

Checklist of cnidarians from Pakistani waters

Shahnawaz Gul^{1*}, André C. Morandini², Vreni Häussermann^{3,4} and Ulrich Pörschmann⁴

1 Department of Zoology, Jamia Millia Government Degree College, Malir, Karachi, Pakistan

2 Departamento de Zoologia, Instituto de Biociências, Universidade de São Paulo, Rua do Matão, trav. 14, n. 101, Cidade Universitária, São Paulo, SP, 05508-090, Brazil

3 Facultad de Recursos Naturales, Escuela de Ciencias del Mar, Pontificia Universidad Católica de Valparaíso, Avda Brasil, 2950, Valparaíso, Chile

4 Huinay Scientific Field Station, Chile

* Corresponding author. E-mail: gulshahnawaz@yahoo.com

Abstract: We present a species list of the marine cnidarians recorded from the Pakistani waters, northern Arabian Sea. It comprises a total of 119 species distributed in 41 families, 14 orders and 4 classes. With 44 species, the order Scleractinia (class Anthozoa) is the best-represented cnidarian taxon. Cnidarians from Pakistan are a poorly studied group which is mentioned in few occasional papers; no new species have been described from the region. The present paper will provide baseline information for future studies in Pakistan.

Key words: Anthozoa, Cubozoa, Hydrozoa, Scyphozoa, northern Arabian Sea

INTRODUCTION

Members of the phylum Cnidaria comprise a diverse group of invertebrates which all have a common and unique feature, the presence of cnidae (Marques and Collins 2004). The number of species listed for the phylum varies among different authors, Zhang (2011), for example, gives 10,105 species. Cnidarians are an important taxonomic group of study; they can be found in all habitats from the intertidal to the deep-sea and from the tropics to the poles. In many habitats they even dominate the benthic communities. Many species are ecologically important predators or prey, others are known for their capacity of hurting humans, some produce important economic losses, others are target species for bioprospecting. As basic metazoans, cnidarians are important for understanding evolutionary patterns.

The marine invertebrate fauna from the coast of Pakistan is poorly known (Kazmi and Naushaba 2013) and even less is known on cnidarian biodiversity with only a few papers published about the group (Table 1). Here we have made an attempt to present an updated checklist of cnidarians from Pakistani waters, northern Arabian Sea.

MATERIALS AND METHODS

The species list was compiled through an extensive literature search. The marine cnidarians listed here were based upon published records from the coast of Pakistan and its off coastal waters of the northern Arabian Sea; the first record come from 1937. The status of all listed species was confirmed using established databases (AIMS Coral Fact Sheets, Schuchert 2014, WoRMS). The classification used here followed Daly et al. (2007). The collection points mentioned in the literature were shown by numbers (1–68, 71–85) in Figure 1, and mentioned along with the localities in Table 1. Collection points 28–66 represent GPS positions of Siphonophorae (Ali-Khan & Shehnaz 2001b: 28, table 1). Abbreviations are NSS (Northern Sheltered Side), RS (Rodrigues Shoals), and TFR (Triple Fin Rocks). For some species, no specific locality or GPS position along Karachi coast of Pakistan mentioned (Haque 1977; Stiasny 1937); this is indicated in the table by a question mark. Locality, Pasha Bundar (Moazzam and Moazzam 2006), could not be identified and was therefore not shown in the map.

Because there were no voucher specimens, it was not possible to check if the identifications are correct. However, a few doubtful records were pointed out and were mentioned in the table by using a question mark in front of the author citation in the references column. The occurrence in the Indian Ocean of most of the hydroids listed here were confirmed by Mammen (1963, 1965a, 1965b); the siphonophores by Rengarajan (1973, 1974, 1975, 1983) and Daniel (1985).

