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Chapter 22

An Annotated Checklist and Bibliography of Deep-Water Isopods and Decapod Crustaceans from Chile, Including the Submarine Ridge Salas y Gomez and Nazca Plates



M. A. Retamal, G. Guzmán, and P. De los Ríos-Escalante

Abstract A list of deep-water species (> 200 m depth) of isopods and decapod crustaceans from off Chile is presented, including the areas of South America, the Antarctic, and offshore islands. Also included are the species that were collected in the Nazca and Sala y Gómez seamounts areas during the ex-Soviet Union Expeditions in the 1970s (1973–1978), although not all species found during these expeditions have not yet been recorded for Chilean waters but in international waters. Isopods were represented by nine species only, four in the Perú-Chile Trench, three off Chiloé, and two in the Magellan Strait. In the case of the decapods, 143 species have been reported in Chile, mostly within the suborder Pleocyemata (134 spp.). These 143 species are grouped in 42 families, 5 of these in the Dendrobranchiata.

Keywords Crustacea · Decapoda · Isopoda · Deep-sea · Pacific Ocean · Antarctic Ocean · Chile

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22.1 Introduction

With over 12,000 described species (Appletans et al. 2012; Poore and Bruce 2012), isopods and decapods crustaceans it is the of the most abundant group of Crustacea. In Chilean waters, this group is represented by about 475 species (Retamal and Moyano 2010; Retamal and Ferrada 2016), thus representing about 4% of known species of the world. Chile is a three continents country, and its coasts are under the influence of subantarctic, insular, and continental waters. The continental coast, measured along a straight line, is about 4000 km long. The Chilean maritime territory includes several insular territories, which are the Juan Fernández Archipelago, Desventuradas Islands with two main islands (San Felix and San Ambrosio islands), the isolated territories of Easter Island, and the tiny Sala y Gómez Island. Remarkably, Easter and Sala y Gomez islands are inhabited by both tropical species linked to the Indo-Pacific Ocean and by species with affinities to the Antarctic territory fauna, between 56°W and 93°W. In these islands, the isopods and crustaceans fauna is very scarce. The northern Chilean continental waters have an average temperature of 20 °C, while the southern waters can reach extreme temperatures of 3–4 °C. Consequently, we find a low variety of isopod and decapod crustaceans in the area, from typical tropical species to subantarctic species.

The list included in this contribution is mostly based on previously published literature and on some unpublished information. Deep-water benthic isopods have been studied first by Beddard (1886), Menzies (1962), and Brandt (1998) in Chiloé islands. Other contributions deal with northern Chile (Brusca and Ninos 1978; Brandt and Wägele 1989; Aydogan et al. 2000) and the Magellan Strait (Park and Wägele 1965; Lorenti and Mariani 1997). Benthic and pelagic deep-water Dendrobranchiata (shrimps) of Chile have been studied mostly by G. Guzmán who produced several contributions on this group of species (e.g., Guzmán and Wicksten 1998, 2000; Guzmán 2004, 2008). Deep-water Pleocyemata (lobsters, hermit crabs, squat lobsters, and true crabs) of Chilean waters has been studied by many authors since the first British expeditions (R/V “Beagle” in 1831–1836; the H.M.S. “Challenger” in 1873–1876) and North American expeditions (U.S.S. “Albatross” in 1888, and U.S.S. “Blake” in 1885–1889) visited the area. More recently, the Swedish Expedition “Lund” (1948–1949) and the Royal Society of Chile Expedition (1958–1959) also made significant contributions to the study of this fauna. In addition, several isolated pioneer contributions were proposed by Molina (1782), Poëppig (1835), d’Orbigny (1842), Philippi (1887), Porter (1901), and Rathbun (1907). Later in the XX century, starting in the 1950s, a long list of contributions was the result of a large group of young Chilean scientists with strong interest for decapod crustaceans (e.g., Guzmán 2003, 2004, 2008).

Between 1950 and 1970, Soviet expeditions have explored the area, collecting and identifying a significant amount of deep-water species of decapods on the Nazca and Salas y Gómez Plates, referred to as “the oceans ridge,” near the Juan Fernandez Archipelago. Several species were also collected slightly further than the Chilean EEZ boundary (Parin et al. 1997). In these contributions (i.e., Vereshchaka

1990; Parin et al. 1997; Zhadan 1997), some species collected near the Chilean offshore islands (Pascua and Salas y Gómez) were included because they occur within the limits of Chile Exclusive Economic Zone (EEZ). Other species were captured much further from Chilean territories (> 350 nm offshore), in international waters, and were also included in this contribution as they might also occur closer to the continent. Species of this group have been collected mainly on the submerged ridge Sala y Gómez and Nazca during the 15° cruise of the R/V “Professor Metsayev,” the 5° cruise of the R/V “Ikhtiandr” (VNIRO), and the 18° cruise of the R/V “Professor Stockman”. They were found in Chilean waters, near the continent but also near the Juan Fernandez Archipelago, and several species occur slightly further than the EEZ boundary (see Parin et al. 1997). Isopod records were obtained by literature reviewing (Beddard 1886; Menzies 1962; Park and Wagele 1965; Brusca and Ninos 1978; Brandt and Wägele 1989; Lorenti and Mariani 1997; Brandt 1998; Aydogan et al. 2000). The list included in this contribution is mostly based on previously published literature and on some unpublished information.

