UTRECHT MICROPALEONTOLOGICAL BULLETINS

W. SISSINGH

LATE CENOZOIC OSTRACODA OF THE SOUTH AEGEAN ISLAND ARC

6

UTRECHT MICROPALEONTOLOGICAL BULLETINS

Editorial Staff: C. W. Drooger, P. Marks, J. E. Meulenkamp and R. C. Tjalsma.

In the series have been published:

Bulletin 1:

FREUDENTHAL, T. — Stratigraphy of Neogene deposits in the Khania Province, Crete, with special reference to Foraminifera of the family Planorbulinidae and the genus *Heterostegina* (Statistical analysis, evolution and stratigraphic application of *Planorbulinella, Linderina, Hellenocyclina* and others. Material from localities in Europe, America and the Indopacific is included).
208 pages, 15 plates, 33 text figs., 10 tables.
Dfl. 39,— (24)* ISBN 90 300 2506 9

Bulletin 2:

MEULENKAMP, J. E. — Stratigraphy of Neogene deposits in the Rethymnon Province, Crete, with special reference to the phylogeny of uniserial *Uvigerina* from the Mediterranean region (Statistical analysis, evolution and stratigraphic application of uniserial Uvigerinids in the Mio-Pliocene of the Mediterranean area.
172 pages, 6 plates, 53 text figs., 22 tables.
Dfl. 36,— (21)* ISBN 90 300 2516 6

Bulletin 3:

VERDENIUS, J. G. — Neogene stratigraphy of the Western Guadalquivir Basin, S. Spain (Stratigraphy of the Neogene succession of the Sevilla area in the Guadalquivir Basin, SW Spain, and a correlation with planktonic foraminiferal zonations of N. Italy. The area includes the type sequence of the Andalusian of Perconig).
109 pages, 9 plates, 12 text figs. Dfl. 34,— (20)* ISBN 90 300 2526 3

Bulletin 4:

TJALSMA, R. C. — Stratigraphy and Foraminifera of the Neogene of the Eastern Guadalquivir Basin, S. Spain. (Stratigraphy of the Neogene deposits of the eastern Guadalquivir Basin, Province of Jaén, SW Spain, with special reference to the ontogeny, variation and systematic position of some Neogene planktonic foraminifera).
161 pages, 16 plates, 28 text figs. Dfl. 55,— (36)* ISBN 90 300 2536 0

Bulletin 5:

DROOGER, C. W., P. MARKS, A. PAPP et al. — Smaller radiate Nummulites of northwestern Europe. (Statistical analysis of *Nummulites variolarius, N. orbignyi* and related species).
137 pages, 5 plates, 50 text figs. Dfl. 47,— (29)* ISBN 90 300 2546 8

Bulletin 6: SISSINGH, W.— Dfl. 83,— (49)* ISBN 90 300 2556 5

* Continued on page 3 of the cover.

LATE CENOZOIC OSTRACODA OF THE SOUTH AEGEAN ISLAND ARC

Copyright © 1972 by Schotanus Publishing Company BV, Langbroek-Utrecht

ISBN 90 300 2546 8

Printed in the Netherlands by Schotanus & Jens Utrecht, Inc.

All rights in this book are reserved. No part of the book may be used or reproduced in any manner without written permission. Brief quotations embodied in critical articles and reviews are permitted.

LATE CENOZOIC OSTRACODA OF THE SOUTH AEGEAN ISLAND ARC

W. Sissingh

SCHOTANUS PUBLISHING COMPANY B.V.
LANGBROEK - UTRECHT - THE NETHERLANDS

CONTENTS

		Page
Abstract		
Chapter I	Introductory remarks	9
Chapter II	Lithostratigraphy and assumed chronostratigraphic position of the formations	15
Chapter III	Paleoecological interpretation	28
Chapter VI	Biostratigraphy	36
Chapter V	Comparisons and attempts at correlation	55
Chapter VI	Systematics	65
References	. . . . .	155
Plates	. . . . .	163

ABSTRACT

A detailed study has been made of Late Cenozoic ostracodes from closely sampled sections and some isolated samples on the Aegean islands of Gavdos, Crete, Karpathos and Rhodos.

The stratigraphic position of the studied lithostratigraphic units has been determined by means of the evolutionary trends in *Planorbulinella* and in uniserial *Uvigerina*, and by planktonic Foraminifera (Chapter II).

For a paleoecologic interpretation a method is introduced for evaluating depth of deposition and salinity, and major trends in the development of the depositional environment (Chapter III).

Based on the three major realms for ostracode life reflected in the assemblages (a brackish water, a shallow marine and a deeper marine environment) some tentative assemblage zones are proposed (Chapter IV).

Comparisons with the ostracode assemblages of Neogene stratotypes show that most of the biozones can be recognized outside the Aegean area (Chapter V).

The systematic part of the study deals with over 200 different taxa. Three new subgenera are proposed. In total 24 new species are described. Because of primary homonymy two species are renamed (Chapter VI).

Chapter I

INTRODUCTORY REMARKS

Until now little was known about Late Cenozoic Ostracoda from the South Aegean islands. The data contained in the extensive paper on Pliocene (?) ostracodes from Rhodos of Terquem (1878) are too fragmentary to be of much value in present-day studies.

Hence, the purpose of our investigation is primarily to give a detailed account of the brackish and marine Ostracoda encountered in the Miocene, Pliocene and Pleistocene sediments of the South Aegean islands of Gavdos, Crete, Karpathos and Rhodos. Emphasis will be placed on paleoecology and on the biostratigraphic value of various associations of genera and species.

The Late Cenozoic sedimentary history of the southern Aegean area is characterized by the deposition of a wide variety of lithostratigraphic units. Especially a large diversity of marine marls, marly limestones and organic limestones has been reported, but various freshwater and brackish sediments are found as well. It is thought likely that in this area the entire Late Cenozoic is covered by a composite section of marine deposits.

As originally assumed by Papp (1947) and substantiated by later investigations a continuous marine sedimentation from the Miocene into the Pliocene may be accepted for the Cretan area. Generally, a "crise de salinité" which is lithologically characterized by the deposition of evaporites and non-marine sediments, is assumed for the entire Mediterranean realm at the end of the Miocene, but in Crete continental deposits seem to be lacking. Chronostratigraphically this event is often considered to be synchronous all over the Mediterranean and corresponding with the Messinian Stage. However, in Italy the isochronous character of the lower and upper boundaries of this stage is disputable (Drooger & Meulenkamp, 1969).

For our study of the Neogene and Pleistocene ostracodes especially closely sampled sections were selected. The sections jointly comprise the major part of the Late Cenozoic interval and they represent different types of depositional environment. Late Miocene deposits occur in Gavdos and Crete, in Karpathos and Rhodos only Pliocene and younger deposits represent the Cenozoic.

Field work in the South Aegean islands has been carried out since 1961 by a team of stratigraphers of Utrecht University, so that for our purpose there was ample material from sampled secions.

The greater part of the samples studied was originally collected and investigated by Freudenthal (1969) and Meulenkamp (1969). The material from central Crete was collected by the present author, the samples from Karpathos and Rhodos were taken by H. E. de Vries and E. F. J. de Mulder, respectively.

Fig. 1. Geographic sketch map of Greece. The inset illustrates the approximate outline of the Mediterranean and western Paratethys during the Late Miocene to show the position of the South Aegean area (partly after Ruggieri, 1967).

The geographic position of the localities is given in figures 1, 3-6. The inset of figure 1 illustrates the position of the area within the approximate Late Miocene configuration of the Mediterranean and western Paratethys. The lithostratigraphic and chronostratigraphic position of the samples is given in Chapter II.

Method of study

For every sample three wash residues (grain sizes between 125μ and 250μ, between 250μ and 595μ and larger than 595μ) were examined. In the coarsest residues ostracodes appeared to be rare, all individuals present were picked. From both other residues comparable quantities were taken, from the middle fraction twice as many as from the finest fraction. As a consequence our quantitative data have a relative value only and conclusions may be drawn only with this limitation in mind.

Frequency of (sub)species:	number	symbol
very rare	1 - 2 valves	·
rare	3 - 5 valves	×
common	6 -15 valves	O
frequent	16-25 valves	●
very frequent	> 25 valves	■

Complete carapaces were counted as two valves each.

Material for comparison

For comparison material was used from several Neogene and Pleistocene stratotypes and from other classic sections situated in the Mediterranean area. In some cases material of the collections of Van den Bold (1946), Keij (1953, 1955, 1957, 1966), Kingma (1948), Kuiper (1918) and Rome (1942) was examined. The collections of Brady (1866, 1867-72, 1868, 1869), comprising ostracodes from the eastern Mediterranean area and stored in the Hancock Museum at Newcastle-upon-Tyne (England) were likewise studied. Recent material available from the Gulf of Naples, the southern Adriatic Sea, Rimini, Venice beach, the Côte d'Azur, Corsica, Rhodos and Cyprus further facilitated the systematic study.

All our described material is stored in the Utrecht Micropaleontological Collection.

Acknowledgements

I first wish to express my sincere gratitude to Professor C. W. Drooger for his guidance and constructive criticism.

A. J. Keij (Rijswijk) introduced me to the study of Ostracoda. For his introduction, much needed advice and deep interest I am very grateful.

Several specialists abroad have contributed advice and willingly examined material, for which I am greatly indebted. Thanks are extended particularly to Professor G. Ruggieri (Palermo), Professor W. A. Van den Bold (Baton Rouge), G. Carbonnel (Lyon), Miss N. Krstic (Beograd) and F. Uliczny (Port Gentil).

A good many colleagues kindly placed samples at my disposal, which has been essential to my work.

I highly appreciate the careful drawings done by J. P. van der Linden and P. Hoonhout, and the preparation of the samples by G. van 't Veld.

Financial supports of the Netherlands Organisation for the Advancement of Pure Scientific Research (Z.W.O.), the State University of Utrecht and the foundation "Het Molengraaff Fonds" are gratefully acknowledged.

Previous work on Recent and subfossil Ostracoda

The first data concerning Recent ostracodes of the eastern Mediterranean were presented by Baird (1850), who described four new species from Tenedos, off the west coast of Turkey. These new forms are *Cythere setosa, C. runcinata, Cythereis prava* and *C. senticosa.*

Brady (1866) reported further new ostracodes from Recent sediments in the Levant, in Crete (Suda Bay), Serpho, and from Hermos and Smyrna (both Turkey). From the Levant the following new species were described: *Cytherella punctata, Bairdia crosskeiana, Cytheridea margaritea, Cythere hodgii, C. oblonga, C. pavonia, C. cribriformis, C. jurinei* var. *costata, Normania affinis, N. glabra* and *Cythereis batei.* From Suda Bay one new species is reported, *Cytherideis nobilis. Normania grisea* and *N. modesta* were described as new from Smyrna.

In De Folin & Périer's "Les Fonds de la Mer" Brady (1867-72) reported many ostracode species from Siros, the Dardanelles, Istanbul, Smyrna, Rhodos, Syria and Port-Said. *Cythere speyeri* and *Loxoconcha raulini* were described as new from Siros, from the Dardanelles *Cythere muscosa* and *Cytheridea ? elatior, Loxoconcha lata* from Istanbul, from Smyrna a dubious species described as *Cythere inconstans,* and from Rhodos *Cytheropteron stellatum.* New species mentioned from Port-Said were *Cythere berchoni* and *Cytheridea castanea,* from

Syria *Ilyobates* ? *judaea, Cythere subsigmoidea, Cytherideis cylindrica, Cytherura deformis* and *C. nervosa. Cytheridea castanea* has also been mentioned from the Gulf of Gascogne, France. A type locality was not designated for this species (see De Folin's footnote on p. 118).

From Tenedos Brady (1868b) described the following new species: *Bairdia formosa, Cythere crispata, C. dissimilis, C. favoides, Cytherura acris, Loxoconcha alata, Paradoxostoma* ? *reniformis, Pontocypris intermedia* and *Sclerochilus* ? *aegaeus.* In this paper *C. speyeri* is again treated as a new species.

In 1869 Brady described ostracodes from Besika Bay (north of Tenedos), Piraeus, Crete and the Dardanelles. From Besika Bay *Cythere affinis, Loxoconcha tumida, L. angustata* and *Cytherideis teres* were described as new. *L. tumida* was also reported from Piraeus. The type locality of this species is therefore uncertain. In the same paper *Pontocypris obtusata* was described as new from Piraeus. New from the Dardanelles was *Cytheropteron acutum.*

After these publications dealing with eastern Mediterranean Ostracoda it took a very long time before new data on Recent marine ostracodes were published. Stephanides (1948) studied freshwater ostracodes from Corfu. Some forms were reported by this author to occur in brackish water.

A small number of ostracode species was reported by Schaefer (1953) from a sulfur spring in the vicinity of Athens.

Numerous marine ostracode species were reported from bottom cores taken in the entire Mediterranean by Puri et al. (1969). Faunal assemblages encountered indicate that there is no significant difference in faunal composition between the eastern and western Mediterranean.

Recently, Barbeito-Gonzalez (1971) has extensively discussed the ostracodes from Naxos (Cyclades).

Previous work on Late Cenozoic Ostracoda

Information about fossil Ostracoda from the eastern Mediterranean is scarce. The first data were presented by Terquem (1878), who described a large number of taxa from Rhodos. Most of these forms were proposed as new. Sample locality and exact stratigraphic level from which Terquem's material had originally been taken (by Hedenberg, Swedish consul at Rhodos) are not known. The age of his material may be either Pliocene and/or Pleistocene. Most of Terquem's descriptions and figures are unreliable for present-day determination.

Bonarelli (1901) in his paper on the geology of the island of Crete, reproduced a report made by G. Capeder concerning ostracodes from Pliocene deposits west of Iraklion. In this report Capeder mentions the following species: *Cythere*

jonesii (Baird), *C. punctata* von Muenster, *C. laquetra* Jones, *C. woodiana* Jones, *Cytherella compressa* (von Muenster) and *Cytheropteron triangulare* (Reuss).

Christodoulou & Haralambous (1960) described a brackish water microfauna from Armeni in southeastern Crete, which according to the authors included *Haplocytheridea dacica dacica* (Hejjas) as the only ostracode taxon. The assemblage would be of Sarmatian Age.

From the Pliocene of the Peleponnesos Bignot, Dercourt & Le Calvez (1964) mentioned some ostracode species, which were determined by V. Apostolescu.

Grekoff, Guernet & Lorenz (1967) described a poor microfauna from marine Neogene deposits (Upper Miocene) of the island of Skiros, north of Euboea. Six ostracode taxa were reported.

The most important contribution to the knowledge of Neogene Ostracoda from the eastern Mediterranean is the investigation of Uliczny (1969). He studied especially Pliocene Hemicytheridae and Trachyleberididae of Cephalonia, Ionian Sea. Both families together were represented in his material by 88 taxa. No less than 33 were assigned to the genus *Aurila*. Most of these forms were proposed as new species or subspecies.

Gramann & Kockel (1969) and more especially Gramann (1969) reported ostracodes from Neogene and Lower Quaternary deposits of the socalled Strimon Basin in Greek Macedonia, including freshwater, brackish water and shallow marine forms.

Becker-Platen (1970) describing Oligocene to Lower Quaternary deposits of southwestern Anatolia (Turkey) listed ostracodes from several strata. The determinations were mainly made by G. Luettig. With a few exceptions only fresh to brackish water ostracodes were reported.

Chapter II

LITHOSTRATIGRAPHY AND ASSUMED CHRONOSTRATIGRAPHIC POSITION OF THE FORMATIONS

II.1. Introduction

In this chapter a review is given of the lithology and relative stratigraphic position of the formations, from which ostracodes were studied.

Our age assignments of the formations are partly based on evolutionary stages in the foraminiferal genera *Planorbulinella* and *Uvigerina*, partly on planktonic foraminifera.

Based on the evolution according to the principle of nepionic acceleration, Freudenthal (1969) established three morphologically adjoining species of *Planorbulinella*, which are successive in time during the Late Miocene in the Cretan realm. These three are *P. rokae* Freudenthal, *P. astriki* Freudenthal and *P. caneae* Freudenthal, respectively (see fig. 2).

Meulenkamp (1969) studied in detail the phylogenetic trends in chamber arrangement of two groups of *Uvigerina*, which are likewise stratigraphically successive. An older, Miocene *melitensis*-lineage and a younger, Miocene to Pliocene *cretensis*-lineage could be distinguished by this author. Both lineages show progressive trends to an uniserial chamber arrangement. Each lineage has been subdivided in four specific units (see fig. 2).

The evolution of the Cretan *Planorbulinella* as well as that of the uniserial uvigerinids are reliable tools for the determination of the relative stratigraphic position of the rock-units, certainly so in the Cretan area. Especially the younger formations are dated by means of planktonic foraminifera.

For more details concerning the studied Neogene formations of Gavdos and Crete we refer to Freudenthal (1969), Meulenkamp (1969) and Sissingh (in press). More data about the Neogene of Karpathos can be found in Desio (1931) and Christodoulou (1960). For Rhodos we refer to Mutti, Orombelli & Pozzi (1967, 1970), Orombelli & Montanari (1967) and Meulenkamp et al. (in prep.). Lithostratigraphic sections published by Freudenthal (1969) and Meulenkamp (1969) are not figured again.

A summary of the relative stratigraphic positions of the formations concerned is given in figure 2.

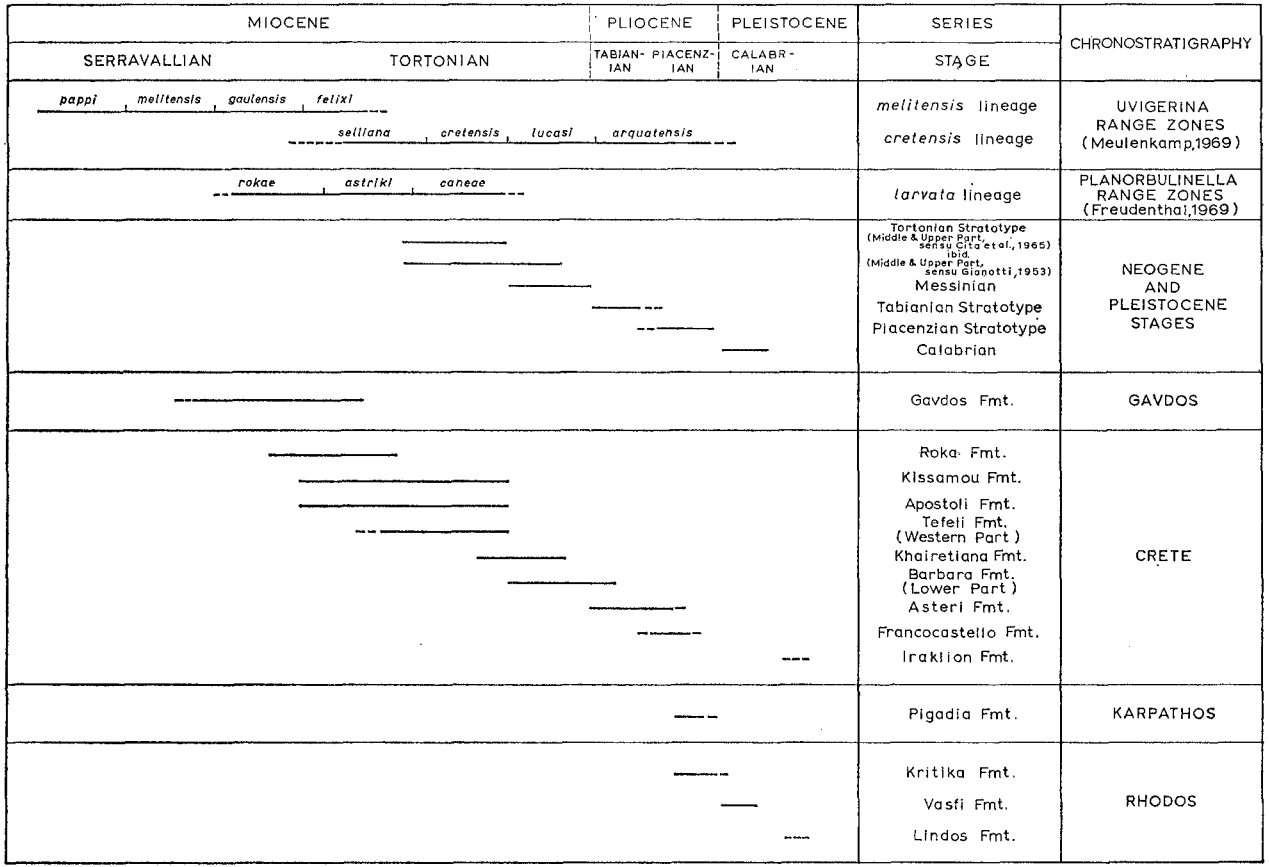


Fig. 2. Correlation chart of *Uvigerina* and *Planorbulinella* Range zones, Late Cenozoic stratotypes and the formations (modifed after Meulenkamp, 1969).

II.2. Gavdos

Reference: Freudenthal, 1969.

II.2.1. GAVDOS FORMATION

Lithology: All Neogene deposits found on Gavdos Freudenthal (1969, p. 48, columns VI) included in the Gavdos Formation. Lithologically, this formation is therefore very variable. The formation comprises conglomerates, brownish sands, marls, bluish to greenish clays with *Crassostrea,* as well as algal limestones containing, among others, heterosteginids. Generally, the strata are strongly affected by block faulting. The exact geographic extension of the formation is not known. The total thickness seems to amount to at least 150 m.

Age: Two sections of this formation were selected to study. Section Ambelos appeared to contain *Uvigerina gaulensis* of Meulenkamp's *melitensis*-lineage. We encountered *U. selliana* of the *cretensis*-lineage in Section Panayia. Thus the Gavdos deposits are probably older than those of the middle and upper parts of the Tortonian type section, which contain assemblages of *U. selliana* close to *U. cretensis* and of *U. cretensis,* respectively (Meulenkamp, 1969).

Provenance of samples:

a) Section Ambelos, exposure 336 (Freudenthal, p. 24) (fig. 3). Coastal cliff north of Ambelos.
b) Section Panayia, exposure 341 (Freudenthal, p. 24) (fig. 3). Near Panayia church along the path from Kastri to Karave beach.

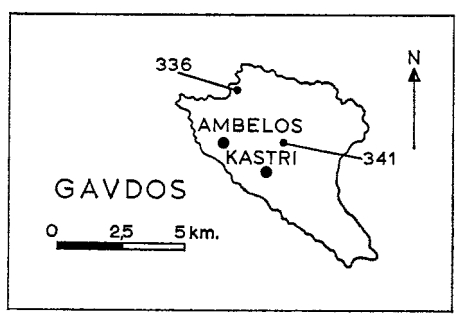


Fig. 3. Index map of Gavdos showing the location of the exposures.

II.3. Western Crete: Province of Khania

Reference: Freudenthal, 1969.

II.3.1. ROKA FORMATION

Lithology: According to Freudenthal (1969, p. 30) the Roka Formation consists of conglomerates, *Heterostegina* bearing sands and organic limestones. The formation is restricted to the western part of the province. The thickness is maximally 60 m. Generally, it does not exceed a few meters.

Age: From the lower part of this formation Freudenthal (p. 77) reports *Planorbulinella rokae. P. astriki* occurs in the upper strata of the formation, in which we also found *U. selliana.* Chronostratigraphically, the lower and middle part of the Roka Formation seem to correspond to the upper part of the Gavdos Formation. The Roka deposits are overlain by the Kissamou Formation (see II.3.2).

Provenance of samples:

a) Section Astrikos, exposure 105 (lower part, Freudenthal, p. 19) (fig. 4). About 1 km southeast of Roka and 0.5-1 km southwest of Astrikos (Kissamou District). The sediments exposed in the top part of this section belong to the Kissamou Formation.

II.3.2. KISSAMOU FORMATION

Lithology: The Kissamou Formation is characterized by amorphous, locally laminated clays with graded and non-graded clastic intercalations. Again according to Freudenthal (1969, p. 33) the clays locally contain numerous marine molluscs. The formation is restricted to the western part of the province, where it is commonly overlain by the Khairetiana Formation (see III.3.3). The thickness amounts to 175 m.

Age: In the lower strata of this formation *P. astriki* has been found by Freudenthal (p. 77). *P. caneae* occurs in the middle and upper part of the formation, together with, among others, *Globorotalia ventriosa* Ogniben. Both *G. ventriosa* and *P. astriki* are present in the Tortonian type section (Freudenthal, p. 78). Hence, the major part of the Kissamou Formation can chronostratigraphically be correlated with this stage (see also Zachariasse, in prep.).

Provenance of samples:

a) Section Astrikos, exposure 105 (upper part, Freudenthal, p. 19) (fig. 4).
b) Section Khairetiana, exposure 368 (Freudenthal, p. 20) (fig. 4). Approximately 0.5 km east to southeast of Khairetiana village (Kissamou District).

II.3.3. KHAIRETIANA FORMATION

Lithology: The Khairetiana Formation is conformably overlying the Kissamou Formation. According to Freudenthal (1969, p. 36) this formation mainly consists of alternating layers of amorphous marls and laminated marls or clays. Gypsum

masses are locally present at the base. The formation is widely distributed throughout the province. Its maximum thickness is probably 100 m.
Age: Planktonic Foraminifera indicative of a Pliocene age were not found in this formation It contains *P. caneae* in the lower part. Assignment to the uppermost Miocene may be accepted at least for the lower part of the formation, below the gypsum. This is in accordance with the occurrence of *U. lucasi,* found in samples close to gypsiferous deposits.

Provenance of samples:

a) Section Khairetiana, exposure 292 (Freudenthal, p. 21) (fig. 4). Along the road from Khairetiana to Kaloudhiana (Kissamou District), near the church at the northern entrance of the first mentioned village.

II.4. Western Crete: Province of Rethymnon, Easternmost part of Province of Khania

Reference: Meulenkamp, 1969.

II.4.1. APOSTOLI FORMATION

Lithology: According to Meulenkamp (1969, p. 24) the Apostoli Formation mainly consists of grey to bluish marls and clays. Marine molluscs are common. The formation is especially found in the central part of Rethymnon Province, e.g. near Apostoli. It is also exposed in the utmost eastern part of Khania Province (near Vryses-Exopolis). The thickness amounts to 120 m maximally.
Age: In the lower beds of this formation *P. astriki, U. gaulensis* and *U. felixi* of the *melitensis*-lineage and *U. selliana* of the *cretensis*-lineage are present. *P. caneae* and *U. cretensis* are found in higher strata (Freudenthal, 1969, p. 78, 79; Meulenkamp, 1969, p. 141). The formation can thus be correlated with the Kissamou Formation in the Khania Province, as well as with the greater part of the Tortonian type section, because *P. astriki* and assemblages of *U. selliana* close to *U. cretensis* are known from the middle part and assemblages of *U. cretensis* from the upper part (sensu Cita et al., 1965) of this stratotype. This age assignment is substantiated by the study of planktonic Foraminifera (Zachariasse, in prep.).

Provenance of samples:

a) Section Apostoli, exposure 814 (Meulenkamp, p. 19) (fig. 4). Approximately 2 km west of Apostoli (Amari District), along the southern slope of the Moni Veni table mountain.
b) Section Exopolis, exposure 850 (Meulenkamp, p. 22) (fig. 4). Near the road

from Exopolis to Yeoryioupolis, Province of Khania (Apokoronou District), in a gully east of the first mentioned village.

II.4.2. ASTERI FORMATION

Lithology: According to Meulenkamp (1969, p. 41) the Asteri Formation is characterized by white and beige fossiliferous marls with abundant concretions. In the upper part of the formation laminated intercalations are found. The formation is only found east of Rethymnon. Its total thickness amounts to about 100 m.

Age: In the Asteri deposits *Globorotalia margaritae* Bolli & Bermudez, *G. puncticulata* (Deshayes) and *G. bononiensis* Dondi are found. Forms of the *U. cretensis* lineage include the most highly evolved species *U. arquatensis* Papp. Meulenkamp (p. 89) reported *U. lucasi* from the basal part of Section Asteri, for which reason he assigned the lower part of the formation to the top part of the Miocene. More recent investigations indicate that the most primitive assemblage is transitional between *U. lucasi* and *U. arquatensis* (personal communication, J. E. Meulenkamp). As a consequence, also the basal part of the Asteri Formation should be considered of Pliocene Age. On the basis of benthonic Foraminifera D. Verhoeve (in prep.) correlates the Asteri Formation with the Lower Pliocene Tabianian stratotype in Italy.

Provenance of samples:

a) Section Asteri, exposure 848-849 (Meulenkamp, p. 42) (fig. 4). Along the road from Asteri (Rethymnon District) to the main road Rethymnon-Iraklion. Exposure 848 is situated in the vicinity of the southern entrance of Asteri, exposure 849 at the northern end of the village.
b) Section Stavromenos II, exposure 884 (Meulenkamp, p. 42) (fig. 4). Along the road from Asteri to the main road Rethymnon-Iraklion, near the point where both these roads meet.

II.4.3. FRANCOCASTELLO FORMATION

Lithology: Two different sedimentary successions are grouped together in the Francocastello Formation by Meulenkamp (1969, p. 44): a series of blue-green clays and organic limestones, and another mainly composed of coarse clastic material. The formation is only known from the Francocastello area at the island's south coast, where it probably attains a maximum thickness of at least 80 m.

Age: As to uniserial uvigerinids only *U. arquatensis* has been found in these deposits. *Globorotalia crassaformis* is quite abundant. Also *G. bononiensis* occurs, but *G. margaritae* and *G. puncticulata* are absent.

As a consequence the relative stratigraphic position of this formation is not very

clear. An approximate Middle Pliocene age seems acceptable as was assumed more or less by Meulenkamp (1969, fig. 53).

Provenance of samples:

a) Section Francocastello II, exposure 817 (Meulenkamp, p. 45) (fig. 4). Coastal cliff approximately 1.5 km east of the ancient castle of Francocastello, between Khora Sfakion and Skaloti, Province of Khania (Sfakia District).

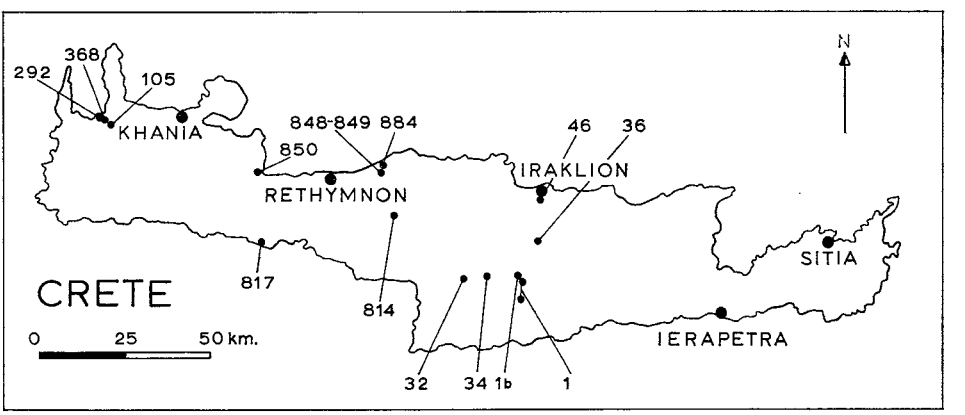


Fig. 4. Index map of Crete showing the location of the exposures.

II.5. Central Crete: Province of Iraklion

Reference: Sissingh, in press.

II.5.1. TEFELI FORMATION

Lithology: The Tefeli Formation is mainly composed of lignites, clays, marls, sands, sandstones and conglomerates containing freshwater and brackish water molluscs. In the upper part of the formation bluish amorphous marls with marine molluscs and sometimes reefal limestones are exposed. The formation is widely distributed throughout Iraklion Province, especially along the Psiloriti Mountains and north of the Messara plain. The thickness is generally less than 100 m. It is overlain by the Barbara Formation (see II.5.2.).

Age: In the upper part of the Tefeli Formation (Section Drosi) *U. cretensis* and *G. ventriosa* occur, probably together with *P. caneae.* These forms indicate that the formation is a lateral equivalent of the Kissamou and Apostoli Formations. The Tefeli deposits in the Kastellios hill in the eastern part of the province have been dated by De Bruijn, Sondaar & Zachariasse (1971) as Early Tortonian

from the joint presence of *U. selliana, Globorotalia acostaensis* Blow and *G. gigantea* Blow.

Provenance of samples:

a) Section Drosi, exposure 34 (figs. 4, 7). Along the road from Drosi to Nivritos (Khainourgiou District), along the southern slope of the east-west directed valley.
b) Section Almiri, exposure 1 (figs. 4, 8). Along the road from Mires to Iraklion from the chapel of Almiri Panayia to the road bifurcation for Kato Moulia (Khainourgiou District).

II.5.2. BARBARA FORMATION

Lithology: The lower part of this formation consists of organic limestones, light-coloured marly limestones and laminated, rarely amorphous marls. Locally gypsum masses, and breccious and slumped marl deposits are included. The upper part of the formation mainly comprises marly limestones and marls, which are generally well-bedded. This formation is very widely distributed in the Iraklion Province. Its total thickness amounts to more than 100 m.

Age: The basal deposits of this formation superjacent to the Tefeli Formation, are either of Late Miocene or of Early Pliocene age. Uvigerinids closely resembling *U. lucasi* are found in isolated samples from the vicinity of Ano Moulia, exposure 1b and Profitis Ilias, exposure 36. *G. margaritae* is common in one of the two isolated samples from Kourtes, exposure 32. In the same sample *G. puncticulata* and *U. arquatensis* are found.

Provenance of samples:

a) Ano Moulia, exposure 1b (one isolated sample) (fig. 4). At the west side of the road from Mires to Iraklion, about 1 km south of the bifurcation for Ano Moulia (Khainourgiou District).
b) Kourtes, exposure 32 (two isolated samples) (fig. 4). About 75 m east of the road from Zaros to Kourtes (Khainourgiou District), on the southern slope of the east-west orientated valley.
c) Profitis Ilias, exposure 36 (one isolated sample) (fig. 4). At the east side of the road from Profitis Ilias (Temenous District) to Iraklion, about 150 m north of the first mentioned village. The sample was taken immediately above the breccias of the Ilias Formation (Sissingh, in press).

II.5.3. IRAKLION FORMATION

Lithology: The Iraklion Formation comprises subhorizontal deposits of limestones, sandstones, conglomerates and marly deposits. Locally, molluscs (especially Pectinidae) are common. The formation is restricted to the area immediately

west and southwest of Iraklion, where it unconformably overlies the Pliocene Stavromenos Formation (Sissingh, in press). Its maximum thickness is 5 m.
Age: This formation evidently belongs, just like the Lindos Formation (II.7.3.), to the Pleistocene terrace deposits, frequently found along the coasts of the islands and the continent of Greece. As to Crete, these sediments have often been dated as Tyrrhenian. From the Iraklion Formation no faunal evidence is available for a relative age determination.

Provenance of samples:

a) Iraklion, exposure 46 (one isolated sample) (fig. 4). At the southwestern border of Iraklion, near the ancient (Turkish?) well.

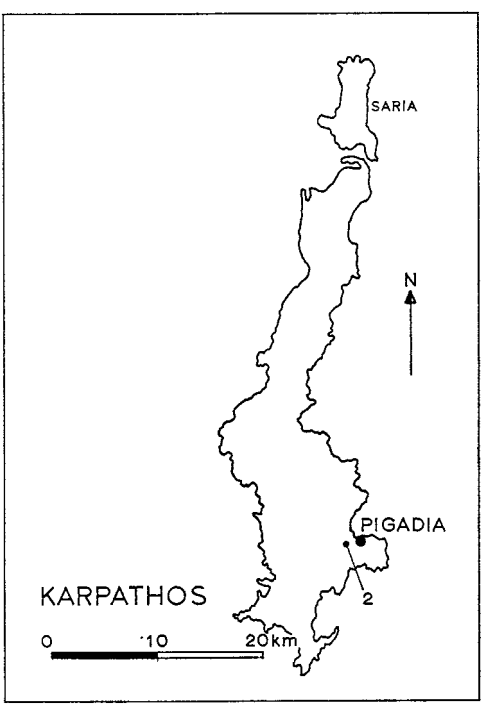


Fig. 5. Index map of Karpathos showing the location of the exposure.

II.6. Karpathos

II.6.1. PIGADIA FORMATION (PROVISIONAL NAME)

Lithology: Neogene deposits exposed in the vicinity of Pigadia (or Karpathos)

and comprising greenish clays and marls with at some levels gravel seams and isolated pebbles, are here provisionally grouped together in the Pigadia Formation. The Pigadia deposits are rather fossiliferous. The strata contain especially molluscs, bryozoans and echinids. In some beds of the section fish, insect and plant remains are found. At some other levels of this section solitary corals occur. The formation is overlain by detritic organic limestones alternating with marls belonging to an unnamed formation. The formation is confined to the area of Pigadia. Its total thickness is not known.

Age: The foraminiferal microfauna of the Pigadia Formation includes *Globigerinoides obliquus* Bolli, *Globoratalia crassaformis, Globigerina pachyderma* Ehrenberg and *U. arquatensis.* All individuals of the latter planktonic species are dextrally coiled. A Late Pliocene age may be assumed. Also bryozoans, which have not been yet reported from post-Pliocene deposits, are found in our samples (personal communication, R. Lagaaij).

Provenance of samples:

a) Section Pigadia, exposure 2 (figs. 5, 9). In the valley north of the road from Pigadia to Menetes, about 2 km southwest of the first mentioned village.

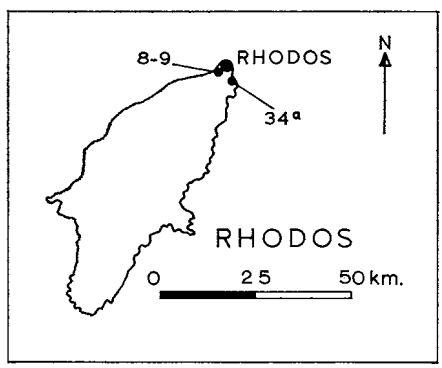


Fig. 6. Index map of Rhodos showing the location of the exposures.

II.7. Rhodos

Reference: Meulenkamp et. al., in prep.

II.7.1. KRITIKA FORMATION

Lithology: The Kritika Formation consists of regularly alternating marine to brackish conglomerates, sands, siltstones, marls and clays exposed in the area

south of Rhodos town. Especially intercalated calcarenitic layers are rich in molluscs. The latter commonly show small-angle unconformaties with the underlying sediments. The total thickness is about 90 m. This formation is part of the Sgourou Formation of Mutti, Orombelli & Pozzi (1967, 1970). From field observations it is clear that the Kritika Formation is stratigraphically succeeded by the Vasfi Formation (see II.7.2), although a distinct contact between both formations is not observed in the Vasfi area (personal communication, E. F. J. de Mulder).

Age: In our samples from the Kritika Formation *Globorotalia inflata* (d'Orbigny) was found. So far no other foraminiferids of stratigraphic importance have been observed. As the stratigraphically superjacent Vasfi Formation is of Early Pleistocene age (see II.7.2) a Late Pliocene age assignment is most reasonable. The Sgourou Formation is placed by Mutti, Orombelli & Pozzi (1967) in upper Pliocene to Lower Pleistocene. As the Kritika Formation corresponds most probably with the basal part of their formation, our age assignment seems to fit well in with that of these authors.

Provenance of samples:

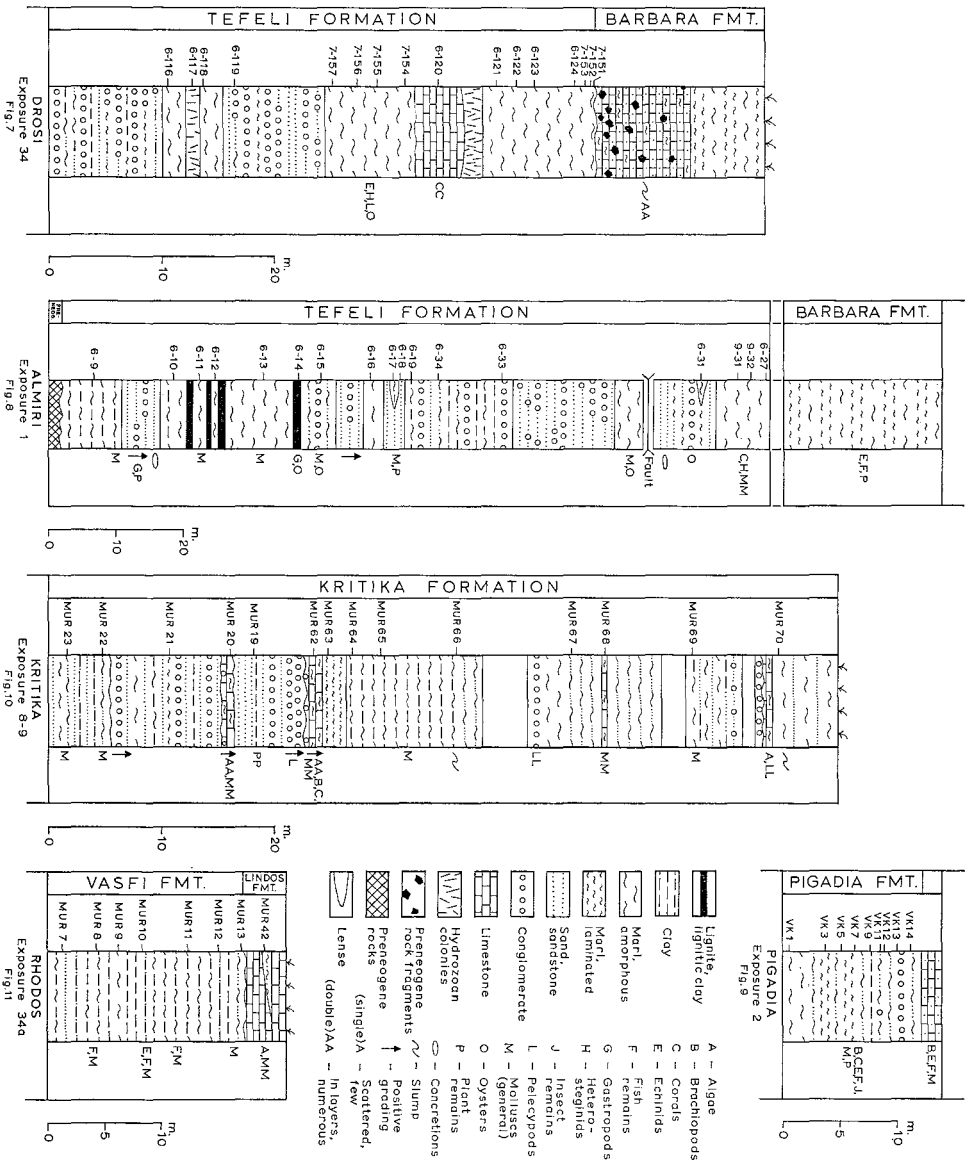
a) Section Kritika, exposure 8-9 (figs. 6, 10). At the southeastern side of the road from Rhodos to Paradision, in a small and steep valley behind the mosque of Kritika.

II.7.2. VASFI FORMATION

Lithology: The Vasfi Formation consists of siltstones and more or less clayey marls. Common macrofossils of this formation are, among others, large echinid spines, solitary corals, brachiopods, bryozoans and scaphopods. The formation differs from the Kritika Formation mainly by the lack of any coarse beds. Vasfi deposits are exposed all along the east coast of the island, south of Rhodos town. The thickness never exceeds 20 m.

Sediments of this formation have been included with those of the Kritika Formation in the Sgourou Formation of Mutti, Orombelli & Pozzi (1967, 1970). The Vasfi Formation is overlain with erosional contacts by the Lindos Formation (see II.7.3).

Age: The microfauna of the Vasfi Formation comprises *G. inflata, Globorotalia truncatulinoides* (d'Orbigny) and *Globigerina pachyderma.* Specimens of the last mentioned species are coiled either dextrally or sinistrally. Also *Hyalinea balthica* (Schroeter) has been found. The latter two species are also reported by Orombelli & Montanari (1965), who studied the foraminiferal microfauna of these deposits for which they concluded a Calabrian Age. This conclusion is considered correct.



Figs. 7-11. Lithostratigraphic columns of the Sections Drosi (fig. 7) and Almiri (fig. 8) on Crete, Pigadia (fig. 9) on Karpathos and Kritika (fig. 10) and Rhodos (fig. 11) on Rhodos, showing the position of the samples.

Provenance of samples:

a) Section Rhodos, exposure 34a (lower part) (figs. 6, 11). Coastal cliff of Vasfi Bay, approximately 200 m east of the coastal road from Rhodos to Koskinou and about 6 km south of Rhodos town. Our locality is the same as that of Orombelli & Montanari (1965). The calcareous upper part of this section belongs to the Lindos Formation.

II.7.3. LINDOS FORMATION

Lithology: This formation is composed of terrace-like deposits of detritic limestones with remains of algae, molluscs and echinids. The maximal thickness of the formation is about 40 m.

These deposits have a clear connection with today's coast of Rhodos. They occur in the area between Paradision and Rhodos town and along the east coast far beyond Lindos. At Vasfi they overlie the Vasfi Formation with erosional contacts. The Lindos deposits have been included in the Sgourou Formation by Mutti, Orombelli & Pozzi (1967, 1970).

Age: Orombelli & Montanari (1967) discussed these sediments as "panchina" and dated these strata provisionally as Calabrian to Sicilian. In our opinion the deposits are probably younger than Calabrian.

Provenance of samples:

a) Section Rhodos, exposure 34a (upper part) (see II.7.2) (figs. 6, 11).

Chapter III

PALEOECOLOGICAL INTERPRETATION

III.1. Method of study

Ecological data on Recent species that might be used for a paleoecological interpretation of our assemblages are much too scarce. So we had to rely on a rather rough method, which appears to give reasonable and trustworthy results, if we compared these results with data on our sections from other sources such as other groups of fossils, and stratigraphical and sedimentological details.

Representatives (valves) of some selected genera were counted for this general paleoecological analysis of the ostracode associations encountered. These genera (indicator genera) are thought to be characteristic for "rather restricted" environments. One group is formed by the genera *Bythocypris, Cytheropteron, Henryhowella, Krithe* and *Parakrithe*. Recent representatives of these genera are generally most numerous in relatively deep water ($\pm$ 100 m and deeper). On the other side the genera *Cyprideis, Cytheridea* and *Xestoleberis* find their highest numerical value in relatively shallow water (down to approximately 50 m). The genus *Cyamocytheridea*, extinct since the Late Miocene, is considered to belong to this group as well. Finally, predominance of *Cyprideis* is considered a reliable indicator for brackish water (equivalent to the oligo- and mesohaline zones of the Venice System, 1958), although exceptions are known.

Countings were performed on all picked valves of forms belonging to these nine genera. Valves of taxa of these genera, which are not discussed in the systematic chapter, were included in the countings.

Our method of paleoecological interpretation is based on the assumption that predominance of one of these groups of indicator genera may be regarded as an indication for depth of the original sedimentary environment. Shifts in the qualitative and quantitative composition of the successive assemblages of indicator genera in the stratigraphic sections are thought to be generally caused by changes in the environment of deposition. Although depth may have been the predominant causal factor, changes in the assemblages may also be attributable to, for instance, the establishment of a more or less open marine environment, which events need not be correlated with significant changes in depth.

As environmental factors of unknown character may be involved we will refrain from seemingly detailed conclusions on depth or salinity. The main purpose of our paleoecological interpretation is to give a rough outline in general terms on

depth of deposition and salinity, and on major trends in the development of the depositional environment of the formations.

III.2. Gavdos

III.2.1. GAVDOS FORMATION

Representatives of our indicator genera are scarce in both sections of this formation. In Section Ambelos (fig. 12) the presence of *Krithe* and *Xestoleberis* in the lower part of the section might suggest that the corresponding sediments were laid down in a somewhat more pronounced marine environment than those of the upper part of the section, in which only *Xestoleberis* occurs. A more convincing trend towards a shallower sedimentary environment may be observed from bottom to top in Section Panayia (fig. 13).

III.3. Western Crete: Province of Khania

III.3.1. ROKA FORMATION

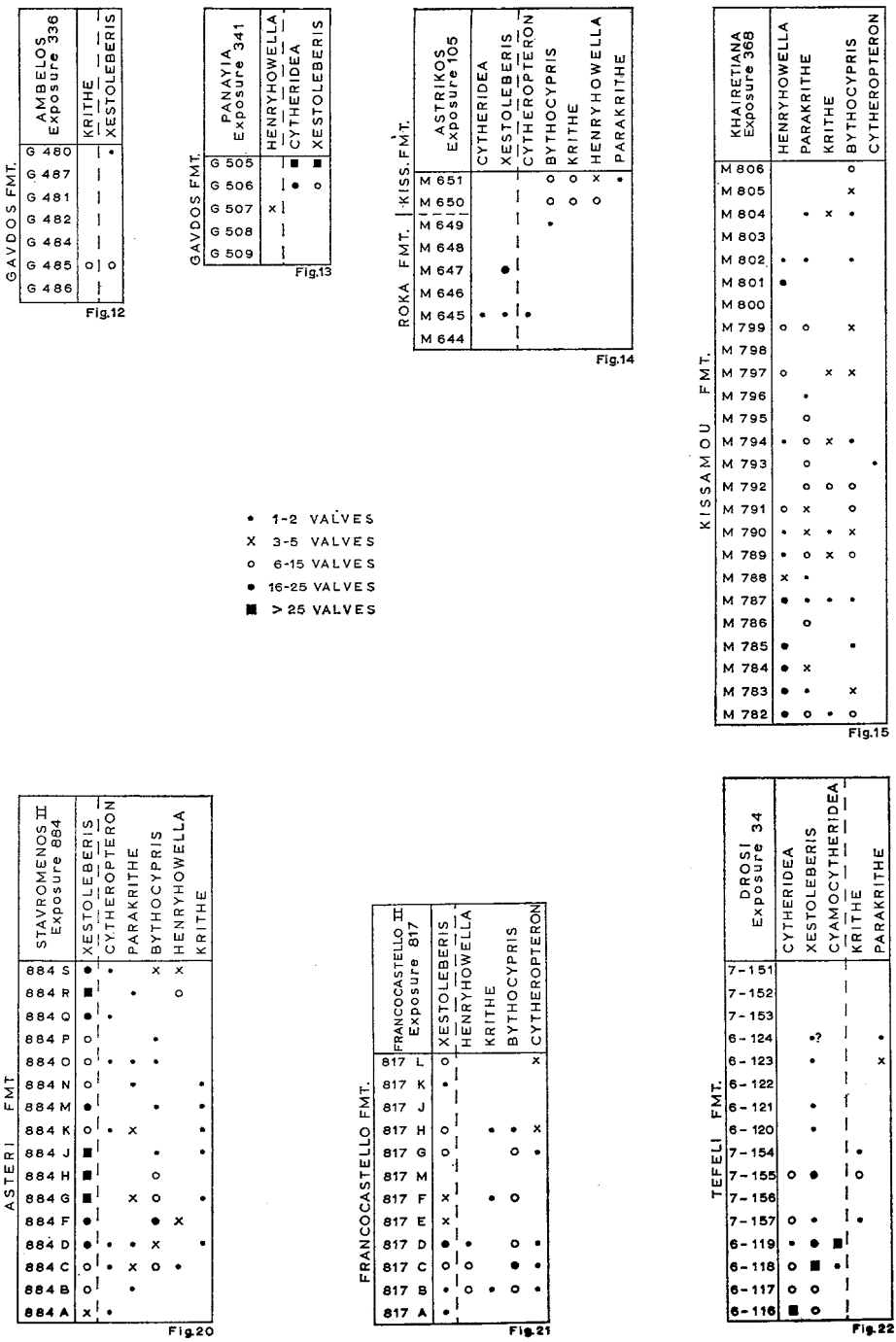
The ostracode fauna of the Roka Formation in Section Astrikos is thought to be characteristic for rather shallow marine conditions. Genera indicative of a relatively deeper water environment were found only in sample M 649 (fig. 14).

III.3.2. KISSAMOU FORMATION

In Section Astrikos the clays of the Kissamou Formation (fig. 14) contain an ostracode assemblage different from that of the underlying Roka deposits. Only indicator genera are present belonging to the group of relatively deep water. These Kissamou deposits therefore were laid down in a distinctly deeper marine environment than the underlying sediments of the Roka Formation. In Section Khairetiana of the Kissamou Formation (fig. 15) indicators for relatively shallow water are equally lacking. The upper strata of this section (from M 804 upwards) were perhaps laid down in somewhat shallower water than those of the lower and middle part of the section, since the genera *Henryhowella, Krithe* and *Parakrithe* are less numerous or absent.

III.3.3. KHAIRETIANA FORMATION

In Section Khairetiana the genus *Xestoleberis* distinctly predominates among our indicator genera (fig. 16). Therefore, the Khairetiana Formation (at least the part studied) may be considered to have formed in a rather shallow marine environment of deposition.



Figs. 12-26. Distribution of the representatives of selected genera in the sections.

