

CRUSTACEA DECAPODA (EXCL. SERGESTIDAE) FROM  
IBERO-MOROCCAN WATERS. RESULTS OF  
BALGIM-84 EXPEDITION

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ABSTRACT

During the Balgim-84 Expedition, carried out from both sides of the Straits of Gibraltar (Atlantic Ocean: Gulf of Cadiz and Mediterranean Sea: Alboran Sea), in depths between 137 and 2,142 m, 3,559 specimens of decapods belonging to 122 species were captured. Many of these species are rare, of biogeographical interest and represent new records for the area. For some species, anatomical details are given. A specimen of *Plesionika* may be a new species. The collection of *Calocarides coronatus*, *Sympagurus acinops*, *Monodaeus guinotae*, *Periclimenes kornii*, *Alpheus talismani*, *Athanas amazone*, *Merhippolyte ancistrosta*, *Eualus cf. lebourae*, *Plesionika williamsi*, *Pontophilus cf. abyssi*, *Spongicoloides evolutus*, *Spongicoloides profundus*, *Odontozona edwardsi*, *Catapaguroides iris* and *Strobopagurus gracilipes*, among others, represents new records for the Mediterranean Sea, eastern Atlantic, and Iberian waters.

Deep fauna studies from the southern part of Spain and the northern coast of Morocco, Gulf of Cadiz and Alboran Sea, have been undertaken by large expeditions using such research ships as: HIRONDELLE (years 1886, 1887, 1888); PRINCESSE-ALICE (1885-1915) (Milne Edwards and Bouvier, 1894, 1899; Bouvier, 1908, 1917, 1922; Hansen, 1922); the TRAVAILLEUR (1880-1882); TALISMAN (1883) (Milne Edwards and Bouvier, 1900; Hansen, 1927); THOR (1908-1910) (Stephensen, 1923); M. SARS (1910) (Silvertsen and Holthuis, 1956; Sund, 1920); FAÏAL (1957) (Nunes-Ruivo, 1961); PRESIDENTE THÉODORE-TISSIER (1957-1960) and THALASSA (1960-1961) (Maurin, 1961, 1962, 1965); CALYPSO (1958) (Pérès, 1962); ATLANTIS II (1969) and THOR (1908-1910) (Casanova and Judkins, 1977; Casanova, 1977). Other expeditions were made by the THALASSA (1966-1968) (Casanova, 1977); METEOR (Türckay, 1976) and GARCÍA DEL CID (Exp. Fauna I, Templado et al., 1993).

Other less extensive expeditions or local studies, conducted to analyse the fauna of the Gulf of Cadiz and Alboran Sea were "Golfo de Cadiz 81 Expedition" (Sardá, et al., 1982), XAÛEN (1965, 1966) (Massuti, 1967), MÁLAGA 775 (1975) (Crespo, et al., 1976) and the I.E.O. expeditions to study the red coral bottoms of the Alboran Sea (García Raso, 1989), the studies of Miranda y Rivera (1933), Ribeiro-Cascalho (1987), García Raso (1981, 1982, 1984a, 1984b, 1985), and others.

A general review of some groups of decapods (Natantia and Macrura Reptantia) from the Moroccan littoral zone were made by Lagardère (1971) and Beaubrun (1978), and previously Zariquiey (1968) published the Iberian Decapods.

All the above cited and other littoral studies have provided a great deal of information of the decapod fauna of this interesting geographical zone, in which a strong dynamic water-mass exists (Madelain, 1970; Huang and Stanley, 1972; Lanoix, 1974; Cano and Gil, 1984; Parrilla and Kinder, 1987; Almazan et al., 1989.). In 1977, Casanova studied the deep pelagic fauna.

Hydrodynamic processes play an important role in the transport and biological exchange between the Atlantic Ocean and the Mediterranean Sea, while the Strait of Gibraltar exhibit a boundary effect. However, the knowledge of the compara-

tive fauna between both "basins" (Alboran and Gulf of Cadiz), the importance of the Straits of Gibraltar as a boundary, and the influence of the water fluxes in the faunistic distribution and composition, are topics that have been poorly analyzed.

The objective of the present paper is to extend the knowledge of decapods, mainly the deep fauna, on both sides of the Straits of Gibraltar. Moreover, it provides us data to establish faunistic affinities and, in part, the influence of water mass circulation on the benthic species distribution.

The pelagic Family Sergestidae has been excluded, but it is the best known decapod group in the analyzed area, both faunistically and biogeographically (including its dynamics through the Straits of Gibraltar) (Abbes and Casanova, 1973; Casanova, 1977; Casanova and Judkins, 1977; Lagardère, 1978). In the Ibero-Moroccan area (At) and Alboran Sea (AL), 13 species belonging to this family have been cited: *Sergestes arcticus* Kröyer, 1855 (At-Al); *Sergestes vigilax* Stimpson, 1860 (At-Al); *Sergestes henseni* (Ortmann, 1893) (At-Al); *Sergestes sargassi* Ortmann, 1893 (At-Al); *Sergestes atlanticus* H. Milne Edwards, 1830 (At); *Sergestes armatus* Kröyer, 1855 (At); *Sergestes pectinatus* Sund, 1920 (At); *Sergia crassus* Hansen, 1922 (= *S. splendens* Sund, 1920) (At); *Sergia robustus* (Smith, 1882) (At-Al); *Sergia japonicus* Bate, 1881 (Al); *Sergia tenuiremis* Kröyer, 1885 (At); *Sergia grandis* (Sund, 1920) (At) and *Petalidium obesum* (Kröyer, 1859) (At).

#### MATERIAL AND METHODS

The specimens were collected in May–June 1984 by N. O. CRYOS during the Balgim Expedition, which was organized by C.N.R.S (PIROCEAN) under the direction of Dr. F. Bouchet (Muséum National d'Histoire Naturelle, Paris).

Four different collecting methods were used: beam-trawl (CP), rock dredge (DR), Waren's epibenthic sledge (DW) and "carottiel Usnel" (KG), but only the three first, and mainly the first two, were useful for collecting decapods.

The measurements used in size determination were: in Macrura, the dorsal maximum carapace length, without including the rostrum; in Paguridae, the maximum cephalothoracic shield length and, in Brachyura, the maximum carapace width (less in some species, in which the maximum carapace length, without including the rostrum, were selected).

The study area is located in the Alboran Sea (Mediterranean Sea) and Gulf of Cadiz (Atlantic Ocean), between 33°45,4'N (off Casablanca) to 36°55'N (off Cabo San Vicente) and 9°31,4'W to 3°03,3'W, and between 137 to 2,142 m in depth. Table 1 shows that 155 stations were established, but only 153 were valid (32 in the Alboran Sea and the rest in the Gulf of Cadiz).

#### RESULTS

The collection totalled 3,559 specimens belonging to 122 species and 36 families. All this material has been deposited in the collection of the Muséum National d'Histoire Naturelle of Paris.

*Checklist of Species Taken and Station Data.*—In the following checklist, for each species collected, the sampling station, depth in meter (m) and the number of specimens caught (e) are given. The maximum size and the size of the smallest ovigerous female are also shown. The uncertain or doubtful specimens (because they are: in bad conditions, very small or a possible contamination) are indicated with?.

##### Family Oplophoridae

*AcanthePHYRA pelagica* (Risso, 1816). Examined material: CP-65, 1,805 m, 1e; CP-97, 1,498–1,532 m, 1e; CP-119, 483–551 m, 1e; CP-123, 1,230–1,238 m, 1e; CP-140, 1,734–1,742 m, 1e. Maximum carapace length, without rostrum, 23 mm.

*AcanthePHYRA eximia* Smith, 1884. Examined material: CP-14, 1,313–1,324 m, 2e; CP-63, 1,488–

Table 1. Sampling stations. For each sample the reference (ref), data (day, month), average depth in meters, latitude N (Lat. N) and longitude W (Long. W), type of bottom (nat. bott.) and the total sampling area in square meters (m<sup>2</sup>) are given. (The samples without Decapoda are not given).

Ref.	Data	Depth (m)	Lat. N	Long. W	Nat. bott.	Area sampled (m <sup>2</sup> )
DR01	28,05	720	36°52.9'	9°15.7'	Shell remains, Foram., Pterop.	324
DW02	28,05	893	36°55.0'	9°16.0'	Shell remains, Foram., Pterop.	334
CP03	28,05	681	36°50.4'	9°14.9'	Shell remains, Foram., Pterop.	6,966
DR06	29,05	1,113	36°46.2'	9°26.8'	Shell remains, Foram., Pterop.	?
DW07	29,05	1,141	36°46.1'	9°27.0'	Shell remains, Foram., Pterop.	276
CP09	29,05	1,163	36°47.6'	9°28.0'	Shell remains, Foram., Pterop.	5,977
CP10	29,05	1,592	36°45.3'	9°32.0'	Shell remains, Foram., Pterop.	5,977
DW11	29,05	1,523	36°44.2'	9°31.4'	Shell remains, Foram., Pterop.	648
CP14	30,05	1,318	36°44.1'	9°27.6'	Shell remains, Foram., Pterop.	657
KR15	30,05	1,305	36°46.4'	9°30.1'	Shell remains, Foram., Pterop.	0.0625
DW16	30,05	1,283	36°45.8'	9°29.4'	Shell remains, Foram., Pterop.	?
CP17	30,05	1,470	36°45.3'	9°30.8'	Shell remains, Foram., Pterop.	5,977
CP18	30,05	1,578	36°48.3'	9°31.1'	...	5,977
DW19	31,05	466	36°35.6'	7°24.8'	...	324
DW20	31,05	452	36°35.9'	7°24.5'	Shell remains	278
CP21	31,05	485	36°36.5'	7°24.0'	...	5,977
DR22	31,05	466	36°35.4'	7°23.6'	Shell remains + Pterop.	324
DR23	31,05	556	36°38.8'	7°19.5'	Shell remains + Pterop.	324
DW24	31,05	545	36°41.1'	7°19.0'	Shell remains + Pterop.	278
CP25	31,05	544	36°41.5'	7°19.4'	Shell remains + Pterop.	5,977
CP26	31,05	392	36°45.5'	7°08.4'	Shell remains + Foram.	5,977
DW27	31,05	370	36°46.3'	7°07.3'	Shell remains + Foram.	278
DW28	31,05	398	36°45.8'	7°07.7'	Shell remains + Foram.	278
DW32	01,06	250	36°47.2'	7°04.4'	Shell remains + Pterop.	278
CP33	01,06	256	36°46.9'	7°04.0'	Sand of shell	5,977
CP34	01,06	180	36°48.8'	7°04.9'	Sand of shell	5,977
CP36	01,06	990	36°16.6'	7°13.7'	Sand of shell	5,573
DR37	01,06	864	36°17.8'	7°15.4'	Sand of shell	356
DR40	02,06	362	36°49.9'	6°08.5'	Sand of shell	162
DR42	02,06	135	35°54.5'	6°13.3'	Sand of shell	162
DW43	02,06	150	35°54.1'	6°14.5'	Sand of shell	333
DR45	02,06	293	35°44.1'	6°17.4'	Sand of shell + Pterop.	162
DW47	02,06	281	35°43.5'	6°18.2'	Sand of shell	278
DR49	03,06	521	35°53.0'	6°32.8'	Sand of shell	162
DW50	03,05	523	35°52.7'	6°31.9'	Sand of shell	278
DR51	03,06	362	35°41.2'	6°29.5'	Shell remains + Pterop.	162
DW53	03,06	364	35°41.0'	6°30.5'	Muddy bott. Foram. Pterop.	278
CP54	03,06	356	35°41.3'	6°29.7'	Muddy bott. Foram. Pterop.	5,977
DR56	03,06	481	35°41.4'	6°35.8'	Sand, shell Pterop.	324
DW57	03,06	548	35°41.7'	6°35.2'	Sand of shell	278
DW58	03,06	826	35°39.4'	6°45.6'	Muddy bott. Foram. Pterop.	278
DW61	04,06	1,222	35°31.3'	7°25.6'	Muddy bott. Foram. Pterop.	278
CP62	04,06	1,250	35°31.3'	7°26.2'	Muddy bott. Foram. Pterop.	4,579
CP63	04,06	1,510	35°30.6'	7°42.1'	Muddy bott. Foram. Pterop.	5,977
DW64	04,06	1,530	35°30.5'	7°46.1'	Muddy bott. Foram. Pterop.	130
CP65	04,06	1,805	35°26.5'	7°59.9'	Muddy bott. Foram. Pterop.	5,977
CP66	05,06	2,110	35°21.3'	8°10.5'	...	5,977
CP68	05,06	2,035	35°11.9'	7°52.6'	...	5,977
CP69	05,06	2,028	35°11.4'	7°50.5'	Muddy bott. Pterop. + "rust"	5,977
DR70	06,06	147	33°51.8'	8°05.7'	Shell remains	162
DR71	06,06	155	33°52.1'	8°07.4'	Shell remains	162
DR72	06,06	173	33°52.0'	8°11.6'	Shell remains	162
DR73	06,06	181	33°52.1'	8°12.8'	Shell remains	162
DW74	06,06	181	33°52.1'	8°12.8'	Shell remains more fine	278
DR75	06,06	252	33°52.7'	8°15.2'	Shell remains more coarse	100
CP78	06,06	248	33°49.2'	8°22.2'	...	5,977

