

BOLETIM

MUSEU DE HISTÓRIA NATURAL DO FUNCHAL

Vol. LXIV (2014), Arts. 337-339

ISSN 2183-279X (online edition) | Available online at: <http://boletim.cm-funchal.pt>



Dezembro de 2014 - FUNCHAL - MADEIRA

Editado pelo Departamento de Ciência e de Recursos Naturais da Câmara Municipal do Funchal

FICHA TÉCNICA // TECHNICAL INFORMATION

Título // Title:

Boletim do Museu de História Natural do Funchal
Vol. 64 (337-339), 2014

Editado por // Edited by:

Departamento de Ciência e de Recursos Naturais da CMF

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Arranjo gráfico // Layout:

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Capa // Cover:

Desenho de contraste // Contrast mark:
Manuela Aranha
Fotografia // Photograph:
Arturo Telle
Penaeus kerathurus (ver // see art. 338, p. 32)

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Website:

<http://boletim.cm-funchal.pt>

ISSN (edição online // online edition):

2183-279X

ISSN (edição impressa // printed edition):

0870-3876

Depósito legal // Legal deposit:

no. 228969/05

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Museu de História Natural do Funchal

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BOLETIM

MUSEU DE
HISTÓRIA NATURAL DO FUNCHAL

Vol. LXIV (2014), Art. 337: 5-27



ISSN 2183-279X (online edition) |

| Available online at: <http://boletim.cm-funchal.pt>

Scientific results of the Spanish-Moroccan RAI-AP-36/2005 and RAI-AP-37/2005 deep-sea campaigns off NW Africa (33° N – 26° N, Northeastern Atlantic). General description and list of stations

By JOSÉ A. GONZÁLEZ ¹*, SALAH BEN CHERIFI ², IGNACIO J. LOZANO ³, KHALID MANCHIH ², SEBASTIÁN JIMÉNEZ ⁴, NAJIB ELOUAMARI ²,
JOSÉ A. PÉREZ-PEÑALVO ¹, ANTONIO GARCÍA-MEDEROS ¹, ROSA DOMÍNGUEZ-SEOANE ¹, JOSÉ I. SANTANA ¹ & MANUEL BISCOITO ⁵

With 7 figures and 3 tables

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ABSTRACT: In the present account, two deep-sea fishing campaigns done in 2005 and 2006 off NW Africa are described in detail. Fishing gear, vessels, area surveyed and collecting methods are described and illustrated. A list of stations is included, serving as a base for future biodiversity and fisheries publications.

Keywords: Deep-sea, living resources, methodology, NW Africa, NE Atlantic Ocean.

RESUMO: Neste trabalho são descritas em detalhe duas campanhas de pesca profunda levadas a cabo em 2005 e 2006 ao largo do noroeste de África. As áreas de pesca, navios, artes e métodos de colheita são descritos e ilustrados. É apresentada uma lista de estações que servirá de base à publicação futura de trabalhos de biodiversidade e biologia pesqueira.

Palavras-chave: Pesca profunda, métodos de colheita, NO de África, NE do Oceano Atlântico.

INTRODUCTION

In the framework of the scientific cooperation between the Spanish Ministry of Agriculture, Fisheries and Food (MAPA) and the Moroccan Ministry of Sea Fisheries (MPM) two series of campaigns were done off NW African coast (36° N – 26° N) in order to study the deep-sea living resources occurring in the area.

The first series took place in 2004 and 2005, with the R/V “Vizconde de Eza” and covered the deep slope from Tangier to Cape Bojador, using bottom trawls between 500 m and 2000 m of depth (RAMOS & FARAJ, 2004; INRH, 2006). The main object of these two cruises was the study of the benthic biodiversity and the identification of new fisheries resources. The Spanish Institute of Oceanography (IEO) and the Moroccan National Institute of Fisheries Research (INRH) were the responsible institutions for this work.

The second series, which are the subject of the present contribution, took place in 2005 and 2006 and used 6 commercial fishing vessels in two pilot studies, to assess the viability of a deep-sea fishery in the area (GONZÁLEZ *et al.*, 2006a and 2006b). The presence of scientific observers on board each fishing vessel allowed the collection of voucher specimens from every fishing operation, turning the cruises done into the largest survey of fishes, decapod crustaceans and cephalopods ever made in this area of the eastern Atlantic. This material is being studied and will be used in a series of publications dealing with the biodiversity of the area. All other fishing data gathered is being treated and will be published, forming the fisheries resources part of the whole results of these two pilot studies. The Canarian Institute of Marine Sciences (ICCM) and the INRH were the responsible institutions for this second series of campaigns (Fig. 1).

The present account describes all the details related to the two pilot studies done (RAI-AP-36/2005 and RAI-AP-37/2005).



Fig. 1 – Spanish-Moroccan scientific team processing data at the Canarian Institute of Marine Sciences.

METHODOLOGY

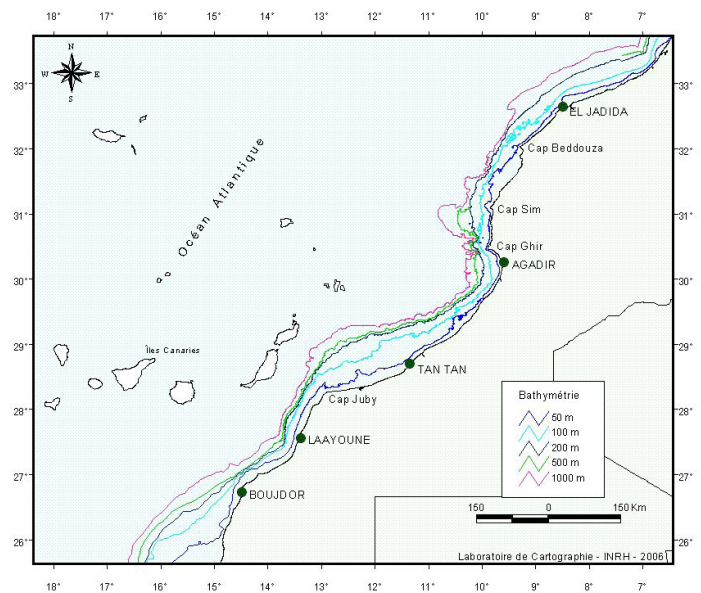


Fig. 2 – Study area covered by the campaigns: from South of El Jadida (33° N) to Cape Bojador (26° N) and between 800 m and 1500 m of depth in the Atlantic EEZ of Morocco.

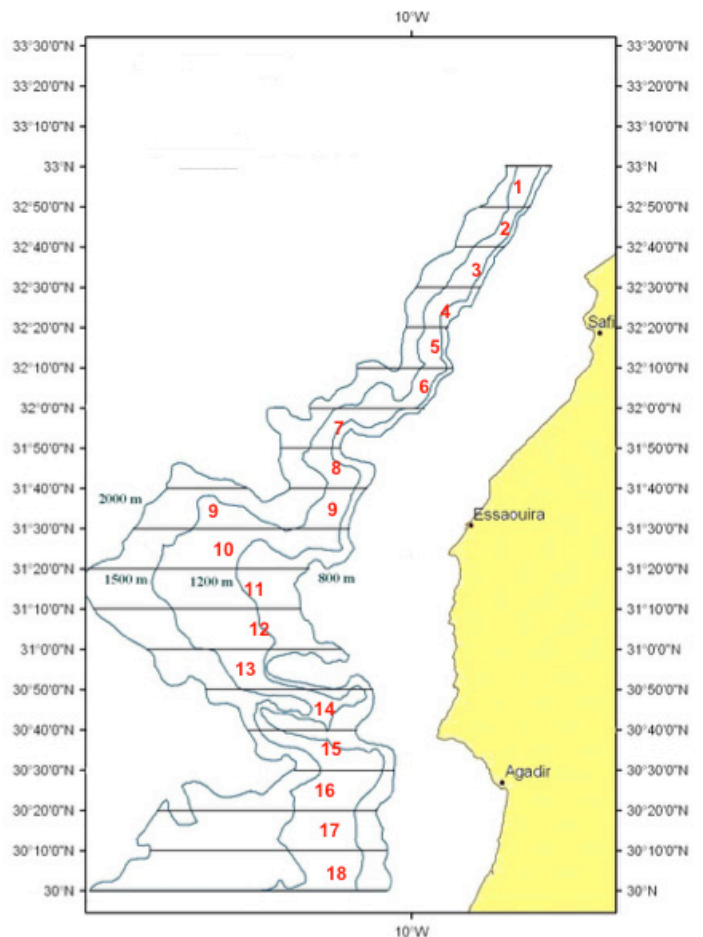


Fig. 3 – North zone of the study area divided into 18 subzones and two depth intervals 800-1200 m (A) and 1200-1500 m (B) (pilot study RAI-AP-36/2005).

Study area

The area covered in the present study goes from the South of El Jadida (33° N) until the Cape Bojador (26° N) and trawls took place between 800 m and 1500 m of depth. The whole study area is situated within the Moroccan EEZ (Fig. 2).

The pilot study RAI-AP-36/2005 took place in the northern part of the area. This zone was divided into 18 subzones (10 minutes latitude each) and two depth intervals 800-1200 m (A) and 1200-1500 m (B) (Fig. 3). For data processing purposes, the zone was divided into three sectors: North, off Safi, subzones 1-6; Central, off Essaouira, subzones 7-12; and South, off Agadir, subzones 13-18 (Fig. 3).

The pilot study RAI-AP-37/2005 took place in the southern part of the area. This zone was divided into 24 subzones (10 minutes latitude each) covering depths between 800-1500 m. (Fig. 4). In order not to interfere with the Spanish EEZ of the Canary Islands, subzones 7-10 were not fished and subzones 11-15 were only fished on the 800-900 m depth stratum. In all other subzones, fishing operations took place on two depth strata: 800-1200 m (A) and 1200-1500 m (B). For data processing purposes, the zone was divided into three sectors: North, from off Sidi Ifni to Tan Tan, subzones 1-6, two depth strata 800-1500 m; Central, from off Tarfaya to El Aaiún, subzones 11-15, one depth stratum 800-900 m; and South, from off El Aaiún to Cape Bojador, subzones 16-24, two depth strata 800-1500 m (Fig. 4).

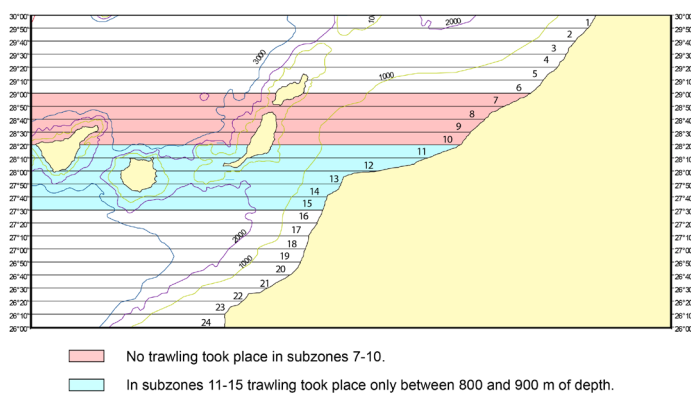


Fig. 4 – South zone of the study area divided into 24 subzones covering depths between 800-1500 m (pilot study RAI-AP-37/2005).

Research vessels and fishing gear

Six Spanish trawlers were used in this study. Fishing vessels “Myrdoma F” and “Farruco” (Fig. 5, Table 1) operated in the North zone (33° N – 30° N, between Safi and Agadir)

(Fig. 3), from November 2005 until February 2006. Fishing vessels “Playa de Pintens”, “Mar Rojo Dos”, “Fula” and “Varalonga” (Fig. 5, Table 1) operated in the South zone (30° N – 26° N, between Sidi Ifni and Cape Bojador) (Fig. 4), from January to April 2006.

Four types of bottom trawls and two mesh sizes were used (Fig. 6). See Table 2 for all technical characteristics and usage.

Table 1 – Main characteristics of the bottom-trawlers involved in the campaigns.

Fishing vessel	Registration	Length (m)	Engine power (H. P.)	Net register tonnage NRT	Gross register tonnage GRT
Farruco	3 ^a -GC-1-301	45.62	1448	368.66	748.00
Myrdoma F	3 ^a -GC-1-196	39.40	780	267.00	418.73
Playa de Pintens	3 ^a -VI-5-9-97	37.00	683	198.30	341.00
Mar Rojo Dos	3 ^a -GC-1-13-00	34.60	1101	257.50	446.00
Fula	3 ^a -GC-1-3-00	41.60	684	293.50	490.00
Varalonga	3 ^a -SS-1-3-00	44.21	900	233.01	448.00



Fig. 5 – Spanish bottom-trawlers involved in the experimental fishing operations. F/V “Myrdoma F” (top left), F/V “Farruco” (top right), F/V “Playa de Pintens” (middle left), F/V “Mar Rojo Dos” (middle right), F/V “Fula” (bottom left) and F/V “Varalonga” (bottom right).



Fig. 6 – Bottom trawl just hauled on-board.

Table 2 – Technical characteristics of the bottom trawls used in the campaigns.

		Bottom trawl			
		"Merlucera"	"Pedreira"	"Pulpeira"	"Hatton Bank"
Trawl-net material	(or optionally)	nylon & polyethylene polyethylene	nylon & polyethylene polystyl	nylon & polyethylene	nylon & polyethylene polyethylene
Mesh size (mm)					
Wings or legs of trawl-net		80 or 160	100 or 120	90/100 or 120	110/130 or 175
Belly of trawl-net		80 or 100	100 or 120	90/100 or 120	110 or 130
Extension of trawl-net		70 or 80	80/90 or 120	80 or 90	80/90 or 100
Cod-end of trawl-net		50 or 70	50 or 70	50 or 70	50 or 70
Reinforcement of lower panel		a lastridge line	a lastridge line	a lastridge line	a lastridge line
Groundrope	(or optionally)	rubber wheel bobbins a section of wire	rubber wheel bobbins a section of chain	a section of wire a section of chain	rubber wheel bobbins rockhopper discs
Length of groundrope (m)		22.5 or 60	20 or 80	14 or 80	28 or 72
Length of the foot rope (m)		65	17 or 55	35 or 75	58 or 80
Trawl doors (otter boards)	(or optionally)	versatile (oval) tiburón type 7	versatile (oval)	versatile (oval) tiburón type 7	versatile (oval) tiburón type 7
Horizontal opening b/w doors (m)		190	170	175	210
Vertical opening of net mouth (m)		4.8 - 5.2	4.2 - 4.8	2.8 - 3.1	4.3 - 4.7
Horizontal opening of mouth (m)		6	5	5.5	7
Other accessories		Scanmar sensors on doors & headline	Scanmar sensors on doors & headline	Scanmar sensors on doors & headline	Scanmar sensors on doors & headline
Towing speed (knots)		3.0 - 3.1	2.8 - 3.0	2.8 - 3.0	2.8 - 3.0
Activity in subzones:	North Zone	11-13	3-4, 9-10, 13, 16-18	12-13	3-4, 9-10, 13, 16-18
	South Zone	2-3, 6	all	all	all
Type of substratum trawled	(and)	irregular, muddy-rocky	irregular rocky-muddy irregular, rocky	irregular rocky-muddy irregular, muddy	irregular rocky-muddy irregular, rocky
% of utilization by vessel:					
	Myrdoma F	25	55	20	0
	Farruco	10	40	10	40
	Playa de Pintens	0	100	0	0
	Mar Rojo Dos	0	60	40	0
	Fula	8	0	42	50
	Varalonga	0	0.01	0.99	99

Fishing operations

In the North zone (Fig. 3) each of the two vessels fished for 79 days and fishing operations took place simultaneously from North to South, starting in subzone 1. In the South zone (Fig. 4) the four vessels also fished for 79 days each. Fishing operations took place simultaneously from North to South, with two vessels starting in subzone 1 and the other two starting in subzone 24 and from South to North.

Each vessel trawled using the two mesh sizes in each depth stratum, in both zones, for approximately the same number of hauls per mesh size. When a depth stratum was classified as "untrawlable", trawling continued on the next stratum. Fishing operations occurred from 06:00 until 20:00. In the South zone, a maximum of two hauls per day were done in night time, before 23:00, in order to assess the extent of nyctimeral movements of the target species. These night operations

took place on previously daytime trawled grounds.

Two scientific observers were permanently placed on board, in order to collect data and voucher specimens. All data was stored on-board in an MS-Access® database and also kept in printed forms for safety reasons.

The observers were able to do on-board preliminary identification of the organisms collected. From every species caught, at least two voucher specimens were preserved frozen for further study in the laboratory (Fig. 7). At least two specimens from each species were also photographed on board. Whenever possible the specimens preserved were deposited in the collections of the Tenerife Museum of Natural Sciences (TFMC) in the Canary Islands and the Funchal Natural History Museum (MMF) in Madeira. Most crustacean and cephalopod specimens were deposited in the collections of the former Canarian Institute of Marine Sciences, now the Marine Sciences Collections Initiative (ICCM) of the University of Las Palmas de Gran Canaria.



Fig. 7 – Scientists sampling fish specimens at the laboratory of the Canarian Institute of Marine Sciences.

RESULTS

A complete list of stations is given in Table 3. These were chronologically grouped by vessel.

In the North zone (Fig. 3), the two vessels carried out 312 hauls, 294 (94.2%) of which were considered valid and 18 (5.8%) non-valid. In the South zone (Fig. 4), the four vessels carried out 752 hauls, 735 (97.7%) of which were considered valid and 17 (2.3%) non-valid. A total of 1,064 hauls, 1,029 (96.7%) of which were considered valid, were done in the whole area surveyed (Fig. 2). The main causes for considering a haul as non-valid were mud clogging, litter-damaged catches, entangling with other fishing gear and malfunction of nets.

ACKNOWLEDGEMENTS

The authors are indebted to Noureddeine Abid, Abdelaziz Chaghif, Badre Mekiassi, Mouaad Benyassine and Jamal Settih (INRH), Noureddeine Chakouk, Mohammed Lamine Diop, Mohammed Aziz Hosni, Omar Khermiz and Adil Naim (MPM), M. Dolores Martín, Mónica Mandado, Severino País, Patricia Ramos, José Casado and Lucía Revenga (Tragsatec, Spain) for their invaluable assistance on board as observers. Thanks are also due to the Masters and Crews of the F/Vs "Myrdoma F", "Farruco", "Playa de Pintens", "Mar Rojo Dos", "Fula" and "Varalonga" for their cooperation and to Prudencio M. Calderín (ex-ICCM) for his laboratory assistance. Enrique de Cárdenas and Manuel (Paco) Manzaneque kindly provided advice and administrative coordination in Madrid, as well as Majida

Maarouf and Ahmed Jouker in Rabat. Financial support was obtained from the European Union, the Spanish Ministry for Fisheries and the owners of the vessels involved.

This paper is dedicated to the Memory of the Spanish marine zoologist Dr. Ignacio J. Lozano Soldevilla (1958-2008), professor of fisheries of the 'Universidad de La Laguna' (Canary Islands) and scientific co-coordinator of these pilot studies.

This is Contribution no. 1 of the Spanish-Moroccan 2005-2006 deep-sea fishery campaigns off NW Africa.

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Table 3 – List of fishing stations. Depth strata: A, 800-1200 m; B, 1200-1500 m.