22.2 Material and Methods

Literature dealing with isopods and decapod crustaceans of Chile was reviewed, and a list of species occurring deeper than 200 m was established. Distribution in Chilean waters is provided for each species, either as a geographic range or as more specific localities (latitude and longitude provided when available), together with the depth range recorded in the area. Species originally collected and/or reported by the Soviet expeditions are indicated (*) and are those reported by Burukovsky (1990), Vereshchaka (1990), Parin et al. (1997), Zhadan (1997), and Zarenkov (1990).

Species have been classified according to De Grave et al. (2009), Poore, and Bruce (2012), and recent changes included in WoRMS (WoRMS editorial board, 2020). Within each family and genus, genera and species are classified in alphabetic order. In this contribution we have focused more on records of benthodemersal or benthopelagic species than on pelagic species. For further information on pelagic species, see the contribution in this volume by Guzmán and Olguin (Chap. 12).

22.3 Results

22.3.1 Systematic Section

Superorder Peracarida.

Order Isopoda.

Suborder Asellota.

Superfamily Janiroidea.

Family Ischnomesidae Hansen, 1916.

1. *Ischnomesus bacilloides* (Beddard, 1886) [= *Ischnosoma bacilloides* Beddard, 1886, former name basionym]. 42°43'S, 82°11'W, 2610 m (Beddard 1886).

Family Joeropsididae Nordenstam, 1933.

2. *Joeropsis bidens* Menzies, 1962. Gulf of Ancud, 42°46'S, 72°59'W, 250–300 m and intertidal zone (Menzies 1962).

Family Macrostylidae Hansen, 1916.

3. *Macrostylis dellacrocei* Aydogan, Wägele and Park, 2000. 23°15'S, 71°21'W, 7800 m (Aydogan et al. 2000).

Family Munnopsidae Lilljeborg, 1864.

4. *Munneurycope hadalis* Aydogan, Wägele and Park, 2000. 23°15'S, 71°21'W, 7800 m (Aydogan et al. 2000).

Suborder Cymothoidea.

Superfamily Cymothoidea.

Family Cirolanidae Dana, 1852.

5. *Cirolana diminuta* Menzies, 1962. Peru-Chile (?), 40–2000, dominant at depth > 700 m (Brusca and Ninos 1978).
6. *Natolana pastorei* (Giambiagi, 1925). Magallanes Strait (no specific locality), 120–515 m. (Lorenti and Mariani 1997).

Suborder Sphaeromatidea.

Superfamily Sphaeromatoidea.

Family Sphaeromatidae Latreille, 1825.

7. *Caecocassidias patagonica* Kussakin, 1967. 43°40'S, 59°35'W, 400–500 m (Brandt 1998).
8. *Exosphaeroma gigas* (Leach, 1818). Peru-Chile (no specific locality), 0–270 m (Brandt and Wägele 1989).

Suborder Valvifera.

Family Rectarcturidae Poore, 2001.

9. *Rectarcturus tuberculatus* Schultz, 1981. Magallanes Strait (no specific locality), 35–3500 m (Lorenti and Mariani 1997; Park and Wägele 1965).

Superorder Eucarida.**Order Decapoda.****Suborder Dendrobranchiata.**

Family Aristeidae Wood-Mason, 1891.

1. *Aristaeomorpha foliacea* (Risso, 1827) (*). Close to seamount Dome Salas y Gómez Ridge (25°04'S, 97°26'W), 200–800 m depth (Burukovsky 1990).

Family Benthescymidae.

2. *Benthoecetes tanneri* (Faxon, 1893). From 18°45'S to 21°19'S, 505–520 m (Guzmán and Wicksten 2000).
3. *Dalicularis altus* (Spence Bate, 1881). 18°25'S, 485 m, and 20°47'S, 950 m (Guzmán and Wicksten 2000).
4. *Maorrancais investigatoris* (Alcock and Anderson, 1899) (*). Seamounts Amber, Pearl, and Ichthyologist, Salas y Gomez Ridge (Burukovsky 1990).

Family Solenoceridae Wood-Mason, 1891.

5. *Hadropenaeus lucasii* Bate, 1881 (*). Seamounts Big, Yarala, Pearl, MayDay, Dome, and Cliff of the Salas y Gomez Ridge (Burukovsky 1990).
6. *Haliporoides diomedea* (Faxon, 1893) Arica (18°25'S, 71°22'W) to Puerto Bueno (50°59'S, 74°13'W), 240–1886 m (Retamal 1994b).
7. *Hymenopenaeus halli* Bruce, 1966 (*). Off Seamount Ichthyologist, Salas y Gómez Ridge (25°07'S, 99°35'W) (Burukovsky 1990).

Family Sicyoniidae Ortmann, 1898.

8. *Sicyonia nasica* Burukovsky, 1990 (*). Off seamounts Dome, New, Dorofeeva, and Yarala, Salas y Gomez Ridge (Burukovsky 1990).

Family Penaeidae Rafinesque, 1815.

9. *Metapenaeopsis stokmani* Burukovsky, 1990 (*). Seamounts Big and Dome, Salas y Gomez Ridge (Burukovsky).

Suborder Pleocyemata.

Infraorder Stenopodoidea.

Family Spongicolidae Schram, 1986.

