

# A comparative analysis of biodiversity and distribution of shallow-water marine isopods (Crustacea : Isopoda) from polar and temperate waters in the East Pacific

Ma. del Carmen Espinosa-Pérez<sup>1,2</sup> and M.E. Hendrickx<sup>1</sup>

<sup>1</sup> Laboratorio de Invertebrados Bentónicos, Unidad Académica Mazatlán, Instituto de Ciencias del Mar y Limnología, UNAM, P.O. Box 811, Mazatlán, Sinaloa, 82000 Mexico

<sup>2</sup> Postgraduate program, Ciencias del Mar y Limnología, ICML, UNAM

Corresponding author : M.E. Hendrickx, e-mail : michel@ola.icmyl.unam.mx

**ABSTRACT.** Checklists of isopods currently reported for the polar and temperate waters of the East Pacific, in depths of 200 m or less, are presented, and compared with an updated list of species known to the eastern tropical Pacific (ETP). A total of 213 species are recorded for the northern subregion (Arctic, Aleutian, and Oregonian Provinces), 133 for the southern subregion (Peru-Chile, Temperate Transitional, and Magellan Provinces) and 134 for the ETP. In total, 420 species are known to occur in the East Pacific. Considering the entire East Pacific region, the isopods fauna is dominated by the Cymothoidea (36.4% of total), followed by the Asellota (21.9%), the Valvifera (17.3%), the Sphaeromatidea (16.2%), the Oniscidea (6.2%), the Linnoriidea (1.4%) and the Microcerberidea (0.5%). The northern and southern polar-temperate faunas include a total of 340 species, with only seven species in common. The northern and southern subregions share only 34 out of 160 genera; of these, 103 occur in the northern subregion, 76 in the ETP and 65 in the southern subregion. The southern and northern subregions share 34 genera and 21 genera are shared by the three subregions, of which 12 belong to the Cymothoidea. Forty-three families are registered in the East Pacific, 41 in the northern subregion and only 22 in the southern subregion, of which 18 are common to both. Comparatively, the ETP contains 25 families and 12 families are found in all three subregions. An analysis by provinces indicates that, according to our present knowledge, the highest number of species in the East Pacific is recorded in the Oregonian Province (140 species), followed by the Californian (128), Cortés (95), Magellan (75), Temperate-Transitional (61), Aleutian (61), Mexican (53), Panamic (52), Peru-Chile (43), and Arctic (15) provinces. Sixteen species are reported for the Galapagos, 10 each for the Juan Fernandez and Guadalupe Islands. A cluster analysis based on presence-absence of species revealed four major groups among the 10 previously recognized provinces, both when species and genera were used. The grouping of provinces into southern, ETP and northern subregions appears well defined and with comparable values of the similarity index, with the exception of the Arctic Province.

**KEY WORDS :** Isopoda, East Pacific, checklists, distribution

## INTRODUCTION

Estuarine and marine isopods are among the most common crustaceans found worldwide. The order Isopoda contains approximately 10000 species, of which about half are terrestrial. Most of the rest are found in brackish, marine and occasionally hypersaline waters (BRUSCA & BRUSCA, 2002; WILLIAMS, 1983). They are found in virtually all kind of habitats, either as free living organisms or partly or exclusively parasites (SCHULTZ, 1961; DEXTER, 1972; 1974; 1976; RIBI, 1981; DELANEY, 1984; KANG & YUN, 1988; ELLISON & FARNSWORTH, 1990; ARRONTES & ANADÓN, 1990; TAYLOR & MOORE, 1995; BRUSCA & BRUSCA, 2002).

The East Pacific is one of the large marine zoogeographic regions of the World. It covers approximately 127 degrees of latitude, from the Sea of Bering to the tip of Tierra de Fuego and has been traditionally divided into eight zoogeographic provinces (BRUSCA & WALLERSTEIN, 1979b; HENDRICKX, 1992), two of which (Arctic and Magellan provinces) also extend beyond the boundaries

of the East Pacific. For the sake of clarity, the entire East Pacific will be considered herein as a zoogeographic region divided into three subregions (the northern temperate subregion; the eastern tropical Pacific subregion; and the southern temperate subregion), each of these subregions being divided in a number of zoogeographic provinces (Fig. 1). An analysis of the biodiversity and distribution of the isopods inhabiting the Mexican Pacific was presented by ESPINOSA-PÉREZ & HENDRICKX (2002) who partly based their analysis on a species checklist they established earlier (see ESPINOSA-PÉREZ & HENDRICKX, 2001a) for the entire eastern tropical Pacific (ETP).

An analysis of the distribution and zoogeographic affinities of the isopods occurring in the northern and southern temperate subregions of the east Pacific is not available, and the zoogeographic affinities of the isopod fauna in the ETP have not been addressed. Some considerations have been presented for restricted geographic areas (see MENZIES, 1962a; AUSTIN, 1985; BRUSCA & IVERSON, 1985; MARKHAM, 1992; BRANDT, et al., 1999; THIEL, 2002; THIEL et al., 2003) or for some groups of

isopods (i.e., at generic, family or higher taxonomic level) (see BRUSCA & WALLERSTEIN, 1979b; BRUSCA, 1981; DELANEY, 1984; BRUSCA et al., 1995).

Checklists of species are important for the study of ecosystems in general and provide comparative data for biodiversity studies. Although some urgently need updating, lists of estuarine and marine isopods that concern one or several zoogeographic provinces are available for the NE Pacific (AUSTIN, 1985), the Antarctic (BRANDT, 1991), the West Atlantic (KENSLEY & SCHOTTE, 1989), Europe (COSTELLO et al., 2005), and Australia (POORE,

2005). Several smaller geographic areas also have checklists, e.g., Italian waters (STOCH, 2003), California (BRUSCA et al., 2006), and Costa Rica (BRUSCA & IVERSON, 1985).

The objective of this paper is to present a distributional checklist of all species of marine and estuarine isopods known from the southern and northern temperate and cold water of the East Pacific and to compare biodiversity within the currently recognized zoogeographic provinces, including the provinces of the eastern tropical Pacific.

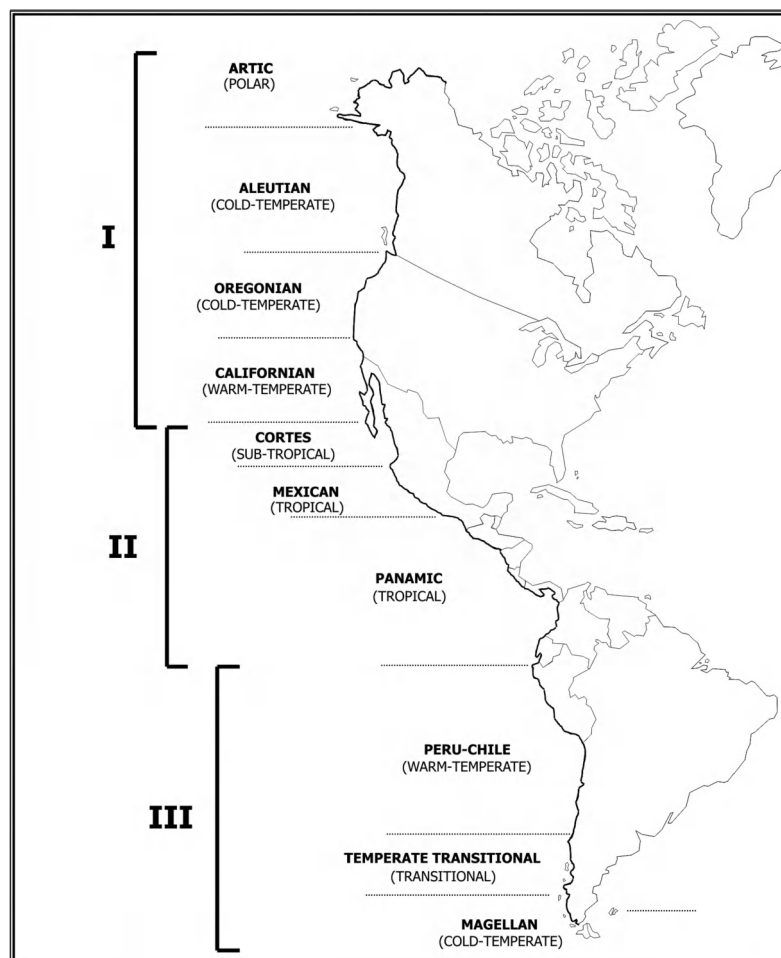


Fig. 1. – Zoogeographic subregions and provinces used in this contribution. Boundaries based on proposals by BRUSCA & WALLERSTEIN (1979b), JARAMILLO (1982), HENDRICKX (1992), and LANCELLOTTI & VAZQUEZ (1999). I, II, and III: northern subregion, ETP, and southern subregion, respectively.

## MATERIAL AND METHODS

The area covered during this study corresponds to the shallow-water (< 200 m) of the warm temperate (Californian), cold temperate (Oregonian and Aleutian), and polar (Arctic) provinces located in the northern hemisphere (the northern subregion), and the warm temperate (Peru-Chile), transitional (Temperate-Transitional), and cold temperate (Magellan) provinces in the southern hemisphere (the southern subregion), of the east coast of America; both subregions are part of the East Pacific region that extends from the Bering Sea to the Magellan

Strait (see Fig. 1). In addition to this, the East Pacific possesses several oceanic Islands (as opposed to the close-to-continent islands) characterized by a certain degree of endemism; each island or group of islands has been considered as isolated zoogeographic entities (see BRIGGS, 1974; BRUSCA & WALLERSTEIN, 1979b; HENDRICKX, 1992). Although the Arctic and Magellan provinces extend beyond the geographic limits of the east Pacific, only records from the East Pacific were considered; thus, Punta Barrow, Bering Sea, and the southern tip of Chile were considered as our boundaries. The lists of isopods for these southern and northern subregions of the eastern

Pacific were established on the basis of published literature, list of species available in websites and some unpublished data from the authors' files. It should be remembered at all times, however, that the information compiled corresponds to our present knowledge of isopods and their distribution in the region. These lists are presented in two appendices and include the name of each species and its currently recognized geographic distribution within the East Pacific. Additionally, the presence of some species in other geographic regions is indicated using the following abbreviations: ATL, Atlantic Ocean; W-ATL, West Atlantic; E-ATL, East Atlantic; I-PAC, Indo-Pacific; I-WPAC, Indo-West Pacific; MED, Mediterranean Sea; ART, Arctic Ocean; ANT, Antarctic Ocean; HAW, Hawaii; COS, Cosmopolitan. The composition of the isopod fauna of the eastern tropical Pacific (ETP) (including the Cortés, Mexican and Panamic provinces, as defined by HENDRICKX, 1992) extending between the northern and the southern temperate subregions was used as a comparative element in this analysis. The ETP data were taken from ESPINOSA-PÉREZ & HENDRICKX (2001a, 2002) and updated on the basis of recently published information or distribution data that was not previously available. All bibliographic references used during this process are cited in the appendices. In addition, two major websites were used; one established by KENSLEY & SCHOTTE (2006) and the other recently made available by BRUSCA et al. (2006). The ETP list published in 2001 included all species recorded in oceanic islands, including species endemic to these islands. In this analysis, however, only species found in the northern and southern temperate oceanic islands and in at least one continental locality have been considered but lists of species found on these islands and with no continental record are provided for comparison.

The recent classification proposed by MARTIN & DAVIS (2001) for Isopoda was used in a former draft of this paper. It includes nine suborders, of which seven (Anthuridea Monod, 1922; Microcerberidea Lang, 1961; Flabellifera Sars, 1882; Asellota Latreille, 1802; Valvifera Sars, 1882; Epicaridea Latreille, 1831; and Oniscidea Latreille, 1802) had representatives in the East Pacific. Virtually all recent literature available for east Pacific isopods is based

on a classification similar to the one proposed by MARTIN & DAVIS (2001). The Flabellifera, however, have long been considered a paraphyletic group and reviewed recently by BRANDT & POORE (2003). On the basis of a thorough cladistic analysis, these authors proposed a reviewed classification of the flabelliferan and related Isopoda which was adopted here (see appendices).

Using the information contained in the two checklists presented herein, and the updated data for the ETP checklist, an analysis of the currently known biodiversity for each currently recognized polar or temperate marine biogeographic province in the East Pacific is proposed, together with a comparative analysis of species, genera and family in each subregion of the East Pacific. The analysis was made possible using a data base containing distributional data of all species known to occur in the East Pacific with at least one record in water no deeper than 200 m (defined herein as shallow water). A cluster analysis was used to classify currently recognized 10 marine biogeographic provinces according to the presence or absence of species. The phenogram was constructed with the Multivariate Statistical Package (version 3.13c) (copyright 1985-2002 Kovach Computing Services, using clustering with the Unweighted Pair Group Method with Arithmetic Mean (UPGMA).

## RESULTS

### *Biodiversity of isopods in the East Pacific*

The updating of the list of species known to occur in the ETP (Table 1) and the two checklists of species recorded in the northern and southern subregions of the East Pacific (Appendices 1, 2) indicate that there are 420 species of isopods inhabiting estuarine and marine ecosystems, in depths <200 m. The Cymothoidea are by far the dominating suborder (153 species; 36.4% of total), followed by the Asellota (92; 21.9%), the Valvifera (73; 17.4%), the Sphaeromatidea (68; 16.2%), the Oniscidea (26; 6.2%), the Limnoriidea (6; 1.4%) and the Microcerberidea (only 2 species, or 0.5%) (Fig. 2).

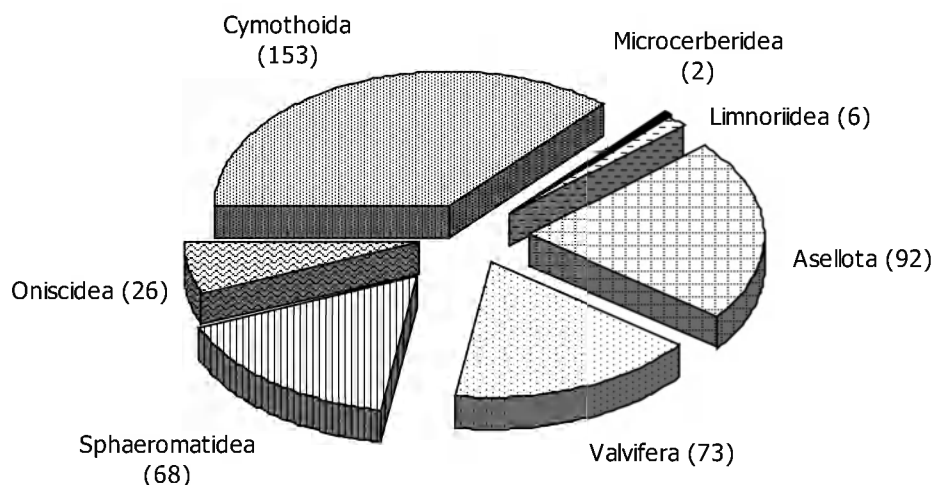


Fig. 2. – Number of species of estuarine and marine isopods recorded from the east Pacific (<200 m depth) classified by suborder (total : 420 species).

### Diversity by subregion

The number of species currently recorded for the northern polar and temperate zoogeographic provinces, or northern subregion of the East Pacific, is 213 (Appendix 1) vs. only 133 species for the southern temperate provinces (Appendix 2). Comparatively, 134 species are now registered for the ETP. This figure includes the 119 shallow water species reported by ESPINOSA-PÉREZ & HENDRICKX (2001a) and an additional 15 species overlooked by these authors, described or registered since for the area, including two Anthuridae, four Cymothoidae, one Gnathiidae (the first recorded for the ETP), one Idoteidae, one Sphaeromatidae, four Bopyridae, one Porcellionidae and one Scyphasidae (see Table 1). When lists are compared, the northern and southern polar-temperate fauna include a total of 340 species, with only seven species in common: *Euryllana arcuata* (Hale, 1925) [an introduced species], *Excorallana braziliensis* (Richardson, 1912), *Natatolana californiensis* (Schultz, 1966), *Ceratothoa gaudichaudii* (H. Milne-Edwards, 1840), *Ianiropsis tridens* (Menzies, 1952), *Munnogonium trillerae* (Menzies & Barnard, 1959) and *Idotea metallica* (Bosc, 1802). Of a total of 43 families recorded in the East Pacific (for the purpose of this paper, *incertae sedis* species are accounted for as a distinct family), 41 occur in the northern subregion and only 22 in the southern subregion, of which 18 are common to both. Comparatively, the ETP contains 25 families (Table 2). Although the northern and southern subregions experience similar climatic conditions, they share only 34 (21.3%) out of 160 genera (Table 3). Comparatively, the ETP shares 12 families with the southern fauna and 23 with the northern fauna. Twelve families are found in all three subregions (28% of all families known for the East Pacific) (Table 2). Altogether, there are 160 genera known from the East Pacific. The highest diversity

at generic level is found in the northern subregion (103), followed by the ETP (76) and the southern subregion (65). The southern and the ETP fauna share only 21 (13.2%) genera, the northern and the ETP fauna 50 (31.3%), and the southern and northern subregions share 34 genera (21.3%). A total of 21 genera (13.2%) are shared by the three subregions: one Anthuridea, 14 Flabellifera, two Asellota, three Valvifera and one Epicaridea (Table 3).

All seven suborders of isopods known to the East Pacific are present in the northern and the ETP subregions, while the Microcerberidea (only two species are known into the East Pacific) and Oniscidea are missing altogether in the southern subregion. The analysis of number of species by suborders indicates that the Cymothoidea is the most diverse group in all three subregions and represents a major portion of the isopods fauna in the southern region (28.1%), in the northern subregion (31.5%), and in the ETP (60.7%) where it dominates. Asellota and Valvifera are both very diverse in the northern subregion (42 and 47 species, respectively) and Asellota is second in diversity in the southern subregion. Sphaeromatidea is represented by twenty-four species in the southern subregion, vs. 29 and 18 species in the other two. The Limnoriidea is better represented in the northern and ETP subregions (4 and 2 species, respectively) than in the south (1 species). From a general viewpoint, Cymothoidea dominates in the ETP (82 spp.) and Cymothoidea (37 spp) and Asellota (49 spp) in the south; the northern subregion is also dominated by Cymothoidea (67 spp), followed by Asellota (42 spp) and Valvifera (47 spp), and poses a comparatively higher diversity for Oniscidea (23 species vs. 0 and 9) and Valvifera (47 species vs. 22 and 18) (Table 2).

TABLE 1

Species recorded from the ETP not included in Espinosa-Pérez & Hendrickx (2001) (15 in total). (1) Cited as *Exosphaeroma* sp.; (2) cited as *Paracerceis* sp. by Espinosa-Pérez & Hendrickx (2001)

Species	Distribution	Source
<i>Haliophasma curri</i> Paul & Menzies, 1971	Isla Culebra, Panama	Kensley, 1980
<i>Skuphomura ecuadoriensis</i> Kensley, 1980	La Libertad, Ecuador	Kensley, 1980
<i>Bopyrissa magellanica</i> Nierstrasz & Brender à Brandis, 1931	Arenas Point, Costa Rica	Nierstrasz & Brender à Brandis, 1931
<i>Orbimorphus constrictus</i> Richardson, 1910	Matapalo, Peru	Richardson, 1910
<i>Pleurocryptella wolffi</i> Bourdon, 1972	Gulf of Panama	Kensley & Schotte, 2001
<i>Stegias angusta</i> Nierstrasz & Brender à Brandis, 1931	Costa Rica	Kensley & Schotte, 2001
<i>Elthusa californica</i> (Schlöde & Meinert, 1884)	Canada to Peru	Brusca et al., 2001
<i>Mothocya panamica</i> Bruce, 1986	Panama Bay	Bruce, 1986
<i>Mothocya rosea</i> Bruce, 1986	USA to Nicaragua	Bruce, 1986
<i>Mothocya arrosor</i> Bruce, 1986	Gulf of California and Guadalupe Island, Mexico to Panama	Bruce, 1986
<i>Paradella tiffany</i> Bruce & Wetzer, 2004	Baja California, Mexico	Bruce & Wetzer, 2004
<i>Gnathia margaritarum</i> Monod, 1926	Gulf of Panama	Kensley & Schotte, 2001
<i>Idotea metallica</i> Bosc, 1802	California, USA, to Gulf of California, Mexico; Montevideo to Beagle Channel, Chile.	Brusca et al., 2001
<i>Porcellionides floria</i> Garthwaite & Sassaman, 1985	USA to Gulf of California, Mexico	Brusca et al., 2001
<i>Alloniscus mirabilis</i> (Stuxberg, 1875)	California, USA to Magdalena Bay, Mexico	Brusca et al., 2001
(1) <i>Exosphaeroma bruscai</i> Espinosa-Pérez & Hendrickx, 2001	Gulf of California, Mexico	Espinosa-Pérez & Hendrickx, 2001b
(2) <i>Paracerceis spinulosa</i> Espinosa-Pérez & Hendrickx, 2002	Gulf of California, Mexico	Espinosa-Pérez & Hendrickx, 2002a

TABLE 2

Number of isopods (by family) in the three subregions of the East Pacific (N, Northern subregion; S, southern subregion; ETP, eastern tropical Pacific).