Table 1. Continued.

Ref.	Data	Depth (m)	Lat. N	Long. W	Nat. bott.	Area sampled (m <sup>2</sup> )
DR79	06,06	260	33°49.3'	8°23.6'	Shell remains	421
DR81	06,06	309	33°45.9'	8°29.9'	Shell remains	100
DR82	06,06	355	33°45.5'	8°32.0'	Shell remains	162
CP84	06,06	345	33°45.4'	8°31.9'	Shell remains	3,982
DR85	07,06	497	34°14.1'	7°23.7'	Shell remains + Pterop.	162
CP86	07,06	512	34°15.1'	7°21.0'	Shell remains	5,977
DW87	07,06	500	34°15.6'	7°17.9'	Shell remains + Foram.	278
DW88	07,06	740	34°20.1'	7°18.6'	Foram. Pterop.	278
CP89	07,06	722	34°20.3'	7°18.4'	Foram. Pterop.	5,977
CP90	07,06	890	34°21.4'	7°23.6'	Shell Pterop. Hexact.	5,977
CP91	07,06	948	34°22.3'	7°25.1'	Shell Pterop. Hexact.	5,977
CP92	08,06	1,182	34°24.3'	7°30.3'	Shell Pterop. Foram.	5,977
DW93	08,06	1,203	34°24.5'	7°31.1'	Sand of shell	278
DW94	08,06	1,175	34°24.9'	7°28.5'	Pterop. Foram.	278
CP95	08,06	1,378	34°24.0'	7°39.3'	Pterop. Foram.	5,977
DW96	08,06	1,255	34°23.5'	7°40.3'	Shell Foram. Pterop.	278
CP97	08,06	1,515	34°25.4'	7°41.1'	...	5,977
CP98	09,06	1,747	34°28.7'	7°41.8'	...	5,775
CP99	09,06	1,870	34°28.2'	7°43.3'	Pterop. Foram.	5,590
DW100	09,06	1,691	34°28.0'	7°42.0'	Pterop. Foram.	278
DR101	09,06	353	34°10.9'	7°29.8'	Shell remains Foram.	278
CP103	09,06	347	34°10.7'	7°29.8'	...	5,977
CP106	10,06	1,906	36°05.5'	8°05.2'	Foram. Pterop.	3,384
DW107	10,06	1,917	36°05.0'	8°05.6'	Foram. Pterop.	278
CP108	10,06	1,527	36°10.8'	8°06.2'	Foram. Pterop.	5,977
CP109	10,06	1,200	36°14.5'	7°56.4'	Foram. Aherma. Pterop.	5,977
DR111	11,06	285	35°56.9'	6°22.1'	Foram. Aherma. Pterop.	486
DR113	11,06	144	35°45.4'	6°04.8'	Sand of shell	97
DW114	11,06	150	35°45.5'	6°04.2'	Sand of shell	278
DR115	11,06	332	35°47.5'	6°04.2'	Sand of shell	486
DW116	11,06	340	35°48.6'	6°04.2'	Sand of shell	463
DR118	13,06	352	35°48.5'	5°12.5'	Shell remains Foram.	162
CP119	13,06	517	35°49.7'	5°13.0'	Shell remains Foram.	5,977
DW120	13,06	425	35°51.2'	5°10.4'	Shell remains Foram.	278
DW121	13,06	570	35°55.6'	5°02.1'	Shell remains Foram.	278
DW122	14,06	905	35°51.4'	3°57.3'	Shell remains Foram.	278
CP123	14,06	1,234	35°47.5'	3°52.2'	Shell remains Foram.	5,977
CP124	14,06	1,405	35°45.7'	3°51.7'	Shell remains Foram.	6,372
DW126	14,06	998	35°36.4'	3°50.8'	Shell remains Foram.	278
CP127	14,06	720	35°35.4'	3°48.5'	Shell remains Foram.	5,977
DW128	14,06	480	35°35.3'	3°45.1'	Shell remains Foram.	278
DR130	15,06	145	35°25.3'	4°19.3'	Shell remains	162
DW132	15,06	170	35°25.7'	4°18.8'	Shell remains	185
DR133	15,06	195	35°25.8'	4°17.4'	Shell remains	162
DW134	15,06	205	35°25.8'	4°17.0'	Shell remains	278
CP135	15,06	395	35°26.5'	4°14.2'	Shell remains	4,777
DW136	15,06	298	35°26.5'	4°18.4'	Shell remains + Foram.	278
CP137	15,06	1,005	35°33.2'	4°23.0'	Shell remains	5,977
CP139	16,06	1,275	36°04.9'	3°09.3'	Shell remains	?
CP140	16,06	1,738	36°05.0'	3°03.3'	...	5,977
DR141	16,06	170	35°56.0'	3°06.5'	Shell remains Foram.	162
DW142	16,06	167	35°56.6'	3°06.4'	Shell remains Foram.	203
DW143	16,06	252	35°56.9'	3°06.8'	Shell remains Foram.	278
DR144	16,06	314	35°56.0'	3°56.0'	Shell remains Foram.	162
CP145	16,06	373	35°56.6'	3°07.9'	Shell remains Foram.	5,977
DW146	16,06	555	35°56.5'	3°08.6'	Shell remains Foram.	278
DW147	17,06	489	35°50.1'	4°57.5'	Shell remains Foram.	278
CP148	17,06	508	35°51.8'	4°59.0'	...	5,977

Table 1. Continued

Ref.	Data	Depth (m)	Lat. N	Long. W	Nat. bott.	Area sampled (m <sup>2</sup> )
CP149	17,06	377	35°47.5'	5°11.0'	...	5,977
CP150	17,06	290	35°47.2'	5°17.0'	Rock + Coral	4,579
DR151	17,06	115	35°55.2'	5°25.4'	Rock + Coral	?
DR152	17,05	550	35°56.7'	5°34.7'	Rock + Coral	162
DR153	17,06	580	35°55.8'	5°35.3'	Rock + Coral	162
CP155	18,06	903	36°19.8'	7°40.6'	Shell Foram. + Pterop.	?
CP156	18,06	1,135	36°20.1'	7°52.7'	Shell Foram. + Pterop.	5,977
DW157	18,06	1,108	36°21.0'	7°55.8'	Shell Foram. + Pterop.	278
DW159	18,06	1,360	36°14.8'	8°02.5'	Foram. Aherma. Pterop.	278
CP160	18,06	1,350	36°14.6'	8°00.9'	Foram. Aherma. Pterop.	5,977

1,535 m, 1e; CP-66, 1,981–2,142 m, 1e; CP-68, 1,998–2,077 m, 1e; CP-106, 1,898–1,909 m, 1e; CP-108, 1,521–1,534 m, 2e. Maximum carapace length, without rostrum, 32 mm.

*Acanthephyra purpurea* A. Milne Edwards, 1881. Examined material: CP-3, 678–684 m, 1e; CP-14, 1,313–1,324 m, 2e; CP-17, 1,434–1,505 m, 1e; DW-13, 1,324–1,433 m, 1e; CP-62, 1,209–1,302 m, 1e; CP-63, 1,488–1,535 m, 1e; CP-66, 1,981–2,142 m, 1e; CP-69, 1,978–2,077 m, 1e; CP-90, 885–895 m, 2e; CP-91, 948 m, 2e; CP-95, 1,378 m, 1e; DW-96, 1,235–1,281 m, 1e; CP-97, 1,498–1,532 m, 2e; CP-106, 1,898–1,909 m, 1e; CP-108, 1,521–1,534 m, 3e. Maximum carapace length, without rostrum, 18 mm; smallest ovigerous females 15 mm.

*Systellaspis debilis* (A. Milne Edwards, 1881). Examined material: CP-03, 678–684 m, 6e; CP-14, 1,313–1,324 m, 1e; CP-18, 1,544–1,612 m, 1e; CP-68, 1,998–2,077 m, 1e; CP-89, 719–724 m, 2e; CP-99, 1,848–1,892 m, 2e; CP-106, 1,898–1,909 m, 1e; CP-108, 1,521–1,534 m, 1e; CP-156, 1,130–1,140 m, 1e. Maximum carapace length, without rostrum, 13 mm; smallest ovigerous female: 12–13 mm. The eggs are big and the number carried is less than 19.

*Oplophorus spinosus* (Brullé, 1839). Examined material: CP-18, 1,544–1,612 m, 1e; CP-90, 885–895 m, 1e. Maximum carapace length, without rostrum, 14.9 mm.

#### Family Nematocarinidae

*Nematocarinus gracilipes* Filhol, 1884. Examined material: CP-62, 1,209–1,302 m, 5e; CP-63, 1,488–1,535 m, 2e; CP-90, 885–895 m, 1e; CP-91, 948 m, 1e; CP-95, 1,378 m, 32e; CP-97, 1,498–1,532 m, 1e; CP-108, 1,521–1,534 m, 9e. Maximum carapace length, without rostrum, 26 mm; smallest ovigerous female 17 mm.

*Nematocarinus exilis* (Bate, 1888) (*N. ensifer* - Zariquiey, 1968, in part). Examined material: CP-09, 1,134–1,192 m, 2e; CP-65, 1,805 m, 1e; CP-66, 1,981–2,142 m, 2e; CP-68, 1,998–2,077 m, 2e; CP-69, 1,978–2,077 m, 5e; CP-90, 885–895 m, 1e; DW-96, 1,235–1,281 m, 13e; CP-99, 1,843–1,892 m, 1e; CP-106, 1,906 m, 3e. Maximum carapace length, without rostrum, 22 mm, ovigerous female 22 mm.