10. *Spongicoloides* aff. *galapagensis* Goy, 1980. Off Cobquecura (36°00'S), 1000 m (Guzmán and Sellanes 2011).
11. *Spongicola parvispina* Zarenkov, 1990 (*). Seamount Ichthyologist, Salas y Gomez Ridge (Zarenkov 1990).

Infraorder Caridea.

Family Nematocarcinidae Smith, 1884.

12. *Nematocarcinus lanceopes* Bate, 1888. Off Chiloé (42°35'S, 74°48'W), 276–597 m (Guzmán and Quiroga 2005).
13. *Nematocarcinus longirostris* Bate, 1888. SW of Valparaíso (33°02'S, 71°06'W) to SW of Valdivia, (39°48'S, 73°14'W) 2516–2654 m (Retamal 1994b).
14. *Nematocarcinus* aff. *productus* Bate, 1888. Off Antofagasta (22°48'S, 70°23'S), 1775 m (Guzmán and Quiroga 2005).
15. *Nematocarcinus pseudocursor* Burukovsky, 1990 (*). In seamount “Soldier” of Nazca Ridge and Seamounts Ichthyologist, Pearl, and Amber og Salas y Gomez Ridge (Burukovsky 1990).
16. *Nematocarcinus undulatipes* Bate, 1888 (*). Seamount South Tropic, Nazca Ridge, and Seamount Ichthyologist, Salas y Gomez Ridge (Burukovsky 1990).

Family Processidae Ortmann, 1896.

17. *Processa pygmaea* Burukovsky, 1990 (*). Seamounts Dome and Ichthyologist, Salas y Gomez Ridge (Burukovsky 1990).

Family Campylonotidae Solaud, 1913.

18. *Campylonotus semistriatus* Bate, 1888. Off Iquique (20°12'S, 70°09'W) to Chernuca Harbor (52°45'S, 73°46'W), 276–1424 m (Torti and Boschi 1976).
19. *Campylonotus vagans* Bate, 1888. Valparaíso (33°02'S, 71°06'W) to Wollaston Islands, 18–320 m (Torti and Boschi 1976).

Family Alpheidae Rafinesque, 1815.

20. *Alpheus romensky* Burucovsky, 1990 (*). Seamount Pearl, Salas y Gomez Ridge (Burukovsky 1990).

Family Hippolytidae Bate, 1888.

21. *Chorismus antarcticus* (Pfeffer, 1887). Andvord Bay, Antarctic, 15–915 m (Holthuis 1952).

Family Thoridae Kingsley, 1879.

22. *Eualus dozei* (A. Milne-Edwards, 1891). From off Concepción (36°33'S) to Grey Island (55°6'S, 67°40'W), 15–270 (Retamal 1994a).
23. *Lebbeus antarcticus* Hale, 1941. From off Antofagasta to southern Chile, 1775–2598 m (Guzmán and Quiroga 2005).
24. *Lebbeus bidentatus* Zarenkov, 1976. Peru-Chile Trench, 1680 m (Wicksten and Méndez 1982). Not reported off Chile, but the Peru-Chile Trench connects to the deep water in the SEP.
25. *Lebbeus carinatus* Zarenkov, 1976. Off Chile, 1800 m (Zarenkov 1976).
26. *Lebbeus scripssi* Wicksten and Méndez, 1982. Off Arica (18°40'S, 70°36.00'W), 768–968 m (Wicksten and Méndez 1982).
27. *Leontocaris pacificus* Zarenkov, 1976. Off Chile, 600–700 m (Zarenkov 1976).
28. *Merhippolyte* aff. *americana* Holthuis, 1961. 42°35.35'S, 74°48.33'W, 507 m (Guzmán and Quiroga 2005).

Family Phyetocarididae, Chace, 1940.

29. *Phyetocaris microphthalma* Chace. Off Arica (18°25'S, 71°43'W), 513 m. (Guzmán 1999).

Family Palaemonidae Rafinesque, 1815.

30. *Bathymenes alcocki* (Kemp, 1922) (*). Seamounts Cliff and Dome, Salas y Gomez Ridge (Burukovsky 1990).

Family Pandalidae Haworth, 1825.

31. *Heterocarpus fenneri* (Crosnier, 1986) (*). Seamounts Dome and Pearl, Salas y Gomez Ridge (Burukovsky 1990).

Remark. See Burukovsky (1990) for the taxonomic status of this species, referred as *Plesionika fenneri* Crosnier 1986.

32. *Heterocarpus laevigatus* Bate, 1888 (*). Seamounts Amber, Communard, Dome, May Day, Pillar, and Pearl, Salas y Gomez Ridge (Burukovsky 1990).
33. *Heterocarpus reedi* Bahamonde, 1954. Between Tal-Tal and Saavedra Harbor, 200–1000 m (Bahamonde 1955).
34. *Heterocarpus sibogae* de Man, 1917(*). Seamounts Amber, Cliff, Dome, May Day, New, Pearl, Pillar, and Yarala, Salas y Gomez Ridge (Burukovsky 1990).
35. *Pandalina nana* Burukovsky, 1990 (*). Seamounts Dome, New, and Amber, Salas y Gomez Ridge (Burukovsky 1990).
36. *Pandalus amplus* (Bate, 1888). Off Antofagasta, 560–2000 (Zabala and Bahamonde 1998). Off Concepción and off Chiloe (Guzmán & Quiroga 2005).
37. *Plesionika edwardsii* (Brandt, 1851) (*). Seamounts Cliff, Ichthyologist, Long, and New, Sala y Gómez Ridge (Burukovsky 1990).
38. *Plesionika ensis* (A. Milne-Edwards, 1881) (*). Seamounts Amber, Dome Pearl and Yarala, Sala y Gómez Ridge (Burukovsky 1990).
39. *Plesionika martia* (A. Milne-Edwards, 1881) (*). Seamounts Amber, Dome, and Ichthyologist, Sala y Gómez Ridge (Burukovsky 1990).
40. *Plesionika ocellus* (Bate, 1888) (*). Seamount Dome, Sala y Gómez Ridge (Burukovsky 1990).