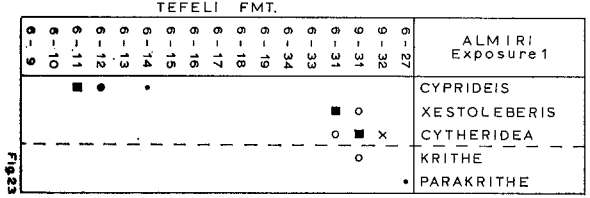


Fig.23

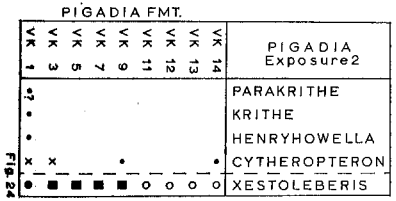


Fig.24

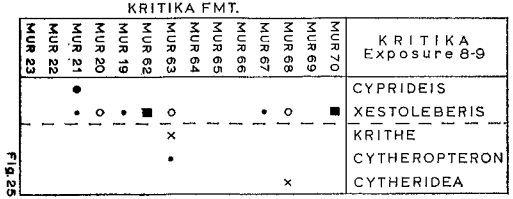


Fig.25

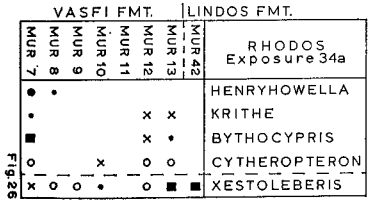


Fig.26

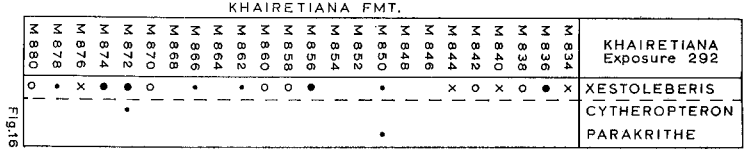


Fig.16

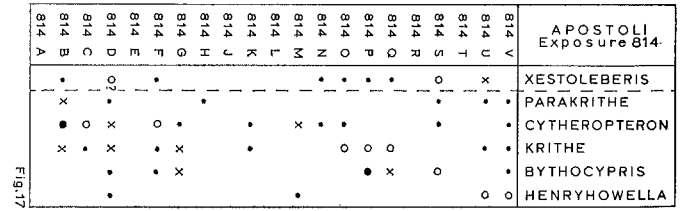


Fig.17

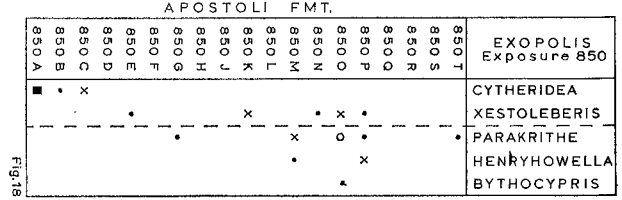


Fig.18

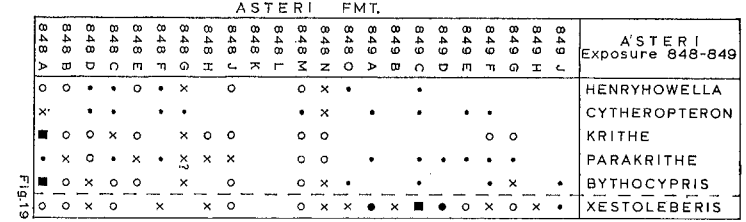


Fig.19

III.4. Western Crete: Province of Rethymnon, Easternmost part of Province of Khania

III.4.1. APOSTOLI FORMATION

The distribution of the indicator genera in Section Apostoli points to fairly deep marine circumstances for the entire section (fig. 17). In Section Exopolis (fig. 18) the genera indicate for the lower and middle part of the section a relatively shallow sedimentary environment, which changes upwards into one with more pronounced open marine, and probably deeper water circumstances. Part of the uppermost strata of the section were probably deposited under less favourable environmental conditions. These beds contain an impoverished assemblage (see also fig. 33).

III.4.2. ASTERI FORMATION

The abundance of representatives of genera indicative of relatively deep water decreases upwards in Section Asteri (fig. 19). Up to exposure 848 the sediments may be regarded as deposited under conditions of open marine environments with relatively deep water. The composition and development of the generic assemblages of the overlying strata at exposure 849 testify a distinctly shallower environment. Depositional circumstances of the sediments found in Section Stavromenos II (fig. 20) are more or less comparable with those prevailing during the sedimentation of the strata in the Asteri exposure.

III.4.3. FRANCOCASTELLO FORMATION

Just as the marls of the Asteri Formation the deposits of Section Francocastello II were formed under relatively open marine circumstances (fig. 21). In the top four samples of the section the genera *Bythocypris*, *Henryhowella* and *Krithe* are absent or less frequent. This last feature may indicate a decreasing depth of deposition. In this upper part of the section *Cytheridea* is more common and some (displaced) valves of the freshwater genus *Candona* were encountered.

III.5. Central Crete: Province of Iraklion

III.5.1. TEFELI FORMATION

In Section Drosi the genera *Cyamocytheridea*, *Cytheridea* and *Xestoleberis* are predominant in the lower part (sample 6-116 to 6-119) (fig. 22). In the higher strata of the section the genera *Krithe* and *Parakrithe* are found. This distribution pattern shows the establishment of more pronounced marine conditions and/or increasing water depth. The uppermost strata of the section contain a strongly impoverished fauna, indeterminable because of pyritisation (see also

fig. 37). The top three samples of the section are barren. These features may point to an aberrant, rather restricted environment.

In the lower strata of Section Almiri, only representatives of *Cyprideis* are found (fig. 23). These beds may have been laid down in brackish water. The samples taken in the conglomeratic middle part of the section do not yield ostracodes. In the uppermost grey to blue marls *Cytheridea* and *Xestoleberis* are the most frequently represented indicator genera. These upper sediments may be regarded as deposited in a marine environment of shallow to moderately deep water.

III.5.2. BARBARA FORMATION

At Ano Moulia (exposure 1b) one isolated sample (sample 6-94) from whitish to yellowish indurated marl of the lower part of the Barbara Formation was studied. At this locality the lower part of the formation is thought to be of Late Miocene age (see III.5.2). The sample yielded a poor ostracode fauna with *Cyprideis* and *Cytheridea* as the only indicator genera (see also Table 1). The assemblage is characteristic for a rather shallow marine environment. *Cyprideis* is only represented by larval valves. These valves may have been displaced.

At a short distance north of Profitis Ilias the isolated sample 7-33 was taken in yellowish coarse-grained sandy marl, at the base of the Barbara Formation. These basal beds are likewise of Late Miocene age. *Cyamocytheridea, Cytheridea, Krithe* and *Xestoleberis* are the indicator genera (see also Table 1). *Cytheridea* and *Xestoleberis* are common. The assemblage is considered to be characteristic for shallow marine water.

At Kourtes (exposure 32) two successive samples, 7-146 and 7-147 respectively, were taken in the basal part of the formation, which at this locality is dated as Early Pliocene (see III.5.2). Sample 7-146 was taken in whitish, rather indurated marl and contains an ostracode fauna with representatives of the genera *Bythocypris, Cytheropteron, Henryhowella, Krithe* and *Xestoleberis* (see also Table 2). All these genera are rare. In sample 7-147 *Xestoleberis* is the only indicator genus represented. The latter sample was taken from a coarse conglomeratic bed with a white marl matrix about 4 meter above sample 7-146. We consider the ostracode assemblage of sample 7-146 as characteristic for a rather deep, relatively open marine environment. The assemblage of sample 7-146 is fairly indicative of shallow water. The ostracodes of this sample may for the greater part have been reworked.

III.5.3. IRAKLION FORMATION

The isolated sample 9-16 taken in a marly stratum yielded a shallow marine

ostracode fauna, with *Cytheridea* and *Xestoleberis* as the only indicator genera (see also Table 3).

III.6. Karpathos

III.6.1. PIGADIA FORMATON

The deposits of Section Pigadia may have originated from a predominant shallow marine environment, because representatives of indicator genera for relatively deep water are rare, and *Xestoleberis* occurs abundantly (fig. 24). The lowermost sample of the section (VK 1) contains most forms that are indicative of deeper water. Depth of deposition may have been greater for this level of the section.

III.7. Rhodos

III.7.1. KRITIKA FORMATION

In the lower part of Section Kritika (sample MUR 21) *Cyprideis* is frequent (fig. 25). At this level brackish water circumstances have prevailed. Sample MUR 63 was taken from a marl just above an angular unconformity. Its ostracode contents indicates rather pronounced marine circumstances: more distinctly so than the samples derived from the remaining upper part of the section (see also fig. 40).

III.7.2. VASFI FORMATION

In Section Rhodos the lowermost sample MUR 7 and both upper samples MUR 12 and MUR 13 contain most representatives of indicator genera for relatively deep water (fig. 26). Corresponding water depths may be assumed to have been greater than it was during deposition of the sediments of the middle part of the section.

III.7.3. LINDOS FORMATION

The overlying Lindos sediments in Section Rhodos were deposited in a relatively shallow marine environment, because in sample MUR 42 *Xestoleberis* is abundant (fig. 26), whereas other indicator genera are absent.

III.8. Conclusions

Although our method of paleoecological interpretation by means of the so-

called indicator genera has a limited value, a more or less gradual Late Miocene transgression in Crete may be deduced from our distribution charts, especially from those constructed for the Apostoli and Tefeli Formations (figs. 18, 22, 23).

At the end of the Miocene the deeper and/or open marine character came to an end, probably in connection with the onset of the "crise de salinité". Faunas from the Khairetiana Formation and part of the Barbara Formation clearly show shallower depth conditions than those of the underlying formations.

In the topmost parts of the Tefeli Formation (Section Drosi) and of the Apostoli Formation (Section Exopolis) the ostracodes are ill-preserved. These faunas are partly pyritised. This suggests a deteriorating water circulation. The first indications for the "crise de salinité" may thus already locally be present in the uppermost strata of stratigraphically underlying bluish marls. After the "crise de salinité" a Pliocene transgression re-established marine conditions in deeper water facies. A regressive trend seems to be observable in the higher part of the Asteri and the Francocastello Formations (figs. 19-21). The Late Pliocene deposits of the Pigadia and Kritika Formations, though all transgressive in a local sense, were laid down in shallower marine environments than the Early Pliocene sediments of the Asteri Formation.

Two Pleistocene periods of increasing marine influence may be derived from our data from Rhodos: an older one represented by the Vasfi Formation and a younger one by the unconformably overlying Lindos Formation, which is possibly to be correlated with the Iraklion Formation on Crete.

Chapter IV

BIOSTRATIGRAPHY

IV.1. The ostracode faunas of the sections and isolated samples

Distribution charts of the ostracode assemblages in the sections are given in figs. 27-41. The ostracode contents of the isolated samples are given in the following tables (for the explanation of the quantitative indications see Chapter I: Method of study). Altogether nearly 15.000 specimens were determined.

Figs. 27-41. Distribution of the ostracode taxa in the sections.

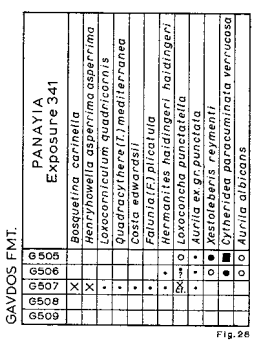


Fig. 28

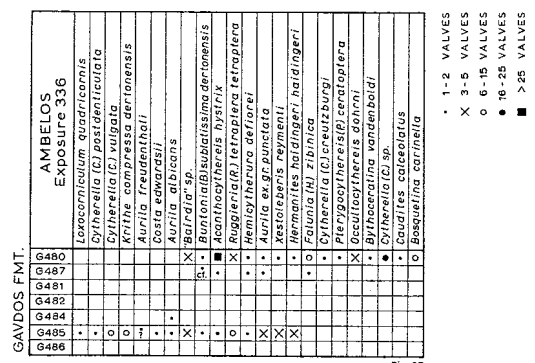
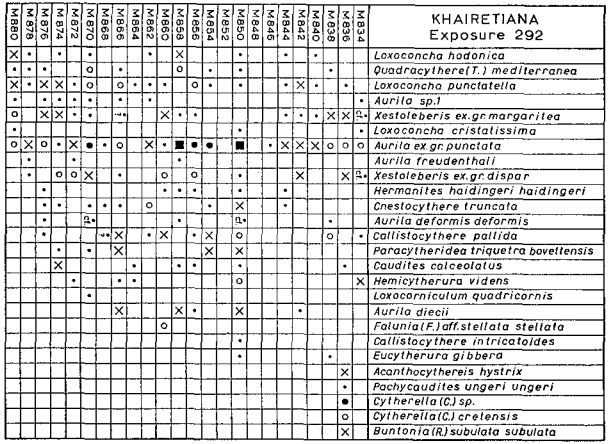


Fig. 27

Fig. 29

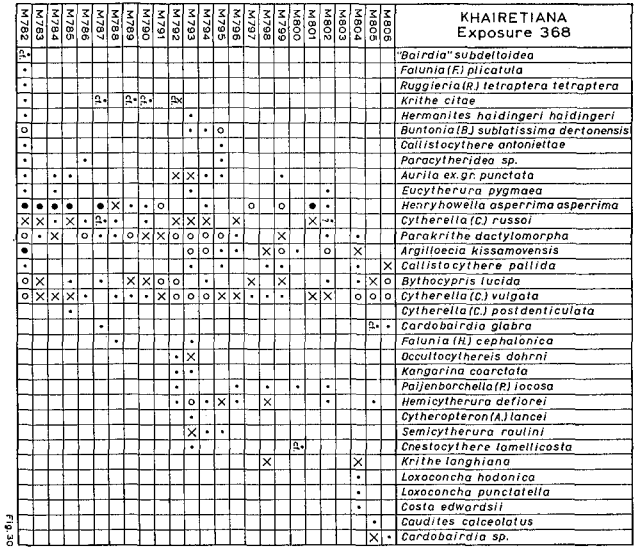
KHAIRETIANA FMT.



KHAIRETIANA Exposure 292
Loxoconcha hodonica
Quadracythere(T.) mediterranea
Loxoconcha punctatella
Aurila sp.1
Xestoleberis ex.gr margaritea
Loxoconcha cristatissima
Aurila ex.gr.punctata
Aurila freudenthali
Xestoleberis ex.gr dispar
Hermanites haidingeri haidingeri
Cnestocythere truncata
Aurila deformis deformis
Callistocythere pallida
Paracytheridea triquetra bovettensis
Caudites calceolatus
Hemicytherura videns
Loxocorniculum quadricornis
Aurila diecii
Falunia(F.)aff.stellata stellata
Callistocythere intricatoides
Eucytherura gibbera
Acanthocythereis hystrix
Pachycaudites ungeri ungeri
Cytherella(C.) sp.
Cytherella(C.) crelensis
Buntonia(R.) subulata subulata

Fig. 31

KISSAMOU FMT.



KHAIRETIANA Exposure 368
"Bairdia" subdeltoidea
Falunia(F.) plicatula
Ruggieria(R.) tetraptera tetraptera
Krithe citae
Hermanites haidingeri haidingeri
Buntonia(B.) sublatissima dertonensis
Callistocythere antoniettae
Paracytheridea sp.
Aurila ex.gr. punctata
Eucytherura pygmaea
Henryhowella asperrima asperrima
Cytherella(C.) russoi
Parakrithe dactylomorpha
Argilloecia kissamovensis
Callistocythere pallida
Bythocypris lucida
Cytherella(C.) vulgata
Cytherella(C.) postdenticulata
Cardobairdia glabra
Falunia(H.) cephalonica
Occultocythereis dohrni
Kangarina coarctata
Paijenborchella(P.) iocosa
Hemicytherura defiorei
Cytherapteron(A.) lancei
Semicytherura raulini
Cnestocythere lamellicosta
Krithe langhiana
Loxoconcha hodonica
Loxoconcha punctatella
Costa edwardsii
Caudites calceolatus
Cardobairdia sp.

Fig. 30

APOSTOLI FMT.

850A	850B	850C	850D	850E	850F	850G	850H	850J	850K	850L	850M	850N	850O	850P	850Q	850R	850S	850T	EXOPOLIS Exposure 850
■	•	X																	*Cytheridea acuminata acuminata*
•	•	■																	*Aurila albicans*
•			•	X	•														*Costa edwardsii*
•	○			X		•													*Loxoconcha variesculpta*
•	•					•	•	•	○	X	○	○	○	•	•	2•			*Aurila cicatricosa*
•	•					•			•	•		•	X	•	•	○		X	*"Bairdia" subdeltoidea*
	•					X							X						*Pachycaudites ungeri ungeri*
	•				•	●	X	•	X	X	○	○	■	○	X				*Hermanites haidingeri haidingeri*
	•	•	•	X		X	X		•		X		•	○		X			*Acanthocythereis hystrix*
	•				•	1•	1•		•	•	•	•	•	•		•			*Quadracythere(T.)mediterranea*
	•	•				○	X		○	X	X	X	●	○	•	•			*Aurila deformis deformis*
	○					X			•	•	•	○	○	X	X	○		•	*Aurila freudenthali*
	X			•		●	○	○	●	●	●	●	■	●	●	○		X	*Aurila ex.gr.punctata*
			•					•			X		•						*Cytherella(C.) vandenboldi*
			•	•			X	•		•			X	X	2•	X			*Callistocythere pallida*
				•						•									*Eucytherura mistrettai*
				X		2•								•	2•		•		*Hemicytherura defiorei*
					X														*Cytherella(C.) sp.*
						•													*Corinocythereis carinata*
						○	•		X										*Falunia(H.) cephalonica*
						•				•	•	X	X						*Cnestocythere lamellicosta*
						•					•		•	•					*Parakrithe dactylomorpha*
						•							•	X					*Bosquetina carinella*
						•		•	•					X					*Cytherella(C.) russoi*
						1•										•			*Paracytheridea triquetra bovettensis*
						•													*Eucytherura pygmaea*
								○	•	•				•					*Occultocythereis dohrni*
								•	•	•	•							•	*Cnestocythere truncata*
									•				X	•					*Cytheretta(C.) subradiosa*
									•		•		X		•	•			*Aurila sp.2*
														X					*Henryhowella asperrima asperrima*
													•						*Bythocypris lucida*
													•						*Loxoconcha hadonica*
													•	■					*Cytherella(C.) postdenticulata*
														○					*Cytherella(C.) vulgata*
														•	•	•		X	*Ruggieria(R.) tetraptera tetraptera*
														•		•			*Kangarina coarctata*
																•			*Semicytherura raulini*

Fig. 32

APOSTOLI FMT.

814A	814B	814C	814D	814E	814F	814G	814H	814J	814K	814L	814M	814N	814O	814P	814Q	814R	814S	814T	814U	814V	APOSTOLI Exposure 814
•												•									*Cytheretta(C.) semiornata*
•												•									*Aurila albicans*
○	■	○	○		●	•	X	X	○		○		•		○				•		*"Bairdia" subdeltoidea*
•		•			X		X	X	•	1•		1•	X	•		X	○		•	•	*Callistocythere pallida*
●									1•		X	•	•		•		X		•		*Aurila freudenthali*
•	X				X		X		•			1•		X	•		•		•	X	*Semicytherura raulini*
•	X		•		X	•			•		1•	•					•		•		*Cytherella(C.) russoi*
	X																				*Cytheretta(C.) subradiosa*
	•											•									*Paijenborchella(P.) solitaria*
	○	X	X		○	•					X			•			•				*Cytheropteron(C.) apostoliensis*
	X	X	X			○	X	○	○		○	○	•	•	X		•				*Ruggieria(R.) tetraptera tetraptera*
	X		•				•						•				•		•	•	*Parakrithe dactylomorpha*
	X	•	•		•	X			•				•		•				•	•	*Cytherella(C.) vulgata*
	■	○	•				○	X	●			○	○				•		•	X	*Acanthocythereis hystrix*
	○																			X	*Cytheropteron(A.) lienci*
	X	•	○		○	X	○	•			•	X	○	X	•		○		○	X	*Hemicytherura defiorei*
	X					X	○	•				○								○	*Eucytherura mistrettai*
	X	•	•		•	X							•	•	○				•	•	*Pseudopsammocythere kollmanni*
	•	X	○		○	•	○	•	X		X	○	X	○	X		○		○	X	*Aurila ex.gr.punctata*
		•					•														*Kangarina coarctata*
		•			•	1•		•													*Loxoconcha variesculpta*
		•					•		•		○		•	•	•				•		*Eucytherura pygmaea*
		○	X		○		○	X	•		X		X	○		•	■		○	•	*Cnestocythere truncata*
		X	•				X						X	X					○	○	*Bosquetina carinella*
			•							2•			•	•		•			•		*Loxoconcha punctatella*
			•		•								●	X		X			•		*Bythocypris lucida*
			•								•								○	○	*Henryhowella asperrima asperrima*
					•																*Incongruellina(L.) keiji*
					•	•															*Loxoconcha cristatissima*
					•	X	○		●												*Costa edwardsii*
					•	■			○		○									X	*Cytherella(C.) vandenboldi*
						•															*Loxoconcha granulata*
							•														*Paijenborchella(P.) iocosa*
							•	•	•		•			•		•				•	*Callistocythere antoniettae*
							•													X	*Occultocythereis dohrni*
									•												*Aurila cruciata minor*
												•									*Neomonoceratina mouliana*
												•								•	*Hermanites haidingeri haidingeri*
													○	X	•						*Krithe citae*
													•							X	*Cnestocythere lamellicosta*
																	•				*Pachycaudites ungeri ungeri*
																				•	*Loxocorniculum quadricornis*
																				X	*Cytherella(C.) postdenticulata*
																				•	*Aurila deformis deformis*
																				X	*Falunia(H.) cephalonica*

Fig. 32

ASTERI FMT.

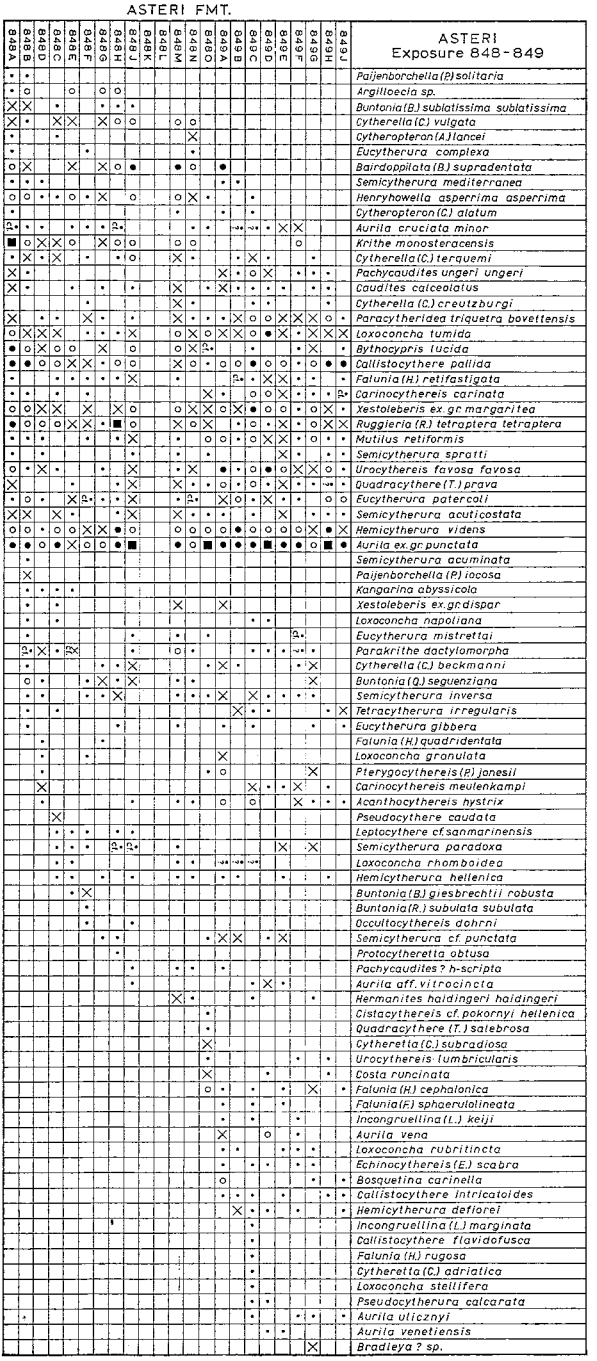


Fig. 24

FRANCOCASTELLO FMT.

817A	817B	817C	817D	817E	817F	817M	817G	817H	817J	817K	817L	FRANCOCASTELLO II Exposure 817
•												*Paijenborchella (E.) malaiensis*
•	•											*Bradleya ? sp.*
•		•										*Buntonia (B.) sublatissima sublatissima*
•		×										*Xestoleberis ventricosa*
•	•		•									*Mutilus dohrni*
•	×	×	○									*Cytherella (C.) vulgata*
×						•						*Quadracythere (T.) salebrosa*
•	×		•						•			*Urocythereis lumbricularis*
•	•	•						•		•		*Carinocythereis carinata*
•	×	○	•			•				•		*Mutilus retiformis*
■	■	●	■	○	×	○	■	○	○	■	●	*Aurila ex.gr. punctata*
×	×	×	○	•	×		○	•	•	•	×	*Callistocythere pallida*
×	•	•	•		•	•		•		•	×	*Paracytheridea triquetra bovettensis*
•		•	○		•	•	•	•	•	×	•	*Aurila ulicznyi*
•		•	P.							•	×	*Falunia (H.) retifastigata*
	•											*Costa punctatissima punctatissima*
	○	○	•									*Henryhowella asperrima asperrima*
	•	•		•								*Semicytherura paradoxa*
	•		•			•						*Pachycaudites ungeri ungeri*
	•				•			•				*Cytherella (C.) beckmanni*
	○	●	○		○		×	•				*Bythocypris lucida*
	×	•							×	•		*Quadracythere (T.) prava*
	×	○	○	•	○	•	○	○		•	•	*Hemicytherura videns*
	×	•	•	•		×	×			×	○	*Loxoconcha tumida*
	•	•									P.	*Semicytherura inversa*
	○	○	●	•	×		×	○			○	*Xestoleberis ex.gr. margaritea*
		×										*Neonesidea corpulenta*
		•	•	•			•				•	*Semicytherura acuticostata*
		•	×	→			•				•	*Semicytherura dispar*
			•									*Semicytherura acuminata*
			×									*Argilloecia sp.*
			•									*Pseudocythere caudata*
			•		•		•					*Eucytherura complexa*
			•				•				×	*Eucytherura mistrettai*
			×								•	*Caudites calceolatus*
			×				×				•	*Xestoleberis ex.gr. dispar*
				•								*Eucytherura guilentopsi*
					•		•					*Eucytherura patercoli*
					×		•				→	*Cytherella (C.) terquemi*
						×						*Bythocypris bosquetiana*
						•						*Aurila veneliensis*
						•						*Paijenborchella (P.) iocosa*
						○					•	*Aurila aspidoides*
						×	→				•	*Urocythereis favosa favosa*
							•					*Paijenborchella (P.) solitaria*
							•				×	*Semicytherura spratti*
											•	*Kangarina abyssicola*
											•	*Urocythereis margaritifera margaritifera*
											•	*Ruggieria (R.) tetraptera tetraptera*
											•	*Buntonia(B) giesbrechtii robusta*
											•	*Occultocythereis dohrni*
											•	*Kangarina coarctata*
											•	*Tetracytherura irregularis*

Fig. 36

ASTERI FMT.

884A	884B	884C	884D	884F	884G	884H	884J	884K	884M	884N	884O	884P	884Q	884R	884S	STAVROMENOS II Exposure 884
•	•				•				•	•	×					*Semicytherura acuminata*
•	•	•	•	×	×	•	•	•	×	○		•	×	×		*Pachycaudites ungeri ungeri*
•					•				•	×	•				•	*Loxoconcha rubritincta*
○	×	○	○	×	●	○	○	●	●	○	○	○	○	●	○	*Callistocythere pallida*
•	•	○	×	→	×	×			○	•	×	○	○	○	×	*Acanthocythereis hystrix*
•	○	•	○	×	○	×	×	•	○	○	○	○	×	○	○	*Paracytheridea triquetra bovettensis*
•	○	○	○	●	●	●	■	○	●	○	○	○	●	●	●	*Xestoleberis ex.gr. margaritea*
•	×	×	○	×	×	●	○	○	○	●	○	•	○	○	○	*Urocythereis favosa favosa*
•		•		•			•		•	•			•	•	•	*Urocythereis lumbricularis*
×	×	×	○	•	×	×		•	•	×	○				•	×	*Mutilus retiformis*
→	•		•	•	×	×		•	○	○				×	•	*Aurila cruciata minor*
•	•		•			•	×	○	○	•	○	×	×	○	×	*Eucytherura patercoli*
•	•	•						•		•					•	*Loxoconcha napoliana*
•		•					•		•	•	○	•		•	×	*Semicytherura paradoxa*
○	×	○	○	○	●	○	●	○	○	○	×	○	○	○	○	*Hemicytherura videns*
●	●	●	●	●	●	■	■	■	■	■	■	●	■	●	●	*Aurila ex.gr. punctata*
•	○	×	×	×	○	○	○	○	■		×		×	○	•	*Loxoconcha tumida*
	•	•	•													*Eucytherura complexa*
	•	×		•	○	×	○		•							*Xestoleberis ex.gr. dispar*
	•	×		•	×	•	×	○	×							*Pterygocythereis (P.) jonesii*
	•											•				*Aurila veneliensis*
	×	×									•		•			*Costa runcinata*
	•		•	•	×	•				×	×		•	•		*Cytherella (C.) beckmanni*
	•	•	•	•	P.	•								•		*Loxoconcha alata*
	•		•		•			•						•		*Falunia (F.) sphaerulolineata*
	•				•			•			•			•		*Pachycaudites ? h-scripta*
	•			•							→	•		•		*Aurila aff. vitrocincta*
	•				•				X		•			•		*Parakrithe dactylomorpha*
	×	×	○			×	•	○		•		•	×		○	×	*Loxoconcha rhomboidea*
	•	•	•												•	*Loxoconcha granulata*
	•	×	×	•	•	×	×	•	○	○		•	×	×	○	*Carinocythereis carinata*
	•	•	•								•	•		•	•	*Carinocythereis meulenkampi*
	•	×	×		×		•	•	×	•	•			•	•	*Semicytherura inversa*
	•					P.	•	•	•	•	•	•		•		*Tetracytherura irregularis*
	○	○	○	×	○	×	○	○	○	○	•	•	○	○	×	*Ruggieria (R.) tetraptera tetraptera*
	•	×	×	•	×	○	•	•		•	○	×	•	×	•	*Caudites calceolatus*
	•		×	•	•	•	•			•	×		•	×	×	*Semicytherura acuticostata*
		•														*Costa edwardsii*
		•			•	•				•	•					*Cistacythereis cf. pokornyi hellenica*
		•		•	×	•				•	×	•				*Cytherella (C.) creutzburgi*
		•		•	×	•	•			•	•		○			*Falunia (H.) rugosa*
		•			→		•			•			•			*Quadracythere ( ) salebrosa*
		•					•	•					•			*Hemicytherura hellenica*
		×		•	•	○	○	•	•	○	→		•	×		*Falunia (H.) retifastigata*
		•			×									•		*Bosquetina carinella*
		•	•		→	•	•	•		•				•		*Aurila pigadiana*
		•	•		×	×				•	•			•	×	*Cytherella (C.) terquemi*
		P.	•	P.	×	○	○	○		×	×		•	○	•	*Bairdoppilata (B.) supradentata*
		○	×	●	○	○	•			•		•	→		×	*Bythocypris lucida*
		•		×										○	×	*Henryhowella asperrima asperrima*
		•		→	•	○	×		×		×		•	×	×	*Quadracythere (T.) prava*
		•												•	•	*Urocythereis favosa exedata*
			•		•											*Pseudopsammocythere similis*
			•	•		•	•									*Semicytherura spratti*
			•				•				•					*Semicytherura mediterranea*
			•				•	•	•	•			•	•		*Echinocythereis (E.) scabra*
			•	•	•		×		×						•	*Incongruellina (I.) semispinescens*
			•			×	○	•	•	×	•	•		×	•	*Callistocythere intricatoides*
				•	•		×	○	○					×		*Cytherella (C.) vulgata*
					•											*Occultocythereis dohrni*
					•	○	×	×								*Argilloecia sp.*
					×	•			•	•				•	•	*Pseudocytherura calcarata*
							•									*Incongruellina (I.) keiji*
							•							•		*Loxoconcha stelifera*
								•								*Costa punctatissima punctatissima*
								•								*Callistocythere flavidofusca*
								•								*Cytheretta (C.) adriatica*
								•				•				*Hemicytheridеis elongata*
								X		•	•				×	*Semicytherura cf. punctata*
								•							•	*Aurila convexa emathiae*
									•		•				×	*Hermanites haidingeri haidingeri*
										•	•				•	*Kangarina coarctata*
									×		•	•	•	•	×	*Falunia (H.) cephalonica*
										•	•	•			•	*Eucytherura gibbera*
												•			•	*Buntonia (Q.) seguenziana*
														•		*Eucytherura mistrettai*
															×	*Bradleya ? sp.*

Fig. 35

PIGADIA FMT.

VK1	VK3	VK5	VK7	VK9	VK11	VK12	VK13	VK14	PIGADIA Exposure 2
•									*Callistocythere flavidofusca*
×									*Pterygocythereis (P.) jonesii*
•									*Henryhowella asperrima asperrima*
•									*Tetracytherura irregularis*
•	•								*Hemicytherura hellenica*
×	•								*Eucytherura patercolli*
×	o	o	o	×	•				*Paracytheridea triquetra bovettensis*
•	o				•				*Loxoconcha alata*
•					•				*Cytheropteron (C.) alatum*
o		•			•				*Bosquetina rhodiensis*
•	×	o	o	×					*Hemicytherura videns*
×	•			o					*Monoceratina mediterranea*
•	•	×	•	•	•	•			*Caudites calceolatus*
•	cf.•		o	o	•	o			*Aurila vena*
•						•			*Eucytherura mistrettai*
•		×				•			*Semicytherura paradoxa*
•	•	•	•			•	•		*Semicytherura acuticostata*
×	×						•		*Costa sp.*
cf.•	•	•		•	•		•		*Callistocythere intricatoides*
•	•			o		×		o	*Cytherella (C.) vulgata*
o	o	o	o	×	×	×		•	*Callistocythere pallida*
o	●	●	●	o	×	×	×	o	*Loxoconcha rhomboidea*
×	•	o		o	×		o	o	*Bairdoppilata (B.) supradentata*
•				•				•	*Kangarina coarctata*
×		•		•	•	•		×	*Bosquetina carinella*
•	•			•	•			•	*Occultocythereis dohrni*
×	×	×	o	o		•	cf.•	•	*Mutilus retiformis*
×	•	×	•	•		•		•	*Urocythereis favosa favosa*
•			•			•	•	•	*Aurila cruciata minor*
×	×	•	×	o		•	•	•	*Aurila uliczнyi*
•			•					×	*Aurila pigadiana*
o	o	o	●	o	×	o	o	o	*Xestoleberis ex.gr.margaritea*
o	o	●	●	o	o	×	•	×	*Xestoleberis ex.gr. dispar*
●	■	■	●	o	●	o	■	●	*Aurila ex.gr. punctata*
×	×	o	×				×	•	*Quadracythere (T.) prava*
	×								*Loxoconcha rubritincta*
	•								*Ruggieria (R.) tetraptera tetraptera*
	•								*Semicytherura inversa*
	×								*Eucytherura gibbera*
	•	•	•						*Callistocythere rastrifera*
	•	•	•	•					*Pseudocytherura calcarata*
	×	•	•		•				*Eucytherura gullentopsi*
	×	×	×			•			*Semicytherura dispar*
	•	•				•			*Semicytherura spratti*
	•		•					•	*Carinocythereis carinata*
	×	×	×				×	•	*Falunia (H.) retifastigata*
	•	•	o	•			×	•	*Echinocythereis (E.) scabra*
	•	•						•	*Pachycaudites? h-scripta*
	•		×					×	*Cytherella (C.) beckmanni*
	×	o	•	×				×	*Pachycaudites ungeri ungeri*
	•	•	×	•		•		•	*Falunia (H.) quadridentata*
		•							*Loxoconcha napoliana*
		•							*Semicytherura mediterranea*
		o							*Semicytherura cf. punctata*
		•		•				•	*Loxoconcha stellifera*
		•	o	•		•		•	*Hermanites haidingeri haidingeri*
		•		o	•	•		•	*Acanthocythereis hystrix*
			•			•			*"Bairdia" formosa*
			•	o				•	*Aurila punctata plagia*
			•	×	•			•	*Loxoconcha tumida*
			•					•	*Cytheretta (F.) triebeli*
			o		•			o	*Neonesidea carpulenta*
				•					*Pseudocythere caudata*
				×	•				*Argilloecia sp.*
					•				*Costa batei batei*
								•	*Urocythereis margaritifera margaritifera*
							•	•	*Aurila veniliae*
								•	*Protocytheretta obtusa*
								•	*Cytheretta (C.) adriatica*
								•	*Saida sp.*
								•	*Urocythereis lumbricularis*
								•	*Mutilus dohrni*
								•	*Aurila venetiensis*
								•	*Aurila cruciata cruciata*
								×	*Macrocypris sp.2*
								o	*Falunia (H.) cephalonica*

Fig. 39

TEFELI FMT.

6-116	6-117	6-118	6-119	7-157	7-156	7-155	7-154	6-120	6-121	6-122	6-123	6-124	7-153	7-152	7-151	7-150	DROSI Exposure 34
■	o	o	•	o		o											*Cytheridea acuminata acuminata*
o	o	■	o				●										*Xestoleberis reymenti*
•	o		o	•		•	cf.×										*Aurila cicatricosa*
o		•		o	cf.	●	×		•								*Callistocythere ennensis*
o	■			o	×	o	o	•		•	•						*Aurila diecii*
o		o	o	■	×	×			cf.		•						*Aurila albicans*
cf.×				●	o	o	■			cf.×	o	o					*Aurila ex.gr. punctata*
o	●								cf.•	•	•						*Cytherella (C.) vulgata*
o		×	×	•		•				×	o	•					*Loxoconcha punctatella*
	×				●	o	•										*Neonesidea nigrescens*
	o		•	?		o	×	•									*Aurila deformis deformis*
	■			×	■	●				cf.×	×	×					*Hermanites haidingeri haidingeri*
	o				•												*Quadracythere (T.) mediterranea*
	o			?					•		×	o					*Cnestocythere truncata*
		•	■														*Cyamocytheridea dertonensis*
		■								cf.•							*Callistocythere pallida*
		●	•	×	•	o				•	•						*Neomonoceratina mouliana*
			•	o	cf.•	•			×	o	×	•					*"Bairdia" subdeltoidea*
				×			•										*Pachycaudites ungeri ungeri*
				×		•			•			o					*Acanthocythereis hystrix*
				o	×	●	×					×					*Aurila freudenthali*
						×											*Aurila sp.2*
						•											*Monoceratina mediterranea*
					cf.	•											*Occultocythereis dohrni*
						•											*Loxoconcha cristatissima*
						•				×							*Ruggieria (R.) tetraptera tetraptera*
										•							*Caudites calceolatus*
										→•	→•						*Paracytheridea triquetra triquetra*
										×	o	×					*Bosquetina carinella*
										•	•		•				*Eucytherura pygmaea*
										×	o	×	×				*Hemicytherura defiorei*
											•	•					*Loxoconcha variesculpta*
											•		o				*Cytherella (C.) posidenticulata*
												•					*Loxocorniculum quadricornis*
													•				*Parakrithe dactylomorpha*
													•				*Cytherella (C.) vandenboldi*
													×				*Loxoconcha napoliana*

Fig. 35

TEFELI FMT.

6-9	6-10	6-11	6-12	6-13	6-14	6-15	6-16	6-17	6-18	6-19	6-34	6-33	6-31	9-31	9-32	6-27	ALMIRI Exposure 1
		■	●														*Cyprideis mehesi*
		•	o		•								•				*Cyprideis cf. sarmatica*
													■	o			*Hemicytherura defiorei*
													o	■	×		*Xestoleberis reymenti*
													o	×	•	•	*Cytheridea acuminata acuminata*
													•	×	o	●	*Cytherella (C.) vulgata*
													o	o	o	o	*Neomonoceratina mouliana*
													•	o	o	■	*Aurila albicans*
														•	o	●	*Callistocythere ennensis*
															o	o	*Acanthocythereis hystrix*
															•	o	*"Bairdia" subdeltoidea*
															•	×	*Aurila diecii*
																•	*Ruggieria (R.) tetraptera tetraptera*
																•	*Aurila freudenthali*
																•	*Loxoconcha variesculpta*
																•	*Occultocythereis dohrni*
																•	*Aurila ex.gr. punctata*
																•	*Parakrithe dactylomorpha*
																•	*Hermanites haidingeri haidingeri*
																•	*Aurila deformis deformis*

Fig. 36

VASFI FMT. | LINDOS FMT.

MUR 7	MUR 8	MUR 9	MUR 10	MUR 11	MUR 12	MUR 13	MUR 42	RHODOS Exposure 34a
●								*Henryhowella asperrima asperrima*
o								*Macrocypris sp.1*
•		-	•	•				*Loxoconcha granulata*
X					o			*Polycope demulderi*
-x			X		●			*Polycope vasfiensis*
•			•		o			*Cytheropterom (C.) alatum*
X					X			*Loxocauda decipiens*
o		•	•		•	•		*Eucytherura complexa*
X			•		o	o		*Polycope reticulata*
■					X	•		*Bythocypris obtusata*
•	X	•	•		X	o		*Callistocythere pallida*
•	X					o		*Echinocythereis (E.) scabra*
•			•		•	X		*Basquetina carinella*
•					o	o		*Pseudocythere caudata*
X					X	X		*Cytheropteron (C.) punctatum*
X			•		•	X		*Monoceratina mediterranea*
X						•		*Argilloecia sp.*
o		•	o		●	o	•	*Cytherella (C.) vulgata*
●	•	X	o	o	o	■	●	*Bairdoppilata (B.) supradentata*
X	•		•	•		■	X	*Acanthocythereis hystrix*
-x	X		-••		o	o	●	*Xestoleberis ex.gr. margaritea*
•					•	X	•	*Propontocypris cf. dispar*
o			•		●	X	•	*Basquetina rhodiensis*
-x		X	•		X	●	o	*Aurila vena*
•	•		X			•	•	*Eucytherura mistrettai*
•	X	-x	•		•	X	X	*Aurila ex.gr. punctata*
	•							*Callistocythere rastrifera*
	X	•						*Aurila ulicznyi*
	X		●					*Cytherella (C.) terquemi*
	•		•			o		*Occultocythereis dohrni*
	o		•		•	o	•	*Loxoconcha tumida*
	•		•				•	*Tetracytherura irregularis*
	o					o	o	*Aurila veniliae*
	X	o				o	■	*Xestoleberis ex.gr. dispar*
		•			•			*Caudites calceolatus*
		•				o	X	*Semicytherura mediterranea*
		•				•	X	*Urocythereis favosa favosa*
			•					*Kangarina abyssicola*
			•	X				*Polycope graeca*
			•		•	o		*Semicytherura acuticostata*
			•			•	•	*Cistacythereis caelatura*
				X				*Leptocythere multipunctata multipunctata*
				o				*Leptocythere tenera*
					o			*Polycope orbicularis ?*
					•			*Loxoconcha stellifera*
					•			*Falunia (F.) sphaerulolineata*
					•			*Cytheropteron (C.) rotundatum*
					•			*Neocytherideis subspiralis*
					•			*Loxoconcha versicolor*
					o			*Polycope? delicata*
					X			*Krithe monosteracensis*
					X			*Incongruellina (I.) semispinescens*
					•	•	•	*Semicytherura dispar*
					•	o	o	*Loxoconcha alata*
					•	X	X	*Pterygocythereis (P.) jonesii*
						o		*"Bairdia" formosa*
						•		*Falunia (H.) retifastigata*
						X		*Pseudocytherura calcarata*
						•		*Cytheropteron (C.) latum*
						X		*Urocythereis sororcula*
						o		*Urocythereis lumbricularis*
						X		*Aurila aspidoides*
						X		*Aurila speyeri speyeri*
						X		*"Bairdia" reticulata*
						•		*Pseudopsammocythere similis*
						o		*Echinocythereis (R.) ruggieri*
						•		*Aurila punctata plagia*
						•	•	*Semicytherura paradoxa*
						•	•	*Semicytherura costata*
						●	o	*Quadracythere (T.) prava*
						•	X	*Semicytherura acuminata*
						X	o	*Cytherella (C.) beckmanni*
						X	•	*Carinacythereis carinata*
						o	o	*Paracytheridea triquetra bovettensis*
							-••	*Costa batei batei*
							•	*Bassleritles berchoni*
							•	*Semicytherura inversa*
							•	*Eucytherura gullentopsi*
							•	*Leptocythere levis*
							-x	*Costa runcinata*
							o	*Loxoconcha rhomboidea*
							•	*Pterygocythereis (P.) ceratoptera*

Fig. 41

KRITIKA FMT.

MUR 23	MUR 22	MUR 21	MUR 20	MUR 19	MUR 62	MUR 63	MDR 65	MUR 96	MUR 97	MDR 68	MDR 69	MUR 70	KRITIKA Exposure 8-9
	●												*Cyprideis torosa torosa*
		•	•								-••		*Aurila veniliae*
		•	o		o	o				■		o	*Aurila cruciata minor*
		•	o		●	o			•	o		■	*Xestoleberis ex.gr. margaritea*
			•										*Bairdoppilata (B.) supradentata*
			-x										*Callistocythere intricatoides*
			-••										*Callistocythere rastrifera*
			•										*Urocythereis lumbricularis*
			X										*Hemicytherura defiorei*
			•										*Hemicytherura videns*
			•										*Eucytherura complexa*
			•										*Pachycaudites ? h-scripta*
			•		•								*Semicytherura mediterranea*
			•			•							*Pseudocytherura calcarata*
			•		•	•							*Tetracytherura irregularis*
			•		o	X							*Aurila vena*
			X		X	o							*Aurila ulicznyi*
			•						X				*Urocythereis margaritifera margaritifera*
			X		o	X					X		*Quadracythere (T.) prava*
			•		•						•		*Xestoleberis ex.gr. dispar*
			X								•		*Caudites calceolatus*
			o	•	X	o					•	•	*Loxoconcha tumida*
			X		X	o						o	*Callistocythere pallida*
			•						o			•	*Urocythereis favosa favosa*
			●	•	●	■				o		X	*Aurila ex. gr. punctata*
			X		•	•						•	*Falunia (H.) retifastigata*
			•		o	X						•	*Semicytherura inversa*
				•									*Leptocythere tenera*
				•						•		•	*Leptocythere multipunctata multipunctata*
					X								*Leptocythere muellerfobaeformis*
					•								*"Bairdia" formosa*
					•								*Semicytherura paradoxa*
					•	•							*Semicytherura acuticostata*
					•	o							*Incongruellina (L.) marginata*
					•	•				•			*Mutilus retiformis*
					o					•			*Neonesidea longevaginata*
					•	•				•			*Mutilus dohrni*
					o					o		X	*Loxoconcha rhomboidea*
						o							*Paracytheridea triquetra bovettensis*
						•							*Echinocythereis (E.) scabra*
						•							*Incongruellina (L.) keiji*
						-••							*Urocythereis favosa exedata*
						o							*Buntonia (R.) subulata subulata*
						o							*Carinocythereis bairdi*
						•							*Hemicytherideis elongata*
						•							*Acanthocythereis hystrix*
						•							*Costa runcinata*
						•							*Cistacythereis caelatura*
						X							*Pseudopsammocythere similis*
						•							*Costa batei batei*
						X							*Ruggieria (R.) tetraptera tetraptera*
						●						X	*Basquetina carinella*
						●						X	*Pterygocythereis (P.) ceratoptera*
						o						X	*Carinocythereis antiquata*
						X						o	*Aurila punctata plagia*
						•				o	•	■	*Aurila praeapuliana*
						•				■	•	•	*Loxoconcha turbida*
						•						•	*Buntonia (B.) giesbrechtii robusta*
						•						X	*Buntonia (B.) sublatissima sublatissima*
						o						X	*Loxoconcha versicolor*
										X			*Aurila cruciata cruciata*
										X			*Cytheridea acuminata neapolitana*
										•			*Semicytherura costata*
												•	*Pterygocythereis (P.) jonesii*
												•	*Cytheretta (C.) subradiosa*
												•	*Incongruellina (I.) semispinescens*

Fig. 40

Table 1: BARBARA FORMATION	ANO MOULIA Exposure 1b Sample 6-94	PROFITIS ILIAS Exposure 36 Sample 7-33
Acanthocythereis hystrix	very rare	common
Aurila albicans		frequent
Aurila diecii	rare	very rare
Aurila freudenthali		very rare
Aurila ex. gr. *punctata*	common	common
Callistocythere pallida	very rare?	
Cnestocythere truncata	very rare	very rare
Cyamocytheridea dertonensis		very rare
Cyprideis cf. *sarmatica*	rare?	
Cytherella (C.) sp.		common
Cytheridea acuminata acuminata	very rare?	common
Falunia (H.) cephalonica		very rare
Loxoconcha punctatella	rare	
Neomonoceratina mouliana		very rare
Quadracythere (T.) mediterranea	very rare	very rare?
Ruggieria (K.) hodgii		rare
Xestoleberis reymenti		common

Table 2: BARBARA FORMATION	KOURTES Exposure 32	
	Sample 7-146 (lower)	Sample 7-147 (upper)
Aurila cf. *cruciata minor*		rare
Aurila ex. gr. *punctata*	frequent	frequent
Bradleya ? sp.	very rare	
Bythocypris bosquetiana	very rare	
Bythocypris lucida	rare	
Buntonia (B.) sublatissima sublatissima	rare	
Callistocythere intricatoides	very rare	
Callistocythere pallida	very rare	rare
Carinocythereis carinata		very rare
Caudites calceolatus	very rare	
Cytherella (C.) beckmanni	very rare	
Cytherella (C.) terquemi	rare	
Cytheropteron (A.) lancei	very rare	
Echinocythereis scabra		very rare
Eucytherura gibbera	very rare	
Falunia (H.) cephalonica		rare
Henryhowella asperrima asperrima	very rare	
Hermanites haidingeri haidingeri	very rare	
Loxoconcha rhomboidea	rare	

(table 2 continued)

	KOURTES Exposure 32 Sample 7-146 (lower)	Sample 7-147 (upper)
Loxoconcha tumida		very rare
Mutilus retiformis		rare
Pachycaudites ? h-scripta		very rare
Pachycaudites ungeri ungeri		very rare
Païjenborchella (P.) iocosa	very rare	
Urocythereis favosa favosa		frequent
Urocythereis sororcula		very rare
Xestoleberis ex. gr. *margaritea*	rare	very rare
Xestoleberis ventricosa	very rare	

Table 3: IRAKLION FORMATION

	IRAKLION Exposure 46 Sample 9-16
Aurila cruciata cruciata	rare
Aurila ex. gr. *punctata*	frequent
Aurila ulicznyi	very rare
"Bairdia" formosa	very rare
Callistocythere pallida	common
Carinocythereis carinata	rare
Caudites calceolatus	very rare
Cytheretta (C.) adriatica	very rare
Cytheretta (C.) subradiosa	rare
Cytheridea acuminata neapolitana	rare
Falunia (H.) retifastigata	very rare
Hemicytherideis elongata	very rare
Hemicytherura gracilicosta	rare
Loxoconcha alata	rare
Loxoconcha rhomboidea	common
Loxoconcha tumida	very rare
Mutilus dohrni	common
Pachycaudites ungeri ungeri	very rare
Paracytheridea cf. *triquetra bovettensis*	very rare
Ruggieria (R.) tetraptera tetraptera	very rare
Semicytherura acuticostata	very rare
Tetracytherura irregularis	very rare
Urocythereis lumbricularis	rare
Xestoleberis ex. gr. *margaritea*	common

IV.2. Major breaks in the faunal succession

Examination of all these figures and tables shows that a significant difference in faunal composition exists between the Miocene and the post-Miocene assemblages. At the end of the Miocene a fairly large number of taxa definitively disappeared. Numerous other forms have occurred since the Pliocene. The relatively sharp contrast between Miocene and Pliocene faunas is illustrated, for instance, by the ostracodes derived from the samples taken from the basal part of the Barbara Formation in central Crete. Although these samples were collected from the same lithostratigraphic unit and from lithologically comparable sediments, both samples from Kourtes (exposure 32) contain an assemblage different from those collected at Ano Moulia (exposure 1b) and Profitis Ilias (exposure 36) (compare Table 1 and 2). Both samples from Kourtes are dated as Pliocene (by means of *Globorotalia margaritae, G. puncticulata* and *Uvigerina arquatensis)* and contain ostracode taxa so far only known from post-Miocene deposits (e.g. *Buntonia sublatissima sublatissima, Cytherella terquemi, Loxoconcha rhomboidea* and *Mutilus retiformis*). The samples from Ano Moulia and Profitis Ilias, both regarded to be of Late Miocene age (presence of *U. lucasi*), yielded forms only known from the Miocene (e.g. *Cnestocythere truncata* and *Cyamocytheridea dertonensis*). Unfortunately no stratigraphic relation to gypsiferous deposits could be established for any of these two exposures.

