

Updating changes in the Iberian decapod crustacean fauna (excluding crabs) after 50 years

J. Enrique García Raso¹, Jose A. Cuesta², Pere Abelló³, Enrique Macpherson⁴

¹ Universidad de Málaga, Departamento de Biología Animal, Campus de Teatinos s/n, 29071 Málaga, Spain. (JEGR) E-mail: garciaso@uma.es. ORCID iD: <https://orcid.org/0000-0003-3092-9518>

² Instituto de Ciencias Marinas de Andalucía, CSIC, Avda. República Saharaui 2, 11519 Puerto Real, Cádiz, Spain. (JAC) E-mail: jose.cuesta@icman.csic.es. ORCID iD: <https://orcid.org/0000-0001-9482-2336>

³ Institut de Ciències del Mar, CSIC, Passeig Marítim de la Barceloneta 37-49, 08003 Barcelona, Spain. (PA) E-mail: pabello@icm.csic.es. ORCID iD: <https://orcid.org/0000-0001-6034-2465>

⁴ Centre d'Estudis Avançats de Blanes, CSIC, Carrer d'Accés a la Cala Sant Francesc 14, 17300 Blanes, Spain. (EM) E-mail: macpherson@ceab.csic.es. ORCID iD: <https://orcid.org/0000-0003-4849-4532>

Summary: An annotated checklist of the marine decapod crustaceans (excluding crabs) of the Iberian Peninsula has been compiled 50 years after the publication of “Crustáceos decápodos ibéricos” by Zariquiey Álvarez (1968). A total of 293 species belonging to 136 genera and 48 families has been recorded. This information increases by 116 species the total number reported by Zariquiey Álvarez in his posthumous work. The families with the greatest species richness are the Paguridae (28) and Palaemonidae (18). References by geographic sectors and for all species are given. The results show that 264 species are reported in the Atlantic sectors, while 178 have been found in the Mediterranean. The species richness and the differences between and within sectors are discussed; these are mainly due to the dimension of the areas, the depth ranges and the confluence of distinct water masses with a different origin and different physicochemical features. Consequently, the greatest richness of decapod species (excluding crabs) is found in the Gulf of Cádiz, with 194 species. The total number of decapods found in and around Iberian waters, including crabs, freshwater species and some new records not yet published, reaches 448.

Keywords: checklist; Decapoda Crustacea; Iberian Peninsula; species richness.

Actualización de los cambios en la fauna de crustáceos decápodos ibéricos (excluidos los cangrejos) después de 50 años

Resumen: Se ha realizado un listado comentado de los crustáceos decápodos marinos (excluidos los cangrejos) de la península ibérica, después de 50 años de la publicación “Crustáceos decápodos ibéricos” por Zariquiey Álvarez (1968). En total se mencionan 293 especies de 136 géneros y 48 familias. Estos datos incrementan en 116 el número de especies citadas por Zariquiey Álvarez en su obra póstuma. Las familias con mayor riqueza específica son Paguridae (28) y Palaemonidae (18). Se citan referencias para cada sector geográfico y especie. Las aguas atlánticas (en su conjunto) muestran una mayor riqueza, con 264 especies, mientras que 178 han sido citadas en aguas mediterráneas ibéricas. Se da el número de especies por sectores y se comentan las diferencias, consecuencia, principalmente, de la dimensión y rango de profundidad de cada uno de ellos y de la confluencia de masas de aguas con orígenes y características físico-químicas diferentes. Así, la mayor riqueza específica (sin incluir los cangrejos) se encuentra en el Golfo de Cádiz con 194 especies. El número total de especies de crustáceos decápodos en aguas ibéricas, incluyendo cangrejos, especies de agua dulce y algunas nuevas citas de especies aún no publicadas, sería de 448.

Palabras clave: lista inventario; Crustacea Decapoda; península ibérica; riqueza de especies.

Citation/Como citar este artículo: García Raso J.E., Cuesta J.A., Abelló P., Macpherson E. 2018. Updating changes in the Iberian decapod crustacean fauna (excluding crabs) after 50 years. *Sci. Mar.* 82(4): 207-229. <https://doi.org/10.3989/scimar.04831.04A>

Editor: J. Templado.

Received: July 6, 2018. **Accepted:** October 31, 2018. **Published:** December 14, 2018.

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INTRODUCTION

The study of decapod crustaceans in the Iberian Peninsula began in the last part of the 19th century, with information and lists obtained from different coastal areas (e.g. Brito Capello 1873, Barceló-Combis 1875, Bolívar 1892, 1916, Buen 1887, 1916, Ferrer Galdiano 1920, 1940, Miranda y Rivera 1921), as well as from the results from the research expeditions that covered parts of these waters (see García Raso 1996 and references cited therein). The first checklist for all Spanish waters was compiled by Miranda y Rivera (1933) and subsequently extended by Zariquiey-Cenarro (1935a, b, 1942). Zariquiey Álvarez (1946) published a synthesis, “Crustáceos Decápodos Mediterráneos”. In Portugal, Nobre (1931, 1936) published “Crustáceos Decápodos e Stomatópodos marinhos de Portugal”. These relatively intensive works on the Iberian decapods culminated just 50 years ago with the publication of “Crustáceos Decápodos Ibéricos”, a posthumous work by Ricardo Zariquiey Álvarez completed by Drs Lipke B. Holthuis, Jacques Forest and Isabella Gordon, which has been, and still is, a basic reference work for this taxonomic group in the Mediterranean Sea and Europe.

Recently, the works of d’Udekem d’Acoz (1999a) and Türkay (2001) offer updated lists of the European decapods, but they do not provide listings of species by geographic sectors.

Today, the number of known Iberian decapod crustaceans has increased mainly due to the large number of studies undertaken along the continental shelf and slope, as well as on bathyal bottoms. Furthermore, climate change and other anthropogenic activities have increased the number of thermophilic and invasive species, reinforcing the utility of check-lists for detecting changes in fauna over time in specific regional areas (Zenetos et al 2010, 2012). Finally, changes in nomenclature and taxonomical reorganizations at different levels (families, genera and species) have taken place in these years due, in part, to the development of molecular techniques (Cuesta et al. 2012, among others) and to larval studies (Marco-Herrero et al. 2013).

These reasons led us to consider that it would be of wider interest to review the list of Iberian decapod crustacean species. We also present this review in homage to and recognition of all these authors, especially Dr. Ricardo Zariquiey Álvarez and his father Ricardo Zariquiey-Cenarro. In this regard, Marco-Herrero et al. (2015) published a first paper with the updated list of the brachyuran crabs, and now, with this present paper, which includes the remaining marine groups, we update the definitive list of all marine Iberian decapod crustaceans. In addition, a list of freshwater species is given to account for the total number of species in Iberian waters.

MATERIALS AND METHODS

In order to draw up the present updated list of Iberian decapod crustaceans (excluding Brachyura), two basic studies were taken as a departure point: Zariquiey

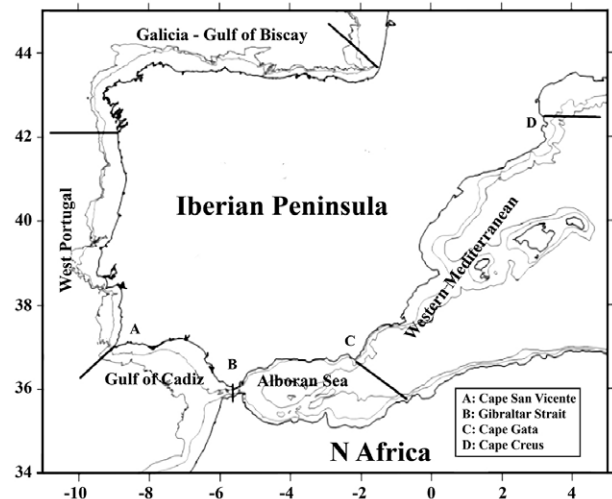


Fig. 1. – Map of the Iberian Peninsula and nearby waters showing the areas considered to characterize the spatial distribution of decapod crustacean species. The –200 and –1000 metres isobaths are shown. Areas: Gulf of Biscay and Galicia (GB-GA); western Portugal (WP); Gulf of Cádiz or southwestern Iberian Peninsula (GC); Alborán Sea (ALB); Spanish western Mediterranean (SWM). Explanation of letters in left lower corner of figure. Figure modified from *Scientia Marina* in Marco-Herrero et al. (2015).

Álvarez (1968) and d’Udekem d’Acoz (1999a), in addition to a large number of subsequent specific publications. Data from relatively recent expeditions in remote areas of the coast, especially those from deep and pelagic waters (e.g. Türkay 1975, García Raso 1996, Fariña et al. 1997, and Cartes et al. 2007, 2014) enabled us to complete the species list. Additional information was obtained from several expeditions and research projects carried out by governmental agencies, which have published information and species lists on the internet. These include the Instituto Español de Oceanografía projects ECOMARG (<http://www.ecomarg.com/biodiversidad.html>), DEEPER (<http://www.ma.ieo.es/deeper>) and INDEMARES (<http://www.indemares.es>), the Alcalá University CALMEN07 Expedition (<http://www.juanjunoy.info/wp-content/uploads/2012/12/CALMEN07.pdf>; Junoy 2008) and studies of specific areas (e.g. Calado and Narciso 2002). Reviews of specific groups and genera (e.g. Macpherson 1988, García-Gómez 1994, Galil 2000, and Macpherson and Segonzac 2005), those with descriptions of new species (e.g. García Muñoz et al. 2014), and new records of introduced species in the area (e.g. García Raso et al. 2014b) were also included.

In addition, in studies on meso- and bathypelagic species in waters some distance from the Iberian Peninsula coast, for example between Portugal and Azores, some species are mentioned but their specific location is not (e.g. Burukovsky 1996). Some of these species, which show wide geographic distribution and extensive vertical movements, have also been included, because although they have not been captured in jurisdictional waters (economic zone) their presence is highly probable, especially considering the scarcity of studies in the pelagic habitat around Iberian waters.

The geographical sectors considered are the same as in Marco-Herrero et al. (2015) (Fig. 1): the Gulf of Biscay and Galicia, western Portugal, the Gulf of Cádiz and the southwestern Iberian Peninsula, the Alboran Sea, and the Spanish western Mediterranean. For each of these sectors and for all species, some selected bibliographic references are given.

For the classification and nomenclature, we followed that adopted in WoRMS (<http://www.marinespecies.org/>) and in recent reviews (Vereshchaka 2000, 2009, Baba et al. 2008, McLaughlin et al. 2010, Osawa and McLaughlin 2010, Boyko and McLaughlin 2010, Chan 2010, De Grave and Fransen 2011, Vereshchaka et al. 2014, and Ng and De Forges 2015, among others).

RESULTS

A total of 293 species of marine and estuarine decapod crustaceans, excluding crabs (Brachyura) were recorded in coastal and offshore waters around the

Iberian Peninsula (Appendix 1). They belong to 136 genera and 48 families. These data increase the number of species recorded by Zariquiey Álvarez (1968) by 116 species of 54 different genera and 22 families (the last two, including reassignments).

The updated checklist by geographical sectors of all decapod crustacean species, excluding Brachyura, recorded in waters around the Iberian Peninsula is shown in Appendix 1. The distribution of some species shows sectors in white, which are absences or “gaps” interspersed among others in which the species is cited. Unless they are at the distribution limit of the species, their presence in these gaps (although not verified) is more than likely.

The families with the highest species richness are Paguridae with 28 species, followed by Palaemonidae with 18 (excluding freshwater species) (Appendix 1).

Table 1 presents the taxonomic changes in the names of genera and species referred to in Zariquiey Álvarez (1968), as well as some synonyms mentioned in recent studies.

Table 1. – Changes in the generic or authority assignation of species in comparison with Zariquiey Álvarez (1968) as well as synonymized species, listed by taxonomic hierarchy. * According to Garcia Gómez (1994) and WoRMS.

