

THE MARINE MOLLUSCA OF THE QATARI WATERS, ARABIAN GULF.

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الرخويات البحرية في المياه القطرية، الخليج العربي

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قسم علوم البحار – كلية العلوم

تم دراسة تركيب مجموعة أنواع الرخويات البحرية التي جمعت من المياه القطرية بالخليج العربي ما بين ١٩٩٦ - ١٩٩٧، حيث سجل ٢٤٦ نوعاً متضمنين ١١٥ من البطن قدميات و ١٢٤ من ذوات المصراعين، أما الطوائف الأخرى فمثلت بثلاث أو أربع أنواع فقط، ويشمل البحث أول قائمة شاملة لأنواع الرخويات الموجودة في المياه القطرية .

Key words: Mollusca, Abundance, Species Composition, Arabian Gulf, Qatar.

ABSTRACT

The species composition of the mollusca community in the Qatari waters of the Arabian Gulf, is reported. Data were obtained from analysis of samples collected during 1996 - 1997. A total of 246 species were recorded, including 115 Gastropoda, 124 Bivalvia, 4 Scaphopoda and 3 Polyplacophora. This study provides the first comprehensive list of mollusca species occurring in the Qatari waters.

INTRODUCTION

The benthic fauna form a principal food source for the demersal fishes and other predators. They are the processors of organic productivity in the overlying waters through nutrient regeneration [1-3].

There have been many studies on marine benthic communities in the Arabian Gulf, particularly those of the intertidal coastal areas of Saudi Arabia, Kuwait, Bahrain and UAE [4-10]. The general features of the intertidal and subtidal macrobenthic fauna of western and northern Gulf are well documented [4-11], however, the intertidal benthic communities of Qatar are poorly known. Recently, Mohammed and AL-Khayat [12] have produced a check-list of benthic mollusca at 8 sites along the tidal east coast and 1 site along the west coast.

In the present investigation, the common mollusca from different habitat of the eastern and southern coast of Qatar are recorded and a preliminary list of the common molluscan species in the Qatari waters is furnished.

MATERIALS AND METHODS

Macrobenthic invertebrates were sampled seasonally during 1996-1997 from 11 stations by the R/V "Mukhtabar AL-Bihar" of the University of Qatar covering the EEZ of Qatar (Figure 1). Each station was visited once during each season (Autumn - Spring). Macrobenthic fauna were collected using a Peterson grab. Samples were carefully sieved on an 0.5 mm screen and fixed with 10% formalin. In the laboratory, all organisms were sorted out, identified to lowest possible taxon using a binocular microscope. Identification was made using the descriptions of Smythe [7], Bosch and Bosch [13], Jones [10], Vine [14], Oliver [15], Green [16] and Bosch et al [17].

The degree of abundance was obtained by identifying each species within the sampling area and assessing it on a five point DAFOR scale as follows: D= dominant; A= abundant; F= frequent; O= occasional and R= rare (Table 1).

RESULTS

Station locations and bottom characters

Stations extend along 2 sectors parallel to the Qatari coast (Figure. 1).

The depth at these locations range between 10 and 55 m. Their bottom characteristics are as follows:

1- Stations M3, 404, 303, 305, 503 and KA are dominated by sandy - mud.

2- Stations 204, 401, 503 and 601 are almost sandy.

3- Stations 201 and UM are clay - mud.

Species Composition:

Table 1 illustrates the degree of abundance for each species recorded at different stations. The present work revealed 246 species of molluscs, including 115 Gastropoda (42 families), 4 Scaphopoda (2 families), 3 Polyplacophora (2 families) and 124 Bivalvia (30 families).

Of the 115 gastropoda species, 27 species were found at stations 201 and KA, and between 13-16 species were found at stations 401, 404 and 503, while 29, 32 and 35 species were found at stations UM, M3 and 303, respectively. The highest number of gastropods species were found at station 305 (47 species), while the lowest was recorded at station 204 (2 species).

Three of the 4 Scaphopoda species were found at stations 201, 303, 305, and 2 species were recorded at stations 401, M3 and UM, while only one species was found at stations 503 and KA. One Polyplacophora species was represented at station KA.

Of the 124 Bivalvia species, 26 species were found at stations 303 and KA, and 18, 20, 27, 29, 31 and 32 species were found at stations 503, 201, 404, 401, 601, and UM, respectively, while 40 species were recorded at stations 305 and M3. The lowest number of species was recorded at station 204 (8 species).

Station 201

At this station the common gastropods were *Pseudominolia nedyma*, *Rhinoclavuis (Proclava) kochi*, *Pirinella conica*, *Turritella cochlea* and *Atys cylindrica*. The most dominant Scaphopoda species were *Dentalium tomlini* and *Laevidentalium longitrorsum*, while the frequent bivalve species was *Tellinia* sp.

Station 204

This station is characterized by the presence of 2 gastropod species: *Triphora* sp., (which was highly dominant) and *Hexaplex kuesterianus*.

Station 303

The dominant gastropod species was *Turritella cochlea* and the abundant bivalve species was *Lioconcha ornata*, while the other species were frequent to rare.