FAMILY	N	S	ETP
<b>CYMOTHOIDA</b>			
Antheluridae	1	0	0
Anthuridae	3	0	7
Paranthuridae	4	4	5
Aegidae	9	5	7
Ancinidae	1	0	2
Cirolanidae	7	11	18
Corallanidae	1	2	7
Cymothoidae	11	4	18
Gnathiidae	7	2	1
Tridentellidae	2	1	0
Bopyridae	16	8	17
Dajidae	2	0	1
Entoniscidae	1	0	0
Cabiropidae	1	0	0
Fabidae	1	0	0
Criptoniscoidea	1	0	0
	<b>68</b>	<b>37</b>	<b>83</b>
<b>MICROCERBERIDEA</b>			
Microcerberidae	1	4	1
<b>LIMNORHIDEA</b>			
Limnoriidae	4	1	2
<b>SPHAEROMATIDEA</b>			
Serolidae	1	7	2
Sphaeromatidae	24	17	14
Tecticipitidae	3	0	0
	<b>28</b>	<b>24</b>	<b>16</b>
<b>ASELLOTA</b>			
Asellidae	1	0	0
Acanthaspidiidae	0	2	0
Janiridae	20	16	1
Joeropsididae	4	3	1
Munnidae	8	6	2
Munnopsidae	1	1	0
Paramunnidae	4	16	0
Santiidae	1	5	0
Gnathostenetroididae	0	0	1
Incerta sedis	3	0	0
	<b>42</b>	<b>49</b>	<b>5</b>
<b>VALVIFERA</b>			
Arcturidae	8	6	1
Chaetiliidae	1	6	0
Holognathidae	1	3	3
Idoteidae	37	7	14
	<b>47</b>	<b>22</b>	<b>18</b>
<b>ONISCIDEA</b>			
Tylidae	1	0	1
Ligiidae	5	0	3
Trichoniscidae	1	0	0
Philosciidae	1	0	0
Platyarthridae	2	0	0
Scyphacidae	6	0	4
Armadillidae	3	0	0
Porcellionidae	4	0	1
	<b>23</b>	<b>0</b>	<b>9</b>
<b>TOTAL</b>	<b>213</b>	<b>133</b>	<b>134</b>

TABLE 3

Number of genera of isopods registered in each subregion of the East Pacific and common to each pair of subregions and to the three subregions (N, northern subregion; S, southern subregion; ETP, eastern tropical Pacific).

FAMILY	N	S	ETP	N-S	N-ETP	S-ETP	N-S-ETP	Genera common to three subregions
<b>CYMOTHOIDA</b>								
Antheluridae	1	0	0	0	0	0	0	
Anthuridae	3	0	5	0	2	0	0	
Paranthuridae	3	1	3	1	3	1	1	<i>Paranthura</i>
Aegidae	2	2	2	2	2	2	2	<i>Aega; Rocinela</i>
Ancinidae	1	0	1	0	1	0	0	
Corallanidae	1	1	2	1	1	1	1	<i>Excorallana</i>
Cymothoidae	7	3	10	3	7	3	3	<i>Anilocra; Ceratothoa; Elthusa;</i>
Gnathiidae	2	1	1	1	1	0	0	
Tridentellidae	1	1	0	1	0	0	0	
Bopyridae	13	4	12	3	4	1	1	<i>Pseudione</i>
Dajidae	2	0	1	0	1	0	0	
Entoniscidae	1	0	0	0	0	0	0	
Cabiropidae	1	0	0	0	0	0	0	
Fabidae	1	0	0	0	0	0	0	
Criptoniscoidea	1	0	0	0	0	0	0	
Cirolanidae	5	5	8	4	4	4	4	<i>Cirolana; Eurylana; Excirolana; Natatolana</i>
<b>MICROCERBERIDEA</b>								
Microcerberidae	1	0	1	0	1	0	0	
<b>LIMNORIIDEA</b>								
Limnoriidae	1	1	1	1	1	1	1	<i>Limnoria</i>
<b>SPHAEROMATIDEA</b>								
Serolidae	1	6	1	0	1	0	0	
Sphaeromatidae	10	11	9	3	5	3	3	<i>Dynamenella; Exosphaeroma; Paradella</i>
Tecticipitidae	1	0	0	0	0	0	0	
<b>ASELOTA</b>								
Asellidae	1	0	0	0	0	0	0	
Acanthaspidiidae	0	1	0	0	0	0	0	
Janiridae	7	7	1	3	0	0	0	
Joeropsidae	1	1	1	1	1	1	1	<i>Joeropsis</i>
Munnidae	2	2	1	2	1	1	1	<i>Uromunna</i>
Munnopsidae	1	1	0	1	0	0	0	
Paramunnidae	3	6	0	3	0	0	0	
Santiidae	1	1	0	1	0	0	0	
Gnathostenetroididae	0	0	1	0	0	0	0	
Incerta sedis	1	0	0	0	0	0	0	
<b>VALVIFERA</b>								
Arcturidae	4	5	1	1	1	1	1	<i>Neastacilla</i>
Chaetiliidae	1	2	0	0	0	0	0	
Holognathidae	1	1	1	0	1	0	0	
Idoteidae	7	2	8	2	7	2	2	<i>Edotia; Idotea</i>
<b>ONISCIDEA</b>								
Tylidae	1	0	1	0	1	0	0	
Ligiidae	2	0	1	0	1	0	0	
Trichoniscidae	1	0	0	0	0	0	0	
Philosciidae	1	0	0	0	0	0	0	
Platyarthridae	2	0	0	0	0	0	0	
Scyphacidae	3	0	2	0	2	0	0	
Armadillidae	2	0	0	0	0	0	0	
Porcellionidae	2	0	1	0	1	0	0	
	<b>103</b>	<b>65</b>	<b>76</b>	<b>34</b>	<b>50</b>	<b>21</b>	<b>21</b>	

### *Species diversity by province*

#### The northern subregion

According to present records, the American continent section of the Arctic Province (East Pacific only) is by far the less diverse, with only 15 species recorded to date, followed by the Aleutian Province (61 species), the Californian Province (128 species) and the Oregonian Province (140 species) (Fig. 3). Anthuroidea (i.e., the superfamily) and Microcerberidea are absent from the two northernmost Provinces, and Microcerberidea is also absent from the Californian Province; another species of

Microcerberidea has been recorded in the ETP, and there is no record for this suborder in the southern subregion. Cymothoidea and Valvifera represent 60% of the known isopods fauna in the Arctic Province, 63% in the Aleutian Province, 46% in the Oregonian Province (where Aselota accounts for 21% of the total of the species vs. 13%, 15%, and 10% from north to south in the other Provinces), and 59% in the Californian Province. Bopyroidea and Cryptoniscoidea (i.e., the two superfamilies) and Oniscidea are rare in the Arctic and their diversity increases towards the warmer water, with a maximum in the Oregonian Province (Fig. 3).

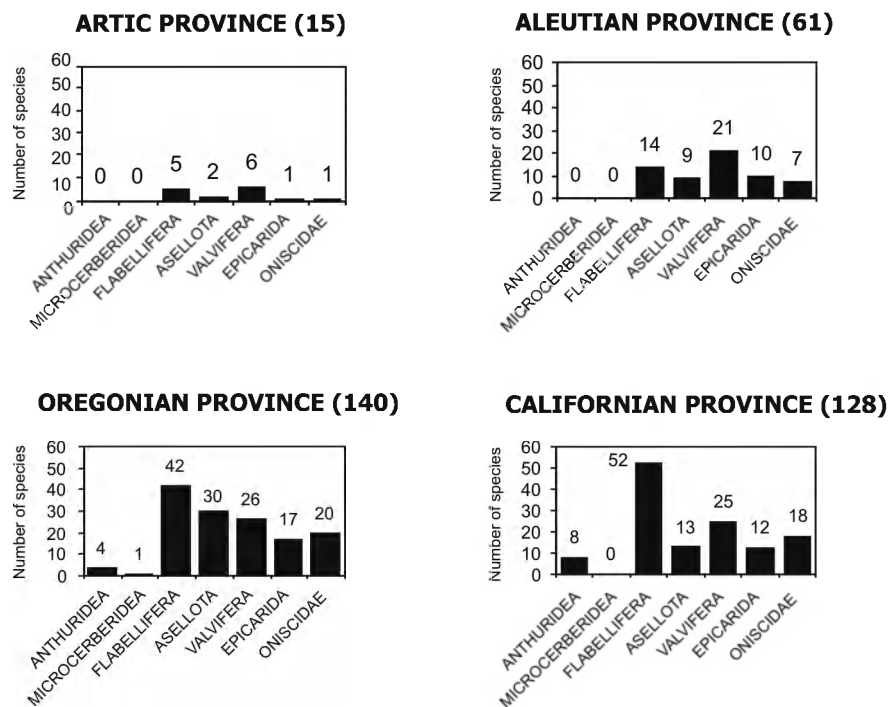


Fig. 3. – Number of species of shallow water isopods recorded in the northern region of the East Pacific by province and suborder. Total number of species in brackets.

### The southern subregion

Off all three Provinces (Juan Fernandez being considered separately; see *infra*) included in the southern subregion of the East Pacific, the Peru–Chile Province appears to be the less diverse with 43 species known to date; the Temperate-Transitional and Magellan (East Pacific only) Provinces feature similar number of species (61 and 75, respectively). Four suborders are not represented in the Magellan Province, which is clearly dominated by Asellota (48% of the species) and Sphaeromatidea (21%). The third suborder in this Province, the Valvifera (20%), is actually poorly represented in the entire southern subregion (a total of 22 species) comparatively with the northern subregion (47 species) (Fig. 4). The Cymothoidea again dominate the other two Provinces (Temperate-Transitional, 41%; Peru–Chile, 32%); the Asellota are numerous (34%) in the Temperate-Transitional Province, but not in the Peru–Chile Province (only 18%). Sphaeromatidea correspond to 30% of the species occurring in the Temperate-Transitional Province, and 23% in the Peru–Chile Province. Only one species of Anthuroidea, *Paranthura porteri* (Boone, 1920), is known from the southern subregion but do not seem to extend into the Magellan Province (Fig. 4; Appendix 2). No species of the superfamilies Bopyroidea and Cryptoniscoidea has been recorded from the East Pacific section of the Magellan Province, and only eight species are known from the other two Provinces, five of these occur in the Temperate–Transitional Province and three in the Peru–Chile Province

(Fig. 4). The Oniscidea are absent altogether from the southern subregion.

### The ETP subregion

The analysis of the distribution of the isopods throughout the different Mexican Provinces of the ETP was presented by ESPINOSA-PÉREZ & HENDRICKX (2002) on the basis of records for 120 species. The addition of 15 species to the ETP isopods fauna does not modify substantially their conclusions, which were drawn at suborder level only, although it increases the number of known Mexican species from 120 to 128 (see Table 1 and Fig. 4). The updating checklist of isopods of the ETP resulting from the addition of these 15 species allows reporting a total of 134 known species (Table 2). All seven suborders considered herein are represented in the ETP. The Cymothoidea is by far the dominant group (61% of the species); Valvifera (18 species) are as diverse as in the southern subregion (22 species) but far less so than in the northern subregion (47 species) (Table 2). With 18 species, Sphaeromatidea represents 13.3% of the species for the entire ETP and are less diverse than in the south (24 species) or in the north (29 species). Anthuroidea are more diverse in the ETP than in the two other subregions (12 vs. 8 and 1 species) (Table 2). The updated distribution of the ETP species by suborder in the three eastern tropical Provinces is presented here (Fig. 4) in order to complete the information available.

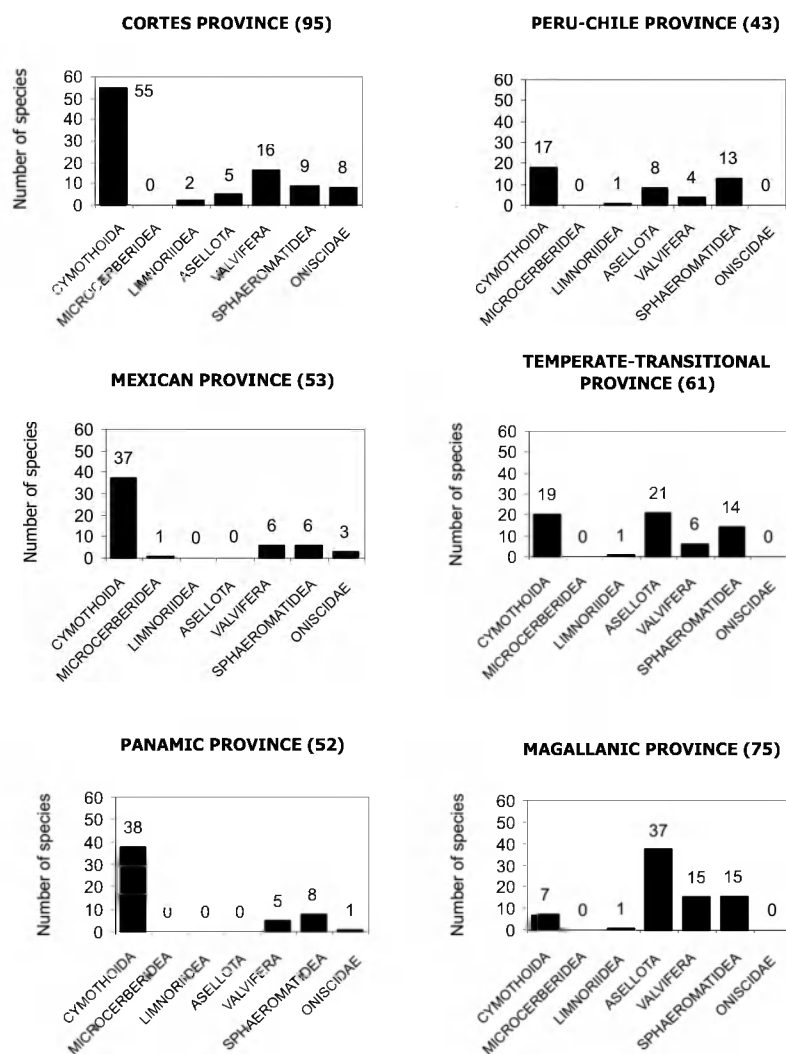


Fig. 4. – Number of species of shallow water isopods recorded in the eastern tropical Pacific and in the southern region of the East Pacific by province and suborder. Total number of species in brackets.

### Oceanic islands

Of the 420 species of isopods recorded for the East Pacific, 40 have been cited for at least one oceanic island in the region. Most belong to the Cymothoidea (25 spp), and the rest belong to the Sphaeromatidea (1 sp), Valvifera (4 spp), Oniscidea (2 spp) or Asellota (1 sp). To our present knowledge, however, number of species known to occur in each oceanic island (or group of islands) is highly variable, from 16 in the Galapagos to only one in the Revillagigedo (Table 4) and ten in the Juan Fernandez Archipelago (Table 5). None of the Juan Fernandez species is reported in any other offshore islands of the East Pacific, thus reinforcing the idea that this group of islands is strongly isolated from the other oceanic islands in the region, a fact partly demonstrated by its endemic component (3 of 9 species, or 33%: *Paranthura skottsbergi* (Nordenstam, 1930), *P. gracilipes* (Nordenstam, 1930) and *P. nana* (Nordenstam, 1930)). Of the 31 species recorded in Table 4, none is found in the seven islands or group of islands; only one species (*Eurydice caudata*

(Richardson, 1899)) is found in four islands and another (*Rocinela signata* (Schioedte & Meinert, 1879)) in three; six are found in two islands and the rest in one. The vast majority of these species (31) are found in one or two subregions of continental America (29) or in another zoogeographic region (*Rocinela hawaiiensis* (Richardson, 1904)) (see Appendices 1, 2 and ESPINOSA-PÉREZ & HENDRICKX, 2001a). The only endemic species recognized to date, *Metacirolana calypso* (Brusca, Wetzer & France, 1995), is only known from the Galapagos.

### Zoogeographic affinities

Cluster analysis using the 10 previously recognized provinces (see Fig. 5), reveals a clear and somewhat similar pattern of similarity when both species and genera were used. The northern, ETP and southern provinces form well separated clusters, although the Arctic Province (I) remains more isolated in both cases, more strongly so when genera are used. The three southern provinces form a well defined second cluster (II) at a point corresponding



TABLE 4

Species of isopods (31) reported for the oceanic islands of the East Pacific (except Juan Fernandez). GPE, Guadalupe; ALI, Alijos Rocks; REV, Revillagigedo; CLI, Clipperton; COCO, Coco; MAL, Malpelo; GAL, Galapagos.

FAMILY		SPECIES	GPE	ALI	REV	CLIP	COCO	MAL	GAL		
CYMOTHOIDA	Aegidae	<i>Aega (Aega) acuminata</i>					*		*		
		<i>Aega (Aega) deshaysiana</i>									
		<i>Rocinela angustata</i>	*								
		<i>Rocinela belliceus</i>		*							
		<i>Rocinela hawaiiensis</i>	*								
		<i>Rocinela signata</i>	*	*					*		
	Corallanidae	<i>Excorallana houstoni</i>								*	
		<i>Excorallana truncata</i>								*	
	Cymothoidae	<i>Anilocra meridionalis</i>								*	
		<i>Cymothoa exigua</i>									
		<i>Elthusa menziesi</i>	*	*							
		<i>Elthusa vulgaris</i>							*		
		<i>Livoneca bowmani</i>							*		
		<i>Mothocya arrosor</i>					*			*	
		<i>Nerocila acuminata</i>								*	
		<i>Nerocila excisa</i>						*		*	
		Cirolanidae	<i>Anopsilana oaxaca</i>					*			
			<i>Aphantolana costaricensis</i>	*							*
			<i>Cirolana diminuta</i>								*
			<i>Cirolana harfordi</i>	*							*
			<i>Cirolana namelessensis</i>							*	*
<i>Cirolana parva</i>							*		*		
<i>Eurydice caudata</i>	*			*			*		*		
<i>Metacirolana calypso</i>								*			
SPHAEROMATIDEA	Sphaeromatidae	<i>Exosphaeroma bruscai</i>					*				
VALVIFERA	Holognathidae	<i>Cleantioides occidentalis</i>							*		
	Idoteidae	<i>Colidotea findleyi</i>	*								
		<i>Colidotea wallersteini</i>									
		<i>Idotea resecata</i>		*							
ONISCIDEA	Ligiidae	<i>Ligia exotica</i>				*					
		<i>Ligia occidentalis</i>				*					
		<b>Total</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>16</b>		

TABLE 5

Species of Isopods reported for Juan Fernandez Archipelago.

FAMILY		SPECIES
CYMOTHOIDA	Anthuridae	<i>Paranthura skottsbergi</i>
		<i>Paranthura gracilipes</i>
		<i>Paranthura nana</i>
	Aegidae	<i>Aega webbi</i>
		<i>Aega bicavata</i> *
		<i>Aega semicarinata</i> *
Corallanidae	<i>Lanocira hirsuta</i>	
Cymothoidae	<i>Ceratothoa gaudichaudii</i> *	
SPHAEROMATIDEA	Sphaeromatidae	<i>Isocladus calcareus</i>
ASELLOTA	Janiridae	<i>Neojaera antarctica</i> *

(\*) Also known from the American continent (Source Rozbaczylo & Castilla, 1987)

to roughly 30% of similarity when species are used and 55% when genera are used. When only species are considered, this cluster is also strongly independent from the others (i.e., I, III, IV), thus reflecting the reduced number of species shared between the southern region and the rest of the East Pacific region. Cluster III corresponds to the northern provinces and shows a very similar pattern, well defined for both species (ca 40% similarity) and genera (ca 54% of similarity). In both species and genera clusters, the tropical provinces provided the better defined cluster (cluster IV) (pairs of provinces form clusters at ca 46 and ca 64% of similarity, respectively). When genera

are used, the cluster analysis shows a better affinity between the ETP and the northern subregion fauna (clusters III and IV), but when species are used there is a weaker link and it also includes the Arctic Province (cluster I). Magellan fauna is also less similar than the Peru-Chile/Temperate-Transitional fauna (both when species and genera are compared); Aleutian fauna shows a similar pattern when compared to Californian/Oregonian fauna. One should be aware, however, that a strict comparison with the Arctic and Magellan isopods fauna should include all records for this group in these two provinces, not only the East Pacific, but this is beyond the scope of this study. We are not aware of any report on total number of Arctic isopods; there are 157 described species for the entire Magellan province (both East Pacific and West Atlantic) (BRANDT, 1991), thus indicating that the Chilean section of this province is probably somewhat under-documented (75 species in our records, including species with a distribution range including the Magellan province but with no sampling record there).

In the ETP the similarity among provinces is higher than in any other cluster, although the Cortés Province is slightly isolated from the two other, probably due to its subtropical character. Also noteworthy is the fact that in all three subregions (excluding the Arctic Province), three pairs of provinces (Temperate-Transitional, Panamanian-Mexican, and Californian-Oregonian) have the highest similarity both when species (ca 53-57%) and genera (ca 66-68%) are used.