In Zariquiey Álvarez (1968)	Current name
<i>Anapagurus brevicarpus</i> A. Milne-Edwards and Bouvier, 1892	<i>Anapagurus chiroacanthus</i> (Lilljeborg, 1856) *
<i>Axius stirhynchus</i> Leach, 1815	<i>Axius stirhynchus</i> Leach, 1816
<i>Callianassa (Callichirus) pestai</i> De Man, 1928	<i>Pestarella candida</i> (Olivier, 1792)
<i>Callianassa (Callichirus) tyrrhena</i> (Petagna, 1792)	<i>Pestarella tyrrhena</i> (Petagna, 1792)
<i>Callianassa truncata</i> Giard and Bonnier, 1890	<i>Necallianassa truncata</i> (Giard and Bonnier, 1890)
<i>Chirostylus formosus</i> (Filhol, 1885)	<i>Gastroptychus formosus</i> (Filhol, 1884)
<i>Dantecia caudani</i> Caullery, 1896 (synonymy)	<i>Parapasiphae sulcatifrons</i> Smith, 1884
<i>Ephyrina hoskynii</i> Wood-Mason, 1891	<i>Ephyrina figueirai</i> Crosnier and Forest, 1973
<i>Hippolyte huntii</i> (Gosse, 1877)	<i>Hippolyte prideauxiana</i> Leach, 1817
<i>Hippolyte longirostris</i> (Czerniavsky, 1868)	<i>Hippolyte garciarasoii</i> D'Udekem d'Acoz, 1996
<i>Munida intermedia</i> var. <i>sarsi</i> Huus, 1935 [in Zariquiey: <i>M. i.</i> var. <i>sarsi</i> Brinkmann, 1936]	<i>Munida sarsi</i> Huus, 1935
<i>Munida iris rutilanti</i> Zariquiey-Alvarez, 1952 (or <i>M. rutilanti</i>)	<i>Munida speciosa</i> von Martens, 1878
<i>Munidopsis tridentata</i> (Esmark, 1857)	<i>Munidopsis serricornis</i> (Lovén, 1853)
<i>Notostomus longirostris</i> Bate, 1888	<i>Notostomus elegans</i> A. Milne-Edwards, 1881
<i>Paguristes oculatus</i> (Fabricius, 1775)	<i>Paguristes eremita</i> (Linnaeus, 1767)
<i>Pagurus alatus</i> Fabricius, 1775	<i>Pagurus excavatus</i> (Herbst, 1791)
<i>Pagurus prideauxi</i> Leach, 1815	<i>Pagurus prideaux</i> Leach, 1815
<i>Pagurus sculptimanus</i> Lucas, 1846	<i>Pagurus forbesii</i> Bell, 1845
<i>Pagurus variabilis</i> (A. Milne-Edwards and Bouvier, 1892)	<i>Pagurus alatus</i> Fabricius, 1775
<i>Palaemon garciacidi</i> Zariquiey Álvarez, 1968	<i>Palaemon longirostris</i> H. Milne-Edwards, 1837
<i>Palaemonetes varians</i> (Leach, 1814)	<i>Palaemon varians</i> Leach, 1813 [in Leach 1913-1914]
<i>Parapagurus bicristatus</i> (A. Milne-Edwards, 1880)	<i>Oncopagurus bicristatus</i> (A. Milne-Edwards, 1880)
<i>Parapagurus gracilipes</i> (A. Milne-Edwards, 1891)	<i>Strobopagurus gracilipes</i> (A. Milne-Edwards, 1891)
<i>Parapandalus narval</i> (Fabricius, 1787)	<i>Plesionika narval</i> (Fabricius, 1787)
<i>Parapandalus richardi</i> (Coutière, 1805)	<i>Stylopandalus richardi</i> (Coutière, 1805)
<i>Plesiopenaeus edwardsianus</i> (Johnson, 1868)	<i>Aristaeopsis edwardsiana</i> (Johnson, 1867)
<i>Polycheles granulatus</i> Faxon, 1893)	<i>Pentacheles laevis</i> Bate 1878
<i>Pontocaris cataphracta</i> (Olivier, 1792)	<i>Aegaeon cataphractus</i> (Olivier, 1792)
<i>Pontocaris lacazei</i> (Gourret, 1887)	<i>Aegaeon lacazei</i> (Gourret, 1887)
<i>Pontonia flavomaculata</i> Heller, 1864	<i>Asidonia flavomaculata</i> (Heller, 1864)
<i>Processa canaliculata</i> Leach, 1815 [in Zariquiey Álvarez 1968]	<i>Processa noveli noveli</i> Al-Adhub and Williamson, 1975
<i>Processa edulis arcassonensis</i> (Nouvel and Holthuis, 1957)	<i>Processa edulis edulis</i> (Risso, 1816)
<i>Processa edulis crassipes</i> (Nouvel and Holthuis, 1957)	<i>Processa edulis edulis</i> (Risso, 1816)
<i>Processa mediterranea</i> (Parisi, 1915)	<i>Processa canaliculata</i> Leach, 1815
<i>Processa parva</i> Holthuis, 1951 [in Zariquiey Álvarez 1968]	<i>Processa modica</i> Williamson and Rochanaburanon, 1979
<i>Psathyrocaris fragilis</i> var. <i>atlantica</i> Caullery, 1896	<i>Psathyrocaris fragilis</i> Wood-Mason, 1893
<i>Sergestes arcticus</i> Krøyer, 1855	<i>Eusergestes arcticus</i> (Krøyer, 1855)
<i>Sergestes mollis</i> Smith, 1884	<i>Sergia japonica</i> (Bate, 1881)
<i>Sergestes robustus</i> Smith, 1882	<i>Robustosergia robusta</i> (Smith, 1882)
<i>Sergestes sargassi</i> Ortmann, 1893	<i>Allosergestes sargassi</i> (Ortmann, 1893)
<i>Sergestes vigilax</i> Stimpson, 1860	<i>Parasergestes vigilax</i> (Stimpson, 1860)
<i>Stereomastis grimaldii</i> (Bouvier, 1905)	<i>Stereomastis nana</i> (Smith, 1884)
<i>Thoralus cranchii</i> (Leach, 1817)	<i>Eualus cranchii</i> (Leach, 1817)
<i>Thoralus sollaudi</i> (Zariquiey Cenarro, 1935)	<i>Eualus sollaudi</i> (Zariquiey Cenarro, 1935)
<i>Uroptychus nitidus</i> var. <i>concolor</i> (A. Milne-Edwards and Bouvier, 1894)	<i>Uroptychus concolor</i> (A. Milne-Edwards and Bouvier, 1894)

Taxonomic groups

Zariquiey Álvarez (1968) considered two supersections: Natantia with three sections, Caridea, Penaeidea and Stenopodidea; and Reptantia with three sections, Macrura Reptantia, Anomura and Brachyura. However, in the current classification these taxa belong to different infraorders (included in two suborders), and the supersection and section ranges are not accepted.

The suborder Dendrobranchiata (previously Section Penaeidea within Supersection Natantia) is represented in the Iberian Peninsula by 38 species in 26 genera and 7 families.

The most important contributions to the knowledge of Dendrobranchiata in the study area are the papers of Maurin (1965), Abbes and Casanova (1973), Casanova and Judkins (1977), Sardà et al. (1982), Abelló et al. (2002), Domenech et al. (1981), Cartes et al. (2007, 2014), Serrano et al. (2011), Abelló and Torres (1998), and the classic works of Sund (1920), Stephensen (1923) and Hansen (1920, 1922).

In the new updated checklist, a new genus and species of the family Aristeidae is recorded for Iberian waters: *Cerataspis monstrosus*, which was captured in the Gulf of Biscay and reported as *Plesiopenaeus armatus* by Saint Laurent (1985). According to its general geographic distribution (Crosnier and Forest 1973, d'Udekem d'Acoz 1999a), this species must also be present in the Atlantic areas of Portugal and the Gulf of Cádiz. Morgan et al. (1985: Fig. 3) showed the presence of mysis larval stages of several species of *Cerataspis* around Iberian waters, while Bracken-Grissom et al. (2012) confirmed molecularly that the adult of *P. armatus* and the larvae of *C. monstrosus* belong to the same species.

In the family Benthescymidae, two new species of the genus *Benthescymus* have been added: *B. brasiliensis* and *B. iridescens* (Appendix 1).

In the family Penaeidae, three other species must be included in the updated list: *Penaeopsis serrata*, *Funchalia villosa* and the introduced species *Penaeus pulchricaudatus* (Abelló and Torres 1998, Abelló et al. 2002, Judkins 2014, d'Udekem d'Acoz 1999a, Rodríguez 1989).

In the Solenoceridae family, *Metapenaeus affinis*, *Hymenopenaeus aphoticus* and *Hymenopenaeus debilis* have been added to the list provided by Zariquiey Álvarez (1968) (Cartes et al. 2014, García Raso 1996, Abelló et al. 2002).

The Sergestidae family has recently been revised by Vereshchaka (2000, 2009) and Vereshchaka et al. (2014). These authors proposed some new genera, although the WoRMs does not include some of them yet. The information on the general distribution of the species can be found in Vereshchaka (2009) and in papers mentioned in the following paragraph.

In Iberian waters, this family shows a high species richness. A total of 15 species in 10 genera, most of them epipelagic and some benthopelagic and bathypelagic, have been reported. Eight of these species were not reported by Zariquiey Álvarez (1968): *Cornotosergestes cornutus* (synonym: *Sergestes cornutus* Krøyer, 1855), *Deosergestes henseni* (syn. *Sergestes*

henseni Ortmann, 1893), *Gardinosegia splendens* (syn. *Sergia splendens* Sund, 1920), *Parasergestes armatus* (syn. *Sergestes armatus* Krøyer, 1855), *Petalidium obesum*, *Sergia burukovskii*, *Sergia grandis* and *Sergia tenuiremis* (syn. *Sergestes kroeyeri* Bate, 1891) (see Appendix 1) (Cartes et al. 2014, d'Udekem d'Acoz 1999a, Torres et al. 2014, Landeira and Fransen 2012, Hansen 1920, 1922, Dos Santos and Moreira 2003).

Judkins (2014) provided geographical distribution maps of pelagic decapod shrimps in the Atlantic Ocean, which allowed us to complete the distribution of some species (such as *Gennadas tinayrei* and *Funchalia villosa*). We also used general information from the Ocean Biogeographic Information System (OBIS) (for example for *F. villosa* <http://www.iobis.org/explore/#/taxon/444697>) and from specific websites edited by recognized research centres or researchers (e.g. *F. woodwardi* reported in Portugal in the French Inventaire National du Patrimoine Naturel (<https://inpn.mnhn.fr/accueil/recherche-de-donnees/especes>)).

Additionally, *Deosergestes arachnipodus* (Cocco, 1832, described as *Acheles arachnipodus*) was considered a synonym of *Sergestes arcticus* by Hansen (1922) and Zariquiey Álvarez (1968). Holthuis (1977a) mentioned that it is a synonym of *S. corniculum* Kroyer, 1885 and that the use of the name *arachnipodus* should be given preference since it is older than *corniculum*. However, Vereshchaka (2009), following Hansen (1922), considered that *D. arachnipodus* is a synonym of *Sergestes arcticus* Kroyer, 1855 (= *Eusergestes arcticus*, see Judkins and Kensley 2008), but this species is still accepted as valid in the WoRMs. We have followed Vereshchaka (2009) in this article, but the situation needs to be clarified.

Other species of Dendrobranchiata not yet reported in Iberian waters but with probable presence due to their biogeographical distribution range, and because they have been reported off northern Morocco, are *Benthescymus bartletti* Smith, 1882 and *Benthonectes filipes* Smith, 1885 (García Raso 1996), as well as *Allosergestes pectinatus* (Sund, 1920) (Sund 1920, d'Udekem d'Acoz 1999a).

The suborder Pleocyemata is the most diverse and rich in species. It includes ten infraorders: Achelata, Polychelida, Astacidea, Stenopodidea, Caridea, Procarididea (with no species in Iberian waters), Axiidea, Gebiidea (both previously included within the Thalassinidea infraorder), Anomura and Brachyura.

The first three infraorders (Achelata, Polychelida and Astacidea) have 18 marine species included in 14 genera. In Zariquiey Álvarez (1968) these taxa were included within the Section Macrura Reptantia in the superfamilies Astacidea and Palinuridea [together with the Polychelidae, Palinuridae and Scyllaridae (the last two belonging presently to the Achelata)].

Some relevant contributions for the study area concerning these infraorders include those of Bouvier (1917), Miranda y Rivera (1921), Silvertsen and Holthuis (1956), Türkay (1976), Domenech et al. (1981), Saint Laurent (1985), Neves (1987), García Raso (1996) and Cartes et al. (2014), as well as the review of Polychelidae by Galil (2000).

New additions to Achelata since Zariquiey Álvarez (1968) are the scyllarid *Acantharctus posteli* (= *Scyllarus posteli* Forest, 1963) (Pozuelo et al. 1976, García Raso 1982c, González-Gordillo and Rodríguez 2003) and the introduced palinurid *Jasus lalandii* (Guerra and Gaudêncio 1982, d'Udekem d'Acoz 1999a).

Within the Polychelida, new additions include *Cardus crucifer* (= *Polycheles crucifer* Thomson, 1873) (d'Udekem d'Acoz 1999a, Türkay 1976), *Pentacheles snyderi* (Galil 2000), and *Willemoesia leptodactyla* (Saint Laurent 1985). *Pentacheles laevis* was quoted in Zariquiey Álvarez (1968) as *Polycheles granulatus* Faxon, 1893) without specifying its distribution area, but d'Udekem d'Acoz (1999a) (following Bouvier 1917) mentioned the species in Galicia and Portugal. *Pentacheles validus* (= *Polycheles validus* A. Milne-Edwards, 1880) could very probably be found in Atlantic Iberian waters since it has been reported in the northern sector of the Gulf of Biscay (Saint Laurent 1985), the Azores and northern Africa (Galil 2000).

The infraorder Stenopodidea was represented in the book of Zariquiey Álvarez (1968) by only two species. The studies of Macpherson (1978), Pretus (1990), Cartes and Sardà (1992), Cartes et al. (1994), García Raso (1996), Goy and Cardoso (2014) and Cartes et al. (2014) have increased this list to seven species (in four genera and two families), most of them from deep waters. *Odontozona addaia* is an endemism of the Iberian Peninsula, described from a marine cave of Menorca (Balearic Islands) (Pretus 1990). *Odontozona edwardsi* (= *Richardina edwardsi* Bouvier, 1908) was captured in northern Spain (Goy and Cardoso 2014), *Richardina fredericii* in the western Mediterranean (Macpherson 1978, Cartes and Sardà 1992, Cartes 1993, Cartes et al. 1994) and *Spongicoloides evolutus* in southern Portugal (García Raso 1996). Other studies (e.g. Neves 1969, García Raso 1985a) have increased the distribution area of some species. In addition, *Spongicoloides profundus* Hansen, 1908 could be added to this list, since although there are no records for Iberian waters, it has been captured in northern Morocco (García Raso 1996) and its biogeographic range reaches northern Europe.

