

Marine Mollusca of Masirah I., South Arabia.

By

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Masirah I. lies about 10 miles off the State of Oman, ($20^{\circ}20'N.$ by $58^{\circ}50'E.$) on the south eastern coast of the Arabian peninsula. It is about 40 miles long by 10 miles wide and consists mostly of volcanic rock bearing very little vegetation.

The collection of marine mollusca herein reported on was made mainly by members of the Royal Air Force and passed on to me by Mr. PHILIP CAMBRIDGE. In addition I have received a small collection made by Dr. GRAHAM EVANS, of Royal School of Mines, Imperial College of Science and Technology, London, made whilst on a brief visit to the island in 1961. These records are included here with his permission, and are indicated by the letters G. E. in parenthesis.

Having been unable to find any published list of the Marine Mollusca of Masirah I. the present paper is offered as a preliminary list, and to encourage further investigation into the molluscan fauna of the area which will, in the present writer's opinion, well repay investigation as there is some indication that it is rich.

One of the characteristics of the fauna is the presence of large forms of Indian Ocean species, and it is with some hesitation that a few of the shells have been referred to well-known species, and not described as a new species till more material is available. Two species recorded here as *Arca* (*Anadara*) sp. and *Beguinia* (*Beguinia*) sp. may well be new species. Until more information is available as to the ecological conditions in the waters round this island, no suggestion can be offered for the presence of so many large forms of Indian Ocean species of mollusca.

All the examples are dead shells, unless otherwise stated, some were old and already decaying but proved a useful source of boring bivalves, and some gastropods contained smaller and more delicate species which might well have been missed by the collectors; *Kellia suborbicularis* (MONTAGU) was preserved in this way.

The order adopted in this paper is that of THIELE, but the names have, in a few cases, been brought up to date.

Loricata.

Chiton (*Acanthopleura*) *haddoni* WINCKWORTH. 1 example, live, on rocks at the eastern end of the island.

Gastropoda.

Diodora funiculata (REEVE) 9 examples. The largest measures 44 mm. in length by 34 mm. in breadth by 15 mm. in height. This is the largest specimen of this species known to me.

Diodora ruppelli (SOWERBY) 1 example.

Lucapinella salebrosa REEVE. 1 example.

Cellana rota GMELIN. 2 examples.

Clanculus pharaonis (LINNÉ). 2 examples.

Trochus (*Trochus*) *kochi* PHILIPPI. Three rather worn examples, two of which are the normal green colour and one brown. PHILIPPI gave no locality for this species, it does not seem to have been recorded either by MELVILL & STANDEN (1901) for the Persian Gulf on the east, or by SHOPLAND (1902) or SMITH (1891) for Aden or the west of this locality. MOAZZO (1939) suggests that the reference by TILLIER & BAVAY (1905) of a shell in their possession to this species is a misidentification for *Trochus erythraeus* BROCCHI. There are four sets of this species in the British Museum (Nat. Hist.) correctly identified, but all are without locality. It seems that definite localities for this species are very rare, and the finding of this species, on Masirah I., a welcome addition to our knowledge of its distribution.

Trochus (*Infundibulum*) *maculata* LINNÉ. 3 examples.

Trochus (*Infundibulops*) *erythraeus* BROCCHI. 1 example.

Monilea (*Priotrochus*) *obscura* (WOOD) 1 example, juvenile.

Turbo coronatus GMELIN. 3 examples.

Nerita textilis GMELIN. 4 examples.

Nerita albicilla LINNÉ. 12 examples.

Turritella torulosa KIENER. 1 example.

Architectonica perspectiva (LINNÉ). 2 examples.

Planaxis sulcatus (BORN). 6 examples, juvenile.

Cerithidea cingulatus (GMELIN). 1 example.

Crepidula (*Siphopatella*) *walshi* HERMANNSEN. 4 examples. Inside cowries. The largest example is 21 mm. in length and a very large example for this species.

Strombus decorus RÖDING. 2 examples. (probably subspecies *persicus* SWAINSON).

Xenophora caperata PHILIPPI. 1 example.

Polinices mamilla LAMARCK. 1 example.

Neverita didyma (RÖDING) 2 examples and 1 example (G. E.).

Cymatium cf. *trilineatus* REEVE. 2 examples.