RESULTS

Table 1 provides the compiled data on the cnidarian species recorded from Pakistani coast and its off coastal waters. The numbers of species per higher taxa reported for Pakistan are: 62 Anthozoa (4 Actiniaria, 1 Antipatharia, 1 Ceriantharia, 11 Octocorallia, 44 Scleractinia, 1

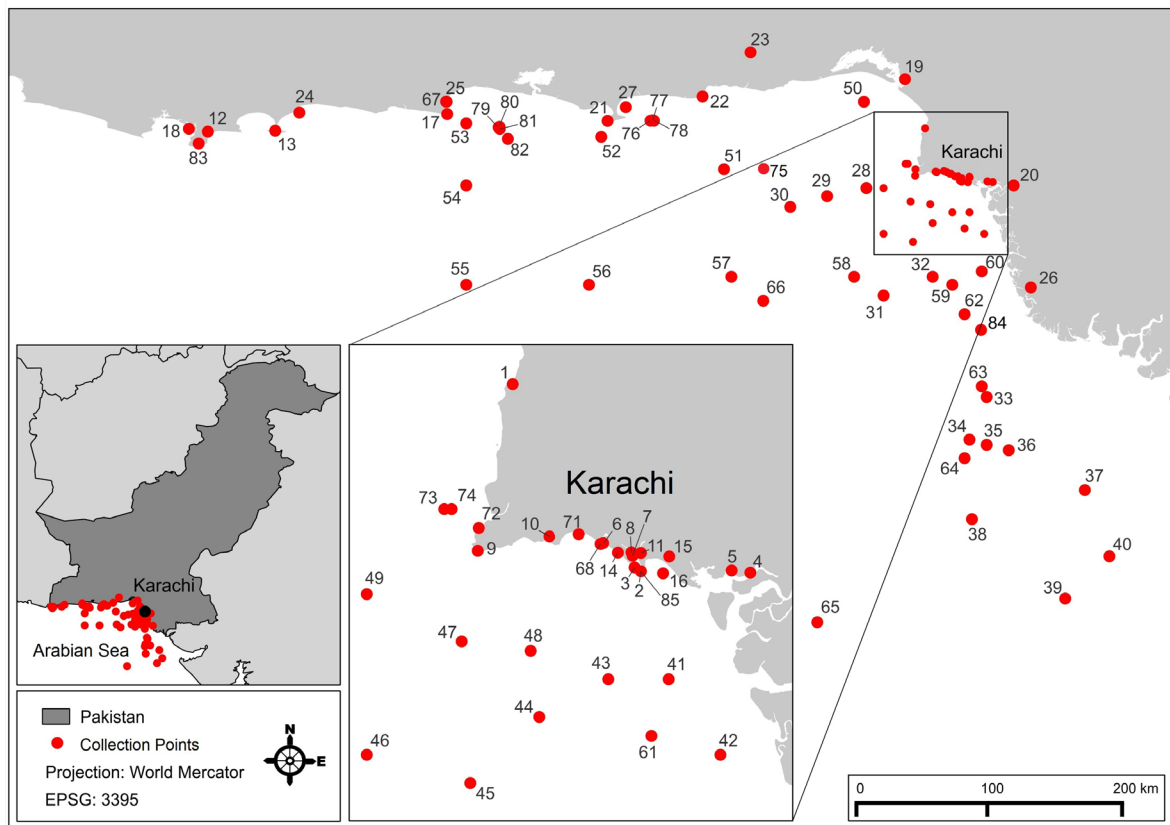


Figure 1. Map showing collection points (red dots, 1–68, 71–85) along the coast of Pakistan and its off coastal waters, the northern Arabian Sea. Coastline of Pakistan comprises of Sindh and Baluchistan provinces. From point 4 (right) to point 9 and 72 (left) is the coastal area of Karachi city at Sindh.

Zoantharia), 2 Cubozoa (1 Carybdeida, 1 Chirodropida), 46 Hydrozoa (5 Anthoathecata, 11 Leptothecata, 30 Siphonophorae), and 9 Scyphozoa (7 Rhizostomeae, 2 Semaestomeae).

DISCUSSION

Cnidarian research along the coast of Pakistan has received little attention, which is reflected by the few papers published on the topic (Table 1). The John Murray Expedition in 1933–34 travelled through most of the western part of the Indian Ocean (Sewell 1935; Morcos 2004) and only just two records (*Pelagia noctiluca*, *Cephea* sp.) came from Pakistani waters, off Karachi. The next paper dealing with cnidarians (hydrozoans, octocorals and anemones) from the Pakistani coast appeared is that of Haque (1977). Since then a few other papers appeared on different cnidarian groups: siphonophores (Ali-Khan and Shehnaz 2001a, 2001b); hydroids (Moazzam and Moazzam 2006; Gul and Gravili 2014); cubo- and scyphomedusae (Tahera and Kazmi 2006; Kazmi and Sultana 2008; Muhammed and Sultana 2008; Gul and Morandini 2013; Gul et al. 2014); corals (Siddiqui et al. 2011; Ali et al. 2014); zoanthids (Gul 2013); and hydromedusae (Gul and Gravili 2013). All of them, however, only contain new records and no new species. The occurrence of corals along Pakistani coast just was pointed out relatively recently (Kazmi and Kazmi 1998; Ishaq et al. 2003; Wilkinson 2004); but Siddiqui et al.

