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Annotated checklist of marine Algerian Crustacean Decapods

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Abstract

Sampling surveys (1976-2013) of soft-bottom communities and some hard bottom communities along the Algerian coast (1,180 km) have allowed the collection of 114 species of crustacean decapods of which 37 were reported for the first time for the Algerian decapods fauna; for these species additional comments concerning their ecological and geographical patterns are given. The inventory of all benthic and pelagic decapods recorded along the Algerian coast reaches 253 species. Three families on a total of 57 families were highly diversified: Paguridae (17 species), Polybiidae (16 species) and Processidae (13 species). The presence of the 253 recorded species along the Algerian coast has been compared with eight other areas from the Mediterranean Sea. The decapods fauna of the Algerian coast is among the most richest of the Mediterranean Sea and comparable of that of West Italy.

Keywords: Decapods, new records, Algerian coast, Mediterranean Sea.

Introduction

The estimation of marine species richness (alpha diversity) living in an area remains a hard task which had began in the 19th century in European countries and continues to date. Within the establishment of marine laboratories along the coast, some of these 'Marine Stations' had enterprise to accumulate all the records of marine species around their implantation and published regularly their inventory such as for the northern marine stations along the English Channel such as Plymouth (Marine Biological Association, 1957; <http://www.mba.ac.uk/pmf/>) and Roscoff (Bourdon, 1965; www.sb-roscoff.fr).

Recent programmes of researches on marine biology had been focused in the framework of the Census of Marine Life. They had established the count of marine species for the worldwide Ocean (Alexander *et al.*, 2011; Boeuf, 2011), the European seas (Costello & Wilson, 2011) or at a regional scale such as the Mediterranean Sea (Fredj, 1974; Coll *et al.*, 2010). For this sub-tropical sea, Coll *et al.* (2010) listed 16,848 marine species, including 10,902 invertebrates present in the Mediterranean Sea. Dauvin *et al.* (2013) reported the presence of 1,642 species (i.e. ~15% of the Mediterranean invertebrate's species) from the soft-bottom communities of the shallow waters (0-136 m) along the 1,180 km of the Algeria coast. For the Mediterranean Sea and also for the Algerian coast, among the macro-invertebrates the polychaetes and the crustaceans

appeared the most diversified, and among the crustaceans the amphipods had been the more diversified and the more studied group with ~ 300 species recorded along the Algerian coast (Dauvin *et al.*, 2013). Among the crustacean, the decapods were the second most diversified group but very few works were dedicated to the taxonomy and to the distribution of this group for the Algerian coast.

Previous works dedicated only on decapods were rare for the Algerian coast. The first inventory was provided by Lucas (1846) corresponding to a scientific exploration of the Algerian coast between 1840 and 1842. Others concerned the Decapoda Reptantia (Forest, 1957), some decapods of the Algerian coast (Sollaud, 1957), and the decapods from the western part of the Algerian coast in the western part of Oran (Délye, 1957); all these records concerned the 1950's. Moreover, Seridji (1971, 1989) gave important information's on the Algerian decapods larvae along the Algerian coasts.

Original studies on the marine soft-bottom macrobenthic habitats were conducted from the 1970s to 1995 in the thesis works of Bakalem (1979, 2008) and Grimes (2010). They concerned the whole Algerian coast, from the Morocco border to the Tunisian border (1,180 km), and took into account sediment coming from 10 bays and 13 harbours. More recent (2010 – 2013) supplementary local works concerned four new areas including hard and soft-bottom around western small islands and areas near Tipaza

(unpublished data). Therefore, a total of 27 areas had been prospected during the 1976-2013 period.

The main objectives of this study were:

1) to give the list of the decapod species recorded during the Bakalem and Grimes work's mainly on soft-bottom communities along whole Algerian coast; for each species, data on the number of collected individuals, the sediment type and the depth at which they were found are given;

2) to give some additional comments concerning the ecological and geographical patterns of the new records for the Algerian decapods species;

3) to furnish a global inventory of the marine crustacean decapods for the Algerian coast taking into account all the available previous data on this group;

4) and to compare the checklist of the decapod fauna of Algeria with inventories and checklists compiled from other areas in the Mediterranean Sea.

General characteristics of the Algerian coastal sampling zone

The geographical limits of the sampling were 35°6'N-2°9'00"W near the Moroccan border and 36°54'00"N-8°26'30"E near the Tunisian border (Fig. 1). The Algerian coastline presents a variety of habitats, from the dominant rocky shores, sometimes with high cliffs, to sandy beaches and dunes in most of the large bays. The Algerian continental shelf is mainly narrow except when it borders rocky shores; it is more extensive in zones with sandy beaches and dunes. The terrestrial input from the oueds ("river" in Arabic) facilitates sedimentation in the bays; moreover sedimentation can also have a biogenic origin, as in Bou Ismail Bay (Grimes, 2010). The distribution of soft-bottom sediments shows an increasing inshore silt gradient, characterized by a succession of fine sand, muddy sand, sandy mud and pure mud (Bakalem, 2008). Coarse sand and gravel are located in

the marine extension of the rocky shores, especially the offshore capes that border the bays (Grimes *et al.*, 2010). So the study represents all the soft-bottom habitats of the south of the Mediterranean Sea including some stations on *Posidonia oceanica* bed and corraligenous.

Material and Methods

Bakalem and Grimes samples were made with the Van Veen grab or the Smith McIntyre grabs (0.1- 0.125 m²; sieving mesh 1 mm²), except Chenoua-Kouali hand sampling by autonomous diver; the localisations and characteristics of sampling stations of the Chenoua-Kouali area are given in the Table 1. All the sampling was done from 1976 to 2013 mainly during the summer (see Bakalem & Romano, 1988; Bakalem & Dauvin, 1995; Bakalem, 2008; Grimes *et al.*, 2009, 2010; Grimes, 2010; Dauvin *et al.*, 2013; Bakalem *et al.*, 2014) for the sampling design and main characteristics of the sampling stations sampling during the Bakalem and Grimes PhDs. The sampling depths ranged between 0 and 136 m. The taxonomy was validated using the WoRMS Editorial Board, 2015 (World Register of Marine Species. Available from <http://www.marinespecies.org> at VLIZ. Accessed 2015-10-9).