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
FARRUCO	1	20-11-2005	3	Safi	A	70	Y	32	31	52	9	46	35	1192
FARRUCO	2	21-11-2005	3	Safi	B	70	N	32	32	10	9	48	15	1515
FARRUCO	3	21-11-2005	3	Safi	B	50	N	32	38	9	9	44	1	1331
FARRUCO	4	21-11-2005	3	Safi	A	50	Y	32	30	45	9	45	45	1103
FARRUCO	5	22-11-2005	4	Safi	A	50	Y	32	27	10	9	47	39	888
FARRUCO	6	22-11-2005	4	Safi	A	50	Y	32	27	10	9	47	39	984
FARRUCO	7	23-11-2005	4	Safi	B	70	Y	32	25	32	9	55	50	1248
FARRUCO	8	23-11-2005	4	Safi	B	50	N	32	24	45	9	57	45	1371
FARRUCO	9	26-11-2005	9	Essaouira	B	70	Y	31	39	25	10	20	25	1341
FARRUCO	10	26-11-2005	9	Essaouira	B	50	Y	31	33	18	10	23	45	1231
FARRUCO	11	27-11-2005	9	Essaouira	A	70	Y	31	31	45	10	20	5	989
FARRUCO	12	27-11-2005	9	Essaouira	A	50	Y	31	40	0	10	16	25	926
FARRUCO	13	28-11-2005	10	Essaouira	B	50	N	31	20	5	10	59	20	1345
FARRUCO	14	30-11-2005	10	Essaouira	A	50	Y	31	27	45	10	44	0	961
FARRUCO	15	30-11-2005	10	Essaouira	A	70	Y	31	19	45	10	53	20	1067
FARRUCO	16	30-11-2005	10	Essaouira	B	70	Y	31	28	25	10	51	55	1236
FARRUCO	17	01-12-2005	11	Essaouira	B	50	Y	31	10	0	10	57	30	1343
FARRUCO	18	02-12-2005	11	Essaouira	B	70	Y	31	10	0	10	56	5	1301
FARRUCO	19	02-12-2005	11	Essaouira	B	50	Y	31	20	0	10	58	45	1296
FARRUCO	20	02-12-2005	11	Essaouira	B	70	N	31	12	30	10	56	30	1243
FARRUCO	21	03-12-2005	12	Essaouira	B	70	N	31	5	30	10	53	45	1317
FARRUCO	22	03-12-2005	12	Essaouira	B	70	N	31	0	0	10	51	10	1408
FARRUCO	23	04-12-2005	12	Essaouira	A	70	Y	31	10	0	10	48	41	1130
FARRUCO	24	04-12-2005	12	Essaouira	A	50	Y	31	0	0	10	42	45	1110
FARRUCO	25	05-12-2005	12	Essaouira	B	50	Y	31	3	55	10	48	45	1235
FARRUCO	26	05-12-2005	12	Essaouira	B	70	Y	31	9	11	10	50	55	1228
FARRUCO	27	06-12-2005	13	Agadir	A	50	Y	30	53	0	10	33	25	1057
FARRUCO	28	06-12-2005	13	Agadir	A	70	Y	30	58	15	10	41	45	1196
FARRUCO	29	07-12-2005	13	Agadir	B	70	Y	30	56	7	10	40	28	1371
FARRUCO	30	07-12-2005	13	Agadir	B	50	Y	30	50	0	10	32	35	1297
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FARRUCO	41	15-12-2005	17	Agadir	A	50	Y	30	21	15	10	23	30	1172
FARRUCO	42	16-12-2005	16	Agadir	A	50	Y	30	20	0	10	23	0	1160
FARRUCO	43	16-12-2005	17	Agadir	A	70	Y	30	10	35	10	34	40	1173
FARRUCO	44	17-12-2005	13	Agadir	A	70	Y	30	51	10	10	32	55	1183
FARRUCO	45	17-12-2005	13	Agadir	B	50	Y	31	0	0	10	42	35	1203
FARRUCO	46	18-12-2005	13	Agadir	A	50	Y	30	52	19	10	34	20	1135
FARRUCO	47	18-12-2005	13	Agadir	B	70	Y	31	0	0	10	45	0	1227
FARRUCO	48	19-12-2005	13	Agadir	A	70	Y	31	1	35	10	44	10	1024
FARRUCO	49	19-12-2005	13	Agadir	A	50	Y	30	52	55	10	24	35	994
FARRUCO	50	20-12-2005	16	Agadir	A	50	Y	30	19	0	10	22	45	1178
FARRUCO	51	20-12-2005	16	Agadir	A	70	Y	30	27	15	10	15	10	1175
FARRUCO	52	27-12-2005	3	Safi	A	50	Y	32	38	35	9	40	45	919
FARRUCO	53	27-12-2005	3	Safi	B	50	Y	32	31	10	9	46	50	1295
FARRUCO	54	27-12-2005	3	Safi	B	70	Y	32	37	45	9	43	44	1308
FARRUCO	55	28-12-2005	4	Safi	B	70	Y	32	22	36	9	56	45	1284
FARRUCO	56	28-12-2005	6	Safi	B	70	Y	31	57	25	10	19	45	1389
FARRUCO	57	29-12-2005	7	Essaouira	B	50	Y	31	51	30	10	22	45	1309
FARRUCO	58	29-12-2005	7	Essaouira	A	50	Y	31	58	45	10	14	15	978
FARRUCO	59	30-12-2005	9	Essaouira	B	50	N	31	31	10	10	25	0	1349
FARRUCO	60	30-12-2005	10	Essaouira	B	50	Y	31	14	55	10	57	15	1228
FARRUCO	61	01-01-2006	9	Essaouira	B	70	N	31	30	17	10	25	15	1327

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
FARRUCO	62	01-01-2006	9	Essaouira	B	50	Y	31	30	0	10	29	45	1394
FARRUCO	63	01-01-2006	9	Essaouira	A	50	Y	31	40	0	10	16	25	950
FARRUCO	64	02-01-2006	9	Essaouira	B	70	N	31	33	10	10	10	25	1419
FARRUCO	65	02-01-2006	10	Essaouira	B	70	Y	31	20	0	10	59	35	1316
FARRUCO	66	03-01-2006	10	Essaouira	B	50	Y	31	29	15	10	52	30	1260
FARRUCO	67	03-01-2006	10	Essaouira	B	50	Y	31	20	0	10	59	0	1336
FARRUCO	68	03-01-2006	10	Essaouira	B	70	Y	31	26	45	10	55	5	1309
FARRUCO	69	04-01-2006	10	Essaouira	A	70	Y	31	20	40	10	48	45	978
FARRUCO	70	04-01-2006	10	Essaouira	A	70	Y	31	25	40	10	43	15	906
FARRUCO	71	05-01-2006	10	Essaouira	A	50	Y	31	20	0	10	47	55	963
FARRUCO	72	05-01-2006	10	Essaouira	A	50	Y	31	29	50	10	41	35	974
FARRUCO	74	06-01-2006	10	Essaouira	A	50	N	31	27	40	10	46	50	979
FARRUCO	75	06-01-2006	10	Essaouira	A	50	S	31	20	45	10	52	30	1040
FARRUCO	75	06-01-2006	10	Essaouira	A	50	Y	31	20	45	10	52	30	1052
FARRUCO	76	06-01-2006	11	Essaouira	A	70	Y	31	10	0	10	49	35	1103
FARRUCO	77	06-01-2006	11	Essaouira	A	70	Y	31	20	10	10	51	45	1093
FARRUCO	78	07-01-2006	11	Essaouira	A	50	Y	31	10	0	10	49	35	1109
FARRUCO	79	07-01-2006	11	Essaouira	A	50	Y	31	20	0	10	51	25	1087
FARRUCO	80	07-01-2006	11	Essaouira	B	50	Y	31	10	45	10	55	50	1227
FARRUCO	81	08-01-2006	11	Essaouira	B	70	Y	31	10	15	10	55	30	1261
FARRUCO	82	08-01-2006	11	Essaouira	A	70	Y	31	22	45	10	50	45	1069
FARRUCO	83	08-01-2006	11	Essaouira	A	50	Y	31	10	0	10	49	30	1095
FARRUCO	84	09-01-2006	12	Essaouira	A	50	Y	31	0	0	10	42	30	1144
FARRUCO	85	09-01-2006	12	Essaouira	A	50	Y	31	10	0	10	48	0	1100
FARRUCO	86	09-01-2006	12	Essaouira	A	70	Y	31	0	0	10	42	35	1139
FARRUCO	87	10-01-2006	12	Essaouira	A	70	Y	31	2	9	10	44	25	1105
FARRUCO	88	10-01-2006	12	Essaouira	B	70	Y	31	10	15	10	52	55	1219
FARRUCO	89	10-01-2006	12	Essaouira	B	70	Y	31	1	0	10	46	55	1222
FARRUCO	90	11-01-2006	12	Essaouira	B	50	Y	31	10	15	10	53	30	1227
FARRUCO	91	11-01-2006	12	Essaouira	B	50	N	31	0	0	10	46	35	1319
FARRUCO	92	11-01-2006	12	Essaouira	B	50	Y	31	7	0	10	54	42	1325
FARRUCO	93	12-01-2006	13	Agadir	A	50	Y	31	56	45	10	29	45	1045
FARRUCO	94	12-01-2006	13	Agadir	A	50	Y	31	0	0	10	42	41	1046
FARRUCO	95	12-01-2006	13	Agadir	A	70	Y	30	56	7	10	28	45	1031
FARRUCO	96	13-01-2006	13	Agadir	A	70	Y	30	59	35	10	42	12	1028
FARRUCO	97	13-01-2006	13	Agadir	B	70	Y	30	50	0	10	32	30	1262
FARRUCO	98	13-01-2006	13	Agadir	B	70	Y	30	59	13	10	42	35	1305
FARRUCO	99	14-01-2006	13	Agadir	B	50	Y	30	50	0	10	32	35	1278
FARRUCO	100	14-01-2006	13	Agadir	B	50	Y	30	56	0	10	39	50	1193
FARRUCO	101	14-01-2006	13	Agadir	B	50	Y	30	51	45	10	34	47	1233
FARRUCO	102	15-01-2006	16	Agadir	A	50	Y	30	18	55	10	23	15	1113
FARRUCO	103	15-01-2006	16	Agadir	A	50	Y	30	27	15	10	12	25	1060
FARRUCO	104	15-01-2006	16	Agadir	A	50	Y	30	18	45	10	19	15	1076
FARRUCO	105	16-01-2006	16	Agadir	A	70	Y	30	27	15	10	13	15	1081
FARRUCO	106	16-01-2006	16	Agadir	A	70	Y	30	18	45	10	26	20	1012
FARRUCO	107	16-01-2006	16	Agadir	A	70	Y	30	26	10	10	15	0	1052
FARRUCO	108	17-01-2006	16	Agadir	A	70	Y	30	26	15	10	14	40	1076
FARRUCO	109	17-01-2006	16	Agadir	A	70	Y	30	17	0	10	21	50	1067
FARRUCO	110	17-01-2006	16	Agadir	A	50	Y	30	24	11	10	21	50	1142
FARRUCO	111	18-01-2006	17	Agadir	B	50	N	30	20	38	10	24	11	1231
FARRUCO	112	18-01-2006	17	Agadir	A	50	Y	30	10	0	10	25	50	1182
FARRUCO	113	18-01-2006	17	Agadir	A	50	Y	30	20	40	10	19	50	1123
FARRUCO	114	19-01-2006	17	Agadir	A	70	Y	30	11	50	10	25	30	1157
FARRUCO	115	19-01-2006	17	Agadir	A	70	Y	30	23	20	10	18	0	1057
FARRUCO	116	19-01-2006	17	Agadir	A	50	Y	30	12	8	10	24	30	1074
FARRUCO	117	20-01-2006	17	Agadir	B	50	Y	30	20	0	10	24	40	1221
FARRUCO	118	20-01-2006	17	Agadir	B	70	Y	30	10	0	10	26	50	1236
FARRUCO	119	20-01-2006	17	Agadir	A	70	Y	30	20	21	10	19	41	1081
FARRUCO	120	21-01-2006	18	Agadir	A	70	Y	30	2	55	10	17	45	1055
FARRUCO	121	21-01-2006	18	Agadir	A	70	Y	30	10	0	10	18	55	1041
FARRUCO	122	21-01-2006	18	Agadir	A	50	Y	30	3	55	10	24	35	1158

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
FARRUCO	123	22-01-2006	18	Agadir	A	50	Y	30	9	10	10	19	50	923
FARRUCO	124	22-01-2006	18	Agadir	B	50	Y	30	2	44	10	14	50	1204
FARRUCO	125	22-01-2006	18	Agadir	B	50	Y	30	6	40	10	27	45	1255
FARRUCO	126	23-01-2006	18	Agadir	B	70	Y	30	5	15	10	23	47	1351
FARRUCO	127	23-01-2006	18	Agadir	B	70	Y	30	8	57	10	29	38	1362
FARRUCO	128	24-01-2006	12	Essaouira	B	70	Y	31	10	0	10	48	35	1183
FARRUCO	129	24-01-2006	12	Essaouira	A	70	Y	30	59	55	10	42	45	1148
FARRUCO	130	25-01-2006	13	Agadir	A	50	Y	30	54	29	10	36	2	1178
FARRUCO	131	25-01-2006	13	Agadir	A	50	Y	31	9	21	10	47	45	1158
FARRUCO	132	25-01-2006	12	Essaouira	A	50	Y	30	59	40	10	42	21	1160
FARRUCO	133	26-01-2006	12	Essaouira	A	50	Y	31	6	8	10	46	15	1175
FARRUCO	134	26-01-2006	12	Essaouira	A	50	Y	31	0	50	10	35	20	917
FARRUCO	135	26-01-2006	13	Agadir	A	70	Y	30	52	40	10	30	50	1099
FARRUCO	136	27-01-2006	13	Agadir	B	70	Y	30	59	24	10	41	55	1275
FARRUCO	137	27-01-2006	12	Essaouira	A	70	Y	31	10	0	10	47	55	1111
FARRUCO	138	27-01-2006	12	Essaouira	A	70	Y	30	57	29	10	37	35	1128
FARRUCO	139	28-01-2006	13	Agadir	B	50	Y	30	58	34	10	40	40	1252
FARRUCO	140	28-01-2006	13	Agadir	B	50	Y	30	53	44	10	36	43	1205
FARRUCO	141	28-01-2006	13	Agadir	B	50	Y	31	0	0	10	44	17	1242
FARRUCO	142	29-01-2006	13	Agadir	B	50	Y	30	57	17	10	38	25	1283
FARRUCO	143	29-01-2006	12	Essaouira	A	50	Y	31	10	0	10	48	20	1169
FARRUCO	144	29-01-2006	12	Essaouira	A	50	Y	30	59	55	10	41	6	1152
FARRUCO	145	30-01-2006	17	Agadir	A	50	Y	30	12	40	10	23	10	1128
FARRUCO	146	31-01-2006	13	Agadir	A	50	N	30	58	28	10	40	50	1200
FARRUCO	147	31-01-2006	12	Essaouira	A	50	Y	31	10	0	10	48	31	1182
FARRUCO	148	31-01-2006	13	Agadir	A	50	Y	30	55	46	10	38	45	1182
FARRUCO	149	01-02-2006	12	Essaouira	B	70	Y	30	59	38	10	43	16	1200
FARRUCO	150	01-02-2006	12	Essaouira	A	70	Y	31	10	0	10	48	0	1077
FARRUCO	151	01-02-2006	13	Agadir	A	70	Y	30	56	50	10	39	50	1175
FARRUCO	152	02-02-2006	12	Essaouira	A	70	Y	31	1	0	10	41	0	1070
FARRUCO	153	02-02-2006	13	Agadir	B	70	Y	30	50	0	10	32	40	1210
FARRUCO	154	02-02-2006	13	Agadir	B	70	Y	30	57	13	10	10	35	1306
FARRUCO	155	03-02-2006	13	Agadir	B	70	Y	30	50	35	10	33	32	1278
FARRUCO	156	03-02-2006	13	Agadir	B	70	N	30	54	47	10	37	39	1208
FARRUCO	157	03-02-2006	13	Agadir	B	70	Y	30	50	19	10	32	55	1294
FARRUCO	158	03-02-2006	13	Agadir	A	70	Y	31	0	47	10	44	55	1204
FARRUCO	159	04-02-2006	13	Agadir	A	70	Y	30	52	16	10	34	15	1140
FARRUCO	160	04-02-2006	13	Agadir	A	70	Y	31	2	50	10	43	10	1090
FARRUCO	161	04-02-2006	13	Agadir	A	70	Y	30	55	47	10	33	26	1072
FARRUCO	162	05-02-2006	13	Agadir	A	50	Y	31	4	30	10	45	35	1147
FARRUCO	163	05-02-2006	13	Agadir	A	50	Y	30	54	45	10	34	25	1105
FARRUCO	164	05-02-2006	13	Agadir	A	50	Y	31	2	44	10	43	45	1072
MYRDOMA F	1	21-11-2005	4	Safi	A	70	Y	32	20	44	9	54	51	1040
MYRDOMA F	2	21-11-2005	4	Safi	B	50	N	32	27	1	9	47	28	1197
MYRDOMA F	3	22-11-2005	4	Safi	B	70	Y	32	20	53	9	54	23	1220
MYRDOMA F	4	22-11-2005	4	Safi	B	50	Y	32	29	36	9	50	9	1330
MYRDOMA F	5	25-11-2005	9	Essaouira	A	70	Y	31	40	13	10	16	21	1009
MYRDOMA F	6	26-11-2005	9	Essaouira	A	70	Y	31	28	27	10	18	46	954
MYRDOMA F	7	26-11-2005	9	Essaouira	A	50	Y	31	40	57	10	16	38	948
MYRDOMA F	8	26-11-2005	9	Essaouira	A	50	Y	31	27	32	10	18	51	973
MYRDOMA F	9	28-11-2005	10	Essaouira	A	50	Y	31	30	19	10	48	59	1097
MYRDOMA F	10	28-11-2005	10	Essaouira	A	50	N	31	19	44	10	57	33	1216
MYRDOMA F	11	30-11-2005	10	Essaouira	A	50	Y	31	31	41	10	42	35	1040
MYRDOMA F	12	30-11-2005	10	Essaouira	A	70	Y	31	18	0	10	47	59	1005
MYRDOMA F	13	01-12-2005	11	Essaouira	A	70	Y	31	13	27	10	40	53	808
MYRDOMA F	14	01-12-2005	11	Essaouira	A	70	Y	31	7	39	10	48	47	1077
MYRDOMA F	15	01-12-2005	11	Essaouira	A	70	Y	31	21	30	10	52	6	1120
MYRDOMA F	16	02-12-2005	11	Essaouira	A	50	N	31	9	58	10	52	42	1191
MYRDOMA F	17	02-12-2005	11	Essaouira	A	50	Y	31	19	45	10	51	12	1111
MYRDOMA F	18	02-12-2005	11	Essaouira	A	50	N	31	13	19	10	52	10	1087