Station 305

The abundant gastropod was *Strombus plicatus siboldii*, while the other species were frequent to rare on DAFOR scale.

Station 401

The gastropod *Cerithium scabridum* was found dominant at this station, while *Rhinocavis (roclava) kochi*, *Pirinella conica* and *Thais savignyi* were found most abundant. The other molluscs were recorded as occasional or rare.

Station 404

There were no dominant or abundant mollusc species at this station. The gastropod *Turritella cochlea* and bivalve *Antigona* sp were found frequently, while the other species ranked between occasional to rare.

Station 503

The Scaphopoda *Laevidentalium longitrorsum* was dominant at this location while other molluscs were less abundant.

Station 601

The frequent gastropod was *Thais savignyi*, while the rest of mollusca vary in their degree of abundance between occasional and rare.

Station M3

The most dominant gastropod was *Turritella cochlea* and the abundant was *Rhinoclavis (Proclava) kochi*, while the dominant bivalve was *Anadara erythraeonesis*.

Station UM

The most dominant gastropod was *Rhinoclavis (Proclava) kochi*, while *Pseudominolia climacota*, *Ethminolia iridifulgens*, *Turritella cochlea*, *Notocochlis* n. sp, *Mitrella blanda*, *Ancilla (Sparella) djiboutina*, *Bullaria ampulla* and *Alys cylindrica* were abundant. The Scaphopoda *Laevidentalium longitrorsum* and bivalve *Ervilia purpurea* were, abundant.

Station KA

At this station, the most dominant gastropods were *Pseudominolia climacota* and *Bothropoma* cf. *munda*, while the abundant species were *Trochus* sp, and *Cerithium scabridum*. The most frequent bivalves were *Anadara erythraeonesis*, *Diplodonta* cf. *globosa* and *Callista florida*. The Polyplacophora *Clistochiton* sp which was absent at all the other stations was present only at this station located in the south eastern coast of Qatar waters.

DISCUSSION

The previous report [13] on the common molluscs from Qatari shores was from the intertidal zone and covered 41 gastropods, 27 bivalves, 1 scaphopod and 1 cephalopod from the tidal east coast. Similarly, Jones and Jones [11] reported on intertidal and shallow subtidal fauna and flora species occurring in Ras Laffan to the north of Qatar. Their collection contained 7 molluscs: *Clypeomorus caeruleum*, *Fuchelus asper*, *Priotrochus obscura*, *Cronaia margaritifera*, *Serpulorbis sulcatus*, *Pinctada radiata*, *Barbatia* sp. and *Conus textile*.

This preliminary list of the mollusc community of Qatari waters is represented by 246 species including 115 gastropods, 124 bivalves, 4 scaphopods and 3 polyplacophors. This indicate that Qatari waters are quite similar in molluscs to other places in the Arabian Gulf [7, 8, 9 & 11]. Biggs [18] listed 97 gastropods and 83 bivalves from Abu Dhabi, while Smythe [8] listed a total of 214 gastropod, 118 bivalve and 3 scaphopods from all habitats in the United Arab Emirates. Vousden [17] reported 1 amphineura, 3 scaphopoda, 100 gastropod and 87 bivalves from all habitats around Bahrain Island. Molluscs, which were commonly found, included cerithids (particularly *Cerithium scabridum*) and other small gastropods (e.g. *Calliostoma* sp. and *Mitrella blanda*) and bivalves (e.g. *Pinctada* sp.). He also found that the muddy subtidal community was dominated by scaphopods *Dentalium longitrorsum* and *Dentalium octangulatum* with densities of up to 157 m². Other mollusca included various gastropods (*Turritella maculata*) and small bivalves (e.g. *Timoclea* sp.). Jones and Richmond [19] observed the highest density and abundance of the Juvenile gastropod *Cerithium scabridum* in the sandy - silt sediment, at over 2000 m² at the north to Qurmah Island (Saudi Arabia), while were 755 m² in the same habitat. Another study revealed a total of 183 gastropods and 163 bivalves along Messaieed in the south - east coast of Qatar [20].

It is worth to mention that the community of molluscs found at stations 204 and at 503 have a total species diversity lower than that observed in the other stations in the Qatari waters.

The dominant gastropods in Qatari waters are *Pseudominolia climacota*, *Bothropoma* cf. *munda*, *Cerithium scabridum*, *Rhinoclavis (Proclava) kochi*,

Turritella cochlea and *Triphora* sp. Among those *Ethminolia iridifulgens*, *Potamides conica*, *Strombus plicatus siboldii*, *Notocochlis* n.sp, *Thais savignyi*, *Mitrella blanda*, *Ancilla djiboutina*, *Bulla ampulla*, and *Alys cylindrica* were abundant according to DAFOR scale. The dominant Scaphopod species are *Dentalium tomlini* and *Laevidentalium longitrorusm*.

Among the bivalves, *Anadara erythraeonensis* and *Malvufundus normalis* at Station 601, *Lioconcha ornata* at Station 303 and *Ervilia purpurea* at station 601 were abundant.