Results and Discussion

The annotated list of crustacean decapods found along the Algerian coast is given in the Table 3. For each species are given general information's about the material examined, the location, the depth ranges and the type of substratum, then some indications of their ecology and their general distribution in the Mediterranean Sea and other parts of the world ocean. Comments on ecology

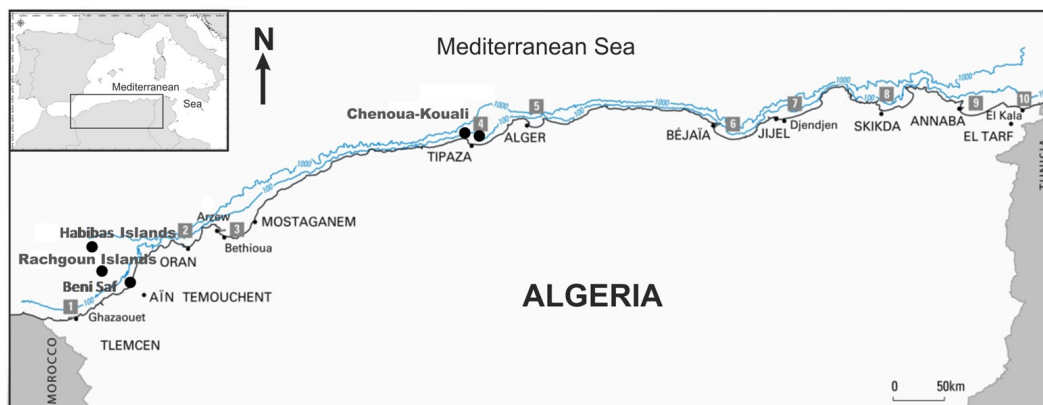


Fig. 1: Location of the sampling sites along the Algerian coast. Black circles, new prospected sites—the Beni Saf, Rachgoun and Habibas Islands in the Oran Bay and from the Chenoua–Kouali area in the western part of Bou Ismail Bay. Grimes *et al.* (2009) sites: 1. Ghazaouet Bay; 2. Oran Bay; 3. Arzew Bay; 4. Bou Ismail Bay; 5. Algiers Bay; 6. Béjaïa Bay; 7. Jijel Bay; 8. Skikda Bay; 9. Annaba Bay; and 10. El Kala Bay.

Table 1. Chenoua-Kouali area (Bou Ismail Bay) – Localisations and characteristics of the stations sampling in this area.

Station	Date	Coordinates (deg.min.sec.)	Substratum/Habitat	Depth (meter)
14-2	October 2012	36.35.74N - 02.30.18E	<i>Posidonia</i> meadows	11
15-2	October 2012	36.35.79N - 02.29.76E	Sand, <i>Posidonia</i> meadows on hard bottom	21
15-6	October 2012	36.35.47N - 02.29.73E	Mediterranean vermetid gastropod formation with <i>Cystoseira</i> spp.	1,5
16-1	June 2012	36.35.41N - 02.29.74E	Fine Sand and hard bottom (beach)	0 – 0.1
16-2	June 2012	36.35.42N - 02.29.73E	Sand with <i>Cymodocea</i>	0.3
16-7	June 2012	36.35.55N - 02.30.71E	<i>Posidonia</i> meadows	3.5
17-1	June 2012	36.35.44N - 02.29.70E	Mediterranean vermetid gastropod formation with <i>Cystoseira</i> spp.	0 – 0.5
17-2	June 2012	36.35.46N - 02.29.70E	<i>Posidonia</i> meadows	1.5
18-1	June 2012	36.35.44N - 02.29.58E	Sand and hard bottom	0.5
20-2	June 2012	36.35.71N - 02.28.18E	<i>Posidonia</i> meadows on hard bottom	4
22-4	August 2012	36.36.12N - 02.27.20E	<i>Posidonia</i> meadows on hard bottom	10
24-1	August 2012	36.35.91N - 02.26.28E	Hard bottom - <i>Posidonia</i> meadows	7
25-1	August 2012	36.35.69N - 02.26.13E	Hard bottom	2
28-1	October 2012	36.38.20N - 02.25.95E	Mud	56
28-5	October 2012	36.36.97N - 02.24.50E	Fine Sand and hard bottom	14
28-6	October 2012	36.36.85N - 02.24.30E	Hard bottom	5
29-2	October 2012	36.37.14N - 02.24.52E	Hard bottom and Sand	15
32-7	October 2012	36.37.44N - 02.24.51E	Hard bottom	5

and distribution according to d'Udekem d'Acoz (1999) and more recent information's published after are given only for the 37 species recorded from the Algerian coast for the first time which are indicated in the Table 2. For the others, information's about ecology and distribution has been reported by d'Udekem d'Acoz (1999).

Inventory of the decapods from the Algerian coast

A total of 114 decapods species had been collected during the Bakalem and Grimes studies which extended from 1976 to 2013. For the Algerian waters, a total of 139 other species had been previously reported by Lucas (1846), Le Danois (1925), Seurat (1927, 1935), Sparck (1931), Dieuzeide (1940, 1950, 1954, 1955a, b), Dieuzeide & Goëau-Brissonière (1951), Molinier & Picard (1952), Dieuzeide & Roland (1956, 1957), Délye (1957), Forest (1957), Sollaud (1957), Maurin (1962), Vaissière & Fredj (1963), Le Gall (1969), Falconetti (1970), Seridji (1971, 1989), mainly in studies on the faunal composition of the benthic communities, as few studies had been dedicated specifically on decapods (see Délye, 1957; Forest, 1957; Sollaud, 1957; and Seridji, 1971, 1989). Falciai (2001) found *Palaemonetes varians* (Leach, 1814) in the marshy of Macta area near Arzew (west of Algiers). Recently, the Non-Native Species *Percnon gibbesi* had been reported from the western part of the Algerian coast (Rais Hamidou and Sidi Fredj) by Lamouti & Bachari (2011) and in the Skikda Bay (Katsanevakis *et al.*, 2011).

So, taken all the records available, the total number of recognized benthic and pelagic decapods species of the Algerian coast reaches 253 including 29 species which are only reported under larvae by Seridji (1971, 1989) (Table 3).

The more diversified families were: Paguridae (17 species), Polybiidae (16), Processidae (13), Hippolytidae (12), Inachidae (11), Palaemonidae (11), Pandalidae (11), Crangonidae (10), Alpheidae (9), Xanthidae (9), Epialtidae (8), Leucosiidae (8), Sergestidae (8), Diogenidae (6), and Galatheididae (6).

Among these 253 species, we accounted:

- 14 Mediterranean Endemic species: *Anapagurus petiti*, *Automate branchialis*, *Brachynotus foresti*, *Brachynotus gemmellaroi*, *Brachynotus sexdentatus*, *Carcinus aestuarii*, *Macropodia longirostris*, *Maja squinado*, *Periclimenes amethysteus*, *Periclimenes granulatus*, *Periclimenes scriptus*, *Pisa muscosa*, *Processa acutirostris* and *Upogebia tipica*.

- 10 Mediterranean Endemic species *sensu lato* (species found in the Mediterranean Sea and in the south of the Iberian Peninsula): *Derilambrus angulifrons*, *Gourettea denticulate*, *Inachus communissimus*, *Lissa chiragra*, *Macropodia czernjawska*, *Palaemon xiphias*, *Pestarella candida*, *Sirpus zariquieyi*, *Synalpheus gambarelloides* and *Xantho poressa*.

- 4 Lessepsian species: *Alpheus inopinatus*, *Alpheus rapacida*, *Glabropilumnus leavis*, and *Percnon gibbesi*.