#### Family Pasiphaeidae

*Pasiphaea sivado* (Risso, 1816). Examined material: CP-25, 543–544 m, 3e; CP-86, 507–518 m, 5e; CP-89, 719–724 m, 38e; CP-103, 347 m, 3e; CP-119, 483–551 m, 9e; CP-135, 390–400 m, 1e; CP-149, 354–390 m, 11e; CP-150, 280–300 m, 3e. Maximum carapace length 22 mm; smallest ovigerous female 18 mm.

*Pasiphaea multidentata* Esmark, 1866. Examined material: CP-137, 1,005 m, 1e. Carapace length 49 mm (total 138 mm).

*Eupasiphae serrata* (Rathbun, 1902). Examined material: CP-65, 1,805 m, 1e. Carapace length, without rostrum, 33.9 mm.

*Psathyrocaris infirma* Alcock and Anderson, 1894. Examined material: CP-89, 719–724 m, 4e. Carapace length, without rostrum, 12 to 15 mm.

#### Family Alpheidae

*Alpheus talismani* Coutière, 1898. Examined material: CP-21, 478–491 m, 1e; CP-89, 719–742 m, 1 + 1? e. Carapace length: 10 to 11.5 mm.

*Alpheus glaber* (Olivier, 1792). Examined material: CP-03, 678–684 m, 1e; CP-25, 543–544 m, 2e; CP-26, 390–394 m, 1e; DW-28, 394–403 m, 1e; DW-32, 250 m, 1e; CP-33, 256 m, 29e; CP-34, 178–182 m, 1e; CP-36, 178–182 m, 16e; DR-45, 293 m, 2e; DR-70, 147 m, 1e; DR-71, 155 m, 8e; DR-72, 173 m, 2e; DR-74, 181 m, 3e; DR-108, 352 m, 1e; CP-135, 390–400 m, 9e; CP-145, 360–386

- m, 11e; CP-148, 497–503 m, 4e; CP-149, 354–390 m, 5e; CP-150, 290 m, 1e. Maximum carapace length: 13,8 mm; smallest ovigerous female 9 mm.
- Alpheus macrocheles* (Hailstone, 1835). Examined material: CP-109, 1,182–1,216 m, 1e (possibly a contamination); CP-135, 390–400 m, 6e; DR-151, 120–110 m, 1e. Maximum carapace length, 13,5 mm.
- Aithanas amazone* Holthuis, 1951. Examined material: CP-34, 178–180 m, 1e; DW-70, 147 m, 1e; DR-71, 155 m, 1e. Maximum carapace length: 4.8 mm; ovigerous female: 3 mm (specimen DR-71).

## Family Processidae

- Processa canaliculata* Leach, 1815. Examined material: DW-20, 450–454 m, 2e; DR-21, 478–491 m, 3e; CP-25, 543–544 m, 5e; CP-26, 390–394 m, 6e; DW-27, 368–371 m, 7e; CP-33, 256 m, 10e; CP-34, 178–182 m, 1e; CP-103, 347 m, 1e; CP-145, 360–386 m 2e. Maximum carapace length: 18 mm; ovigerous females: 12 to 18 mm.
- Processa noveli* Al-adhub and Williamson, 1975. Examined material: CP-26, 390–394 m, 4e; DW-27, 368–371 m, 18e; DR-28, 394–403 m, 2 + 3?e; CP-34, 178–182 m, 2e; DR-144, 228–300 m, 9 + 4?e; CP-145, 360–386 m, 1e; CP-149, 354–390 m, 2e. Maximum carapace length: 11.8 mm; smallest ovigerous female: 6,5 mm.
- Processa elegantula* Nouvel and Holthuis, 1957. Examined material: DW-43, 150 m, 1e; DW-50, 518–526 m, 1e?. Maximum carapace length: 11.5 mm; ovigerous female: 11.5 mm.
- Processa* spp. Examined material: DR-27, 368–371 m, 1e (male 3, 8 mm carapace length without rostrum); DR-72, 172 m. 1e (male of 6.5 mm carapace length, without rostrum).

## Family Pandalidae

- Heterocarpus grimaldii* A. Milne Edwards and Bouvier, 1900, Examined material: CP-10, 1,582–1,602 m, 3e; CP-17, 1,434–1,505m, 4e; CP-18, 1,544–1,612 m, 3e; CP-62, 1,209–1,302 m, 10e; CP-63, 1,488–1,535 m, 4e; CP-92, 1,182 m, 2e; CP-95, 1,378 m, 13e; CP-97, 1,498–1,532 m, 3e; CP-108, 1,521–1,534 m, 14e. Maximum carapace length, without rostrum: 33 mm; ovigerous female: 23.2 to 33 mm.
- Chlorotocus crassicornis* (Costa, 1871). Examined material: CP-21, 478–491 m, 7e; DR-22, 472–462 m, 1e. CP-25, 543–544 m, 5e; CP-26, 390–394 m, 3e; CP-33, 256m, 6e; CP-54, 352–360 m, 1e; CP-66, 1,981–2,142 m, 1e; CP-78, 246–250 m, 4e; DR-81, 309 m, 1e; CP-84, 345 m, 28e; CP-103, 347 m, 17e. Maximum carapace length, without rostrum: 22,5 mm; ovigerous female: 17.2 to 22.5 mm.
- Stylopandalus richardi* (Coutière, 1905). Examined material: CP-14, 1,313–1,324 m, 1e; CP-18, 1,544–1,612 m, 1e; CP-66, 1,981–2,142 m, 1e. Maximum carapace length, without rostrum: 8.6 mm; ovigerous female: 6.8 mm.
- Plesionika narval* (Fabricius, 1787). Examined material: CP-25, 543–544 m, 1e; CP-78, 246–250 m, 1e. Maximum carapace length, without rostrum: 9 mm (rostrum length: 19 mm).
- Plesionika acanthonotus* (Smith, 1882). Examined material: DW-13, 1,324–1,433 m, 2e; CP-14, 1,313–1,324 m, 1e; CP-62, 1,209–1,302 m, 1e; CP-86, 507–518m, 2e; CP-90, 885–895 m, 2e; CP-91, 948 m, 3e; CP-109, 1,182–1,216 m, 1e; CP-123, 1,230–1,238 m, 5e; CP-124, 1405 m, 1e; CP-155, 903 m, 13e. Maximum carapace length, without rostrum: 16 mm; ovigerous females: 9 to 11 mm.
- Plesionika heterocarpus* (Costa, 1871). Examined material: CP-26, 390–394 m, 2e; CP-33, 256 m, 8e; CP-34, 178–181 m, 10e; CP-54, 352–360 m, 1e; DR-75, 252 m, 3e; CP-78, 246–250 m, 11e; DR-81, 309 m, 12e; CP-84, 345 m, 5e; DR-85, 497 m, 73e; CP-89, 719–724 m, 82e; DR-101, 353 m, 1e; CP-103, 347 m, 11e; DR-113, 144 m, 1e; CP-119, 483–551 m, 1e; DW-134, 205 m, 2e; CP-145, 360–386 m, 1e; CP-155, 903 m, 1e. Maximum carapace length, without rostrum: 16 mm; ovigerous female: 9.3 to 16 mm.
- Plesionika antigai* Zariquiey A., 1955. Examined material: DR-49, 518–524 m, 1e; DW-50, 518–526 m, 5e; DR-115, 332 m, 3e; DW-134, 205 m, 3e. Maximum carapace length, without rostrum, 12.5 mm; ovigerous female 8.5 to 15.5 mm.
- Plesionika giglioli* (Senna, 1903). Examined material: CP-119, 483–551 m, 2e; CP-135, 390–400 m, 5e; CP-145, 360–386 m, 5e. Maximum carapace length, without rostrum: 15.5 mm; ovigerous female: 15.5 mm.
- Plesionika* sp. Examined material: 1 female, DW-96, 1,235–1,281 m (MNHN Na-11919).
- Plesionika williamsi* Forest, 1964. Examined material: CP-156, 1,130–1,140 m, 1e. Maximum carapace length, without rostrum: 30 mm (rostrum length: 30 mm).
- Plesionika ensis* (A. Milne Edwards, 1881). Examined material: CP-21, 478–491 m, 1e. Carapace length, without rostrum: 8 mm.
- Plesionika martia* (A. Milne Edwards, 1883). Examined material: CP-03, 678–684 m, 9e; CP-62, 1,209–1,302 m, 1e; CP-86, 507–518 m, 32e; CP-89, 719–724 m, 3e; CP-109, 1,182–1,216 m, 6e;

CP-119, 483–551 m, 15e; CP-145, 360–386 m, 1e; DW-146, 544–565 m, 1e; CP-148, 497–503 m, 3e; DR-152, 534–560 m, 1e; CP-155, 903 m, 3e; CP-156, 1,132–1,140 m, 11e; CP-160, 1,340–1,362 m, 2e. Maximum carapace length, without rostrum: 24.5 mm; smallest ovigerous female: 15.5 mm.

*Pandalina profunda* Holthuis, 1946. Examined material: DW-128, 480 m, 1e; DW-136, 298 m, 1e; DR-144, 328 m, 3e; DR, 146, 544–565 m, 7e. Maximum carapace length, without rostrum: 4.5 mm; smallest ovigerous female: 4 mm.

*Pandalina brevirostris* (Rathke, 1843). Examined material: DR-49, 518–524 m, 2e; DW-50, 518–526 m, 1e; DR-151, 120–110 m, 4e; DR-152, 534–535 m, 10e; DR-153, 568–604 m, 49 e. Maximum carapace length, without rostrum: 5.0 mm; ovigerous female: 3.0 to 4.5 mm.

#### Family Hippolytidae

*Eualus lebourae* Holthuis, 1951. Examined material: DR-151, 120–110 m, 1e. Carapace length, without rostrum: 3.0 mm.

*Merhippolyte ancistrotata* Crosnier and Forest, 1973. Examined material: CP-103, 347 m, 2e. Maximum carapace length, without rostrum: 5.8 mm; ovigerous female: 5.2 mm.

Family Bathypalaemonellidae (family proposed by Chace, 1992 and previously referred to by Saint-Laurent, 1985)

*Bathypalaemonella serratipalma* L. H. Pequegnat, 1970. Examined material: CP-66, 1,981–2,142 m, 1e; CP-68, 1,998–2,077 m, 3e. Maximum carapace length, without rostrum: 15 mm; ovigerous female: 13 mm.

#### Family Palaemonidae

*Periclimenes kormii* (Lo Bianco, 1903). Examined material: DR-153, 1 ovigerous female, 568–604 m, (MNHN Na-11916). Diameter of eggs  $0.58\text{--}0.55 \times 0.46\text{--}0.40$  mm.

#### Family Glyphocrangonidae

*Glyphocrangon longirostris* (Smith, 1882). Examined material: CP-65, 1,805 m, 2e; CP-68, 1,998–2,077 m, 1e; DW-96, 1,235–1,281 m, 1e; CP-99, 1,848–1,892 m, 5e; CP-106, 1,898–1,909 m, 1e. Maximum carapace length, without rostrum, 24 mm; ovigerous females: 18 mm to 24 mm. The females carried no more than 58 big eggs; diameter:  $2.9\text{--}2.6 \times 2.25\text{--}2.15$  mm.

