

# Contribution to the knowledge of the deep brachyuran fauna (Crustacea: Decapoda) in waters off Mauritania (NW Africa)

SUSANA S. DE MATOS-PITA<sup>1,2</sup>, SARA CASTILLO<sup>1,2</sup> AND FRAN RAMIL<sup>1</sup>

<sup>1</sup>Facultad de Ciencias del Mar, Universidad de Vigo, Campus Lagoas-Marcosende, Vigo 36310, Pontevedra, España, <sup>2</sup>Instituto Español de Oceanografía, Centro Oceanográfico de Vigo, Subida Radio Faro 50, Vigo 36390, Pontevedra, España

*Four multidisciplinary oceanographic surveys were conducted in November and December from 2007 to 2010, along the Mauritanian coast (NW Africa). A total of 10,514 brachyuran crabs belonging to 33 species were captured in 316 hauls at depths between 79 and 1867 m. The most speciose family was Inachidae represented by nine species; the remaining 24 species belonged to 16 other brachyuran families. Monodaeus cristulatus is reported for the first time since its original description. Seven other species, Ethusa rugulosa, Pseudomyra mbizi, Inachus grillator, Macropodia gilsoni, Macropodia hesperiae, Solenolambrus noordendei and Spinolambrus notialis extend their range of distribution northwards and, together with Goneplax barnardi, are reported here for the first time in Mauritanian waters. New data about depth ranges are reported for Acanthocarpus brevispinis, Ethusa rugulosa, Inachus aguiarii, Inachus grillator, Inachus nanus, Macropodia macrocheles, Solenolambrus noordendei, Spinolambrus notialis, Liocarcinus corrugatus and Monodaeus cristulatus. New data relating to the spawning period for most of the species are also included, as are some biogeographic and bathymetric considerations about brachyurans studied in the area.*

**Keywords:** Brachyura, deep-sea, Mauritanian waters, distribution, new records

Submitted 27 February 2015; accepted 5 April 2016; first published online 18 May 2016

## INTRODUCTION

The infraorder Brachyura is regarded as the most diverse taxon within the Crustacea, with more than 6500 species (de Grave *et al.*, 2009) related to 102 families (Ahyong *et al.*, 2011).

The brachyuran fauna from the north-eastern Atlantic, and especially from European coasts, is currently one of the best known worldwide. The knowledge on diversity and distribution of decapod fauna in this region was summarized by d'Udekem d'Acoz (1999). Further publications, mostly focused on the Mediterranean Sea, provided new information on bathymetry and/or biogeographic distributions of decapods (Maynou & Cartes, 2000; Sánchez-Jerez *et al.*, 2000; Modena *et al.*, 2001; Abelló *et al.*, 2002; Pipitone & Arculeo, 2003; Company *et al.*, 2004; Politou *et al.*, 2005; Ungaro *et al.*, 2005; Ateş *et al.*, 2006; Fanelli *et al.*, 2007; Pipitone & Vaccaro, 2011; El Lakhraç *et al.*, 2012), or information related to new findings or the biology of a particular brachyuran species (Mura & Cau, 2002; Giacobbe & Spano, 2006; Rossetti *et al.*, 2006; Guerao & Abelló, 2007; Mavidis *et al.*, 2008; Isajlović *et al.*, 2009; Massi *et al.*, 2010; Neudecker *et al.*, 2011; Capezzuto *et al.*, 2012; Porporato *et al.*, 2012).

However, where West Africa is concerned, the only comprehensive monographs on brachyuran crabs are those by Monod (1956) and Manning & Holthuis (1981). In addition,

some local studies on crustacean or decapod fauna were also undertaken along the West African coast, the most representative being those by Barnard (1950, 1955) in South Africa; Macpherson (1983, 1991) in Namibia; Henriksen (2009) in the Gulf of Guinea; Muñoz *et al.* (2012) in Guinea-Bissau; Fransen (1991) in both the Canarian-Cape Verdean Region and the Banc d'Arguin (Mauritania); Anadón (1981) in northern Mauritania and south-western Sahara; González Pérez (1995) in the Canary Islands and García-Raso (1996) in Ibero-Moroccan waters. All these works include citations for brachyurans and collectively have improved the knowledge of this group. However, no other references focus particularly on Mauritania other than a succinct list of brachyurans (Monod, 1933) and some scant records (Monod, 1956; Anadón, 1981; Manning & Holthuis, 1981; Fransen, 1991).

From 2007 to 2010, the ECOAFRIK project, led by the Spanish Institute of Oceanography (IEO), in collaboration with the University of Vigo (Spain), carried out four annual multidisciplinary surveys in Mauritanian waters (MAURIT surveys). This work presents the taxonomic results for the deep brachyuran fauna and is the first contribution associated exclusively with this group in waters off Mauritania. We also provide new data about the geographic distribution, bathymetric range and spawning periods for some of the species studied.

## MATERIALS AND METHODS

The MAURIT surveys were conducted annually from 2007 to 2010 onboard the Spanish RV 'Vizconde de Eza' along the

### Corresponding authors:

S.S. De Matos-Pita and F. Ramil  
Emails: soto@uvigo.es; framil@uvigo.es

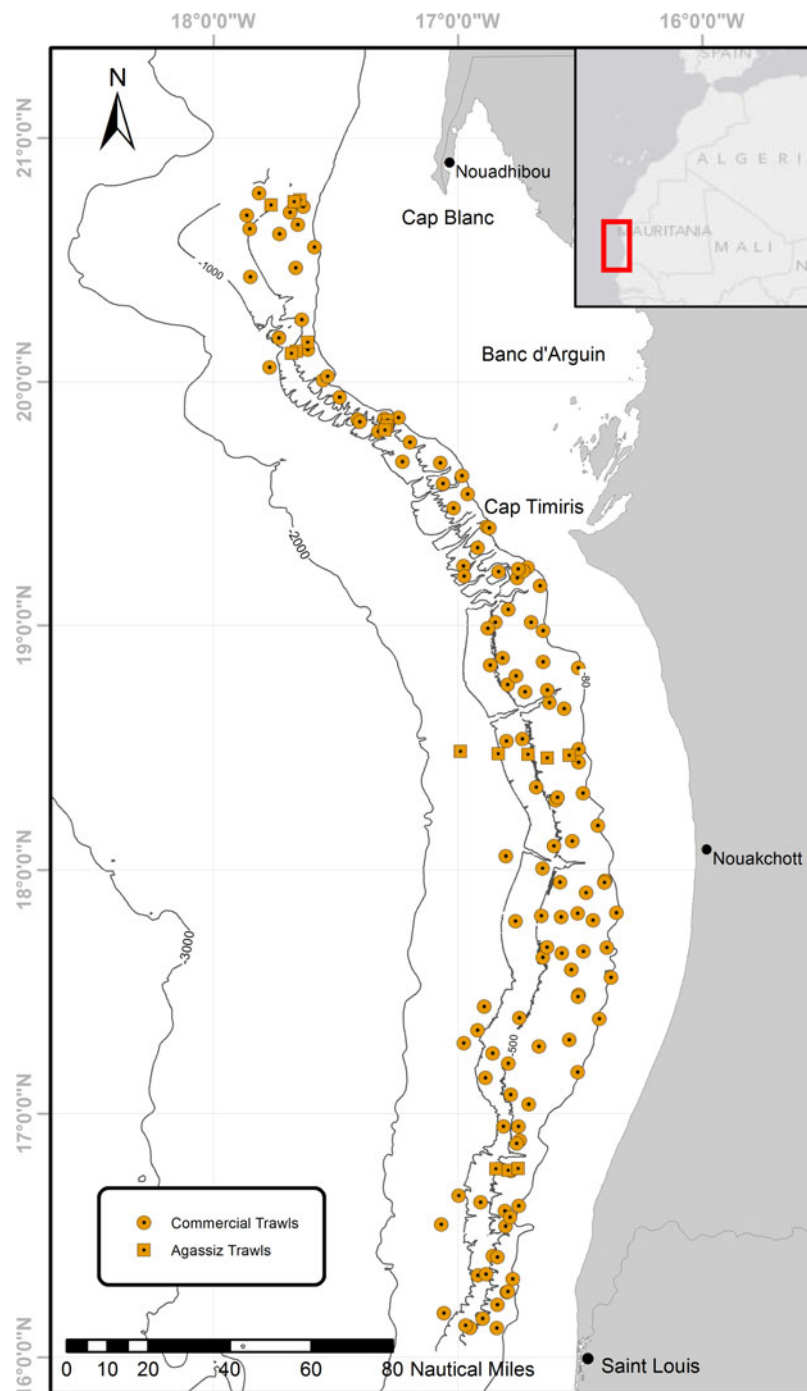
Mauritanian coast ( $16^{\circ}05'49''\text{N}$   $20^{\circ}48'13''\text{W}$ , see [Map 1](#)) in November–December.

A total of 316 stations were sampled at depths between 79 and 1867 m by means of two different bottom trawl gears. A total of 291 stations were sampled with a commercial trawl (Lofoten type, coded MU), following a stratified random sampling procedure. Another 25 stations were sampled with a 3.5 m beam trawl (coded MUBV) along five transects perpendicular to the coastline in five bathymetric strata (150, 300, 500, 1000, 1500 m), distributed along the Mauritanian coast (see [Map 1](#)). Station data, including coordinates, depth, date and collected species, are summarized in [Table 1](#).

Samples were sorted and identified onboard to the lowest taxonomic level. For each species all the specimens were counted, weighed and pictured. A representative collection of each station and of each species was preserved in 70% ethanol and stored for further studies in the laboratory.

The classification adopted in the present work follows [Ahyong \*et al.\* \(2011\)](#) to the family level, and genera assignments follow [de Grave \*et al.\* \(2009\)](#). Subsections, superfamilies, families and species are usually listed in alphabetical order.

For each species we provide some relevant literature references, including those with the descriptions of the species that best fit with our specimens. We also provide the material



**Map 1.** Sampling area showing the location of the MAURIT stations with presence of brachyurans.

**Table 1.** Data of the MAURIT stations: date, coordinates, bathymetric range and captured species.

Station code	Date	Latit N start	Long W start	Depth start (m)	Latit N turn	Long W turn	Depth turn (m)	Species
MU01	17/11/2007	20°46'60"	17°47'44"	817	20°45'54"	17°49'51"	820	<i>Chaceon maritae</i>
MU02	17/11/2007	20°42'00"	17°50'30"	616	20°40'01"	17°53'04"	626	<i>Bathynectes piperitus</i>
MU14	21/11/2007	20°39'01"	17°50'15"	502	20°36'18"	17°51'50"	511	<i>Bathynectes piperitus</i> , <i>Paromola cuvieri</i>
MU15	21/11/2007	20°27'14"	17°51'47"	670	20°24'31"	17°50'04"	675	<i>Bathynectes piperitus</i> , <i>Chaceon maritae</i>
MU17	22/11/2007	20°10'22"	17°42'24"	818	20°11'25"	17°45'26"	861	<i>Chaceon maritae</i>
MU18	22/11/2007	20°14'01"	17°39'16"	519	20°16'37"	17°37'16"	402	<i>Bathynectes piperitus</i> , <i>Chaceon maritae</i> , <i>Paromola cuvieri</i>
MU19	22/11/2007	20°05'04"	17°46'18"	1222	20°02'05"	17°46'09"	1218	<i>Chaceon maritae</i>
MU23	24/11/2007	19°50'44"	17°25'25"	532	19°50'46"	17°23'48"	415	<i>Bathynectes piperitus</i> , <i>Chaceon maritae</i> , <i>Paromola cuvieri</i>
MU26	25/11/2007	19°39'08"	17°12'32"	744	19°41'31"	17°14'38"	744	<i>Chaceon maritae</i>
MU33	27/11/2007	19°15'21"	16°59'38"	741	19°13'57"	16°57'33"	736	<i>Chaceon maritae</i>
MU37	29/11/2007	19°02'16"	16°50'40"	403	18°59'15"	16°50'52"	442	<i>Bathynectes piperitus</i> , <i>Paromola cuvieri</i>
MU44	01/12/2007	18°30'41"	16°43'46"	606	18°33'41"	16°44'31"	596	<i>Bathynectes piperitus</i> , <i>Goneplax barnardi</i>
MU45	01/12/2007	18°44'11"	16°46'53"	420	18°46'41"	16°48'40"	427	<i>Bathynectes piperitus</i>
MU46	01/12/2007	18°33'12"	16°48'22"	848	18°30'14"	16°47'40"	847	<i>Chaceon maritae</i>
MU48	02/12/2007	18°01'53"	16°48'35"	1239	18°04'51"	16°47'49"	1218	<i>Chaceon maritae</i>
MU51	03/12/2007	17°47'32"	16°39'47"	464	17°49'51"	16°39'13"	468	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i>
MU52	03/12/2007	17°48'50"	16°45'25"	774	17°45'54"	16°46'14"	792	<i>Bathynectes piperitus</i>
MU54	03/12/2007	17°39'49"	16°39'02"	414	17°36'58"	16°39'10"	451	<i>Bathynectes piperitus</i> , <i>Goneplax barnardi</i>
MU55	04/12/2007	17°26'37"	16°54'13"	1310	17°25'58"	16°52'49"	1218	<i>Chaceon maritae</i>
MU56	04/12/2007	17°19'07"	16°55'48"	1091	17°21'53"	16°54'26"	1159	<i>Chaceon maritae</i>
MU57	04/12/2007	17°11'05"	16°47'52"	430	17°13'32"	16°47'20"	406	<i>Bathynectes piperitus</i> , <i>Goneplax barnardi</i>
MU62	06/12/2007	16°09'35"	17°04'18"	1236	16°12'06"	17°02'32"	1244	<i>Chaceon maritae</i>
MU63	06/12/2007	16°18'39"	16°55'12"	848	16°21'32"	16°54'59"	798	<i>Bathynectes piperitus</i>
MU64	06/12/2007	16°23'28"	16°51'44"	452	16°26'24"	16°51'01"	468	<i>Bathynectes piperitus</i>
MU67	07/12/2007	16°31'10"	17°04'27"	1381	16°34'09"	17°03'38"	1390	<i>Chaceon maritae</i>
MU68	07/12/2007	16°38'19"	16°59'29"	1136	16°41'10"	17°00'05"	1146	<i>Chaceon maritae</i>
MU70	08/12/2007	16°55'14"	16°48'39"	755	16°58'20"	16°48'53"	801	<i>Bathynectes piperitus</i> , <i>Chaceon maritae</i>
MU71	08/12/2007	17°07'09"	16°52'54"	812	17°10'16"	16°53'27"	837	<i>Bathynectes piperitus</i>
MU73	09/12/2007	17°15'50"	16°58'10"	1330	17°18'42"	16°58'55"	1284	<i>Chaceon maritae</i>
MU79	11/12/2007	18°04'20"	16°36'39"	554	18°07'20"	16°36'07"	576	<i>Bathynectes piperitus</i> , <i>Chaceon maritae</i>
MU86	19/11/2008	20°44'40"	17°37'37"	91	20°41'40"	17°38'19"	103	<i>Macropipus rugosus</i> , <i>Solenolambrus noordendei</i>
MU87	19/11/2008	20°37'29"	17°42'37"	271	20°35'19"	17°44'55"	305	<i>Ebalia nux</i> , <i>Homola barbata</i>
MU88	19/11/2008	20°29'25"	17°39'03"	94	20°26'46"	17°40'35"	120	<i>Homola barbata</i> , <i>Inachus angolensis</i>
MU90	20/11/2008	20°09'23"	17°36'47"	110	20°06'30"	17°36'48"	110	<i>Macropipus rugosus</i>
MU99	23/11/2008	18°21'45"	16°41'12"	569	18°18'55"	16°40'20"	598	<i>Acanthocarpus brevispinis</i>
MU100	23/11/2008	18°08'43"	16°32'09"	236	18°05'23"	16°31'34"	238	<i>Macropodia macrocheles</i>
MU101	23/11/2008	17°58'45"	16°24'17"	104	17°55'53"	16°23'27"	96	<i>Macropipus rugosus</i>
MU105	24/11/2008	17°58'21"	16°34'32"	343	17°55'27"	16°35'19"	346	<i>Macropodia macrocheles</i>
MU119	29/11/2008	17°31'58"	16°23'00"	82	17°34'58"	16°21'47"	80	<i>Homola barbata</i> , <i>Macropodia gilsoni</i> , <i>Macropodia hesperiae</i>
MU120	30/11/2008	16°05'49"	16°51'20"	109	16°08'23"	16°49'32"	105	<i>Homola barbata</i> , <i>Inachus aguiarii</i> , <i>Macropipus rugosus</i> , <i>Macropodia gilsoni</i> , <i>Monodaes cristulatus</i> , <i>Pisa armata</i>
MU121	30/11/2008	16°10'05"	16°53'01"	274	16°08'48"	16°54'43"	400	<i>Acanthocarpus brevispinis</i> , <i>Paromola cuvieri</i>

Continued

Table 1. Continued

Station code	Date	Latit N start	Long W start	Depth start (m)	Latit N turn	Long W turn	Depth turn (m)	Species
MU122	30/11/2008	16°17'53"	16°47'08"	107	16°20'35"	16°45'47"	97	<i>Homola barbata</i>
MU123	30/11/2008	16°23'07"	16°50'01"	278	16°26'08"	16°50'26"	362	<i>Goneplax barnardi</i>
MU125	01/12/2008	16°35'49"	16°45'35"	103	16°38'39"	16°44'29"	101	<i>Macropipus rugosus</i>
MU126	01/12/2008	16°36'35"	16°54'20"	668	16°39'42"	16°54'26"	826	<i>Bathynectes piperitus</i> , <i>Chaceon maritae</i>
MU127	01/12/2008	16°37'29"	16°48'23"	260	16°34'28"	16°48'28"	353	<i>Bathynectes piperitus</i>
MU128	01/12/2008	16°33'15"	16°48'07"	218	16°31'09"	16°48'27"	404	<i>Homola barbata</i>
MU129	02/12/2008	16°52'43"	16°45'08"	95	16°53'53"	16°44'25"	93	<i>Inachus aguiarii</i> , <i>Macropodia hesperiae</i> , <i>Spinolambrus notialis</i>
MU130	02/12/2008	16°44'31"	16°46'48"	252	16°47'12"	16°47'01"	362	<i>Inachus angolensis</i>
MU131	02/12/2008	17°00'55"	16°43'21"	102	17°03'33"	16°41'50"	104	<i>Homola barbata</i> , <i>Inachus aguiarii</i> , <i>Macropodia gilsoni</i> , <i>Pisa armata</i> , <i>Spinolambrus notialis</i>
MU133	02/12/2008	17°08'44"	16°31'19"	87	17°11'31"	16°29'49"	87	<i>Inachus angolensis</i>
MU134	03/12/2008	17°06'06"	16°46'45"	311	17°03'10"	16°47'13"	436	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i>
MU135	03/12/2008	17°15'20"	16°41'04"	185	17°17'38"	16°39'07"	173	<i>Macropipus rugosus</i>
MU136	03/12/2008	17°16'40"	16°33'04"	103	17°19'34"	16°32'06"	112	<i>Pisa armata</i>
MU137	03/12/2008	17°21'43"	16°25'29"	81	17°24'47"	16°25'00"	84	<i>Inachus angolensis</i> , <i>Macropipus rugosus</i>
MU138	04/12/2008	17°27'42"	16°30'29"	123	17°30'44"	16°30'12"	130	<i>Macropipus rugosus</i> , <i>Macropodia gilsoni</i>
MU139	04/12/2008	17°39'19"	16°23'23"	96	17°42'25"	16°23'20"	97	<i>Macropodia gilsoni</i> , <i>Pisa armata</i>
MU140	04/12/2008	17°39'25"	16°38'11"	376	17°42'28"	16°38'00"	377	<i>Paromola cuvieri</i>
MU141	04/12/2008	17°46'56"	16°34'53"	280	17°49'52"	16°34'16"	277	<i>Macropodia macrocheles</i>
MU143	05/12/2008	18°15'41"	16°35'16"	322	18°18'29"	16°36'34"	322	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i> , <i>Goneplax rhomboides</i>
MU144	05/12/2008	18°17'21"	16°29'14"	119	18°20'19"	16°29'12"	138	<i>Macropipus rugosus</i>
MU147	06/12/2008	18°41'01"	16°34'31"	134	18°38'04"	16°33'14"	139	<i>Macropipus rugosus</i> , <i>Pisa armata</i>
MU148	06/12/2008	18°42'02"	16°36'28"	215	18°39'56"	16°38'29"	245	<i>Macropipus rugosus</i>
MU149	06/12/2008	18°47'59"	16°30'21"	93	18°51'05"	16°30'26"	146	<i>Macropipus rugosus</i> , <i>Macropodia gilsoni</i> , <i>Macropodia macrocheles</i>
MU150	07/12/2008	18°44'54"	16°44'10"	292	18°42'20"	16°42'42"	341	<i>Paromola cuvieri</i>
MU151	07/12/2008	18°49'50"	16°38'03"	110	18°52'17"	16°39'59"	134	<i>Macropodia gilsoni</i>
MU152	07/12/2008	18°50'25"	16°48'58"	381	18°53'35"	16°49'03"	316	<i>Goneplax barnardi</i>
MU154	08/12/2008	18°57'13"	16°38'48"	92	19°00'10"	16°39'13"	102	<i>Macropipus rugosus</i> , <i>Macropodia hesperiae</i> , <i>Pisa armata</i>
MU155	08/12/2008	19°04'38"	16°46'17"	210	19°03'18"	16°48'58"	257	<i>Macropipus rugosus</i> , <i>Macropodia macrocheles</i>
MU156	08/12/2008	19°08'17"	16°39'56"	107	19°11'17"	16°39'40"	102	<i>Macropodia gilsoni</i>
MU157	08/12/2008	19°12'04"	16°50'13"	278	19°14'27"	16°49'40"	454	<i>Macropodia macrocheles</i> , <i>Paromola cuvieri</i>
MU158	08/12/2008	19°15'38"	16°43'32"	80	19°12'56"	16°42'10"	98	<i>Calappa pelii</i> , <i>Homola barbata</i>
MU159	09/12/2008	17°37'55"	16°34'30"	224	17°41'01"	16°34'24"	229	<i>Macropodia macrocheles</i>
MU160	09/12/2008	17°38'31"	16°29'14"	143	17°41'17"	16°29'07"	147	<i>Macropipus rugosus</i>
MU161	09/12/2008	17°47'48"	16°20'46"	89	17°50'57"	16°21'16"	92	<i>Inachus angolensis</i> , <i>Macropipus rugosus</i> , <i>Macropodia gilsoni</i>
MU162	09/12/2008	17°52'50"	16°28'28"	148	17°55'53"	16°28'31"	149	<i>Homola barbata</i> , <i>Macropipus rugosus</i>
MU166	11/12/2008	18°09'24"	16°25'38"	87	18°12'19"	16°25'32"	85	<i>Inachus nanus</i> , <i>Macropipus rugosus</i> , <i>Macropodia gilsoni</i>
MU167	11/12/2008	18°28'10"	16°30'11"	101	18°31'12"	16°30'27"	108	<i>Macropipus rugosus</i>
MU168	12/12/2008	19°25'20"	16°52'13"	87	19°23'20"	16°53'28"	92	<i>Inachus angolensis</i> , <i>Macropipus rugosus</i> , <i>Macropodia gilsoni</i>
MU170	12/12/2008	19°30'49"	16°57'20"	102	19°33'55"	16°57'47"	92	<i>Macropodia gilsoni</i> , <i>Solenolambrus noordendei</i>
MU171	12/12/2008	19°35'19"	16°59'05"	105	19°38'25"	16°58'55"	100	<i>Monodaeus cristulatus</i> , <i>Solenolambrus noordendei</i>
MU173	13/12/2008	19°44'50"	17°11'02"	314	19°45'24"	17°12'22"	540	<i>Macropodia macrocheles</i>
MU174	13/12/2008	19°50'01"	17°13'22"	85	19°52'17"	17°15'46"	84	<i>Inachus angolensis</i>
MU175	13/12/2008	19°47'30"	17°18'26"	618	19°48'07"	17°20'32"	850	<i>Bathynectes piperitus</i> , <i>Paromola cuvieri</i>

