131 *Capros aper*	AZO	MAD	CAN	000	AFR	
132 *Caranx hippos*	000	MAD	000	000	AFR	
133 *Caranx latus*	000	MAD	000	000	000	
134 *Caranx lugubris*	AZO	000	000	000	000	
135 *Caranx rhonchus*	000	000	CAN	000	AFR	
136 *Carapus birpex*	000	MAD	000	000	000	E
137 *Carapus cuspis*	000	MAD	000	000	000	E
138 *Carcharhinus brevipinna*	000	000	000	CAV	AFR	CP
139 *Carcharhinus falciformis*	000	MAD	CAN	000	000	CP
140 *Carcharhinus galapagensis*	000	000	000	CAV	000	CP
141 *Carcharhinus isodon*	000	MAD	CAN	000	000	CP
142 *Carcharhinus limbatus*	000	MAD	CAN	000	AFR	CP
143 *Carcharhinus longimanus*	AZO	MAD	CAN	CAV	AFR	CP
144 *Carcharhinus obscurus*	000	MAD	CAN	CAV	AFR	CP
145 *Carcharhinus plumbeus*	000	MAD	000	CAV	AFR	CP
146 *Carcharodon carcharias*	000	MAD	CAN	000	000	CP
147 *Caristius maderensis*	000	MAD	000	000	000	E
148 *Caulophryne jordani*	000	MAD	000	000	000	
149 *Caulophryne polynema*	AZO	000	000	000	000	
150 *Centracanthus cirrus*	AZO	MAD	CAN	000	AFR	
151 *Centrobranchus nigroocellatus*	In the area ----------					15
152 *Centrodraco acanthopoma*	000	MAD	000	000	AFR	
153 *Centrolabrus trutta*	AZO	MAD	CAN	CAV	000	
154 *Centrolophus niger*	AZO	MAD	CAN	000	000	
155 *Centrophorus granulosus*	000	MAD	CAN	000	AFR	CP
156 *Centrophorus lusitanicus*	000	000	000	000	AFR	CP
157 *Centrophorus machiquensis*	000	MAD	000	000	000	E-CP
158 *Centrophorus squamosus*	AZO	MAD	000	000	AFR	CP

159 Centrophorus uyato	In the area ----------					16-CP
160 *Centrophryne spinulosa*	In the area ----------					17
161 *Centroscymnus coelolepis*	AZO	MAD	000	000	AFR	CP
162 *Centroscymnus crepidater*	000	MAD	000	000	AFR	CP
163 *Centroscymnus cryptacanthus*	000	MAD	000	000	000	CP
164 *Cephalopholis taeniops*	000	000	000	000	AFR	
165 *Cepola macrophthalma*	000	000	CAN	000	AFR	
166 *Ceratoscopelus maderensis*	000	MAD	CAN	000	AFR	
167 *Ceratoscopelus warmingii*	AZO	MAD	000	000	000	
168 *Cetomimus hempeli*	000	MAD	CAN	000	000	E
169 *Cetonurus globiceps*	AZO	MAD	CAN	000	AFR	
170 *Cetorhinus maximus*	AZO	000	000	000	000	CP
171 *Cetostoma regani*	In the area ----------					18
172 *Chaenophryne draco*	000	MAD	000	000	000	
173 *Chaenophryne longiceps*	In the area ----------					19
174 *Chaetodipterus goreensis*	000	000	000	CAV	000	
175 *Chaetodon hoefleri*	000	000	000	000	AFR	
176 *Chalinura brevibarbis*	In the area ----------					20
177 *Chalinura mediterranea*	AZO	000	000	000	000	
178 *Chalinura profundicola*	000	MAD	CAN	000	000	
179 *Channomuraena vittata*	000	000	000	CAV	000	
180 *Chauliodus danae*	In the area ----------					21
181 *Chauliodus sloani*	000	000	000	000	AFR	
182 *Chaunax pictus*	AZO	MAD	000	000	AFR	
183 *Cheilopogon exiliens*	AZO	MAD	CAN	CAV	AFR	
184 *Cheilopogon furcatus*	000	000	000	CAV	000	
185 *Cheilopogon pinnatibarbatus*	AZO	MAD	CAN	CAV	AFR	
186 *Chelidoperca africana*	000	000	000	000	AFR	
187 *Chelon bispinosus*	000	000	000	CAV	000	
188 *Chelon labrosus*	AZO	MAD	CAN	CAV	AFR	
189 *Chiasmodon niger*	AZO	MAD	000	000	000	
190 *Chilomycterus atringa*	000	MAD	CAN	000	AFR	
191 *Chimaera monstrosa*	AZO	MAD	000	000	AFR	C
192 *Chirostomias pliopterus*	In the area ----------					22
193 *Chlamydoselachus anguineus*	000	MAD	000	000	000	CP
194 *Chlopsis bicolor*	000	000	000	000	AFR	
195 *Chlorophthalmus agassizi*	000	000	000	000	AFR	
196 *Chromis chromis*	AZO	MAD	CAN	CAV	AFR	
197 *Chromis limbatus*	000	MAD	CAN	CAV	AFR	
198 *Chromis lineatus*	000	000	000	CAV	000	
199 *Citharichthys stampflii*	000	000	000	000	AFR	
200 *Citharus linguatula*	000	000	000	000	AFR	
201 *Coccorella atlantica*	AZO	MAD	000	000	000	

202 *Coelorhynchus coelorhynchus*	000	000	CAN	CAV	AFR	
203 *Coelorhynchus occa*	000	000	000	CAV	AFR	
204 *Conger conger*	000	000	CAN	000	AFR	
205 *Conocara macroptera*	AZO	000	CAN	000	000	
206 *Conocara microlepis*	In the area ---------- 23					
207 *Conocara murrayi*	AZO	MAD	CAN	000	AFR	
208 *Conocara salmonea*	000	000	000	CAV	000	
209 *Coris julis*	AZO	MAD	CAN	000	AFR	
210 *Coryphaena equiselis*	AZO	MAD	CAN	CAV	AFR	
211 *Coryphaena hippurus*	AZO	MAD	CAN	CAV	AFR	
212 *Coryphaenoides guentheri*	000	000	CAN	000	000	
213 *Coryphaenoides macrocephalus*	000	MAD	000	000	000	
214 *Coryphaenoides thelestomus*	000	MAD	000	000	000	E
215 *Coryphaenoides zaniophorus*	000	MAD	CAN	000	AFR	
216 *Coryphoblennius galerita*	000	MAD	CAN	000	AFR	
217 *Cottunculus thomsonii*	000	000	000	000	AFR	
218 *Cryptopsaras couesi*	AZO	MAD	000	000	000	
219 *Ctenolabrus rupestris*	000	000	000	000	AFR	
220 *Ctenochirichthys longimanus*	000	MAD	000	000	000	
221 *Ctenoscopelus phengodes*	AZO	000	000	000	000	
222 *Cubiceps gracilis*	AZO	MAD	000	CAV	000	
223 *Cyclothone acclinidens*	In the area ---------- 24					
224 *Cyclothone alba*	In the area ---------- 25					
225 *Cyclothone braueri*	In the area ---------- 26					
226 *Cyclothone livida*	In the area ---------- 27					
227 *Cyclothone microdon*	In the area ---------- 28					
228 *Cyclothone pallida*	In the area ---------- 29					
229 *Cyclothone pseudopallida*	In the area ---------- 30					
230 *Cyclothone obscura*	In the area ---------- 31					
231 *Cyema atrum*	AZO	MAD	000	000	000	
232 *Cynoglossus browni*	000	000	000	CAV	000	
233 *Cynoglossus cadenati*	000	000	000	CAV	000	
234 *Cynoglossus canariensis*	000	000	CAN	CAV	000	
235 *Cynoponticus ferox*	000	000	000	000	AFR	
236 *Cypselurus melanurus*	000	000	000	CAV	000	
237 *Cyttopsis roseus*	000	MAD	000	000	AFR	
238 *Dactylopterus volitans*	AZO	MAD	CAN	CAV	AFR	
239 *Dalatias licha*	AZO	MAD	000	000	AFR	CP
240 *Dalophis imberbis*	000	000	000	000	AFR	
241 *Dasyatis centroura*	000	MAD	CAN	CAV	AFR	CH
242 *Dasyatis pastinaca*	AZO	MAD	CAN	CAV	AFR	CH
243 *Deania mauli*	000	MAD	000	000	000	CP
244 *Deania calceus*	In the area ---------- 32-CP					