The molluscan fauna of Qatari waters is diverse, but poorly known, and considerably more taxonomic work is necessary before any comprehensive zoogeographic summery is implemented. It important to know more about relationships with related species outside Arabian Gulf region before any statements concerning the origin and biogeographic affinities can be made. However, the molluscan fauna of Qatari waters (Table 1) indicated that most of these faunal list have been made outside the

Arabian Gulf, the Gulf of Oman and the Red Sea. Of these records, some have already been observed for the Indo-West Pacific as a whole which in turn can be devided into three biogeographic components. Firstly, widespread Indo-Pacific species: these are a considerable number of molluscs which are found throughout the tropical Indian and West Pacific Oceans, examples: *Inquisitor graiffithi*, *Umbonium vestiarium*, *Ficus subintermedia*, *Thais savignyi*, *Bullaria ampulla*, *Callista florida*, *Tapes sulcarius*, *Dentalium octangulata*, *Barbiatia foliata* and *Pinctada radiata*. Secondly, species restricted in distribution to the Northern Indian Ocean, the Arabian Gulf and the Red Sea, examples: *Fusinus townsendia*, *Ancilla castenea* and *Anadara ehrenbergi*. Thirdly, species endemic to the Arabian Gulf, examples: *Strombus persicus* and *Mitella blanda*.

More detailed studies of molluscs community structure, habitats and seasonal variation on the family, species and group levels are needed.

Table 1: Species list of Mollusca community in the Qatari water's.

(D=Dominant; A=Abundant; F=Frequent; O=Occasional and R=Rare.)

Station	201	204	303	305	401	404	503	601	M3	UM	KA
Water depth (m)	10	19	27	36	11	55	40	10.5	23	11.5	12
Species											
Class: Gastropoda											
Family: Fissurellidae											
<i>Diodora rueppellii</i> (Sowerby, 1843)				R				R			
Family: Trochidae											
<i>Perrinia stellata</i> (A. Adams, 1864)										R	
<i>Vaceuchelus angulatus</i> (Pease, 1868)								R			
<i>Trochus</i> sp											A
<i>Turcica stellata</i> (A. Adams, 1863)			R						R		
<i>Ethminolia degregorii</i> (Caramagna, 1888)				R							R
<i>Priotrochus kotschyi</i> (Philippi, 1849)											R
<i>Priotrochus obscurus</i> (Wood, 1828)											R
<i>Pseudominolia climacota</i> (Melvill, 1897)	R				R		R	R	R	A	D
<i>Pseudominolia gradata</i> (Sowerby, 1895)								R			
<i>Pseudominolia nedyma</i> (Melvill, 1897)	F										
<i>Umbonium vestiarium</i> (Linnaeus, 1758)											R
<i>Ethminolia iridifulgens</i> (Melvill, 1910)								R		A	
<i>Stomatia c.f. rubra</i> (Lamarck, 1822)											R
Family: Skeneidae											
<i>Lodderia novemcarinata</i> (Melvill, 1906)			R	R							
Family: Turbinidae											
<i>Bothropoma cf munda</i> (H. Adams, 1873)									R		D
Family: Truncatellidae											
<i>Truncatella marginata</i> Kuster, 1855	R								R	R	
Family: Calyptraeidae											
<i>Calyptraea pellucida</i> (Reeve, 1859)	O		R	R						R	
<i>Calyptraea</i> sp.			R								
Family: Cerithiidae											
<i>Argyropeza divina</i> Melvill & Standen, 1901							R				
<i>Cerithium scabridum</i> Philippi, 1848	R				D						A
<i>Rhinoclavis (Proclava) kochi</i> (Philippi, 1848)	F		O		A	O	R	R	A	D	R
Family: Potamididae											
<i>Pirinella conica</i> (Blainville)	F		R		A		R			R	F
Family: Turritellidae											
<i>Turritella cochlea</i> Reeve, 1849	F		D	F	R	F	O		D	A	R
<i>Turritella</i> sp.	R										
Family: Stromboidae											
<i>Strombus(Dolomena)plicatus siboldii</i> Sowerby,1842				A							
<i>Strombus(Conomurex) persicus</i> Swainson, 1821			R						R		F
<i>Strombus(Canarium) fusiformis</i> Sowerby, 1842				R							
Family: Xenophoridae											
<i>Xenophora</i> sp.						O					
Family: Naticidae											
<i>Natica (Naticarius) alapapilionis</i> (Roding, 1798)				R					O	O	
<i>Natica vitellus</i> (Linnaeus, 1758)				R							