MU177	14/12/2008	18°48'41"	16°52'00"	584	18°51'44"	16°51'59"	580	<i>Bathynectes piperitus, Chaceon maritae</i>
MU179	16/11/2009	18°48'25"	16°45'59"	303	18°46'46"	16°45'23"	304	<i>Bathynectes piperitus, Macropodia macrocheles</i>
MU181	17/11/2009	19°11'00"	16°44'53"	142	19°12'27"	16°45'50"	148	<i>Macropipus rugosus</i>
MU182	17/11/2009	19°11'39"	16°57'03"	726	19°12'40"	16°59'52"	726	<i>Chaceon maritae</i>
MU183	18/11/2009	19°40'41"	17°04'53"	138	19°39'27"	17°03'38"	177	<i>Eurynome aspera, Solenolambrus noordendei</i>
MU184	18/11/2009	19°29'44"	17°01'19"	213	19°28'06"	17°00'43"	202	<i>Homola barbata, Macropipus rugosus, Macropodia macrocheles</i>
MU186	19/11/2009	19°35'44"	19°03'59"	174	19°34'06"	17°03'19"	174	<i>Homola barbata, Macropipus rugosus, Spinolambrus notialis</i>
MU188	19/11/2009	19°50'08"	17°25'24"	627	19°50'05"	17°22'43"	627	<i>Chaceon maritae, Paromola cuvieri</i>
MU200	25/11/2009	20°41'16"	17°41'53"	352	20°42'16"	17°40'27"	334	<i>Homola barbata, Inachus leptochirus</i>
MU204	26/11/2009	20°37'53"	17°39'26"	155	20°39'35"	17°39'01"	145	<i>Homola barbata, Inachus leptochirus</i>
MU205	27/11/2009	20°33'56"	17°33'28"	89	20°32'22"	17°36'54"	93	<i>Inachus angolensis, Macropipus rugosus</i>
MU207	29/11/2009	20°00'54"	17°32'20"	88	19°59'52"	17°33'48"	117	<i>Goneplax rhomboides, Inachus nanus</i>
MU208	29/11/2009	20°02'03"	17°32'25"	96	20°00'38"	17°31'32"	79	<i>Macropipus rugosus</i>
MU209	29/11/2009	19°57'01"	17°28'59"	115	19°55'23"	17°29'02"	150	<i>Eurynome aspera</i>
MU210	30/11/2009	19°24'53"	16°52'06"	86	19°23'10"	16°52'25"	90	<i>Macropodia gilsoni, Medorippe lanata, Inachus angolensis, Solenolambrus noordendei</i>
MU211	30/11/2009	19°21'50"	16°52'50"	92	19°21'18"	16°52'35"	109	<i>Pisa armata</i>
MU212	30/11/2009	19°19'55"	16°54'08"	163	19°18'19"	16°56'04"	200	<i>Inachus angolensis, Inachus nanus, Monodaeus cristulatus, Solenolambrus noordendei</i>
MU214	02/11/2009	17°22'35"	16°45'41"	650	17°24'29"	16°44'02"	588	<i>Bathynectes piperitus, Goneplax barnardi</i>
MU216	16/06/2009	16°06'20"	16°58'01"	422	16°08'07"	16°55'60"	422	<i>Goneplax barnardi</i>
MU217	04/12/2009	16°17'47"	16°47'36"	111	16°14'11"	16°48'17"	113	<i>Macropodia gilsoni</i>
MU219	06/12/2009	16°12'13"	16°50'28"	125	16°13'35"	16°50'01"	129	<i>Monodaeus cristulatus</i>
MU222	07/12/2009	17°13'22"	16°51'52"	729	17°16'16"	16°51'04"	723	<i>Bathynectes piperitus</i>
MU223	09/12/2009	17°48'20"	16°26'40"	116	17°46'46"	16°26'55"	117	<i>Homola barbata, Macropodia gilsoni</i>
MU224	09/12/2009	17°36'05"	16°31'52"	173	17°34'40"	16°32'23"	177	<i>Macropipus rugosus</i>
MU226	09/12/2009	16°55'55"	16°44'58"	109	16°57'43"	16°45'16"	107	<i>Inachus aguiarii</i>
MU227	10/12/2009	17°48'20"	16°30'33"	183	17°50'10"	16°30'32"	181	<i>Goneplax rhomboides, Macropipus rugosus</i>
MU233	13/12/2009	18°44'26"	16°37'12"	165	18°43'50"	16°38'48"	189	<i>Macropodia gilsoni, Macropodia macrocheles, Solenolambrus noordendei</i>
MU235	14/12/2009	19°01'34"	16°41'55"	123	19°00'00"	16°42'04"	123	<i>Macropodia gilsoni</i>
MU243	20/11/2010	20°10'10"	17°42'28"	827	20°11'26"	17°45'21"	850	<i>Chaceon maritae</i>
MU251	24/11/2010	19°50'43"	17°17'14"	107	19°51'16"	17°18'46"	107	<i>Inachus angolensis</i>
MU260	29/11/2010	19°12'38"	16°43'31"	101	19°14'08"	16°44'20"	120	<i>Inachus angolensis</i>
MU261	29/11/2010	19°14'26"	16°44'14"	111	19°13'19"	16°46'02"	146	<i>Pisa armata, Inachus nanus</i>
MU263	29/11/2010	19°00'43"	16°52'26"	615	18°57'50"	16°52'52"	624	<i>Paromola cuvieri</i>
MU266	01/12/2010	17°57'46"	16°24'13"	103	17°55'56"	16°23'46"	103	<i>Macropipus rugosus</i>
MU267	02/12/2010	17°58'53"	16°39'38"	673	18°01'43"	16°38'43"	670	<i>Bathynectes piperitus, Chaceon maritae</i>
MU276	07/12/2010	16°18'56"	16°53'25"	637	16°21'53"	16°52'41"	562	<i>Bathynectes piperitus</i>
MU277	07/12/2010	16°15'19"	16°47'58"	112	16°16'55"	16°47'22"	110	<i>Macropodia longipes, Inachus aguiarii</i>
MU280	08/12/2010	16°33'56"	16°47'49"	230	16°34'50"	16°46'27"	239	<i>Macropodia macrocheles</i>
MU281	09/12/2010	16°53'26"	16°45'19"	100	16°51'45"	16°45'47"	106	<i>Homola barbata</i>
MU285	11/12/2010	17°27'50"	16°30'34"	128	17°29'38"	16°30'23"	132	<i>Macropipus rugosus</i>
MU290	14/12/2010	18°16'53"	16°35'23"	311	18°18'44"	16°35'35"	311	<i>Euchirograpsus liguricus, Monodaeus cristulatus</i>
MU291	14/12/2010	18°26'32"	16°29'17"	106	18°26'22"	16°31'18"	137	<i>Inachus angolensis, Macropipus rugosus</i>
MUBV01	21/11/2009	20°09'46"	17°36'52"	112	20°10'06"	17°36'51"	112	<i>Calappa pelii, Ethusa rugulosa, Inachus angolensis, Macropipus rugosus, Medorippe lanata, Pseudomyra mbizi, Solenolambrus noordendei</i>

Continued

Table 1. Continued

Station code	Date	Latit N start	Long W start	Depth start (m)	Latit N turn	Long W turn	Depth turn (m)	Species
MUBV02	21/11/2009	20°07'36"	17°39'36"	318	20°07'47"	17°39'42"	330	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i> , <i>Ethusa rugulosa</i> , <i>Homola barbata</i> , <i>Inachus angolensis</i> , <i>Solenolambrus noordendi</i>
MUBV03	21/11/2009	20°07'04"	17°40'48"	528	20°07'18"	17°40'54"	538	<i>Bathynectes piperitus</i> , <i>Chaceon maritae</i> , <i>Goneplax barnardi</i> , <i>Paromola cuvieri</i>
MUBV08	26/11/2009	20°44'50"	17°38'47"	174	20°45'03"	17°38'37"	168	<i>Liocarcinus corrugatus</i> , <i>Monodaeus cristulatus</i>
MUBV09	27/11/2009	20°43'34"	17°45'48"	549	20°43'43"	17°45'25"	555	<i>Bathynectes piperitus</i> , <i>Goneplax barnardi</i>
MUBV10	27/11/2009	20°44'25"	17°40'07"	332	20°44'37"	17°40'16"	344	<i>Atelecyclus rotundatus</i> , <i>Bathybectes piperitus</i> , <i>Cyonomus granulatus</i> , <i>Ebalia nux</i> , <i>Ethusa rugulosa</i> , <i>Inachus grallator</i> , <i>Inachus leptochirus</i> , <i>Monodaeus cristulatus</i> , <i>Solenolambrus noordendi</i>
MUBV13	03/12/2009	16°46'23"	16°50'37"	493	16°46'31"	16°50'58"	517	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i> , <i>Chaceon maritae</i> , <i>Goneplax barnardi</i>
MUBV14	03/12/2009	16°46'02"	16°47'36"	300	16°45'49"	16°47'33"	281	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i> , <i>Euchirograpsus liguricus</i> , <i>Goneplax barnardi</i> , <i>Goneplax rhomboides</i> , <i>Inachus angolensis</i> , <i>Inachus grallator</i> , <i>Monodaeus cristulatus</i>
MUBV15	03/12/2009	16°46'27"	16°45'08"	148	16°46'39"	16°44'56"	135	<i>Calappa pelli</i> , <i>Inachus angolensis</i> , <i>Macropodia gilsoni</i> , <i>Pseudomyra mbizi</i> , <i>Pisa armata</i> , <i>Solenolambrus noordendi</i>
MUBV17	11/12/2009	18°28'37"	16°50'03"	1022	18°28'23"	16°50'01"	1026	<i>Ethusa rosacea</i>
MUBV18	11/12/2009	18°28'27"	16°42'43"	559	18°28'14"	16°42'40"	574	<i>Bathynectes piperitus</i> , <i>Goneplax barnardi</i>
MUBV19	11/12/2009	18°27'35"	16°38'02"	306	18°27'22"	16°37'58"	306	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i> , <i>Goneplax barnardi</i>
MUBV20	12/12/2009	18°28'16"	16°32'37"	155	18°28'02"	16°32'32"	155	<i>Ethusa rugulosa</i>
MUBV21	23/11/2010	19°50'36"	17°17'13"	107	19°50'41"	17°17'40"	109	<i>Calappa pelli</i> , <i>Distolambrus maltzani</i> , <i>Ethusa rugulosa</i> , <i>Homola barbata</i> , <i>Inachus angolensis</i> , <i>Macropipus rugosus</i> , <i>Macropodia gilsoni</i> , <i>Medorippe lanata</i> , <i>Solenolambrus noordendi</i> , <i>Spinolambrus notialis</i>
MUBV22	23/11/2010	19°49'07"	17°17'25"	300	19°49'14"	17°17'47"	300	<i>Acanthocarpus brevispinis</i> , <i>Bathynectes piperitus</i> , <i>Macropodia macrocheles</i> , <i>Megalopa Paromola cuvieri</i>
MUBV25	24/11/2010	19°48'09"	17°17'50"	499	19°47'56"	17°17'23"	520	<i>Bathynectes piperitus</i> , <i>Goneplax barnardi</i>

examined (with additional material for some species), mention of the station code, the depth range and the number of specimens captured, in parentheses. As a measurement of specimens, we used the carapace length (CL), measured along the dorsal midline, from the base of rostrum to the posterior margin of the carapace. This measurement was obtained for males, females and ovigerous females, or combinations of all three, when appropriate. We also summarize the biological features and geographic distributions (mainly those published in the last 30 years), including the new data reported with this work, along with some remarks when required. In addition, we include pictures, mostly taken onboard when captured, of each species described.

In the laboratory, pictures were taken with a motorized Nikon SMZ25 stereomicroscope, using NIS-Elements Microscope Imaging Software, with an Extended Depth of Focus (EDF) patch.

The specimens examined for this work are largely deposited in the collections of the University of Vigo (Spain) (Marine Zoology Laboratory) and at the Oceanographic Centres of the Spanish Institute of Oceanography (IEO) in Cádiz (Collection of Decapod and Stomatopod Crustaceans, CCDE-IEOCD) and Málaga (The Marine Fauna Collection, CFM-IEOMA).

Abbreviations used are: ICMD: Biological Reference Collections samples code of the ICM-CSIC (Instituto de Ciencias del Mar-Consejo Superior de Investigaciones Científicas), Barcelona, Spain; USNM: United States Natural Museum, Smithsonian National Museum of Natural History, Washington, USA; IEO-CD: Instituto Español de Oceanografía, Centro Oceanográfico de Cádiz, Spain.

## RESULTS

### SYSTEMATICS

- Order DECAPODA Latreille, 1803  
 Infraorder BRACHYURA Latreille, 1802  
 Section DROMIACEA de Haan, 1833  
 Superfamily HOMOLOIDEA de Haan, 1839  
 Family HOMOLIDAE de Haan, 1839  
 Genus *Homola* Leach, 1815  
*Homola barbata* (Fabricius, 1793)  
 (Figure 1)

*Cancer barbatus* Fabricius, 1793: 460.

*Homola barbata*: Guinot & Richer de Forges, 1995: 323 figs. 1A, 7A, B, 8a, b, e, 9a, 13a (references).

### MATERIAL EXAMINED

MU87, 271–305 m, (2); MU88, 94–120 m, (1); MU119, 82–80 m, (1); MU120, 109–105 m, (1); MU122, 82–80 m, (1); MU128, 218–404 m, (1); MU131, 102–104 m, (1); MU158, 80–98 m, (1); MU162, 148–149 m, (1); MU184, 213–202 m, (1); MU186, 174 m, (1); MU200, 352–334 m, (7); MU204, 155–145 m, (1); MU223, 116–117 m, (2); MU281, 100–106 m, (1); MUBV02, 318–330 m, (1); MUBV21, 107–109 m, (1).

Males: 12.78–14.51 mm, females: 12.77–23.30 mm, ovigerous females: 15.53–21.11 mm.



Fig. 1. *Homola barbata* (Fabricius, 1793), ovigerous female CL: 21.11 mm dorsal view, MU281.

### IDENTIFICATION

Our specimens agree well with the description provided by Manning & Holthuis (1981: 25) and González-Gurriarán & Méndez (1986: 59).

### BIOLOGY

A photophilic and sciaphilic species (Pipitone & Vaccaro, 2011) previously cited from bottoms of mud, mud with rocks, muddy sand, muddy shells, seagrass, rocks and sometimes in caves (d'Udekem d'Acoz, 1999; Pipitone & Arculeo, 2003; Pipitone & Vaccaro, 2011). Bathymetric range between 2 and 637 m (d'Udekem d'Acoz, 1999). Often holding algae or small pieces of sponges over the carapace with the fifth pair of pereopods, and sometimes reported below the tentacles of the anemone *Telmatactis cricoides* (Duchassaing, 1850) (d'Udekem d'Acoz, 1999).

Ovigerous females have been recorded in February (García Raso, 1984) and from April to September (Zariquiey Álvarez, 1968; Manning & Holthuis, 1981).

Our specimens were collected on coarse sand, coarse muddy sand, sandy mud with shell debris and muddy sand bottoms, at depths between 80–98 and 334–352 m. Ovigerous females were captured in November and December.

### GEOGRAPHIC DISTRIBUTION

Eastern Atlantic, from the Bay of Biscay to Angola, including the Azores, Madeira, Cape Verde, Desertas, Canary and Gulf of Guinea Islands; the Walter Shoals (E South Africa) (Guinot & Richer de Forges, 1995); Central and Western Mediterranean Basin (d'Udekem d'Acoz, 1999).

Later records for this species (Monteiro *et al.*, 2001; Pipitone & Arculeo, 2003; Ungaro *et al.*, 2005; Henriksen, 2009; Pipitone & Vaccaro, 2011; Muñoz *et al.*, 2012) fit well within this geographic distribution.

### REMARKS

The ovigerous females recorded for the first time in November and December indicate that this species spawns all year round except in winter.

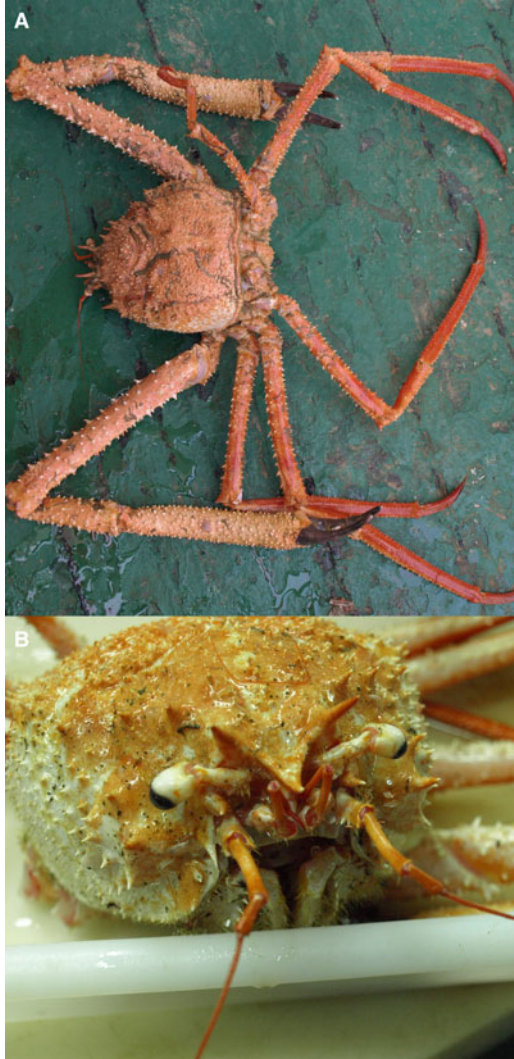


Fig. 2. *Paromola cuvieri* (Risso, 1816), adult: (A) dorsal view, MUBV03; (B) frontal view, MU140.

*Paromola* Wood-Mason & Alcock, 1891

*Paromola cuvieri* (Risso, 1816)

(Figure 2A, B)

*Dorippe cuvieri* Risso, 1816: 35

*Paromola cuvieri*: Guinot & Richer de Forges, 1995: 362, figures 2, 21a, b (references).

#### MATERIAL EXAMINED

MU14, 502–511 m, (1); MU18, 519–402 m, (4); MU23, 532–415 m, (17); MU37, 403–442 m, (2) MU121, 274–400 m, (1); MU140, 376–377 m, (1); MU150, 292–341 m, (2) MU157, 278–454 m, (1); MU175, 618–850 m, (1); MU188, 627 m, (1); MU263, 615–624 m, (2) MUBV03, 528–538 m, (1); MUBV22, 300 m, (1).

Male: 95.20 mm, female: 76.20 mm, megalopa: 7.78 mm.

#### IDENTIFICATION

Our specimens agree well with the descriptions and figures provided by Capart (1951: 25) and Zariquiey Álvarez (1968: 301).

#### BIOLOGY

Deep-water species taken on bottoms with mud or sandy mud, over a cold-water coral community (Pipitone & Arculeo, 2003; Isajlović *et al.*, 2009; Capezzuto *et al.*, 2012). The isolated record from the Menez Gwen hydrothermal vent must be considered with caution until confirmed (Martin & Haney, 2005). This species is often reported holding a sponge over the carapace using the fifth pereopods (Capezzuto *et al.*, 2012) and is also found with cirripeds, gorgonians and sea anemones on carapace and legs (González, 1995; Guinot & Richer de Forges, 1995). Bathymetric range usually between 80 and 300 m (d'Udekem d'Acoz, 1999), although the species was once reported at 10 m (Manning & Holthuis, 1981) and up to 1165 m depth (Cartes *et al.*, 2004). Ovipigerous females have been recorded in March, from May to July, October and November (Zariquiey Álvarez, 1968; Manning & Holthuis, 1981).

Our specimens were collected in muddy sand and sandy mud bottoms, in depths between 274–400 and 618–850 m. No ovipigerous females were caught.

#### GEOGRAPHIC DISTRIBUTION

North and East Atlantic, from southern Iceland, the Hebrides and southern Scandinavia, south to north-western South Africa (Tripp Seamount), including the Azores, Madeira, Canary and Cape Verde Islands; Mediterranean Sea (d'Udekem d'Acoz, 1999; Martin & Haney, 2005).

Further additional records (Macpherson, 1991; Maynou & Cartes, 2000; Abelló *et al.*, 2002; Biagi *et al.*, 2002; Pipitone & Arculeo, 2003; Sardà *et al.*, 2003; Cartes *et al.*, 2004; Company *et al.*, 2004; Politou *et al.*, 2005; Ungaro *et al.*, 2005; Fanelli *et al.*, 2007; Isajlović *et al.*, 2009; Capezzuto *et al.*, 2012; Muñoz *et al.*, 2012) fall within this geographic range.