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
MYRDOMA F	19	03-12-2005	12	Essaouira	A	50	Y	31	10	15	10	48	57	1106
MYRDOMA F	20	04-12-2005	12	Essaouira	A	50	Y	31	9	56	10	43	0	944
MYRDOMA F	21	04-12-2005	12	Essaouira	A	50	Y	30	59	23	10	43	33	1176
MYRDOMA F	22	05-12-2005	12	Essaouira	A	70	Y	31	10	35	10	44	41	984
MYRDOMA F	23	05-12-2005	12	Essaouira	A	70	Y	31	2	0	10	41	55	1031
MYRDOMA F	24	06-12-2005	13	Agadir	A	70	Y	30	59	0	10	41	57	1082
MYRDOMA F	25	08-12-2005	16	Agadir	A	70	Y	30	26	31	10	12	22	998
MYRDOMA F	26	08-12-2005	16	Agadir	A	70	Y	30	18	11	10	22	54	1116
MYRDOMA F	27	08-12-2005	16	Agadir	A	50	Y	30	28	30	10	14	44	1168
MYRDOMA F	28	09-12-2005	16	Agadir	A	50	Y	30	26	30	10	13	15	1119
MYRDOMA F	29	09-12-2005	16	Agadir	A	50	Y	30	20	26	10	27	59	1203
MYRDOMA F	30	09-12-2005	16	Agadir	A	50	Y	30	25	43	10	14	20	1093
MYRDOMA F	31	11-12-2005	17	Agadir	A	50	Y	30	11	16	10	26	48	1130
MYRDOMA F	32	11-12-2005	17	Agadir	A	50	Y	30	21	55	10	17	59	1043
MYRDOMA F	33	11-12-2005	17	Agadir	A	70	Y	30	11	18	10	19	47	1014
MYRDOMA F	34	12-12-2005	17	Agadir	A	70	Y	30	23	20	10	18	53	990
MYRDOMA F	35	12-12-2005	17	Agadir	A	70	Y	30	10	51	10	21	37	1163
MYRDOMA F	36	14-12-2005	18	Agadir	A	70	Y	30	8	18	10	12	50	917
MYRDOMA F	37	14-12-2005	18	Agadir	A	70	Y	30	11	0	10	21	10	1016
MYRDOMA F	38	15-12-2005	17	Agadir	A	50	Y	30	25	22	10	19	10	1026
MYRDOMA F	39	15-12-2005	16	Agadir	A	50	Y	30	15	20	10	25	0	1143
MYRDOMA F	40	15-12-2005	16	Agadir	A	50	Y	30	26	4	10	14	8	1044
MYRDOMA F	41	16-12-2005	16	Agadir	A	50	Y	30	27	41	10	17	46	1138
MYRDOMA F	42	16-12-2005	16	Agadir	A	50	Y	30	14	8	10	21	17	1087
MYRDOMA F	43	17-12-2005	11	Essaouira	A	70	Y	31	22	0	10	51	8	1074
MYRDOMA F	44	17-12-2005	11	Essaouira	A	70	Y	31	13	2	10	51	0	1066
MYRDOMA F	45	17-12-2005	12	Essaouira	A	50	N	31	0	32	10	38	0	1066
MYRDOMA F	46	18-12-2005	13	Agadir	A	50	Y	30	52	33	10	31	34	1018
MYRDOMA F	47	18-12-2005	13	Agadir	A	50	N	31	0	2	10	45	52	1176
MYRDOMA F	48	18-12-2005	13	Agadir	A	70	Y	30	52	47	10	32	28	1161
MYRDOMA F	49	20-12-2005	16	Agadir	A	50	Y	30	23	58	10	22	31	1074
MYRDOMA F	50	20-12-2005	16	Agadir	A	50	N	30	19	52	10	12	48	986
MYRDOMA F	51	21-12-2005	16	Agadir	A	70	Y	30	23	32	10	27	19	1111
MYRDOMA F	52	21-12-2005	16	Agadir	A	70	Y	30	26	3	10	12	59	1031
MYRDOMA F	53	21-12-2005	16	Agadir	A	70	Y	30	23	15	10	28	5	1069
MYRDOMA F	54/55	22-12-2005	16	Agadir	A	70	Y	30	26	58	10	14	14	1082
MYRDOMA F	56	28-12-2005	4	Safi	B	70	Y	32	19	30	9	56	24	1313
MYRDOMA F	57	28-12-2005	4	Safi	A	70	Y	32	28	8	9	54	47	1110
MYRDOMA F	58	29-12-2005	9	Essaouira	A	70	Y	31	30	3	10	22	39	1113
MYRDOMA F	59	29-12-2005	9	Essaouira	B	70	Y	31	40	12	10	17	12	1230
MYRDOMA F	60	29-12-2005	9	Essaouira	A	70	N	31	33	0	10	18	14	1039
MYRDOMA F	61	30-12-2005	9	Essaouira	B	70	Y	31	40	0	10	18	34	1269
MYRDOMA F	62	30-12-2005	9	Essaouira	B	50	Y	31	32	0	10	25	11	1337
MYRDOMA F	63	30-12-2005	9	Essaouira	B	50	N	31	39	0	10	18	0	1266
MYRDOMA F	64	31-12-2005	9	Essaouira	A	70	Y	31	41	21	10	16	34	982
MYRDOMA F	65	31-12-2005	9	Essaouira	A	50	Y	31	33	0	10	17	42	974
MYRDOMA F	66	31-12-2005	9	Essaouira	A	50	Y	31	24	31	10	22	55	940
MYRDOMA F	67	01-01-2006	10	Essaouira	A	70	Y	31	30	58	10	46	42	1028
MYRDOMA F	68	01-01-2006	10	Essaouira	A	50	Y	31	19	55	10	51	57	1100
MYRDOMA F	69	02-01-2005	10	Essaouira	A	50	N	31	20	14	10	54	0	1137
MYRDOMA F	70	02-01-2005	10	Essaouira	A	50	Y	31	32	35	10	45	51	1169
MYRDOMA F	71	03-01-2006	10	Essaouira	B	50	Y	31	32	57	10	48	0	1237
MYRDOMA F	72	03-01-2006	10	Essaouira	B	50	N	31	18	56	10	58	0	1278
MYRDOMA F	73	04-01-2006	10	Essaouira	B	70	Y	31	30	15	10	51	31	1225
MYRDOMA F	74	04-01-2006	10	Essaouira	B	70	Y	31	20	19	10	57	29	1242
MYRDOMA F	75	04-01-2006	10	Essaouira	A	70	Y	31	27	10	10	46	26	1048
MYRDOMA F	76	05-01-2006	11	Essaouira	A	50	Y	31	8	0	10	47	50	1092
MYRDOMA F	77	05-01-2006	11	Essaouira	B	50	Y	31	21	55	10	56	16	1208
MYRDOMA F	78	07-01-2006	11	Essaouira	B	50	Y	31	20	49	10	58	54	1256
MYRDOMA F	79	07-01-2006	11	Essaouira	A	70	Y	31	10	22	10	49	4	1139
MYRDOMA F	80	08-01-2006	11	Essaouira	B	70	Y	31	22	19	10	57	58	1253

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
MYRDOMA F	81	08-01-2006	11	Essaouira	B	70	Y	31	8	50	10	50	0	1203
MYRDOMA F	82	09-01-2006	12	Essaouira	B	70	Y	31	0	0	10	47	0	1219
MYRDOMA F	83	09-01-2006	12	Essaouira	A	70	Y	31	10	59	10	48	0	1074
MYRDOMA F	84	09-01-2006	12	Essaouira	A	70	Y	31	0	6	10	44	0	1182
MYRDOMA F	85/86	10-01-2006	12	Essaouira	B	70	Y	31	11	37	10	55	55	1266
MYRDOMA F	87	10-01-2006	12	Essaouira	B	50	Y	30	59	0	10	44	24	1294
MYRDOMA F	88	11-01-2006	12	Essaouira	A	50	Y	31	12	1	10	46	42	1022
MYRDOMA F	89	11-01-2006	12	Essaouira	A	50	Y	30	59	59	10	35	48	939
MYRDOMA F	90	11-01-2006	12	Essaouira	A	50	Y	31	10	0	10	44	13	977
MYRDOMA F	91	12-01-2006	13	Agadir	A	50	Y	30	52	30	10	30	35	1060
MYRDOMA F	92	12-01-2006	13	Agadir	A	50	Y	31	2	58	10	41	43	1005
MYRDOMA F	93	12-01-2006	13	Agadir	A	50	Y	30	52	30	10	31	51	1050
MYRDOMA F	94	13-01-2006	13	Agadir	B	50	Y	31	0	0	10	46	0	1269
MYRDOMA F	95	13-01-2006	13	Agadir	B	70	Y	30	53	18	10	35	0	1233
MYRDOMA F	96	13-01-2006	13	Agadir	B	70	Y	30	59	0	10	43	57	1263
MYRDOMA F	97	14-01-2006	13	Agadir	A	70	Y	30	51	0	10	33	0	1119
MYRDOMA F	98	14-01-2006	13	Agadir	A	70	Y	31	2	55	10	41	46	1031
MYRDOMA F	99	14-01-2006	13	Agadir	A	70	Y	30	52	47	10	33	17	1052
MYRDOMA F	100	15-01-2006	16	Agadir	A	70	Y	30	18	10	10	22	42	1126
MYRDOMA F	101	15-01-2006	16	Agadir	A	70	Y	30	27	15	10	12	6	1087
MYRDOMA F	102	15-01-2006	16	Agadir	A	70	Y	30	23	26	10	28	0	1144
MYRDOMA F	103	16-01-2006	16	Agadir	A	70	Y	30	19	58	10	24	15	1127
MYRDOMA F	104	16-01-2006	16	Agadir	A	50	Y	30	26	0	10	12	41	1032
MYRDOMA F	105	16-01-2006	16	Agadir	A	50	Y	30	19	24	10	23	40	1079
MYRDOMA F	106	17-01-2006	17	Agadir	A	50	Y	30	11	0	10	24	0	1153
MYRDOMA F	107	17-01-2006	17	Agadir	B	50	Y	30	25	0	10	23	36	1271
MYRDOMA F	108	18-01-2006	17	Agadir	A	50	Y	30	11	30	10	23	40	1192
MYRDOMA F	109	18-01-2006	17	Agadir	A	50	Y	30	22	57	10	27	1	1198
MYRDOMA F	110	18-01-2006	17	Agadir	A	70	Y	30	11	55	10	19	5	1056
MYRDOMA F	111	19-01-2006	17	Agadir	A	70	Y	30	24	19	10	19	6	1030
MYRDOMA F	112	19-01-2006	17	Agadir	A	70	Y	30	10	30	10	15	21	1063
MYRDOMA F	113	19-01-2006	17	Agadir	B	70	Y	30	22	0	10	26	0	1258
MYRDOMA F	114	20-01-2006	18	Agadir	A	70	Y	30	7	0	10	12	59	1047
MYRDOMA F	115	20-01-2006	18	Agadir	B	70	Y	30	8	37	10	29	25	1340
MYRDOMA F	116	21-01-2006	18	Agadir	B	50	Y	30	2	30	10	15	32	1134
MYRDOMA F	117	21-01-2006	18	Agadir	B	50	Y	30	5	12	10	32	18	1340
MYRDOMA F	118	22-01-2006	16	Agadir	A	50	Y	30	29	0	10	13	1	1077
MYRDOMA F	119	22-01-2006	16	Agadir	A	50	Y	30	23	36	10	28	10	1137
MYRDOMA F	120	22-01-2006	16	Agadir	A	50	Y	30	25	36	10	14	0	1006
MYRDOMA F	121	21-01-2006	13	Agadir	A	50	Y	31	2	51	10	42	0	1039
MYRDOMA F	122	23-01-2006	13	Agadir	A	50	Y	30	53	17	10	28	57	996
MYRDOMA F	123	23-01-2006	16	Agadir	A	50	Y	31	0	56	10	41	8	1005
MYRDOMA F	124	24-01-2006	13	Agadir	A	50	N	31	3	14	10	39	2	914
MYRDOMA F	125	24-01-2006	11	Essaouira	A	70	Y	31	20	0	10	55	44	1158
MYRDOMA F	126	24-01-2006	11	Essaouira	B	70	Y	31	8	28	10	54	0	1267
MYRDOMA F	127	25-01-2006	13	Agadir	A	70	Y	30	52	40	10	30	58	1066
MYRDOMA F	128	25-01-2006	13	Agadir	A	70	Y	31	1	46	10	41	0	1031
MYRDOMA F	129	25-01-2006	12	Essaouira	A	70	Y	31	11	12	10	47	0	976
MYRDOMA F	130	26-01-2006	13	Agadir	A	50	Y	30	53	0	10	33	0	1014
MYRDOMA F	131	26-01-2006	13	Agadir	A	50	Y	30	59	59	10	44	26	1124
MYRDOMA F	132	26-01-2006	13	Agadir	A	50	Y	30	53	0	10	33	32	1134
MYRDOMA F	133	27-01-2006	13	Agadir	A	50	Y	30	59	58	10	43	55	1127
MYRDOMA F	134	27-01-2006	12	Essaouira	A	50	Y	31	14	15	10	0	26	1263
MYRDOMA F	135	28-01-2006	12	Essaouira	B	50	Y	30	54	19	10	38	21	1248
MYRDOMA F	136	29-01-2006	13	Agadir	A	50	Y	30	55	5	10	36	55	1176
MYRDOMA F	137	29-01-2006	13	Agadir	A	50	Y	31	3	0	10	44	1	1115
MYRDOMA F	138	29-01-2006	13	Agadir	A	50	Y	30	52	18	10	33	16	1145
MYRDOMA F	139	30-01-2006	16	Agadir	A	70	Y	30	27	54	10	21	0	1098
MYRDOMA F	140	30-01-2006	16	Agadir	A	70	Y	30	15	57	10	22	49	1222
MYRDOMA F	141	30-01-2006	16	Agadir	A	70	Y	30	28	0	10	17	59	1138
MYRDOMA F	142	31-01-2006	16	Agadir	A	70	Y	30	15	54	10	22	21	1124

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
MYRDOMA F	143	31-01-2006	16	Agadir	A	70	Y	30	26	41	10	14	26	1118
MYRDOMA F	144	31-01-2006	16	Agadir	A	70	Y	30	23	39	10	28	20	1101
MYRDOMA F	145	01-02-2006	13	Agadir	A	70	Y	30	2	32	10	43	39	1082
MYRDOMA F	146	01-02-2006	13	Agadir	A	70	Y	30	52	24	10	33	43	1071
MYRDOMA F	147	01-02-2006	12	Essaouira	A	70	Y	31	6	59	10	41	58	1051
MYRDOMA F	148	02-02-2006	13	Agadir	A	70	Y	30	52	3	10	31	51	1039
MYRDOMA F	149	02-02-2006	13	Agadir	A	70	Y	31	3	15	10	40	59	992
MYRDOMA F	150	02-02-2006	13	Agadir	A	70	Y	30	52	15	10	34	59	1069
MYRDOMA F	151	03-02-2006	13	Agadir	A	70	Y	31	2	39	10	44	7	1121
MYRDOMA F	152	03-02-2006	13	Agadir	A	70	Y	30	53	0	10	33	59	1076
MYRDOMA F	153	03-02-2006	13	Agadir	A	70	Y	31	2	59	10	44	27	1129
MYRDOMA F	154	04-02-2006	13	Agadir	A	70	Y	30	53	14	10	33	59	1072
MYRDOMA F	155	04-02-2006	13	Agadir	A	70	Y	31	2	6	10	43	46	1084
MYRDOMA F	156	04-02-2006	13	Agadir	A	70	Y	30	51	51	10	33	45	1131
MYRDOMA F	157	05-02-2006	13	Agadir	A	70	Y	31	2	55	10	45	7	1140
MYRDOMA F	158	05-02-2006	13	Agadir	A	70	Y	30	54	57	10	34	17	1091
MYRDOMA F	159	05-02-2006	13	Agadir	A	70	Y	31	5	59	10	41	37	1048
MYRDOMA F	160	06-02-2006	13	Agadir	A	70	Y	31	0	46	10	42	34	1134
FULA	1	24-01-2006	1	Sidi Ifni-Tan Tan	A	50	Y	29	54	0	10	23	2	1095
FULA	2	24-01-2006	1	Sidi Ifni-Tan Tan	A	50	Y	29	58	7	10	16	8	1070
FULA	3	25-01-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	43	30	10	32	22	825
FULA	4	25-01-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	50	0	10	21	7	834
FULA	5	25-01-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	41	5	10	42	6	839
FULA	6	26-01-2006	2	Sidi Ifni-Tan Tan	B	50	N	29	42	57	10	42	56	1180
FULA	7	26-01-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	48	1	10	25	57	812
FULA	8	26-01-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	41	1	10	36	1	897
FULA	9	26-01-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	39	1	10	38	2	877
FULA	10	27-01-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	37	6	10	43	8	1032
FULA	11	28-01-2006	3	Sidi Ifni-Tan Tan	B	70	N	29	33	7	10	57	3	1250
FULA	12	29-01-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	21	9	11	1	9	1013
FULA	13	29-01-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	28	5	10	50	9	825
FULA	14	29-01-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	21	4	11	1	1	847
FULA	15	30-01-2006	4	Sidi Ifni-Tan Tan	B	50	Y	29	28	1	11	7	3	1268
FULA	16	30-01-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	29	6	10	49	9	915
FULA	17	30-01-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	21	6	11	1	4	875
FULA	18	31-01-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	13	9	11	36	0	836
FULA	19	31-01-2006	5	Sidi Ifni-Tan Tan	A	70	N	29	19	6	11	13	1	810
FULA	20	31-01-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	15	5	11	28	9	896
FULA	21	01-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	19	5	11	15	6	858
FULA	22	01-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	15	8	11	28	0	962
FULA	23	01-02-2006	5	Sidi Ifni-Tan Tan	B	50	Y	29	14	5	11	45	1	1208
FULA	24	02-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	3	8	12	20	1	846
FULA	25	02-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	0	2	12	33	0	877
FULA	26	02-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	5	2	12	17	3	882
FULA	27	03-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	4	9	12	21	3	915
FULA	28	03-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	0	0	12	32	9	909
FULA	29	04-02-2006	11	Tarfaya-El Aaiún	A	70	Y	28	10	3	13	16	5	807
FULA	30	04-02-2006	11	Tarfaya-El Aaiún	A	70	Y	28	20	6	13	12	4	836
FULA	31	04-02-2006	11	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	17	35	804
FULA	32	05-02-2006	12	Tarfaya-El Aaiún	A	50	Y	28	0	5	13	24	0	819
FULA	33	05-02-2006	12	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	17	45	807
FULA	34	05-02-2006	12	Tarfaya-El Aaiún	A	70	Y	28	0	8	13	23	4	800
FULA	35	06-02-2006	13	Tarfaya-El Aaiún	A	70	Y	28	0	0	13	24	6	816
FULA	36	06-02-2006	13	Tarfaya-El Aaiún	A	70	Y	27	50	0	13	29	7	831
FULA	37	06-02-2006	13	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	24	5	834
FULA	38	07-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	1	830
FULA	39	07-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	30	1	922
FULA	40	07-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	41	5	13	36	2	873
FULA	41	08-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	31	8	13	42	5	905
FULA	42	08-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	37	0	900