(2011) were the first to give species names. A recent paper on the subject (Ali et al. 2014) mentioned that the distribution and growth of corals is poor in Pakistan.

The reason why cnidarians are so little known in Pakistani waters is probably related to the absence of specialists in the area. The decline of taxonomists is a phenomenon that can be observed worldwide (Disney 1998; Godfray 2002). In addition, identification especially of the soft-bodied hexacorals (Häussermann 2004) and of octocorals needs years of experience and is done by fewer and fewer scientists. We propose to promote the formation of taxonomic specialists who go in the field to collect cnidarians and later identify them, and to increase funding for this type of baseline research to improve the knowledge about the phylum Cnidaria in Pakistan. The species list compiled for the present paper is supposed to be the pillars of further research on cnidarians in the region.

Remarks on recorded species

The various species of hydrozoans, octocorals and anemones reported by Haque (1977) are briefly described and without figures. Voucher specimens are not available, and thus, confirmation of identifications and further comments are complicated.

Some species are certainly misidentified (see below), but we have no access to specimens for detailed inspections and observations. The tube anemone, *Cerianthus*

membranaceus, is indeed not an Indian Ocean species but restricted to the Mediterranean Sea (S.N. Stampar, personal communication); *Plumularia insignis* is also not an Indian Ocean species (T.P. Miranda, personal communication; see also Genzano 1995: 6; Vervoort and Watson 2003: 396); they were mentioned by Haque (1977) and here considered because of these previous records. The same is true for the cubozoan jellyfish *Carybdea marsupialis* recorded from Pakistan (Kazmi and Sultana 2008); however, the figures provided in the paper suggest erroneous identification. This species is in fact restricted to Mediterranean Sea (I. Straehler-Pohl, personal communication). Similarly, Gul and Morandini (2015) argued that the *Rhizostoma pulmo* record (Muhammed and Sultana 2008) is also based upon erroneous identification; there is no access to the specimens, but the figures indicate that the specimens actually belong to a different genus.

Although the order Scleractinia appeared in the list as the best-represented taxon, many are either doubtful or not fully identified. The same is true for the alcyonacean species. We conclude that the taxonomic study of Pakistani soft and hard corals needs a detailed approach and attention.

For several of the described taxa we would have expected a much larger diversity; more specific sampling techniques and detailed observations will certainly provide more records in the future.

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Table 1. Checklist of cnidarians from Pakistan and off its coastal waters. Numbers after each collection point correspond to the numbers in Figure 1 showing the precise site of collection of the species. For abbreviations see text. Question marks in front of reference means that we consider the record doubtful probably misidentified and, those in front of the locations (Karachi, off Karachi) mean no specific locality or GPS position not mentioned.

Species	Collection points	References
Class Anthozoa Ehrenberg, 1831		
Subclass Hexacorallia Haeckel, 1866		
Order Actiniaria Hertwig, 1882		
Family Haliactiidae Carlgren, 1949		
<i>Phytocoetes gangeticus</i> Annandale, 1915	Manora ²	Haque 1977
Family Haloclavidae Verrill, 1899		
<i>Metapeachia tropica</i> (Panikkar, 1938)	Korangi Creek ⁴ , Bhit Island ⁷ , Baba Island ⁸	Haque 1977
Family Actiniidae Rafinesque, 1815		
<i>Anemonia indica</i> Parulekar, 1968 (= <i>Anemonia indicus</i>)	Cape Monze ⁹ , Buleji ¹⁰	Haque 1977
Family Sagartiidae Gosse, 1858		
<i>Actinotheroe modesta</i> (Verrill, 1866) (= <i>Sagartia modesta</i>)	Baba Island ⁸	Haque 1977
Order Antipatharia		
Family Antipathidae		
<i>Antipathes</i> sp.	Ormara RS-3 ⁷⁸	Ali et al. 2014
Order Ceriantharia Perrier, 1883		
Family Cerianthidae Milne-Edwards & Haime, 1852		
<i>Cerianthus membranaceus</i> (Spallanzani, 1784)	Korangi Creek ⁴ , Bhit Island ⁷ , Baba Island ⁸	? Haque 1977
Order Scleractinia Bourne, 1900		
Family Acroporidae Verrill, 1902		
<i>Acropora</i> sp.	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Astreopora</i> sp.	Ras Gunz ¹²	Siddiqui et al. 2011

Continued

Table 1. Continued.

