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*Centaurea spathulata* Zerafa 1827

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# RECENT BRACHIOPODS FROM MALTA

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## 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.

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## 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 <sup>2</sup> 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 <sup>2</sup> 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.



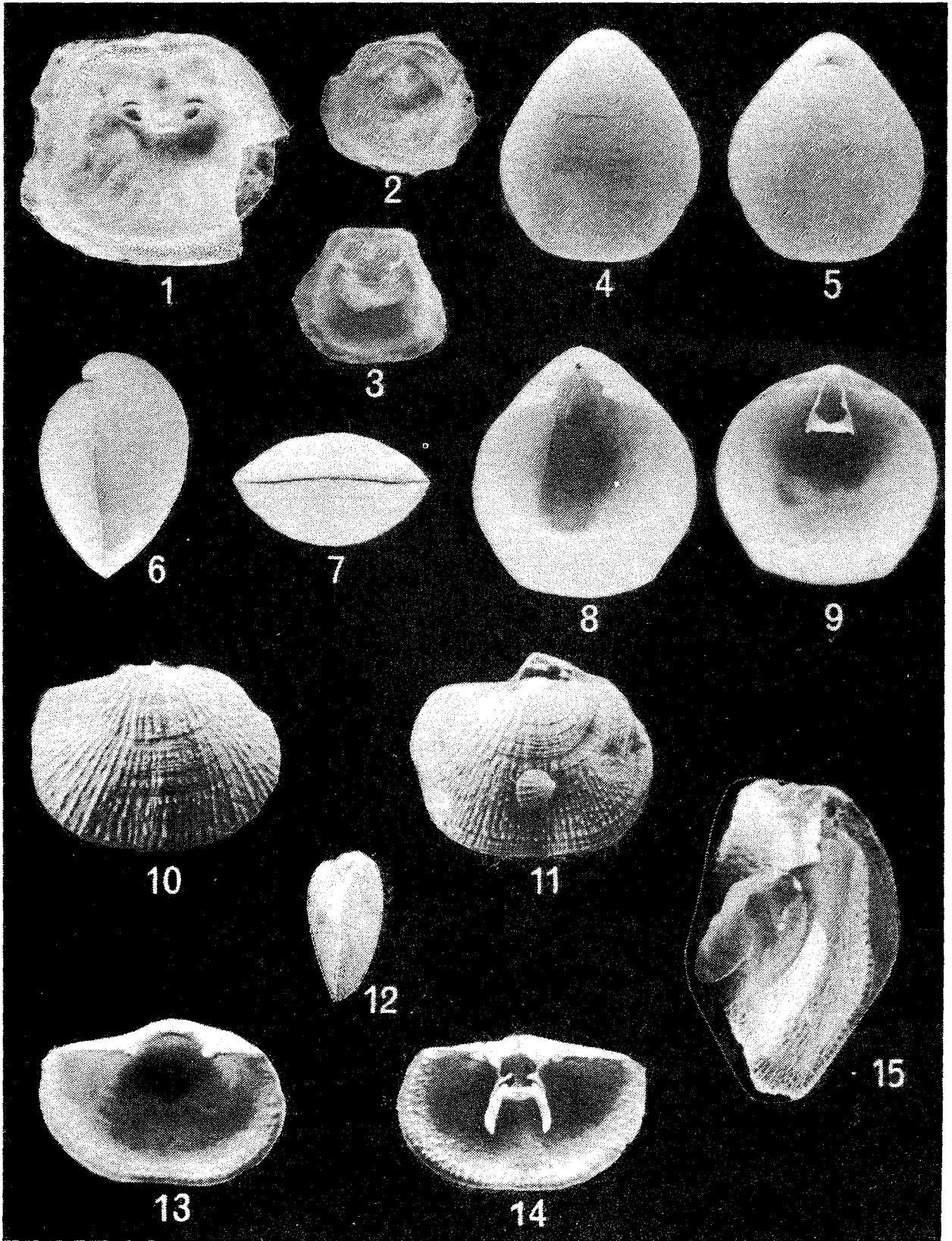


PLATE 1

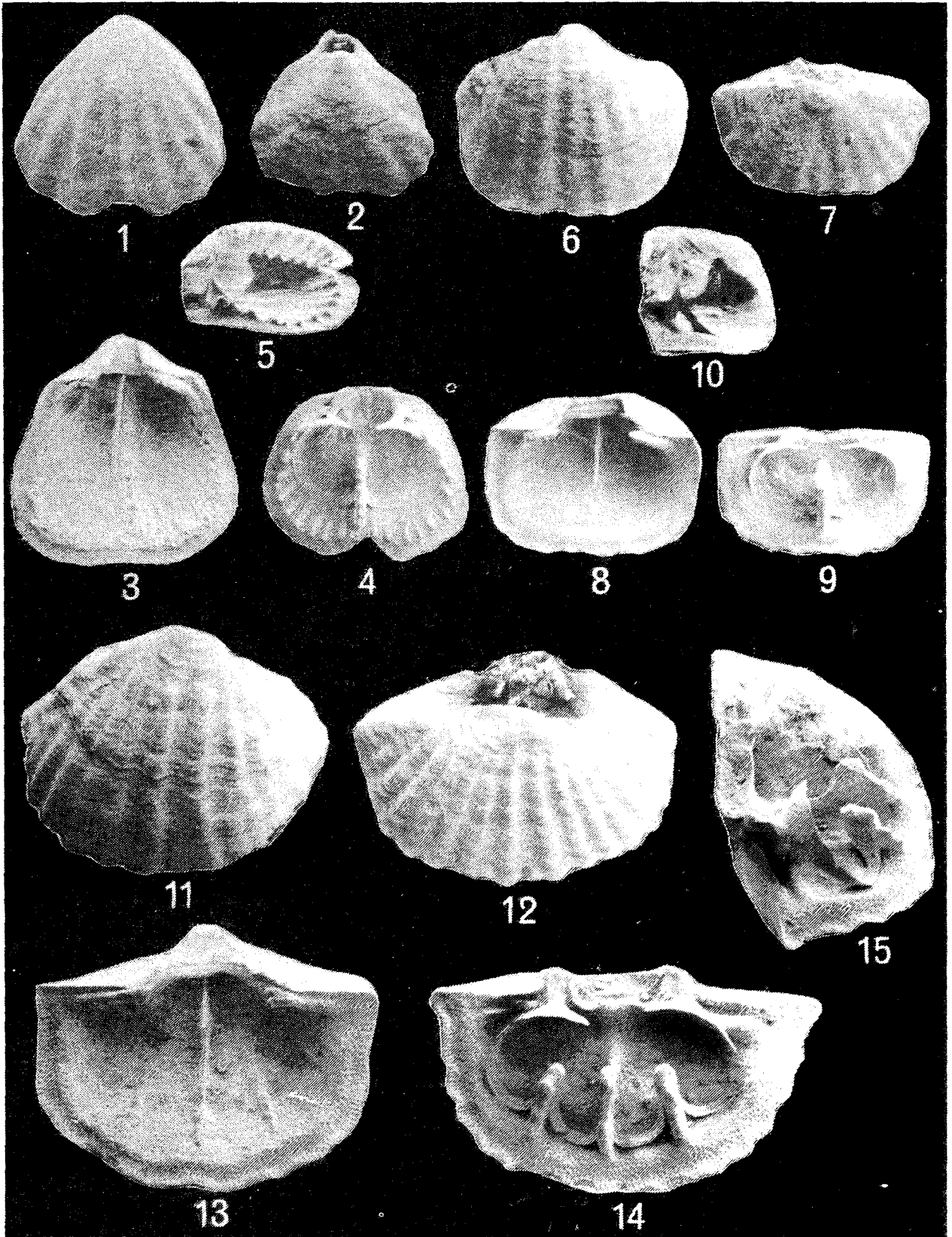


PLATE 2

#### ACKNOWLEDGEMENTS

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## LANDINGS OF *DERMOCHELYS CORIACEA* LINN. (REPTILIA, DERMOCHELIDAE) IN MALTA (CENTRAL MEDITERRANEAN)

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### ABSTRACT

The Leathery Turtle (*Dermochelys coriacea* Linn.) has not previously featured in Maltese herpetological literature. Nevertheless a considerable number of landings many of which have been reported in the local press, have been made in recent years. These landings are reviewed here.

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Previous writers on Malta's herpetology, including the Testudines, have not included the Leathery Turtle, *Dermochelys coriacea* Linn., presumably as none were recorded as taken from Maltese waters. During the past decade, however, the following landings were made:

1970 - 5th August; Żurrieq (South Malta); 1.98 m long, approximately 340 kg. Taken to Maltaquarium but died of its wounds two days later (Ref. 1, 2, 3, 7, 10, 11).

1972 - 22nd March; Żurrieq; 1.40 m long, approximately 101 kg (ref. 8).

1975 - 9th October; The Strand, Sliema (NE Malta); details not available (Ref. 12).

1976 - 13th May; Marsaxlokk (SE Malta); no details available (Ref. 4, 13).