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<i>Natica pseustes</i> Watson, 1881				R					R		
<i>Natica pulicaris</i> Philippi, 1852				R							
<i>Natica</i> sp.	R										
<i>Notocochlis</i> n.sp			R		R				O	A	R
<i>Sinum</i> sp.											R
Family: Ficidae											
<i>Ficus subintermedia</i> (Orbigny, 1852)			R								
Family: Cerithiopsidae											
<i>Seila bandorensis</i> (Melvill, 1893)			R								
Family: Triphoridae											
<i>Triphora idonea</i> (Melvill & Standen, 1901)				R							
<i>Triphora</i> sp		D		R				R			R
<i>Viriola corrugata</i> (Hinds, 1843)			R	R				O			
<i>Viriola</i> sp.			R								
Family: Epitoniidae											
<i>Amaea acuminata</i> (Sowerby, 1844)					R			R			
<i>Epitonium acumleatum</i> (Sowerby, 1844)				R							
<i>Epitonium townsendi</i> (Melvill & Standen, 1903)								R			
<i>Epitonium</i> sp.								R			
<i>Eglisia tricarinata</i> Adams & Reeve, 1850)			R								
Family: Eulimidae											
<i>Hypermastus boschorum</i> Waren, 1991				R					R		
<i>Niso venosa</i> Sowerby, 1895											R
Family: Muricidae											
<i>Hexaplex kuesterianus</i> (Tapparone-Canefri, 1875)		O		R		R	R	R	R	R	R
Family: Thaididae											
<i>Thais savignyi</i> (Deshayes, 1844)			R		A			F		O	R
Family: Coralliophilidae											
<i>Coralliophila</i> sp.	R										
Family: Columbellidae											
<i>Mitrella blanda</i> (Sowerby, 1844)	R								R	A	R
<i>Miterlla cartwrighti</i> (Melvill, 1897)	R										
<i>Mitrella</i> sp.	R			R							
<i>Zafra comistea</i> (Melvill, 1906)								R			
<i>Zafra phaula</i> (Melvill & Standen, 1901)			R		R	O					
Family: Nassariidae											
<i>Nassarius(Niotha) albescens gemmuliferus</i> (A. Adams,1852)					R		O		R		
<i>Nassarius (Niotha) jactabundus</i> (Melvill ,1906)			R	R		O		R	R	R	R
<i>Nassarius(Zeuxis) frederici</i> (Melvill & Standen,1901)			R	F				O			
<i>Nassarius (Niotha) splendidulus</i> (Dunker, 1846)			R								
<i>Nassarius</i> sp.	R		R	R			O		R	R	
Family: Fascioliariidae											
<i>Fusinus forceps</i> (Perry, 1811)											R
<i>Fusinus townsendi</i> (Melvill, 1899)			R						R	R	R
Family: Olividae											
<i>Ancilla (Sparella) castanea</i> (Sowerby, 1830)			R		R		O		O	R	R
<i>Ancilla (Chilotygya) exigua exigua</i> (Sowerby, 1830)				R							
<i>Ancilla (Sparella) djiboutina</i> (Jousseume, 1894)	R		R	R	R				F	A	R
<i>Ancilla</i> sp.				R							
Family: Marginellinae											
<i>Gibberula mazagonica</i> (Melvill, 1892)	R										R
Family: Mitridae											

<i>Mitra bovei</i> Kiener, 1838	R		O	F			R			
<i>Mitra</i> sp			R							
<i>Domiporta granatina</i> (Lamarck, 1811)				R						
<i>Neocancilla circula</i> (Kiener, 1838)							R			R
"Ziba" <i>pretiosa</i> (Reeve, 1844)			R	R						
Family: Costellariidae										
<i>Costellaria diaconalis</i> (Melvill & Standen, 1903)			R	R					O	F
<i>Costellaria malcolmensis</i> (Melvill & Standen, 1901)							R			
<i>Costellaria obeliscus</i> (Reeve, 1844)				R						
<i>Costellaria</i> sp.							R			R
Family: Cancellariidae										
<i>Scalptia</i> sp.			R	R						
Family: Conidae										
<i>Conus milesi</i> Sith, 1887			R	R						
<i>Conus ardisiaceus</i> Kiener, 1845										R
<i>Conus saecularis</i> Melvill, 1898							R			
<i>Conus dictator</i> (Melvill, 1898)							R			
Family: Turridae										
<i>Etrema spurca</i> (Hinds, 1844)			R	O					R	
<i>Funa tayloriana</i> (Reeve, 1846)				O			R			
<i>Daphnella thia</i> Melvill & Standen, 1903				R						
<i>Inquisitor griffithi</i> (Gray, 1834)			R		R				R	
<i>Inquisitor flaviduleus</i> (Lamarck, 1822)	R		R				R			
<i>Inquisitor sinensis</i> (Hinds, 1843)			R	R					R	
<i>Splendrillia lucida</i> (G. & H. Nevill, 1875)				R		O			R	R
<i>Splendrillia persica</i> (Smith, 1888)				R						
<i>Splendrillia resplendens</i> (Melvill, 1898)			R	R						
<i>Citharomangelia</i> sp			R				R	O	R	R
Family: Architectonicidae										
<i>Heliacus</i> sp									R	
Family: Mathildidae										
<i>Mathilda carystia</i> Melvill & Standen 1903									R	
Family: Pyramidellidae										
<i>Gurmatia pulchrior</i> (Melvill, 1904)	R								R	
<i>Odostomia eutropia</i> Melvill, 1899					R					R
<i>Otopleura mitralis</i> (A. Adams in Sowerby, 1854)						R				
<i>Tropaeas</i> sp									R	
<i>Turbonilla linjaica</i> Melvill & Standen, 1901)	R									R
<i>Turbonilla</i> sp.	R									
Family: Amathinidae										
<i>Leucotina</i> sp.	O									
Family: Acteonidae										
<i>Punctacteon eloiseae</i> (Abbott, 1973)					R					
<i>Punctacteon fabreanus</i> (Crosse, 1874)					R				R	
<i>Pupa affinis</i> (A. Adams, 1855)	R								R	F
Family: Bullidae										
<i>Bullaria ampulla</i> Linnaeus, 1758	R									A R
<i>Bulla</i> sp.										R
Family: Haminoeidae										
<i>Atys cylindrica</i> (Helbling, 1779)	F				R				R	A R
<i>Haminoea</i> sp.									R	
Family: Retusidae										

