

A Taxonomic Review of the Bivalve and Gastropod Mollusc Fauna along the Saudi Intertidal Zone of the Arabian Gulf

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ABSTRACT. The bivalve and gastropod fauna of Saudi Arabian intertidal zone of the Arabian Gulf were surveyed during 1993. The investigated area covered a distance of about 250 km. Sampling took place from Jubayl (Station: 1, at the northwestern side of the Gulf), going southeastwards through Rahima (St: 2), Ras Tanura (St: 3), Safwa (St: 4), Qatif (St: 5), Dammam (St: 6), Khobar (St: 7), adjacent to King Fahd Bridge (K.F.B., St: 8), Aziziyah (St: 9), Half-Moon Beach (H.M.B. St: 10), Uquayr (St: 11) and Salwa (St: 12), at the southeastern Saudi-Qatari borders. 130 mollusc species were identified from the investigated area, of these 62 species were gastropods and 68 bivalves. The identified species were listed in their proper taxa. The gastropod species were related to 3 subclasses, 5 orders, 4 suborders; 19 superfamilies, 32 families, and 46 genera. While bivalves were related to 2 sub-classes, 5 orders, 19 superfamilies, 25 families and 52 genera.

Historical Review About the Arabian Gulf Molluscs

The hydrobiology, fishery and benthos of the northern, eastern and southern regions of the Arabian Gulf as well as Omani Gulf have been surveyed and studied by some specialists and expeditions. Of the latter we mention, the Danish Survey Expedition (1762), the Danish Fisheries Investigation (1937-1938). The German Oceanographic Vessel "Meteor" (1965), and the Japanese Trainingship "Umitaka Maru" R/V of Tokyo University (1968).

The offshore benthic molluscs of the previously mentioned regions have also received considerable attention from the following workers: Melvill (1898, 1928), Smythe (1972, 1975 and 1979), Purser (1973), Bosch and Bosch (1982, 1989), and Glayzer *et al.* (1984).

According to the available literature, the Saudi Arabian mollusc fauna of the Arabian Gulf has also been studied by a small number of conchologists and malacologists. Biggs and Grantier (1960) gave an account on the molluscan shells of Ras Tanura; Basson *et al.* (1977) studied the biotopes and the benthic communities; Sharabati (1981) discussed the general occurrence of the bivalve and gastropod mollusc species,

genera, and families among the different ecological habitats; Smythe (1982) reported on the sea shells of the Arabian Gulf; McCain (1984a, b) studied the marine ecology of the intertidal infauna, and the near shore bottom communities among the northeastern sandy beach extending from Safania to Manifa.

The Present Investigation

There is very little information on the Saudi intertidal mollusc population of the Arabian Gulf. Hence, the present work was conveniently suggested to determine the seashore molluscs of this zone, particularly from the systematic point of view.

The present investigation covered a distance of about 250 km along the Saudi intertidal zone of the Arabian Gulf. The bivalve and gastropod shells were sampled during 1993 from 12 stations starting from Jubayl (at the northwestern side of the Gulf), then continued down in the southeastern direction to Salwa (at the most southeastern Saudi-Qatari borders), (Fig. 1), 130 molluscan species (62 gastropods and 68 bivalves) were identified from the whole area. The identified species were listed systematically and their geographical distribution within the investigated area

was recorded. The gastropod fauna was related to 3 subclasses, 5 orders, 4 suborders, 19 superfamilies, 32 families and 46 genera. While the bivalves were related to 2 subclasses, 5 orders, 19 superfamilies, 25 families, and 52 genera.

The taxonomical method used during the present study was mainly based upon that of Moore *et al.* (1960 and 1969a, b). Furthermore, the following systematic

references were used as important guides for the identification of the species concerned: Jukes (1914); Diener (1923); Davies (1933); Salisbury (1934); Frizel (1936); Ranson (1950); Rogers (1951); Hirase & Taki (1961); Chavan (1952); Hatai & Nisiyama (1952); Haas (1954); Kira (1955); Allan (1956); Abbott (1960, 1962); Cox (1961); Habe (1961, 1965); Rosewater (1961); Taylor and Sohl (1962); Cate