Section CYCLODORIPPOIDA Ah Yong *et al.*, 2007

Superfamily CYCLODORIPPOIDEA Ortmann, 1892

Family CYMONOMIDAE Bouvier, 1897

Genus *Cymonomus* A. Milne-Edwards, 1880

*Cymonomus granulatus* (Norman, in Thomson, 1873)

(Figure 3)

*Ethusa granulata* Norman in Thomson, 1873: 176.

*Cymonomus granulatus*: Zariquiey Álvarez, 1968: 813 (references).



Fig. 3. *Cymonomus granulatus* (Norman, in Thomson, 1873), adult dorsal view, MUBV10.



## MATERIAL EXAMINED

MUBV10, 332–344 m, (35).

Males: 4.64–5.23 mm, female: 3.52 mm, ovigerous females: 3.26–3.73 mm.

## IDENTIFICATION

Our specimens agree with those described in Milne-Edwards & Bouvier (1900: 34) (see Remarks).

## BIOLOGY

Mainly found on shell debris and muddy bottoms (Mura & Cau, 2002), between 155 m (García Raso, 1996) and 2425 m (d'Udekem d'Acoz, 1999). Ovigerous females reported from May to July (García Raso, 1996; Mura & Cau, 2002).

Our specimens were collected at 332–344 m and ovigerous females were captured in November.

## GEOGRAPHIC DISTRIBUTION

Eastern Atlantic from SW Scotland to Mauritania; West and Central Mediterranean Sea (d'Udekem d'Acoz, 1999). In the Mediterranean Sea, this species has been reported in the Alborán Sea (Abelló *et al.*, 2002) and in the Sardinian Channel (Mura & Cau, 2002). In the NE Atlantic, Cartes *et al.* (2007) reported the species on Le Danois Bank (Cantabrian Sea).

## REMARKS

In our specimens, the mesial margin of the ocular peduncles are more tuberculate than spinulose as described by Milne-Edwards & Bouvier (1900: 34). The rest of the characters agree well with the referred description and, consequently, our specimens remain within this species.

This is the first time that ovigerous females are reported at the end of the year, which suggests a biannual spawning strategy for this species.

Section EUBRACHYURA de Saint Laurent, 1980

Subsection HETEROTREMATA Guinot, 1977

Superfamily CALAPPOIDEA de Haan, 1833

Family CALAPPIDAE de Haan, 1833

Genus *Acanthocarpus* Stimpson, 1871

*Acanthocarpus brevispinis* Monod, 1946

(Figure 4)

*Acanthocarpus bispinosus* Milne-Edwards, 1880 var. *brevispinis*, Monod, 1946: 7, figures 1–4, pl. figures 1–2.

*Acanthocarpus brevispinis*: Manning & Holthuis, 1981: 50 (references).



Fig. 4. *Acanthocarpus brevispinis* Monod, 1946, adult dorsal view, MU51.

## MATERIAL EXAMINED

MU51, 468–466 m, (1); MU99, 569–598 m, (1); MU121, 274–400 m, (1); MU134, 311–436 m, (1); MU143, 322 m, (4); MUBV02, 318–330 m, (1); MUBV13, 493–517 m, (3); MUBV14, 300–281 m, (9); MUBV19, 306 m, (12); MUBV22, 300 m, (7).

Males: 15.56–55.29 mm; female: 49.85 mm; ovigerous female: 55.29 mm.

## IDENTIFICATION

Our specimens agree well with the descriptions given by Capart (1951: 36; as *Acanthocarpus africanus*) and Manning & Holthuis (1981: 50).

## BIOLOGY

Previously reported on sandy and shelly mud bottoms (Manning & Holthuis, 1981), at depths from 100 m (Manning & Holthuis, 1981) to 517 m (Muñoz *et al.*, 2012). Ovigerous females have been recorded in March and October (Manning & Holthuis, 1981).

Our specimens were collected from 274–400 to 569–598 m on sandy mud bottoms; ovigerous females were captured in December.

## GEOGRAPHIC DISTRIBUTION

West Africa from Cape Juby (S Morocco) to Namibia (Manning & Holthuis, 1981; Macpherson, 1983, 1991). Further records for this species were reported by Henriksen (2009) from Nigeria and Gabon, and by Muñoz *et al.* (2012) from Guinea-Bissau.

## REMARKS

Material from the station MU99 at 569–598 m is the deepest known record for this species; the finding of ovigerous females in December confirms a biannual spawning strategy.

Genus *Calappa* Weber, 1795

*Calappa pelii* Herklots, 1851

(Figure 5)

*Calappa Pelii* Herklots, 1851: 12.

*Calappa pelii*: Manning & Holthuis, 1981: 52 (references).



Fig. 5. *Calappa pelii* Herklots, 1851, female CL: 33.94 mm dorsal view, MU158.

**MATERIAL EXAMINED**

MU158, 80–98 m, (1); MUBV01, 112 m, (4); MUBV15, 148–135 m, (1); MUBV21, 107–109 m, (7).

Males: 21.11–31.91 mm; females: 30.14–40.79 mm; ovigerous female: 58.87 mm.

**IDENTIFICATION**

Our specimens agree well with the descriptions given by Capart (1951: 39, as *Calappa peli*) and Manning & Holthuis (1981: 52).

**BIOLOGY**

Bottoms of mud and broken shells, usually at depths between 8–20 and 400 m. Ovigerous females reported in March, May, August, October and December (Manning & Holthuis, 1981).

Our specimens were collected in depths between 80–98 and 135–148 m on sandy bottoms, and ovigerous females were captured in November.

**GEOGRAPHIC DISTRIBUTION**

West Africa from Western Sahara to Namibia, including Principe Island, and Central Mediterranean Sea (Macpherson, 1991; d'Udekem d'Acoz, 1999). Recent records for this species are from Guinea-Bissau (Muñoz *et al.*, 2012) and from the Gulf of Guinea (Henriksen, 2009).

Superfamily CANCROIDEA Latreille, 1802

Family ATELECYCLIDAE Ortmann, 1893

Genus *Atelecyclus* Leach, 1814

*Atelecyclus rotundatus* (Olivi, 1792)

(Figure 6)

*Cancer rotundatus* Olivi, 1792: 47, pl. 2 figure 2.

*Atelecyclus rotundatus*: Manning & Holthuis, 1981: 68 (references); González Gurriarán & Méndez, 1986: 113, figure 38, photo 26.

**MATERIAL EXAMINED**

MUBV10, 332–344 m, (1).

Female: 27.64 mm.



Fig. 6. *Atelecyclus rotundatus* (Olivi, 1792), female CL: 27.64 mm dorsal view, MUBV10.

**IDENTIFICATION**

Our specimen agrees well with the specifications provided by Forest (1957: 469) and the descriptions in González Gurriarán & Méndez (1986: 113).

**BIOLOGY**

Recorded from sandy bottoms, often with gravel and small stones as well as muddy sand, shelly sand, gravel with shell debris and mud; also recorded on rocks, coralligenous substrates and in *Posidonia* meadows (d'Udekem d'Acoz, 1999; Pipitone & Arculeo, 2003; Ateş *et al.*, 2006; Guillén *et al.*, 2011). Bathymetric distribution from intertidal to 795 m, usually between 9 and 300 m (d'Udekem d'Acoz, 1999). Ovigerous females were recorded in January and December (García Raso, 1984).

Only one female was collected in the MAURIT surveys between 332–344 m.

**GEOGRAPHIC DISTRIBUTION**

Eastern Atlantic from SW Faroe Islands to South Africa (beyond Cape of Good Hope, Barnard, 1950), including the Canary, Cape Verde and Ascension Islands; Mediterranean Sea (d'Udekem d'Acoz, 1999).

Later records (Abelló *et al.*, 2002; Pipitone & Arculeo, 2003; Ateş *et al.*, 2006; Serrano *et al.*, 2006, 2011; García-Muñoz *et al.*, 2008; Sánchez *et al.*, 2008; Muñoz *et al.*, 2012; Ellis *et al.*, 2013) fit well within this geographic distribution.

Superfamily DORIPPOIDEA MacLeay, 1838

Family DORIPPIDAE MacLeay, 1838

Genus *Medorippe* Manning & Holthuis, 1981

*Medorippe lanata* (Linnaeus, 1767)

(Figure 7)

*Cancer lanatus* Linnaeus, 1767: 1044.

*Medorippe lanata*: Manning & Holthuis, 1981: 31, figures 4a–h (references).

**MATERIAL EXAMINED**

MU210, 86–90 m, (1); MUBV01, 112 m, (2); MUBV21, 107–109 m, (19).

Males: 6.88–20.84 mm, female: 11.27 mm, ovigerous female: 23.68 mm.

**IDENTIFICATION**

Our specimens agree well with the description and figures in Capart (1951: 30; as *Dorippe lanata*) and in Manning & Holthuis (1981: 31).



Fig. 7. *Medorippe lanata* (Linnaeus, 1767), ovigerous female CL: 23.68 mm dorsal view, MUBV01.

**BIOLOGY**

Mostly recorded on soft heterogeneous substrates (mud, sandy mud, muddy sand and sand) at depths varying from 9 to 769 m (d'Udekem d'Acoz, 1999; El Lakhraçh *et al.*, 2012). On Mediterranean soft bottoms, this species has been associated with demersal assemblages currently exploited by trawling (Rossetti *et al.*, 2006). Ovigerous females have been reported from March to November (Zariquiey Álvarez, 1968: 313 as *Dorippe lanata*; Manning & Holthuis, 1981: 32; Modena *et al.*, 2001; Rossetti *et al.*, 2006).

Our specimens were collected from 86–90 to 112 m, on sand with biogenic debris bottoms. Ovigerous females were captured in November.

**GEOGRAPHIC DISTRIBUTION**

East Atlantic, from Portugal to South Africa (up to Natal) and Mozambique, including the Canary Islands and Mediterranean Sea (Barnard, 1950, 1955; Manning & Holthuis, 1981; d'Udekem d'Acoz, 1999).

Further records (Modena *et al.*, 2001; Abelló *et al.*, 2002; Biagi *et al.*, 2002; Pipitone & Arculeo, 2003; Ungaro *et al.*, 2005; Rossetti *et al.*, 2006; Fanelli *et al.*, 2007; Henriksen, 2009; El Lakhraçh *et al.*, 2012; Muñoz *et al.*, 2012) fit well within its geographic distribution.

**REMARKS**

Manning & Holthuis (1981) erected the genera *Medorippe* and *Phyllodorippe* in order to accommodate the Atlantic species of dorippids previously included in the genus *Dorippe*. *Medorippe* can be differentiated from *Phyllodorippe* by the male gonopod morphology (short, stubby, straight, without distal appendages and lobulated at the outer margin of base vs long, slender, S-shaped, with two short distal appendages and lacking a lobe in the proximal part) and by the presence of a row of spines on the dorsal margin of pereopods 2 and 3.

Family ETHUSIDAE Guinot, 1977

Genus *Ethusa* Roux, 1830

*Ethusa rosacea* A. Milne-Edwards & Bouvier, 1897  
(Figure 8)

*Ethusa rosacea* A. Milne-Edwards & Bouvier, 1897: 298; Monod, 1956: 88 (references); Manning & Holthuis, 1981: 38 (references).



Fig. 8. *Ethusa rosacea* A. Milne Edwards & Bouvier, 1897, ovigerous female CL: 11.16 mm dorsal view, MUBV17.

**MATERIAL EXAMINED**

MUBV17, 1022–1026 m, (1).

Ovigerous female: 11.16 mm.

**IDENTIFICATION**

Our specimen agrees well with the original description and the figures provided later by Milne-Edwards & Bouvier (1900: pls III figure 5, X figures 5–8) and by Capart (1951: figure 5).

**BIOLOGY**

Bottoms of sand, muddy sand and sandy mud (Manning & Holthuis, 1981; d'Udekem d'Acoz, 1999), with a bathymetric range of 84 m (Henriksen, 2009) to 1113 m (d'Udekem d'Acoz, 1999). Ovigerous females have been recorded in March, April and June (Manning & Holthuis, 1981).

Only one ovigerous female was collected in December between 1022–1026 m.

**GEOGRAPHIC DISTRIBUTION**

The species is recorded in the Eastern Atlantic from scattered localities between Mauritania and Angola, including the Canary and Cape Verde Islands (d'Udekem d'Acoz, 1999). Henriksen (2009) reported this species from the Gulf of Guinea.

**REMARKS**

The poor development of the outer frontal teeth, the sparse setation of the carapace and the transversal broadness of the walking legs dactylus ensure the identification of our specimen as *E. rosacea*.

Ovigerous females are recorded for the first time at the end of the year, suggesting a biannual spawn strategy.

*Ethusa rugulosa* A. Milne-Edwards & Bouvier, 1897  
(Figure 9)

*Ethusa rugulosa* A. Milne-Edwards & Bouvier, 1897: 297; Manning & Holthuis, 1981: 39 (references).

**MATERIAL EXAMINED**

MUBV01, 112 m, (1); MUBV02, 318–330 m, (1); MUBV10, 332–344 m, (26); MUBV20, 155 m, (1); MUBV21, 107–109 m, (1).

Males: 8.83–16.60 mm, females: 11.64–14.93 mm, ovigerous females: 11.09–12.64 mm.



Fig. 9. *Ethusa rugulosa* A. Milne-Edwards & Bouvier, 1897, adult male dorsal view, MUBV21.

## IDENTIFICATION

Our specimen agrees well with the description and figures of the type provided by Milne-Edwards & Bouvier (1900: 24).

## BIOLOGY

This species has been recorded from different soft bottoms, including sand and shells, muddy sand, shelly mud and also hard substrates (Manning & Holthuis, 1981: 39; Henriksen, 2009: 154). Bathymetric range between 55–60 and 275 m (Manning & Holthuis, 1981: 39). Ovigerous females have been recorded in July (Manning & Holthuis, 1981: 39).

Our specimens were collected from 107–109 to 332–344 m with ovigerous females in November.

## GEOGRAPHIC DISTRIBUTION

Eastern Atlantic, recorded from scattered localities: Mauritania (present work), the Cape Verde Islands, Senegal, Sierra Leona, Liberia and Angola (Manning & Holthuis, 1981) (see Remarks). This species was also reported from the Gulf of Guinea by Henriksen (2009).

## REMARKS

Our finding is the first record of this species in Mauritania, extending the northern distribution up to Cape Blanc. Also, the bathymetric range is extended from 275 m reported in the literature to 332–344 m in this work.

The presence of ovigerous females for the first time at the end of the year suggests a biannual spawn.

Superfamily GONEPLACOIDEA MacLeay, 1838  
 Family GONEPLACIDAE MacLeay, 1838  
 Genus *Goneplax* Leach, 1814  
*Goneplax barnardi* (Capart, 1951)  
 (Figure 10)

*Carcinoplax barnardi* Capart, 1951: 170, figures 65 a, b.

*Goneplax barnardi*: Castro, 2007: 689, figure 27b (references).

## MATERIAL EXAMINED

MU44, 606–596 m, (1); MU54, 414–451 m, (2); MU57, 430–406 m, (5); MU123, 278–362 m, (1); MU152, 381–316 m, (1); MU214, 650–588 m, (1); MU216, 422 m, (5); MUBV03, 528–538 m, (6); MUBV09, 549–555 m, (1); MUBV13, 493–517 m, (14); MUBV14, 300–281 m, (7); MUBV18, 559–574 m, (11); MUBV19, 306 m, (1); MUBV25, 499–520 m, (2).  
 Males: 9.73–20.01 mm, females: 12.52–15.61 mm, ovigerous females: 11.18–15.51 mm.



Fig. 10. *Goneplax barnardi* (Capart, 1951), male CL: 20.01 mm dorsal view, MUBV09.

## IDENTIFICATION

Our specimens agree well with the description of the type and with the detailed figures provided in Monod (1956: 351).

## BIOLOGY

Previously reported from mud and sandy mud bottoms, from 200 to 590 m (d'Udekem d'Acoz, 1999: 241). Ovigerous females have been recorded in March and May (Manning & Holthuis, 1981: 160).

Our specimens were collected between 278–362 and 588–650 m on sand and sandy mud bottoms. Ovigerous females were captured in December.

## GEOGRAPHIC DISTRIBUTION

East Atlantic, from Western Sahara to Angola, including the Cape Verde Islands (Castro, 2007) (see Remarks). Muñoz et al. (2012) later reported this species from Guinea-Bissau.

## REMARKS

Castro (2007) removed this species from the former *Carcinoplax* to *Goneplax* because of its longer eye peduncles, dorsal margin of the ambulatory legs (P2–P5) meri armed with an acute distal tooth (although this character is also present in the Western Pacific *Carcinoplax spinosissima* Rathbun, 1914), and slender dactyli carinated on both sides. Obviously, Castro (2007: 690) meant Eastern Atlantic when he wrote 'Western Atlantic along the west coast of Africa'.

This record constitutes the first for the species in Mauritanian waters and it is the first time that ovigerous females are reported at the end of the year. The known spawn period (March, May and December) suggests that the species is a biannual spawner.

*Goneplax rhomboides* (Linnaeus, 1758)  
 (Figure 11)

*Cancer rhomboides* Linnaeus, 1758: 626.

*Goneplax rhomboides*: Castro, 2007: 687, figure 27A (references).

## MATERIAL EXAMINED

MU143, 322 m, (1); MU207, 88–117 m, (1); MU227, 183–181 m, (3); MUBV14, 300–281 m, (2).  
 Males: 9.98–13.06 mm, ovigerous female: 10.05 mm.



Fig. 11. *Goneplax rhomboides* (Linnaeus, 1758), male CL: 13.06 mm dorsal view, MU143.

## IDENTIFICATION

Our specimens agree well with the descriptions and figures in Monod (1956: 354; as *Goneplax angulata*) and in Zariquiey Álvarez (1968: 414).

## BIOLOGY

Burrowing species (Atkinson, 1974; Neudecker *et al.*, 2011), usually found in mud, sandy mud, muddy sand and sand bottoms; also on rocks and shells (Manning & Holthuis, 1981; d'Udekem d'Acoz, 1999; Pipitone & Arculeo, 2003; Ateş *et al.*, 2006; Trenkel *et al.*, 2007; Mutlu & Ergev, 2008; Fanelli *et al.*, 2009; Metin *et al.*, 2009; Guillén *et al.*, 2011; Neudecker *et al.*, 2011; El Lakhraç *et al.*, 2012; Ellis *et al.*, 2013). Bathymetric range from intertidal zone (d'Udekem d'Acoz, 1999) to 600–999 m (Company *et al.*, 2004; Cartes *et al.*, 2009). Ovigerous females were reported from January to March, from May to August, and in November and December (Zariquiey Álvarez, 1968; Manning & Holthuis, 1981; García Raso, 1984, 1996).

Our specimens were collected between 88–117 and 322 m on sandy mud and muddy sand bottoms; and the ovigerous female was captured in December.

## GEOGRAPHIC DISTRIBUTION

East Atlantic, from the coast of SE Norway and SW Sweden, the North Sea, SW United Kingdom and Ireland, the continental European coast southwards to Western Africa, at least up to Senegal (see Remarks), including Madeira and the Canary Islands, and in the Mediterranean Sea (Castro, 2007; Guinot & Castro, 2007; Berggren, 2008; Berggren & Stefan, 2010).

Further records for this species from European waters and in the Mediterranean Sea, not included in the above-mentioned references, are Maynou & Cartes (2000), Monteiro *et al.* (2001), Biagi *et al.* (2002), Pipitone & Arculeo (2003), Company *et al.* (2004), Ungaro *et al.* (2005); Vincent (2005), Ateş *et al.* (2006), Sartor *et al.* (2006), Serrano *et al.* (2006), Fanelli *et al.* (2007), Trenkel *et al.* (2007), Mutlu & Ergev (2008), Cartes *et al.* (2009), Fanelli *et al.* (2009), Metin *et al.* (2009), Neudecker *et al.* (2011), Serrano *et al.* (2011), El Lakhraç *et al.* (2012) and Ellis *et al.* (2013).

## REMARKS

*Goneplax rhomboides* has long been described as a species with a wide geographic distribution in East Atlantic waters, from the North Atlantic to South Africa (Barnard, 1950; Manning & Holthuis, 1981; d'Udekem d'Acoz, 1999). However, Guinot & Castro (2007) described the new species, *Goneplax clevai*, from the South Atlantic and western limits of the Indo-West Pacific region, including in their new species some specimens reported from the Ivory Coast to South Africa and previously identified as *G. rhomboides*. Guinot & Castro (2007: 25) accept as valid the material from Senegal mentioned by Monod (1956) for *G. rhomboides*. Consequently, the southern distribution limit of *G. rhomboides* will remain unclear southwards from Senegal until all the recorded specimens from the West African coasts can be properly checked.

Superfamily LEUCOSIOIDEA Samouelle, 1819

Family LEUCOSIIDAE Samouelle, 1819

Genus *Ebalia* Leach, 1817



Fig. 12. *Ebalia nux* Norman in A. Milne-Edwards, 1883, male CL: 7.02 mm dorsal view, MUBV10.

*Ebalia nux* Norman in A. Milne-Edwards, 1883  
(Figure 12)

*Ebalia nux* A. Milne-Edwards, 1883: pl. 5; Holthuis & Manning, 1981: 61 (references).

## MATERIAL EXAMINED

MU87, 271–305 m, (1); MUBV10, 332–344 m, (3).

Males: 7.02–7.20 mm.

## IDENTIFICATION

Our specimens agree well with those figured by Milne-Edwards & Bouvier (1900: plates III, figure 7, XIII: figures 1–5), and with the descriptions provided by Zariquiey Álvarez (1968: 328), and by González Gurriarán & Méndez (1986: 71).

## BIOLOGY

This species has been recorded on shell, sand, sand and rocks, sand with calcareous algae, mud and sandy mud bottoms (d'Udekem d'Acoz, 1999; Ateş *et al.*, 2006); it has been also reported living on the sea pen, *Pteroeides spinosum* (Ellis, 1764), in the Mediterranean Sea (Porporato *et al.*, 2012). Depths records vary between 80 and 2983 m but usually from 150 to 500 m (d'Udekem d'Acoz, 1999). Ovigerous females have been recorded in March (Manning & Holthuis, 1981) and May–June (García Raso, 1996).

Our specimens, all males, were collected between 271–305 and 332–344 m.

## GEOGRAPHIC DISTRIBUTION

Eastern Atlantic, from the Shetland Islands and Norway to Mauritania, including the Azores, Canary and Cape Verde Islands; and Mediterranean Sea (d'Udekem d'Acoz, 1999).