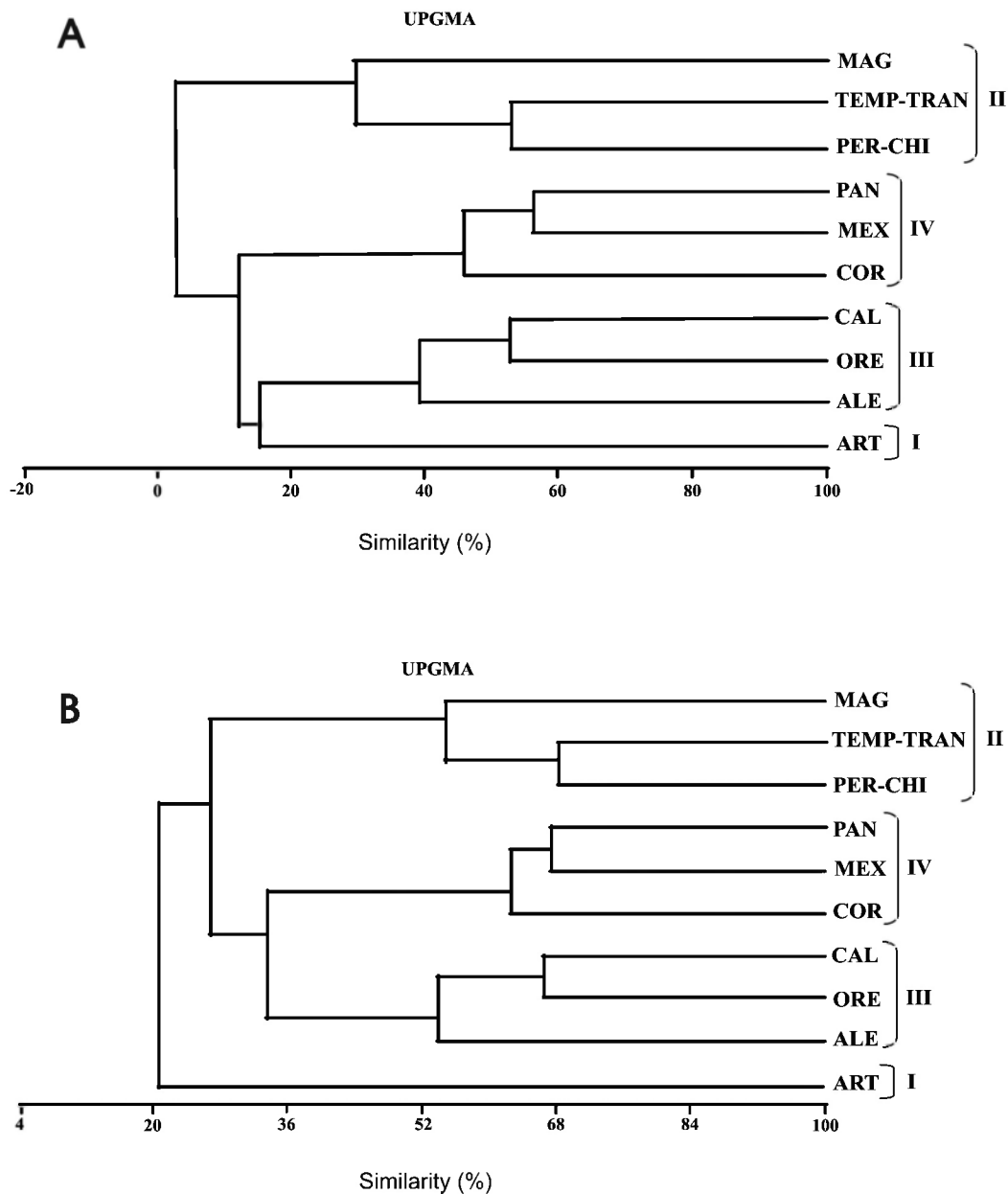


Fig. 5. – Cluster analysis showing the similarity among zoogeographic provinces currently recognized for the East Pacific based on the presence-absence of all known species (A) and genera (B) in each province.

## DISCUSSION

A significant proportion (87 species, or 20.6%) of the 420 species recorded for the East Pacific is found in one or several other marine zoogeographic regions of the world; thus proportion of species endemic to the East Pacific is just below 80%. Of the 213 species of isopods recorded for the northern subregion, 40 (18.7%) are found in at least one other zoogeographic region; the rest (173 species; 81.3%) are endemic to the East Pacific. The majority of these 40 species occur in the Pacific Ocean (West Pacific, 1; Hawaii, 4) or in the Indo-Pacific (15). As many as 15 species are recorded in the Atlantic Ocean (West Atlantic, 6; North Atlantic, 1; throughout the Atlantic, 9). Finally, 5 species have been found in the Mediterranean Sea, 9 in the

Arctic and 3 are considered cosmopolitan. The extended list of species available for the ETP (134 known species) indicates that 109 species (81.3%) are endemic to the East Pacific; the rest, 25 species (18.7%) have one or more records in another zoogeographic region. Of these, 10 are found throughout the Atlantic and 8 in the West Atlantic; the Indo-West-Pacific component is also important (Indo Pacific, 7; West Pacific, 2; throughout the Pacific, 2; Hawaii, 3) and two species have been recorded in the Mediterranean. Of the 133 species of isopods recorded for the southern subregion, 40 (29.6%) are found in at least one other zoogeographic region; the rest (90 species; 70.4%) are endemic to the East Pacific, of which as many as 87 are endemic to the southern subregion. Of these 40 species, the majority is found in the Atlantic (West Atlantic, 23; South

Atlantic, 2; throughout the Atlantic, 2) and in the Antarctic (8), and mostly correspond to species belonging to the Magellan Province. Eight species occur in the Indo-Pacific, and the remaining species (2) are either cosmopolitan or Indo-West Pacific. These observations coincide with conclusions of MENZIES (1962a), who established a clear affinity of the Chilean isopods fauna with the southern circumpolar fauna.

According to BRIGGS (1974), the Juan Fernandez Archipelago should be considered as a subprovince of the Peru–Chile Province, a suggestion that coincides with our present knowledge of level of endemism registered for isopods (33%) and with the fact that non-endemic species belong to the Peru–Chile Province. Although we can speculate on the lack of sampling effort in several other oceanic islands of the East Pacific, the presence of a single endemic (in the Galapagos) is rather surprising. The presence of two species of *Ligia* (both found in the ETP; one found in the Indo-Pacific and Hawaii) on Clipperton is probably due to accidental introduction. Considering all (non Juan Fernandez) oceanic islands of the region, and exception for the endemic *Metacirolana calypso*, only one species (*Anilocra meridionalis*; Galapagos) is not found on continental East Pacific and originates from the Pacific.

To our knowledge and previous to this study, there was only one list of marine isopods available for any major zoogeographic region: the Antarctic region (BRANDT, 1991), where 226 shallow-water (shelf) species are reported of a total of 346 species. The isopods of the other major regions (e.g., the tropical east Atlantic, west Atlantic, east Pacific, and Indo-Pacific; and the Arctic) have been compiled only for some sections (see Table 6). The one presented for the Caribbean area (West Atlantic) by KENSLEY & SCHOTTE (1989) covers the entire Caribbean Sea, the Bahamas, the southern tip of Florida and the southern coastline of the Gulf of Mexico; as such, the area is typically tropical-subtropical. It included 298 species but is over 15 years old and needs some updating. AUSTIN (1985) listed 155 species of isopods for the NE Pacific, roughly from Kodiak Island, Alaska, to Point Conception, California, USA, including the Oregonian Province and the southern part of the Aleutian Province (both cold temperate), while BRUSCA et al. (2006) listed 191 species for California, USA. In both cases there is a clear dominance of Cymothoidea and Asellota. Information presented by AUSTIN (1985) and BRUSCA et al. (2006)

was considered in the present study, verified and eventually included in the corresponding checklist (see Appendix 1) and in Table 6. The European list roughly corresponds to cold and warm temperate provinces in the northeastern Atlantic and included 614 species (COSTELLO et al., 2005). Another list is available for Italian waters and includes 203 species (STOCH, 2003), presumably covered by the European list. In their review of Costa Rican isopods, BRUSCA & IVERSON (1985) included 33 species, all included in the checklist presented by ESPINOSA-PÉREZ & HENDRICKX (2001a). According to THIEL et al. (2003), there are 133 species of marine isopods in Chile (including deep water species); these authors refer to a web site where the list of species can be consulted, but the site in question is not reachable and we cannot compare our data with theirs. All species of our southern subregion list (see Appendix 2; 135 species, excluding species found exclusively below 200 m) occur in Chilean water and we were able to consult all the sources used by THIEL et al. (2003). With 879 species, the Australian list provided by POORE (2005) corresponds to several cold–temperate, warm–temperate and tropical provinces of the western Pacific (see BRIGGS, 1974 for details) and, as such, is the most complete list available to-date for comparison purposes with the East Pacific, although it includes several records for deep-water species and our list does not. The Australian list is the only one using the classification proposed by BRANDT & POORE (2003) for higher categories.

Because all checklists compiled for the geographic areas considered above, except the one for Australia, were build using a classification similar to the one proposed by MARTIN & DAVIS (2001), comparison of number of species by suborders is presented using both the classification proposed by MARTIN & DAVIS (2001) and by BRANDT & POORE (2003) (Table 6). Numbers of species on record for the Microcerberioidea, Asellota, Valvifera and Oniscidea remain constant between the two classifications. In the new classification, however, Cymothoidea is granted the category of suborder, and includes the superfamilies Cirolanoidea (Dana, 1852), Cymothooidea (Leach, 1814), Bopyroidea (Rafinesque, 1815), Cryptoniscoidea (Kosmann, 1880), and Anthuroidea (Leach, 1914), thus making it the dominant suborder for all areas considered in our comparative analysis instead of Flabellifera (see Table 6).

TABLE 6

Number of species of marine and brackish water isopods recorded for some selected geographic areas. Numbers are presented using both classifications proposed by Martin & Davis (2001) and Brandt & Poore (2003). Other sources as indicated.

Martin & Davis, 2001

REGION	TOTAL	ANT	MIC	FLA	ASE	VAL	EPI	ONI	SOURCE
Costa Rica	33	1	-	29+1	-	2	-	-	Brusca & Iverson, 1985
NE Pacific	155	6	1	46+3	30	28	19	22	Austin, 1985
Caribbean	298	54	2	126+10	31	11	53	11	Kensley & Schotte, 1989
California	191	10	1	60+8	38	34	16	24	Brusca et al., 2001
Australia	879	149	-	461+45	74	74	39	37	Wilson et al., 2004
Europa	672	49	5	169+26	308	58	56	1	Costello et al., 2005
East Pacific	420	17	2	157+10	92	73	43	26	This study

Brandt &amp; Poore, 2003

REGION	TOTAL	CYM	MIC	LIM	ASE	VAL	SPH	ONI	SOURCE
Costa Rica	33	21	-	1	-	2	9	-	Brusca & Iverson, 1985
NE Pacific	155	46	1	4	30	28	24	22	Austin, 1985
Caribbean	298	200	2	11	31	11	32	11	Kensley & Schotte, 1989
California	191	64	1	4	38	34	26	24	Brusca et al., 2001
Australia	879	458	-	28	74	74	208	37	Wilson et al., 2004
Europa	672	261	5	4	308	58	35	1	Costello et al., 2005
East Pacific	420	153	2	6	92	73	68	26	This study

Cymothoida is the dominant suborder of isopods in the East Pacific (36.4% of the 420 spp). This is not surprising as Cymothoida is one of the most diverse group of marine isopods worldwide (WETZER & BRUSCA, 1997), is commonly found in great numbers and generally features large size compare to other groups of minute isopods (SCHULTZ, 1969; BRUSCA & IVERSON, 1985). Cymothoida is by far the dominating group in Australian waters (458 spp, ca. 52.1%) and in the Caribbean with 200 species (67% of total) but not in cooler, European waters where it represents only 38.9.0%. The latter figure is closer to the proportion of Cymothoida occurring in the cold-temperate Oregonian Province (27.90%), warm-temperate Californian Province (39.1%), and Temperate-Transitional Province (32.2%). In the East Pacific, proportion of continental Cymothoida increases from the north (approx. 39, 58, 70 and 73% for the Californian, Cortés, Mexican and Panamic Provinces, respectively), and from the south (approx. 33 and 41% for the Temperate-Transitional and the Peru-Chile Provinces, respectively) towards the tropics. Asellota have been extremely successful in a wide variety of habitats (WILSON, 1980) but their fragility and small size required specific collecting strategies (WETZER & BRUSCA, 1997). With 1800 known species worldwide, Asellota is the second most abundant suborder of isopods for the East Pacific (22.8% of all species) and shows a different distributional trend, with proportion of 0 to ca. 5% in the three ETP provinces and a tendency to increase towards the highest latitude, particularly in the southern hemisphere (approx. 16, 34 and 49% for the Peru-Chile, the Temperate-Transitional and the Magellan Provinces, respectively). Asellota are also the dominant component of European isopods fauna (45.8%) but represent a small fraction of the Caribbean fauna (31 species, or 10.4%) and Australian faunae (74 spp, or 8.4%). With 17.5% of the total of species, the Valvifera (ca 570 species known worldwide) (KENSLEY & SCHOTTE, 2006) is the third suborder best represented in the East Pacific, particularly in cold provinces. Preference of this suborder for cooler water was previously emphasized by BRUSCA & WALLERSTEIN (1979b); in the East Pacific, the group is clearly more abundant in the northern (47 species) than in the southern (22) subregion, while it is represented by 18 species in the ETP. Comparatively, Valvifera account for 8.6% (58 species) of European isopods fauna, 8.4% (74 species) of Australian fauna, and a surprisingly low 3.9% (11 species) in the fully tropical Caribbean area (Table 6). The ETP (mostly tropical) hosts 18 species of Valvifera, or 13.4% of the total number of isopods species known to date for this subregion.

The Bopyroidea and Cryptoniscoidea, a group of obligate parasites, is represented in the East Pacific by 43 species (10.2%) and is better represented in the ETP; com-

paratively, these two superfamilies represent 17.8% of the isopod fauna in the Caribbean, 8.3% in Europe and only 4.4% in Australia. The Oniscidea, a suborder containing ca 5000 species of mostly terrestrial isopods (BRUSCA & BRUSCA, 2002), is represented in the East Pacific by 26 species (6.2%), with no species recorded for the southern subregion and almost all of them (23 out of 26) occurring in the northern subregion, despite the fact that environmental conditions (i.e., water temperature, substrate, currents) are very similar in both areas. There is only one species on record for Europe, 11 in the Caribbean (3.7%), and 37 in Australia (4.2%). With only 17 recorded species, Anthuroidea account for only 4.7% of the East Pacific isopods fauna. Comparatively, Anthuroidea represent 18.1% of the Caribbean fauna, 17.0% of the Australian fauna, and 7.3% of the European fauna, thus reflecting their stronger affinity for tropical and subtropical water. Nevertheless, there is a strong contrast between the two cold-temperate areas studied herein; there is only one record for Anthuroidea in the southern subregion of the East Pacific but seven in the northern subregion. Finally, the small suborder of Microcerberidea (45 known species) (KENSLEY & SCHOTTE, 2006) is represented by two species in the East Pacific, vs. none in Australia, two in the Caribbean and five in Europe.

Strong differences are noted when number of genera and species known for the three East Pacific subregions are compared. The highest genera and species diversity occurs in the northern subregion (213 spp vs. 134 in the ETP and 130 in the south; 103 genera vs. 76 in ETP and 65 in the south). This N to S gradient has also been observed for decapod crustaceans (WICKSTEN, 1989), amphipods (BOUSFIELD & HENDRYCKS, 1995), some groups of brown algae (ESTES & STEINBERG, 1988) and some families of fishes (HERALD, 1961). The similarity of the northern and southern temperate faunae with the adjacent ETP also varies; as many as 50 genera are shared between the ETP and the northern subregion, but only 21 between the southern subregion and the ETP.

In all the oceanic islands of the East Pacific, including the Galapagos, efforts have mostly been orientated towards the study of terrestrial flora and fauna, and of large, more accessible marine species. Only a few species of isopods have so far been reported from these islands and this evidently reflects a lack of sampling effort, even though availability of habitats might somewhat be restricted in some of these islands. Excluding the peculiar case of Juan Fernandez, only one endemic isopod has been recognized for these islands (*Metacirolana calypso*, off the Galapagos). In the decapod crustacean, the next best known major group of Crustacea in the East Pacific, the insular component includes over 40 species endemic to one or several East Pacific islands (excluding Juan

Fernandez), a contrasting figure considering that the number of decapod crustaceans species reported for the East Pacific, ca. 1500, is only 3.6 times as much as the number of isopods species (418) (see GARTH, 1946, 1992; HENDRICKX & ESTRADA-NAVARRETE, 1989; HENDRICKX, 1995; HENDRICKX & HARVEY, 1999; BOSCHI, 2000a, 2000b; HERNANDEZ-AGUILERA, 2002; WICKSTEN & HENDRICKX, 2003). Adequate sampling effort is also crucial, as demonstrated by the fact that four species have been reported for the Alijos Rocks, a small offshore group of rocks visited only twice by scientists (see ANON, 1996; RAMÍREZ & OSORIO, 2000), while only one species is known from the Revillagigedo, a group of islands more extensively studied (see GARTH 1992; KETCHUM & REYES-BONILLA, 2001; HERNANDEZ-AGUILERA, 2002).

Cluster analysis revealed four major groups (I to IV) among the 10 previously recognized provinces (see Fig. 5), and a similar pattern was observed when both species and genera were used. The grouping of provinces into southern, ETP and northern subregions appears well defined and with comparable values of the similarity index, with the exception of the Arctic Province. In its review of decapod crustaceans of the East Pacific, BOSCHI (2000b) observed a very similar pattern, but with a much earlier linkage among ETP provinces than among southern or northern provinces (note: the Arctic Province was not included in this analysis). The low affinity of the Arctic species group with the other northern provinces (i.e., Aleutian, Oregonian and Californian) is certainly linked to the peculiarity of the Arctic Sea fauna which extends along the extreme NW coast of the American continent.

Although our general knowledge of isopods of the East Pacific is fairly good, large geographic areas (e.g., most of Central America, continental Ecuador, Colombia, SW Mexico) are clearly under-documented compared to others (e.g., the west coast of the United States, the Gulf of California). We feel, however, that any attempt to produce an area-taxon analysis would be premature. Lists of known species and distribution of previously recorded species are likely to increase with adequate sampling effort (i.e., sampling each habitat with adequate sampling gear) and training of experts in these geographic areas. Our data base includes a total of 1838 records, 946 for the northern subregion (83, 178, 340, and 365 records respectively in the four provinces, from north to south), 642 for the ETP (428, 101, and 113), and 250 for the southern subregion (63, 155, and 32), thus indicating a larger sampling effort in the western USA-Canada section of the northern subregion, and in the 'Gulf of California' (Cortes province). Recent problems linked to exchange of specimens at international level have had dramatic consequences with respect to the potential assistance of foreign experts. Regional workshops similar to those recently organized in Chile (Universidad Católica del Norte, Coquimbo) on Peracarida taxonomy could partly solve this kind of situation and strongly impact the quality of performances achieved by local scientists and students. One way or another, it is hoped that our basic knowledge of this interesting group of organisms will increase dramatically in the forthcoming years.

