

RECENT BRACHIOPODS FROM MALTA

LOGAN, A. & J. P. A. NOBLE

Department of Geology, University of New Brunswick. N. B., CANADA

ABSTRACT

Six species of Recent Brachiopoda, obtained by the authors from both shallow and deep waters around Malta, are listed, briefly described and illustrated. Other Mediterranean brachiopod species which might be expected to be present in this region are also listed, in the hope they might be recorded in the future by local naturalists.

INTRODUCTION

In July 1977 we paid a brief visit to Malta to collect living specimens of brachiopods. The purpose of this report is to list, briefly describe and illustrate the species we obtained at that time, and to provide a check-list of other Mediterranean species likely to occur around the coasts of Malta, in the hope that local naturalists will eventually be able to account for those species not recorded by us in our preliminary survey.

The phylum Brachiopoda is now of minor importance in modern seas but has had a long and impressive geological history, so it is not surprising that many of the studies on the taxonomy and ecology of living brachiopods have been done by paleontologists attempting to compare modern-day occurrences with those of the fossil record. Such studies were begun in the early part of the nineteenth century, when brachiopods were obtained by most of the early expeditions to the Mediterranean sea. By 1885 all species had been individually described but in many different journals and reports. They were subsequently brought together by a paleontologist, Thomas DAVIDSON, who published between 1886 and 1888 an exhaustive three-part monograph on Recent Brachiopods, including thorough re-descriptions and illustrations of all species then described from the Mediterranean Sea. This work remains the most authoritative treatise on Recent brachiopods to this day and a re-study by LOGAN (1979) found no additional species from the Mediterranean to add to those previously re-described by DAVIDSON.

It is worth mentioning that DAVIDSON had no collection of Recent Brachiopoda from Malta at his disposal, although he had previously (1864) described Miocene brachiopods from Malta, including some species that are still extant in this area. Over one hundred years later PEDLEY (1976) also investigated Miocene brachiopod populations from Malta, this

Table 1: Occurrence of Recent Brachiopods from the vicinity of Malta

Species	Locality	Depth	Substrate	Remarks
<i>Crania anomala</i>	Wied iż-Żurrieq	-35 m	On undersides of boulders (densities of up to 250/m ² recorded)	Recorded also by CARUANA (1867? from Marsamuscetto Harbour, attached to boulders at a depth of 14 - 50 m.
<i>Gryphys vitreus</i>	Medina Bank	- 70 to - 100 m	Unknown	Collected by local fishermen and presented to us. Also mentioned by CARUANA (1867) as occurring "at a distance from the island".
<i>Terebratulina retusa</i>	---	--	----	Not collected by us, but CARUANA (1867) records it as occurring "at a distance from the island", along with the previous species
<i>Argyrotheca cuneata</i>	Wied iż-Żurrieq	-25 m	on cave walls and roof and between boulders.	Recorded also by CARUANA (1867) from Malta but with no details of locality, substrate or depth.
	Ġnejna Bay	-10 to -20 m	undersides of overhangings and boulders.	

Table 1: continued

Species	Locality	Depth	Substrate	Remarks
<i>Argyrotheca cordata</i>	Wied iż-Żurrieq	-25 m	On cave walls and roof and beneath boulders.	---
	Ġnejna Bay	-10 to -20 m	On undersides of overhangings (densities of up to 100/m ² recorded)	
<i>Megathiris detruncata</i>	Wied iż-Żurrieq	-25 m	on cave walls and roof	Recorded by CARUANA (1867) as "somewhat rare. Found on stones at great depths, on <i>Spondylus gaederopus</i> , on <i>Chama gryphoides</i> and other bivalve shells."
? <i>Platidia</i> sp.	---	---	----	CARUANA (1867) records <i>Orthis lunifera</i> on stones at great depths, attached to bivalve shells. This species is problematical (see DAVIDSON, 1887, p.149) but is probably a <i>Platidia</i> .
<i>Megerlia truncata</i>	Medina Bank	-70 m to -100 m	Unknown	Collected by local fishermen and presented to us. CARUANA (1867) records it as "not common. Found attached to branches of <i>Oculina</i> ."
	6 - 7 Km North of Valletta Harbour	115 m to 120 m	Attached to <i>Lithothamnion</i> sp.	Collected by local fishermen and presented to Dr. G. Zammit-Maempel (pers. comm.)

time from a paleontological viewpoint, little realising, apparently, that modern-day counterparts of several of his fossil species were to be found in the nearby shallow waters off the Maltese coasts.