Species	Collection points	References
<i>Montipora mollis</i> Bernard, 1897	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰ , Astola Island off S ⁸²	Ali et al. 2014
Family Agariciidae		
<i>Pavona explanulata</i> (Lamarck, 1816)	Ormara RS-3 ⁷⁸	Ali et al. 2014
Family Dendrophylliidae		
? <i>Dendrophyllia robusta</i> (Bourne, 1905)	Charna Island N ⁷³ , Ormara RS-3 ⁷⁸	Ali et al. 2014
<i>Turbinaria</i> sp.	Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
Family Faviidae Gregory, 1900		
<i>Cladocora</i> cf. <i>caespitosa</i> (Linnaeus, 1767)	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Cyphastrea serailia</i> (Forskål, 1775)	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favia lizardensis</i> Veron, Pichon & Wijsman-Best, 1977	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favia truncatus</i> ? Veron, 2000	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favia</i> sp. 1	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favia</i> sp. 2	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favia</i> sp. 3	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favia</i> sp. 4	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favites</i> cf. <i>acuticollis</i> (Ortmann, 1889)	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favites</i> sp.	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Favites complanata</i> (Ehrenberg, 1834)	Ormara RS-1 ⁷⁶ , Ormara RS-2 ⁷⁷ , Ormara RS-3 ⁷⁸ , Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰ , Astola Island TFR ⁸¹	Ali et al. 2014
<i>Favites pentagona</i> (Esper, 1795)	Mubarak village ⁷² , Charna Island N ⁷³ , Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰ , Astola Island TFR ⁸¹	Ali et al. 2014
<i>Favites spinosa</i> (Klunzinger, 1879)	Astola Island NSS-1 ⁷⁹	Ali et al. 2014
<i>Goniastrea</i> cf. <i>retiformis</i> (Lamarck, 1816)	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Leptastrea</i> cf. <i>bottae</i> (Milne Edwards & Haime, 1849)	Sandspit ⁶⁸ , Charna Island N ⁷³	Ali et al. 2014
? <i>Leptastrea pruinosa</i> Crossland, 1952	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Platygyra daedalea</i> (Ellis & Solander, 1786)	Ras Gunz ¹²	Siddiqui et al. 2011
<i>Plesiastrea versipora</i> (Lamarck, 1816)	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
Family Mussidae		
<i>Acanthastrea hillae</i> Wells, 1955	Ormara RS-2 ⁷⁷ , Astola Island NSS 2-4 ⁸⁰ , Astola Island off S ⁸²	Ali et al. 2014
<i>Acanthastrea maxima</i> Sheppard & Salm, 1988	Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
Family Pocilloporidae		
<i>Pocillopora damicornis</i> (Linnaeus, 1758)	Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
Family Poritidae		
<i>Alveopora</i> sp.	Mubarak village ⁷² , Charna Island N ⁷³ , Charna Island NW ⁷⁴	Ali et al. 2014
? <i>Goniopora albicans</i> Veron, 2000	Charna Island N ⁷³ , Ormara RS 2 ⁷⁷	Ali et al. 2014
<i>Goniopora columna</i> Dana, 1846	Charna Island NW ⁷⁴	Ali et al. 2014
<i>Goniopora djiboutiensis</i> Vaughan, 1907	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Goniopora</i> cf. <i>savignyi</i> (Dana, 1846)	Ormara RS 1 ⁷⁶ , Astola Island NSS 2-4 ⁸⁰ , Astola Island off S ⁸²	Ali et al. 2014
<i>Goniopora somaliensis</i> Vaughan, 1907	Astola Island NSS 1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Porites harrisoni</i> Veron, 2000	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Porites lutea</i> Quoy & Gaimard, 1833	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰ , Astola Island TFR ⁸¹	Ali et al. 2014
<i>Porites lobata</i> Dana, 1846	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰ , Astola Island TFR ⁸¹	Ali et al. 2014
<i>Porites monticulosa</i> Dana, 1846	Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Porites nodifera</i> Klunzinger, 1879	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Porites solida</i> (Forskål, 1775)	Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
Family Siderastreidae		
<i>Coscinaraea monile</i> Forskål, 1775	Charna Island N ⁷³ , Ormara RS 1 ⁷⁶ , Astola Island NSS-1 ⁷⁹ , Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Coscinaraea</i> sp.	Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Psammocora contigua</i> (Esper, 1794) (= <i>Psammocora obtusangula</i>)	Astola Island NSS 2-4 ⁸⁰	Ali et al. 2014
<i>Psammocora superficialis</i> Gardiner, 1898	Charna Island N ⁷³	Ali et al. 2014
<i>Psammocora</i> sp.	Sandspit ⁶⁸ , Charna Island N ⁷³	Ali et al. 2014
Order Zoantharia Gray, 1832		
<i>Zoanthus sansibaricus</i> Carlgren, 1900	Manora ²	Gul 2013