Later records for this species (Abelló *et al.*, 2002; Ateş *et al.*, 2006; Porporato *et al.*, 2012) are all from the Mediterranean, with the exception of a report by Cartes *et al.* (2007) from Le Danois Bank (Cantabrian Sea).

Genus *Pseudomyra* Capart, 1951

*Pseudomyra mbizi* Capart, 1951

(Figure 13)

*Pseudomyra mbizi* Capart, 1951: 49, figure 14, pl. II figure 24; Manning & Holthuis, 1981: 66 (references).

## MATERIAL EXAMINED

MUBV01, 112 m, (9); MUBV15, 148–135 m, (93).



Fig. 13. *Pseudomyra mbizi* Capart, 1951, adult dorsal view, MUBV01.

Males: 16.54–20.31 mm, female: 15.96–17.45 mm, ovigerous females: 15.45–17.63 mm.

#### IDENTIFICATION

Our specimens agree well with the original description and figures.

#### BIOLOGY

The species has been collected on a variety of bottoms, such as mud, sandy mud with shells, mud with foraminifera, muddy sand, broken shells, and also on coral and rocks. Bathymetric range between 12–15 and 300 m, although usually recorded from 50 to 100 m (Manning & Holthuis, 1981). Ovigerous females have been recorded from March to August, October and December (Manning & Holthuis, 1981).

Our specimens were captured in depths between 112 and 135–148 m. The ovigerous females were caught in December.

#### GEOGRAPHIC DISTRIBUTION

West Africa from Mauritania (present work) to Angola (Manning & Holthuis, 1981) (see Remarks). Henriksen (2009) reports this species from the Gulf of Guinea.

#### REMARKS

This is the first record of this species from Mauritanian waters, which extends its north distribution up to the Banc d'Arguin.

Superfamily MAJOIDEA Samouelle, 1819  
 Family EPIALTIIDAE MacLeay, 1838  
 Genus *Pisa* Leach, 1814  
*Pisa armata* (Latreille, 1803)  
 (Figure 14)

*Maja armata* Latreille, 1803: 98.

*Pisa armata*: Manning & Holthuis, 1981: 318 (references).

#### MATERIAL EXAMINED

MU120, 109–105 m, (1); MU131, 102–104 m, (2); MU136, 103–112 m, (1); MU139, 96–97 m, (2); MU147, 134–139 m, (1); MU154, 92–102 m, (2); MU211, 92–109 m, (1); MU261, 111–146 m, (1); MUBV15, 148–135 m (1).

Males: 17.74–22.14 mm, females: 21.08–22.12 mm, ovigerous females: 22.27–24.67 mm.



Fig. 14. *Pisa armata* (Latreille, 1803), female CL: 22.12 mm dorsal view, MU139.

#### IDENTIFICATION

Our specimens agree well with the descriptions and figures provided by Capart (1951: 90) and by González-Gurriarán & Méndez (1986: 183).

#### BIOLOGY

This species has been recorded from rocky bottoms with gorgonians and corals, and also from sandy mud, mud, sand and shells bottoms (Manning & Holthuis, 1981; d'Udekem d'Acoz, 1999; García Raso & Manjón-Cabeza, 2002; Pipitone & Arculeo, 2003; Ateş *et al.*, 2006). Pipitone & Arculeo (2003) recorded the species on bottoms with *Posidonia* meadows, although they showed no correlation with the meadow structure (Sánchez-Jerez *et al.*, 2000). Bathymetric range extends from 3–10 m (Pipitone & Arculeo, 2003) to 162 m (d'Udekem d'Acoz, 1999). Ovigerous females were recorded from March to May, from July to August and from November to December (Zariquiey Álvarez, 1968; Manning & Holthuis, 1981; García Raso, 1984).

Our specimens, often with sponges, ascidians and bryozoans over the carapace, were captured between 96–97 and 135–148 m on shell debris, sand and sandy mud bottoms. Ovigerous females were collected in December.

#### GEOGRAPHIC DISTRIBUTION

East Atlantic from Southern North Sea and SW British Isles to Angola, including the Azores, Canary and Cape Verde Islands; and Mediterranean Basin (d'Udekem d'Acoz, 1999).

Later records for this species (Sánchez-Jerez *et al.*, 2000; Abelló *et al.*, 2002; García Raso & Manjón-Cabeza, 2002; Pipitone & Arculeo, 2003; Ateş *et al.*, 2006) fit well within its distribution.

#### REMARKS

Ng *et al.* (2008) reviewed the nomenclatural and taxonomic problems within brachyurans, and rearranged the former family Pisididae as a subfamily into Epialtidae.

Family INACHIDAE MacLeay, 1838  
*Inachus* Weber, 1795  
*Inachus aguiarii* de Brito Capello, 1876  
 (Figure 15A, B)

*Inachus aguiarii* de Brito Capello, 1876: 265, pl. 2 figures 1–3  
*Inachus aguiarii*: Manning & Holthuis, 1981: 283 (references).

#### MATERIAL EXAMINED

MU120, 109–105 m, (4); MU129, 95–93 m, (1); MU131, 102–104 m, (1); MU226, 109–107 m, (1); MU277, 112–110 m, (1).

Males: 9.35–11.61 mm, ovigerous females: 10.35–11.36 mm.

#### IDENTIFICATION

Our specimens agree with those described in Zariquiey Álvarez (1948: 301 as *Inachus thoracicus* ssp. *aguiarii*).

#### BIOLOGY

Previously recorded from hard bottoms with sponges and kelp; also from soft bottoms of sandy mud often mixed with shell fragments, sand or sand with calcareous algae. Recorded at depths from 20 to 100 m (d'Udekem d'Acoz, 1999). Ovigerous females recorded in February, March and August (Zariquiey Álvarez, 1968; García Raso, 1989).

Our specimens were collected from 93–95 to 110–112 m on sand, coarse sand, gravel and sandy mud bottoms.

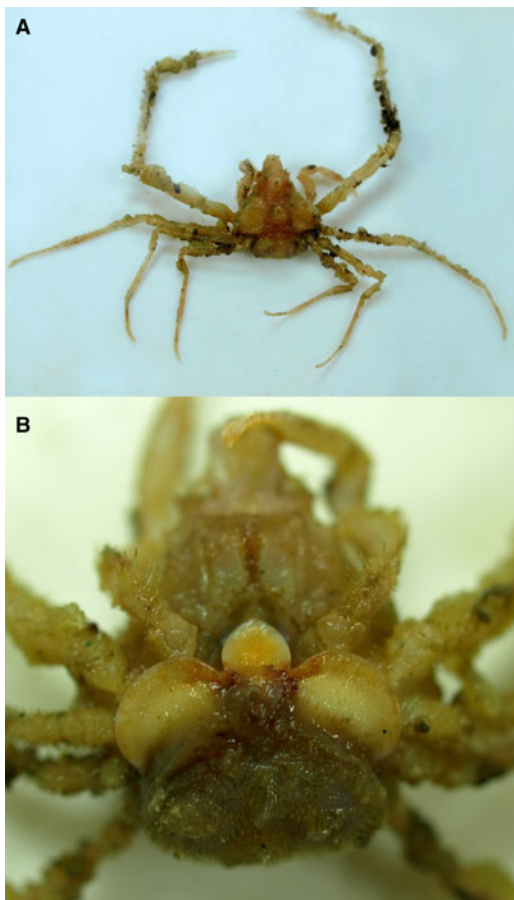


Fig. 15. *Inachus aguiarii* Brito Capello, 1876, ovigerous female CL: 11.36 mm, MU277: (A) general dorsal view; (B) ventral view, detail of sternal callosities.

Ovigerous females were captured in November and December.

#### GEOGRAPHIC DISTRIBUTION

East Atlantic from Portugal to Guinea including the Desertas and Canary Islands (d'Udekem d'Acoz, 1999); in the Mediterranean Sea, the species was reported only in the Alboran and Aegean Seas (Guerao & Abelló, 2007).

#### REMARKS

Bathymetric range is slightly increasing from that reported in the literature.

Our records of ovigerous females in November and December suggests that this species spawns all year round.

*Inachus angolensis* Capart, 1951  
 (Figure 16)

*Inachus angolensis* Capart, 1951: 72, figure 72, pl. I figure 7, pl. II figure 10; Manning & Holthuis, 1981: 283 (references).

#### MATERIAL EXAMINED

MU88, 94–120 m, (1); MU130, 252–362 m, (1); MU133, 87 m, (1); MU137, 81–84 m, (3); MU161, 89–92 m, (1); MU168, 87–92 m, (1); MU174, 85–84 m, (4); MU205, 89–93 m, (1); MU210, 86–90 m, (9); MU212, 163–200 m, (1); MU251, 107 m, (1); MU260, 101–120 m, (1); MU291, 106–137 m, (1); MUBV01, 112 m, (12); MUBV02, 318–330 m, (1); MUBV14, 300–281 m, (1); MUBV15, 148–135 m, (11); MUBV21, 107–109 m, (6).

Males: 10.04–15.11 mm, females: 8.36–13.67 mm, ovigerous females: 11.56–15.35 mm.

#### IDENTIFICATION

Our specimens agree well with the original description and also with the notes and the figures provided by Monod (1956: 524, figures 712 and 713).

#### BIOLOGY

This species has been recorded from mud, sandy mud and sandy bottoms (Manning & Holthuis, 1981), at depths from 0–81 m (Henriksen, 2009) up to at least 350 m (Manning & Holthuis, 1981). Ovigerous females were recorded from February to June, September and October (Manning & Holthuis, 1981).

Our specimens were captured between 81–84 and 252–362 m on coarse sand, sandy mud with gravel or shell



Fig. 16. *Inachus angolensis* Capart, 1951, adult dorsal view, MUBV01.

fragments. Ovigerous females were collected in November and December.

#### GEOGRAPHIC DISTRIBUTION

West Africa from Western Sahara (Manning & Holthuis, 1981) to Namibia (Macpherson, 1991). Henriksen (2009) reports this species from the Gulf of Guinea.

#### REMARKS

Our finding of ovigerous females in November and December suggests that this species spawns throughout the year.

*Inachus grillator* Manning & Holthuis, 1981  
(Figure 17A, B)

*Inachus grillator* Manning & Holthuis, 1981: 287, figures 73, 74.

#### MATERIAL EXAMINED

MUBV10, 332–344 m, (1); MUBV14, 300–281 m, (1).  
Males: 6.91 and 7.72 mm.

#### IDENTIFICATION

Our specimens agree well with the original description.

#### BIOLOGY

Reported from green mud, brown sandy mud, muddy sand and green muddy sand, at depths between 100 and 250–300 m (Manning & Holthuis, 1981) and down to 325 m (Fransen, 1991). Ovigerous females have been recorded in January and November (Manning & Holthuis, 1981).

Only two males were collected during the MAURIT surveys, at 281–300 and 332–344 m depth.

#### GEOGRAPHIC DISTRIBUTION

West Africa in Mauritania (Fransen, 1991 in part; present work) and from Nigeria to Namibia (Manning & Holthuis, 1981; Macpherson, 1991) (see Remarks).

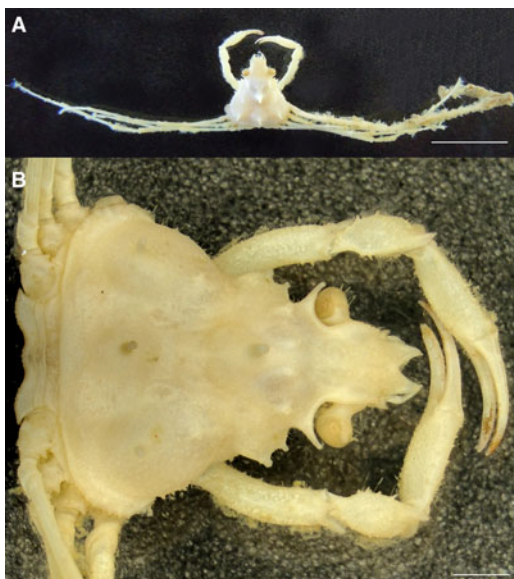


Fig. 17. *Inachus grillator* Manning & Holthuis, 1981, male CL: 6.91 mm, MUBV10, in ethanol: (A) general dorsal view; (B) dorsal carapace detail. Scale bars: (A) 1 cm; (B) 1 mm.

#### REMARKS

Although the possibility of finding this species up to the Western Sahara (Manning & Holthuis, 1981) or the Canary Islands (González Pérez & Quiles Lucas, 2003) has been mentioned in the literature, to date no records further north than Nigeria – excepting those in Fransen (1991) – have been reported from Mauritania and the Canary Islands. The fact that Manning & Holthuis (1981) described *I. grillator* as a ‘deep-water species, known to occur at depths between 100 and 250–300 m’ suggests that further revision is required for Fransen’s (1991) records for this species at less than 100 m depth. Our record confirms the presence of this species in Mauritanian waters and slightly increases the previously reported bathymetric range.

This species closely resembles another *Inachus* species, *I. dorsettensis*. However, after analysing some specimens of *I. dorsettensis* from Galicia (NW Spain), we conclude that the slenderness of the pereopods and the shape of the dactyli of the fifth pereopods ensure the identification of the Mauritanian material as *I. grillator*.

*Inachus leptochirus* Leach, 1817  
(Figure 18A–C)

*Inachus leptochirus* Leach, 1817, in Leach 1815–1875: 1 p, pl. XXII.b figures 1, 2, 3; Manning & Holthuis, 1981: 291 (references).

#### MATERIAL EXAMINED

MU200, 352–334 m, (4); MU204, 155–145 m, (1); MUBV10, 332–344 m, (29).  
Males: 9.28–19.21 mm, female: 13.93–19.33 mm, ovigerous females: 10.56–18.37 mm.

#### IDENTIFICATION

Our specimens agree well with notes and figures in Bouvier (1940: 356) and Zariquiey Álvarez (1968: 472).

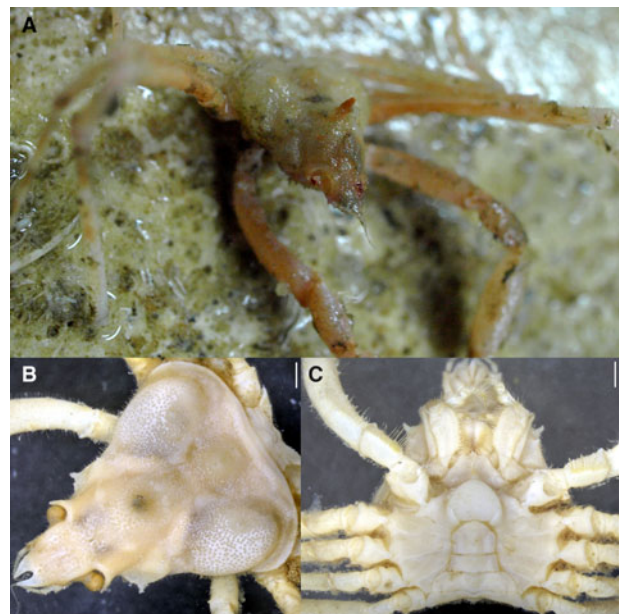


Fig. 18. *Inachus leptochirus* Leach, 1817, MUBV10: (A) adult general view; (B) male CL: 12.42 mm, in alcohol, carapace dorsal view; (C) same ventral view. Scale bars: B, C, 1 mm.



**BIOLOGY**

Bottoms of gravel, sand, mud and maerl beds, at depths between 27 m (d'Udekem d'Acoz, 1999) and 500–650 m (Serrano *et al.*, 2011). Ovigerous females have been observed in February, May and November (Zariquiey Álvarez, 1968).

Our specimens were captured between 145–155 and 334–352 m on coarse sand and muddy sand bottoms, mixed with shell debris. Ovigerous females were collected in November.

**GEOGRAPHIC DISTRIBUTION**

East Atlantic, from the Faroe Islands to Mauritania, including the Azores; and Mediterranean Sea (d'Udekem d'Acoz, 1999). This species was recently reported in the N Iberian Peninsula by Serrano *et al.* (2011).

*Inachus nanus* Manning & Holthuis, 1981  
(Figure 19)

*Inachus nanus* Manning & Holthuis, 1981: 291, figure 75a–e.

**MATERIAL EXAMINED**

MU166, 87–85 m, (2); MU207, 88–117 m, (1); MU212, 163–200 m, (1); MU261, 111–146 m, (1).

Male: 9.50 mm, ovigerous female: 6.72 mm.

**IDENTIFICATION**

Our specimens agree well with the original description.

**BIOLOGY**

Previously reported on broken shells, bryozoans, gravel, mud with foraminifera and muddy sand bottoms. Depth records between 29 and 118 m (d'Udekem d'Acoz, 1999: 198). Ovigerous females have been collected in February, May to July, September and October (Manning & Holthuis, 1981).

Our specimens were found between 85–87 and 163–200 m on muddy sand, coarse muddy sand and shell debris bottoms. Ovigerous females were captured in December.

**GEOGRAPHIC DISTRIBUTION**

West Africa from Mauritania to Cameroon, including the Canary Islands (d'Udekem d'Acoz, 1999).



Fig. 19. *Inachus nanus* Manning & Holthuis, 1981, ovigerous female CL: 6.72 mm, MU166, in ethanol, dorsal view. Scale bar 1 mm.

**REMARKS**

This record slightly increases the bathymetric range of this species down to 163–200 m; the presence of ovigerous females in December suggests that this species spawns throughout the year.

Genus *Macropodia* Leach, 1814

*Macropodia gilsoni* (Capart, 1951)

(Figure 20A, B)

*Achaopsis gilsoni* Capart 1951: 65, pl. I figure 4, 10, pl. II figure 3.

*Macropodia gilsoni*: Manning & Holthuis, 1981: 297 (references).

**MATERIAL EXAMINED**

MU119, 82–80 m, (2); MU120, 109–105 m, (3); MU131, 102–104 m, (1); MU138, 123–130 m, (2); MU139, 96–97 m, (1); MU149, 93–146 m, (1); MU151, 110–134 m, (1); MU156, 107–102 m, (1); MU161, 89–92 m, (2) MU166, 87–85 m, (2) MU168, 87–92 m, (2) MU170, 102–92 m, (13); MU210, 86–90 m, (4); MU217, 111–113 m, (1); MU223, 116–117 m, (2); MU233, 165–189 m, (1); MU235, 123 m, (1); MUBV15, 148–135 m, (10); MUBV21, 107–109 m, (1).

Males: 4.71–9.36 mm, females: 3.21–5.09 mm, ovigerous females: 11.05–4.35 mm.

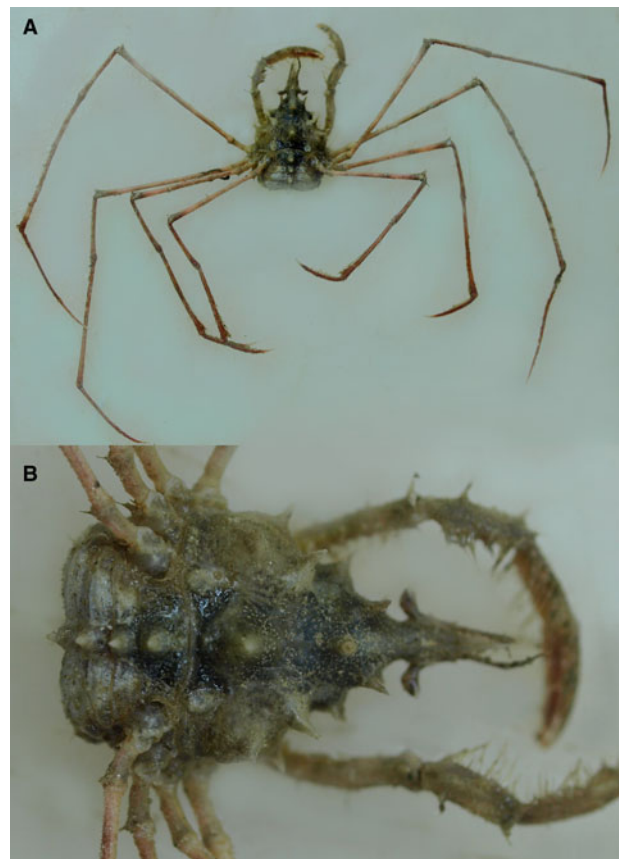


Fig. 20. *Macropodia gilsoni* (Capart, 1951), ovigerous female CL: 14.35 mm, MUBV21: (A) general dorsal view; (B) dorsal carapace detail.

## IDENTIFICATION

Our specimens agree well with the description of the type and also with the figures provided by Monod (1956: 555).

## BIOLOGY

Species recorded on various kinds of muddy bottoms, including bottoms with shells and bryozoans or foliate foraminifera (Manning & Holthuis, 1981), at depths from 37 m (Holthuis & Manning, 1981) up to 264 m (Henriksen, 2009, see Remarks). Ovigerous females recorded throughout the year, except in July (Manning & Holthuis, 1981: 297).

Our specimens were captured between 80–82 and 165–189 m on sandy mud, sand and muddy sand bottoms usually mixed with shell debris. Some specimens carried the hydrozoan *Obelia bidentata* Clark, 1875, on the carapace and legs. Ovigerous females were collected in November and December.

## GEOGRAPHIC DISTRIBUTION

West Africa from Mauritania (present work) to Angola (Manning & Holthuis, 1981) (see Remarks). Henriksen (2009) reported this species off Nigeria, Cameroon and Congo.

## REMARKS

Our record is the first report of this species in Mauritania, extending its geographic distribution northwards from Senegal to the Banc d'Arguin.

The record for this species in Henriksen (2009) from Cameroon at station 938, Long.: 9.150 Lat.: 3.900, at 0 m depth, must be considered as an error (0 m, null sampling?).

*Macropodia hesperiae* Manning & Holthuis, 1981  
(Figure 21)

*Macropodia hesperiae* Manning & Holthuis, 1981: 298, figure 77a–e.

## MATERIAL EXAMINED

MU119, 82–80 m, (1); MU129, 95–93 m, (1); MU154, 92–102 m, (2).

Male: 6.48 mm, female: 6.52 mm, ovigerous female: 5.82 mm.

## IDENTIFICATION

Our specimens agree well with the original description.



Fig. 21. *Macropodia hesperiae* Manning & Holthuis, 1981, male CL: 6.48 mm, MU119, in ethanol, dorsal view. Scale bar 1 mm.

## BIOLOGY

Previously recorded on bottoms of mud, sand and compacted sand, at depths varying from 46–49 to 82–97 m. Ovigerous females have been reported in May (Manning & Holthuis, 1981).

Our specimens were captured between 80–82 and 92–102 m on compact coarse sand bottoms.