To our knowledge there is only one prior published record of Maltese Recent brachiopods and that is by CARUANA (1867), who listed seven species (as well as a number of fossil forms); this reference appears to have been overlooked by DAVIDSON, as well as by most subsequent investigators, including MICALLEF and EVANS (1968) who did not even list the phylum Brachiopoda in their guide to the marine fauna of Malta.

To date, eleven species of brachiopods have been recognised from the Mediterranean, together with several varieties, some of which have been raised to specific status by various authors. The species recognised by LOGAN (1979) are as follows:

Class INARTICULATA

Craniidae: *Crania anomala* (Müller)

Class ARTICULATA

Terebratulidae: *Gryphys vitreus* Born

Cancellothyrididae: *Terebratulina retusa* (Linnaeus)

Megathyrididae: *Argyrotheca cistellula* (Searles-Wood)
Argyrotheca cuneata (Risso)
Argyrotheca cordata (Risso)
Megathiris detruncata (Gmelin)

Platidiidae: *Platidia anomoioides* (Scacchi and Philippi)

Platidia davidsoni (Deslongchamps)

Kraussinidae: *Megerlia truncata* (Linnaeus)

Thecideidae: *Lacazella mediterranea* (Risso)

OCCURRENCES FROM MALTA AND VICINITY

In 1977 we visited two main localities in Malta: Wied iż-Żurrieq, on the south coast and Gnejna Bay, on the west coast. Although we were not able to do any dredging in deep water, we were also given brachiopods inadvertently dredged up by fishermen from Medina Bank, south-east of Malta. Data from all our collections are shown in Table 1.

At Wied iż-Żurrieq, we obtained living brachiopods from a submarine cave at -25m depth. The brachiopods were too small to be seen at the time of collection, but were easily identifiable in the laboratory from scrapings from the cave walls and roof, while dead examples were relat-

ively common in sediment samples taken from the floor of the cave. The megathyridids *Argyrotheca cuneata*, *Argyrotheca cordata* and *Megathiris detruncata* were identified from this locality, while the undersides of boulders from -35m depth at the base of vertical cliffs at the same locality yielded *Argyrotheca cuneata*, *Argyrotheca cordata* and abundant *Crania anomala*.

The submerged vertical walls of a grotto on the south side of Ġnejna Bay exhibited occasional jutting ledges, the underside of which yielded numerous *Argyrotheca cuneata* and *Argyrotheca cordata*. In addition we observed *Argyrotheca cuneata* from the undersides of boulders at the base of the grotto walls and dead examples of both species from sediments in the same locality.

LOGAN (1979) has shown that both a shallow-water group and a eurybathic group of brachiopod species are present in the Mediterranean Sea. Members of the shallow-water group are all small in size, inhabiting protected, light-poor environments such as caves, where they are associated with other attached benthos, such as ahermatypic corals, sponges, bryozoans, encrusting foraminifera and colonial ascidians. The shallow-water group comprises the three species of *Argyrotheca* previously mentioned, plus *Megathiris detruncata* and *Lacazella mediterranea*, all occurring most abundantly between -20 m to -60 m depth. Of these species we have recorded *Argyrotheca cuneata*, *Argyrotheca cordata* and *Megathiris detruncata* from Malta; *Argyrotheca cistellula* and *Lacazella mediterranea* should therefore be sought. *Argyrotheca cistellula* is extremely small and easily missed but *Lacazella mediterranea* is quite distinctive and its occurrence in Malta would be of particular interest, since, apart from one doubtful record off Crete, it appears to be absent from the Eastern Mediterranean and possibly also from the northern part of the western basin, being found mostly along the Algerian and Tunisian coasts (LOGAN, 1979).

The eurybathic group consists of six species. *Megerlia truncata*, already dredged from Medina Bank, is occasionally found in shallow water but is more typical of the bathyal zone, where it occurs attached to patches of hard substrate such as stones. *Crania anomala* is common in both shallow and deep waters while *Gryphus vitreus*, *Terebratulina retusa*, *Platidia anomioides* and *Platidia davidsoni* are most common between -100 and -300 m, ranging down to occasional depths in excess of -1000 m. These species should therefore be expected in dredge hauls from deeper waters off the Maltese Islands.

In conclusion, we urge local naturalists to search for recent brachiopods off the coasts of Malta. Identifications may be made from the detailed descriptions and illustrations of DAVIDSON (1886-88) and LOGAN (1979). We append here brief, non-technical descriptions and illustrations of the species so far obtained by us and look forward to learning of additional species records in the future.