Continued

Table 1. Continued.

Species	Collection points	References
Subclass Octocorallia Haeckel, 1866		
Order Alcyonacea		
Family Melithaeidae		
? <i>Clathraria</i> sp.	Astola Island TFR ⁸¹ , Jiwani ⁸³	Ali et al. 2014
Family Plexauridae		
? <i>Bebryce</i> sp.	Ormara RS-1 ⁷⁶ , Ormara RS-2 ⁷⁷ , Ormara RS-3 ⁷⁸ , Astola Island TFR ⁸¹ , Jiwani ⁸³	Ali et al. 2014
<i>Echinogorgia</i> sp.	Sandspit ⁶⁸ , Ormara RS-1 ⁷⁶ , Ormara RS-2 ⁷⁷ , Ormara RS-3 ⁷⁸ , Astola Island TFR ⁸¹ , Jiwani ⁸³	Ali et al. 2014
? <i>Echinogorgia</i> sp.	Sandspit ⁶⁸ , Ormara RS-1 ⁷⁶ , Ormara RS-3 ⁷⁸	Ali et al. 2014
<i>Menella</i> sp.	Goth Abdul Rehman ⁷¹ , Ormara RS-1 ⁷⁶ , Ormara RS-2 ⁷⁷ , Ormara RS-3 ⁷⁸ , Jiwani ⁸³	Ali et al. 2014
<i>Paraplexaura</i> sp.	Goth Abdul Rehman ⁷¹ , Ormara RS-3 ⁷⁸ , Astola Island off S ⁸² , Jiwani ⁸³	Ali et al. 2014
Family Subergorgiidae		
<i>Annella</i> sp.	Sandspit ⁶⁸ , Goth Abdul Rehman ⁷¹ , Ormara RS-3 ⁷⁸ , Jiwani ⁸³	Ali et al. 2014
? <i>Subergorgia</i> sp.	Jiwani ⁸³	Ali et al. 2014
Order Pennatulacea Verrill, 1865		
Family Renillidae Gray, 1870		
<i>Renilla reniformis</i> (Pallas, 1766)	Korangi Creek ⁴ , Keamari ¹¹	Haque 1977
Family Veretillidae Herklots, 1858		
<i>Cavernularia obesa</i> Valenciennes in Milne Edwards & Haime, 1850	? Karachi	Haque 1977
Family Virgulariidae Verrill, 1868		
<i>Scytalium tentaculatum</i> Kölliker, 1880	Korangi Creek ⁴ , Baba Island ⁸ , Keamari ¹¹ , Gwadar ¹³	Haque 1977
Class Cubozoa Werner, 1973		
Order Carybdeida Gegenbaur, 1856		
Family Carybdeidae Gegenbaur, 1856		
<i>Carybdea marsupialis</i> (Linnaeus, 1758)	Gwadar Fish Harbour ¹³	? Kazmi and Sultana 2008
Order Chirodropida Haeckel, 1880		
Family Chiropsalmidae Thiel, 1936		
<i>Chiropsoides buitendijki</i> (van der Horst, 1907) (= <i>Chiropsalmus buitendijki</i>)	Kaka village ⁶ (Sandspit)	Tahera and Kazmi 2006