Some specimens carried the hydrozoan species *Nemertesia* sp. and some colonies of the branched bryozoan species *Synnotum aegyptiacum* (Audouin, 1826) on their carapaces. The only ovigerous female was collected in December.

## GEOGRAPHIC DISTRIBUTION

West Africa from Mauritania (present work) to Nigeria (Manning & Holthuis, 1981).

## REMARKS

González Pérez (1995) mentioned one specimen from the Canary Islands identified as *Macropodia* aff. *hesperiae* and collected at 821 m. However, since all the previous records of this species, including those in this study, were found in depths between 46–49 and 92–102 m, we don't consider as valid the record from Canary Islands until further confirmation of the species identification.

Our finding extends the distribution area of this species northwards, from Senegal up to Cape Timiris.

The record of ovigerous females in December indicates that this species spawns at least biannually.

*Macropodia longipes* (A. Milne-Edwards & Bouvier, 1899)  
(Figure 22)

*Stenorhynchus longipes* A. Milne-Edwards & Bouvier, 1899: 48  
*Macropodia longipes*: Manning & Holthuis, 1981: 300 (references).

## MATERIAL EXAMINED

MU277, 112–110 m, (1).

Male: 7.45 mm.

## IDENTIFICATION

Our specimen agrees well with descriptions provided in Forest & Zariquiey Álvarez (1964: 226) and González-Gurriarán & Méndez (1986: 169).



Fig. 22. *Macropodia longipes* (A. Milne-Edwards and Bouvier, 1899), male CL: 7.45 mm MU277, dorsal view. Scale bar: 1 mm.

**BIOLOGY**

Species reported in the literature from bottoms of sand and broken shells (Anadon, 1981), sand, silt, gravel and coarse sands (Serrano *et al.*, 2011), and in seagrasses (Ateş *et al.*, 2006). Depth records from 9 m (d'Udekem d'Acoz, 1999) to 1249 m (Cartes *et al.*, 2004). Ovigerous females recorded in February, March, August and September (Zariquiey Álvarez, 1968; Pipitone & Tumbiolo, 1993: 362).

The only specimen examined here was a male, collected between 110 and 112 m on a muddy sand bottom.

**GEOGRAPHIC DISTRIBUTION**

East Atlantic, from the Gulf of Gascogne to Mauritania, including the Cape Verde Islands; and Mediterranean Sea (Forest, 1978 as *Macropodia tenuirostris longipes*).

Further records for this species all refer to the Mediterranean Sea (Modena *et al.*, 2001; Abelló *et al.*, 2002; Biagi *et al.*, 2002; Cartes *et al.*, 2004; Colloca *et al.*, 2004; Politou *et al.*, 2005; Ungaro *et al.*, 2005; Ateş *et al.*, 2006; Fanelli *et al.*, 2007; García-Muñoz *et al.*, 2008; Serrano *et al.*, 2011).

**REMARKS**

Since Forest (1978) declared *Macropodia tenuirostris longipes* as the deepest form of *M. tenuirostris tenuirostris*, some authors subsequently synonymized both subspecies under the name *Macropodia tenuirostris* (d'Udekem d'Acoz, 1999; Pipitone & Arculeo, 2003). However, we follow Ng *et al.*

(2008), who kept them as two different species, only including here references that refer to *M. longipes* as a separate species or subspecies.

Although the rostrum of our specimen is a little damaged, the slightly curved (not arcuated) P4, P5 dactylus, the basal article of antenna with strong spines ventrally, the presence of a nuchal spine and the absence of spines on the supraorbital margin ensure its identification as *M. longipes*.

*Macropodia macrocheles* (A. Milne-Edwards & Bouvier, 1898) (Figure 23A–C)

*Stenorhynchus macrocheles* A. Milne-Edwards & Bouvier, 1898: 153

*Macropodia macrocheles*: Manning & Holthuis, 1981: 301 (references)

**MATERIAL EXAMINED**

MU100, 236–238 m, (3); MU105, 343–346 m, (1); MU141, 280–277 m, (11); MU149, 93–146 m, (1); MU155, 210–257 m, (3); MU157, 278–454 m, (3); MU159, 224–229 m, (7); MU173, 314–540 m, (1); MU179, 303–304 m, (1); MU184, 213–202 m, (2); MU233, 165–189 m, (1); MU280, 230–239 m, (2); MUBV22, 300 m, (1).

Males: 4.41–9.75 mm, ovigerous females: 5.17–6.45 mm.

**IDENTIFICATION**

Our specimens agree well with the descriptions and figures in Milne-Edwards & Bouvier (1900: 159) and Capart (1951: 77).



**Fig. 23.** *Macropodia macrocheles* (A. Milne-Edwards & Bouvier, 1898): (A) male CL: 8.86 mm dorsal view, MU184; (B) ovigerous female CL: 5.17 mm, MU141, in ethanol, dorsal view; (C) same, epistome detail. Scale bars B, C: 1 mm.

**BIOLOGY**

Collected on mud, sand and muddy sand bottoms, at depths between 96 and 300 m (Manning & Holthuis, 1981). Ovigerous females have been recorded in January, February, May, June and December (Manning & Holthuis, 1981).

Our specimens were captured in depths between 93–143 and 314–540 m on muddy sand and sandy mud bottoms. Some specimens carried hydroid colonies of *Clytia gracilis* (Sars, 1850), *Clytia paulensis* (Vanhöffen, 1910), *Antennella secundaria* (Gmelin, 1791) and a branched unidentified bryozoan species of the genus *Bugula* Oken, 1815, on their carapaces. Ovigerous females were collected in December.

**GEOGRAPHIC DISTRIBUTION**

West Africa, from Mauritania (Manning & Holthuis, 1981) to Namibia (Macpherson, 1991).

**REMARKS**

Our findings slightly extend the bathymetric range previously reported in the literature.

Family MAJIDAE Samouelle, 1819  
Genus *Eurynome* Leach, 1814  
*Eurynome aspera* (Pennant, 1777)  
(Figure 24)

*Cancer Asper* Pennant, 1777: 7, pl IX.A, figure 20.

*Eurynome aspera*: Griffin, 1974; Manning & Holthuis, 1981: 311 (references).

**MATERIAL EXAMINED**

MU183, 138–177 m, (1), MU209, 115–150 m, (1).  
Males: 10.35–11.87 mm.

**IDENTIFICATION**

Our specimens agree with the description and figures provided by Zariquiey Álvarez (1968: 462) and González-Gurriarán & Méndez (1986: 178).

**BIOLOGY**

Mainly reported on firm substrates of relatively large particles, bottoms of shelly sand, calcareous algae, muddy shells and gravel, maerl beds and on rock (Manning & Holthuis, 1981; Ballesteros, 2006) and in *Posidonia* meadows (Pipitone &



Fig. 24. *Eurynome aspera* (Pennant, 1777), male CL: 10.35 mm dorsal view, MU209.

Arculeo, 2003; Ateş *et al.*, 2006). Bathymetric range between 10 and 1216 m (d'Udekem d'Acoz, 1999: 188). Ovigerous females reported in April (Zariquiey Álvarez, 1968).

Specimens examined were two males collected at 115–150 and 138–177 m.

**GEOGRAPHIC DISTRIBUTION**

East Atlantic, from Norway to Angola, including the Azores, Desertas, Canary and Cape Verde Islands; Mediterranean Sea; West Indian Ocean from False Bay, South Africa, to Durban (Griffin, 1974; d'Udekem d'Acoz, 1999).

Later records for this species (Abelló *et al.*, 2002; García Raso & Manjón-Cabeza, 2002; Pipitone & Arculeo, 2003; Ateş *et al.*, 2006; Serrano *et al.*, 2006; Cartes *et al.*, 2007; García-Muñoz *et al.*, 2008; Ellis *et al.*, 2013) fit well within its geographic distribution.

Superfamily PARTHENOPOIDEA MacLeay, 1838

Family PARTHENOPIDAE MacLeay, 1838

Genus *Distolambrus* Tan & Ng, 2007

*Distolambrus maltzami* (Miers, 1881)

(Figure 25)

*Heterocrypta Maltzami* Miers, 1881: 209, pl. 13: figure 1

*Heterocrypta maltzami*: Manning & Holthuis 1981: 322 (references)

*Distolambrus maltzami*: Tan & Ng, 2007: 103, figure 5; Henriksen, 2009: 80, figure 40

**MATERIAL EXAMINED**

MUBV21, 107–109 m, (2).

Ovigerous female: 8.08 mm.

**IDENTIFICATION**

Our specimen agrees well with the description provided by Milne-Edwards & Bouvier (1900: 121, as *Heterocrypta Maltzani* and *Heterocrypta Maltzani* var. *Marioni*).

**BIOLOGY**

Previously reported from bottoms of shell debris, shelly sand, sand, muddy sand, mud, calcareous algae and rock (Manning & Holthuis, 1981, as *Heterocrypta maltzami*; d'Udekem d'Acoz, 1999, as *Heterocrypta maltzami marionis*). Bathymetric range oscillates between 22 and 550 m (d'Udekem d'Acoz, 1999, as *Heterocrypta maltzami marionis*), but all previous West



Fig. 25. *Distolambrus maltzami* (Miers, 1881), ovigerous female CL: 8.08 mm, MUBV21, in ethanol, dorsal view. Scale bar: 1 mm.

African records are from less than 100 m depth (0–70 m) (Manning & Holthuis, 1981; as *Heterocrypta maltzami*).

On the West African coast, ovigerous females have been found throughout the year (Zariquiey Álvarez, 1968; as *Heterocrypta maltzami*).

Only one ovigerous female was collected in December during the MAURIT surveys, between 107 and 109 m.

#### GEOGRAPHIC DISTRIBUTION

Eastern Atlantic Ocean from the Bay of Biscay to Angola, including the Azores and Cape Verde Islands (Manning & Holthuis, 1981), as well as in the Mediterranean Sea (d'Udekem d'Acoz, 1999).

Later records (Pipitone & Arculeo, 2003; Serrano *et al.*, 2006; Henriksen, 2009; Massi *et al.*, 2010) fit well within its geographic distribution.

#### REMARKS

In their systematic revision of the subfamily Parthenopinae, Tan & Ng (2007) relocated the former *Heterocrypta maltzami* in their new genus *Distolambrus*. Both genera can be easily differentiated by the presence of a V-shaped ridge on the gastric region of *Distolambrus* (U-shaped in *Heterocrypta*); the branchial ridge not continuous with the gastric ridge (continuous in *Heterocrypta*); male with fused thoracic sternites without a transverse groove (with a broad transverse groove in *Heterocrypta*); third maxilliped merus subtriangular (subquadrate in *Heterocrypta*); and the posterior margin not produced beyond the base of the abdomen (produced in *Heterocrypta*).

Genus *Solenolambrus* Stimpson, 1871  
*Solenolambrus noordendei* (Capart, 1951)  
 (Figure 26)

*Heterocrypta noordendei* Capart, 1951: 108, figure 37, pl. II figure 15.

*Solenolambrus noordendei*: Manning & Holthuis, 1981: 336 (references); Tan, 2004: 500, figures 137G, H; 140B (references).

#### MATERIAL EXAMINED

MU86, 91–103 m, (1); MU170, 102–92 m, (13); MU171, 105–100 m, (19); MU183, 138–177 m, (1); MU210, 86–90 m, (1); MU212, 163–200 m, (2); MU233, 165–189 m, (1); MUBV01, 112 m, (63); MUBV02, 318–330 m, (2); MUBV10, 332–344 m, (6); MUBV15, 148–135 m, (11); MUBV21, 107–109 m, (18).

Males: 8.26–13.61 mm, ovigerous females: 6.71–10.81 mm.

#### IDENTIFICATION

Our specimens agree well with the original description.

#### BIOLOGY

Species found on a variety of bottoms such as mud, muddy sand, mud with branched foraminifera, sandy mud, shelly mud, broken shells, coral or rock, at depths between 64 and 215 m. Ovigerous females have been previously recorded in February, March, May, July and November (Manning & Holthuis, 1981).

Our specimens were captured in depths from 86–90 to 332–344 m, in bottoms of coarse sand with mud and shell debris, muddy sand and sandy mud. Ovigerous females were collected in November and December.



Fig. 26. *Solenolambrus noordendei* (Capart, 1951), ovigerous female CL: 9.04 mm dorsal view, MU233.

#### GEOGRAPHIC DISTRIBUTION

West Africa from Mauritania (present work) to Angola (Manning & Holthuis, 1981).

#### REMARKS

Our records extend northwards the geographic distribution, from Senegal to Cape Blanc. They also broaden the bathymetric range of the species down to 322–344 m. The presence of ovigerous females also in December suggests that this species spawns throughout the year.

Genus *Spinolambrus* Tan & Ng, 2007  
*Spinolambrus notialis* (Manning & Holthuis, 1981)  
 (Figure 27)

*Parthenope notialis* Manning & Holthuis, 1981: 331, figures 85, 86a–b.

*Spinolambrus notialis*: Tan, 2004: 524, figures 144A–B, 146B; Tan & Low, 2014: 96, figure 2B.

#### MATERIAL EXAMINED

MU131, 102–104 m, (1); MU186, 174 m, (1); MUBV21, 107–109 m, (1).

Female: 7.21 mm, ovigerous female: 10.08 mm.

#### IDENTIFICATION

Our specimens agree well with the original description.

#### BIOLOGY

Species recorded on bottoms of mud, sandy mud or sand, mostly mixed with broken shells, bryozoans, branched or foliate foraminifera, calcareous algae, corals and rocks. Bathymetric range from 18 to 162 m (Manning & Holthuis 1981: 335 as *Parthenope notialis*). Ovigerous females have been reported in February, March, May, June, July, September and November (Zariquiey Álvarez, 1968: 441 as *Parthenope macrochelos*; Manning & Holthuis, 1981: 335 as *Parthenope notialis*).

Our specimens were captured from 102–104 to 174 m, on coarse sand and muddy sand bottoms. Ovigerous females were collected in December.

#### GEOGRAPHIC DISTRIBUTION

West Africa from Mauritania (present work, see Remarks) to Angola (Manning & Holthuis, 1981: 335 as *Parthenope*



Fig. 27. *Spinolambrus notialis* (Manning & Holthuis, 1981), ovigerous female CL: 10.08 mm dorsal view, MU131.

*notialis*). Muñoz *et al.* (2012) reported this species from Guinea-Bissau.

#### REMARKS

This species was relocated by Tan & Ng (2007) in their new genus *Spinolambrus* erected to include some species of the subfamily Parthenopinae previously placed within the genera *Lambrus* and *Parthenope* from both the Atlantic and the Eastern Pacific.

Manning & Holthuis (1981) established the distribution range of this species at least from Senegal to Angola, inasmuch as the authors pointed out that most of the records of *S. macrochelos* (as *P. macrochelos*) from tropical West Africa were based on *S. notialis*. In consequence, they described the records of Maurin (1968; as *Lambrus macrocheles*) from the Western Sahara and Mauritanian waters as dubious, and a further taxonomic revision would assign them to *S. notialis* or *S. macrochelos*. The same occurs with the citation in Fransen (1991), although in this case Fransen referred to the specimens as '*Parthenope notialis/miersi*' [*Parthenope miersi* was synonymized with *S. macrochelos* (Tan, 2004)].

The southernmost distribution of *S. macrochelos* was confirmed by Tan & Low (2014) in Salé (Morocco) and the authors suggest that the distributions of *S. macrochelos* and *S. notialis* may overlap in North-west Africa.

Our record off Banc d'Arguin confirms the presence of this species in Mauritanian waters and slightly extends its bathymetric distribution.

The presence of ovigerous females in December confirms that this species spawns all the year round.

Superfamily PORTUNOIDEA Rafinesque, 1815  
Family CARCINIDAE MacLeay, 1838  
Genus *Liocarcinus* Stimpson, 1871  
*Liocarcinus corrugatus* (Pennant, 1777)  
(Figure 28A–C)

*Cancer corrugatus* Pennant, 1777: 5, pl. V figure 9.

*Liocarcinus corrugatus*: Manning & Holthuis, 1981: 84 (references).

#### MATERIAL EXAMINED

MUBVo8, 174–168 m, (2).

Male: 13.07 mm.

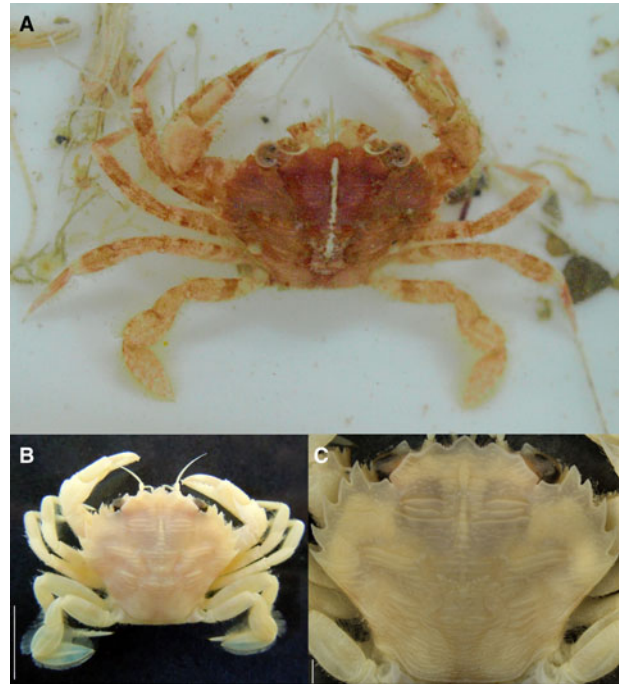


Fig. 28. *Liocarcinus corrugatus* (Pennant, 1777), male CL: 13.07 mm, MUBVo8: (A) dorsal view; (B) same, in ethanol; (C) dorsal carapace, in alcohol. Scale bars: B, 1 cm; C, 1 mm.

#### IDENTIFICATION

Our specimen agrees well with those described by Zariquiey Álvarez (1968) and González-Gurriarán & Méndez (1986).

#### BIOLOGY

Mainly reported on coarse soft bottoms such as gravel, coarse sand, sandy mud, muddy sand and maerl beds (d'Udekem d'Acoz, 1999; as *Polybius (Necora) corrugatus*; El Lakhraç *et al.*, 2012), but also recorded on rocks and in *Posidonia oceanica* (Linnaeus) Delile, 1813 meadows (Pipitone & Arculeo, 2003; as *Polybius corrugatus*; Pipitone & Vaccaro, 2011). Depth records from 5–10 m (Pipitone & Arculeo, 2003; as *Polybius corrugatus*) to 147 m (d'Udekem d'Acoz, 1999; as *Polybius (Necora) corrugatus*). Ovigerous females reported from November to January, March, May, June and July (Zariquiey Álvarez, 1968; as *Macropipus corrugatus*; García Raso, 1984).

Only one male was captured during the MAURIT surveys, between 168 and 174 m.

#### GEOGRAPHIC DISTRIBUTION

East Atlantic, from the Orkney Islands to Angola, including the Azores, Madeira, Canary and Cape Verde Islands; and Mediterranean Basin (d'Udekem d'Acoz, 1999: 219) (see Remarks).

Further records in the literature (Abelló *et al.*, 2002; García Raso & Manjón-Cabeza, 2002; Pipitone & Arculeo, 2003; as *Polybius corrugatus*; Ateş *et al.*, 2006; García-Muñoz *et al.*, 2008; Pipitone & Vaccaro, 2011; El Lakhraç *et al.*, 2012; Muñoz *et al.*, 2012) fit well within this geographic distribution.

#### REMARKS

*Liocarcinus corrugatus* was also reported from many localities in the Indo-Pacific, but d'Udekem d'Acoz (1999) stated that

all these records probably belong to one or more closely allied species. Ng *et al.* (2001) followed d'Udekem d'Acoz and excluded *L. corrugatus* from the checklist of brachyurans from Taiwan, but later Yaldwin & Webber (2011) included this species in the Decapoda checklist of New Zealand.

Our data slightly increase the bathymetric range previously reported in the literature.

Family GERYONIDAE Colosi, 1923  
Genus *Chaceon* Manning & Holthuis, 1989  
*Chaceon maritae* (Manning & Holthuis, 1981)  
(Figure 29A, B)

*Geryon maritae* Manning & Holthuis, 1981: 112, figures 24a, 25, 26.

#### MATERIAL EXAMINED

MU01, 817–820 m, (2); MU15, 670–675 m, (1); MU17, 818–861 m, (3); MU18, 519–402 m, (40); MU19, 1222–1218 m, (1); MU23, 532–415 m, (2); MU26, 744 m, (1); MU33, 741–736 m, (2); MU46, 848–847 m, (3); MU48, 1239–1218 m, (1); MU55, 1310–1218 m, (1); MU56, 1091–1159 m, (1); MU62, 1236–1244 m, (1); MU67, 1381–1390 m, (1); MU68, 1136–1146 m, (5); MU70, 755–801 m, (3); MU73, 1330–1284 m, (1); MU79, 554–576 m, (5); MU126, 668–826 m, (2); MU177, 584–580 m, (9); MU182, 726 m, (1); MU188, 627 m, (1); MU243, 827–850 m, (3); MU267, 673–670 m, (16); MUBV03, 528–538 m, (1); MUBV13, 493–517 m, (1).  
Males: 23.63–68.34 mm; females: 21.94–77.95 mm.

#### IDENTIFICATION

Our specimens agree well with the original description.

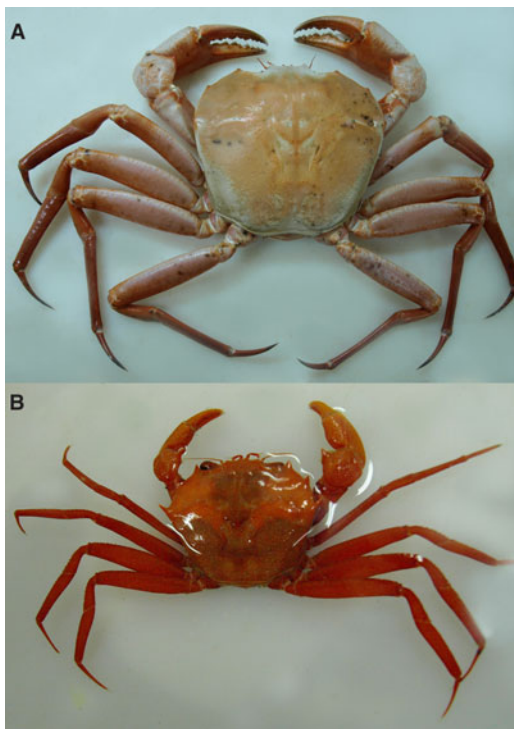


Fig. 29. *Chaceon maritae* (Manning & Holthuis, 1981): (A) adult dorsal view, MU243; (B) juvenile CL: 21.94 mm dorsal view, MU177.

