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A PRELIMINARY CHECK-LIST OF BENTHIC MOLLUSCA ON THE QATARI COASTS, ARABIAN GULF

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قائمة مبدئية بأنواع الرخويات المتواجدة في الشواطئ القطرية بالخليج العربي

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في هذا البحث تم تسجيل مبدئي لأنواع الرخويات البحرية التي جمعت من الشواطئ القطرية بالخليج العربي كما تم تسجيل المواقع والمناطق البيئية عامة للعائلات الشائعة ، وقد تمثلت طائفة البطنقدميات بـ ٤١ نوعًا وتمثلت طائفة ذات المصراعين بـ ٢٧ نوعًا أما الطوائف الأخرى فلم تمثل إلا بنوع واحد فقط لكل طائفة .

Key Words: Arabian Gulf, Marine Mollusca - Qatari coasts.

ABSTRACT

In this paper, an annotated checklist of the benthic marine Mollusca collected from Qatari coasts, Arabian Gulf, is presented. Localities and habitats are given for the common families of the recorded groups. Gastropoda were represented by 41 species; Bivalvia by 27 species and both Scaphopoda and Cephalopoda by one species only.

INTRODUCTION

The benthic Mollusca form an important food web component in the Arabian Gulf [1, 2]. Their distribution and composition are contributory factors which affect the bottom fauna communities and their biological roles in this tropical environment [1, 2, 3]. Species composition and distribution of different molluscan taxa in the Arabian Gulf and Gulf of Oman have been generally reviewed by Smythe[4] and Bosch and Bosch [5]. Also Smythe [6, 7] presented an annotated list of the molluscs collected along the coasts of Bahrain Island and the United Arab Emirates. Among the fauna of the Kuwaiti shores in the north west of the Arabian Gulf, Jones [8] listed the common sea-shells in the intertidal and sub-tidal areas.

Accounts of Mollusca in the Arabian Gulf, included some limited collections of shells in the nineteenth century in scattered localities [9, 10], but major studies were made by Melvill and Standen [11, 12], and Melvill [13]. Eames and Wilkins [14], Biggs [15, 16] and Ahmed [17] recorded new species of bivalves and gastropods, some of which may perhaps be endemic.

Concerning Qatari coasts, there is no literature dealing with the common species of molluscs or their distribution and diversity. In this paper, the common marine Mollusca along different sites on the Qatari coasts are recorded, giving a preliminary check-list which covers live and dead shells collected from coast lines, without sampling sub-tidal zones.

MATERIALS AND METHODS

Between 10 to 12 visits were made along the Qatari coasts in different seasons and different localities during the period March 1992 - December 1993. In each visit, the shells in each location were collected by hand from shore line and in open water direction (about 50 m far from shore line). Live shells were washed in sea water and preserved in 5% formalin whereas dead and cast-up shells were kept in dry plastic bags. In the laboratory, shells (after separating the animals from live ones) were sorted out, cleaned in bleach solution and kept for identification. Identifications were made from the descriptions of Smythe [4], Bosch and Bosch [5, 18] Jones [8] and Vine [19].

The bottom characters of the visited localities were investigated in the field and described in relation to the type of substrate. The degree of abundance of each species was noted and is shown in Table 1 as follows : VC = very common C = common; UC = uncommon and R = rare.