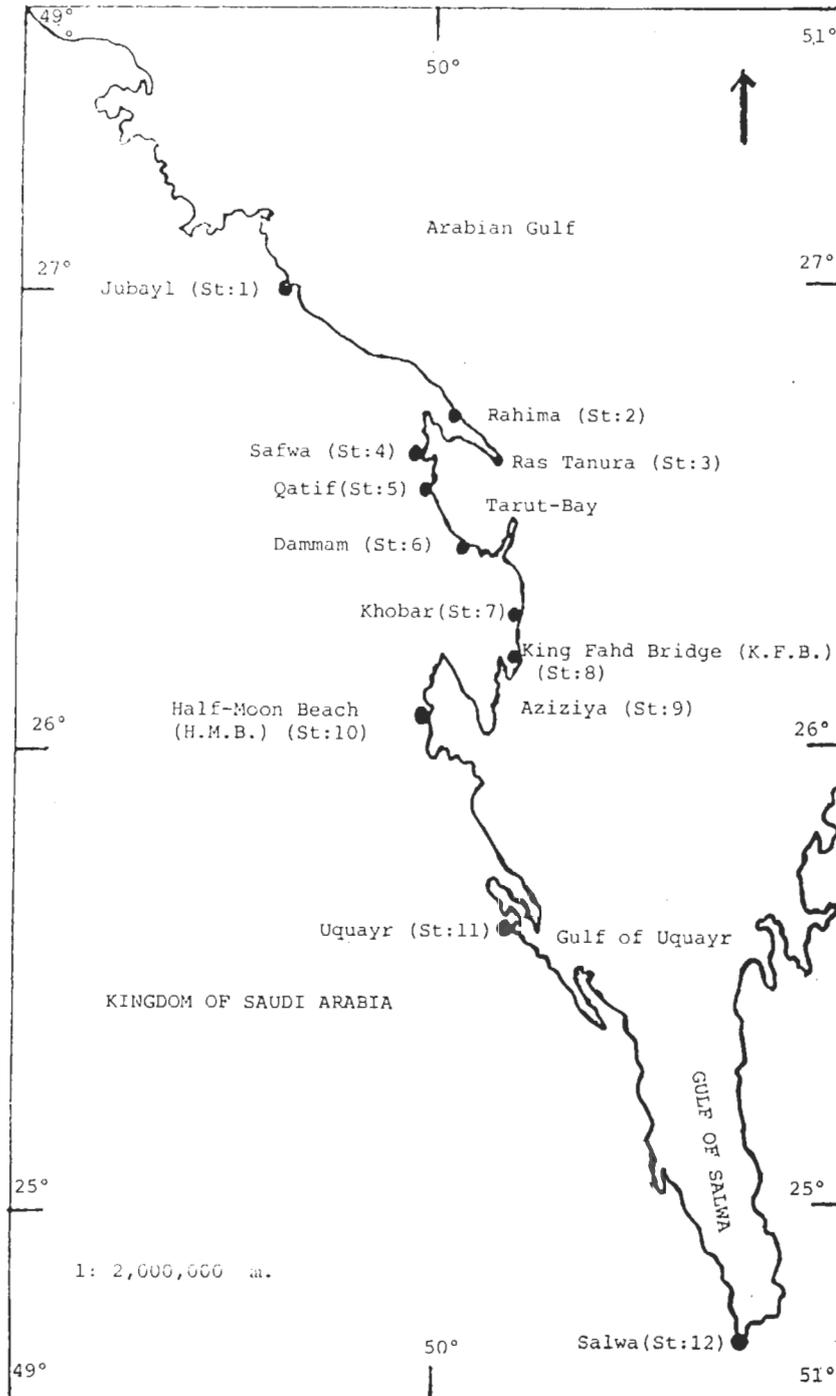


FIG. 1. Investigated area.

(1964); Hasan (1974, 1983) and Angeletti (1978).

The identified gastropod and bivalved mollusc species were photographed and kept in the Department of Aquatic Resource Development, College of Agricultural and Food Sciences, King Faisal University, Kingdom of Saudi Arabia.

Conclusion

According to the available literature, no systematic and geographic studies have been done on the mollusc fauna along the Saudi coastal area of the Arabian Gulf, and the present work is the first in this context. In the following taxonomic list station numbers where each species is located are shown between brackets.

However, further investigations of Saudi Arabian inshore and offshore regions of the Arabian Gulf are still needed to determine the whole mollusc population, their systematic order, and geographic distribution.

Taxonomic List and First Geographical Stations of the Recorded Species

PHYLUM: MOLLUSCA

A – CLASS: GASTROPODA

Sub class: Prosobranchia

Order: Archaeogastropoda

Super family: Fissurellacea

Family: Fissurellidae (Key hole limpets)

G: *Diodora* Gray, 1821

Sp: *Diodora funiculata* (Reeve, 1850)
[1, 2, 4-12]

Super family: Trochacea

Family: Trochidae (Top shells)

G: *Monilia* Swainson, 1840

Sp: *Monilea gradata* Sowerby, 1895
[1, 2, 4, 5, 7-9]

G: *Trochus* Linn. 1758

Sp: *Trochus erythraeus* Brocchi, 1821
[1-12]

G: *Umbonium* Link, 1807

Sp: *Umbonium vestiarium* (Linn., 1758)
[4, 5, 8-10]

Family: Turbinidae (Turbans)

G: *Turbo* Linn., 1758

Sp: *Turbo radiatus* Gmelin, 1791
[1-12]

Super Family: Neritacea

Family: Neritidae (Slipper winkles)

G: *Nerita* Linn., 1758

Sp: *Nerita albicilla* (Linn., 1758)
[1, 12]

Order: Mesogastropoda (Monotocardia)

Super family: Architectonica

Family: Architectonicidae (Sundial shells)

G: *Architectonica* Roding, 1798

Sp: *Architectonica perspectiva* (Linn., 1758)
[1, 12]

Super family; Turritellacea

Family: Turritellidae (Turret or screw shells)