The infraorder Caridea is a very large taxonomic group, with 128 marine species in Iberian peninsular waters included in 51 genera and 14 families. Fifty of these species were not mentioned in 1968. The taxonomy/phylogeny of the Caridea is not yet fully resolved, as is the case of the Palaemonidae, which appear in two clades (Aznar-Cormano et al. 2015), although only one of them is in Iberian waters.

Within the Alpheidae family, *Alpheus platydactylus* was reported for the first time in Spanish waters by Forest (1965), *Synalpheus africanus* (as *S. hululensis*) by García Raso (1984a), *Automate branchialis* by Guillen Nieto (1996), and *Alpheus talismani* and *Athanas amazona* by García Raso (1996) and Marina et al. (2015). These species have subsequently been found in other peninsular areas (e.g. Box et al. 2007, García Raso et al. 2010, Duris 1996, Abelló et al. 2002) (Appendix 1). Recently two new records of *Alpheus* species (Palero et al. unpublished data) have been found in Iberian

waters, thus increasing to 12 the number of marine species of this family. As potential additions, we can mention the African *Athanas grimaldii* Coutière, 1911, given its report in the Gulf of Biscay, France (Coutière 1911), although it needs confirmation (Nouvel 1941 in d'Udekem d'Acoz 1999a).

De Grave et al. (2014) showed that the former family Hippolytidae is not a monophyletic group and proposed to split it into five families. We have followed this criterion. Therefore, this group at present contains the following families: Lysmatidae Dana, 1852, Thoridae Kingsley, 1879, Bythocarididae Christoffersen, 1987, Merguuiidae Christoffersen, 1990 and Hippolytidae S. Bate, 1888 s.s. Four genera and 11 species belonging to three of these families have been added to Iberian peninsular waters since Zariquiey Álvarez (1968).

Within the Bythocarididae family, only the occurrence of *Bythocaris cosmetops* has been reported in the Alboran Sea (García Raso et al. 2011).

Six new records for the Hippolytidae family have been provided in Iberian waters. *Caridion gordonii* was reported on the Galicia Bank seamounts (Cartes et al. 2014) and *Caridion steveni* off Portugal (larvae) (Paula 1987), in the Balearic Islands (García Socias and García 1996, as *Caridion* sp., Torres et al. 2014, larvae) and in the Ebro Delta area (Abelló et al. 2002). *Merhippolyte ancistrota* was captured off Morocco, both in the Alboran Sea and in the Atlantic Ocean (d'Udekem d'Acoz and Duriš 1996, García Raso 1996), and recently also in the Gulf of Cádiz (García Raso, unpublished data, INDEMARES-Chica Expedition). *Hippolyte lagarderei* was reported in Cádiz by López de la Rosa et al. (2002), *Hippolyte niezabitowskii* in Málaga by García Raso et al. (1998), *Hippolyte leptometrae* in the Gulf of Biscay (Gascogne) and in the Mediterranean (France and Turkey, d'Udekem d'Acoz 1999a), and recently in the Alboran Sea (García Raso pers. comm.). García Raso and Manjón-Cabeza (1996) provided information on the expansion of the distribution area for other species. However, the presence of *Hippolyte holthuisi* in northern Spain (Anadón 1975) needs to be confirmed.

Within the Thoridae family *Eualus drachi* was captured in the Alboran Sea (Duris 1996, García Raso et al. 2014a), *Eualus lebourae* in the Strait of Gibraltar off Ceuta (García Raso 1996), and the boreal species *Lebbeus microceros* on the Galicia Bank (Cartes et al. 2014). Paula (1987) found larvae of *Eualus gaimardii* in southwestern Portugal during six months of an annual cycle.

The presence of three additional species in Iberian waters is very possible. These belong to the Lysmatidae family: *Lysmata nilita* Dohrn and Holthuis, 1950, known in the Azores, Canary Islands and Mediterranean Sea, see (d'Udekem d'Acoz 1999a), *Lysmata olavoii* Fransen, 1991, reported in the Azores and Mediterranean Sea (d'Udekem d'Acoz 1999a), and *Lysmata unicoloris* Holthuis and Maurin, 1952, captured in Atlantic waters of Morocco (Lagardère 1971).

The Ogyridae family is represented by only one species, *Ogyrides rarispina*, not mentioned by Zariquiey Álvarez (1968), recorded in Cádiz by Holthuis (1977b)

and later by López de la Rosa et al. (2002), Cuesta et al. (2006) and González-Ortegón (2008).

The Bresiliidae family, not mentioned by Zariquiey Álvarez (1968), is represented in Iberian waters by *Bresilia atlantica*, and was caught recently on the Galicia Bank (Cartes et al. 2014).

The Crangonidae family has 15 species included in seven genera in the study area. Of these, five have been reported since 1968 in Iberian waters. Four of these are found exclusively in Atlantic waters: *Sabinea hystrix* and *Metacrangon jacqueti* in the Galicia Bank by Cartes et al. (2014); *Parapontophilus abyssii* in the Gulf of Biscay and in the Gulf of Cádiz by Saint Laurent (1985) and García Raso (1996), respectively; and *Crangon allmani* in the Bay of Cascais, Portugal by Santinho (2009), although only larvae of this species have been captured. Anadón (1975) provided information on the presence of *Crangon crangon* in Galicia. *Pontophilus norvegicus* was first mentioned in Spanish Mediterranean waters by Forest (1965), and has also been reported in the Atlantic by d'Udekem d'Acoz (1999a) and Cartes et al. (2007). *Philocheras bispinosus*, reported by Zariquiey Álvarez (1968), Neves (1975), and García Raso and Manjón-Cabeza (2002), is represented by two subspecies or species according to the WoRMS. The subspecies *Philocheras bispinosus neglectus* (Sars, 1883) has been only reported by García Raso and Manjón-Cabeza (2002) in the Alboran Sea, and by Santinho (2009) in Portugal. More data on the distribution of some species in Portugal are available in Paula (1987), Dos Santos (1999) and Dos Santos et al. (2008). In addition, the presence of the African species *Parapontophilus talismani* (Crosnier and Forest 1973) (= *Pontophilus talismani*) is possible because it has been recorded in the northern part of the Gulf of Biscay (Saint Laurent 1985).

The Glyphocrangonidae family (not mentioned in Zariquiey Álvarez 1968) is represented by three Atlantic species: *Glyphocrangon atlantica*, *G. sculpta* and *G. longirostris*, the first two captured in the Gulf of Biscay (Holthuis 1971 and Saint Laurent 1985), and the third on the Galicia Bank (Cartes et al. 2014).

The Nematocarinidae family is represented by three species, two of them cited since 1968: *Nematocarcinus exilis* in the Atlantic Ocean (Saint Laurent 1985, Cartes et al. 2014, García Raso 1996) and in the Mediterranean Sea (Abelló and Valladares 1988), and *N. gracilipes* only in Atlantic waters off western Portugal and in the Gulf of Cádiz (Neves 1982, García Raso 1996); the presence of *N. ensifer* is mentioned in Portugal (without location) by Cardoso and Serejo (2007).

The Acanthephyridae family, included in Ophlophoridae in Zariquiey Álvarez (1968), is represented by 14 species within seven genera. Five of these have been cited since 1968: *Acanthephyra brevirostris* in Galicia and Portugal (Crosnier and Forest 1973), *Acanthephyra purpurea* in Galicia and Portugal (d'Udekem d'Acoz 1999a, Silvertsen and Holthuis 1956) and also in the Gulf of Cádiz (Portuguese and Spanish waters) (García Raso 1996, García Raso unpublished data, INDEMARES-Chica 0211), *Heterogenys micropthalma* (syn. *Acanthephyra micropthalma* Smith,

1885) in Portugal (Coutière 1911, see d'Udekem d'Acoz 1999a), *Hymenodora glacialis* in the Gulf of Biscay (Saint Laurent 1985); and *Kemphyra corallina* in western Portugal (see d'Udekem d'Acoz 1999a). Finally, *Meningodora miccyla* (Chace, 1940) could also be present in Iberian waters because it was reported between the Azores and Portugal by Burukovsky (1996), although without a specific locality.

The Ophlophoridae family is represented by four species, in two genera; three of them not mentioned by Zariquiey Álvarez (1968). *Oplophorus spinosus* was captured in Galicia (Cartes et al. 2014), southern Portugal and Cádiz (García Raso 1996, and García Raso INDEMARES-Chica, unpublished data); *Systemaspis braueri* was found in the Cantabrian Sea by Saint Laurent (1985) and Crosnier and Forest (1973); and *Systemaspis cristata* has been reported from the Gulf of Biscay (Crosnier and Forest 1973) and in the west and south of Portugal (d'Udekem d'Acoz 1999a).

The Gnathophyllidae family has only one species in Iberian Peninsula waters, *Gnathophyllum elegans*, with a Mediterranean distribution (Zariquiey Álvarez 1968, García Raso 1982b), although it could be found in the Gulf of Cádiz [see WoRMS: *Gnathophyllum elegans* (Risso, 1816), accessed at <http://www.marine-species.org/aphia.php?p=taxdetails&id=107608> on 2018-04-03].

The Bathypalaemonellidae family has not been recorded in Iberian waters, but *Bathypalaemonella serratipalma* Pequegnat, 1970 was caught in the central part of the Gulf of Cádiz (Ibero-Moroccan), in waters close to the coast of Morocco (García Raso 1996).

Concerning the Palaemonidae family, Grippa and d'Udekem d'Acoz (1996) reviewed the species belonging to the genus *Periclimenes* from the Mediterranean and the northeastern Atlantic. González-Ortegón and Cuesta (2006) made a very useful illustrated key to identify the species of *Palaemon* and *Palaemonetes* (= *Palaemon*, after De Grave and Ashelby 2013) from European waters. In total, 18 marine and estuarine species of palaemonids are known from peninsular waters. Four of them have been captured since 1968: *Brachycarpus biunguiculatus* in the Mediterranean (in the Alboran Sea by García Raso 1987a, 1990, and in the Balearic Islands by Torres et al. 2014); *Periclimenes aegylios* in the Balearic Islands (García Socias and Gracia 1996); *P. kornii* in the Gulf of Cádiz (Saint Laurent and García Raso 1993), the Alboran Sea (d'Udekem d'Acoz 1999b, and García Raso unpublished data) and, with doubts, in Catalan Sea waters (Cartes et al. 1994, as *Periclimenes* sp.). An introduced species, *Palaemon macrodactylus*, has also been reported in the Gulf of Cádiz, in the Guadiana, Guadalquivir, Guadalete, San Pedro and Salado estuaries (Cuesta et al. 2004, 2006, González-Ortegón et al. 2005), in Cascais, western Portugal (Santinho 2009) and in the Balearic Islands as larvae (Torres et al. 2012). Finally, González-Ortegón et al. (2006), Cuesta et al. (2012) and Cartaxana (2015) found, by analysing the variation in mtDNA, that there is no reason to recognize *Palaemon garciacidi* (a species described by Zariquiey-Alvarez 1968) as a species distinct from *P. longirostris*. In addition, larvae of

Ascidonia flavomaculata were captured in Portugal by Paula (1987). Finally, *Balssia noeli* Bruce, 1998 has not been reported in Spanish waters, but its presence in Iberian Peninsula waters is quite probable since it was described by Bruce (1998) from Banyuls-sur-Mer, in the NW Mediterranean.

The Pandalidae family is represented by 17 species (within six genera), five of which were not recorded in Iberian waters by Zariquiey Álvarez (1968). These are *Dichelopandalus bonnieri* captured off northern Spain (Fariña et al. 1997, Domenech et al. 1981); *Heterocarpus grimaldii* off southern Portugal (Crosnier and Forest 1973 and García Raso 1996); *Plesionika ensis* in the Alboran Sea and Gulf of Cádiz (García Raso 1981, 1996), *Plesionika geniculatus* off Portugal (d'Udekem d'Acoz 1999a) and *Plesionika williamsi* off southern Portugal (García Raso 1996). Neves (1985) reported the occurrence of *Chlorotocus crassicornis* on the Portuguese coast, Fariña et al. (1997) in Galicia and Landeira et al. (2015) in the Gulf of Cádiz, while describing several larval stages. A rare pandalid whose presence is probable (although not verified) is *Plesionika alexandri* (A. Milne-Edwards, 1883). It was captured off northern Morocco during the Balgim Expedition (García Raso 1996 as *Plesionika* sp.) and in the Azores (d'Udekem d'Acoz 1999a, Fransen and Biscoito 2006).

The Phyetocarididae family is not mentioned in Iberian waters, but the species *Phyetocaris microphthalma* Chace, 1940 has been reported between the Azores and Portugal (Burukovsky 1996), without indicating a specific locality. It is a similar case to that of *Meningodora miccyla*.