- 12 exploited species: *Aristaeomorpha foliacea*, *Aristeus antennatus*, *Homarus gammarus*, *Palinurus elephas*, *Palinurus mauritanicus*, *Parapenaeus longirostris*, *Penaeus kerathurus*, *Plesionika edwardsii*, *Plesionika martia*, *Plesionika narval*, *Scyllarides latus* and *Scyllarus arctus*.

And 4 species protected under the Bern Convention: *Homarus gammarus*, *Scyllarides latus*, *Palinurus elephas* and *Maja squinado*; however in Algeria the first three species are the object of illegal fishing.

Table 2. Annotated list of crustacean decapods first reported along the Algerian coast.

Family Species	Sites of collections – Depth – Type of benthic substratum	Abundance
Family ALPHEIDAE		
<i>Alpheus rapacida</i> De Man, 1908	Ghazaouet Bay; 88 m; mud. Oran Bay; 79 and 88 m; muddy sand.	1 ind. 4 ind.
Family ATELECYCLIDAE		
<i>Ateleyclus undecimdentatus</i> (Herbst, 1783)	Arzew Bay; 80 and 92 m; sand and gravel.	2 ind.
Family CALLIANASSIDAE		
<i>Gourettea denticulata</i> (Linnaeus, 1758)	Bou Ismail Bay; 15 to 61 m; sandy gravel and <i>Posidonia</i> meadows.	2 ind.
Family EPIALTIIDAE		
<i>Pisa muscosa</i> (Linnaeus, 1758)	Chenoua-Kouali area (Bou Ismail Bay); stations 22(4), 24(1); 7-10 m.	2 ind.
Family GALATHEIDAE		
<i>Galathea bolivari</i> Zariquiey- Alvarez, 1950	Arzew Bay; 14 m; <i>Posidonia</i> meadows. Bou Ismail Bay; 16-96 m; mud and hard bottom.	3 ind. 10 ind.
Family HIPPOLYTIDAE		
<i>Hippolyte leptocerus</i> (Heller, 1863)	Arzew Bay; 16 m; <i>Posidonia</i> meadows. Bou Ismail Bay; 21 m; hard bottom. Chenoua-Kouali area (Bou Ismail Bay; station 28(6), 5 m. Bou Ismail Bay; 16-21 m; fine sand and hard bottom.	1 ind. 1 ind. 1 ind. 3 ind.
<i>Eualus sollaudi</i> (Zariquiey-Cenarro, 1935)	Algiers Bay of; 8-10 m; fine sand.	2 ind.
Family INACHIDAE		
<i>Dorhynchus thomsoni</i> Thomson, 1873	Algiers Bay; 12 m; fine sand.	1 ind.
<i>Macropodia czernjawska</i> (Brandt, 1880)	Arzew harbour; 13m; muddy gravel. Bou Ismail Bay; 20 m; hard bottom.	1 ind. 1 ind.
<i>Macropodia linarensi</i> Forest & Zaraqiey-Alvarez, 1964	Bay of Bou Ismail; 20-21 m; muddy gravel and hard bottom.	2 ind.
Family LEUCOSIIDAE		
<i>Ebalia granulosa</i> H. Milne Edwards, 1837	Arzew Bay; 60 m; sand and gravel. Bou Ismail Bay; 110 m; mud charged with vegetables debris and empty mollusc shell.	1 ind. 1 ind.
<i>Ebalia tumefacta</i> (Montagu, 1808)	Algiers harbour; 20 m; compact putrid mud.	1 ind.
<i>Merocryptus boletifer</i> Milne Edwards & Bouvier, 1894	Bou Ismail Bay; 17 m; sand.	1 ind.
Family MAJIDAE		
<i>Eurynome spinosa</i> Hailstone, 1835	Bay of Oran; 85 m; coarse sand charged with gastropods shells and polychaeta tubes.	1 ind.
Family PAGURIDAE		
<i>Anapagurus curvidactylus</i> Chevreux & Bouvier, 1892	Bou Ismail Bay; 88-90 m; muddy gravel.	1 ind.
<i>Anapagurus hynnmanni</i> (Bell, 1846)	Bethioua harbour (two stations); 57m; coarse sand.	7 ind.
<i>Anapagurus petiti</i> Dechancé & Forest, 1862	Oran Bay; 40 and 80 m; sand and gravel.	3 ind.
<i>Pagurus carneus</i> (Pocock, 1889)	Western to central sectors of the Algerian coast: Oran bay and harbour, Bou Ismail Bay; 22-110 m; mud charged with vegetables debris sandy mud, muddy sand, fine sand charged with gastropods shells, coarse shelly sand, <i>Posidonia</i> meadows.	Common species
Family PANOPEIDAE		
<i>Panopeus africanus</i> A. Milne-Edwards, 1867	Arzew Bay; 83 m; muddy gravel.	1 ind.
Family PLAGUSIIDAE		
<i>Euchirograpsus liguricus</i> H. Milne Edwards, 1853	Arzew Bay; 55 m; mud. Older Skikda harbour; putrid mud.	1 ind. 1 ind.
Family POLYBIIDAE		
<i>Liocarcinus bolivari</i> (Zariquiey Alvarez, 1948)	Arzew Bay; 82 m; sand and gravel.	1 ind.
<i>Liocarcinus holtsatus</i> (Fabricius, 1798)	Three stations of new Skikda harbour; 18 m; mud and on pebbly mud.	3 ind.
<i>Liocarcinus maculatus</i> (Risso, 1827)	Algiers Bay; 10 to 23 m; muddy sand and fine sand.	3 ind.
<i>Liocarcinus marmoreus</i> (Leach, 1814)	Bou Ismail Bay; 45 to 70 m; sandy mud and muddy gravel.	3 ind.
<i>Liocarcinus navigator</i> (Herbst, 1794)	Bou Ismail Bay; 110 m; muddy bottom charged with some vegetables debris and empty mollusks shell.	2 ind.
<i>Liocarcinus pusillus</i> (Leach, 1816)	Chenoua-Kouali area (Bou Ismail Bay); stations 16(2), 25(1); 0,3 and 2 m. Bou Ismail Bay; sandy mud, fine sand, and muddy gravel. Algiers Bay on fine sand. 10-56 m.	3 ind. 3 ind. 2 ind.
<i>Liocarcinus vernalis</i> (Risso, 1816)	Oran harbour; 12 m; putrid compact mud.	1 ind.
<i>Liocarcinus zariquieyi</i> Gordon, 1968	Oran, Arzew and Bou Ismail bays; 42 to 90 m; mud, sandy mud and mainly coarse sand charged with empty shell and vegetables debris and empty polychaetes tubes, and hard bottom.	Common species
Family PROCESSIDAE		
<i>Processa acutirostris</i> Nouvel & Holthuis, 1957	Chenoua-Kouali area (Bou Ismail Bay) ;station 14(2); 11 m.	2 ind.
<i>Processa edulis edulis</i> (Risso, 1816)	Two stations of the Oran Bay; coarse sand with molluscs shells and polychaetes tubes empty. Bou Ismail Bay; 22 m; coarse sand and <i>Posidonia</i> meadows. Bejaia Bay; 22-87 m; compact mud and on sand.	4 ind. 2 ind. 2 ind.
<i>Processa macrophthalma</i> Nouvel & Holthuis, 1957	Algiers Bay; 68 m; pure mud.	1 ind.
<i>Processa robusta</i> Nouvel & Holthuis, 1957	Oran Bay; 21 m; coarse sand.	1 ind.