BRIEF DESCRIPTIONS OF SPECIES

1. *Crania anomala* (Müller) (Pl. 1, figs. 1-3)

Adult shell size up to about 15 mm wide, subcircular in outline, attachment by cementation, lower valve conforming to shape of attachment surface, upper valve conical, with apex subcentral. Surface of shell with concentric growth lines only, shell light brown in colour. Removal of

upper valve reveals a complex pattern of muscles which are reflected in a distinctive set of muscle attachment scars on the internal surfaces of both valves.

2. *Gryphus vitreus* (Born) (Pl. 1, figs. 4 - 9)

Adult shell size up to about 35 mm long and 30 mm wide, elongate-oval in outline, biconvex, white to semi-transparent in appearance, smooth except for faint concentric growth lines, finely punctate. Attachment by pedicle. Internally, a prominent horseshoe-shaped filamentous lophophore covers and is supported by a short, delicate, looped brachial skeleton attached to the hinge area of the smaller valve.

3. *Argyrotheca cuneata* (Risso) (Pl. 2, figs. 1 - 6)

Adult shell size rarely exceeding 4 mm in width, outline of shell variable, usually slightly wider than long. Shell biconvex, coarsely punctate, strongly ribbed with 3 - 6 cream-coloured ribs, inter-rib areas pink-red in colour, giving distinctive candy-striped appearance to shell. Attachment by pedicle. Internally there is a prominent, wide lophophore supported by a delicate, arcuate brachial skeleton attached to the valve floor of the smaller valve and divided by a prominent raised median septum.

4. *Argyrotheca cordata* (Risso) (Pl. 2, figs. 6 - 10)

Adult shell size rarely exceeding 4 mm in length or width, outline of shell variable, from an elongate heart-shape to a broadly transverse shape. Shell biconvex, coarsely punctate, very faintly ribbed in some specimens, virtually smooth in others, cream-white to semi-transparent in appearance. Attachment by pedicle. Internally similar to previous species of *Argyrotheca* except for strongly serrated anterior margin of median septum and row of submarginal ridges, noded at their anterior extremities, in the smaller valve.

5. *Megathiris detruncata* (Gmelin) (Pl. 2, figs. 11 - 15)

Adult shell size rarely exceeding 5 mm in length or 6 mm in width; outline of shell variable, but usually wider than long in adult form. Shell biconvex, coarsely punctate, ribbed, with 8 - 14 rounded ribs intersected by strong concentric growth lines, producing a scalloped anterior margin. Shell cream or light brown in colour. Attachment by pedicle. Internally similar to previous species of *Argyrotheca* except for two crested and serrated lateral septa flanking median septum in smaller valve.

6. *Megerlia truncata* (Linnaeus) (Pl. 1, figs. 10 - 15)

Adult shell size up to 20 mm in width and 18 mm in length, outline of shell usually wider than long; shell biconvex, finely punctate, fine radial ribs crossed by faint concentric growth lines, shell light-brown in colour. Attachment by pedicle. Internally there is a prominent lophophore supported by a complex, elongate, looped brachial skeleton attached to the hinge area of the smaller valve, the brachial skeleton being also attached to and supported by a prominent median septum. Interior of both valves covered with small radially-disposed tubercles.

Legend to Plate 1:

Figs. 1 -3. *Crania anomala*. 1,2 - interiors of two pedicle valves, showing muscle scars and traces of mantle canals, x 2 and x 3 respectively, Wied iz-Zurrieq, -35 m, hypotypes USNM 250884 and USNM 250885; 3 - interior of smaller (brachial) valve of specimen preserved in alcohol showing lophophore and principal muscles, x2, same locality and depth as before, hypotype 250883.

Figs. 4 - 9. *Gryphus vitreus*. 4-7 - pedicle valve, brachial valve, side and anterior views, x1, Medina Bank, -70 to -100 m, hypotype USNM 250987; 8,9 - interiors of pedicle and brachial valves, showing dentition, muscle scars and brachial skeleton, x 1, same locality and depth as before, hypotypes USNM 250988 and USNM 250989.

Figs. 10-15. *Megerlia truncata*. 10,12 - pedicle valve and side view, x2, Medina Bank, -70 to -100 m, hypotype USNM 250990; 11 - brachial valve (note attached juvenile), x2, same locality and depth as before, hypotype USNM 250991; 13-14 - interiors of pedicle and brachial valves of complete specimen showing dentition and brachial skeleton, x 2, same locality and depth as above, hypotype USNM 250992; 15 - oblique side view of interior of brachial valve of previous specimen, x 4.