Table 1
Check-list of Mollusca in the Qatari coasts

Class 1:	Gastropoda	Degree of abundance	Location
1. Family	: Fissurelliadae (keyhole limpets)		
	: *Diodora rueppelli* (Sowerby, 1834).	UC	2,4,5,6
	: *Diodors funiculata* (Reeve, 1850)	UC	2,3,4,5
2. Family	: Patellidae (limpets)		
	: *Patella exusta pica* (Reeve, 1854)	R	3,5,7,8
3. Family	: Acmaeidae		
	: *Acmaea saccbarina* (Deshayes, 1863)	R	2,7,8
4. Family	: Trochidae		
	: *Trochus kochi* Philippi (1844)	UC	1,2,3,5,6
	: *Euchellus erythraeus* (Brocchi, 1821)	C	1,3,7,9
	: *Euchellus atratus* (Gmelin, 1791)	VC	2,3,4
	: *Euchelus erythraeus* (Brocchi, 1821)	C	2,3,7,9
	: *Monodonta vermiculata* (Fischer, 1874)	UC	
	: *Priotrochus obscura* (Wood, 1828)	UC	2,3,7,8,3
5. Family	: Turbinidae (turban shells)		
	: *Turbo brunneus* (Roeding, 1798)	R	2,8
6. Family	: Littorinidae (winkles)		
	: *Littorina neritoides* (Linnaeus, 1758)	R	1,2,4,5,6
	: *Littorina undulata* (Gray, 1839)	R	2,5
	: *Littorina littorea* (Linnaeus, 1758)	R	2,5,6,7
	: *Littorina scabra* (Linnaeus, 1758)	UC	1,5,6,7
	: *Nodilittorina millegrana* (Philippi, 1848)	R	1,4,5,7
7. Family	: Neritidae		
	: *Nerita albicilla* (Linnaeus, 1758)	R	5,6,7,8
8. Family	: *Turritellidae* (turret shells)		
	: *Turritella torulosa* Kiener (1843)	R	1,5,7,8,9
9. Family	: Vermetidae (worm shells)		
	: *Vermetus sulcatus* (Lamarck, 1818)	C	2,3,7,8
10. Family	: Planaxidae		
	: *Planaxix sulcatus* (Born, 1778)	VC	All Stations
11. Family	: Potamididae		
	: *Cerithidea cingulata* (Gmelin, 1791)	VC	2,3,5,6
	: *Pirinella conica* (Blainville, 1826)	VC	
12. Family	: Cerithiidae (horne shells)		
	: *Clypeomorus bifasciatus* (Sowerby, 1855)	C	All Stations
	: *Cerithium scabridum* Philippi (1848)	UC	All Stations

Table 1 Contd

Class 1:	Gastropoda	Degree of abundance	Location
	: *Rhinoclavis fasciata* (Bruguiere, 1792)	R	2,4,5,6
	: *Rhinoclavis kochi* (Philippi, 1848)	R	2,3,4,8
13. Family	: Xenophoridae (carrier shells)		
	: *Xenophora corrugata* (Reeve, 1843)	R	1,3,4,7
14. Family	: Strombidae (conchs)		
	: *Strombus decorus persicus* (Swainson, 1822)	R	2,3,8
15. Family	: Cypracidae (conchs) *Cypraea ocellata* (Linnaeus, 1758)	UC	2,5,7
16. Family	: Muricidae (spine shells)		
	: *Hexaplex kuesterianus* (Tapparone-Canefri, 1875)	C	2,7,8
	: *Chicoreus ramosus* (Linnaeus, 1758)	R	1,8
17. Family	: Thaididae (rock shells)		
	: *Morula granulata* (Duclos, 1832)	VC	2,4,5,6
	: *Cronia konnanensis* (Melvill, 1893)	VC	2,3,4,5,6
18. Family	: Columbellidae (dove shells)		
	: *Anachis misera* (Sowerby, 1844)	C	2,8,9
19. Family	: Nassariidae (basket whelks)		
	: *Nassarius arcularis plicatus* (Roeding, 1798)	C	2,7,8,9
20. Family	: Fasciolariidae (spindle shells)		
	: *Fusinus townsendi* (Melvill, 1899)	R	2,3,4,7,8
21. Family	: Olividae (short spired shells)		
	: *Ancilla castanea* (Sowerby, 1830)	UC	3,5,6,7
22. Family	: Marginellidae (sunken spired shells)		
	: *Mrginella pergrandis* Clover (1973)	R	2,3,4,5,6
	: *Marginella mazagonica* Melvill (1893)	UC	7,8,9
23. Family	: Conidae (cone shells)		
	: *Conus flavidus* (Lamarck, 1822)	UC	1,2,5,8
24. Family	: Bullidae (bubble shells)		
	: *Bullaria ampulla* (Linnaeus, 1758)	VC	2,3,5,6
25. Family	: Atyidae (fragile sunken-spired shells)		
	: *Atys cylindrica* (Helbling, 1779)	UC	2,7,8,9
26. Family	: Siphonariidae		
	: *Siphonaria kurracheensis* (Smith, 1903)	R	2,3,6,7

Class 2:	Bivalve	Degree of abundance	Location
1. Family	: Arcidae		
	: *Barbatia fusca* (Wood, 1828)	UC	1,2,4,5
	: *Anadara rufescens* (Reeve, 1844)	UC	1,2,3,7,8

Table 1 Contd.