A less pronounced, but still distinct break in the faunal succession corresponds with the Pliocene/Pleistocene boundary. A smaller number of taxa are found to disappear or to appear at this boundary.

More details concerning both these breaks can be found in the following section (IV.3).

Finally, it may be concluded that there is in general no essential difference between the Late Miocene, Pliocene and Pleistocene ostracode assemblages of the southern Aegean area and those described from the corresponding time intervals in Italy.

IV.3. Tentative ostracode biozones

IV.3.1. INTRODUCTION

It was shown in the preceding chapter that three major environments for ostracode life are reflected in our assemblages: a brackish water, a shallow marine and a deeper, more open marine environment. Of course, the subdivision is not decisive.

On the basis of these assemblage types successive samples of sections could be

grouped together. Next we put these sections and parts of sections in an order that could be used as the framework of a range chart (fig. 42). The order follows from the observations on superposition, and on a relative age based on planktonic foraminifera and the *Planorbulinella* and *Uvigerina* lineages of Freudenthal (1969) and Meulenkamp (1969).

As a consequence the composite lithostratigraphic column of the range chart contains several ill-delimited repetitions of certain chronostratigraphic intervals. In the range chart we entered all taxa that have a restricted stratigraphic distribution according to our data (and often according to the literature as well). Most of the rare species have been left out.

The range chart now suggests a biozonation in which all environments are incorporated. The order of biozones that is suggested is real only for those belonging to the same environment. The degree to which the zones of different environments are thought to be synchronous is shown in figure 43.

All zones are assemblage zones. For none of the three environmental realms we have been able to fill the column completely with a set of biozones. For this reason, as well as for the restricted number of observations, the zones have to be considered tentative. The subjective character of the zonation has to be born in mind; additional data may easily lead to the choice of other markers.

The relation between the biozones and the stratigraphic position of sections and isolated samples is schematically illustrated in figure 44.

IV.3.2. DESCRIPTION OF THE BIOZONES

Cyprideis cf. *sarmatica* Zone

This zone is characterized by *Cyprideis* cf. *sarmatica* and *Cyprideis mehesi.* The zone is only found on Crete, where it comprises the lower part of the Tefeli Formation in Section Almiri.
Type section: Lower part of Section Almiri, exposure 1: Tefeli Formation.
Corresponding chronostratigraphic interval: "Middle Tortonian".
Remarks: Sediments of this zone were laid down in a brackish water environment.

Cyprideis torosa torosa Zone

This zone is based on the presence of *Cyprideis torosa torosa.* The lower part of the Kritika Formation in the Section Kritika on Rhodos is placed in this zone. *C. torosa torosa* is common in the present Mediterranean. As a consequence the zone, as defined here, would range up to the Recent.
Type section: Lower part of Section Kritika, exposure 8-9: Kritika Formation.
Corresponding chronostratigraphic interval: from Upper Pliocene to Recent.
Remarks: Sediments of this zone were deposited in brackish environments. In the literature *Cyprideis torosa torosa* was so far only known from post-Pliocene

deposits. Because of insufficient data concerning its occurrence during the Pliocene the zone cannot yet be considered as a range zone.

Cytheridea paracuminata verrucosa Zone

This zone is characterized by the nominate subspecies. The lower boundary of this zone cannot be defined. The zone is found on Gavdos as well as on Crete. It includes the Gavdos Formation in Section Panayia and the lower part of the Roka Formation in Section Astrikos.
Type section: Section Panayia, exposure 341: Gavdos Formation.
Corresponding chronostratigraphic interval: up to and including "Lower Tortonian".
Remarks: Sediments referred to this zone were laid down in relatively shallow marine water.

Cytheridea acuminata acuminata Zone

This zone is characterized by the predominance of *Cytheridea acuminata acuminata* and *Cyamocytheridea dertonensis*. It is found on Crete only. Included are the lower part and the upper middle part of the Tefeli Formation in Section Drosi and Section Almiri, respectively. Moreover, the basal beds of the Apostoli Formation in Section Exopolis belong to this zone.
Type section: Lower part of Section Drosi, exposure 34: Tefeli Formation.
Corresponding chronostratigraphic interval: "Middle Tortonian".
Remarks: Sediments of this zone were deposited in shallow marine environments.

Loxoconcha hodonica Zone

This zone is named after *Loxoconcha hodonica*, which is relatively abundant in this zone.

Selected forms confined to this zone are:*Aurila* sp. 1, *Cytherella cretensis* and *Falunia* aff. *stellata stellata*.

In this zone the following taxa were found for the first time: *Buntonia subulata subulata*, *Callistocythere intricatoides*, *Eucytherura gibbera* and *Hemicytherura videns*.

In this zone several taxa disappear definitively from the record. Among others: *Aurila albicans*, *A. deformis deformis*, *A. diecii*, *A. freudenthali*, *Cnestocythere truncata*, *Cyamocytheridea dertonensis*, *Cyprideis* cf. *sarmatica* ?, *Cytheridea acuminata acuminata*, *Loxoconcha cristatissima*, *L. hodonica*, *L. punctatella*, *Loxocorniculum quadricornis*, *Neomonoceratina mouliana*, *Quadracythere mediterranea* and *Xestoleberis reymenti*.

This zone is so far only recognized in Crete. The zone comprises the Khairetiana Formation in the Khairetiana Section and at some places the lower Barbara Formation (Ano Moulia, exposure 1b; Profitis Ilias, exposure 36).

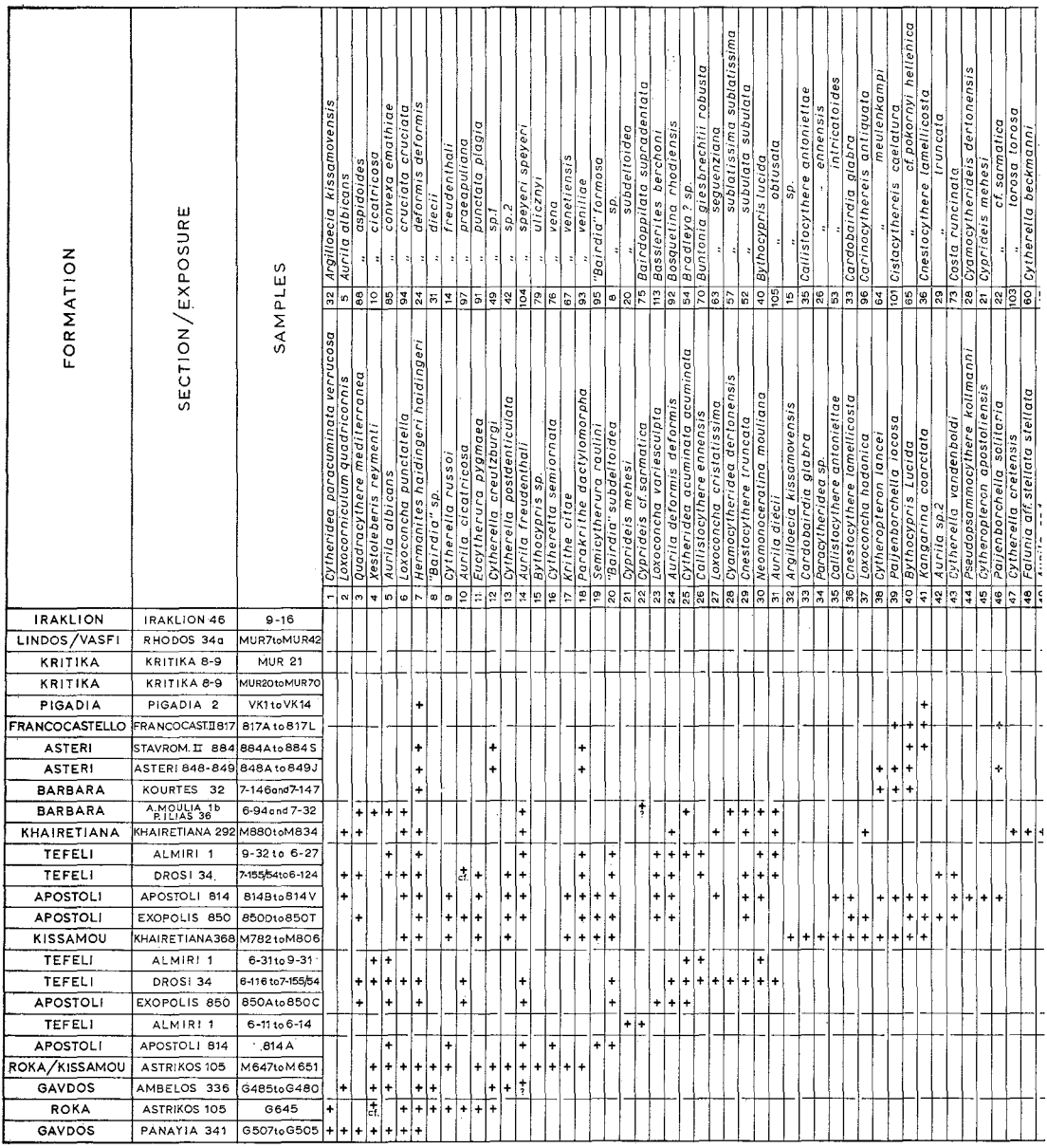


Fig. 42. Range chart of the stratigraphically more important ostracode taxa (see text for explanation).


54 Bradleya? sp.
55 Pachycaudites? h-scripta
56 Mutilus retiformis
57 Buntonia sublatissima sublatissima
58 Cytherella terquemi
59 Urocythereis favosa favosa
60 Cytherella beckmanni
61 Loxoconcha rhomboidea
62 Loxoconcha tumida
63 Buntonia seguenziana
64 Carinocythereis meulenkampi
65 Cistacythereis cf. pokornyi hellenica
66 Quadracythere salebrosa
67 Aurila venetiensis
68 Semicytherura spratti
69 Hemicytherura hellenica
70 Buntonia giesbrechtii robusta
71 Eucytherura complexa
72 Pseudocytherura calcarata
73 Costa runcinata
74 Semicytherura inversa
75 Bairdoppilata supradentata
76 Aurila vena
77 Semicytherura paradoxa
78 Quadracythere prava
79 Aurila uticznyi
80 Falunia retifastigata
81 Semicytherura acuticostata
82 Tetracytherura irregularis
83 Urocythereis lumbricularis
84 Cytheretta adriatica
85 Aurila convexa emathiae
86 Loxoconcha alata
87 Urocythereis margaritifera margaritifera
88 Aurila aspidoides
89 Eucytherura gullentopsi
90 Mutilus dohrni
91 Aurila punctata plagia
92 Bosquetina rhodiensis
93 Aurila veniliae
94 Aurila cruciata cruciata
95 "Bairdia" formosa
96 Carinocythereis antiquata
97 Aurila praepuliana
98 Loxoconcha versicolor
99 Leptocythere tenera
100 Leptocythere multipunctata multipunctata
101 Cistacythereis caelatura
102 Cytheridea acuminata neapolitana
103 Cyprideis torosa torosa
104 Aurila speyeri speyeri
105 Bythocypris obtusata
106 Cytheropteron latum
107 Cytheropteron punctatum
108 Cytheropteron rotundatum
109 Echinocythereis ruggieri
110 Loxocauda decipiens
111 Neocytherideis subspiralis
112 Polycope reticulata
113 Bassleriles berchoni
43 " vandenboldi
84 Cytheretta adriatica
16 semiornata
25 Cytheridea acuminata acuminata
102 " acuminata neapolitana
1 " paracuminata verrucosa
45 Cytheropteron apostoliensis
38 " lancei
106 " latum
107 " punctatum
108 " rotundatum
109 Echinocythereis ruggierii
71 Eucytherura complexa
50 " gibbera
89 " gullentopsi
11 " pygmaea
80 Falunia retifastigata
48 " aff. stellata stellata
69 Hemicytherura hellenica
51 " videns
7 Hermanites haidingeri haidingeri
41 Kangarina coarctata
17 Krithe citae
100 Leptocythere multipunctata multipunctata
99 " tenera
110 Loxocauda decipiens
86 Loxoconcha alata
27 " cristatissima
37 " hodonica
6 " punctatella
61 " rhomboidea
62 " tumida
23 " variesculpta
98 " versicolor
2 Loxocorniculum quadricornis
90 Mutilus dohrni
56 " retiformis
111 Neocytherideis subspiralis
30 Neomonoceratina mouliana
55 Pachycaudites h-scripta
34 Paracytheridea sp.
18 Parakrithe dactylomorpha
39 Paijenborchella iocosa
46 " solitaria
112 Polycope reticulata
72 Pseudocytherura calcarata
44 Pseudopsammocythere kollmanni
3 Quadracythere mediterranea
78 " prava
66 " salebrosa
81 Semicytherura acuticostata
74 " inversa
77 " paradoxa
19 " raulini
68 " spratti
82 Tetracytherura irregularis
59 Urocythereis favosa favosa
83 " lumbricularis
87 " margaritifera margaritifera
4 Xestoleberis reymenti
CYTHERIDEA PARACUMINATA VERRUCOSA
CYTHERETTA SEMIORNATA
CYTHERIDEIS cf. SARMATICA
CYTHERIDEA ACUMINATA ACUMINATA
CYTHERELLA VANDENBOLDI
LOXOCONCHA HODONICA
AURILA CONVEXA EMATHIAE
UROCYTHEREIS MARGARITIFERA MARGARITIFERA
CYPRIDEIS TOROSA TOROSA
AURILA SPEYERI SPEYERI
MIDDLE/UPPER MIOCENE
PLIOCENE
LOWER PLEIST.
ASSEMBLAGE ZONE
AGE

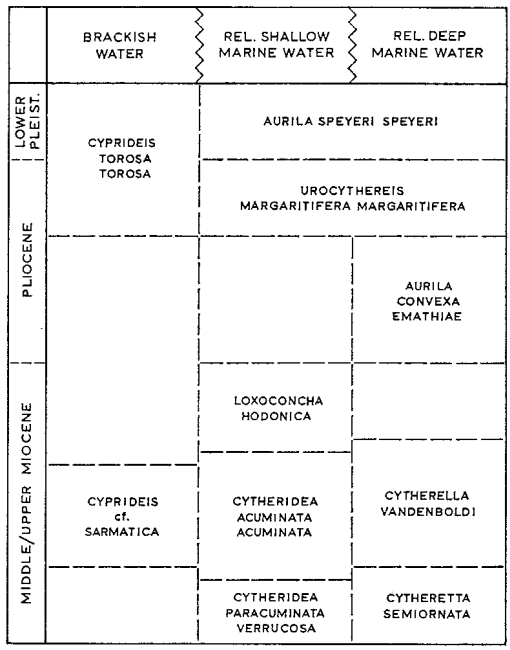


Fig. 43. Proposed ostracode biozonation for the Late Cenozoic of the South Aegean island arc.

Type section: Section Khairetiana, exposure 292: Khairetiana Formation.
Corresponding chronostratigraphic interval: "Upper Tortonian" (sensu Gianotti, 1953: "Messinian").
Remarks: Sediments belonging to this zone were deposited in shallow marine environments.

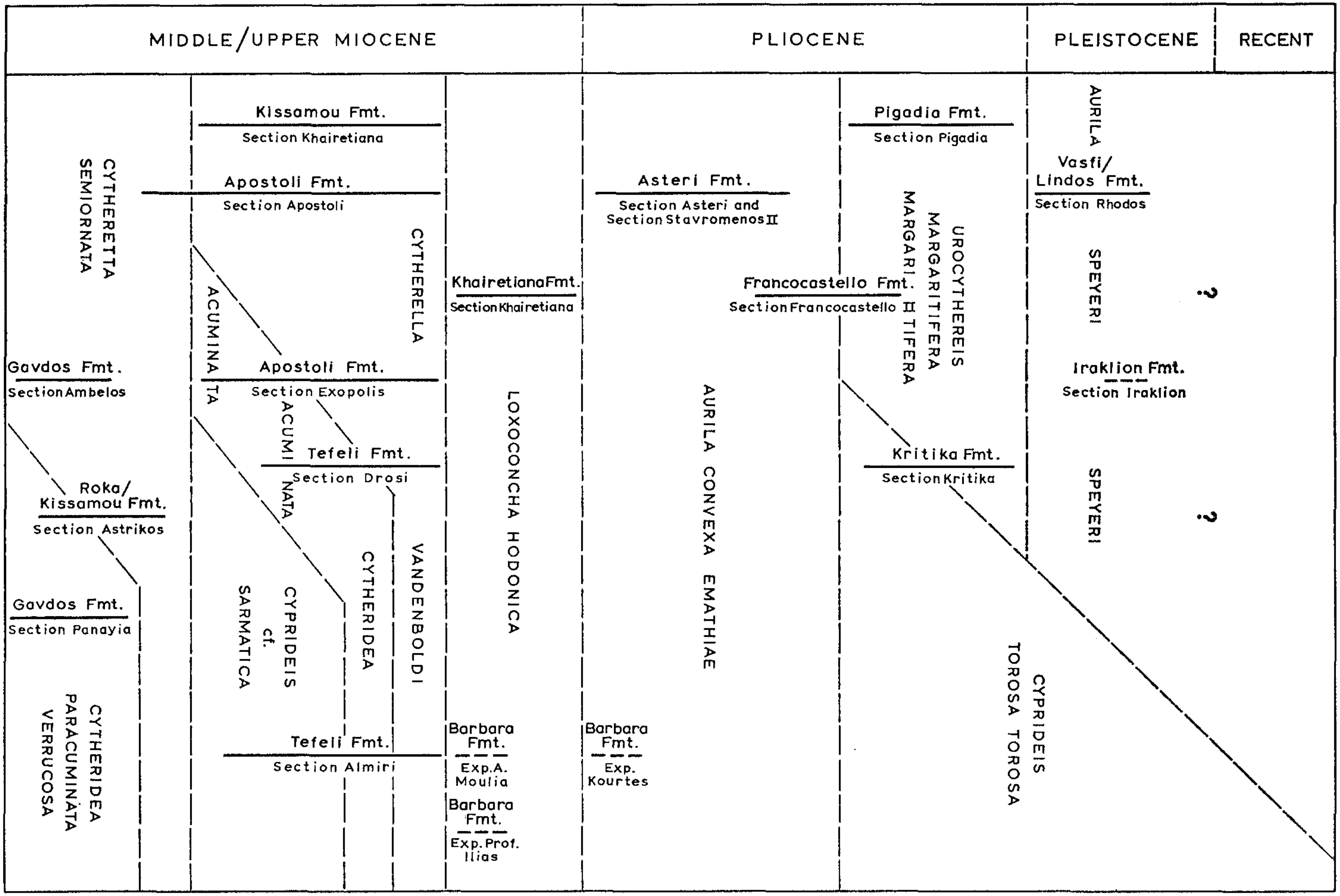
Cytheretta semiornata Zone

Characteristic forms for this zone are *Cytheretta semiornata* and *Bythocypris* sp., which may be accompanied by *„Bairdia"* sp.

The lower boundary of this zone cannot be defined.

The zone is found on Crete, where it comprises the upper part of the Roka Formation and the Kissamou deposits in Section Astrikos, and the lower strata of the Apostoli Formation in Section Apostoli.
Type section: Middle and upper part of Section Astrikos, exposure 105: Roka and Kissamou Formations.

Fig. 44. Relation between the proposed biozones and the lithostratigraphic units. →



MIDDLE/UPPER MIOCENE
PLIOCENE
PLEISTOCENE
RECENT
Kissamou Fmt.
Section Khairetiana
Apostoli Fmt.
Section Apostoli
CYTHERETTA SEMIORNATA
CYTHERELLA
ACUMINATA
Khairetiana Fmt.
Section Khairetiana
Gavdos Fmt.
Section Ambelos
Apostoli Fmt.
Section Exopolis
ACUMINATA
Tefeli Fmt.
Section Drosi
Roka/ Kissamou Fmt.
Section Astrikos
Gavdos Fmt.
Section Panayia
CYPRIDEIS cf. SARMATICA
CYTHERIDEA
VANDENBOLDI
LOXOCONCHA HODONICA
CYTHERIDEA PARACUMINATA VERRUCOSA
Tefeli Fmt.
Section Almiri
Barbara Fmt.
Exp. A. Moulia
Barbara Fmt.
Exp. Prof. Ilias
Barbara Fmt.
Exp. Kourtes
Asteri Fmt.
Section Asteri and Section Stavromenos II
AURILA CONVEXA EMATHIAE
Francocastello Fmt.
Section Francocastello II
Pigadia Fmt.
Section Pigadia
UROCYTHEREIS MARGARITIFERA MARGARITIFERA
Kritika Fmt.
Section Kritika
CYPRIDEIS TOROSA TOROSA
AURILA
Vasfi/ Lindos Fmt.
Section Rhodos
SPEYERI
?
Iraklion Fmt.
Section Iraklion
SPEYERI
?

Corresponding chronostratigraphic interval: up to and including "Lower Tortonian".
Remarks: The deposits of this zone were laid down in relatively deep marine environments.

Cytherella vandenboldi Zone

Confined to this zone: *Argilloecia kissamovensis, Aurila* sp. 2, *Callistocythere antoniettae, Cardobairdia glabra, Cnestocythere lamellicosta, Cytherella vandenboldi, Cytheropteron apostoliensis, Paracytheridea* sp. and *Pseudopsammocythere kollmanni.*

Forms appearing in the *C. vandenboldi* Zone and known from higher zones as well, are: *Bythocypris lucida, Cytheropteron lancei, Kangarina coarctata, Loxoconcha hodonica* (very rare), *Paijenborchella iocosa* and *P. solitaria.*

Taxa, which disappear in this zone are: *Aurila cicatricosa, "Bairdia" subdeltoidea, Cytherella postdenticulata, C. russoi, Eucytherura pygmaea, Krithe citae* and *Semicytherura raulini.*

The zone is found on Crete only and comprises the upper part of the Tefeli Formation in Section Drosi and Section Almiri, the major upper part of the Apostoli Formation in Section Apostoli and Section Exopolis as well as the entire Kissamou Formation in Section Khairetiana.
Type section: Middle and upper part of Section Apostoli, exposure 814: Apostoli Formation.
Corresponding chronostratigraphic interval: "Middle Tortonian".
Remarks: Deposition of the sediments of this zone took place in moderately deep to deep marine environments.

Callistocythere ennensis and *Loxoconcha variesculpta* are only known from this zone and from the near-contemporaneous *C. acuminata acuminata* Zone of shallow water.

Aurila deformis deformis, A. diecii, Cnestocythere truncata, Cyamocytheridea dertonensis, Cytheridea acuminata acuminata, Loxoconcha cristatissima and *Neomonoceratina mouliana* appear in both these coeval zones ranging upwards into the *Loxoconcha hodonica* Zone.

Aurila convexa emathiae Zone

Confined to this zone are: *Aurila convexa emathiae, Bradleya* ? sp., *Buntonia seguenziana, Carinocythereis meulenkampi, Cistacythereis* cf. *pokornyi hellenica* and *Quadracythere salebrosa.*

Numerous taxa appear in this zone for the first time, among others: *Aurila ulicznyi, A. vena, A. venetiensis, Bairdoppilata supradentata, Buntonia sublatissima sublatissima, B. giesbrechtii robusta, Costa runcinata, Cytherella beckmanni, C. terquemi, Cytheretta adriatica, Eucytherura complexa, Falunia retifastigata,*

Hemicytherura hellenica, Loxoconcha alata, L. rhomboidea, L. tumida, Mutilus retiformis, Pachycaudites ? h-scripta, Pseudocytherura calcarata, Quadracythere prava, Semicytherura acuticostata, S. inversa, S. paradoxa, S. spratti, Tetracytherura irregularis, Urocythereis favosa favosa and *U. lumbricularis.*

In this zone disappear the following species: *Bythocypris lucida, Cytherella creutzburgi, Cytheropteron lancei, Parakrithe dactylomorpha, Paijenborchella iocosa* and *P. solitaria.*

This zone only recognized on Crete, comprises the Asteri Formation in Section Asteri and Section Stavromenos II. Moreover, it was found in the lower part of the Barbara Formation at Kourtes (exposure 32).

Type section: Section Stavromenos II, exposure 884: Asteri Formation.

Corresponding chronostratigraphic interval: approximately Lower and Middle Pliocene.

Remarks: Deposits of this zone were formed in relatively open marine and deep water. The ostracode assemblage from Section Francocastello II of the Francocastello Formation is considered to be intermediate between that of this zone and that of the succeeding *Urocythereis margaritifera margaritifera* Zone. Because of the presence of *Bradleya* ? sp., *Bythocypris lucida, Paijenborchella iocosa* and *P. solitaria* it resembles the *Aurila convexa emathiae* Zone. On the other hand, elements of the *U. margaritifera margaritifera* Zone are *Aurila aspidoides, Eucytherura gullentopsi, Mutilus dohrni* and *Urocythereis margaritifera margaritifera.* The distribution of all these taxa in the Francocastello II Section is such that no accurate zonal boundary can be recognized.

Urocythereis margaritifera margaritifera Zone

Aurila praeapuliana is confined to this zone. In our material *Carinocythereis antiquata* and *Urocythereis margaritifera margaritifera* are equally restricted to this zone, but both are known as living species in the present Mediterranean. So far they are not known from Early Pliocene and older deposits.

For the first time appearing in this zone are: *Aurila aspidoides, A. cruciata cruciata, A. punctata plagia, A. veniliae, "Bairdia" formosa, Bosquetina rhodiensis, Cistacythereis caelatura, Cytheridea acuminata neapolitana, Eucytherura gullentopsi, Leptocythere multipunctata multipunctata, L. tenera, Loxoconcha versicolor* and *Mutilus dohrni.*

Taxa disappearing in this zone, among others: *Aurila venetiensis, Buntonia giesbrechtii robusta, B. sublatissima sublatissima, B. subulata subulata, Hemicytherura hellenica, Hermanites haidingeri haidingeri, Mutilus retiformis, Pachycaudites ? h-scripta* and *Semicytherura spratti.*

The zone is named after one of the most common taxa.

The deposits of the Pigadia Formation in the Pigadia Section on Karpathos

and those of the major upper part of the Kritika Formation in the Kritika Section on Rhodos belong to this zone. As remarked already the Section Francocastello II of the Francocastello Formation cannot be placed accurately in either this zone or the preceeding *A. convexa emathiae* Zone.
Type section: Section Pigadia, exposure 2: Pigadia Formation.
Corresponding chronostratigraphical interval: Upper Pliocene approximately.
Remarks: This zone includes deposits laid down in shallow water as well as in rather deep marine environments.

Aurila calciplena Uliczny and *Thaerocythere bulbusspinata* Uliczny are also confined to this zone. Both species were found only in isolated samples from Rhodos and Karpathos, respectively.

Aurila speyeri speyeri Zone

In this zone the following selected forms occur for the first time: *Aurila speyeri speyeri, Basslerites berchoni, Bythocypris obtusata, Cytheropteron latum, C. punctatum, C. rotundatum, Echinocythereis ruggierii, Loxocauda decipiens, Neocytherideis subspiralis* and *Polycope reticulata.*

Leptocythere multipunctata multipunctata is the most common in this zone, but is rarely represented in the *Urocythereis margaritifera margaritifera* Zone.

An important feature of this zone is the absence of the genera *Hermanites, Pachycaudites* and *Ruggieria.* The upper boundary of this zone cannot be defined owing to lack of data.

This zone comprises strata found on Rhodos and Crete. On Rhodos it includes the Vasfi and Lindos deposits, exposed in Section Rhodos, on Crete the Iraklion Formation (Iraklion, exposure 46).
Type section: Section Rhodos, exposure 34a: Vasfi and Lindos Formations.
Corresponding chronostratigraphic interval: Lower Pleistocene and possibly higher. Upper boundary not defined.
Remarks: To this zone belong deposits laid down in shallow to rather deep marine environments.

Chapter V

COMPARISONS AND ATTEMPTS AT CORRELATION

V.1. Langhian stratotype

Ostracoda from the Langhian stratotype at Cessole-Bricco della Croce (Piedmont)were studied by Oertli (1961). Altogether 23 species were reported, most of them in open nomenclature. The fauna is dominated by the genera *Cytherella*, *Krithe* and *Henryhowella* and thus most indicative of rather deep marine water. Four of the species occur in the Miocene of the South Aegean area as well: *Cytherella postdenticulata*, *Henryhowella asperrima asperrima* (= *H. ruggierii* Oertli), *Krithe citae* and *K. langhiana*. All four these species are found in our *Cytherella vandenboldi* Zone, especially as it is known from the Kissamou Formation. *C. postdenticulata* and *H. asperrima asperrima* occur in the *Cytheretta semiornata* Zone already. There is no striking resemblance with any of our zonal associations, which would warrant a suggestion of contemporaneity.

The "Langhian" ostracode fauna described by Russo (1964) from Valle del Pescale (northern Apennines) is more or less similar to that of the type Langhian. Probably Russo's *Bairdia* sp. 1 corresponds with our "*Bairdia*" sp., which is incidentally present in the *C. paracuminata verrucosa* and the *C. semiornata* Zone.

V.2. Serravallian reference section

So far nothing is known about ostracodes from the type Serravallian. We examined therefore some samples (JT 493-500, taken by T. Freudenthal and P. Marks) from the reference section at Gavi (Piedmont) for their ostracode contents. With the exception of sample JT 497, our samples JT 493 to JT 500 correspond closely to the samples A to G, indicated from the Gavi section in the Excursion Guidebook I of the Fourth Congress of the Stratigraphic Mediterranean Neogene Committee (1967, fig. 17). Sample JT 497 was taken between the samples D and E of the Gavi section.

The following taxa were recognized:

	SAMPLES							
	lower				—			upper
	JT 493	JT 494	JT 495	JT 496	JT 497	JT 498	JT 499	JT 500
Henryhowella asperrima asperrima	+	+	+	+	+	+	+	
Aurila ex. gr. *punctata*	+		+	+	+	+	+	+
Cytherella postdenticulata	+	+	+ ?	+ ?	+			
Loxocorniculum quadricornis			+	+				
Cnestocythere lamellicosta			+ cf					+
Pachycaudites cf. *ungeri depauperata* Ruggieri			+	+			+	+
Cytherella russoi			+		+ ?	+	+	+
Hermanites haidingeri haidingeri							+	+
Cytherella vulgata								+
Paracytheridea triquetra bovettensis								+
Pachycaudites ? *h-scripta*								+
Callistocythere appenninica Dieci & Russo								+

Also the genera "*Bairdia*", *Falunia* and *Xestoleberis* are represented. In general it may be said that similar assemblages are found in the Tortonian strata of Montegibbio and of the Rio Mazzapiedi-Castellania in northern Italy (Dieci & Russo, 1964b; Ascoli, 1968) as well as in those near Enna on Sicily (Ruggieri, 1962). As far as the recognized taxa are known from the South Aegean area this Serravallian assemblage resembles that of the *Cytheretta semiornata* Zone as well as that of the *Cytherella vandenboldi* Zone.

V.3. Tortonian stratotype

From the area of the Tortonian stratotype, near S. Agata Fossili (Piedmont), Capeder (1902), Dieci & Russo (1964b) and Ascoli (1968) studied ostracodes.

Especially the last mentioned author clearly referred to the ostracodes from the type section of the Tortonian. In his fauna the co-occurrence of the following species is most interesting: *Callistocythere antoniettae*, *Cardobairdia glabra*, *Cnestocythere lamellicosta*, *C. truncata*, *Cytherella vandenboldi* (reported as *C.* aff. *pulchra* Ruggieri), *Kangarina coarctata*, *Loxoconcha punctatella*, *Loxocorniculum quadricornis*, *Paijenborchella solitaria*, and *Pseudopsammocythere kollmanni*. Although more taxa may be listed, which were found equally in the Miocene of

Gavdos and/or Crete, the species mentioned above indicate quite convincingly that the type Tortonian ostracode fauna resembles that of our *Cytherella vandenboldi* Zone fairly well.

V.4. Sahelian of Carnot, N. Algeria

Actually, a stratotype has not been designated for this stage. Since Brives (1897) the type Sahelian has been thought to be situated in the area north of Carnot, Algeria. Ostracodes from this area were studied by Sissingh (1972). The following named taxa were reported: *Acanthocythereis hystrix, "Bairdia"* cf. ? *subdeltoidea, Buntonia subulata subulata, Callistocythere antoniettae chrysocythere cataphracta* Ruggieri, *Cytherella vulgata, Eucytherura mistrettai* (as *E. ruggierii), E. textilis textilis* Ruggieri, *Falunia ruida* Ruggieri, *Henryhowella asperrima asperrima, Kangarina coarctata, Loxoconcha dertonensis* Ruggieri, *L. variesculpta* and *Ruggieria tetraptera tetraptera.*

Comparison shows that because of the co-occurrence of *B.* cf. *subdeltoidea, C. antoniettae, K. coarctata* and *L. variesculpta* in the Carnot fauna, the "type" Sahelian assemblage corresponds better with the fauna of our *Cytherella vandenboldi* Zone than with any of our other assemblages.

V.5. Messinian neo-stratotype

Ostracodes from the Pasquasia-Capodarso section on Sicily, neo-stratotype of the Messinian Stage, were studied by Decima (1964) and by Colalongo (1968b). The last mentioned author distinguished two ostracode horizons. The older one corresponds with the "marne argillose intermedie" and is characterized by *Cyprideis pannonica agrigentina* Decima. The overlying younger horizon, comprising the "marne argillose superiori", contains *C. pannonica pseudoagrigentina* Decima. A similar stratigraphic succession was found in the "Messinian" of Eraclea Minoa (Agrigento, Sicily) (Decima, 1964).

From the latter locality forms intermediate between both taxa are reported from the base of the "marne argillose superiori". In the lower horizon at Pasquasia and in the upper one at Eraclea Minoa also *C.* ex. gr. *mehesi* occurs. Until now no *Cyprideis* representatives of the *pannonica*-group have been found in the Aegean area.

On Crete *C. mehesi* (new name for *C. tuberculata*) is only known from the *Cyprideis* cf. *sarmatica* Zone.

V.6. Andalusian stratotype

Ostracodes from the "Formazione marnoso-arenacea di Carmona-Dos Hermanas" in Andalusia (S. Spain), type section of the Andalusian Stage, were studied by Borragan (1966). According to this author the type Andalusian ostracode fauna possesses a character intermediate between Miocene and Pliocene faunas and thus would fit in well with the originally assumed stratigraphic position of the stage corresponding with the interval between the Tortonian and the Pliocene, i.e. the Messinian Stage, according to Perconig (1966, 1968). However, Meulenkamp (1969) and Verdenius (1970) assumed a younger, Pliocene age on the basis of uniserial uvigerinids and planktonic Foraminifera, respectively. For this reason we preferred to study material from the samples collected by Verdenius in the type-area, rather than discussing the reported type Andalusian fauna, which includes several forms in preliminary determination.

Five samples from two sections (Verdenius, exp. 219, 237) in the Ecija Formation near Carmona were studied on ostracodes. Both lithologic columns from which these samples were taken are presented by Verdenius (p. 34, fig. 3). As outlined by Verdenius (p. 71) the upper part of the Ecija Formation near Carmona corresponds with the basal part of the "Formazione marnoso-arenacea". The lower boundary of this formation of Perconig is not clearly defined within the Ecija Formation. The samples from exposure 219 and 237 (especially the uppermost ones 219W and 237A-G) are all more or less representative for the Andalusian.

Moreover, three isolated samples taken in clayey sediments intercalated in the Guadaira Formation near Carmona were examined. This formation overlies the Ecija Formation and forms the top of the Andalusian. The review of the fauna encountered is given on next page.

There are also found unrecognized species of, among others, the genera *Aurila, Callistocythere, Costa, Cytheretta, Falunia, Incongruellina, Krithe, Semicytherura* and *Xestoleberis.*

Most of the (sub)species recognized are known from Upper Miocene and Pliocene deposits. In Italy, so far *Aurila semilunata, Chrysocythere cataphracta* (of which only one fragment was found), *Quadracythere* cf. *sulcatopunctata* and *Urocythereis seminula* are only known from Miocene ("Tortonian") strata. The joint occurrence of *Buntonia sublatissima sublatissima, Carinocythereis bairdi, Cytheretta triebeli, Falunia emaciata, F. rugosa* and *Loxoconcha tumida,* all known only from post-Miocene deposits of the Mediterranean Basin, suggests a Pliocene age.

	ECIJA FORMATION					GUADAIRA FORMATION		
	exposure 219 lower - upper		exposure 237 lower - upper			isolated samples		
	219U	219W	237G	237F	237A	212	279	280
Urocythereis favosa favosa	+	+	+	+	+	+	+	+
Henryhowella asperrima asperrima	+	+	+			+	+	+
Acanthocythereis hystrix	+	+			+	+	+	+
Loxoconcha tumida	+	+	+	+	+	+	+	+
Aurila ex. gr. *punctata*	+	+	+	+	+	+	+	+
Paracytheridea triquetra bovettensis	+ cf	+ cf	+ cf	+	+	+	+	+
Pterygocythereis ceratoptera	+			+				
Falunia emaciata (Brady)	+							
Protocytheretta obtusa		+		+	+			+
Buntonia sublatissima sublatissima		+		+				
Buntonia sublatissima dertonensis		+ cf	+					
Ruggieria tetraptera tetraptera		+				+		+
Quadracythere cf. *sulcatopunctata* (Reuss)		+			+		+	+
Buntonia subulata subulata			+					
Costa batei batei			+			+	+	+
Falunia cephalonica				+	+			
Eucytherura mistrettai				+				
Cytheridea acuminata neapolitana				+				+
Urocythereis seminula (Seguenza)				+	+		+	+
Chrysocythere cataphracta Ruggieri					+			
Cytheretta triebeli					+			
Aurila semilunata (Seguenza)					+	+	+	+
Carinocythereis bairdi					+	+		+
Falunia rugosa						+		
Pachycaudites ungeri ungeri								+
Monoceratina mediterranea								+
Hermanites haidingeri haidingeri								+

V.7. "Tortonian" of Montebaranzone, northern Apennines

The rich ostracode fauna from Montebaranzone, dated as Early-Middle Tortonian by Russo (1968a, b), comprises numerous species which were found in our Miocene assemblage zones.

Especially the occurrence of *Cytheridea paracuminata verrucosa* and *Cytheretta* aff. *semiornata* is of interest as both these forms indicate that the Montebaranzone fauna probably corresponds with our *C. paracuminata verrucosa* and *C. semiornata* Zones.

V.8. "Tortonian" of Enna, Sicily

Two samples taken from "Tortonian" clay deposits exposed in the vicinity of Enna, central Sicily, were studied by Ruggieri (1962b). The rich fauna contains, among others, *Aurila cicatricosa, Callistocythere pallida, Cnestocythere truncata, Kangarina coarctata, Loxoconcha punctatella, L. variesculpta, Pachycaudites ungeri ungeri, Paracytheridea triquetra bovettensis* and *Paijenborchella solitaria.* Especially this group of taxa allows the correlation of the assemblage with the *Cytherella vandenboldi* Zone of Crete.

V.9. "Sahelian" of Bonfornello, Sicily

From a section of "Sahelian" marly clay Ruggieri et al. (1969) report numerous taxa, several of which are left in open nomenclature, however. In the fauna the joint occurrence of the following species suggests a correlation with the *Cytherella vandenboldi* Zone: *Aurila albicans, A. deformis deformis, Callistocythere antoniettae, C. pallida, Hemicytherura defiorei, Loxoconcha punctatella, L. variesculpta* and *Quadracythere mediterranea.* However, since *Hemicytherura videns, Falunia stellata stellata* and *Ruggieria hodgii* are present, also some resemblance exists to the *Loxoconcha hodonica* Zone. With the exception of *F. zibinica,* all other species of Bonfornello, also present in our material, have no biostratigraphic value, because of their wide stratigraphic range both according to the literature and to our data.

Ten forms are listed by Ruggieri et al. as being confined to "Sahelian" deposits in Italy. Amongst these only *Xestoleberis reymenti* was recognized in our material. This species has a wide range in Greece, occurring throughout the entire Middle/Upper Miocene of Gavdos and Crete.

V.10. Pliocene and Pleistocene of the Romagna Apennines

Five ostracode cenozones were distinguished in the Pliocene and Pleistocene ("Calabrian") of the Santerno section by Colalongo (1968a). These zones could not be recognized in our area of study, although some species, such as *Parakrithe dactylomorpha* (*affinis* of Colalongo) from the Italian Lower Pliocene and *Cytheridea acuminata neapolitana, Eucytherura gullentopsi* and *Leptocythere multipunctata multipunctata* from the Upper Pliocene - Pleistocene interval seem to have a rather corresponding stratigraphic distribution. Just as in Italy, *L. multipunctata multipunctata* seems to appear as a common species in Greece for the

first time during the Pleistocene (see also Ruggieri, 1959). In the upper part of Section Kritika of the Pliocene Kritika Formation this species is occurring more rarely than in the overlying Pleistocene Vasfi Formation.

Most of the taxa listed by us as confined to the Pliocene were not reported from the Santerno section.

V.11. Pliocene and Pleistocene of Le Castella, Calabria

Ostracoda from the Le Castella section were studied by Colalongo (1965). In this section several species are found either in the Pliocene or in the Pleistocene ("Calabrian") part of the section, although in Greece and elsewhere these forms are known from Pliocene as well as from Pleistocene (and sometimes older) deposits. The only notable correspondence with our data seems to be the appearance of *Basslerites berchoni* in the Pleistocene. In Italy this species is so far only known from Pleistocene to Recent deposits.

Cytheropteron testudo Sars, only found in Pleistocene strata in Italy (see also Ruggieri, 1959), is regarded by Colalongo to be an indicator for relatively low water temperatures. However, since the ostracode assemblages of the Le Castella section are characteristic for rather deep water, this species cannot be used for the appraisal of general climatic changes.

No forms restricted to the Pliocene and older strata are known from the section.

V.12. Pliocene of Cephalonia, Ionian Sea

Pliocene Ostracoda of Cephalonia were studied by Uliczny (1969) with special attention to the Hemicytheridae and Trachyleberididae. This author distinguished five ostracode zones in the Pliocene series, from which the interval corresponding to the *Sphaeroidinellopsis* and *Globorotalia margaritae* Zones would be lacking (Hug, 1969).

The lowermost ostracode zone is characterized by the presence of *Aurila cruciata minor* and *Cistacythereis caelatura* and the absence of some other forms. This zone is followed by a zone to which *A. convexa emathiae*, *Cistacythereis pokornyi hellenica* and *Urocythereis sororcula* are confined. *Urocythereis minoos* Uliczny is restricted to the third zone. Some other species appear here for the first time, e.g. *Carinocythereis antiquata* and *Costa punctatissima punctatissima*. The following zone is characterized by *A. calciplena* and to some extent by *A. praeapuliana* as well. *Buntonia subulata rectangularis* Ruggieri appears herein for

the first time. The fifth zone is defined by the appearance of other taxa, such as *A. speyeri speyeri, A. ulicznyi* (= *A.* sp. B. Uliczny) and *Urocythereis margaritifera margaritifera.*

Comparison with our data shows that both lower zones together correspond best with our *Aurila convexa emathiae* Zone. *A. convexa emathiae* and *C.* (cf.) *pokornyi hellenica* are confined to Lower/Middle Pliocene strata, also according to our data.

Because of the presence of *A. calciplena, A. praeapuliana* and *C. antiquata,* Uliczny's third and fourth zones may be correlated with the *Urocythereis margaritifera margaritifera* Zone. The uppermost, fifth zone of Uliczny includes the following group of taxa: *Aurila fastigata* Uliczny, *A. speyeri speyeri, A. ulicznyi, Heterocythereis albomaculata* (Baird), *Urocythereis margaritifera margaritifera, Falunia turbida* (Mueller) and *Buntonia giesbrechtii giesbrechtii* (Mueller). This zone has been placed by Uliczny in the uppermost Pliocene, although he remarked (p. 119) that some of these forms have so far only been reported from post-Pliocene deposits. Only *A. fastigata* is today exclusively known from the Pliocene.

A. ulicznyi and *U. margaritifera margaritifera* are known from Pliocene as well as from Pleistocene strata. Since *A. calciplena* is absent from this zone, and, on the other hand, *A. speyeri speyeri, B. giesbrechtii giesbrechtii, F. turbida* and *H. albomaculata* - all known so far only from Pleistocene to Recent deposits in the Mediterranean - are present, we prefer to correlate this zone with our Pleistocene *Aurila speyeri speyeri* Zone.

V.13. Neogene of the Rhone Basin

Miocene ostracodes from marine and lacustrine deposits of the Rhone Basin were extensively studied by Carbonnel (1969).

Some data concerning ostracodes from Pliocene strata were added. With respect to the taxa, which occur in the South Aegean area as well, it is interesting to note that in the Rhone Basin *Loxoconcha punctatella* is also confined to the Miocene and *L. rhomboidea* and *L. tumida* are known only from post-Miocene strata. As a whole, the Late Miocene ostracode faunas from both areas are so different that comparisons are meaningless.

V.14. Neogene of the Vienna and Pannonian Basins

As to the Neogene Ostracoda of the Vienna and Pannonian Basins we want to confine ourselves to some remarks concerning the stratigraphic distribution of

Cyprideis and *Cytheridea* taxa. From both basins these genera were especially studied by Kollmann (1960) and Krstic (1968a, b). In our Miocene material the following forms are recognized and also reported by these authors: *Cyprideis mehesi* (as *C. tuberculata tuberculata*), *C.* (cf.) *sarmatica, Cytheridea acuminata acuminata* and *C. paracuminata verrucosa.*

The three first mentioned taxa are reported from the "Lower/Middle Tortonian to Lower/Middle Pannonian" deposits of the Vienna and Pannonian Basins. Comparison suggests possibilities to correlate with our *Cyprideis* cf. *sarmatica* and *Cytheridea acuminata acuminata* Zones. *C. paracuminata verrucosa* is reported from older "Upper Helvetian to Lower/Middle Tortonian" strata of the Vienna Basin. The stratigraphic distribution of this taxon indicates a possible correlation with our *C. paracuminata verrucosa* Zone.

V.15. Neogene of the Dacian Basin

Neogene ostracodes of northwestern Bulgaria were extensively studied by Stancheva (1962, 1963, 1964, 1965a, b). From the "Tortonian" deposits about one quarter of the total number of species is known from the southern Aegean area. A higher proportion of this fauna has originally been described from the Vienna Basin.

Younger, "Sarmatian to Pontian" ostracode faunas are endemic and have no taxa in common with those of our area of study. These faunas are dominated by the genera *Candona, Leptocythere* and *Loxoconcha.*

V.16. Neogene of Greek Macedonia

The Neogene of the Strimon Basin in Greek Macedonia has been studied by Gramann & Kockel (1969). From this basin ostracodes are especially reported from the so-called "Dafni-Schichten" and "Choumnikon-Schichten", which strata are dated as "Maeot-Bessarab" and "Pont (Novorossien)", respectively.

Among others the following species are reported: *Aurila deformis deformis, Cyamocytheridea freybergi* Gramann, *Cytheridea acuminata neapolitana, Cyprideis pannonica agrigentina, Loxoconcha* cf. *granifera* (Reuss), *L. hodonica* and *L. tumida.* Comparison with the South Aegean area and Italy shows that this assemblage is most characteristic for the Upper Miocene. *L. tumida* is the only species so far not yet reported from pre-Pliocene strata.

Cyprideis cf. *pannonica pseudoagrigentina, Loxoconcha hodonica,* and *L. tumida* are also reported from the "Choumnikon-Schichten".

Because of the presence of *Aurila deformis deformis* and *L. hodonica* both assemblages from the Strimon Basin resemble those of the *Cytherella vandenboldi* and *Loxoconcha hodonica* Zone best.

In addition to *L. hodonica* the "Dafni-Schichten" and especially the "Choumnikon-Schichten" are found to contain some other forms which are known from the Pannonian Basin, namely *Bakunella dorsoarquata* (Zalany), *Camptocypris balcanica* (Zalany), *Hemicytheria* cf. *loerenthei* (Méhes), *Pontoniella acuminata acuminata* (Zalany) and *P. acuminata striata* (Mandelstam).

These taxa indicate that probably a connection existed between the Pannonian and Mediterranean Basins till the very end of the Miocene. The original marine faunas from the Vienna-Pannonian and Dacian Basins (see section V.15) apparently changed into more brackish water faunas. Elements of the latter faunas are not only found in the eastern Mediterranean but they are also known from Italy. The assemblage described by Grekoff & Molinari (1963) from marly deposits from the top Miocene (below the basis of the marine Pliocene) near Lugagnano contains "paratethyan" forms such as *Leptocythere praebacuana* Livental (reported as *Callistocythere* ex. gr. *bendovanica* (Livental), *Loxocauda* ex. gr. *limbata* (Schweyer) (reported as belonging to *Pseudocythere*), *Loxoconcha hodonica* and *L. rhombovalis* Pokorny. This assemblage best corresponds with our *L. hodonica* Zone.

All these forms, with the exception of *L. rhombovalis*, have been described by Agalarova (1967) from the "'Pontian" of Azerbaydzhan (U.S.S.R.). *L. hodonica* is reported as *L. djaffarovi* Schneider.

The occurrence of Late Miocene "paratethyan" ostracodes in the Mediterranean Basin, westwards as far as Italy, would correspond with the distribution of Late Miocene "paratethyan" molluscs in this basin (Gillet, 1957a, b).

V.17. Conclusions

From the preceding comparisons the conclusion seems to be justified that most of the Miocene zones can be recognized in Italy at chronostratigraphic intervals corresponding well with those in the South Aegean. The uppermost Miocene *Loxoconcha hodonica* Zone apparently represents a period of increasing influence of "paratethyan" shallow water ostracodes in the Mediterranean as far west as Italy. So far both assemblage zones we defined for the Aegean Pliocene can be distinguished only in Cephalonia.

Chapter VI

SYSTEMATICS

VI.1. General remarks

The classification adopted is for the greater part based on that of Hartmann (1964). Some minor modifications are introduced. For instance, schizodont Ostracoda are grouped together in the subfamily Schizocytherinae Mandelstam, as proposed by Hanai (1970). The suprageneric classification given by Hartmann differs mainly from the classification of Moore's Treatise (1961) by lowering numerous families of the Treatise to subfamily rank. The systematic subdivision presented by Hartmann is close to that of Van Morkhoven (1962, 1963). The classification of Hemicytheridae and Trachyleberididae proposed by Hazel (1967) is not followed, because the criteria for delimitation of both these groups presented by this author, in our opinion hardly justify the consideration of these groups as separate families. For the moment both these important groups should be treated best as subfamilies belonging to the family Cytheridae. For a discussion concerning problems encountered by delimitation of hemicytherine and trachyleberidine Ostracoda we refer to Hazel (1967) and Pokorny (1964, 1968).

As to nomenclature of hinge structures the classification given in Moore's Treatise (1961) was mainly followed, although this system is not sufficiently detailed to classify precisely all hinge types.

On account of the late moment of publication but little attention could be given to the systematics of Barbeito-Gonzalez (1971).

VI.2. Systematic discussions and descriptions

Subclass OSTRACODA Latreille, 1806
Order MYODOCOPIDA Pokorny, 1953
Suborder HALOCYPRIFORMES Skogsberg, 1920
Family POLYCOPIDAE Sars, 1866
Genus **Polycope** Sars, 1866

Type species: Polycope orbicularis Sars, 1866.
Diagnosis: Carapace sublenticular. Lateral surface smooth, punctate, costate, spinose or reticulate. Hinge adont. Central muscle scar pattern consisting of a cluster of three or four spots.

Polycope ? delicata n. sp. (Pl. 1, fig. 5)

Etymology: the delicate polycope.
Holotype: a left valve.
Paratypes: 14 loose valves.
Type locality: Section Rhodos, exposure 34a.
Type level: Vasfi Formation (sample MUR 12), Lower Pleistocene.
Diagnosis: A species tentatively included in the genus *Polycope*, characterized by a circular outline, blunt rostrum-like projection and a delicate ornamentation composed of spirally arranged ridges and minute pits.
Description: Carapace more or less circular in outline with anterodorsally a blunt rostrum-like extension. Valves thin-shelled and transparent. Lateral surface covered with thin ridges which are spirally arranged. The central region has two or three short subvertical ridges. Between the ridges numerous minute pits occur. Muscle scars are not observed.
Dimensions: L/H = 0.28/0.20 mm (holotype), 0.25-0.28/0.20-0.21 mm (paratypes).
Remarks: This species is well characterized by its shape and peculiar ornamentation of the lateral surface. As the muscle scar pattern is not known and the general shape of this species is not very typical for *Polycope*, the generic assignment is questionable (personal communication, G. Hartmann, Hamburg).
Occurrence: Rhodos: Vasfi 34a.