Class Hydrozoa Owen, 1843		
Subclass Hydroidolina Marques & Collins, 2004		
Order Anthoathecata Cornelius, 1992		
Suborder Filifera Kühn, 1913		
Family Eudendriidae Agassiz, 1862		
<i>Eudendrium capillare</i> Alder, 1856	Jiwani ¹⁸	Moazzam and Moazzam 2006
Family Hydractiniidae L. Aggasiz, 1862		
<i>Hydractinia epidocleensis</i> Leloup, 1931	Clifton ¹⁵ , Pasni bay ⁶⁷	Moazzam and Moazzam 2006
Suborder Capitata Kühn, 1913		
Family Pennariidae McCrady, 1859		
<i>Pennaria disticha</i> (Goldfuss, 1820)	Sonmiani ¹⁹ , Port Qasim ²⁰	Moazzam and Moazzam 2006
Family Porpitiidae Goldfuss, 1818		
<i>Porpita porpita</i> (Linnaeus, 1758)	Manora ² , Clifton ¹⁵	Gul and Gravili 2014
<i>Vellella vellella</i> (Linnaeus, 1758)	Manora ⁸⁵	Gul (2015)
Order Leptothecata Cornelius, 1992		
Suborder Conica Broch, 1910		
Family Aequoreidae Eschscholtz, 1829		
<i>Aequorea pensilis</i> (Haeckel, 1879)	Clifton ¹⁵ , Damb (Sonmiani) ¹⁹	Gul and Gravili 2013
Family Plumulariidae McCrady, 1859		
<i>Macrorhynchia philippina</i> Kirchenpauer, 1872	Cape Monze ⁹ , Jiwani ¹⁸ , Pedi Zur (Ormara) ²¹ , Pasha Bundar	Moazzam and Moazzam 2006
<i>Plumularia insignis</i> Allman, 1883 (= <i>Plumularia flabellum</i> Allman, 1883)	Keamari ¹¹	? Haque 1977
<i>Pycnotheca mirabilis</i> (Allman, 1883)	Buleji ¹⁰ , Taq (Ormara) ²¹ , Ras Zarrin (Pasni) ¹⁷	Moazzam and Moazzam 2006
Family Sertulariidae Lamouroux, 1812		
<i>Dynamena crisioides</i> Lamouroux, 1824	Demi Zur ²⁷ (Gwadar), Ras Juddi (Pasni) ¹⁷ , Ras Malan ²² , Pasha Bundar	Moazzam and Moazzam 2006
<i>Dynamena quadridentata</i> (Ellis & Solander, 1786)	Manora ² , Hingol ²³ , Demi Zur ²⁷ (Gwadar)	Moazzam and Moazzam 2006
<i>Sertularia distans</i> (Lamouroux, 1816)	Buleji ¹⁰ , Shadi Khor ²⁵ (Pasni), Jabal Sur ²⁴	Moazzam and Moazzam 2006