<i>Retusa tarutana</i> Smythe, 1979	R		R	R					R	R	
<i>Retusa</i> sp.				R							
Family: Ringiculidae											
<i>Ringicula propinqua</i> Hinds, 1844				R							
Family: Scaphandridae											
<i>Tornatina inconspicua</i> H. Adams, 1872				R							
Family: Cavoliniidae											
<i>Diacavolinia flexipes</i> (Van der Spoel, 1993)				R							
<i>Cavolinia</i> sp.							O				
Class: Scaphopoda											
Family: Dentaliidae											
<i>Dentalium octangulatum</i> Donovan, 1803	R		R	F					R	R	
<i>Dentalium tomlini</i> Melvill, 1918	D		R	O	R		O			R	
Family: Laevidentaliidae											
" <i>Laevidentalium</i> " cf <i>curvotracheatum</i> (Plate, 1908)					R				O		
<i>Laevidentalium longitrossum</i> (Reeve, 1843)	D		R	O			F			A	R
Class: Polyplacophora											
Family: Ischnochitonidae											
<i>Callistochiton</i> sp											A
Family: Chitonidae											
<i>Chiton (Rhyssoplax) affinis</i> Issel, 1869											R
<i>Chiton</i> sp											R
Class: Bivalvia											
Family: Nuculidae											
<i>Nucula consentenea</i> Melvill & Standen, 1907											R
Family: Nuculanidae											
<i>Nuculana brookei</i> (Hanely, 1860)				R					R	R	
Family: Yoldiidae											
<i>Yoldia tropica</i> Melvill, 1897	R										R
Family: Arcidae											
<i>Barbatia foliata</i> (Forsskal, 1775)	R								R		
<i>Barbatia sulcata</i> (Lamarck, 1819)				R		R					
<i>Arca plicata</i> (Dillwyn, 1817)				R	R		R	R			R
<i>Anadra (Scapharca) natalensis</i> (Krauss, 1848)				R							
<i>Anadara ehrenbergi</i> (Dunker, 1868)	R	O					R			R	R
<i>Anadara erythraeonensis</i> (Philippi, 1851)				O	R	R				A	F
<i>Trisidos</i> sp	R			R	R		R				
<i>Barbatia</i> sp.										R	
Family: Noetiidae											
<i>Striarca erythraea</i> (Issel, 1869)							R				
<i>Striarca symmetrica</i> (Reeve, 1844)						R			R		
Family: Glycymerididae											
<i>Glycymeris striatularis</i> (Larmack, 1818)						R					R
<i>Glycymeris maskatensis</i> (Melvill, 1897)		O		R	O					R	R
<i>Brachidontes variabilis</i> (Krauss, 1848)									R		
<i>Modiolus (Modulatus) sirahensis</i> (Jousseau, 1891)	R	O		R	R						R
<i>Modiolus ligneus</i> (Reeve, 1858)									R	R	
<i>Modiolus</i> sp.										R	
<i>Amygdalum peasei</i> (Newcomb, 1870)							R				
<i>Musculus</i> sp											R
<i>Gregariella simplicifilis</i> Barnard, 1964											R