Polycope demulderi n. sp. (Pl. 1, fig. 1)

Etymology: named in honour of Mr. E. F. J. de Mulder, Utrecht, The Netherlands.
Holotype: a right valve.
Paratypes: 22 loose valves, 1 complete carapace.
Type locality: Section Rhodos, exposure 34a.
Type level: Vasfi Formation (sample MUR 12), Lower Pleistocene.
Diagnosis: A species of the genus *Polycope*, characterized by an ornamentation comprising a reticulation, a central circular crest, spines and a broad keel along the anteroventral, ventral and posteroventral margin.
Description: Carapace sublenticular, thin-shelled. Dorsal margin irregular, slightly convex. Anterior, ventral and posterior margin broadly rounded. Anteroventral, ventral and posteroventral margin broadly keeled and between this keel and the outer margin provided with a row of spatulate spines. The central part of the lateral surface is covered with an incomplete reticulation, and circumscribed by a prominent but irregular crest. The upper part of the valve is spinose,

mostly with two, sometimes with three to five pronounced spines. The internal features are those of the genus.
Dimensions: L/H = 0.27/0.29 mm (holotype), 0.25-0.27/0.25-0.28 mm (paratypes).
Remarks: By the presence of short spines and higher muri this species is easily differentiated from *Polycope reticulata* Mueller.
Occurrence: Rhodos: Vasfi 34a.

Polycope graeca n. sp. (Pl. 1, fig. 3)

Etymology: the Greek polycope.
Holotype: a right valve.
Paratypes: 6 loose valves.
Type locality: Section Rhodos, exposure 34a.
Diagnosis: A species of the genus *Polycope,* characterized by an ornamentation consisting of numerous small clavellate spines.
Description: Carapace sublenticular, thin-shelled. Dorsal margin straight. Anterior, ventral and posterior margin broadly rounded without any obtuse angle. The lateral surface is densely and regularly covered with small, irregular-shaped clavellate spines. The internal features are those of the genus.
Dimensions: L/H = 0.30/0.28 mm (holotype), 0.29/0.26 mm (paratype).
Remarks: So far no comparable *Polycope* species is known from the Mediterranean.
Occurrence: Rhodos: Vasfi 34a.

Polycope orbicularis Sars ? (Pl. 1, fig. 2)

Polycope orbicularis Sars, 1928, p. 31, pl. 14, pl. 15, fig. 1.

Remarks: Except for the smaller size, our specimens are not notably different from the specimens figured by Sars. The species was originally described from off the coast of Norway.
Dimensions: L/H = 0.54/0.50 mm.
Occurrence: Rhodos: Vasfi 34a.

Polycope reticulata Mueller (Pl. 1, fig. 4)

Polycope reticulata Mueller, 1894, p. 235, pl. 7, figs. 44, 49, 50, pl. 8, fig. 20.

Dimensions: L/H = 0.62/0.55 mm.
Occurrence: Rhodos: Vasfi 34a.

Polycope vasfiensis n. sp. (Pl. 1, fig. 6)

Etymology: named after the village of Vasfi, Rhodos.
Holotype: a left valve.
Paratypes: 28 loose valves.
Type locality: Section Rhodos, exposure 34a.
Type level: Vasfi Formation (sample MUR 12), Lower Pleistocene.
Diagnosis: A species of the genus *Polycope*, characterized by a very finely punctate ornamentation and a serrate keel along the anteroventral margin.
Description: Carapace sublenticular, thin-shelled. Dorsal margin flattened. Anterior and posterior margin broadly rounded. Lateral surface closely and very finely punctate. The anteroventral margin is provided with a transversely ribbed and finely serrate keel with about 6 to 8 denticles. The muscle scar pattern normally consists of three juxtaposed scars. In a single specimen an irregular cluster of nine scars was observed. Other internal features are those of the genus.
Dimensions: L/H = 0.50/0.47 mm (holotype), 0.43-0.48/0.38-0.44 mm (paratypes).
Occurrence: Rhodos: Vasfi 34a.

Order PODOCOPIDA Mueller, 1894
Suborder PLATYCOPA Sars, 1866
Family CYTHERELLIDAE Sars, 1866
Genus **Cytherella** Jones, 1849

Type species: Cytherina ovata Roemer, 1840 (designation by Ulrich, 1894).
Diagnosis: Carapace subrectangular-ovate to egg-shaped in lateral view, generally thick-shelled. Lateral surface smooth, with a variable number of pits and/or ridges. Hinge adont. Muscle scar pattern pinnate, composed of two parallel rows of spots.

Subgenus **Cytherella** Jones, 1849

Synonym: Morrowina Loetterle, 1937.
Diagnosis: Lateral surface generally smooth, punctate or foveolate. Posteriorly sometimes with small papillae on the lateral surface. Females with single posterior brood cavities.

Cytherella (Cytherella) postdenticulata Oertli (Pl. 2, fig. 1)

Cytherella postdenticulata Oertli, 1961, p. 19, pl. 1, figs. 1-11; Ruggieri, 1962b, p. 8, textfig. 3; Dieci & Russo, 1964b, p. 52, pl. 9, fig. 2; Russo, 1964, p. 232, pl. 40, fig. 2.

Remarks: This species was originally described from the Langhian stratotype at Cessole-Bricco della Croce (northern Italy).
Occurrence: Gavdos: Gavdos 336. Crete: Kissamou 105, 368; Apostoli 814, 850; Tefeli 34.

Cytherella (Cytherella) russoi n. sp. (Pl. 1, figs. 10, 11)

Etymology: named in honour of Dr. A. Russo, Modena, Italy.
Holotype: a right valve.
Paratypes: 76 valves (including complete carapaces).
Type locality: Section Khairetiana, exposure 368.
Type level: Kissamou Formation (sample M 792), Upper Miocene ("Tortonian").
Diagnosis: A species of the subgenus *Cytherella*, characterized by the egg-shaped outline in lateral view and rather wedge-shaped appearance with a sharply pointed anterior end in dorsal view.
Description: Carapace egg-shaped in lateral view, relatively thin-shelled. Dorsal margin convex, ventral margin nearly straight. Anterior margin more broadly rounded than the posterior margin. Greatest height approximately in the middle of the carapace. Right valve relatively higher than left valve. Posterodorsal margin oblique. Lateral surface smooth and polished. At the site of the central muscle scars there is a shallow, elongate depression. The right valve overlaps the left one, especially along the anterior part of the dorsal and ventral margin. In dorsal view the carapace is flattened and wedge-shaped, with a sharply pointed anterior end. Widest at about $\frac{3}{4}$ of the length from the anterior margin. The sides are convex.
Dimensions: L/H/B = 0.87/0.59/0.24 mm (holotype, right valve), 0.80-0.87/0.53-0.58/0.24-0.26 mm (paratypes, loose valves).
Remarks: Cytherella lata Brady (1880) resembles our species in lateral outline, but it is larger and relatively more elongate. Probably our new species is reported from the Tortonian of the Rio Mazzapiedi-Castellania (province of Alessandria) and from the Rio delle Bagole (Province of Modena) as *Cytherella compressa* (von Muenster) by Dieci & Russo (1964b, p. 52, pl. 14, fig. 1). *C. compressa* is not egg-shaped in lateral view, but it has more or less parallel dorsal and ventral margins.
Occurrence: Crete: Roka 105; Kissamou 105, 368; Apostoli 814, 850.

Cytherella (Cytherella) sp. (Pl. 1, fig. 7)

Description: Carapace relatively small, oblong-ovate in lateral view. Dorsal and ventral margins subparallel. Ventral margin sometimes slightly sinuous. Anterior

and posterior margins both broadly rounded. Lateral surface completely smooth and polished. Carapaces in dorsal view wedge-like. Males are flattened and widest at about ⅔ of the length from the anterior margin with the sides slightly undulating. Females are inflated and posteriorly wider. Greatest width at about 7/8 of the length. The sides are nearly straight. The right valve overlaps the left one all along the dorsal, posterior and ventral margin and less clearly so along the anterior margin. No muscle scar depression. In a single female carapace a shallow depression is present between the centre and the dorsal margin. In larval carapaces the posterior margin is oblique posterodorsally.
Dimensions: L/H/B = 0.75/0.43/0.33 mm (complete carapace).
Remarks: Because of the relatively small number of specimens and the absence of reliable diagnostic features this form is labelled in open nomenclature.
Occurrence: Gavdos: Gavdos 336. Crete: Apostoli 850; Khairetiana 292; Barbara 36.

Cytherella (Cytherella) terquemi n. sp. (Pl. 1, figs. 8, 9)

Etymology: named in honour of the late O. Terquem, ostracode specialist of the 19th century.
Holotype: a left valve.
Paratypes: 77 valves (including complete carapaces).
Type locality: Section Rhodos, exposure 34a.
Type level: Vasfi Formation (sample MUR 10), Lower Pleistocene.
Diagnosis: A species of the subgenus *Cytherella,* characterized by a completely smooth carapace with a distinctly oblique posterodorsal outline.
Description: In lateral view the thick-shelled carapace is oblong-ovate. The dorsal margin is straight, the ventral margin slightly concave in the middle or straight. The anterior margin is broadly rounded, anterodorsally somewhat oblique, and in the left valve with a narrow rim along this margin. The dorsal part of the posterior margin is distinctly oblique and its ventral part is broadly rounded. Lateral surface completely smooth, in most cases polished. In dorsal view most valves are broadest at the posterior end. At the place of the central muscle scar, a shallow, elongate depression is found. The right valve strongly overlaps the left one along the dorsal margin, less so along the posterodorsal and ventral margins. The pinnate muscle scar pattern is composed of 8-11 spots.
Dimensions: L/H/B = 0.80/0.45/0.20 mm (holotype), 0.68-0.83/0.44-0.50/0.20 mm (paratypes).
Remarks: On the basis of the lateral outline adults of this species can well be separated from those of *C. vulgata* and *C. russoi.* Larval valves of these three species are difficult to differentiate.

Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Barbara 32. Rhodos: Vasfi 34a.

Cytherella (Cytherella) vandenboldi n. sp. (Pl. 2, figs. 4, 5)

Etymology: named in honour of Prof. W. A. van den Bold, Baton Rouge, U.S.A.
Holotype: a right male valve.
Paratypes: 67 valves (including complete carapaces).
Type locality: Section Apostoli, exposure 814.
Type level: Apostoli Formation (sample 814 V), Upper Miocene ("Tortonian").
Diagnosis: A species of the subgenus *Cytherella*, characterized by an oblong-ovate outline, truncate posterior end and punctate ornamentation.
Description: Carapace relatively large and elongate, oblong-ovate in lateral view. Dorsal and ventral margins subparallel. Anterior margin regularly and broadly rounded. Posterior margin posterodorsally slightly oblique, posteroventrally broadly rounded. The lateral surface is covered with regularly distributed pits of variable size. The location of the central muscle scars is externally indicated by a small and shallow depression. The posterior end of the valves is truncate in dorsal view and the anterior end is rounded. The female valve is posteriorly wider than that of the male. The greatest breadth is situated at the posterior margin. In dorsal view the sides are more or less straight in males, in females somewhat convex. The male valve possesses two shallow depressions, near the anterior and near the posterior margins, giving these valves a sinuous appearance in dorsal view.
Dimensions: L/H/B = 0.72/0.37/0.15 mm (holotype, male), 0.72-0.80/0.40-0.45/0.16-0.20 mm (paratypes).
Remarks: In several features our form resembles *Cytherella abyssorum* Sars (1866). Reyment (1960, p. 50), who studied Recent individuals of *C. abyssorum* from the Cattegat (situated between Denmark and Sweden) showed that its posterior margin is provided with small denticles. In dorsal view male valves in our material are anteriorly more rounded than the male valve figured by Reyment (p. 51, fig. 8).

Our species resembles *Cytherella punctata* Brady (1866) in ornamentation and by a similar lateral outline, but it differs in dorsal view. In *Cytherella punctata* the posterior end is rounded instead of truncate as it is in *C. vandenboldi* n. sp.

Cytherella sordida Mueller (1894) also possesses a punctate ornamentation, but it differs by the presence of raised anterior and posterior margins. This species may be referred to the subgenus *Cytherelloidea*. The *Cytherella* carapace from the Upper Miocene N'Tchingué Formation of Gabon (W. Africa), figured by van den Bold (1966, p. 158, pl. 1, fig. 10; see also van den Bold, 1968a) as *C.*

sordida Mueller differs from Mueller's species by lacking these raised margins. It seems to be identical with our new species. *Cytherella* sp. aff. *C. pulchella* Ruggieri, reported by Ascoli (1968, p. 42, pl. 1, figs. 7-9) from the type Tortonian might also be referred to our species
Occurrence: Crete: Apostoli 814, 850; Tefeli 34.

Cytherella (Cytherella) vulgata Ruggieri (Pl. 2, fig. 2)

Cytherella sp. Ruggieri, 1952b, p. 35, pl. 7, figs. 9, 10.
Cytherella urtica Ruggieri, 1959, p. 190 (nomen nudum).
Cytherella sp. Ruggieri, 1960, p. 2, pl. 2, fig. 8.
Cytherella vulgata Ruggieri, 1962b, p. 9, pl. 1, figs. 9, 10; Colalongo, 1965, p. 86, pl. 10, fig. 1.

Remarks: This species was originally described from the "Tortonian" of Enna (central Sicily).
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105; Kissamou 105, 368; Apostoli 814, 850; Tefeli 1, 34; Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Vasfi 34a; Lindos 34a.

Subgenus **Cytherelloidea** Alexander, 1929

Type species: Cythere (Cytherella) Williamsoniana Jones, 1849.
Diagnosis: Lateral surface generally with prominent ridges. Carapace frequently compressed and wedge-shaped in dorsal view. Females with two posterior brood cavities.

Cytherella (Cytherelloidea) beckmanni (Barbeito-Gonzalez) (Pl. 2, fig. 3)

Cytherelloidea beckmanni Barbieto-Gonzales, 1971, p. 262, pl. 2, figs. 1c, 2c, 3c, pl. 45, figs. 14, 15.

Remarks: The species was originally described from Naxos (Cyclades).
Dimensions: L/H/B = 0.72-0.76/0.43-0.45/0.15 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Barbara 32. Karpathos: Pigadia 2. Rhodos: Vasfi 34a; Lindos 34a.

Cytherella (Cytherelloidea) cretensis n. sp. (Pl. 2, fig. 7)

Etymology: named after the island of Crete.
Holotype: a complete female carapace.
Paratypes: 12 valves (including complete carapaces).
Type locality: Section Khairetiana, exposure 292.
Type level: Khairetiana Formation (sample M 836), Upper Miocene ("Tortonian").

Diagnosis: A species of the subgenus *Cytherelloidea*, characterized by a subrectangular, posteriorly truncate carapace with a marginal ridge well developed along the posterior and anterior margins and a foveolate ornamentation.
Description: The thick-shelled carapace is subrectangular in lateral view, the dorsal margin is slightly sinuate and the ventral margin somewhat concave. The anterior margin is broadly rounded. The posterior margin is posterodorsally somewhat oblique and posteroventrally broadly rounded. A marginal rim is present. It is most conspicuous along the anterior and posterior margins, somewhat narrower along the dorsal and ventral margins. The more or less rounded central region of the valve is raised and pitted to smooth. The relatively depressed area surrounding the raised central region is covered with large foveolae. These depressions increase marginwards in size and they may occur on the anterior and posterior ridges. The right valve strongly overlaps the left one along the dorsal and posterodorsal margin and less so along the entire ventral and anteroventral margin.

Sexual dimorphism is pronounced. The female carapace is cuneiform in dorsal view. Its anterior end is rounded, posteriorly it is truncate. The male carapace is not so wide posteriorly. In lateral view the female carapace is more thick-set than the more elongate male carapace. The larval carapaces lack the raised central region and their lateral surface is completely foveolate to punctate. A dorsoventral depression may be present in these larval forms.
Dimensions: L/H/B = 0.68/0.40/0.28 mm (holotype, complete female carapace), 0.55-0.57/0.35-0.40/0.20-0.25 mm (paratypes, complete carapaces).
Remarks: As to the lateral ornamentation this species resembles *Cytherella variopunctata* Lienenklaus (1900). However, this species is more elongate and posteriorly more flattened.
Occurrence: Crete: Khairetiana 292.

Cytherelloidea (Cytherelloidea) creutzburgi n. sp. (Pl. 2, fig. 6)

Etymology: named in honour of Prof. N. Creutzburg, Freiburg, Germany.
Holotype: a complete carapace.
Paratypes: 26 valves (including complete carapaces).
Type locality: Section Stavromenos II, exposure 884.
Type level: Asteri Formation (sample 884 G), Lower/Middle Pliocene.
Diagnosis: A species of the subgenus *Cytherelloidea*, characterized by broadly rimmed anterior and ventral margins and by one longitudinal ridge.
Description: Carapace oblong-ovate in lateral view. Dorsal margin nearly straight, ventral margin sinuous, with a broad concavity in the middle. Anterior and posterior margins broadly rounded. Posterior margin posterodorsally oblique,

posteroventrally broadly rounded. Lateral surface polished. Anterior, posterior and ventral margins broadly rimmed. Dorsal margin with a less pronounced ridge. A single longitudinal lateral ridge runs from mid-posterior to near the anterior marginal rim.
The posteroventral region shows a rather distinct depression between the marginal rim and the longitudinal ridge. At the location of the central muscle scars there is externally a small, shallow pit. In dorsal view the carapace is truncate and widest at the posterior end. The right valve overlaps the left one virtually all along the margins, especially along the dorsal and ventral margins, but hardly so along the anterior and posteroventral margins.
Dimensions: L/H/B = 0.70/0.40/0.30 mm (holotype, complete carapace), 0.67-0.70/0.38-0.40/0.15 mm (paratypes, loose valves).
Remarks: This form resembles *Cytherelloidea circuminflata* Dieci & Russo (1964). However, this species lacks the longitudinal ridge and it is punctate in the central part of the valves.
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105; Asteri 848-849, 884.

Suborder ? METACOPA Sylvester-Bradley, 1961
Superfamily HEALDIACEA Harlton, 1933
Family SAIPANETTIDAE McKenzie, 1968

Genus **Cardobairdia** van den Bold, 1960

Type species: Cardobairdia ovata van den Bold, 1960
Diagnosis: Carapace ovate in lateral view, left valve with the margin strongly folded inwards and strongly overlapping the right valve along the entire periphery. Hinge antimerodont. Muscle scars numerous, arranged in a large circular area.

Cardobairdia glabra van den Bold (Pl. 2, fig. 8)

Cardobairdia ovata van den Bold, 1960 (pars), p. 155, pl. 2, fig. 2c (non pl. 2, fig. 2a, b).
Cardobairdia glabra van den Bold, 1968b, p. 45, pl. 2, fig. 1, pl. 8, fig. 2; Russo, 1968a, p. 45, pl. 7, fig. 1.

Remarks: Our individuals are somewhat smaller than those of van den Bold (1968), but still within the variation of the species (personal communication Dr. W. A. van den Bold, Baton Rouge).
Dimensions: L/H/B = 0.50-0.53/0.32/0.17 mm.
Occurrence: Crete: Kissamou 368.

Cardobairdia sp. (Pl. 2, fig. 9)

Remarks: Some specimens were found, which differ from *C. glabra* van den Bold, by their smaller size and a more elongate outline in lateral view. In general shape this form resembles *Cardobairdia* sp. described and figured by Russo (1968a, p. 48, pl. 7, fig. 3). However, Russo's form is laterally somewhat more compressed.
Dimensions: L/H/B = 0.47/0.21/0.15 mm (right valve), 0.50/0.30/0.28 mm (complete carapace).
Occurrence: Crete: Kissamou 368.

Suborder PODOCOPA Sars, 1866
Family BAIRDIIDAE Sars, 1866

Remarks: Generic designations and diagnosis are based on Maddocks' (1969) revision of Recent Bairdiidae. Species of uncertain generic position are reported under *"Bairdia"*.

Genus **Bairdoppilata** Coryell, Sample & Jennings, 1935

Type species: Bairdoppilata martyni Coryell, Sample & Jennings, 1935.
Diagnosis: Carapace rounded subhexagonal in lateral view. Lateral surface smooth, punctate and/or with a ridge pattern. Adductor muscle scars oblong arranged in a loose spiral, or subquadrate in three horizontal rows. Auxiliary dentition present.
Remarks: Glyptobairdia Stephenson, 1946, is characterized among other things, by a robust carapace, one that has a ridge pattern on the punctate lateral surface, stout spines along the margins and adductor muscle scars arranged in three horizontal rows. This taxon is considered by Maddocks (1969) to be a subgenus of *Bairdoppilata.*

Subgenus **Bairdoppilata** Coryell, Sample & Jennings, 1935

Diagnosis: Carapace relatively thin-shelled. Lateral surface smooth or finely punctate. Oblong adductor muscle scars arranged in a loose spiral.

Bairdoppilata (Bairdoppilata) supradentata (Terquem) (Pl. 2, figs. 10, 11)

Bairdia subdeltoidea, Terquem, 1878 (non *Cythere subdeltoidea* von Muenster, 1830), p. 92, pl. 10, fig. 14.
Bairdia subdeltoidea (von Muenster) var. *supradentata* Terquem, 1878, p. 93, pl. 10, fig. 1.
Bairdia subdeltoidea (von Muenster) var. *conformis* Terquem, 1878, p. 93, pl. 10, fig. 17.
? *Bairdia octopunctata* Ruggieri, 1962b, p. 12, textfigs. 5-7.
Bairdia subdeltoidea conformis Terquem, Colalongo, 1965, p. 86, pl. 10, figs. 2, 3.

Remarks: We have named this form after the first mentioned variety of *B. subdeltoidea* in Terquem's paper on Ostracoda from Rhodos. Our material shows this species to be rather variable in shape and ornamentation. Generally, the valves are typically "bairdioid", with a more or less elongated posterior end. In dorsal view the valves are rather compressed. The lateral surface is in most cases finely and closely punctate. However, specimens with widely spaced puncta or even with almost completely smooth valves are also present. Anteriorly, as well as along the posterior part of the ventral margin a tuberculate denticulation may be found. Internally, right valves of adult individuals bear "bairdoppilate" toothlets at the anterior and posterior marginal angles. The adductor muscle scar pattern consists of eight or nine spots arranged in a loose spiral, thus in a similar way as in *B. octopunctata* Ruggieri, which was described from the "Tortonian" of Enna (Sicily). According to Ruggieri (1962b, p. 13) this species differs from *B. subdeltoidea* var. *conformis* Terquem by its smaller size and a dentellate marginal ornamentation. *B. octopunctata* possesses eight adductor muscle scars.

Because of our observations concerning the variation it is quite possible that *B. octopunctata* is conspecific with our form. No good diagnostic feature to differentiate both forms is apparent.

Dimensions: L/H/B = 1.10/0.77/0.30 mm (left valve), 1.12/0.75/0.32 mm (right valve).

Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Genus **Neonesidea** Maddocks, 1969

Type species: Triebelina schulzi Hartmann, 1962.

Diagnosis: Carapace elongate-subtriangular in lateral view. Lateral surface smooth or finely punctate. Hinge simple, the hinge bar may be serrate. Adductor muscle scars more or less wedge-shaped and arranged in four zigzag rows.

Neonesidea corpulenta (Mueller) (Pl. 2, fig. 12)

Bairdia corpulenta Mueller, 1894, p. 272, pl. 13, figs. 39, 40, pl. 14, figs. 8, 9, 11, 24, pl. 15, fig. 24.

Occurrence: Crete: Francocastello 817. Karpathos: Pigadia 2.

Neonesida longevaginata (Mueller) (Pl. 2, fig. 13)

Bairdia longevaginata Mueller, 1894, p. 271, pl. 13, figs. 30, 31, pl. 14, figs. 6, 7, 27.

Occurrence: Rhodos: Kritika 8-9.

Neonesida nigrescens (Ruggieri) (Pl. 2, fig. 14)

Bairdia nigrescens Ruggieri, 1962b, p. 11, textfigs. 4, 4a, pl. 1, figs. 7, 8.

Remarks: Compared with our other *Neonesidea* forms *N. nigrescens* is different by its finely pitted carapace. Ventrally the carapace is sinuous, dorsally strongly convex. The posterior end is rather pointed and somewhat turned upwards. The species was originally described from the "Tortonian" of Enna (central Sicily).
Dimensions: L/H/B = 0.95/0.60/0.19 mm (left valve), 0.87/0.50/0.17 mm (right valve).
Occurrence: Crete: Tefeli 34.

Group **"Bairdia"**

"Bairdia" formosa Brady (Pl. 3, fig. 1)

Bairdia formosa Brady, 1868b, p. 221, pl. 14, figs. 5-7.
Bairdia rustica Terquem, 1878, p. 91, pl. 10, fig. 12.
? *Bairdia subulata* Terquem, 1878, p. 91, pl. 10, fig. 10.
Bairdia serrata Mueller, 1894, p. 273, pl. 13, fig. 41, pl. 14, figs. 13-15, pl. 15, fig. 23.

Remarks: According to Terquem *B. rustica* would differ from *B. subulata* by a non-punctate lateral surface and a different muscle scar pattern. However, it seems that both forms are conspecific with *Bairdia formosa.* Also *B. serrata* corresponds very well in shape and size of the carapace. Originally described from Tenedos, off the west coast of Turkey.
Occurrence: Crete: Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

"Bairdia" reticulata Mueller (Pl. 3, fig. 2)

Bairdia reticulata Mueller, 1894, p. 273, pl. 13, fig. 35, pl. 15, figs. 1-4, 30, 37.

Remarks: This species is tentatively placed in the genus *Paranesidea* Maddocks by Maddocks (1969). Our specimens were found to be identical with Recent material of this species from the Gulf of Calvi, N. W. Corsica.
Occurrence: Rhodos: Vasfi 34a.

"Bairdia" subdeltoidea (von Muenster) (Pl. 3, figs. 5, 6)

Cythere subdeltoidea von Muenster, 1830, p. 64.
Cytherina subdeltoidea (von Muenster), Roemer, 1838, p. 517, pl. 6, fig. 16.
Nesidea subdeltoidea (von Muenster), Kuiper, 1918, p. 14, pl. 1, fig. 2.
Bairdia subdeltoidea (von Muenster), Ruggieri, 1960, p. 2, textfig. 1, pl. 1, fig. 2, pl. 2, fig. 10; Dieci & Russo, 1964b, p. 55, pl. 14, fig. 3.

Remarks: According to Blake (1931, p. 162) Astrup (Germany) should be considered as the type locality of this species. The species thus would have a range from Oligocene to Miocene.
Occurence: Crete: Kissamou 368; Apostoli 814, 850; Tefeli 1, 34.

"Bairdia" sp. (Pl. 3, figs. 3, 4)

Remarks: Under this name we include some loose specimens, whose right valves are more elongate-subhexagonal in lateral view than those of *"B." subdeltoidea* (von Muenster). Left valves are strikingly subtriangular.
Dimensions: L/H/B = 1.28/0.80/0.45 mm.
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105; cf. Kissamou 105.

Genus **Bythocypris** Brady, 1880

Type species: Bythocypris reniformis Brady, 1880
Diagnosis: Carapace more or less reniform. Surface smooth. Hinge adont. Inner lamella anteriorly wider than posteriorly. Anterior vestibulum large.

Bythocypris bosquetiana (Brady) (Pl. 3, fig. 7)

Bairdia bosquetiana Brady, 1866a, p. 364, pl. 57, fig. 5.
Bythocypris bosquetiana (Brady), Mueller, 1894, p. 275, pl. 13, fig. 38, pl. 14, figs. 16-18, 20, 31, pl. 15, figs. 13-17, 26, 27, 34; Sars, 1928, p. 64, pl. 29.

Remarks: This species differs from *B. lucida* (Seguenza) and *B. obtusata* (Sars) by the more concave ventral margin, a straighter dorsal margin and a larger size. The valves are rounded at both ends and laterally strongly compressed.

Originally described from the Atlantic Ocean. Also found in our recent material from the Adriatic Sea at 929 m. depth.
Occurrence: Crete: Francocastello 817; Barbara 32.

Bythocypris lucida (Seguenza) (Pl. 3, figs. 8, 9)

Cytheridea lucida Seguenza, 1880, p. 290, pl. 16, fig. 51.
Bythocypris lucida (Seguenza), Dieci & Russo, 1964b, p. 56, pl. 14, fig. 7.

Remarks: Most right valves of our material have a dorsal margin that is less convex than shown in the schematic figure given by Seguenza. This species was originally described from the Pliocene of Reggio di Calabria (southern Italy).
Occurrence: Crete: Kissamou 368; Apostoli 814, 850; Asteri 848-849, 884; Francocastello 817; Barbara 32.

Bythocypris obtusata (Sars) (Pl. 3, figs. 10, 11)

Bairdia obtusata Sars, 1866, p. 24.
Bythocypris obtusata (Sars), Sars, 1928, p. 65, pl. 30, fig. 1; Colalongo, 1965, p. 88, pl. 10, figs. 4, 5.

Remarks: Both valves of the carapace are rather different. The left valve is relatively high, with a distinctly convex dorsal margin. The ventral margin is nearly straight, the posterior margin is posteroventrally slightly pointed. The right valve is more reniform. In this valve the dorsal margin is again convex, the ventral margin is provided with a broad, although shallow concavity. The species differs from the preceding one by the dorsally more convex valves. In *B. lucida* the valves often have subparallel dorsal and ventral margins, the dorsal margin may be slightly curved. Both valves of *B. lucida* are relatively more elongate.

B. obtusata was originally described from off the south coast of Norway.
Occurrence: Rhodos: Vasfi 34a.

Bythocypris sp. (Pl. 3, figs. 12, 13)

Remarks: These individuals resemble *B. obtusata* (Sars) in lateral outline. However, both valves have a less convex dorsal margin, and hence are slightly more elongated. Posteriorly the right valves are more pointed. In dorsal view the valves are more compressed than those of *B. obtusata*, which are also larger.
Dimensions: L/H/B = 0.96/0.52/0.25 mm (left valve), 0.95/0.46/0.15 mm (right valve).
Occurrence: Crete: Roka 105; Kissamou 105.

Family CYPRIDIDAE Baird, 1845
Subfamily MACROCYPRIDINAE Mueller, 1912
Genus **Macrocypris** Brady, 1867

Type species: Cythere minna Baird, 1850.
Diagnosis: Carapace elongate in lateral view, anteriorly rounded, posterior end pointed or narrowly drawn-out. Lateral surface smooth. Anteriorly and posteriorly a wide vestibulum. Muscle scars in rosette pattern. Hinge modified antimerodont.

Macrocypris sp. 1 (Pl. 3, fig. 14)

Remarks: In lateral outline this form resembles *M. tenuicauda* Brady (1880),

which was originally described from the West Indies and off the coast of North Brazil. Both forms have the more or less straight middle part of the dorsal margin and the elongated posterior end in common. In our form, however, the posterior end is less pointed than it is in *M. tenuicauda.*
Dimensions: L/H/B = 1.45/0.50/0.30 mm.
Occurrence: Rhodos: Vasfi 34a.

Macrocypris sp. 2 (Pl. 3, fig. 15)

Remarks: This form resembles *M. succinea* Mueller (1894) in lateral outline. Both have a more or less regularly and broad convex dorsal margin, a rounded anterior and a pointed posterior end. Our form differs from Mueller's species by a distinctly larger size.
Dimensions: L/H/B = 1.42/0.58/0.29 mm.
Occurrence: Karpathos: Pigadia 2.

Subfamily PARACYPRIDINAE Sars, 1923
Genus **Aglaiocypris** Sylvester-Bradley, 1946

Synonym: Aglaïa Brady, 1868 (preoccupied).
Type species: Aglaïa pulchella Brady, 1868.
Diagnosis: Carapace elongate in lateral view, anteriorly and posteriorly rounded. Lateral surface smooth. Hinge adont. Muscle scar pattern consisting of a cluster of several spots.

Aglaiocypris ? miocenica (Dieci & Russo)

Cushmanidea miocenia Dieci & Russo, 1964a, p. 16, pl. 2, fig. 4, pl. 4, fig. 4; Dieci & Russo, 1964b, p. 77, pl. 14, fig. 11, pl. 17, fig. 4; Russo, 1964, p. 239, pl. 43, fig. 4.
Aglaiocypris ? miocenica (Dieci & Russo), Russo, 1968a, p. 15, pl. 8, fig. 1.

Remarks: This species was tentatively transferred to the genus *Aglaiocypris* because of its shape and muscle scar pattern. It has a subvertical row of three relatively large adductor scars with two smaller ones in front. Species of the genus *Aglaiocypris* are reported to possess a rather irregular cluster of five scars. The species was originally described from the Tortonian of the Rio Mazzapiedi-Castellania and the Rio delle Bagole.
Occurrence: Crete: Kissamou 105.

Subfamily PONTOCYPRIDINAE Mueller, 1894
Genus **Argilloecia** Sars, 1866

Type species: Argilloecia cylindrica Sars, 1866.
Diagnosis: Carapace elongate in lateral view, posteroventrally pointed. Lateral surface smooth. Hinge adont. Muscle scar pattern consisting of a closely set group of five spots.

Argilloecia kissamovensis n. sp. (Pl. 4, figs. 1, 2)

Etymology: named after the village of Kissamou, Province of Khania, Crete.
Holotype: a right female valve.
Paratypes: 74 valves (including complete carapaces).
Type locality: Section Khairetiana, exposure 368.
Type level: Kissamou Formation (sample M 794), Upper Miocene ("Tortonian").
Diagnosis: A species of the genus *Argilloecia*, characterized by a short, relatively high carapace.
Description: Carapace elongate-ovate in lateral view with a pronounced convex dorsal margin and relatively high valves. The greatest height is found behind the middle. The ventral margin has a shallow concavity approximately in the middle. The anterior margin is broadly rounded, the posterior margin somewhat angular, with a blunt point just below the middle. The lateral surface is smooth and polished. The right valve is relatively high and it overlaps the left valve strongly along the dorsal and ventral margins, less so along the anterior margin. The muscle scar pattern consists of three relatively large and elongated muscle scars with two smaller ones immediately behind this row. The hinge is adont. Inner lamella narrow. Vestibula lacking. Males are more elongate than females.
Dimensions: L/H/B = 0.51/0.27/0.15 mm (holotype, right valve), 0.53/0.25/0.13 mm (paratype, left valve).
Remarks: Argilloecia cylindrica Sars, type species of the genus, has comparable inner features, but it is distinctly more extended. Compared with the *Argilloecia* species described by Mueller (1894) from the Gulf of Naples, *A. kissamovensis* may easily be differentiated by the less elongate outline, the more strongly convex dorsal margin and the absence of broad inner lamella and vestibula.
Occurrence: Crete: Kissamou 368.

Argilloecia sp.

Remarks: This form resembles *A. acuminata* Mueller, 1894, but it is less elongated. The absolute length of the carapace is approximately the same, but our form is relatively higher.

Dimensions: L/H/B = 0.52-0.58/0.25/0.12 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Vasfi 34a.

Genus **Propontocypris** Sylvester-Bradley, 1947

Type species: Pontocypris trigonella Sars, 1866.
Diagnosis: In lateral view carapace subtriangular relatively high. Lateral surface smooth or punctate. Posteroventrally no marginal spines on the right valve. Hinge adont.

Propontocypris sp. cf. **P. dispar** (Mueller)

Remarks: Only larval valves were found, which resemble *Pontocypris dispar* Mueller (1894, p. 250, pl. 9, figs. 2, 3, 13-20) from the Gulf of Naples fairly well in general outline. However, juvenile forms of this group cannot be determined with certainty.
Occurrence: Rhodos: Vasfi 34a; Lindos 34a.

Family CYTHERIDAE Baird, 1850
Subfamily NEOCYTHERIDEIDINAE Puri, 1957
Genus **Hemicytherideis** Ruggieri, 1952

Type species: Cytheridea elongata Brady, 1868.
Diagnosis: Carapace elongate in lateral view, anteriorly and posteriorly broadly rounded. Lateral surface smooth or reticulate. Hinge desmodont.
Remarks: Further data concerning *Pontocythere tschernjawskii* Dubowsky (1939), type species of *Pontocythere*, are needed to decide whether *Hemicytherideis* is a synonym of *Pontocythere* Dubowski.

Hemicytherideis elongata (Brady)

Cytheridea elongata Brady, 1868a, p. 421, pl. 28, figs. 13-16, pl. 40, fig. 6.
Hemicytherideis elongata (Brady), Ruggieri, 1952b, p. 66, pl. 2, figs. 2-6.
Cushmanidea elongata (Brady), Masoli, 1968, p. 34, pl. 2, fig. 17, pl. 9, figs. 123-125.
non *Cytheridea elongata* Terquem, 1878, p. 126, pl. 14, fig. 20.

Remarks: This species was originally reported from the Atlantic Ocean (Gulf of Biscay) and from Pleistocene deposits of Scotland and Ireland.

Terquem's *Cytheridea elongata* belongs to a different genus, its specific name is a homonym.
Occurrence: Crete: Asteri 884; Iraklion 46. Rhodos: Kritika 8-9.

Genus **Neocytherideis** Puri, 1952

Type species: Neocytherideis elongatus Puri, 1952.
Diagnosis: In lateral view carapace elongate, anteriorly pointed. Lateral surface smooth, pitted or with transverse furrows. Hinge weakly lophodont.

Neocytherideis subspiralis (Brady, Crosskey & Robertson)

Cytherideis subspiralis Brady, Crosskey & Robertson, 1874, p. 211, pl. 10, figs. 16, 17; Ruggieri, 1953b, p. 108, pl. 4, fig. 36, pl. 6, fig. 57.

Remarks: Originally described from the "Boulder Clay" of Burn of Haster, near Wick in Scotland.

Subfamily KRITHINAE Mandelstam, 1960
Genus **Krithe** Brady, Crosskey & Robertson, 1874

Synonyms: Ilyobates Sars, 1866 (preoccupied)
Neocyprideis Hanai, 1959
Parakrithella Hanai, 1959
Type species: Ilyobates praetexta Sars, 1866 (designation by Brady & Norman, 1889).
Diagnosis: Carapace elongate-ovate in lateral view, posterior end often incised. Lateral surface smooth or with papillae. Anterior vestibulum well developed, with simple or branching marginal pore canals. The "adont" hinge may be crenulate in the posterior part.
Remarks: From the Antarctic area Benson (1964, p. 16) and Sissingh (1970, p. 418) have described a *Krithe* species with a partly crenulate "adont" hinge and a posterior incision in the valve. The genus *Parakrithella* Hanai, 1959 has been erected to separate *Krithe*-like forms with such a hinge structure, but without a posterior incision. Both these features are now thought to be of specific value only. For this reason Van Morkhoven's (1963) assumption that *Parakrithella* has to be considered as a junior synonym of *Krithe* is followed.

Krithe citae Oertli (Pl. 4, fig. 4)

Krithe citae Oertli, 1961, p. 25, pl. 3, figs. 31-34; Russo, 1964, p. 20, pl. 46, fig. 3.

Remarks: This species was originally described from the Langhian stratotype at Cessole-Bricco delle Croce (northern Italy).
Dimensions: L/H/B = 0.75/0.35/0.15 mm.
Occurrence: Crete: Kissamou 105, 368; Apostoli 814.

Krithe compressa dertonensis Ruggieri (Pl. 4, fig. 5)

Krithe compressa dertonensis Ruggieri, 1962b, p. 16, textfigs. 8, 9, pl. 1, figs. 14, 15; Dieci & Russo, 1964b, p. 79, textfig. 6, pl. 15, fig. 7.

Remarks: This form was originally described from the "Tortonian" of Enna (central Sicily).
Dimensions: L/H/B = 0.75-0.77/0.36-0.37/0.13 mm.
Occurrence: Gavdos: Gavdos 336.

Krithe langhiana Oertli (Pl. 4, fig. 6)

Krithe langhiana Oertli, 1961, p. 24, pl. 3, figs. 24-30; Dieci & Russo, 1967, p. 14, pl. 1, figs. 5, 6, pl. 3, fig. 6.

Remarks: A more extensive synonymy of this species is given by Dieci & Russo (1967, p. 14). It was originally described from the Langhian stratotype.
Dimensions: L/H/B = 0.68/0.40/0.20 mm.
Occurrence: Crete: Kissamou 368.

Krithe monosteracensis (Seguenza) (Pl. 4, fig. 7)

Ilyobates bartonensis (Jones) *monosteracensis* Seguenza, 1880, p. 194, 290, 325, pl. 17, fig. 29.

Remarks: Originally described from Pliocene and Pleistocene deposits of the Province of Reggio di Calabria.
Dimensions: L/H/B = 0.72-0.77/0.35-0.40/0.15 mm.
Occurrence: Crete: Asteri 848-849. Rhodos: Vasfi 34a.

Genus **Parakrithe** van den Bold, 1958

Type species: Cytheridea (Dolocytheridea) vermunti van den Bold, 1946.
Diagnosis: Carapace elongate-ovate in lateral view, no posterior inward curvature. Lateral surface smooth. Hinge as in *Krithe*. Anterior vestibulum shallow with relatively long marginal pore canals.

Parakrithe dactylomorpha Ruggieri (Pl. 4, fig. 9)

Parakrithe dactylomorpha Ruggieri, 1962b, p. 15, pl. 1, figs. 1-6; Dieci & Russo, 1964b, p. 78, pl. 15, fig. 10.

Remarks: Originally described from the "Tortonian" of Enna (central Sicily).
Dimensions: L/H/B = 0.50/0.23/0.12 mm.
Occurrence: Crete: Kissamou 105, 368; Apostoli 814, 850; Tefeli 1, 34; Asteri 848-849, 884.

Genus **Pseudopsammocythere** Carbonnel, 1966

Type species: Pseudopsammocythere kollmanni Carbonnel, 1966.
Diagnosis: Carapace subrectangular, distinctly elongated. Lateral surface smooth. Anterior vestibulum present, with straight or slightly curved pore canals. Hinge desmodont.

Pseudopsammocythere kollmanni Carbonnel (Pl. 4, fig. 3)

Pseudopsammocythere kollmanni Carbonnel, 1966, p. 50, pl. 1, figs. 1-8; Carbonnel, 1969, p. 72, pl. 16, figs. 9, 10.

Remarks: This species resembles *Psammocythere* sp. 2 Oertli (1961) in general shape and size, but it seems to be different from the latter by the presence of an anterior vestibulum and a smaller number of anterior marginal pore canals. *P. kollmanni* was originally described from the "Tortonian" of the Rhone Basin.
Dimensions: L/H/B = 0.48-0.50/0.20/0.17 mm (complete carapaces).
Occurrence: Crete: Apostoli 814.

Pseudopsammocythere similis (Mueller) (Pl. 4, fig. 8)

Krithe similis Mueller, 1894, p. 359, pl. 30, figs. 2, 17-21.

Dimensions: L/H/B = 0.55/0.23/0.07 mm.
Remarks: This species, assigned to *Pseudopsammocythere* by Carbonnel (1969, p. 72), possesses a "quadrilobate" frontal scar comparable to that of the type species *P. kollmanni.*
Occurrence: Crete: Asteri 884. Rhodos: Kritika 8-9; Vasfi 34a.

Subfamily CYTHERIDEINAE Sars, 1925
Genus **Cyamocytheridea** Oertli, 1956

Type species: Bairdia punctatella Bosquet, 1852.
Diagnosis: Carapace more or less oval in lateral view. Surface smooth or pitted. Hinge antimerodont. Anterior vestibulum present.

Cyamocytheridea dertonensis Ruggieri (Pl. 5, figs. 1, 2)

Cyamocytheridea dertonensis Ruggieri, 1958, p. 131, textfigs. 9-15; Dieci & Russo, 1964b, p. 76, pl. 13, fig. 3.

Remarks: Our individuals correspond in outline with Ruggieri's species. The greatest height is situated behind the middle of the carapace. The lateral surface is covered with widely spaced pits. The species was originally described from the Tortonian of Piemont (Scrivia river).
Dimensions: L/H/B = 0.57/0.32/0.17 mm (male left valve), 0.65/0.36/0.19 mm (male right valve).
Occurrence: Crete: Tefeli 34; Barbara 36.

Genus **Cyprideis** Jones, 1857

Synonyms: Anomocytheridea Stephenson, 1938.
Toscanella Molinari, 1962.
Type species: Candona torosa Jones, 1850.
Diagnosis: Carapace ovate-reniform in lateral view. Lateral surface smooth or finely pitted. Hinge entomodont-like.

Cyprideis mehesi n. nom.

Cytheridea pannonica (Méhes) var. *tuberculata* Méhes, 1908 (non *Cytheridea tuberculata* Terquem,1878), p. 621, pl. 10, figs. 17-21.
Cyprideis tuberculata (Méhes), Kollmann, 1960, p. 161, pl. 13, figs. 7-14.

Remarks: A new name is proposed to replace Méhes' homonym. In our material larval valves may possess four or five nodes.

Originally described from the "Lower Pannonian" of Sopron (Durafalva), Budapest-Köhanya and Perematon in Hungaria.
Occurrence: Crete: Tefeli 1.

Cyprideis sp. cf. **C. sarmatica** Krstic (Pl. 5, fig. 3)

? *Cyprideis ruggierii* Decima, 1964, p. 115, pl. 10, figs. 4-7, pl. 11, figs. 1, 2, pl. 15, figs. 5-10.
cf. *Cyprideis (Cyprideis) sarmatica* Krstic, 1968a, p. 112, pl. 1, figs. 7-12.

Remarks: In the opinion of Dr. N. Krstic (Beograd), who kindly examined our material, the Cretan form differs from typical *C. sarmatica* by a somewhat larger size. *C. sarmatica* may be a junior synonym of *C. ruggierii* since shape and ornamentation are closely corresponding.

C. sarmatica was originally described from "Sarmatian" strata at Sopot near Beograd, Yugoslavia.

Dimensions: L/H/B = 0.80-0.83/0.43-0.48/0.30 mm (female valves).
Occurrence: Crete: Tefeli 1; ? Barbara 1b.

Cyprideis torosa torosa (Jones)

Candona torosa Jones, 1850, p. 27, pl. 3, fig. 6.
Cyprideis torosa (Jones), Wagner, 1957, p. 39, pl. 14; Kollmann, 1960, p. 160, textfig. 2a, pl. 3, fig. 1, pl. 12, figs. 1-5, 9, 11, pl. 13, figs. 5, 6, pl. 19, figs. 12, 13, 17, pl. 20, fig. 12; Decima, 1964, p. 117, pl. 11, figs. 3-8, pl. 12, figs. 1-8, pl. 15, figs. 11-15.

Remarks: A more extensive synonymy of this species has been given by Sandberg (1964, p. 91). In our material some valves, male as well as female, have a short spine at the posterodorsal angle. Only larval valves may show nodes on the surface.

This species was originally described from the Pleistocene and Recent of England.
Occurrence: Rhodos: Kritika 8-9.

Genus Cytheridea Bosquet, 1852

Type species: Cythere Muellerii von Muenster, 1830 (designation by Brady & Norman, 1889).
Diagnosis: Carapace ovate-subtriangular in lateral view. Lateral surface pitted. Hinge entomodont-like.

Cytheridea acuminata acuminata Bosquet (Pl. 5, fig. 4)

Cytherina Muelleri, Reuss, 1850 (non *Cythere Muellerii* von Muenster, 1830), p. 55, pl. 8, fig. 21.
Cytheridea Muelleri (von Muenster) var. *acuminata* Bosquet, 1852 (pars), p. 39, pl. 2, fig. 4.
Cytheridea (Cytheridea) acuminata Bosquet, Goerlich, 1952, p. 132, pl. 2, figs. 7-15, pl. 3,fig. 19.
Cytheridea acuminata Bosquet, Kollmann, 1960, p. 142, textfigs. 2b, c, 3c, pl. 5, figs. 11-16, pl. 6, figs. 15, 16.
Cytheridea acuminata acuminata Bosquet, Dieci & Russo, 1967, p. 13, pl. 3, fig. 5.

Remarks: All our specimens show more or less distinctly the presence of an obtuse angle before the middle of the dorsal margin and one posterodorsally. Type level and locality of this form are the "Tortonian" of Nussdorf (near Vienna) (see Goerlich, 1952, p. 132).
Occurrence: Crete: Apostoli 850; Tefeli 1, 34; Barbara 1b, 36.

Cytheridea acuminata neapolitana Kollmann (Pl. 5, fig. 5)

Cytheridea Muelleri, Terquem, 1878 (non *Cythere Muellerii* von Muenster, 1830), p. 125, pl. 14, fig. 19.

Cytheridea Muelleri, Mueller, 1894 (non *Cythere Muellerii* von Muenster, 1830), p. 362, pl. 39, figs. 3, 26, 28-34.
Cytheridea Muelleri, Neviani, 1928 (non *Cythere Muellerii* von Muenster, 1830), p. 68, pl. 1, figs. 45-47.
Cytheridea neapolitana Kollmann, 1960, p. 152, pl. 7, figs. 7-10.
Cytheridea muelleri, Dieci & Russo, 1964b (non *Cythere Muellerii* von Muenster, 1830), p. 76, pl. 12, fig. 14.
Cytheridea (Cytheridea) acuminata neapolitana Kollmann, Ruggieri, 1967b, p. 358, pl. 37, fig. 7.
Cytheridea neapolitana Kollmann, Masoli, 1968, p. 32, pl. 9, figs. 117-119.

Remarks: This form differs from the nominate by a regularly curved dorsal margin and lack of an obtuse posterodorsal angle, and by the slightly different arrangement of the pits on the lateral surface. Type locality is the Gulf of Naples.
Occurrence: Crete: Iraklion 46. Rhodos: Kritika 8-9.

Cytheridea paracuminata verrucosa Kollmann (Pl. 5, fig. 6)

Cytheridea paracuminata verrucosa Kollmann, 1960, p. 148, pl. 5, figs. 7-10; Russo, 1968a, p. 36, pl. 5, fig. 5.

Remarks: This form is well characterized by a small pustular elevation at the posteroventral angle. It was originally described from the Miocene "Lageniden-zone" of Flüssig (south of Graz) in eastern Austria.
Occurrence: Gavdos: Gavdos 341. Crete: Roka 105.

Subfamily CYTHERINAE Baird, 1850
Genus **Cnestocythere** Triebel, 1950

Type species: Cnestocythere lamellicosta Triebel, 1950.
Diagnosis: Carapace subquadrate in lateral view, with subdorsal caudal process. Lateral surface covered with some prominent longitudinal ridges with shorter ridges in between. Hinge antimerodont.

Cnestocythere lamellicosta Triebel (Pl. 5, fig. 7)

Cnestocythere lamellicosta Triebel, 1950, p. 317, pl. 1, figs. 1-8.

Remarks: Keij (1955, p. 133) regarded this form as conspecific with *C. truncata* (Reuss), with which opinion Ruggieri (1962b, p. 54) disagreed. Also in our opinion we are dealing with two distinct species because *C. lamellicosta* is characterized by a more elongate outline and thinner crests on the lateral surface.

This species was originally described from the "Tortonian" of the Vienna Basin (e.g. Nussdorf).
Occurrence: Crete: Kissamou 368; Apostoli 814, 850.

Cnestocythere trunctata (Reuss)

Cypridina truncata Reuss, 1850, p. 79, pl. 10, fig. 15.
Cnestocythere truncata (Reuss), Triebel, 1950, p. 319, pl. 2, figs. 9-11; Keij, 1955, p. 133, pl. 18, fig. 16; Ruggieri, 1962b, p. 54, pl. 6, figs. 10, 11; Dieci & Russo, 1964b, p. 61, pl. 10, fig. 1.

Remarks: Originally described from the "Tortonian" of the Vienna Basin (Kostel in Czechoslovakia and Grinzing near Vienna in Austria).
Occurrence: Crete: Apostoli 814, 850; Tefeli 34; Khairetiana 292; Barbara 1b, 36.

Subfamily LEPTOCYTHERINAE Hanai, 1957

Genus **Callistocythere** Ruggieri, 1953

Synonym: Cryptocythere Mandelstam, 1958.
Type species: Cythere littoralis Mueller, 1894.
Diagnosis: Carapace elongate-subrectangular or reniform in lateral view. Lateral surface reticulate, punctate to distinctly pitted, with foveoles or with numerous short ridges. Hinge entomodont, with two to four teethlets in the anteromedian hinge element of the left valve. Marginal pore canals branching.

Callistocythere antoniettae Ruggieri

Callistocythere antoniettae Ruggieri, 1967b, p. 367, textfigs. 26-29, pl. 37, figs. 2, 3.
Callistocythere (Callistocythere) antoniettae Ruggieri, Aruta, 1966, p. 4, textfig. 4, no. 5, pl. 1, fig. 2.

Dimensions: L/H = 0.46/0.25 mm.
Occurrence: Crete: Kissamou 368; Apostoli 814.

Callistocythere ennensis Ruggieri (Pl. 5, fig. 8)

Callistocythere ennensis Ruggieri, 1962b, p. 53, pl. 6, fig. 7; Dieci & Russo, 1964b, p. 59, pl. 9, fig. 9.

Remarks: Frequently, the median longitudinal ridge on the lateral surface is very prominent and more or less forming a cross with a pronounced subvertical ridge. The anteroventral margin may be without the usual papillate denticulation.

C. ennensis was originally described from the "Tortonian" of Enna (central Sicily).
Dimensions: L/H = 0.49/0.27-0.28 mm.
Occurrence: Crete: Tefeli 1, 34.

Callistocythere flavidofusca (Ruggieri)

Leptocythere flavidofusca Ruggieri, 1950b, p. 46, textfig. 31, pl. 1, figs. 6, 7.