The Pasiphaeidae family is represented by eight species within four genera, but only four species were mentioned in Zariquiey Álvarez (1968). New records are *Eupasiphae gilesii*, quoted in the Gulf of Biscay (North) and Galicia (Abbes and Casanova 1973) and between the Azores and Portugal (Burukovsky 1996, d'Udekem d'Acoz 1999a); *Pasiphaea ecarina*, recently captured by Cartes et al. (2014) on the Galicia Bank; *P. hoplocerca*, found along the Spanish and Portuguese Atlantic coasts (Cartes et al. 2014, d'Udekem d'Acoz 1999a, Dos Santos and Moreira 2003) and also in the Gulf of Cádiz by the INDEMARES-Chica expedition (García Raso unpublished data); *P. tarda*, recently reported in Cantabria and Galicia by Cartes et al. (2007 and 2014 respectively); and *Psathyrocaris fragilis* (previously reported by Zariquiey Álvarez 1968 as *Psathyrocaris fragilis* var. *atlantica* Caulery, 1896), found in Cantabria by Cartes et al. (2007). Other species whose presence is possible are *Psathyrocaris infirma*, reported in the Gulf of Biscay, French waters (Lagardère 1970) and in Moroccan Atlantic waters (d'Udekem d'Acoz 1999a); *Eupasiphae serrata* (Rathbun, 1902), whose northernmost reference is from northern Morocco, at 35°09'N, far from the coast (Crosnier 1988, García Raso 1996), which could be found in the southern waters of the Iberian Peninsula; and *Parapasiphae compta* Smith, 1884, mentioned between 48° and 44°N and 15° and 17°W (Crosnier 1988, d'Udekem d'Acoz 1999a). Two other pelagic species

of this group that may appear in peninsular Atlantic waters, but more rarely since their closest references are some distance offshore, are *Parapasiphae cristata* Smith, 1884 and *Pasiphaea liocerca* Chace, 1940 (Silvertsen and Holthuis 1956).

The Processidae family is represented in Iberian waters by 10 species, all of them belonging to the genus *Processa*. With the exception of *P. macrodactyla*, all other species were already reported by Zariquiey Álvarez (1968), although the names of some species have been modified (see Table 1). *P. macrodactyla* is an African species first recorded in European waters in the Alboran Sea, in Málaga (García Raso and Salas 1985); later it was found in the Bay of Cádiz (Ortega et al. 2005) and in the Catalan Sea (Aguirre and Sánchez 2005). Today there are references of this species even in Turkish waters (Ateş et al. 2004). The occurrence of *P. acutirostris* from Guipuzcoa (Martínez et al. 2007 as *P. cf. acutirostris*) needs to be confirmed. We should also mention that the capture of *P. intermedia* during the CALMEN07 expedition (Junoy 2008) is the first reference on the Iberian Mediterranean coasts. Finally, Williamson and Rochanaburanon (1979) described two subspecies of *P. modica* (reported as *P. parva* by Zariquiey Álvarez 1968): *P. m. carolii* and *P. m. modica*, the first reported from Cadaqués and southwestern Spain and the second in Atlantic waters, from the North Sea to NW France. The distribution of both subspecies in the Iberian Peninsula has not been studied.

Gurney (1942) considered *Amphionides reynaudii* (H. Milne-Edwards, 1833) (a species of the family Amphionididae Holthuis, 1955) to be in the Caridea, and although its taxonomic position is not yet fully elucidated, DNA analysis shows its close affinity with the Pandalidae (De Grave et al. 2015). This pelagic species is widely distributed, since it is present in the Pacific, Indian and Atlantic oceans, particularly in tropical and subtropical waters between 36°N and 36°S (De Grave et al. 2015, Fransen 2010), including waters south of the Iberian Peninsula. Consequently, it has not been included in the checklist (Appendix 1), but its presence is likely offshore the southern part of the Peninsula, especially considering the current temperature increase of the oceans.

The old Thalassinidea infraorder is presently considered paraphyletic and was therefore divided into two new infraorders: Axiidea and Gebiidea (Bracken et al. 2009, Dworschak et al. 2012). A study of the European and Mediterranean Thalassinidea was carried out by Ngoc-Ho (2003).

The Axiidea infraorder is represented in Iberian waters by six families: Axiidae, Calocarididae, Callianassidae, Eucalliidae, Bathycalliidae and Gourretiidae (Dworschak et al. 2012), containing 13 species within 12 genera, nine of them not mentioned by Zariquiey Álvarez (1968).

In the Axiidae family the new reported species are *Calocarides coronatus* in Cantabria (Cartes et al. 2007), the Alboran Sea (García Raso 1996, Abelló et al. 2002) and Catalonia (Cartes et al. 1994), and *Levantocaris hornungae* off the Catalan coast (pers. comm. by Saint Laurent in d'Udekem d'Acoz 1999a).

Concerning the Calocarididae family, *Calastacus laevis* was quoted in the Bay of Biscay (Saint Laurent 1972a) and *Calocaris cf. templemani* on the Galicia Bank (Cartes et al. 2014) (as *Calocariopsis* in Sakai 2011). Additional data on the distribution of other species such as *Calocaris macandreae*, the most common axiid in Mediterranean waters, are provided by Diez et al. (1994) and Rueda et al. (2012a).

The species of the Callianassidae family from the NE Atlantic and Mediterranean Sea were studied by Saint Laurent and Bozic (1976), but currently this family has been split into several families. In the Iberian Peninsula Zariquiey Álvarez (1968) reported four species in three genera, but since this work several more species have been reported: *Necallianassa truncata* (previously mentioned by Zariquiey in waters of Melilla as *Callianassa truncata*) in Guipuzcoa (Martínez et al. 2007), Chingudi Bay, Hendaye (Lagardère 1966), Cascais, western Portugal (Santhino 2009) and the Balearic Islands (Torres et al. 2014). In the last two areas the reports were based on the capture of larvae. *Pestarella candida* was reported in the Gulf of Cádiz (García Raso 1985b, as *Callianassa pestae*), Algeciras, the Strait of Gibraltar-Alboran (García Raso 1983 as *Callianassa pontica*) and Cadaqués, NE Spain (Ngoc-Ho 2003). In Sakai (2011) the last two species are reported as *Trypaea truncata* and *Gilvossius candidus* (*Pestarella tyrrena* is also cited as *Gilvossius tyrrenus*), but these changes have not been accepted in the WoRMS.

Two additional species of Axiidea have recently been captured associated with mud volcanoes in the Gulf of Cádiz: *Vulcanocalliax arutyunovi* (Dworschak and Cunha 2007), belonging to the Bathycalliidae family, and *Calliax lobate*, captured during the INDEMARES-Chica expeditions (Rueda et al. 2012b, García Raso et al. 2018) and belonging to the Eucalliidae family. The eucallicid *Calliaxina punica* (Saint Laurent and Manning, 1982) could also be found in Spanish Mediterranean waters, since it is a typical Mediterranean species whose presence is known in the South of France (Ngoc-Ho 2003), but it has not yet been recorded.

The Gourretiidae family is represented in the Iberian Peninsula by a single species, *Gouretia denticulata*, recorded only in the Gulf of Cádiz (López de la Rosa et al. 1998).

The infraorder Gebiidea is composed of four families, two of them present in Iberian waters.

The Upogebiidae family contains at present four Iberian species. Only one species has been added since Zariquiey's work: *Upogebia mediterranea*, from the Balearic Islands (Ngoc-Ho 2003). However, three additional species could be found: *Gebiacantha talismani* (Bouvier, 1915), whose presence is known in Morocco (Saint Laurent and Loeuff 1979, García Raso 1996), and whose distribution includes the Mediterranean and East Africa (Ngoc-Ho 2003); *Upogebia nitida* (A. Milne-Edwards, 1868), captured in Toulon and Banyuls (S France), Italy, Algeria, and from Mauritania to the Gulf of Guinea (Ngoc-Ho 2003); and *Upogebia stellata* (Montagu, 1808), known from the North At-

lantic to France and also with a single occurrence, in Greece (Thessalou-Legaki 1986, Ngoc-Ho 2003).

The Laomediidae family is represented by a single species, *Jaxea nocturna*, found along the whole Iberian coast.

The Anomura infraorder is represented by 85 species belonging to 26 genera and 10 families.

Five species of the Chirostylidae family have been recorded in Iberian waters, two of which have been cited since 1968. These new occurrences are *Uroptychus bouvieri*, mentioned only in the NW sector of Spain (Cartes et al. 2014), although it probably occurs along the entire Atlantic coast since it has also been captured in northern Morocco (García Raso 1996); and *Uroptychus cartesi*, a new species described from the Galicia Bank (Baba and Macpherson 2012). In addition, *Uroptychus maroccanus* Türkay, 1976 is a well-known deep-sea species found in northern Morocco (Türkay 1976, García Raso 1996) and could probably be found in the Iberian sector of the Gulf of Cádiz.

The Galatheididae family is represented in the Iberian waters by 10 species, all of them belonging to the genus *Galathea*. The geographical distribution of the species given by Zariquiey Álvarez (1968) has been expanded (see Türkay 1976, Neves 1977, García Raso 1987b, 1989), and the list has increased by two additional species: *Galathea capillata*, captured in the Gulf of Cádiz near the Strait of Gibraltar (García Raso and Manjón-Cabeza 2002); and *G. machadoi* recently captured on the Bank of Galicia (Cartes et al. 2014) and the Gulf of Cádiz (García Raso unpublished data, INDEMARES-Chica). *Galathea intermedia* could contain a complex of species. For instance, d'Udekem d'Acoz (1996) mentioned two subspecies (*G. intermedia intermedia* Lilljeborg, 1851 and *G. i. parroceli* Gouret, 1887), but these subspecies should not be included until their taxonomic position is clarified. The presence of *Galathea rufipes* A. Milne-Edwards and Bouvier, 1894 in the Gulf of Biscay also needs to be confirmed (see comments in d'Udekem d'Acoz 1999a).

The Munididae family is represented by eight species, all of them belonging to the genus *Munida*. The nomenclature and diagnosis of the species of the genus *Munida* from the northeastern Atlantic was revised by Rice and Saint Laurent (1986), who considered *Munida perarmata* a synonym of *Munida tenuimana*. However, Rodríguez Flores et al. (2016), using both morphological and molecular data, showed that *M. tenuimana* is a species restricted to NE Atlantic waters, whereas the Mediterranean specimens belong to a different species: they recommended that the name *Munida perarmata* should be resurrected. Furthermore, two additional species have been recorded in the area: *Munida micropthalma*, on the Galicia Bank (Cartes et al. 2014), and *Munida sanctipauli*, captured in the Gulf of Cádiz (García Raso unpublished data, INDEMARES-Chica 0211). New references of some species for different sectors are given (e.g. García Socias and Gracia 1988) in Appendix 1. Finally, *Munida rutilanti* has been shown to be a junior synonym of *M. speciosa* von Martens (Rodríguez Flores et al. 2016).

The Munidopsidae family is represented in Iberian waters by 13 species. All of them except *Galacantha rostrata* are included within the genus *Munidopsis*. Ten of these species were reported later than 1968 (Zariquiey Álvarez 1968): *M. abyssicola*, *M. acutispina*, *M. allae*, *M. antonii*, *M. aries* (= *Munidopsis sundi* Sivertsen and Holthuis, 1956), *M. curvirostra*, *M. marionis*, *M. parfaii*, *M. thieli* and *M. vaillantii*. All of them were reported from Atlantic waters of northern Spain, and/or in western and/or southern Portugal (see Appendix 1) (Saint Laurent 1985, Macpherson and Segonzac 2005, Cartes et al. 2014, Türkay 1975 and 1976, d'Udekem d'Acoz 1999a, and data from ORBIS). In addition, Abelló and Valladares (1988) recorded *Munidopsis serricornis* in the Catalan Sea.

The Porcellanidae family includes four species, all mentioned in Zariquiey Álvarez (1968). *Pisidia longimama* was cited in Portugal by Neves (1977) and Nunes-Ruivo (1961), and in Galicia by Anodon (1975). The taxonomy of the genus *Pisidia* is currently under review and, based on morphological and molecular studies, the three known species will be validated and a fourth new species will be described (Cuesta et al. unpublished information).

The Albuneidae family is represented in Iberian waters by just one species already mentioned by Zariquiey Álvarez (1968), *Albunea carabus*, which shows a Mediterranean distribution, although it has recently been found in southern Portugal (Pereira et al. 2008).

No species of the Lithodidae family were mentioned by Zariquiey Álvarez (1968), but three species have been captured in northern Spain, all of them on deep-sea bottoms (see Saint Laurent 1985 and Macpherson 1988): *Neolithodes grimaldii*, *Paralomis microps* and *Paralomis bouvieri* Hansen, 1908. The last species was located in the Cantabrian Sea according to Figure 33 in Macpherson (1988).

The six species of the Diogenidae family known in Iberian Peninsula waters were all mentioned by Zariquiey Álvarez (1968).

Six species of the Parapaguridae family are now known in Iberian waters, three of them since 1968. *Parapagurus nudus* and *P. abyssorum* in the Gulf of Biscay (Saint Laurent 1985), and *Paragiopagurus ruticheles* in southern Portugal (Lemaitre 1990 as *Sympagurus ruticheles*). Lemaitre (1989) did a review of the genus *Parapagurus* in the eastern Atlantic, completing the previous study by Saint Laurent (1972b).