#### BIOLOGY

Species inhabiting bottoms of mud, sandy mud and corals at depths from 100–300 m (Manning & Holthuis, 1981; as *Geryon maritae*) to 1994 m (Le Roux, 2001).

Although several works focus on the population dynamics of *C. maritae* for fishing purposes (Gaertner & Laloé, 1986; Melville Smith, 1988; Le Roux, 2001), surprisingly, none of them include data about the spawning period for this species.

Our specimens were collected between 402–519 and 1381–1390 m on muddy sand and sandy mud bottoms.

#### GEOGRAPHIC DISTRIBUTION

West Africa from the Western Sahara to Namibia (Manning & Holthuis, 1981; d'Udekem d'Acoz, 1999) (see Remarks). Le Roux (2001) reported this species off Namibia and Muñoz *et al.* (2012) from Guinea-Bissau.

#### REMARKS

Species occurrence in the Canary Islands (González *et al.*, 1996) needs confirmation (d'Udekem d'Acoz, 1999).

Family MACROPIPIDAE Stephenson & Campbell, 1960  
Genus *Bathynectes* Stimpson, 1871  
*Bathynectes piperitus* Manning & Holthuis, 1981  
(Figure 30)

*Bathynectes piperitus* Manning & Holthuis, 1981: 77, figures 16, 17.

#### MATERIAL EXAMINED

MU02, 616–626 m, (1); MU14, 502–511 m, (6); MU15, 670–675 m, (1); MU18, 519–402 m, (31); MU23, 532–415 m, (2); MU37, 403–442 m, (5); MU44, 606–596 m, (14); MU45, 420–427 m, (2); MU51, 464–468 m, (2); MU52, 774–792 m, (2); MU54, 414–451 m, (1); MU57, 430–406 m, (1); MU63, 848–798 m, (59); MU64, 452–468 m, (11); MU70, 755–801 m, (1); MU71, 812–837 m, (6); MU79, 554–576 m, (2); MU123, 278–362 m, (1); MU126, 668–826 m, (3); MU127, 260–353 m, (1); MU134, 311–436 m, (1); MU143, 322 m, (2); MU175, 618–850 m, (2); MU177, 584–580 m, (2); MU179, 303–304 m, (1); MU214, 650–588 m, (1); MU222, 729–723 m, (2); MU267, 673–670 m, (1); MU276, 637–562 m, (1); MUBV02, 318–330 m, (6); MUBV03, 528–538 m, (4); MUBV09, 549–555 m, (10); MUBV10, 332–344 m, (4); MUBV13, 493–517 m, (30); MUBV14, 300–281 m, (2); MUBV18, 559–574 m, (24); MUBV19, 306 m, (30); MUBV22, 300 m, (16); MUBV25, 499–520 m, (3).



Fig. 30. *Bathynectes piperitus* Manning & Holthuis, 1981, male CL: 13.60 mm dorsal view, MU123.

Males: 13.60–55.06 mm; females: 13.13–41.98 mm; ovigerous females: 35.52–40.72 mm.

#### IDENTIFICATION

Our specimens agree well with the original description.

#### BIOLOGY

Collected on mud, muddy sand, sand and gravel bottoms and on corals, in depths from 200 to 628 m. Ovigerous females recorded from February to June (Manning & Holthuis, 1981).

Our specimens were captured at depths from 260–353 to 618–850 m on sand and sandy mud bottoms. Ovigerous females were collected in November and December.

#### GEOGRAPHIC DISTRIBUTION

Known in West Africa, from the Cape Verde Islands (Manning & Holthuis, 1981) and Mauritania (present work) to Namibia (Macpherson, 1991), the species is probably present up to Western Saharan waters (see Remarks). Henriksen (2009) reports this species off Gabon.

#### REMARKS

Specimens of *Bathynectes piperitus* have been largely identified under the name of the European and Mediterranean *B. maravigna* (Prestandrea, 1839). The differences between both species were summarized by Manning & Holthuis (1981). Our Mauritanian record of *B. piperitus* supports the opinion expressed by Manning & Holthuis (1981) that the records of *B. superbus* (= *B. maravigna*) from Cape Bojador (Western Sahara) and Mauritania, given by Maurin (1968), and those of *Bathynectes*, given by Filhol (1885), may in fact be referable to *B. piperitus*.

Our records of ovigerous females determine a spawning period between November and June.

Genus *Macropipus* Prestandrea, 1833  
*Macropipus rugosus* (Doflein, 1904)  
 (Figure 31)

*Elliptodactylus rugosus* Doflein, 1904: 94, pl. XXX figures 1–3, pl. XXXII figure 7.

*Macropipus rugosus* Manning & Holthuis, 1981: 86 (references).

#### MATERIAL EXAMINED

MU86, 91–103 m, (3); MU90, 110 m, (6); MU101, 104–96 m, (2304); MU120, 109–105 m, (1); MU125, 103–101 m, (132); MU135, 185–173 m, (25); MU137, 81–84 m, (1); MU138, 123–130 m, (233); MU144, 119–138 m, (8); MU147, 134–139 m, (7); MU148, 215–245 m, (106); MU149, 93–146 m, (5); MU154, 92–102 m, (4819); MU155, 210–257 m, (25); MU160, 143–147 m, (565); MU161, 89–92 m, (6); MU162, 148–149 m, (232); MU166, 87–85 m, (37); MU167, 101–108 m, (354); MU168, 87–92 m, (1); MU181, 142–148 m, (18); MU184, 213–202 m, (54); MU186, 174 m, (1); MU205, 89–93 m, (1); MU208, 96–79 m, (1); MU224, 173–177 m, (12); MU227, 183–181 m, (3); MU266, 103 m, (57); MU285, 128–132 m, (31); MU291, 106–137 m, (256); MUBV01, 112 m, (1); MUBV21, 107–109 m, (4).

Males: 7.39–32.41 mm, females: 7.43–24.95 mm, ovigerous females: 18.49–23.43 mm.



Fig. 31. *Macropipus rugosus* (Doflein, 1904), ovigerous female CL: 23.43 mm dorsal view, MUBV01.

#### IDENTIFICATION

Our specimens agree well with the original description and with the notes provided by Guinot (1961: 2).

#### BIOLOGY

Bottoms of mud, muddy sand, sand, broken shells, foraminifera, bryozoans and also on calcareous algae and rocks, at depths from 5 to 400 m. Ovigerous females previously recorded in June and September (Manning & Holthuis, 1981: 86).

Our specimens were captured between 81–84 and 210–257 m on muddy sand, sandy mud, coarse muddy sand, sand and on coarse sand with shell debris bottoms. Ovigerous females were collected in November and December.

#### GEOGRAPHIC DISTRIBUTION

West Africa from Western Sahara to Angola, including São Tomé and Príncipe Islands (Manning & Holthuis, 1981: 86). Further records can be found at Nigeria, Príncipe and Congo (Henriksen, 2009) and Guinea-Bissau (Muñoz *et al.*, 2012).

#### REMARKS

Ovigerous females were reported for the first time at the end of the year, indicating that this species spawns in the second half of the year.

Superfamily XANTHOIDEA MacLeay, 1838

Family XANTHIDAE MacLeay, 1838

Genus *Monodaeus* Guinot, 1967

*Monodaeus cristulatus* Guinot & Macpherson, 1988  
 (Figures 32A–C & 33E–H)

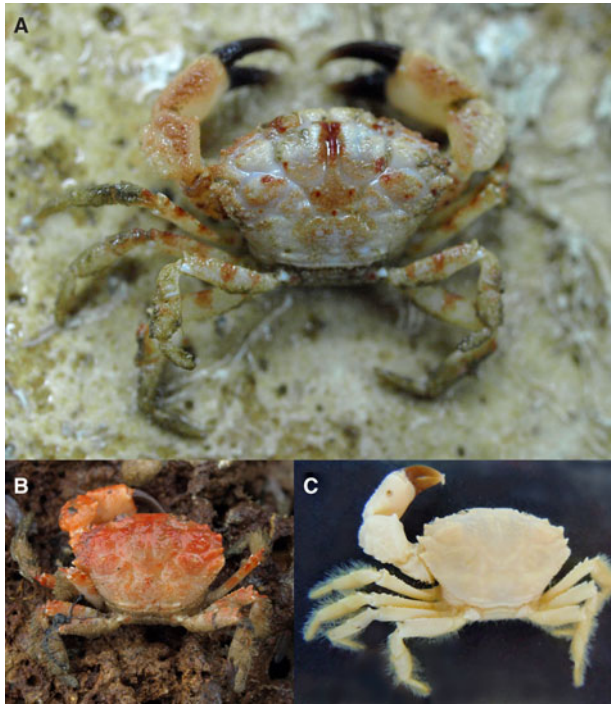
*Monodaeus cristulatus* Guinot & Macpherson, 1988: 744, figures 8, 9, 14, 19, 20, 25, 26, pl. 3 figures D–G.

#### MATERIAL EXAMINED

MU120, 109–105 m, (1); MU171, 105–100 m, (5); MU212, 163–200 m, (1); MU219, 125–129 m, (1); MU290, 311 m, (1); MUBV08, 174–168 m, (2); MUBV10, 332–344 m, (12); MUBV14, 300–281 m (1).

Males: 4.36–14.08 mm, females: 3.53–4.96 mm, ovigerous female: 6.57 mm.





**Fig. 32.** *Monodaesus cristulatus* Guinot & Macpherson, 1988: (A) medium size specimen, CL ~ 5 mm dorsal view, MUBV10; (B) male CL: 14.08 mm dorsal view, MUBV14; (C) same in ethanol.

#### COMPARATIVE MATERIAL EXAMINED

*Monodaesus cristulatus*: **Namibia**, Exp. Benguela XII, station P42, 185 m, 28°56'59.99"S 14°55'47.99"E, Macpherson, E. det., 10 specimens (USNM 221965); Exp. Benguela XIV, station P53, 179–183 m, 29°19'S 15°05'E, Macpherson, E. det., three specimens: 1 male CL: 15.58 mm (ICMD000034) and two juveniles CL: 4.30 mm (ICMD000037) and 3.77 mm (ICMD000039).

*Monodaesus couchii* (Couch, 1851): **Gulf of Cádiz**, Exp. ARSA0311, station L14, 692 m, 36°12'54.0"N 7°00'32.4"W, 2 females CL: 11.31 and 9.20 mm (IEO-CD-AR11/001); station L31, 359 m, 36°02'27.6"N 6°20'09.6"W, 1 male CL: 7.31 mm (IEO-CD-AR11/017). **Morocco** (Atlantic coast): Exp. CCLME 2012, station 297, 239 m, 34°52'03.0"N 6°45'24.1"W, 1 female CL: 14.23 mm (IEO-CD-CCLME12/1226). **NW Mediterranean**: Barcelona, Exp. Pont 90, station G3, 192–430 m, 41°07'59.9"N 2°03'00.0"E, Sardá, F. det., 4 specimens: 2 males CL: 22.11 mm (ICMD 291/1981(s01)) and 22.42 mm (ICMD 291/1981(s02)), 2 ovigerous females CL: 17.03 mm (ICMD 291/1981(s03)) and 14.25 mm (ICMD 291/1981(s04)). **SW Mediterranean**: Málaga, Exp. Medits94 station Lance 16, 553–563 m, 36°23'48.1"N 4°28'54.5"W (off Pta. Calaburras), Abelló, P. det., 1 female CL: 12.34 mm (ICMD000005); Exp. Medits97 station Lance 6, 721–735 m, 36°18'33.1"N 4°44'34.1"W (off Marbella), Abelló, P. det., 1 male CL: 16.09 mm (ICMD000013); Exp. Medits97 station Lance 19, 524–526 m, 36°36'59.4"N 3°48'56.8"W (off Nerja), Abelló, P. det., 1 male CL: 20.60 mm (ICMD000017).

#### IDENTIFICATION

Our specimens agree with the original description (see Remarks).



**Fig. 33.** *Monodaesus couchii* (Couch, 1851), males: (A) CL: 22.11 mm dorsal view; (B) same, right pereiopods P3, P4, P5 detail; (C) CL: 16.09 mm dorsal view; (D) same, right pereiopods P2 to P5 detail. *Monodaesus cristulatus* Guinot & Macpherson, 1988, males: (E) CL: 12.02 mm dorsal view; (F) same, right pereiopods P2 to P5 detail; (G) CL: 8.36 mm dorsal view; (H) same, left pereiopods P2 to P5 detail. (A, B) ICMD 291/1981(s01); (C, D) ICMD000013; (E, F) MU212, UVIGO/03087; (G, H) MUBV10, UVIGO/11948. Scale bars: A, C, E, G, 1 cm; B, D, F, H, 1 mm.

#### BIOLOGY

This species was captured on coral, at depths from 160 to 300 m; ovigerous females were reported from July and August (label with paratypes ICMD000031, ICMD000032 and ICMD000033; Guinot & Macpherson, 1988: 744).

Our specimens were found on sandy bottoms and hidden in the holes of large stones hauled up in the net, at depths from 100–105 to 332–344 m. The ovigerous female was captured in December.

#### GEOGRAPHIC DISTRIBUTION

Western Africa in Mauritania (present work) and Namibia (Guinot & Macpherson, 1988) (see Remarks).

#### REMARKS

*Monodaesus cristulatus* has only been previously reported from Namibian coasts (28°–29°S). Following Guinot & Macpherson (1988), the closest species is *Monodaesus couchii*, previously reported from various localities of NW Africa (Manning & Holthuis, 1981), including Mauritanian waters (Milne-Edwards & Bouvier, 1900; Anadon, 1981; Fransen, 1991). We have compared our material with specimens of *M. cristulatus* from Namibia and with samples of *M. couchii* from the

Western Mediterranean, Gulf of Cádiz and Moroccan Atlantic coasts (see comparative material examined). After these comparisons, we included our specimens in *M. cristulatus*, due to the presence of a dorsal crest on P2–P5 meri and a proximal protuberance on P2–P4 dorsal carpi (Figure 33E–H), which are absent in *M. couchii* (Figure 33A–D). In juveniles of *M. cristulatus* the specific characters are not clearly developed (Guinot & Macpherson, 1988), which hinders species separation when studying isolated specimens. However, checking a series of different features on specimens of various sizes allows for accurate identification.

The possible misidentification of the two species and our findings of *Monodaeus cristulatus* in Mauritanian waters point to a need for a revision of the records of *M. couchii* south of Cape Blanc. Our records suggest that *M. cristulatus* can be found along the West African coast between Banc d'Arguin, Mauritania and Namibia.

Subsection THORACOTREMATA Guinot, 1977

Superfamily GRAPSOIDEA MacLeay, 1838

Family PLAGUSIIDAE Dana, 1851

Genus *Euchirograpsus* H. Milne-Edwards, 1853

*Euchirograpsus liguricus* H. Milne-Edwards, 1853  
(Figure 34)

*Euchirograpsus liguricus* H. Milne-Edwards, 1853: 175; Türkay, 1975: 105, figures 1–3, 17, 23 (references).

#### MATERIAL EXAMINED

MU290, 311 m, (3); MUBV14, 300–281 m, (3).

Males: 6.61–20.68 mm; females: 6.30–11.39 mm.

#### IDENTIFICATION

Our specimens agree well with the description provided by Türkay (1975: 105) and with the comments and pictures after Giacobbe & Spano (2006).

#### BIOLOGY

Collected on gravel, shell, sand, sandy mud and muddy bottoms, the species is also recorded on bottoms of rock with gorgonians, sponges, calcareous algae and kelp, and coral reefs (Manning & Holthuis, 1981: 248; d'Udekem d'Acoz, 1999: 250, Giacobbe & Spano, 2006). Depth records range between 10 m (d'Udekem d'Acoz, 1999: 250) and 620–621 m (Abelló *et al.*, 2002). Oviparous females were collected only in March (Manning & Holthuis, 1981).



Fig. 34. *Euchirograpsus liguricus* H. Milne-Edwards, 1853, male CL: 20.68 mm dorsal view, MUBV14.

Our material was collected at 281–300 and 311 m. The species was caught in a ghost net hauled with the Lofoten trawl and in the holes of a large stone captured with the beam trawl.

#### GEOGRAPHIC DISTRIBUTION

East Atlantic from West Portugal to Namibia including the Azores, Madeira, Savage, Canary and Cape Verde Islands; Western and Central Mediterranean Sea (d'Udekem d'Acoz, 1999; Giacobbe & Spano, 2006). Abelló *et al.* (2002) report this species from the Eastern Alborán Sea.

#### DISCUSSION

A total of 10,514 brachyuran specimens were studied from waters off Mauritania at depths from 79 to 1867 m, comprising 33 species belonging to 17 families and 24 genera. The brachyuran diversity found in recent works carried out with a similar methodology on West African coasts is slightly lower than the values of our study. García Raso (1996) reported 31 brachyuran species from the Ibero-Moroccan Bay and adjacent waters at depths from 137 to 2142 m; Muñoz *et al.* (2012) listed 44 brachyuran species off Guinea-Bissau at depths between 20 and 1000 m, of which only 24 were found deeper than 80 m; and Macpherson (1991) included 21 brachyuran species in Namibian waters from 100 to 1000 m.

The most abundant species so far was *Macropipus rugosus* (89%), mainly due to the high number of specimens captured at two stations off Nouakchott (MU101, 2304 specimens; MU154, 4819 specimens). However, the remaining stations showed similar abundances to those reported for this species in Guinea-Bissau (Muñoz *et al.*, 2012), Guinea (Le Loef, 1993) and the Gulf of Guinea (Henriksen, 2009). Conversely, the following three species, *Atelecyclus rotundatus*, *Ethusa rosacea* and *Macropodia longipes*, were represented by only one specimen each. The low abundance of *A. rotundatus* is probably explained by its burrowing behaviour (González-Gurriarán & Méndez, 1986; S. de Matos-Pita, unpublished data), which hinders or prevents the capture of the species by the trawl. *Macropodia longipes*, although reported from the Gulf of Gascogne to the Cape Verde Islands and the Mediterranean Sea, has only been recorded in Mauritanian waters on the Banc d'Arguin (Forest, 1978, as *Macropodia tenuirostris longipes*). *Ethusa rosacea* and *M. longipes* are both considered as rare species because they were seldom reported and always in very low abundance (Monod, 1956; Manning & Holthuis, 1981; Henriksen, 2009).

Different patterns are observed for the latitudinal distribution of the species in the area studied. Eleven species, *Homola barbata*, *Paromola cuvieri*, *Acanthocarpus brevispinis*, *Goneplax barnardi*, *Inachus angolensis*, *Macropodia gilsoni*, *M. macrocheles*, *Chaceon maritae*, *Bathynectes piperitus*, *Macropipus rugosus* and *Monodaeus cristulatus*, are evenly distributed along most of the Mauritanian coast. Three species, *Medorippe lanata*, *Eurynome aspera* and *Distolambrus maltzami*, were sampled only north of Cape Timiris, and another six, *Ethusa rosacea*, *Pisa armata*, *Inachus aguairii*, *Macropodia hesperiae*, *M. longipes* and *Euchirograpsus liguricus* were only captured between Cape Timiris and the Senegalese border. *Callappa pelii*, *Ethusa rugulosa*, *Goneplax rhomboides*, *Pseudomyra mbizi*, *Inachus*

*grallator*, *I. nanus*, *Solenolambrus noordendei* and *Spinolambrus notialis* were scarcely sampled north and south of Cape Timiris. Finally, another five species, *Cymonomus granulatus*, *Atelecyclus rotundatus*, *Ebalia nux*, *Inachus leptochirus* and *Liocarcinus corrugatus*, were sampled only off Cape Blanc.

Analysis of the geographic distribution reveals three different contingents within the Mauritanian brachyuran fauna. The main zoogeographic group (18 species, 54.5%) is composed of species distributed along the West African coast, mainly in the tropical region. Within this group, 14 species, *A. brevispinis*, *C. pelii*, *E. rosacea*, *E. rugulosa*, *G. barnardi*, *P. mbizi*, *I. angolensis*, *M. gilsoni*, *M. macrocheles*, *S. noordendei*, *S. notialis*, *C. maritae*, *B. piperitus* and *M. rugosus* were mostly evenly reported from the Western Sahara and Mauritania to Angola and Namibia. Two species, *I. nanus* and *M. hesperiae*, were reported between Mauritania and the Gulf of Guinea. *Inachus grallator*, previously reported between the Gulf of Guinea and Namibia, and *M. cristulatus*, only known from the type locality (Namibia), have a discontinuous latitudinal distribution and are now both recorded in Mauritanian waters. Species with a restricted and/or discontinuous distribution in tropical West Africa have been reported in recent decades (Manning & Holthuis, 1981; Macpherson, 1991), but a more complete sampling effort in West African waters will certainly extend their known distribution.

The second zoogeographic group (10 species, 30.3%) is represented by species widely distributed in the Lusitanian province, including the Mediterranean Sea. The southern limit of the Lusitanian province was recently established at Cape Juby (south Morocco) by Briggs & Bowen (2012), but set up at Cap Vert (Senegal) by Briggs (1995). *Macropodia longipes* is the only species with a strictly Lusitanian distribution, while the distributional limits of the remaining species extend further northwards or southwards. Five species range southwards to Guinea (*I. aguiarii*), Angola (*D. maltzami*), Namibia (*E. liguricus*), South Africa (*H. barbata*) and even into the Indian Ocean up to Mozambican waters (*M. lanata*). Another four species, *C. granulatus*, *G. rhomboides*, *E. nux* and *I. leptochirus*, extend their distribution area to northern European seas.

Finally, the third zoogeographic group includes five species (15%) widely distributed in the E Atlantic and Mediterranean, with records from northern European seas southwards to Angola (*P. armata* and *L. corrugatus*), South Africa (*P. cuvieri* and *A. rotundatus*) and even to Durban in the West Indian Ocean (*E. aspera*).