(continued)

Table 2 (continued)

Family Species	Sites of collections – Depth – Type of benthic substratum	Abundance
Family UPOGEBIIDAE <i>Upogebia stellata</i> (Montagu, 1808)	Ghazaouet and Bou Ismail bays, Rachgoun island, Arzew harbour; 23-88 m; muddy and sandy mud.	Common species
Family VARUNIDAE <i>Asthenognathus atlanticus</i> Monod, 1933 <i>Brachynotus atlanticus</i> Forest, 1957 <i>Brachynotus foresti</i> Zariquiey Alvarez, 1968	Algiers Bay; 10 to 45 m; sandy mud, fine sand. Rachgoun Island; 23 m; sandy mud. Older Skikda harbour; 16 m; sandy mud with pebbles and charged with vegetables debris. Skikda Bay; 70 m; mud with calcareous concretions and shelly debris.	2 ind. 1 ind. 3 ind. 1 ind.
Family XANTHIDAE <i>Microcassiope minor</i> (Dana, 1852)	Bou Ismail Bay; 62 to 109 m; muddy sand and muddy gravel.	4 ind.

Biogeographical considerations

As several studies had been recently published for the Mediterranean decapods and especially the d'Udekem d'Acoz (1999) reference book, we have compared the presence in the Mediterranean Sea of the 253 existing decapods fauna recorded in the Algerian waters with seven other areas (Table 3).

- Alboran Sea: Iberian Peninsula (Mediterranean Sea) (Zariquiey-Alvarez, 1968; Gonzalez-Gordillo *et al.*, 2001; Marco-Herrero *et al.*, 2015) and Mediterranean Morocco coast (Zariquiey-Alvarez, 1968; Beaubrun, 1978) – 233 common species;

- French Mediterranean coast: Noël (1993); <http://inpn.mnhn.fr/> - 194 common species;

- West Italy (Tyrrhenian Sea and Ligurian Sea): Froglija (2010) - 209 common species;

- Central Italy (Ionian Sea and Sicily straits): Pipitone & Arculeo (2003) and Froglija (2010) - 186 common species;

- Tunisia coast: Forest & Guinot (1956), El Lakhraç & Hattour (2010), Shaiek *et al.* (2010), El Lakhraç *et al.* (2012), and Daoulatli *et al.* (2014) – 94 common species;

- Adriatic Sea: Ungaro *et al.* (2005), Müller & Schubart (2007), and Kirincic & Stevcic (2008) – 187 common species

- Aegean Sea: Koukouras *et al.* (1992), d'Udekem d'Acoz (1995), Ates *et al.* (2010), and Corsini-Foka & Pancucci-Papadopoulou (2012), Bakir *et al.* (2014) – 204 common species;

- Levantine Basin: Syria: Hasan (2008); Turkey: Ates *et al.* (2010), Bakir *et al.* (2014); Israël: Galil & Shlagman (2011) – 167 common species.

This comparison permitted to underline three main points:

- the Algerian decapods fauna shared a large number of species with the Alboran Sea (92% of common species), the West Italy (83 %) and the Central Italy (74%), the Aegean Sea (80%), the French Mediterranean Coast (77%) and the Adriatic Sea (75%);

- the low number of shared decapods with the Tunisian coasts probably due to two main causes, the weak length of these national coast and the lack of knowledge of this group for this country;

- the low number of shared species with the Levantine Basin (65%) probably due to the impoverishment of the decapods as other crustacean species such as amphipods (Dauvin *et al.*, 2013).

At the scale of the Mediterranean decapod fauna, the total number recorded by Coll *et al.* (2010) was 383 species, nevertheless since this inventory 16 new species at been recorded in the Mediterranean Sea *Actaea savignii*, *Actaeodes tomentosus*, *Callinectes exasperatus*, *Charybdis (Charybdis) japonica*, *Elamena mathoei*, *Eurycarcinus integrifrons*, *Penaeus aztecus*, *Penaeus subtilis*, *Gonioinfradens paucidentatus*, *Lysmata kempii*, *Matuta victor*, *Nikoides sibogae*, *Saron marmoratus*, *Xanthias lamarkii*, *Palaemon macrodactylus*, and *Pagurus mbizi* (Kapiris *et al.*, 2014; Corsini-Foka & Kondylatos, 2015; Cuesta *et al.*, 2015; Galil *et al.*, 2015), for a total of 399 species; so 63% of the decapods presented in the Mediterranean Sea was also recorded along the Algerian coast. Taken into account only the western Mediterranean Sea, the number was 316 species among them 79% were sampled in the Algerian waters. The diversity of the actual Algerian decapods fauna was similar than those counted for the Alboran Sea (233 species) (Zariquiey-Alvarez, 1968; Gonzalez-Gordillo *et al.*, 2001; Marco-Herrero *et al.*, 2015), the Levantine Basin (240 species) (Hasan, 2008; Galil & Shlagman, 2011; Bakir *et al.*, 2014), the Turkish waters (261 species) (Ates *et al.*, 2010; Bakir *et al.*, 2014), and the Adriatic Sea (241 species) (Kirincic & Stevcic, 2008). It remained lower than the Western Italian coast (266 species) (Froglija, 2010) and the Aegean Sea (281 species) (Corsini-Foka & Pancucci-Papadopoulou, 2012) and higher than this found along the French Mediterranean coast (213 species) (Noël, 1993) and the Central Italian coast (212 species) (Pipitone & Arculeo, 2003; Froglija, 2010).

Apart some deep species which could be recorded on the continental slope and the bathyal zone of the Algerian waters which were insufficiently sampled in the western Mediterranean Sea, the inventory of the shallow and coastal marine decapods species could be considered more or less complete for the continental shelf of the Algerian waters. Nevertheless, 29 species remained only reported under larvae by Seridji (1971, 1989), supplementary samplings were needed to record their adult stages.