41. *Plesionika santaecatalinae* (Wicksten & Mendez, 1983). 21°20'S, 70°26'W (Retamal and Soto 1995).
42. *Plesionika* aff. *williamsi* Forest, 1963 (*). Seamount Yarala, Sala y Gómez Ridge (Burukovsky 1990).
43. *Stylopandalus richardi* (Coutière, 1905). Off Caldera (27°04'S, 70°49'W), Valparaíso, Archipélago Juan Fernández (33°38'S, 78°50'W), to former Desventuradas Islands, and near Easter Island, 500–1000 m (Guzmán and Rivera 2002).

Family Stylodactylidae Spence Bate 1888.

44. *Stylodactylus pubescens* Burukovsky, 1990 (*). Seamount May Day, Sala y Gómez Ridge (Burukovsky 1990).

Family Crangonidae Haworth, 1825.

45. *Aegaeon rathbuni* de Man, 1918 (*). Seamount Dome, Sala y Gómez Ridge (Burukovsky 1990).
46. *Metacrangon bahamondei* Retamal and Gorny, 2003. (55°44'S, 66°14'W) 413–746 m (Retamal and Gorny 2003).
47. *Metacrangon procax* Faxon, 1853. Antofagasta to Chiloé, 1351 m (Guzmán and Quiroga 2005).
48. *Notocrangon antarcticus* (Pfeffer, 1887). Foster, Andvord and South Bays, Antarctic Peninsula, 250–760 m (Retamal 1976).
49. *Paracrangon areolata* Faxon, 1893. Between 35°31'S, 73°04'W and 35°43'S, 73°16'W; off Iquique; 580–800 m (Báez and Soto 1997).
50. *Parapontophilus gracilis* (Smith, 1882). 22°48'S, 70°42'W, 1775 m (Guzmán and Quiroga 2005).
51. *Parapontophilus junceus* (Spence Bate, 1888) (*). Seamounts Amber, Ichthyologist, and Pearl, Sala y Gómez Ridge (Burukovsky 1990).
52. *Parapontophilus occidentalis* (Faxon, 1893). 22°48'S, 70°42'W, 1775 m (Guzmán & Quiroga 2005).
53. *Philocheras nikiforovi* (Burukovsky, 1990) (*). Seamounts Dome and Big, Sala y Gómez Ridge (Burukovsky 1990).
54. *Sclerocrangon atrox* Faxon, 1893. Chilean Patagonia (53°23'S to 50°02'S, 76°20'W to 76°20'W), 693–680 m (Bahamonde 1981).

Family Glyphocrangonidae Haworth, 1825.

55. *Glyphocrangon alata* (Faxon, 1893). Between Iquique (20°12'S, 70°09'W) and Lebu, 600–1300 m (Retamal 1994b).
56. *Glyphocrangon loricata* (Faxon, 1895). Off Iquique (20°12'S, 70°09'W) and Algarrobo (33°22'S, 71°40'W), 434–757 m (Retamal 1994b).
57. *Glyphocrangon wagini* Burukovsky, 1990 (*). Seamounts Amber, Ichthyologist, and Pearl, Sala y Gómez Ridge (Burukovsky 1990).

Infraorder Astacidea.

Family Nephropidae Dana, 1852.

58. *Nephropsis occidentalis* Faxon, 1893. Off Iquique (Retamal and Moyano 2010).
59. *Thymops birsteinii* (Zarenkov and Semenov, 1972). 56°49'S to 56°48'S, 145–1200 m (Bahamonde 1979).

Infraorder Achelata.

Family Palinuridae Latreille, 1802.

60. *Projasus bahamondei* George, 1976. Off Huasco to Constitución; Juan Fernández Archipelago (33°38'S, 78°50'W), San Félix (26°17'S, 80°05'W), and San Ambrosio (26°20'S, 79°53'W) Islands, possibly at O'Higgins Ridge; 175–550 m (George 1976; Retamal 1994b).
61. *Jasus frontalis* H. Milne Edwards, 1837. Near Robinson Crusoe, Santa Clara, and Alejandro Selkirk Islands (Juan Fernández Archipelago 33°38'S, 78°50'W), San Félix (26°17'S, 80°05'W), and San Ambrosio (26°20'S, 79°53'W) Islands (former Desventuradas Islands), 2–200 m (Retamal and Arana 2000).

Infraorder Axiidea.

Family Axiidae Huxley, 1879.

62. *Calocarides quinqueseriatus* (Rathbun, 1902). 32°08'S, 71°50'W, 320–400 m (Andrade and Báez 1977).