Class 2:	Bivalve	Degree of abundance	Location
	: *Anadara antiquata* (Linnaeus, 1758)	C	1,3,5,6
	: *Anadara ehrenbergi* (Dunker, 1868)	UC	2,3,4,5,6
	: *Barbatia helblingii* (Bruguiere, 1789)	UC	2,4,6,7
2. Family	: Mytilidae (mussels)		
	: *Brachidontes variabilis* (Krauss, 1848)	VC	2,3,7,9
3. Family	: Pinnidae		
	: *Pinna bicolor* Gmelin (1791)	C	2,3,5,6
4. Family	: *Pteriidae* (pearl oysters, hammer oyster)		
	: *Pinctada radiata* (Leach, 1814)	VC	2,3,4,8,9
	: *Malleus regula* (Forsskal, 1775)	R	1,2,3,4,8
5. Family	: Pectinidae (scallops)		
	: *Chlamys ruschenbergerii* (Tryon, (1870)	UC	2,6,7,8
6. Family	: Spondylidae		
	: *Spondylus gaederopus* (Linnaeus, 1758)	C	1,2,3,8
7. Family	: Lucinidae		
	: *Codakia tigerina* (Linnaeus, 1758)	R	1,2,4
	: *Diplodonta globosa* Sturany (1901)	R	1,2,8,9
	: *Diplodonta ravayensis* Sturany (1901)	R	1,2,4,7
8. Family	: Cardiidae		
	: *Trachycardium lacunosum* (Reeve, 1845)	C	2,3,4,8
	: *Laevicardium papyraceum* (Bruguiere, 1789)	UC	2,4,5,8
9. Family	: Donacidae		
	: *Donax scalpellum* (Gray, 1857)	UC	1,2,3
10. Family	: Psammobiidae		
	: *Asaphis deflorata* (Linnaeus, 1758)	UC	1,2,9,4
11. Family	: Veneridae		
	: *Circenita callipyga* (Born, 1778)	VC	All Stations
	: *Circ corrugata* (Dallwyn, 1817)	C	All Stations
	: *Circe intermedia* Reeve (1964)	C	1,2,4,5,7
	: *Callista multiradiata* (Sowerby, 185)	UC	1,2,3,5,6
	: *Marcia hiantina* (Lamarck, 1818)	R	2,6,8,9
	: *Marcia opima* (Gmelin, 1791)	UC	2,3,4,7
	: *Tapes texturata* (Lamarck, 1818)	R	1,3,4,6
	: *Tivela damaoides* (Gray, 1843)	R	2,3,7
12. Family	: Pandoridae		
	: *Laternula navicula* (Reeve, 1864)	UC	3,4,5,6

Table 1 Contd.

Class 3:	Scaphopoda	Degree of abundance	Location
	: *Dentalium octangulatum* Donovan (1803)	C	All Stations
Class 4:	Cephalopoda		
	: *Sepia sp.*	C	All Stations

RESULTS

1. Collecting localities and bottom characters

Most of the collecting localities (Fig. 1) are situated on the eastern coast of Qatari peninsula whereas only two are on the western side. They are indicated by numbers as follows:-

1. UMM SAID : Open sandy beach with sandy creeks.

2. AL-WAKRAH: Bottom mainly covered by pebbles. sand and rocky outcrops with crevices and sandy bottomed rock pools.

3. SEMMAYSIMAH: Pebbles and coarse sand with fragmented rocks of the local region.

4. AL-KHOR: Silt sand with some mud, with stretches of coarse sand and pebbles.

5. RAS-MATBAKH: Mangrove swamp with mud and silt.

6. RAS-LAFFAN: Sandy beach with flat sea bed covered with algal debris, weeds and some rocks.

7. RUWAIS: Man-made rocky creek walls, with boulders, pebbles and some silty patches.

8. DUKHAN: Flat rocky bed covered with silt, sand, pebbles, algal debris and tarballs. It contains also some rock pools.

9. ABU-SAMRAH: Very big boulders with rock creeks. Its floor covered mainly by tarballs, as well as silt and algae.

2. Species composition and notes on the habitats of common families.

2.1 Species composition

The recorded molluscan species in the collecting localities, with the degree of abundance of each are presented in Table 1. This includes 41 gastropods (from 26 families), 27 bivalves (12 families), one scaphopod *(Dentalium octangulatum)* and one cephalopod *(Sepia sp.)*. Degrees of abundance within the gastropod group were as follows: 17 species rare, 12 species uncommon, 5 species common, and 6 species very common. In the bivalve group, rare and uncommon species were represented by 7 and 9 species respectively, whereas the common and very common states were represented by 6 and 4 species only.