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## REFERENCES

- ALDANA, M., J. OYARZUN & M. GEORGE-NASCIMENTO (1995). Parasitic isopods as population indicators in the horse mackerel (Nichols, 1920) *Trachurus symmetricus murphyi* (Pisces: Carangidae) of the Chilean coast. *Biol. Pesq.*, 24: 23-32.
- ANON (1996). Isopods of Rocas Alijos. In: SCHMIEDER, RW (ed), *Rocas Alijos. Scientific results from Cordell Expeditions* (Vol. 75). Monographiae Biologicae, Kluwer Academic Publishers, Dordrecht (The Netherlands): 275.
- ARRONTES J. & R. ANADÓN (1990). Seasonal variation and population dynamics of isopods inhabiting intertidal macroalgae. *Sci. Mar.*, 54(3): 231-240.
- ASTETE-ESPINOZA, L.P. & C.W.M. CACERES (2000). Effects of parasitism in nutritional physiology of the ghost shrimp *Neotrypaea uncinata* parasitized by the isopod (*Ionella agassizi*). *Rev. Chil. Hist. Nat.*, 73(2): 243-252.
- AUDOUIN, J.V. & H. MILNE-EDWARDS (1841). Description des Crustacés nouveaux ou peu connus et remarquables par leur organisation, conservés dans la collection du Muséum d'Histoire Naturelle. *Arch. Mus. Hist. Nat., Paris* 2: 77-98.
- AUSTIN, W.C. (1985). Isopoda. In: KHOYATAN MARINE LABORATORY (ed), *An annotated checklist of marine invertebrates in the cold temperate northeast Pacific.*, British Columbia: 575-587.
- BENEDICT, E.J. (1897). A revision of the genus *Synadotea*. *Proc. Acad. Nat. Sci. Phila.*, 49: 389-404.
- BENEDICT, E.J. (1898). Two new isopods of the genus *Idotea* from the coast of California. *Proc. Biol. Soc. Wash.*, 12: 53-55.
- BENEDICT, J.E. (1905). A new generic name and specific descriptions. In: RICHARDSON H. (ed), *Monograph on the Isopoda of North America*. (Vol. 54). Bulletin United States National Museum: 400.
- BOONE, P.L. (1923). New Marine Tanaid and Isopod Crustacea from California. *Proc. Biol. Soc. Wash.*, 36: 147-156.
- BOSCHI, E.E. (2000a). Biodiversity of marine decapod brachyurans of the Americas. *J. Crust. Biol.*, 20(2): 337-342.
- BOSCHI, E.E. (2000b). Species of decapod crustaceans and their distribution in the American marine zoogeographic provinces. *Rev. Invest. Des. Pesq.*, 13: 7-136.
- BOSCHMAN, H. (1962). Rhizocephala. *Disc. Rep.* 33: 55-92.
- BOUSFIELD, E.L. & E.A. HENDRYCKS (1995). A revision of family Pleustidae (Amphipoda: Gammaridea) part 1. Systematics and biogeography of component subfamilies. *Amphipacifica*, 1(1): 17-57.
- BOWMAN, T.E. (1977). Isopod crustaceans (except Anthuridae) collected on the Presidential Cruise of 1938. *Proc. Biol. Soc. Wash.*, 89(57): 653-666.
- BOYKO, C.B. & J.D. WILLIAMS (2003). A revision of *Anathelges* and *Stegophrixus* (Isopoda: Bopyridae: Athelginae) with descriptions of two new genera and one new species. *J. Crust. Biol.*, 23(4): 795-813.

- BRANDT, A.K. (1991). Zur Besiedlungsgeschichte des antarktischen Schelfes am Beispiel der Isopoda (Crustacea, Malacostraca). *Ber. Polarforsch.*, 98 : 1-240.
- BRANDT, A., K. LINCE & U. MÜHLENHARDT-SIEGEL (1999). Biogeography of Crustacea and Mollusca of the Subantarctic and Antarctic regions. *Sci. Mar.*, 63(1) : 383-389.
- BRANDT, A. & G.C.B. POORE (2003). Higher classification of the flabelliferan and related Isopoda based on reappraisal of relationships. *Inv. Syst.* 17 (6) : 893-923.
- BRIGGS, J.C. (1974). *Marine Zoogeography*. McGraw-Hill. U.S.A. 475 pp.
- BRUCE, N.L. (1986). Revision of the isopod crustacean genus *Mothocya* Costa, in Hope, 1851 (Cymothoidae : Flabellifera), parasitic on marine fishes. *J. Nat., Hist.*, 20 : 1089-1192.
- BRUCE, N.L. (2002). *Tridentella rosemariae* sp. nov. (Isopoda, Tridentellidae) from northern New Zealand waters. *Crustaceana*, 75(2) : 159-170.
- BRUCE, N.L. (2004). Reassessment of the isopod crustacean *Aegadshaysiana* (Milne-Edwards, 1840) (Cymothoida : Argidae) : a world-wide complex of 21 species. *Zool. J. Linn. Soc.*, 142 : 135-232.
- BRUSCA, R.C. (1977). Range extensions and new host records of cymothoid isopods (Isopoda : Cymothoidae) in the Eastern Pacific Ocean. *Bull. South. Cal. Acad. Sci.*, 76(2) : 127-131.
- BRUSCA, R.C. (1980). *Common intertidal invertebrates of the Gulf of California*. The University of Arizona Press. U.S.A. 513 pp.
- BRUSCA, R.C. (1981). A monograph on the Isopoda Cymothoidae (Crustacea) of the Eastern Pacific. *Zool. J. Linn. Soc.*, 73(2) : 117-199.
- BRUSCA, R.C. (1983). Two new idoteid from Baja California and the Gulf of California (Mexico) and an analysis of the evolutionary history of the genus *Colidotea* (Crustacea : Isopoda : Idoteidae). *Trans. San Diego Soc. Nat. Hist.*, 20(4) : 69-79.
- BRUSCA, R.C. & G.J. BRUSCA (2002). *Invertebrates*. In : SINAUER ASSOCIATE (ed), Inc. U.S.A. 936 pp.
- BRUSCA, R.C., V.R. COELHO & S. TAITI (2006). A guide to the coastal isopods of California [on line]. Available by Internet : <URL : <http://phylogeny.arizona.edu/eukariotes/animals/arthropoda/crustacea/isopoda/accessory/caguide/caguide.html>> (2001)
- BRUSCA, R.C. & F.C. FRANCE (1992). The genus *Rocinela* (Crustacea : Isopoda : Aegidae) in the tropical eastern Pacific. *Zool. J. Linn. Soc.*, 106 : 231-275.
- BRUSCA, R.C. & E.W. IVERSON (1985). A guide to the marine isopod Crustacea of Pacific Costa Rica. *Rev. Biol. Trop.*, 33(1) : 1-77.
- BRUSCA, R.C. & M. NINOS (1978). The status of *Cirolana californiensis* Schultz, and *C. diminuta* Menzies and George, with a key to the California species of *Cirolana* (Isopoda : Cirolanidae). *Proc. Biol. Soc. Wash.* 91(2) : 379-385.
- BRUSCA, R.C. & B.R. WALLERSTEIN (1977). The marine isopod Crustacea of the Gulf of California 1. Family Idoteidae. *Am. Mus. Nov.* 2634 : 1-17.
- BRUSCA, R.C. & B.R. WALLERSTEIN (1979a). The marine isopod crustaceans of the Gulf of California 2. Idoteidae : new genus and species, range extensions, and comments on evolution and taxonomy within the family. *Proc. Biol. Soc. Wash.*, 92(2) : 253-271.
- BRUSCA, R.C. & B.R. WALLERSTEIN (1979b). Zoogeographic patterns of idoteid isopods in the Northeast Pacific, with a review of shallow water zoogeography of the area. *Bull. Biol. Soc. Wash.*, 3 : 67-105.
- BRUSCA, R.C., R. WETZER & S.C. FRANCE (1995). Cirolanidae (Crustacea : Isopoda : Flabellifera) of the Tropical Eastern Pacific. *Proc. San Diego Soc. Nat. Hist.*, 30 : 1-96.
- CALDERON, A.L.E. & J.F. CAMPOY (1993). Biodiversidad marina y costera de México. In : SALAZAR-VALLEJO S.I. & N.E. GONZALEZ (eds.), *Bahia de Las Guasimas, Estero Los Algodones y Bahía de Lobos, Sonora*. CONABIO/CIQRO. México. Pp 411-419.
- CALMAN, W.T. (1898). On a collection of Crustacea from Puget Sound. *An. New York Acad. Sci.*, 11 : 259-267.
- CAMPOS, E. & A.R. DE CAMPOS (1989). Epicarideos de Baja California : distribución y notas ecológicas de *Probopyrus pandalicola* (Packard, 1879) en el Pacífico oriental. *Rev. Biol. Trop.*, 37(1) : 29-36.
- CAMPOS, E. & A.R. DE CAMPOS (1990). Taxonomic remarks on *Schizobopyrina* Markham, 1985, with the description of *S. bruscai* (Crustacea : Isopoda : Bopyridae). *Proc. Wash. Acad. Sci.*, 103(3) : 633-642.
- CAMPOS-GONZÁLEZ, E., G. RUÍZ-CAMPOS & L.J. MACIAS-CHÁVEZ (1986). Nuevos huéspedes para *Lironeca menziesi* Brusca, 1981 (Crustacea, Isopoda, Cymothoidae) con algunos comentarios sobre preferencia por los mismos. *Cienc. Mar.*, 12(2) : 99-104.
- CARLTON, J.T. & E.W. IVERSON (1981). Biogeography and natural history of *Sphaeroma walkeri* Stebbing (Crustacea : Isopoda) and its introduction to San Diego Bay, California. *J. Nat. Hist.*, 15 : 31-48.
- CARVACHO, A. (1975). Sur le genre *Paradynamenopsis* Menzies et l'espèce *Paradynamenopsis lundae* Menzies (Isopoda : Sphaeromatidae) : redescription et remarques. *Crustaceana*, 29(3) : 225-230.
- CARVACHO, A. (1977). Isopodes intertidaux des côtes du centre et du nord du Chili. I Families des Cirolanidae, Excorallanidae et Corallanidae. *Crustaceana*, 32 : 27-44.
- CARVACHO, A. (1981). Le genre *Janira* Leach avec description d'une nouvelle espèce (Isopoda, Asellota). *Crustaceana*, 41 : 131-142.
- CARVACHO, A. (1982). Isopodos litorales de la costa de Concepcion Chile central. *Stud. Neotrop. Fauna & Environm.*, 17 : 195-207.
- CARVACHO, A. (1983). Asellota del golfo de California, con descripción de dos nuevos géneros y dos nuevas especies (Crustacea, Isopoda). *Cah. Biol. Mar.*, 24 : 281-295.
- COSTELLO M.J., C.S. EMBLOW & J. DOWSE (2005). European Register of Marine Species [on line] (June 2005). Available by Internet : URL : <http://www.marbef.org/data/ermstaxdetails.php?id=1131>
- CRISP, D.J. (1968). Distribution of the parasitic isopod *Hemioniscus balani* with special reference to the east coast of north America. *J. Fish. Res. Board. Can.*, 25(6) : 1161-1167.
- DELANEY, M.P. (1984). Isopods of the genus *Excorallana* Stebbing, 1904 from the Gulf of California, Mexico (Crustacea, Isopoda, Corallanidae). *Bull. Mar. Sci.*, 34(1) : 1-20.
- DELANEY, M.P. (1989). Phylogeny and biogeography of the marine isopod family Corallanidae (Crustacea, Isopoda, Flabellifera). *Contrib. Sci., Nat. Hist. Mus. Los Angeles Co.*, 409 : 1-75.
- DELANEY, M.P. (1993). X-ray microanalysis of the cuticle surface of two southern California marine isopod species. *Bull. South. Cal. Acad. Sci.*, 92(2) : 64-69.
- DEXTER, D.M. (1972). Comparison of the community structures in a Pacific and Atlantic Panamanian sandy beach. *Bull. Mar. Sci.*, 22 : 449-485.
- DEXTER, D.M. (1974). Sandy-beach fauna of the Pacific and Atlantic coast of Costa Rica and Colombia. *Rev. Biol. Trop.*, 22 : 51-66.
- DEXTER, D.M. (1976). The sand-beach fauna of Mexico. *Southwest. Nat.*, 20 : 479-485.
- ELLISON, A.M. & FARNSWORTH, E.J. (1990). The ecology of Belizean mangrove-root fouling communities. I. Epibenthic fauna are barriers to isopod attack of mangrove roots. *J. Exp. Mar. Biol. Ecol.*, 142 : 91-104.
- ESPINOSA-PÉREZ, M.C. & M.E. HENDRICKX (1997). New geographic records of two species of Cirolanidae (Crustacea :

- Isopoda) from the eastern tropical Pacific. *An. Inst. Biol., UNAM*, 68(1): 175-185.
- ESPINOSA-PÉREZ, M.C. & M.E. HENDRICKX (2001a). Checklist of isopods (Crustacea : Peracarida : Isopoda) from the Eastern Tropical Pacific. *Belg. J. Zool.*, 131(1): 43-55.
- ESPINOSA-PÉREZ, M.C. & M.E. HENDRICKX (2001b). A new species of *Exosphaeroma* Stebbing (Crustacea : Isopoda : Sphaeromatidae) from the Pacific coast of Mexico. *Proc. Biol. Soc. Wash.*, 114(3): 640-648.
- ESPINOSA-PÉREZ, M.C. & M.E. HENDRICKX (2002). Distribution and ecology of isopods (Crustacea : Peracarida : Isopoda) of the Pacific coast of Mexico. In: ESCOBAR-BRIONES E. & F. ALVAREZ (eds.), *Modern Approaches to the Study of Crustacea*. Kluwer Acad. Publs. : 95-103.
- ESTES, J.A. & P.D. STEINBERG (1988). Predation, herbivore and kelp evolution. *Paleobiol.*, 14(1): 19-36.
- GARTH, J.S. (1946). Distribution studies of Galapagos Brachyura. *Allan Hancock Pac. Exped.*, 5(11): 603-638.
- GARTH, J.S. (1992). The brachyuran crabs of the Revillagigedo Islands, Colima, Mexico, with remarks on insular endemism in the eastern tropical Pacific. *Proc. Biol. Soc. Wash.*, 24: 1-6.
- GARTHWAITE, R. & C. SASSAMAN (1985). *Porcellionides floria*, new species, from North America : provinciality in the cosmopolitan isopod *Porcellionides pruinosus* (Brandt). *J. Crust. Biol.*, 5(3): 539-555.
- GARTHWAITE, R. & S. TAITI (1989). *Platyarthrus aiasensis* Legrand (Isopoda : Oniscidea : Platyarthridae) in the Americas. *Bull. South. Cal. Acad. Sci.*, 88: 42-43.
- GEORGE, R.Y. & J.O. STROMBERG (1968). Some new species and new records of marine isopods from San Juan Archipelago, Washington, U.S.A. *Crustaceana*, 14(3): 225-254.
- GLYNN, P.W. & C.S. GLYNN (1974). On the systematics of *Ancinus* (Isopoda, Sphaeromatidae), with the description of a new species from the Tropical Eastern Pacific. *Pac. Sci.*, 28(4): 401-422.
- GUZMAN, H.M., V.L. OBANDO, R.C. BRUSCA, & P.M. DELANEY (1988). Aspects of the population biology of the marine isopod *Excorallana tricornis occidentalis* Richardson, 1905 (Crustacea : Isopoda : Corallanidae) at Cano Island, Pacific Costa Rica. *Bull. Mar. Sci.*, 43 (1) : 77-87.
- HATCH, M.H. (1947). The Chelifera and Isopoda of Washington and adjacent regions. *Univ. Wash. Publ. Biol.*, 10 : 155-274.
- HENDRICKX, M.E. (1992). Distribution and zoogeographic affinities of decapod crustaceans of the Gulf of California, Mexico. *Proc. San Diego Soc. Nat. Hist.*, 20 : 1-11.
- HENDRICKX, M.E. (1995). Checklist of brachyuran crabs (Crustacea : Decapoda) from the Eastern Tropical Pacific. *Bull. Inst. Roy. Sci. Nat. Bruxelles*, 65 : 125-150.
- HENDRICKX, M.E. & F.D. ESTRADA-NAVARRETE (1989). A checklist of the species of pelagic shrimps (Penaeoidea and Caridea) from the eastern Pacific with notes on their geographic and depth distribution. *CalCofi Rep.*, 30 : 104-121.
- HENDRICKX, M.E. & A.W. HARVEY (1999). Checklist of Anomura crabs (Crustacea : Decapoda) from Eastern Tropical Pacific. *Belg. J. Zool.*, 129(2): 327-352.
- HENDRICKX, M.E. & A.M. VAN DER HEIDEN (1983). New records of twelve species of crustaceans along the Pacific coast of México. *An. Inst. Cien. Mar Linn., UNAM*, 10(1): 277-280.
- HERALD, E.S. (1961). *Living fishes of the world*. Doubleday, New York.
- HERNANDEZ-AGUILERA, J.L. (2002). Crustáceos del archipiélago de Revillagigedo (Stomatopoda y Decapoda, de Thalassinidea a Brachyura), Pacífico Tropical Oriental. *Contrib. Stud. East Pac. Crust.* 1 : 301-318.
- IVERSON, E.W. (1972). A new subtidal *Synidotea* from central California (Crustacea : Isopoda). *Proc. Biol. Soc. Wash.* 85 (47) : 541-547.
- IVERSON, E.W. (1974). Range extensions for some California marine isopod crustaceans. *Bull. South. Cal. Acad. Sci.*, 73(3) : 164-169.
- IVERSON, E.W. (1978). Status of *Exosphaeroma inornata* Dow and *E. media* George and Stromberg (Isopoda : Sphaeromatidae) with ecological notes. *J. Fish. Res. Board Can.*, 35 : 1381-1384.
- IVERSON, E.W. & G.D. WILSON (1981). *Paramunna quadranti-frons*, new species, the first record of the genus in the north Pacific Ocean (Crustacea : Isopoda : Pleurogoniidae). *Proc. Biol. Soc. Wash.*, 93(4) : 982-988.
- JACKSON, H.G. (1923). A revision of the isopod genus *Ligidium* (Brandt). *Proc. Zool. Soc. London*, 1923 : 823-839.
- JARAMILLO, E. (1982). Taxonomy, natural history and zoogeography of sand beach isopods from the coasts of Southern Chile. *Stud. Neotrop. Fauna & Environ.*, 17(4) : 175-194.
- JARAMILLO, E., J. NAVARRO & J. WINTER (1981). The association between *Mytilus chilensis* Hupe (Bivalvia, Mytilidae) and *Edotea magallanica* Cunningham (Isopoda, Valvifera) in southern Chile. *Biol. Bull.*, 160 : 107-113.
- JAY, C.V. (1989). Prevalence, size and fecundity of the parasitic isopod *Argeia pugettensis* on its host shrimp *Crangon franciscorum*. *Am. Midl. Nat.*, 121(1): 68-77.
- KANG, Y.J. & S.G. YUN (1988). Ecological study on isopod crustaceans in surfgrass beds around Tongbacksum, Haeundae, Pusan. *Oc. Res.*, 10 (1) : 23-31.
- KENSLEY, B. & H.W. KAUFMAN (1978). *Cleantioides*, a new genus from Baja California and Panama. *Proc. Biol. Soc. Wash.*, 91(3) : 658-665.
- KENSLEY, B. & M. SCHOTTE (1989). *Guide to the marine isopod crustaceans of the Caribbean*. Smithsonian Institution Press. Washington. 308 pp.
- KENSLEY, B. & M. SCHOTTE (2006). World List of Marine, Freshwater and Terrestrial Isopod Crustaceans. [on line]. Available by Internet : <URL : <http://www.nmnh.si.edu/iz/isopod/index.html>>.
- KETCHUM, J.T. & H. REYES-BONILLA (2001). Taxonomía y distribución de los corales hermatípicos (Scleractinia) del Archipiélago de Revillagigedo, México. *Rev. Biol. Trop.*, 49(3-4) : 803-848.
- KURIS, A.M. & J.T. CARLTON (1977). Description of new species, *Crangon handi*, and new genus, *Lissocrangon*, of crangonid shrimps (Crustacea : Caridea) from the California coast, with notes on adaptation in body shape and coloration. *Biol. Bull.*, 153(3) : 540-559.
- LANCELLOTTI, D.A. & J.A. VAZQUEZ (1999). Biogeographical patterns of benthic macroinvertebrates in the southeastern Pacific littoral. *J. Biogeog.*, 26 : 1001-1006.
- LANCELLOTTI, D.A. & J.A. VAZQUEZ (2002). Zoogeografía de macroinvertebrados bentónicos de la costa de Chile : contribución para la conservación marina. *Rev. Chil. Hist. Nat.* 13(1) : 99-129.
- LORENTI, M. & S. MARIANI (1997). Isopod assemblages in the Strait of Magellan : structural and functional aspects. *Polar Biol.*, 18(4) : 254-259.
- MARKHAM, J.C. (1974). Parasitic bopyrid isopods of the amphio-American genus *Stegophryxus* Thompson with the description of a new species from California. *Bull. South. Cal. Acad. Sci.*, 73 : 33-41.
- MARKHAM, J.C. (1975). A review of the bopyrid isopod genus *Munidion* Hansen, 1897, parasitic on galatheid crabs in the Atlantic and Pacific oceans. *Bull. Mar. Sci.*, 25(3) : 422-441.
- MARKHAM, J.C. (1977). The status and systematic position of the species of the bopyrid isopod genus *Phyllodurus* Stimpson, 1857. *Proc. Biol. Soc. Wash.*, 90(4) : 813-818.
- MARKHAM, J.C. (1985). A review of the bopyrid isopods infesting caridean shrimps in the northwestern Atlantic Ocean, with special reference to those collected during the Hour-