Legend to Plate 2: (all photographs are scanning electron micrographs, x 10)

Figs. 1 - 5. *Argyrotheca cuneata*. 1,2 - pedicle and brachial valves, Ġnejna Bay, -10 m, hypotypes USNM 250993 and USNM 250994; 3-5 - pedicle valve interior and brachial valve interior (front and side views), showing dentition, median septum and brachial skeleton, same locality and depth as before, hypotypes USNM 250995 and USNM 250996.

Figs. 6 - 10. *Argyrotheca cordata*. 6-7 - pedicle and brachial valves, Wied iz-Zurrieq, -25 m, hypotypes USNM 250997 and USNM 250998; 8 - 10 - pedicle valve interior and brachial valve interior (front and side views), showing dentition, median septum and brachial skeleton, same locality and depth as before, hypotypes USNM 250999 and USNM 251000).

Figs. 11 - 15. *Megathiris detruncata*. 11,12 - pedicle and brachial valves, Wied iz-Zurrieq, -25 m, hypotypes USNM 251001 and USNM 251002; 13-15 - pedicle valve interior and brachial valve interior (front and side views), showing dentition, median septum, lateral septa and brachial skeleton, same locality and depth as before, hypotypes USNM 251003 and USNM 251004.

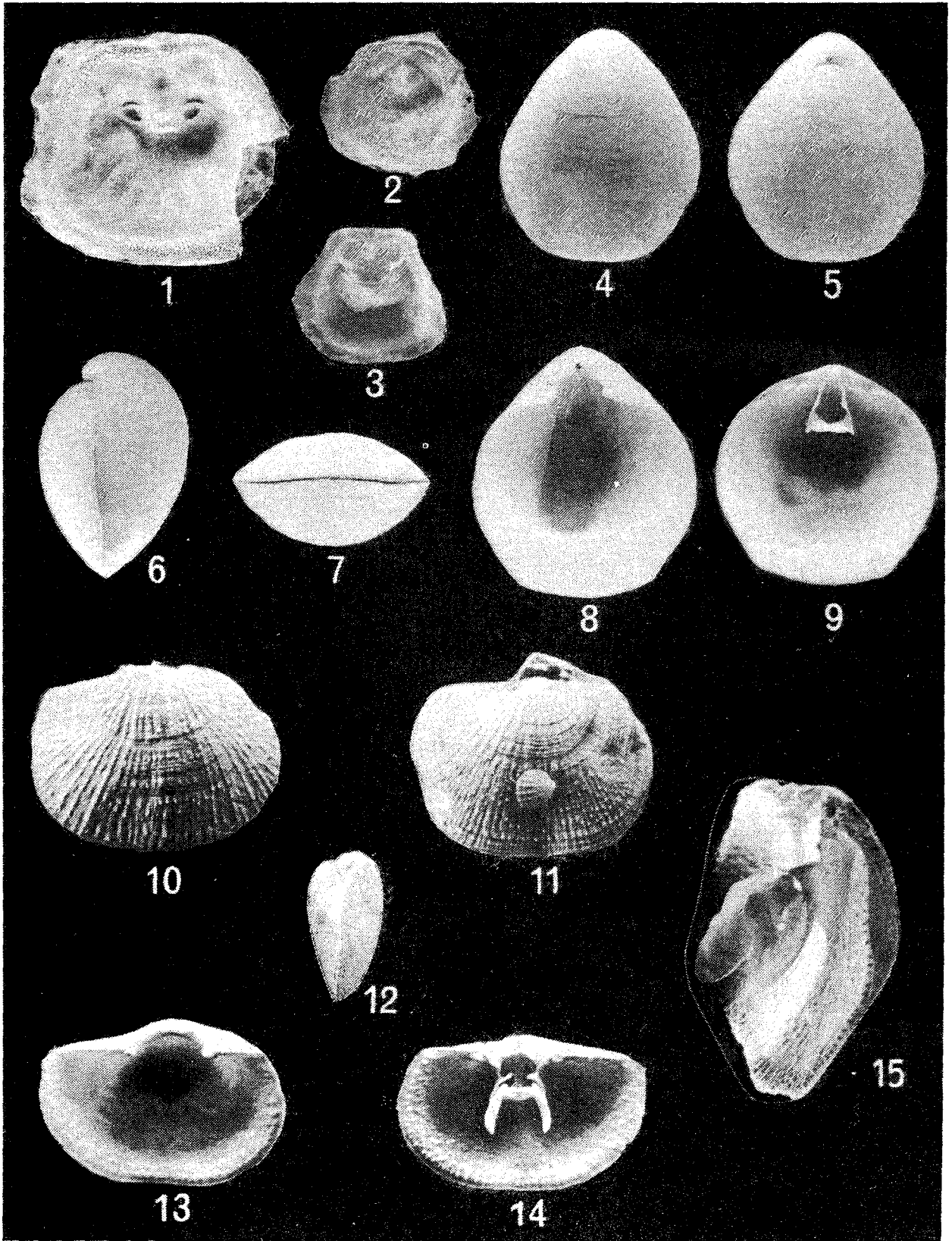


PLATE 1

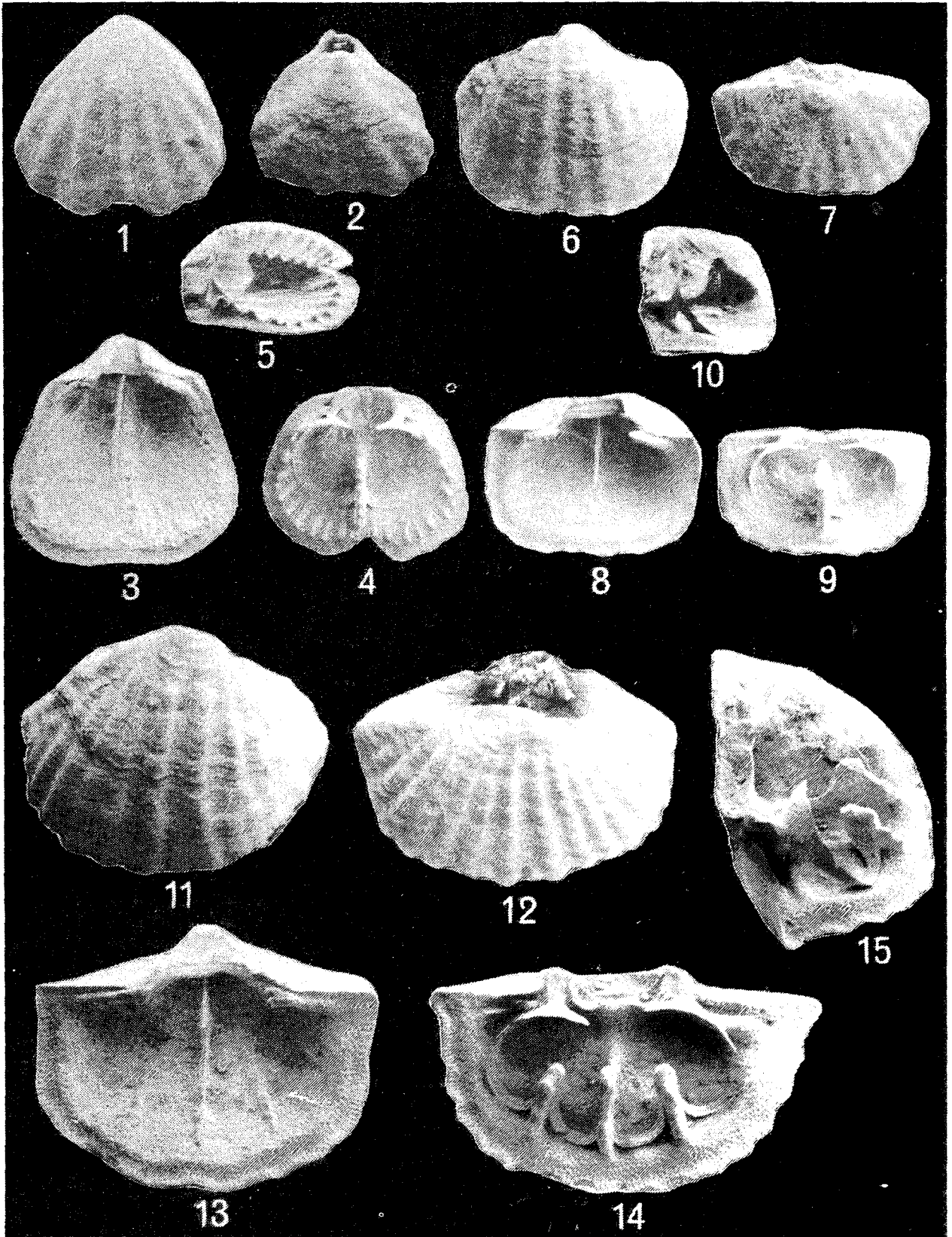


PLATE 2

ACKNOWLEDGEMENTS

The co-operation of Dr. V. Jaccarini, P.J. Schembri and L. Agius of the Fort St. Lucian Marine Station in Malta is gratefully acknowledged. The scanning electron micrographs were taken by Paul Nitishin of the University of New Brunswick. Financial support was provided by N.R.C. Operating Grants A4331 and A4384 to Logan and Noble respectively.

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received Oct. 1979