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
FULA	43	08-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	33	1	13	41	4	903
FULA	44	09-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	4	13	44	8	908
FULA	45	09-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	6	800
FULA	46	09-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	45	0	858
FULA	47	10-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	42	3	900
FULA	48	10-02-2006	16	El Aaiún-C.Bojador	B	70	Y	27	20	0	13	47	5	1220
FULA	49	11-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	2	2	13	58	9	883
FULA	50	11-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	10	0	13	48	1	985
FULA	51	11-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	2	2	13	59	7	918
FULA	52	12-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	2	9	14	1	0	1008
FULA	53	12-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	9	8	13	47	7	915
FULA	54	12-02-2006	18	El Aaiún-C.Bojador	B	50	Y	27	7	1	14	3	6	1224
FULA	55	13-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	13	0	951
FULA	56	13-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	58	0	14	4	6	927
FULA	57	13-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	12	8	941
FULA	58	14-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	13	6	973
FULA	59	14-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	58	1	14	3	9	920
FULA	60	14-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	12	5	865
FULA	61	15-02-2006	20	El Aaiún-C.Bojador	A	70	Y	26	48	0	14	13	6	900
FULA	62	15-02-2006	20	El Aaiún-C.Bojador	A	70	Y	26	41	4	14	20	7	898
FULA	63	15-02-2006	20	El Aaiún-C.Bojador	A	70	Y	26	46	8	14	13	6	867
FULA	64	16-02-2006	20	El Aaiún-C.Bojador	A	50	Y	26	49	5	14	13	7	965
FULA	65	16-02-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	0	14	23	0	959
FULA	66	16-02-2006	20	El Aaiún-C.Bojador	B	50	Y	26	50	0	14	18	5	1257
FULA	67	17-02-2006	23	El Aaiún-C.Bojador	A	50	N	26	13	3	15	14	6	858
FULA	68	17-02-2006	23	El Aaiún-C.Bojador	A	50	Y	26	18	6	15	5	4	911
FULA	69	17-02-2006	23	El Aaiún-C.Bojador	A	50	Y	26	14	2	15	16	7	901
FULA	70	18-02-2006	23	El Aaiún-C.Bojador	A	70	Y	26	14	3	15	13	5	860
FULA	71	18-02-2006	23	El Aaiún-C.Bojador	A	70	Y	26	19	6	15	2	1	883
FULA	72	19-02-2006	24	El Aaiún-C.Bojador	A	70	Y	26	8	0	15	24	6	833
FULA	73	19-02-2006	24	El Aaiún-C.Bojador	A	70	Y	26	0	7	15	35	3	904
FULA	74	20-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	58	1	14	4	2	924
FULA	75	20-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	49	0	14	14	1	981
FULA	76	20-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	57	2	14	4	9	941
FULA	77	21-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	58	1	14	4	5	937
FULA	78	21-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	12	8	953
FULA	79	21-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	54	9	14	4	6	941
FULA	80	22-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	1	13	53	5	989
FULA	81	22-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	0	5	14	4	6	1022
FULA	82	22-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	8	0	13	53	6	1013
FULA	83	23-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	6	5	13	53	0	949
FULA	84	23-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	1	2	14	3	4	986
FULA	85	23-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	2	13	53	0	988
FULA	86	24-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	39	7	13	37	6	850
FULA	87	24-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	43	1	880
FULA	88	24-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	9	13	37	4	900
FULA	89	25-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	49	4	13	30	3	901
FULA	90	25-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	37	6	900
FULA	91	25-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	4	887
FULA	92	26-02-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	9	875
FULA	93	26-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	37	3	890
FULA	94	26-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	1	13	29	5	900
FULA	95	03-03-2006	24	El Aaiún-C.Bojador	A	50	Y	26	2	7	15	30	0	824
FULA	96	03-03-2006	24	El Aaiún-C.Bojador	A	50	Y	26	10	0	15	22	97	895
FULA	97	04-03-2006	23	El Aaiún-C.Bojador	A	50	Y	26	15	5	15	13	1	877
FULA	98	04-03-2006	23	El Aaiún-C.Bojador	A	50	Y	26	20	0	15	0	9	877
FULA	99	05-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	49	2	14	13	2	937
FULA	100	05-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	7	14	23	5	980
FULA	101	05-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	49	1	14	13	6	961
FULA	102	06-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	40	7	14	22	7	954
FULA	103	06-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	49	2	14	13	8	981

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
FULA	104	07-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	56	2	14	6	8	979
FULA	105	07-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	48	0	14	14	3	957
FULA	106	07-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	57	0	14	6	2	933
FULA	107	08-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	58	4	14	4	9	944
FULA	108	08-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	47	6	14	14	7	935
FULA	109	08-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	52	8	14	10	2	953
FULA	110	08-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	14	6	956
FULA	111	09-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	8	3	13	51	6	980
FULA	112	09-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	3	7	967
FULA	113	09-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	8	6	13	49	7	952
FULA	114	10-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	1	4	14	2	0	946
FULA	115	10-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	8	0	13	49	8	925
FULA	116	10-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	2	14	2	9	929
FULA	117	11-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	7	5	13	53	9	939
FULA	118	11-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	2	14	3	0	924
FULA	119	11-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	7	1	13	51	4	931
FULA	120	11-03-2006	18	El Aaiún-C.Bojador	B	70	Y	27	7	8	14	2	4	1220
FULA	121	12-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	32	4	13	41	8	931
FULA	122	12-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	15	8	13	45	5	957
FULA	123	12-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	32	4	13	42	0	938
FULA	124	13-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	1	13	45	4	969
FULA	125	13-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	9	13	42	1	925
FULA	126	13-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	0	13	45	5	964
FULA	127	14-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	3	13	37	3	929
FULA	128	14-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	28	9	13	43	3	928
FULA	129	14-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	4	13	37	2	932
FULA	130	15-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	30	1	904
FULA	131	15-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	38	8	13	38	2	936
FULA	132	15-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	44	4	13	33	5	940
FULA	133	15-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	4	13	42	9	938
FULA	134	16-03-2006	13	Tarfaya-El Aaiún	A	50	Y	27	58	0	13	26	9	887
FULA	135	16-03-2006	13	Tarfaya-El Aaiún	A	50	Y	27	46	1	13	32	6	914
FULA	136	16-03-2006	13	Tarfaya-El Aaiún	A	50	Y	27	58	1	13	25	9	861
FULA	137	17-03-2006	12	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	17	5	811
FULA	138	17-03-2006	12	Tarfaya-El Aaiún	A	50	Y	27	52	3	13	25	3	869
FULA	139	17-03-2006	12	Tarfaya-El Aaiún	A	50	Y	28	10	1	13	15	5	821
FULA	140	18-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	14	0	13	15	0	807
FULA	141	18-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	6	1	13	19	4	801
FULA	142	18-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	21	1	13	10	1	803
FULA	143	19-03-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	5	0	12	21	5	925
FULA	144	19-03-2006	6	Sidi Ifni-Tan Tan	A	70	Y	28	59	7	12	34	9	980
FULA	145	19-03-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	5	0	12	19	9	922
FULA	146	20-03-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	5	4	12	17	8	897
FULA	147	20-03-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	1	1	12	31	5	927
FULA	148	21-03-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	20	6	11	7	4	816
FULA	149	21-03-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	18	0	11	25	5	974
FULA	150	22-03-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	14	7	11	37	2	972
FULA	151	22-03-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	18	7	11	20	4	956
FULA	152	22-03-2006	5	Sidi Ifni-Tan Tan	B	70	Y	29	15	7	11	41	1	1231
FULA	153	23-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	28	7	10	51	3	869
FULA	154	23-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	20	9	11	2	6	850
FULA	155	23-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	30	6	10	53	3	936
FULA	156	24-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	20	5	11	3	3	949
FULA	157	24-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	32	3	10	53	1	973
FULA	158	24-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	21	8	11	1	7	917
FULA	159	25-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	38	0	10	41	8	985
FULA	160	25-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	30	22	10	54	7	1060
FULA	161	25-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	38	4	10	39	9	926
FULA	162	26-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	38	1	10	40	6	934
FULA	163	27-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	29	0	13	43	0	933
FULA	164	27-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	39	9	13	37	6	927

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
FULA	165	27-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	26	0	13	44	2	944
FULA	166	28-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	43	8	913
FULA	167	28-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	41	2	13	36	8	920
FULA	168	28-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	44	0	962
FULA	169	29-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	2	13	30	5	920
FULA	170	29-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	39	9	13	37	5	893
FULA	171	29-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	1	13	29	5	865
FULA	172	30-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	6	13	29	1	875
FULA	173	30-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	1	13	31	3	865
FULA	174	30-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	6	13	35	0	883
FULA	175	31-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	45	0	918
FULA	176	31-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	43	1	948
FULA	177	31-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	3	13	46	1	983
FULA	178	01-04-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	1	13	42	6	905
FULA	179	01-04-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	47	0	1040
FULA	180	02-04-2006	13	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	24	3	803
FULA	181	02-04-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	7	835
FULA	182	02-04-2006	13	Tarfaya-El Aaiún	A	50	Y	27	59	9	13	29	5	893
FULA	183	03-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	29	9	13	42	5	893
FULA	184	03-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	8	895
FULA	185	03-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	42	3	875
FULA	186	04-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	37	1	850
FULA	187	04-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	42	5	895
FULA	188	04-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	1	820
FULA	189	05-04-2006	12	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	16	0	805
FULA	190	05-04-2006	12	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	24	3	820
FULA	191	05-04-2006	12	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	18	2	860
FULA	192	06-04-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	2	803
FULA	193	06-04-2006	13	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	23	9	830
FULA	194	06-04-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	30	5	870
MAR ROJO DOS	1	22-01-2006	24	Sidi Ifni-Tan Tan	A	70	Y	26	6	10	15	28	90	960
MAR ROJO DOS	2	22-01-2006	24	Sidi Ifni-Tan Tan	A	70	Y	26	0	0	15	36	7	950
MAR ROJO DOS	3	23-01-2006	24	Sidi Ifni-Tan Tan	A	50	Y	26	5	6	15	27	4	897
MAR ROJO DOS	4	23-01-2006	24	El Aaiún-C.Bojador	A	50	N	26	7	8	15	23	7	800
MAR ROJO DOS	5	24-01-2006	23	El Aaiún-C.Bojador	A	70	N	26	20	0	15	7	8	891
MAR ROJO DOS	6	24-01-2006	23	Sidi Ifni-Tan Tan	A	50	Y	26	11	4	15	18	5	952
MAR ROJO DOS	7	25-01-2006	23	El Aaiún-C.Bojador	A	70	Y	26	14	0	15	17	0	1060
MAR ROJO DOS	8	25-01-2006	23	El Aaiún-C.Bojador	A	50	Y	26	19	7	15	6	6	1087
MAR ROJO DOS	9	26-01-2006	22	El Aaiún-C.Bojador	A	70	N	26	22	6	15	52	7	878
MAR ROJO DOS	10	27-01-2006	20	El Aaiún-C.Bojador	A	50	Y	26	39	6	14	20	2	830
MAR ROJO DOS	11	27-01-2006	20	El Aaiún-C.Bojador	A	70	N	26	50	0	14	10	6	823
MAR ROJO DOS	12	28-01-2006	20	El Aaiún-C.Bojador	B	50	Y	26	42	9	14	29	0	1249
MAR ROJO DOS	13	03-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	59	6	14	4	8	940
MAR ROJO DOS	14	03-02-2006	19	El Aaiún-C.Bojador	A	70	Y	27	0	0	14	11	4	928
MAR ROJO DOS	15	03-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	58	7	14	5	5	898
MAR ROJO DOS	16	04-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	11	8	1001
MAR ROJO DOS	17	04-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	57	4	14	6	0	980
MAR ROJO DOS	18	04-02-2006	19	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	4	5	1003
MAR ROJO DOS	19	05-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	9	4	13	46	7	893
MAR ROJO DOS	20	05-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	3	1	14	0	3	923
MAR ROJO DOS	21	05-02-2006	18	El Aaiún-C.Bojador	B	50	Y	27	10	0	13	57	6	1207
MAR ROJO DOS	22	06-02-2006	18	El Aaiún-C.Bojador	B	70	Y	27	7	0	14	4	0	1260
MAR ROJO DOS	23	06-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	8	13	48	5	920
MAR ROJO DOS	24	06-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	3	2	13	59	2	917
MAR ROJO DOS	25	07-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	43	6	946
MAR ROJO DOS	26	07-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	44	6	873
MAR ROJO DOS	27	07-02-2006	16	El Aaiún-C.Bojador	B	50	Y	27	30	0	13	46	5	1215
MAR ROJO DOS	28	08-02-2006	16	El Aaiún-C.Bojador	B	70	Y	27	22	7	13	48	5	1213
MAR ROJO DOS	29	08-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	43	0	942
MAR ROJO DOS	30	08-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	0	13	44	9	883

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
MAR ROJO DOS	31	09-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	42	2	850
MAR ROJO DOS	32	09-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	35	8	827
MAR ROJO DOS	33	09-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	31	0	13	41	0	850
MAR ROJO DOS	34	10-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	7	854
MAR ROJO DOS	35	10-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	50	0	13	29	6	849
MAR ROJO DOS	36	10-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	3	845
MAR ROJO DOS	37	10-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	1	13	42	9	865
MAR ROJO DOS	38	11-02-2006	13	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	25	1	861
MAR ROJO DOS	39	11-02-2006	13	Tarfaya-El Aaiún	A	70	Y	27	50	0	13	29	5	878
MAR ROJO DOS	40	11-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	5	838
MAR ROJO DOS	41	12-02-2006	12	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	17	6	838
MAR ROJO DOS	42	12-02-2006	12	Tarfaya-El Aaiún	A	70	Y	28	0	0	13	25	6	850
MAR ROJO DOS	43	13-02-2006	11	Tarfaya-El Aaiún	A	70	Y	28	20	0	13	11	5	835
MAR ROJO DOS	44	13-02-2006	11	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	17	7	830
MAR ROJO DOS	45	13-02-2006	11	Tarfaya-El Aaiún	A	70	Y	28	13	0	13	15	6	828
MAR ROJO DOS	46	14-02-2006	6	Sidi Ifni-Tan Tan	B	50	Y	29	5	3	12	33	8	1214
MAR ROJO DOS	47	14-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	4	7	12	18	1	923
MAR ROJO DOS	48	14-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	2	0	12	28	5	846
MAR ROJO DOS	49	14-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	3	6	12	21	6	853
MAR ROJO DOS	50	15-02-2006	6	Sidi Ifni-Tan Tan	A	70	N	29	2	5	12	26	4	860
MAR ROJO DOS	51	15-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	6	7	12	10	5	880
MAR ROJO DOS	52	15-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	2	3	12	27	2	873
MAR ROJO DOS	53	15-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	5	3	12	15	0	860
MAR ROJO DOS	54	16-02-2006	5	Sidi Ifni-Tan Tan	B	50	Y	29	15	5	11	35	5	1223
MAR ROJO DOS	55	16-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	19	4	11	15	3	985
MAR ROJO DOS	56	16-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	20	0	11	7	7	850
MAR ROJO DOS	57	17-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	19	6	11	16	4	885
MAR ROJO DOS	58	17-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	15	2	11	31	6	918
MAR ROJO DOS	59	17-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	12	1	11	39	4	921
MAR ROJO DOS	60	17-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	7	3	12	3	2	858
MAR ROJO DOS	61	18-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	14	0	11	35	9	895
MAR ROJO DOS	62	18-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	18	8	11	19	0	907
MAR ROJO DOS	63	19-02-2006	4	Sidi Ifni-Tan Tan	B	50	Y	29	27	9	11	3	9	1226
MAR ROJO DOS	64	19-02-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	30	1	10	50	3	970
MAR ROJO DOS	65	19-02-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	21	0	11	5	5	921
MAR ROJO DOS	66	20-02-2006	4	Sidi Ifni-Tan Tan	B	70	Y	29	30	0	10	56	0	1238
MAR ROJO DOS	67	21-02-2006	3	Sidi Ifni-Tan Tan	B	50	Y	29	40	0	10	41	1	1213
MAR ROJO DOS	68	21-02-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	30	1	10	51	5	1052
MAR ROJO DOS	69	21-02-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	38	6	10	42	3	1013
MAR ROJO DOS	70	22-02-2006	3	Sidi Ifni-Tan Tan	B	70	Y	29	40	0	10	50	0	1286
MAR ROJO DOS	71	22-02-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	30	5	10	49	2	977
MAR ROJO DOS	72	22-02-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	40	0	10	41	2	1019
MAR ROJO DOS	73	23-02-2006	2	Sidi Ifni-Tan Tan	B	50	Y	29	47	8	10	40	4	1306
MAR ROJO DOS	74	23-02-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	40	0	10	36	9	1030
MAR ROJO DOS	75	23-02-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	50	8	10	26	4	910
MAR ROJO DOS	76	24-02-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	49	1	10	26	0	915
MAR ROJO DOS	77	28-02-2006	2	Sidi Ifni-Tan Tan	B	50	Y	29	40	1	10	47	3	1238
MAR ROJO DOS	78	28-02-2006	2	Sidi Ifni-Tan Tan	B	70	Y	29	48	4	10	37	5	1203
MAR ROJO DOS	79	01-03-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	41	4	10	38	7	1048
MAR ROJO DOS	80	01-03-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	49	6	10	26	1	989
MAR ROJO DOS	81	01-03-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	41	6	10	38	1	953
MAR ROJO DOS	82	02-03-2006	3	Sidi Ifni-Tan Tan	B	50	N	29	40	0	10	46	0	1218
MAR ROJO DOS	83	02-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	30	0	10	52	7	1053
MAR ROJO DOS	84	02-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	40	0	10	42	7	1030
MAR ROJO DOS	85	03-03-2006	3	Sidi Ifni-Tan Tan	B	70	Y	29	30	0	10	58	0	1200
MAR ROJO DOS	86	03-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	39	4	10	45	8	1107
MAR ROJO DOS	87	03-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	30	0	10	56	0	1126
MAR ROJO DOS	88	04-03-2006	4	Sidi Ifni-Tan Tan	B	50	Y	29	24	4	11	9	5	1209
MAR ROJO DOS	89	04-03-2006	4	Sidi Ifni-Tan Tan	B	70	Y	29	28	8	10	58	0	1200
MAR ROJO DOS	90	04-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	40	0	10	42	0	1017
MAR ROJO DOS	91	05-03-2006	4	Sidi Ifni-Tan Tan	A	70	N	29	22	0	11	2	9	905

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
MAR ROJO DOS	92	05-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	30	0	10	50	2	911
MAR ROJO DOS	93	05-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	22	7	11	6	4	975
MAR ROJO DOS	94	06-03-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	14	0	11	36	0	1010
MAR ROJO DOS	95	09-03-2006	11	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	18	3	845
MAR ROJO DOS	96	09-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	20	0	13	11	7	869
MAR ROJO DOS	97	09-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	10	0	13	18	3	880
MAR ROJO DOS	98	10-03-2006	12	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	25	3	870
MAR ROJO DOS	99	10-03-2006	12	Tarfaya-El Aaiún	A	70	Y	28	10	0	13	18	0	843
MAR ROJO DOS	100	10-03-2006	12	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	25	4	845
MAR ROJO DOS	101	11-03-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	5	858
MAR ROJO DOS	102	11-03-2006	13	Tarfaya-El Aaiún	A	70	Y	27	55	4	13	27	6	860
MAR ROJO DOS	103	11-03-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	4	844
MAR ROJO DOS	104	12-03-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	1	869
MAR ROJO DOS	105	12-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	48	0	13	30	6	864
MAR ROJO DOS	106	12-03-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	3	879
MAR ROJO DOS	107	12-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	48	0	13	30	8	854
MAR ROJO DOS	108	13-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	41	8	835
MAR ROJO DOS	109	13-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	36	8	13	38	5	870
MAR ROJO DOS	110	13-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	42	0	867
MAR ROJO DOS	111	14-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	0	13	44	8	919
MAR ROJO DOS	112	14-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	1	883
MAR ROJO DOS	113	15-03-2006	16	El Aaiún-C.Bojador	B	70	Y	27	22	0	13	48	0	1208
MAR ROJO DOS	114	15-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	42	6	905
MAR ROJO DOS	115	15-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	4	854
MAR ROJO DOS	116	15-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	22	0	13	44	4	852
MAR ROJO DOS	117	15-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	5	845
MAR ROJO DOS	118	16-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	8	14	2	4	927
MAR ROJO DOS	119	16-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	9	4	13	46	7	859
MAR ROJO DOS	120	16-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	4	2	13	56	0	864
MAR ROJO DOS	121	16-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	4	851
MAR ROJO DOS	122	17-03-2006	18	El Aaiún-C.Bojador	B	50	Y	27	7	0	14	3	0	1213
MAR ROJO DOS	123	17-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	7	0	13	49	5	987
MAR ROJO DOS	124	17-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	3	5	13	57	2	867
MAR ROJO DOS	125	17-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	8	1	13	48	5	870
MAR ROJO DOS	126	18-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	12	0	885
MAR ROJO DOS	127	18-03-2006	19	El Aaiún-C.Bojador	A	70	Y	27	0	0	14	2	5	885
MAR ROJO DOS	128	18-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	9	2	13	46	9	903
MAR ROJO DOS	129	18-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	0	14	2	8	916
MAR ROJO DOS	130	19-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	11	6	900
MAR ROJO DOS	131	19-03-2006	19	El Aaiún-C.Bojador	A	70	Y	27	0	0	14	1	5	860
MAR ROJO DOS	132	19-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	10	5	845
MAR ROJO DOS	133	20-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	0	14	22	0	885
MAR ROJO DOS	134	20-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	12	0	867
MAR ROJO DOS	135	20-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	0	14	22	0	868
MAR ROJO DOS	136	21-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	40	0	14	22	5	870
MAR ROJO DOS	137	21-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	12	0	920
MAR ROJO DOS	138	21-03-2006	20	El Aaiún-C.Bojador	B	50	Y	26	43	5	14	28	7	1236
MAR ROJO DOS	139	22-03-2006	23	El Aaiún-C.Bojador	A	70	N	26	16	1	15	7	8	835
MAR ROJO DOS	140	22-03-2006	23	El Aaiún-C.Bojador	A	50	Y	26	20	0	14	57	8	875
MAR ROJO DOS	141	22-03-2006	23	El Aaiún-C.Bojador	A	70	Y	26	16	7	15	7	8	958
MAR ROJO DOS	142	23-03-2006	23	El Aaiún-C.Bojador	A	50	Y	26	20	0	14	58	0	833
MAR ROJO DOS	143	23-03-2006	23	El Aaiún-C.Bojador	A	70	Y	26	16	0	15	13	9	898
MAR ROJO DOS	144	24-03-2006	24	El Aaiún-C.Bojador	A	50	Y	26	0	0	15	33	4	815
MAR ROJO DOS	145	24-03-2006	24	El Aaiún-C.Bojador	A	70	Y	26	10	0	15	22	5	866
MAR ROJO DOS	146	25-03-2006	24	El Aaiún-C.Bojador	A	50	Y	26	8	3	15	27	2	881
MAR ROJO DOS	147	26-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	12	0	883
MAR ROJO DOS	148	26-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	7	14	21	3	883
MAR ROJO DOS	149	26-03-2006	20	El Aaiún-C.Bojador	A	70	N	26	48	0	14	13	3	820
MAR ROJO DOS	150	27-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	41	0	14	22	6	863
MAR ROJO DOS	151	27-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	12	5	860
MAR ROJO DOS	152	27-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	41	8	14	22	8	928