- glass cruises in the Gulf of Mexico. *Mem. Hourglass Cruises*, 7(3): 1-156.
- MARKHAM, J.C. (1992). The Isopoda Bopyridae of the eastern Pacific missing or just hiding? *Proc. San Diego Soc. Nat. Hist.*, 17: 1-5.
- MARTIN, J.M. & G.E. DAVIS (2001). An updated classification of the recent Crustacea. *Nat. Hist. Mus. Los Angeles Co. Sci. Ser.*, 39: 1-124.
- MENZIES, R.J. (1950). A remarkable new species of marine isopod *Erichsonella cremulata* n sp, from Newport Bay, California. *Bull. South. Cal. Acad. Sci.*, 49(1): 29-35.
- MENZIES, R.J. (1951). New marine isopods, chiefly from northern California, with notes on related forms. *Proc. U.S. Nat. Mus.*, 101(3273): 105-156.
- MENZIES, R.J. (1952). Some marine Asellota isopods from Northern California, with descriptions of nine new species. *Proc. U.S. Nat. Mus.*, 102: 117-159.
- MENZIES, R.J. (1954). A review of the systematics and ecology of the genus '*Exosphaeroma*', with the description of a new genus, a new species, and a new subspecies (Crustacea, Isopoda, Sphaeromidae). *Am. Mus. Nov.*, 1683: 1-24.
- MENZIES, R.J. (1957). The marine borer family *Limnoriidae* (Crustacea, Isopoda) Part I: Northern and Central America: Systematics, distribution, and ecology. *Bull. Mar. Sci.*, 7(2): 101-200.
- MENZIES, R.J. (1962a). The zoogeography, ecology and systematics of the Chilean marine isopods. *Rep. Lunds Univ. Ars.*, 57(2): 1-162.
- MENZIES, R.J. (1962b). The marine isopod fauna of Bahia de San Quintin, Baja California, Mexico. *Pac. Nat.*, 3(11): 338-348.
- MENZIES, R.J., & J.L. BARNARD (1959). Marine Isopoda on coastal shelf bottoms of Southern California: systematics and ecology. *Pac. Nat.*, 1(11-12): 3-35.
- MENZIES, R.J. & R.Y. GEORGE (1972). Isopod Crustacea of the Peru-Chile Trench. *Anton Bruun Rep.*, 9: 1-124.
- MENZIES, R.J. & M.A. MILLER (1972). Systematics and Zoogeography of the genus *Synidotea* (Crustacea: Isopoda) with an account of Californian species. *Smithson. Contrib. Zool.*, 102: 1-33.
- MIRANDA-VARGAS, P. & D. ROCCATAGLIATA (2004). A redescription and new host record for the parasitic isopod *Pseudione tuberculata* (Epicaridea: Bopyridae) from the Beagle Channel, Argentina. *Cah. Biol. Mar.*, 45(2): 157-166.
- MOLINA, R.E. & F.A. MANRIQUE (1996). Range extension for *Ceratothoa gaudichaudii* (Isopoda: Cymothoidae) in the eastern tropical Pacific. *Bull. Mar. Sci.*, 58(2): 602-603.
- MULAIK, B.S. (1960). Contribución al conocimiento de los isópodos terrestres de México (Isopoda, Oniscoidea). *Rev. Soc. Mex. Hist. Nat.*, XXI(1): 79-292.
- MUÑOZ, G.I. (1997). First record of bopyrid isopods (Isopoda: Epicaridea) in the ghost-shrimp *Notiast branchyoptalma* (M. Edwards, 1870) and some aspects on the host-parasite relationship. *Gayana Ocean.*, 5(1): 33-39.
- NIERSTRASZ, H.F. & G.A. BRENDER A BRANDIS (1931). Papers from Dr. Th. Mortensen's Pacific Expedition 1914-16. 57. Epicaridea 2. *Videns. Medd. Dan. Nat. For. Kjobenhavn*, 91: 147-225.
- NORDENSTAM, A. (1930). The Natural History of Juan Fernandez and Easter Island. In: SKOTTSBERG, C. (ed), *Tanaidacea and marine Isopoda from Juan Fernandez. Vol. 3*. Pp. 525-552.
- NUNOMURA, N. (1978). Tanaidaceans and anthuridean isopods collected on the Presidential Cruise of 1938. *Proc. Biol. Soc. Wash.*, 91(4): 936-952.
- OHLIN, A. (1901). Isopoda from Tierra del Fuego and Patagonia. i. Valvifera. *Sven. Exped. Magellan. ii*: 261-306.
- ORMSBY, B. (1991). *Synisoma wetzerae*, a new species and the first records of *Synisoma* from the new world (Crustacea: Isopoda: Valvifera: Idoteidae). *Proc. Biol. Soc. Wash.*, 104(4): 758-763.
- POORE, G.C.B. (1984). *Colanthura*, *Califanthura*, *Cruranthura* and *Cruregens*, related genera of the Paranthuridae (Crustacea: Isopoda). *J. Nat. Hist.*, 18: 697-715.
- POORE, G.C.B. (1996). Species differentiation in *Synadotea* (Isopoda: Idoteidae) and recognition of introduced marine species: a reply to Chapman and Carlton. *J. Crust. Biol.*, 16(2): 384-394.
- POORE, G.C.B. (2005). Isopoda. Australian Faunal Directory [online] (2005) Available by Internet: <URL: http://www.deh.gov.au/cgi-bin/abrs/fauna/tree.pl?pstrVol=PERACARIDA.
- PRADO, L.M., C. GUISTADO & E. ACUÑA (1998). *Pseudione humboldtensis*, a new species (Isopoda: Bopyridae) of parasite of *Cervimunida johni* and *Pleuroncodes monodon* (Anomura: Galatheididae) from the northern coast of Chile. *Proc. Biol. Soc. Wash.*, 111(2): 272-277.
- RAMÍREZ, M.E. & C. OSORIO (2000). Patrones de distribución de macroalgas y macroinvertebrados intermareales de la isla de Robinson Crusoe, archipiélago de Juan Fernández. Chile. *Invest. Mar., Valparaíso*, 28: 1-13.
- RIBI, G. (1981). Does the wood boring isopod *Sphaeroma terebrans* benefit red mangroves (*Rhizophora mangle*)? *Bull. Mar. Sci.*, 3(4): 925-928.
- RICHARDSON, H. (1899). Key to the isopods of the Pacific coast of North America, with descriptions of twenty-two new species. *Proc. U.S. Natl. Mus.*, 21(1175): 815-869.
- RICHARDSON, H. (1904). Contributions to the Natural History of the Isopoda. *Proc. U.S. Natl. Mus.*, 27: 1-89.
- RICHARDSON, H. (1905). A monograph on the isopods of North America. *Bull. U.S. Natl. Mus.*, 54: 1-727.
- RICHARDSON, H. (1909). Isopods collected in the northwest Pacific by the United States Bureau of Fisheries Steamer 'Albatross' in 1906. *Proc. U.S. Natl. Mus.*, 37: 75-129.
- ROKICKI, J. (1984). A new isopod, *Anilocra huacho* sp. n. of the family Cymothoidae from coastal waters of Peru. *Parasitologia*, 18: 242-244.
- ROZBACZYLO, N. & J.C. CASTILLA (1987). Invertebrados marinos del archipiélago de Juan Fernández. In: CASTILLA, J.C. (ed), *Islas oceánicas chilenas: conocimiento científico y necesidades de investigaciones*. Ediciones Universidad Católica de Chile: 167-189.
- SALAZAR-VALLEJO, S.I. & A. LEIJA-TRISTAN (1989). *Progebiophilus bruscai* n sp, a new bopyrid isopod parasitic on the mud shrimp, *Upogebia dawsoni* Williams (Thalassimoidea), from the Gulf of California. *Cah. Biol. Mar.*, 30(4): 423-432.
- SASSAMAN, C. (1985). *Cabirops montereyensis*, a new species of hyperparasitic isopod from Monterey Bay, California (Epicaridea: Cabiropsidae). *Proc. Biol. Soc. Wash.*, 98: 778-789.
- SCHIÖDTE, J.C. & F.W.S. MEINERT (1879). Symbolae ad monographiam Cymothoarum Crustaceorum Isopodum Familiae. *Natur. Tidsskrift, Tredie Raekke*, 12: 1-166.
- SCHULTZ, G.A. (1961). Distribution and establishment of a land isopod in North America. *Syst. Zool.*, 10(4): 193-196.
- SCHULTZ, G.A. (1964). Some marine isopod crustaceans from off the southern California coast. *Pac. Sci.*, 18: 307-314.
- SCHULTZ, G.A. (1966). Submarine canyons of southern California Part IV Systematics: Isopoda. *Allan Hancock Pac. Exped.*, 27(4): 1-56.
- SCHULTZ, G.A. (1969). *How to know the marine isopod crustaceans*. W.M.C. Brown Company Publishers, U.S.A. 359 pp.
- SCHULTZ, G.A. (1970). A review of the species of the genus *Tylos* Latreille from the New World (Isopoda: Oniscoidea). *Crustaceana*, 19: 297-305.



- SCHULTZ, G.A. (1984). Four species of *Alloniscus* Dana, 1854, from the west coast of north America and Hawaii (Isopoda, Oniscoidea). *Crustaceana*, 47(2) : 149-167.
- SHIELDS, D.J. & J. GÓMEZ-GUTIÉRREZ (1996). *Oculophryxus bicualis*, a new genus and species of dajid isopod on the Euphausiid *Stylocheiron affine* Hansen. *Int. J. Parasitol.*, 26(3) : 261-268.
- STOCH, F. (2003). Checklist of the species of the Italian fauna [on line] (December, 2003). Available by Internet : <URL : <http://www.faunaitaliana.it/checklist/introduction.html>>
- STUARDO, J., R. VEGA & I. CESPEDES (1986). New bopyrid isopod parasitic on *Callianassa uncinata* H. Milne Edwards with functional and ecological remarks. *Gayana, Zool.*, 50(1-4) : 17-36.
- TAYLOR, A.C. & P.G. MOORE (1995). The burrows and physiological adaptations to a burrowing lifestyle of *Natatolana borealis* (Isopoda : Cirolanidae). *Mar. Biol.*, 123 : 805-814.
- THIEL, M. (2002). The zoogeography of algae-associated peracarids along the Pacific coast of Chile. *J. Biogeogr.*, 29(8) : 999-1008.
- THIEL, M., E. GONZALEZ, M.J. BALANDA, R. HEARD & R. WATLING (2003). Diversity of Chilean peracarids (Crustacea : Malacostraca). *Contrib. Stud. East Pac. Crustac.*, 2 : 177-189.
- VAN DER HEIDEN, M.A. & M.E. HENDRICKX (1982). *Inventario de la fauna marina y costera del sur de Sinaloa, México*. Instituto de Ciencias del Mar y Limnología, Estación Mazatlán, UNAM. Mexico. 135 pp.
- VARGAS, A.J., H.K. DEAN, D. MAURER & P. ORELLANA (1985). Lista preliminar de invertebrados asociados a los sedimentos del Golfo de Nicoya, Costa Rica. *Brenesia*, 24 : 327-342.
- WÄGELE, J.W. & N.L. BRUCE (1989). *Natatolana pastorei* (Giambiagi, 1925) (Crustacea, Isopoda Cirolanidae) from the Straits of Magellan South America : redescription and notes on functional morphology. *Proc. Biol. Soc. Wash.*, 102(1) : 95-105.
- WALLERSTEIN, R.B. (1980). A taxonomic listing of common marine invertebrate species from southern California. In : STRAUGHAN, D. & R.W. KLINK (eds.), *Isopoda*. Technical Report of the Allan Hancock Foundation. Washington, USA : 230-236.
- WETZER, R. & R.C. BRUSCA (1997). Descriptions of the species of the suborders Anthuridea, Epicaridea, Flabellifera, Gnathiidea, and Valvifera. In : BLAKE J.A. & SCOTT P.H. (eds.), *Taxonomic atlas of the benthic fauna of Santa Maria Basin and western Santa Barbara Channel. Vol. 11. The Crustacea. Part 2. The order Isopoda*. Santa Barbara Museum of Natural History, California, U.S.A. : 9-56.
- WETZER, R., H.G. KUCK, P. BAÉZ, R.C. BRUSCA & L.M. JURKEVICS (1991). Catalogue of the isopod Crustacea type collection of the Natural History Museum of Los Angeles County. *Tech. Rep., Nat. Hist. Mus. Los Angeles Co.*, 3 : 1-59.
- WICKSTEN, M.K. (1989). Ranges of offshore decapod crustaceans in the Pacific ocean. *Trans. S. Diego Soc. Nat. Hist.*, 21(19) : 291-316.
- WICKSTEN, M.K. & M.E. HENDRICKX (2003). An updated checklist of benthic marine and brackish water shrimps (Decapoda : Penaeoidea, Stenopodidea, Caridea) from the Eastern Tropical Pacific. In : HENDRICKX M.E. (ed), *Contributions to the Study of East Pacific Crustaceans 2*. Instituto de Ciencias del Mar y Limnología, UNAM, Mexico. 303p : 49-76.
- WILLIAMS, W.D. (1983). On the ecology of *Haloniscus searlei* (Isopoda, Oniscoidea), an inhabitant of Australia salt lakes. *Hydrobiologia*, 105 : 137-142.
- WILLIAMS, JR. E.H. & L.B. WILLIAMS (1981). Nine new species of *Anilocra* (Crustacea : Isopoda : Cymothoidae) external parasites of West Indian coral reef fishes. *Proc. Biol. Soc. Wash.*, 94 (4) : 1005-1047.
- WILSON, G.D. (1980). New insights into colonization of the deep sea : Systematics and zoogeography of the Munnidae and the Pleurogoniidae comb. nov. (Isopoda; Janiroidea). *J. Nat. Hist.*, 14 : 215-236.
- WINKLER, H. (1992). Redescription and family status of the magallanic isopod *Janthopsis laevis* Menzies, 1962 (Asellota : Acanthaspidiidae). *Bull. Zoöl. Mus.*, 13(10) : 93-99.
- WINKLER, H. (1994). Paramunnidae (Crustacea : Isopoda : Asellota) from the Magellan Strait. *Zool. J. Linn. Soc.*, 110 : 243-296.
- WINKLER, H. & A. BRANDT (1993). *Janiridae* (Crustacea, Asellota) from the southern hemisphere : *Janiroopsis varians* sp.n. and redescription of five little-known species. *Zool. Scr.*, 22(4) : 387-424.

## APPENDIX 1.

### List of species of isopods reported for the Californian, Oregonian, Aleutian, and Arctic zoogeographic provinces (213 species). Species reported only in oceanic islands not included. Sequence of orders and families is according to Brandt & Poore (2003)

#### CYMOTHOIDA Wägele, 1989

##### Aegidae White, 1850

1. *Aega lecontii* Dana, 1854  
Monterey Bay, California, USA (RICHARDSON, 1905; KENSLEY & SCHOTTE, 2006).
2. *Aega microphthalma* Dana, 1854  
Monterey Bay, California, USA (BRUSCA et al., 2006).
3. *Aega symmetrica* Richardson, 1905  
Southern Alaska to California, USA (RICHARDSON 1905a; HATCH, 1947; BRUSCA et al., 2006). ART.
4. *Rocinela angustata* Richardson, 1904  
From Bering Sea south to central western Baja California, Mexico (HATCH, 1947; BRUSCA & FRANCE, 1992; BRUSCA et al., 2006).
5. *Rocinela bellicepe* Stimpson, 1864  
Aleutian Islands, Alaska, to Channel Islands, California, USA. Gulf of California, Angel de la Guarda Island (29°19.9'N, 113°10.4'W) and Mazatlan, Sinaloa, Mexico. Clarion Island (BRUSCA & FRANCE, 1992; ESPINOSA-PÉREZ & HENDRICKX, 2001a).
6. *Rocinela laticauda* Hansen, 1897  
Piedras Blancas, California, USA, and from Guaymas, Sonora, to Acapulco, Guerrero, Mexico (RICHARDSON, 1905; BRUSCA & FRANCE, 1992; CALDERÓN & CAMPOY, 1993).
7. *Rocinela propodialis* Richardson, 1905  
From British Columbia, Canada to Washington, USA (RICHARDSON, 1905; HATCH, 1947).
8. *Rocinela signata* Schiödte & Meinert, 1879  
From Newport Bay, California, USA, to Gulf of Guayaquil, Ecuador, including the whole Gulf of California, Mexico. Galapagos Islands (BOWMAN, 1977; BRUSCA & FRANCE, 1992). W-ATL.

9. *Rocinela tridens* Hatch, 1947  
Known only from Canoe Island, Washington, USA (HATCH, 1947).

#### Corallanidae Hansen, 1890

10. *Excorallana tricornis occidentalis* Richardson, 1905  
From Santa Catalina Island, California, USA, south to Panama, including the whole Gulf of California, Mexico (DELANEY, 1984; 1989; 1993; GUZMAN et al., 1988; Brusca, pers. comm., April 2000).

#### Cymothoidae Leach, 1814

11. *Anilocra occidentalis* Richardson, 1899  
Known only from Monterey Bay, California, USA (RICHARDSON, 1899).
12. *Ceratothoa gaudichaudii* (H. Milne-Edwards, 1840)  
From southern California, USA, south to Cape Horn, Chile, including the whole Gulf of California, Mexico. Galapagos Islands (BRUSCA, 1981; MOLINA & MANRIQUE, 1996; ESPINOSA-PÉREZ & HENDRICKX, 2001a). I-PAC.
13. *Ceratothoa gilberti* (Richardson, 1904)  
From southern California, USA, to Punta Banda, west coast of Baja California; Tortugas Bay, Southern Baja California, and Mazatlan, Sinaloa, Gulf of California, Mexico (BRUSCA, 1981).
14. *Elthusa californica* (Schiödte & Meinert, 1884)  
From Boundary Bay, British Columbia, Canada to Peru (HATCH, 1947; BRUSCA, 1981; BRUSCA et al., 2006).
15. *Elthusa menziesi* (Brusca, 1981)  
Todos Santos and San Quintin Bays, west coast of Baja California, and Gulf of California, Mexico. Alijos Rocks. Guadalupe Island (CAMPOS et al., 1986; WETZER et al., 1991; ESPINOSA-PÉREZ & HENDRICKX, 2001a).
16. *Elthusa vulgaris* (Stimpson, 1857)  
From Washington, USA, south to off Puerto Madero, Chiapas, including the whole Gulf of California, Mexico. Near Malpelo Island (BRUSCA, 1981; AUSTIN, 1985; ESPINOSA-PÉREZ & HENDRICKX, 2001a).
17. *Enispa convexa* (Richardson, 1905)  
Channel Islands, California, USA, to Gulf of Guayaquil, Ecuador. A single record at Playa Novilleros, southern Gulf of California, Mexico (BRUSCA, 1977; 1981; BRUSCA & IVERSON, 1985; WETZER et al., 1991).
18. *Mothocya gilli* Bruce, 1986  
From Asuncion Bay to Almeja Bay, west coast of Baja California, and from Guaymas, Sonora, Gulf of California, to Manzanillo, Colima, Mexico (BRUCE, 1986; WETZER et al., 1991).
19. *Mothocya rosea* Bruce, 1986  
San Diego, California, USA to Nicaragua (BRUCE, 1986).

20. *Nerocila acuminata* Schiödte & Meinert, 1881  
From Long Beach, California, USA, south to Peru, including the whole Gulf of California, Mexico. Galapagos Islands (BRUSCA, 1981). HAW. W-ATL.
21. *Renocila thresherorum* Williams & Williams, 1981  
From Newport, California, USA to southern Gulf of California, Mexico (WILLIAMS & WILLIAMS, 1981; BRUSCA, 1981).

#### Gnathiidae Leach, 1814

22. *Caecognathia crenulatifrons* (Monod, 1926)  
From Point Santa Cruz, Monterey Bay, California, USA to Point Banderas, Baja California, Mexico. Off Santa Cruz Island, Santa Cruz Canyon, California, USA (IVERSON, 1974; BRUSCA et al., 2006).
23. *Caecognathia sanctaerucis* (Schultz, 1972)  
Santa Maria Basin, Santa Cruz Canyon, Southern California, USA (BRUSCA et al., 2006).
24. *Gnathia clementensis* Schultz, 1966  
Known only from San Clemente Canyon, California, USA (SCHULTZ, 1966; BRUSCA et al., 2006).
25. *Gnathia productatridens* Menzies & Barnard, 1959  
Point Concepcion to Santa Barbara County, California, USA (WETZER, et al., 1991; BRUSCA et al., 2006).
26. *Gnathia steveni* Menzies, 1962  
From southern California, Los Angeles, USA to San Quintin Bay, northwestern Baja California, Mexico (WETZER et al., 1991; BRUSCA et al., 2006).
27. *Gnathia tridens* Menzies & Barnard, 1959  
Point Conception and San Clemente Island, California, USA. A single record from Gulf of Alaska (WETZER et al., 1991; BRUSCA et al., 2006).
28. *Gnathia trilobata* Schultz, 1966  
Off Point Loma, San Diego County, California, USA. La Jolla and San Diego Canyons (WETZER, et al., 1991; BRUSCA et al., 2006).

#### Tridentellidae Bruce, 1984

29. *Tridentella glutacantha* Delaney & Brusca, 1985  
Farallon Islands, near San Francisco, to Santa Catalina Island, southern California, USA (HATCH, 1947; WETZER, et al., 1991; BRUSCA et al., 2006). May include two species (BRUCE, 2002).
30. *Tridentella quinicornis* Delaney & Brusca, 1985  
Southern California, Channel Islands, USA (WETZER, et al., 1991; BRUSCA et al., 2006).