2.2 Notes on the habitats of the common families

2.2.1 Class: Gastropoda

A: Family: Trochidae: Members of this family were represented by five species. They were collected live from

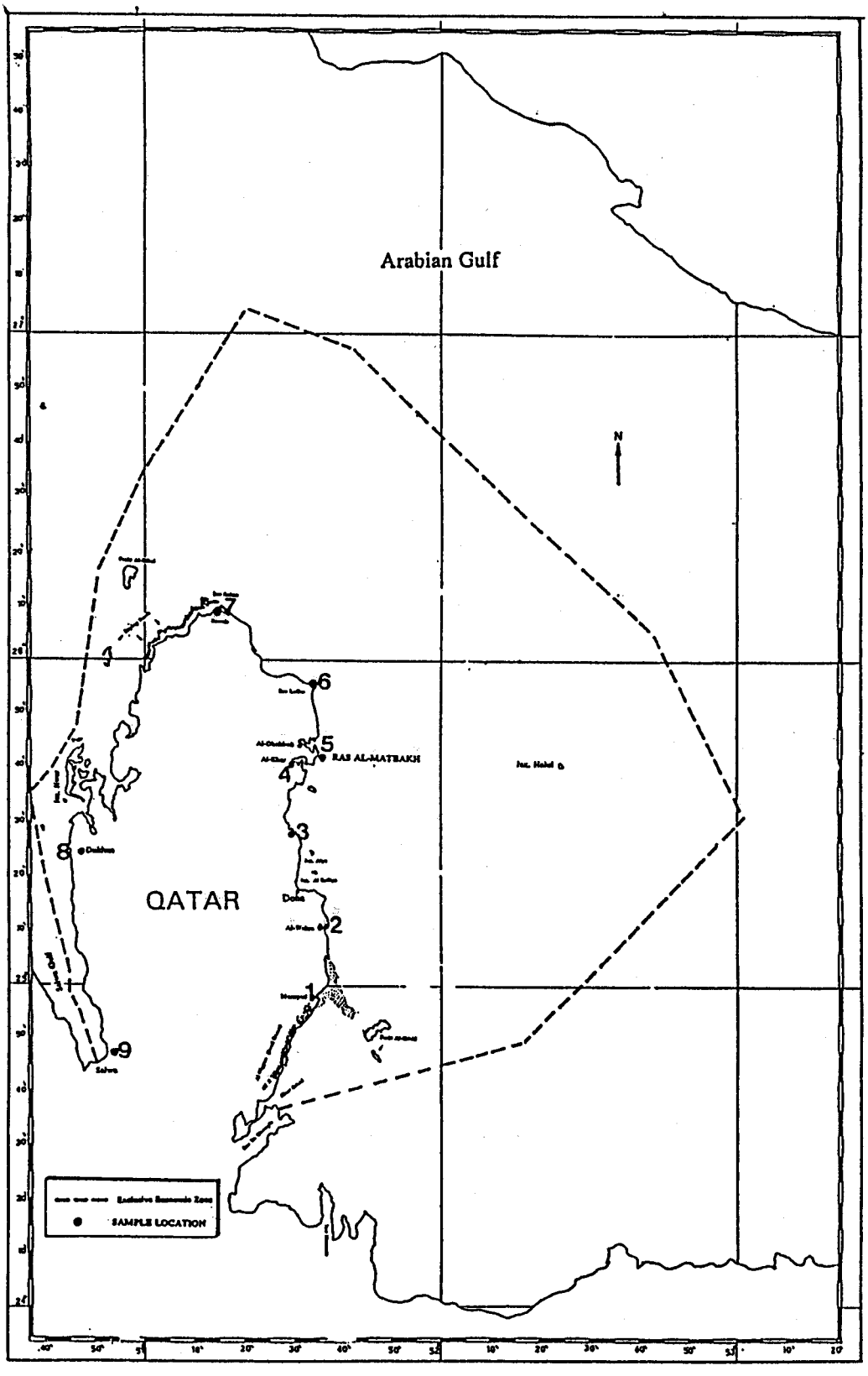

Fig. 1: Area of study and sampling locations.

crevices and between stones and boulders and from rock pools. The most common species were *Euchelus atratus* and *Trochus erythraeus* which were usually found grazing on algae.