Infraorder Polychelida.

Family Polychelidae Wood-Mason, 1874.

63. *Pentacheles validus* A. Milne-Edwards, 1888. West of Valparaíso (33°42'S 75°17'W), 2500 m (Retamal 1994b).
64. *Stereomastis sculpta* (Smith, 1880). From off Los Vilos (31°56'S, 71°38' to 71°47'W), 300–500 m, to off Quintero (32°42'S, 71°34' to 71°45'W), 280–350 m (Báez and Andrade 1979).
65. *Stereomastis pacifica* (Faxon, 1893). Off Arica (18°40.5'S, 70°36.0'W), 768–968 m, and off Valparaíso (30°46'S, 81°31'W), 3000 m (Wicksten & Mendez, 1981).
66. *Stereomastis suhmi* (Bate, 1878). From Coquimbo to the Messier Channel, W of Chilean Patagonia, and near Magellan Strait (53°28'S, 70°47'W), 293–2220 m (Báez and Andrade 1979).
67. *Willemoesia inornata* Faxon, 1893. W of Valparaíso (33°42'S, 78°18'W and 34°7'S, 73°56'W), 2520–4000 m (Wicksten & Mendez, 1981, Retamal 1994b).
68. *Willemoesia pacifica* Sund, 1920. W of Valparaíso (33°42'S, 78°18'W), 2520 m (Retamal 1994b, Wicksten & Mendez, 1981).

Infraorder Anomura.

Superfamily Galattheoidea.

Family Chirostylidae Ortmann, 1892.

69. *Gastroptychus hendersoni* (Alcock and Anderson, 1899). From off Papudo (33°31'S, 71°27'W) to Sarmiento Channel (50°44'S, 74°31'W), Patagonia, 420–750 m (Retamal 1994b).
70. *Uroptychus parvulus* (Henderson, 1885). From off Zapallar (33°32'71°28'W) to Sarmiento Channel (50°44'S, 74°31'W), Magellan Strait (53°28'S, 70°47'W), 300–800 m (Retamal 1994b).

Family Munidopsidae Ortmann, 1892.

71. *Galacantha diomedea* Faxon, 1893. Off Arica, Iquique, and Antofagasta, associated to Patagonian toothfish fishery (Guzmán and Sellanes 2015).

72. *Galacantha rostrata* (A. Milne-Edwards, 1880). Juan Fernandez Archipelago. 1700–3000 m deep (Retamal 1994b); off Antofagasta, 1175 m (Guzmán and Sellanes 2015).
 73. *Munidopsis alfredolaguardai* Hendrickx and Ayon-Parente, 2013. Off Concepción and Chiloe (Guzmán and Sellanes 2015).
 74. *Munidopsis agassizii* Faxon, 1893. Off Iquique, associated to Patagonian toothfish fishery (Guzmán and Sellanes 2015).
 75. *Munidopsis barrerae* Bahamonde, 1964. 31°44'S to 32°31'S, 300–840 m (Bahamonde 1964).
 76. *Munidopsis cochlearis* Khodina, 1973. 23°49'08"S, 71°06'54"W, 4500 m (Khodkina 1973).
 77. *Munidopsis follirostris* Khodina, 1973. Near Juan Fernández Island (30°13'09"S, 78°47'03"W), 1280 m (Khodkina 1973).
 78. *Munidopsis hamata* Faxon, 1893. Chigualoco Bay (31°44'S, 71°418"W), 400 m (Bahamonde 1973). Off Arica and Iquique (Guzmán and Sellanes 2015).
 79. *Munidopsis opalescens* Benedict, 1903. Off Patagonia 700–1000 m (Bahamonde 1973). Off Concepción (Guzmán and Sellanes 2015).
 80. *Munidopsis palmatus* Khodina, 1973. 32°11'6"S 71°46'3"W, 660–700 m (Khodkina 1973).
 81. *Munidopsis quadrata* Faxon, 1893. Off Arica (Luke 1977). Off Antofagasta and Constitución (Guzmán and Sellanes 2015).
 82. *Munidopsis subsquamosa* Henderson, 1888. W of Chiloé Island, 2500–3200 m (Baba et al. 2008). Off Caldera (Guzmán and Sellanes 2015).
 83. *Munidopsis tanneri* Faxon, 1893. Arica and Off Valparaiso (Guzmán and Sellanes 2015).
 84. *Munidopsis trifida* (Henderson, 1888) Collingwood Strait (Benedict 1902), Aysen (Haig 1955). Off Concepcion and Chiloe (Guzmán and Sellanes 2015).
 85. *Munidopsis verrucosus* Khodkina, 1973. 23°47'7"S, 71°03'9"W and 23°15'5"S, 71°39'8"W, 4300–4880 m (Khodkina 1973).
 86. *Munidopsis villosa* Faxon, 1893. Off Algarrobo (33°22'S, 71°40'W), 250–800 m (Bahamonde 1964). Off Arica (Luke 1977).
- Family Munididae Ahyong, Baba, Macpherson, and Poore, 2010.
87. *Cervimunida johni* Porter, 1903. Coquimbo to Mocha Island (Porter 1903; Haig 1955).
 88. *Munida curvipes* Benedict, 1903. Near Chonos Archipelago (45°08'S, 73°14'W), 1890 m (Bahamonde and López 1962); Puerto Otway, Patagonia, 2743 m (Retamal 1994b).
 89. *Munida montemaris* Bahamonde and López, 1962. Punta Angeles, Valparaíso (33°02'S, 71°06'W), 280–400 m (Bahamonde and López 1962).
 90. *Munida propinqua* (Faxon, 1893). From off Iquique (20°12'S, 70°09'W) to Quintero (32°47'S, 71°42'W), 700–1000 m (Retamal 1994b).
 91. *Pleuroncodes monodon* (H. Milne Edwards, 1837). Off Arica (18°25'S, 71°22'W) to Mocha Island (38°22'S, 73°54'W), 20–400 m (unpubl. data).
- Family Lithodidae Samouelle, 1819.
92. *Glyptolithodes cristatipes* (Faxon, 1893). Off Arica (18°25'S, 71°22'W), off Quintero (32°47'S, 71°42'W), 245–800 m (Del Solar, 1972).