In this region, the affinity with Atlantic-Mediterranean fauna was previously reported for different taxa: Porifera (van Soest, 1993), Hydrozoa (Ansín Agis *et al.*, 2001), Bryozoa (Aristegui & Cruz, 1986) and Echinodermata (Hernández *et al.*, 2013; Calero *et al.*, in preparation). For all these taxa, the Canary Current was highlighted as the main means of larval dispersion southwards, also enabling the presence of typical boreal species, such as *C. granulatus*, *G. rhomboides*, *E. nux* and *I. leptochirus*, in NW African waters. Conversely, the presence of tropical species in Mauritania (*C. pelii*, *E. rosacea*, *E. rugulosa*, *G. barnardi*, *P. mbizi*, *I. angolensis*, *I. grallator*, *I. nanus*, *M. gilsoni*, *M. hesperiae*, *M. macrocheles*, *S. noordendei*, *S. notialis*, *C. maritae*, *B. piperitus* and *M. rugosus*) is more difficult to explain because of dominant current systems precluding their dispersion northwards (Aristegui & Cruz, 1986; Hernández *et al.*, 2013). However, a thin surface coastal current flowing northwards along the Gabonese and Congolese coasts (Stramma & Schott, 1999), and the so-called ‘Mauritania Current’ (Stramma & Schott, 1999) flowing northwards in summer and autumn between Cap Vert and Cape Blanc (Pastor *et al.*, 2008), probably facilitate the northwards dispersion of tropical species along the West African coastline. The importance of small currents in the dispersion of species was highlighted by Briggs (1995) as the main way of successfully transporting species in an opposite direction to that of the main flow across the Tropical Pacific and the Atlantic Oceans.

There are three bathymetrical groups of brachyurans in Mauritanian waters. The first group includes 13 species collected exclusively on the shelf (80–200 m; *C. pelii*, *M. lanata*, *P. mbizi*, *P. armata*, *I. aguiarii*, *I. nanus*, *M. gilsoni*, *M. hesperiae*, *M. longipes*, *E. aspera*, *D. maltzami*, *S. notialis* and *L. corrugatus*); the second is represented by nine species collected both on the shelf and upper slope (80–400 m; *H. barbata*, *E. rugulosa*, *G. rhomboides*, *I. angolensis*, *I.*

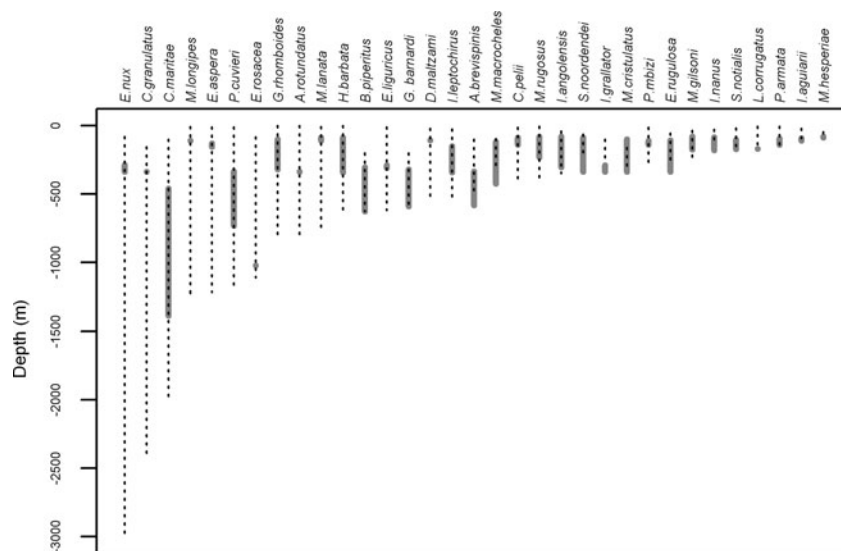


Fig. 35. Depth records of brachyuran species. Translucent continuous line from MAURIT surveys, dotted line from the literature.

*leptochirus*, *M. macrocheles*, *S. noordendei*, *M. rugosus* and *M. cristulatus*); and the third accounts for nine species exclusively recorded along the upper slope (300–700 m; *P. cuvieri*, *C. granulatus*, *A. brevispinis*, *A. rotundatus*, *G. barnardi*, *E. nux*, *I. grallator*, *B. piperitus* and *E. liguricus*) (Figure 35). In addition, *C. maritae* was collected on the upper and middle slope (460–1385 m) and *E. rosacea* only at 1024 m.

Despite the increase in decapod diversity with depth described in several regions, peaking between 1000 and 2000 m (see Muñoz *et al.*, 2012 for references), brachyuran crabs do not seem to follow this general trend in Mauritanian waters.

Our results emphasize the highest specific richness of the deep shelf (22 species, 66.66%) and its drastic reduction beyond 700 m (two species, 6.06%). The importance of crustaceans and at least of some brachyuran families (Inachidae, Portunidae, Parthenopidae and Dorippiidae) on the Mauritanian deep shelf was previously pointed out by Duineveld *et al.* (1993). A similar bathymetric pattern was described for the brachyurans off Guinea-Bissau by Muñoz *et al.* (2012), clearly dominated by shelf species and only three typical deep species, which also include *C. maritae*. Soto (1991) also reported a strong reduction in species diversity beyond 500 and 700 m in the Straits of Florida. This reduction was related to the high trophic level of brachyurans and the more limited food availability in deep waters (Escobar-Briones *et al.*, 2008).

Analysis of bathymetric ranges shows that in Mauritanian waters all but three of the studied species are stenobathic, with depth ranges narrower than 300 m (Menzies *et al.*, 1973; Pielou, 1992). Only *P. cuvieri*, *C. maritae* and *B. piperitus* (depth ranges of 322, 397 and 925 m, respectively) can be considered eurybathic species. However, considering data from the literature, only 13 of the studied species are stenobathic (*E. rugulosa*, *P. mbizi*, *P. armata*, *I. aguiai*, *I. grallator*, *I. nanus*, *M. gilsoni*, *M. hesperiae*, *M. macrocheles*, *S. noordendei*, *S. notialis*, *L. corrugatus* and *M. cristulatus*). In consequence, the Mauritanian brachyuran fauna is dominated by eurybathic species, a feature also shared with the brachyurans of the Straits of Florida (Soto, 1991).

## ACKNOWLEDGEMENTS

The authors wish to thank all those who made possible the study of the material captured in Maurit surveys, especially Dr Ana Ramos and the Spanish Institute of Oceanography (IEO). We thank Drs Félix Pérez and Pere Abelló from the Instituto de Ciencias Marinas (ICM-CSIC) for their invaluable help and patience in locating some of the comparison material checked here. We would also like to thank Luis Miguel Agudo for providing the map.

## FINANCIAL SUPPORT

This work was undertaken within the framework of the ECOAFRIK project and was partially funded by the Galician government (Spain, Project Ref. 10MMA602020PR) and by the 'MAVA Fondation pour la nature' (MAVA contract 12/87 AO C4/2012). This is ECOAFRIK publication number 5.

## REFERENCES

- Abelló P., Carbonell A. and Torres P. (2002) Biogeography of epibenthic crustaceans on the shelf and upper slope off the Iberian Peninsula Mediterranean coasts: implications for the establishment of natural management areas. *Scientia Marina* 66, 183–198.
- Ahyong S.T., Lai J.C.Y., Sharkey D., Colgan D.J. and Ng P.K.L. (2007) Phylogenetics of the brachyuran crabs (Crustacea: Decapoda): the status of Podotremata based on small subunit nuclear ribosomal RNA. *Molecular Phylogenetics and Evolution* 45, 576–586.
- Ahyong S.T., Lowry J.K., Alonso M., Bamber R.N., Boxshall G.A., Castro P., Gerken S., Karaman G.S., Goy J.W., Jones D.S., Meland K., Rogers D.C. and Svavarsson J. (2011) Subphylum Crustacea Brünnich, 1772. In Zhang Z.-Q. (ed.) Animal biodiversity: an outline of higher-level classification and survey of taxonomic richness. *Zootaxa* 3148, 165–191.
- Anadon R. (1981) Crustáceos Decápodos recogidos durante la campaña 'Atlor VII' en las costas noroccidentales de Africa (Noviembre 1975). *Resultados Expediciones Científicas* 9, 151–159.
- Ansín Agís J., Ramil F. and Vervoort W. (2001) Atlantic Leptolida (Hydrozoa, Cnidaria) of the families Aglaopheniidae, Halopterididae, Kirchenpaueriidae and Plumulariidae collected during the CANCAP and Mauritania-II expeditions of the National Museum of Natural History, Leiden, the Netherlands. *Zoologische Verhandlungen* 233, 268 pp.
- Aristegui J. and Cruz T. (1986) Consideraciones biogeográficas sobre el orden Cheilostomata (Ectoprocta) en Canarias. *Vieraea* 16, 161–171.
- Ateş A.S., Katakán T. and Kocataş A. (2006) Bathymetric distribution of decapod crustaceans on the continental shelf along the Aegean coasts of Turkey. *Crustaceana* 79, 129–141.
- Atkinson R.J.A. (1974) Behavioural ecology of the mud-burrowing crab *Goneplax rhomboides*. *Marine Biology* 25, 239–252.
- Ballesteros E. (2006) Mediterranean coralligenous assemblages: a synthesis of present knowledge. *Oceanography and Marine Biology: An Annual Review* 44, 123–195.
- Barnard K.H. (1950) Descriptive catalogue of South African decapod Crustacea. *Annals of the South African Museum* 38, 1–837.
- Barnard K.H. (1955) Additions to the fauna-list of South African Crustacea and Pycnogonida. *Annals of the South African Museum* 43, 1–107.
- Berggren M. (2008) Ny krabba funnen i Skagerrak. [A new crab discovered in the Skagerrak]. *Fauna och Flora (Stockholm)* 103, 20–21.
- Berggren M. and Stefan A. (2010) Fyrkantkrabba *Goneplax rhomboides* etablerad på västkusten [Angular crab *Goneplax rhomboides* established along the Swedish west Coast]. *Fauna och Flora (Stockholm)* 105, 8–11.
- Biagi F., Sartor P., Ardizzone G.D., Belcari P., Belluscio A. and Serena F. (2002) Analysis of demersal assemblages off the Tuscany and Latium coasts (north-western Mediterranean). *Scientia Marina* 66, 233–242.
- Bouvier E.-L. (1897) Sur la classification, les origines et la distribution des crabes de la famille des Dorippidés. *Bulletin de la Société Philomathique de Paris, 8e série* 9, 54–70.
- Bouvier E.L. (1940) Décapodes marcheurs. *Faune de France* 37, 1–404.
- Briggs J.C. (1995) *Global biogeography*. Amsterdam: Elsevier.
- Briggs J.C. and Bowen B.R. (2012) A realignment of marine biogeographic provinces with particular reference to fish distributions. *Journal of Biogeography* 39, 12–30.

- Calero B., Ramil F. and Ramos A.** (in preparation) Echinoderms of Mauritanian deep bottoms. In Ramos A., Sanz J.L. and Ramil F. (eds) *Deep-sea ecosystems off Mauritania*. Dordrecht: Springer.
- Capart A.** (1951) Crustacés Décapodes Brachyures. *Expédition océanographique Belge dans les eaux côtières africaines de l'Atlantique Sud (1948–1949)*. *Résultats Scientifiques* 3, 11–205, Plates 1–3.
- Capezzuto F., Maiorano P., Panza M., Indennitate A., Sion L. and D'Onghia G.** (2012) Occurrence and behaviour of *Paromola cuvieri* (Crustacea, Decapoda) in the Santa Maria di Leuca cold-water coral community (Mediterranean Sea). *Deep-sea Research. Part 1. Oceanographic Research Papers* 59, 1–7.
- Cartes J.E., Maynou F., Fanelli E., Papiol V. and Lloris D.** (2009) Long-term changes in the composition and diversity of deep-slope megabenthos and trophic webs off Catalonia (western Mediterranean): are trends related to climatic oscillations? *Progress in Oceanography* 82, 32–46.
- Cartes J.E., Maynou F., Moranta J., Massuti E., Lloris D. and Morales-Nin B.** (2004) Patterns of bathymetric distribution among deep-sea fauna at local spatial scale: comparison of mainland vs insular areas. *Progress in Oceanography* 60, 29–45.
- Cartes J.E., Serrano A., Velasco F., Parra S. and Sánchez F.** (2007) Community structure and dynamics of deep-water decapod assemblages from Le Danois Bank (Cantabrian Sea, NE Atlantic): influence of environmental variables and food availability. *Progress in Oceanography* 75, 797–816.
- Castro P.** (2007) A reappraisal of the family Goneplacidae MacLeay, 1838 (Crustacea, Decapoda, Brachyura) and revision of the subfamily Goneplacinae, with the description of 10 new genera and 18 new species. *Zoosystema* 29, 609–774.
- Colloca F., Carpentieri P., Balestri E. and Ardizzone G.D.** (2004) A critical habitat for Mediterranean fish resources: shelf-break areas with *Leptometra phalangium* (Echinodermata: Crinoidea). *Marine Biology* 145, 1129–1142.
- Colosi G.** (1923) Una specie fossile de Gerionide (Decapodi brachiuri). *Boletino della Società dei Naturalisti in Napoli* 35 (Series 2, Vol. 15), 248–255.
- Company J.B., Maiorano P., Tselepides A., Politou C.Y., Plaity W., Rotllant G. and Sardà F.** (2004) Deep-sea decapod crustaceans in the western and central Mediterranean Sea: preliminary aspects of species distribution, biomass and population structure. *Scientia Marina* 68, 73–86.
- Dana J.D.** (1851) *Conspectus Crustaceorum quæ in Orbis Terrarum circumnavigatione, Carolo Wilkes e Classe Reipublicæ Fœderatæ Duce, lexit et descripsit. Proceedings of the Academy of Natural Sciences of Philadelphia* 5, 247–254.
- de Brito Capello F.** (1876) *Catalogo dos Crustaceos de Portugal. Jornal de sciencias mathematicas, physicas e naturaes, Lisboa* 5, 264–274, plate.
- De Grave S., Pentcheff N.D., Ah Yong S.T., Chan T.-Y., Crandall K.A., Dworschak P.C., Felder D.L., Feldmann R.M., Fransén C.H.J.M., Goulding L.Y.D., Lemaitre R., Low M.E.Y., Martin J.W., Ng P.K.L., Schweitzer C.E., Tan S.H., Tshudy D. and Wetzer R.** (2009) A classification of the living and fossil genera of decapod Crustaceans. *Raffles Bulletin of Zoology* (Suppl. 21), 1–109.
- Doflein F.** (1904) Brachyura. In Chun C. (ed.) *Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition auf dem Dampfer 'Valdivia' 1898–1899*, Volume 6. Jena: Verlag von Gustav Fischer, i–xiv, 314 pp, 58 plates, 1 text plate.
- d'Udekem d'Acoz C.** (1999) Inventaire et distribution des crustacés décapodes de l'Atlantique nord-oriental, de la Méditerranée et des eaux continentales adjacentes au nord de 25°N. *Patrimoines Naturels (M.N.H.N./S.P.N.)* 40, 1–383.
- Duineveld G.C.A., Lavalaye M.S.S. and Van Noort G.J.** (1993) The trawl fauna of the Mauritanian shelf (Northwest Africa): density, species composition and biomass. In Wolff W.J., Van Der Land J., Nieuhuis P.H. and de Wilde P.A.W.J. (eds) *Ecological studies in the coastal waters of Mauritania: Proceedings of a symposium held at Leiden, the Netherlands, 25–27 March 1991*. *Hydrobiologia* 258, 165–174.
- El Lakhraç H., Hattour A., Jarboui O., Elhasni K. and Ramos-Esplá A.** (2012) Spatial distribution and abundance of the stomatopoda and decapoda crustaceans sampled by bottom trawl in the Gulf of Gabes (Tunisia, Central Mediterranean). *Cahiers de Biologie Marine* 53, 435–446.
- Ellis J.R., Martínez I., Burt G.J. and Scott B.E.** (2013) Epibenthic assemblages in the Celtic Sea and associated with the Jones Bank. *Progress in Oceanography* 117, 76–88.
- Escobar-Briones E.G., Gaytan-Caballero A. and Legendre P.** (2008) Epibenthic megacrustaceans from the continental margin, slope and abyssal plain of the Southwestern Gulf of Mexico: factors responsible for variability in species composition and diversity. *Deep Sea Research* 55, 2667–2678.
- Fabricius J. C.** (1793) *Entomologia systematica emendata et aucta. Secundum, Classes, Ordines, Genera, Species adjectis synonymis, locis, observationibus, descriptionibus*, Volume 2. Christian Gottlieb Proft, Hafniae (=Copenhagen) viii+519 pp.
- Fanelli E.F., Cartes J.E., Badalamenti F., Rumolo P. and Sprovieri M.** (2009) Trophodynamics of suprabenthic fauna on coastal muddy bottoms of the southern Tyrrhenian Sea (western Mediterranean). *Journal of Sea Research* 61, 174–187.
- Fanelli E.F., Colloca F. and Ardizzone G.D.** (2007) Decapod crustacean assemblages off the West coast of central Italy (western Mediterranean). *Scientia Marina* 71, 19–28.
- Filhol H.** (1885) *La vie au fond des mers*. Paris: La Nature 13(1) (623, 9 May), 355–358, figs. 1–3; (626, 30 May), 411–414, figs. 1, 2; 13(2) (630, 27 June), 55–58, figs. 1–3; (635, 1 August), 132–134, figs. 1–3; (641, 12 September), 227–230, figs. 1–3; (644, 3 October), 283–286, figs. 1–4; (650, 14 November), 379–382, figs. 1, 2; (652, 28 November), 407–410, figs. 1–3.
- Forest J.** (1957) Sur la validité et le nom des deux espèces d'*Atelecyclus* (Crustacea Decapoda Brachyura). *Bulletin du Muséum national d'Histoire naturelle, Paris*, 2e série 29, 469–474.
- Forest J.** (1978) Le genre *Macropodia* Leach dans les eaux atlantiques européennes (Crustacea Brachyura Majidae). *Cahiers de Biologie Marine* 19, 323–342.
- Forest J. and Zariquiey Álvarez R.** (1964) Le genre *Macropodia* Leach en Méditerranée. I. Description et étude comparative des espèces (Crustacea Brachyura Majidae). *Bulletin du Muséum national d'Histoire naturelle, Paris*, 2e série 36, 222–244.
- Fransen C.H.J.M.** (1991) *Preliminary report on Crustacea collected in the eastern part of the North Atlantic during CANCAP and MAURITANIA Expeditions of the former Rijksmuseum van Natuurlijke Historie, Leiden*. Leiden: National Natuurhistorisch Museum, 200 pp.
- Gaertner D. and Laloé F.** (1986) Étude biométrique de la taille à première maturité sexuelle de *Geryon maritae* Manning et Holthuis, 1981 du Sénégal. *Oceanologica Acta* 9, 479–487.
- García-Muñoz J.E., Manjón-Cabeza M.E. and García-Raso J.E.** (2008) Decapod crustacean assemblages from littoral bottoms of the Alborán Sea (Spain, west Mediterranean Sea): spatial and temporal variability. *Scientia Marina* 72, 437–449.
- García Raso J.E.** (1984) Brachyura of the coast of Southern Spain. *Spixiana* 7, 105–113.
- García Raso J.E.** (1989) Resultados de la segunda campaña del I.E.O. para la exploración de los fondos de Coral Rojo en el Mar de Alborán.