<i>Leiosolenus</i> sp.						R					
<i>Solamen adamsianum</i> (Melvill & Standen, 1907)						R					
Family: Pteriidae											
<i>Pteria</i> sp.						R					R
<i>Pterelectroma zebra</i> (Reeve, 1857)											R
<i>Pinctada radiata</i> (Leach, 1814)	R	R			R			R	R	R	O
<i>Pinctada cf nigra</i> (Gould, 1850)					R				R	R	
Family: Malleidae											
<i>Malvufundus normalis</i> Lamarck, 1819								A			
<i>Malvufundus regula</i> (Forsskal, 1775)					R			O	R	R	R
Family: Isognomonidae											
<i>Isognomon</i> sp.		R									
<i>Parviperna</i> sp.											R
<i>Pinna</i> sp.				R							
<i>Limatulella viali</i> (Jousseaum in Lamy, 1920)				R							
Family: Ostreidae											
<i>Ostrea</i> sp.						R					
Family: Pectinidae											
<i>Peaten dorotheae</i> Melvill in Melvill & Standen, 1907)								R			
<i>Chlamys (Scaechlamys) livida</i> (Lamarck, 1819)					R					R	
<i>Chlamys senatoria</i> (Gmelin, 1791)					R				R		R
<i>Decatopecten plica</i> (Linnaeus, 1758)					R						
Family: Spondyliidae											
<i>Spondylus exilis</i> (Sowerby, 1895)								R			
Family: Placunidae											
<i>Placuna</i> sp.											R
Family: Lucinidae											
<i>Lucina dentifera</i> Jonas, 1846	R		O	R	R		R		O	O	
<i>Bellucina semperiana</i> (Issel, 1869)	O		R	R	R	R			R	F	
<i>Ctena divergens</i> (Philippi, 1850)								R			
" <i>Lucina</i> " sp.					R	R					
<i>Myrtea fabula</i>								R			
<i>Myrtea</i> sp.								R			
<i>Divaricella ornatissima</i> (Orbigny, 1846)				R			R				
Family: Ungulinidae											
<i>Diplodonta cf globosa</i> (Forsskal, 1775)	R		R	R	O		R	O	R	R	F
<i>Diplodonta subrotundata</i> Issel, 1869				R		R	O		R		
<i>Diplodonta genthila</i> Melvill, 1898					R	O			R		
<i>Diplodonta</i> sp.	R						R				
<i>Scintilla</i> sp.									R		
<i>Cardita crassicosta</i> Lamarck, 1819				R							
<i>Cardita finchi</i> (Melvill, 1898)				R		R					
<i>Cardita variegata</i> Bruguiere, 1792									R		
Family: Chamoidea											
<i>Chama asperella</i> Lamarck, 1819	R			R	O	R		R	R	R	
<i>Chama reflexa</i> Reeve, 1846		O						R	R	R	
<i>Bathytormus jousseau mei</i> (Lamy, 1918)			R	R			R	R	R		
<i>Bathytormus radiatus</i> (Sowerby, 1825)									R		
Family: Cardiidae											
<i>Fulvia australe</i> (Sowerby, 1834)	R	O	R	R	O		O	R	O	O	R
<i>Fulvia fragile</i> (Forsskal, 1775)					R						
<i>Acrosterigma lacunosa</i> (Reeve, 1845)								O			

<i>Acrosterigma maculosa</i> (Wood, 1815)					R			R	R	R	
Family: Mactridae											
<i>Mactra</i> (<i>Moctrotoma</i>) <i>ovalina</i> Lamark, 1818			R	R							
<i>Mactra</i> sp.				R		R					
<i>Lutraria australis</i> Deshayes, 1855			R								
Family: Cardiliidae											
<i>Cardilia</i> sp.											R
<i>Cardilia semisulcata</i> (Lamarck, 1819)						R					
Family: Cultellidae											
<i>Siliqua</i> sp.								R	R		
Family: Tellinidae											
<i>Tellina adamsi</i> (Bertin, 1878)							R	R			
<i>Tellina arsinoensis</i> Issel, 1869						R				R	R
<i>Tellina nitens</i> Deshayes, 1854										R	
<i>Tellina</i> (<i>Exotica</i>) <i>triradiata</i> H. Adams, 1871										R	R
<i>Tellina</i> (<i>Arcopella</i>) <i>isseli</i> H. Adams, 1871			R	R				R			
<i>Tellina valtonis</i> Hanley, 1844	O			R	O	R	R		O	R	R
<i>Tellina vernalis</i> Hanley, 1844									R		
<i>Tellinia</i> sp.	F		R	R		O		R			
<i>Leptomya cochlearis</i> (Hinds, 1844)											R
<i>Pharaonella wallaceae</i> (Salisbury, 1934)									R		
<i>Tellidora pellyana</i> H. Adams, 1873									R		
<i>Pinguitellina pinguis</i> (Hanley, 1844)	R										R
<i>Scutarcopagia</i> sp.	R								R		R
<i>Tellinella cf pulchella</i> (Lamarck, 1818)								R			
Family: Donacidae											
<i>Donax nitidus</i> Deshayes, 1855				R	R						
<i>Donax bipartitus</i> Sowerby, 1892											R
<i>Donax</i> sp.				R	R						
Family: Psammobiidae											R
<i>Gari weinkauffi</i> (Crosse, 1864)			R					R	R		R
<i>Gari</i> sp.											R
Family: Semelidae											
<i>Semele carnicolor</i> (Hanley, 1845)				R							
<i>Cumingia striata</i> (Reeve, 1853)								R			
<i>Ervilia purpurea</i> (Lamy, 1914)	R			O					R	D	
<i>Ervilia scaliola</i> (Issel, 1869)	R					R					
<i>Iacra seychellarum</i> (A. Adams, 1856)											R
<i>Leptomya</i> sp.									R		
Family: Solecurtidae											
<i>Azorinus coarctatus</i> (Gmelin, 1791)						R					R
Family: Veneridae											
<i>Antigona lamellaris</i> (Schumacher, 1817)						R			R		
<i>Antigona</i> sp.			O	O		F					R
<i>Pitar yerburyi</i> (Smith, 1891)			R								
<i>Bassina calophylla</i> (Philippi, 1846)						R		R			
<i>Bassina foliacea</i> (Philippi, 1846)							R		R		
<i>Timoclea arakana</i> (Nevill, 1871)	R		F	O	R	R	O	R	R		
<i>Timoclea</i> sp.							R				
<i>Lioconcha ornata</i> (Dillwyn, 1817)	O	R	A						R		O
<i>Circe intermedia</i> (Tomlin, 1924)				R							
<i>Gafrarium pectinatum</i> (Linnaeus, 1758)					R						