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Table 3. List of the recorded decapod species along the Algerian coast and their presence in other locations from the Mediterranean Sea

Species names	Contributors	Algeria	Alboran Sea	Morocco (Mediterranean)	France (Mediterranean)	West Italy	Central Italy	Tunisia	Adriatic Sea	Aegean Sea	Levantine Basin
<i>AcanthePHYra eximia</i>	Smith, 1884	1	1	1	1	1	1			1	1
<i>AcanthePHYra pelagica</i>	(Risso, 1816)	1	1	1	1	1	1		1	1	1
<i>Acanthonyx lunulatus</i>	(Risso, 1816)	1	1	1	1	1	1	1	1	1	1
<i>Achaeus cranchii</i>	Leach, 1817	1	1		1	1	1		1	1	1
<i>Achaeus gracilis</i>	(Costa, 1839)	1	1		1	1	1		1	1	1
<i>Aegaeon cataphractus</i>	(Olivi, 1792)	1	1	1	1	1	1	1	1	1	1
<i>Aegaeon lacazei</i>	(Gourret, 1887)	1	1	1	1	1	1		1	1	1
<i>Albunea carabus</i>	(Linnaeus, 1758)	1		1		1	1				1
<i>Allosergetes sargassi</i>	(Ortmann, 1893)	1	1	1		1	1		1		1
<i>Alpheus dentipes</i>	Guérin, 1832	1	1	1	1	1	1	1	1	1	1
<i>Alpheus glaber</i>	(Olivi, 1792)	1		1	1	1	1	1	1		1
<i>Alpheus inopinatus</i>	Holthuis & Gottlieb, 1958	1						1			1
<i>Alpheus macrocheles</i>	(Hailstone, 1835)	1	1	1	1	1	1		1	1	1
<i>Alpheus rapacida</i>	de Man, 1908	1									1
<i>Anamathia rissoana</i>	(Roux, 1828)	1	1		1	1	1		1	1	
<i>Anapagurus bicorniger</i>	A. Milne-Edwards & Bouvier, 1892	1	1		1	1	1		1	1	1
<i>Anapagurus breviaculeatus</i>	Fenizia, 1937	1			1	1	1		1	1	1
<i>Anapagurus chiroacanthus</i>	(Lilljeborg, 1856)	1	1		1	1	1		1	1	
<i>Anapagurus curvidactylus</i>	Chevreur & Bouvier, 1892	1				1	1				
<i>Anapagurus hyndmanni</i>	(Bell, 1846)	1	1								
<i>Anapagurus laevis</i>	(Bell, 1846)	1	1		1	1	1			1	
<i>Anapagurus petiti</i>	Dechancé & Forest, 1962	1	1		1	1	1			1	
<i>Aristaeomorpha foliacea</i>	(Risso, 1827)	1	1		1	1	1		1	1	1
<i>Aristeus antennatus</i>	(Risso, 1816)	1	1	1	1	1	1		1	1	1
<i>Ascidonia flavomaculata</i>	(Heller, 1864)	1				1	1				
<i>Asthenognathus atlanticus</i>	Monod, 1933	1	1		1						
<i>Atelecyclus rotundatus</i>	(Olivi, 1792)	1	1	1	1	1	1	1	1	1	
<i>Atelecyclus undecimdentatus</i>	(Herbst, 1783)	1	1				1		1		
<i>Athanas nitescens</i>	(Leach, 1813 [in Leach, 1813-1814])	1	1	1	1	1	1	1	1		1
<i>Automate branchialis</i>	Holthuis & Gottlieb, 1958	1			1				1	1	1
<i>Axius stirynchus</i>	Leach, 1815	1	1	1	1	1			1	1	
<i>Bathynectes longipes</i>	(Risso, 1816)	1	1		1	1	1		1	1	
<i>Bathynectes maravigna</i>	(Prestandrea, 1839)	1	1	1		1	1		1	1	1
<i>Brachycarpus biunguiculatus</i>	(Lucas, 1846)	1	1			1	1	1			1
<i>Brachynotus atlanticus</i>	Forest, 1957	1	1								
<i>Brachynotus foresti</i>	Zariquiey Alvarez, 1968	1	1			1	1		1	1	1
<i>Brachynotus gemmellaroii</i>	(Rizza, 1839)	1	1			1	1	1	1	1	1
<i>Brachynotus sexdentatus</i>	(Risso, 1827)	1	1		1	1	1	1	1	1	1
<i>Calappa granulata</i>	(Linnaeus, 1758)	1	1		1	1	1	1	1	1	1
<i>Calcinus tubularis</i>	(Linnaeus, 1767)	1	1	1	1	1	1		1	1	1
<i>Callinassa subterranea</i>	(Montagu, 1808)	1	1		1	1	1		1	1	1
<i>Calocaris macandreae</i>	Bell, 1853	1	1	1	1	1	1		1	1	1
<i>Carcinus aestuarii</i>	Nardo, 1847	1	1		1	1	1	1	1	1	1
<i>Carcinus maenas</i>	(Linnaeus, 1758)	1	1	1	1						
<i>Caridion gordonii</i>	(Spence Bate, 1858)	1									
<i>Cestopagurus timidus</i>	(Roux, 1830)	1	1		1	1	1		1	1	1
<i>Chlorotocus crassicornis</i>	(A. Costa, 1871)	1	1	1	1	1	1	1	1	1	1
<i>Clibanarius erythropus</i>	(Latreille, 1818)	1	1	1	1	1	1		1	1	1
<i>Corystes cassivelaunus</i>	(Pennant, 1777)	1	1	1	1	1	1	1	1	1	1

(continued)

Table 3 (continued)