Remarks: Both in lateral outline and in ornamentation our specimens resemble the figured holotype quite closely.

Originally described from the Pleistocene of Imola, northern Italy.

Dimensions: L/H = 0.53-0.54/0.30 mm.

Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2.

Callistocythere intricatoides (Ruggieri)

Leptocythere (Callistocythere) flavidofusca Ruggieri var. *intricatoides* Ruggieri, 1953b, p. 99, pl. 3, fig. 23, pl. 6, fig. 58.

Remarks: This form differs from *C. flavidofusca* (Ruggieri) in the more regular-reniform outline, less distinct ornamentation and especially in the presence of a broad and curved ridge near the posterior margin. It differs from *C. pallida* (Mueller) by a greater size, a more regular outline, the broad prominent ridge near the posterior margin and the convex appearance in dorsal view.

Originally described from the Pleistocene of the Regione Santoregna (Catanzaro Marina) in southern Italy.

Dimensions: L/H = 0.55/0.32 mm.

Occurrence: Crete: Khairetiana 292; Asteri 848-849, 884; Barbara 32. Karpathos: Pigadia 2. Rhodos: cf. Kritika 8-9.

Callistocythere pallida (Mueller)

Cythere pallida Mueller, 1894, p. 354, pl. 28, fig. 17.
Leptocythere (Callistocythere) pallida (Mueller), Ruggieri, 1953b, p. 102, pl. 3, fig. 24; Aruta, 1966, p. 4, pl. 1, fig. 4.
Callistocythere pallida (Mueller), Ruggieri, 1962b, p. 52, pl. 6, figs. 3, 4; Ruggieri, 1967b, p. 355, pl. 37, fig. 8.

Occurrence: Crete: Kissamou 368; Apostoli 814, 850; Tefeli 34; Khairetiana 292; Asteri 848-849, 884; Francocastello 817; ? Barbara 1b, 32; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Callistocythere rastrifera (Ruggieri)

Leptocythere (Callistocythere) rastrifera Ruggieri, 1953b, p. 100, pl. 3, fig. 25, pl. 4, figs. 28, 33, pl. 6, fig. 50.

Remarks: This species was originally described from Pleistocene terrace deposits of Calabria, southern Italy.

Dimensions: L/H = 0.46/0.24 mm (female valve), 0.47-0.48/0.22 mm (male valve).
Occurrence: Karpathos: Pigadia 2. Rhodos: cf. Kritika 8-9; Vasfi 34a.

Genus **Leptocythere** Sars, 1925

Type species: Cythere pellucida Baird, 1850.
Diagnosis: Carapace oblong in lateral view, thin-shelled. Lateral surface smooth, punctate or pitted. Hinge entomodont. Left valve hinge with one single, crenulate tooth in front of the median element. Marginal pore canals branching.

Leptocythere levis (Mueller)

Cythere levis Mueller, 1894, p. 357, pl. 27, fig. 31, pl. 28, figs. 11, 12.
Leptocythere macallana levis (Mueller), Ruggieri, 1950b, p. 44, textfig. 33, pl. 1, fig. 13.
Dimensions: L/H = 0.45/0.19 mm.
Occurrence: Rhodos: Lindos 34a.

Leptocythere muellerfabaeformis Puri

Cythere fabaeformis Mueller, 1894 (non *Cythere (Cytheridea) fabaeformis* Speyer, 1863), p. 356, pl. 27, fig. 35, pl. 29, figs. 11, 16.
Leptocythere fabaeformis (Mueller) (non *Cythere (Cytheridea) fabaeformis* Speyer, 1863), De Vos, 1957, p. 9, textfig. 3, pls. 11, 16; Kurc, 1961, p. 190, pl. 5, fig. 71; Masoli, 1968, p. 17, pl. 1, fig. 10, pl. 5, figs. 66-68.
Leptocythere muellerfabaeformis Puri, 1963, p. 373.
Dimensions: L/H = 0.42/0.22-0.23 mm.
Occurrence: Rhodos: Kritika 8-9.

Leptocythere multipunctata multipunctata (Seguenza) (Pl. 5, fig. 9)

Cythere multipunctata Seguenza, 1884, p. 29, pl. 1, fig. 9.
Leptocythere multipunctata (Seguenza), Ruggieri, 1950b, p. 52, pl. 1, figs. 8, 15; Pucci, 1953, p. 165, pl. 1, fig. 2.
Remarks: Originally described from "Calabrian" deposits of Rizzolo, near Syracusa on Sicily.
Dimensions: L/H = 0.40/0.20 mm.
Occurrence: Rhodos: Kritika 8-9; Vasfi 34a.

Leptocythere sp. cf. **L. sanmarinensis** Ruggieri

cf. *Leptocythere sanmarinensis* Ruggieri, 1967b, p. 365, textfigs. 25, 30-32, pl. 37, figs. 4, 5.

Remarks: Our few specimens have a more acuminate posterior end than the typical.

L. sanmarinensis was originally described from allochthonous Miocene strata of the Val Marecchia area (northern Apennines).
Dimensions: L/H = 0.45/0.22 mm.
Occurrence: Crete: Asteri 848-849.

Leptocythere tenera (Brady)

Cythere tenera Brady, 1868a, p. 399, pl. 28, figs. 29-32.
Leptocythere tenera (Brady), Sars, 1928, p. 175, pl. 80, fig. 2.
Leptocythere (Leptocythere) tenera (Brady), Ruggieri, 1953b, p. 97, pl. 3, fig. 22.

Remarks: Originally reported from Great Britain, the Bay of Biscay and from glacial deposits in Norway.
Dimensions: L/H = 0.40/0.20 mm.
Occurrence: Rhodos: Kritika 8-9; Vasfi 34a.

Subfamily TRACHYLEBERIDINAE Sylvester-Bradley, 1948
Genus **Acanthocythereis** Howe, 1963

Type species: Acanthocythereis araneosa Howe, 1963.
Diagnosis: Carapace subtriangular to subrectangular in lateral view. Lateral surface spinose and reticulate. Hinge holamphidont.

Acanthocythereis hystrix (Reuss)

Cypridina hystrix Reuss, 1850, p. 74, pl. 10, fig. 6.
Cythereis senticosa Baird, 1850b, p. 256, pl. 18, figs. 16-18.
Trachyleberis hystrix (Reuss), Ruggieri, 1952b, p. 95, pl. 9, fig. 5; Dieci & Russo, 1964b, p. 69, pl. 12, fig. 6.
Cythereis hystrix (Reuss), Ruggieri, 1953b, p. 65, pl. 1, fig. 2.
Trachyleberis (Trachyleberis) hystrix (Reuss), Ruggieri, 1962b, p. 18, pl. 1, fig. 21.

Remarks: In juvenile valves the reticulate ornamentation between the spines is lacking; the spines are relatively widely spaced. The distinct eye tubercle is provided with some groups of two or four fused papillae, which have a morphology similar to that of the top part of the normal spines, which are often subdivided into two to four prongs.

In adult individuals the spines are connected by a reticulation. The eye tubercle is now relatively large, the ornamentation with papillae has shifted to the periphery of the tubercle.

Cythereis senticosa Baird (1850) was originally described from Tenedos, off the west coast of Turkey.
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105; Apostoli 814, 850; Tefeli 1, 34; Khairetiana 292; Asteri 848-849, 884; Barbara 1b, 36. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Genus **Bosquetina** Keij, 1957

Type species: Cythere pectinata Bosquet, 1852.
Diagnosis: Carapace subtriangular or subtrapezoid in lateral view, triangular in rear view. Lateral surface smooth or finely punctate, with ventrolateral keel bearing one or more spines. Hinge weakly holamphidont.

Bosquetina carinella (Reuss)

Cypridina carinella Reuss, 1850, p. 76, pl. 10, fig. 10.
Cythere pectinata Bosquet, 1852, p. 113, pl. 6, fig. 1.
Cythere cordiformis Terquem, 1878, p. 102, pl. 11, fig. 12.
Cythere subtrigona Seguenza, 1880, p. 125, 193, pl. 8, fig. 2.
Cythere subtrigona var. *marginato-striata* Seguenza, 1880, p. 125, pl. 12, fig. 6.
Cythereis dentata Mueller, 1894, p. 379, pl. 32, figs. 23, 27, 31.
Bosquetina pectinata (Bosquet), Keij, 1957, p. 118, pl. 15, figs. 11-14.

Remarks: A more extensive synonymy of this species is given by Ruggieri (1962b, p. 45). This synonymy is here followed, although the type figure of *Cypridina carinella* Reuss shows a right valve with a posterior end, which is more broadly rounded than it is in our material or in that of the other enumerated species of our reference list.
Occurrence: Gavdos: Gavdos 336, 341. Crete: Apostoli 814, 850; Tefeli 34; Asteri 848-849, 884. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Bosquetina rhodiensis n. sp. (Pl. 6, figs. 1-3)

Etymology: named after the island of Rhodos.
Holotype: a right female valve.
Paratypes: 43 loose valves (including several larvae).
Type locality: Section Rhodos, exposure 34a.
Type level: Vasfi Formation (sample MUR 12), Lower Pleistocene.
Diagnosis: A species of the genus *Bosquetina,* characterized by a subtrapezoid lateral outline, a nearly smooth lateral surface and a sinuous ventrolateral keel with one prominent spine and some smaller ones on its posterior part.
Description: The carapace is subtrapezoid in lateral outline. The dorsal margin

is straight and oblique, the ventral margin straight or slightly convex. The anterior margin is broadly rounded, with the upper part somewhat oblique, the posterior margin straight and oblique, ventrally ending in a blunt point. The greatest height occurs at the anterior cardinal angle. Venter distinctly pronounced with a well developed, sinuous ventrolateral keel. This keel bears a sharp, pointed spine, followed posteriorly by three or four smaller ones. At the anterior end of the keel some small papillae are found. Along the lower part of the anterior margin several spines are present, most of them are very short, but some may be longer. At the posterior extremity some papillae are arranged along the margin. The lateral surface is smooth or finely pitted. In dorsal aspect the greatest width coincides with the position of the large spine.

Internal features are those of the genus. Sexual dimorphism is distinct. Females are relatively higher. Juveniles transparent and have a relatively short lateroventral keel bearing one single large spine at the posterior end.

Dimensions: L/H/B = 1.23/0.75/0.35 mm (holotype, right female valve), 1.15/0.68/0.36 mm (paratype, left female valve).

Remarks: Bosquetina rhodiensis differs from *B. carinella* (Reuss) and *B. dentata curta* Bassiouni (1962) by the subtrapezoid, relatively high carapace, and the sinuous ventrolateral keel. Both other taxa have a more elongated carapace with a regularly curved keel. *B. rhodiensis* has been reported as *B. carinella* from Le Castella section by Colalongo (1965, p. 91, pl. 11, fig. 2), since the figured left valve shows the same lateral outline and it possesses a sinuous ventrolateral keel.

Occurrence: Kapathos: Pigadia 2. Rhodos: Vasfi 34a; Lindos 34a.

Genus **Buntonia** Howe, 1935

Type species: Buntonia shubutaensis Howe, 1935.

Diagnosis: Carapace subtriangular to subelliptical in lateral view. Lateral surface entirely or partly ornamented with ridges, reticulate network, pits or papillae.

Remarks: Revisions of the genus *Buntonia* have been given by Howe (1947) and by Reyment & Elofson (1959). The latter authors concluded that *Semicythereis* Elofson (1943) is a junior synonym of *Buntonia*, and that *Protobuntonia* Grekoff (1954) has to be regarded as a subgenus. *Quasibuntonia* Ruggieri (1958) would differ from typical *Buntonia* species by the possession of a narrow anterior vestibulum, which in our opinion may be not such a good diagnostic feature for a separate genus or even subgenus (Reyment, 1963, p. 197). For the moment the genus is thought to comprise four subgenera, *Buntonia* s. str., *Protobuntonia* Grekoff (1954), *Quasibuntonia* Ruggieri (1958) and *Rectobuntonia* n. subgen.

Subgenus **Buntonia** Howe, 1935
Synonyms: Pyricythereis Howe, 1936
Semicythereis Elofson, 1943.
Diagnosis: Carapace roughly subtriangular in lateral view. Anterior marginal zone broad, with numerous pore canals. No anterior vestibulum.

Buntonia (Buntonia) giesbrechtii robusta Ruggieri (Pl. 6, fig. 4)

Buntonia giesbrechtii robusta Ruggieri, 1954, p. 563, figs. 20, 23, 30; van den Bold, 1966, p. 165, pl. 3, fig. 1.
Buntonia robusta Ruggieri, Uliczny, 1969, p. 111, pl. 18, fig. 5.

Remarks: The lateral surface bears two broad, prominent longitudinal ridges and numerous pits. The pits are largest at the inner side of the thickened ridge parallel to the anterior margin, along which they are arranged in two concentric rows.

Originally described from Castell' Arquato.
Occurrence: Crete: Asteri 848-849; Francocastello 817. Rhodos: Kritika 8-9.

Buntonia (Buntonia) sublatissima dertonensis Ruggieri (Pl. 6, fig. 6)

Buntonia sublatissima dertonensis Ruggieri, 1954, p. 565, figs. 25, 26, 32, 33; Dieci & Russo, 1964b, p. 75, pl. 12, fig. 12; van den Bold, 1966, p. 166, pl. 2, fig. 14.

Remarks: This form differs mainly from the nominate by the less coarse lateral ornamentation, in which prominent longitudinal ridges and large pits are absent.

Originally described from allochthonous "Tortonian" deposits of Romagna (Italy).
Occurrence: Gavdos: Gavdos 336. Crete: Kissamou 368.

Buntonia (Buntonia) sublatissima sublatissima (Neviani) (Pl. 6, fig. 7)

Cytheropteron latissimum, Capelli, 1905 (non *Cythere latissima* Norman, 1865), p. 328, pl. 10, fig. 50.
Cythere sublatissima Neviani, 1906, p. 198, fig. 8.
Buntonia giesbrechtii, Ruggieri, 1953b, (non *Cythereis giesbrechtii* Mueller, 1894), p. 29, 84, 140 (pars), pl. 1, fig. 9.
Buntonia sublatissima (Neviani), Ruggieri, 1954, p. 564, figs. 22, 24, 27, 29, 31.
Buntonia sublatissima sublatissima (Neviani), Medioli, 1960, p. 215, fig. 1.

Remarks: The ventrolateral surface bears two or three longitudinal ridges with rows of relatively large pits in between. The upper posterior part of the surface is less coarsely pitted.

This species was originally described from Post-Pliocene deposits of Carrubare (Calabria).

Occurrence: Crete: Asteri 848-849; Francocastello 817; Barbara 32. Rhodos: Kritika 8-9.

Subgenus **Quasibuntonia** Ruggieri, 1958

Synonym: Isobuntonia Apostolescu, 1961.
Type species: Cythere radiatopora Seguenza, 1880.
Diagnosis: Carapace as in *Buntonia* s. str., but with narrow anterior vestibulum.

Buntonia (Quasibuntonia) seguenziana (Ruggieri) (Pl. 6, fig. 5)

Quasibuntonia seguenziana Ruggieri, 1958, p. 138, figs. 5, 6, 7, 25.

Remarks: In most specimens the middle part of the lateral surface is smooth, but there is intergradation with individuals, the surface of which is coarsely punctate or reticulate all over. Originally described from the Pliocene of Vallone Zarucco (Sicily).
Occurrence: Crete: Asteri 848-849, 884.

Subgenus **Rectobuntonia** n. subgen.

Type species: Buntonia subulata subulata Ruggieri, 1954.
Etymology: the straight *Buntonia.*
Diagnosis: A subgenus of *Buntonia,* characterized by an elongate-subelliptical carapace.The lateral surface is virtually smooth, only at the posterior end small papillae, pits or faint ridges with minute puncta in between may be present. Hinge weakly developed, holamphidont. No anterior vestibulum.
Remarks: Both *Buntonia subulata* s. str. Ruggieri (1954) and *B. subulata rectangularis* Ruggieri (1954) are forms different from the type species of *Buntonia.* Both taxa are not triangular, but more elongate and rather elliptical in lateral view. The dorsal and ventral margins converge but slightly towards the posterior end, if at all. The carapaces are relatively thin-shelled, frequently transparent and polished. Typical *Buntonia* species, such as the type species *B. shubutaensis* Howe, *B. giesbrechtii* (Mueller) and *B. sublatissima* (Neviani) are more triangular in lateral outline, relatively thick-shelled and almost entirely ornamented with pits and longitudinal ridges.

Relative to *Rectobuntonia, Protobuntonia* is more strongly calcified and with distinctly converging dorsal and ventral margins. The same differentiation is valid for *Quasibuntonia* which moreover possesses an anterior vestibulum.

Also *B. posteropunctata* Moyes (1965) has to be placed in the new subgenus.

It possesses a subelliptical outline with nearly parallel sides and it is weakly ornamented on the posterior part of the lateral surface only.

Buntonia (Rectobuntonia) subulata subulata Ruggieri (Pl. 6, figs 8, 9)

Buntonia subulata subulata Ruggieri, 1954, p. 568, textfigs. 34-37.

Remarks: This form is often slightly sinuous in its dorsal and ventral margins. At the posterior end small papillae, faint ridges and puncta are found. *B. (R.) subulata rectangularis* Ruggieri (1954) is more rectangular, less elongate and has more pronounced ridgelets with adjoining minute puncta.

Originally described from the "Tortonian" of the Romagna (Italy).

Dimensions: L/H/B = 0.57/0.35/0.15 mm ((left valve), 0.55/0.31/0.13 mm (right valve).

Occurrence: Crete: Khairetiana 292; Asteri 848-849. Rhodos: Kritika 8-9.

Genus **Carinocythereis** Ruggieri, 1956

Type species: Cytherina carinata Roemer, 1838.

Diagnosis: Carapace subrectangular in lateral view. Valves with maximally four blade-like longitudinal ridges, which are often perforated. Surface between ridges covered with papillae and/or short spines. The longitudinal ridges may be strongly "reduced". Hinge hemiamphidont.

Remarks: Among the forms, referred by Ruggieri (1956) to his genus *Carinocythereis* several are now placed in the genus *Falunia* Grekoff & Moyes (1955). A recent review of the genera of this group has been given by Sissingh (1971).

Carinocythereis antiquata (Baird) (Pl. 6, fig. 10)

Cythereis antiquata Baird, 1850a, p. 176, pl. 20, fig. 2; Mueller, 1894, p. 374, pl. 29, figs. 18, 24, pl. 31, figs. 1, 5, 6.

Cythere antiquata (Baird), Brady, 1868a, p. 417, pl. 30, figs. 17-20; Brady, Crosskey & Robertson, 1874, p. 170, pl. 12, figs. 8-10.

Carinocythereis antiquata (Baird), Uliczny, 1969, p. 73, pl. 4, figs. 9, 10, pl. 16, fig. 5.

Remarks: This species was originally described from the Island of Skye, Scotland.

Occurrence: Rhodos: Kritika 8-9.

Carinocythereis bairdi Uliczny (Pl. 6, fig. 11)

Favella ? antiquata, Ruggieri, 1950b, (non *Cythereis antiquata* Baird, 1850), p. 23, pl. 1, fig. 1.

Cythereis antiquata, Kruit, 1955 (non *Cythereis antiquata* Baird, 1850), p. 484, pl. 5, fig. 8.

Carinocythereis carinata, Masoli, 1968 (non *Cytherina carinata* Roemer, 1838), p. 23, pl. 7, figs. 101, 102.
Carinocythereis bairdi Uliczny, 1969, p. 75, pl. 5, figs. 1-4, pl. 18, fig. 7.

Remarks: Carinocythereis antiquata (Baird) has a ventral marginal ridge, which passes without interruption into the ridge along the anterior margin. In *Carinocythereis bairdi* there is an interruption in the lower part of the comparable anterior ridge. At the place of this interruption a double row of spines is found. The ventrolateral ridge in *C. bairdi* continues parallel to the lower part of the marginal anterior ridge. Such a vertical extension is not found in *C. antiquata*. In this form the ventrolateral ridge ends in the anteroventral corner of the valve.
Occurrence: Rhodos: Kritika 8-9.

Carinocythereis carinata (Roemer) (Pl. 6, fig. 12)

Cytherina carinata Roemer, 1838, p. 518, pl. 5, fig. 28.
Cythereis senilis Jones, 1856, p. 37, pl. 3, fig. 8.
Cythere senilis (Jones), Terquem, 1878, p. 115, pl. 13, fig. 14.
Carinocythereis carinata (Roemer), Ruggieri, 1956, p. 165, textfig. 1; Ruggieri, 1962b, p. 32, pl. 3, figs. 8, 9; Uliczny, 1969, p. 76, pl. 16, fig. 6, pl. 18, fig. 6.

Remarks: The synonymy of *C. senilis* is after Uliczny (1969).

This species was originally described from the Pliocene of Castell' Arquato.
Occurrence: Crete: Apostoli 850; Asteri 848-849, 884; Francocastello 817; Barbara 32; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Vasfi 34a; Lindos 34a.

Carinocythereis meulenkampi n. sp. (Pl. 6, figs. 13, 14)

Etymology: named in honour of Dr. J. E. Meulenkamp, Utrecht, The Netherlands.
Holotype: a left valve.
Paratypes: 24 loose valves.
Type locality: Section Asteri, exposure 848-849.
Type level: Asteri Formation (sample 848-D), Lower Pliocene.
Diagnosis: A species of the genus *Carinocythereis*, characterized by the absence of a median ridge and possession of a dense cover of rounded papillae of variable size.
Description: Carapace subrectangular, relatively large. Dorsal margin straight, horizontal or slightly oblique. Ventral margin slightly convex. Anterior margin broadly rounded. Posterior margin truncate to obtusely angled. Along the ventral and anterior margin there is a broad keel, which is generally transversely ribbed and sometimes perforated. The keel is protruding well above the eye tubercle. Anterior margin with approximately 13 spines, most of them directed downward,

the more ventral ones are papillae-like. Posterior margin with 5-6 spines and some papillae. Only one blade-like ventrolateral ridge, sometimes with perforations. There is no median ridge, but on top of the subcentral tubercle a more or less distinct elongated spine may be found. The remaining lateral surface is densely covered with rounded papillae of different size. The eye tubercle is large and distinct. In dorsal view the valves have convex sides, with the greatest width at about ⅔ of the length from the anterior margin. The internal features are those of the genus.
Dimensions: L/H/B = 0.90/0.46/0.30 mm (holotype, left valve), 0.87/0.48/0.30 mm (paratype, right valve).
Remarks: This species differs from other *Carinocythereis* species by the numerous papillae of variable size on the lateral surface, and by the near-absence of longitudinal blade-like ridges.
Occurrence: Crete: Asteri 848-849, 884.

Genus **Cistacythereis** Uliczny, 1969

Type species: Cistacythereis cebrenidos Uliczny, 1969.
Diagnosis: Carapace subrectangular in lateral view. Surface ornamented with four ridges. Median ridge connected to a ridge parallel to the anterior margin. Interspaces between the ridges coarsely reticulate or pitted. Hinge holamphidont.
Remarks: This genus resembles *Carinocythereis* Ruggieri (1956) in lateral outline and hinge structure, but it differs strongly in ornamentation of the lateral surface. *Cistacythereis* seems to be related to *Falunia* Grekoff & Moyes (1955). Forms belonging to the latter genus are relatively more tapering to, and less truncate at the posterior end. The ornamentation is generally less pronounced in true *Falunia* species than it is in *Cistacythereis* (see also Sissingh, 1971).

Cistacythereis caelatura Uliczny (Pl. 7, fig. 1)

Cistacythereis caelatura Uliczny, 1969, p. 82, pl. 6, figs. 1-3, pl. 16, fig. 18.

Remarks: The longitudinal ridges are pronounced, especially the median ridge. The intercostal reticulation is also very distinct. Behind the ridge along the anterior margin two relatively large fossae are found.
Dimensions: L/H/B = 0.70/0.38/0.13 mm.
Occurrence: Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Cistacythereis sp. cf. **C. pokornyi hellenica** Uliczny (Pl. 7, fig. 2)

cf. *Cistacythereis pokornyi hellenica* Uliczny, 1969, p. 85, pl. 7, figs. 1, 2, pl. 16, fig. 10.

Remarks: Comparison with material from Cephalonia (Collection Uliczny) showed our specimens to have more pronounced longitudinal ridges.
Dimensions: L/H/B = 0.82/0.45/0.27 mm.
Occurrence: Crete: Asteri 848-849, 884.

Genus **Costa** Neviani, 1928

Synonym: Rectotrachyleberis Ruggieri, 1952.
Type species: Cytherina Edwardsii Roemer, 1838 (designation by Howe, 1955).
Diagnosis: Carapace subrectangular in lateral view. Surface with three longitudinal ridges. Median ridge often sloping to the anteroventral corner, sometimes with a downward curve at its posterior end, and never connected to the anterior marginal ridge. Interspaces commonly more or less reticulate. Hinge holamphidont.

Costa batei batei (Brady) (Pl. 7, fig. 3)

Cythereis batei Brady, 1866a, p. 384, pl. 40, fig. 8.
Cythere flagellum Terquem, 1878, p. 114, pl. 13, fig. 2.
Cythereis hamata Mueller, 1894, p. 373, pl. 29, fig. 19, pl. 31, figs. 14-16.
Cythere hamata (Mueller), Namias, 1900, p. 96, pl. 14, fig. 26.
Cythere fimbriata Capeder, 1900, p. 64, pl. 1, fig. 8.
Cythereis batei Brady, Ruggieri, 1953b, p. 67, pl. 1, fig.4.
Costa batei batei (Brady), Ruggieri, 1962a, p. 4, pl. 8, fig. 8.

Remarks: According to Van Morkhoven (1963, p. 200) this species should be placed in the subgenus *Rectotrachyleberis* Ruggieri, 1952. This subgenus is not accepted, because it is only based on the character of the lateral ornamentation.

C. batei batei (Brady) was originally described from the Levant.
Occurrence: Karpathos: Pigadia 2. Rhodos: Kritika 8-9; cf. Lindos 34a.

Costa edwardsii (Roemer) (Pl. 7, fig. 4)

Cytherina Edwardsii Roemer, 1838, p. 518, pl. 6, fig. 27.
Trachyleberis edwardsi (Roemer), Ruggieri, 1950b, p. 15, textfig. 4.
Costa edwardsii edwardsii (Roemer), Ruggieri, 1962a, p. 3, textfig. 1, pl. 8, figs. 1-5; Dieci & Russo, 1964b, p. 71, pl. 17, fig. 1.

Remarks: This species differs from *Costa reticulata* (Reuss, 1850) by the absence of a transverse ridge connecting the dorsal, median and ventral longitudinal ridges at the posterior end.

Originally *C. edwardsii* was described from Palermo on Sicily.
Occurrence: Gavdos: Gavdos 336, 341. Crete: Kissamou 368; Apostoli 814, 850; Asteri 884.

Costa punctatissima punctatissima Ruggieri (Pl. 7, fig. 5)

Cythere polytrema, Capelli, 1905 (non *Cythere polytrema* Brady, 1878), p. 315, pl. 9, fig. 22.
Costa punctatissima Ruggieri, 1962a, p. 7, pl. 8, figs. 10-12.
Costa punctatissima punctatissima Ruggieri, Uliczny, 1969, p. 88, pl. 7, fig. 3.

Remarks: This species is well characterized by the reticulate ornamentation with punctate sola.

Originally described from the Pliocene of Castell' Arquato.
Occurrence: Crete: Asteri 884; Francocastello 817.

Costa runcinata (Baird) (Pl. 7, fig. 6)

Cythere runcinata Baird, 1850b, p. 254, pl. 18, figs. 7-9.
Trachyleberis edwardsi padana Ruggieri, 1950b, p. 15, textfigs. 5, 6.
Costa edwardsii runcinata (Baird), Ruggieri, 1962a, p. 3, textfig. 2, pl. 8, fig. 6.

Remarks: This species differs from *C. edwardsii* (Roemer) by its less prominent longitudinal ridges and by a more regular reticulate ornamentation. Male valves possess a vertical sulcus, which extends from the dorsal margin to the area close to the ventral margin.

Originally described from Tenedos, off the west coast of Turkey.
Occurrence: Crete: Asteri 848-849, 884. Rhodos: Kritika 8-9; cf. Lindos 34a.

Costa sp. (Pl. 7, fig. 7)

Cythereis stimpsoni, Ruggieri, 1953b, (non *Cythere Stimpsoni* Brady, 1868), p. 68, pl. 2, fig. 13.
Costa ? tricostata (Reuss) subsp. indet. Ruggieri, 1962a, p. 6, pl. 8, fig. 13.

Remarks: Only a few loose adult valves of this form have been found. The valves have three well developed longitudinal ridges. The median one is not bent downwards at its posterior end. The interspaces are reticulate, the fossae are largest behind the ridge parallel to the anterior margin. Female valves are posteriorly less acuminate than those of males. Our individuals resemble in all essential features the forms Ruggieri described from Calabria (Catanzaro Marina).
Occurrence: Karpathos: Pigadia 2.

Genus **Echinocythereis** Puri, 1954

Type species: Cythereis garretti Howe & McGuirt, 1935.
Diagnosis: Carapace subquadrate or distinctly elongate in lateral view. Lateral surface smooth or pitted covered with short spines or papillae, which may be superimposed on a reticulation pattern. Hinge holamphidont.

Remarks: The genus *Echinocythereis* is thought to comprise two subgenera *Echinocythereis* s. str. and *Rhodicythereis* n. subgen.

Subgenus **Echinocythereis** Puri, 1954

Diagnosis: Carapace subquadrate in lateral view. Lateral surface smooth or pitted, ornamented with spines or papillae arranged in concentric rows and often superimposed on a reticulation network.

Echinocythereis (Echinocythereis) scabra (von Muenster)

Cythere scabra von Muenster, 1830, p. 63.
Cytherina scabra (von Muenster), Roemer, 1838, p. 516, pl. 6, fig. 9.
Trachyleberis scabra (von Muenster), Keij, 1955, p. 129, pl. 19, fig. 1.
Echinocythereis scabra (von Muenster), Keij, 1957, p. 104, pl. 15, fig. 2, pl. 17, figs. 9, 10; Oertli, 1956, p. 80, pl. 10, figs. 278-280.

Remarks: Larval valves are reticulate; the muri sometimes consist of minute papillae arranged in rows.

Originally described from the Upper Oligocene of Astrup (Germany) and the Lower Miocene of Bordeaux (France).
Occurrence: Crete: Asteri 848-849, 884; Barbara 32. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Subgenus **Rhodicythereis** n. subgen.

Type species: Echinocythereis (Rhodicythereis) ruggierii n. sp.
Etymology: Cythereis from Rhodos.
Diagnosis: A subgenus of *Echinocythereis,* characterized by a distinctly elongate carapace with near-parallel dorsal and ventral margins. Lateral surface smooth, delicately reticulate or regularly covered with numerous papillae. Bigger marginal spines are lacking.
Remarks: Species assigned to this new subgenus differ from typical *Echinocythereis* by a distinctly more elongate carapace, which is in dorsal view less inflated. In *Rhodicythereis* the ventral margin is straight and not convex as in *Echinocythereis* s. str.
Close resemblance exists between both groups in internal features, such as the presence of a similar heavily developed holamphidont hinge and a muscle scar pattern consisting of four elongate adductor scars with two rounded scars in front.

The new subgenus is proposed for a new species from Rhodos, another from the Pliocene of Crete left in open nomenclature, and for *Cythere favoides* Brady (1868).

Echinocythereis (Rhodicythereis) ruggierii n. sp. (Pl. 4, fig. 10, Pl. 7, figs. 8-10)

Etymology: named in honour of Prof. G. Ruggieri, Palermo, Italy.
Holotype: a right valve.
Paratypes: 6 valves (including a complete carapace).
Type locality: Section Rhodos, exposure 34a.
Type level: Vasfi Formation (sample MUR 13), Lower Pleistocene.
Diagnosis: A species belonging to *Rhodicythereis*, characterized by its completely smooth lateral surface.
Description: Carapace subrectangular-elongate in lateral outline. Dorsal and ventral margins subparallel to very slightly converging. Anterior margin broadly rounded. Posterior margin obliquely rounded, somewhat pointed near the middle. Greatest height at the place of the eye tubercle. Surface of valves smooth. Eye tubercle pronounced. Along the lower part of the anterior and posterior margins there are several small papillae. Greatest width at about in the middle, hardly increasing towards the posterior end. Muscle scar pattern consisting of four elongate scars with two scars in front. Both lowermost adductor scars are fused. The upper frontal scar more or less circular in outline, the lower one rather bean-shaped. All these scars are clearly visible at the outer surface, just as two relatively large mandibular scars and some small dorsal scars. Marginal pore canals numerous at the anterior and posterior end. Hinge typically holamphidont.
Dimensions: L/H/B = 1.80/0.51/0.25 mm (holotype, right valve), 1.85/0.52/0.42 mm (paratype, complete carapace).
Remarks: This species is easily differentiated from the reticulate *Cythere favoides* Brady and the papillate *Echinocythereis (R.)* sp. by its smooth and polished lateral surface.
Occurrence: Rhodos: Vasfi 34a.

Echinocythereis (Rhodicythereis) sp. (Pl. 7, fig. 11)

Remarks: This form is ornamented with small papillae, which in the anterior part of the valve are more or less connected to form faint ridges parallel to the anterior margin.
Dimensions: L/H/B = 1.05/0.50/0.28 mm.
Occurrence: One single right valve of an adult specimen has been found in sample 778-A from the Dhramia Formation, Rethymnon Province, Crete (see Meulenkamp, 1969, p. 38). The age of this formation is thought to be Pliocene.

Genus **Falunia** Grekoff & Moyes, 1955

Type species: Falunia girondica Grekoff & Moyes, 1955.

Diagnosis: Carapace subrectangular in lateral view, posterior end truncate to subacuminate. Lateral surfaces with dorsal, median and ventrolateral, longitudinal ridges. One or more of these ridges may be lacking or hardly developed. Interspaces between the ridges smooth, pitted, reticulate or with short longitudinal ridges. Hinge hemiamphidont or entomodont.
Remarks: The genus is thought to comprise two subgenera, *Falunia* s. str. and *Hiltermannicythere* Bassiouni, 1970. The subgenus *Falunia* is not a very homogeneous group (see Sissingh, 1971).

Subgenus **Falunia** Grekoff & Moyes, 1955

Diagnosis: Carapace subrectangular, posteriorly truncate. Lateral surface without prominent longitudinal ridges. Hinge entomodont.

Falunia (Falunia) plicatula (Reuss) (Pl. 7, fig. 12)

Cypridina plicatula Reuss, 1850, p. 84, pl. 10, fig. 23.
Cythere clavigera Capeder, 1900, p. 62, pl., fig. 3.
Cythereis plicatula (Reuss), Keij, 1955, p. 125, pl. 17, fig. 18, pl. 20, fig. 3.
Falunia plicatula (Reuss), Keij, 1957. p. 114, pl. 9, fig. 6, pl. 12, fig. 8; Dieci & Russo, 1964b, p. 70, pl. 12, fig. 9.

Remarks: Although reported to be a common species in Miocene strata in Europe, it was but rarely encountered in our Miocene material.
Occurrence: Gavdos: Gavdos 341. Crete: Roka 105; Kissamou 368.

Falunia (Falunia) sphaerulolineata (Jones) (Pl. 7, fig. 13)

Cythere sphaerulolineata Jones, 1856, p. 36, pl. 3, fig. 6.
Cythereis sphaerulolineata (Jones), Kuiper, 1918, p. 55, pl. 3, fig. 22.
Falunia girondica Grekoff & Moyes, 1955, p. 332, textfig. 1, pl. 19, figs. 1, 2.
Falunia sphaerulolineata (Jones), Moyes, 1965, p. 65, pl. 6, fig. 12; Carbonnel, 1969, p. 117, pl. 5, fig. 21, pl. 13, fig. 9.

Remarks: Our individuals agree especially well with those figured by Carbonnel (1969) from the Upper Miocene of the Rhone Basin.
Type level of this species is the "Crag of Suffolk" (Pliocene), England.
Dimensions: L/H/B = 0.92/0.47/0.20 mm.
Occurrence: Crete: Asteri 848-849, 884. Rhodos: Vasfi 34a.

Falunia (Falunia) sp. aff. **F. stellata stellata** (Capeder) (Pl. 7, fig. 14)

aff. *Cytheridea stellata* Capeder, 1902, p. 17, pl., fig. 37.
aff. *Falunia stellata stellata* (Capeder), Ruggieri, 1967b, p. 358, textfigs. 10, 11, pl. 37, fig. 1.

Remarks: Only one complete carapace and nine loose valves were found, which all seem to be juvenile. The lateral surface of these specimens is densely covered with puncta, which tend to a hexagonal outline. A narrow ventrolateral keel is present. Along the anterior and posterior margins up to eight small and four larger spines were found respectively. According to Ruggieri (1967b, p. 359) valves of adults are almost smooth. The juvenile character of our material prevents a more definite determination.

Originally described from the Scrivia valley (northern Italy).
Occurrence: Crete: Khairetiana 292.

Subgenus **Hiltermannicythere** Bassiouni, 1970

Type species: Cythereis quadridentata Baird, 1850.
Diagnosis: Carapace relatively elongate, posterior end tapering. Three longitudinal ridges are often present. Hinge hemiamphidont.
Remarks: The specimens figured as *F. (H.) quadridentata* (Baird) by Bassiouni (1970, pl. 1, figs. 1-3, pl. 2, figs. 5-8) do not belong to this species because longitudinal slits in the lateral surface are lacking. The individuals had best be referred to *Cythereis turbida* Mueller (1894), the lateral surface of which is covered with rounded pits. *F. turbida* is therefore not a junior synonym of *F. quadridentata* (Baird) as suggested by Bassiouni.

Falunia (Hiltermannicythere) cephalonica Uliczny (Pl. 7, fig. 15)

Cythere quadridentata (Baird), Brady, 1868a (pars), p. 413, pl. 31, figs. 23-27 (non pl. 31, figs. 19-22).
Falunia cephalonica Uliczny, 1969, p. 93, pl. 8, fig. 2, pl. 17, fig. 4.

Remarks: Most of our specimens have a regular ornamentation of the lateral surface, consisting of many low costules with small, longitudinally elongated pits in between. Towards the anterior and posterior margins the pits are larger and subquadrate in outline. Distinct longitudinal ribs are lacking. Our specimens of this species show a pronounced sexual dimorphism. Males are more elongate and less high. *F. scitula* Aruta (1966) described from the Upper Miocene of Calatafimi (Sicily), differs mainly from *F. cephalonica* by a less regular ornamentation of the central region and by the lack of larger pits near the anterior and posterior margins.
Dimensions: L/H/B = 0.82/0.42/0.25 mm (female valve), 0.78-0.85/0.39-0.41/0.19-0.20 mm (male valve).
Occurrence: Crete: Roka 105; Kissamou 368; Apostoli 814, 850; Asteri 848-849, 884; Barbara 32, 36. Karpathos: Pigadia 2.

Falunia (Hiltermannicythere) quadridentata (Baird) (Pl. 7, fig. 16)

Cythere quadridentata Baird, 1850a, p. 173, pl. 21, fig. 2; Brady 1868a, (pars), p. 413, pl. 31, figs. 19-22 (non pl. 31, figs. 23-27).
Falunia quadridentata (Baird), Uliczny, 1969, p. 97, pl. 8, fig. 5, pl. 17, fig. 6.

Remarks: This species differs from the preceding one mainly by the presence of pronounced median and ventrolateral ridges. Our individuals are smaller than the type specimens of Baird, which have a length of 1.2 mm (Ascoli in Neale, 1969, p. 411), but they are of the same size as those of Uliczny (1969).

Originally reported from off the coast of England and Scotland.
Dimensions: L/H/B = 0.80/0.40/0.19 mm.
Occurrence: Crete: Asteri 848-849. Karpathos: Pigadia 2.

Falunia (Hiltermannicythere) retifastigata (Jones) (Pl. 7, figs. 17, 18)

Cythere retifastigata Jones, 1856, p. 36, pl. 3, fig. 7.
Cythere plicatula, Brady, 1866a (non *Cyprideis plicatula* Reuss, 1850), p. 374, pl. 60, fig. 1.
Cythereis rubra Mueller, 1894, p. 372, pl. 28, figs. 21, 26, pl. 31, figs. 2, 3.
Falunia retifastigata (Jones), Uliczny, 1969, p. 98, pl. 5, fig. 9.

Remarks: We included specimens in which the posterior ends of the median and ventrolateral ridge are not connected by a short transverse ridge. One single (typical) specimen is very large, reaching a length of 0.95 mm and a height of 0.52 mm. Between the longitudinal ridges larval valves possess a reticulation with some pitted sola.

Originally described from the "Crag of Suffolk" (England).
Dimensions: L/H/B = 0.80/0.40/0.19 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Falunia (Hiltermannicythere) rugosa (Costa) (Pl. 7, fig. 19)

Cytherina rugosa Costa, 1853, p. 184, pl. 16, fig. 12.
Falunia rugosa (Costa), Uliczny, 1969, p. 100, pl. 8, figs. 6, 7, pl. 17, figs. 7, 8.

Remarks: The reticulate ornamentation tends to be composed of hexagonal fossae. Sexual dimorphism is distinct in this species. Males are more elongate than females.

Originally described from deposits exposed near Naples.
Dimensions: L/H/B = 0.75/0.42/0.20 mm (female valve), 0.77/0.38/019 mm (male valve).
Occurrence: Crete: Asteri 848-849, 884.

Falunia (Hiltermannicythere) zibinica (Dieci & Russo) (Pl. 7, fig. 20)

Carinocythereis zibinica Dieci & Russo, 1964a, p. 14, pl. 2, fig. 1, pl. 4, fig. 1; Dieci & Russo, 1964b, p. 70, pl. 11, fig. 9, pl. 15, fig. 2, pl. 17, fig. 3.

Remarks: Probably the figures given by Dieci & Russo (1964a, b) represent valves of female individuals. In our material relatively elongate valves predominate, which may be ascribed to male individuals. The longitudinal ridges are never prominent.

Originally described from the "Tortonian" of the Rio delle Bagole (northern Italy).

Dimensions: L/H/B = 0.70/0.38/0.17 mm (female valve), 0.72/0.32/0.15 mm (male valve).

Occurrence: Gavdos: Gavdos 336.

Genus **Henryhowella** Puri, 1957

Synonym: Howella Puri, 1956 (preoccupied).

Type species: Cythere evax Ulrich & Bassler, 1904.

Diagnosis: Carapace subrectangular in lateral view, with three longitudinal plications. Lateral surface covered with spines superimposed on reticulation. Hinge holamphidont.

Henryhowella asperrima asperrima (Reuss)

Cypridina asperrima Reuss, 1850, p. 74, pl. 10, fig. 5.

Henryhowella asperrima (Reuss), van den Bold, 1960, p. 169, pl. 4, fig. 10, pl. 8, fig. 2; Ruggieri, 1962b, p. 18, pl. 11, figs. 16-19; Dieci & Russo, 1964b, p. 73, pl. 11, fig. 7; Colalongo, 1965, p. 93, pl. 11, figs. 3-8.

Henryhowella ruggierii Oertli, 1961, p. 28, pl. 4, figs. 39-45; Russo, 1964, p. 243, pl. 45, fig. 3.

Remarks: The nominate subspecies seems to differ from *Henryhowella asperrima echinata* (Reuss) (= *Cypridina echinata* Reuss, 1851, non *Henryhowella echinata* Puri, 1956) by the typical papillate-reticulate ornamentation, while real spines seem to be absent in the latter (see Keij, 1957, p. 91).

Variation in ornamentation as well as in shape is very wide in *H. asperrima asperrima*. Ruggieri (1962b, p. 91) distinguished two types: a "forma piccola" and a "forma grande". The second form would be identical with *H. ruggierii* Oertli (1961). On the basis of measurements performed by Colalongo (1965, p. 96) both forms seem to intergrade and consequently we consider *H. ruggierii* to be a junior synonym. Also on the basis of the type of ornamentation both groups seem to be hardly distinguishable, if at all.

Occurrence: Gavdos: Gavdos 341. Crete: Kissamou 105, 368; Apostoli 814, 850;

Asteri 848-849, 884; Francocastello 817; Barbara 32. Karpathos: Pigadia 2. Rhodos: Vasfi 34a.

Genus **Incongruellina** Ruggieri, 1958

Type species: Incongruellina semispinescens Ruggieri, 1958.
Diagnosis: Carapace subtriangular to subtrapezoid in lateral view, mostly with a broad ventrolateral keel. Lateral surface smooth. Hinge holamphidont.
Remarks: The genus is thought to comprise two subgenera, *Incongruellina* s. str. and *Lixouria* Uliczny, 1969.

Subgenus **Incongruellina** Ruggieri, 1958

Diagnosis: Anteriorly and posteroventrally a distinct vestibulum. Accomodation groove present. Left valve strongly overlaps right one.

Incongruellina (Incongruellina) semispinescens Ruggieri (Pl. 5, fig. 10)

Incongruellina semispinescens Ruggieri, 1958, p. 140, figs. 3, 3a, 4, 8, 28-30.
Remarks: I. semispinescens was originally described from "Calabrian" deposits of Caltagirone (Sicily).
Dimensions: L/H/B = 0.75/0.50/0.25 mm (left valve), 0.75/0.42/0.25 mm (right valve).
Occurrence: Crete: Asteri 884. Rhodos: Kritika 8-9; Vasfi 34a.

Subgenus **Lixouria** Uliczny, 1969

Type species: Cythereis unicostulata Kuiper, 1928.
Diagnosis: Only a small anteroventral vestibulum, or none at all; posteroventral vestibulum lacking. Accomodation groove absent. The left valve overlaps the right one but slightly.
Remarks: According to the original diagnosis vestibula are completely lacking in this subgenus. Uliczny considered *Ruggieria carinata* Moyes (1965) to be a junior synonym of the type species *Cythereis unicostulata* Kuiper (1928). However, the individuals of Uliczny from Cephalonia are identical with Moyes species, but different from *Cythereis unicostulata* (see below). Both our Mediterranean species are probably not consubgeneric with the type species of *Lixouria.* As stated in the original description of Moyes' form, a shallow vestibulum may occur anteroventrally, which presence we also observed in part of our own specimens. Consequently, it appears that the presence or absence of such an anterior

vestibulum in *Incongruellina* is not of subgeneric value, as this difference occurs within the range of variation of a single species.

Incongruellina (Lixouria) keiji n. sp. (Pl. 5, fig. 14)

Etymology: named in honour of Dr. A. J. Keij, Rijswijk, The Netherlands.
Holotype: a right valve.
Paratypes: 6 valves (including one complete carapace).
Type locality: Section Asteri, exposure 848-849.
Type level: Asteri Formation (sample 849-C), Lower Pliocene.
Diagnosis: A species of the subgenus *Lixouria*, characterized by a distinct ventrolateral keel, which ends in a long and pointed spine, projecting sidewards.
Description: Carapace subtrapezoid in lateral view. Dorsal margin straight, ventral margin slightly convex. Anterior and posterior margins obliquely rounded. Ventrolateral keel triangular in dorsal view, ending in a relatively long and outward pointed spine of approximately 0.1 mm length. The anterior margin is bordered by 9-13 small spines. Two or three small spines are situated at the posteroventral angle. The lateral surface is smooth and polished, the eye tubercle rather distinct. Muscle scar pattern consisting of four adductor scars and a frontal scar composed of one relatively large spot coalescing with a smaller one. Marginal pore canals are numerous.
Dimensions: L/H/B (excluding spine) = 0.85/0.43/0.35 mm (holotype), 0.78-0.81/0.42-0.45/0.32 mm (paratypes).
Remarks: This species differs from the preceding in the ventrolateral keel ending in a stout spine, directed sidewards.
Occurrence: Crete: Apostoli 814; Asteri 848-849, 884. Rhodos: Kritika 8-9.

Incongruellina (Lixouria) marginata (Terquem) (Pl. 5, figs. 11-13)

Cythere marginata Terquem, 1878, p. 106, pl. 12, fig. 7.
Cythere testudo Namias, 1900, p. 104, pl. 15, figs. 14, 15.
Ruggieria carinata Moyes, 1965, p. 91, pl. 11, figs. 10-12.
Incongruellina (Lixouria) unicostulata, Uliczny, 1969 (non *Cythereis unicostulata* Kuiper, 1928), p. 107, pl. 9, figs. 2-4, pl. 18, fig. 2.
Ruggieria (Keija) (sic) carinata carinata Moyes, Carbonnel, 1969, p. 128, pl. 16, figs. 5-8.

Remarks: Kuiper (1928, p. 65) based *Cythereis unicostulata* on two loose valves, one left and one right valve. Comparison of our form with Kuiper's original material showed that *C. unicostulata* is smaller in size, relatively higher and that it has a relatively long and straight dorsal margin. Its posterior margin is not obliquely but evenly rounded. The longitudinal ridge is less well developed and placed relatively higher above the ventral margin. Also in internal features dif-

ferences with *I. marginata* could be observed, i.e. the number of anterior marginal pore canals in *C. unicostulata* is smaller. Part of the specimens available from the Tsoutsouras Formation on Crete (Zachariasse, in prep.) have a ventrolateral keel ending in a short, blunt spine. Similar types were figured by Namias (1900) and by Carbonnel (1969, pl. 16, figs. 6, 7).
Dimensions: L/H/B = 0.92/0.52/0.25 mm.
Occurrence: Crete: Asteri 848-849. Rhodos: Kritika 8-9.

Genus **Occultocythereis** Howe, 1951

Type species: Occultocythereis delumbata Howe, 1951.
Diagnosis: Carapace subrectangular in lateral view, strongly compressed in dorsal view. Lateral surface with a prominent elevation at the posterior cardinal angle, a longitudinal ridge along the dorsal margin and posteroventrally a wing-like projection. Hinge holamphidont.

Occultocythereis dohrni Puri

Cythereis lineata Mueller, 1894 (non *Cythereis triplicata* (Roemer) var. *lineata* Chapman & Sherborn, 1893), p. 377, pl. 29, figs. 21, 26, pl. 31, figs. 25-30, 33.
Occultocythereis bituberculata, Ruggieri, 1953b, (non *Cypridina bituberculata* Reuss, 1850), p. 82, pl. 1, fig. 3; Ruggieri, 1962b, p 20, pl. 1, fig.20; Dieci & Russo, 1964b, p. 73, pl. 12, fig. 8.
Occultocythereis lineata (Mueller), Triebel, 1961, p. 214, pl. 4, fig. 29, pl. 5, figs. 30-32.
Occultocythereis dohrni Puri, 1963, p. 373.

Remarks: Measurements of adult valves of both sexes show that all our individuals are smaller than the specimens of O. *bituberculata* (Reuss) from the "Tortonian" of Nussdorf (Vienna Basin) (Triebel, 1961, p. 214). Triebel reported for females a length of 0.62-0.66 mm and for males a length of 0.65-0.69 mm. Our female individuals never exceed a length of 0.60 mm and males are maximally 0.63.

It seems all Italian individuals referred to O. *bituberculata* are also shorter than the Austrian forms (see Ruggieri, 1953b, 1962b, and Dieci & Russo, 1964b). As to dimensions all Mediterranean individuals agree better with *Cythereis lineata* Mueller. Triebel stated that female valves of *Occultocythereis lineata* are shorter than those of O. *bituberculata* and are less rounded anteriorly. Dorsal and ventral margins of Mueller's species are also less converging. In females the dorsal ridge is sinuous. In males this ridge is straighter. The ventral ridge bifurcates at the posterior end. All these features occur often in our individuals. For this reason our form is referred to Mueller's species, for which Puri (1963) introduced the new name O. *dohrni,* since the original name is preoccupied.

Our measurements indicate an increase in length during time. The largest specimens occur in the Kritika and Vasfi Formation.
Dimensions: Pigadia and Vasfi Formations: L/H = 0.59-0.60/0.30-0.33 mm (female valves), 0.60-0.63/0.32-0.33 mm (male valves). Remaining formations: L/H = 0.50-0.53/0.26-0.30 mm (female valves), 0.56-0.58/0.26-0.30 mm (male valves).
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105; Kissamou 368; Apostoli 814, 850; Tefeli 1, 34; Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Vasfi 34a.

Genus **Pterygocythereis** Blake, 1933

Type species: Cythereis Jonesii Baird, 1850.
Diagnosis: Carapace subrectangular with prominent alae. Lateral surface smooth, with spines or ridges. Hinge holamphidont or hemiamphidont.
Remarks: The genus is thought to comprise two subgenera, *Pterygocythereis* s. str., and *Pterygocythere* Hill, 1954.

Subgenus **Pterygocythereis** Blake, 1933

Synonyms: Fimbria Neviani, 1928 (preoccupied).
Diogmopteron Hill, 1954.
Diagnosis: Characterized by the presence of a holamphidont hinge.

Pterygocythereis (Pterygocythereis) ceratoptera (Bosquet) (Pl. 8, fig. 1)

Cythere ceratoptera Bosquet, 1852, p. 114, pl. 6. fig. 2.
Cythereis Jonesii, Mueller, 1894 (non *Cythereis Jonesii* Baird, 1850), p. 375, pl. 29, figs. 23, 25, pl. 31, figs. 23, 24.
Pterygocythereis ceratoptera (Bosquet), Oertli, 1956, p. 86, pl. 11, figs. 299-301, pl. 16, figs. 402, 403; Witt, 1967, p. 34, pl. 2, fig. 5.