#### Family Crangonidae

*Philocheras echinulatus* (Sars, 1862). Examined material: CP-21, 478 m, 6e; DR-25, 543–544 m, 1e; CP-26, 390–394 m, 8e; DW-27, 371–368 m, 1e; CP-33, 256 m, 1e; CP-34, 178–182 m, 1e; DW-43, 150 m, 1e; DR-45, 293 m, 12e; DW-47, 281 m, 6e; DR-49, 518–524 m, 8e; DW-50, 518–526 m, 18e; DR-51, 362 m, 2e; DW-53, 360 m, 3e; DR-57, 548 m, 1e; DR-82, 353 m, 1e; DR-85, 495 m, 1e; CP-103, 347 m, 9e; CP-109, 483–551 m, 2e; DR-144, 328 m, 1e; CP-145, 360–386 m, 10e; CP-149, 354–390 m, 1e. Maximum carapace length 9.5 mm; ovigerous female: 7.3 to 9.5 mm.

*Philocheras sculptus* (Bell, 1847). Examined material: DR-42, 133–137 m, 2e; DW-43, 150 m, 5e; DR-71, 155 m, 1e; DR-72, 173 m, 1e; DR-73, 181 m, 1e; DR-74, 181 m, 5e; DR-113, 144 m, 1e; DR-93, 1,203 m, 1e; DR-130, 145 m, 1e. Maximum carapace length, without rostrum: 4.9 mm; ovigerous female: 3.3 to 4.9 mm.

*Philocheras bispinosus* (Hailstone, 1835). Examined material: DW-32, 250 m, 3e. Maximum carapace length 2.5 mm.

*Pontophilus spinosus* (Leach, 1815). Examined material: CP-145, 360–386 m, 1e (11.2 mm carapace length).

*Pontophilus gracilis* Smith, 1882 (non. *P. gracilis* Bate, 1888). Examined material: CP-91, 948 m, 1e.

*Pontophilus cf abyssii* Smith, 1884 (?*P. challengerii* Ortmann, 1893). Examined material: CP-108, 1,521–1,534, 1e.

*Aegaon lacazei* (Gourret, 1887). Examined material: DR-45, 293 m, 1e; CP-135, 390–400 m, 2e; DR-144, 328 m, 1e; CP-145, 360–386 m, 11e. Maximum carapace length, without rostrum: 12 mm; smallest ovigerous female: 11 mm.

#### Family Stenopodidae

*Spongicoloides koehleri* (Caulery, 1896). Examined material: CP-62, 1,209–1,302 m, 1e; CP-91, 948 m, 1e; CP-92, 1,182 m, 2e. Maximum carapace length: 9.3 mm (female), 7.5 mm (male).

*Spongicoloides evolutus* (Bouvier, 1905). Examined material: CP-63, 1,488–1,535m, 1e; CP-108, 1,521–1,534m, 2e. Maximum carapace length: 7 mm (female) and 6.7 mm (male).

*Spongicoloides profundus* Hansen, 1908. Examined material: CP-98, 1,721–1,773 m, 1 very small specimen (3.3 mm carapace length).

*Odontozona edwardsi* (Bouvier, 1908). Examined material: CP-62 1,209–1,302 m, 4e; CP-91, 948 m, 1e.

#### Family Penaeidae

*Parapenaeus longirostris* (Lucas, 1846). Examined material: CP-21, 478–491 m, 1e; DR-22, 462–472 m, 1e; CP-25 343–544 m, 3e; CP-33, 256 m, 3e; CP-34, 178–182 m, 1e; DR-45, 293 m, 2e; CP-78, 246–250 m, 6e; DR-81, 309 m, 1e; DR-82, 355 m, 3e; CP-84, 345m, 16e; CP-103, 347 m, 21e; CP-145, 360–386 m, 1e. Maximum carapace length, without rostrum, male: 28.3 mm, female: 34.0 mm.

*Penaeopsis serrata* Bate, 1881. Examined material: CP-21, 478–491 m, 1e; CP-103, 347 m, 1e. Maximum carapace length, without rostrum: 26,3 mm.

*Funchalia woodwardi* Johnson, 1867. Examined material: CP-18, 1,544–1,612 m, 1e; CP-21, 478–491 m, 1e. Maximum carapace length, without rostrum: 11.1 mm.

#### Family Solenoceridae

*Solenocera membranacea* (Risso, 1816). Examined material: DW-20, 450–454 m, 2e; CP-21, 478–491 m, 5e; CP-25, 543–544 m, 14e; CP-26, 390–394 m, 2e; DR-27, 368–371 m, 4e; CP-33, 256 m, 3e; CP-34, 178–182 m, 5e; DR-73, 181 m, 1e; DR-75, 252 m, 1e; CP-84, 345 m, 1e; CP-103, 347 m, 24e; CP-119, 483–551 m, 1e; CP-135, 390–400 m, 3e; CP-145, 360–386 m, 7e; CP-149, 354–390 m, 7e. Maximum carapace length, without rostrum, male: 15 mm, female: 18 mm.

*Hymenopenaeus debilis* Smith, 1882., Examined material: CP-09, 1,134–1,192 m, 11e; CP-17, 1,434–1,505 m, 1e; CP-62, 1,209–1,302 m, 3e; CP-90, 885–895 m, 1e; CP-91, 948 m, 2e; CP-97, 1,498–1,532 m, 3e; CP-98, 719–724 m, 1e; CP-108, 1,521–1,534 m, 1e, CP-156, 1,130–1,140 m, 2e. Maximum carapace length, without rostrum, male: 14 mm, female: 19 mm.

One small female of DW-58 (8 mm of carapace length) showed some differences, which related it to *H. aphoticus*: a red cornea (in alcohol), not black; thelycum with a smaller central rounded area (eighth sternum); and third legs with smaller inner basal expansions.

#### Family Benthescymidae

*Benthescymus bartletti* Smith, 1882. Examined material: CP-69, 1,978–2,077 m, 1 male of 24.5 mm carapace length (without rostrum).

*Bentheogennema intermedia* (Bate, 1888). Examined material: CP-99, 1,848–1,892 m, 1 female of 10.2 mm carapace length (without rostrum).

*Benthonectes filipes* Smith, 1885. Examined material: CP-97, 1,498–1,532 m, 1 male of 12 mm carapace length (without rostrum).

*Gennadas valens* (Smith, 1884). Examined material: CP-14, 1,313–1,324 m, 1e; CP-91, 948 m, 1e; DW-96, 1,235–1,291 m, 1e. Maximum carapace length, without rostrum, male: 8.5 mm, female: 9.3 mm.

#### Family Aristeidae

*Aristeus antennatus* (Risso, 1816). Examined material: CP-89, 719–724 m, 1e; CP-109, 1,182–1,216 m, 1e; CP-156, 1,130–1,140 m, 9e. Maximum carapace length, without rostrum, male: 28.9 mm, female: 53.1 mm.

*Plesiopenaeus edwardsianus* (Johnson, 1867). Examined material: CP-10, 1,582–1,602 m, 2e; CP-17, 1,434–1,505 m, 1e; CP-89, 719–724 m, 2e; CP-90, 885–895 m, 4e; CP-92, 1,182 m, 12e; CP-95, 1,378 m, 1e; CP-108, 1,521–1,534 m, 2e; CP-160, 1,340–1,362 m, 2e. Maximum carapace length, without rostrum, male: 64.2 mm, female: 80.1 mm.

#### Family Nephropidae

*Nephrops norvegicus* (Linnaeus, 1758). Examined material: CP-03, 678–684 m, 11e; CP-21, 478–491 m, 2e; CP-25, 543–544 m, 18e; CP-26, 390–394 m, 2e; CP-33, 256 m, 1e. Maximum carapace length, without rostrum: 45.6 mm.

*Nephropsis atlantica* Norman, 1882. Examined material: CP-10, 1,582–1,602 m, 4e; CP-62, 1,209–1,302 m, 13e; CP-63, 1,488–1,535 m, 5e; CP-90, 885–895 m, 11e; CP-91, 948 m, 15e; CP-92, 1,182 m, 6e; CP-95, 1,378 m, 6e; CP-108, 1,521–1,534 m, 3e. Maximum carapace length, without rostrum: 27 mm; ovigerous female: 18.8 to 24.8 mm.

#### Family Palinuridae

*Palinurus mauritanicus* Gravel, 1911. Examined material: CP-135, 390–400 m, 1 small specimen (8.5 mm carapace length).



## Family Polychelidae

*Polycheles typhlops* Heller, 1862. Examined material: CP-03, 678–684 m, 19e; CP-63, 1,488–1,535 m, 1e; CP-89, 719–724 m, 21e; CP-90, 885–895 m, 41e; CP-91, 948 m, 21e; CP-92, 1,185 m, 10e; CP-95, 1,378 m, 1e; CP-103, 347 m, 1e; CP-109, 1,182–1,216 m, 1e; CP-124, 1,405 m, 2e; CP-160, 1,340–1,362 m, 1e. Maximum carapace length, without rostrum: 40.2 mm. Smallest ovigerous female: 37.4 mm; some of these (from CP-03 and CP-90) carried spermatophors.

*Polycheles crucifera* (Willemoes-Suhm, 1873). Examined material: CP-10, 1,582–1,602 m, 1e; CP-63, 1,488–1,535 m, 2e; CP-68, 1,998–2,077 m, 1e; CP-69, 1,978–2,077 m, 2e; CP-98, 1,721–1,773 m, 2e; CP-99, 1,848–1,892 m, 3e. Maximum carapace length, without rostrum, female: 23.7 mm, male: 16.5 mm. A specimen, from CP-99, is an Eryonidae larvae.

*Polycheles granulatus* Faxon, 1893. Examined material: CP-69, 1,978–2,077 m, 1e; CP-95, 1,378 m, 1e; CP-98, 1,721–1,773 m, 2e; CP-99, 1,848–1,892 m, 1e. Maximum carapace length, without rostrum, male: 25.4, female: 26.5 mm.

*Stereomastis sculpta* (Smith, 1880). Examined material: CP-68, 1,998–2,077 m, 2e; CP-69, 1,978–2,077 m, 2e; CP-91, 948 m, 1e; CP-92, 1,182 m, 1e; CP-98, 1,721–1,773 m, 2e; CP-108, 1,521–1,534 m, 1e; CP-99, 1,848–1,892 m, 1e. Maximum carapace length, without rostrum, male: 17.9 mm, female: 32.4 mm.

*Eryoneicus puritanii* Lo Bianco, 1903. Examined material: CP-92 1,182 m, 1e.

## Family Axiidae

*Calocariscus macandreae* Bell, 1846. Examined material: CP-09, 1,134–1,192 m, 2e; DW-27, 371–368 m, 1e; CP-33, 356 m, 1e; CP-89, 719–724 m, 3e; CP-127, 720 m, 1e; DW-128, 480 m, 1e; CP-135, 390–400 m, 3e; CP-137, 1,005 m, 1e; CP-148, 497–503 m, 4e. Maximum carapace length: 12.8 mm.

*Calocariscus coronatus* (Trybom, 1904). Examined material: CP-127, 720 m, 1 female. Carapace length, without rostrum: 5.1 mm. The specimen have lost the legs and the right third maxilliped.