245 *Decapterus macarellus*	AZO	MAD	000	000	000	
246 *Decapterus punctatus*	000	MAD	CAN	CAV	AFR	
247 *Deltentosteus quadrimaculatus*	000	000	000	000	AFR	
248 *Dentex angolensis*	000	000	000	000	AFR	
249 *Dentex canariensis*	000	000	CAN	000	AFR	
250 *Dentex dentex*	000	MAD	CAN	000	AFR	
251 *Dentex gibbosus*	000	000	CAN	000	AFR	
252 *Dentex macrophthalmus*	000	000	CAN	CAV	AFR	
253 *Dentex maroccanus*	000	000	000	000	AFR	
254 *Diaphus adenomus*	000	000	000	000	AFR	
255 *Diaphus bertelseni*	000	MAD	000	000	000	
256 *Diaphus brachycephalus*	000	MAD	000	000	000	
257 *Diaphus dumerilii*	000	MAD	000	000	000	
258 *Diaphus effulgens*	000	MAD	000	000	000	
259 *Diaphus holti*	In the area ----------					33
260 *Diaphus lucidus*	000	MAD	000	000	000	
261 *Diaphus metopoclampus*	In the area ----------					34
262 *Diaphus mollis*	000	MAD	CAN	000	000	
263 *Diaphus rafinesquei*	000	000	CAN	000	000	
264 *Diaphus subtilis*	000	MAD	000	000	000	
265 *Diaphus termophilus*	000	000	CAN	CAV	000	
266 *Dicentrarchus labrax*	000	000	CAN	000	AFR	
267 *Dicentrarchus punctatus*	000	000	CAN	000	AFR	
268 *Dicologoglossa cuneata*	000	000	000	000	AFR	
269 *Dicologoglossa hexophthalma*	000	MAD	CAN	000	AFR	
270 *Diodon hystrix*	000	MAD	000	000	AFR	
271 *Diogenichthys atlanticus*	000	000	CAN	000	AFR	
272 *Diplecogaster bimaculata p.*	AZO	000	CAN	CAV	000	E
273 *Diplecogaster ctenocrypta*	000	000	CAN	000	000	
274 *Diplodus annularis*	000	MAD	CAN	000	000	
275 *Diplodus bellottii*	000	000	000	CAV	AFR	
276 *Diplodus cervinus*	000	MAD	CAN	CAV	AFR	
277 *Diplodus fasciatus*	000	000	000	CAV	000	
278 *Diplodus puntazzo*	000	000	CAN	CAV	AFR	
279 *Diplodus sargus cadenati*	000	MAD	CAN	CAV	AFR	
280 *Diplodus prayensis*	000	000	000	CAV	000	
281 *Diplodus vulgaris*	000	MAD	CAN	000	AFR	
282 *Diplophos maderensis*	000	MAD	000	000	000	
283 *Diplophos taenia*	000	MAD	000	000	AFR	
284 *Diplospinus multristiatus*	000	MAD	000	000	000	
285 *Diretmoides parini*	000	MAD	000	000	AFR	
286 *Diretmoides pauciradiatus*	000	MAD	000	000	000	
287 *Diretmus argenteus*	In the area ----------					35

288 *Dolichopteryx longipes*	In the area ----------					36
289 *Dolopichthys danae*	000	MAD	000	000	000	
290 *Dolopichthys jubatus*	000	MAD	000	000	000	
291 *Drepane luna*	000	000	000	CAV	000	
292 *Dysomma brevirostre*	000	MAD	000	000	000	
293 *Echelus myrus*	000	000	CAN	000	AFR	
294 *Echelus pachyrhynchus*	000	000	000	000	AFR	
295 *Echidna peli*	000	000	000	CAV	000	
296 *Echiichthys vipera*	000	MAD	CAN	000	AFR	
297 *Echinomacrurus mollis*	In the area ----------					37
298 *Echinorhinus brucus*	In the area ----------					38-CP
299 *Echiostoma barbatum*	000	MAD	000	000	000	
300 *Einara edentula*	AZO	MAD	000	000	AFR	
301 *Einara macrolepis*	000	MAD	000	000	000	
302 *Electrona rissoi*	In the area ----------					39
303 *Enchelycore anatina*	AZO	MAD	CAN	CAV	000	
304 *Enchelycore nigricans*	000	000	000	CAV	000	
305 *Engraulis encrasicholus*	000	000	CAN	000	AFR	
306 *Entelurus aequoraeus*	AZO	000	000	000	000	
307 *Ephippion guttiferum*	000	000	CAN	CAV	AFR	
308 *Epigonus constanciae*	000	MAD	000	000	000	
309 *Epigonus denticulatus*	000	000	000	000	AFR	
310 *Epigonus telescopus*	000	MAD	CAN	000	AFR	
311 *Epinephelus aeneus*	000	MAD	000	000	AFR	
312 *Epinephelus alexandrinus*	000	000	CAN	000	AFR	
313 *Epinephelus caninus*	000	000	CAN	000	AFR	
314 *Epinephelus goreensis*	000	000	000	CAV	000	
315 *Epinephelus guaza*	AZO	MAD	CAN	CAV	AFR	
316 *Erythrocles monodi*	000	000	CAN	CAV	000	
317 *Etmopterus pusillus*	AZO	MAD	000	000	AFR	CP
318 *Etmopterus spinax*	In the area ----------					40-CP
319 *Eugomphodus taurus*	000	000	CAN	CAV	AFR	CP
320 *Eurypharynx pelecanoides*	000	MAD	000	000	000	
321 *Eustomias filifer*	000	MAD	000	000	AFR	
322 *Eustomias furcifer*	AZO	000	000	000	000	
323 *Eustomias macronema*	In the area ----------					41
324 *Eustomias longibarba*	000	MAD	000	000	000	
325 *Eustomias obscurus*	AZO	MAD	000	000	000	
326 *Eustomias schmidti*	In the area ----------					42
327 *Eustomias simplex*	In the area ----------					43
328 *Eustomias tetranema*	AZO	MAD	CAN	000	000	
329 *Eutaeniophorus festivus*	000	MAD	000	000	000	
330 *Euthynnus alleteratus*	In the area ----------					44