G: *Turritella* Lamarck, 1799

Sp: *Turritella cochlea* Reeve, 1849
[1, 3, 5, 9, 11]

Sp: *Turritella turulosa* Kiener, 1843-1844
[1, 12]

Family: Vermetidae (Worm shells)

G: *Vermetus*

Sp: *Vermetus sulcatus* (Lamarck, 1818)
[1, 12]

Super family: Cerithiacea

Family: Potamididae (Telescope shells)

G: *Cerithidea*

Sp: *Cerithidea cingulata* (Gmelin, 1791)
[1, 11]

G: *Perinella* Gray, 1847

Sp: *Pirenella conica* (Blainville)
[1, 12]

G: *Terebralia*

Sp: *Terebralia palustris* (Linn., 1767)
[1, 3]

Family: Cerithiidae (Horn shells)

G: *Cerithium* Adanson, 1757

Sp: *Cerithium scabridum* Philippi, 1848
[1, 11]

Family: Planaxidae (Cluster winkles)

G: *Planaxis* Lamarck, 1818

Sp: *Planaxis sulcatus* (Born, 1778)
[2, 3, 5, 9]

Super family: Epitoniacea

Family: Epitonidae (Weatle traps)

G: *Amaea* H. & A. Adams, 1853

Sp: *Amaea acuminata* (Sowerby, 1844)
[1, 3, 5, 8, 10]

Super family: Strombacea

Family: Strombidae (Cone shells)

G: *Strombus* Linn. 1758

Sp: *Strombus decorus percicus* Swainson, 1821
[1, 12]

Sp: *Strombus fasciatus* Born, 1778
[1, 12]

Sp: *Strombus gibberulus* Linn., 1758
[1, 2, 4, 5, 8, 9, 11, 12]

Sp: *Strombus plicatus siboldi* Sowerby, 1842
[2, 3, 6, 9, 12]

G: *Tibia* Roding, 1798

Sp: *Tibia fusus* Linn, 1758
[1, 3, 11]

Sp: *Tibia insulaechorab curta* Sowerby, 1814
[3, 11]

Super Family: Calyptraeacea

Family: Calyptraeidae (Cup and Saucer shells)

G: *Calyptraea* Lamarck, 1799

Sp: *Calyptraea pellucida* Reeve, 1859
[3, 10, 12]

G: *Crepidula* Lamarck, 1799

Sp: *Crepidula walshii* ... Hermansoon, 1859
[3, 12]

Super family: Cypraeacea

Family: Cypraeidae (Coweries)

G: *Cypraea* Linn., 1758

Sp: *Cypraea arabica* Linn., 1758
[1, 3, 5, 8, 10, 12]

Sp: *Cypraea chinensis* Gmelin, 1791
[1, 3, 5, 12]

Sp: *Cypraea grayana* Schilder, 1930
[1, 3, 5, 11]

Sp: *Cypraea turdus winkworthi* ... Schilder & Schilder, 1939
[1, 3, 5, 11]

Super family: Naticaceae

Family: Naticidae (Moon snails or Necklace shells)

G: *Natica* Scopoli, 1777

Sp: *Natica pulicaris* Philippi, 1851
[2, 4, 6, 8, 9, 12]

Sp: *Natica vitellus* (Linn., 1758)
[1, 4, 5, 9, 12]

G: *Neverita* Risso, 1926

Sp: *Neverita didyma* (Roding, 1798)
[3, 5, 9, 11]

G: *Polynices* Montfort, 1810

Sp: *Polynices tumidus* (Swainson, 1840)
[2, 4, 5, 8, 10]

Super family: Tonnacea

Family: Cassidae (Helmet or Bonnet shells)

G: *Semicassis* Morch, 1852

SP: *Semicassis faurotis* (Jousseaume, 1888)
[1, 4, 5, 8, 9]

Family: Cymatidae (Triton shells)

G: *Ranularia*

Sp: *Ranularia boschi* (Abbott & Lewis, 1970)
[3, 6, 8, 10]

Family: Tonnidae (Tun shells)

G: *Tonna* Brunnich, 1772

Sp: *Tonna dolium* (Linn., 1758)
[1, 3, 5, 8, 10, 12]

Super family: Melanellacea

Family: Melanellidae

G: *Niso*

Sp: *Niso venosa* Sowerby, 1895
[4, 5, 8, 10, 11]

Order: Neogastropoda

Sub-Order: Stenoglossa

Super family: Muricacea

Family: Muricidae (Comb shells)

G: *Hexaplex* Perry

Sp: *Hexaplex kusterianus* . (Tapparone-Canefri, 1875)
[1, 4, 6, 8, 11, 12]

G: *Murex* Linn., 1758

Sp: *Murex scolopax* Dillwyn, 1817
[1, 3, 7, 10, 11]

Sp: *Murex malabricus* Smith, 1894
[3, 5, 6, 8, 10, 12]

Family: Thaididae (Rock shells – Dog Welks)

G: *Rapana* Schumacher

Sp: *Rapana bulbosa* (Solander, 1817)
[1, 12]