Species names	Contributors	Algeria	Alboran Sea	Morocco (Mediterranean)	France (Mediterranean)	West Italy	Central Italy	Tunisia	Adriatic Sea	Aegean Sea	Levantine Basin
											1
<i>Crangon crangon</i>	(Linnaeus, 1758)	1	1		1	1			1	1	1
<i>Dardanus arrosor</i>	(Herbst, 1796)	1	1		1	1	1	1	1	1	1
<i>Dardanus calidus</i>	(Risso, 1827)	1	1	1	1	1	1	1	1	1	1
<i>Deosergestes corniculum</i>	(Krøyer, 1855)	1									
<i>Derilambrus angulifrons</i>	(Latreille, 1825)	1	1	1	1	1	1	1	1	1	1
<i>Diogenes pugilator</i>	(Roux, 1829)	1		1	1	1	1	1	1	1	1
<i>Distolambrus maltzami</i>	(Miers, 1881)	1	1		1	1	1		1	1	
<i>Dorhynchus thomsoni</i>	Thomson, 1873	1	1			1	1		1	1	1
<i>Dromia personata</i>	(Linnaeus, 1758)	1	1		1	1	1	1	1	1	1
<i>Ebalia cranchii</i>	Leach, 1817	1	1		1	1			1	1	1
<i>Ebalia deshayesii</i>	Lucas, 1846	1	1		1	1	1			1	1
<i>Ebalia edwardsii</i>	Costa, 1838	1	1		1	1	1		1	1	
<i>Ebalia granulosa</i>	H. Milne Edwards, 1837	1	1		1	1	1		1	1	1
<i>Ebalia nux</i>	A. Milne-Edwards, 1883	1	1			1			1		1
<i>Ebalia tuberosa</i>	(Pennant, 1777)	1	1		1	1	1		1	1	
<i>Ebalia tumefacta</i>	(Montagu, 1808)	1	1		1					1	
<i>Eriphia verrucosa</i>	(Forskål, 1775)	1	1	1	1	1	1	1	1	1	1
<i>Ethusa mascarone</i>	(Herbst, 1785)	1	1		1	1	1	1	1	1	1
<i>Eualus cranchii</i>	(Leach, 1817 [in Leach, 1815-1875])	1	1	1	1	1	1	1	1	1	1
<i>Eualus occultus</i>	(Lebour, 1936)	1	1	1	1	1		1	1	1	
<i>Eualus pusiolus</i>	(Krøyer, 1841)	1									
<i>Eualus sollaudi</i>	(Zariquiey Cenarro, 1936)	1	1		1	1			1	1	
<i>Euchirograpsus liguricus</i>	H. Milne Edwards, 1853	1	1		1	1	1				
<i>Eurynome aspera</i>	(Pennant, 1777)	1	1	1	1	1	1		1	1	1
<i>Eurynome spinosa</i>	Hailstone, 1835	1	1		1	1	1		1		
<i>Eusergestes arcticus</i>	(Krøyer, 1855)	1	1	1		1	1		1	1	
<i>Funchalia woodwardi</i>	Johnson, 1868	1	1			1	1				
<i>Galathea bolivari</i>	Zariquiey Álvarez, 1950	1	1		1	1			1	1	1
<i>Galathea dispersa</i>	Bate, 1859	1	1	1	1	1	1	1	1	1	1
<i>Galathea intermedia</i>	Liljeborg, 1851	1	1		1	1	1	1	1	1	1
<i>Galathea nexa</i>	Embleton, 1834	1	1		1	1	1		1	1	
<i>Galathea squamifera</i>	Leach, 1814	1	1	1	1	1	1		1	1	1
<i>Galathea strigosa</i>	(Linnaeus, 1761)	1	1		1	1	1		1	1	
<i>Gennadas elegans</i>	(Smith, 1882)	1	1			1	1		1	1	1
<i>Geryon longipes</i>	A. Milne-Edwards, 1882	1	1		1	1	1		1	1	1
<i>Geryon trispinosus</i>	(Herbst, 1803)	1	1								
<i>Glabropilumnus laevis</i>	(Dana, 1852)	1				1	1				1
<i>Gnathophyllum elegans</i>	(Risso, 1816)	1	1		1	1	1		1	1	1
<i>Goneplax rhomboides</i>	(Linnaeus, 1758)	1	1	1	1	1	1	1	1	1	1
<i>Gourretia denticulata</i>	(Lutze, 1937)	1	1		1	1		1	1	1	1
<i>Herbstia condyliata</i>	(Fabricius, 1787)	1	1	1	1	1	1		1	1	1
<i>Hippolyte holthuis</i>	Zariquiey Alvarez, 1953	1	1		1	1	1		1	1	1
<i>Hippolyte inermis</i>	Leach, 1816	1	1	1	1	1	1	1	1	1	1
<i>Hippolyte leptocerus</i>	(Heller, 1863)	1	1		1	1	1	1	1	1	1
<i>Hippolyte prideauxiana</i>	Leach, 1817 [in Leach, 1815-1875]	1	1		1	1	1		1	1	
<i>Hippolyte varians</i>	Leach, 1814 [in Leach, 1813-1814]	1	1		1						
<i>Homarus gammarus</i>	(Linnaeus, 1758)	1	1	1	1	1	1		1	1	1
<i>Homola barbata</i>	(Fabricius, 1793)	1	1		1	1	1		1	1	1
<i>Ilia nucleus</i>	(Linnaeus, 1758)	1	1	1	1	1	1	1	1	1	1
<i>Inachus communissimus</i>	Rizza, 1839	1	1		1	1	1		1	1	1
<i>Inachus dorsettensis</i>	(Pennant, 1777)	1	1	1	1	1	1	1	1	1	1
<i>Inachus phalangium</i>	(Fabricius, 1775)	1	1		1	1	1	1	1	1	1

(continued)

Table 3 (continued)

Species names	Contributors	Algeria	Alboran Sea	Morocco (Mediterranean)	France (Mediterranean)	West Italy	Central Italy	Tunisia	Adriatic Sea	Aegean Sea	Levantine Basin
<i>Inachus thoracicus</i>	Roux, 1830	1	1	1	1	1	1	1	1	1	1
<i>Jaxea nocturna</i>	Nardo, 1847	1	1	1	1	1			1	1	1
<i>Latreillia elegans</i>	Roux, 1830	1	1			1	1		1	1	1
<i>Ligur ensiferus</i>	(Risso, 1816)	1	1		1	1	1				
<i>Liocarcinus bolivari</i>	(Zariquiey Alvarez, 1948)	1	1		1	1			1		
<i>Liocarcinus corrugatus</i>	(Pennant, 1777)	1	1	1	1	1	1	1	1	1	1
<i>Liocarcinus depurator</i>	(Linnaeus, 1758)	1	1	1	1	1	1	1	1	1	1
<i>Liocarcinus holsatus</i>	(Fabricius, 1798)	1	1								
<i>Liocarcinus maculatus</i>	(Risso, 1827)	1	1		1	1	1		1	1	1
<i>Liocarcinus marmoreus</i>	(Leach, 1814)	1	1								
<i>Liocarcinus navigator</i>	(Herbst, 1794)	1	1		1	1	1	1		1	1
<i>Liocarcinus navigator navigator</i>	(Herbst, 1794)	1	1								
<i>Liocarcinus pusillus</i>	(Leach, 1816)	1	1	1	1						1
<i>Liocarcinus rondeletii</i>	(Risso, 1816)	1	1		1						
<i>Liocarcinus vernalis</i>	(Risso, 1816)	1	1	1	1	1	1	1	1	1	1
<i>Liocarcinus zariquieyi</i>	Gordon, 1968	1	1		1	1	1		1	1	1
<i>Lissa chiragra</i>	(Fabricius, 1775)	1	1	1	1	1	1		1	1	1
<i>Lophozozymus incisus</i>	(H. Milne Edwards, 1834)	1									
<i>Lucifer typus</i>	H. Milne Edwards, 1837 [in H. Milne Edwards, 1834-1840]	1	1			1	1		1	1	1
<i>Lysmata nilita</i>	Dohrn & Holthuis, 1950	1			1	1			1		
<i>Lysmata seticaudata</i>	(Risso, 1816)	1	1		1	1	1		1	1	1
<i>Macropipus tuberculatus</i>	(Roux, 1830)	1	1		1			1	1	1	
<i>Macropodia czernjawska</i>	(Brandt, 1880)	1	1		1	1	1	1	1	1	1
<i>Macropodia linaresi</i>	Forest & Zariquiey Alvarez, 1964	1	1		1	1			1	1	1
<i>Macropodia longirostris</i>	(Fabricius, 1775)	1	1	1	1	1	1	1	1	1	1
<i>Macropodia rostrata</i>	(Linnaeus, 1761)	1	1	1	1	1	1	1	1	1	1
<i>Macropodia tenuirostris</i>	(Leach, 1814)	1	1						1	1	1
<i>Maja crispata</i>	Risso, 1827	1	1		1	1	1	1	1	1	1
<i>Maja squinado</i>	(Herbst, 1788)	1	1	1	1	1	1	1	1	1	1
<i>Medorippe lanata</i>	(Linnaeus, 1767)	1	1		1	1	1	1	1	1	1
<i>Merocryptus boletifer</i>	A. Milne-Edwards & Bouvier, 1894	1	1						1	1	
<i>Microcassiope minor</i>	(Dana, 1852)	1	1							1	1
<i>Mithrax verrucosus</i>	H. Milne Edwards, 1832	1									
<i>Monodaeus couchii</i>	(Couch, 1851)	1	1	1	1	1	1		1	1	
<i>Monodaeus guinotae</i>	Forest, 1976	1	1		1	1	1			1	
<i>Munida curvimana</i>	A. Milne Edwards & Bouvier, 1894	1	1							1	1
<i>Munida intermedia</i>	A. Milne Edwards & Bouvier, 1899	1	1		1				1		
<i>Munida rugosa</i>	(Fabricius, 1775)	1	1		1	1	1		1	1	
<i>Munida rutilanti</i>	Zariquiey Álvarez, 1952	1	1	1		1	1			1	
<i>Munida sarsi</i>	Huus, 1935	1									
<i>Munida tenuimana</i>	Sars, 1872	1	1			1	1		1	1	
<i>Necallianassa truncata</i>	(Giard & Bonnier, 1890)	1	1	1	1	1		1	1	1	1
<i>Necora puber</i>	(Linnaeus, 1767)	1	1		1	1	1			1	
<i>Nematopagurus longicornis</i>	A. Milne-Edwards & Bouvier, 1892	1	1							1	
<i>Nephrops norvegicus</i>	(Linnaeus, 1758)	1	1	1	1	1	1	1	1	1	
<i>Nepinnotheres pinnotheres</i>	(Linnaeus, 1758)	1	1		1	1	1	1	1	1	
<i>Pachygrapsus marmoratus</i>	(Fabricius, 1787)	1	1	1	1	1	1	1	1	1	1
<i>Pachygrapsus maurus</i>	(Lucas, 1846)	1	1		1	1	1			1	1
<i>Paguristes eremita</i>	(Linnaeus, 1767)	1	1	1	1	1	1	1	1	1	1
<i>Pagurus alatus</i>	Fabricius, 1775	1	1		1	1	1	1	1	1	1
<i>Pagurus anachoretus</i>	Risso, 1827	1	1	1	1	1	1	1	1	1	1
<i>Pagurus carneus</i>	(Pocock, 1889)	1	1								