Remarks: Originally described from Basele (near Rupelmonde) and Berg (near Tongeren) in Belgium, and from Etampes in the Paris Basin.
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105. Rhodos: Kritika 8-9; Lindos 34a.

Pterygocythereis (Pterygocythereis) jonesii (Baird) (Pl. 8, fig. 2)

Cythereis Jonesii Baird, 1850a, p. 175, pl. 20, fig. 1.
Cythere Jonesii (Baird), Brady, 1868a, p. 418, pl. 30, figs. 13-16; Capeder, 1900, p. 65, pl. 1, fig. 12.
Cythere Jonesii (Baird) var. *ceratoptera,* Capeder, 1900 (non *Cythere ceratoptera* Bosquet, 1852), p. 65, pl. 1, fig. 13.

Pterygocythereis jonesii (Baird) *ceratoptera,* Ruggieri, 1950b (non *Cythere ceratoptera* Bosquet, 1852), p. 26, pl. 1, fig. 10.
Pterygocythereis jonesii (Baird), Hill, 1954, p. 809, pl. 98, fig. 1, pl. 99, fig. 1; Kruit, 1955, p. 484, pl. 5, fig. 6.

Remarks: In our material we found a single adult specimen (from the Vasfi Formation) with scattered spines on the lateral surface.

P. jonesii was originally described from the Island of Skye, Scotland.
Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Genus **Ruggieria** Keij, 1957

Type species: Cythere michelinia Bosquet, 1852.
Diagnosis: Carapace subovate or subrectangular in lateral view, sometimes with an upturned posterior end. Anterior and posterior ends with marginal spines. Lateral surface partly or entirely reticulate, pitted and/or with longitudinal ridges. Hinge holamphidont or hemiamphidont. Vestibulum may be present.
Remarks: The genus is thought to comprise two subgenera: *Ruggieria* s. str. and *Keijella* Ruggieri, 1967. The latter subgenus was erected to separate *Ruggieria hodgii* (Brady) (=*Cythere hodgii* Brady, 1866). This species differs from true *Ruggieria* species by the presence of an anterior vestibulum. This diagnostic feature seems not sufficient to distinguish a subgenus, but some slight differences in hinge structure between both subgenera are observable as well (see Ruggieri, 1967b, textfig. 21).

Subgenus **Ruggieria** Keij, 1957

Diagnosis: No anterior vestibulum present. Hinge holamphidont.

Ruggieria (Ruggieria) tetraptera tetraptera (Seguenza)

Cythere tetraptera Seguenza, 1880, p. 125, pl. 12, fig. 9.
Ruggieria tetraptera tetraptera (Seguenza), Ruggieri, 1962b, p. 47, pl. 5, figs. 11-13; Ruggieri, 1963, p. 11, textfigs. 7-9, pl. 1, fig. 1; Dieci & Russo, 1964b, p. 68, pl. 11, fig. 6; Ruggieri, 1967b, p. 361, textfigs. 17-20.

Remarks: Ruggieria (Ruggieria) tetraptera angustata (Seguenza, 1880), characterized by some accessory longitudinal ridges, is lacking in our material.

R. tetraptera tetraptera was originally described from the Miocene of Benestare, Calabria.
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105; Kissamou 368; Apostoli

814, 850; Tefeli 1, 34; Asteri 848-849, 884; Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Subgenus **Keijella** Ruggieri, 1967

Type species: Cythere hodgii Brady, 1866.
Diagnosis: Anterior vestibulum present. Hinge hemiamphidont.

Ruggieria (Keijella) hodgii (Brady) (Pl. 8, fig. 3)

Cythere hodgii Brady, 1866a, p. 373, pl. 59, fig. 3.
Cythere punctigibba Capeder, 1902, p. 14, pl., fig. 26.
Ruggieria (Keijella) hodgii (Brady), Ruggieri, 1967b, p. 362, textfigs. 21-23.

Remarks: Originally described from the Levant.
Dimensions: L/H/B = 0.75/0.41/0.23 mm.
Occurrence: Crete: Barbara 36.

Subfamily HEMICYTHERINAE Puri, 1953

Genus **Aurila** Pokorny, 1955

Synonym: Auris Neviani, 1928 (preoccupied).
Type species: Cythere convexa Baird, 1850.
Diagnosis: Carapace ear-shaped to subtriangular in lateral view. Surface smooth, pitted or reticulate. A ventrolateral keel may be present. Hinge holamphidont.

Aurila albicans (Ruggieri) (Pl. 8, fig. 4)

Mutilus (Aurila) albicans Ruggieri, 1958, p. 133, textfigs. 1, 2, 16-19, 20, 21, 26, 27 Dieci & Russo, 1964b, p. 62, pl. 10, fig. 4.

Remarks: A. albicans is characterized by a strongly convex dorsal margin and a ventrally rather straight carapace, so that the lateral outline is often strikingly triangular. The lateral surface is finely punctate. The lower part of the anterior margin and the subventral caudal process are smooth or spinose.

Originally described from the Upper Miocene ("Sahelian") of the Republic of San Marino.
Dimensions: L/H/B = 0.97/0.67/0.27 mm.
Occurrence: Gavdos: Gavdos 336, 341. Crete: Roka 105; Apostoli 814, 850; Tefeli 1, 34; Barbara 36.

Aurila aspidoides Uliczny (Pl. 8, fig. 5)

Aurila aspidoides Uliczny, 1969, p. 16, pl. 1, figs. 3, 4, pl. 10, figs. 4, 5.

Remarks: This species is easily recognized by the large dimensions of the laterally distinctly compressed valves, which are densely covered by small pits. Along the anterior margin some rectangular depressions are found. *A. veniliae* Uliczny (1969) is more reniform and dorsally less convex.
Dimensions: L/H/B = 0.85-1.0/0.55-0.60/0.18 mm (left valve).
Occurrence: Crete: Francocastello 817. Rhodos: Vasfi 34a .

Aurila cicatricosa (Reuss) (Pl. 8, fig. 15)

Cypridina cicatricosa Reuss, 1850, p. 67, pl. 9, fig. 21.
Cythere cicatricosa (Reuss), Capeder, 1902, p. 8, pl., fig. 8.
Hemicythere cicatricosa (Reuss) *arborescens,* Ruggieri, 1950b, (non *Cythere arborescens* Brady, 1865), p. 35, textfigs. 9, 21.
Aurila cicatricosa (Reuss), Oertli, 1956, p. 97, pl. 13, figs. 357-360.

Remarks: The species is well characterized by its compact shape and the finely punctate lateral surface, mostly with five angular depressions along the anterior margin.
Dimensions: L/H/B = 0.90/0.62/0.30 mm (left valve).
Occurrence: Crete: Roka 105; Apostoli 850; Tefeli 34.

Aurila convexa emathiae Uliczny (Pl. 9, fig. 1)

Aurila convexa emathiae Uliczny, 1969, p. 22, pl. 1, figs. 7, 8, pl. 11, figs. 3, 4.

Remarks: This form differs from the nominate by the larger size and the pronounced pits at the anterior and posterior ends, which pits may contain up to four puncta. In dorsal aspect the sides are more convex than in *Aurila convexa* sensu Uliczny (1969).
Dimensions: L/H/B = 0.93/0.64/0.30 mm (left valve).
Occurrence: Crete: Asteri 884.

Aurila cruciata cruciata (Ruggieri) (Pl. 8, fig. 6)

Hemicythere cicatricosa (Reuss) *cruciata* Ruggieri, 1950b, p. 32, textfigs. 17-20, pl. 1, fig. 5.

Remarks: Originally described from the Pleistocene of Imola in northern Italy.
Dimensions: L/H/B = 1.0/0.70/0.35 mm (left valve).
Occurrence: Crete: Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Aurila cruciata minor Uliczny (Pl. 8, fig. 7)

Aurila cruciata minor Uliczny, 1969, p. 24, pl. 2, fig. 1, pl. 11, fig. 15.

Remarks: This subspecies differs from the nominate by a smaller size and a smaller opaque spot, which is more or less cruciform. Generally the pits on the lateral surface are of different size and distributed as indicated by Uliczny. However, in our material several specimens occur whose central region is more closely pitted. These individuals are well within the variation of the subspecies. Also included are individuals with a more convex margin as found in Uliczny's figures.
Dimensions: L/H/B = 0.80/0.55/0.24 mm (left valve).
Occurrence: Crete: Apostoli 814; Asteri 848-849, 884; cf. Barbara 32. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Aurila deformis deformis (Reuss) (Pl. 9, fig. 2)

Cythere deformis Reuss, 1850, p. 69, pl. 9, fig. 25; Bosquet, 1852, p. 82, pl. 4, fig. 4.
Pokornyella ? deformis (Reuss), Gramann, 1969, p. 503, pl. 36, fig. 5.

Remarks: Our specimens agree well in size and general shape with Reuss' figures. *Hemicythere deformis minor* Moyes (1965) would differ from this form by its smaller size and the frequent presence of a more pronounced, sometimes thorn-like ridge at the posterodorsal angle. Specimens from Moulin de Bernachon (type section of the Aquitanian) showed that this short ridge is sometimes hardly present. Such individuals better resemble the nominate species. However, our individuals have short ridges ventrolaterally and lower down at the posteroventral angle. In typical *H. deformis minor* only such a posteroventral ridge is found. Moreover, in our form there is a small knob-like extension just above the short ventrolateral ridge. Sexual dimorphism in *A. deformis deformis* is distinct. Males are relatively elongate and low, females are shorter, and dorsally more convex, comparable to the figure of Bosquet (pl. 4, fig. 4a).
Dimensions: L/H/B = 1.07/0.66/0.37 mm (left valves).
Occurrence: Crete: Apostoli 814, 850; Tefeli 1, 34; Khairetiana 292.

Aurila diecii n. sp. (Pl. 8, figs. 8, 9)

Etymology: named in honour of Dr. G. Dieci, Modena, Italy.
Holotype: a left valve.
Paratypes: 87 valves (including complete carapaces).
Type locality: Section Drosi, exposure 34.
Type level: Tefeli Formation (sample 6-117), Upper Miocene ("Tortonian").
Diagnosis: A species of the genus *Aurila*, characterized by a nearly semicircular

lateral outline, a ventrolateral keel, a posterodorsal extension and a smooth, thickened area at the place of the muscle scars.
Description: Carapace nearly semicircular in lateral view. Dorsal margin strongly convex, gradually merging into the anterior margin, ventral margin nearly straight. Greatest height occurs in the middle. The ventrolateral keel is distinct. Behind this keel is a small additional ridge-like extension. Most specimens possess a distinct posterodorsal process. The lateral surface is covered with rectangular to rounded pits, arranged in concentric rows near the anterior and dorsal margins. Overlying the muscle scars a smooth and elongated, thickened area is found. The eye tubercle is distinct. In dorsal view the greatest width is found just behind the middle. Internal features are those of the genus.
Dimensions: L/H/B = 0.68/0.45/0.22 mm (holotype, left valve), ±0.67/±0.44/±0.36 mm (paratypes, complete carapaces).
Remarks: This species strongly resembles *Mutilus (Aurila)* sp. Dieci & Russo, 1967 (= *Hemicythere* ? cf. *deformis* Dieci & Russo, 1964) in outline and ornamentation of the lateral surface.

However, Dieci & Russo's form is smaller and possesses a stout posteroventral spine, which is lacking in our specimens. Nevertheless, *A. diecii* may be identical with the forms described by Dieci & Russo.
Occurrence: Crete: Tefeli 1, 34; Khairetiana 292; Barbara 1b, 36.

Aurila freudenthali n. sp. (Pl. 9, fig. 3)

Etymology: named in honour of Dr. T. Freudenthal, Bordeaux, France.
Holotype: a left valve.
Paratypes: 126 valves (including complete carapaces).
Type locality: Section Exopolis, exposure 850.
Type level: Apostoli Formation (sample 850-B), Upper Miocene ("Tortonian").
Diagnosis: A species of the genus *Aurila,* characterized by a nearly semicircular lateral outline and a pronounced ventral swelling, which is ventrally flattened. Lateral surface coarsely punctate.
Description: Carapace relatively large, nearly semicircular in lateral view. Dorsal margin distinctly convex, ventral margin slightly convex. Anterior margin obliquely rounded, gradually passing into the dorsal margin. Posterior margin short, nearly straight and oblique. The greatest height occurs just behind the eye tubercle. The venter is pronounced, ventrally flattened and bordered by a ridge, along which relatively small pits are arranged in one or two rows. The flattened side of the swelling is ornamented with similar rows of pits, alternating with long but low ridges. The remaining part of the surface is covered with relatively large subrectangular, circular to oval pits, which near the dorsal and anterior

margins are arranged in rows. At the place of the muscle scars pits are smaller. Carapace with greatest width approximately in the middle. Internal features are those of the genus. The difference between left and right valves is relatively small. The right valves are posterodorsally more angular.
Dimensions: L/H/B = 0.88/0.58/0.13 mm (holotype, left valve), ±0.90/±0.51/±0.13 mm (paratypes, right valves).
Remarks: A. freudenthali resembles *Mutilus (Aurila) longus* Ruggieri (1962) in lateral outline but differs from this species by a sharper-keeled venter, the presence of rows of angular pits along the margins and a distinctly larger size.
Occurrence: Gavdos: ? Gavdos 336. Crete: Roka 105; Apostoli 814, 850; Tefeli 1, 34; Khairetiana 292; Barbara 36.

Aurila pigadiana n. sp. (Pl. 8, fig. 10)

Etymology: named after the village of Pigadia, Karpathos.
Holotype: a left valve.
Paratypes: 14 valves (including complete carapaces).
Type locality: Section Pigadia, exposure 2.
Type level: Pigadia Formation (sample VK 14), Upper Pliocene.
Diagnosis: A species of the genus *Aurila*, characterized by a more or less semicircular lateral outline and a compressed alar-like extension in the posteroventral region.
Description: Carapace relatively small, more or less semicircular in lateral view. Dorsal margin convex, ventral margin nearly straight. Anterior margin obliquely rounded. Posterior margin posteroventrally ending in a short truncate caudal process. Greatest height occurs at the eye tubercle. In front of the caudal process there is a compressed alar-like extension. Lateral surface with rather large pits and reticulation in between. Along the anterior margin there are three concentric rows of relatively large meshes, along the dorsal margin a single row of large depressions. All meshes are more or less polygonal or rectangular in outline. In dorsal view the greatest width occurs at the posteroventral extension. Internal features are those of the genus.
Dimensions: L/H/B = 0.68/0.41/0.20 mm (holotype, left valve), ±0.68/0.40-0.43/0.31-0.35 mm (paratypes, complete carapaces).
Remarks: This form may be identical with *Aurila* sp. *A.* (Uliczny, 1969, p. 44, pl. 14, fig. 2) from the Pliocene of Cephalonia. *A. pigadiana* differs from *A. ulicznyi* n. sp. by the lack of a pronounced subcentral swelling.
Occurrence: Crete: Asteri 884. Karpathos: Pigadia 2.

Aurila praeapuliana Uliczny (Pl. 9, fig. 8)

Aurila praeapuliana Uliczny, 1969, p. 38, pl. 3, fig. 2, pl. 13, fig. 4.

Remarks: This species is characterized by a thick-shelled carapace with a narrow ventrolateral keel and subrectangular to slit-like depressions on the lateral surface. The depressions are largest behind the anterior margin.
Dimensions: L/H/B = 0.86/0.54/0.23 mm (left valve).
Occurrence: Rhodos: Kritika 8-9.

Aurila ex. gr. **punctata** (von Muenster)

Cythere punctata von Muenster, 1830, p. 62.
Cytherina punctata (von Muenster), Roemer, 1838, p. 515, pl. 6, fig. 5.
Cythere convexa Baird, 1850a, p. 174, pl. 21, fig. 3.

Remarks: Although the differences between *A. convexa* and *A. punctata* are not well established, authors commonly treat both forms as different species. This may be correct, although such procedure cannot be based on the original descriptions, which are too schematic.

In our extensive material, which includes numerous pre-adult valves, we were not able to separate adequately *A. convexa* and *A. punctata,* neither in the way indicated by Ruggieri (1962, p. 38) nor with the methods described by Bassiouni (1966, p. 638) or Uliczny (1969, p. 22, 40). For this reason both taxa are lumped together, which group may even comprise other punctate taxa as well. However, certain variants (or subspecies) of both taxa could well be distinguished, e.g. *A. convexa emathiae* and *A. punctata plagia.*
Occurrence: All sections and isolated samples.

Aurila punctata plagia Uliczny (Pl. 8, fig. 16)

Aurila punctata plagia Uliczny, 1969, p. 41, pl. 3, fig. 3, pl. 13, fig. 6.

Remarks: This form is characterized by a posterior "flattening" of the dorsal margin, a low ventrolateral keel and an ornamentation mainly consisting of subrectangular pits. Behind the anterior margin three more or less parallel rows of relatively large pits can be recognized. Posteroventrally one or two short spines may be found. *A. punctata nilensis* Bassiouni (1966) is smaller and more semicircular in lateral outline.
Dimensions: L/H/B = 0.70/0.45/0.20 mm (left valve).
Occurrence: Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Aurila sp.1 (Pl. 9, fig. 5)

Remarks: Mainly juvenile valves of this species were available. Both left and right valves are distinctly elongated. The dorsal margin is somewhat convex, the ventral margin nearly straight. The ventral swelling is flattened at the base. Greatest height is situated near the eye spot. The lateral surface is densely covered with puncta, which are arranged in concentric rows with faint ridges in between. The lower puncta are relatively large. At the anteroventral margin and on the slightly pronounced posteroventral caudal process several blunt spines may be found. No suitable name could be found in the literature. Our form differs from *Aurila speyeri speyeri* (Brady) by the more elongate shape, and the arrangement of the surface pits in concentric rows.
Dimensions: L/H/B = 0.97/0.50/0.26 mm (left valve).
Occurrence: Crete: Khairetiana 292.

Aurila sp. 2 (Pl. 9, fig. 9)

Remarks: Some *Aurila* valves were found, which at first sight resemble *A. magnei* Keij (1955). However, comparison with the type material of this species showed our form to be laterally less flattened. Moreover, they show a well developed subcentral swelling. In *A. magnei* a smooth spot is present at the corresponding place.
Dimensions: L/H/B = 0.78/0.45/0.25 mm (left valve).
Occurrence: Crete: Apostoli 850; Tefeli 34.

Aurila speyeri speyeri (Brady) (Pl. 9, fig. 6)

Cythere Speyeri Brady, 1867-72, (1868), p. 99, pl. 12, figs. 8-10; Brady, 1868a (pars), p. 222, pl. 15, fig. 8 (non pl. 15, figs. 9-11).
Cythereis Speyeri (Brady), Mueller, 1894, p. 367, pl. 32, figs. 24, 25, 28, 30.
Hemicythere speyeri (Brady), Ruggieri, 1953b, p. 89, pl. 3, fig. 20.
Aurila speyeri speyeri (Brady), Uliczny, 1969, p. 46, pl. 13, figs. 8-9.

Remarks: A. speyeri speyeri was originally described from the island of Sira, Eastern Mediterranean. Examination of Brady's material from Tenedos showed that two different forms were included here. The second non-typical form is different from *A. speyeri speyeri* in size, shape and arrangement of the pits. It is very similar to or perhaps even identical with *A. punctata punctata* of authors (e.g. Uliczny, 1969).
Dimensions: L/H/B = 1.02/0.58/0.22 mm (left valve).
Occurrence: Rhodos: Vasfi 34a.

Aurila ulicznyi n. sp. (Pl. 8, figs. 13, 14)

Etymology: named in honour of Dr. F. Uliczny, Port Gentil, Gabon.
Holotype: a complete carapace.
Paratypes: 72 valves (including complete carapaces).
Type locality: Section Kritika, exposure 8-9.
Type level: Kritika Formation (sample MUR 63), Upper Pliocene.
Diagnosis: A species of the genus *Aurila,* characterized by a carapace with a subtrapezoid lateral outline, reticulate lateral surface, a prominent posteroventral alar prolongation, and a rounded elevation at the place of the muscle scars.
Description: Carapace relatively small, subtrapezoid in lateral view. Dorsal margin slightly sinuous and sloping backwards. Ventral margin nearly straight to sinuous. Greatest height at the small eye tubercle. Anterior margin broadly rounded, upper part sometimes oblique. Posterior margin with well developed posteroventral process. Lateral surface with prominent wing-like extension in the posteroventral region. At the place of the muscle scars a second, rounded elevation is found. The remaining lateral surface somewhat undulating. Surface completely reticulate. Largest meshes are found behind the anterior margin. Reticulation crests are generally rather high. The carapace is compressed in dorsal view, greatest breadth occurs at the posteroventral projection. Juveniles generally have a lower centroventral boss, or it may be entirely lacking.
Dimensions: L/H/B = 0.75/0.45/0.40 mm (holotype, complete carapace), 0.71/0.42/0.25 mm (paratype, right valve).
Remarks: This form has been described from the Pliocene of Cephalonia as *Aurila* sp. *B.* by Uliczny (1969, p. 45, pl. 14, figs. 3, 4). Juveniles agree with specimens described by Uliczny (1969, p. 45, pl. 14, fig. 2) as *Aurila* sp. *A.* ssp. a.

A. ulicznyi differs from *Aurila pigadiana* n. sp. by the subtrapezoid lateral outline and by the presence of a rounded boss in the centroventral region.
Occurrence: Crete: Asteri 848-849; Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Aurila vena (Seguenza) (Pl. 9, fig. 4)

Cythere venus Seguenza, 1883, p. 48, pl. 1, fig. 7.

Remarks: The carapaces are rather trapezoid in lateral outline. The lateral surface is closely covered with pits. Although our specimens are more densely pitted than the left valve figured by Seguenza, they are referred to this species because of the very good agreement with the type description.

Originally described from the Quaternary of Rizzolo.
Dimensions: L/H/B = 0.80/0.50/0.18 mm (left valve).

Occurrence: Crete: Asteri 848-849. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Aurila venetiensis (Uliczny) (Pl. 8, figs. 11, 12)

Mutilus venetiensis Uliczny, 1969, p. 54, pl. 3, fig. 7, pl. 14, fig. 10, pl. 15, fig. 1.

Remarks: This species differs from *A. cimbaeformis* (Seguenza, 1882) by a relatively more elongate lateral outline, a thickened dorsal margin and a ridge in diagonal direction across the lateral surface.
Dimensions: L/H/B = 0.72/0.43/0.22 mm (right valve).
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2.

Aurila veniliae Uliczny (Pl. 9, fig. 7)

? *Cythere abscisa* Terquem, 1878, p. 108, pl. 12, fig. 12.
Aurila veniliae Uliczny, 1969, p. 48, pl. 3, fig. 5, pl. 14, fig. 5.

Remarks: The lateral surface of this species is covered with numerous fine puncta. On the lower part of the flattened venter some low, predominantly longitudinal ridges are present. Some subrectangular depressions occur along the anterior margin. *Cythere abscisa* Terquem resembles Uliczny's species in lateral outline, and possibly in ornamentation as well.
Dimensions: L/H/B = 0.88/0.54/0.20 mm (left valve).
Occurrence: Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Aurila sp. aff. **A. vitrocincta** (Ruggieri) (Pl. 9, fig. 10)

aff. *Hemicythere cimbaeformis vitrocincta* Ruggieri, 1950b, p. 42, textfigs. 23-25, pl. 1, fig. 9.

Remarks: Only pre-adult valves are found. This species was originally described from the Pleistocene of Imola, northern Italy.
Dimensions: L/H/B = 0.64/0.39/0.15 mm (juvenile valve).
Occurrence: Crete: Asteri 848-849, 884.

Genus **Basslerites** Howe, 1937

Synonym: Basslerella Howe, 1935 (preoccupied).
Type species: Basslerella miocenica Howe, 1935.
Diagnosis: Carapace elongate-ovate, posterior end obtuse. Lateral surface smooth. Hinge hemiamphidont.

Basslerites berchoni (Brady)

Cythere Berchoni Brady, 1867-72, (1869), p. 117, pl. 14, figs. 3-4.
Cythereis teres, Mueller, 1894 (non *Cythere teres* Brady ,1869), p. 379, pl. 29, figs. 6, 15.
Basslerites teres, Ruggieri, 1950b (non *Cythere teres* Brady, 1869), p. 42, textfig. 26.

Remarks: This species was originally described from off the coast at Port-Said (Egypt).
Occurrence: Rhodos: Lindos 34a.

Genus **Bradleya** Hornibrook, 1952

Type species: Cythere arata Brady, 1880.
Diagnosis: Carapace subrectangular in lateral view, relatively high. Dorsally with a distinct rib; ventrolaterally with a prominent keel-like ridge. No caudal process. Lateral surface smooth or reticulate. Hinge hemiamphidont.
Remarks: According to Van Morkhoven (1963, p. 160) it is doubtful whether taxa with a median longitudinal ridge, a relatively pronounced subcentral tubercle and an almost smooth posterior tooth in the right valve may be included in this genus. For instance, *B. dictyon* Hornibrook, 1953 (non *Cythere dictyon* Brady, 1880), *Cythereis dictyon*, van den Bold, 1946 (non *C. dictyon* Brady, 1880) and our form discussed below, may belong to a separate genus since they differ true *Bradleya* species by the possession of a median ridge (see Benson, 1964, p. 34).

Bradleya ? sp. (Pl. 9, fig. 13)

Remarks: This species resembles *B. dictyon*, Hornibrook (1953) (non *Cythere dictyon* Brady, 1880) by the presence of a similar median ridge and in the prominent reticulation. However, in our species the dorsal ridge is not distinctly convex but nearly straight. It bends downwards behind the weakly developed eye tubercle, where it is connected with the median longitudinal ridge. Compared with Hornibrook's form yet another distinct ridge runs downwards to the median ridge behind the eye tubercle. The ventrolateral ridge continues in forward direction turning upwards parallel to the anterior margin.
Dimensions: L/H/B = 0.95-1.02/0.52-0.55/$\pm$0.26 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Barbara 32.

Genus **Caudites** Coryell & Fields, 1937

Type species: Caudites medialis Coryell & Fields, 1937.
Diagnosis: Carapace elongate-subtriangular in lateral view. Surface mostly with

more or less longitudinally directed ridges, but without coarse reticulation. Free inner lamella locally fused to the outer lamella. Hinge holamphidont.

Caudites calceolatus (Costa)

Cytherina calceolatus Costa, 1853, p. 185, pl. 16, fig. 14.
Caudites calceolatus (Costa), Masoli, 1968, p. 26, pl 2, fig. 14, pl. 7, figs. 99, 100; Uliczny, 1969, p. 49, pl. 14, fig. 6.

Remarks: In our material juveniles predominate. These valves are transparent, finely punctate and they possess 3 or 4 backward directed spines on the posterior half of the ventral margin.
Occurrence: Gavdos: Gavdos 336. Crete: Kissamou 368; Tefeli 34; Khairetiana 292; Asteri 848-849, 884; Francocastello 817; Barbara 32; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Genus **Hermanites** Puri, 1955

Synonym: Hermania Puri, 1954 (preoccupied).
Type species: Hermania reticulata Puri, 1954.
Diagnosis: Carapace subrectangular in lateral view, with a ventral and a posterodorsal ridge and with a prominent subcentral tubercle. Lateral surface reticulate. Hinge holamphidont.

Hermanites haidingeri haidingeri (Reuss)

Cypridina Haidingeri Reuss, 1850, p. 78, pl. 10, fig. 13.
Cythereis haidingeri (Reuss), Ruggieri, 1953b, p. 76, pl. 2, fig. 12.
Trachyleberis haidingeri (Reuss), Keij, 1955, p. 125, pl. 6, fig. 10.
Hermanites haidingeri rectangularis Ruggieri, 1962b, p. 23, textfigs. 23, pl. 2, figs. 1-5.
Hermanites haidingeri minor Ruggieri, 1962b, p. 25, pl. 2, figs. 6-10; Dieci & Russo, 1964b, p. 71, pl. 12, fig. 3; Carbonnel, 1969, p. 118, pl. 6, fig. 1.

Remarks: This form resembles *H. haidingeri antiquus* Moos, 1965. It differs mainly from Moos' subspecies in being more inflated and by the absence of lamella-like dorsal, ventral and anterior ridges. Our impression that *H. haidingeri minor* and *H. haidingeri rectangularis* are based on aberrant valves is confirmed by Dr. G. Ruggieri (personal communication).
Occurrence: Gavdos: Gavdos 336, 341. Crete: Roka 105; Kissamou 105, 368; Apostoli 814, 850; Tefeli 1, 34; Khairetiana 292; Asteri 848-849, 884; Barbara 32. Karpathos: Pigadia 2.

Genus **Mutilus** Neviani, 1928

Type species: Cythereis (Mutilus) laticancellata Neviani, 1928 (designation by Ruggieri, 1956).
Diagnosis: Carapace subrectangular in lateral view. Lateral surface coarsely reticulate, with deep interspaces each containing one to three tubular normal pore canals. Hinge holamphidont.
Remarks: In our generic definition special diagnostic weight is given to the presence of tubular pore canals.

Mutilus dohrni Uliczny (Pl. 9, fig. 11)

Mutilus dohrni Uliczny, 1969, p. 52, pl. 3, fig. 6, pl. 14, fig. 8.
Remarks: This form differs from *M. retiformis* (Terquem) by the thicker and lower muri of the surface reticulation. Tubes of the normal pores are less prominent.
Dimensions: L/H/B = 0.82/0.56/0.50 mm (complete carapace).
Occurrence: Crete: Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Mutilus retiformis (Terquem) (Pl. 9, fig. 12)

Cythere retiformis Terquem, 1878, p. 116, pl. 13, fig. 16.
Cythereis (Mutilus) laticancellata Neviani, 1928a, p. 93, pl. 2, figs. 66-68.
Mutilus retiformis (Terquem), Ruggieri, 1956, p. 169, textfigs. 2, 3; Uliczny, 1969, p. 53, pl. 14, fig. 8.
Remarks: This species was originally described from Rhodos. It can be sufficiently well recognized from Terquem's figures.
Dimensions: L/H/B = 0.81/0.50/0.25 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Barbara 32. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Genus **Pachycaudites** Uliczny, 1969

Type species: Cypridina ungeri Reuss, 1859.
Diagnosis: Carapace subtriangular to subrectangular in lateral view, relatively large and calcified. Lateral surface ornamented with some broad, longitudinal ridges. Interspaces partly reticulate. Hinge holamphidont. No vestibula.

Pachycaudites ? h-scripta (Capeder) (Pl. 10, fig. 1)

Cythere h-scripta Capeder, 1900, p. 61, pl. 1, fig. 1.
Hemicythere polyptycha, Ruggieri, 1953b, (non *Cypridina polyptycha* Reuss, 1850), p. 92, pl. 6, fig. 61.
Mutilus (Aurila) ? *pulchra* Stancheva, 1962, p. 40, pl. 4, fig. 10.
Pachycaudites h-scripta (Capeder), Uliczny, 1969, p. 57, pl. 3, figs. 8, 9, pl. 15, fig. 2.

Remarks: Although resemblance exists in internal features between this species and *P. ungeri* (Reuss), the type species of *Pachycaudites,* the overall shape and ornamentation of our forms are so much different that the generic position (as well as that of *Cypridina polyptycha* Reuss (1850) and *P.* sp. Uliczny) is considered doubtful. The muscle scar pattern of *P. ? h-scripta* consists of four adductor muscle scars, of which the lower three are subdivided, and three frontal scars.

Mutilus (Aurila) ? *pulchra* Stancheva from the Neogene ("Tortonian") of northwestern Bulgaria perfectly corresponds to our species in shape and ornamentation.

Occurrence: Crete: Asteri 848-849, 884; Barbara 32. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Pachycaudites ungeri ungeri (Reuss) (Pl. 10, fig. 2)

Cypridina Ungeri Reuss, 1850, p. 79, pl. 11, fig. 11.
Caudites ungeri (Reuss), Ruggieri, 1962b, p. 42, pl. 5, figs. 1-5; Dieci & Russo, 1964b, p. 67, pl. 12, fig. 7.
Pachycaudites ungeri (Reuss), Uliczny, 1969, p. 59, pl. 15, fig. 3.

Remarks: Juveniles lack prominent ridges, but they have two, rather pointed posterior extensions. The lateral surface of these individuals is vaguely reticulate with the interspaces densely covered with puncta.

Originally described from the "Leithakalk" of St. Nikolai near Wildon in the Vienna Basin.

Occurrence: Crete: Apostoli 814, 850; Tefeli 34; Khairetiana 292; Asteri 848-849, 884; Francocastello 817; Barbara 32; Iraklion 46 (reworked?). Karpathos: Pigadia 2.

Genus **Quadracythere** Hornibrook, 1952

Type species: Cythere truncula Brady 1898.
Diagnosis: Carapace subquadrate-subrectangular in lateral view, with a short subventral caudal process. Lateral surface heavily ornamented with distinct dorsomarginal and ventrolateral ribs. Hinge holamphidont.
Remarks: The subgenus is thought to comprise three subgenera, *Quadracythere* s. str., *Hornibrookella* Moos, 1965, and *Tenedocythere* n. subgen.

Subgenus **Tenedocythere** n. subgen.

Type species: Cythere prava Baird, 1850.
Etymology: Cythere from Tenedos.
Diagnosis: A subgenus of *Quadracythere* characterized by a lateral surface with some longitudinal ridges, a smooth posterior tooth in the right valve and anterior marginal pore canals without thickened median parts.
Remarks: Typical *Quadracythere* species are strongly reticulate and they lack superimposed longitudinal ridges. The posterior tooth of the right valve is lobed, and the anterior marginal pore canals have a median swelling. *Hornibrookella* Moos (1965) proposed as a subgenus of *Quadracythere* comprises species in which the uppermost adductor muscle scar is subdivided into two smaller spots. The orientation and shape of the posterior tooth in the right valve is also different by being lobate and placed perpendicular to the upper part of the posterior margin. Additional longitudinal ridges are lacking.

The following taxa are placed in our new subgenus: *Cythere prava* Baird (1850), *Cypridina corrugata* Reuss (1850), *Cypridina sulcatopunctata* Reuss (1850), *Quadracythere ? sulcatopunctata mediterranea* Ruggieri (1962), *Quadracythere prava salebrosa* Uliczny (1969). The internal features of *C. corrugata* Reuss and *C. sulcatopunctata* Reuss are not well known.

Quadracythere (Tenedocythere) mediterranea Ruggieri (Pl. 10, fig. 3)

Quadracythere ? sulcatopunctata mediterranea Ruggieri, 1962b, p. 30, pl. 3, figs. 1-4; Dieci & Russo, 1964b (pars), p. 65, pl. 11, fig. 1 (non pl. 11, fig. 2).

Remarks: Originally described from the "Tortonian" of Enna (central Sicily).
Dimensions: L/H/B = 0.85/0.50/0.25 mm.
Occurrence: Gavdos: Gavdos 341. Crete: Apostoli 850; Tefeli 34; Khairetiana 292; Barbara 1b, 36?

Quadracythere (Tenedocythere) prava (Baird) (Pl. 10, fig. 4)

Cythere prava Baird, 1850b, p. 256, pl. 18, figs. 13-15.
Cythere dissimilis Brady, 1868b, p. 222, pl. 15, figs. 12, 13.
Cythereis prava (Baird), Mueller, 1894, p. 376, pl. 29, figs. 22, 27, pl. 31, figs. 31, 32, 34, pl. 36, figs. 31, 32.
Cythereis polygonata Rome, 1942, p. 25, pl. 3, fig. 60, pl. 5, fig. 62, pl. 6, fig. 61, pl. 7, figs. 58, 59.

Remarks: Cythere dissimilis, originally described from Tenedos, and *Cythereis polygonata,* originally described from the Mediterranean off Monaco, are both based on larvae. The material of *C. dissimilis* from Tenedos, present in the Brady Collection (Allen Hancock Museum in Newcastle-upon-Tyne, England) appears to consists of juveniles. Also the material of *C. polygonata* in the Rome Collec-

tion, present at the Geological Institute of Louvain (Belgium), appears to be composed of juvenile specimens only. The similar ornamentation indicates that both forms are juveniles of Q. *prava* (Baird). *C. prava* and *C. dissimilis* were both originally described from Tenedos, off the west coast of Turkey.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Quadracythere (Tenedocythere) salebrosa Uliczny (Pl. 10, fig. 5)

Quadracythere prava salebrosa Uliczny, 1969, p. 70, pl. 4, figs. 3, 4.

Remarks: This form differs from Q. *prava* (Baird) by the presence of five relatively long, longitudinal ridges between the posterodorsal and ventrolateral ridge. The schematic type figure of *Cythere corrugata* Terquem (1878, p. 118, pl. 13, fig. 20) shows a comparable ornamentation, but it would differ from Q. *salebrosa* by the presence of a distinct subcentral tubercle.
Dimensions: L/H/B = 0.85/0.50/0.25 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817.

Genus **Urocythereis** Ruggieri, 1950

Type species: Cytherina favosa Roemer, 1838.
Diagnosis: Carapace elongate - subrectangular in lateral view. Lateral surface coarsely reticulate or with large foveoles. Hinge holamphidont.

Urocythereis favosa exedata Uliczny (Pl. 10, fig. 6)

Urocythereis favosa n. subsp. Bassiouni, 1966, p. 635, pl. 40, figs. 8, 9.
Urocythereis favosa exedata Uliczny, 1969, p. 62, pl. 4, fig. 5, pl. 15, fig. 4.

Remarks: This form intergrades with the nominate subspecies. In typical specimens elongated interspaces are present anteroventrally behind a well developed ridge, which runs parallel to the anterior margin. The crests of the lateral ornamentation are of variable thickness. The posteroventral part of the surface ornamentation is more irregular because of the near-absence of crests.
Dimensions: L/H/B = 0.85/0.45/0.25 mm.
Occurrence: Crete: Asteri 884. Rhodos: ? Kritika 8-9.

Urocythereis favosa favosa (Roemer)

Cytherina favosa Roemer, 1838, p. 516, pl. 6, fig. 7.
Urocythereis favosa (Roemer), Ruggieri, 1950b, p. 28, textfigs. 10-14, pl. 1, fig. 4.
Hemicythere (Urocythereis) favosa (Roemer), Ruggieri, 1953b, p. 95, pl. 1, fig. 5.

Remarks: Type locality of this form is Castell' Arquato.
Dimensions: L/H/B = 0.89/0.47/0.25 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Barbara 32. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Urocythereis margaritifera margaritifera (Mueller) (Pl. 10, fig. 8)

Cythereis margaritifera Mueller, 1894, p. 368, pl. 32, figs. 26, 29, 32, 35-37.
Hemicythere (Urocythereis) margaritifera (Mueller), Ruggieri, 1953b, p. 94, pl. 1, fig. 6.
Urocythereis margaritifera margaritifera (Mueller), Uliczny, 1969, p. 65, pl. 15, fig. 8.

Remarks: This form is well characterized by a carapace surface covered with circular elliptic or irregularly shaped pits. In contrast with *U. margaritifera alba* Uliczny (1969) these pits are relatively widely spaced and less angular in outline.
Dimensions: L/H/B = 0.88/0.42/0.40 mm (complete carapace).
Occurrence: Crete: Francocastello 817. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Urocythereis lumbricularis (Terquem) (Pl. 10, fig. 7)

Cythere lumbricularis Terquem, 1878, p. 105, pl. 12, fig. 6.
Urocythereis labyrinthica labyrinthica Uliczny, 1969, p. 93, pl. 4, fig. 6, pl. 15, fig. 5.

Remarks: This species is well characterized by its typical ornamentation composed of long sinuous crests. A similar ornamentation is found in *C. lumbricularis* Terquem.

Originally described from the Pliocene or Pleistocene of Rhodos.
Dimensions: L/H/B = 0.90/0.45/0.27 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Urocythereis sororcula (Seguenza) (Pl. 10, fig. 9)

Cythere sororcula Seguenza, 1880, p. 192, 289, pl. 14, fig. 18.
Urocythereis sororcula (Seguenza), Uliczny, 1969, p. 67, pl. 4, fig. 8, pl. 16, fig. 1.

Remarks: U. sororcula is characterized by the presence of elongate grooves more or less parallel to the anterior margin. The groove immediately behind the anterior margin is longest.

This species was originally described from Pliocene deposits of the Province of Reggio di Calabria.
Dimensions: L/H/B = 0.85/0.45/0.22 mm.
Occurrence: Crete: Barbara 32. Rhodos: Vasfi 34a.

Subfamily CYTHERETTINAE Triebel, 1952

Genus **Cytheretta** Mueller, 1894

Type species: Cytheretta rubra Mueller, 1894.
Diagnosis: Carapace elongate-ovate in lateral view. Lateral surface smooth, pitted, reticulate or with several low ridges, or with three conspicuous longitudinal ridges and a dentellate posterior end. Hinge holamphidont. Inner lamella very wide.
Remarks: The genus is thought to comprise two subgenera, *Cytheretta* s. str. and *Flexus* Neviani, 1928.

Subgenus **Cytheretta** Mueller, 1894

Synonyms: Pseudocytheretta Cushman, 1906
Cylindrus Neviani, 1928
Prionocytheretta Méhes, 1941.
Diagnosis: Carapace elongate-ovate in lateral view. Lateral surface ornamentation not consisting of three conspicuous longitudinal ridges.

Cytheretta (Cytheretta) adriatica Ruggieri

Cythere Jurinei, Brady, 1866a (non *Cythere Jurinii* von Muenster, 1830), p. 372, pl. 59, fig. 1.
Cythere Jurinei, Capeder, 1900 (non *Cythere Jurinii* von Muenster, 1830), p. 66, pl., fig. 14.
Cythere Jurinei, Capelli, 1905 (non *Cythere Jurinii* von Muenster, 1830), p. 319, pl. 10, fig. 32.
Cythereis (Cylindrus) Jurinei, Neviani, 1928a, (non *Cythere Jurinii* von Muenster, 1830), p. 106, pl. 2, figs. 94-96.
Cytheretta jurinei, Ruggieri, 1950b, (non *Cythere Jurinii* von Muenster, 1830), p. 11, textfig. 3, pl. 1. fig. 11.
Cytheretta adriatica Ruggieri, 1952b, p. 94.
Cytheretta ruggierii Puri, 1958, p. 186, pl. 2, figs. 1-5.

Remarks: This species has been confused with *Cytheretta Jurinii* von Muenster, which species seems to be restricted to Oligocene and Lower Miocene deposits. Comparison of our specimens with material from the Lower Miocene of the Aquitaine Basin, present in the Utrecht Micropaleontological Collection and originally studied by Keij (1955), showed that *C. Jurinii* reaches greater maximum size and is more elongate. Its lateral surface is smooth or in the posterior part ornamented with short, pitted grooves, the number of which varies from three to six (compare also Triebel, 1952, pl. 3, figs. 16, 17 and Keij, 1957, pl. 10, fig. 1). Characteristic specimens of *C. adriatica* have five to twelve pitted grooves, which are also longer. The anterior area may be smooth.

According to the type description and figures *Cytheretta ruggierii* Puri comprises individuals, the lateral surface of which is covered with numerous long, longitudinal ribs with single rows of pits in between. This species was originally described from Rimini, Adriatic Sea. Examination of topotype material showed that this type of ornamentation is identical with that of *C. adriatica* and may again cover only the posterior half of the lateral surface. The variation observed in these topotypes warrants the placing of this species in the synonymy of *C. adriatica.*

C. adriatica was originally described from the Pleistocene of Imola.
Occurrence: Crete: Asteri 848-849, 884; Iraklion 46. Karpathos: Pigadia 2.

Cytheretta (Cytheretta) semiornata (Egger) (Pl. 10, figs. 11, 12)

Cythere Jurinei von Muenster var. *semiornata* Egger, 1858, p. 419, pl. 3, fig. 7.
Cythere semi-sulcata Capeder, 1902, p. 14, pl., fig. 29.
Cytheretta semiornata (Egger), Witt. 1967, p. 75, pl. 7, figs. 11-15.

Remarks: This form bears four to six longitudinal, more or less elevated ridges and/or grooves on the lateral surface. However, the posterodorsal region is smooth. The ventrolateral ridges and grooves are longest and extend to near the anterior margin. The grooves in between the ridges may be pitted.

This form was originally described from the Miocene of Ortenburg (S. Germany).
Dimensions: L/H/B = 0.95/0.47/0.29 mm.
Occurrence: Crete: Roka 105; Apostoli 814.

Cytheretta (Cytheretta) subradiosa (Roemer)

Cytherina subradiosa Roemer, 1838, p. 517, pl. 6, fig. 20.
Ilyobates ? Judaea Brady, 1867-72, (1868), p. 112, pl. 13, figs. 17, 18.
Cytheretta rubra Mueller, 1894, p. 382, pl. 8, figs. 9, 10, 13, 16, pl. 39, figs. 88-22, 24.
Cytheridea subradiosa (Roemer), Namias, 1900, p. 105, pl. 15, fig. 17.

Remarks: Examination of Brady's material of *Ilyobates ? Judaea* from off the coast of Jaffa showed this species to be identical with *Cytherina subradiosa* Roemer. See for more extensive synonymy Ascoli (1965, p. 92). Originally described from the Pliocene (?) of Castell' Arquato.
Occurrence: Crete: Apostoli 814, 850; Asteri 848-849; Iraklion 46. Rhodos: Kritika 8-9.

Subgenus **Flexus** Neviani, 1928

Synonym: Eucytheretta Puri, 1958.

Type species: Cythere plicata von Muenster, 1830.
Diagnosis: Carapace tapering to the posterior end. Lateral surface with three conspicuous longitudinal ridges. Interspaces smooth or reticulate.

Cytheretta (Flexus) triebeli (Ruggieri)

Cypridina plicata, Reuss, 1850, (non *Cythere plicata* von Muenster, 1830), p. 83, pl. 10, fig. 21.
Cythere plicata, Namias, 1900 (non *Cythere plicata* von Muenster, 1830), p. 95, pl. 14, fig. 24; Capelli, 1905, p. 318, pl. 10, fig. 29.
Eucytheretta triebeli Ruggieri, 1962b, p. 49, pl. 5, figs. 8, 9.
Flexus triebeli (Ruggieri), Dieci & Russo, 1964b, p. 75, pl. 11, fig. 1.

Remarks: Only one complete carapace and two isolated valves have been found.
Originally described from the "Calabriano inferiore" of Toscana.
Occurrence: Karpathos: Pigadia 2.

Genus **Protocytheretta** Puri, 1958

Type species: Cythere daniana Brady, 1869.
Diagnosis: Carapace subrectangular in lateral view, posterior end laterally compressed. Surface with three prominent longitudinal ridges. Interspaces reticulate.

Protocytheretta obtusa Ruggieri (Pl. 10, fig. 10)

Protocytheretta obtusa Ruggieri, 1962b, p. 48, pl. 6, figs. 1, 2; Dieci & Russo, 1964b, p. 75, pl. 11, fig. 10.

Remarks: The complete carapace found in our material from Karpathos differs slightly from the type figure by having a rather distinct ridge connecting the posterior ends of the dorsal and median longitudinal ridges.
Originally described from the "Tortonian" of Enna (central Sicily).
Dimensions: L/H/B = 0.82/0.41/0.36 mm (complete carapace).
Occurrence: Crete: Asteri 848-849. Karpathos: Pigadia 2.

Subfamily LOXOCONCHINAE Sars, 1925

Genus **Loxocauda** Schornikov, 1969

Type species: Pseudocythere muelleri Schornikov, 1969.
Diagnosis: Carapace subrectangular in lateral view, with caudal process. Lateral surface smooth, with weak ribs or pits. Inner lamella wide, with anterior and posterior vestibula. Hinge rectodont.

Loxocauda decipiens (Mueller)

Loxoconcha decipiens Mueller, 1894, p. 347, pl. 27, figs. 10-14, pl. 29, figs. 2, 9.

Remarks: As to carapace morphology this species ought to be placed in the genus *Pseudocythere*. However, because of the presence of four adductor muscle scars only it had better be placed in *Loxocauda*. Longitudinal costules are not very distinct in our material.
Dimensions: L/H/B = 0.43/0.22/0.10 mm.
Occurrence: Rhodos: Vasfi 34a.

Genus **Loxoconcha** Sars, 1866

Synonyms: Normania Brady, 1866
Loxoleberis Sars, 1866.
Type species: Cythere rhomboidea Fisher, 1855 (non *Cythere rhomboidea* Brady, 1866) (designation by Brady & Norman, 1889).
Diagnosis: Carapace rhomboidal, ovate or elongate in lateral view. Lateral surface smooth, punctate, reticulate or with ridges. Hinge gongylodont.

Loxoconcha alata Brady (Pl. 10, fig. 13)

Loxoconcha alata Brady, 1868b, p. 223, pl. 14, figs. 8-13; Brady, 1880, p. 122, pl. 27, fig. 6.
Loxoconcha xena Barbeito-Gonzalez, 1971, p. 308, pl. 33, figs. 1, 2.

Remarks: This species is easily recognized by the prominent knob-like extension in the posteroventral region.

L. alata was originally described from Tenedos, off the west coast of Turkey.
Dimensions: L/H/B = 0.65/0.42/0.30 mm (female valve), 0.67-0.68/0.37-0.38/0.25 mm (male valve).
Occurrence: Crete: Asteri 884; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Vasfi 34a; Lindos 34a.

Loxoconcha cristatissima Ruggieri (Pl. 10, fig. 14)

Loxoconcha cristatissima Ruggieri, 1967b, p. 374, textfigs. 37, 38.

Remarks: The rather coarse ornamentation of relatively high crests and reticulate interspaces makes this species easily recognizable.

Originally described from the "Tortonian" of Benestare (Calabria).
Dimensions: L/H/B = 0.71/0.37/0.35 mm.
Occurrence: Crete: Apostoli 814; Tefeli 34; Khairetiana 292.

Loxoconcha granulata Sars

Loxoconcha granulata Sars, 1866, p. 64; Sars, 1928, p. 219, pl. 102, fig. 1.

Remarks: Originally described from off the coast of Norway.
Occurrence: Crete: Apostoli 814; Asteri 848-849, 884. Rhodos: Vasfi 34a.

Loxoconcha hodonica Pokorny (Pl. 10, figs. 15, 16)

Loxoconcha hodonica Pokorny, 1952, p. 308, 352, 391, textfigs. 36, 37, pl. 5, figs. 1, 1a; Grekoff & Molinari, 1961, p. 5, pl. 2, figs. 5, 6.
Loxoconcha cf. *hodonica* Pokorny, Gramann, 1969, p. 509, pl. 34, figs. 1, 2.

Remarks: The general shape as well as the polygonal reticulate ornamentation of most of our specimens are in agreement with the type figures. In some specimens the posteroventral extension is hardly developed, however. Others are relatively elongate; they are considered to be males.

This species was originally described from the basal horizon of the *Congeria subglobosa* beds at Hodonin (Pliocene, Pannonian) in central Czechoslovakia.
Dimensions: L/H/B =0.53-0.57/0.31/0.24 mm (female valves), 0.60/0.27/0.22 mm (male valves).
Occurrence: Crete: Kissamou 368; Apostoli 850; Khairetiana 292.

Loxoconcha napoliana Puri

Loxoconcha mediterranea Mueller, 1894 (non *Loxoconcha avellana mediterranea* Seguenza, 1885), p. 347, pl. 26, figs. 33-42, pl. 29, figs. 3, 10.
Loxoconcha napoliana Puri, 1963, p. 373; Ruggieri, 1964, p. 518, textfig. 4; Masoli, 1968, p. 53, pl. 3, fig. 31, pl. 12, figs. 181-184.

Occurrence: Crete: Tefeli 34; Asteri 848-849, 884. Karpathos: Pigadia 2.

Loxoconcha punctatella (Reuss)

Cypridina punctatella Reuss, 1850, p. 65, pl. 9, fig. 15.
Loxoconcha punctatella (Reus), Keij, 1955, p. 132, pl. 20, figs. 7, 8; Oertli, 1956, p. 69, pl. 9, figs. 224-232; Keij, 1957, p. 143, pl. 12, figs. 12, 13; Ruggieri, 1962b, p. 60, pl. 7, figs. 10, 11; Dieci & Russo, 1964b, p. 84, pl. 13, fig. 12.

Occurrence: Gavdos: Gavdos 341. Crete: Roka 105; Kissamou 105, 368; Apostoli 814; Tefeli 34; Khairetiana 292; Barbara 1b.

Loxoconcha rhomboidea (Fischer)

Cythere impressa Baird, 1850a, (non *Cythere impressa* McCoy, 1844), p. 173, pl. 21, fig. 9.
Cythere rhomboidea Fischer, 1855, p. 656.

Loxoconcha impressa (Baird), Brady, 1868a, p. 433, pl. 25, figs. 35-40, pl. 40, fig. 4; Brady, Crosskey & Robertson, 1874, p. 185, pl. 8, figs. 1-4; Mueller, 1894, p. 342, pl. 27, figs. 16, 17, 20, pl. 28, figs. 1, 6.
Loxoconcha bairdii Mueller, 1912, p. 306.
Loxoconcha impressa (Baird), Sars, 1928, p. 218, pl. 101.
Loxoconcha rhomboidea (Fischer), Wagner, 1957, p. 64, pl. 27.
non *Cythere rhomboidea* Brady, 1866a, p. 381, pl. 62, fig. 5.