331 *Eutrigla gurnardus*	AZO	MAD	000	000	000	
332 *Evermannella balbo*	000	MAD	000	000	000	
333 *Evermannella indica*	In the area ----------					45
334 *Exocoetus obtusirostris*	AZO	MAD	CAN	CAV	AFR	
335 *Exocoetus volitans*	AZO	MAD	CAN	000	000	
336 *Facciolella oxyrhyncha*	000	MAD	000	000	AFR	
337 *Fistularia tabacaria*	000	000	000	CAV	000	
338 *Fistularia petimba*	000	000	000	CAV	000	
339 *Flagellostomias boureei*	AZO	000	000	000	000	
340 *Gadella maraldi*	000	MAD	000	000	AFR	
341 *Gadiculus argenteus a.*	000	000	000	000	AFR	
342 *Gadomus arcuatus*	000	000	CAN	000	AFR	
343 *Gadomus dispar*	000	000	000	000	AFR	
344 *Gadomus longifilis*	AZO	MAD	CAN	000	AFR	
345 *Gaidropsarus granti*	AZO	000	CAN	000	000	E
346 *Gaidropsarus guttatus*	AZO	MAD	CAN	000	000	E
347 *Galeocerdo cuvieri*	000	MAD	CAN	000	000	CP
348 *Galeoides decadactylus*	000	000	000	000	AFR	CP
349 *Galeorhinus galeus*	000	MAD	CAN	000	AFR	CP
350 *Galeus melastomus*	000	000	000	000	AFR	CP
351 *Gempylus serpens*	AZO	000	CAN	000	000	
352 *Gephyroberyx darwini*	000	MAD	CAN	CAV	AFR	
353 *Ginglymostoma cirratum*	000	000	000	CAV	AFR	CP
354 *Girella zonata*	000	000	CAN	CAV	000	
355 *Glossanodon leioglossus*	000	000	CAN	000	AFR	
356 *Gnathophis codoniphorus*	AZO	MAD	000	000	000	E
357 *Gnathophis mystax*	000	MAD	CAN	000	AFR	
358 *Gobius auratus*	000	MAD	CAN	000	000	
359 *Gobius cobitis*	000	000	000	000	AFR	
360 *Gobius cruentatus*	000	000	000	000	AFR	
361 *Gobius fallax*	000	000	CAN	000	000	
362 *Gobius gasteveni*	000	MAD	CAN	000	000	
363 *Gobius niger*	000	000	CAN	000	AFR	
364 *Gobius paganellus*	AZO	MAD	CAN	000	AFR	
365 *Gonichthys coccoi*	000	MAD	000	000	000	
366 *Gonostoma atlanticum*	In the area ----------					46
367 *Gonostoma bathyphilum*	In the area ----------					47
368 *Gonostoma denudatum*	In the area ----------					48
369 *Gonostoma elongatum*	In the area ----------					49
370 *Grammatostomias circularis*	000	MAD	000	000	000	
371 *Grammicolepis brachiusculus*	000	000	000	000	AFR	
372 *Guentherus altivela*	000	000	000	000	AFR	
373 *Gymnammodytes cicerelus*	000	000	000	000	AFR	

374 *Gymnothorax maderensis*	000	MAD	CAN	000	000	E
375 *Gymnothorax polygonius*	000	MAD	000	000	000	
376 *Gymnothorax unicolor*	AZO	MAD	CAN	CAV	AFR	
377 *Gymnothorax vicinus*	000	MAD	CAN	CAV	000	
378 *Gymnura altavela*	000	MAD	CAN	000	AFR	CH
379 *Halargyreus johnsonii*	000	MAD	000	000	AFR	
380 *Halobatrachus didactylus*	000	MAD	000	000	AFR	
381 *Halosaurus johnsonianus*	AZO	000	CAN	000	AFR	
382 *Halosaurus ovenii*	AZO	MAD	CAN	000	000	
383 *Haplophryne mollis*	AZO	MAD	000	000	000	
384 *Harriotta raleighana*	000	000	CAN	000	000	C
385 *Haulosauropsis macrochir*	In the area ----------					50
386 *Helicolenus dactylopterus*	AZO	MAD	CAN	000	AFR	
387 *Hemiramphus balao*	000	000	CAN	000	000	
388 *Hemiramphus brasiliensis*	000	000	000	CAV	000	
389 *Heptranchias perlo*	000	000	000	000	AFR	CP
390 *Heteromycteris proboscideus*	000	000	000	000	AFR	
391 *Hexanchus griseus*	000	000	000	000	AFR	CP
392 *Himantolophus albinares*	000	MAD	000	000	000	E
393 *Himantolophus compressus*	000	MAD	000	000	000	
394 *Himantolophus groenlandicus*	AZO	MAD	000	000	000	
395 *Hippocampus hippocampus*	000	000	CAN	000	AFR	
396 *Hippocampus ramulosus*	AZO	MAD	CAN	000	AFR	
397 *Hirundichthys rondeletii*	In the area ----------					51
398 *Hirundichthys speculiger*	000	000	CAN	CAV	AFR	
399 *Histiobranchus bathybius*	AZO	000	000	000	000	
400 *Histrio histrio*	AZO	000	000	000	000	
401 *Holcomycteronus squamosus*	AZO	MAD	CAN	000	000	
402 *Holtbyrnia macrops*	AZO	MAD	CAN	000	000	
403 *Hoplostethus atlanticus*	AZO	000	000	000	AFR	
404 *Hoplostethus cadenati*	000	000	000	000	AFR	
405 *Hoplostethus mediterraneus*	000	MAD	000	000	AFR	
406 *Howella sherborni*	000	MAD	000	000	000	
407 *Hygophum benoiti*	000	000	CAN	000	AFR	
408 *Hygophum hygomii*	000	000	CAN	000	000	
409 *Hygophum reinhardtii*	000	000	CAN	000	AFR	
410 *Hygophum taaningi*	000	MAD	000	000	000	
411 *Hymenocephalus gracilis*	000	000	000	000	AFR	
412 *Hymenocephalus italicus*	000	000	000	000	AFR	
413 *Hyporhamphus picarti*	000	000	000	000	AFR	
414 *Ichthyococcus ovatus*	In the area ----------					52
415 *Idiacanthus fasciola*	In the area ----------					53
416 *Ijimaia loppei*	000	000	000	000	AFR	