#### Aporobopyridae Rafinesque, 1815

31. *Anathelges hyphalus* Markham, 1974  
From Carmel Cove, California, USA, to Baja California, Mexico (WETZER, et al., 1991; BRUSCA et al., 2006).
32. *Aporobopyrus mugensis* Shiino, 1964  
From Bodega Harbor, southern California, USA, to Ensenada, Baja California, Mexico (CAMPOS & CAMPOS, 1989; BRUSCA et al., 2006).
33. *Aporobopyrus oviformis* Shiino, 1934  
Point Mugu, Ventura, California, USA (BRUSCA et al., 2006). I-PAC.

34. *Argeia pugettensis* Dana, 1853  
From off Nanaimo, British Columbia, Canada south to South Humboldt Bay, California, USA (HATCH, 1947; JAY, 1989; BRUSCA et al., 2006). I-PAC.
35. *Asymmetrione ambodistorta* Markham, 1985  
Known only from Corona del Mar, New Port, California, USA (MARKHAM, 1985).
36. *Bopyriscus calmani* (Richardson, 1905)  
Southern and central California, USA (RICHARDSON, 1905; BRUSCA et al., 2006).
37. *Bopyroides hippolytes* (Kroyer, 1838)  
Unalaska Island, Aleutian Islands, Alaska to Heceta Bank, Oregon, USA (HATCH, 1947). I-PAC.
38. *Hemiarthrus abdominalis* (Kroyer, 1840)  
From Queen Charlotte Islands, British Columbia, Canada, south to Alki Point, Seattle, Washington, USA (HATCH, 1947). N-ATL. ART.
39. *Ione cornuta* Bate, 1864.  
Boundary Bay, British Columbia, Canada to San Francisco Bay, California, USA (HATCH, 1947; BRUSCA et al., 2006).
40. *Munidion parvum* Richardson, 1904  
From British Columbia, Depature Bay, Canada to Juan de Fuca Strait, Washington, USA (RICHARDSON, 1904; HATCH, 1947).
41. *Munidion pleurocondis* Markham, 1975  
Central coast of California, USA, to west coast of Baja California, Mexico (MARKHAM, 1975; SALAZAR-VALLEJO & LEIJA-TRISTAN, 1989).
42. *Phylloporus abdominalis* Stimpson, 1857  
From southern British Columbia, Canada south to northwest Baja California, Mexico (HATCH, 1947; MARKHAM, 1977; BRUSCA et al., 2006).
43. *Progebiophilus bruscai* Salazar-Vallejo & Leija-Tristan, 1989  
West coast of Baja California, Tortugas and Todos Santos Bays, and on the west coast of the Gulf of California, from San Felipe, Baja California, to La Paz, South Baja California, Mexico (SALAZAR-VALLEJO & LEIJA-TRISTAN, 1989).
44. *Pseudione galacanthae* Hansen, 1897  
Coast of Canada and into the Gulf of California, Mexico (BRUSCA, 1980; AUSTIN, 1985; SALAZAR-VALLEJO & LEIJA-TRISTAN, 1989).
45. *Pseudione giardi* Calman, 1898  
Bering Sea to Puget Sound, Washington, USA (CALMAN, 1898; MARKHAM, 1974).
46. *Schizobopyrina striata* (Nierstrasz & Brender à Bandis, 1929)  
Southern California, USA and Puertecitos, Baja California, Gulf of California, Mexico (CAMPOS & CAMPOS, 1990).
- Dajidae Giard & Bonnier, 1887**
47. *Holophryxus alaskensis* Richardson, 1905  
Behm and Lynn Cannal zone, Alaska, and Santa Barbara Channel, California, USA (RICHARDSON, 1905; BRUSCA et al., 2006).
48. *Oculophryxus bicaulis* Shields & Gómez-Gutiérrez, 1996  
West coast of Baja California (20-29°N – 112-118°W), Mexico (SHIELDS & GÓMEZ-GUTIÉRREZ, 1996). W-PAC. W-ATL.
- Entoniscidae Kossmann, 1881**
49. *Portunion conformis* Muscatine, 1956  
Marin County to San Francisco Bay, California, USA (BRUSCA et al., 2006).
- Cabiropidae Giard & Bonnier, 1887**
50. *Cabirops montereyensis* Sassaman, 1985  
Known only from Monterey Bay, California, USA (SASSAMAN, 1985).
- Hemioniscidae Bonnier, 1900**
51. *Hemioniscus balani* Buchholz, 1866  
From Alaska, USA south to west coast of Baja California, Mexico (CRISP, 1968; CAMPOS & CAMPOS, 1989; BRUSCA et al., 2006).
- Fabidae Danforth, 1963**
52. *Faba setosa* Nierstrasz & Brender à Bandis, 1931  
Central California, USA (BRUSCA et al., 2006).
- Anthuridae Leach, 1814**
53. *Amakusanthura californiensis* (Schultz, 1964)  
Known only from SSW Santa Monica, California, USA (SCHULTZ, 1964)
54. *Cyathura munda* Menzies, 1951  
Marine County, California, USA, to Mexican border. Gulf of California, Mexico (MENZIES, 1951; WETZER & BRUSCA, 1997).
55. *Haliophasma geminatum* Menzies & Barnard, 1959  
Puget Sound, Washington, USA south to San Quentin Bay, at the west coast of Baja California, Mexico, including Channel Islands, California, USA (MENZIES & BARNARD, 1959; MENZIES, 1962b; SCHULTZ, 1964; AUSTIN, 1985).
- Antheluridae Poore & Lew Ton, 1988**
56. *Ananthura luna* (Schultz, 1966).  
Santa Monica Bay to San Diego, California, USA, including Santa Monica, La Jolla, Coronado and Tanner Canyons (SCHULTZ, 1966; BRUSCA et al., 2006).
- Paranthuridae Menzies & Glynn, 1968**
57. *Califanthura squamosissima* (Menzies, 1951)  
Marine County, California, USA, to Tangola-Tangola Bay, Oaxaca, Mexico, including the east coast of the Gulf of California, probably to Puerto Peñasco, Sonora (NUNOMURA, 1978; HENDRICKX & VAN DER HEIDEN, 1983; POORE, 1984a; WETZER et al., 1991; CALDERÓN & CAMPOY, 1993).
58. *Colanthura bruscai* Poore, 1984  
Off San Clemente (33°22.9'N, 117°35.8'W), California, USA, to Salinas Bay, Costa Rica, including

the east coast of the Gulf of California, Mexico (POORE, 1984; WETZER et al., 1991).

59. *Paranthura elegans* Menzies, 1951  
Tomales Point, Marine County, California, USA, to San Quintin Bay, Baja California, Mexico; including the east coast of the Gulf of California, north to Guaymas, Sonora, Mexico (MENZIES, 1951; WETZER & BRUSCA, 1997; ESPINOSA-PÉREZ & HENDRICKX, 2001a)
60. *Paranthura linearis* (Boone, 1923)  
Only known for Laguna Beach, California, USA (BOONE, 1923; BRUSCA et al., 2006).

#### Cirolanidae Dana, 1852

61. *Cirolana harfordi* (Lockington, 1877)  
Vancouver Island to Magdalena Bay, west coast of Baja California, Mexico. A single record at La Paz, southwestern tip of the Gulf of California (BRUSCA et al., 1995). I-PAC.
62. *Eurydice caudata* Richardson, 1899  
From San Diego, California, USA, to La Libertad, Ecuador, including the Gulf of California, Mexico. Guadalupe, Revillagigedo, Coco and Galapagos Islands (BOWMAN, 1977; WALLERSTEIN, 1980; BRUSCA et al., 1995).
63. *Euryllana arcuata* (Hale, 1925)  
From San Francisco Bay, California, USA and Antofagasta, Chile (BRUSCA et al., 2006; CARVACHO, 1977). I-PAC. W-ATL.
64. *Exciorolana chiltoni* (Richardson, 1905)  
From British Columbia, Canada south to Los Angeles, California, USA (HATCH, 1947; GEORGE & STROMBERG, 1968; IVERSON, 1974; BRUSCA et al., 2006). W-ATL.
65. *Exciorolana linguifrons* (Richardson, 1899)  
Monterey Bay to southern California, USA (RICHARDSON, 1905; BRUSCA et al., 2006).
66. *Natatolana californiensis* (Schultz, 1966)  
From southern California, USA, to Cedros Island, west coast of Baja California, Mexico. In the Gulf of California, at Angel de la Guarda Island and off La Paz, South Baja California, Mexico (BRUSCA & NINOS, 1978; BRUSCA et al., 1995). A single record in Costa Rica (BRUSCA, et al., 2006) and another in the Peru-Chile Trench (7°7.9'S, 80°37'W) (MENZIES & GEORGE, 1972).
67. *Natatolana carlenae* Brusca, Wetzer & France, 1995  
From Cedros Island, west coast of Baja California, Mexico, to Secas Island, Panama, including the whole Gulf of California, Mexico (BRUSCA et al., 1995).

#### LIMNORIIDEA Brandt & Poore, 2002

##### Limnoriidae White, 1850

68. *Limnoria algarum* Menzies, 1957  
Oregon south to San Diego, California, USA (MENZIES, 1957; BRUSCA et al., 2006).

69. *Limnoria lignorum* (Rathke, 1799)  
From Kodiak Island, Alaska to Point Arena, California, USA (MENZIES, 1957; BRUSCA et al., 2006). ATL.
70. *Limnoria quadripunctata* Holthuis, 1949  
From Humboldt Bay to San Diego, California, USA (MENZIES, 1957; BRUSCA et al., 2006).
71. *Limnoria tripunctata* Menzies, 1951  
From San Francisco Bay, California, USA south to Mazatlan, Sinaloa, including the whole Gulf of California, Mexico (MENZIES, 1951; BRUSCA & IVERSON, 1985). W-ATL.

#### SPHAEROMATIDEA Wägele, 1989

##### Sphaeromatidae Latreille, 1825

72. *Bathycopea daltonae* (Menzies & Barnard, 1959)  
From Monterey Bay to San Miguel Island, California, USA (WETZER et al., 1991; BRUSCA et al., 2006).
73. *Discerceis granulosa* (Richardson, 1899)  
Southern California, USA to Cedros Island, western coast of Baja California, Mexico (RICHARDSON, 1905; BRUSCA et al., 2006).
74. *Dynamene tuberculosa* Richardson, 1899  
From Aleutian Islands, Alaska to southern California, USA (BRUSCA et al., 2006).
75. *Dynamenella benedicti* (Richardson, 1899)  
A single record from Monterey Bay, California (BRUSCA et al., 2006).
76. *Dynamenella conica* Boone, 1923  
From San Francisco Bay to Monterey Bay, California, USA (BRUSCA et al., 2006).
77. *Dynamenella dilatata* (Richardson, 1899)  
Monterey Bay, California, USA (HATCH, 1947; BRUSCA et al., 2006).
78. *Dynamenella glabra* (Richardson, 1899)  
From Coos Bay, Oregon to Monterey Bay, California, USA (HATCH, 1947; BRUSCA et al., 2006).
79. *Dynamenella shearereri* (Hatch, 1947)  
From Coos Bay, Oregon south to southern California, USA (BRUSCA et al., 2006).
80. *Dynoides elegans* (Boone, 1923)  
San Pedro to La Jolla, California, USA (BOONE, 1923; BRUSCA et al., 2006).
81. *Exosphaeroma amplicauda* (Stimpson, 1857)  
From Kyska Harbor, Alaska south to Los Angeles, California, USA (RICHARDSON, 1905; HATCH, 1947; BRUSCA et al., 2006).
82. *Exosphaeroma aphrodita* Boone, 1923  
Known only from La Jolla, California, USA (BOONE, 1923; BRUSCA et al., 2006).
83. *Exosphaeroma inornata* Dow, 1958  
From Puget Sound, Washington south to San Diego, California, USA (IVERSON, 1978; BRUSCA et al., 2006).
84. *Exosphaeroma octoncum* (Richardson, 1899)  
Tomales Bay to Monterey Bay, California, USA (IVERSON, 1974; BRUSCA et al., 2006).

85. *Exosphaeroma rhomburum* (Richardson, 1899)  
Monterey Bay, California, USA (BRUSCA et al., 2006).
86. *Gnorimosphaeroma insulare* (Van Name, 1940)  
From Popoff Island, Aleutian Islands, Alaska to San Nicolas Island, Channel Islands, California, USA (WETZER et al., 1991; BRUSCA et al., 2006).
87. *Gnorimosphaeroma noblei* Menzies, 1954  
Central California, from Humbolt Bay to Tomales Bay, California, USA (MENZIES, 1954). ART.
88. *Gnorimosphaeroma oregonensis* (Dana, 1853)  
Kyska Harbor, Alaska south to Monterey Bay, California, USA (MENZIES, 1954; BRUSCA et al., 2006).
89. *Gnorimosphaeroma rayi* Hoestlandt, 1969  
Tomales Bay, California, USA (HATCH, 1947). HAW. I-PAC.
90. *Paracerceis cordata* (Richardson, 1899)  
Aleutian Islands, Alaska to southern California, USA (RICHARDSON, 1905; BRUSCA et al., 2006).
91. *Paracerceis gilliana* (Richardson, 1899)  
From Mendocino County to Santa Catalina Island, California, USA (RICHARDSON, 1905; BRUSCA et al., 2006).
92. *Paracerceis sculpta* (Holmes, 1904)  
From San Clemente Island, California, USA, south to San Juan de Alima, Michoacan, Mexico, including the whole Gulf of California, Mexico (RICHARDSON, 1905; BRUSCA, 1980; ESPINOSA-PÉREZ & HENDRICKX, 2001b). ATL. MED.
93. *Paradella diana* (Menzies, 1962)  
Los Angeles, California, USA, to San Juan de Alima, Michoacan, Mexico. West coast of the Gulf of California, from Guaymas, Sonora to Sayulita, Nayarit, Mexico (MENZIES, 1962b; IVERSON, 1974; ESPINOSA-PÉREZ & HENDRICKX, 2001a). I-PAC. ATL. MED.
94. *Sphaeroma quoyanum* H. Milne-Edwards, 1840  
From Newport Bay, California south to San Quintin Bay, northwestern Baja California, Mexico (IVERSON, 1974; CARLTON & IVERSON, 1981; BRUSCA et al., 2006). I-PAC.
95. *Sphaeroma walkeri* Stebbing, 1905  
San Diego Bay, California, USA (CARLTON & IVERSON, 1981; BRUSCA et al., 2006). HAW. I-PAC. ATL. MED.
- Tecticipitidae Iverson, 1982**
96. *Tecticeps alascensis* Richardson, 1897  
Aleutian Islands, Alaska, to off coast of California, USA (RICHARDSON, 1905). I-PAC. ART.
97. *Tecticeps convexus* Richardson, 1899  
Northern California, USA to northwestern Baja California, Mexico (KURIS & CARLTON, 1977; BRUSCA et al., 2006).
98. *Tecticeps pugettensis* Hatch, 1947  
Known only from Whibdey Island, Washington, USA (HATCH, 1947).
- Ancinidae Dana, 1852**
99. *Ancinus granulatus* Holmes & Gay, 1909  
Southern California, USA, to Cedros Island, west coast of Baja California, Mexico. Gulf of California, San Felipe, Baja California (northwest coast) and Mazatlan, Sinaloa (southeast coast) (GLYNN & GLYNN, 1974; WALLERSTEIN, 1980; VAN DER HEIDEN & HENDRICKX, 1982).
- Serolidae Dana, 1852**
100. *Heteroserolis carinata* Lockington, 1877  
From Santa Monica Bay, California, USA, to San Quintin Bay, Baja California, Mexico. Gulf of California, from Angel de la Guarda Island to San Miguel Cape and Tiburon Island to Lobos Bay (MENZIES & BARNARD, 1959; CALDERÓN & CAMPOY, 1993; ESPINOSA-PÉREZ & HENDRICKX, 1997; WETZER & BRUSCA, 1997).
- MICROCERBERIDEA Lang, 1961**
- Microcerberidae Karaman, 1933**
101. *Coxicerberus abbotti* (Lang, 1960)  
Central California, USA (BRUSCA et al., 2006).
- ASELLOTA Latreille, 1802**
- Asellidae Latreille, 1802**
102. *Caecidotea tomalensis* (Harford, 1877)  
Vancouver Island, British Columbia, Canada south to Klamath L., Oregon, USA (HATCH, 1947).
- Janiridae Sars, 1897**
103. *Caecianiropsis psammophila* Menzies & Pettit, 1956  
Tomales Point, Marin County, to Asilomar, Monterey County, California, USA (WETZER et al., 1991; BRUSCA et al., 2006).
104. *Caecijaera horvathi* Menzies, 1951  
Los Angeles, California, USA (WETZER et al., 1991). HAW.
105. *Iais californica* (Richardson, 1904)  
Humbolt Bay south to San Diego, California, USA (IVERSON, 1974; BRUSCA et al., 2006). I-PAC.
106. *Ianiropsis analoga* Menzies, 1952  
From San Juan Islands, Washington south to Marin County, California, USA (MENZIES, 1952).
107. *Ianiropsis derjugini* (Gurjanova, 1933)  
Monterey Bay, California, USA (BRUSCA et al., 2006). ART.
108. *Ianiropsis epilittoralis* Menzies, 1952  
Coast of California, from Marin County to San Luis Obispo County, USA (MENZIES, 1952; IVERSON, 1974).
109. *Ianiropsis kincaidi* (Richardson, 1904)  
Aleutian Islands, Yakutat Island, Alaska, south to Monterey Bay, California, USA (RICHARDSON, 1904; BRUSCA et al., 2006). ART.

110. *Ianiropsis magnocula* Menzies, 1952  
From San Juan Islands, Washington to off Russian River, California, USA (MENZIES, 1952; BRUSCA et al., 2006).
111. *Ianiropsis minuta* Menzies, 1952  
Marin County, California, USA (MENZIES, 1952; BRUSCA et al., 2006).
112. *Ianiropsis montereyensis* Menzies, 1952  
From Marin County to Monterey County, California, USA (MENZIES, 1952; WETZER et al., 1991; BRUSCA et al., 2006).
113. *Ianiropsis tridens* Menzies, 1952  
From San Juan Islands, Washington south to Monterey County, California, USA. A single record at Iquique, Chile (MENZIES, 1952; 1962a; WETZER et al., 1991; BRUSCA et al., 2006).
114. *Jaera wakishiana* Bate, 1865  
Known only from Esquimalt Harbor, British Columbia, Canada (RICHARDSON, 1905).
115. *Janira maculosa* Leach, 1814  
From Depature Bay, British Columbia, Canada to San Juan Islands, Washington, USA (HATCH, 1947). ATL.
116. *Janiralata erostrata* (Richardson, 1899)  
Aleutian Islands, Attu Island (Chichagof Harbor), Alaska, USA (RICHARDSON, 1899).
117. *Janiralata davisi* Menzies, 1951  
Known only from Carmel Cove, Monterey County, California, USA (MENZIES, 1951).
118. *Janiralata holmesi* (Richardson, 1905)  
Alaska, USA (RICHARDSON, 1905).
119. *Janiralata occidentalis* (Walker, 1898)  
From San Juan Islands, Turn Island, Washington to Oregon, USA (HATCH, 1947, BRUSCA, et al., 2006).
120. *Janiralata rajata* Menzies, 1951  
Monterey Bay, California, USA (BRUSCA et al., 2006).
121. *Janiralata solasteri* (Hatch, 1947)  
From Dall Island, Gulf of Alaska south to southern California, USA (HATCH, 1947).
122. *Janiralata triangulata* (Richardson, 1899)  
Known only from Monterey Bay, California, USA (BRUSCA et al., 2006).

#### **Joeropsididae Nordenstam, 1933**

123. *Joeropsis concava* (Schultz, 1966)  
Southern California, Santa Cruz Island and San Diego, USA (WETZER, et al., 1991; BRUSCA et al., 2006).
124. *Joeropsis dubia dubia* (Menzies, 1951)  
Newport Bay, Orange County, California, USA, to San Quintin Bay, west coast of Baja California, Mexico. Gulf of California, Percebu Lagoon and Concepcion Bay, Mexico (MENZIES, 1962b; CARVACHO, 1983; WETZER et al., 1991).
125. *Joeropsis dubia paucispinis* (Menzies, 1951)  
Marin County, California to Santa Monica Canyon, California, USA (SCHULTZ, 1966; BRUSCA et al., 2006).
126. *Joeropsis lobata* (Richardson, 1899)  
From Coos Bay, Oregon to Monterey Bay, California, USA (BRUSCA et al., 2006).