G: *Thais* Roding, 1798

Sp: *Thais mancinella* (Linn, 1758)
[1, 2, 4, 5, 8, 9]

Sp: *Thais mutabilis* (Linn., 1807)
[1, 3, 6, 10, 12]

Sp: *Thais savigny* Deshayes, 1844
[1, 3, 6, 8, 12]

Sp: *Thais tissoti* (Petit, 1853)
[1, 2, 6, 9, 12]

Super family: Collumbellacea (Pyreniaceae)

Family: Collumbellidae (Pyrenidae) (Dove shells)

G: *Mitrella*

Sp: *Mitrella blanda* (Sowerby, 1844)
[3, 5, 8, 10]

Super family: Buccinacea

Family: Buccinidae

G: *Babylonia* Schluter

Sp: *Babylonia spirata* (Linn., 1758)
[1, 2, 5, 11]

Family: Fascioliariidae (Tulip or Spindle shells)

G: *Fusinus* Rfinesque, 1815

Sp: *Fusinus arabicus* (Melville, 1898)
[1, 3, 5, 9, 11, 12]

G: *Peristerina* Morch, 1853

Sp: *Peristerina nassatula forskalii* (Tapparone-Canefri, 1875)
[1, 2, 4, 5, 8, 10]

Family: Melongenidae (Crown shells)

G: *Volema* (Bolten) Roding, 1798

Sp: *Volema pyrum* (Gmelin, 1791)
[1, 12]

- Family:** Nassariidae (Mud snails, Dog welks, Basket welks)
- G:** *Bullia* Griffith
- Sp:** *Bullia mauritiana* Gray, 1839
[1, 2, 4, 12]
- G:** *Nassarius* Dumeril
- Sp:** *Nassarius albescens gemmuliferus* (A. Adams, 1852)
[2, 4, 5, 9, 12]
- Sp:** *Nassarius arcularis plicatus* . (Roding, 1798)
[1, 3, 5, 8, 10, 11]
- Sp:** *Nassarius coronatus* . (Bruguiere, 1798)
[1, 4, 9, 11]
- Super family:** Volutacea
- Family:** Olividae (Olive shells)
- G:** *Ancilla* Lamarck, 1799
- Sp:** *Ancilla castenea* (Sowerby, 1830)
[1, 10, 12]
- G:** *Oliva* Bruguiere, 1789
- Sp:** *Oliva bulbosa* (Roding, 1798)
[1, 12]
- Family:** Costellariidae
- G:** *Vexillum* Roding, 1798
- Sp:** *Vexillum acuminatum* . (Gmelin, 1791)
[3, 5, 8, 10]
- Sub-Order:** Taxoglossa
- Super family:** Concaacea
- Family:** Terebridae (Auger shells)
- G:** *Duplicaria*
- Sp:** *Duplicaria duplicata* (Linn., 1758)
[1, 10, 12]
- Sub class:** Opisthobranchia (Euthyneura)
- Order:** Tectibranchia (Cephalaspida)
- Sub order:** Ballomorpha
- Family:** Bullidae (Bubble shells)
- G:** *Bulla* (Linn., 1758)
- Sp:** *Bulla ampulla* (Linn., 1758)
[1, 2, 5, 11]
- Family:** Atyidae
- G:** *Atys*
- Sp:** *Atys cylindrica* (Helbling, 1779)
[1, 3, 6, 8, 12]
- Sub-Order:** Pyramidellomorpha (Entomotaeniata)
- Super family:** Pyramidellacea
- Family:** Pyramidellidae
- G:** *Salinator*
- Sp:** *Salinator fragilis* (Lamarck, 1822)
[4, 5, 8, 10]
- Sub-Class:** Pulmonata (Lung shells)
- Order:** Basommatophora
- Super family:** Siphonariacea
- Family:** Siphonariidae (False limpets)
- G:** *Siphonaria*
- Sp:** *Siphonaria laciniosa* (Linn., 1758)
[6, 7, 10]
- Sp:** *Siphonaria tenuicostulata* .. Smith, 1903
[1, 3, 6, 8]
- B. CLASS: BIVALVIA**
- Sub-Class:** Pteriomorpha
- Order:** Arcoidea
- Super family:** Arcacea
- Family:** Arcidae (Ark shells)
- G:** *Acar* (Gray) A. Adams, 1857
- Sp:** *Acar plicata* (Dillwyn, 1817)
[1, 3, 5, 7, 11]
- G:** *Anadara* Gray, 1847
- Sp:** *Anadara ehrenbergi* (Dunker, 1868)
[1, 5, 7, 12]
- Sp:** *Anadara uropigimelana*
..... (Bory de St. Vincent, 1824)
[1, 5, 8, 11]
- G:** *Barbatia* Gray, 1842
- Sp:** *Barbatia fusca* (Bruguiere, 1789)
[1, 11]
- Sp:** *Barbatia helblingi* (Bruguiere, 1789)
[1, 10, 11]
- Sp:** *Barbatia obliquata* (Wood, 1838)
[1, 3, 5, 10]
- Super family:** Limopsacea
- Family:** Glycymeridae (Bitter sweet clams or Dog welks)
- G:** *Glycymeris* De Costa, 1778
- Sp:** *Glycymeris lividus* Reeve, 1844
[1, 11]
- Sp:** *Glycymeris pectunculus maskatensis* (Melvill, 1897)
[1, 8, 10, 12]
- Order:** Mytiloidea
- Super family:** Mytilacea
- Family:** Mytillidae (Mussels)
- G:** *Brachiodontes* Swainson, 1840
- Sp:** *Brachiodontes variabilis* (Krauss)
[1, 6, 8, 10]
- G:** *Lithophaga* Roding, 1789
- Sp:** *Lithophaga cumingiana* .. (Reeve, 1857)
[1, 2, 4, 8, 10, 12]
- Super family:** Pinnacea
- Family:** Pinnidae (Razor pen shells)
- G:** *Pinna* Linn., 1758
- Sp:** *Pinna muricata* Linn., 1758
[3, 4, 7, 9, 10, 12]
- G:** *Streptopinna* Von Martenz, 1880
- Sp:** *Streptopinna saccata* Linn., 1758
[3, 4, 5, 8, 12]