417 *Ilyophis brunneus*	AZO	MAD	CAN	000	AFR	
418 *Istiophorus albicans*	In the area ---------- 54					
419 *Isurus oxyrinchus*	000	000	000	000	AFR	CP
420 *Isurus paucus*	000	000	000	000	AFR	CP
421 *Kali macrodon*	000	MAD	000	000	000	
422 *Kali macrura*	000	MAD	000	000	000	
423 *Katsuwonus pelamis*	In the area ---------- 55					
424 *Kyphosus incisor*	000	MAD	000	000	000	
425 *Kyphosus sectator*	000	MAD	000	000	000	
426 *Labrisomus nuchipinnis*	000	MAD	CAN	000	000	
427 *Labrus bergylta*	AZO	MAD	CAN	000	AFR	
428 *Labrus bimaculatus*	AZO	MAD	000	000	AFR	
429 *Labrus merula*	AZO	000	000	000	AFR	
430 *Laemonema laureysi*	000	000	000	000	AFR	
431 *Laemonema robustum*	000	MAD	000	000	000	E
432 *Laemonema yarrellii*	000	MAD	000	000	AFR	
433 *Lagocephalus laevigatus*	000	MAD	CAN	CAV	AFR	
434 *Lagocephalus lagocephalus*	AZO	MAD	000	000	000	
435 *Lamna nasus*	In the area ---------- 56-CP					
436 *Lampadena chavesi*	AZO	MAD	000	000	000	
437 *Lampadena speculigera*	000	MAD	000	000	000	
438 *Lampadena urophaos at.*	000	MAD	000	000	000	
439 *Lampanyctus alatus*	000	000	CAN	000	000	
440 *Lampanyctus ater*	000	000	CAN	CAV	000	
441 *Lampanyctus crocodilus*	In the area ---------- 57					
442 *Lampanyctus cuprarius*	000	MAD	CAN	000	000	
443 *Lampanyctus festivus*	000	MAD	CAN	000	000	
444 *Lampanyctus intricarius*	In the area ---------- 58					
445 *Lampanyctus lineatus*	000	MAD	CAN	000	000	
446 *Lampanyctus photonotus*	AZO	MAD	CAN	000	000	
447 *Lampanyctus pusillus*	000	MAD	CAN	000	000	
448 *Lampris guttatus*	000	MAD	CAN	000	000	
449 *Lappanella fasciata*	000	MAD	000	000	000	
450 *Lasiognathus saccostoma*	000	MAD	000	000	000	
451 *Lepadogaster candollei*	000	000	CAN	000	000	
452 *Lepadogaster lepadogaster p.*	000	000	CAN	000	AFR	
453 *Lepadogaster zebrina*	000	MAD	CAN	000	000	E
454 *Lepidion guentheri*	AZO	MAD	000	000	000	
455 *Lepidocybium flavobrunneum*	000	MAD	CAN	CAV	AFR	
456 *Lepidophanes gaussi*	000	000	CAN	000	000	
457 *Lepidophanes guentheri*	000	MAD	000	000	000	
458 *Lepidopus caudatus*	AZO	MAD	CAN	000	AFR	
459 *Lepidorhombus boscii*	000	000	000	000	AFR	

460 *Lepidorhombus whiffiagonis*	000	000	000	000	AFR	
461 *Lepidotrigla cavillone*	000	000	000	000	AFR	
462 *Lepidotrigla dieuzeidei*	000	000	000	000	AFR	
463 *Leptoderma macrops*	000	000	000	000	AFR	
464 *Leptoderma sp.*	AZO	000	000	000	000	
465 *Leptostomias gladiator*	In the area ----------					59
466 *Leptostomias haplocaulus*	In the area ----------					60
467 *Leptostomias longibarba*	In the area ----------					61
468 *Lestidiops affinis*	In the area ----------					62
469 *Lestidiops jayakari*	000	MAD	000	000	000	
470 *Lestidiops sphyrenoides*	In the area ----------					63
471 *Lesueurigobius heterofasciatus*	000	MAD	000	000	AFR	E
472 *Lesueurigobius sanzoi*	000	000	000	000	AFR	
473 *Lesueurigobius suerii*	000	000	CAN	000	AFR	
474 *Lethrinus atlanticus*	000	000	000	CAV	000	
475 *Leucobrotula adipata*	In the area ----------					64
476 *Lichia amia*	000	MAD	CAN	000	AFR	
477 *Linophryne brevibarbata*	000	MAD	000	000	000	
478 *Linophryne lucifera*	000	MAD	000	000	000	
479 *Linophryne macrorhinus*	000	MAD	000	000	000	
480 *Linophryne maderensis*	000	MAD	000	000	000	E
481 *Linophryne polypogon*	000	MAD	CAN	000	000	E
482 *Linophryne sexfilis*	000	MAD	000	000	000	E
483 *Lionurus carapinus*	In the area ----------					65
484 *Lipophrys pholis*	000	MAD	000	000	AFR	
485 *Lipophrys trigloides*	000	MAD	CAN	000	000	
486 *Lithognathus mormyrus*	000	000	CAN	CAV	AFR	
487 *Liza aurata*	AZO	MAD	CAN	CAV	AFR	
488 *Liza ramada*	AZO	MAD	000	CAV	AFR	
489 *Lobianchia dofleini*	000	000	CAN	000	000	
490 *Lobianchia gemellari*	000	000	CAN	000	AFR	
491 *Lobotes surinamensis*	AZO	MAD	CAN	000	AFR	
492 *Lophiodes kempi*	000	000	000	000	AFR	
493 *Lophius budegassa*	000	000	CAN	000	AFR	
494 *Lophius vaillanti*	000	000	CAN	CAV	AFR	
495 *Lophotus lacepedei*	000	MAD	CAN	000	000	
496 *Lowenia rara*	In the area ----------					66
497 *Luvarus imperialis*	AZO	MAD	000	000	000	
498 *Lycodontis afer*	000	000	000	CAV	AFR	
499 *Lyconus brachycolus*	000	MAD	000	000	000	
500 *Macroparalepis affinis*	000	000	CAN	000	000	
501 *Macroparalepis brevis*	In the area ----------					67
502 *Macroparalepis nigra*	000	MAD	000	000	000	E