(continued)

Table 3 (continued)

Species names	Contributors	Algeria	Alboran Sea	Morocco (Mediterranean)	France (Mediterranean)	West Italy	Central Italy	Tunisia	Adriatic Sea	Aegean Sea	Levantine Basin
<i>Pagurus cuanensis</i>	Bell, 1846	1	1	1	1	1	1	1	1	1	1
<i>Pagurus excavatus</i>	(Herbst, 1791)	1	1		1	1	1	1	1	1	1
<i>Pagurus forbesii</i>	Bell, 1846	1	1		1	1			1	1	1
<i>Pagurus prideaux</i>	Leach, 1815	1	1		1	1	1	1	1	1	1
<i>Palaemon adspersus</i>	Rathke, 1837	1	1	1	1	1	1	1	1	1	1
<i>Palaemon elegans</i>	Rathke, 1837	1	1	1	1	1	1	1	1	1	1
<i>Palaemon longirostris</i>	H. Milne Edwards, 1837 [in H. Milne Edwards, 1834-1840]	1	1			1	1	1		1	1
<i>Palaemon serratus</i>	(Pennant, 1777)	1	1	1	1	1	1	1	1	1	1
<i>Palaemon xiphias</i>	Risso, 1816	1	1	1	1	1	1	1		1	1
<i>Palicus caronii</i>	(Roux, 1830)	1	1			1	1		1	1	1
<i>Palinurus elephas</i>	(Fabricius, 1787)	1	1	1	1	1	1	1	1	1	1
<i>Palinurus mauritanicus</i>	Gruvel, 1911	1	1	1	1	1					
<i>Pandalina brevisrostris</i>	(Rathke, 1843)	1	1		1	1	1	1	1	1	1
<i>Pandalina profunda</i>	Holthuis, 1946	1	1		1	1			1	1	
<i>Panopeus africanus</i>	A. Milne-Edwards, 1867	1	1								
<i>Paractaea rufopunctata</i>	(H. Milne Edwards, 1834)	1	1		1	1	1			1	1
<i>Paragalene longicirura</i>	(Nardo, 1869)	1	1			1			1	1	
<i>Parapenaeus longirostris</i>	(Lucas, 1846)	1	1	1	1	1	1	1	1	1	1
<i>Parasergestes vigilax</i>	(Stimpson, 1860)	1	1	1		1	1		1	1	1
<i>Paromola cuvieri</i>	(Risso, 1816)	1	1		1	1	1			1	
<i>Parthenope expansa</i>	(Miers, 1879)	1	1			1	1			1	
<i>Parthenopoides massena</i>	(Roux, 1830)	1	1		1	1	1	1	1	1	1
<i>Pasiphaea multidentata</i>	Esmark, 1866	1	1	1	1	1	1		1	1	1
<i>Pasiphaea sivado</i>	(Risso, 1816)	1	1	1	1	1	1		1	1	1
<i>Percnon gibbesi</i>	(H. Milne Edwards, 1853)	1	1			1	1	1		1	1
<i>Penaeus japonicus</i>	Spence Bate, 1888	1	1		1				1	1	1
<i>Penaeus kerathurus</i>	(Forskål, 1775)	1	1	1	1	1	1	1	1	1	1
<i>Periclimenes amethysteus</i>	(Risso, 1827)	1	1		1	1			1	1	
<i>Periclimenes granulatus</i>	Holthuis, 1950	1					1				
<i>Periclimenes scriptus</i>	(Risso, 1822)	1	1		1	1			1	1	
<i>Pestarella candida</i>	(Olivi, 1792)	1	1		1	1	1	1	1	1	1
<i>Pestarella tyrrhena</i>	(Petagna, 1792)	1	1		1	1	1	1	1	1	1
<i>Philocheas bispinosus bispinosus</i>	(Hailstone, 1835a)	1	1		1	1			1	1	1
<i>Philocheas bispinosus neglectus</i>	(Sars G.O., 1883)	1	1		1				1		
<i>Philocheas echinulatus</i>	(M. Sars, 1862)	1	1			1			1	1	
<i>Philocheas fasciatus</i>	(Risso, 1816)	1	1	1	1	1	1	1	1	1	
<i>Philocheas sculptus</i>	(Bell, 1847 [in Bell, 1844-1853])	1	1	1	1	1			1	1	
<i>Philocheas trispinosus</i>	(Hailstone in Hailstone & Westwood, 1835)	1	1		1	1		1		1	1
<i>Pilumnus hirtellus</i>	(Linnaeus, 1761)	1	1		1	1	1	1	1	1	1
<i>Pilumnus spinifer</i>	H. Milne Edwards, 1834	1	1	1	1	1	1		1	1	1
<i>Pilumnus villosissimus</i>	(Rafinesque, 1814)	1	1	1	1	1	1		1	1	1
<i>Pinnotheres pisum</i>	(Linnaeus, 1767)	1	1	1	1	1	1		1	1	1
<i>Pirimela denticulata</i>	(Montagu, 1808)	1	1	1	1	1	1	1	1	1	1
<i>Pisa armata</i>	(Latreille, 1803)	1	1	1	1	1	1	1	1	1	1
<i>Pisa hirticornis</i>	(Herbst, 1804)	1	1		1	1	1		1	1	1
<i>Pisa muscosa</i>	(Linnaeus, 1758)	1	1	1	1	1	1	1	1	1	1
<i>Pisa tetraodon</i>	(Pennant, 1777)	1	1	1	1	1	1	1	1	1	1
<i>Pisidia bluteli</i>	(Risso, 1816)	1	1		1	1	1		1	1	1
<i>Pisidia longicornis</i>	(Linnaeus, 1767)	1	1	1	1	1	1	1	1	1	1
<i>Planes minutus</i>	(Linnaeus, 1758)	1	1		1	1	1		1	1	1
<i>Plesionika acanthonotus</i>	(Smith, 1882)	1	1		1	1	1		1	1	