Cymatium ranzanii BIANCONI. The discovery of this species on Masirah I. is an interesting addition to our knowledge of its distribution. It was described by BIANCONI (1850) as from Mozambique but not figured. TRYON (1881) records *Triton tigrinus* BRODERIP (1833) and says his figure on plate 10 is of this species, but a few lines further down writes "*T. ranzanii* BIANCONI (fig. 71) from Mozambique, E. coast of Africa appears to be the same species."

HAAS (1954) records one specimen of a shell from Dubai on the Trucial Oman Coast, Persian Gulf, which thinks looks like *C. ranzanii* and tentatively refers it to that species. He goes on to say that the species has only been figured once, and that was by TRYON and gives as his reference the work and figure

above cited. He concludes with the remark "and to the best of my knowledge it has not been reported again."

GROSCH (1963) predicted, on a study of the ecological conditions of the Indian Ocean, that *Cymatium ranzanii* BIANCONI 1851 (!) "should have a good chance around Ras al Hud or Mosera Island" It had, of course, previously been reported from Socotra by SHOPLAND (1902). The presence of these two dead shells now recorded from Masirah Island confirms GROSCH's surmise and we can hope that the reporting of the species from Ras al Hadd¹⁾ will not long be delayed. It is clearly a rare shell and not the same as BRODERIP's *tigrinus*.

Tonna luteostoma (KÜSTER). 1 juvenile example.

Pyrula ficus (LINNÉ). 4 examples.

Pyrula ficoides (LAMARCK). 1 example.

Murex kusterianus TAPPARONE CANEFRI. Many examples (including 1 G.E.), some very large, the largest being 120 mm. in height by 110 mm. in breadth. Some contained many boring mollusca.

Murex scolopax DILLWYN. 1 example and 1 G.E.

Purpurea rudolphi LAMARCK. 2 large and worn examples, the largest is 64.5 mm. × 43.8 mm.

Thais pseudohippocastanum DAUTZENBERG (1929). 1 example (G.E.).

Babylonia valentiana (SWAINSON). 1 example.

Babylonia spirata (LAMARCK). 1 example.

Fasciolaria trapezium (LINNÉ). 1 example.

Nassarius obockensis (JOUSSEAUME). 1 example.

Oliva bulbosa RÖDING. 4 examples.

Ancilla cinnamomea LAMARCK. 3 examples.

Mitra punctostriata A. ADAMS. 1 example.

Conus fumigatus HWASS. 1 example.

Conus capitaneus LINNÉ. 1 example.

Cypraea (Erosaria) ocellata LINNÉ. 4 examples.

Cypraea (Erosaria) turdus LAMARCK. 8 examples and several worn examples (G.E.) all of which show a wide variety of form including one high example, 2 very much flatter than the form common at Aden, and one whitish example.

Cypraea (Erronea) caurica LINNÉ. 2 examples.

Cypraea (Erosaria) nebrites MELVILL. 3 worn examples and several worn examples (G.E.).

Cypraea (Erosaria) marginalis pseudocellata SCHILDER. 1 example, large.

Terebra caerulsecens LAMARCK. 3 examples.

Terebra cf. *lamarckii* KIENER. 1 example (G.E.).

Bullaria ampulla (LINNÉ). 2 examples.

Siphonaria sp. 1 example.

Sanhaliotis gigantea (GMELIN). Several large sized examples collected; one measured 112 mm. length × 83 mm. breadth, and one recently dead shell 122 mm. × 93 mm. Again we have a case of a species not named by SMITH (1891) or SHOPLAND (1902) for Aden, or by MELVILL & STANDEN (1901) for the Persian Gulf (two well-collected areas) but now turning up in numbers in an intermediate locality.

¹⁾ Arabic راس الحت

Bivalvia.

Anadara secticostata (REEVE). 1 valve.

Barbatia obliquata (WOOD). 1 recently dead juvenile.

Scapharca natalensis (KRAUSS). 1 worn valve, 55 mm. wide \times 46 mm. high.

Anadara sp. One beachworn valve of a species which it is difficult to assign to any described species from the Erythro-Farsian Sub-region. The chief character is the paucity of radial ribs for the size of the shell, 64.2 mm. in length by 50.0 mm. in height. There are only 21 ribs, which are very broad and deep, and the breadth and depth of the interstices are also remarkable. The widest ridge is 5.7 mm. and the widest interstice 4.3 mm. The nearest species to which this valve could be referred is *Anadara antiquata* (LINNÉ), but in a similar sized shell of this species from Zanzibar there are 33 ribs. I am informed by Dr. MYRA KEEN that *Anadara granosa* (LAMARCK) has some named forms similar to this shell, but these are from Japanese waters and one hesitates to connect the two. Until more material is available from these waters the exact status of this form must remain an open question.