93. *Lithodes murrayi* (MacPherson, 1988). From off Iquique (20°12'S, 70°09'W) to the Magellan Strait (53°28'S, 70°47'W), 70–581 m (MacPherson 1988).
94. *Lithodes panamensis* Faxon, 1893. Off Arica (18°25'S, 71°22'W), off Iquique (20°12'S, 70°09'W), 760–850 m (Retamal 1992).
95. *Lithodes santolla* (Molina, 1782). Valdivia (39°48'S, 73°14'W) to southern tip of South America, 0–700 m (Retamal 1992).
96. *Lithodes wiracocha* Haig, 1974. From off Iquique (20°12'S, 70°09'W) to Magellan Strait (53°28'S, 70°47'W), 620–800 m (Haig 1974).
97. *Neolithodes diomedea* (Benedict, 1894). From off Arica (18°25'S, 71°22'W) to Chonos Archipelago, 300–1200 m (Retamal 1992).
98. *Paralomis aspera* Faxon, 1893. Off Iquique (20°12'S, 70°09'W), 560–1270 m (Retamal 1992).
130. *Paralomis chilensis* Andrade, 1980. Off Coquimbo (29°57'S, 71°20'W) and Los Vilos (31°54'S, 71°31'W), 400–1800 m (Andrade 1980).
99. *Paralomis diomedea* (Faxon, 1896). Off Iquique (20°12'S, 70°09'W), 830–935 m (Del Solar, 1972).
100. *Paralomis longipes* Faxon, 1893. Off Iquique (20°12'S, 70°09'W), 700–800 m (Retamal 1992).
101. *Paralomis otsuae* Wilson, 1988. 22°48'S, 70°42'W, 1740 m (Wilson 1990).
102. *Paralomis papillata* (Benedict, 1895). Off Iquique (20°12'S, 70°09'W), 712–744 m (Haig 1974).
103. *Paralomis sonne* Guzmán, 2009. 22°48.7'S, 70°42.29'W, 1775 m (Guzmán 2009).

Superfamily Paguroidea.

Family Paguridae Latreille, 1802.

104. *Pagurus delsolari* Haig, 1974. Off Iquique (20°12'S, 70°09'W) to Constitución (35°20'S, 72°25'W), 275–650 m (Haig 1974).
105. *Pagurus comptus* White, 1847. Off Coquimbo (29°57'S, 71°20'W) to southern Chile, 16–400 m (Forest and Saint Laurent 1967).

Family Parapaguridae Smith, 1882.

106. *Oncopagurus haigae* (de Saint Laurent, 1972). Valparaíso (33°02'S, 71°06'W), Sala y Gómez (26°28'S, 105°05'W) Plate, from Quisco (33°24'S, 71°42'W) to Taitao Peninsula (46°23'S, 74°41'W), 189–497 m (de Saint Laurent 1972; Olguin et al. 2014).
107. *Oncopagurus mironovi* Zhadan, 1997. Nazca Plate (24°56.5'S, 88°31.6'W), 570–575 m (Zhadan 1997).
108. *Oncopagurus stockmani* Zhadan, 1977 (*). Nazca Plate (27°07'S, 81°18'W), 235 m (Zhadan 1997).
109. *Parapagurus abyssorum* (Filhol, 1885). 39°51'S, 96°52'W, 3603–3621 m; off Valdivia (39°48'S, 73°14'W), 1930 km W of the coast of Chile (Lemaitre 1999).
110. *Parapagurus holthuisi* Lemaitre, 1989. W of Valparaíso (33°42'S, 78°18'W); off Juan Fernández Archipelago, 2115 m (Lemaitre 1999).