## Family Upogebiidae

*Gebiacantha talismani* (Bouvier, 1915). Examined material: DR-71, 155 m, 1 juvenile.

## Family Chirostylidae

*Chirostylus formosus* (Filhol, 1885). Examined material: CP-95, 1,378 m, 3e. The greater specimen is a ovigerous female of 20.5 mm carapace length without the rostrum.

*Uroptychus bowieri* Caullery, 1896. Examined material: CP-91, 948 m, 1 ovigerous female. Carapace length, without the rostrum: 5 mm.

*Uroptychus maroccanus* Türkay, 1976. Examined material: CP-95, 1,378 m, 1 male. Carapace length, without rostrum: 4 mm.

## Family Galatheidae

*Munidopsis curvirostra* Whiteaves, 1874. Examined material: CP-68, 1,998–2,077 m, 1e; CP-69, 1,978–2,077 m, 1e; CP-99, 1,848–1,892 m, 4e. Maximum carapace length, without rostrum: 9.3 mm.

*Galathea intermedia* Lilljeborg, 1851. Examined material: DR-113, 144m, 6e; DW-114, 140–158 m, 3e; DR-130, 145 m, 1e.

*Munida sarsi* Huus, 1935. Examined material: CP-21, 478–491 m, 3e; CP-25, 544–543 m, 22 e. Sex-ratio: 1:1.

*Munida intermedia* A. Milne Edwards and Bouvier, 1899. Examined material: CP-21, 478–491 m, 1e; CP-25, 544–543 m, 7e; CP-33, 256 m, 2e; CP-86, 507–518 m, 1e; CP-135, 390–400 m, 41e. Sex-ratio (females/males): 1.3.

*Munida tenuimana* G. O. Sars, 1872. Examined material: DW-24, 543–546, 1e; CP-14, 1,314–1,324 m, 1e.

*Munida rullanti* Zariquiey, 1952. Examined material: CP-26, 390–394 m, 6e; CP-33, 256 m, 15e; CP-34, 178–182 m, 28e; CP-45, 352–360 m, 10e; CP-62, 1,209–1,303 m, 1e; CP-103, 347 m, 2e; DW-132, 170 m, 4e; DR-133, 195 m, 4e; CP-134, 205 m, 1e; CP-145, 360–386 m, 1e. Maximum carapace length, without rostrum: 19.1 mm; smallest ovigerous female: 5.8 mm.

## Family Diogenidae

*Dardanus arrosor* (Herbst, 1796). Examined material: DR-49, 518–524 m, 1e; CP-86, 507–518 m, 2e; DW-114, 140–158 m, 2e; CP-119, 483–551 m, 2e; DR-133, 195 m, 1e; DW-134, 205 m, 1e; DR-141, 165–177 m, 1e; CP-145, 360–386 m, 1e; CP-149, 354–390 m, 7e. Smallest ovigerous female: 10 mm cephalothoracic shield length.

## Family Paguridae

*Pagurus prideaux* Leach, 1815. Examined material: CP-119, 483–551 m, 1e; DW-132, 170 m, 3e; DW-136, 298 m, 4e; DW-142, 167 m, 1e; CP-145, 360–386 m, 16e; CP-149, 354–390 m, 2e.

*Pagurus alatus* Fabricius, 1775. (Non *Pagurus alatus* - Zariquiey 1968) Examined material: CP-03,

- 678–684 m, 25e; CP-09, 1,134–1,192 m, 31e; CP-14, 1,313–1,324 m, 28e; CP-17, 143–1,505 m, 23e; DW-20, 454–450 m, 2e; CP-21, 478–491 m, 109e; CP-25, 543–544 m, 27e; DW-28, 394–403 m, 1e; DR-37, 860–868 m, 2e; DR-49, 518–524 m, 1e; CP-54, 352–360 m, 5e; DR-85, 497 m, 3e; CP-86, 507–518 m, 154e; CP-89, 719–724 m, 62e; CP-90, 885–895 m, 17e; CP-91, 948 m, 15e; CP-92, 1,182 m, 6e; CP-109, 1,182–1,216 m, 99e; CP-119, 483–551 m, 5e; CP-135, 390–400 m, 1e; CP-145, 386–360 m, 1e; CP-155, 903 m, 13e; CP-156, 1,140–1,130 m, 152e; CP-160, 1,362–1,340 m, 5e. Smallest ovigerous female: 2.5 mm cephalothoracic shield length.
- Catapaguroides microps* A. Milne Edwards and Bouvier, 1892. Examined material: CP-63, 1,488–1,535 m, 1e; CP-68, 1,998–2,077 m, 4e; CP-69, 1,878–2,077 m, 3e; CP-91, 948 m, 2e; CP-92, 1,182 m, 2e; CP-95, 1,378 m, 1e; DW-96, 1,281–1,235 m, 1e; CP-99, 1,848–1,892 m, 1e; CP-108, 1,521–1,534 m, 2e. Smallest ovigerous female: 2.0 mm cephalothoracic shield length.
- Catapaguroides iris* Bouvier, 1922. Material examinado: CP-91, 948 m, 1e; CP-90, 890 m, 1e?
- Anapagurus laevis* (Bell, 1846). Material examinado: DR-40, 360 m, 3e; DR-49, 518–524 m, 5e; DW-50, 526–518 m, 2e; DR-115, 332 m, 7e; CP-119, 483–551 m, 3e; DW-132, 170 m, 3e; DR-134, 205 m, 1e. Smallest ovigerous female: 3.2 mm cephalothoracic shield length.
- Anapagurus longispina* A. Milne Edwards and Bouvier, 1900. Examined material: DW-74, 181 m, 3e; DR-133, 195 m, 1e; DW-134, 205 m, 2e. Ovigerous female of 1.7 mm cephalothoracic shield length.
- Nematopagurus longicornis* A. Milne Edwards and Bouvier, 1892. Examined material: DW-132, 170 m, 3e; DR-133, 195 m, 2e. Ovigerous female of 1.3 mm cephalothoracic shield length.

#### Family Parapaguridae

- Parapagurus pilosimanus* S. I. Smith, 1879. Examined material: CP-10, 1,582–1,602 m, 3e; CP-17, 1,434–1,505 m, 1e; CP-18, 1,544–1,612 m, 1e; CP-63, 1,488–1,535 m, 2e; CP-65, 1,805 m, 3e; CP-68, 1,998–2,077 m, 6e; CP-69, 1,978–2,077 m, 3e; CP-95, 1,378 m, 5e; CP-98, 1,721–1,773 m, 3e; CP-99, 1,848–1,892 m, 2e; CP-108, 1,521–1,534, 6e; CP-109, 1,182–1,216 m, 1e. The specimens belonging (in accordance with its chelipeds) to the subspecies or species *P. p. pilosimanus* and *P. p. nudus* (Saint-Laurent, 1972; Lemaitre, 1986).
- Sympagurus bicristatus* (A. Milne Edwards, 1880). Examined material: CP-10, 1,582–1,602 m, 16e; CP-17, 1,434–1,505 m, 57e; CP-92, 1,182 m, 12e; CP-156, 1,140–1,130 m, 5e; DW-157, 1,108 m, 3e. Ovigerous female of 3.5 mm cephalothoracic shield length.
- Sympagurus acinops* Lemaitre, 1989. Examined material: CP-97, 1 ovigerous female, 1,498–1,532 m (MNHN-Pg 4454). Eggs, diameter: 0.8–0.71 × 0.71–0.61 mm.
- Strobopagurus gracilipes* (A. Milne Edwards, 1891). Examined material: CP-156, 1,140–1,130 m, 1 male. Cephalothoracic shield length: 4 mm.

#### Family Homolidae

- Homologenus rostratus* A. Milne Edwards, 1880. Examined material: CP-10, 1,582–1,602 m, 1e; CP-63, 1,488–1,535 m, 3e; CP-69, 1,998–2,077 m, 2e; DW-88, 738–742 m, 3e; CP-92, 1,182 m, 1e; CP-95, 1,378 m, 1e; CP-98, 1,721–1,773 m, 6e; CP-99, 1,848–1,892 m, 10e. Maximum carapace width.—female: 12.2 mm (smallest ovigerous females: 11.1 mm) male: 8.6 mm.
- Homola barbata* (Fabricius, 1793). Examined material: CP-84, 345 m, 1e; CP-34, 178–182 m, 1e. Both specimens are juveniles.

#### Family Cymonomidae

- Cymonomus granulatus* (Thomson, 1873). Examined material: DW-20, 454 m, 7e (more 2 megalops); CP-21, 478–491 m, 1e; DR-22, 462–472 m, 2e; DW-71, 155 m, 1e; CP-109, 1,182–1,216 m, 2e; DW-128, 480 m, 4e; CP-135, 390–400 m, 4e; DW-157, 1,108 m, 1e. Maximum carapace length, with rostrum.—male: 5.5 mm; female: 5.7 mm (smallest ovigerous female: 3.5 mm).

#### Family Dorippidae

- Ethusina talismani* A. Milne Edwards and Bouvier, 1897. Examined material: CP-66, 1,981–2,142 m, 1e; DR-69, 1,978–2,077 m, 1e; CP-99, 1,848–1,892 m, 1e, CP-106, 1,898–1,909 m, 1e. Also, there is a female specimen dated from DR-72, at 173 m, but probably it is a “contamination” error. All captured specimen are females. Maximum carapace width: 9.3 mm.

#### Family Calappidae

- Calappa granulata* (Linnaeus, 1758). Examined material: DW-43, 150 m, 1e; DR-113, 144 m, 4e; DW-114, 140–158 m, 1e. Ovigerous female: 66 mm of carapace width.

#### Family Leucosiidae

- Ebalia nux* A. Milne Edwards, 1883. Examined material: DW-20, 450–455 m, 1e; CP-21, 478–491 m, 15e; DR-45, 293 m, 1e; DW-53, 364 m, 2e; DW-71, 155 m, 1e; DW-74, 181 m, 5e; DR-72, 173 m, 1e; DR-80, 309 m, 4e; DR-82, 355 m, 15e; CP-84, 345 m, 1e; DR-85, 497 m, 1e; DW-87,

500 m, 1e; CP-119, 483–551 m, 2e; DW-128, 480 m, 2e; DW-132, 170 m, 2e; DR-133, 195 m, 13e; DW-134, 205 m, 5e; CP-135, 390–400 m, 25e; DW-136, 298 m, 5e; DW-142, 167 m, 1e; DR-144, 300–328 m, 1e; CP-145, 386–360 m, 1e; DW-146, 544–565 m, 1e; CP-149, 354–390 m, 3e. Maximum carapace width.—male: 9.3 mm; female: 9.3 mm; smallest ovigerous female: 5.6 mm.

*Ebalia cranchii* Leach, 1817. Examined material: DW-71, 155 m, 3e; DR-72, 173 m, 1e; DR-74, 181 m, 4e; DR-133, 195 m, 1e. Maximum carapace width.—female: 5.2 mm, male: 5.0 mm.

*Ebalia granulosa* H. Milne Edwards, 1837. Examined material: CP-34, 178–182 m, 4e (2 males and 2 females). Carapace width.—male: 8.3–8.5 mm, ovigerous female: 8.0–8.8 mm).