503 *Macrorhamphosus gracilis*	000	MAD	000	CAV	AFR	
504 *Macrorhamphosus scolopax*	000	000	000	CAV	AFR	
505 *Macrostomias longibarbatus*	000	MAD	CAN	000	000	
506 *Makaira nigricans*	In the area ---------- 68					
507 *Malacocephalus laevis*	000	000	000	CAV	AFR	
508 *Malacosteus niger*	In the area ---------- 69					
509 *Manta birostris*	000	000	000	CAV	000	CH
510 *Margrethia obtusirostra*	In the area ---------- 70					
511 *Masturus lanceolatus*	AZO	000	000	000	000	
512 *Mauligobius maderensis*	000	MAD	CAN	000	000	E
513 *Maulisia argipalla*	000	MAD	000	000	000	
514 *Maulisia mauli*	000	MAD	000	000	000	
515 *Maurolicus muelleri*	AZO	000	000	000	AFR	
516 *Melamphaes longivelis*	000	MAD	000	000	000	
517 *Melamphaes microps*	In the area ---------- 71					
518 *Melamphaes simus*	In the area ---------- 72					
519 *Melamphaes suborbitalis*	000	MAD	000	000	000	
520 *Melamphaes typhlops*	000	MAD	000	000	000	
521 *Melanocetus johnsoni*	000	MAD	000	000	000	
522 *Melanocetus murrayi*	000	MAD	000	000	000	
523 *Melanonus zugmayeri*	AZO	MAD	000	000	000	
524 *Melanostomias bartonbeani*	In the area ---------- 73					
525 *Melanostomias biseriatus*	000	MAD	000	000	000	
526 *Melanostomias macrophotus*	In the area ---------- 74					
527 *Melanostomias* melanops	000	MAD	000	000	000	
528 *Melanostomias tentaculatus*	000	MAD	000	000	000	
529 *Melanostomias valdiviae*	In the area ---------- 75					
530 *Merluccius merluccius*	000	000	CAN	000	AFR	
531 *Merluccius senegalensis*	000	000	000	CAV	AFR	
532 *Meteoria erythrops*	AZO	000	000	000	000	
533 *Microchirus azevia*	000	000	CAN	000	AFR	
534 *Microchirus boscanion*	000	000	000	000	AFR	
535 *Microchirus frechkopi*	000	000	000	000	AFR	
536 *Microchirus ocellatus*	000	MAD	CAN	000	AFR	
537 *Microchirus variegatus*	000	000	000	000	AFR	
538 *Microlophicthys microlophus*	000	MAD	000	000	000	
539 *Microstoma microstoma*	000	MAD	000	000	000	
540 *Minychthys sentus*	000	000	CAN	000	000	
541 *Mitsukurina owstoni*	000	MAD	000	000	000	CP
542 *Mobula mobular*	AZO	000	CAN	000	AFR	CH
543 *Mola mola*	AZO	MAD	000	000	000	
544 *Molva dipterygia m.*	000	000	000	000	AFR	
545 *Monochirus hispidus*	000	000	000	000	AFR	

546 *Monomitopus metriostoma*	AZO	000	000	000	AFR	
547 *Mora moro*	AZO	MAD	CAN	000	AFR	
548 *Mugil bananensis*	000	000	000	CAV	000	
549 *Mugil capurrii*	000	000	000	000	AFR	
550 *Mugil cephalus*	AZO	MAD	CAN	CAV	AFR	
551 *Mullus barbatus*	AZO	000	CAN	000	AFR	
552 *Mullus surmuletus*	000	000	000	000	AFR	
553 *Muraena augusti*	AZO	MAD	CAN	000	000	
554 *Muraena robusta*	000	000	000	CAV	000	
555 *Muraena helena*	AZO	MAD	CAN	CAV	AFR	
556 *Muraena melanotis*	000	000	CAN	CAV	000	
557 *Muraena miliaris*	000	000	000	CAV	000	
558 Mustelus *asterias*	000	MAD	CAN	000	AFR	CP
559 *Mustelus mustelus*	000	MAD	CAN	CAV	AFR	CP
560 *Mustelus punctulatus*	000	000	000	000	AFR	CP
561 *Mycteroperca rubra*	000	MAD	CAN	000	AFR	
562 *Myctophum nitidulum*	In the area ----------					76
563 *Myctophum punctatum*	000	000	000	000	AFR	
564 *Myctophum selenops*	000	MAD	000	000	000	
565 *Myliobatis aquila*	AZO	MAD	CAN	000	AFR	CH
566 *Myrichthys pardalis*	000	000	CAN	CAV	000	
567 *Myripristis jacobus*	000	000	000	CAV	000	
568 *Mystriophis rostellatus*	000	000	000	000	AFR	
569 *Nanichthys simulans*	AZO	MAD	CAN	000	000	
570 *Narcetes stomias*	000	000	000	000	AFR	
571 *Naucrates ductor*	AZO	MAD	CAN	CAV	AFR	
572 *Negaprion brevirostris*	000	MAD	CAN	000	000	CP
573 *Nematonurus armatus*	In the area ----------					77
574 *Nemichthys curvirostris*	In the area ----------					78
575 *Nemichthys scolopaceus*	In the area ----------					79
576 *Neocyttus helgae*	000	MAD	000	000	000	
577 *Neolatus tripes*	000	MAD	000	000	000	
578 *Neonesthes capensis*	In the area ----------					80
579 *Neoscopelus macrolepidotus*	000	MAD	000	000	AFR	
580 *Neoscopelus microchir*	000	MAD	000	000	AFR	
581 *Nesiarchus nasutus*	000	MAD	CAN	000	000	
582 *Nessorhamphus ingolfianus*	AZO	000	000	000	000	
583 *Nettastoma melanurum*	000	000	000	000	AFR	
584 *Nezumia aequalis*	AZO	MAD	CAN	CAV	AFR	
585 *Nezumia longebarbata*	000	MAD	000	000	000	
586 *Nezumia sclerorhynchus*	AZO	MAD	CAN	000	AFR	
587 *Nomeus gronovii*	000	000	CAN	000	000	
588 *Normichthys operosus*	AZO	000	000	000	000	

589 *Notacanthus bonapartei*	In the area ----------					81
590 *Notacanthus chemnitzii*	000	MAD	000	000	000	
591 *Notolepis rissoi*	In the area ----------					82
592 *Notolychnus valdiviae*	000	000	CAN	000	000	
593 *Notoscopelus bolini*	In the area ----------					83
594 *Notoscopelus caudispinosus*	000	MAD	000	000	000	
595 *Notoscopelus resplendens*	000	000	CAN	000	000	
596 *Oblada melanura*	000	MAD	CAN	CAV	AFR	
597 *Odontaspis ferox*	000	MAD	000	000	AFR	CP
598 *Odontaspis noronhai*	000	MAD	000	000	000	E-CP
599 *Odontomacrurus murrayi*	AZO	MAD	CAN	000	AFR	
600 *Odontostomops normalops*	In the area ----------					84
601 *Oedalechilus labeo*	000	000	000	000	AFR	
602 *Omosudis lowei*	000	MAD	000	000	000	
603 *Oneirodes anisacanthus*	000	MAD	000	000	000	
604 *Oneirodes eschrichtii*	000	MAD	000	000	000	
605 *Oneirodes macronema*	AZO	000	000	000	000	
606 *Oneirodes myrionemus*	000	MAD	000	000	000	
607 *Ophichthus ophis*	000	000	000	CAV	000	
608 *Ophidion barbatum*	000	000	000	000	AFR	
609 *Ophioblennius atlanticus a.*	000	000	CAN	000	000	
610 *Ophisurus serpens*	000	MAD	000	000	AFR	
611 *Opisthoproctus grimaldi*	In the area ----------					85
612 *Opisthoproctus* soleatus	In the area ----------					86
613 *Orcynopsis unicolor*	AZO	MAD	000	000	AFR	
614 *Oxynotus centrina*	000	000	000	000	AFR	CP
615 *Oxynotus paradoxus*	In the area ----------					87-CP
616 *Pagellus acarne*	000	MAD	CAN	CAV	AFR	
617 *Pagellus bellottii bellottii*	000	000	CAN	000	AFR	
618 *Pagellus bogaraveo*	000	MAD	CAN	000	AFR	
619 *Pagellus erythrinus*	000	MAD	CAN	CAV	AFR	
620 *Pagrus auriga*	000	MAD	CAN	000	AFR	
621 *Pagrus caeruleostictus*	000	000	CAN	000	AFR	
622 Pagrus *pagrus*	000	MAD	CAN	000	AFR	
623 *Palinurichthys pringlei*	000	000	000	000	AFR	
624 *Panturichthys mauritanicus*	000	000	000	000	AFR	
625 *Parablennius incognitus*	000	000	CAN	000	000	
626 *Parablennius parvicornis*	AZO	MAD	CAN	000	AFR	
627 *Parablennius pilicornis*	000	000	000	000	AFR	
628 *Parablennius ruber*	AZO	MAD	000	000	000	E
629 *Parablennius tentacularis*	000	000	CAN	000	AFR	
630 *Parabrotula plagiophthalmus*	In the area ----------					88
631 *Paraconger* macrops	AZO	MAD	000	000	000	E