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Table 1. Continued.

Species	Collection points	References
Suborder Proboscidoidea Broch, 1910		
Family Campanulariidae Johnston, 1836		
<i>Clytia hummelincki</i> (Leloup, 1935)	Jiwani ¹⁸ , Gadani ¹	Moazzam and Moazzam 2006
<i>Clytia noliformis</i> (McCrary, 1859) sensu Calder, 1991	Sandspit ¹⁴ , Demi Zur ²⁷ (Gwadar), Jabal Sur ²⁴	Moazzam and Moazzam 2006
<i>Orthopyxis cf. everta</i> (Clark, 1876) (= <i>Orthopyxis cf. crenata</i> (Hartlaub, 1901)	Cape Monze ⁹ , Buleji ¹⁰ , Pedi Zur (Gwadar) ¹³ , Ormara ²¹	Moazzam and Moazzam 2006
<i>Thyrosocyphus fruticosus</i> (Esper, 1793) (= <i>Campanularia juncea</i>)	Bhit Island ⁷	Haque 1977
Order Siphonophorae Eschscholtz, 1829		
Suborder Calycothorae Leuckart, 1854		
Family Abylidae Agassiz, 1862		
<i>Abyla haeckeli</i> (Lens & van Riemsdijk, 1908)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Abylopsis tetragona</i> (Otto, 1823)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Abylopsis eschscholtzii</i> Huxley, 1859	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Bassia bassensis</i> Quoy & Gaimard, 1827	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Ceratocymba leuckartii</i> (Huxley, 1859)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Enneagonum hyalinum</i> Quoy & Gaimard, 1827	28 – 66	Ali-Khan and Shehnaz 2001a
Family Diphyidae Quoy & Gaimard, 1827		
<i>Chelophyes appendiculata</i> (Eschscholtz, 1829)	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Chelophyes contorta</i> (Lens & van Riemsdijk, 1908)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Dimophyes arctica</i> (Chun, 1897)	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Diphyes bojani</i> (Eschscholtz, 1829)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Diphyes chamissonis</i> Huxley, 1859	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Diphyes dispar</i> Chamisso & Eysenhardt, 1821	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Eudoxides mitra</i> (Huxley, 1859)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Lensia campanella</i> (Moser, 1917)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Lensia cossack</i> Totton, 1941	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Lensia hotspur</i> Totton, 1941	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Lensia subtilis</i> (Chun, 1886)	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Lensia subtiloides</i> (Lens & van Riemsdijk, 1908)	28 – 66	Ali-Khan and Shehnaz 2001a
<i>Sulculeolaria monoica</i> (Chun, 1888)	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Sulculeolaria quadrialvis</i> Blainville, 1834	28 – 66	Ali-Khan and Shehnaz 2001a
Family Hippopodiidae Kölliker, 1853		
<i>Hippopodius hippopus</i> (Forskål, 1776)	28 – 66	Ali-Khan and Shehnaz 2001b
Family Prayidae Kölliker, 1853		
<i>Amphicaryon acaule</i> Chun, 1888	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Rosacea plicata</i> Bigelow, 1911	28 – 66	Ali-Khan and Shehnaz 2001b
Suborder Cystonecetae Haeckel, 1887		
Family Physaliidae Brandt, 1835		
<i>Physalia physalis</i> (Linnaeus, 1758) (= <i>Physalia utriculus</i>)	? Karachi	Haque 1977
Suborder Physonectae Haeckel, 1888		
Family Agalmatidae Brandt, 1835		
<i>Agalma elegans</i> (Sars, 1846)	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Agalma okenii</i> Eschscholtz, 1825	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Cordagalma ordinata</i> (Haeckel, 1888) (= <i>Cordagalma cordiforme</i>)	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Halistemma rubrum</i> (Vogt, 1852)	28 – 66	Ali-Khan and Shehnaz 2001b
<i>Nanomia bijuga</i> (delle Chiaje, 1844)	28 – 66	Ali-Khan and Shehnaz 2001b
Family Forskaliidae Haeckel, 1888		
<i>Forskalia</i> sp.	28 – 66	Ali-Khan and Shehnaz 2001b
Class Scyphozoa Goette, 1887		
Subclass Discomedusae Haeckel, 1880		
Order Rhizostomeae Cuvier, 1800		
Family Catostylidae Claus, 1883		
<i>Catostylus perezii</i> Ranson, 1945 (= <i>Catostylus mosaicus</i>)	Korangi Creek ⁵ , Manora ³	Tahera and Kazmi 2006; Gul and Morandini 2013
Family Cepheidae Agassiz, 1862		
<i>Cephea</i> sp.	? Off Karachi	Stiasny 1937
<i>Cephea coerulea</i> Vanhöffen, 1902	Off Pakistani coast ⁷⁵	Gul et al. 2015
<i>Netrostoma setouchianum</i> (Kishinouye, 1902)	Charna Island ⁷⁴	Gul et al. 2015
<i>Marivagia stellata</i> Galil & Gershwin, 2010	Off Pakistani coast ⁸⁴	Gul et al. 2014
Family Rhizostomatidae Cuvier, 1800		
<i>Rhizostoma pulmo</i> (Macri, 1778)	Keti Bandar ²⁶ (Thatta)	? Muhammed and Sultana 2008

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Table 1. Continued.

Species	Collection points	References
<i>Rhopilema hispidum</i> (Vanhöffen, 1888)	Manora ² , Clifton ¹⁵ , off Cape Monze ⁹ , Charna Island ²³	Gul and Morandini 2015
Order Semaestomeae L. Agassiz, 1862		
Family Pelagiidae Gegenbaur, 1856		
<i>Pelagia</i> cf. <i>noctiluca</i> (Forskål, 1775)	? Off Karachi, Manora ³ , Clifton ¹⁶	Stiasny 1937; Gul and Morandini 2013
<i>Sanderia malayensis</i> Goette, 1886	? Off Karachi	Stiasny 1937