*Ebalia* sp. (?*E. tumefacta* or ?*E. deshayesi*) Examined material: CW-134, 205 m, 1 female in bad condition. Carapace width 6.1 mm.

#### Family Portunidae

*Polybius henslowii* Leach, 1820. Examined material: CP-21, 478–491 m, 6e; CP-25, 543–544 m, 2e; CP-26, 390–394 m, 64e; CP-33, 256 m, 21e; DW-50, 518–526 m, 8e; DW-53, 364 m, 2e; CP-84, 345 m, 1e; CP-86, 507–518 m, 5e; CP-115, 332 m, 6e. Maximum carapace width.—male: 48.9 mm; female: 47.8 mm.

*Bathynectes maravigna* (Prestandrea, 1839). Examined material: CP-25, 543–544 m, 14e; DW-50, 518–526 m, 2e; CP-86, 507–518 m, 2e; CP-90, 895 m, 1e; CP-91, 948 m, 1e; CP-109, 1,182–1,216 m, 1e; CP-135, 390–400 m, 2e; CP-156, 1,130–1,140 m, 1e. Maximum carapace width (without lateral teeth).—male: 45.9 mm; female: 50.8 mm.

*Macropipus tuberculatus* (Roux, 1830). Examined material: CP-145, 360–386 m, 1e; CP-149, 354–390 m, 1e; (both specimens are females. Carapace width: 18.0 and 40.6 mm respectively).

*Liocarcinus maculatus* (Risso, 1827). Examined material: DR-42, 133–137 m, 3e; DW-43, 150m, 6e; DW-132, 170 m, 1e. Maximum carapace width.—male (DR-42): 10.8 mm.

*Liocarcinus depurator* (Linnaeus, 1758). Examined material: DW-142, 167 m, 2e; DW-134, 205 m, 1e. The three specimens (1 male, 1 female; 1 male, respectively) are small. Carapace width.—female: 12.0 mm, male: 12.0 mm.

#### Family Goneplacidae

*Goneplax rhomboides* (Linnaeus, 1758). Examined material: CP-03, 678–684 m, 1e; CP-25, 543–544 m, 11e; CP-26, 390–394 m, 35e; DW-27, 368–371 m, 3e; DW-28, 394–403 m, 2e; CP-33, 256 m, 1e; CP-34, 178–182 m, 9e; DR-51, 362 m, 6e; CP-54, 352–360 m, 47e; CP-62, 1,209–1,302 m, 2e; DR-70, 147 m, 3e; DR-71, 155 m, 7e; DR-72, 173 m, 3e; DR-73, 181 m, 1e; DR-101, 353 m, 5e; CP-103, 347 m, 5e; DR-118, 352 m, 2e; DR-144, 300–328 m, 1e; CP-149, 354–390 m, 3e. Maximum carapace width.—male: 34.3 mm; female: 22.6 mm; smallest ovigerous female: 13.4 mm.

#### Family Xanthidae

*Pilumnus inermis* A. Milne Edwards and Bouvier, 1894. Examined material: DW-132, 170 m, 11e; DR-133, 195 m, 4e. Maximum carapace width.—male: 11.4 mm; female: 14.4 mm; smallest ovigerous female: 6.6 mm.

*Xantho pilipes* A. Milne Edwards, 1867. Examined material: DR-42, 133–137 m, 1 juvenile.

*Monodaeus guinoatae* Forest, 1976. Examined material: CP-21, 478–491 m, 2e; DR-22, 462–472 m, 3e; DR-23, 556 m, 4e (1 female with Sacculina), CP-25, 543–544 m, 7e; DR-37, 860–868 m, 1e; DR-51, 362 m, 1e; CP-54, 352–360 m, 17e; DR-56, 475–488 m, 3e; CP-71, 155 m, 5e; DR-85, 497 m, 1e; CP-86, 507–518 m, 1e; DR-118, 352 m, 1e; CP-119, 483–551 m, 1e; DW-120, 425 m, 2e; DW-128, 480 m, 1e; DR-133, 195 m, 12e (1 female with Sacculina); CP-135, 390–400 m, 51e; DW-136, 298 m, 1e; DW-143, 252 m, 1e; DW-147, 485–492 m, 1e; CP-148, 497–503 m, 14e; CP-149, 354–390 m, 3e. Maximum carapace width.—male: 28.9; female: 19.4 mm (ovigerous females have not been found). Sex-ratio (on 133 specimens), females/males: 1.27.

#### Family Parthenopidae

*Parthenope macrochelos* (Herbst, 1790). Examined material: DW-136, 298 m, 1 male. Carapace width: 42.1 mm.

*Parthenope expansa* (Miers, 1879). Examined material: DW-132, 170 m, 6e. Maximum carapace width.—male: 10 mm, female: 7.5 mm, smallest ovigerous female: 6.8 mm.

*Parthenope massena* (Roux, 1830). Examined material: DR-42, 133–137 m, 4e. Maximum carapace width.—male: 7.2 mm; female: 10.8 mm, ovigerous female: 10.8 mm.

*Heterocrypta maltzami* Miers, 1881. Examined material: DW-132, 170 m, 1 female. Carapace width: 5.5 mm.

#### Family Majidae

*Ergasticus clouei* Studer, 1883. Examined material: CP-20, 450–455 m, 1e; CP-21, 478–491 m, 2e; CP-25, 543–544 m, 2e; CP-26, 390–394 m, 1e; CP-91, 948 m, 2e; CP-135, 390–400 m, 10e. Maximum carapace width.—male: 16.9 mm (14.5 mm without teeth); female: 11.0 mm (10.4 mm without teeth), smallest ovigerous female: 7.6 mm.

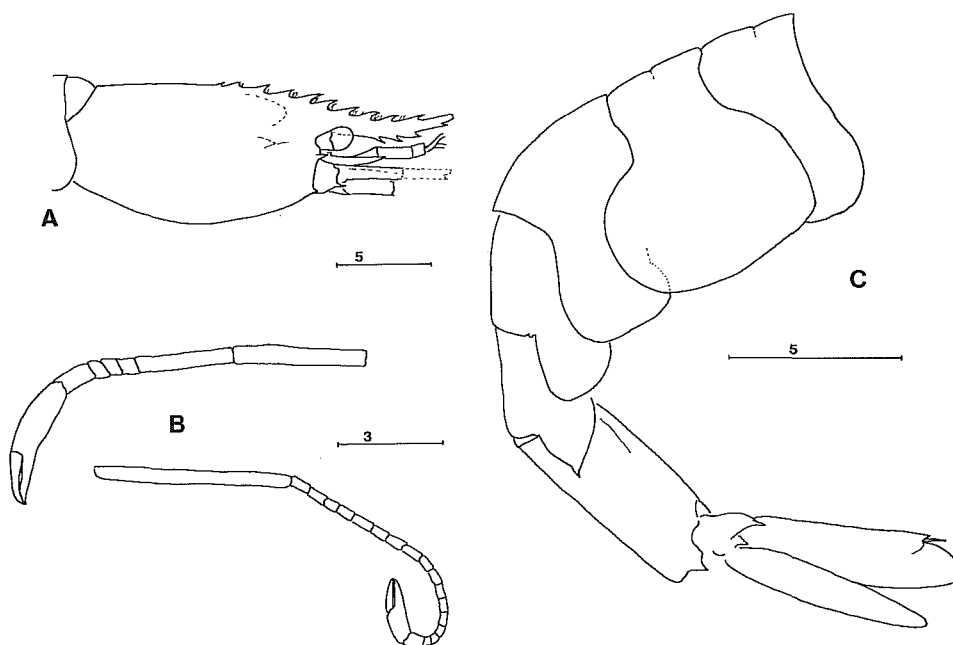


Figure 1. *Plesionika* sp. A—carapace in lateral view; B—second pereopods, and C—abdomen in lateral view. Scales in mm.

*Dorhynchus thomsoni* Thomson, 1873. Examined material: CP-62, 1,209–1,302 m, 1e; C-91, 948 m, 2e. Maximum carapace width.—male: 6.5 mm; female: 6.3 mm.

*Rochinia carpenteri* (Thomson, 1873). Examined material: CP-90, 885–895 m, 3e; CP-91, 948 m, 3e; CP-92, 1,182 m, 9e; CP-95, 1,378 m, 2e; CP-135, 390–400 m, 1e; CP-160, 1,340–1,362 m, 1e. Maximum carapace width (without lateral teeth).—male: 14.3 mm, female: 24.6 mm, ovigerous female: 24.6 mm.

*Eurynome aspera* (Pennant, 1777). Examined material: DR-42, 133–137 m, 6e; DW-43, 150 m, 2e; DW-74, 181 m, 1e; DR-130, 145 m, 1e; DW-132, 170 m, 7 + 2?e; DR-133, 195 m, 1e. Maximum carapace width.—male: 9.0 mm, female: 9.7 mm.

*Eurynome spinosa* Hailstone, 1835. Examined material: DR-42, 133–135 m, 1 female: 4.8 mm of carapace width.

*Macropodia tenuirostris* (Leach, 1814). Examined material: CP-33, 256 m, 1e; CP-82, 355 m, 1e; CP-84, 345 m, 1e; DW-114, 140–158 m, 1e; CP-119, 483–551 m, 1e; DW-134, 205 m, 1e; CP-145, 390–386 m, 4e; CP-149, 354–390 m, 1e. Maximum carapace width.—male: 13.9 mm, female: 13.0 mm, smallest ovigerous female: 13 mm.

*Macropodia linaresi* Forest and Zariquiey A., 1964. Examined material: DW-114, 140–158 m, 3e. Maximum carapace width.—male: 3.8 mm, female: 5 mm, ovigerous female: 5 mm.

*Inachus leptochirus* Leach, 1817. Examined material: DR-40, 362 m, 1e; DW-50, 518–526 m, 2e; DW-57, 548 m, 1e; CP-119, 483–551 m, 1e. Maximum carapace width.—male: 21 mm, female: 17.4 mm.

*Inachus dorsettensis* (Pennant, 1777). Examined material: CP-34, 178–182 m, 1e; DR-42, 133–135 m, 3e; DW-43, 150 m, 11e; DW-114, 140–158 m, 2e; CP-150, 280–300 m, 1e. Maximum carapace width.—male: 11.3 mm, female: 8.2 mm, smallest ovigerous female: 6.2 mm. Ratio carapace length/width.—male: 1.08 to 1.27, female: 1.1 to 1.25.

#### CONSIDERATION OF SOME SPECIES

##### *Plesionika* sp.

*Discussion*.—Probably, the single captured specimen (1 female, St. DW-96) belongs to a new species (Fig. 1); but, because this one is not well preserved and a relative variability exists in this *Plesionika* group, no specific name can be given.

*Description.*—Rostrum more or less straight, slightly overreaching distal end of antennal scale, with 10 dorsal teeth, all fixed and distributed regularly over entire length, including 5 on carapace posterior to level of orbital margin; ventral margin armed with 4 teeth (Fig. 1A). Carapace with slight middorsal carina becoming obsolete in posterior ½ and lacking lateral carinae. Antennal spine overreaching branchiostegal spine. Antennular peduncle with ventromesial tooth on basal article. Stylocerite slightly reaching basal level of second article of antennular peduncle. Distolateral tooth of antennal scale not reaching distal margin of blade. Third maxilliped with exopod, distal part of penultimate segment overreaching distal margin of antennal scale. Specimen only has first left pereopod and two second ones. With epipods on 4 anterior pairs of pereopods. Second legs short and slightly unequal; left thicker and shorter than right one and with carpus of 5 articles ( $1 > 5 > 2 = 3 = 4$ ), which do not reach distal part of antennal blade; right, with carpus of 17 articles overreaching distal level of antennal scale.