Order: Pteroida**Super family: Pteriacea****Family: Pteriidae (Pearl shells)****G:** *Pteria* Scopoli, 1777**Sp:** *Pteria marmorata* (Reeve, 1857)
[4, 10]**G:** *Pinctada* Roding, 1798**Sp:** *Pinctada margaritifera* (Linn., 1758)
[1, 7, 9, 12]**Sp:** *Pinctada radiata* Leach, 1814)
[1, 12]**Family: Malleidae (Hammer oysters and Sponge fingers)****G:** *Malleus* Lamarck, 1799**Sp:** *Malleus regula* (Forskali, 1758)
[3, 8, 10, 12]**Super family: Pectinacea****Family: Pectinidae (Scallops)****G:** *Chlamys* Roding, 1798**Sp:** *Chlamys ruschenbergii* (Tryon, 1870)
[1, 2, 4, 9, 11, 12]**Sp:** *Chlamys senatorius* (Gmelin, 1791)
[1, 3, 5, 8, 11]**G:** *Decatopecten* Ruppel, 1839**Sp:** *Decatopecten plica* (Linn., 1758)
[1, 2, 4, 5, 8, 10]**G:** *Pecten* Muller, 1776**Sp:** *Pecten erythraeensis* (Sowerby, 1847)
[1, 2, 4, 12]**Family: Plicatulidae****G:** *Plicatula* Lamarck, 1801**Sp:** *Plicatula imbricata* Menke, 1843
[3, 5, 7, 9, 11]**Family: Spondylidae (Thorny oysters)****G:** *Spondylus* Linn., 1758**Sp:** *Spondylus exilis* (Sowerby, 1895)
[1, 3, 5, 11]**Super family: Anomiacea****Family: Anomiidae (Jingle shells or saddle oysters)****G:** *Anomia* (Linn.) Muller, 1776**Sp:** *Anomia laqueata* Reeve, 1859
[1, 6, 8, 12]**Super family: Limacea****Family: Limidae (File shells)****G:** *Lima* Chemnitz, 1784**Sp:** *Lima sowerbyi* Deshayes, 1863
[1, 2, 4, 5, 7, 9, 12]**Super family: Ostreacea****Family: Ostreidae (True oysters)****G:** *Ostrea* (Linn.) Muller, 1776**Sp:** *Ostrea cristagalli* Linn., 1758
[1, 11]**Sp:** *Ostrea cucullata* (Born, 1775)
[2, 4, 7, 9, 12]**Sub-Class: Heterodonta****Order: Veneroida****Super family: Cardiacea****Family: Cardiidae (Heart cockles)****G:** *Laevicardium* Swainson, 1840**Sp:** *Laevicardium papyraceum* . (Bruguiere, 1789)
[1, 5, 8, 9, 11, 12]**G:** *Trachycardium* Morch, 1853**Sp:** *Trachycardium lacunosum* . (Reeve, 1845)
[1, 7, 9]**Super family: Carditacea****Family: Carditidae (Cardita clams)****G:** *Cardita* Bruguiere, 1789**Sp:** *Cardita bicolor* (Lamarck, 1822)
[1, 12]**Sp:** *Cardita gubernaculum* (Reeve, 1843)
[1, 3, 5, 8, 10, 11]**Super family: Chamacea****Family: Chamidae (Jewel boxes)****G:** *Chama* Linn., 1758**Sp:** *Chama pacifica* Broderip, 1834
[1, 2, 4, 8, 10, 12]**Super family: Lucinacea****Family: Lucinidae (Saucer shells)****G:** *Codakia* Scopoli, 1777**Sp:** *Codakia tigerina* Linn., 1758
[1, 2, 4, 8, 10, 12]**G:** *Divaricella* Von Martenz, 1880**Sp:** *Divaricella cumingiana*
..... (Adams & Adams, 1863)
[1, 2, 3, 5, 9, 12]**Family: Ungulinidae****G:** *Diplodonta* Brown, 1831**Sp:** *Diplodonta ravayensis* Sturany, 1901
[1, 2, 4, 12]**Super family: Mactracea****Family: Mactridae (Surf clams and Trough shells)****G:** *Lutraria* Lamarck, 1799**Sp:** *Lutraria philippinarum* Reeve, 1854
[1, 3, 5, 12]**G:** *Mactra* Linn. 1767**Sp:** *Mactra glabrata glabrata* . (Gmelin, 1791)
[1, 2, 4, 5, 7, 9, 11]**Super family: Tellinacea****Family: Tellinidae (Tellins)****G:** *Apolymetis* Salizbury, 1929**Sp:** *Apolymetis dubia* (Deshayes, 1854)
[1, 10, 12]**G:** *Tellina* Linn., 1758