Remarks: See for a more extensive synonymy Elofson (1941, p. 322) and Ruggieri (1952b, p. 72).

The species was originally described from the coasts along the Baltic Sea and from the Cattegat, between Denmark and Sweden.
Occurrence: Crete: Asteri 848-849, 884; Barbara 32; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Lindos 34a.

Loxoconcha rubritincta Ruggieri

Loxoconcha guttata, Ruggieri, 1952b, (non *Cythere guttata* Norman, 1865), p. 74, pl. 4, figs. 7-9; Ruggieri, 1953b, p. 112, pl. 6, fig. 55.
Loxoconcha rubritincta Ruggieri, 1964, p. 521, textfigs. 8-11.

Remarks: Characteristic features of this species are the relatively elongate outline, the flattened sides, the sharply defined pits of the lateral surface and the prominent "groove" along the posterior and posteroventral margin.

Type locality is Venice beach (Venezia-Lido).
Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2.

Loxoconcha stellifera Mueller

Loxoconcha stellifera Mueller, 1894, p. 343, pl. 27, figs. 15, 18, pl. 28, figs. 2, 7.

Remarks: This species is characterized by a smooth and polished lateral surface with scattered minute puncta. Colalongo (1965, p. 111, pl. 12, fig. 7) reported this species from the Le Castella section, but the figured valve seems to be rather coarsely punctate and better resembles *L. rhomboidea* (Fischer).
Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2. Rhodos: Vasfi 34a.

Loxoconcha tumida Brady

Loxoconcha tumida Brady, 1869, p. 48, pl. 8, figs. 11, 12; Ruggieri, 1952b, p. 75, pl. 4, figs. 2-6; Masoli, 1968, p. 55, pl. 3, fig. 34, pl. 12, figs. 191-193; Carbonnel, 1969, p. 183, pl. 13, figs. 23, 24.

Remarks: Originally described from Piraeus and Besika Bay (Greece).
Occurrence: Crete :Asteri 848-849, 884; Francocastello 817; Barbara 32. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Loxoconcha turbida Mueller

Loxoconcha levis Mueller, 1894 (non *Loxoconcha levis* Brady, 1870), p. 344, pl. 27, figs. 8, 19, 22, pl. 28, figs. 4, 8.
Loxoconcha turbida Mueller, 1912, p. 308; Ruggieri, 1952b, p. 73, pl. 4, fig. 1.

Remarks: This species is characterized by its subrhomboidal lateral outline with an obtuse angle in the posterior margin at approximately $^2/_3$ of the height from the ventral margin. The lateral surface is more or less smooth; in the central region several small pits are found.
Occurrence: Rhodos: Kritika 8-9.

Loxoconcha variesculpta Ruggieri

Loxoconcha variesculpta Ruggieri, 1962b, p. 58, textfig. 13, pl. 7, figs. 12, 13; Aruta, 1966, p. 4, textfig. 2, no. 4, textfig. 6, no. 2.

Remarks: The increase in size of the polygonal meshes of the reticulation towards the ventral margin is not always apparent in our material.

Originally described from the "Tortonian" of Enna (central Sicily).
Occurrence: Crete: Apostoli 814, 850; Tefeli 1, 34.

Loxoconcha versicolor Mueller

Loxoconcha versicolor Mueller, 1894, p. 346, pl. 27, fig. 4, pl. 28, figs. 5, 10; Ruggieri, 1964, p. 520, textfig. 5.

Occurrence: Karpathos: Pigadia 8-9. Rhodos: Vasfi 34a.

Genus Loxocorniculum Benson & Coleman, 1963

Type species: Cythere ? Fisheri Brady, 1869.
Diagnosis: Carapace subrhomboidal in lateral view. Lateral surface reticulate, with a posterodorsal protuberance. Hinge gongylodont.
Remarks: The genus *Loxocorniculum* has been erected by Benson & Coleman (1963, p. 38) to separate species, previously assigned to *Loxoconcha,* which have a protuberance on the posterodorsum. In addition to the type species *Loxoconcha Fisheri* (Brady), the following taxa are placed in this genus by the original authors: *Loxoconcha antillea* van den Bold var. *rugosa* van den Bold (1946), *L. anderseni* Puri (1954), *L. postdorsolatum* Puri (1960) and questionably *L. lilljeborchi* Brady (1868). In our opinion some more species may be placed in this genus: e.g. *L. alata* Brady var. *longispina* Keij (1953) and *L. quadricornis* Ruggieri (1962).

Loxocorniculum quadricornis (Ruggieri) (Pl. 10, fig. 17)

Loxoconcha quadricornis Ruggieri, 1962b, p. 60, pl. 7, fig. 15; Dieci & Russo, 1964b, p. 84, pl. 13, fig. 13.

Remarks: This species resembles *Loxoconcha rugosa* van den Bold (1946), the type material of which is stored in the Utrecht Micropaleontological Collection. Comparison with the holotype of the latter species showed that our form differs especially in the type of surface ornamentation. The reticulation of *L. rugosa* is rather coarse and consists for the greater part of longitudinally elongated meshes. The meshes are never elongated in *L. quadricornis*.

Holotype and paratypes of *L. longispina* Keij (1953), all from the Snellius Expedition, appear to be smaller than our forms.

Originally *L. quadricornis* was described from the "Tortonian" of Enna.

Dimensions: L/H/B = 0.56/0.32/0.25 mm.

Occurrence: Gavdos: Gavdos 336, 341. Crete: Apostoli 814; Tefeli 34; Khairetiana 292.

Subfamily PARACYTHERIDEINAE Puri, 1957

Genus **Paracytheridea** Mueller, 1894

Type species: Paracytheridea depressa Mueller, 1894.

Diagnosis: Carapace elongate in lateral view, alate and with a dorsal caudal process. Subcentral swelling prominent. Lateral surface with ridges, tubercles or reticulation. Hinge antimerodont.

Paracytheridea triquetra bovettensis (Seguenza)

Cytheropteron bovettensis Seguenza, 1880, p. 365, pl. 17, fig. 54.

Paracytheridea depressa Mueller, 1894, p. 341, pl. 29, figs. 4, 8, pl. 26, figs. 16, 17.

Paracytheridea triquetra, Neviani, 1928a, (non *Cypridina triquetra* Reuss, 1850), p. 49, pl. 1, figs. 33-35.

Paracytheridea bovettensis (Seguenza), Ruggieri, 1952b (pars), p. 77, pl. 6, fig. 6 (non pl. 7, fig. 8); Ruggieri, 1962b, p. 14, pl. 1, fig. 11.

Remarks: The difference between *P. bovettensis* and *P. triquetra* (Reuss) is not very clear. The detailed description of the ornamentation of *P. triquetra* (Reuss), given by Oertli (1957, p. 54) is in agreement with several individuals of our material. Frequently there is a distinct ridge running downwards from the eye tubercle to the more or less diagonal major ridge. Also a subrectangular interspace between this diagonal ridge and the thickened ventral margin can be recognized

in several of our specimens. As our form seems to be closely related to *P. triquetra*, it is regarded as a subspecies of the latter.

This form was originally described from Pleistocene deposits of the Province of Reggio di Calabria.

Occurrence: Crete: Apostoli 850; Tefeli 34; Khairetiana 292; Asteri 848-849, 884; Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Paracytheridea sp. (Pl. 11, fig. 1)

Remarks: From the Kissamou Formation some small, elongate valves of *Paracytheridea* are known, the lateral surface of which is irregularly rugose. This form may be identical to *Paracytheridea* sp. described by Aruta (1966) from the Upper Miocene of Calatafimi (Sicily).

Dimensions: L/H/B = 0.48/0.23/0.15 mm.

Occurrence: Crete: Kissamou 368.

Subfamily CYTHERURINAE Mueller, 1894

Genus **Cytheropteron** Sars, 1866

Type species: Cythere latissima Norman, 1865.

Diagnosis: Carapace ovate-subrhomboidal in lateral view, with caudal process and alate extension. Lateral surface smooth, punctate, reticulate and/or with other ornamentation elements. Hinge antimerodont or lophodont-like.

Remarks: The genus is thought to comprise two subgenera, *Cytheropteron* s. str. and *Aversovalva* Hornibrook, 1952.

Subgenus **Cytheropteron** Sars, 1866

Diagnosis: Hinge consisting of a curved crenulated groove between two cusped teeth in the right valve, and a curved crenulate bar between two terminal sockets in the left valve.

Cytheropteron (Cytheropteron) alatum Sars (Pl. 11, fig. 2)

Cytheropteron alatum Sars, 1866, p. 81; Brady & Norman, 1889, p. 214, pl. 20, figs. 8-10; Sars, 1928, p. 225, pl. 104, fig. 1.

Remarks: Our individuals agree well with Recent material from the Baie des Anges, Antibes (S. France).

This species was originally described from the Christiana Fjord (Norway).

Occurrence: Crete: Asteri 848-849. Karpathos: Pigadia 2. Rhodos: Vasfi 34a.

Cytheropteron (Cytheropteron) apostoliensis n. sp. (Pl. 11, figs. 3, 4)

Etymology: named after the village of Apostoli, Province of Rethymnon, Crete.

Holotype: a left valve.

Paratypes: 25 valves (including complete carapaces).

Type locality: Section Apostoli, exposure 814.

Type level: Apostoli Formation (sample 814-B), Upper Miocene ("Tortonian").

Diagnosis: A species of the subgenus *Cytheropteron,* characterized by a subrhomboidal outline, a triangular alate extension with a shallow concavity in the upper part. Lateral surface finely punctate.

Description: Carapace subrhomboidal in lateral view. Dorsal margin convex, ventral margin sinuous. Anterior end obliquely rounded with a concavity near the eye spot in the right valve. Posterior end of the right valve with a small and obtuse caudal process. Alate extensions triangular, pointed backwards. The upper face of the alae shows a shallow concavity, their lower side has a low, but sharp ridge, directed more or less longitudinally. Upper part of the lateral surface somewhat undulating and with a ridge along the posterior half of the dorsal margin, which passes posterodorsally into a broader elevation. Surface finely punctate and polished. Internal features are those of the subgenus. Larval valves are more triangular in lateral aspect because of the more strongly convex dorsal margin.

Dimensions: L/H/B = 0.40/0.25/0.15 mm (holotype, left valve), 0.38/0.18/0.19 mm (paratype, right valve).

Remarks: This species differs from *C. punctatum* Brady (1869) by a dorsally less convex carapace and a larger and wider alate projection, which, moreover, is concave in the upper part. The valves of *C. punctatum* are distinctly more convex. The lateral surface of our species is less regularly inflated and it has some faint ridges.

Occurrence: Crete: Apostoli 814.

Cytheropteron (Cytheropteron) latum Mueller (Pl. 11, fig. 5)

Cytheropteron latum Mueller, 1894, p. 300, pl. 20, figs. 3, 9, pl. 21, figs. 10-14.

Occurrence: Rhodos: Vasfi 34a.

Cytheropteron (Cytheropteron) punctatum Brady (Pl. 11, fig. 6)

Cytheropteron punctatum Brady, 1868a, p. 449, pl. 34, figs. 45-48; Sars, 1928, p. 227, pl. 105, fig. 1.

Remarks: Originally described from off the coast of Scotland (Minch, Ormeshead).
Occurrence: Rhodos: Vasfi 34a.

Cytheropteron (Cytheropteron) rotundatum Mueller (Pl. 11, fig. 7)

Remarks: Comparison with Recent material from the Baie des Anges, Antibes (S. France), showed our valves to fit in well with this species.
Cytheropteron rotundatum Mueller, 1894, p. 301, pl. 20, figs. 4, 10, pl. 21, fig. 20.
Occurrence: Rhodos: Vasfi 34a.

Subgenus **Aversovalva** Hornibrook, 1952

Type species: Cytheropteron (Aversovalva) aureum Hornibrook, 1952.
Diagnosis: Hinge consisting of a straight to crenulate groove between two terminal simple teeth in the right valve and a straight crenulate bar and accomodation groove between two terminal sockets in the left valve.

Cytheropteron (Aversovalva) lancei Carbonnel (Pl. 11, fig. 8)

Cytheropteron (Aversovalva) lancei Carbonnel, 1969, p. 203, pl. 10, figs. 13-15.

Remarks: In all features our individuals well agree with the typical forms (G. Carbonnel, personal communication). However, our material includes specimens, the alate extension of which ends in a short spine. The degree of development of such a spine may have been environment-controlled. A similar environmental influence may be true for *Incongruellina marginata* (Terquem), in which likewise a variant with a posterior spine of the alae is known.

Both left and right valves resemble in lateral outline and development of the alate extension those of the type species *C. (A.) aureum* Hornibrook (1952). However, in dorsal view our specimens are less compressed, and the lateral surface of *C. (A.) aureum* is reticulate. A spine at the posterior end of the keel has not been described for this species.

C. (A.) lancei was originally described from the "Burdigalian" of the Rhône Basin.
Dimensions: L/H/B = 0.38-0.40/0.20-0.22/0.18 mm.
Occurrence: Crete: Kissamou 368; Apostoli 814; Asteri 848-849; Barbara 32.

Genus **Eucytherura** Mueller, 1894

Type species: Cythere complexa Brady, 1866 (designation by Alexander, 1936).
Diagnosis: Carapace parallelogram-shaped in lateral view, with a subdorsal caudal process. Lateral surface reticulate or with pits. Hinge lophodont or pentodont.

Eucytherura complexa (Brady) (Pl. 12, fig. 10)

Cythere complexa Brady, 1866b, p. 210; Brady & Norman, 1889, p. 145, pl. 19, figs. 31, 32. *Eucytherura complexa* (Brady), Mueller, 1894, p. 306, pl. 20, figs. 13, 17, pl. 21, fig. 3; van den Bold, 1957, p. 245, pl. 4, fig. 14; Colalongo, 1965, p. 106, pl. 12, fig. 4; Mistretta, 1967, p. 2, textfig. 2c, pl. 1, fig. 4.

Remarks: Originally described from the Hebrides.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Rhodos: Kritika 8-9; Vasfi 34a.

Eucytherura gibbera Mueller (Pl. 12, fig. 12)

Eucytherura gibbera Mueller, 1894, p. 307, pl. 19, figs. 21-26, pl. 20, figs. 14, 16, 19, pl. 21, figs. 1, 2; Mistretta, 1967, p. 3, textfig. 2c, pl. 1, fig. 2.

Occurrence: Crete: Khairetiana 292; Asteri 848-849, 884; Barbara 32. Karpathos: Pigadia 2.

Eucytherura gullentopsi Ruggieri

Eucytherura gullentopsi Ruggieri, 1952b, p. 88, pl. 7, figs. 2-4; Mistretta, 1967, p. 5, textfig. 2a, pl. 1, fig. 1.

Remarks: Originally described from the Pleistocene of Imola.
Occurrence: Crete: Francocastello 817. Karpathos: Pigadia 2. Rhodos: Lindos 34a.

Eucytherura mistrettai n. nom

Eucytherura ruggierii Mistretta, 1967 (non *Eucytherura ? ruggierii* van den Bold, 1958), p. 6, textfig. 2d, pl. 1, fig. 6.

Remarks: Diagnostic features of this species are: a subrhomboidal carapace, a sharp ventrolateral keel and a polygonal reticulate ornamentation of the lateral surface. A new name is proposed here to replace Mistretta's homonym.

Originally described from the Pleistocene deposits ("Sicilian") of Acqua dei Corsari, Sicily.

Dimensions: L/H/B = 0.40/0.22/0.15 mm.
Occurrence: Crete: Apostoli 814, 850; Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Vasfi 34a; Lindos 34a.

Eucytherura patercoli Mistretta (Pl. 11, fig. 9)

Eucytherura patercoli Mistretta, 1967, p. 6, textfig. 2b, pl. 1, fig. 3.

Remarks: A species characterized by elongate valves with subparallel dorsal and ventral margins and a polygonal reticulate ornamentation of the lateral surface.

Originally described from Pleistocene deposits ("Sicilian") of Acqua dei Corsari (Palermo).
Dimensions: L/H/B = 0.42/0.20/0.15 mm.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2.

Eucytherura pygmaea (Reuss) (Pl. 11, fig. 10)

Cypridina pygmaea Reuss, 1850, p. 82, pl. 10, fig. 20.
Cythere pygmaea (Reuss), Bosquet, 1852, p. 124, pl. 6, fig. 10.

Remarks: This species differs from *E. textilis textilis* Ruggieri (1962) by the presence of a sharp median ridge, which is relatively low or interrupted in the middle. Originally described from the Miocene deposits of the Vienna Basin and near Bordeaux.
Dimensions: L/H/B = 0.45/0.25/0.17-0.18 mm.
Occurrence: Crete: Roka 105; Kissamou 105, 368; Apostoli 814, 850; Tefeli 34.

Genus **Hemicytherura** Elofson, 1941

Type species: Cythere cellulosa Norman, 1865.
Diagnosis: Carapace subrectangular to subtriangular in lateral view, posterior end generally with pronounced caudal process. Lateral surface reticulate or coarsely pitted. Hinge hemimerodont.

Hemicytherura defiorei Ruggieri

Hemicytherura defiorei Ruggieri, 1953c, p. 50, textfigs. 8, 11-13; Dieci & Russo, 1964b, p. 81, p. 13, fig. 5; Aruta, 1966, p. 4, pl. 1, fig. 9.

Remarks: Originally described from the "Tortonian" of the Monte Rosso in the Scrivia valley, Piemont.
Occurrence: Gavdos: Gavdos 336. Crete: Roka 105; Kissamou 105, 368; Apostoli 814, 850; Tefeli 1, 34; Asteri 848-849. Rhodos: Kritika 8-9.

Hemicytherura gracilicosta Ruggieri

Hemicytherura videns gracilicosta Ruggieri, 1953c, p. 50, textfigs. 5, 7.
Hemicytherura gracilicosta Ruggieri, Mistretta, 1967, p. 9, pl. 1, figs. 11, 12.

Remarks: Typical individuals were encountered only in material from the Iraklion Formation. This species is differentiated from *H. videns* (Mueller, 1894) by its less prominent ridges on the lateral surface, while the carapace is less robust.

It was originally described from Pleistocene deposits ("Calabriano inferiore sensu lato") of Castellanselmo, Tuscany.

Occurrence: Crete: Iraklion 46.

Hemicytherura hellenica n. sp. (Pl. 11, figs. 11, 12)

Etymology: the Greek one.
Holotype: a left valve.
Paratypes: 21 loose valves.
Type locality: Section Stavromenos II, exposure 884.
Type level: Asteri Formation (sample 884-C), Lower/Middle Pliocene.
Diagnosis: A species of the genus *Hemicytherura,* especially characterized by the presence of a pronounced wing-like ridge at the posterodorsal angle and another extension in the posterocentral region.
Description: Carapace small, subrectangular in lateral view. Dorsal margin of right valves distinctly convex and ventral margin slightly sinuous. Dorsal and ventral margins of left valves subparallel. Anterior margin oblique, ventrally broadly rounded. Posterior end with a stout, blunt or pointed caudal process at or just above the middle. Lateral surface irregularly reticulate, with a pronounced ridge, running downwards from the eye spot to half way the lateral surface of the valve, where it curves forward to the anterior margin. At the posterodorsal angle a pronounced wing-like ridge is found. In the posterocentral region a pointed knob is present. The other ridges of the reticulation are relatively indistinct. Internal features are those of the genus.
Dimensions: L/H/B = 0.37/0.20/0.08 mm (holotype, left valve), 0.38/0.20/0.08 mm (paratypes, right valves)
Remarks: This species differs primarily from *H. videns* (Mueller) and from *H. gracilicosta* Ruggieri by the pronounced ridge at the posterodorsal angle. A comparable but smaller wing-like extension is found in *H. defiorei* Ruggieri, which species has a larger posteroventral wing and a more pronounced mesh-work reticulation. A posterocentral knob is lacking in *H. defiorei.*
Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2.

Hemicytherura videns (Mueller)

Cytheropteron videns Mueller, 1894, p. 303, pl. 20, figs. 2, 8.
Cytherura (Hemicytherura) cellulosa, Ruggieri, 1952b, (non *Cythere cellulosa* Norman, 1865), p. 85, pl. 7, fig. 1.
Hemicytherura videns (Mueller), Ruggieri, 1953c, p. 49, textfigs. 4, 6, 9; Dieci & Russo, 1964b, p. 81, pl. 13, fig. 6.

Occurrence: Crete: Khairetiana 292; Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Kritika 8-9.

Genus **Kangarina** Coryell & Fields, 1937

Type species: Kangarina quellita Coryell & Fields, 1937.
Diagnosis: Carapace subovate in lateral view, relatively small. Dorsal and ventral margins sinuous. Lateral surface bearing ridges, interspaces pitted or irregularly reticulate. Caudal process subdorsal. Hinge antimerodont.

Kangarina abyssicola (Mueller)

Cytheropteron abyssicolum Mueller, 1894, p. 302, pl. 20, figs. 5, 11, pl. 21, figs. 4-9.
Cytheropteron (Kangarina) abyssicolum Mueller, Ruggieri, 1952b, p. 77, pl. 6, fig. 9.
Kangarina abyssicola (Mueller), Ruggieri, 1953c, p. 53, textfig. 15; Medioli, 1960, p. 214, 215, textfig. 3; Mistretta, 1967, p. 9, pl. 1, fig. 5.

Remarks: This species differs from *K. coarctata* Ruggieri by its larger size, a less sinuous outline and less prominent lateral ridges. The interspaces are relatively large.
Occurrence: Crete: Asteri 848-849; Francocastello 817. Rhodos: Vasfi 34a.

Kangarina coarctata Ruggieri

Kangarina abyssicola coarctata Ruggieri, 1953c, p. 53, textfig. 16.
Kangarina abyssicola, Keij, 1955, (non *Cytheropteron abyssicolum* Mueller, 1894), p. 134, pl. 20, fig. 11.
Kangarina abyssicola coarctata Ruggieri, Ruggieri, 1962b, p. 55, pl. 6, fig. 8; Dieci & Russo, 1964b, p. 82, pl. 13, fig. 9.

Remarks: Originally described from the "Tortonian" of the Monte Rosso in the Scrivia valley, Piemont.
Occurrence: Crete: Kissamou 368; Apostoli 814, 850; Asteri 848-849; Francocastello 817. Karpathos: Pigadia 2.

Genus **Pseudocytherura** Dubowsky, 1939

Synonym: Paracytheropteron Ruggieri, 1952.

Type species: Pseudocytherura pontica Dubowsky, 1939.
Diagnosis: Carapace subrectangular to subrhomboidal in lateral view, with a subdorsal caudal process and a broad alate extension. Lateral surface reticulate. Hinge antimerodont.

Pseudocytherura calcarata (Seguenza) (Pl. 12, fig. 11)

Cytheropteron calcaratum Seguenza, 1880, p. 365, pl. 17, fig. 53.
Paracytheridea (Paracytheropteron) calcarata (Seguenza), Ruggieri, 1952b, p. 79, pl. 6, figs. 1-3, pl. 7, fig. 7.
Pseudocytherura calcarata (Seguenza), Masoli, 1967, p. 49, pl. 11, figs. 167-169.
Remarks: Originally described from Pleistocene deposits of the Province of Reggio di Calabria.
Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Genus **Semicytherura** Wagner, 1957

Type species: Cythere nigrescens Baird, 1838.
Diagnosis: Carapace subovate to parallelogram-shaped in lateral view, with a subdorsal or a subcentral caudal process. Lateral surface variable from nearly smooth to strongly ornamented with ridges and reticulation. Hinge antimerodont.

Semicytherura acuminata (Mueller) (Pl. 12, fig. 1)

Cytherura acuminata Mueller, 1894, p. 291, pl. 18, figs. 4, 16, pl. 19, fig. 15.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Rhodos: Vasfi 34a; Lindos 34a.

Semicytherura acuticostata (Sars) (Pl. 12, fig. 2)

Cytherura acuticostata Sars, 1866, p. 76; Sars, 1928, p. 210, pl. 98, fig. 1; Ruggieri, 1952b, p. 84, pl. 5, figs. 6, 7.
Semicytherura acuticostata (Sars), Masoli, 1968, p. 38, pl. 3, fig. 25, pl. 9, figs. 135, 136.
Remarks: Originally described from several places along the coast of Norway.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a.

Semicytherura costata (Mueller)

Cytherura costata Mueller, 1894, p. 295, pl. 8, figs. 11, 15, pl. 32, fig. 33.
Occurrence: Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Semicytherura dispar (Mueller) (Pl. 12, fig. 3)

Cytherura dispar Mueller, 1894, p. 293, pl. 19, fig. 16, pl. 20, figs. 1, 6, 7.

Occurrence: Crete: Francocastello 817. Karpathos: Pigadia 2. Rhodos: Vasfi 34a; Lindos 34a.

Semicytherura inversa (Seguenza) (Pl. 12, fig. 4)

Cytherura inversa Seguenza, 1880, p. 365, pl. 17, fig. 51; Namias, 1900, p. 109, pl. 15, fig. 24.
Cytherura cribriformis Mueller, 1894, p. 295, pl. 17, figs. 1, 6, pl. 19, fig. 10.
Semicytherura inversa (Seguenza), Masoli, 1968, p. 41, pl. 10, figs. 145, 146.

Remarks: Originally described from Pleistocene deposits of the Province of Reggio di Calabria.
Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Lindos 34a.

Semicytherura mediterranea (Mueller) (Pl. 12, fig. 5)

Cytherura mediterranea Mueller, 1894, p. 289, pl. 18, figs. 6, 9, pl. 19, fig. 18; Ruggieri, 1952b, p. 83, pl. 5, figs. 10, 11.

Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Semicytherura paradoxa (Mueller) (Pl. 12, fig. 6)

Cytherura paradoxa Mueller, 1894, p. 294, pl. 17, figs. 3, 9, pl. 19, fig. 12; Ruggieri, 1953b, p. 120, pl. 5, figs. 45, 46.
Semicytherura paradoxa (Mueller), Masoli, 1968, p. 43, pl. 10, figs. 147-149.

Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Semicytherura sp. cf. **S. punctata** (Mueller) (Pl. 12, fig. 7)

cf. *Cytherura punctata* Mueller, 1894, p. 292, pl. 18, figs. 2, 10, 12, 13, pl. 19, fig. 13; Ruggieri, 1952b, p. 25, pl. 5, figs. 3-5.

Remarks: In our specimens the median ridge on the lateral surface is either lacking, or faintly to strongly developed. In most valves the posterior end is different from that in the type figures by the presence of a blunt spine at the posteroventral angle.
Occurrence: Crete: Asteri 848-849, 884. Karpathos: Pigadia 2.

Semicytherura raulini n. sp. (Pl. 11, fig. 14)

Etymology: named in honour of V. Raulin, one of the early authors on the geology of Crete.
Holotype: a left valve.
Paratypes: 35 loose valves.
Type locality: Section Apostoli, exposure 814.
Type level: Apostoli Formation (sample 814-B), Upper Miocene ("Tortonian").
Diagnosis: A species of the genus *Semicytherura*, characterized by its large alar projection and a posterodorsal elevation. Except for some low ridges, the lateral surface is virtually smooth. Subdorsally there is a stout caudal process.
Description: Carapace parallelogram-shaped in lateral view. Dorsal and ventral margins sinuous. Anterior margin very broadly rounded, upper part nearly straight. Posterior end with a pronounced subdorsal process. Ventrolaterally there is a prominent alar projection, along the dorsal margin an irregular ridge. In the posterodorsal region a pointed elevation is found, which is connected to the dorsal margin by a narrow ridge. The remaining lateral surface is polished and covered with very small puncta and some low indistinct ridges. Internal features are those of the genus.
Dimensions: L/H/B = 0.45/0.25/0.23 mm (holotype), 0.45-0.49/0.25-0.27/0.25-0.26 mm (paratypes).
Remarks: This species resembles *Semicytherura mediterranea* (Mueller) in general shape. However, the dorsal margin of the latter is straight, not sinuous. The lateral surface of *S. mediterranea* is densely covered with pits, which tend to form a reticulate network.
Occurrence: Crete: Kissamou 368; Apostoli 814, 850.

Semicytherura spratti n. sp. (Pl. 11, fig. 15)

Etymology: named in honour of T. Spratt, 19th century investigator into the geology of Crete.
Holotype: a left valve.
Paratypes: 23 loose valves.
Type locality: Section Asteri, exposure 848-849.
Type level: Asteri Formation (sample 849-E), Lower Pliocene.
Diagnosis: A species of the genus *Semicytherura*, characterized by a subrectangular lateral outline, a prominent posterodorsal process, a smooth or faintly striate lateral surface and a large ventrolateral keel. At the posteroventral angle a small spine.
Description: Carapace parallelogram-shaped in lateral outline. The dorsal margin

is horizontal and slightly sinuous, the ventral margin is subparallel to the dorsal one. Anterior margin rounded. Posterodorsally there is a prominent caudal process. Surface smooth or faintly striate. A narrow ridge runs along the dorsal margin. Ventrolaterally there is a prominent keel pointed backwards. In the left valves rounded elevations are found around the obscure eye spot. A narrow rim extends posteriorly along the ventral margin. Just below the middle of the anterior margin a short subhorizontal ridge is found behind the anterior rim. In well preserved specimens a short pointed spine occurs at the posteroventral angle. Internal features are those of the genus.

Remarks: This species somewhat resembles the *Cytherura* sp. reported by Ruggieri (1953b, pl. 5, fig. 47) from Calabria. However, Ruggieri's form has a more oblique anterior margin, a turned-upwards caudal process and a punctate lateral surface. A short subhorizontal ridge behind the anterior margin is not present.

Dimensions: L/H/B = 0.43/0.22/0.15 mm (holotype), 0.41-0.42/0.18-0.20/0.15 mm (paratypes).

Occurrence: Crete: Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2.

Genus **Tetracytherura** Ruggieri, 1952

Type species: Cytheridea angulosa Seguenza, 1880.

Diagnosis: Carapace subtrapezoid in lateral view. Lateral surface finely reticulate, with minute puncta in the interspaces. Hinge pentodont. Anterior vestibulum present.

Tetracytherura irregularis (Terquem)

Cythere irregularis Terquem, 1878, p. 101, pl. 11, fig. 10.
Cytheridea angulosa Seguenza, 1880, p. 363, pl. 17, fig. 47; Capelli, 1905, p. 320, pl. 10, fig. 36.
Bairdia angulosa (Seguenza), Namias, 1900, p. 90, pl. 14, fig. 10.
Tetracytherura angulosa (Seguenza), Ruggieri, 1952b, p. 87, pl. 6, figs. 7, 8.

Remarks: The consideration of *Cytheridea angulosa* Seguenza as a junior synonym of *Cythere irregularis* Terquem as proposed by Howe (1969, p. 6), who compared material from Rhodos and Italy and was not able to separate both species, is here followed. It is not known whether *Cythere irregularis* Terquem has priority over *C. irregularis* Miller, which species was described in the same year.

Dimensions: L/H/B = 0.52/0.30/0.20 mm (female valve), 0.52/0.25-0.26/0.17-0.18 mm (male valve).

Occurrence: Crete: Asteri 848-849, 884; Francocastello 817; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Subfamily SCHIZOCYTHERINAE Mandelstam, 1960

Genus **Neomonoceratina** Kingma, 1948

Type species: Neomonoceratina columbiformis Kingma, 1948.
Diagnosis: Carapace subrhomboidal in lateral view. A pronounced caudal process above the middle of the posterior end. Lateral surface with distinct subcentral, vertical sulcus, and ornamented with two longitudinal ridges. Remaining surface reticulate, pitted or smooth, rarely spinose. Hinge schizodont. No eye spots.

Neomonoceratina mouliana n. sp. (Pl. 12, figs. 8, 9)

Etymology:: named after the village of Ano Moulia, Province of Iraklion, Crete.
Holotype: a left female valve.
Paratypes: 62 valves (including complete carapaces).
Type locality: Section Almiri, exposure 1.
Type level: Tefeli Formation (sample 6-27), Upper Miocene ("Tortonian").
Diagnosis: A species of the genus *Neomonoceratina,* characterized by a relatively high carapace with a large and tender caudal process. Lateral surface with prominent ridges and rather coarse intercostal ornamentation.
Description: Carapace subrhomboidal in lateral view. Dorsal margin straight or slightly sinuous, somewhat sloping to the posterior end. Ventral margin curving upwards in posterior direction. Anterior margin broadly rounded. Posterior end with a well developed caudal process turned upwards. The lateral surface has a rather deep subcentral, vertical sulcus and two longitudinal ridges. The upper ridge across the central part of the lateral surface is relatively low. It extends from the anterior margin to a point below the posterodorsal angle of the valve. The lower ridge is well developed, it may even be blade-like and ending in a short, but sharp posterior spine. The surface is coarsely punctate to reticulate. Posterodorsally one or two knob-like spines may be present. There are no eye spots. The internal features are those of the genus. Sexual dimorphism is pronounced. Males are more elongate and posteriorly more pointed.
Dimensions: L/H/B = 0.60/0.34/0.16 mm (holotype, female valve), 0.68/0.32/0.15 mm (paratypes, male valves).
Remarks: Comparison with the original material of Kingma's collection showed that *Neomonoceratina columbiformis* Kingma (1948) is more elongate, while it frequently has small spines along the anterior margin. It has a larger spine at the posterior end of the ventrolateral ridge. Intercostal pits are smaller and more widely spaced. Finally, the subdorsal caudal process is shorter in *N. columbiformis.*

More or less the same differences are noticed between our *N. mouliana* and *N. microreticulata* Kingma (1948) in which, moreover, the intercostal ornamentation is more pronounced. *N. macropora* Kingma (1948) differs primarily from our species by possessing a very large ventrolateral alar-like extension.
Occurrence: Crete: Apostoli 814; Tefeli 1, 34; Barbara 36.

Genus **Paijenborchella** Kingma, 1948

Type species: Paijenborchella iocosa Kingma, 1948.
Diagnosis: Carapace subovate in lateral view, with a slender ventral caudal process. Lateral surface smooth, pitted, reticulate or with ridges. Ventrolaterally a longitudinal ridge, which may end in a long spine. Median sulcus prominent. Hinge schizodont. No eye spots.
Remarks: The genus *Paijenborchella* is here thought to comprise two subgenera *Paijenborchella* s. str. and *Eopaijenborchella* Keij, 1966.

Subgenus **Paijenborchella** Kingma, 1948

Diagnosis: Carapace long, drawn-out and ending in a slender ventral caudal process. Lateral surface smooth or with ridges. Alar ridge ending in a prominent spine.

Paijenborchella (Paijenborchella) iocosa Kingma (Pl. 12, fig. 16)

Paijenborchella iocosa Kingma, 1948, p. 86, pl. 8, fig. 12; Keij, 1953, p. 166, pl. 2, fig. 6.
Paijenborchella (Paijenborchella) iocosa Kingma, Keij, 1966, p. 347, pl. 1, figs. 1-16, pl. 2, figs. 4-10.

Remarks: Our specimens agree with the "typical" variant (see Keij, 1966, pl. 1, fig. 1), having a well developed alar spine directed outwards. This species has not yet been reported from Italian Neogene or Quaternary deposits. It differs from *Paijenborchella (P.) solitaria* Ruggieri by the possession of two longitudinal ridges. *P. (P.) iocosa* was originally described from Neogene deposits of Bodjonegoro well (Java).
Occurrence: Crete: Kissamou 368; Apostoli 814; Asteri 848-849; Francocastello 817; Barbara 32.

Paijenborchella (Paijenborchella) solitaria Ruggieri (Pl. 12, fig. 17)

Paijenborchella solitaria Ruggieri, 1962b, p. 54, pl. 6, fig. 9.
Paijenborchella (Paijenborchella) solitaria Ruggieri, Keij, 1966, p. 350, pl. 1, fig. 17, pl. 2, figs. 11-14.

Remarks: Originally described from the "Tortonian" of Enna.
Occurrence: Crete: Apostoli 814; Asteri 848-849; Francocastello 817.

Subgenus **Eopaijenborchella** Keij, 1966

Type species: Paijenborchella lomata Triebel, 1949.
Diagnosis: Carapace ovate in lateral view. Surface with pits, reticulation, ridges and spines. No large alar process.

Paijenborchella (Eopaijenborchella) malaiensis Kingma (Pl. 12, fig. 15)

Paijenborchella malaiensis Kingma, 1948, p. 87, pl. 8, fig. 13; Keij, 1953, p. 167, pl. 2, fig. 7.
Paijenborchella cymbula Ruggieri, 1950a, p. 60, textfig.
Paijenborchella (Eopaijenborchella) malaiensis Kingma, Keij, 1966, p. 352, pl. 2, figs. 15-17, pl. 3, figs. 1-15.

Remarks: Originally described from the Neogene of Atjeh (north Sumatra) and of the Bodjonegoro well (Java).
Occurrence: Crete: Francocastello 817.

Subfamily XESTOLEBERIDINAE Sars, 1928

Genus **Xestoleberis** Sars, 1866

Type species: Cythere aurantia Baird, 1838 (designation by Brady & Norman, 1889).
Diagnosis: Carapace egg-shaped. Lateral surface smooth, frequently with opaque spots. Hinge modified hemi- or antimerodont. "Xestoleberis-spot" in anterodorsal region.
Remarks: As in our material of this genus intraspecific variation is very wide and overlapping between different species, the larger part of the *Xestoleberis* specimens from the Khairetiana and younger formations is subdivided into two groups: the *Xestoleberis* ex. gr. *dispar* and the *Xestoleberis* ex. gr. *margaritea*. Each group probably includes different taxa, but they could not be well separated.

Xestoleberis ex. gr. **dispar** Mueller

Xestoleberis dispar Mueller, 1894, p. 334, pl. 25, figs. 2, 3, 9, 35.

Remarks: Included are all forms with valves, that are more or less subtriangular in lateral outline as in *X. dispar* Mueller.

Occurrence: Crete: Khairetiana 292; Asteri 848-849, 884; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Xestoleberis ex. gr. **margaritea** (Brady)

Cytheridea margaritea Brady, 1866a, p. 370, pl. 8, fig. 19.
Xestoleberis communis Mueller, 1894, p. 338, pl. 25, figs. 32, 33 39, pl. 26, figs. 1, 6.

Remarks: In this group also *X. communis* Mueller is included. Especially, the large number of larval valves hampered the separation in clearly different taxa. Not included are forms figured as *X. margaritea* by Mueller (1894, p. 336, pl. 27, figs. 2, 7). *X margaritea* was originally described from the Levant.
Occurrence: Crete: Khairetiana 292; Asteri 848-849, 884; Francocastello 817; Barbara 32; Iraklion 46. Karpathos: Pigadia 2. Rhodos: Kritika 8-9; Vasfi 34a; Lindos 34a.

Xestoleberis reymenti Ruggieri (Pl. 4, fig. 11)

Xestoleberis reymenti Ruggieri, 1967b, p. 379, textfigs. 47-52.

Remarks: In our material the internal features are hardly visible. We therefore referred specimens to this species mainly by the shape of the carapace, which is piriform with the greatest height at approximately 1/2 to 2/3 of the length from the anterior margin.

Originally described from the "Argille di Casa i Gessi" ("Lower Messinian" or "Sahelian") of the Republic of San Marino.
Dimensions: L/H/B = 0.60/0.37/0.19 mm.
Occurrence: Gavdos: Gavdos 336, 341. Crete: Roka 105; Tefeli 1, 34; Barbara 36.

Xestoleberis ventricosa Mueller (Pl. 4, fig. 12)

Xestoleberis ventricosa Mueller, 1894, p. 335, pl. 25, figs. 4, 5, 14, 34, 38.

Occurrence: Crete: Francocastello 817; Barbara 32.

Subfamily BYTHOCYTHERINAE Sars, 1926

Genus **Bythoceratina** Hornibrook, 1952

Type species: Bythoceratina mestayerae Hornibrook, 1952.
Diagnosis: Carapace subrhomboidal in lateral view. Valves with ventrolaterally one or two hollow spines or a wing-like projection. Lateral surface smooth, punctate, reticulate or with short spines. Hinge lophodont.

Bythoceratina vandenboldi Ruggieri

Bythoceratina ? vandenboldi Ruggieri, 1960, p. 6, pl. 1, figs. 6, 7, pl. 2, fig. 3.
Bythoceratina vandenboldi Ruggieri, Colalongo, 1965, p. 113, pl. 12, fig. 8.

Remarks: Originally described from the Miocene of the area of Ragusa (Sicily).
Dimensions: L/H/B excluding spines = 0.77/0.41/0.27-0.28 mm (female ? right valve), 0.81/0.37-0.38/0.25 mm (male ? right valve).
Occurrence: Gavdos: Gavdos 336.

Genus **Monoceratina** Roth, 1928

Synonym: Bythocytheremorpha Mandelstam, 1958.
Type species: Monoceratina ventrale Roth, 1928.
Diagnosis: Carapace elongate-subrhomboidal in lateral view, with generally a subdorsal caudal process. Lateral surface smooth, pitted, striate, reticulate or with small spines. Hinge adont.

Monoceratina mediterranea n. sp. (Pl. 12, figs. 13, 14)

Etymology: named after the Mediterranean Sea.
Holotype: a left female valve.
Paratypes: 22 loose valves.
Type locality: Section Rhodos, exposure 34a.
Type level: Vasfi Formation (sample MUR 7), Lower Pleistocene.
Diagnosis: A species of the genus *Monoceratina,* characterized by a distinct subcentral sulcus, a large ventrolateral keel, a low ridge along the dorsal margin and a smooth and polished lateral surface.
Description: Carapace subrhomboidal in lateral view. Dorsal margin somewhat sinuous, ventral margin almost straight. Anterior margin rounded, upper part oblique. Posterior margin slightly rounded ventrally, sloping upward to the distinct subdorsal caudal process. Ventrolateral keel large, broadly rounded in dorsal view and ending in a rather irregular, blunt point. Subcentrally a vertical sulcus is distinctly expressed. Along the dorsal margin there is a low ridge. The lateral surface is smooth and polished. Sexual dimorphism is distinct. Males are more elongate. Juveniles have an indistinct reticulation on the dorsal and ventral side of the keel and a ridge situated just before the sulcus extending from the dorsal ridge downwards. Internal features are those of the genus.
Dimensions: L/H/B = 0.82/0.45/0.38 mm (holotype, female valve), 0.75-0.85/0.45/0.38 mm (paratypes).
Remarks: From Rio Riozzo near Castell' Arquato this form has been described

and figured as *Monoceratina* sp. by Ruggieri (1953b, p. 127, pl. 2, fig. 15). It also occurs in the Adriatic Sea (see Ascoli, 1965, pl. 4) and in the Gulf of Naples (see Puri & Dickau, 1969, pl. 4, fig. 1).
Occurrence: Crete: Tefeli 34. Karpathos: Pigadia 2. Rhodos: Vasfi 34a.

Genus **Pseudocythere** Sars, 1866

Type species: Pseudocythere caudata Sars, 1866.
Diagnosis: Carapace subrectangular in lateral view, with caudal process continuous with dorsal margin. Lateral surface smooth. Inner lamella wide, with anterior and posteroventral vestibula. Hinge adont.

Pseudocythere caudata Sars

Pseudocythere caudata Sars, 1866, p. 88; Mueller, 1894, p. 285, pl. 16, figs. 5, 10, 30-36; Neviani, 1906, p. 211, textfig. 15; Sars, 1928, p. 239, pl. 109, fig. 2.

Remarks: Our material closely resembles the type figure of Sars and the individual figured by Mueller (1894). However, as originally pointed out by Elofson (1941) and later on by Van Morkhoven (1963) and by Benson (1964) the specimen figured by Mueller is not quite the same as Sars' type. In lateral outline both forms are hardly different and in both illustrations a minute thorn-like extension is found at the posteroventral angle. However, the development of the anterior vestibulum is different. In the type figure the vestibulum is less deep than it is in Mueller's form. In Mueller's form marginal pore canals are slightly widened. As in our material intermediate forms are present, there is no good reason to separate *P. caudata* sensu Mueller from the type.

The individuals described and figured as *P. caudata* by Wagner (1963, p. 35, pl. 12, figs. 1-3) were included in the genus *Loxocauda* by Schornikov (1969), since this form possesses four adductor muscle scars and two frontal scars.
Occurrence: Crete: Asteri 848-849; Francocastello 817. Karpathos: Pigadia 2. Rhodos: Vasfi 34a.

Family INCERTAE SEDIS

Genus **Saida** Hornibrook, 1952

Type species: Saida truncata Hornibrook, 1952.
Diagnosis: Carapace more or less oval in lateral view, small. Ventrolateral swelling ending in blunt process. Lateral surface pitted. Hinge lophodont.

Saida sp. (Pl. 11, fig. 13)

Remarks: Only a single right valve has been found. In lateral aspect it is oval. Ventrolaterally an alar process is present, which extends more or less parallel to the lower margin as a broadly rounded keel. The lateral surface is coarsely punctate. Internal features are not visible.
Dimensions: L/H/B = 0.35/0.23/0.12 mm.
Occurrence: Karpathos: Pigadia 2.

REFERENCES

Agalarova, D. A., 1967. Mikrofauna der pontischen Ablagerungen Aserbeidschans und der angrenzenden Gebiete. 121 pp. Leningrad.

Aruta, L., 1966. Ostracodi del Saheliano (Miocene sup.) dei dintorni di Calatafimi (Sicilia sud-occidentale). Riv. Miner. Sicil., no. 100-102, pp. 3-12.

Ascoli, P., 1965. Crociera talassografica adriatica 1955. VI. Ricerche ecologiche sugli Ostracodi contenuti in 16 carote prelevate sul fondo del mare Adriatico. Archiv. Oceanogr. Limnol., Venezia, 16 (1), pp. 70-137.

——— 1968. Preliminary report on the Ostracoda of the type-Tortonian. Giorn. Geol., ser. 2a, 35 (2), pp. 31-54.

Baird, W., 1850a. The natural history of the British Entomostraca. Roy Soc. London, (1850), 364 pp.

——— 1850b. Description of several new species of Entomostraca. Proc. Zool. Soc. London, 18, pp. 254-257.

Barbeito-Gonzalez, P. J., 1971. Die Ostracoden des Küstenbereiches von Naxos (Griechenland) und ihre Lebensbereiche. Mitt. Hamburg. Zool. Mus. Inst., 67, pp. 255-326.

Bassiouni, M. A., 1966. Ostracoden aus dem „Pliozän" von Kom el Shelul Pyramiden Plateau, Gineh (Ägypten). Geol. Jahrb., 82, pp. 631-654.

——— 1970. *Falunia (Hiltermannicythere)*, a new subgenus from the Gulf of Naples and related fossil forms. Rev. Espan. Micropaleont., 2 (2), pp. 117-130.

Becker-Platen, J. D., 1970. Lithostratigraphische Untersuchungen im Känozoikum Südwest-Anatoliens (Türkei). Beihefte Geol. Jahrb., Heft 97, 244 pp.

Benson, R. H., 1964. Recent cytheracean ostracodes from McMurdo Sound and the Ross Sea, Antarctica. Paleont. Contr. Univ. Kansas, Arthropoda, art. 6, pp. 1-36.

Benson, R. H. & Coleman, G. J., 1963. Recent marine ostracodes from the eastern Gulf of Mexico. Paleont. Contr. Univ. Kansas, Arthropoda, art. 2, pp. 1-52.

Bignot, G., Dercourt, J. & Le Calvez, Y., 1963. Contribution à l'étude des niveaux pliocène du Péloponnèse et des marnes supra-oligocènes de Zante (Grèce). Bull. Soc. Géol. Fr., ser 7, 5, pp. 1093-1099.

Blake, C. H., 1931. Notes on Ostracoda. J. Paleont., 5, pp. 160-163.

Bold, W. A. van den, 1946. Contribution to the study of Ostracoda with special reference to the Tertiary and Cretaceous microfauna of the Caribean region. Univ. Utrecht, Thesis, 167 pp.

——— 1957. Oligo-Miocene Ostracoda from southern Trinidad. Micropaleont., 3, pp. 231-254.

——— 1960. Eocene and Oligocene Ostracoda of Trinidad. Micropaleont., 6, pp. 145-196.

——— 1966. Les Ostracodes du Néogène du Gabon. Rev. Inst. Fr. Pétrole, 21, pp. 155-189.

——— 1968a. Ostracodes du Néogène du Gabon et de l'Italie (note technique). Rev. Inst. Fr. Pétrole, 23, pp. 1327-1328.

——— 1968b. Ostracoda of the Yague Group (Neogene) of hte northern Dominican Republic. Bull. Amer. Paleont., 54, n. 239, pp. 1-106.

Bonarelli, G., 1901. Appunti sulla costituzione geologica dell' isola di Creta. Atti R. Accad. Lincei, Mem. Cl. Sci. Fis. Mat. Nat., 3, pp. 518-548.

Borragan, J., 1966. Los Ostracodos del Mioceno superior de facies marina de la Cuenca del Guadalquivir (Esp.). Proc. Third Session C.M.N.S. Bern 1964, pp. 270-279.

Bosquet, J., 1852. Description des Entomostracés fossiles des terrains tertiaires de la France et de la Belgique. Mém. Cour. Mém. Sav. Etrang., 24, p. 1-142.

Brady, G. S., 1866a. On new or imperfectly known species of marine Ostracoda. Trans. Zool. Soc. London, 5, pp. 359-393.

——— 1866b. Report on the Ostracoda dredged amongst the Hebrides. Rept. Brit. Assoc. Adv. Sci., (1866), pp. 208-211.

——— 1867-1872. Ostracoda. In: Folin, L. & Perier, L., Les Fonds de la Mer, I. pp. 1-316.

——— 1868a. A monograph of the Recent British Ostracoda. Trans. Linn. Soc. London, 26 (2), pp. 353-495.

——— 1868b. Contributions to the study of the Entomostraca III: Marine Ostracoda from Tenedos. Ann. Mag. Nat. Hist. London, ser. 4, 2, pp. 220-225.

——— 1869. Contributions to the study of the Entomostraca IV: Ostracoda from the River Scheldt and the Grecian Archipelago. Ann. Mag. Nat. Hist. London, ser. 4, 3, pp. 45-50.

——— 1880. Report on the Ostracoda dredged by H.M.S. *Challenger* during the years 1873-1876. Rep. Sci. Res. Voy. H.M.S. Challenger, Zool., 1 (3), pp. 1-184.

Brady, G. S., Crosskey, H. W. & Robertson, D., 1874. A monograph of the post-Tertiary Entomostraca of Scotland including species from England and Ireland. Paleont. Soc. London, (1874), 274 pp.

Brady, G. S. & Norman, A. M., 1889. A monograph of the marine and freshwater Ostracoda of the North Atlantic and of northwestern Europe. I. Podocopa. Sci. Proc. Roy. Dublin Soc., 4 (2), pp. 63-270.

Brives, A., 1897. Les terrains tertiaires du bassin du Chéliff et du Dahra. Thesis no. 21, Lyon.

Bruijn, H. de, Sondaar, P. Y. & Zachariasse, W. J., 1971. Mammalia and Foraminifera from the Neogene of Kastellios Hill, (Crete), a correlation of continental and marine biozones. I, II. Proc. Kon. Ned. Akad. Wetensch., ser. B, 74, pp. 482-503.

Capeder, G., 1900. Contribuzione allo studio degli entomostraci dei terreni Pliocenici del Piemonte e della Liguria. Atti R. Accad. Sci. Torino, 35, pp. 60-73.

——— 1902. Contribuzione allo studio degli entomostraci Ostracodi della strato terreni Miocenici del Piemonte. Atti. R. Accad. Sci. Torino, 38, pp. 5-18.

Capelli, G. B., 1905. Contribuzione allo studio degli Ostracodi fossili della strato a sabbie grigie della Farnesina presso Roma. Boll. Soc. Geol. Ital., 24, pp. 303-342.

Carbonnel, G., 1966. Essai d'étude statistique à propos d'un nouveau genre d'ostracode *Pseudopsammocythere*. Rev. Micropaleont., 9, pp. 50-54.

——— 1969. Les Ostracodes du Miocène Rhodanien, pt. I, II. Doc. Lab. Géol. Fac. Sci. Lyon, no. 32 (1,2), pp. 1-469.

Christodoulou, G., 1960. Geologische und mikropaläontologische Untersuchungen auf der Insel Karpathos (Dodekanes). Paleontographica, Abt. A, 115, pp. 1-143.

Christodoulou, G. & Haralambous, D., 1960. Über ein Sarmatvorkommen auf Süd-Ostkreta. Elliniki Geologiki Etairia, 4 (1), pp. 81-85.

Cita, M. B., Premoli Silva, I. & Rossi, R., 1965. Foraminiferi planctonici del Tortoniano-tipo. Riv. Ital. Paleont., 71, pp. 217-308.

Colalongo, M. L., 1965. Gli Ostracodi della serie de le Castella (Calabria). Giorn. Geol., ser. 2a, 33, pp. 83-123.