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
MAR ROJO DOS	153	28-03-2006	19	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	2	8	893
MAR ROJO DOS	154	28-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	12	5	903
MAR ROJO DOS	155	28-03-2006	19	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	5	8	903
MAR ROJO DOS	156	29-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	12	0	903
MAR ROJO DOS	157	29-03-2006	19	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	3	2	903
MAR ROJO DOS	158	29-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	12	5	903
MAR ROJO DOS	159	30-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	8	0	13	48	7	892
MAR ROJO DOS	160	30-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	0	14	2	5	893
MAR ROJO DOS	161	30-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	8	3	13	48	9	893
MAR ROJO DOS	162	31-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	5	14	3	1	898
MAR ROJO DOS	163	31-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	8	5	13	48	0	893
MAR ROJO DOS	164	31-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	4	1	13	57	9	898
MAR ROJO DOS	165	01-04-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	5	905
MAR ROJO DOS	166	01-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	0	13	44	5	905
MAR ROJO DOS	167	01-04-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	4	907
MAR ROJO DOS	168	02-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	42	5	908
MAR ROJO DOS	169	02-04-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	44	4	908
MAR ROJO DOS	170	02-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	42	5	907
MAR ROJO DOS	171	03-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	4	888
MAR ROJO DOS	172	03-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	42	4	888
MAR ROJO DOS	173	03-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	5	888
MAR ROJO DOS	174	04-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	42	5	874
MAR ROJO DOS	175	04-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	5	870
MAR ROJO DOS	176	04-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	42	5	870
MAR ROJO DOS	177	05-04-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	7	858
MAR ROJO DOS	178	05-04-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	4	858
MAR ROJO DOS	179	05-04-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	29	5	858
MAR ROJO DOS	180	06-04-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	4	858
MAR ROJO DOS	181	06-04-2006	14	Tarfaya-El Aaiún	A	50	N	27	50	0	13	29	4	870
MAR ROJO DOS	182	06-04-2006	14	Tarfaya-El Aaiún	A	70	Y	27	50	0	13	29	4	858
PLAYA DE PINTENS	1	22-01-2006	24	Sidi Ifni-Tan Tan	A	70	Y	26	5	18	15	28	27	879
PLAYA DE PINTENS	2	22-01-2006	24	Sidi Ifni-Tan Tan	A	50	Y	26	2	50	15	35	50	936
PLAYA DE PINTENS	3	23-01-2006	24	Sidi Ifni-Tan Tan	A	50	Y	26	5	0	15	28	80	994
PLAYA DE PINTENS	4	23-01-2006	24	Sidi Ifni-Tan Tan	A	70	Y	26	9	85	15	22	12	823
PLAYA DE PINTENS	5	24-01-2006	23	Sidi Ifni-Tan Tan	A	70	Y	26	16	46	15	7	48	814
PLAYA DE PINTENS	6	24-01-2006	23	Sidi Ifni-Tan Tan	A	50	Y	26	12	25	15	16	64	859
PLAYA DE PINTENS	7	24-01-2006	23	El Aaiún-C.Bojador	A	50	Y	26	19	50	15	10	0	1080
PLAYA DE PINTENS	8	25-01-2006	23	El Aaiún-C.Bojador	A	50	Y	26	11	20	15	29	48	1135
PLAYA DE PINTENS	9	25-01-2006	23	El Aaiún-C.Bojador	A	70	N	26	12	10	15	24	5	985
PLAYA DE PINTENS	10	25-01-2006	23	El Aaiún-C.Bojador	A	50	Y	26	19	0	15	8	0	1060
PLAYA DE PINTENS	11	26-01-2006	22	El Aaiún-C.Bojador	A	70	Y	26	23	50	14	54	0	880
PLAYA DE PINTENS	12	27-01-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	0	14	23	0	850
PLAYA DE PINTENS	13	27-01-2006	20	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	11	27	913
PLAYA DE PINTENS	14	28-01-2006	20	El Aaiún-C.Bojador	B	70	Y	26	43	60	14	28	80	1230
PLAYA DE PINTENS	15	28-01-2006	20	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	12	25	955
PLAYA DE PINTENS	16	29-01-2006	19	El Aaiún-C.Bojador	A	70	Y	26	59	40	14	3	50	920
PLAYA DE PINTENS	17	29-01-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	12	72	920
PLAYA DE PINTENS	18	29-01-2006	19	El Aaiún-C.Bojador	A	70	Y	26	58	0	14	8	80	1005
PLAYA DE PINTENS	19	30-01-2006	19	El Aaiún-C.Bojador	A	70	Y	27	0	0	14	3	0	980
PLAYA DE PINTENS	20	30-01-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	11	81	925
PLAYA DE PINTENS	21	30-01-2006	19	El Aaiún-C.Bojador	A	70	Y	26	58	60	14	5	20	990
PLAYA DE PINTENS	22	31-01-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	30	14	3	50	1118
PLAYA DE PINTENS	23	31-01-2006	18	El Aaiún-C.Bojador	A	70	Y	27	9	18	13	47	70	1014
PLAYA DE PINTENS	24	31-01-2006	18	El Aaiún-C.Bojador	A	70	Y	27	3	0	14	0	50	969
PLAYA DE PINTENS	25	01-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	9	20	13	51	0	1072
PLAYA DE PINTENS	26	01-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	6	35	14	4	91	1190
PLAYA DE PINTENS	27	01-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	9	20	13	49	0	1045
PLAYA DE PINTENS	28	02-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	0	13	43	64	1038
PLAYA DE PINTENS	29	02-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	19	0	13	47	0	1146
PLAYA DE PINTENS	30	03-02-2006	16	El Aaiún-C.Bojador	B	70	Y	27	32	50	13	46	50	1220

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
PLAYA DE PINTENS	31	03-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	45	20	997
PLAYA DE PINTENS	32	03-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	70	13	43	0	986
PLAYA DE PINTENS	33	04-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	41	0	13	35	50	860
PLAYA DE PINTENS	34	04-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	42	55	875
PLAYA DE PINTENS	35	04-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	40	860
PLAYA DE PINTENS	36	05-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	20	13	29	11	853
PLAYA DE PINTENS	37	05-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	74	880
PLAYA DE PINTENS	38	05-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	48	50	13	31	20	890
PLAYA DE PINTENS	39	06-02-2006	13	Tarfaya-El Aaiún	A	70	Y	28	0	78	13	24	44	884
PLAYA DE PINTENS	40	06-02-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	30	35	874
PLAYA DE PINTENS	41	06-02-2006	13	Tarfaya-El Aaiún	A	70	Y	28	0	84	13	25	50	900
PLAYA DE PINTENS	42	07-02-2006	12	Tarfaya-El Aaiún	A	50	Y	28	10	50	13	18	30	898
PLAYA DE PINTENS	43	07-02-2006	12	Tarfaya-El Aaiún	A	70	Y	28	0	0	13	25	55	895
PLAYA DE PINTENS	44	07-02-2006	12	Tarfaya-El Aaiún	A	70	Y	28	9	20	13	21	30	894
PLAYA DE PINTENS	45	08-02-2006	11	Tarfaya-El Aaiún	A	70	Y	28	18	60	13	23	60	899
PLAYA DE PINTENS	46	08-02-2006	11	Tarfaya-El Aaiún	A	50	Y	28	10	0	13	18	85	898
PLAYA DE PINTENS	47	09-02-2006	6	Sidi Ifni-Tan Tan	B	50	Y	29	8	70	12	26	30	1220
PLAYA DE PINTENS	48	09-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	1	0	12	36	60	1063
PLAYA DE PINTENS	49	09-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	5	60	12	28	40	986
PLAYA DE PINTENS	50	10-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	8	80	12	21	40	1100
PLAYA DE PINTENS	51	10-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	0	70	12	31	18	948
PLAYA DE PINTENS	52	10-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	5	30	12	14	40	890
PLAYA DE PINTENS	53	11-02-2006	5	Sidi Ifni-Tan Tan	B	70	Y	29	13	80	12	8	80	1265
PLAYA DE PINTENS	54	11-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	10	40	11	55	10	1015
PLAYA DE PINTENS	55	11-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	14	0	11	38	0	1048
PLAYA DE PINTENS	56	12-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	15	0	11	35	0	1027
PLAYA DE PINTENS	57	12-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	15	55	11	35	80	1040
PLAYA DE PINTENS	58	12-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	12	0	11	46	20	990
PLAYA DE PINTENS	59	13-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	15	0	11	35	30	1030
PLAYA DE PINTENS	60	13-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	20	90	11	16	50	1108
PLAYA DE PINTENS	61	14-02-2006	4	Sidi Ifni-Tan Tan	B	70	Y	29	21	0	11	21	50	1200
PLAYA DE PINTENS	62	14-02-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	24	25	11	7	60	1113
PLAYA DE PINTENS	63	14-02-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	28	50	10	53	77	1035
PLAYA DE PINTENS	64	15-02-2006	4	Sidi Ifni-Tan Tan	B	50	Y	29	23	60	11	18	40	1253
PLAYA DE PINTENS	65	15-02-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	23	50	11	2	57	1008
PLAYA DE PINTENS	66	15-02-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	31	50	10	53	60	1028
PLAYA DE PINTENS	67	16-02-2006	3	Sidi Ifni-Tan Tan	B	50	Y	29	38	60	10	54	70	1328
PLAYA DE PINTENS	68	16-02-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	30	0	10	55	70	1138
PLAYA DE PINTENS	69	16-02-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	35	50	10	46	50	1088
PLAYA DE PINTENS	70	17-02-2006	3	Sidi Ifni-Tan Tan	B	50	Y	29	40	60	10	46	80	1235
PLAYA DE PINTENS	71	17-02-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	32	48	10	53	29	1090
PLAYA DE PINTENS	72	17-02-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	39	20	10	42	80	1030
PLAYA DE PINTENS	73	18-02-2006	3	Sidi Ifni-Tan Tan	B	70	Y	29	42	50	10	43	20	1210
PLAYA DE PINTENS	74	18-02-2006	3	Sidi Ifni-Tan Tan	B	70	Y	29	40	0	10	43	30	1175
PLAYA DE PINTENS	75	19-02-2006	2	Sidi Ifni-Tan Tan	B	70	Y	29	52	50	10	34	10	1285
PLAYA DE PINTENS	76	19-02-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	40	0	10	41	10	1070
PLAYA DE PINTENS	77	20-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	43	14	13	34	43	890
PLAYA DE PINTENS	78	20-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	29	0	13	44	60	970
PLAYA DE PINTENS	79	21-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	10	0	13	48	30	975
PLAYA DE PINTENS	80	21-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	10	23	13	48	80	1058
PLAYA DE PINTENS	81	21-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	44	0	1065
PLAYA DE PINTENS	82	22-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	80	13	42	80	1030
PLAYA DE PINTENS	83	22-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	46	80	1055
PLAYA DE PINTENS	84	22-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	0	13	42	20	940
PLAYA DE PINTENS	85	22-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	42	0	13	35	42	890
PLAYA DE PINTENS	86	23-02-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	19	0	11	27	0	1053
PLAYA DE PINTENS	87	28-02-2006	2	Sidi Ifni-Tan Tan	B	70	Y	29	39	50	10	42	80	1219
PLAYA DE PINTENS	88	28-02-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	48	70	10	30	0	1010
PLAYA DE PINTENS	89	01-03-2006	2	Sidi Ifni-Tan Tan	B	50	Y	29	40	20	10	46	20	1228
PLAYA DE PINTENS	90	01-03-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	48	30	10	33	54	1105
PLAYA DE PINTENS	91	01-03-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	39	0	10	43	20	1080

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
PLAYA DE PINTENS	92	02-03-2006	3	Sidi Ifni-Tan Tan	B	70	Y	29	39	50	10	45	70	1238
PLAYA DE PINTENS	93	02-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	30	65	10	52	21	1118
PLAYA DE PINTENS	94	02-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	37	20	10	45	0	1055
PLAYA DE PINTENS	95	03-03-2006	3	Sidi Ifni-Tan Tan	B	70	Y	29	28	0	10	59	0	1200
PLAYA DE PINTENS	96	03-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	28	0	10	58	80	1130
PLAYA DE PINTENS	97	04-03-2006	4	Sidi Ifni-Tan Tan	B	50	Y	29	30	0	10	57	10	1225
PLAYA DE PINTENS	98	04-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	22	90	11	10	35	1088
PLAYA DE PINTENS	99	04-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	20	20	11	23	40	1062
PLAYA DE PINTENS	100	05-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	23	30	11	13	20	1163
PLAYA DE PINTENS	101	05-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	18	0	11	36	50	1053
PLAYA DE PINTENS	102	06-03-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	15	70	11	42	0	1088
PLAYA DE PINTENS	103	09-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	10	0	13	18	80	870
PLAYA DE PINTENS	104	09-03-2006	11	Tarfaya-El Aaiún	A	50	Y	28	20	20	13	14	6	898
PLAYA DE PINTENS	105	09-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	12	0	13	20	0	874
PLAYA DE PINTENS	106	10-03-2006	12	Tarfaya-El Aaiún	A	70	Y	28	10	0	13	19	60	873
PLAYA DE PINTENS	107	10-03-2006	12	Tarfaya-El Aaiún	A	50	Y	27	57	60	13	27	10	898
PLAYA DE PINTENS	108	10-03-2006	12	Tarfaya-El Aaiún	A	70	Y	28	9	0	13	23	70	876
PLAYA DE PINTENS	109	11-03-2006	13	Tarfaya-El Aaiún	A	70	Y	28	0	0	13	27	0	879
PLAYA DE PINTENS	110	11-03-2006	13	Tarfaya-El Aaiún	A	70	Y	27	48	50	13	31	65	882
PLAYA DE PINTENS	111	11-03-2006	13	Tarfaya-El Aaiún	A	70	Y	27	58	0	13	29	40	871
PLAYA DE PINTENS	112	12-03-2006	14	Tarfaya-El Aaiún	A	70	Y	27	51	50	13	30	0	870
PLAYA DE PINTENS	113	12-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	39	50	13	37	70	888
PLAYA DE PINTENS	114	12-03-2006	14	Tarfaya-El Aaiún	A	70	Y	27	37	50	13	39	0	884
PLAYA DE PINTENS	115	13-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	27	20	884
PLAYA DE PINTENS	116	13-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	37	40	13	38	90	886
PLAYA DE PINTENS	117	13-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	28	50	13	43	20	846
PLAYA DE PINTENS	118	13-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	37	0	13	40	70	878
PLAYA DE PINTENS	119	14-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	50	13	41	70	874
PLAYA DE PINTENS	120	14-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	26	50	13	44	31	955
PLAYA DE PINTENS	121	14-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	32	60	13	39	60	928
PLAYA DE PINTENS	122	15-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	80	13	43	20	971
PLAYA DE PINTENS	123	15-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	19	50	13	45	85	980
PLAYA DE PINTENS	124	15-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	0	13	43	50	1022
PLAYA DE PINTENS	125	16-03-2006	18	El Aaiún-C.Bojador	A	70	Y	26	59	0	14	5	50	979
PLAYA DE PINTENS	126	16-03-2006	17	El Aaiún-C.Bojador	A	50	Y	27	10	20	13	47	90	970
PLAYA DE PINTENS	127	16-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	6	0	13	51	0	935
PLAYA DE PINTENS	128	17-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	9	0	14	19	60	984
PLAYA DE PINTENS	129	17-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	0	70	14	4	20	978
PLAYA DE PINTENS	130	17-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	10	20	13	47	15	989
PLAYA DE PINTENS	131	18-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	48	70	14	13	30	903
PLAYA DE PINTENS	132	18-03-2006	19	El Aaiún-C.Bojador	A	70	Y	27	0	86	14	3	83	965
PLAYA DE PINTENS	133	18-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	12	80	13	46	40	990
PLAYA DE PINTENS	134	19-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	49	80	14	13	10	973
PLAYA DE PINTENS	135	19-03-2006	19	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	2	83	895
PLAYA DE PINTENS	136	20-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	41	14	14	23	16	986
PLAYA DE PINTENS	137	20-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	53	0	14	10	60	1001
PLAYA DE PINTENS	138	20-03-2006	19	El Aaiún-C.Bojador	A	70	Y	27	6	30	13	57	30	1005
PLAYA DE PINTENS	139	21-03-2006	20	El Aaiún-C.Bojador	B	70	Y	26	43	0	14	26	30	1238
PLAYA DE PINTENS	140	21-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	51	23	14	10	50	915
PLAYA DE PINTENS	141	21-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	43	0	14	20	0	935
PLAYA DE PINTENS	142	22-03-2006	23	El Aaiún-C.Bojador	A	70	Y	26	14	40	15	16	70	957
PLAYA DE PINTENS	143	22-03-2006	23	El Aaiún-C.Bojador	A	50	Y	26	21	10	14	57	20	1018
PLAYA DE PINTENS	144	22-03-2006	23	El Aaiún-C.Bojador	A	70	Y	26	19	30	15	5	80	914
PLAYA DE PINTENS	145	23-03-2006	23	El Aaiún-C.Bojador	A	50	Y	26	17	0	15	14	0	1003
PLAYA DE PINTENS	146	23-03-2006	23	El Aaiún-C.Bojador	A	70	Y	26	21	50	15	0	10	1065
PLAYA DE PINTENS	147	23-03-2006	23	El Aaiún-C.Bojador	A	50	Y	26	14	0	15	18	30	1130
PLAYA DE PINTENS	148	24-03-2006	24	El Aaiún-C.Bojador	A	50	Y	26	8	60	15	25	60	1013
PLAYA DE PINTENS	149	24-03-2006	24	El Aaiún-C.Bojador	A	70	Y	26	0	32	15	43	26	960
PLAYA DE PINTENS	150	25-03-2006	24	El Aaiún-C.Bojador	A	50	Y	26	8	20	15	28	40	938
PLAYA DE PINTENS	151	25-03-2006	24	El Aaiún-C.Bojador	A	70	Y	26	11	0	15	22	60	885
PLAYA DE PINTENS	152	26-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	51	70	14	11	30	940