Abdominal segments (Fig. 1C) without middorsal carina or boss on tergum. Postero-dorsal margin of third somite rounded and without median tooth. Pleura of fourth segment rounded, fifth with sharp posteroventral tooth. Sixth somite about twice (1, 87) as long as 5th. Specimen lacking telson.

*Coloration.*—after 6 years preserved in alcohol, only a yellowish-orange color could be detected, more intense on gastric carapace area and on the tergum of abdominal somites.

*Remarks.*—The specimen belongs to the *Plesionika* group with short rostrum, without dorsal posterior movable teeth, and with the second pereopods slightly unequal in length, in which are included *P. bifurcata* Alcock and Anderson, 1894, *P. spinidorsalis* (Rathbun, 1906) (Burukovsky, 1981; Chace, 1985), *P. laevis* (A. Milne Edwards, 1883), (redescribed by Kensley and Tobias, 1985 and previously placed in the genus *Heterocarpus* from which it was transferred to *Plesionika* by Crosnier, 1986a) and *P. fenneri* Crosnier, 1986 (Crosnier, 1986a, b). *Heterocarpus alexandri* A. Milne Edwards, 1883 is also closely related (Chace, 1989).

However, our specimen differs from these species as follows: *P. fenneri* has 1 or 2 dorsal movable spines on the carapace. *P. laevis* and *P. bifurcata* (also *P. fenneri*) have a curved rostrum directed oblique-dorsally, and a different rostral formula (postero-orbital dorsal teeth + rostral teeth/ventral teeth): 6–7 + 6/12–13, and 3 + 4/6 respectively. *P. laevis* and *H. alexandri* show a middorsal carina or a boss on tergum of 3rd abdominal somite. In *P. laevis*, *P. fenneri* and *P. bifurcata* the pleura of fourth abdominal segment have a sharp posteroventral tooth. *P. spinidorsalis*, from Hawaii and South China Sea, is a closely related species with similar rostrum, but with 7 to 10 postorbital dorsal teeth and pleura of fifth abdominal segment rounded posteroventrally.

#### *Philocheras echinulatus* (M. Sars, 1862)

*Crangon echinulatus* M. Sars, 1862: 186.

*Cheraphilus echinulatus* : G. O. Sars, 1882

*Philocheras echinulatus* : Kemp, 1910: 144, pl. 21, fig 7a–d.

*Discussion.*—Chace (1984) analyzed the validity of the genus *Philocheras*, which had been treated as a synonym of *Pontophilus* by several authors following Kemp (1911), and recognized it as a distinct taxon. Chace distinguished the species of *Philocheras* from *Pontophilus* by: 1) the absence of lateral teeth

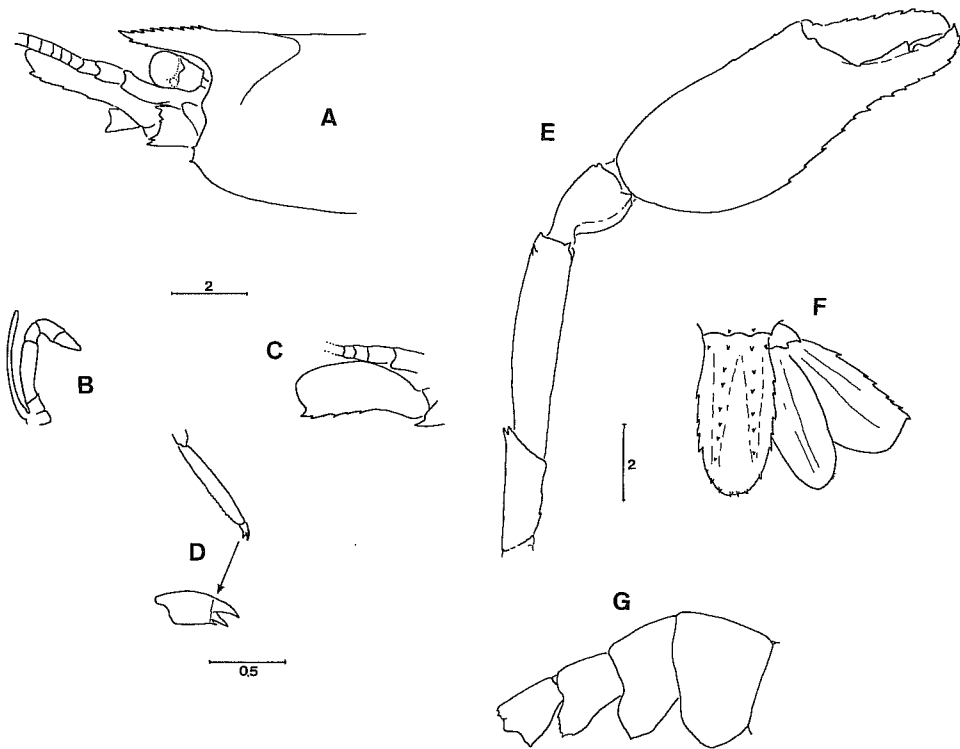


Figure 2. *Spongiacoloides koehleri* (Caullery, 1896). Specimen from CP-92. A: carapace, anterolateral aspect, B: right 2nd maxilliped, C: left antennal scale, D: left 4th pereopod, propodus and dactyl (and detail of this), E: right 3rd pereopod, F: telson and right uropod, dorsal view, G: last abdominal somites, lateral aspect. Scales in mm.

on the basal half of the rostrum, 2) the absence of a longitudinal suture extending from the orbital margin to the branchial region of carapace (although there is an apparently suborbital suture in *Pontophilus gorei* Dardeau, 1980), and 3) the absence of any trace of an exopod on the first pereopod. Moreover, some "inconstant" characters may also justify the subdivision into two genera.

The species *Philocheras echinulatus* (as happens in *Pontophilus gorei*) shows some characters of *Pontophilus*. Thus, it has a longitudinal suture extending obliquely from the orbital margin to the branchial region of carapace and the development of the endopods of pleopods, which are different in males and females, show an intermediate position (Zariquiey, 1968; Smaldon, 1979). In males, the endopods are longer than  $\frac{1}{2}$  exopods length (but not in females) and, on the 2nd to 5th, an appendix interna is present (but not in females).

### *Spongiacoloides koehleri* (Caullery, 1896)

#### Figure 2

*Spongiicola koehleri* Caullery, 1896: 382, pl.16, figs. 1-9.

*Discussion.*—There are some anatomical characters that, because of its taxonomical importance in the group, must be discussed.

In the studied specimens the epipods of 4th pereopod could be lacking (are lacking in specimens CP-92, are rudimentary in CP-91 and are well developed

in CP-62), therefore this is a variable character (referred before by Saint-Laurent and Cleva, 1976).

On the other hand, in the Balgim-84 specimens and in all preserved specimens in the collection of the "Muséum National d'Histoire Naturelle" of Paris, the third maxillipeds have no exopods but there are well developed ones on the 2nd maxillipeds (Fig. 2B). This last is against the characteristics of the genus referred by Hansen (1908) for *Spongicoloides profundus* and Holthuis (1946)'s data. Also, the exopod on the 2nd maxilliped was used by Bruce and Baba (1973) to describe the genus *Spongiocaris*. Subsequently, Saint-Laurent and Cleva (1976) considered this last genus as a synonym of *Spongicoloides* and they modified the generic diagnosis, including in it the existence or not of an exopod on the maxilliped (which was not taken in account by Baba, 1983).

Other differences found in the Balgim-84 specimens are the lack of pleurobranch on the 2nd maxilliped and the existence of an arthrobranch on the first one.

This species has been cited in Iberic waters, from the Gulf of Vizcaya, at 1,410 m (Caullery, 1896) and close to the Straits of Gibraltar (Sund, 1920; Holthuis, 1946). During Balgim-84, it was caught in the central area of the Gulf of Cadiz and off Rabat.

### *Spongicoloides evolutus* (Bouvier, 1905)

#### Figure 3

*Spongicola evoluta* Bouvier, 1905: 983.

*Discussion.*—A rare species, described by Bouvier (1905) from specimens caught off Sahara at 882 m. Later, it was cited by Bouvier (1908), Milne Edwards and Bouvier (1909) and Holthuis (1946). The last author stated that figures are needed. They are given in (Fig. 3).

As in the species mentioned above, there are interesting anatomical characters with regard to the branchial formula. The branchial formula shown by Bouvier (1905) is similar to that of *Spongicola venusta* and *Spongicoloides koehleri* with the only difference that the epipods of the walking pereopods are lacking. Later, Holthuis (1946) in a comparative study gave some differences in relation to *S. koehleri* (in contrast to Bouvier's data); he cited 1 arthrobranch (not 2) on the 3rd maxilliped, but 2 arthrobranches exist in *S. koehleri* and in the Balgim specimens of both species (as on the 1st to 4th walking pereopods). On the other hand (as happened in *S. koehleri*) pleurobranches have not been found on the 2nd maxillipeds, but there is one arthrobranch on the 1st maxillipeds.

Baba (1980) described a new species *S. novaezelandiae* close to *S. evolutus*. The differences are in the gills of the maxillipeds; in Baba's species there are A) 2 arthrobranches on the 3rd maxilliped (which is not a valid character to separate them, as has been shown), B) 2nd maxillipeds without pleurobranches (neither valid) and with 2 arthrobranches, and C) one arthrobranch on the 1st (neither valid). The only useful character to differentiate both species is the number of arthrobranches placed on the 2nd maxilliped (2 in Baba's species and 1 in Bouvier's species).

On the other hand, in relation to the size, differences in the gill development have been observed. The smallest specimens (CP-63, 4 mm of carapace length) show less developed gills and the anterobasal arthrobranches are as simple plates. These differences in the branchial development, the few known specimens, the fragility of these structures, and the differences found in references should lead us to be careful when using the branchial formula to separate species.