Glycymeris striatularis (LAMARCK). 3 valves.

Brachidontes striatularis HANLEY. 15 examples, live and mostly juvenile "attached to the outside of a decaying shell" (Spring 1966).

Perna irisans JOUSSEAUME. 2 examples, juvenile and probably live.

Vulsella cf. *attenuata* REEVE. 1 example.

Pinctada radiata (LEACH). 1 valve.

Chlamys ruschenbergerii TRYON. 1 valve.

Chlamys crassicostatus (SOWERBY). 1 valve but it has some characters different from those bearing this name in Brit. Mus. (N. H.) and must therefore be considered a tentative determination.

Chlamys senatorius (GMELIN). 1 valve, juvenile.

Aquiptecten townsendi SOWERBY. 3 valves, juveniles.

Spondylus exilis SOWERBY. 1 valve, juvenile.

Anomia laqueata REEVE. 12 upper valves; REEVE's type is orange copper in colour, these are mostly more reddish copper, but some are yellow and some white. REEVE gives no locality for his type.

Ostrea (Alectryonia) cucullata BORN. Three masses of dead shells were collected consisting of 5, 6 and 9 examples respectively. They are very deep and can be referred to the subspecies *cornucopiae* LAMARCK.

Cardita crassicostata LAMARCK. 1 valve. This species is not recorded by any writers on the Erythro-Farsian sub-region known to me and may be an addition to the molluscan fauna of the area.

Venericardita antiquata (LINNÉ). 1 valve and 1 valve (G.E.).

Venericardita (Cardites) canaliculata (REEVE). 1 example.

Beguinia (Beguinia) sp. A very large and rather worn valve, unlike any species commonly found in the sub-region. It is related to *B. (B.) gubernaculum* REEVE but longer, narrower and the ventral margin more concave.

Kellia suborbicularis MONTAGU. 2 examples and 6 valves inside a gastropod shell; the species is reported from the Makran Coast by MELVILL & STANDEN (1907) but not by SHOPLAND (1902) for Aden.

Trachicardium lacunosum (REEVE). 4 valves; 1 valve (G.E.).

Trachicardium maculosum (WOOD). 2 valves.

Acanthocardia (*Rudicardia*) *pseudolima* (LAMARCK). 2 valves.

Comus platyaulax (TOMLIN). One rather large and worn valve seems to be closely related to, if not identical with, this species from South African waters. Another, but smaller valve, was sent by Mr. PHILIP CAMBRIDGE from Salalah on the South coast of Arabia and somewhat west of Masirah I. According to BARNARD (1963) this species has not been taken alive off the South African coast. COX (1930) reported subfossil species of the *Comus* from East Africa, an SPRY (1964: 34) reports finding one valve of *platyaulax* collected at Dar-es-Salam. This specimen is before me and measures 23 mm. length \times 18 mm. height, whereas the Masirah I. example measures 34.5 mm. \times 30.5 mm. height. This East African specimen is smaller and more attenuated posteriorly than the Masirah I. example, and may possibly be a new species, but equally it may be a rather abnormal form of *platyaulax*.

This species is probably a deep water shell and can be considered rare. The examples from Masirah I. and Salalah being the most northerly examples known so far. No live examples have, as yet, been found in this area and BARNARD's remark seems to hold good for all localities known so far.

Gafrarium arabicum (LAMARCK). 7 valves (G.E.).

Gafrarium dispar (DILLWYN). 1 example and 1 valve.

Circe (*Circe*) *scripta* (LINNÉ). 1 valve (G.E.).

Circe (*Circe*) *callipygia* (BORN). 3 examples and several valves.

Pitar (*Amiantis*) *grata* (DESHAYES). 1 valve, deformed, probably referable to this species.

Tivela pondrosa (KOCH) PHILIPPI.

***Tivela mulawana* n. sp.²⁾**

T. trigonal, donaciform, posterior dorsal and anterior dorsal edges straight and at right angles to each other, anterior end of the shell broadly rounded, posterior end sharply angled and only slightly rounded, lower or ventral margin straight; external ligament short; inner margins of valves smooth. Externally the shell bears a silky epidermis covering a cream-coloured surface, with brown rays. There are dark bands at regular intervals running parallel to the lines of growth. Interior coloured purple except near the margins.