The Paguridae family is the most diverse, with 28 species within six genera. New references for different geographic sectors have been given by Ingle (1993), García Raso (1982a, 1984b, 1985c), and the ECOMARG (IEO) 2005 and 2006 Expeditions, among others (see Appendix 1). Seven species of pagurids have been added since Zariquiey Álvarez (1968): *Anapagurus alboranensis*, described from the Alboran Sea by García-Gómez (1994) and later recorded in the Gulf of Cádiz (Manjón-Cabeza and García Raso 1998) and along the Spanish Mediterranean coasts (Macpherson and Raventos 2004); *Anapagurus pusillus*, captured in Atlantic waters in southern and western Portugal

(García-Gómez 1994, Sampaio et al. 2016) and in northern Spain (Cantabria, ECOMARG IEO, Serrano et al. 2006); *Catapaguroides iris*, captured in the Gulf of Cádiz (one specimen from INDEMARES-Chica 0211, García Raso unpublished data), previously known in Azores and the north of Morocco (Ingle 1993, García Raso 1996); *Pagurus pseudosculptimanus*, described by García Muñoz et al. (2014) and recorded in the Alboran Sea; the African *Pagurus mbizi*, which is penetrating into the Mediterranean through the Alboran Sea (García Raso et al. 2014b); *Pagurus pubescentulus*, recorded in Cantabria (IEO ECOMARG, Serrano et al 2006); and *Michelopagurus atlanticus*, a deep-sea (790-1575 m according to Lemaitre and Tavares 2015) amphi-Atlantic species recently found off Aveiro, Costa de Prata (western Portugal) at a much shallower depth (41 m) by Sampaio et al. (2016), which is noteworthy. Also, the occurrence of *Anapagurus smythi* Ingle, 1993 in the Cantabrian Sea (IEO ECOMARG <http://www.ecomarg.com/biodiversidad.html>) should be reviewed (so it is not included in Appendix 1). The specimen of *Catapaguroides iris* from INDEMARES-Chica 0211 shows a mixture of morphological characteristics of the two species cited in the area. The cephalothoracic shield has the same length and width ($L/W=0.93$, as shown in Figure 81a, p. 367 in Ingle 1993, for the holotype of *C. iris*), no longer than wide (as in Figure 85a, p. 345 in Ingle 1993, for a paratype of *C. megalops*), but the carpus of the large cheliped has an incomplete row of five spines (not a simple row of setosed tubercles as shown in Figure 81f in Ingle 1993 for *C. iris*, nor a complete and well-developed row of small sub-acute setose tubercles as shown in Figure 85g in Ingle 1993, for *C. megalops*). To complicate matters further, Saint Laurent (1968) drew a specimen ($L/W=0.98$) designated ?*C. megalops*, with a shield similar to that drawn by Ingle 1993 for *C. iris*, but with a strong row (even double row) of acute tubercles-spines. However, the deep-sea species *C. megalops* A. Milne-Edwards and Bouvier, 1892 could also be found, since it is known in nearby areas of the Atlantic (Morocco and Azores, Ingle 1993).

Other studies have increased the distribution area of some marine species in Spanish (García Muñoz et al. 2008, García Raso 1985c, García Raso et al. 2014a, Serrano et al 2006) and Portuguese waters (e.g. *Pagurus chevreuxi* by Almeida 2008). Furthermore, larvae of *Cestopagurus timidus* have been captured in southwestern Portugal (Paula 1987).

To complete the information regarding the Iberian Peninsula decapod crustacean fauna, it is worth mentioning that up to nine strictly freshwater species have been reported in the Iberian Peninsula, including the Balearic Islands (excluding brachyuran crabs). These are four crayfishes (Vedia and Miranda 2013): *Austropotamobius italicus italicus* (Faxon, 1914) (recorded as *A. pallipes lusitanicus* in Zariquiey Álvarez 1968) and *Pacifastacus leniusculus* (Dana, 1852) (both within the family Astacidae Latreille, 1802); *Procambarus clarkii* (Girard, 1852) (family Cambaridae Hobbs, 1942); and *Cherax destructor* Clark, 1936 (family Parastacidae Huxley, 1879). The last three species have been inten-

tional human-mediated introductions for aquaculture. One yet undescribed alpheid shrimp of the genus *Bermudacaris* was discovered in an anchialine cave in the Balearic Islands (Gràcia et al. 2003, Gràcia and Jaume 2011). The freshwater list also includes three atyids, *Atyaephyra desmarestii* (Millet, 18319), present in all Iberian freshwaters, *Dugastella valentina* (Ferrer Galdiano, 1924), present in the Gulf of Valencia (Sanz and Gómez 1984), and *Typhlatya miravetensis* Sanz and Platvoet, 1995, described from a cave in Ullal de la Rambla de Miravet in Cabanes, Castellón by Sanz and Platvoet (1995), and also one palaemonid, *Palaemon zariquieyi* Sollaud, 1938 (Sanz Brau 1986) (as *Palaemonetes* in Zariquiey Álvarez 1968). The latter three species are endemic to the eastern sector.

DISCUSSION

Species richness and distribution by geographic sectors

The number of marine decapod crustacean species (excluding Brachyura) reported by geographic sectors (Table 2) shows that the greatest specific richness is found in Atlantic waters, with 264 species, while a total of 178 species have been found in Mediterranean waters. These differences are the consequence of the relative extension of the areas, the depth ranges and the confluence of different water masses. The whole Atlantic sector has the greatest extension, the largest range of depths, and also the greatest diversity of water masses, with different characteristics and associated species. As an example, the various different water masses found in the Gulf of Biscay and Galicia are East North Atlantic Central Water, Mediterranean Outflow Water, which forms in the Gulf of Cádiz and progresses northwards, and Labrador Sea Cold Water (Cartes et al. 2007, 2014). In the Gulf of Cádiz there are clear influences of two marine ecoregions, the Lusitanian (with Atlantic and African sectors) and the Mediterranean (Spalding et al. 2007), or three provinces (Lusitanica, Mauritanica and the Mediterranean) (Bianchi et al. 2012), with different associated species. It must also be borne in mind that the fauna present in the Mediterranean has an ancient Atlantic origin (originated after the Messinian salinity crisis in the late Miocene 5.6 mya, Bianchi et al. 2012). Consequently, most Mediterranean species are also found in the Atlantic. The interaction of the water masses present and their dynamics, with the geological and environmental history, account for the present biogeographic structures. The greatest species richness is found in the Gulf of Cádiz and Gulf of Biscay - Galicia (GB-GA) sectors, with 194 and 176 species respectively. The Alboran Sea shows a lower species richness, probably because of its shorter coastal extension and lower range of depths, especially when compared with adjacent sectors.

Geographically, a total of 222 species have been identified in southern Iberian areas (GC + ALB), 176 species in northern areas (GB-GA), 160 species in eastern Spanish waters (SWM) and 155 species in western Portugal (WP).

The total number of marine decapod species known in and around Iberian waters, excluding Brachyura, is 293. However, this number increases to 305 when the nine freshwater species and several unpublished new records (see above) are also included.

Introduced marine decapod species

The number of introduced species (excluding brachyuran crabs) in the Iberian waters is relatively low (four, see Appendix 1 “Int”) and appears to be mainly related to human activities such as aquaculture (Zenetos et al. 2010, 2012). The four species are *Penaeus pulchricaudatus* (Penaeidae family), previously reported as *Penaeus japonicus* Spence Bate, 1888 (Rodríguez 1989, Guerra and Gaudêncio 2016, Tsoi et al. 2014), *Panulirus regius* and *Jasus lalandii* (Palinuridae family) (Zariquiey Álvarez 1968, Guerra and Gaudêncio 1982, Holthuis 1991), and *Palaemon macrodactylus* (Palaemonidae family).

Tsoi et al. (2014) showed that the references of *P. japonicus* in the Mediterranean corresponded to the cryptic species *P. pulchricaudatus*, but they only analysed specimens from its eastern basin. Therefore, we assume that the Iberian specimens also correspond to *P. pulchricaudatus*. This should, however, be checked since it is likely that these reports may be due to escapes from aquaculture facilities.

No additional occurrences of *Panulirus regius* and *Jasus lalandii* have been reported in Iberian waters, suggesting that their introduction around the Iberian Peninsula has not been successful. However, Frogliola et al. (2012) captured several specimens of *P. regius* in Italian waters in the Ligurian Sea and considered, taking into account the very long larval planktonic life of the species and the size of the specimens caught, that the occurrence of a successful population could be related to a population range expansion driven by global warming and Atlanto-Mediterranean currents rather than being a direct result of human introductions. In addition, Guerra and Gaudêncio (2016) mentioned the occurrence of the western Atlantic lobster *Panulirus guttatus* (Latreille, 1804) on the Portuguese coast, but without specifying any reference and introduction pathway (this species has not been considered in this paper).

The shrimp *Palaemon macrodactylus* has been introduced most probably through ballast water and presently shows well-established populations (Cuesta et al. 2004, Torres et al. 2012, Chícharo et al. 2009, González-Ortegón et al. 2010).

Additionally, the cause of the presence of certain African species (whose previously known northern limits of distribution were far to the south of the Iberian Peninsula) is not clear. They could be human-mediated introductions, but the scarcity of studies along the NW African coasts may also explain the lack of knowledge concerning the precise distribution areas of the species. Range expansions may also be due to climate change effects because the warming of the waters favours the northern expansion of thermophilic Atlantic species along the Atlantic coasts, and their introduction and further expansion in the Mediterranean Sea (e.g. *Pagurus mbizi*, García Raso et al. 2014b). Thus, the

Table 2. – Number of marine decapod, families (F), genera (G), species, total (sp) and new registers after Zariquiey Álvarez (1968) (spnr) (excluded crabs and freshwater species) ordered by families and geographical sectors. GB-GA, Gulf of Biscay and Galicia; WP, western Portugal; GC, Gulf of Cádiz or southwestern Iberian Peninsula; ALB, Alboran Sea; SWM, Spanish western Mediterranean; S, southern Iberian waters (GC+ALB); A, Atlantic Iberian waters (GB-GA+WP+GC); M, Mediterranean Spanish waters (ALB+SWM).

F	G	sp	spnr	Geographical sectors										
				GB-GA	WP	GC	ALB	SWM	S	A	M			
7	26	38	17	Dendrobranchiata										
	4	4	1	Family Aristeidae	4	3	3	2	2	3	4	2		
	3	7	2	Family Benthescymidae	6	5	5	2	1	5	7	2		
	4	6	3	Family Penaeidae	2	5	6	4	5	6	6	5		
	3	4	3	Family Solenoceridae	3	1	4	2	1	4	4	2		
	1	1	0	Family Sicyoniidae			1	1	1	1	1	1		
	10	15	8	Family Sergestidae	7	10	14	7	8	14	15	9		
	1	1	0	Family Luciferidae	1	1	1	1	1	1	1	1		
				Pleocyemata										
2	6	8	2	Achelata										
	3	4	1	Family Palinuridae	1	2	3	2	3	3	3	3		
	3	4	1	Family Scyllaridae	1	2	3	4	3	4	3	4		
1	5	7	3	Polychelida										
	5	7	3	Family Polychelidae	6	4	4	1	2	4	7	2		
1	3	3	0	Astacidea										
	3	3	0	Family Nephropidae	3	3	3	2	2	3	3	2		
2	4	7	4	Stenopodidea										
	3	5	3	Family Stenopodidae	2	1	1	2	3	2	3	3		
	1	2	1	Family Spongicolidae	1		2			2	2			
17	51	128	50	Caridea										
	4	10	5	Family Alpheidae	4	6	8	9	8	10	8	9		
	1	1	1	Family Bythocarididae				1		1		1		
	3	12	6	Family Hippolytidae	6	5	8	9	7	12	9	10		
	2	8	4	Family Thoridae	4	5	3	6	3	6	6	6		
	2	2	0	Family Lysmatidae	1	1	1	2	2	2	1	2		
	1	1	1	Family Ogyrididae			1			1	1			
	1	1	1	Family Bresiliidae	1						1			
	7	15	5	Family Crangonidae	12	11	11	10	11	11	15	11		
	1	3	3	Family Glyphocrangonidae	3						3			
	1	3	2	Family Nematocarinidae	2	2	2		1	2	3	1		
	7	14	5	Family Acanthephyridae	10	9	5	2	2	5	14	2		
	2	4	3	Family Oplophoridae	4	3	3			3	4			
	1	1	0	Family Gnathophyllidae				1	1	1		1		
	7	18	4	Family Palaemonidae	6	9	11	14	17	16	11	18		
	6	17	5	Family Pandalidae	6	9	16	12	11	16	17	12		
	4	8	4	Family Pasiphaeidae	8	5	4	2	2	4	8	2		
	1	10	1	Family Processidae	5	5	9	8	10	10	10	10		
6	12	13	9	Axiidea										
	3	3	2	Family Axiidae	1	1	1	1	3	2	2	3		
	3	3	2	Family Calocarididae	3		1	1	1	1	3	1		
	3	4	2	Family Callianassidae	3	3	3	4	4	4	4	4		
	1	1	1	Fam. Eucalliidae			1			1	1			
	1	1	1	Fam Bathycalliidae			1			1	1			
	1	1	1	Fam Gourretiidae			1			1	1			
2	2	5	1	Gebiidea										
	1	4	1	Family Upogebiidae	2	2	2	2	4	2	2	4		
	1	1	0	Family Laomeidiidae	1	1	1	1	1	1	1	1		
10	27	85	32	Anomura										
	2	5	2	Family Chirostyliidae	5						5			
	1	10	2	Family Galatheidae	5	6	8	6	7	9	8	7		
	1	8	2	Family Munididae	6	6	7	4	4	7	8	4		
	2	13	11	Family Munidopsidae	10	4	2		1	2	13	1		
	2	4	0	Family Porcellanidae	3	3	3	3	4	3	3	4		
	1	1	0	Family Albuneidae			1	1	1	1	1	1		
	2	3	3	Family Lithodidae	3						3			
	5	6	0	Family Diogenidae	4	5	5	6	6	6	6	6		
	4	6	3	Family Parapaguridae	3	1	4			4	6			
	7	28	7	Family Paguridae	18	16	21	20	17	25	26	21		
48	136	293	116		176	155	194	155	160	222	264	178		

presence of these species today could be the result of natural expansions of their geographic distribution ranges rather than human-mediated introduction.