3rd July; off Filfla (islet south of Malta); captured by Marsaxlokk fishermen and taken to the Natural History Museum at Mdina for preservation. Mr. J. Vella-Gaffiero, Officer in Charge, informed me that it was approximately 1.95 m long and weighing 300 kg. An attempt was made to mount it, but in July 1977 it was in a very bad state of preservation (Ref. 5, 14).

9th November; Gozo (island NW of Malta); 1.85 m long. It was taken to the University of Malta where skeletal material and some internal organs are still preserved (information supplied by Rev. Dr. Victor Jaccarini of the Biology Department of the University).

1977 - 3rd June; Spinola (NE Malta); dead specimen 1.85 m long (Ref. 15). On inspecting specimen, the present writer removed some of the barnacles adhering to the folds of the skin at the base of the neck, limbs and tail. These were identified by Dr. G. A. Boxhall of the British Museum (Natural History) as *Stomatolepas elegans* Costa, (Ref. 16), who further informed me that its normal host is the Leathery Turtle and its distribution is therefore dependent on that of the turtle. Some examples of *Dermochelys coriacea* taken elsewhere in the Mediterranean had been accompanied by *Echeneis remora* Linn. or by *Naucrates ductor* Linn. (Ref. 6, 9) both fish usually associated with large marine animals.

13th July; Marsaxlokk; no details available. Mr. J. Vella-Gaffiero of the Natural History Museum, Mdina, confirmed its capture.

In conclusion may I add that this turtle is not edible and efforts should be made by the fishing authorities to discourage its aimless destruction.

I am grateful for the co-operation of Dr. G.A. Boxhall, Rev. Fr. V. Jaccarini and Mr. J. Vella-Gaffiero in clarifying details as referred to above.

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NOTES ON THE FLORA OF MALTA: *JUNCUS SUBULATUS* FORSKÅL

BRULLO, S. Istituto Botanico, Via Antonino Longo, 95125, Catania, ITALIA.

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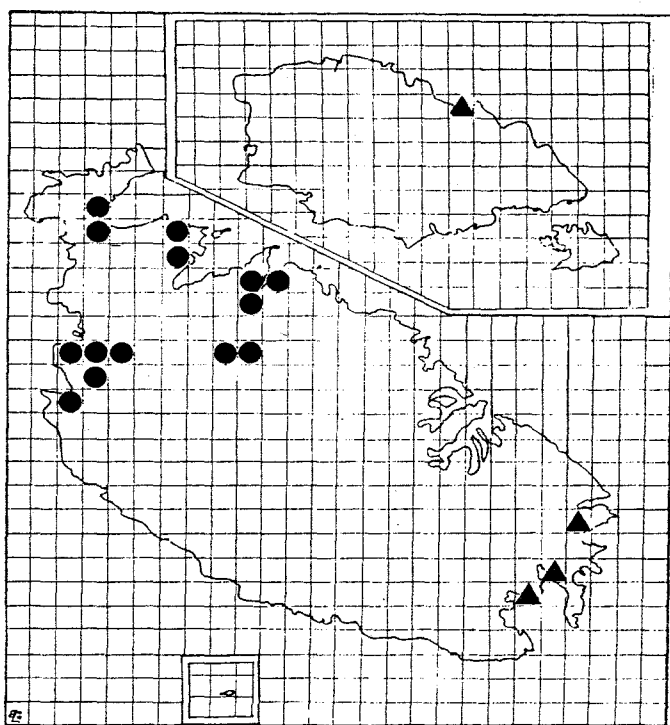


Fig. 1. Distribution of *Juncus subulatus* (●) and *Juncus maritimus* (▲)

Large populations of *Juncus subulatus* Forskål have been observed in several localities in Malta, notably at Għadira, Salini, Għajjn Riġana, Gnejna, Wied il-Hmar, Għajjn Hadid, Mistra and Wied Gerżuma (fig.1).

The first two stations are salt-marshes while in the other stations this species grows along freshwater courses.

In spite of the considerable extent of the populations, this species has never been recorded. Recent finds have been misreported as *Juncus maritimus* (EXCURSIONIST 1971, 1972; HASLAM et al. 1977) while the only specimen which we could locate at the herbarium of the Argotti Botanic Gardens (ARG), collected by John Borg (no date,

no locality, but flourished between 1910 and 1935) was labelled "*Juncus articulatus* var. *lamprocarpus*". Both *Juncus maritimus* Lam. and *Juncus articulatus* L. occur in the Maltese Islands. The former is confined to a few salt-marshes in eastern Malta and northern Gozo while the latter species is often found together with *Juncus subulatus* along water courses.