Holotype L. 39.0 mm. H. 24.8 mm. B.M. (N.H.) Reg. No. 1968800.

Paratype 1 L. 36.4 mm. H. 24.2 mm. Senckenberg-Mus. Reg. No. SMF 194888.

2 L. 37.3 mm. H. 23.0 mm. BIGGS Colln. No. 1022 K.

3 L. 38.7 mm. H. 24.0 mm. Manchester Museum Reg. No. EE 3658.

4 L. 31.2 mm. H. 20.8 mm. BIGGS Colln. No. 1022 G (live example).

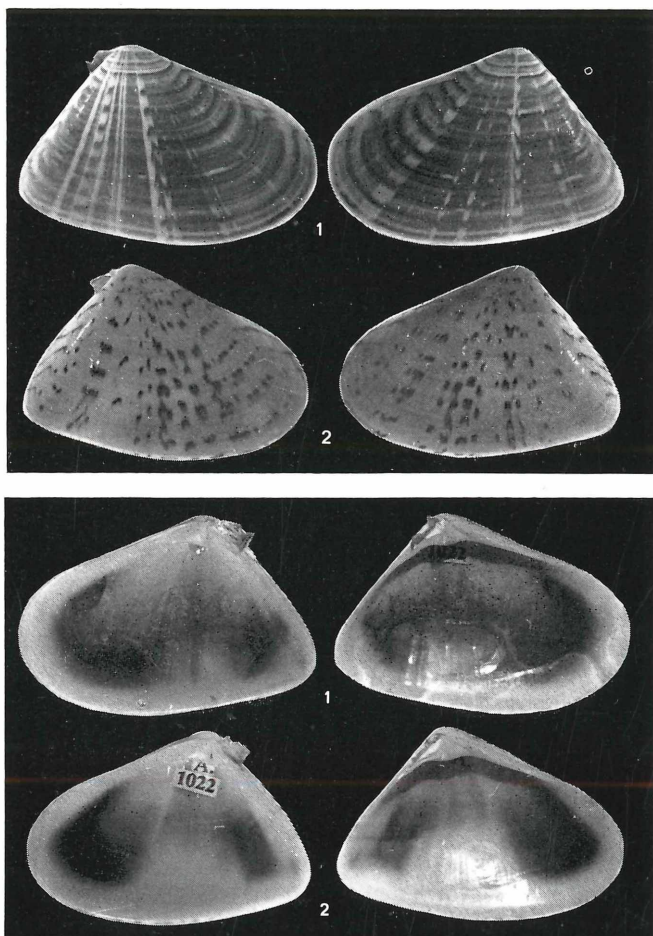
5 L. 45.3 mm. H. 30.5 mm. BIGGS Colln. No. 1022 H (valve only).

Other paratypes in National Museum of Wales, Cardiff, Reg. No. 1968-130. 1-3. and in collection of Mr. PHILIP CAMBRIDGE and Mrs. ANN ROBERTS. There are also 26 beach-worn valves rather faded and some bored by predators.

²⁾ Arabic عَمْلَانَة (coloured).

The paratypes show a very considerable variation in markings as will be seen from figure of paratype 1. Many other paratypes have a reduction in colour and one of the juvenile single valves is almost entirely white. Even those which are distinctly cream with brown rays show considerable variation in the width of the brown rays. The holotype and paratype 1 were quite possibly live or only recently dead when taken; paratype 4 was the only live example and probably juvenile.

The proposed new species externally bears a great likeness to *Donax cuneatus* (LINNÉ) but the dentition places the new species in the Veneridae.



Figs. 1-2. *Tivela mulawana* n. sp. — 1) Holotype 1022B (Brit. Mus. 1968800); 2) Paratype 1022A (SMF 194888).

Irus irus (LINNÉ). 5 examples, mostly found inside dead gastropods.
Macra decora DESHAYES. 1 valve and 5 juvenile valves.
Donax cuneatus (LINNÉ). 2 examples, very fresh.
Donax townsendi SOWERBY. 3 examples and 3 valves.
Donax scalpellum GRAY. 2 examples.
Semele sinensis A. ADAMS. 1 valve.
Strigilla tomlini SMITH. 1 example.
Macoma orbicularis (SOWERBY). 1 valve.
Siliqua radiata (LINNÉ). 1 damaged example.

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