- Crustáceos Decápodos. *Boletín Instituto Español de Oceanografía* 5, 27–36.
- García Raso J.E.** (1996) Crustacea Decapoda (excl. Sergestidae) from Ibero-Moroccan waters. Results of Balgim-84 Expedition. *Bulletin of Marine Science* 58, 730–752.
- García Raso J.E. and Manjón-Cabeza M.E.** (2002) An infralittoral decapod crustacean community of southern Spain affected by anthropogenic disturbances. *Journal of Crustacean Biology* 22, 83–90.
- Giacobbe S. and Spano N.** (2006) A new record of *Euchirograpsus liguricus* (Decapoda, Brachyura) in the Mediterranean Sea. *Crustaceana* 79, 555–562.
- González J.A., Santana J.I. and Fernández-Vergaz V.** (1996) The family Geryonidae (Decapoda, Brachyura) in the Canary Islands. *Crustaceana* 69, 627–635.
- González-Gurriarán E. and Méndez M.** (1986) *Crustáceos decápodos das costas de Galicia. I. Brachyura*. Cuadernos da Área de Ciencias Biolóxicas, Seminario de Estudos Galegos, Volume 2 (2nd edition). Ed. do Castro, Castro-Sada O. and Coruña A. Do Castro, pp. 1–242.
- González Pérez J.A.** (1995) *Catálogo de los Crustáceos Decápodos de las Islas Canarias. Gambas, Langostas, Cangrejos*. Santa Cruz de Tenerife: Publicaciones. Turquesa, 282 pp.
- González Pérez J.A. and Quiles Lucas J.A.** (2003) Arthropoda Decapoda. In Moro L., Martín J.L., Garrido M.J. and Izquierdo I. (eds) *Lista de especies marinas de Canarias (algas, hongos, plantas y animales)*. Consejería de Política Territorial y Medio Ambiente del Gobierno de Canarias, España, pp. 74–80.
- Griffin D.J.G.** (1974) Spider crabs (Crustacea: Brachyura: Majidae) from the International Indian Ocean Expedition, 1963–1964. *Smithsonian Contributions to Zoology* 182, 1–35.
- Guerao G. and Abelló P.** (2007) The first zoea morphology of *Inachus aguairii*, *Inachus communissimus* and *Ergasticus clouei* (Decapoda, Brachyura, Majoidea) with implications for Inachidae systematics. *Zootaxa* 1429, 55–68.
- Guillén J. E., Gras D., Soler G. and Triviño A.** (2011) Relationship between taxocenoses of decapod crustaceans and characteristics of coastal detritic bottoms in the east and southeast of the Spanish coast. *Mediterranea. Serie Estudios Biológicos, Época II, Número Especial*, 31 pp.
- Guinot D.** (1961) Caracteres et affinités de *Macropipus australis* sp.nov., Crustace Decapode Brachyure de la cote sud-ouest Africaine. *Bulletin de l'Institut royal des Sciences naturelles de Belgique* 37, 1–13, figures 1–7, plates 1, 2.
- Guinot D.** (1967) Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyours. II. Les anciens genres *Micropanope* Stimpson et *Medaeus* Dana. *Bulletin du Muséum national d'Histoire naturelle, Paris, 2<sup>e</sup> série* 39, 345–374.
- Guinot D.** (1977) Propositions pour une nouvelle classification des Crustacés Décapodes Brachyours. *Comptes rendus hebdomadaires des séances de l'Académie des sciences, série D* 285, 1049–1052.
- Guinot D. and Castro P.** (2007) A new species of *Goneplax* Leach, 1814 (Crustacea, Decapoda, Brachyura, Goneplacidae) from the south Atlantic and the western limits of the Indo-West Pacific region, long confused with *G. rhomboides* (Linnaeus, 1758). *Zootaxa* 1577, 17–31.
- Guinot D. and Macpherson E.** (1988) Remarques sur le genre *Monodaeus* Guinot, 1967, avec la description de deux espèces nouvelles (Crustacea, Decapoda, Brachyura). *Bulletin du Muséum national d'Histoire naturelle, Paris, 4<sup>e</sup> série* 10, 731–757.
- Guinot D. and Richer de Forges B.** (1995) Crustacea, Decapoda, Brachyura: Révision de la famille des Homolidae de Haan, 1839. In Crosnier A. (ed.) *Résultats des Campagnes MUSORSTOM, Volume 13. Mémoires du Muséum national d'Histoire naturelle Paris* 163, 283–517.
- Haan W. de** (1833–1850) Crustacea. In Siebold P. F. von (ed.) *Fauna Japonica sive Descriptio animalium, quae in Itinere per Japoniam, jussu et auspiciis Superiorum, Qui Summun in India Batava Imperium Tenent, suscepto, Annis 1823–1830 collegit, notis, observationibus e adumbrationibus illustravit*. Lugduni-Batavorum, Leiden, fasc. 1–8, pp. i–xxx, i–xvii, i–xxxi, 1–243, plates 1–55, A–J, L–Q, circular Table 2. [1833, fasc. 1, Praemissa, pp. ix, x; 1839, fasc. 4, pp. 73–108.]
- Henriksen C.S.** (2009) *Investigation of crustaceans from shelf areas in the Gulf of Guinea, with special emphasis on Brachyura*. Master thesis. University of Bergen, Norway, 163 pp.
- Herklots J.A.** (1851) *Addimenta ad Faunam Carcinologicam Africae Occidentalis, sive, Descriptiones specierum novarum e Crustaceorum ordine quas in Guinea collegit vir strenuus H.S. Pel.* Leiden: Lugduni-Batavorum, pp. 1–31.
- Hernández J.C., Clemente S., Tuya F., Pérez-Ruzafa A., Sangil C., Moro-Abad L. and Bacallado-Aránega J.J.** (2013) Echinoderms of the Canary Islands, Spain. In Alvarado J.J. and Solis-Marín F.A. (eds) *Echinoderm research and diversity in Latin America*. Heidelberg: Springer, pp. 471–510.
- Isajlović I., Vrgoč N. and Dulčić J.** (2009) On a record of the box crab, *Paromola cuvieri* (Risso, 1816) (Decapoda, Brachyura, Homolidae) in the south-east Adriatic (Croatian waters). *Crustaceana* 82, 1087–1090.
- Latreille P.A.** (1802) *Histoire naturelle, générale et particulière des Crustacés et des Insectes. Ouvrage faisant suite à l'histoire naturelle générale et particulière, composée par Leclerc de Buffon, et rédigée par C.S. Sonnini, membre de plusieurs Sociétés savantes. Familles naturelles des genres*. Tome 3. Paris: F. Dufart, 467 pp.
- Latreille P.A.** (1803) *Histoire naturelle générale et particulière des Crustacés et des insectes*. Tome 6. Paris: F. Dufart, 390 pp.
- Leach W.E.** (1813–1815) Crustaceology. In Brewster D. (ed.) *The Edinburgh Encyclopædia*. Vol. 7. Edinburgh: Blackwood, pp. 383–384 [1813], 385–437, 765–766 [1814], plate 221 [1815].
- Leach W.E.** (1815–1875) *Malacostraca podophthalmata britanniae; or descriptions of such British species of the Linnean genus Cancer as have their eyes elevated on footstalks*. London: Sowerby, 124 pp, plates 1–45.
- Le Lœuff P.** (1993) La faune benthique des fonds chalus, ables du plateau continental de la Guinée. Premiers résultats en référence à la faune de la Côte-d'Ivoire. *Revue d'Hydrobiologie Tropicale* 26, 229–252.
- Le Roux L.** (2001) The impact of emigration on population estimates of deep-sea red crab *Chaceon maritae* off Namibia. *South African Journal of Marine Sciences* 23, 61–66.
- Linnaeus C.** (1758) *Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Editio decima reformata. Holmiæ, Impensis direct, Laurentii Salvii (Estocolmo, Salvius publ.), tomus I, 1–824.
- Linnaeus C.** (1767) *Systema naturæ, Tom. I. Pars II. Editio duodecima, reformata*. Holmiæ: Laurentii Salvii, pp. 533–1327.
- Macpherson E.** (1983) Crustáceos decápodos capturados en las costas de Namibia. *Resultados Expediciones Científicas* 11, 3–80.
- Macpherson E.** (1988) Revision of the family Lithodidae Samouelle, 1819 (Crustacea, Decapoda, Anomura) in the Atlantic Ocean. *Monografías de Zoología Marina* 2, 9–153.
- Macpherson E.** (1991) Biogeography and community structure of the decapod Crustacean fauna of Namibia (Southeast Atlantic). *Journal of Crustacean Biology* 11, 401–415.

- Manning R.B. and Holthuis L.B.** (1981) West African Brachyuran Crabs. *Smithsonian Contributions to Zoology* 306, 1–379.
- Manning R.B. and Holthuis L.B.** (1989) Two new genera and nine new species of geryonid crabs (Crustacea, Decapoda, Geryonidae). *Proceedings of the Biological Society of Washington* 102, 50–77.
- Martin J.W. and Haney T.A.** (2005) Decapod crustaceans from hydrothermal vents and cold seeps: a review through 2005. *Zoological Journal of the Linnean Society* 145, 445–522.
- Massi D., Micalizzi R., Giusto G.B. and Pipitone C.** (2010) First record of *Heterocrypta maltzami* Miers, 1881 (Decapoda, Brachyura, Parthenopidae) in the Strait of Sicily. *Crustaceana* 83, 1141–1145.
- Maurin C.** (1968) Les crustacés captures par la ‘Thalassa’ au large des côtes nord-ouest africaines. *Revue Roumaine de Biologie (Série de Zoologie)* 13, 479–493.
- Mavidis M., Türkay M. and Koukouras A.** (2008) The genera *Atergatis*, *Microcassiope*, *Monodaesus*, *Paractea*, *Paragalene*, and *Xantho* (Decapoda, Xanthidae) in the Mediterranean Sea. *Crustaceana* 81, 1035–1053.
- Maynou F. and Cartes J.E.** (2000) Community structure of bathyal decapod crustaceans off south-west Balearic Islands (western Mediterranean): seasonality and regional patterns in zonation. *Journal of the Marine Biological Association of the United Kingdom* 80, 789–798.
- Melville Smith R.** (1988) The commercial fishery for and population dynamics of red crab *Geryon maritae* off South West Africa, 1976–1986. *South African Journal of Marine Sciences* 6, 79–95.
- Menzies R.J., George R.Y. and Rowe G.T.** (1973) *Abyssal environment and ecology of the world oceans*. New York, NY: John Wiley and Sons.
- Metin C., Gökçe G., Aydin I. and Bayramiç I.** (2009) Bycatch reduction in trammel net fishery for prawn (*Melicertus kerathurus*) by using guarding net in İzmir bay on Aegean Coast of Turkey. *Turkish Journal of Fisheries and Aquatic Sciences* 9, 133–136.
- Miers E.J.** (1881) On a Collection of Crustacea made by Baron Hermann Maltzam [sic] at Goree Island, Senegambia. *Annals and Magazine of Natural History, series 5* 8, 204–220, 259–281, 364–377, plates 13–16.
- Milne-Edwards A.** (1880) Reports on the results of dredging, under the supervision of Alexander Agassiz, in the Gulf of Mexico, and in the Caribbean Sea, 1877, '78, '79, by the U. S. Coast Survey Steamer ‘Blake’, Lieut.-Commander C.D. Sigsbee, U.S.N., and Commander J.R. Bartlett, U.S.N., commanding. VIII. Études préliminaires sur les Crustacés. *Bulletin of the Museum of Comparative Zoology at Harvard College* 8: 1–68, plates 1–2.
- Milne-Edwards A.** (1883) *Recueil de figures de crustacés nouveaux ou peu connus*. Expedition du Travailleur, 3 pp, plates 1–44.
- Milne-Edwards A. and Bouvier E.-L.** (1897) Crustacés nouveaux provenant des campagnes du Travailleur et du Talisman. *Bulletin du Muséum d'Histoire naturelle, Paris, 1er série* 3, 297–301.
- Milne-Edwards A. and Bouvier E.-L.** (1898) Crustacés provenant des campagnes du Travailleur et du Talisman. *Bulletin du Muséum d'Histoire naturelle, Paris, 1<sup>er</sup> série* 4, 152–154.
- Milne-Edwards A. and Bouvier E.-L.** (1899) Crustacés décapodes provenant des campagnes de l'Hirondelle (supplément) et de la Princesse-Alice (1891–1897). *Résultats des Campagnes Scientifiques accomplies sur son Yacht par Albert Ier Prince Souverain de Monaco* 13, 1–106.
- Milne-Edwards A. and Bouvier E.-L.** (1900) Crustacés décapodes. Première partie. Brachyures et Anomoures. In Milne-Edwards A. (ed.) *Expéditions scientifiques du Travailleur et du Talisman pendant les années 1880, 1881, 1882, 1883*. Paris: Masson, pp. 1–396, 32 pls.
- Milne-Edwards H.** (1853) Memoire sur la famille des Ocypodiens, suite. *Annales des Sciences Naturelles, series 3 (Zoology)* 20, 163–228, plates 6–11.
- Modena M., Mori M. and Vacchi M.** (2001) Note su alcuni crostacei malacostraci raccolti in aree adiacenti alla M/C Haven (Mar Ligure). *Biologia Marina Mediterranea* 8, 675–679.
- Monod T.** (1933) Sur quelques Crustacés de l'Afrique occidentale (liste des Décapodes Mauritanien et des Xanthidés ouest-Africains). *Bulletin du Comité d'Études Historiques et Scientifiques de l'Afrique Occidentale Française* 15[1932], 456–548.
- Monod T.** (1946) Sur la présence du genre *Acanthocarpus* dans l'Atlantique oriental. *Publicações do Instituto de Zoologia do Porto* 32, 7–8, figs 1–4, 1 plate.
- Monod T.** (1956) Hippidea et Brachyura ouest-africains. *Mémoires de l'Institut Français d'Afrique Noire* 45, 1–674, Figures 1–884, Tables 1–10.
- Monteiro P., Araújo A., Erzini K. and Castro M.** (2001) Discards of the Algarve (southern Portugal) crustacean trawl fishery. *Hydrobiologia* 449, 267–277.
- Muñoz I., García-Isarch E., Sobrino I., Burgos C., Funny R. and González-Porto M.** (2012) Distribution, abundance and assemblages of decapod crustaceans in waters off Guinea-Bissau (north-west Africa). *Journal of the Marine Biological Association of the United Kingdom* 92, 475–494.
- Mura M. and Cau A.** (2002) Occurrence of a rare deep-sea crab, *Cyonomus granulatus* (Norman, 1873) (Decapoda, Brachyura), in the Sardinian Channel. *Crustaceana* 75, 1133–1139.
- Mutlu E. and Ergev M.B.** (2008) Spatio-temporal distribution of soft-bottom epibenthic fauna on the Cilician shelf (Turkey), Mediterranean Sea. *Revista de biologia tropical* 56, 1919–1946.
- Neudecker T., Schiefenhövel K., Kehlert T. and Becker K.-H.** (2011) On the occurrence of angular crab (*Goneplax rhomboides*, Linnaeus 1758) in the German Bight, North Sea. *Marine Biodiversity* 41, 555–561.
- Ng P.K.L., Guinot D. and Davie P.J.F.** (2008) Systema Brachyorum: Part I. An annotated checklist of the extant Brachyuran crabs of the world. *Raffles Bulletin of Zoology Supplement Series* 17, 1–286.
- Ng P.K.L., Wang C.-H., Ho P.-H. and Shih H.-T.** (2001) An annotated checklist of brachyuran crabs from Taiwan (Crustacea: Decapoda). *National Taiwan Museum Special Publication Series* 11, 1–86.
- Olivi G.** (1792) Catalogo ragionato degli Animali del Golfo e delle Lagune di Venezia; preceduto da una Dissertazione sulla Storia fisica e naturale del Golfo; e accompagnato da Memorie, ed Osservazioni di Fisica Storia naturale ed Economia. *Zoologia Adriatica*, Bassano, xxxii+334 pp, pls. 1–9.
- Ortmann A.E.** (1892) Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen. V Theil. Die Abtheilungen Hippidea, Dromiidea und Oxystomata. *Zoologische Jahrbücher. Abtheilung für Systematik, Geographie und Biologie der Thiere* 6, 532–588.
- Ortmann A.E.** (1893) Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen. VII. Theil. Abtheilung: Brachyura (Brachyura genuina Boas) II. Unterabtheilung: Cancroidea, 2. Section: Cancrinea, 1. Gruppe: Cyclometopa. *Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Thiere* 7, 411–495, plate 17.

- Pastor M.V., Pelegrí J.L., Hernández-Guerra A., Font J., Salat J. and Emelianov M. (2008) Water and nutrient fluxes off Northwest Africa. *Continental Shelf Research* 28, 915–936.
- Pennant T. (1777) *Crustacea, mollusca, testacea*. *British zoology*, Volume 4. London: White, 154 pp, 93 pls.
- Pielou E.C. (1992) *Biogeography*. Malabar: Krieger Publishing Company.
- Pipitone C. and Arculeo M. (2003) The marine Crustacea Decapoda of Sicily (central Mediterranean Sea): a checklist with remarks on their distribution. *Italian Journal of Zoology* 70, 69–78.
- Pipitone C. and Tumbiolo M.L. (1993) Decapod and stomatopod crustaceans from the trawlable bottoms of the Sicilian Channel (central Mediterranean Sea). *Crustaceana* 65, 358–364.
- Pipitone C. and Vaccaro A.M. (2011) Crustacea Decapoda from Ustica (southern Tyrrhenian Sea): species distribution in different habitats and sampling approach. In Pessani D., Tirelli T. and Froggia C. (eds) *IX Colloquium Crustacea Mediterranea Torino, Spetember 2–6, 2008*. Torino: Museo Regionale di Scienze Naturali, pp. 413–434.
- Politou C.-Y., Maiorano P., D'Onghia G. and Mytilineou C. (2005) Deep-water decapod crustacean fauna of the Eastern Ionian Sea. *Belgian Journal of Zoology* 135, 235–241.
- Porporato E.M.D., de Domenico F., Mangano M.C., Rinelli P. and Spanò N. (2012) *Ebalia nux* (Decapoda, Brachyura) found among the leaves of *Pteroeides spinosum* (Anthozoa, Octocorallia). *Crustaceana* 85, 125–128.
- Risso A. (1816) *Histoire naturelle des Crustacés des environs de Nice*. Paris: Librairie Grecque-Latine-Allemande, 175 pp., pl. 1–3.
- Rossetti I., Sartor P., Francesconi B., Mori M. and Belcari P. (2006) Biological aspects of *Medorippe lanata* (Linnaeus, 1767) (Brachyura: Dorippidae) from the Eastern Ligurian Sea (Western Mediterranean). *Hydrobiologia* 557, 21–29.
- Roux P. (1828–1830) *Crustacés de la Méditerranée et de son littoral. Décrits et Lithographiés par Polydore Roux, Conservateur du Cabinet d'histoire naturelle de la Ville de Marseille*. Paris, 174 [unnumbered] pp, plates 1–10 [1828], plates 11–15 [1829], plates 16–45 [1830].
- Saint Laurent M. de (1980) Sur la classification et la phylogénie des Crustacés Décapodes Brachyours. I. Podotremata Guinot, 1977 et Eubrachyura sect. nov. *Comptes rendus hebdomadaires des séances de l'Académie des sciences, série D* 290, 1265–1268.
- Samouelle G. (1819) *The entomologist's useful compendium; or an introduction to the knowledge of British insects, comprising the best means of obtaining and preserving them, and a description of the apparatus generally used; together with the genera of Linné, and the modern method of arranging the classes Crustacea, Myriapoda, Spiders, Mites and Insects, from their affinities and structure, according to the views of Dr. Leach; also an explanation of the terms used in entomology; a calendar of the times of appearance and usual situations of near 3,000 species of British insects; with instructions for collecting and fitting up objects for the microscope*. London, 496 pp., 12 pls.
- Sánchez F., Serrano A., Parra A., Ballesteros M. and Cartes J.E. (2008) Habitat characteristics as determinant of the structure and spatial distribution of epibenthic and demersal communities of Le Danois Bank (Cantabrian Sea, N Spain). *Journal of Marine Systems* 72, 64–86.
- Sánchez-Jerez P., Barberá-Cebrián C. and Ramos-Esplá A.A. (2000) Influence of the structure of *Posidonia oceanica* (Linnaeus) Delile, 1813 meadows modified by bottom trawling on crustacean assemblages: comparison of amphipods and decapods. *Scientia Marina* 64, 319–326.
- Sardà F., Company J.B. and Castellón A. (2003) Intraspecific aggregation structure of a shoal of a western Mediterranean (Catalan coast) deep-sea shrimp, *Aristeus antennatus* (Risso, 1816), during the reproductive period. *Journal of Shellfish Research* 22, 569–579.
- Sartor P., Francesconi B., Rossetti I. and de Ranieri S. (2006) Catch composition and damage incurred to crabs discarded from the Eastern Ligurian Sea 'rapido' trawl fishery. *Hydrobiologia* 557, 121–133.
- Serrano A., Sánchez F. and García-Castrillo G. (2006) Epibenthic communities of trawlable grounds of the Cantabrian Sea. *Scientia Marina* 70(S1), 149–159.
- Serrano A., Sánchez F., Punzón A., Velasco F. and Olaso I. (2011) Deep sea megafaunal assemblages off the northern Iberian slope related to environmental factors. *Scientia Marina* 75, 425–437.
- Soto L.A. (1991) Faunal zonation of the deep-water brachyuran crabs in the Straits of Florida. *Bulletin of Marine Science* 49, 623–637.
- Stephenson W. and Campbell B. (1960) The Australian portunids (Crustacea: Portunidae) IV: Remaining genera. *Australian Journal of Marine and Freshwater Research* 11, 73–122, plates 1–6.
- Stimpson W. (1871) Preliminary report on the Crustacea dredged in the Gulf Stream in the Straits of Florida, by L.F. de Pourtales, Assist. U. S. Coast Survey. Part I. Brachyura. *Bulletin of the Museum of Comparative Zoology at Harvard College* 2, 109–160.
- Stramma L. and Schott F. (1999) The mean flow field of the tropical Atlantic Ocean. *Deep Sea Research Part II: Topical Studies in Oceanography* 46, 279–303.
- Tan S.H. (2004) *A systematic revision of the Parthenopidae (Crustacea: Decapoda: Brachyura)*. PhD thesis. Department of Biological Sciences, National University of Singapore, 730 pp.
- Tan S.H. and Low M.E. (2014) The Mediterranean and Eastern Atlantic species of *Spinolambrus* Tan & Ng, 2007: *S. macrochelos* (Herbst, 1790), *S. notialis* (Manning & Holthuis, 1981) and *S. verrucosus* (Studer, 1883), with a note on the identity of *Lambrus spinosissimus* Osório, 1923 (Crustacea: Decapoda: Brachyura: Parthenopidae). *Zootaxa* 3753, 96–100.
- Tan S.H. and Ng P.K.L. (2007) Descriptions of new genera from the subfamily Parthenopinae (Crustacea: Decapoda: Brachyura: Parthenopidae). *Raffles Bulletin of Zoology Supplement* 16, 95–119.
- Thomson C.W. (1873) *The depths of the sea. An account of the general results of the dredging cruises of H. M.S.S. Porcupine and Lightning during the summers of 1868, 1869 and 1870, under the scientific direction of Dr Carpenter, F. R. S., J. Gwyn Jeffreys, F. R. S., and Dr Wyville Thomson, F. R. S*. London: Macmillan, 527 pp.
- Trenkel V.M., Le Loc'h F. and Rochet M.J. (2007) Small-scale spatial and temporal interactions among benthic crustaceans and one fish species in the Bay of Biscay. *Marine Biology* 151, 2207–2215.
- Türkay M. (1975) Zur Kenntnis der Gattung *Euchirograpsus* mit Bemerkungen zu *Brachygrapsus* und *Litocheira* (Crustacea: Decapoda). *Senckenbergiana Biologica* 52, 103–132.
- Ungaro N., Marano C.A., Ceriola L. and Martino M. (2005) Distribution of demersal crustaceans in the southern Adriatic Sea. *Acta Adriatica* 46, 27–40.
- Van Soest R.W.M. (1993) Distribution of sponges on the Mauritanian continental shelf. *Hydrobiologia* 258, 95–106.
- Vincent T. (2005) Quelques Crustacés rares en Manche – Stomatopodes et Décapodes – Des collections du Muséum d'histoire naturelle du Havre (Normandie, France): *Rissoides desmaresti*, *Nephrops norvegicus* et *Goneplax rhomboïdes*. *Bulletin de la Société géologique de Normandie et des amis du Muséum du Havre* 92, 23–32.
- Weber F. (1795) *Nomenclator entomologicus secundum nomenclologiam systematicam ill. Fabricii, adjectis speciebus recens detectis et varietatibus*. Chilonii et Hamburg, C.E. Bohn, pp. i–viii, 1–171.
- Wood-Mason J. and Alcock A. (1891) Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander R. F.



Hoskyn, R. N., commanding.— No. 21. Note on the Results of the last Season's Deep-sea Dredging. *Annals and Magazine of Natural History, series 6* 7, 1–19, 186–202, 258–272.

**Yaldwyn J.C. and Webber W.R.** (2011) Annotated checklist of New Zealand Decapoda (Anthropoda: Crustacea). *Tuhinga* 22, 171–272.

**Zariquiey Álvarez R.** (1948) Decapodos españoles I. Formas mediterráneas nuevas o interesantes. *Revista Española de Entomología* 24, 257–309.

and

**Zariquiey Álvarez R.** (1968) Crustáceos Decápodos Ibéricos. *Investigación Pesquera* 32, 1–510.

**Correspondence should be addressed to:**

S.S. de Matos-Pita and F. Ramil  
Facultad de Ciencias del Mar, Universidad de Vigo, Campus  
Lagoas-Marcosende, Vigo 36310, Pontevedra, España  
email: [soto@uvigo.es](mailto:soto@uvigo.es); [framil@uvigo.es](mailto:framil@uvigo.es)