632 *Paragaleus pectoralis*	000	000	000	CAV	000	CP
633 *Paralepis atlantica atlantica*	In the area ---------- 89					
634 *Paralepis brevirostris*	In the area ---------- 90					
635 *Paralepis coregonoides b.*	In the area ---------- 91					
636 *Paralepis harryi*	000	MAD	000	000	000	E
637 *Paraliparis edwardsi*	000	000	000	000	AFR	E
638 *Parapristipoma humile*	000	000	CAN	CAV	AFR	
639 *Parapristipoma octolineatum*	000	MAD	CAN	CAV	AFR	
640 *Parataeniophorus gulosus*	000	MAD	000	000	000	
641 *Paravocettinops trilinearis*	000	MAD	000	000	000	
642 *Parexocoetus mento atlanticus*	000	000	000	CAV	000	
643 *Parophidion vassali*	000	MAD	000	000	AFR	
644 *Pellonula leonensis*	000	000	CAN	000	000	
645 *Pentherichthys venustus*	000	MAD	000	000	000	E
646 *Peristedion cataphractum*	000	000	000	000	AFR	
647 *Photonectes braueri*	AZO	MAD	000	000	000	
648 *Photonectes dinema*	AZO	MAD	CAN	000	000	
649 *Photonectes parvimanus*	000	MAD	CAN	000	000	
650 *Photostomias guernei*	In the area ---------- 92					
651 *Photostylus pycnopterus*	AZO	MAD	000	000	000	
652 *Phrynichthys wedli*	000	MAD	000	000	000	
653 *Phteirichthys lineatus*	AZO	000	000	000	000	
654 *Phycis blennoides*	000	000	000	000	AFR	
655 *Phycis phycis*	000	MAD	CAN	CAV	AFR	
656 *Physiculus dalwigki*	000	MAD	000	000	AFR	
657 *Physiculus huloti*	000	000	000	000	AFR	
658 *Pisodonophis semicinctus*	000	000	000	000	AFR	
659 *Platybelone argalus*	AZO	000	CAN	CAV	000	
660 *Platyberyx opalescens*	000	MAD	000	000	000	
661 *Platyrhina schoenleinii*	000	000	000	000	AFR	CH
662 *Platytroctes apus*	000	000	000	000	AFR	
663 *Plectorhinchus mediterraneus*	000	000	CAN	000	AFR	
664 *Polyacanthonotus challengeri*	AZO	000	CAN	000	AFR	
665 *Polyacanthonotus rissoanus*	AZO	000	000	000	000	
666 *Polyipnus polli*	In the area ---------- 93					
667 *Polymetme corythaeola*	000	000	000	000	AFR	
668 *Polymixia nobilis*	AZO	MAD	CAN	CAV	000	
669 *Polyprion americanus*	000	000	CAN	CAV	AFR	
670 *Pomadasys incisus*	000	MAD	CAN	CAV	AFR	
671 *Pomadasys peroteti*	000	000	CAN	000	000	
672 *Pomatomus saltator*	000	MAD	CAN	000	AFR	
673 *Pontinus accraensis*	000	000	CAN	000	000	
674 *Pontinus kuhlii*	AZO	MAD	CAN	CAV	AFR	

675 *Poromitra capito*	000	MAD	000	000	000
676 *Poromitra crassiceps*	AZO	000	000	000	000
677 *Poromitra megalops*	AZO	000	000	000	000
678 *Priacanthus arenatus*	000	MAD	CAN	CAV	AFR
679 *Priacanthus cruentatus*	000	MAD	CAN	000	AFR
680 *Prionace glauca*	AZO	MAD	CAN	CAV	AFR CP
681 *Pristis microdon*	000	000	000	CAV	000 CH
682 *Pristis pectinata*	000	000	CAN	CAV	AFR CH
683 *Pristis pristis*	000	MAD	CAN	CAV	AFR CH
684 *Prognichthys gibbifrons*	000	000	000	CAV	000
685 *Promethichthys prometheus*	AZO	MAD	CAN	CAV	AFR
686 *Protogrammus sousai*	In the area ---------- 94 E				
687 *Psenes maculatus*	In the area ---------- 95				
688 *Psenes pellucidus*	In the area ---------- 96				
689 *Psettodes belcheri*	000	000	000	000	AFR
690 Pseudocaranx *dentex*	AZO	MAD	CAN	CAV	000
691 *Pseudolepidaplois scrofa*	000	MAD	CAN	CAV	AFR E
692 Pseudophichthys *splendens*	AZO	000	000	000	AFR
693 *Pseudoscopelus altipinnis*	000	MAD	000	000	000
694 *Pseudotolithus senegalensis*	000	000	000	000	AFR
695 *Pseudotolithus typus*	000	000	000	CAV	AFR
696 *Pseudotriakis microdon*	AZO	MAD	000	CAV	000 CP
697 *Pseudupeneus prayensis*	000	000	000	000	AFR
698 *Pteraclis carolinus*	000	MAD	000	000	000
699 *Pteromylaeus bovinus*	000	MAD	CAN	CAV	AFR CH
700 *Pterosmaris melanurus*	000	MAD	CAN	CAV	000
701 *Pterothrissus belloci*	000	000	000	000	AFR
702 *Pterycombus brama*	In the area ---------- 97				
703 *Rachycentron canadum*	000	000	000	000	AFR
704 *Radiicephalus elongatus*	AZO	000	CAN	000	AFR
705 *Radinesthes decimus*	In the area ---------- 98				
706 *Raja alba*	000	MAD	000	000	AFR CH
707 *Raja asterias*	000	000	000	000	AFR CH
708 *Raja batis*	000	MAD	000	000	AFR CH
709 *Raja bigelowi*	AZO	000	000	000	000 CH
710 *Raja brachyura*	000	MAD	000	000	AFR CH
711 Raja clavata	000	MAD	CAN	000	AFR CH
712 *Raja fullonica*	000	MAD	000	000	000 CH
713 *Raja maderensis*	AZO	MAD	000	000	000 E-CH
714 *Raja miraletus*	000	MAD	CAN	000	AFR CH
715 *Raja montagui*	000	000	000	000	AFR CH
716 *Raja naevus*	000	000	000	000	AFR CH
717 *Raja oxyrinchus*	000	MAD	CAN	000	AFR CH