111. *Parapagurus jeanette* Lemaitre, 1999. Otway harbor, Gulf of Penas (46°53.15'S, 75°12'W), 82–1485 m (Lemaitre 1999).
112. *Paragiopagurus wallisi* (Lemaitre, 1994) (*). Nazca Plate (25°05.1'S, 97°27.9'W), 260–265 m (Zhadan 1997).
113. *Paragiopagurus boletifer* (de Saint Laurent, 1972) (*). Submerged ridge, Sala y Gómez Ridge (26°28'S, 105°21'W), and Nazca Plate (25°34.0'S, 85°27.0'W), 240–245 m (Zhadan 1997).
114. *Strobopagurus* aff. *gracilipes* (A. Milne-Edwards, 1891) (*). Nazca Plate (24°58.5'S, 88°31.6'W), 570–575 m (Zhadan 1997).
115. *Sympagurus affinis* (Henderson, 1888) (*). Nazca Plate (25°07.8'S, 99°34.0'W), 350–490 m (Parin et al. 1997; station 2023, R/V “Prof. Stockman,” 18° cruise), 147–1450 m (Lemaitre 2004).
116. *Sympagurus dimorphus* (Stüder, 1883). 22° S, 57°S, 91–1995 m (Lemaitre 2004; Olguin et al. 2014).
117. *Sympagurus dofleini* (Balss, 1912) (*). Submerged ridge, Sala y Gómez Ridge (26°28'S, 105°05'W), (Lemaitre 2004).
118. *Tylaspis anomala* Henderson, 1885 (*). NE of Easter Island (19°11'S, 102°24'W), 4143 m; 32°36'S, 137°43'W, 4344 m (Lemaitre 1998).

Infraorder Brachyura.

Superfamily Dromioidea.

Family Dromiidae De Haan 1833.

119. *Lauridromia dehaani* (Rathbun, 1923). Seamount Big, Salas y Gomez Ridge (Zarenkov 1990).

Superfamily Homolodromiidea.

Family Homolodromidae De Haan, 1839.

120. *Homolodromia robertsi* (Garth, 1973). 19°03'S, 32°06'W, 560–850 m (Garth 1973; Báez and Martin 1989).

Superfamily Homoloidea.

Family Cymonomidae Bouvier, 1898.

121. *Cymonomus menziesi* Garth, 1971. Chile-Perú Trench, 1000 m (Garth and Haig 1971); off Chiloé (42°35.35'S, 80°37'W), 507 m (Guzmán 2003).

Family Homolidae De Haan, 1839.

122. *Homologenus orientalis* Zarenkov, 1990 (*). Seamount Ichthyologist, Sala y Gómez Ridge (Zarenkov 1990).

123. *Moloha faxoni* (Schmitt, 1921). Off San Félix (26°17'S, 80°05'W) and San Ambrosio (26°20'S, 79°53'W) Islands (unpubl. data).

124. *Paramola japonica* Parisi (*). Seamounts Dorofeeva and New, Sala y Gómez Ridge (Zarenkov 1990).

125. *Paramola rathbuni* Porter, 1908. Juan Fernandez Archipelago (Porter 1927).

Family Latreilliidae Stimpson, 1858.

126. *Eplumula phalangium* (De Haan, 1839 in De Haan, 1833–1850) (*). Seamounts Big and Dome, Sala y Gómez Ridge (Zarenkov 1990).

Superfamily Leucosioidea Samouelle, 1819.

Family Leucosiidae.

127. *Ancylodactyla nana* (Zarenkov, 1990) (*). Seamounts Communard and Dome, Sala y Gómez Ridge (Zarenkov 1990).

128. *Ebalia sculpta* Zarenkov, 1990(*). Seamounts Big, Cliff, and Dome, Sala y Gómez Ridge (Zarenkov 1990).

Superfamily Majoidea.

Family Epialtidae McLeay, 1838.

129. *Libidoclaea granaria* H. Milne Edwards and Lucas, 1842. From off Coquimbo (33°38'S, 78°50'W) to Strait of Magellan, 60–450 m (Rathbun 1925).

130. *Libidoclaea smithi* (Miers, 1886). Canyon off the Bio Bio River (36°49'S, 73°17'W), 480 m, to Strait of Magellan (53°28'S, 70°47'W) (Pineda and Retamal 1997).

131. *Lophorochinia parabranchia* Garth, 1969. N of Iquique (20°12'S, 70°09'W) and off Punta Patache (20°48'S, 70°12'W) to Quintero (32°47'S, 71°42'W), 282 m (Retamal 1994b).

Family Inachidae McLeay, 1838.

132. *Cyrtomaia danieli* Zarenkov, 1990 (*). Seamounts Amber, Ichthyologist, May Day, and Yarala, Sala y Gómez Ridge (Zarenkov 1990).

133. *Cyrtomaia platypes* Yokoya, 1933 (*). Seamounts Cliff and Dome, Sala y Gómez Ridge (Zarenkov 1990).

Superfamily Parthenopoidea.

Family Parthenopidae McLeay, 1838.

134. *Zarenkolambrus epibranchialis* (Zarenkov, 1990) (*). Seamounts Cliff and Needle, Sala y Gómez Ridge (Zarenkov 1990).

135. *Hispidolambrus mironovi* (Zarenkov, 1990) (*). Seamounts Big, Dome, and Ichthyologist, Sala y Gómez Ridge (Zarenkov 1990).

Superfamily Calappoidea.

Family Calappidae De Haan, 1833.

136. *Mursia zarenkovi* Galil and Spiridonov, 1998 (*). Seamounts Big, Dome, and Ichthyologist, Sala y Gómez Ridge, and Seamount Eclipse, Nazca Ridge (Zarenkov 1990).

137. *Platymera gaudichaudii* (H. Milne Edwards, 1837). From off Arica (18°25'S, 71°22'W) to Talcahuano (36°42'S, 72°46'W), and off Juan Fernández Archipelago (33°38'S, 78°50'W), 10–450 m (Galil 1993; Retamal et al. 2013).

Superfamily Portunoidea.

Family Geryonidae Colosi, 1923.