General reflections on the total specific richness in the Iberian Peninsula

The total number of decapod species in the Iberian Peninsula (marine and continental), including the 140

species of crabs reported by Marco-Herrero et al. (2015) and other new species in process of description, comes to 449. Regarding the crabs mentioned by Marco-Herrero et al. (2015), some references need clarification. In this regard, there are cases under study of synonyms within the Calappidae and Leucosiidae families [e.g. *Calappa tuerkayana* Pastore, 1995, a synonym of *Calappa granulata* (Linnaeus, 1758) (Holthuis 2001); a similar case could be found within the genus *Ebalia*]

that will decrease the number of species in it. However, other species have to be added, such as *Inachus parvirostris* (Risso, 1816), captured on the CALMEN07 expedition (Junoy 2008) in the vicinity of Alboran Island (García Raso, unpublished data, INDEMARES Alboran expedition) and *Pinnotheres petunculi* Hesse, 1872 (Pérez-Miguel et al. 2017). Within the Pinnotheridae family there are also new species of crabs in process of description.

Consequently, the total number of decapod crustacean species in Iberian waters could reach 448, much higher than the total reported in Italy, with 324 marine and freshwater species (Froglia 2010); in Turkey, with 265 (Ateş et al. 2010, Deval and Froglia 2016); and on the coasts of Algeria, with 253 (Grimes et al. 2016). However, when only the species richness of the Iberian Mediterranean coasts (with less km of coastline) is compared with that of Italy, the number of species (about 296) is lower, although still higher than those reported for Algeria and Turkey. The position of the Iberian Peninsula in the western Mediterranean Sea, surrounded by both Atlantic and Mediterranean waters, is probably the main reason for this greater richness of species. The wide range of depths and long coastlines occurring in the area may be important additional reasons for the high species richness.

Finally, we must mention that molecular analysis studies are currently being carried out to verify the validity of some species. Moreover, the exploration of deep habitats and ecosystems under the European Framework Directive for the Marine Strategy will report additional new occurrences and species. Accurate faunistic analysis of fishery discards may also become an increasing source of biodiversity knowledge that may help to understand biogeographic patterns and dynamic changes in distribution, including early detection of allochthonous and invasive species (Gorelli et al. 2016, Anjos et al. 2018). Another interesting and necessary activity, which is also carried out in some areas, is the study of meroplanktonic larvae in relation to hydrographic currents and climate change, because it improves knowledge of specific composition and biocenoses, and can explain the presence of new records and the increase of the biogeographical range of some species (Torres 2015, Landeira et al. 2017, Landeira and Lozano-Soldevilla 2018).

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to Isabel M. Muñoz for providing information on some species. We thank Royston F. Snart for the English revision of the manuscript. This work was partly supported by the INDEMARES/CHICA “Mud volcanoes from Gulf Cadiz” and INDEMARES/ALBORAN Projects, EC contract INDEMARES-LIFE+ (07/NAT/E/000732) and FEDER funding assigned to equipment of the R/V *Cornide de Saavedra* (FICTS-2010-01), CTM2017-88080 (AEI/FEDER, UE). Finally, thanks are due to Dr E. González-Ortegón and an unknown reviewer for fruitful comments and critical reading of the manuscript.

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Appendix 1. – Checklist of marine decapod crustacean species from the Iberian Peninsula (excluded Brachyura) by geographic sectors: Gulf of Biscay and Galicia (GB-GA); western Portugal (WP); Gulf of Cadiz or southwestern Iberian Peninsula (GC); Alborán Sea (ALB); Spanish western Mediterranean (SWM). The presence of the species in each geographic sector is coded by numbers that correspond to references below: (1) Abbes and Casanova 1973; (2) Abelló and Torres 1998; (3) Abelló and Valladares 1988; (4) Abelló et al. 2002; (5) Aguirre and Sánchez 2005; (6) Anadón 1975; (7) Baba and Macpherson 2012; (8) Box et al. 2007; (9) Cartes 1993; (10) Cartes and Sardà 1992; (11) Cartes et al. 2007; (12) Cartes et al. 1994; (13) Cartes et al. 2014; (14) Chicharro et al. 2009; (15) Crosnier and Forest 1973; (16) Cuesta et al. 2004; (17) Cuesta et al. 2006; (18) d'Udekem d'Acoz 1999a; (19) d'Udekem d'Acoz 1999b; (20) d'Udekem d'Acoz and Duris 1996; (21) Diez et al. 1994; (22) Domenech et al. 1981; (23) Dos Santos 1999; (24) Dos Santos and Moreira 2003; (25) Dos Santos et al. 2008; (26) Duris 1996; (27) Dworschak and Cunha 2007; (28) Fariña et al. 1997; (29) Forest 1965; (30) Galil 2000; (31) García-Gómez 1994; (32) García Muñoz et al. 2014; (33) García Muñoz et al. 2008; (34) García Raso 1981; (35) García Raso 1982a; (36) García Raso 1982b; (37) García Raso 1982c; (38) García Raso 1983; (39) García Raso 1984a; (40) García Raso 1984b; (41) García Raso 1985a; (42) García Raso 1985b; (43) García Raso 1985c; (44) García Raso 1987a; (45) García Raso 1987b; (46) García Raso 1989; (47) García Raso 1990; (48) García Raso 1996; (49) García Raso et al. 2010; (50) García Raso and Salas 1985; (51) García Raso and Manjón-Cabeza 1996; (52) García Raso and Manjón-Cabeza 2002; (53) García Raso et al. 1998; (54) García Raso et al. 2011; (55) García Raso et al. 2014a; (56) García Raso et al. 2014b; (57) García Socias and Gracia 1988; (58) García Socias and Gracia 1996; (59) González-Gordillo and Rodríguez 2003; (60) Goy and Cardoso 2014; (61) Grippa and d'Udekem d'Acoz 1996; (62) Guerra and Gaudêncio 1982; (63) Guillén Nieto 1996; (64) Hansen 1920; (65) Hansen 1922; (66) Holthuis 1971; (67) Holthuis 1977b; (68) Ingle 1993; (69) Judkins 2014; (70) Lagardère 1966; (71) Landeira and Fransén 2012; (72) Lemaitre 1989; (73) Lemaitre 1990; (74) López de la Rosa et al. 1998; (75) López de la Rosa et al. 2002; (76) Macpherson 1978; (77) Macpherson 1988; (78) Macpherson and Raventós 2004; (79) Macpherson and Segonzac 2005; (80) Manjón-Cabeza and García Raso 1998; (81) Marina et al. 2015; (82) Martínez et al. 2007; (83) Neves 1969; (84) Neves 1975; (85) Neves 1977; (86) Neves 1982; (87) Neves 1985; (88) Neves 1987; (89) Ngoc-Ho 2003; (90) Nunes-Ruivo 1961; (91) Ortega et al. 2005; (92) Paula 1987; (93) Pereira et al. 2008; (94) Pozuelo et al. 1976; (95) Pretus 1990; (96) Rice and Saint Laurent 1986; (97) Rodríguez 1989; (98) Rueda et al. 2012a; (99) Rueda et al. 2012b; (100) Saint Laurent 1972a; (101) Saint Laurent 1985; (102) Saint Laurent and Bozic 1976; (103) Saint Laurent and García Raso 1993; (104) Santinho 2009; (105) Sardà et al. 1982; (106) Serrano et al. 2006; (107) Serrano et al. 2011; (108) Sund 1920; (109) Torres et al. 2012; (110) Torres et al. 2014; (111) Türkay 1975; (112) Türkay 1976; (113) Sampaio et al. 2016; (114) Guerra and Gaudencio 2016; (115) González-Ortegón and Cuesta 2006; (116) García Raso et al. 2018; (Z) Zariquiy Álvarez 1968.

Abbreviations: CAL07, CALMEN07 expedition; Eco05, Eco06, ECOMARG Project 2005, 2006 (IEO); GR, unpublished data from García Raso; GRch, unpublished data from García Raso from Chica expedition; GRde, unpublished data from García Raso from DEEPER expedition; GRia, unpublished data from García Raso from Alboran Island; IMM, unpublished data from Isabel M. Muñoz; INDavil, INDEMARES project Cañon de Aviles (IEO); Int., introduced species; OBIS, data from Ocean Biogeographic Information System; PE, unpublished data from Pere Abelló; Z, data from Zariquiy Álvarez (1968); * New record after Zariquiy Álvarez (1968); ?, questionable or imprecise reference.

	Geographical sectors				
	GB-GA	WP	GC	ALB	SWM
Suborder Dendrobranchiata (previously Infraorder Penaeidea)					
Superfamily Penaeoidea Rafinesque, 1815					
Family Aristeidae Wood-Mason in Wood-Mason and Alcock, 1891					
<i>Aristaeopsis edwardsiana</i> (Johnson, 1867)	13	18	Z, 18, 48		
<i>Aristaeomorpha foliacea</i> (Risso, 1827)	Z, 18	18	Z, 18, 105	Z	Z
<i>Aristeus antennatus</i> (Risso, 1816)	Z, 18	18	Z, 18, 105	Z	Z
* <i>Cerataspis monstrosus</i> Gray, 1828	101				
Family Benthescycymidae Wood-Mason in Wood-Mason and Alcock, 1891					
<i>Bentheogennema intermedia</i> (Spence Bate, 1888)	Z	18	?, 18		
* <i>Benthescycymus brasiliensis</i> Spence Bate, 1881	101				
* <i>Benthescycymus iridescens</i> Spence Bate, 1881	18				
<i>Gennadas brevisrostris</i> Bouvier, 1905	18	18	Z, 18		
<i>Gennadas elegans</i> (Smith, 1882)	Z	18	Z, 18	Z	Z
<i>Gennadas tinayrei</i> Bouvier, 1906		69	Z, 18		
<i>Gennadas valens</i> (Smith, 1884)	13	18	Z, 18	18, 108	
Family Penaeidae Rafinesque, 1815					
* <i>Funchalia villosa</i> (Bouvier, 1908)		69	69	18	OBIS?
<i>Funchalia woodwardi</i> Johnson, 1867	13	OBIS	Z, 18, 48		4
<i>Parapenaeus longirostris</i> (Lucas, 1846)	18, 28	18	Z, GRch	Z	Z
* <i>Penaeopsis serrata</i> Spence Bate, 1881			18, GRch	2, GRde	4
* <i>Penaeus pulchricaudatus</i> Stebbing, 1914 (Int.)		114	18, 97		
<i>Penaeus kerathurus</i> (Forskål, 1775)		18	Z, GR	Z	Z
Family Solenoceridae Wood-Mason in Wood-Mason and Alcock, 1891					
* <i>Metapenaeus affinis</i> (H. Milne-Edwards, 1837 [in Milne-Edwards, 1834-1840])	13		IMM		
* <i>Hymenopenaeus aphoticus</i> Burkenroad, 1936			48?		
* <i>Hymenopenaeus debilis</i> Smith, 1882	13		48	4	
<i>Solenocera membranacea</i> (Risso, 1816)	22	18	Z, 18	Z	Z
Family Sicyoniidae Ortman, 1898					
<i>Sicyonia carinata</i> (Brünnich, 1768)			Z, 18	Z	Z
Superfamily Sergestoidea Dana, 1852					
Family Sergestidae Dana, 1852					
<i>Allosergestes sargassi</i> (Ortman, 1893)		69, OBIS	Z	36	Z
* <i>Cornuosergestes cornutus</i> (Krøyer, 1855)	65	23	23		
<i>Deosergestes corniculum</i> (Krøyer, 1855)	?	18	Z, GRch	36	Z
* <i>Deosergestes henseni</i> (Ortman, 1893)		23	23		110
<i>Eusergestes arcticus</i> (Krøyer, 1855)	Z, 18	18	18	36	Z, 18, 108
* <i>Gardinosergia splendens</i> (Sund, 1920)		69?	69, 71		110
* <i>Parasergestes armatus</i> (Krøyer, 1855)	13		69		
<i>Parasergestes vigilax</i> (Stimpson, 1860)			23	Z	Z
* <i>Petalidium obesum</i> (Krøyer, 1855)			64, 65		
<i>Robustosergia robusta</i> (Smith, 1882)	Z	Z	GRch	36	Z
<i>Sergestes atlanticus</i> H. Milne-Edwards, 1830	?	Z?, 69, OBIS	Z?, 23, GRch	18, 108	PE?
* <i>Sergia burukovskii</i> Vereshchaka, 2000			71		
* <i>Sergia grandis</i> (Sund, 1920)		24			