718	*Raja radiata*	000	000	000	000	AFR CH
719	*Raja radula*	000	000	000	000	AFR CH
720	*Raja undulata*	000	000	CAN	000	AFR CH
721	*Ranzania laevis*	000	MAD	000	000	000
722	*Regalecus glesne*	In the area ---------- 99				
723	*Remora australis*	In the area ---------- 100				
724	*Remora brachyptera*	AZO	MAD	000	000	000
725	*Remora remora*	000	MAD	000	000	000
726	*Remorina albescens*	In the area ---------- 101				
727	*Rhincodon typus*	000	000	000	CAV	000 CP
728	*Rhinobatos cemiculus*	000	000	CAN	000	AFR CH
729	*Rhinobatos rhinobatos*	000	000	CAN	000	AFR CH
730	*Rhinoptera marginata*	000	000	CAN	000	AFR CH
731	*Rhizoprionodon acutus*	000	MAD	000	000	AFR CP
732	*Rhynchohyalus natalensis*	000	MAD	000	000	000
733	*Rinoctes nasutus*	AZO	000	000	000	000
734	*Rosenblattichthys hubbsi*	In the area ---------- 102				
735	*Roulenia attrita*	AZO	MAD	000	CAV	AFR
736	*Roulenia maderensis*	AZO	MAD	000	000	000
737	*Ruvettus pretiosus*	000	MAD	CAN	CAV	AFR
738	*Rypticus saponaceus*	000	000	000	CAV	000
739	*Saccopharynx ampullaceus*	000	MAD	000	000	000
740	*Saccopharynx harrisoni*	000	MAD	000	000	000
741	*Saccopharynx paucovertebratis*	In the area ---------- 103 E				
742	*Saccopharynx ramosus*	In the area ---------- 104				
743	*Saccopharynx thalassa*	000	MAD	CAN	000	000
744	*Sagamichthys schnakenbecki*	AZO	000	000	000	000
745	*Sarda sarda*	AZO	MAD	CAN	000	AFR
746	*Sardina pilchardus*	000	MAD	CAN	000	AFR
747	*Sardinella aurita*	000	000	CAN	000	AFR
748	*Sardinella maderensis*	000	MAD	CAN	000	AFR
749	*Sargocentron hastatus*	000	000	000	CAV	000
750	*Sarpa salpa*	000	MAD	CAN	CAV	AFR
751	*Scartella cristata*	000	000	CAN	000	000
752	*Schedophilus medusophagus*	AZO	MAD	000	000	000
753	*Schedophilus ovalis*	AZO	MAD	CAN	000	000
754	*Sciaena umbra*	000	000	CAN	000	AFR
755	*Scomber japonicus*	AZO	MAD	CAN	000	AFR
756	*Scomber scombrus*	AZO	MAD	CAN	000	AFR
757	*Scomberesox saurus*	000	000	CAN	000	AFR
758	*Scomberomorus tritor*	000	000	CAN	000	AFR
759	*Scombrolabrax heterolepis*	000	MAD	000	000	000
760	*Scopelarchus analis*	AZO	MAD	000	000	000

761 *Scopelarchus michaelsarsi*	In the area ----------					105
762 *Scopelengys tristis*	000	MAD	000	000	000	
763 *Scopeloberyx opisthopterus*	In the area ----------					106
764 *Scopeloberyx robustus*	In the area ----------					107
765 *Scopeloberyx rudiventer*	AZO	000	000	000	000	E
766 *Scopelogadus beanii*	In the area ----------					108
767 *Scopelosaurus argenteus*	AZO	MAD	000	000	000	
768 *Scopelosaurus lepidus*	In the area ----------					109
769 *Scopelosaurus smithii*	000	MAD	000	000	000	
770 *Scorpaena azorica*	AZO	000	000	000	000	E
771 *Scorpaena canariensis*	000	000	CAN	000	000	
772 *Scorpaena elongata*	000	000	000	000	AFR	
773 *Scorpaena laevis*	AZO	MAD	000	CAV	AFR	
774 *Scorpaena loppei*	000	000	000	000	AFR	
775 *Scorpaena maderensis*	AZO	MAD	CAN	CAV	AFR	
776 *Scorpaena normani*	000	000	000	000	AFR	
777 *Scorpaena notata*	AZO	MAD	CAN	000	AFR	
778 *Scorpaena porcus*	AZO	000	CAN	000	AFR	
779 *Scorpaena scrofa*	AZO	MAD	CAN	CAV	AFR	
780 *Scyliorhinus canicula*	000	000	000	000	AFR	CP
781 *Scyliorhinus stellaris*	000	000	000	000	AFR	CP
782 *Scymnodon obscurus*	000	MAD	000	000	AFR	CP
783 *Scymnodon ringens*	000	MAD	000	000	AFR	CP
784 *Searsia koefoedi*	In the area ----------					110
785 *Selar crumenophthalmus*	000	000	000	CAV	000	
786 *Selene dorsalis*	000	MAD	000	CAV	000	
787 *Seriola carpenteri*	000	000	000	000	AFR	
788 *Seriola fasciata*	000	MAD	000	000	000	
789 *Seriola rivoliana*	AZO	MAD	000	000	000	
790 *Seriola zonata*	000	MAD	000	000	000	
791 *Serranus atricauda*	AZO	MAD	CAN	000	AFR	
792 *Serranus cabrilla*	AZO	MAD	CAN	000	AFR	
793 *Serranus hepatus*	000	000	CAN	000	AFR	
794 *Serranus scriba*	AZO	MAD	CAN	000	AFR	
795 *Serrivomer beani*	AZO	MAD	000	000	000	
796 *Serrivomer brevidentatus*	In the area ----------					111
797 *Setarches guentheri*	000	MAD	000	CAV	AFR	
798 *Simenchelys parasitica*	AZO	MAD	000	000	000	
799 *Solea impar*	000	000	000	000	AFR	
800 *Solea kleinii*	000	000	CAN	000	AFR	
801 *Solea lascaris*	000	000	CAN	000	AFR	
802 *Solea senegalensis*	000	000	000	000	AFR	
803 *Solea vulgaris*	000	000	CAN	000	AFR	