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
PLAYA DE PINTENS	153	26-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	39	60	14	22	80	935
PLAYA DE PINTENS	154	26-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	50	80	14	28	60	950
PLAYA DE PINTENS	155	27-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	52	50	14	12	90	1059
PLAYA DE PINTENS	156	27-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	41	60	14	22	9	980
PLAYA DE PINTENS	157	27-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	49	30	14	12	50	962
PLAYA DE PINTENS	158	28-03-2006	19	El Aaiún-C.Bojador	A	70	Y	27	0	25	14	4	7	950
PLAYA DE PINTENS	159	28-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	48	10	14	12	80	990
PLAYA DE PINTENS	160	29-03-2006	19	El Aaiún-C.Bojador	A	70	Y	27	0	60	14	3	44	930
PLAYA DE PINTENS	161	29-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	49	50	14	15	30	1055
PLAYA DE PINTENS	162	29-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	59	30	14	3	90	1019
PLAYA DE PINTENS	163	30-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	10	40	13	47	60	1033
PLAYA DE PINTENS	164	30-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	50	14	6	0	1025
PLAYA DE PINTENS	165	30-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	9	20	13	51	1	1065
PLAYA DE PINTENS	166	31-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	10	50	13	47	60	1012
PLAYA DE PINTENS	167	31-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	1	0	14	4	50	1013
PLAYA DE PINTENS	168	31-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	10	5	13	49	30	1113
PLAYA DE PINTENS	169	01-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	5	13	42	10	1025
PLAYA DE PINTENS	170	01-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	19	80	13	45	10	910
PLAYA DE PINTENS	171	02-04-2006	16	El Aaiún-C.Bojador	A	50	Y	27	32	50	13	41	70	970
PLAYA DE PINTENS	172	02-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	0	13	44	30	880
PLAYA DE PINTENS	173	02-04-2006	16	El Aaiún-C.Bojador	A	50	Y	27	29	80	13	55	80	1148
PLAYA DE PINTENS	174	03-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	80	13	35	90	856
PLAYA DE PINTENS	175	03-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	28	90	13	43	10	856
PLAYA DE PINTENS	176	03-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	39	30	13	36	80	850
PLAYA DE PINTENS	177	04-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	29	70	13	42	20	855
PLAYA DE PINTENS	178	04-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	41	20	13	35	70	881
PLAYA DE PINTENS	179	04-04-2006	15	Tarfaya-El Aaiún	A	50	Y	27	31	0	13	41	80	868
PLAYA DE PINTENS	180	05-04-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	80	13	29	0	870
PLAYA DE PINTENS	181	05-04-2006	14	Tarfaya-El Aaiún	A	70	Y	27	39	10	13	37	30	880
PLAYA DE PINTENS	182	06-04-2006	14	Tarfaya-El Aaiún	A	50	Y	27	51	80	13	29	20	870
PLAYA DE PINTENS	183	06-04-2006	14	Tarfaya-El Aaiún	A	70	Y	27	43	0	13	34	40	865
VARALONGA	1	24-01-2006	1	Sidi Ifni-Tan Tan	A	50	Y	29	50	0	10	29	50	1037
VARALONGA	2	24-01-2006	1	Sidi Ifni-Tan Tan	A	50	Y	29	58	80	10	18	40	1103
VARALONGA	3	24-01-2006	1	Sidi Ifni-Tan Tan	A	70	Y	29	50	0	10	27	0	1038
VARALONGA	4	25-01-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	44	0	10	32	0	898
VARALONGA	5	25-01-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	49	80	10	25	30	920
VARALONGA	6	25-01-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	43	10	10	34	30	965
VARALONGA	7	26-01-2006	2	Sidi Ifni-Tan Tan	B	50	Y	29	42	70	10	44	10	1284
VARALONGA	8	26-01-2006	2	Sidi Ifni-Tan Tan	A	50	Y	29	49	30	10	24	30	875
VARALONGA	9	26-01-2006	2	Sidi Ifni-Tan Tan	A	70	Y	29	44	30	10	31	60	878
VARALONGA	10	27-01-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	35	20	10	41	80	874
VARALONGA	11	27-01-2006	3	Sidi Ifni-Tan Tan	B	70	Y	29	39	40	10	48	10	1219
VARALONGA	12	28-01-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	33	70	10	49	80	1067
VARALONGA	13	29-01-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	24	0	10	59	90	1047
VARALONGA	14	29-01-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	29	90	10	51	30	886
VARALONGA	15	29-01-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	22	60	10	59	80	864
VARALONGA	16	30-01-2006	4	Sidi Ifni-Tan Tan	B	70	Y	29	26	50	11	7	70	1241
VARALONGA	17	30-01-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	29	80	10	51	30	946
VARALONGA	18	30-01-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	22	80	10	59	50	879
VARALONGA	19	31-01-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	13	40	11	37	10	880
VARALONGA	20	31-01-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	19	80	11	11	90	853
VARALONGA	21	31-01-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	17	0	11	22	70	840
VARALONGA	22	01-02-2006	5	Sidi Ifni-Tan Tan	B	70	Y	29	19	70	11	33	30	1220
VARALONGA	23	01-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	19	90	11	12	50	984
VARALONGA	24	01-02-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	17	0	11	22	70	844
VARALONGA	25	02-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	4	90	12	16	80	843
VARALONGA	26	02-02-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	1	60	12	29	80	873
VARALONGA	27	02-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	3	70	12	21	90	848
VARALONGA	28	03-02-2006	6	Sidi Ifni-Tan Tan	B	50	Y	29	9	90	12	24	30	1217
VARALONGA	29	03-02-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	0	90	12	30	80	876

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
VARALONGA	30	04-02-2006	11	Tarfaya-El Aaiún	A	50	Y	28	10	40	13	17	10	818
VARALONGA	31	04-02-2006	11	Tarfaya-El Aaiún	A	70	Y	28	19	90	13	12	30	866
VARALONGA	32	04-02-2006	11	Tarfaya-El Aaiún	A	70	Y	28	10	0	13	17	60	843
VARALONGA	33	05-02-2006	12	Tarfaya-El Aaiún	A	70	Y	28	0	80	13	24	20	841
VARALONGA	34	05-02-2006	12	Tarfaya-El Aaiún	A	50	Y	28	9	80	13	18	0	864
VARALONGA	35	05-02-2006	12	Tarfaya-El Aaiún	A	50	Y	28	1	50	13	23	50	808
VARALONGA	36	06-02-2006	13	Tarfaya-El Aaiún	A	50	Y	27	51	40	13	29	50	877
VARALONGA	37	06-02-2006	13	Tarfaya-El Aaiún	A	50	Y	27	59	90	13	24	70	878
VARALONGA	38	06-02-2006	13	Tarfaya-El Aaiún	A	70	Y	27	50	70	13	28	80	837
VARALONGA	39	07-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	41	20	13	35	70	863
VARALONGA	40	07-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	30	10	899
VARALONGA	41	07-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	70	13	36	50	883
VARALONGA	42	08-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	42	50	900
VARALONGA	43	08-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	37	60	870
VARALONGA	44	08-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	32	10	13	41	20	853
VARALONGA	45	09-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	80	17	45	90	1014
VARALONGA	46	09-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	20	904
VARALONGA	47	09-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	45	30	940
VARALONGA	48	10-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	20	13	48	10	1256
VARALONGA	49	10-02-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	41	60	874
VARALONGA	50	10-02-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	0	13	45	0	905
VARALONGA	51	11-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	4	0	13	57	40	908
VARALONGA	52	11-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	8	50	13	49	30	975
VARALONGA	53	11-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	4	0	13	59	50	970
VARALONGA	54	12-02-2006	18	El Aaiún-C.Bojador	B	50	Y	27	7	80	14	1	80	1223
VARALONGA	55	12-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	9	30	13	47	30	1000
VARALONGA	56	12-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	4	20	13	59	60	955
VARALONGA	57	13-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	51	40	14	10	20	890
VARALONGA	58	13-02-2006	19	El Aaiún-C.Bojador	A	70	N	26	56	20	14	7	30	956
VARALONGA	59	13-02-2006	18	El Aaiún-C.Bojador	A	50	N	27	7	30	13	51	60	968
VARALONGA	60	14-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	51	10	14	12	10	943
VARALONGA	61	14-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	59	90	14	2	80	895
VARALONGA	62	14-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	70	14	12	60	945
VARALONGA	63	15-02-2006	20	El Aaiún-C.Bojador	A	50	Y	26	46	60	14	14	50	868
VARALONGA	64	15-02-2006	20	El Aaiún-C.Bojador	A	70	Y	26	40	0	14	22	90	915
VARALONGA	65	15-02-2006	20	El Aaiún-C.Bojador	A	70	Y	26	45	30	14	13	50	838
VARALONGA	66	15-02-2006	20	El Aaiún-C.Bojador	B	70	Y	26	45	0	14	25	60	1243
VARALONGA	67	18-02-2006	23	El Aaiún-C.Bojador	A	70	Y	26	12	60	15	15	40	835
VARALONGA	68	18-02-2006	23	El Aaiún-C.Bojador	A	50	Y	26	18	50	15	4	90	840
VARALONGA	69	19-02-2006	24	El Aaiún-C.Bojador	A	70	Y	26	5	50	15	26	80	836
VARALONGA	70	19-02-2006	24	El Aaiún-C.Bojador	A	50	Y	26	1	50	15	39	80	950
VARALONGA	71	20-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	59	0	14	3	80	932
VARALONGA	72	20-02-2006	19	El Aaiún-C.Bojador	A	50	Y	26	56	20	14	12	0	905
VARALONGA	73	21-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	57	50	14	5	50	965
VARALONGA	74	21-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	0	14	14	10	993
VARALONGA	75	21-02-2006	19	El Aaiún-C.Bojador	A	70	Y	26	58	0	14	5	70	998
VARALONGA	76	22-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	6	30	13	55	0	995
VARALONGA	77	22-02-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	40	14	3	70	945
VARALONGA	78	22-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	6	70	13	53	10	940
VARALONGA	79	22-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	10	13	51	10	928
VARALONGA	80	23-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	2	50	14	0	50	940
VARALONGA	81	23-02-2006	18	El Aaiún-C.Bojador	A	50	Y	27	6	60	13	52	70	928
VARALONGA	82	24-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	39	0	13	37	40	875
VARALONGA	83	24-02-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	42	60	899
VARALONGA	84	24-02-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	60	900
VARALONGA	85	25-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	48	50	13	30	60	875
VARALONGA	86	25-02-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	37	60	875
VARALONGA	87	25-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	49	30	13	30	90	899
VARALONGA	88	26-02-2006	13	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	30	40	900
VARALONGA	89	26-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	38	10	900
VARALONGA	90	26-02-2006	14	Tarfaya-El Aaiún	A	50	Y	27	48	20	13	30	80	879

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
VARALONGA	91	03-03-2006	24	El Aaiún-C.Bojador	A	50	Y	26	1	0	15	32	0	808
VARALONGA	92	03-03-2006	24	El Aaiún-C.Bojador	A	70	Y	26	9	70	15	22	80	877
VARALONGA	93	04-03-2006	23	El Aaiún-C.Bojador	A	70	Y	26	13	60	15	14	30	854
VARALONGA	94	04-03-2006	23	El Aaiún-C.Bojador	A	70	Y	26	19	90	15	4	0	995
VARALONGA	95	05-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	48	80	14	12	30	898
VARALONGA	96	05-03-2006	20	El Aaiún-C.Bojador	A	70	Y	26	40	30	14	21	90	869
VARALONGA	97	06-03-2006	20	El Aaiún-C.Bojador	B	50	Y	26	50	0	14	17	0	1200
VARALONGA	98	06-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	20	14	22	10	927
VARALONGA	99	07-03-2006	19	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	3	0	880
VARALONGA	100	07-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	50	0	14	12	30	937
VARALONGA	101	07-03-2006	20	El Aaiún-C.Bojador	A	50	Y	26	40	70	14	20	80	988
VARALONGA	102	08-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	58	60	14	3	80	881
VARALONGA	103	08-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	10	14	11	30	905
VARALONGA	104	08-03-2006	19	El Aaiún-C.Bojador	A	70	Y	26	57	80	14	4	0	846
VARALONGA	105	08-03-2006	19	El Aaiún-C.Bojador	A	50	Y	26	51	90	14	11	10	929
VARALONGA	106	09-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	20	13	51	20	930
VARALONGA	107	09-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	0	50	14	2	40	931
VARALONGA	108	09-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	6	20	13	51	30	857
VARALONGA	109	10-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	3	40	13	57	40	903
VARALONGA	110	10-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	9	0	13	48	0	870
VARALONGA	111	10-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	2	80	13	58	30	892
VARALONGA	112	10-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	7	60	13	50	40	910
VARALONGA	113	11-03-2006	18	El Aaiún-C.Bojador	B	70	Y	27	9	90	13	53	70	1228
VARALONGA	114	11-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	0	0	14	3	50	950
VARALONGA	115	11-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	6	30	13	51	90	901
VARALONGA	116	12-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	50	924
VARALONGA	117	12-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	0	13	46	0	1021
VARALONGA	118	12-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	42	20	900
VARALONGA	119	13-03-2006	16	El Aaiún-C.Bojador	B	70	Y	27	20	0	13	48	20	1202
VARALONGA	120	13-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	42	20	897
VARALONGA	121	13-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	60	13	45	0	930
VARALONGA	122	14-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	39	60	13	36	80	875
VARALONGA	123	14-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	0	13	42	20	860
VARALONGA	124	14-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	70	905
VARALONGA	125	15-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	40	70	13	35	80	898
VARALONGA	126	15-03-2006	14	Tarfaya-El Aaiún	A	50	Y	27	50	0	13	30	20	887
VARALONGA	127	15-03-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	90	13	35	30	827
VARALONGA	128	15-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	34	0	13	40	30	853
VARALONGA	129	16-03-2006	13	Tarfaya-El Aaiún	A	70	Y	28	0	0	13	23	70	838
VARALONGA	130	16-03-2006	13	Tarfaya-El Aaiún	A	70	Y	27	51	50	13	29	0	880
VARALONGA	131	16-03-2006	13	Tarfaya-El Aaiún	A	50	Y	28	0	0	13	24	40	837
VARALONGA	132	17-03-2006	12	Tarfaya-El Aaiún	A	50	Y	28	9	0	13	18	0	817
VARALONGA	133	17-03-2006	12	Tarfaya-El Aaiún	A	50	Y	28	1	0	13	23	60	833
VARALONGA	134	17-03-2006	12	Tarfaya-El Aaiún	A	70	Y	28	10	0	13	17	70	823
VARALONGA	135	18-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	20	0	13	11	60	836
VARALONGA	136	18-03-2006	11	Tarfaya-El Aaiún	A	70	Y	28	0	0	13	17	20	817
VARALONGA	137	18-03-2006	11	Tarfaya-El Aaiún	A	50	Y	28	20	0	13	11	60	817
VARALONGA	138	19-03-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	4	70	12	18	30	873
VARALONGA	139	19-03-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	2	0	12	30	60	930
VARALONGA	140	19-03-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	6	30	12	16	80	905
VARALONGA	141	20-03-2006	6	Sidi Ifni-Tan Tan	B	70	Y	29	2	70	12	41	90	1207
VARALONGA	142	20-03-2006	6	Sidi Ifni-Tan Tan	A	70	Y	29	4	70	12	19	40	980
VARALONGA	143	20-03-2006	6	Sidi Ifni-Tan Tan	A	50	Y	29	7	0	12	4	20	806
VARALONGA	144	21-03-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	10	60	11	37	20	962
VARALONGA	145	21-03-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	10	40	11	48	20	989
VARALONGA	146	21-03-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	14	30	11	37	10	991
VARALONGA	147	22-03-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	14	20	11	36	10	1041
VARALONGA	148	22-03-2006	5	Sidi Ifni-Tan Tan	A	70	Y	29	10	60	11	48	30	1012
VARALONGA	149	22-03-2006	5	Sidi Ifni-Tan Tan	A	50	Y	29	14	40	11	36	70	1005
VARALONGA	150	23-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	29	0	10	52	0	965
VARALONGA	151	23-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	22	40	11	0	0	890

Table 3 (continued).

Fishing vessel	Haul No.	Date dd/mm/yy	Subzone No.	Sector	Stratum	Mesh (mm)	Validity	Latitude hauling (N)			Longitude hauling (W)			Mean depth (m)
								Deg	Min	Sec	Deg	Min	Sec	
VARALONGA	152	23-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	29	0	10	51	20	848
VARALONGA	153	24-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	23	20	11	0	60	1015
VARALONGA	154	24-03-2006	4	Sidi Ifni-Tan Tan	A	70	Y	29	30	0	10	53	60	1023
VARALONGA	155	24-03-2006	4	Sidi Ifni-Tan Tan	A	50	Y	29	20	80	11	1	60	878
VARALONGA	156	25-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	39	0	10	41	30	1040
VARALONGA	157	25-03-2006	3	Sidi Ifni-Tan Tan	A	50	Y	29	32	40	10	50	10	1005
VARALONGA	158	25-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	35	50	10	43	30	949
VARALONGA	159	26-03-2006	3	Sidi Ifni-Tan Tan	A	70	Y	29	39	0	10	41	0	1026
VARALONGA	160	27-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	32	40	13	41	30	840
VARALONGA	161	27-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	35	0	884
VARALONGA	162	27-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	30	70	13	42	40	900
VARALONGA	163	28-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	31	60	13	42	40	900
VARALONGA	164	28-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	20	892
VARALONGA	165	28-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	43	20	900
VARALONGA	166	28-03-2006	15	Tarfaya-El Aaiún	A	50	Y	27	40	0	13	36	60	900
VARALONGA	167	29-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	20	30	13	45	30	933
VARALONGA	168	29-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	28	40	13	43	80	979
VARALONGA	169	29-03-2006	16	El Aaiún-C.Bojador	A	50	Y	27	30	0	13	41	50	950
VARALONGA	170	29-03-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	35	70	885
VARALONGA	171	30-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	21	0	13	45	20	924
VARALONGA	172	30-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	42	0	928
VARALONGA	173	30-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	20	30	13	45	0	916
VARALONGA	174	30-03-2006	16	El Aaiún-C.Bojador	A	70	Y	27	30	0	13	42	80	940
VARALONGA	175	31-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	2	80	13	59	60	922
VARALONGA	176	31-03-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	30	13	50	90	920
VARALONGA	177	31-03-2006	18	El Aaiún-C.Bojador	A	70	Y	27	0	60	14	2	90	927
VARALONGA	178	01-04-2006	18	El Aaiún-C.Bojador	A	70	Y	27	3	0	13	59	50	932
VARALONGA	179	01-04-2006	18	El Aaiún-C.Bojador	A	50	Y	27	7	50	13	50	70	944
VARALONGA	180	01-04-2006	18	El Aaiún-C.Bojador	A	70	Y	27	1	70	14	1	60	930
VARALONGA	181	02-04-2006	19	El Aaiún-C.Bojador	A	70	Y	26	50	40	14	11	50	912
VARALONGA	182	02-04-2006	19	El Aaiún-C.Bojador	A	70	Y	26	59	30	14	3	50	933
VARALONGA	183	03-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	0	13	43	70	900
VARALONGA	184	03-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	37	60	897
VARALONGA	185	04-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	50	13	43	0	900
VARALONGA	186	04-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	36	70	900
VARALONGA	187	04-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	27	0	13	43	0	900
VARALONGA	188	05-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	21	0	13	45	10	905
VARALONGA	189	05-04-2006	16	El Aaiún-C.Bojador	A	70	Y	27	31	0	13	40	60	945
VARALONGA	190	05-04-2006	14	Tarfaya-El Aaiún	A	70	Y	27	49	80	13	29	80	868
VARALONGA	191	06-04-2006	14	Tarfaya-El Aaiún	A	70	Y	27	40	0	13	37	60	890
VARALONGA	192	06-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	30	60	13	42	40	895
VARALONGA	193	06-04-2006	15	Tarfaya-El Aaiún	A	70	Y	27	39	80	13	37	60	900



BOLETIM

MUSEU DE
HISTÓRIA NATURAL DO FUNCHAL

Vol. LXIV (2014), Art. 338: 29-34



ISSN 2183-279X (online edition) |

| Available online at: <http://boletim.cm-funchal.pt>

The family Penaeidae from the Canary Islands (Northeastern Atlantic), with first record of *Penaeus kerathurus*

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With 5 figures

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ABSTRACT: The prawn genus *Penaeus* is recorded for the first time from the Canary Islands based on the first record of *P. kerathurus*. A brief account on all Penaeidae species occurring in the Canary Islands waters is also included, with data relevant for their natural history.