	Geographical sectors				
	GB-GA	WP	GC	ALB	SWM
<i>Sergia japonica</i> (Spence Bate, 1881)	Z?, 13	Z?, 18	Z?	Z, 18	
* <i>Sergia tenuiremis</i> (Krøyer, 1855)			5, 65		
Family Luciferidae De Haan, 1849 [in De Haan, 1833-1850]					
<i>Lucifer typus</i> H. Milne-Edwards, 1837	82	18, 104	Z	18, 36	Z
Suborder Pleocyemata					
Infraorder Achelata					
Family Palinuridae Latreille, 1802					
* <i>Jasus lalandii</i> (H. Milne-Edwards 1837) (Int.)			18, 62		
<i>Palinurus elephas</i> (Fabricius, 1787)	Z	18	GR	Z	Z
<i>Palinurus mauritanicus</i> Gruvel, 1911		18, GR	18	Z	Z
<i>Panulirus regius</i> De Brito Capello, 1864 (Int.)					Z
Family Scyllaridae Latreille, 1825					
* <i>Acantharctus posteli</i> (Forest, 1963)			59, 94	37	
<i>Scyllarides latus</i> (Latreille, 1803)		18	18, GR	GR	Z
<i>Scyllarus arctus</i> (Linnaeus, 1758)	Z	18	GR	Z	Z
<i>Scyllarus pygmaeus</i> (Spence Bate, 1888)				Z	Z
Infraorder Polychelida					
Superfamily Eryonoidea De Haan, 1841					
Family Polychelidae Wood-Mason, 1875					
* <i>Cardus crucifer</i> (Thomson, 1873)			18, 48, 112		
<i>Pentacheles laevis</i> Spence Bate 1878	18	18	18		
* <i>Pentacheles snyderi</i> (Rathbun, 1906)	30				
<i>Polycheles typhlops</i> Heller, 1862	22	18	18	18	Z
<i>Stereomastis nana</i> (Smith, 1884)	Z	18			
<i>Stereomastis sculpta</i> (Smith, 1880)	Z	18	GRch		12
* <i>Willemoesia leptodactyla</i> (Willemoes-Suhm, 1873)	101				
Infraorder Astacidea					
Superfamily Astacoidea Latreille, 1802					
Family Astacidae Latreille, 1802 - All freshwater					
Superfamily Nephropoidea Dana, 1852					
Family Nephropidae Dana, 1852					
<i>Homarus gammarus</i> (Linnaeus, 1758)	Z	18, 88	Z	Z	Z
<i>Nephrops norvegicus</i> (Linnaeus, 1758)	Z	18, 88	Z	Z	Z
<i>Nephropsis atlantica</i> Norman, 1882	Z	18	Z, 48, 112,		
Infraorder Stenopodidea					
Family Stenopodidae Claus, 1872					
* <i>Odontozona addaia</i> Pretus, 1990					95
* <i>Odontozona edwardsi</i> (Bouvier, 1908)	60				
* <i>Richardina fredericii</i> Lo Bianco, 1903				PE	9, 10, 76
<i>Richardina spinicincta</i> A. Milne-Edwards, 1881	Z				
<i>Stenopus spinosus</i> Risso, 1827		83, 92	18	41	Z
Family Spongicolidae Schram, 1986					
* <i>Spongicoloides evolutus</i> (Bouvier, 1905)			48		
<i>Spongicoloides koehleri</i> (Caullery, 1896)	Z, 13		Z		
Infraorder Caridea					
Superfamily Alpheoidea Rafinesque, 1815					
Family Alpheidae Rafinesque, 1815					
<i>Alpheus dentipes</i> Guérin-Méneville, 1832	Z	18	18	Z	Z
<i>Alpheus glaber</i> (Olivi, 1792)	Z	18	48, 105	Z	Z
<i>Alpheus macrocheles</i> (Hailstone, 1835)	Z	18	48, GRch	Z	Z
* <i>Alpheus platydactylus</i> Coutière, 1897				4, 26, GRia	29
* <i>Alpheus talismani</i> Coutière, 1898			48		
* <i>Athanas amazone</i> Holthuis, 1951			48	48, 81	PE
<i>Athanas nitescens</i> (Leach, 1813 [in Leach, 1813-1814])	Z	18	Z	Z	Z
* <i>Automate branchialis</i> Holthuis and Gottlieb, 1958				49	8, 63
* <i>Synalpheus africanus</i> Crosnier and Forest, 1965		23	23	39	
<i>Synalpheus gambarelloides</i> (Nardo, 1847)		18	18	Z	Z
Family Bythocarididae Christoffersen, 1987					
* <i>Bythocaris cosmetops</i> Holthuis, 1951				54	
Family Hippolytidae Spence Bate, 1888					
* <i>Caridion gordonii</i> (Spencer Bate, 1858)	13	23	23		
* <i>Caridion steveni</i> Lebour, 1930		92	23	PE?	4, 58, 110
<i>Hippolyte garciarasoii</i> D'Udekem d'Acoz, 1996	Z		Z, 18	Z	Z
<i>Hippolyte holthuisi</i> Zariquiey-Alvarez, 1953	6?			53	Z
<i>Hippolyte inermis</i> Leach, 1815	Z	18	Z	Z	Z
* <i>Hippolyte lagarderei</i> D'Udekem d'Acoz, 1995			75		
<i>Hippolyte leptocerus</i> (Heller, 1863)	Z	18	75	36	GR
* <i>Hippolyte leptometrae</i> Ledoyer, 1969				GR	
* <i>Hippolyte niezabitoskii</i> D'Udekem d'Acoz, 1996				53	
<i>Hippolyte prideauxiana</i> Leach, 1817				39	
<i>Hippolyte varians</i> Leach, 1814	Z	18	Z, 18		Z
* <i>Merhippolyte ancistrota</i> Crosnier and Forest, 1973			GRch	? 20	CAL07?
Family Thoridae Kingsley, 1879					
<i>Eualus cranchii</i> (Leach, 1817)	Z	18	51	Z	Z
* <i>Eualus drachi</i> Noël, 1978				26, 55	
* <i>Eualus gaimardii</i> (H. Milne-Edwards, 1837)		92			
* <i>Eualus lebourae</i> Holthuis, 1951				48?	
<i>Eualus occultus</i> (Lebour, 1936)	Z	18	75	45	Z

	Geographical sectors				
	GB-GA	WP	GC	ALB	SWM
<i>Eualus pusiolus</i> (Krøyer, 1841)	Z	92		Z	
<i>Eualus sollaudi</i> (Zariquiey-Cenarro, 1935)		18?	18?	36?	Z
* <i>Lebbeus microceros</i> (Kroyer, 1841)	13				
Family Lysmatidae Dana, 1852					
<i>Ligur ensiferus</i> (Risso, 1816)				4, GR	Z
<i>Lysmata seticaudata</i> (Risso, 1816)	Z	18	Z	Z	Z
Family Ogyrididae Holthuis, 1955					
* <i>Ogyrides rarispina</i> Holthuis, 1951			67, 75		
Superfamily Bresilioidea Calman, 1896					
Family Bresiliidae Calman, 1896					
* <i>Bresilia atlantica</i> Calman, 1896	13				
Superfamily Crangonoidea Haworth, 1825					
Family Crangonidae Haworth, 1825					
<i>Aegaeon cataphractus</i> (Olivi, 1792)		92	Z, 18	Z	Z
<i>Aegaeon lacazei</i> (Gourret, 1887)	Z	18	GRch	Z	Z
<i>Crangon crangon</i> (Linnaeus, 1758)	6	18	Z	59	Z
* <i>Crangon allmani</i> Kinahan, 1857		23, 104			
* <i>Metacrangon jacqueti</i> (A. Milne-Edwards, 1881)	11				
* <i>Parapontophilus abyssii</i> (Smith, 1884)	97		48		
<i>Philocheras bispinosus</i> (Hailstone, 1835)	82	84, 104	48	52	Z
<i>Philocheras echinulatus</i> (Sars, 1861)	11, 18	92, 25	18, GRch	36	Z
<i>Philocheras fasciatus</i> (Risso, 1816)	Z	92, 23	18, 75	Z	Z
<i>Philocheras monacanthus</i> (Holthuis, 1961)			18, 75	Z	Z
<i>Philocheras sculptus</i> (Bell, 1847)	INDAvil	18	46, 23	36	Z
<i>Philocheras trispinosus</i> (Hailstone, 1835)	Z	18	75	36	Z
* <i>Pontophilus norvegicus</i> (Sars, 1861)	11, 18	23			29
<i>Pontophilus spinosus</i> (Leach, 1815)	Z	18	105	36	Z
* <i>Sabinea hystrix</i> (A. Milne-Edwards, 1881)	18				
Family Glyphocrangonidae Smith, 1884					
* <i>Glyphocrangon atlantica</i> Chace, 1939	101				
* <i>Glyphocrangon longirostris</i> (Smith, 1882)	13, 101				
* <i>Glyphocrangon sculpta</i> (Smith, 1882)	66				
Superfamily Nematocarcinoidea Smith, 1884					
Family Nematocarcinidae Smith, 1884					
<i>Nematocarcinus ensifer</i> (Smith, 1882)	Z	?	15		
* <i>Nematocarcinus exilis</i> (Spence Bate, 1888)	101, 13		48		3
* <i>Nematocarcinus gracilipes</i> Filhol, 1884		86			
Superfamily Oplophoroidea Dana, 1852					
Family Acanthephyridae Spence Spence Bate, 1888					
* <i>Acanthephyra brevirostris</i> Smith, 1885	15	15			
<i>Acanthephyra eximia</i> Smith, 1884	Z		Z, 48	4	Z
<i>Acanthephyra pelagica</i> (Risso, 1816)	Z		Z	Z	Z
* <i>Acanthephyra purpurea</i> A. Milne-Edwards, 1881	18	18	48, GRch		
<i>Ephyrina benedicti</i> Smith, 1885		Z, 18			
<i>Ephyrina bifida</i> Stephensen, 1923	Z				
<i>Ephyrina figueirai</i> Crosnier and Forest, 1973	Z, 101	Z, 18			
* <i>Heterogenys microphthalmia</i> (Smith, 1885)		18			
* <i>Hymenodora glacialis</i> (Buchholz, 1874)	101				
<i>Hymenodora gracilis</i> Smith, 1886	Z, 101	18?			
* <i>Kemphyra corallina</i> (A. Milne-Edwards, 1883)	97	18			
<i>Meningodora mollis</i> Smith, 1882	Z	18	?		
<i>Meningodora vesca</i> (Smith, 1886)		Z?	Z		
<i>Notostomus elegans</i> A. Milne-Edwards, 1881			Z, 18		
Family Oplophoridae Dana, 1852					
* <i>Oplophorus spinosus</i> (Brullé, 1839)	13	OBIS, 69	48, GRch		
* <i>Systellaspis braueri</i> (Balss, 1914)	15, 101				
* <i>Systellaspis cristata</i> Faxon, 1893	15	18	18		
<i>Systellaspis debilis</i> (A. Milne-Edwards, 1881)	Z, 22	18	Z		
Superfamily Palaemonoidea Rafinesque, 1815					
Family Gnathophyllidae Dana, 1852					
<i>Gnathophyllum elegans</i> (Risso, 1816)				36	Z
Family Palaemonidae Rafinesque, 1815					
<i>Ascidonia flavomaculata</i> (Heller, 1864)		92	23	36	Z
<i>Balssia gastii</i> (Balss, 1921)				39	Z
* <i>Brachycarpus biunguiculatus</i> (Lucas, 1846)				44, 47	110
<i>Palaemon adspersus</i> Rathke, 1837	Z	18, 88	Z, 88	Z	Z
<i>Palaemon elegans</i> Rathke, 1837	Z	18	Z	Z	Z
<i>Palaemon longirostris</i> H. Milne-Edwards, 1837	Z	18	Z, 75	Z	Z
* <i>Palaemon macrodactylus</i> Rathbun, 1902 (Int.)		14, 104	16, 17		109
<i>Palaemon serratus</i> (Pennant, 1777)	Z	18	Z	Z	Z
<i>Palaemon varians</i> (Leach, 1814)	Z	18	Z	GR	
<i>Palaemon xiphias</i> Risso, 1816			115	Z	Z
* <i>Periclimenes aegylios</i> Grippa and d'Udekem d'Acoz, 1996					57
<i>Periclimenes amethysteus</i> (Risso, 1827)					Z
<i>Periclimenes granulatus</i> Holthuis, 1950				4	Z
* <i>Periclimenes kornii</i> (Lo Bianco, 1903)			103	18, 19, GR	12?
<i>Periclimenes sagittifer</i> (Norman, 1861)	22, 18	18	18	GR	Z?, 58, 61
<i>Periclimenes scriptus</i> (Risso, 1822)				33	Z