138. *Chaceon chilensis* Chirino-Gálvez and Manning, 1989. Near Robinson Crusoe Island (Juan Fernández Archipelago 33°38'S, 78°50'W), 300–1000 m (Chirino-Gálvez and Manning 1989). (*). Seamounts New and Pearl, Sala y Gómez Ridge, and Seamounts Eclipse and Profesor Mesyatsev, Nazca Ridge (Zarenkov 1990).

Family Progeryonidae Stevcic, 2005.

139. *Progeryon mararae* Guinot and Richer de Forges, 1981 (*). Seamount Dome, Sala y Gómez Ridge (Zarenkov 1990).

Superfamily Cancroidea.

Family Atelecyclidae Ortmann, 1893.

140. *Trichopeltarion corallinus* (Faxon, 1893). 18°43'S, 507m, and 36°00.23'S, 922m (Guzmán et al. 2009).
141. *Trichopeltarion hystricosus* (Garth in Garth and Haig, 1971). Off Pisagua (21°19'S, 70°26'W), 605–610 m (Retamal and Soto 1993; Guzmán et al. 2009).
- Family Cancridae Latreille, 1802.
142. *Cancer porteri* (Rathbun, 1930). Off continental Chile, 0–500 m (Retamal 1994b).
143. *Platepistoma balssii* (Zarenkov, 1990) (*). Seamounts Big, New, and Yarala, Sala y Gómez Ridge (Zarenkov 1990).

22.4 Discussion

The extended continental Chilean coast has two very well-marked zoogeographic regions: one cold template in the South, from the large island of Chiloé to Cape Horn, and the other warm template in the North, the latter extending, according to some authors (e.g., Brättstrom and Johanssen 1983), from Arica to Talcahuano where a transition zone starts with a mixture of species (Brättstrom and Johanssen 1983). Other authors (e.g., Retamal and Moyano 2010), however, believe that the transition zone starts in Valparaíso and finishes in the large island of Chiloé. The total number of decapods recorded in Chilean waters is 475 (unpubl. data). Some species cited by Vereshchaka (1990), Parin et al. (1997), and Zhadan (1997) from the submerged ridge of Sala y Gómez and Nazca (about 25°S, 75–100°W) have been included herein although these ridges are slightly out of the boundaries of the Chilean EEZ, 200 nm from the coast of continental Chile, and 350 nm from Easter Island and Salas y Gómez Island.

There are only nine species of deep-water isopods on record, four in the Peru-Chile trench, three in Chiloé islands, and two in the Magellan Strait, thus showing a lack of information regarding the abyssal isopods in central Chile and off the oceanic islands. Among the decapods, there exists a clear dominance of shrimps and prawns in Chilean deep water. On the contrary, benthic species of Brachyura are poorly represented.

A total of 143 species of benthic-demersal or benthic-pelagic species of decapod crustaceans occur below 200 m off the coast of Chile (Table 22.1). The Dendrobranchiata are represented by five families that are represented by one to three species. In the Anomura, Parapaguridae is represented by 14 species, Lithodidae by 13, and Munidopsidae by 11. The rest of the deep-water decapods belong to the Brachyura, with 14 families and 12 species. The majority of the Brachyura families have only one to two representatives in deep water. In Chile, including Easter Islands, most records for Brachyura are from shallow water. Brachyuran crabs are also known to be scarce in deep water.

The 46 species discovered on Salas y Gómez and Nazca submerged ridges and around the former Desventuradas Islands live mostly in deep water. However, recent

Table 22.1 Number of species of deep-water decapod crustaceans recorded for each family present in Chilean waters

| | | | |
|-------------------------|---|------------------|----|
| Dendrobranchiata | | Astacidea | |
| Aristeidae | 1 | Nephropidae | 1 |
| Benthescymidae | 3 | Achelata | |
| Solenoceridae | 3 | Palinuridae | 2 |
| <i>Sicyoniidae</i> | 1 | Axiidea | |
| Penaeidae | 1 | Axiidae | 2 |
| Pleocyemata | | Anomura | |
| Caridea | | Chirostylidae | 2 |
| Nematocarcinidae | 4 | Munidopsidae | 11 |
| Campylonotidae | 2 | Munididae | 5 |
| Hippolytidae | 1 | Lithodidae | 13 |
| Thoridae | 6 | Paguridae | 2 |
| Physetocaridae | 1 | Parapaguridae | 13 |
| Pandalidae | 9 | Brachyura | |
| Crangonidae | 7 | Homolodromidae | 2 |
| Glyphocrangonidae | 2 | Cymonomidae | 1 |
| Stenopodidea | | Calappidae | 1 |
| Spongicolidae | 1 | Atelecyclidae | 2 |
| | | Cancriidae | 1 |
| | | Epialtidae | 3 |
| | | Geryonidae | 1 |

studies in the seamounts surrounding the Desventuradas Island have allowed for the collection of many additional specimens under study. This will probably increase diversity of decapods associated with the seamounts of the SEP (unpubl. data).

While studying deep-water species living around the Juan Fernández Archipelago, Retamal and Arana (2000) found that some of them (i.e., *Jasus frontalis*, *Projasus bahamondei*, *Geryon chilensis*) spend long periods as larval stages, have arrived from distant points, and are present above the submerged ridge, sometime in large numbers.

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