B: Family: Littorinidae: Five species of this family were rarely recorded among localities particularly in sheltered places and on rocky surfaces. *Nodilittorina millegrana,* however, were picked up from crevices and between stones on exposed beaches (RUWAIS).

C: Family: Planaxidae *Planaxix sulcatus* was only the species of this family. It formed wide carpets on the rocks and hard substrates in the littoral or supralittoral zones and at all edges of the rocky pools.

D: Family: Potamididae The mud-snails were represented by two common species *(Cerithidea cingulata;* and *Pirinella conica).* They were usually found in huge quantities in mangrove swamps and in the muddy creeks.

E: Family: Cerithiidae The common species *Clypeomorus bifasciatus* was collected from coarse sand areas and from sediment composed of mixtures of sand, coral fragments and algal debris.

F: Families: Thaididae, Marginellidae and Bullidae: Members of these families were collected mainly from rocky localities and from rock pools as well as between boulders.

G: Other families were collected from different substrates and no specific habitats or niches were observed to be characteristic of particular groups.

2.2.3 Class: Bivalvia

A: Families: Arcidae, Cardiidae, Pinnidae, and Veneridae.

Species of these families were most found dead (with very few live shells), in coarse sand and silt bottoms or burrowing for few centimeters in mud. *Circenita callipyga* cast-up shells (F: Veneridae) formed shell belts on the shallow banks in AL-WAKRAH locality. Live individuals of Pinnidae were found digging down to 20 cm in soft sand and silty-muddy substrates.

B: Families: Mytilidae, Pectinidae and Pteriidae: Mussels, Pearl oysters, and Scallops were usually found alive or dead on rocky flats and or big boulders attached by byssus threads or cemented to the rocks or under big stones in and out of rock pools.

C: Other families were sparsely distributed in different habitats and no characteristic substrate was observed for any of them.

DISCUSSION

Because the present records dealt only with the common molluscs collected from Qatari shores, it is unrealistic to compare them with those from the neighbouring Bahrain Island [6] or from the United Arab Emirates [7]. This is due to the fact that in the present investigation, no attempt was made to collect shells from sub-tidal zones or in coral reef beds or in pearl oyster beds. Nevertheless this check-list recorded about 41 gastropods, 27 bivalves, 1 scaphopod and 1 cephalopod, which indicate preliminarily that Qatari waters are quite rich in molluscs like other places in the Arabian Gulf [5, 6 & 7]. Smythe [6] recorded 49 gastropod and 36 bivalve species in the Bahrain Island. In 1979. She also recorded about 205 gastropod, 122 bivalve and 3 scaphopod shells from all habitats in the United Arab Emirates.

The habitats of the common species are quite different from family to family and from group to group, and they need detailed study. Live Trochidae, for-example, were collected mostly from rock pools. Also *Planaxis sulcatus* formed large communities on the surfaces of rocks in the supratidal and intertidal zones. Bosch and Bosch [5] and Smythe [6 & 7] recorded similar observation in Gulf of Oman and different places within the Arabian Gulf. Also, the habitats (and may be the quantity) of the mud-snails in the mangrove swamps show more or less similar patterns in other mangrove areas[17].

Pearl oysters are important for the production of natural pearls in the Arabian Gulf [20, 21]. These species and their relatives (Mytilidae and Pectinidae) need hard substrate on which to settle and grow [22, 23]. Spat of pearl oysters, *Brachidontes sp.* and *Chlamys sp.* were usually found attached or cemented to hard substrate in rock pools in Al-WAKRAH, ABU-SAMRAH and RUWAIS. Some live individuals of Families Veneridae, Arcidae and Cardiidae, on the other hand were collected from coarse sand, silt or mud substrate. *Veneridae species* are known to live in soft sand and mud substrates [24, 25].

REFERENCES

[1] **McCain, J.C., 1984 a.** Marine Ecology of Saudi Arabia. The intertidal fauna of the sand beaches in the Northern Area, Arabian Gulf, Fauna of Saudi Arabia. 6: 53-78 .