#### **Munnidae Sars, 1897**

127. *Munna fernaldi* George & Stromberg, 1968  
Known only from San Juan Island, Washington, USA (GEORGE & STROMBERG, 1968).
128. *Munna chromatocephala* Menzies, 1952  
From Puget Sound, Washington south to Marin County, California, USA (MENZIES, 1952; BRUSCA et al., 2006).
129. *Munna halei* Menzies, 1952  
Coast of California, from San Luis Obispo to Marine County, California, USA (MENZIES, 1952; BRUSCA et al., 2006).
130. *Munna kroyeri* Goodsir, 1843  
North Beach, Washington, USA (HATCH, 1947). ATL.
131. *Munna minuta* Hatch, 1947  
Carkeek Park, Washington, USA (HATCH, 1947).
132. *Munna spinifrons* Menzies & Barnard, 1959  
Point Conception to Point Loma, San Diego, California, USA. (MENZIES & BARNARD, 1959; BRUSCA et al., 2006).
133. *Munna stephenseni* Gurjanova, 1933  
From Bering Sea to central California, USA (BRUSCA et al., 2006).
134. *Uromunna ubiquita* (Menzies, 1952)  
San Juan Archipelago, Washington, USA, to San Quintin Bay, west coast of Baja California, Mexico. Northern Gulf of California, Guaymas, Sonora and Percebu Lagoon, Mexico (MENZIES, 1962b; GEORGE & STROMBERG, 1968; CARVACHO, 1983; WETZER et al., 1991; CALDERÓN & CAMPOY, 1993).

#### **Munnopsidae Sars, 1869 (sensu lato Wilson, 1989)**

135. *Ilyarachna acarina* Menzies & Barnard, 1959  
Point Conception to Point Loma, San Diego, California, including Santa Maria, San Pedro and Santa Catalina Basins, USA (MENZIES & BARNARD, 1959; BRUSCA et al., 2006).

#### **Paramunnidae Vanhöffen, 1914**

136. *Munnogonium erratum* (Schultz, 1964)  
Off Gaviota Pier, Santa Barbara Channel, California, USA (SCHULTZ, 1964).
137. *Munnogonium tillerae* (Menzies & Barnard, 1959)  
From Satellite Channel, British Columbia, Canada. A single record for the Strait of Magellan, Chile (MENZIES & BARNARD, 1959; WETZER et al., 1991; WINKLER, 1994).
138. *Paramunna quadrantifrons* Iverson & Wilson, 1981  
Southern Channel Islands and Tanner Bank, California, USA (IVERSON & WILSON, 1981; WETZER et al., 1991).
139. *Pleurogonium californiense* Menzies, 1951  
From off Russian River, Sonoma County south to Point Loma, San Diego, California, USA (SCHULTZ, 1966; BRUSCA et al., 2006).

**Santiidae Wilson, 1987**

140. *Santia hirsuta* (Menzies, 1951)  
Known only from Tomales Point, California, USA (MENZIES, 1951).

**Incertae sedis**

141. *Tole alascensis* (Benedict, 1905)  
Known only from Alaska coast (71°2'N, 157°46'W), USA (BENEDICT, 1905).
142. *Tole sarsi* (Richardson, 1905)  
Amchitka Island, Aleutian Islands, Alaska, USA (RICHARDSON, 1905).
143. *Tole triangulata* (Richardson, 1899)  
Monterey Bay, California, USA (RICHARDSON, 1899).

**VALVIFERA Sars, 1882****Arcturidae Dana, 1849**

144. *Arcturus brevispinis* Richardson, 1909  
Aleutian Islands, Alaska, USA (BENEDICT, 1898).
145. *Arcturus glaber* Benedict, 1898  
Aleutian Islands, Alaska, USA (RICHARDSON, 1909).
146. *Arcturus diversispinis* Richardson, 1909  
Aleutian Islands, Alaska, USA (RICHARDSON, 1909).
147. *Arcturus magnispinis* Richardson, 1909  
Bering Sea (RICHARDSON, 1909).
148. *Idaturus allelomorphus* Menzies & Barnard, 1959  
From Monterey Bay to Point Loma, California, USA, including Cortes and Tanner Banks (MENZIES & BARNARD, 1959; IVERSON, 1974; BRUSCA et al., 2006).
149. *Idaturus hedgpethi* Menzies, 1951  
Tomales Bay, California, USA (MENZIES, 1951; BRUSCA et al., 2006).
150. *Neastacilla californica* (Boone, 1918)  
Southern California, USA. Consag Rocks and Topolobampo Bay, Gulf of California, Mexico (MENZIES & BARNARD, 1959; ESPINOSA-PÉREZ & HENDRICKX, 2001a).
151. *Pleurioprion murdochi* (Benedict, 1898)  
Bering Sea, west of Point Franklin, Alaska, USA (BENEDICT, 1898).

**Chaetiliidae Dana, 1849**

152. *Mesidotea entomon* (Linnaeus, 1767)  
From Aberdeen, Washington south to Monterey Bay, California, USA (HATCH, 1947; BRUSCA et al., 2006). ART.

**Holognathidae Thomson, 1904**

153. *Cleantioides occidentalis* (Richardson, 1899)  
From the southern coast of California, USA south to Ecuador, including the east coast of the Gulf of California, from Puerto Peñasco, Sonora, to Mazatlan, Sinaloa, Mexico. Galapagos Islands (KENSLEY &

KAUFMAN, 1978; BRUSCA & IVERSON, 1985; BRUSCA et al., 2006).

**Idoteidae Samouelle, 1819**

154. *Colidotea findleyi* Brusca & Wallerstein, 1977  
From San Diego, California, USA to San Eugenio Point, west coast of Baja California, Mexico. Gulf of California, from San Felipe, Baja California and Puerto Peñasco to Lobos Point, Sonora. Guadalupe Island (WETZER et al., 1991; BRUSCA et al., 2006).
155. *Colidotea rostrata* (Benedict, 1898)  
From San Pedro, California, USA to Point Sal-sipuedes, Baja California, Mexico (DELANEY, 1993; BRUSCA et al., 2006).
156. *Colidotea wallersteini* Brusca, 1983  
Known only from Point Santa Clara, northwestern Baja California, Mexico. Guadalupe Island (BRUSCA, 1983; WETZER, et al., 1991).
157. *Edotia sublittoralis* Menzies & Barnard, 1959  
Vancouver Island, Canada to Newport, California, USA. A single record from Gulf of Nicoya, Costa Rica (VARGAS et al., 1985; BRUSCA et al., 2006).
158. *Erichsonella crenulata* Menzies, 1950  
Southern California, USA to San Quintin Bay, northwestern Baja California, Mexico (MENZIES, 1950; 1962b).
159. *Eusymmerus antennatus* Richardson, 1899  
From San Eugenio Point, west coast of Baja California, south to Gulf of Nicoya, Costa Rica, including the east coast of the Gulf of California (BRUSCA & WALLERSTEIN, 1977; VARGAS et al., 1985; CALDERÓN & CAMPOY, 1993).
160. *Eusymmerus pseudocolata* (Boone, 1923)  
From Point Conception to San Diego, California, USA (SCHULTZ, 1969; BRUSCA et al., 2006).
161. *Idotea aculeata* (Stafford, 1913)  
British Columbia, Canada, to Cedros Island, west coast of Baja California, Mexico. Gulf of California, Mexico, Guaymas, Sonora and La Paz, South Baja California (MENZIES, 1950; BRUSCA & WALLERSTEIN, 1977; AUSTIN, 1985; CALDERÓN & CAMPOY, 1993; BRUSCA et al., 2006).
162. *Idotea fewkesi* Richardson, 1905  
Gulf of Alaska south to Monterey Bay, California, USA (HATCH, 1947; BRUSCA et al., 2006).
163. *Idotea kirchanskii* Miller & Lee, 1969  
From Oregon to southern California, USA (BRUSCA et al., 2006).
164. *Idotea metallica* Bosc, 1802  
Coast of California, USA, and Gulf of California, Mexico and from Montevideo to Beagle Channel, Chile (RICHARDSON, 1905; SCHULTZ, 1969; BRANDT et al., 1999; BRUSCA et al., 2006). COS.
165. *Idotea montereyensis* (Maloney, 1933)  
From British Columbia Estuary, Canada to northwestern Baja California, Mexico (BRUSCA et al., 2006).
166. *Idotea obscura* Rafi, 1972  
British Columbia, Canada (KENSLEY & SCHOTTE, 2006).

167. *Idotea ochotensis* Brandt, 1851  
From Vancouver Island, Canada south to San Francisco Bay, California, USA (HATCH, 1947; BRUSCA et al., 2006). ART.
168. *Idotea resecata* Stimpson, 1857  
From Karta Bay, Gul of Alaska, USA, south to Tortola Bay, west coast of Baja California, Mexico; San Lucas Cape and La Paz, South Baja California, Gulf of California. Alijos Rocks (BRUSCA & WALLERSTEIN, 1977; AUSTIN, 1985; BRUSCA et al., 2006).
169. *Idotea rufescens* Fee, 1926  
From Gabriola Pass, British Columbia, Canada to Coronados Island, central western Baja California, Mexico (MENZIES, 1950; WETZER & BRUSCA, 1997; BRUSCA et al., 2006).
170. *Idotea schmitti* Menzies, 1950  
Bering Sea to Banda Point, northwestern Baja California, Mexico (RICHARDSON, 1909; IVERSON, 1974; BRUSCA et al., 2006).
171. *Idotea stenops* Benedict, 1898  
From Alaska, USA, to San Eugenio Point, west coast of Baja California, Mexico, and from San Telmo Point to La Paz, South Baja California, Mexico (BRUSCA & WALLERSTEIN, 1977; AUSTIN, 1985; BRUSCA et al., 2006).
172. *Idotea urotoma* Stimpson, 1864  
From Alaska, USA, to the west coast of Baja California, Mexico. Guaymas, Sonora and la Paz, South Baja California, Gulf of California (BRUSCA & WALLERSTEIN, 1977; AUSTIN, 1985; CALDERÓN & CAMPOY, 1993; BRUSCA et al., 2006).
173. *Idotea wosnesenskii* Brandt, 1851  
Aleutian Islands, Alaska, to southern California, USA. A single record at La Paz, South Baja California, Gulf of California, Mexico (BRUSCA & WALLERSTEIN, 1977; BRUSCA, 1980; AUSTIN, 1985). I-PAC
174. *Synidotea angulata* Benedict, 1897  
From British Columbia Estuary, British Columbia, Canada south to Eureka, California, USA (HATCH, 1947; BRUSCA et al., 2006).
175. *Synidotea bicuspidata* (Owen, 1839)  
Northern Aleutian Islands, Alaska, USA (RICHARDSON, 1909).
176. *Synidotea berolzheimeri* Menzies & Miller, 1972  
Central California, from Sonoma County to San Luis Obispo, USA (MENZIES & MILLER, 1972; BRUSCA et al., 2006).
177. *Synidotea calcarea* Schultz, 1966  
Tanner and Santa Rosa Canyons, California, USA (SCHULTZ, 1966; BRUSCA et al., 2006).
178. *Synidotea consolidata* (Stimpson, 1857)  
Southern Alaska to San Francisco Bay, California, USA (BRUSCA et al., 2006).
179. *Synidotea cornuta* Rafi & Laubitz, 1990  
British Columbia, Canada (KENSLEY & SCHOTTE, 2006).
180. *Synidotea harfordi* Benedict, 1897  
Oregon County, USA, to Gulf of Nicoya, Costa Rica, including whole Gulf of California, Mexico (BRUSCA & WALLERSTEIN, 1979a; WALLERSTEIN, 1980; VARGAS et al., 1985). I-PAC.
181. *Synidotea laevis* Benedict, 1897  
Northern Aleutian Islands, Alaska, USA (BENEDICT, 1897).
182. *Synidotea laticauda* Benedict, 1897  
From Willapa Bay, Washington to San Francisco Bay, California, USA (BENEDICT, 1897; POORE, 1996; BRUSCA et al., 2006).
183. *Synidotea magnifica* Menzies & Barnard, 1959  
San Luis Obispo, California, USA to northwestern Baja California, Mexico (MENZIES & BARNARD, 1959; BRUSCA et al., 2006).
184. *Synidotea media* Iverson, 1972  
Point Soberanes to Santa Maria Basin, California, USA (IVERSON, 1972; BRUSCA et al., 2006).
185. *Synidotea minuta* Rafi & Laubitz, 1990  
British Columbia, Canada (KENSLEY & SCHOTTE, 2006).
186. *Synidotea nebulosa* Benedict, 1897  
From Kyska Harbor, Alaska south to Whidbey Island, Washington, USA (BENEDICT, 1897; HATCH, 1947). I-PAC.
187. *Synidotea nodulosa* (Kroyer, 1846)  
From Bering Strait to Dixon Entrance, Washington, USA (BENEDICT, 1897; HATCH, 1947). ATL.
188. *Synidotea pettiboneae* Hatch, 1947  
British Columbia, Canada to Monterey Bay, California, USA (HATCH, 1947; KENSLEY & SCHOTTE, 2006).
189. *Synidotea ritteri* Richardson, 1904  
From Vancouver Island, Canada to Shell Beach, California, USA (MENZIES & MILLER, 1972; BRUSCA et al., 2006).
190. *Synisoma wetzeriae* Ormsby, 1991  
Santa Catalina Island, California, USA, and Guaymas, Sonora, Gulf of California, Mexico (ORMSBY, 1991; ESPINOSA-PÉREZ & HENDRICKX, 2001a).

#### ONISCIDEA Latreille, 1802

##### Armadillidae Brandt, 1831

191. *Cubaris affinis* (Dana, 1854)  
Coast of California, USA (BRUSCA et al., 2006).
192. *Cubaris californica* (Budde-Lund, 1885)  
San Francisco Bay to San Pedro, Los Angeles, California, USA (RICHARDSON, 1905; BRUSCA et al., 2006).
193. *Venezillo microphthalmus* (Arcangeli, 1932)  
Central and southern California, USA (BRUSCA et al., 2006).

##### Ligiidae Brandt, 1883

194. *Ligia occidentalis* Dana, 1853  
From Oregon, USA, south to Chamela Bay, Jalisco, Mexico, including the whole Gulf of California,



Mexico (RICHARDSON, 1905; AUSTIN, 1985; BOWMAN, 1977; ESPINOSA-PÉREZ & HENDRICKX, 2001a).

195. *Ligia pallasii* Brandt, 1833  
From Kyska Harbor, Alaska south to Santa Cruz Island, California, USA (RICHARDSON, 1905; HATCH, 1947; BRUSCA et al., 2006).
196. *Ligidium gracile* (Dana, 1856)  
Aleutian Islands, Alaska to Santa Clara, California, USA (JACKSON, 1923; HATCH, 1947; BRUSCA et al., 2006).
197. *Ligidium hypnorum* (Cuvier, 1792)  
From Canada to coast of California, USA (JACKSON, 1923).
198. *Ligidium latum* Jackson, 1923  
San Francisco Bay to Santa Barbara, California, USA (BRUSCA et al., 2006).

#### Philosciidae Kinahan, 1857

199. *Littorophiloscia richardsonae* (Holmes & Gay, 1909)  
Vancouver Island, Canada south to Cedros Island, western Baja California, Mexico (GEORGE & STRÖMBERG, 1968; HATCH, 1947; BRUSCA et al., 2006).

#### Platyarthridae Vandel, 1946

200. *Niambia capensis* (Dollfus, 1895)  
From Washington to southern California, USA (BRUSCA et al., 2006). I-PAC.
201. *Platyarthrus aiasensis* Legrand, 1953  
Dana Point, California, USA (GARTHWAITE & TAITI, 1989). ATL. MED.

#### Porcellionidae Brandt, 1831

202. *Porcellio dilatatus* Brandt, 1833  
Coast of California, USA (BRUSCA et al., 2006). MED.
203. *Porcellio laevis* Latreille, 1804  
Coast of California, USA (BRUSCA et al., 2006). COSMO
204. *Porcellio scaber* Latreille, 1804  
From Queen Charlotte Island, British Columbia, Canada south to San Mateo, California, USA (HATCH, 1947; BRUSCA, et al., 2006). COSMO
205. *Porcellionides floria* Garthwaite & Sassaman, 1985  
Southern California, USA and Gulf of California, Mexico (GARTHWAITE & SASSAMAN, 1985; BRUSCA et al., 2006). ATL

#### Scyphacidae Dana, 1852

206. *Alloniscus mirabilis* (Stuxberg, 1875)  
From San Mateo, California, USA to Magdalena Bay, Mexico (SCHULTZ, 1984; BRUSCA et al., 2006).
207. *Alloniscus perconvexus* Dana, 1856  
From Tofino, British Columbia, Canada south to Magdalena Bay, west coast of Baja California, Mexico (MULAIK, 1960; GEORGE & STRÖMBERG, 1968).

208. *Armadilloniscus coronacapitalis* Menzies, 1950  
From Marin County to San Miguel and Anacapa Islands, California, USA (BRUSCA et al., 2006).
209. *Armadilloniscus holmesi* Arcangeli, 1933  
From British Columbia, Canada, to Magdalena Bay, west coast of Baja California, Mexico (MULAIK, 1960; BOWMAN, 1977; WALLERSTEIN, 1980; AUSTIN, 1985).
210. *Armadilloniscus lindahli* (Richardson, 1905)  
From Tomales Bay, southern California, USA to Cedros Island, western Baja California, Mexico (RICHARDSON, 1905; BRUSCA et al., 2006).
211. *Detonella papillicornis* (Richardson, 1904)  
Cook Inlet, Alaska to San Francisco Bay, California, USA (HATCH, 1957; BRUSCA et al., 2006). ART.

#### Trichoniscidae Sars, 1899

212. *Brackenridgia heroldi* (Arcangeli, 1932)  
Central and southern California, USA (BRUSCA et al., 2006).

#### Tylidae Dana, 1852

213. *Tylos punctatus punctatus* Holmes & Gay, 1909  
San Diego, California, USA, to Ensenada, west coast of Baja California, Mexico. Gulf of California, Mexico, Puerto Peñasco, Sonora to Mazatlan, Sinaloa (east coast) and la Paz, South Baja California (west coast) (SCHULTZ, 1970; AUSTIN, 1985; ESPINOSA-PÉREZ & HENDRICKX, 2001a).

### APPENDIX 2.

**List of species of isopods reported for the Peru-Chile and Magellan zoogeographic provinces (133 species). Species reported only in oceanic islands not included. Sequence of orders and families is according to BRANDT & POORE (2003).**

#### CYMOTHOIDA Wägele, 1989

##### Aegidae White, 1850

1. *Aega magnifica* (Dana, 1853)  
Gulf of Ancud, Strait of Magellan and Beagle Channel, Chile (MENZIES, 1962a; LORENTI & MARIANI, 1997; BRANDT et al., 1999; BRUCE, 2004). ATL.
2. *Aega semicarinata* Miers, 1875  
Gulf of Ancud and Juan Fernández Archipelago, Chile (NORDENSTAM, 1930; MENZIES, 1962a).
3. *Aega webbi* (Guérin-Meneville, 1836).  
Known only from Juan Fernández Archipelago, Chile (ROZBACYLO & CASTILLA, 1987; KENSLEY & SCHOTTE, 2006). MED (?).
4. *Aega uschakovi* Kussakin, 1967  
Coast of Chile (KENSLEY & SCHOTTE, 2006).
5. *Rocinela australis* Schiödte & Meinert, 1879  
Strait of Magellan, Chile (SCHIOEDTE & MEINERT, 1879).

**Corallanidae Hansen, 1890**

6. *Excorallana meridionalis* Carvacho & Yañez, 1971  
Chilean coasts north off Valparaiso, Chile (CARVACHO, 1977; LANCELOTTI & VASQUEZ, 2002).
7. *Lanocira hirsuta* Nordenstam, 1930  
Known only from Juan Fernández Archipelago, Chile (ROZBACYLO & CASTILLA, 1987).

**Cymothoidae Leach, 1814**

8. *Anilocra huacho* Rokicki, 1984  
From Huacho to Chancay, Peru (ROKICKI, 1984).
9. *Ceratothoa gaudichaudii* (H. Milne-Edwards, 1840)  
From southern California, USA, south to Cape Horn, Chile, including the whole Gulf of California, Mexico. Galapagos Islands (BRUSCA, 1981; MOLINA & MANRIQUE, 1996; ESPINOSA-PÉREZ & HENDRICKX, 2001a). I-PAC.
10. *Ceratothoa trigonocephala* (Leach, 1818)  
From Iquique to Talcahuano, Chile (ALDANA, et al., 1995). I-PAC.
11. *Elthusa raynaudi* (H. Milne-Edwards, 1840)  
Northern Gulf of Ancud, Chile (MENZIES, 1962a). I-PAC.

**Gnathiidae Leach, 1814**

12. *Caecognathia antarctica* (Studer, 1884)  
Beagle Channel, Chile (BRANDT et al., 1999). ANT.
13. *Caecognathia vanhoeffeni* (Menzies, 1962)  
Gulf of Ancud, Chile (MENZIES, 1962a).

**Tridentellidae Bruce, 1984**

14. *Tridentella laevicephalax* Menzies, 1962  
Northern and central Chile, from Mejillones Peninsula to Gulf of Ancud (MENZIES, 1962a; CARVACHO, 1977).