<i>Redicirce sulcata</i> (Gray, 1838)												R
<i>Callista florida</i> (Lamarck, 1818)				R	O		R		R			F
<i>Pitar</i> sp.				O		R	R					
<i>Sunetta</i> sp.			R	R	R			R				O
<i>Dosinia erythraea</i> (Romer, 1860)								R				
<i>Dosinia contracta</i> (Philippi, 1844)								R				
<i>Dosinia tumida</i> (Gray, 1838)				R				R				
<i>Dosinia</i> sp.				R								
<i>Paphia undulata</i> (Born, 1778)				R	R			R				R
<i>Protapes sinuosa</i> (Lamarck, 1818)			R									
<i>Tapes sulcarius</i> (Lamarck, 1818)						R	R			R	R	
<i>Kyrina kyrina</i> Jousseau, 1894			R	R								
Family: Corbulidae												
<i>Corbula taitensis</i> Lamarck, 1818			R	O		R		R				
<i>Corbula sulculosa</i> H. Adams, 1870	R											
Family: Pandoridae												
<i>Pandora</i> sp.			R									
Family: Thraciidae												
<i>Brechites attrahens</i> (Lightfoot, 1786)												R
Family: Cuspidariidae												
<i>Cardiomya alcocki</i> (Smith, 1894)				R								

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REFERENCES

- [1] **Hale, S. S., 1976.** The Role of Benthic Communities in the Nitrogen and Phosphorus Cycles in an Estuary. Mineral Cycling in South Eastern Ecosystem ERDA Symposium Series, 1975, 291-308.
- [2] **Gary, J. S., 1981.** The Ecology of Marine Sediments. Cambridge Studies in Modern Biology 2. Cambridge University Press, 185 pp.
- [3] **Hylleberg, J. and H. Riss-Vestergaard, 1984.** Marine Environments. The Fate of Detritus. Akademisk Forlag, Denmark, 284 pp.
- [4] **McCain, J. C., 1984 a.** Marine Ecology of Saudi Arabia. The Intertidal Fauna of Sand beaches in the Northern Area, Arabian Gulf. Fauna of Saudi Arabia. 6: 53-78.
- [5] **McCain, J. C., 1984 b.** Marine Ecology of Saudi Arabia. The Nearshore Soft Benthic Communities of the Northern Area, Arabian Gulf. Fauna of Saudi Arabia. 6: 79-101.
- [6] **Farmer, D., 1983.** Marine Life. In: Clayton, D and Pilcher C., (eds), Kuwait's Natural History: An Introduction. Kuwait Oil Co., pp. 192-247.
- [7] **Smythe, K. R., 1972.** Marine Mollusca from Bahrain Island, Persian Gulf. J. Conch. 27: 491-496.
- [8] **Smythe, K. R., 1979.** The Marine Mollusca of the United Arab Emirates, Arabian Gulf. J. Conch. 30: 57-80.
- [9] **Basson, P. W.; J. E. Burchard; J. T. Hardy and A. R. Price, 1977.** Biotopes of The Western Arabian Gulf. Marine Life and Environments of Saudi Arabia. Aramco, Saudi Arabia. 284pp.
- [10] **Jones, D. A., 1986.** A Field Guide to the Seashores of Kuwait and the Arabian Gulf. University of Kuwait 192 pp.
- [11] **Jones, D. A. and M. D. Richmond, 1992.** Intertidal and Subtidal Marine Habitat Surveys. In: Establishment of A Marine Habitat and Wildlife Sanctuary for the Gulf Region. Final Report for Phase I: 134-161. Jubail and Frankfurt. CEC/NWCWD.
- [12] **Mohammed, S. Z. and Jassim A. AL-Khayat, 1994.** A Preliminary Check- list of Benthic Mollusca on the Qatari Coasts, Arabian Gulf. Qat. Univ. Sci. J., 14(1): 201-206.
- [13] **Bosch, D. and E. Bosch, 1989.** Sea Shells of Southern Arabia. Motivate Publishing, M.A.E. 124pp.
- [14] **Vine, P., 1986.** Red Sea Invertebrates. IMMEL Publishing, London. 224 pp.
- [15] **Oliver, P. G., 1992.** Bivalved Seashells of the Red Sea. Hemmen & Nat. Mus. Wales, UK. 330 pp.
- [16] **Bosch, D. T.; S. P. Dance; R. G. Moolenbeek and P. G. Oliver, 1995.** Seashells of Eastern Arabia. Motivate Publishing, London. 296 pp.
- [17] **Green, S., 1994.** Bahrain Seashells. Arabian Printing & Publishing House. Bahrain. 183 pp.
- [18] **Biggs, H. E. J., 1973.** The Marine Mollusca of the Trucial Coast, Persian Gulf. Bull. Br. Mus. Nat. Hist. (Zool). 24: 344-421; 6 pls.
- [19] **Jones, D. A. and R. E. Jones, 1985.** An onshore and Environmental Survey Related to the Proposed Development of Qatar North Gas Field. Marine Science Laboratoies, Menai Bridge, UK. Unpublished report, 16pp.
- [20] **Scientific and Applied research Center (SARC), 1997.** Baseline Eco-Survey of the Marine Environment Opposite Messaieed Industrial area. Part II. Biological Analysis. Report prepared for Qatar General Petroleum Corporation, Oil and Gas Operations.