- Sp:** *Tellina foliacea* Linn., 1758
[1, 3, 5, 7, 9, 12]
- Sp:** *Tellina inflata* Gmelin, 1791
[1, 11]
- Family:** Donacidae (Wedge shells)
- G:** *Donax* Linn., 1758
- Sp:** *Donax cuneatus*
[4, 5, 7, 9, 11, 12]
- Sp:** *Donax scalpellum* Gray, 1857
[4, 5, 7, 8, 10, 12]
- Family:** Psammobiidae (Garidae) (Sun set clams)
- G:** *Asaphis* Modeer, 1793
- Sp:** *Asaphis deflorata* (Linn., 1758)
[1, 12]
- G:** *Sanguinolaria* Lamarck, 1799
- Sp:** *Sanguinolaria cumingiana* . (Deshayes, 1855)
[1, 5, 7, 11]
- Family:** Semelidae
- G:** *Semele* Schumacher, 1817
- Sp:** *Semele scabra* (Hanley, 1845)
[1, 3, 5, 10, 12]
- Sp:** *Semele sinensis* Reeve, 1850
[1, 3, 5, 9, 11, 12]
- Super family:** Tridacnacea
- Family:** Tridacnidae (Giant clams)
- G:** *Tridacna* Bruguiere, 1797
- Sp:** *Tridacna maxima* (Roding, 1798)
[1, 7, 9, 11]
- Super family:** Solenacea
- Family:** Solenidae (Razor shells or Jack-knife clams)
- G:** *Phaxas* Leach, 1852
- Sp:** *Phaxas cultellus* (Linn., 1758)
[1, 3, 5, 8, 12]
- G:** *Solen* Linn., 1758
- Sp:** *Solen brevis* Gray, 1832
[3, 5, 8, 12]
- Super family:** Veneracea
- Family:** Veneridae
- G:** *Amiantis* Carpenter, 1864
- Sp:** *Amiantis umbonella* ... (Lamarck, 1818)
[1, 3, 5, 7, 11]
- G:** *Bassina* Jukes-Browne, 1914
- Sp:** *Bassina callophyla* (Philippi, 1836)
[1, 3, 5, 6, 8, 12]
- G:** *Callista* (Poli, 1791) Morch, 1853
- Sp:** *Callista erycina* (Linn., 1758)
[1, 11]
- Sp:** *Callista multiradiata* (Sowerby, 1851)
[1, 5, 7, 12]
- G:** *Circe* (Schumacher, 1817)
- Sp:** *Circe corrugata* (Dilwyn, 1817)
[1, 12]
- G:** *Circentia* Jousseau, 1888
- Sp:** *Circentia callipyga* (Born, 1778)
[1, 5, 8, 10, 12]
- G:** *Dosinia* Scopoli, 1777
- Sp:** *Dosinia alta* (Dunker, 1848)
[1, 7, 9, 11]
- Sp:** *Dosinia tumida* (Gray, 1838)
[1, 7, 9, 12]
- G:** *Gafrarium* Roding, 1798
- Sp:** *Gafrarium pectinatum* (Linn., 1758)
[1, 7, 9, 12]
- G:** *Irus* Oken, 1815
- Sp:** *Irus irus* (Linn., 1758)
[1, 5, 9, 10, 12]
- G:** *Marcia* H. Adams & A. Adams, 1857
- Sp:** *Marcia ceylonensis* (Lamarck, 1818)
[3, 5, 7, 11]
- Sp:** *Marcia hiantina* (Lamarck, 1818)
[3, 5, 7, 9, 10, 12]
- G:** *Paphia* Roding, 1798
- Sp:** *Paphia gallus* (Gmelin, 1791)
[1, 6, 8, 10, 11]
- Sp:** *Paphia sulcaris* (Lamarck, 1818)
[1, 6, 8, 10, 12]
- Sp:** *Paphia textile* (Gmelin, 1791)
[1, 9, 10, 12]
- G:** *Priglypta* Jukes-Browne, 1914
- Sp:** *Periglypta reticulata* (Linn., 1758)
[1, 3, 5, 10]
- G:** *Sunetta* Link, 1807
- Sp:** *Sunetta effosa* Hanley, 1843
[3, 5, 7, 9, 11, 12]
- G:** *Tapes* Muhlfeld, 1811
- Sp:** *Tapes texturata* (Lamarck, 1818)
[1, 3, 5, 10, 12]
- G:** *Tivela* Link, 1807
- Sp:** *Tivela adamoides* (Gray, 1843)
[3, 8, 10, 12]
- Order:** Myoida
- Super family:** Myacea
- Family:** Corbulidae (Basket clams)
- G:** *Corbula* Lamarck, 1799
- Sp:** *Corbula sulculosa* Lamarck, 1799
[1, 5, 8, 10, 12]