[2] **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.

[3] **Farmer, D., 1983.** Marine Life. In: Clayton, D and Pilcher C, (Eds), Kuwait's Natural History: An Introduction. Kuwait Oil Co., pp. 192-247.

[4] **Smythe, K.R., 1982.** Sea Shells of the Arabian Gulf. George Allen and Unwin London 123 pp.

[5] **Bosch, D.** and **E. Bosch, 1982.** Sea Shells of Oman. Longman Group, 206 pp.

[6] **Smythe, K.R., 1972.** Marine Mollusca from Bahrain Island, Persian Gulf, J. Conch. 27: 491-496.

[7] **Smythe, K.R., 1979.** The marine mollusca of the United Arab Emirates, Arabian Gulf, J. Conch. 30: 57-80.

[8] **Jones, D.A., 1986.** A Field Guide to the Seashores of Kuwait and the Arabian Gulf. University of Kuwait 192 pp.

[9] **Issel, A., 1865.** Catalogo del Molluschi raccolte della Missione Italiana in Persia. Mem. R. Acad. Sci. Torino 23: 387-439.

[10] **Martens, E., 1874.** Uber vorderasiatischen Conchylien nach den Sammlungen des Prof. Haussknecht. 127 pp., 9 pls. Cassel.

[11] **Melvill, J.C.** and **R. Standen, 1901.** The Mollusca of the Persian Gulf... etc. Proc. Zool. Soc. Lond. 327-460 .

[12] **Melvill, J.C.** and **R. Standen, 1906.** The Mollusca of the Persian Gulf... etc. II. Pelecypoda. Proc. Zool. Soc. Lond. 783-848, pls. 53-56.

[13] **Melvill, J.C., 1928.** The Marine Mollusca of the Persian Gulf... etc, Malac. Soc. Lond. 18: 93-127.

[14] **Eames, F.E.** and **G.L. Wilkins, 1957.** Six new molluscan species from the alluvium of Lake Hamar near Basrah, Iraq. Proc. Malac. Soc. Lond. 22: 198-203, pls 27-28.

[15] **Biggs, H.E.J., 1958.** Littoral Collecting in the Persian Gulf. J. Conch., London 24: 270-275.

[16] **Briggs, H.E.J., 1973.** The marine Mollusca of the Trucial Coast, Persian Gulf, Bull. Br. Mus. Nat. Hist. (Zool). 24: 344-421; 6 pls.

[17] **Ahmed, M.M., 1975.** Systematic study on Mollusca from the Arabian Gulf and Shatt Al Arab. 42 pp., 17 pls. Basrah, Iraq.

[18] **Bosch, D.** and **E. Bosch, 1989.** Sea Shells of Southern Arabia. Motivate publishing, M.A.E. 124 pp.

[19] **Vine, P., 1986.** Red Sea Invertebrates. IMMEL Publishing, London. 224 pp.

[20] **Basson, P.W., J.E. Burchard, J.T. Hardy** and **A.R. Price, 1977.** Biotopes of the Western Arabian Gulf. Aramco, Saudi Arabia. 218 pp.

[21] **Mohammed, S.Z., 1992.** Pearl Oyster Project Progress Reports, Pearl Oyster Project, SARC, Qatar University, Report No. 1, 14 pp.

[22] **Seed, R., 1969.** The ecology of Mytilus edulis L. (Lamellibranchiata) on exposed rocky shores. I. Breeding and settlement. Oecologia, 13: 277-316.

[23] **Bayne, B.L. (Ed.), 1976.** Marine Mussels: Their Ecology and Physiology. Cambridge University Press, 506 pp.

[24] **Ghobashy, A.F.A., S. Z. Mohammed, H.R. Gabr** and **A.R. Brand, 1992.** Community structure and seasonal variation of Mollusca at Lake Timsah, Suez Canal. J. Egypt. Ger. Soc. Zool. 7 (B): 139-160.

[25] **Mohammed, S.Z., H.R. Gabr, A.R.A. Ghobashy** and **A.R. Brand, 1992.** Species Composition and Distribution of Benthic Molluscs in Lake Timsah (Suez Canal) J. Egypt. Ger. Soc. Zool. 7 (B): 161-174.