	GB-GA	Geographical sectors			
		WP	GC	ALB	SWM
<i>Pontonia pinnophylax</i> (Otto, 1821)				Z	Z
<i>Typton spongicola</i> O.G. Costa, 1844		18	18	47	Z
Superfamily Pandalioidea Haworth, 1825					
Family Pandalidae Haworth, 1825					
<i>Chlorotocus crassicornis</i> (Costa, 1871)	28	87	Z	34, 36	Z
* <i>Dichelopandalus bonnieri</i> Caullery, 1896	22, 28	23	23		
<i>Heterocarpus ensifer</i> A. Milne-Edwards, 1881			Z	PE	PE
* <i>Heterocarpus grimaldii</i> A. Milne-Edwards and Bouvier, 1900			15, 48		
<i>Pandalina brevisrostris</i> (Rathke, 1843)	Z	18	48, 59	48, 59	Z
<i>Pandalina profunda</i> Holthuis, 1946	11	18	GRch	41	Z
<i>Plesionika acanthonotus</i> (Smith, 1882)		18	105	34	Z
<i>Plesionika antigai</i> Zariquiey-Alvarez, 1955			GRch	34	Z
<i>Plesionika edwardsii</i> (Brandt, 1851)			Z	Z	Z
* <i>Plesionika ensis</i> (A. Milne-Edwards, 1881)			48	34	
* <i>Plesionika geniculatus</i> (A. Milne-Edwards, 1883)		18			
<i>Plesionika gigliolii</i> (Senna, 1902)			GRch	34	Z
<i>Plesionika heterocarpus</i> (Costa, 1871)	28	18	Z	Z	Z
<i>Plesionika martia martia</i> (A. Milne-Edwards, 1883)	Z	18	Z, 18	34	Z
<i>Plesionika narval</i> (Fabricius, 1787)			Z	34	Z
* <i>Plesionika williamsi</i> Forest, 1974			48		
<i>Stylopandalus richardi</i> (Coutière, 1905)		OBIS, 6	Z, 18		
Superfamily Pasiphaeioidea Dana, 1852					
Family Pasiphaeidae Dana, 1852					
* <i>Eupasiphae gilesii</i> (Wood-Mason, 1892)	1, 18	18?			
<i>Parapasiphae sulcatifrons</i> Smith, 1884	13, 101	15	Z, 18		
* <i>Pasiphae ecarina</i> Crosnier, 1969	13				
* <i>Pasiphaea hoplocerca</i> Chace, 1940	13	18	24, GRch		
<i>Pasiphaea multidentata</i> Esmark, 1866	Z	18	18, GRch	36	Z
<i>Pasiphaea sivado</i> (Risso, 1816)	Z	18	Z	Z	Z
* <i>Pasiphaea tarda</i> (Krøyer, 1845)	11, 13				
<i>Psathyrocaris fragilis</i> Wood-Mason, 1893	Z				
Superfamily Processoidea Ortmann, 1896					
Family Processidae Ortmann, 1896					
<i>Processa acutirostris</i> Nouvel and Holthuis, 1957	82?			18, GR	Z
<i>Processa canaliculata</i> Leach, 1815	82	18	48	Z	Z
<i>Processa edulis edulis</i> (Risso, 1816)	Z, 6	18	Z, 73	47	Z
<i>Processa elegantula</i> Nouvel and Holthuis, 1957			73		Z
<i>Processa intermedia</i> Holthuis, 1951			Z		CAL07
* <i>Processa macrodactyla</i> Holthuis, 1952			91	50	5
<i>Processa macrophthalma</i> Nouvel and Holthuis, 1957		18	51, 80	36	Z
<i>Processa modica</i> Williamson in Williamson and Rochanaburanon, 1979	82	18	73	Z	Z
<i>Processa nouveli nouveli</i> Al-Adhub and Williamson, 1975	Z	18	73	36	Z
<i>Processa robusta</i> Nouvel and Holthuis, 1957			73	18	Z
Infraorder Axiidea					
Family Axiidae Huxley, 1879					
<i>Axius styrinchus</i> Leach, 1815		23, 92	17		Z
* <i>Calocarides coronatus</i> (Trybom, 1904)	11			48?, PE	12, PE
* <i>Levantocaris hornungae</i> Galil and Clark, 1993					18
Family Calocarididae Ortmann, 1891					
* <i>Calastacus laevis</i> de Saint Laurent, 1972	100				
<i>Calocaris macandreae</i> Bell, 1846	21		48, 98	Z	Z
* <i>Calocaris cf. templemani</i> Squires, 1965	13				
Family Callianassidae Dana, 1852					
<i>Callianassa subterranea</i> (Montagu, 1808)	Z, 22	102		89	Z
* <i>Necallianassa truncata</i> (Giard and Bonnier, 1890)	70, 82	104	23	Z?	110
* <i>Pestarella candida</i> (Olivi, 1792)			42	38	89
<i>Pestarella tyrrhena</i> (Petagna, 1792)	22	18	GR	38	Z
Family Eucalliidae Manning and Felder, 1991					
* <i>Calliax lobata</i> (de Gaillande and Lagardère, 1966)			99, 116		
Family Bathycalliidae Sakjaj and Turkay, 1999					
* <i>Vulcanocalliax arutyunovi</i> Dworschak and Cunha 2007			27		
Fam Gourrettiidae Sakai 1999					
* <i>Gourretia denticulata</i> (Lutze, 1937)			74		
Infraorder Gebiidea					
Family Upogebiidae Borradaile, 1903					
<i>Upogebia deltaura</i> (Leach, 1815)	Z	18	23	38	Z
* <i>Upogebia mediterranea</i> Noël, 1992					89
<i>Upogebia pusilla</i> (Petagna, 1792)	22, 89	18	42	38	Z
<i>Upogebia tipica</i> (Nardo, 1868)					Z
Family Laomediidae Borradaile, 1903					
<i>Jaxea nocturna</i> Nardo, 1847	Z, 21	104	59	Z, 38	Z
Infraorder Anomura					
Superfamily Chirostyloidea Ortmann, 1892					
Family Chirostylidae Ortmann, 1892					
<i>Gastroptychus formosus</i> (Filhol, 1884)	Z				
* <i>Uroptychus bouvieri</i> Caullery, 1896	13				
* <i>Uroptychus cartesi</i> Baba and Macpherson 2012	7				
<i>Uroptychus concolor</i> (A. Milne-Edwards and Bouvier, 1894)	Z				

	GB-GA	Geographical sectors			
		WP	GC	ALB	SWM
<i>Uroptychus rubrovittatus</i> (A. Milne-Edwards, 1881)	Z, 13				
Superfamily Galatheoidea Samouelle, 1819					
Family Galatheidae Samouelle, 1819					
<i>Galathea bolivari</i> Zariquiey-Alvarez, 1950				45	Z
* <i>Galathea capillata</i> Miyake and Baba, 1970			52		
<i>Galathea cenarroi</i> Zariquiey-Alvarez, 1968					Z
<i>Galathea dispersa</i> Spence Bate, 1859	Z	85, 112	Z	Z	Z
<i>Galathea faiali</i> Nunes-Ruivo, 1961		18	GRch		
<i>Galathea intermedia</i> Lilljeborg, 1851	Z	18	80	45	Z
* <i>Galathea machadoi</i> Barrois, 1888	13		GRch		
<i>Galathea nexa</i> Embleton, 1834		85, 112	85	46	Z
<i>Galathea squamifera</i> Leach, 1814	Z	85	Z	Z	Z
<i>Galathea strigosa</i> (Linnaeus, 1767)	Z	85	Z	52	Z
Family Munididae Ah Yong, Baba, Macpherson, Poore, 2010					
<i>Munida curvimana</i> A. Milne-Edwards and Bouvier, 1894		Z, 18	85, 90		
<i>Munida intermedia</i> A. Milne-Edwards and Bouvier, 1899		85	18, 48	46	Z
* <i>Munida microphthalmia</i> A. Milne-Edwards, 1880	13				
<i>Munida perarmata</i> A. Milne-Edwards and Bouvier, 1894	18, Z	96	Z, 48	Z	Z
<i>Munida rugosa</i> (Fabricius, 1775)	Z	85	Z	Z	Z
* <i>Munida sanctipauli</i> Henderson, 1885			GRch		
<i>Munida sarsi</i> Huus, 1935	Z	23	Z, 48		
<i>Munida speciosa</i> von Martens, 1878	Eco06, 107	85, 112	48, 112	Z	57
Family Munidopsidae Ortmann, 1898					
* <i>Galacantha rostrata</i> (A. Milne-Edwards, 1880)	79				
* <i>Munidopsis abyssicola</i> Baba, 2005	79, 101				
* <i>Munidopsis acutispina</i> Benedict, 1902	13				
* <i>Munidopsis allae</i> Khodkina and Đuriš, 1989		OBIS			
* <i>Munidopsis antonii</i> (Filhol, 1884)	79, 101				
* <i>Munidopsis aries</i> (A. Milne-Edwards, 1880)		79			
<i>Munidopsis crassa</i> Smith, 1885	Z, 111				
* <i>Munidopsis curvirostra</i> Whiteaves, 1874	101		112		
* <i>Munidopsis marionis</i> (A. Milne-Edwards, 1882)			79		
* <i>Munidopsis parfaiti</i> (A. Milne-Edwards and Bouvier, 1894)	101, 111				
<i>Munidopsis serricornis</i> (Lovén, 1853)	Z?, 13	Z?			3
* <i>Munidopsis thieli</i> Türkay, 1975	111				
* <i>Munidopsis vaillantii</i> (A. Milne-Edwards, 1881)	18	18			
Family Porcellanidae Haworth, 1825					
<i>Pisidia bluteli</i> (Risso, 1816)					Z
<i>Pisidia longicornis</i> (Linnaeus, 1767)	Z	104	80	Z	1
<i>Pisidia longimana</i> (Risso, 1816)	6	85, 90	Z	45	Z
<i>Porcellana platycheles</i> (Pennant, 1777)	Z	Z	42, 85	Z	Z
Superfamily Hippoidea Latreille, 1825					
Family Albuneidae Stimpson, 1858					
<i>Albunea carabus</i> (Linnaeus, 1758)			93	Z	Z
Superfamily Lithodoidea Samouelle, 1819					
Family Lithodidae Samouelle, 1819					
* <i>Neolithodes grimaldii</i> (A. Milne-Edwards and Bouvier, 1894)	77, 101				
* <i>Paralomis bouvieri</i> Hansen, 1908	???				
* <i>Paralomis microps</i> Filhol, 1884	77				
Superfamily Paguroidea Latreille, 1802					
Family Diogenidae Ortmann, 1892					
<i>Calcinus tubularis</i> (Linnaeus, 1767)			23, 80	35	Z
<i>Clibanarius erythropus</i> (Latreille, 1818)	Z	18	59, GR	Z	Z
<i>Dardanus arrosor</i> (Herbst, 1796)	68	85	Z	Z	Z
<i>Dardanus calidus</i> (Risso, 1827)		85		Z, 35	Z
<i>Diogenes pugilator</i> (Roux, 1829)	Z	68	Z	Z	Z
<i>Paguristes eremita</i> (Linnaeus, 1767)	Z	85	Z, 85	Z	Z
Family Parapaguridae Smith, 1882					
<i>Oncopagurus bicristatus</i> (A. Milne-Edwards, 1880)			Z, 48		
* <i>Parapagurus ruticheles</i> (A. Milne-Edwards, 1891)			18, 73		
* <i>Parapagurus abyssorum</i> (Filhol, 1885)	101				
* <i>Parapagurus nudus</i> (A. Milne-Edwards, 1891)	101				
<i>Parapagurus pilosimanus</i> Smith, 1879	Z, 72, 101		48		
<i>Strobopagurus gracilipes</i> (A. Milne-Edwards, 1891)		Z	48, GRch		
Family Paguridae Latreille, 1802					
* <i>Anapagurus alboranensis</i> Garcia-Gomez, 1994			80	31	78
<i>Anapagurus bicorniger</i> A. Milne-Edwards and Bouvier, 1892	106, Eco06		Z, 18	35	Z
<i>Anapagurus breviaculeatus</i> Fenizia, 1937			80	40	Z
<i>Anapagurus chiroacanthus</i> (Lilljeborg, 1856)	Z, 18	18		33	Z
<i>Anapagurus curvidactylus</i> Chevreux and Bouvier, 1892	Z				Z
<i>Anapagurus hyndmanni</i> (Bell, 1845)	Z	18	80	35	Z
<i>Anapagurus laevis</i> (Bell, 1845)	Z	68	Z	35	Z
<i>Anapagurus longispina</i> A. Milne-Edwards and Bouvier, 1900			Z, 31	48, 55	Z
<i>Anapagurus petiti</i> Dechancé and Forest, 1962	107, Eco05			35	Z
* <i>Anapagurus pusillus</i> Henderson, 1888	106, Eco06	113	31		
* <i>Catapaguroides iris</i> Bouvier, 1922			GRch		
<i>Catapaguroides microps</i> A. Milne-Edwards and Bouvier, 1892	Z		48, 112		

	GB-GA	Geographical sectors			
		WP	GC	ALB	SWM
<i>Cestopagurus timidus</i> (Roux, 1830)		92	18	35	Z
* <i>Michelopagurus atlanticus</i> (Bouvier 1922)		113			
<i>Nematopagurus longicornis</i> A. Milne-Edwards and Bouvier, 1892	Z	18	18	55	Z
<i>Pagurus alatus</i> Fabricius, 1775	Z	18	Z	Z	Z
<i>Pagurus anachoretus</i> Risso, 1827		18	18	Z	Z
<i>Pagurus bernhardus</i> (Linnaeus, 1758)	Z	85	85		
<i>Pagurus carneus</i> (Pocock, 1889)	Z	18	Z, 68		
<i>Pagurus chevreuxi</i> (Bouvier, 1896)	106		113	43	Z
<i>Pagurus cuanensis</i> Bell, 1845	Z	68	51	Z	Z
<i>Pagurus excavatus</i> (Herbst, 1791)	Z	85	Z, 85	35	Z
<i>Pagurus forbesii</i> Bell, 1845	Z	68	51	35	Z
* <i>Pagurus mbizi</i> Forest 1955				56	
<i>Pagurus prideaux</i> Leach, 1815	Z	68	Z	Z	Z
* <i>Pagurus pseudosculptimanus</i> García Muñoz, Cuesta and García Raso 2014				32	
* <i>Pagurus pubescentulus</i> (A. Milne-Edwards and Bouvier, 1892)	106, Eco06				
<i>Spiropagurus elegans</i> Miers, 1881		85	14, 51	35	