**Bopyridae Rafinesque, 1815**

15. *Anathelges thompsoni* Nierstrasz & Brender a Brandis, 1931.  
Valparaiso, Chile (NIERSTRASZ & BRENDER A BRANDIS, 1931; BOYKO & WILLIAMS, 2003).
16. *Ione ovata* Shiino, 1964  
San Vicente and Coliumo Bays, Concepcion, Chile (MUÑOZ, 1997; ASTETE-ESPINOZA & CACERES, 2000).
17. *Ionella agassizi* Bonnier, 1900  
San Vicente and Coliumo Bays, Concepcion, Chile (MUÑOZ, 1997; ASTETE-ESPINOZA & CACERES, 2000).
18. *Pseudione brattstroemi* Stuardo, Vega & Cespedes, 1986  
Coliumo Bay, Dichato, Chile (STUARDO, VEGA & CESPEDES, 1986; MUÑOZ, 1997).
19. *Pseudione chiloensis* Roman-Contreras & Wehrmann, 1997
20. *Pseudione galacanthae* Hansen, 1897  
Coast of Canada and into the Gulf of California, Mexico, and from Gulf of Penas to Strait of Magellan, Chile (BRUSCA, 1980; AUSTIN, 1985; STUARDO

et al., 1986; SALAZAR-VALLEJO & LEJIA-TRISTÁN, 1989). W-ATL

21. *Pseudione humboldtensis* Prado, Guisado & Acuña, 1998  
Off the coast of Chile, from 26°58'56"S to 32°01'81"S (PRADO et al., 1998).
22. *Pseudione tuberculata* Richardson, 1904  
Off Archipelago of Los Chonos south to Strait of Magellan, Chile (BOSCHMAN, 1962; MIRANDA-VARGAS & ROCCATAGLIATA, 2004). W-ATL.

**Paranthuridae Menzies & Glynn, 1968**

23. *Paranthura porteri* (Boone, 1920)  
From Arica south to Archipelago of Chiloe, Chile (LANCELOTTI & VASQUEZ, 2002).
24. *Paranthura skottsbergi* Nordenstam, 1930  
Known only from Juan Fernández Archipelago, Chile (ROZBACYLO & CASTILLA, 1987).
25. *Paranthura gracilipes* Nordenstam, 1930  
Known only from Juan Fernández Archipelago, Chile (ROZBACYLO & CASTILLA, 1987).
26. *Paranthura nana* Nordenstam, 1930  
Known only from Juan Fernández Archipelago, Chile (ROZBACYLO & CASTILLA, 1987).

**Cirolanidae Dana, 1853**

27. *Cirolana robusta* Menzies, 1962  
From Antofagasta to Concepcion, Chile (MENZIES, 1962a; CARVACHO, 1977).
28. *Cirolana urostylis* Menzies, 1962  
From Antofagasta to Boca del Guafo, Chile (MENZIES, 1962a; CARVACHO, 1977).
29. *Euryllana arcuata* (Hale, 1925)  
From San Francisco Bay, California, USA and Antofagasta, Chile (BRUSCA et al., 2006; CARVACHO, 1977). I-PAC. W-ATL.
30. *Exciorolana braziliensis* Richardson, 1912  
From the northern Gulf of California, Mexico, to Concepción, Chile (ESPINOSA-PÉREZ & HENDRICKX, 2001a). ATL.
31. *Exciorolana hirsuticauda* Menzies, 1962  
From Coquimbo south to Gulf of Ancud, Chile (MENZIES, 1962a; CARVACHO, 1977; JARAMILLO, 1982).
32. *Exciorolana monodi* Carvacho, 1977  
From Aconcagua Province to Gulf of Ancud, Chile (CARVACHO, 1977; JARAMILLO, 1982).
33. *Natanolana albinota* (Vanhöffen, 1914)  
Northern Gulf of Ancud, Chile (MENZIES, 1962a).
34. *Natanolana californiensis* (Schultz, 1966)  
From southern California, USA, and in the Gulf of California, Mexico, to Perú-Chile Trench (ESPINOSA-PÉREZ & HENDRICKX, 2001a).
35. *Natanolana chilensis* (Menzies, 1962)  
Gulf of Ancud, Chile (MENZIES, 1962a).
36. *Natanolana pastorei* (Giambiagi, 1924)  
Strait of Magellan to Punta Arenas, Chile; doubtful in Beagle Channel (WÄGELE & BRUCE, 1989;

LORENTI & MARIANI, 1997; BRANDT et al., 1999). W-ATL.

37. *Pseudolana concinna* (Hale, 1925)  
Gulf of Ancud, Chile (MENZIES, 1962a). I-PAC.

#### LIMNORIIDEA Brandt & Poore, 2002

##### Limnoriidae White, 1850

38. *Limnoria chilensis* Menzies, 1962  
From Valparaiso south to Archipelago of Los Chonos, Chile (LANCELLOTTI & VASQUEZ, 2002). W-ATL.

#### SPHAEROMATIDEA Wägele, 1989

##### Sphaeromatidae Latreille, 1825

39. *Amphoroidea typa* H. Milne-Edwards, 1840  
Coast of Chile, from Coquimbo to Port Lagunas (MENZIES, 1962a).
40. *Cassinidopsis emarginata* (Guérin-Méneville, 1943)  
Strait of Magellan to Cape Horn, Chile (LANCELLOTTI & VASQUEZ, 2002). W-ATL.
41. *Cymodocella foveolata* Menzies, 1962  
Northern and central Chile, from Iquique to Archipelago of Los Chonos (MENZIES, 1962a).
42. *Dynamenella acuticauda* Menzies, 1962  
Southern coast of Chile, from Point Corona to Point Arenas, Strait of Magellan, Chile (MENZIES, 1962a).
43. *Exosphaeroma gigas* (Leach, 1818)  
From San Vicente Bay south to Strait of Magellan and Beagle Channel, Chile (MENZIES, 1962a; BRANDT et al., 1999; THIEL, 2002). I-PAC.
44. *Exosphaeroma lanceolata* (White, 1847)  
From northern Iquique south to Cape Horn, Chile (MENZIES, 1962a; LANCELLOTTI & VASQUEZ, 2002). W-ATL. I-PAC.
45. *Exosphaeroma studeri* Vanhoeffen, 1914  
Strait of Magellan, Chile (MENZIES, 1962a; LORENTI & MARIANI, 1997).
46. *Ischyromene eatoni* (Miers, 1875)  
From Valparaiso south to Point Santa Maria, Strait of Magellan, Chile (MENZIES, 1962a).
47. *Ischyromene tuberculata* (Menzies, 1962)  
Coquimbo to Point Corona, Chile (MENZIES, 1962a).
48. *Isocladus bahamondei* Carvacho, 1997  
Coast of Chile, from Concepción Bay to off Lar River (CARVACHO, 1997).
49. *Isocladus calcareus* (Dana, 1853)  
From Coquimbo south to Cape Horn, Chile (LANCELLOTTI & VASQUEZ, 2002). W-ATL. I-PAC.
50. *Isocladus integra* (Heller, 1868)  
Coast of Chile (KENSLEY & SCHOTTE, 2006).
51. *Moruloidea darwini* (Cunningham, 1871)  
Strait of Magellan and Beagle Channel, Chile (MENZIES, 1962a; LORENTI & MARIANI, 1997). W-ATL.

52. *Paradella bakeri* (Menzies, 1962)  
Iquique to Point Corona, Chile (MENZIES, 1962a; LANCELLOTTI & VASQUEZ, 2002).
53. *Pseudosphaeroma lundae* (Menzies, 1962)  
Known only from Chile, Coquimbo to Archipelago of Los Chonos (MENZIES, 1962a; CARVACHO, 1975).
54. *Sphaeroma gayi* Nicolet, 1849  
Coast of Chile (KENSLEY & SCHOTTE, 2006).
55. *Sphaeroma propinqua* Nicolet, 1849  
Coast of Chile (KENSLEY & SCHOTTE, 2006).

##### Serolidae Dana, 1852

56. *Acanthoserolis schythei* (Lukten, 1858)  
Gulf of Ancud south to Cape Horn, Chile (MENZIES, 1962a; LANCELLOTTI & VASQUEZ, 2002).
57. *Cristaserolis gaudichaudii* (Audouin & Milne-Edwards, 1841)  
From Valparaiso south to Strait of Magellan, Chile (MENZIES, 1962a; LORENTI & MARIANI, 1997; LANCELLOTTI & VASQUEZ, 2002). W-ATL.
58. *Cristaserolis plana* (Dana, 1853)  
Point Wether, Boca de Guafo, south to Cape Horn, Chile (AUDOUIN & MILNE-EDWARDS, 1841; LANCELLOTTI & VASQUEZ, 2002).
59. *Neoserolis exigua* (Nordenstam, 1933)  
Beagle Channel, Chile (BRANDT et al., 1999). W-ATL.
60. *Septemserolis ovata* (Sheppard, 1957)  
Beagle Channel, Chile (BRANDT et al., 1999). ANT.
61. *Serolis paradoxa* (Fabricius, 1775)  
From Valparaiso south to Cape Horn, Chile (MENZIES, 1962a; LANCELLOTTI & VASQUEZ, 2002). ATL.
62. *Thysanoserolis elliptica* (Sheppard, 1933)  
Strait of Magellan, Chile (LORENTI & MARIANI, 1997). W-ATL.

##### ASELLOTA Latreille, 1803

##### Acanthaspidiidae Menzies, 1962

63. *Ianthopsis bovalli* (Studer, 1884)  
Strait of Magellan and Beagle Channel, Chile (LORENTI & MARIANI, 1997; BRANDT et al., 1999). W-ATL.
64. *Ianthopsis laevis* Menzies, 1962  
From Gulf of Ancud to Strait of Magellan, Chile (MENZIES, 1962a; WINKLER, 1992).

##### Janiridae Sars, 1897

65. *Austrofilus furcatus* (Hodgson, 1910)  
Beagle Channel, Chile (BRANDT et al., 1999).
66. *Iais chilense* (Winkler, 1992)  
Known only from Las Cruces, Province of Santiago, Chile (WINKLER, 1992).
67. *Iais pubescens* (Dana, 1853)  
South coast of Chile, from Gulf of Ancud to Strait of Magellan (MENZIES, 1962a). ANT.
68. *Ianiropsis chilensis* Menzies, 1962  
Gulf of Ancud south to Strait of Magellan, Chile (MENZIES, 1962a).

69. *Ianiropsis kussakini* Carvacho, 1982  
Province of Concepcion (36-37°S), Chile (CARVACHO, 1982).
70. *Ianiropsis perplexus* Menzies, 1962  
Archipelago of Los Chonos, Chile (MENZIES, 1962a).
71. *Ianiropsis tridens* Menzies, 1952  
From San Juan Islands, Washington south to Monterey County, California, USA. A single record at Iquique, Chile (MENZIES, 1952; 1962a; WETZER et al., 1991; BRUSCA et al., 2006).
72. *Ianiropsis varians* Winkler & Brandt, 1993  
Strait of Magellan, Chile (BRANDT et al., 1999)
73. *Iathrippa hirsuta* (Carvacho, 1981)  
Known only from Dichato Beach, Concepcion, Chile (CARVACHO, 1981).
74. *Iathrippa menziesi* Sivertsen & Holthuis, 1980  
From Gulf of Ancud to Strait of Magellan, Chile (MENZIES, 1962a).
75. *Iathrippa multidentis* Menzies, 1962  
Strait of Magellan (53°11'S, 70°55'W), Chile (MENZIES, 1962a).
76. *Iathrippa longicauda* (Chilton, 1884)  
Coast of Chile; doubtful record from Beagle Channel, Chile (MENZIES, 1962a; BRANDT et al., 1999). I-WPAC. W-ATL.
77. *Janira hirsuta* Carvacho, 1981.  
Known only from Dichato Beach, Concepcion, Chile (CARVACHO, 1981).
78. *Neojaera antarctica* (Pfeffer, 1887)  
Strait of Magellan and Beagle Channel, Chile (WINKLER & BRANDT, 1993; BRANDT et al., 1999). ANT
79. *Neojaera elongatus* Menzies, 1962  
From Iquique south to Valparaiso, Chile (MENZIES, 1962a).
80. *Notasellus chilensis* (Menzies, 1962)  
Gulf of Ancud to Strait of Magellan, Chile (MENZIES, 1962a; WINKLER & BRANDT, 1993; BRANDT et al., 1999). ANT

#### Joeropsididae Nordenstam, 1933

81. *Joeropsis bidens* Menzies, 1962  
North coast of Chile, from Iquique south to Gulf of Ancud (MENZIES, 1962a).
82. *Joeropsis curvicornis* (Nicolet, 1849)  
Strait of Magellan to Beagle Channel, Chile (LORENTI & MARIANI, 1997; BRANDT et al., 1999). W-ATL.
83. *Joeropsis intermedius* Nordenstam, 1933  
Beagle Channel to north of the gulf of Ancud, Chile (MENZIES, 1962a; LORENTI & MARIANI, 1997; BRANDT et al., 1999). W-ATL.

#### Munnidae Sars, 1897

84. *Munna chilensis* Menzies, 1962  
Strait of Magellan and Beagle Channel, Chile (MENZIES, 1962a; BRANDT et al., 1999).

85. *Munna gallardoi* Winkler, 1992  
Strait of Magellan and Beagle Channel, Chile (LORENTI & MARIANI, 1997; BRANDT et al., 1999)
86. *Munna lundae* Menzies, 1962  
Known only from Strait of Magellan (53°11' S, 70°55' W), Chile (MENZIES, 1962a).
87. *Munna spicata* Thodorczyk & Wägele, 1994  
Beagle Channel, Chile (BRANDT et al., 1999)
88. *Uromunna nana* (Nordenstam, 1933)  
From Iquique, northern Chile, south to Strait of Magellan and Beagle Channel (MENZIES, 1962a; BRANDT et al., 1999).
89. *Uromunna schauinslandi* (G.O. Sars, 1905)  
Gulf of Ancud, Guar Island, Chile (MENZIES, 1962a).

#### Munnopsidae Sars, 1969

90. *Ilyarachna antarctica* Vanhöffen, 1914  
Beagle Channel, Chile (BRANDT et al., 1999). ANT

#### Paramunnidae Vanhöffen, 1914

91. *Allostrata ovalis* Winkler, 1994  
Strait of Magellan and Beagle Channel, Chile (WINKLER, 1994; BRANDT et al., 1999).
92. *Austrosignum dentatum* Winkler, 1994  
Strait of Magellan and Beagle Channel, Chile (WINKLER, 1994; BRANDT et al., 1999).
93. *Austrosignum globifrons* Menzies, 1962  
Known only from Strait of Magellan, Chile (MENZIES, 1962a).
94. *Austrosignum grande* Hodgson, 1910  
Northern Gulf of Ancud, E Tenglo Island, Chile (MENZIES, 1962a).
95. *Austrosignum latifrons* Menzies, 1962  
Northern Gulf of Ancud, E Quellin Island, Chile (MENZIES, 1962a).
96. *Magellianira serrata* Winkler, 1994  
Known only from Strait of Magellan (WINKLER, 1994).
97. *Munnogonium trillerae* (Menzies & Barnard, 1959)  
From Satellite Channel, British Columbia, Canada. A single record for the Strait of Magellan, Chile (MENZIES & BARNARD, 1959; WETZER et al., 1991; WINKLER, 1994).
98. *Paramunna integra* Nordenstam, 1933  
Strait of Magellan and Beagle Channel, Chile (WINKLER, 1994; BRANDT et al., 1999).
99. *Paramunna magellanensis* Winkler, 1994  
Strait of Magellan and Beagle Channel (WINKLER, 1994; BRANDT et al., 1999).
100. *Paramunna menziesi* Winkler, 1994  
Known only from Strait of Magellan (WINKLER, 1994).
101. *Paramunna parasimplex* Winkler, 1994  
Strait of Magellan and Beagle Channel, Chile (WINKLER, 1994; BRANDT et al., 1999).
102. *Paramunna patagoniensis* Winkler, 1994  
Known only from Strait of Magellan (WINKLER, 1994).

103. *Paramunna simplex* Menzies, 1962  
From Seno Reloncavi, northern Gulf of Ancud, south to Strait of Magellan, Chile (MENZIES, 1962a; WINKLER, 1994).
104. *Paramunna subtriangulata* (Richardson, 1908)  
Strait of Magellan, Chile (MENZIES, 1962a; WINKLER, 1994).
105. *Pleurosignum chilense* Menzies, 1962  
Gulf of Ancud to Strait of Magellan, Chile (MENZIES, 1962a; BRANDT et al., 1999).
106. *Pleurosignum magnum* Vanhöffen, 1914  
Northern Gulf of Ancud, Maillen Island, Chile (MENZIES, 1962a). ANT.

#### Santiidae Wilson, 1987

107. *Santia compacta* Siversten & Holthuis, 1980  
Strait of Magellan and Beagle Channel, Chile (WINKLER, 1994; BRANDT et al., 1999). S-ATL
108. *Santia dimorphis* (Menzies, 1962)  
From Archipelago of Chiloe south to Cape Horn, Chile (LANCELLOTTI & VASQUEZ, 2002).
109. *Santia hispina* (Vanhöffen, 1914)  
Strait of Magellan and Beagle Channel, Chile (WINKLER, 1994; BRANDT et al., 1999). S and W-ATL.
110. *Santia laevifrons* (Menzies, 1962)  
Central coast of Chile, from Montamar south to Peñon Blanco, Chonos Archipelago (MENZIES, 1962a; LANCELLOTTI & VASQUEZ, 2002).
111. *Santia mawsoni* (Hale, 1937)  
From Montamar, N of Valparaiso, to Cape Horn (LANCELLOTTI & VASQUEZ, 2002).

#### VALVIFERA Sars, 1882

##### Arcturidae Dana, 1849

112. *Astacilla diomedea* Benedict, 1898  
Strait of Magellan, Chile (RICHARDSON, 1909).
113. *Litarcturus americanus* (Beddard, 1886)  
Strait of Magellan, Chile (MENZIES, 1962a).
114. *Neastacilla magellanica* (Ohlin, 1901)  
Strait of Magellan, Chile; doubtful record in the Beagle Channel (OHLIN, 1901; MENZIES, 1962a; BRANDT et al., 1999).
115. *Rectarcturus kophameli* (Ohlin, 1901)  
Strait of Magellan, Chile (LORENTI & MARIANI, 1997). W-ATL
116. *Rectarcturus tuberculatus* Schultz, 1981  
Strait of Magellan, Chile (LORENTI & MARIANI, 1997). W-ATL
117. *Xenarcturus spinulosus* Sheppard, 1957  
Strait of Magellan, Chile (LORENTI & MARIANI, 1997). W-ATL

##### Chaetiliidae Dana, 1849

118. *Chaetilia paucidens* Menzies, 1962  
From Montamar, north of Valparaiso to Chiloe Island, Chile (MENZIES, 1962a; JARAMILLO, 1982).
119. *Macrochiridothea kruimeli* Nierstrasz, 1918  
Strait of Magellan, Chile (MENZIES, 1962a). ANT.
120. *Macrochiridothea mehuinensis* Jaramillo, 1977  
Southern Chile (JARAMILLO, 1982).
121. *Macrochiridothea michaelseni* Ohlin, 1901  
Strait of Magellan, Chile (MENZIES, 1962a).
122. *Macrochiridothea setifer* Menzies, 1962  
Southern Chile (MENZIES, 1962a; JARAMILLO, 1982).
123. *Macrochiridothea stebbingi* Ohlin, 1901  
Gulf of Ancud from Strait of Magellan and Beagle Channel, Chile (MENZIES, 1962a; LORENTI & MARIANI, 1997; BRANDT et al., 1999). W-ATL

##### Holognathidae Thomson, 1904

124. *Cleantis chilensis* Menzies, 1962  
Known only from Tocopilla, Chile (MENZIES, 1962a).
125. *Cleantis gayi* Miers, 1881  
Coast of Chile (KENSLEY & SCHOTTE, 2006).
126. *Cleantis linearis* Dana, 1849  
Central Chile (MENZIES, 1962a).

##### Idoteidae Samouelle, 1819

127. *Edotia chilensis* (Gay, 1849)  
Coast of Chile (KENSLEY & SCHOTTE, 2006).
128. *Edotia dahli* Menzies, 1962  
Northern Valparaiso south to Strait of Magellan, Chile (MENZIES, 1962a).
129. *Edotia doellojuradoi* Giambiagi, 1922  
Coast of Chile (KENSLEY & SCHOTTE, 2006). W-ATL.
130. *Edotia magellanica* Cunningham, 1871  
From Santiago Bay south to Strait of Magellan, Chile (MENZIES, 1962a; JARAMILLO, et al., 1981).
131. *Edotia transversa* Menzies, 1962  
Gulf of Ancud, Chile (MENZIES, 1962a).
132. *Edotia tuberculata* Guérin-Méneville, 1843  
Strait of Magellan, Chile (MENZIES, 1962a). W-ATL.
133. *Idotea metallica* Bosc, 1802  
Coast of California, USA, and Gulf of California, Mexico and from Montevideo to Beagle Channel, Chile (RICHARDSON, 1905; SCHULTZ, 1969; BRANDT et al., 1999; BRUSCA et al., 2006). COS.

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