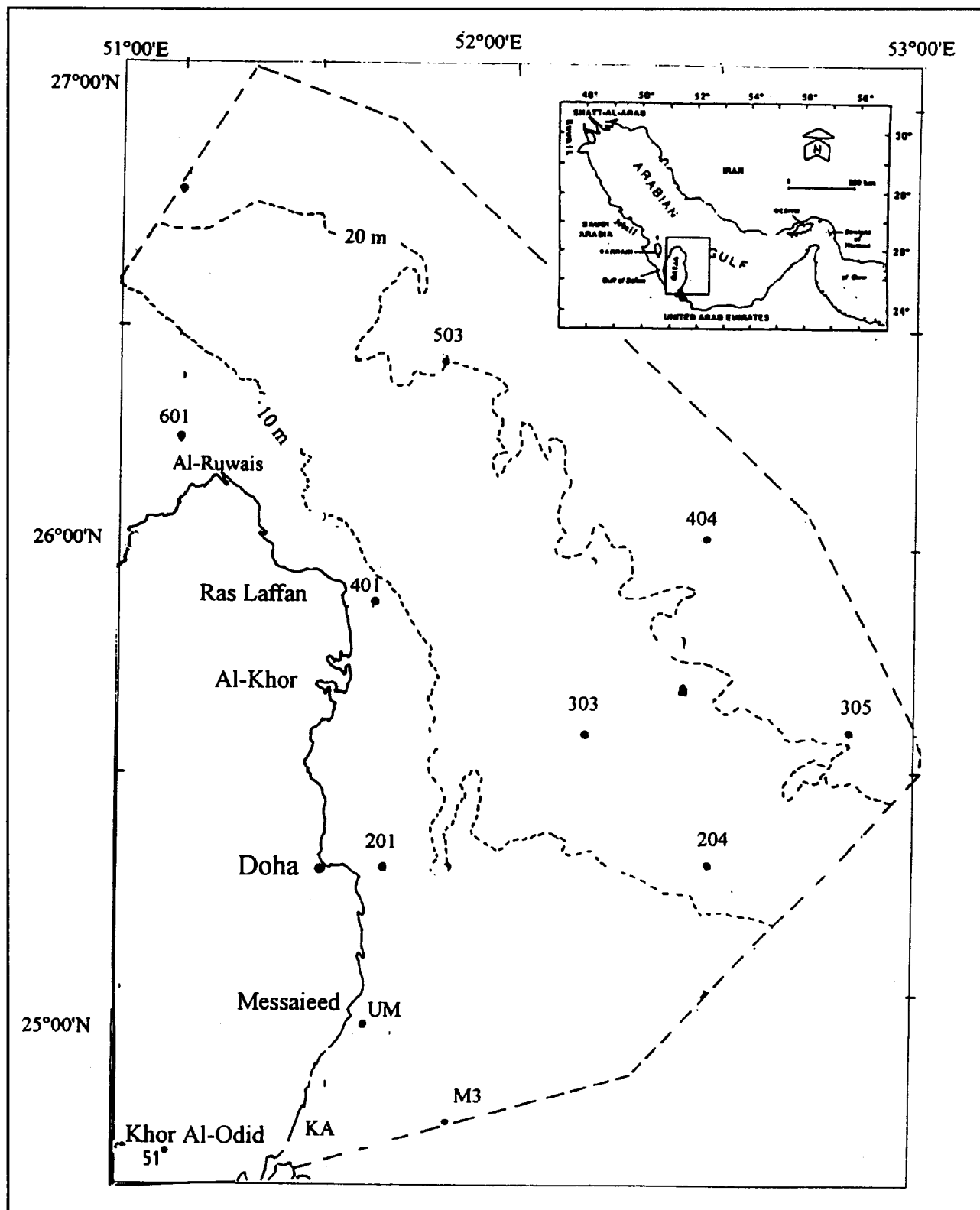


Figure 1. Selected stations in Qatari Waters