Keywords: Crustacea, Decapoda, Penaeidae, *Penaeus kerathurus*, new record, Canary Islands, NE Atlantic.

RESUMO: Neste artigo é assinalada pela primeira vez para as ilhas Canárias uma espécie de camarão, *Penaeus kerathurus*. É incluída uma breve resenha de todas as espécies de Penaeidae que ocorrem nas águas das ilhas Canárias, com dados relevantes para a sua história natural.

Palavras-chave: Crustacea, Decapoda, Penaeidae, *Penaeus kerathurus*, novo assinalamento, Arquipélago das Canárias, NE do Oceano Atlântico.

INTRODUCTION

Within the decapod crustaceans, the suborder Dendrobranchiata Spence Bate, 1888 and in particular the family Penaeidae Rafinesque, 1815, have received poor attention from carcinologists in waters around the Canary Islands. SANTAELLA (1973) excluded this group from his catalogue of decapods from the Canaries. In his annotated and illustrated catalogue on the Canarian decapods, GONZÁLEZ (1995) compiled all information available on Penaeidae, including previous records of three species of the genus *Funchalia* Johnson, 1868 and a dubious new record of *Penaeopsis serrata* Spence Bate, 1881. In his impressive compilation, D'UDEKEM D'ACÓZ (1999) included only two species of *Funchalia* from the Canaries and validated GONZÁLEZ (1995) record of *P. serrata*.

QUILES *et al.* (2001) published the first documented record of *P. serrata* from the Canary Islands, and GONZÁLEZ & QUILES (2003) included the above-mentioned four Penaeidae species in their checklist of the Canary Islands marine biota.

Recently LANDEIRA & FRANSEN (2012) identified 29 species of mesopelagic shrimps collected between 200 and 750 m of depth from off the western islands of the Canary Archipelago, including both Dendrobranchiata and Caridea.

As a result of the above mentioned studies, the family Penaeidae is represented at least by two genera and four species in the waters of the Canary Islands: *Funchalia danae* Burkenroad, 1940, *Funchalia villosa* (Bouvier, 1905), *Funchalia woodwardi* Johnson, 1868, and *P. serrata*.

In the last years, underwater professional photographers have provided us with some photographs of a shallow-water Penaeid species from the Canaries, which is not yet recorded from this archipelago. Moreover, a local fisherman provided us with one specimen of this uncommon and unrecorded Penaeidae.

The goal of the present paper is to gather all available data relevant for the natural history of the Penaeidae occurring in the Canary Islands waters, including the first record of a 5th species of this family from this archipelago with a discussion on its most probable ways of colonisation.

MATERIAL AND METHODS

A thorough bibliographic search was done in order to compile the relevant information on the Penaeidae of the Canary Islands.

Examined specimens were measured according to standard carcinological procedures and preserved in

70% ethanol afterwards. Specimens were registered and deposited in the study collection (ICCM) of the Biology Department of the University of Las Palmas de Gran Canaria.

Abbreviations used: CL – Carapace length.

SYSTEMATICS

Funchalia danae Burkenroad, 1940

A single record (holotype) from West of Lanzarote Island (BURKENROAD, 1940). All further references were based on this record (GONZÁLEZ, 1995; PÉREZ FARFANTE & KENSLEY, 1997; D'UDEKEM D'ACÓZ, 1999; GONZÁLEZ & QUILES, 2003). The species was not found by LANDEIRA & FRANSEN (2012) during the surveys around this archipelago, where it seems to be rare.

F. danae is a pelagic species, capable to migrate to surface at night (CROSNIER & FOREST, 1973). It occurs in the northwest Pacific, south-central Indian Ocean, Arabian Sea and eastern Atlantic (Congo), including the Azores, Madeira, Canary and Saint Helena Islands (GRIPPA, 1987; PÉREZ FARFANTE & KENSLEY, 1997; D'UDEKEM D'ACÓZ, 1999).

Funchalia villosa (Bouvier, 1905)

This species was firstly recorded from the Canary Islands by LENZ & STRUNCK (1914), as *Funchalia vanhoeffeni*. Further specimens were collected by FOXTON (1970), BORDES (2009) and LANDEIRA & FRANSEN (2012). Further references were based on these records (GONZÁLEZ, 1995; PÉREZ FARFANTE & KENSLEY, 1997; D'UDEKEM D'ACÓZ, 1999; GONZÁLEZ & QUILES, 2003).

F. villosa is a pelagic species occurring at daytime down to 2608 m of depth, usually between 350 and 950 m (CROSNIER, 1985) and migrating at night to a depth of 50 m (FOXTON, 1970). It occurs in the Antarctic, southwest and eastern Indian Ocean, Australia, western Atlantic (Gulf of Mexico and the Caribbean Sea), eastern Atlantic off Madeira and Canary Islands, western Mediterranean and southern Atlantic off Tristan da Cunha and Valdivia Bank (GRIPPA, 1987; PÉREZ FARFANTE & KENSLEY, 1997; D'UDEKEM D'ACÓZ, 1999).

Funchalia woodwardi Johnson, 1867

A single record from the Canary Islands (SUND, 1920) based on material collected at West of Lanzarote Island. Further references were based on this record (GONZÁLEZ, 1995; GONZÁLEZ & QUILES, 2003). PÉREZ FARFANTE & KENSLEY (1997) and D'UDEKEM D'ACÓZ (1999) do not mention this species for the Canary Islands. Also it was not recorded by LANDEIRA & FRANSEN (2012) from around this archipelago, where it seems to be rare.

F. woodwardi is a pelagic species living from 27 m to 1544 m of depth and migrating at night to shallow waters

(D'UDEKEM D'ACÓZ, 1999). It occurs in the Indo-Pacific Ocean (Australia), Arabian Sea, and eastern Atlantic, from Norway to South Africa, including the Azores, Madeira (type locality), Canaries and western Mediterranean (JOHNSON, 1867; PÉREZ FARFANTE & KENSLEY, 1997; D'UDEKEM D'ACÓZ, 1999).

Penaeopsis serrata Spence Bate, 1881

Material examined: ICCM-006, CL = 26 mm, female, 27° 40' N 15° 44' W, 499 m, off Arguineguín, SW of Gran Canaria Island, 29 October 2004, F/V Juan Carlos Primero, cruise Pandcan4, sta. 10, bottom trap.

Additional material was also examined for comparison purposes: ICCM-155, CL = 35 mm, female, 36° 47' N 08° 33' W, 505 m, off Cape of San Vicente, Algarve, Portugal, 15 September 2006, F/V Atardecer, cruise APPE-29/2005, sta. 12, bottom trawl.

The first record of this species from the Canary Islands was made by GONZÁLEZ (1995) based on a colour photograph of one specimen collected off Tenerife at unknown depth, the identity of which was later validated by D'UDEKEM D'ACÓZ (1999). QUILES *et al.* (2001) published the first documented record of this species from the Canaries, based on the collection of 12 specimens off several islands. Further references were based on these records (D'UDEKEM D'ACÓZ, 1999; GONZÁLEZ & QUILES, 2003).

P. serrata is a littoral to bathyal benthic species, found on muddy and muddy-sandy substrates. Off the Canaries it has been collected between 284 m and 600 m of depth, sometimes reported as prey of fishes such as the stout beardfish *Polymixia nobilis* (Polymixiidae) or the rosy dory *Cyttopsis rosea* (Parazenidae) (QUILES *et al.*, 2001). Elsewhere, it occurs from 120 m to 750 m of depth. It is an amphi-Atlantic species. In the north-western Atlantic, it occurs from New Jersey to Brazil and in the north-eastern Atlantic, from southern Portugal to Mauritania, including the Canary Islands (PÉREZ FARFANTE & KENSLEY, 1997; D'UDEKEM D'ACÓZ, 1999).

The species was not collected during the Dutch CANCAP expeditions to the waters of the Canaries, Cape Verde Islands and Mauritania (1976-1986) (FRANSEN, 1991). Off the Canary Islands this species seems to be uncommon, as occasional catches of few individuals have been made by local small-scale fisheries with bottom traps. The material from Cape S. Vicente, confirms south Portugal as the northern limit of the species' distribution in the East Atlantic Ocean.

Penaeus kerathurus (Forskål, 1775) (Figs. 1-5)

Material examined: ICCM-398 (Figs. 1-2), CL = 31 mm, male, 28° 08' N 15° 25' W, 8-10 m, outside the outer seawall

of a marina ('Muelle Deportivo') at Las Palmas de Gran Canaria, NE of Gran Canaria Island, 5 June 2014, bottom shrimp-trap.



Fig. 1 – *Penaeus kerathurus* (Forskål, 1775), ICCM-398, CL = 31 mm, male, freshly caught (photo by anonymous fisherman).

Additional material: Two more specimens observed amongst the catch of a trammel net set in a nearby locality. Both localities are situated in the close vicinity of the 'Puerto de La Luz y de Las Palmas', which is one of the largest harbours in Africa.

P. kerathurus is a demersal species occurring in shallow coastal marine and brackish waters, living on sandy, sandy-muddy, muddy sand or shell gravel substrates (FRANSEN, 1991; D'UDEKEM D'ACÓZ, 1999), from 0.5 m (juveniles) to 90 m of depth, mainly between 5 m and 40 m (D'UDEKEM D'ACÓZ, 1999). It occurs in the eastern Atlantic, from southern England to Atlantic Morocco and Mauritania, southwards to northern Angola, the entire Mediterranean Sea and the Suez Canal (PÉREZ FARFANTE & KENSLEY, 1997; D'UDEKEM D'ACÓZ, 1999).



Fig. 2 – *Penaeus kerathurus* (Forskål, 1775), ICCM-398, CL = 31 mm, male, fixed.

The present material represents the first record of this species from the Canary Islands. In the last five years, several underwater professional photographers have provided us with some superb photographs of this species taken in waters of Lanzarote (Figs. 3-5), Gran Canaria and Tenerife Islands. At last, a local fisherman provided us with one specimen of this uncommon and yet unrecorded Penaeidae.



Fig. 3 – *Penaeus kerathurus* (Forskål, 1775) on a sandy bottom in Lanzarote Island; lateral view (photo by Arturo Telle).



Fig. 4 – *Penaeus kerathurus* (Forskål, 1775) on a sandy bottom in Lanzarote Island; lateral view (photo by Arturo Telle).

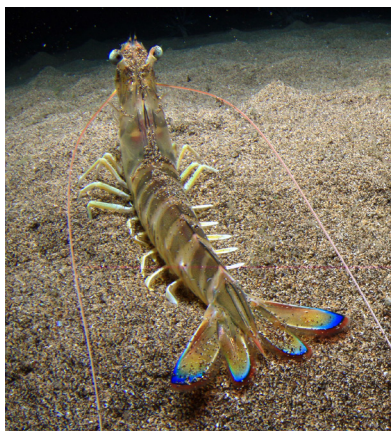


Fig. 5 – *Penaeus kerathurus* (Forskål, 1775) on a sandy bottom in Lanzarote Island; dorsal view (photo by Arturo Telle).

DISCUSSION

To date, and according to the present account, the family Penaeidae is represented in the Canary Islands by three genera (*Funchalia* Johnson, 1868, *Penaeopsis* Spence Bate, 1881 and *Penaeus* Fabricius, 1798) and five valid species: *F. danae*, *F. villosa*, *F. woodwardi*, *P. serrata*, and *P. kerathurus*, all of them rare or uncommon.

Species of *Funchalia* are clearly pelagic, migrating into surface waters at night.

Penaeopsis serrata is mainly a benthic species, but since it has been caught in the Canary Islands' waters with semi-floating shrimp traps, set 2.4 m above seabed (ARRASATE-LÓPEZ *et al.*, 2012), it can be also considered as nektobenthic or benthopelagic.

Penaeus kerathurus is a demersal shallow-water species occurring in both marine and brackish habitats. Three hypotheses can be put forward to explain the recent colonisation of the Canary Islands by this species.

It is widely known that the members of the genus *Penaeus* are very prolific and undergo 11 larval stages (5 nauplii, 3 protozoae and 3 mysis) until adulthood. These larvae are planktonic and therefore carried by currents toward the shore where they arrive as postlarvae. These postlarvae usually penetrate inshore brackish waters, abandon their planktonic way of life and become bottom dwellers living in shallow areas (e.g., PÉREZ FANFANTE, 1978; LAGARDÈRE, 1981). *P. kerathurus* is distributed along the Atlantic Moroccan and Western Saharan coasts, *i.e.* less than 100-120 km from the easternmost Canary Islands, Fuerteventura and Lanzarote. On the other hand, the Canaries are under the influence of the Eastern Central Atlantic subtropical gyre, which could facilitate the transport of marine larvae from the Northwest African coast to the archipelago (e.g. AGUILERA *et al.*, 1994; BARTON *et al.*, 1998). Moreover, a mesoscale distribution of larval fish and crustaceans has been recently described in filaments of the upwelling system from the African coast, reaching the southeast of this archipelago (RODRÍGUEZ *et al.*, 2004; BÉCOGNÉE *et al.*, 2009). These studies have demonstrated that short-lived African larvae are arriving to the Canary Islands transported by currents or upwelling filaments, since a quasi-permanent flow of this type of organisms has been documented. So, the first hypothesis is a natural colonisation and perhaps *Penaeus kerathurus* postlarvae find the vicinity of ports and marinas of the Canary Islands, where adults are frequently photographed by scuba-divers, as the most hyposaline (brackish) suitable environments. This distribution pattern is similar to the

one off the Spanish coast in the Iberian Peninsula, where this prawn species is more abundant in brackish waters near the mouth of some rivers. The absence of permanent freshwater streams in the Canary Islands could explain the rarity of *Penaeus* species on their shores.

In the early 1980's, different aquaculture experiments with *P. kerathurus* were carried out in nearby ground facilities onshore. The authors have interviewed some of the scientists and technicians responsible for these experiments, who have recognized the real possibility of accidental escapes of larvae and/or postlarvae into the sea. This second hypothesis points towards a man-made unintentional introduction.

Finally, it would be worth mentioning ballast waters, in particular from oilrigs, discharged close to or in the surroundings of main harbours. *Penaeus* larvae could well be pumped in ballast waters, somewhere in the African coast. Transport of species by drilling platforms has been documented in the past elsewhere (BERCAW, 1993; FERREIRA *et al.*, 2006).

Over the last five years, oilrig transits between neighbouring African coast and major ports of the Canaries, situated precisely on the islands of Gran Canaria, Tenerife and Lanzarote, have substantially increased due to repair and maintenance works. This third hypothesis represents another man-made unintentional introduction and if true, puts in evidence the changes of biodiversity due to human activities, which are of particular importance in island ecosystems.

ACKNOWLEDGEMENTS

The authors are indebted to Arturo Telle for providing the superb photographs of living individuals of *Penaeus kerathurus* from the Canary Islands, to the anonymous fisherman for giving the examined specimen of this species, and to Raül Triay-Portella for laboratory assistance. Thanks are also due to Manuel Biscoito, editor-in-chief of the MMF scientific publications, for revising the English and critical reading of the manuscript. Financial support was received from the EU ERDF in the framework of the Interreg III B project PESCPROF-1 (MAC/4.2/M12) and the Spanish Ministry for Fisheries as part of the APPE 29/2005 project.

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BOLETIM

MUSEU DE
HISTÓRIA NATURAL DO FUNCHAL

Vol. LXIV (2014), Art. 339: 35-41



ISSN 2183-279X (online edition) |

| Available online at: <http://boletim.cm-funchal.pt>

New records of decapod crustaceans from off the Archipelago of Madeira (Northeastern Atlantic)

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With 1 figure

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ABSTRACT: Ten decapod crustacean species belonging to the families Oplophoridae, Nematocarinidae, Hippolytidae, Pandalidae, Epialtidae, Inachidae and Majidae are recorded for the first time from the Archipelago of Madeira. The family Nematocarinidae, represented by *Nematocarcinus gracilis*, is recorded for the first time from the study area.

Keywords: Crustacea, Decapoda, Oplophoridae, Nematocarinidae, Hippolytidae, Pandalidae, Epialtidae, Inachidae, Majidae, new record, Madeira Island, seamounts, NE Atlantic Ocean.

RESUMO: No presente trabalho os autores assinalam, pela primeira vez, para o arquipélago da Madeira 10 novas espécies de crustáceos decápodes pertencentes às famílias Oplophoridae, Nematocarinidae, Hippolytidae, Pandalidae, Epialtidae, Inachidae e Majidae. A família Nematocarinidae, representada por *Nematocarcinus gracilis*, é assinalada pela primeira vez para a área de estudo.

Palavras-chave: Crustacea, Decapoda, Oplophoridae, Nematocarinidae, Hippolytidae, Pandalidae, Epialtidae, Inachidae, Majidae, novo assinalamento, ilha da Madeira, montes submarinos, Oceano Atlântico nordeste.

INTRODUCTION

Up to now, at least 175 species of decapod crustaceans have been recorded from the waters of the Archipelago of Madeira (ARAÚJO & CALADO, 2003; CALADO *et al.*, 2004; DOS SANTOS *et al.*, 2008; ARAÚJO *et al.*, 2009, 2013).

Following a series of research surveys around the Archipelago of Madeira, including some seamounts located between these islands and Portugal mainland (ARAÚJO *et al.*, 2008), as well as an in-depth search on the collections of the Funchal Natural History Museum (MMF), a lot of 10 species newly for the area were found and are reported herein.

MATERIAL AND METHODS

All studied specimens were collected within the 200-mile Economic Exclusive Zone of Madeira, and were captured with baited bottom traps. They are all preserved in 70% ethanol in the collections of the MMF. In some cases photographs of the freshly caught specimens were taken. Specimens were measured according to standard carcinological procedures and sexed. The systematic arrangement of the present account follows DE GRAVE *et al.* (2009).

Abbreviations used:

CL – Carapace length; CW – Carapace width.

SYSTEMATICS

Family Oplophoridae Dana, 1852

Kemphyra corallina (A. Milne-Edwards, 1883)

Material examined: MMF 036158, 1 male, 30.29 mm CL, 1 ovigerous female, 29.73 mm CL, Unicorn Seamount, 34° 45' 26.33" N 14° 25' 19.78" W, ca. 2500 m, bottom trap, RECPROFMAD-1 cruise, leg 2, R/V Arquipélago, 25.10.2004; MMF 036162 (Fig. 1A), 2 non-ovigerous females, 22.91-22.92 mm CL, 1 ovigerous female, 21.47 mm CL, 1 male, 19.85 mm CL, Seine Seamount, 33° 44' 28.29" N 14° 19' 05.38" W, ca. 2500 m, bottom trap, RECPROFMAD-1 cruise, leg 1, R/V Arquipélago, 02.11.2004; MMF 036164, 1 male, 15.33 mm CL, Seine Seamount, 33° 44' 28.29" N 14° 19' 05.38" W, ca. 2500 m, bottom trap, RECPROFMAD-1 cruise, leg 2, R/V Arquipélago, 04.11.2004; MMF 036219, 1 male, 16.64 mm CL, Unicorn Seamount, 34° 45' 26.33" N 14° 25' 19.78" W, ca. 2500 m, bottom trap, RECPROFMAD-1 cruise, leg 2, R/V Arquipélago, 25.10.2004.