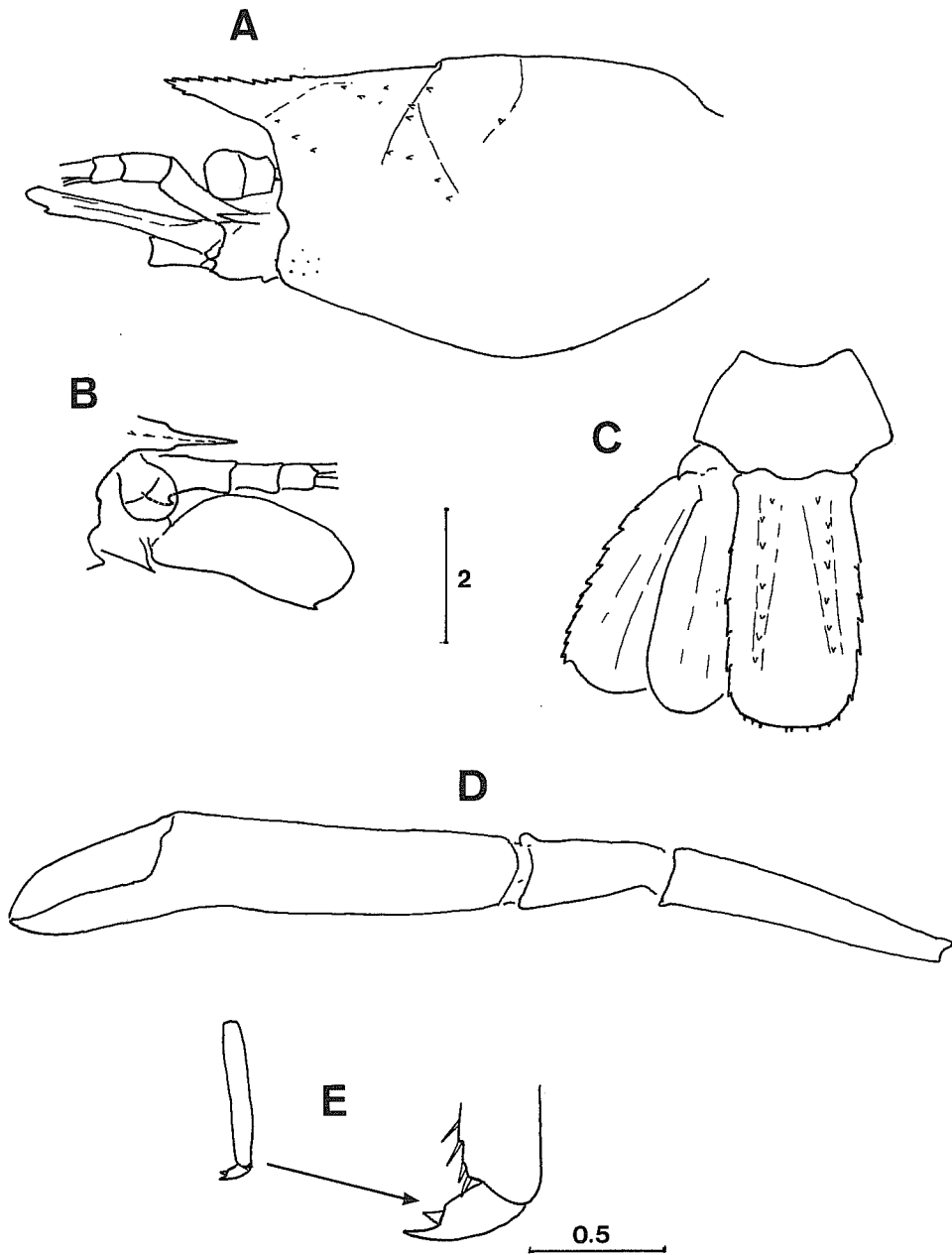


Figure 3. *Spongiocoloides evolutus* (Bouvier, 1905). Specimen from CP-108. A: carapace, lateral view, B: left antennal scale, dorsal view, C: telson and left uropod, dorsal aspect, D: left 3rd pereopod, and E: left 4th pereopod, propodus and dactyl. Scales in mm.



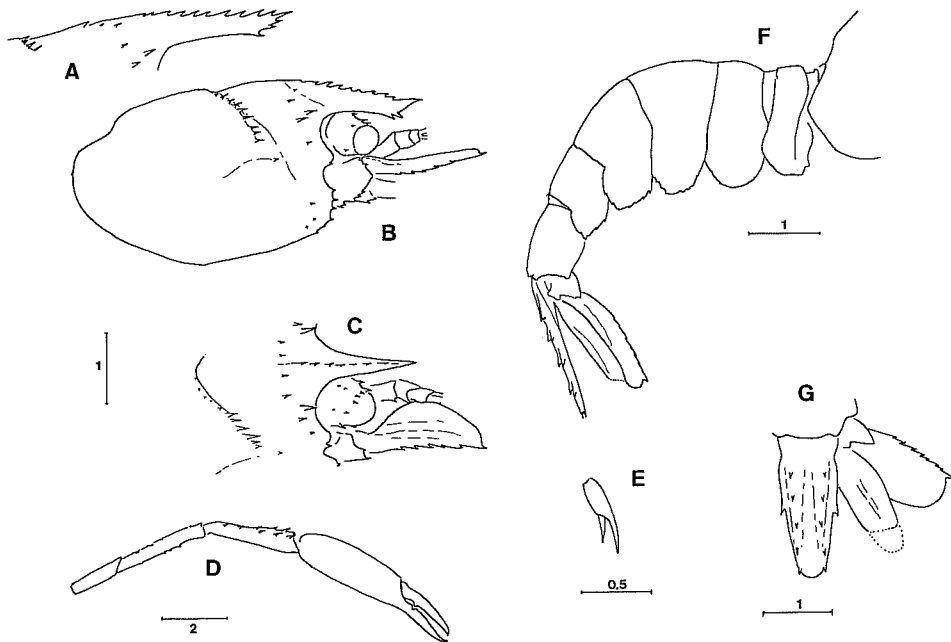


Figure 4. *Odontozona edwardsi* (Bouvier, 1908). A: Specimen from CP-91, B-G: specimen from CP-62. A: aspect of the rostrum, B: carapace, lateral view, C: carapace and antennal scale, dorsal view, D: right 3rd pereopod, E: dactyl of right 5th pereopod, F: abdomen, right view, and G: telson and right uropod, dorsal view. Scales in mm.

The Balgim-84 specimens come from the central area of the Gulf of Cadiz and off Huelva. This species could be easily differentiated from the one above by the telson, which is wider distally (Fig. 3c).

#### *Spongicoloides profundus* Hansen, 1908

*Spongicoloides profundus* Hansen, 1908: 45, pl. 3, fig 5a-k, pl. 4, fig. 1a-l.

*Discussion.*—This species is only known from the reference of Hansen (1908), 4 specimens were caught from bottoms with sponges SW of Iceland, at 1,480 m. Our very small specimen came from off Rabat.

This species is close to *S. novaezelandiae* and *S. evolutus* (all with wide distal end of telson) and it could be differentiated from the other Atlantic species, *S. evolutus*, because there is only one small arthrobranch on the 1st to 4th pereopods (not 2).

#### *Odontozona edwardsi* (Bouvier, 1908)

##### Figure 4

*Richardina edwardsi* Bouvier, 1908: 888.

*Odontozona edwardsi*: Holthuis, 1946: 40.

*Discussion.*—A rare species, cited by Bouvier (1908) from the northwest African coast, off Morocco and Sudan.

Some Balgim specimens have been figured (Fig. 4), because Holthuis (1946) believed it was necessary.



Figure 5. *Monodaeus guinotae* Forest, 1976. Specimen from CP-25. Right half of carapace and merus of last pereopods. Scale in mm.

*Monodaeus guinotae* Forest, 1976  
Figure 5

*Micropanope* sp. Forest and Guinot, 1958: 12, figs. 8,9.

*Micropanope* sp. Forest, 1965: 378, figs. 32,33.

*Monodaeus guinotae* Forest, 1976: 63, figs. 1-7.

*Discussion.*—The morphology of the captured specimens are in accordance with Forest's figures and description and with the data given by Türkay and Koukouras (1988). The anterolateral teeth of the carapace are acute and directed outward, and the walking legs are slender and long, so the distal part of the merus of 4th pereopod overreaches the apex of the ultimate or even penultimate anterolateral teeth.

This Mediterranean species (Manning and Holthuis, 1981) is very close to *M.*

*couchi*, even in the first male pleopod, which in Xanthidae has high taxonomic value, and is similar in both species (Türkay and Koukouras, 1988). It is possible that some Mediterranean references given as *M. couchi* could belong to *M. guinotae*. On the other hand, one examined specimen from Portugal showed a doubtful position, suggesting it would be interesting to review the specimens from the Portuguese waters.

*Munida sarsi* Huss, 1935 and  
*Munida intermedia* Lilljeborg, 1851

Some anatomical differences of taxonomic interest have been found. According to Rice and Saint-Laurent (1986) *M. sarsi* lacks a spine at the distal external angle of merus of the third maxilliped, which is present in *M. intermedia*. However, in some Balgim specimens belonging to *M. sarsi* a spine or sharp projection has been found.

The two species could be readily distinguished by the striae on the abdominal tergites, in having many more intercalary striae *M. sarsi* (Rice and Saint-Laurent, 1986: fig. 4a, b; p. 157). However, it is important to know that with size, and in both species, an increase in the number of the striae occurs; thus, Rice and Saint-Laurent's figures belong to medium size specimens, but in the largest ones more intercalary striae appear and, in this way, the pattern found in big *M. intermedia* specimens is similar to the one found in medium sized specimens of *M. sarsi*.

On the other hand, the spines of the fourth abdominal tergite are lacking in most small specimens of *Munida intermedia* (size less than 16.6 mm of carapace length, without rostrum, ex. CP-135), which is more common in specimens from northern European areas (Rice and Saint-Laurent, 1986). Also, they are more often present in large specimens (ex. CP-25) than in smaller. In consequence, this character exhibits a considerable geographical and ontogenetic variation.

*New Records of Species from the Studied Area.*—The capture of some species from the study area represent their first record for the Mediterranean Sea, east Atlantic waters and/or Iberian waters.

The capture of one specimen of *Calocarides coronatus* Trybom, 1904 from Alboran Sea, off Alhucemas Bay-Cabo Quilates (Morocco), represents the first record of the species for the Mediterranean Sea and extends its distribution area. Previously it was only known from north European waters (Trybom, 1904; Wollebaek, 1908; Balss, 1926 in Bouvier, 1940).

*Catapaguroides iris* Bouvier, 1922 was only known from Azores (Bouvier, 1922; Saint-Laurent, 1968). This is also the case with *Strobopagurus gracilipes* (A. Milne Edwards, 1891) (Milne Edwards and Bouvier, 1894).

The capture of one specimen of *Sympagurus acinops* Lemaitre, 1989, off Rabat, represents the first record of the species from east Atlantic waters (Lemaitre, 1989) and shows an amphi-Atlantic distribution.

The capture of *Alpheus talismani* Coutière, 1898 and *Merhippolyte ancistrotrota* Crosnier and Forest, 1973, in the Gulf of Cadiz, represent the northern known limit of the species distribution (Holthuis, 1951; Crosnier and Forest, 1966; 1973).

The presence of *Monodaeus guinotae* Forest, 1976, in the entire study area represents a new record of the species for Spanish waters and the Atlantic Ocean (Forest, 1965, 1976; Forest and Guinot, 1958; Türkay and Koukouras, 1988).

Finally, other new records for Spanish waters are the capture of: *Spongiocoloides evolutus*, *Alpheus talismani*, *Athanas amazone* Holthuis, 1951 (García Raso, 1987); *Plesionika williamsi* Forest, 1964; *Eualus cf lebourae* Holthuis, 1951 (Holthuis, 1951); *Periclimenes kornii* (Lo Bianco, 1903) (Saint-Laurent and García

Raso, 1993) and *Pontophilus cf. abyssii* Smith, 1884) (Crosnier and Forest, 1973; Chace, 1984; Saint-Laurent, 1985).

However, the capture of *Eupasiphae serrata* (Rathbun, 1902) confirms its presence in Iberian waters, because (although it was not cited by Zariquiey, 1968) Crosnier (1988) mentioned that some references of *Parapasiphea grimaldii* given for Spanish waters could belong to this species.

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