804 *Somniosus rostratus*	000	MAD	000	000	AFR	CP
805 *Sparisoma cretense*	AZO	MAD	CAN	000	AFR	
806 *Sparus aurata*	000	000	CAN	CAV	AFR	
807 *Sparus gibbiceps*	000	000	000	000	AFR	
808 *Spectrunculus grandis*	In the area ----------					112
809 *Sphagemacrurus grenadae*	000	000	000	000	AFR	
810 *Sphagemacrurus hirundo*	AZO	MAD	000	CAV	AFR	E
811 *Sphoeroides cutaneus*	AZO	000	CAN	000	AFR	
812 *Sphoeroides spengleri*	AZO	MAD	CAN	000	000	
813 *Sphyraena guachancho*	000	000	CAN	000	000	
814 *Sphyraena sphyraena*	AZO	MAD	CAN	CAV	AFR	
815 *Sphyrna lewini*	000	000	000	000	AFR	CP
816 *Sphyrna zygaena*	000	000	CAN	000	AFR	CP
817 *Spicara maena*	000	000	CAN	000	AFR	
818 *Spicara smaris*	000	000	CAN	000	AFR	
819 *Spondyliosoma cantharus*	000	MAD	CAN	CAV	AFR	
820 *Sprattus sprattus sprattus*	000	000	000	000	AFR	
821 *Squaliodus laticaudus*	000	MAD	000	CAV	AFR	CP
822 *Squalus acanthias*	000	MAD	CAN	000	AFR	CP
823 *Squalus blainvillei*	000	000	CAN	000	AFR	CP
824 *Squatina aculeata*	000	000	000	000	AFR	CP
825 *Squatina oculata*	000	000	000	000	AFR	CP
826 *Squatina squatina*	000	000	CAN	000	AFR	CP
827 *Stephanolepis hispidus*	000	MAD	CAN	000	000	
828 *Sternoptyx diaphana*	In the area ----------					113
829 *Sternoptyx pseudobscura*	AZO	000	000	000	000	
830 *Stomias boa boa*	000	000	000	000	AFR	
831 *Stomias brevibarbatus*	000	MAD	000	000	AFR	
832 *Stromateus fiatola*	000	000	CAN	000	AFR	
833 *Stylephorus chordatus*	000	000	CAN	000	AFR	
834 *Sudis hyalina*	In the area ----------					114
835 *Symbolophorus veranyi*	000	000	000	CAV	AFR	
836 *Symphodus bailloni*	000	000	000	000	AFR	
837 *Symphodus mediterraneus*	000	000	000	000	AFR	
838 *Symphodus melops*	AZO	000	000	000	000	
839 *Symphurus ligulatus*	000	000	CAN	000	AFR	
840 *Symphurus nigrescens*	AZO	000	000	000	AFR	
841 *Synaphobranchus kaupi*	AZO	MAD	000	000	000	
842 *Synaptura lusitanica*	000	000	000	000	AFR	
843 *Synchiropus phaeton*	AZO	MAD	000	000	AFR	
844 *Syngnathus acus*	AZO	000	CAN	000	AFR	
845 *Synodus saurus*	AZO	MAD	CAN	CAV	AFR	
846 *Synodus synodus*	000	MAD	CAN	000	000	

847	*Taaningichthys bathyphilus*	In the area ---------- 115				
848	*Taaningichthys minimus*	In the area ---------- 116				
849	*Taaningichthys paurolychnus*	000	MAD	000	000	000
850	*Taenioconger longissimus*	000	MAD	CAN	000	000
851	*Taeniura grabata*	000	000	000	CAV	000 CH
852	*Talismania antillarum*	000	000	000	000	AFR
853	*Talismania homoptera*	000	000	000	000	AFR
854	*Talismania mekistonema*	AZO	000	000	000	000
855	*Taractes asper*	000	MAD	000	000	000
856	*Taractes rubescens*	000	MAD	000	000	000
857	*Taractichthys longipinnis*	AZO	MAD	CAN	CAV	000
858	*Tarpon atlanticus*	AZO	000	000	000	000
859	*Tetragonurus atlánticus*	In the area ---------- 117				
860	*Tetragonurus cuvieri*	In the area ---------- 118				
861	*Tetrapturus albidus*	In the area ---------- 119				
862	*Tetrapturus georgei*	000	MAD	000	000	AFR
863	*Tetrapturus pfluegeri*	000	MAD	000	000	000
864	*Thalassoma pavo*	AZO	MAD	CAN	000	AFR
865	*Thorogobius ephippiatus*	000	MAD	CAN	000	000
866	*Thunnus alalunga*	AZO	MAD	CAN	CAV	AFR
867	*Thunnus albacares*	AZO	MAD	CAN	CAV	AFR
868	*Thunnus obesus*	AZO	MAD	CAN	CAV	AFR
869	*Thunnus thynnus*	AZO	000	CAN	CAV	AFR
870	*Torpedo marmorata*	000	MAD	CAN	000	AFR CH
871	*Torpedo nobiliana*	AZO	MAD	000	000	AFR CH
872	*Torpedo torpedo*	000	000	CAN	000	AFR CH
873	*Trachinocephalus myops*	000	000	000	CAV	000
874	*Trachinus araneus*	000	000	CAN	000	AFR
875	*Trachinus draco*	000	MAD	CAN	000	AFR
876	*Trachinus pellegrini*	000	000	CAN	CAV	AFR
877	*Trachinus radiatus*	000	000	CAN	000	AFR
878	*Trachipterus arcticus*	000	MAD	000	000	000
879	*Trachonurus villosus*	AZO	MAD	CAN	000	AFR
880	*Trachurus mediterraneus*	000	000	000	000	AFR
881	*Trachurus picturatus*	AZO	MAD	CAN	000	AFR
882	*Trachurus trachurus*	000	MAD	CAN	CAV	AFR
883	*Trachurus trecae*	000	000	000	000	AFR
884	*Trachynotus ovatus*	AZO	MAD	CAN	CAV	AFR
885	*Trachynotus teraia*	000	000	000	CAV	000
886	*Trachyrhynchus scabrus*	000	000	000	CAV	AFR
887	*Trachyscorpia cristulata* e.	In the area ---------- 120				
888	*Trichiurus lepturus*	000	000	000	000	AFR
889	*Trigla lucerna*	000	000	CAN	000	AFR

890	*Trigla lyra*	000	MAD	000	000	AFR
891	*Trigloporus lastoviza*	AZO	MAD	CAN	000	AFR
892	*Trigonolampa miriceps*	In the area ----------				121
893	*Tripterygion delaisi*	000	MAD	CAN	000	000
894	*Trisopterus luscus*	000	000	000	000	AFR
895	*Tylosurus acus imperialis*	000	000	000	CAV	AFR
896	*Umbrina canariensis*	000	000	CAN	000	AFR
897	*Umbrina cirrosa*	000	000	CAN	000	AFR
898	*Umbrina ronchus*	000	000	CAN	000	AFR
899	*Uncisudis longirostris*	000	MAD	000	000	000
900	*Uranoscopus scaber*	000	000	CAN	000	AFR
901	*Valenciennellus tripunctulatus*	In the area ----------				122
902	*Vanneaugobius pruvoti*	000	000	CAN	000	AFR
903	*Venefica proboscidea*	000	000	000	000	AFR
904	*Vinciguerria attenuata*	In the area ----------				123
905	*Vinciguerria nimbaria*	AZO	MAD	000	000	000
906	*Vinciguerria poweriae*	000	000	000	CAV	AFR
907	*Viridentex acromegalus*	000	000	000	CAV	000
908	*Xenodermichthys copei*	AZO	MAD	000	000	AFR
909	*Xiphias gladius*	AZO	MAD	CAN	CAV	AFR
910	*Xyrichthys novacula*	AZO	MAD	CAN	CAV	AFR
911	*Zenopsis conchifer*	000	MAD	CAN	000	AFR
912	*Zeus faber*	AZO	MAD	CAN	000	AFR
913	*Zu cristatus*	AZO	MAD	000	000	000
	TOTAL LOCALITIES:	222	440	337	167	431