(continued)

Table 3 (continued)

Species names	Contributors										
		Algeria	Alboran Sea	Morocco (Mediterranean)	France (Mediterranean)	West Italy	Central Italy	Tunisia	Adriatic Sea	Aegean Sea	Levantine Basin
<i>Plesionika antigai</i>	Zariquiey Alvarez, 1955	1	1			1			1	1	
<i>Plesionika edwardsii</i>	(Brandt, 1851)	1	1		1	1	1		1	1	1
<i>Plesionika ensis</i>	(A. Milne-Edwards, 1881)	1	1								
<i>Plesionika gigliolii</i>	(Senna, 1902)	1	1		1	1	1			1	1
<i>Plesionika heterocarpus</i>	(A. Costa, 1871)	1	1	1	1	1	1	1	1	1	1
<i>Plesionika martia</i>	(A. Milne-Edwards, 1883)	1	1		1	1	1		1	1	1
<i>Plesionika narval</i>	(Fabricius, 1787)	1	1		1	1	1		1	1	1
<i>Polybius henslowii</i>	Leach, 1820	1	1	1		1	1				
<i>Polycheles typhlops</i>	Heller, 1862	1	1	1	1	1	1		1	1	1
<i>Pontonia pinnophylax</i>	(Otto, 1821)	1	1	1	1	1	1	1	1	1	1
<i>Pontophilus spinosus</i>	(Leach, 1816)	1	1	1	1	1	1		1	1	1
<i>Porcellana platycheles</i>	(Pennant, 1777)	1	1	1	1	1	1	1	1	1	1
<i>Portunus latipes</i>	(Pennant, 1777)	1	1	1	1	1	1		1	1	1
<i>Portunus (Portunus) hastatus</i>	(Linnaeus, 1767)	1	1	1	1	1	1	1	1	1	1
<i>Processa acutirostris</i>	Nouvel & Holthuis, 1957	1	1	1	1	1	1	1	1	1	1
<i>Processa canaliculata</i>	Leach, 1815 [in Leach, 1815-1875]	1	1	1	1	1	1			1	
<i>Processa edulis crassipes</i>	(Nouvel & Holthuis, 1957)	1			1						
<i>Processa edulis edulis</i>	(Risso, 1816)	1	1	1	1	1	1	1	1	1	1
<i>Processa elegantula</i>	Nouvel & Holthuis, 1957	1	1		1	1	1	1		1	1
<i>Processa macrophthalma</i>	Nouvel & Holthuis, 1957	1	1		1	1	1		1	1	1
<i>Processa modica carolii</i>	Williamson in Williamson & Rochanaburanon, 1979	1			1	1	1				
<i>Processa modica modica</i>	Williamson in Williamson & Rochanaburanon, 1979	1	1			1	1		1	1	1
<i>Processa nouveli holthuisi</i>	Al-Adhub & Williamson, 1975	1									
<i>Processa nouveli nouveli</i>	Al-Adhub & Williamson, 1975	1	1		1	1	1		1	1	1
<i>Processa parva</i>	Holthuis, 1951	1		1							
<i>Processa robusta</i>	Nouvel & Holthuis, 1957	1	1	1	1	1		1	1	1	
<i>Rochinia carpenteri</i>	(Thomson, 1873)	1	1								
<i>Scyllarides latus</i>	(Latreille, 1803)	1	1	1	1	1	1		1	1	1
<i>Scyllarus arctus</i>	(Linnaeus, 1758)	1	1	1	1	1	1		1	1	1
<i>Scyllarus pygmaeus</i>	(Bate, 1888)	1	1	1		1	1		1	1	1
<i>Sergestes atlanticus</i>	H. Milne Edwards, 1830	1	1	1						1	
<i>Sergestes henseni</i>	(Ortmann, 1893)	1	1	1				1			
<i>Sergia robusta</i>	(Smith, 1882)	1	1	1	1	1	1		1	1	1
<i>Sicyonia carinata</i>	(Brünnich, 1768)	1	1	1	1	1	1	1	1	1	1
<i>Sirpus zariquieyi</i>	Gordon, 1953	1	1		1	1	1		1	1	1
<i>Solenocera membranacea</i>	(Risso, 1816)	1	1	1	1	1	1	1	1	1	1
<i>Spinolambrus macrochelos</i>	(Herbst, 1790)	1	1		1	1	1	1	1	1	1
<i>Stenopus spinosus</i>	Risso, 1827	1	1		1	1	1	1	1	1	1
<i>Synalpheus gambarelloides</i>	(Nardo, 1847)	1	1	1	1	1	1	1	1	1	1
<i>Thia scutellata</i>	(Fabricius, 1793)	1	1		1	1	1	1	1	1	1
<i>Upogebia deltaura</i>	(Leach, 1815)	1	1		1	1	1	1	1	1	1
<i>Upogebia pusilla</i>	(Petagna, 1792)	1	1		1	1	1		1	1	1
<i>Upogebia stellata</i>	(Montagu, 1808)	1								1	
<i>Upogebia tipica</i>	(Nardo, 1869)	1			1	1	1		1	1	1
<i>Xaiva biguttata</i>	(Risso, 1816)	1	1		1	1	1			1	1
<i>Xantho granulicarpus</i>	Forest, in Drach & Forest, 1953	1		1	1			1		1	1
<i>Xantho hydrophilus</i>	(Herbst, 1790)	1	1		1				1	1	1
<i>Xantho pilipes</i>	A. Milne-Edwards, 1867	1	1	1	1	1	1	1	1	1	1
<i>Xantho poressa</i>	(Olivi, 1792)	1	1	1	1	1	1	1	1	1	1
Total		253	228	101	194	209	186	94	187	204	167

(continued)

very useful comments and suggestions on the first version of the typescript.

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