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References

- Abbott, R.T.** (1960) *Indopacific Mollusca, Monograph of Molluscs of Western Pacific and Indian Ocean, I*, Philadelphia: pp. 33-144, 11-117 pls. Delaware Museum of Natural History, Greenville, Delaware.
- (1962) *Sea Shells of The World*, New York, 106 p., 790 text figs.
- Allan, J.** (1956) *Cowery of the World Seas*, Georgian House, Sydney, Melb. 161 p., 15 pls.
- Angeletti, S.** (1978) *The Seas and Their Shells, a Collector Guide to the Seashells of the World*, Doubleday & Company, Garden City, New York, 303 p., 262 figs.
- Basson, P.W.; Buchard, J.E.; Hardy, J.T. and Price, A.A.G.** (1977) *Biotores of the Western Arabian Gulf, Marine Life and Environments of Saudi Arabia*, Department of Loss Prevention and Environmental Affairs, ARAMCO-Dhahran, 284 p.
- Biggs, H.E.J. and Grantier, I.** (1960) A preliminary list of mollusca of Ras Tanura, Persian Gulf. *J. Conch. Lond.* **24**(11): 387-392.
- Bosch, D. and Bosch, E.** (1982) *Sea Shells of Oman*, Longman, Essex, England, 206 p.
- and ——— (1989) *Sea Shells of Southern Arabia*, Motivate Pub. supported by Shell Market, Middle East, U.A.R., 95 p.
- Cate, C.N.** (1964) Western Australian Coweries. *Veliger*, **7**: 212-232.
- Chavan, A.** (1952) Nomenclature notes on Carditids and Lucinids, *J. Acad. Sci., Washington*, **42**(4): 116-122.
- Cox, L.R.** (1961) Observations on the family Cardiniidae (Class: Bivalvia), *Proc. Mal. Soc. Lond.*, **34**(6): 325-339.
- Davies, A.M.** (1933) The bases classification of the Lamellibranchia, *Proc. Mal. Soc. Lond.*, **20**: 322-326.
- Diener, C.** (1923) Lamellibranchiata *Tridacna*, Fossilium Catalogus, I, *Animalia*, **19**, 359.
- Frizzell, D.L.** (1936) Preliminary classification of Veneracea, Pelecypods, *Bull. Roy. His. Nat. Belgique*, **12**(34): 84.
- Glazer, B.A., Glazer, D.T. and Smythe, K.R.** (1984) The marine mollusc of Kuwait, Arabian Gulf. *J. Conch., Lond.*, **31**: 311-330.
- Haas, F.** (1954) Some marine shells from the Persian Gulf collected by Ronald Codari. *Nautilus*, **68**: 46-49.
- Habe, T.** (1961) *Coloured Illustrations of Shells of Japan*, Hoikusha Publ. Co., Osaka, (II), 182 p., 66 pls.
- (1965) Family Solenidae in Japan and its adjacent areas. *Japan. J. Mal.* **32**(4): 188-197: 12-13 pls.
- Hasan, A.K.** (1974) *Studies on bottom mollusca (gastropods and bivalves) in Abu Qir Bay. Alex.*, M.Sc. Thesis, Alex. Univ., 319 p., 106 figs.
- (1983) *Studies on the mollusc fauna of the Mediterranean and Red Seas and their exchange through the Suez Canal*, D.Sc. Thesis, Cairo Univ., 307 p., 189 pls.
- Hatai, K. and Nasyama, S.** (1952) Checklist of the Japanese Tertiary marine molluscs. *Tohoku Univ. Sci. Rept.* **3**(2): 464 p.
- Hirase, S. and Taki, I.** (1961) *An illustrated handbook of shells from Japanese Islands and their adjacent territory, in natural colours*, Maruzen Publ. Co., Tokyo, 124 p.
- Jukes, B.A.L.** (1914) A synopsis of veneridae. *Proc. Mal. Soc., Lond.* **8**(1): 58-94.
- Kira, T.** (1955) *The Shells of Japan*, Osaka, 204 p.
- McCain, J.C.** (1984a) Marine ecology of Saudi Arabia, near the shore soft bottom benthic communities of the northern area, Arabian Gulf. *Fauna of Saudi Arabia*, **6**: 79-101.
- (1984b) Marine ecology of Saudi Arabia. The intertidal in fauna of the sand beaches in the northern area, Arabian Gulf. *Fauna of Saudi Arabia*, **6**: 53-78.
- Melvill, J.C.H.A.** (1898) Further investigations into the molluscan fauna of the Arabian Sea, Persian Gulf and Gulf of Oman, with description of 40 species. *Manch. Mem.* **42**(4), 39 p.
- (1928) The marine mollusca of the Persian Gulf, Gulf of Oman and north Arabian sea through the collection of Capt. F.W. Townsend, 1893-1914. *Proc. Mal. Soc. London*, **18**: 93-117.
- Moore, R.C.; Knight, J.B.; Cox, L.R.; Keen, A.M.; Smith, A.G.; Batten, R.L.; Yochelson, E.L.; Ludbrook, N.H.; Robertson, R.; Yonge, C.M.** (1960) *Treatise on Invertebrate Paleontology, Part I, Mollusca I*. Geol. Soc. Amer. & Univ. Kansas, 351 p., 216 figs.
- , **Cox, R.; Newell, N.D.; Boyd, D.W.; Branson, C.C.; Casey, A.; Chavan, A.; Coogan, A.H.; Dechaseaux, C.; Fleming, C.A.; Haas, F.; Hertlein, L.G.; Kauffman, E.G.; Keen, A.M.; La Rocque, A.; McAlester, A.L.; Nuttall, C.P.; Perkins, B.F.; Puri, H.S.; Smith, L.A.; Ryan, T.S.; Stenzel, H.B.; Trueman, E.R.; Turner, E.R.; Turner, R.D. and Wier, J.** (1969a) *Treatise on Invertebrate Paleontology: Part N, Vol. 1*(3), Mollusca 6, Bivalvia, Geol. Soc. Amer., Univ. Kansas, 489 p., 76 figs.
- (1969b) *Treatise on Invertebrate Paleontology, Part N, Vol. 2*(3), Mollusca 6, Bivalvia, Geol. Soc. Amer., Univ. Kansas: pp. 491-952, Figs: E2-H2.
- Purser, B.H.** (1973) *The Persian Gulf*, Springer-Verlag, Berlin, 471 p., 7 pls.
- Ranson, G.** (1950) Classification des Ostreida. *J. Conch., Paris*, **90**: 195-200.
- Rogers, J.A.** (1951) *The Shell Book, a popular guide to the knowledge of families of living organisms and an aid to the identification of shells*, Charles Brandford, Boston, 463 p., 104 pls.
- Rosewater, K.** (1961) The family Pinnidae in the Indopacific. *Indopacific Mollusca*, **1**: 175-225.
- Salisbury, A.E.** (1934) On the nomenclature of Tellinidae: description of new species and some remarks on distribution, Persian Gulf and Mascat. *Proc. Mal. Soc. Lond.*, **21**: 74-91; 9-13 pls.
- Sharabati, D.P.** (1981) *Saudi Arabian seashells, selected Red Sea and Arabian Gulf Molluscs*, Royal Smeets Offset, Netherlands, 119 p.
- Smythe, K.R.** (1972) Marine mollusca from Bahrain Island, Persian Gulf. *J. Conch. Lond.*, **27**: 491-496.
- (1975) On the occurrence of *Salinator fragilis* (Lamarck) in the Arabian Gulf. *J. Conch.*, **28**: 335-338.
- (1979) The marine mollusca of the U.A.E., Arabian Gulf. *J. Conch. London*, **30**: 57-80.
- (1982) *Sea Shells of the Arabian Gulf*. George Allen & Unwin, London, 123 p.
- Taylor, D. and Sohl, N.F.** (1962) An outline of gastropod classification. *Malacologia*, **1**: 7-32.