Remarks: *K. corallina* is the thirteenth Oplophoridae species recorded from the Archipelago of Madeira. FIGUEIRA

(1957) recorded nine species from these islands: *Acantheephyra curtirostris* Wood-Mason & Alcock, 1891, *Acantheephyra eximia* Smith, 1884, *Acantheephyra pelagica* (Risso, 1816), *Acantheephyra purpurea* A. Milne-Edwards, 1881, *Ephyrina figueirai* Crosnier & Forest, 1973, *Notostomus elegans* A. Milne-Edwards, 1881, *Oplophorus spinosus* (Brullé, 1839), *Systellaspis cristata* (Faxon, 1893) and *Systellaspis debilis* (A. Milne-Edwards, 1881). CROSNIER & FOREST (1973) recorded *Acantheephyra stylostratis* (Spence Bate, 1888) based on a specimen from "between Gibraltar and Madeira" (another specimen in MMF was collected "close to Madeira"), and FRANSEN (1991) recorded *Acantheephyra microphthalma* Smith, 1885, *Heterogenys microphthalma* (Smith, 1885) and *Meningodora mollis* Smith, 1882.

K. corallina has been recorded from the Bay of Biscay to South Africa and Southwest of the Azores, and from the Indian Ocean (D'UDEKEM D'ACÓZ, 1999). It is here recorded for the first time from the Archipelago of Madeira.

Family Nematocarinidae Smith, 1884

Nematocarcinus gracilipes Filhol, 1884

Material examined: MMF 036708, 1 non-ovigerous female, 20.22 mm CL, Madeira Island, Cabo Girão, 32° 36.389' N 17° 02.260' W, ca. 750 m, bottom trap, CHACMAD-1 cruise, stn. 32, R/V Arquipélago, 21.10.2005; MMF 036591, 1 non-ovigerous female, 24.03 mm CL, Porto Santo Island, 33° 09.29' N 16° 20.3' W, ca. 750 m, bottom trap, CHACMAD-1 cruise, stn. 5, R/V Arquipélago, 05.10.2005; MMF 036593, 2 non-ovigerous females, 29.79-23.12 mm CL, Porto Santo Island, 33° 09.29' N 16° 20.3' W, ca. 750 m, bottom trap, CHACMAD-1 cruise, stn. 5, R/V Arquipélago, 05.10.2005; MMF 036614, 1 non-ovigerous female, 18.92 mm CL, Madeira Island, Seixal, 32° 51.974' N 17° 06.641' W, ca. 750 m, bottom trap, CHACMAD-1 cruise, stn. 17, R/V Arquipélago, 14.10.2005; MMF 036618, 1 non-ovigerous female, 19.23 mm CL, Porto Santo Island, 32° 01.48' N 16° 13.69' W, ca. 750 m, bottom trap, CHACMAD-1 cruise, stn. 12, R/V Arquipélago, 07.10.2005; MMF 036653 (Fig. 1B), 1 non-ovigerous female, 18.55 mm CL, Madeira Island, Paúl do Mar, 32° 42.673' N 17° 15.268' W, ca. 750 m, bottom trap, CHACMAD-1 cruise, stn. 29, R/V Arquipélago, 21.10.2005.

Remarks: *Nematocarcinus gracilipes* has been recorded in the Eastern Atlantic from west of Portugal to Morocco, Canary Islands, Cape Verde Islands and Ascension Island (D'UDEKEM D'ACÓZ, 1999). The family Nematocarinidae is here recorded for the first time from the Archipelago of Madeira.

Family Hippolytidae Spence Bate, 1888

Ligur ensiferus (Risso, 1816)

Material examined: MMF 012116, 1 non-ovigerous female, 9.24 mm CL, Madeira Island, Funchal Bay, no depth data, bottom trap, 10.08.1957; MMF 012117, 1 non-ovigerous female, 10.33 mm CL, Madeira Island, Funchal Bay, no depth data, bottom trap, 10.08.1957; MMF 012118, 1 non-ovigerous female, 8.58 mm CL, Madeira Island, Funchal Bay, no depth data, bottom trap, 10.08.1957; MMF 012119, 1 non-ovigerous female, 8.44 mm CL, Madeira Island, Funchal Bay, no depth data, bottom trap, 10.08.1957; MMF 023246, 3 non-ovigerous females, 23.49, 17.62 and 18.66 mm CL, Madeira Island, Funchal Bay, 32° 37.4' N 16° 54' W, ca. 300 m, bottom trap, 21.07.1978; MMF 023925, 1 non-ovigerous female, 18.09 mm CL, and MMF 023926, 2 non-ovigerous females, 19.07-24.60 mm CL, Madeira Island, Funchal Bay, 32° 37.40' N 16° 54.00' W, ca. 300 m, bottom trap, 10.01.1986; MMF 023933, 2 non-sexed specimens due to lost pleopods, 14.11-17.12 mm CL, Madeira Island, Funchal Bay, 32° 37.40' N 16° 54.00' W, ca. 400 m, bottom trap, 16.01.1986; MMF 023938, 2 non-sexed specimens (lost pleopods), 16.48-16.63 mm CL, Madeira Island, Funchal Bay, 32° 37.15' N 16° 53.95' W, ca. 520 m, bottom trap, 17.01.1986; MMF 024259, 1 non-ovigerous female, 24.16 mm CL, and 3 non-sexed specimens (lost pleopods), 18.97, 17.87 and 15.22 mm CL, Madeira Island, Garajau, 32° 37.85' N 16° 52.76' W, ca. 300 m, bottom trap, 13.04.1988; MMF 024312, 5 non-ovigerous females, 26.34, 19.26, 13.74, 15.05 and 11.42 mm CL, and 3 non-sexed specimens (lost pleopods), 23.58, 15.85 and 14.12 mm CL, Madeira Island, Pináculo, 32° 37.88' N 16° 52.49' W, ca. 280 m, bottom trap, 12.01.1989; MMF 024316, 2 non-sexed (lost pleopods), 15.43-23.10 mm CL, Madeira Island, Pináculo, 32° 37.59' N 16° 51.72' W, ca. 360 m, bottom trap, 13.01.1989; MMF 024321, 1 non-ovigerous female, 12.88 mm CL and 1 non-sexed specimen (lost pleopods), 22.52 mm CL, Madeira Island, Pináculo, 32° 37.74' N 16° 52.49' W, ca. 400 m, bottom trap, 26.01.1989; MMF 025366, 5 ovigerous females, 21.66, 23.94, 23.42, 23.27 and 19.22 mm CL and 2 non-ovigerous females, 16.20 and 13.39 mm CL, Madeira Island, Funchal Bay, 32° 37.15' N 16° 53.95' W, ca. 500 m, bottom trap, 20.05.1992; MMF 025367, 1 ovigerous female, 23.76 mm CL, Madeira Island, Funchal Bay, 32° 37.40' N 16° 54.00' W, ca. 300 m, bottom trap, 20.05.1992; MMF 036156 (Fig. 1C), 1 non-ovigerous female, 21.88 mm CL, Porto Santo Island, Ilhéu de Fora, 33° 07.91' N 16° 15.69' W, ca. 500 m, bottom trap, RECPROFMAD-1 cruise, R/V Arquipélago, 24.10.2004; MMF 036547, 1 male, 14.57

mm CL, MMF 036601, 1 non-ovigerous female, 19.49 mm CL, MMF 036679, 1 non-ovigerous female, 23.27 mm CL, Madeira Island, Ponta do Tristão, 32° 55.898' N 17° 12.996' W, ca. 750 m, bottom trap, stn. 20, CHACMAD-1, cruise, R/V Arquipélago, 15.10.2005; MMF 036607, 1 non-ovigerous female, 19.39 mm CL, Madeira Island, Paúl do Mar, 32° 42.673' N 17° 15.268' W, ca. 750 m, bottom trap, stn. 29, CHACMAD-1 cruise, R/V Arquipélago, 20.10.2005; MMF 036686, 1 non-ovigerous female, 20.15 mm CL, Madeira Island, Cabo Girão, 32° 36.389' N 17° 02.260' W, ca. 750 m, bottom trap, stn. 32, CHACMAD-1 cruise, R/V Arquipélago, 21.10.2005; MMF 039025, 1 male and 1 non-ovigerous female, 16.67 and 18.06 mm CL, Madeira Island, Porto Moniz, 32° 43.95' N 17° 16.15' W, ca. 500 m, bottom trap, stn. 12, CHACMAD-3 cruise, F/V Baía de Câmara de Lobos, 22.04.2008; MMF 039036, 1 male, 15.00 mm CL, MMF 039040, 2 non-ovigerous females, 12.53-23.05 mm CL, MMF 039045, 1 non-ovigerous female, 17.98 mm CL, MMF 039049, 1 male, 17.00 mm CL, Madeira Island, Porto Moniz, 32° 53.62' N 17° 09.27' W, ca. 600 m, bottom trap, stn. 14, CHACMAD-3 cruise, F/V Baía de Câmara de Lobos, 23.04.2008; MMF 039073, 1 ovigerous female, 26.35 mm CL, Madeira Island, Calheta, 32° 42' N 17° 11.52' W, ca. 600 m, bottom trap, stn. 22, CHACMAD-3 cruise, F/V Baía de Câmara de Lobos, 03.05.2008.

Remarks: Until the present, ten Hippolytidae species have been recorded from the Archipelago of Madeira. *Lysmata grabhami* (Gordon, 1935) was originally described from Madeira. LEDOYER (1967) recorded three species: *Eualus occultus* (Lebour, 1936), *Hippolyte varians* Leach, 1814 and *Thor amboinensis* (de Man, 1888). FRANSEN (1991) recorded *Lysmata olavo* from the Selvagens Islands. *Hippolyte prideuxiana* Leach, 1817 and *Lysmata seticaudata* (Risso, 1816) were recorded by WIRTZ (1994) and WIRTZ (1997), respectively; *Hippolyte leptocerus* (Heller, 1863) by D'UDEKEM D'ACÓZ (1996), and *Eualus lebourae* Holthuis, 1951 by FRANSEN & WIRTZ (1997).

L. ensiferus occurs in the Eastern Atlantic from Morocco to Senegal, the Azores, Canary Islands and Cape Verde Islands. It is also present in the Western Mediterranean and Western Atlantic (Bahamas, Guadalupe and Martinique) (D'UDEKEM D'ACÓZ, 1999). Although it has been present in the MMF collection since 1957, it is here recorded for the first time from the Archipelago of Madeira.

Family Pandalidae Haworth, 1825

Plesionika alexandri (A. Milne-Edwards, 1883)

Material examined: MMF 036233 (Fig. 1D), 1 ovigerous

female, 12.15 mm CL, Unicorn Seamount, 34° 32.3' N, 14° 41.56' W, ca. 2000 m, bottom trap, leg 2, RECPROFMAD-1 cruise, 26.10.2004.

Remarks: The family Pandalidae is represented by twelve species in Madeiran waters. *Stylopandalus richardi* (Coutière, 1905) was originally described from Madeira. *Heterocarpus ensifer* A. Milne-Edwards, 1881 and *Heterocarpus laevigatus* Spence Bate, 1888 were recorded by FIGUEIRA (1957), *Plesionika heterocarpus* (A. Costa, 1871) by CROSNIER & FOREST (1973), *Plesionika narval* (Fabricius, 1787) by CHAN & CROSNIER (1991), and *Heterocarpus grimaldii* A. Milne-Edwards & Bouvier, 1900, *Plesionika edwardsii* (Brandt, 1851), *Plesionika ensis* (A. Milne-Edwards, 1881), *Plesionika gliolioli* (Senna, 1902), *Plesionika martia* (A. Milne-Edwards, 1883) and *Plesionika williamsi* Forest, 1964 by BISCOITO (1993).

P. alexandri was previously recorded from the Gulf of Mexico, the Azores and off West Africa, South of Gibraltar (CHACE, 1989; GARCÍA RASO, 1996; FRANSEN & BISCOITO, 2006). This amphi-Atlantic species is here recorded for the first time from the Archipelago of Madeira.

Family Epialtidae MacLeay, 1838

Pisa armata (Latreille, 1803)

Material examined: MMF 023559, 1 male, 13.08 mm CL, 7.23 mm CW, Madeira Island, no additional data, 01.01.1893 (badly preserved specimen).

Pisa tetraodon (Pennant, 1777)

Material examined: MMF 023458, 1 non-ovigerous female, 28.83 mm CL, 16.93 mm CW, Madeira Island, Funchal Bay, 32° 38.74' N 16° 53.10' W, ca. 4 m, bottom trap, 18.11.1964; MMF 023312 (Fig. 1E), 1 male, 34.53 mm CL, 28.65 mm CW, Madeira Island, Baía d'Abra, 32° 44.76' N 16° 41.71' W, in a fishing net at 2-3 m of depth, stony bottom with sand, 22.07.1979.

Rochinia carpenteri (C. W. Thomson, 1873)

Material examined: MMF 025364, 1 non-ovigerous female, 23.50 mm CL, 17.54 mm CW, Madeira Island, Funchal Bay, 32° 37.80' N, 16° 54.10' W, ca. 100 m, bottom trap, 23.01.1992; MMF 036536, 1 non-ovigerous female, 33.89 mm CL, 27.48 mm CW, Madeira Island, Cabo Girão, 32° 36.791' N, 17° 04.202' W, ca. 750 m, bottom trap, stn. 33, CHACMAD-1 cruise, R/V Arquipélago, 21.10.2005; MMF 036585 (Fig. 1F), 1 male, 35.50 mm CL, 28.03 mm CW, Madeira Island, Cabo Girão, 32° 36.791' N 17° 04.202' W, ca. 750 m, bottom trap, stn. 33, CHACMAD-1 cruise, R/V Arquipélago, 21.10.2005; MMF 036645, 1 male, 27.79 mm

CL, 21.34 mm CW, Madeira Island, Cabo Girão, 32° 36.791' N 17° 04.202' W, ca. 750 m, bottom trap, stn. 33, CHACMAD-1 cruise, R/V Arquipélago, 21.10.2005.

Remarks: The family Epialtidae is represented in the Archipelago of Madeira by nine species: *Acanthonyx brevifrons* A. Milne-Edwards, 1869 recorded by A. MILNE-EDWARDS & BOUVIER (1900), *Acanthonyx lunulatus* (Risso, 1816) by LEDOYER (1967), *Anamathia rissoana* (Roux, 1828) (as *Rochinia rissoana*) and *Pisa nodipes* (Leach, 1815) by ZARIQUIEY ÁLVAREZ (1968), *Herbstia condyliata* (Fabricius, 1787) by MANNING & HOLTHUIS (1981), and *Pisa carinimana* Miers, 1879 by RAMALHOSA *et al.* (2014).

Pisa armata, *P. tetraodon* and *Rochinia carpenteri* are here recorded for the first time from Madeira. All three species occur only in the Eastern Atlantic and Mediterranean: *Pisa armata* from SW of British Isles to Angola, including the Azores, Canary Islands and Cape Verde Islands; *P. tetraodon* from SW of British Isles to Mauritania and Canary Islands; *Rochinia carpenteri* from South Iceland to Mauritania, Azores and Canary Islands (D'UDEKEM D'ACÓZ, 1999).

Family Inachidae MacLeay, 1838

Inachus leptochirus Leach, 1817

Material examined: MMF 025354 (Fig. 1G), 1 non-ovigerous female, 15.92 mm CL, 13.74 mm CW, Madeira Island, Funchal Bay, 32° 37.40' N 16° 54.00' W, ca. 300 m, bottom trap, 23.06.1992.

Inachus thoracicus Roux, 1830

Material examined: MMF 023742, 1 male, 14.75 mm CL, 13.48 mm CW, Madeira Island, Funchal Bay, Ponta do Garajau, 32° 37.93' N 16° 51.58' W, ca. 90 m, bottom trap, 28.03.1985; MMF 025353 (Fig. 1H), 1 male, 19.69 mm, 18.20 mm CW, Madeira Island, Funchal Bay, 32° 37.80' N 16° 54.10' W, ca. 100 m, bottom trap, 28.05.1992.

Remarks: Until now the family Inachidae was represented in Madeira by five species. *Ergasticus clouei* A. Milne-Edwards, 1882 and *Inachus aguiarii* de Brito Capello, 1876 were recorded by A. MILNE-EDWARDS & BOUVIER (1900), *Achaeus cranchii* Leach, 1817 by ZARIQUIEY ÁLVAREZ (1968), *Stenorhynchus lanceolatus* (Brullé, 1837) by MANNING & HOLTHUIS (1981) and *Inachus phalangium* (Fabricius, 1775) by FRANSEN & WIRTZ (1997).

Inachus leptochirus and *I. thoracicus* are here recorded for the first time from Madeira. Both species occur only in the Eastern Atlantic and Mediterranean: *I. leptochirus* from Färoe Islands to Mauritania and Azores; *I. thoracicus* from West of Portugal to Congo and Canary Islands (MANNING & HOLTHUIS, 1981; D'UDEKEM D'ACÓZ, 1999).

Family Majidae Samouelle, 1891

Eurynome spinosa Hailstone, 1835

Material examined: MMF 023561, 1 male, 6.17 mm CL, 4.38 mm CW, and 2 non-ovigerous females, 5.84-6.69 mm CL, 4.11-5.09 mm CW; MMF 023562 (Fig. 1I), 1 non-ovigerous female, 5.48 mm CL, 4.25 mm CW; MMF 023566, 1 non-ovigerous female, 6.51 mm CL, 4.72 mm CW, Madeira Island, ca. 70 m, 01.01.1889.

Remarks: *Eurynome spinosa* is the third species of the family Majidae recorded from the Archipelago of Madeira. A. MILNE-EDWARDS & BOUVIER (1900) recorded *Eurynome aspera* (Pennant, 1777), and WIRTZ (1995) recorded *Maja brachydactyla* Balss, 1922 (as *Maja squinado*).

E. spinosa occurs in the Eastern Atlantic, from South Norway to Morocco, the Mediterranean and Azores (D'UDEKEM D'ACÓZ, 1999), and it is here recorded for the first time from Madeira.

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Fig. 1 – **A)** Non-ovigerous female of *Kempfya corallina* (MMF 036162) recorded for the archipelago of Madeira (Unicorn Seamount). Escala = 10 mm; **B)** Non-ovigerous female of *Nematocarcinus gracilipes* (MMF 036653) recorded for Madeira Island. Escala = 10 mm; **C)** Non-ovigerous female of *Ligur ensiferus* from Porto Santo Island (MMF 036156). Escala = 10 mm; **D)** Ovigerous female of *Plesionika alexandri* from Unicorn Seamount (MMF 036233). Escala = 5 mm; **E)** Male of *Pisa tetraodon* from Madeira Island (MMF 023312). Escala = 10 mm; **F)** Male of *Rochinia carpenteri* from Madeira Island (MMF 036585). Escala = 10 mm; **G)** Non-ovigerous female of *Inachus leptochirus* from Madeira Island (MMF 025354). Escala = 10 mm; **H)** Male of *Inachus thoracicus* from Madeira Island (MMF 025353). Escala = 10 mm; and **I)** Non-ovigerous female of *Eurynome spinosa* from Madeira Island (MMF 023562). Escala = 5 mm.