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## TWO NEW CASUAL GRASSES FROM MALTA

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### ABSTRACT

The occurrence of two casual grasses, *Urochloa panicoides* P. Beauv. and *Echinochloa frumentacea* Link in the Maltese islands is recorded for the first time.

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Early in October 1978, Mr. Michael Briffa found an unfamiliar panicoid grass in a neglected patch close to the Dragonara Casino (St. Julians, Malta). This was subsequently identified as *Urochloa panicoides* Palisot de Beauvois (fig. 1a), a native of South Africa, Tropical East Africa and India which occurs widely as a casual in various parts of the world.

The author subsequently visited the site together with Mr. Briffa. *Urochloa panicoides* was growing in company of several other ruderals and adventives including *Mirabilis jalapa* (L.)Juss., *Datura innoxia* Miller, *Ricinus communis* L., *Digitaria sanguinalis* (L.)Scop., *Cynodon dactylon* (L.) Pers., *Sorghum halepense* (L.)Pers., *Echinochloa colonum* (L.)Link and *Echinochloa frumentacea* Link. This last is also a new record for Malta (fig. 1b). In July 1979, Mr. Briffa found another small patch of *Echinochloa frumentacea* at the Exiles (Sliema/St. Julians, Malta).

*Echinochloa frumentacea* which is commonly cultivated for fodder in India, probably owes its presence in Malta to its occasional inclusion in bird-seed mixtures. The correct determination of this species is critical owing to the fact that various records of this plant from several parts of the world should be ascribed to *Echinochloa utilis* Ohwi et Yabuno, a forage grass of Chinese and Japanese origin the separate status of which has only recently been recognised (OHWI & YABUNO 1962). This species has also appeared as a casual in other parts of the world (DUVIGNEAUD 1976) and is also present in bird-seed mixtures (HUBBARD, personal communication). According to OHWI & YABUNO (1962) and DUVIGNEAUD (1976) *Echinochloa utilis* is derived from the wild *Echinochloa crus-galli* (L.) P. Beauv. while *Echinochloa frumentacea* is derived from the wild *Echinochloa colonum*.

According to HUBBARD (personal communication), *Echinochloa frumentacea* has obtuse spikelets about 3 mm long, the panicle pale in colour and with white grains while *Echinochloa utilis* has acute spikelets about 4 mm long, the panicle usually purplish and the grains brown. All the plants so far



encountered in Malta coincide well with *Echinochloa frumentacea*.

I am indebted to the late Dr. C.E. Hubbard and to Dr. A Hansen for the information which they provided and to Mr. Briffa for permission to report his finds.

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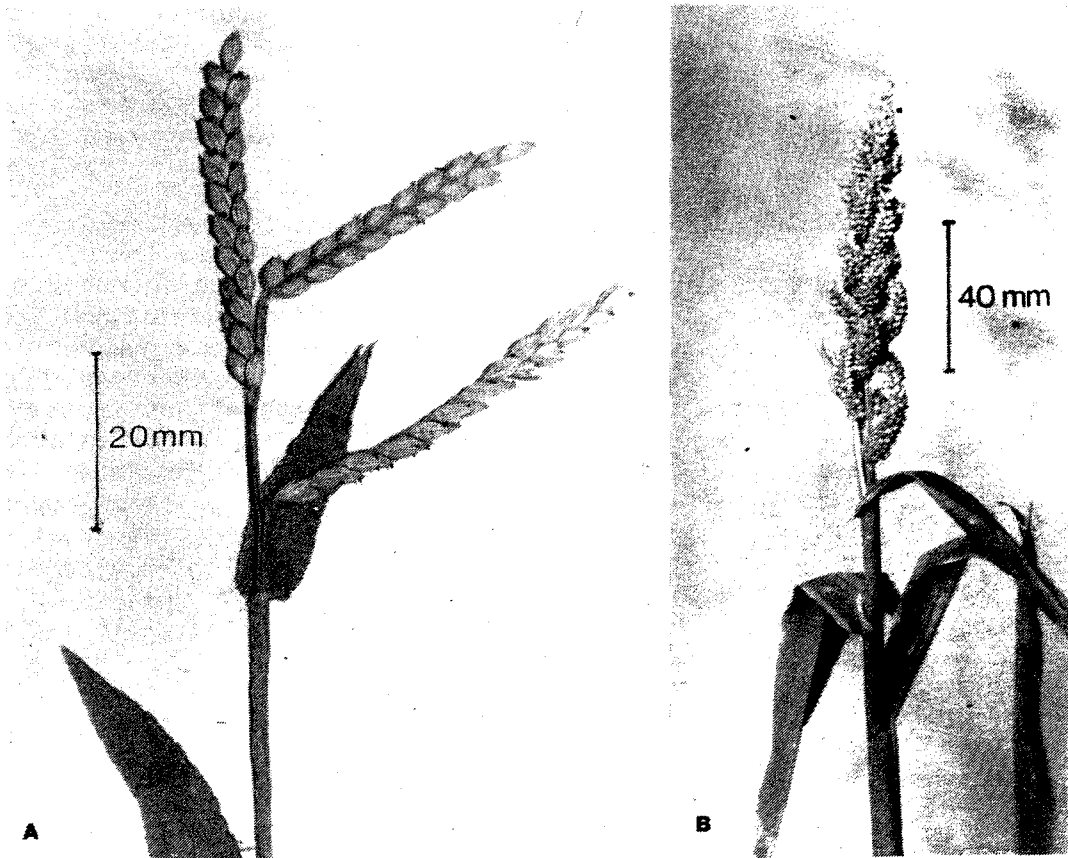