دراسة تصنيفية على الرخويات ذات المصراعين والبطنقدميات القاطنة بمناطق المد والجزر للشاطئء السعودي للخليج العربي

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المستخلص: يستمد هذا البحث أهميته في كونه الأول الذي يتطرق لدراسة تصنيفية على أنواع البطنقدميات وذات المصراعين الرخوية على طول الشاطئء السعودي للخليج العربي بدءاً من الجبيل شمالاً وحتى سلوى جنوباً. فمن خلال اثنتي عشر موقعا شملت هذه الدراسة جمعت عينات ممثلة لتلك الرخويات وتمت دراستها تصنيفياً للتعرف عليها وفقاً للنظم والقواعد العلمية المتعارف عليها في هذا الصدد. وأسفر ذلك عن تعريف مائة وثلاثين نوعاً منها. ويمثل البطنقدميات فيها اثنتان وستون نوعاً، وذات المصراعين ثمانية وستون نوعاً. ومن دراسة التسلسل التصنيفي لهاتين الطائفتين تبين انتماء الأنواع البطنقدمية إلى ثلاث تحت طوائف وخمس رتب وأربع تحت رتب وتسع عشرة فوق عائلة واثنتين وثلاثون عائلة وستة وأربعون جنساً. بينما انتسبت الأنواع ذات المصراعين إلى تحت طائفتين وخمس رتب وتسع عشرة فوق عائلة وخمس وعشرون عائلة واثنان وخمسون جنساً. ولقد زود كل نوع من هذه الأنواع بأرقام بين قوسين تدل على تسجيله لأول مرة في مناطق تواجده الحالية.