Fig. 1, a. *Urochloa panicoides*; b. *Echinochloa frumentacea* (nos. 6023, 6355 from author's herbarium).

# A PRELIMINARY LIST OF FRESHWATER CRUSTACEANS FROM THE MALTESE ISLANDS

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## ABSTRACT

Two species of branchiopods, one species of cladoceran, two species of ostracods, one species of isopod and one species of amphipod from a small collection of freshwater Crustacea are recorded from the Maltese Islands.

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## INTRODUCTION

Previous records of freshwater crustaceans from the Maltese Islands were those of MEDLYCOTT (in SEDDALL, 1870) and of GULIA (1873). MEDLYCOTT recorded *Branchipus stagnalis* (Cuv.) as rare in tanks and freshwater, and *Cypris pubera* O.F. Müller in stagnant pools on Manoel Island. GULIA lists *Limnodia melitensis* sp. nov., *Daphnia pulex* Müller and *Cyclops vulgaris* Edw. GULIA also states that besides these, other species of *Daphnia*, three species of *Cypris* and one species of *Cypridina* also occur. *Limnodia melitensis* Gulia is a *nomen nudum* since GULIA gives no description of this species.

The Maltese freshwater Crustacea have received little attention since GULIA's paper. ZAMMIT-LUCIA (1971) in a study of the macrofauna of Chadwick's reservoir between December 1969 and May 1970 recorded the genera *Cypris*, *Cyclops* and *Daphnia* as well as *Asellus aquaticus*. This author was more concerned with the ecology of the reservoir and did not attempt to identify the Crustacea to species level.

The present work deals with a small collection of freshwater crustacea collected from stagnant pools from Malta and Gozo in 1972. It is interesting to note that the rainfall from September to April and from September to November, when the collection was made was 69.1 cm and 8.1 cm respectively. The specimens were collected using a fine net with specimen tube attached.

## SPECIES LIST

Subclass: Branchiopoda

Order: Anostraca; Family: Branchipodidae; Subfamily: Branchipodinae

*Branchipus stagnalis* L. - Four specimens from Wied ta' l-Isperanza (Mosta), 30/IV/72 from a stagnant pool of 1 m diameter and 0.5 m depth.

Order: Cladocera; Family: Daphnidae

*Simocephalus vetulus* (O.F. Müller) - Collected from a large pool at Rabat under the Mtarfa bridge where it was very common. Specimens kept alive in a freshwater aquarium reproduced successfully.

Order: Conchostraca; Family: Cyzicidae

*Eocyclus* (?) *orientalis* Daday - Three specimens from the same pool as *Branchipus stagnalis*. Wied ta l-Isperanza (Mosta), 30/IV/72.

Subclass: Ostracoda

Order: Podocopa; Family: Cypridae; Subfamily: Cyprinae

*Herpetocypris reptans* (Baird 1835) - Collected from Gozo, 24/IV/72.

*Herpetocypris intermedius* (Kaufmann 1900) - Collected from Gozo, 24/IV/72.

Subclass: Malacostraca

Superorder: Peracarida; Order: Isopoda; Suborder: Asellota; Family: Asellidae

*Asellus* (*Proasellus*) *coxalia* Dollfus - Collected from Gozo, 24/IV/72.

Superorder: Peracarida; Order: Amphipoda; Family: Gammaridae

*Gammarus pungens* Milne-Edwards - Collected from Rabat under the Mtarfa bridge and also from Bañrija, both in November 1972.

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(Author's Note: This paper was prepared in 1972)

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