——— 1968a. Cenozone a Foraminiferi ed Ostracodi nel Pliocene e Bassa Pleistocene della serie del Santerno e dell' Appennino Romagnolo. Giorn. Geol., ser. 2a, 35, pp. 29-61.

——— 1968b. Ostracodi del Neostratotipo del Messiniano. Giorn. Geol., ser. 2a, 35, pp. 67-72.
Costa, O.G., 1853. Paleontologia del Regno di Napoli. Part 3. 196 pp. (not seen).

Decima, A., 1964. Ostracodi del Gen. *Cyprideis* Jones del Neogene e del Quaternario italiani. Paleont. Ital., 57, pp. 81-133.

Desio, A., 1931. Le isole italiane dell' Egeo. Mem. Descr. Carta Geol. Ital., 24, 534 pp.

Dieci, G. & Russo, A., 1964a. Alcune specie nuove di Ostracodi dell' Appennino settentrionale. Atti Soc. Nat. Mat. Modena, 96, pp. 1-19.

——— 1964b. Ostracodi Tortoniani dell' Appennino settentrionale (Tortona, Montegibbio, Castelvetro). Boll. Soc. Paleont. Ital., 3 (1), pp. 38-88.

——— 1967. Riesame di alcune specie di Ostracodi Tortoniani dell' Appennino settentrionale. Boll. Soc. Paleont. Ital., 6 (1), pp. 3-17.

Drooger, C. W. & Meulenkamp, J. E., 1969. Stratigraphic marginal notes to the symposium on oceanization of the western Mediterranean area. Verh. Kon. Ned. Geol. Mijnb. Gen., 26, pp. 149-151.

Egger, J. G., 1858. Die Ostracoden der Miocän-Schichten bei Ortenburg in Nieder-Bayern. N. Jahrb. Miner. Geogn. Geol., (1858), pp. 403-443.

Elofson, O., 1941. Zur Kenntnis der marinen Ostracoden Schwedens, mit besonderer Berücksichtigung des Skagerraks. Uppsala Univ. Zool. Bidr., 19, pp. 215-534.

Fischer, S., 1855. Beitrag zur Kenntnis der Ostracoden. Abh. Math. Phys. Cl. Bayer. Akad. Wiss., 7 (3), pp. 635-666.

Freudenthal, T., 1969. Stratigraphy of Neogene deposits in the Khania Province, Crete, with special reference to Foraminifera of the family Planorbulinidae and the genus *Heterostegina*. Utrecht Micropaleont. Bull., 208 pp.

Gianotti, A., 1953. Microfaune della serie Tortoniana del Rio Mazzapiedi-Castellania (Tortona-Alessandria) (1), Riv. Ital. Paleont. Strat. Mem. 6, pp. 167-308.

Gillet, S., 1957a. Relations entre bassin euxinique et méditerranéen au Néogène et au Quaternaire. C. R. Acad. Sc. Paris, 244, pp. 1803- 1805.

——— 1957b. Contribution à l'histoire du bassin euxinique et méditerranéen au Néogène et au Quaternaire. Bull. Serv. Carte géol. Als. Lorr., 10 (2), pp. 49.

——— 1961. Essai de paléogéographie du Néogène et du Quaternaire inférieur d'Europe orientale. Rev. Géogr. Phys. Géol. Dyn., 4, pp. 218-250.

Goerlich, F., 1952. Über die Genotypen und den Begriff der Gattungen *Cyprideis* und *Cytheridea* (Ostracoden). Senckenb., 33, pp. 185-192.

Gramann, F., 1969. Das Neogen im Strimon-Becken (Griechisch-Ostmazedonien). Teil II: Ostracoden und Foraminiferen aus dem Neogen des Strimon-Beckens. Geol. Jahrb., 87, pp. 485-528.

Gramann, F. & Kockel, F., 1969. Das Neogen im Strimon-Becken (Griechisch-Ostmazedonien). Teil I: Lithologie, Stratigraphie und Paläogeographie. Geol. Jahrb., 87, pp. 445-484.

Grekoff, N., Guernet, C. & Lorenz, J., 1967. Existence du Miocène marin au centre de la mer Egée, dans l'île de Skyros (Grèce). C. R. Acad. Sc. Paris, 265, pp. 1276-1277.

Grekoff, N. & Molinari, V., 1963. Sur une faune d'ostracodes saumatres du Néogène de Castell' Arquato (Emilia). Geol. Romana, 2, pp. 1-6.

Grekoff, N. & Moyes, J., 1955. Un nouveau genre d'ostracodes du basin d'Aquitaine: *Falunia girondica* n. g., n. sp. Bull. Soc. Géol. Fr., ser. 6, pp. 331-335.

Hanai, T., 1970. Studies on the ostracod subfamily Schizocytherinae Mandelstam. J. Paleont., 44, pp. 693-729.

Hartmann, G., 1964. Neontological and paleontological classification of Ostracoda. Publ. Staz. Zool. Napoli, 33 (suppl.), pp. 550-587.

Hazel, J. E., 1967. Classification and distribution of the Recent Hemicytheridae and Trachyleberididae (Ostracoda) off northeastern North America. Geol. Surv. Prof. Paper 564, pp. 1-49.

Hill, B. L., 1954. Reclassification of winged *Cythereis* and winged *Brachycythere*. J. Paleont., 28, pp. 804-826.

Hornibrook, N. de B., 1952. Tertiary and Recent marine Ostracoda of New Zealand. New Zealand. Geol. Surv., Paleont. Bull., 18, pp. 1-82.

Howe, H. V., 1947. Revision of the ostracod genus *Buntonia*. Am. Ass Petrol. Geol., Programm 1947 Meeting, 50 pp.

——— 1969. Homonymy and other mancreated taxonomic afflictions of Recent Ostracoda. In: The Taxonomy, Morphology and Ecology of Recent Ostracoda.
Edited by J. W. Neale, Oliver & Boyd, Edinburgh, pp. 3-13.

Hug, F., 1970. Das Pliozän von Kephallinia. Mitt. Bayer. Staatssamml. Paläont. Hist. Geol., 10, pp. 87-152.

Jones, T. R., 1850. Description of the Entomostraca of the Pleistocene beds of Newbury, Copford, Cleaton, and Grays. Ann. Mag. Nat. Hist. ser. 2, 6, pp. 25-28.

——— 1856. A monograph of the Tertiary Entomostraca of England. Paleont. Soc. London, 68 pp.

Keij, A. J., 1953. Preliminary note on the Recent Ostracoda of the *Snellius* Expedition. Proc. Kon. Ned. Akad. Wetensch., ser. B, 56, pp. 155-168.

——— 1957. Eocene and Oligocene Ostracoda of Belgium. Inst. R. Sci. Nat. Belg., mém. 136, pp. 1-260.

——— 1966. Southeast Asian Neogene and Recent species of *Paijenborchella* (Ostracoda). Micropaleont., 12, pp. 343-354.

Keij, A. J., in Drooger, C. W., Kaasschieter, J. P. H. & Keij, A. J. 1955. The microfauna of the Aquitanian-Burdigalian of southwestern France, pt. 4: Ostracoda. Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., ser. 1, 21(2), pp. 101-136.

Kingma, J. Th., 1948. Contribution to the knowledge of the young-Caenozoic Ostracoda from the Malayan region. Univ. Utrecht, Thesis, 118 pp.

Kollmann, K., 1960. Cytherideinae und Schulerideinae n. subfam. (Ostracoda) aus dem Neogen des östl. Österreich. Mitt. Geol. Gesell. Wien, 51, pp. 89-195.

Krstic, N., 1968a. Ostracodes des couches congériennes: 1. *Cyprideis* I. Bull. Mus. Hist. Nat. Belgrade, sér. a, 23, pp. 107-151.

——— 1968b. Ostracodes des couches congériennes: 3. *Cyprideis* II. Bull. Mus. Hist. Nat. Belgrade, sér. a, 23, pp. 154-183.

Kruit, C., 1955. Sediments of the Rhône Delta: I. Grain size and microfauna. Verh. Kon. Ned. Mijnb. Gen., Geol. Ser., 15, pp. 357-556.

Kuiper, W. N., 1918. Oligocäne und Miocäne Ostracoden aus den Niederlanden. Univ. Groningen, Thesis, 91 pp.

Kurc, G., 1961. Foraminifères et Ostracodes de l'étang de Thau. Rev. Trav. Inst. Pèches marit., 25, pp. 132-247.

Maddocks, R. F., 1969. Revision of Recent Bairdiidae (Ostracoda). U.S. Nat. Mus. Bull., 295, pp. 1-126.

Masoli, M., 1968. Ostracodi recenti dell'Adriatico settentrionale, tra Venezia e Trieste. Mem. Mus. Trident. Sci. Nat. Trento, 17 (1), pp. 1-100.

Medioli, F., 1960. La Microfauna ed Ostracodi del Calabriano di Talignano Val Taro (Parma). Atti Soc. Ital. Sci. Nat. Milano, 99, pp. 209-220.

——— 1962. Foraminiferi ed Ostracodi del Calabriano della Val Rouvacchia presso Tabiano (Parma). Boll. Soc. Geol. Ital., 81 (4), pp. 261-286.

Méhes, G., 1908. Beiträge zur Kenntnis der Pliozänen Ostracoden Ungarns. II. Die Darwinulidaeen und Cytheridaeen der Unterpannonischen Stufe. Földt. Közl., 38, pp. 601-635.

Meulenkamp, J. E., 1969. Stratigraphy of Neogene deposits in the Rethymnon Province, Crete, with special reference to the phylogeny of uniserial *Uvigerina* from the Mediterranean region. Utrecht Micropaleont. Bull., 2, 168 pp.

Mistretta, F., 1967. Ostracodi dei generi *Eucytherura, Hemicytherura* e *Kangarina* nel Siciliano di Acqua dei Corsari (Palermo). Riv. Miner Sicil., no. 103-105, pp. 1-11.

Moore, R. C. & Pitrat, C. W. (ed.), 1961. Treatise on Invertebrate Paleontology, pt. Q, Arthropoda 3, Crustacea, Ostracoda. Univ. Kansas Press.

Morkhoven, F. P. C. M. van, 1962, 1963. Post-paleozoic Ostracoda, vol. 1,2. Elsevier, Amsterdam.
Moyes, J., 1958. *Falunia sphaerulolineata* Jones, 1858, nom nouveau pour *Falunia girondica* Grekoff & Moyes, 1955 (note rectificative). C. R. Somm. Soc. géol. Fr., N. 11, p. 236.

——— 1965. Les ostracodes du Miocène Aquitain: essai de paléoécologie stratigraphique et de paléogéographie. Thèse Fac. Sci. Univ. Bordeaux, 319 pp.

Mueller, G. W., 1894. Die Ostracoden des Golfes von Neapel und der angrenzenden Meeresabschnitte. Naples Sta. Zool., Fauna Flora Golfes Neapel, monogr. 21, 404 pp.

——— 1912. Ostracoda. Das Tierreich, 31, pp. 1-434.

Muenster, G. von, 1830. Über einige fossile Arten *Cypris* (Mueller, Lamk) und *Cythere* (Mueller, Latreille, Desmaret). Jahrb. Miner. Geogn. Petr., 1 (1), pp. 60-67.

Mutti, E., Orombelli, G. &. Pozzi, R., 1967. Geological map of Rhodes Island (Greece) 1:50.000. Univ. Milan, Inst. Geol. (Italy).

——— 1970. Geological studies on the Dodekanese islands (Aegean Sea). IX. Geological map of the island of Rhodes (Greece). Explanatory notes. Ann. Géol. Pays. Hell., ser. 1, 22, pp. 77-226.

Namias, L., 1900. Ostracodi fossili della Farnesina e Monte Mario presso Roma. Paleont. Ital., 6. pp. 83-112.

Neale, J. W. (ed.), 1969. The taxonomy, morphology and ecology of Recent Ostracoda. Oliver & Boyd, Edinburgh.

Neviani, A., 1906. Ostracodi delle sabbie postplioceniche di Carrubbare. Boll. Soc. Geol. Ital., 25, pp. 181-216.

——— 1928a. Ostracodi fossili d'Italia I. Vallebiaja (Calabriano). Mem. Pont. Accad. Sci. N. Lincei, 11, pp. 1-118.

——— 1928b. Di alcuni Ostracodi raccolti sulle spiaggie di Bari e di Rimini. Atti Pont. Accad. Sci. N. Lincei, 81, pp. 123-132.

Oertli, H. J. 1956. Ostracoden aus der Oligozänen und Miozänen Molasse der Schweiz. Schweiz. Paläont. Abh., 74, pp. 1-120.

——— 1961. Ostracodes du Langhien-type. Riv. Ital. Paleont. Strat., 67 (1), pp. 17-44.

Orombelli, G. & Montanari, C., 1967. Geological studies on the dodecanese islands (Aegean Sea) VI. The Calabrian of the island of Rhodes (Greece). Boll. Soc. Geol. Ital., 86, pp. 103-113.

Papp, A., 1947. Über die Entwicklung der Ägäis im Jungtertiär. Sitzb. Akad. Wiss. Wien, Mat. Nat. Abt., ser. 1, 155, pp. 243-279.

Perconig, E., 1964. Sull'esistenza del Miocene superiore in facies marina nella Spagna meridionale. Proc. Third Session C.M.N.S. Bern 1964, pp. 288-302.

——— 1968. Biostratigrafia della sezione di Carmona (Andalusia, Spagna) in base ai Foraminiferi planctonici. Giorn. Geol., ser. 2a, 35, pp. 191-218.

Pokorny, V., 1952. The Ostracods of the so-called Basal Horizon of the Subglobosa Beds at Hodonin (Pliocene, Inner Alpine Basin, Czechoslovakia). Sborn. Ustr. Ust. Geol., 19, pp. 229-396.

——— 1964. The taxonomic delimitation of the subfamilies Trachyleberidinae and Hemicytherinae (Ostracoda, Crustacea). Acta Univ. Carol., Geol., 3, pp. 275-284.

——— 1968. The concept of monophyly and phylogeny of the Hemicytheridae (Ostracoda, Crustacea). Casopis Miner. Geol., 13, pp. 421-429.

Pucci, A., 1953. Ostracodi pleistocenici della valle del Tronto. Giorn. Geol., ser. 2a, 25, pp. 163-172.

Puri, H. S., 1958. Ostracode subfamily Cytherettinae. Florida Geol. Surv., Geol. Bull., 40, pp. 183-194.

——— 1963. Preliminary notes on the Ostracoda of the Gulf of Naples. Experientia, 29, pp. 368-373.

Puri, H. S., Bonaduce, G. & Malloy, J., 1964. Ecology of the Gulf of Naples. Pubbl. Staz. Zool. Napoli, 33 (suppl.), pp. 87-199.

Puri, H. S., Bonaduce, G. & Gervasio, A. M., 1969. Distribution of Ostracoda in the Mediterranean. In: The Taxonomy, Morphology and Ecology of Recent Ostracoda. Edited by J. W. Neale, Oliver & Boyd, Edinburgh, pp. 356-411.

Puri, H. S., & Dickau, B. E., 1969. Use of normal pores in taxonomy of Ostracoda. Trans. Gulf Coast Ass. Geol. Soc., 19, pp. 353-367.

Reuss, A. E., 1850. Die fossilen Entomostraceen des österreichischen Tertiär-Beckens. Haidingers Naturw. Abh., 3 (1), pp. 41-92.

Reyment, R. A., 1960. Studies on Nigerian Upper Cretaceous and Lower Tertiary Ostracoda. Part 1: Senonian and Maastrichtian Ostracoda. Stockholm Contr. Geol., 7, pp. 1-238.

——— 1963. Studies on Nigerian Upper Cretaceous and Lower Tertiary Ostracoda. Part 2: Danian, Paleocene and Eocene Ostracoda. Stockholm Contr. Geol., 10, pp. 1-286.

Reyment, R. A., & Elofson, O., 1959. Zur Kenntnis der Ostracoden-gattungen *Buntonia*. Stockholm Contr. Geol., 3, pp. 157-164.

Roemer, F. A. 1838. Die Cytherinen des Molasse-Gebirges. N. Jahrb. Miner. Geogn. Geol. Petr., (1838), pp. 514-519.

Rome, D. R., 1939. Note sur des ostracodes marins des environs de Monaco. Bull. Inst. Océanogr. Monaco, no. 768, pp. 1-14.

——— 1942. Ostracodes marins des environs de Monaco. Bull. Inst. Océanogr. Monaco, no. 819, pp. 1-31.

Ruggieri, G., 1950a. Una nuova *Paijenborchella* del Pliocene della Calabria. Giorn. Geol., ser. 2a, 21, pp. 59-63.

——— 1950b. Gli Ostracodi delle sabbie grigie Quaternarie (Milazziano) di Imola. Parte I. Giorn. Geol., ser. 2a, 21, pp. 1-58.

——— 1952a. Note preliminare sugli Ostracodi di alcune spiaggie adriatiche. Note Labor. Biol. Mar. Fano, 4, pp. 57-64.

——— 1952b. Gli Ostracodi delle sabbie grigie Quaternarie (Milazziano) di Imola. Parte II. Giorn. Geol., ser. 2a, 22, pp. 61-115.

——— 1953a. Correzioni ad alcuni lavori su Ostracodi dell' autore stesso. Giorn. Geol., ser. 2a, 23, pp. 169-170.

——— 1953b. Età e fauna di un terazzo marino sulla costa ionica della Calabria. Giorn. Geol., ser. 2a, 23, pp. 19-168.

——— 1953c. Iconografia degli Ostracodi marini del Pliocene e Pleistocene italiani. Parte I. Atti Soc. Ital. Sci. Nat., 92, pp. 40-56.

——— 1954. Iconografia degli Ostracodi marini del Pliocene e Pleistocene italiani. Parte II. Atti Soc. Ital. Sci. Nat., 93, pp. 561-575.

——— 1956. La suddivisione degli Ostracodi già compresi nel genere "*Cythereis*" proposta de Neviani nel 1928. Atti Soc. Ital. Sci. Nat., 95, pp. 161-185.

——— 1958. Alcuni Ostracodi del Neogene italiano. Atti Soc. Ital. Sci. Nat., 97 (2), pp. 127-146.

——— 1959. Enumerazione degli Ostracodi marini del Neogene Quaternario e Recente italiani descritti o elencati nell' ultimo decennio. Atti Soc. Ital. Sci. Nat., 98, pp. 183-208.

——— 1960. Ostracofauna Miocenica del Ragusano. Riv. Miner. Sicil., no. 63, pp. 1-7.

——— 1962a. Alcuni Ostracodi Quaternarie e Recenti pertinenti al genere *Costa* Neviani. Boll. Soc. Paleont. Ital., 1 (2), pp. 3-9.

——— 1962b. Gli Ostracodi marini del Tortoniano (Miocene medio-superiore) di Enna nella Sicilia centrale. Paleont. Ital., 56, mem. 2, pp. 1-68.

——— 1963. Neotipi di Ostracodi Tortoniani di Benestare (Calabria). Boll. Soc. Paleont. Ital., 2 (1), pp. 3-15.

——— 1964. Ecological remarks on the present and past distribution of four species of *Loxoconcha* in the Mediterranean. Pubbl. Staz. Zool. Napoli, 33 (suppl.), pp. 515-528.

——— 1967a. The Miocene and later evolution of the Mediterranean Sea. Syst. Ass. Publ. no. 7, Aspects of Tethyan Biogeography, pp. 283-290.

——— 1967b. Due Ostracofaune del Miocene alloctono della Val Marecchia (Appennino sett.). Riv. Ital. Paleont., 73 (1), pp. 351-384.

——— 1967c. Considerazioni critiche su alcune recenti publicazioni italiane su Ostracodi. Atti Soc. Ital. Sci. Nat., 106, pp. 102-110.

Ruggieri, G., Torre, G., Moroni, M. A. & Aruta, L., 1969. Miocene superiore (Saheliano) nei dintorni di Bonfornello. (Palermo). Atti Accad. Gioennia. Sci. Nat. Catania, ser. 7, 1 (suppl.), pp. 175-193.

Russo, A., 1964. Ostracodi Langhiani del Pescale (Appennino settentrionale modenese). Boll. Soc. Paleont. Ital., 3 (2), pp. 227-251.

——— 1968a. Ostracodi Tortoniani di Montebaranzone (Appennino settentrionale modenese). Boll. Soc. Paleont. Ital., 7 (1) pp. 6-56.

——— 1968b. Ostracodi Tortoniani di Montebaranzone (Appennino modenese): aggiunte e rettifiche. Boll. Soc. Paleont. Ital., 7 (1), pp. 85, 86.

Sandberg, P. A., 1964. The ostracod genus *Cyprideis* in the Americas. Stockholm Contr. Geol., 12, pp. 1-178.

Sars, G. O., 1866. Oversigt of Norges marine Ostracoder. Förh. Vidensk. Selsk. Christiania, 7, pp. 1-130.

——— 1928. An account of the Crustacea of Norway. Bergen Museum (Norw.), 9, pp. 1-277.

Schaeffer, H. W., 1953. Über Meeres — und Brackwasser — Ostracoden aus dem deutschen Küstengebiet; mit 2. Mitteilung über Ostracoden-Fauna Griechenlands. Hydrobiologia, 5 (4), pp. 351-389.

Seguenza, G., 1880. Le formazioni Terziarie nella provincia di Reggio (Calabria). Mem. Cl. Sci. Fis. Mat. Nat. R. Accad. Lincei Roma, ser. 3, pp. 1-446.

——— 1883. Gli Ostracodi dei periodi Terziarii e Quaternarii viventi nel Mare di Messina. Boll. Soc. Geol. Ital., 2, pp. 57-63.

——— 1883-1886. Il Quaternario di Rizzolo. Il Naturalista Siciliano, 2, pp. 182-185, pp. 199-204, pp. 223-229, pp. 256-259; 3, pp. 16-22, pp. 48-51, pp. 67-71, pp. 115-117, pp. 141-144, pp. 179-183, pp. 223-226, pp. 262-265, pp. 287-290, pp. 308-311, pp. 349-357; 4, pp. 33-36, pp. 55-59, pp. 89-92, pp. 116-120, pp. 157-161, pp. 204-208, pp. 214-217, p. 250, pp. 295-308; 5, pp. 22-24, pp. 31-33, pp. 123-126, pp. 149-151, pp. 186-188, pp. 238-239.

Sissingh, W., 1970. Some subfossil podocopid ostracodes from the Breid Bay area. Antarctica. Proc. Kon. Ned. Akad. Wetensch., ser. B, 73, pp. 414-425.

——— 1971. Tricostate Trachyleberidinae (Ostracoda) from Neogene-Recent deposits of Europe. Proc. Kon. Ned. Akad. Wetensch., ser. B, 74, pp. 195-205.

——— 1972. Ostracodes from the Sahelian near Carnot, N. Algeria. Proc. Kon. Ned. Akad. Wetensch., ser. B, 75, pp. 84-95.

——— 1972. Stratigraphy of Late Cenozoic deposits in the western Iraklion Province, Crete (Greece). Kon. Ned. Akad. Wetensch. (in press).

Stancheva, M., 1962. Ostracoda from the Neogene in northwestern Bulgaria. I. Tortonian Ostracoda. Trav. Géol. Bulg., Sér. Paléont., 4, pp. 5-64.

——— 1963. Ostracoda from the Neogene in northwestern Bulgaria. II. Sarmatian Ostracoda. Trav. Géol. Bulg., Sér. Paléont., 5, pp. 5-60.

——— 1964. Ostracoda from the Neogene in northwestern Bulgaria. III. Maeotian Ostracoda. Trav. Géol. Bulg., Sér. Paléont., 6, pp. 55-115.

——— 1965a. Ostracoda from the Neogene in northwestern Bulgaria. IV. Pontian Ostracoda. Trav. Géol. Bulg., Sér. Paléont., 7, pp. 15-32.

——— 1965b. Ostracoda from the Neogene in northwestern Bulgaria. V. Development and stratigraphical importance. Trav. Géol. Bulg., Sér. Paléont., 7, pp. 32-62.

Stephanides, T., 1948. Korfu and Greece Ostracods. Prak. Hell. Hydrobiol. Inst., 2, pp. 70-107.

Terquem, O., 1878. Les foraminifères et les entomostracés-ostracodes du Pliocène supérieur de l'île de Rhodes. Mém. Soc. Géol. Fr., sér. 3, 1, pp. 1-135.

Triebel, E., 1950. Homöomorphe Ostracoden-Gattungen. Senckenb., 31, pp. 313-330.

——— 1952. Ostracoden der Gattung *Cytheretta* aus dem Tertiär des Mainzer Beckens. Notizbl. Hess. Landesamtes Bodenforsch. Wiesbaden, 6 (3), pp. 15-30.

——— 1961. Geschlechts-Dimorphismus und Asymmetrie der Klappen bei der Ostracodengattung *Occultocythereis*. Senckenb. Lethaea, 42, pp. 205-225.

Uliczny, F., 1969. Hemicytheridae und Trachyleberididae (Ostracoda) aus dem Pliozän der Insel Kephallinia (Westgriechenland). Inaugural-Dissertation München, 152 pp.

Verdenius, J. G., 1970. Neogene stratigraphy of the western Guadalquivir Basin (southern Spain). Utrecht Micropaleont. Bull., 3, 109 pp.

Voss, A. P. C. de, 1957. Liste annotée des ostracodes marins des environs de Roscoff. Trav. Sta. Biol. Roscoff, 3 (35-41), suppl. 9, pp. 1-74.

Wagner, C. W., 1957. Sur les Ostracodes du Quaternaire récent des Pays-Bas et sur leur utilisation dans l'étude géologique des dépôts holocènes. Mouton & Co., The Hague.

Witt, W., 1967. Ostracoden der bayerischen Molasse (unter besonderer Berücksichtigung der Cytherinae, Leptocytherinae Trachyleberidinae, Hemicytherinae und Cytherettinae). Geol. Bavar., 57, pp. 5-120.

PLATE 1

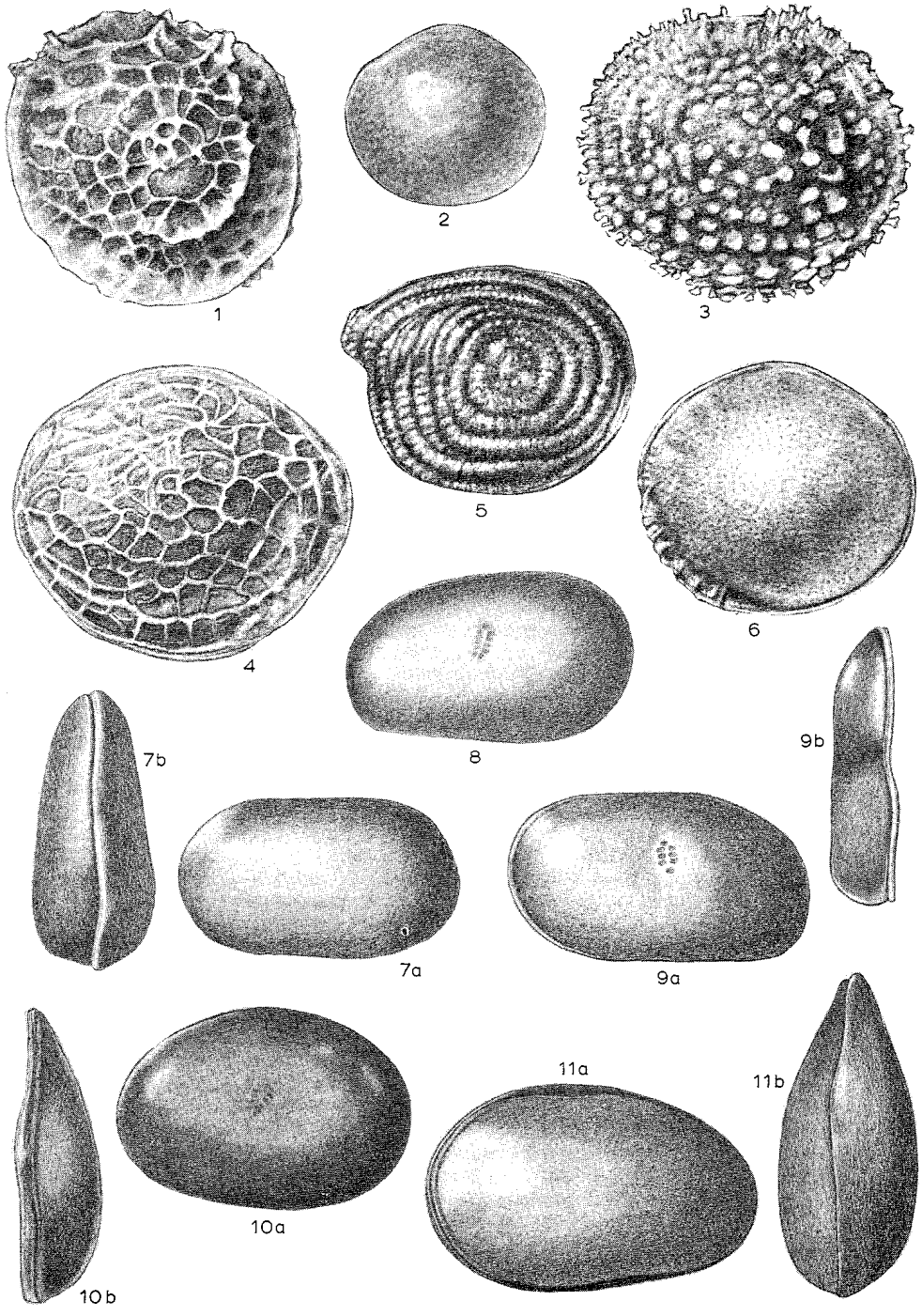


PLATE 1

		Page
Fig. 1.	*Polycope demulderi* n. sp. Holotype. Right valve. Vasfi Formation (sample MUR 12), Rhodos. x 145	66
Fig. 2.	*Polycope orbicularis* Sars ? Left valve. Vasfi Formation (sample MUR 12), Rhodos. x 145	67
Fig. 3.	*Polycope graeca* n. sp. Holotype. Right valve. Vasfi Formation (sample MUR 12), Rhodos. x 145	67
Fig. 4.	*Polycope reticulata* Mueller. Right valve. Vasfi Formation (sample MUR 12), Rhodos. x 70	67
Fig. 5.	*Polycope ? delicata* n. sp. Holotype. Left valve. Vasfi Formation (sample MUR 12), Rhodos. x 145	66
Fig. 6.	*Polycope vasfiensis* n. sp. Holotype. Left valve. Vasfi Formation (sample MUR 12), Rhodos. x 70	68
Fig. 7.	*Cytherella (Cytherella)* sp. Complete carapace: a) lateral view right valve, b) dorsal view. Khairetiana Formation (sample M 836), Crete. x 50	69
Fig. 8.	*Cytherella (Cytherella) terquemi* n. sp. Paratype. Right valve. Vasfi Formation (sample MUR 10), Rhodos. x 50	70
Fig. 9.	*Cytherella (Cytherella) terquemi* n. sp. Holotype. Left valve: a) lateral view, b) dorsal view. Vasfi Formation (sample MUR 10), Rhodos. x 50	70
Fig. 10.	*Cytherella (Cytherella)) russoi* n. sp. Holotype. Right valve: a) lateral view, b) dorsal view. Kissamou Formation (sample M 792), Crete. x 50	69
Fig. 11.	*Cytherella (Cytherella) russoi* n. sp. Paratype. Complete carapace: a) lateral view left valve, b) dorsal view. Kissamou Formation (sample M 792), Crete. x 50	69

PLATE 2

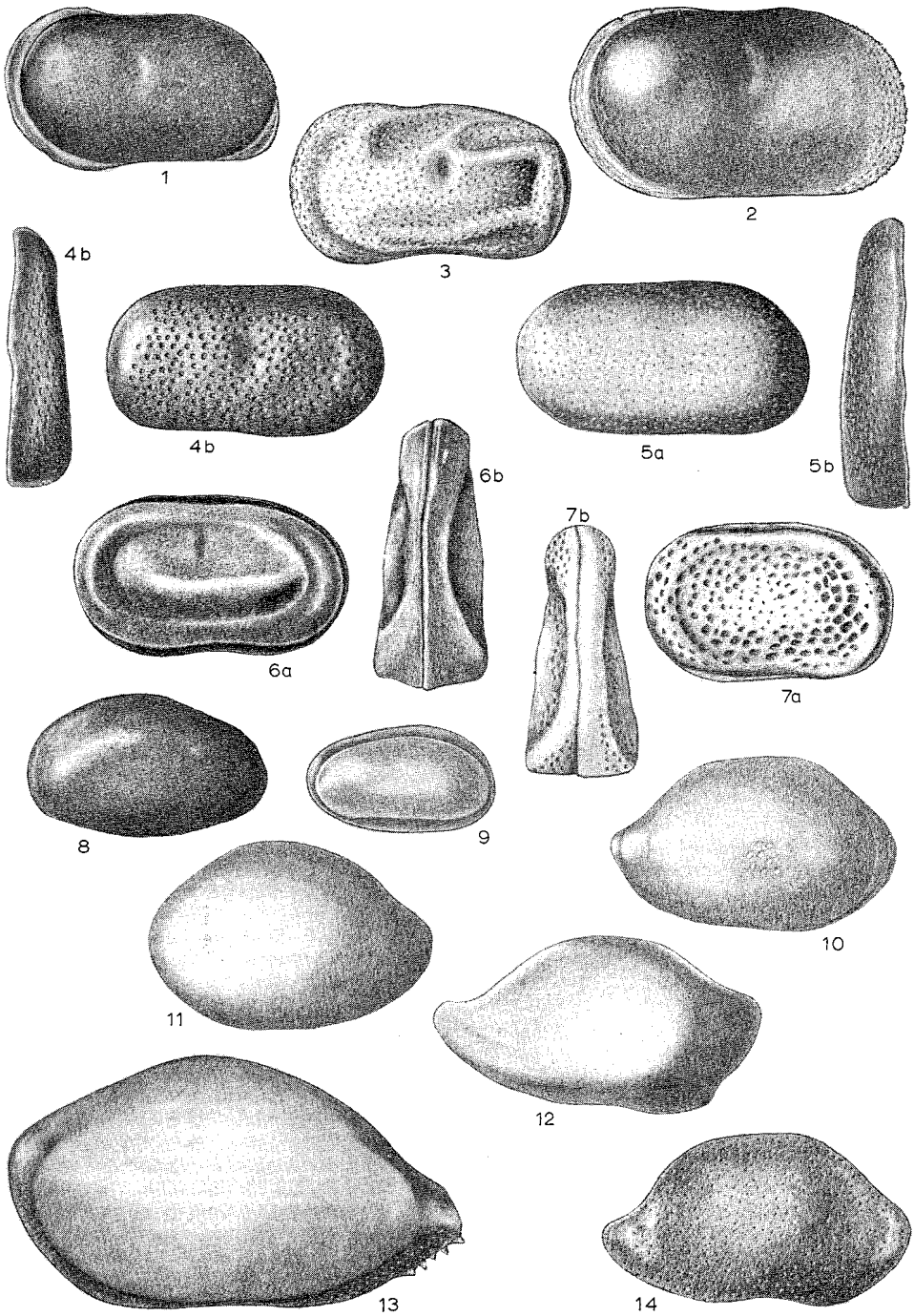


PLATE 2

		Page
Fig. 1.	*Cytherella (Cytherella) postdenticulata* Oertli. Left valve. Apostoli Formation (sample 850-P), Crete. x 50	68
Fig. 2.	*Cytherella (Cytherella) vulgata* Ruggieri. Left valve. Vasfi Formation (sample MUR 7), Rhodos. x 50	72
Fig. 3.	*Cytherella (Cytherelloidea) beckmanni* (Barbeito-Gonzalez). Left valve. Vasfi Formation (sample MUR 13), Rhodos. x 50	72
Fig. 4.	*Cytherella (Cytherella) vandenboldi* n. sp. Holotype. Male right valve: a) lateral view, b) dorsal view. Apostoli Formation (sample 814-V), Crete. x 50	71
Fig. 5.	*Cytherella (Cytherella) vandenboldi* n. sp. Paratype. Female left valve: a) lateral view, b) dorsal view. Apostoli Formation (sample 850-0), Crete. x 50	71
Fig. 6.	*Cytherella (Cytherelloidea) creutzburgi* n. sp. Holotype. Complete carapace: a) lateral view left valve. b) dorsal view. Asteri Formation (sample 884-G), Crete. x 50	73
Fig. 7.	*Cytherella (Cytherelloidea) cretensis* n. sp. Holotype. Complete female carapace: a) lateral view left valve, b) dorsal view. Khairetiana Formation (sample M836), Crete. x 50	72
Fig. 8.	*Cardobairdia glabra* van den Bold. Left valve. Kissamou Formation (sample M 805), Crete. x 50	74
Fig. 9.	*Cardobairdia* sp. Complete carapace: Lateral view right valve. Kissamou Formation (sample M 805), Crete. x 50	75
Fig. 10.	*Bairdoppilata (Bairdoppilata) supradentata* (Terquem). Right valve. Vasfi Formation (sample MUR 13), Rhodos. x 35	75
Fig. 11.	*Bairdoppilata (Bairdoppilata) supradentata* (Terquem). Left valve. Vasfi Formation (sample MUR 13), Rhodos. x 35	75
Fig. 12.	*Neonesidea corpulenta* (Mueller). Right valve. Pigadia Formation (sample VK 7), Karpathos. x 50	76
Fig. 13.	*Neonesidea longevaginata* (Mueller). Left valve. Kritika Formation (sample MUR 62), Rhodos. x 50	76
Fig. 14.	*Neonesidea nigrescens* (Ruggieri). Right valve. Tefeli Formation (sample 6-117), Crete. x 50	77

PLATE 3

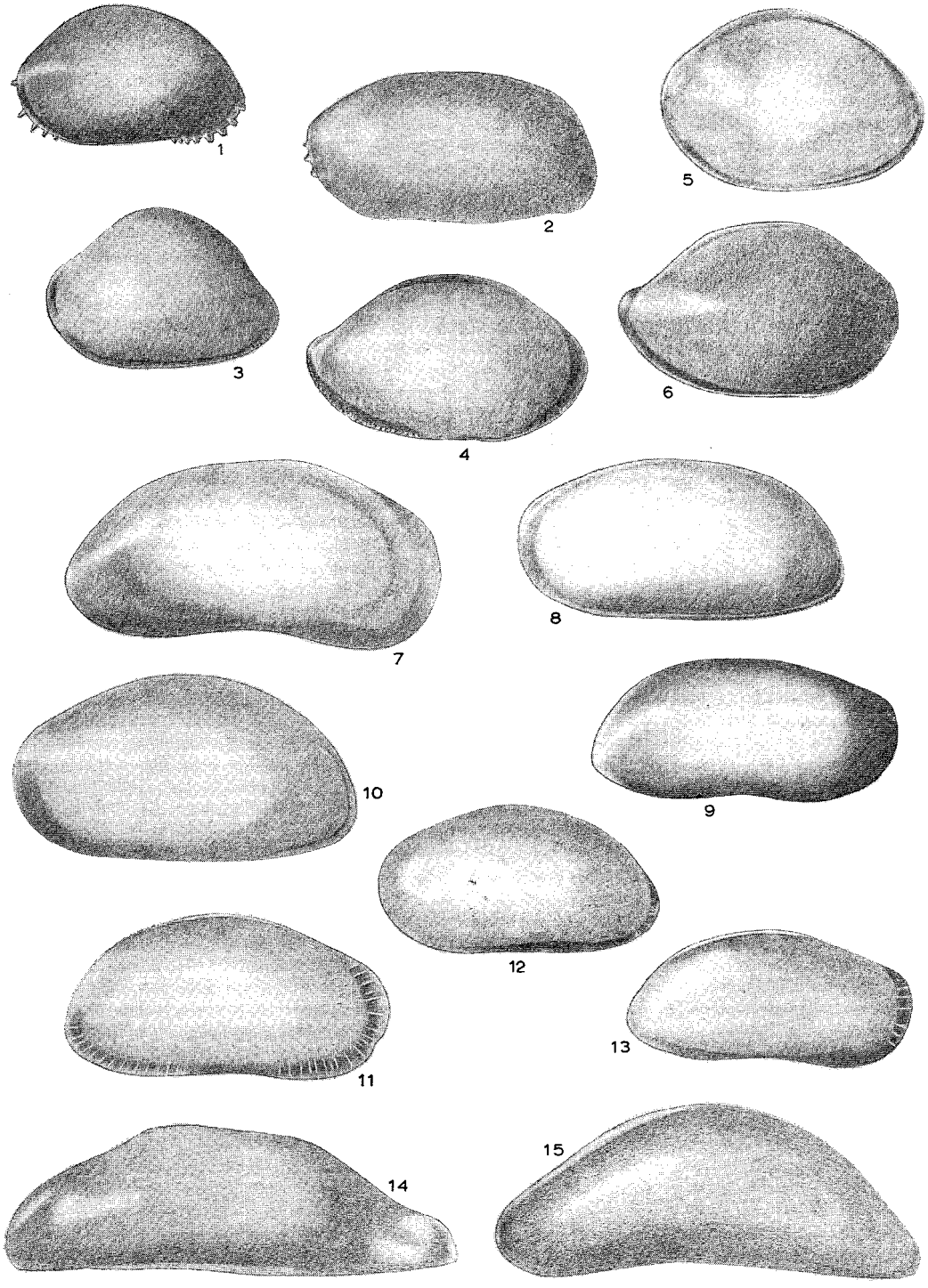


PLATE 3

		Page
Fig. 1.	*"Bairdia" formosa* Brady. Left valve. Kritika Formation (sample MUR 62), Rhodos. x 40	77
Fig. 2.	*"Bairdia" reticulata* Mueller. Right valve. Vasfi Formation (sample MUR 13), Rhodos. x 40	77
Fig. 3.	*"Bairdia"* sp. Left valve. Kissamou Formation (sample M 650), Crete. x 30	78
Fig. 4.	*"Bairdia"* sp. Right valve. Roka Formation (sample M 645), Crete. x 30	78
Fig. 5.	*"Bairdia" subdeltoidea* (von Muenster). Left valve. Apostoli Formation (sample 814-B), Crete. x 30	77
Fig. 6.	*"Bairdia" subdeltoidea* (von Muenster). Right valve. Apostoli Formation (sample 814-B), Crete. x 30	77
Fig. 7.	*Bythocypris bosquetiana* (Brady). Right valve. Francocastello Formation (sample 817-C), Crete. x 40	78
Fig. 8.	*Bythocypris lucida* (Seguenza). Left valve. Asteri Formation (sample 848-A), Crete. x 40	78
Fig. 9.	*Bythocypris lucida* (Seguenza). Right valve. Asteri Formation (sample 848-M), Crete. x 40	78
Fig. 10.	*Bythocypris obtusata* (Sars). Left valve. Vasfi Formation (sample MUR 7), Rhodos. x 40	79
Fig. 11.	*Bythocypris obtusata* (Sars). Right valve. Vasfi Formation (sample MUR 7), Rhodos. x 40	79
Fig. 12.	*Bythocypris* sp. Left valve. Kissamou Formation (sample M 651), Crete. x 40	79
Fig. 13.	*Bythocypris* sp. Right valve. Kissamou Formation (sample M 651), Crete. x 40	79
Fig. 14.	*Macrocypris* sp. 1. Left valve. Vasfi Formation (sample MUR 7), Rhodos. x 40	79
Fig. 15.	*Macrocypris* sp. 2. Left valve. Pigadia Formation (sample VK 14), Karpathos. x 40	80

PLATE 4

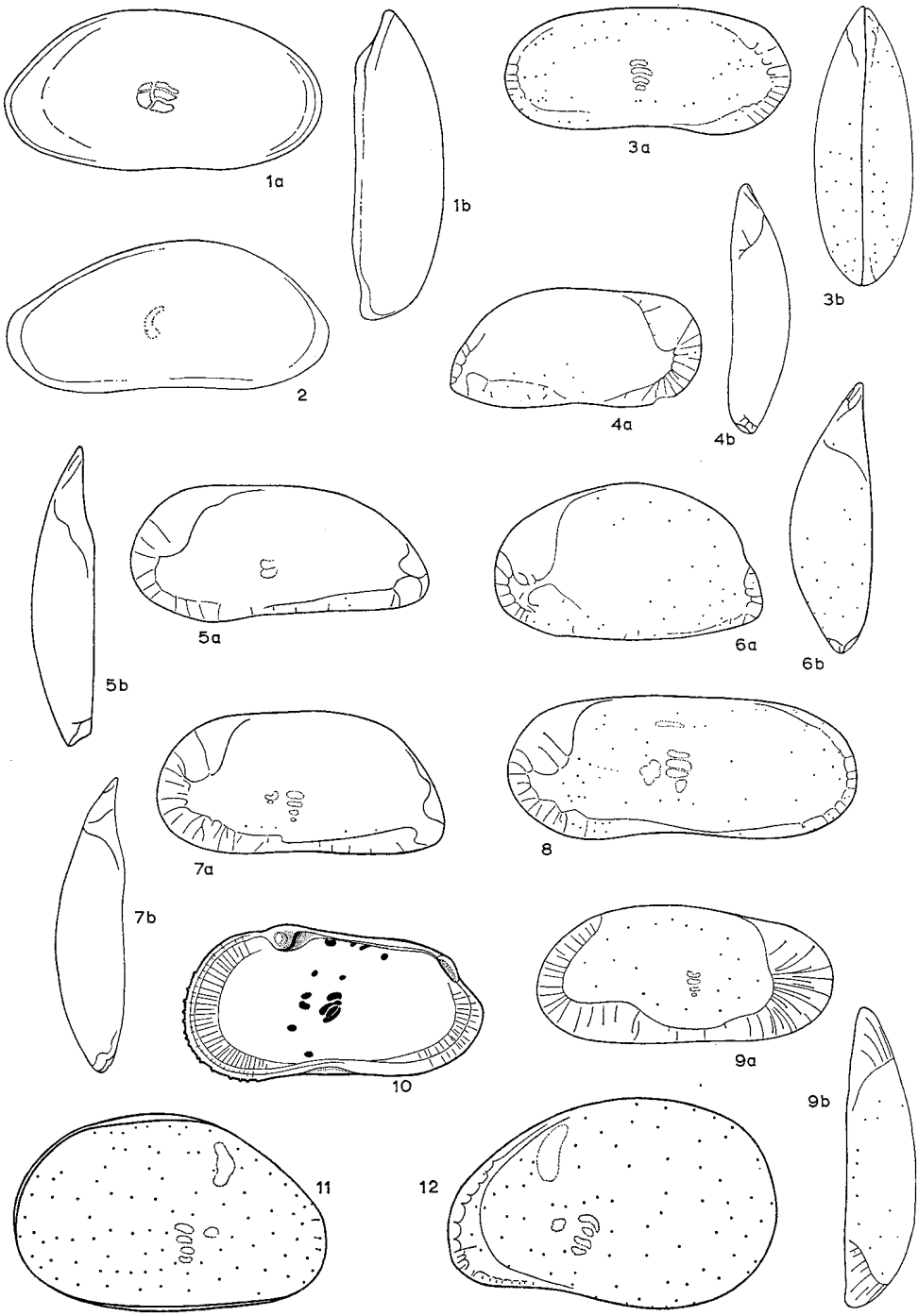


PLATE 4

		Page
Fig. 1.	*Argilloecia kissamovensis* n. sp. Holotype. Female right valve: a) lateral view, b) dorsal view. Kissamou Formation (sample M 794), Crete. x 80	81
Fig. 2.	*Argilloecia kissamovensis* n. sp. Paratype. Male left valve. Kissamou Formation (sample M 782), Crete. x 80	81
Fig. 3.	*Pseudopsammocythere kollmanni* Carbonnel. Complete carapace: a) lateral view right valve, b) dorsal view. Apostoli Formation (sample 814-D), Crete. x 80	85
Fig. 4.	*Krithe citae* Oertli. Right valve: a) lateral view, b) dorsal view. Apostoli Formation (sample 814-Q), Crete. x 50	83
Fig. 5.	*Krithe compressa dertonensis* Ruggieri. Left valve: a) lateral view, b) dorsal view. Gavdos Formation (sample G 485), Gavdos. x 50	84
Fig. 6.	*Krithe langhiana* Oertli. Left valve: a) lateral view, b) dorsal view. Kissamou Formation (sample M 797), Crete. x 50	84
Fig. 7.	*Krithe monosteracensis* (Seguenza). Left valve. Asteri Formation (sample 848-A), Crete. x 50	84
Fig. 8.	*Pseudopsammocythere similis* (Mueller). Left valve. Kritika Formation (sample MUR 63), Rhodos. x 80	85
Fig. 9.	*Parakrithe dactylomorpha* Ruggieri. Right valve: a) lateral view, b) dorsal view. Asteri Formation (sample 884-O), Crete. x 80	84
Fig. 10.	*Echinocythereis (Rhodicythereis) ruggierii* n. sp. Holotype. Right valve: schematic view of interior. Vasfi Formation (sample MUR 13), Rhodos. x 40	103
Fig. 11.	*Xestoleberis reymenti* Ruggieri. Complete carapace: lateral view right valve. Tefeli Formation (sample 6-118), Crete. x 80	151
Fig. 12.	*Xestoleberis ventricosa* Mueller. Left valve. Francocastello Formation (sample 817-C), Crete. x 80	151

PLATE 5

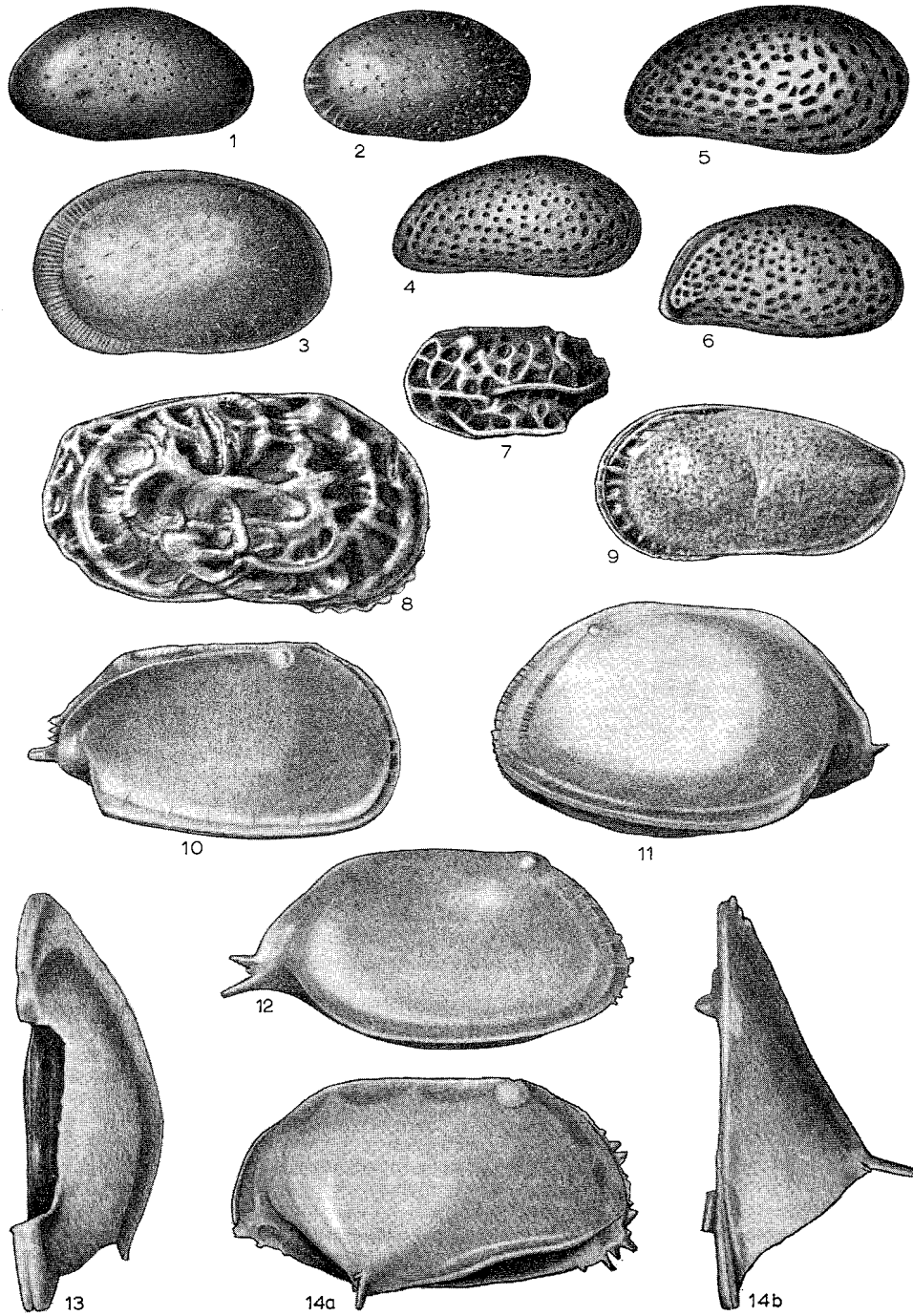


PLATE 5

		Page
Fig. 1.	*Cyamocytheridea dertonensis* Ruggieri. Male left valve. Tefeli Formation (sample 6-119), Crete. x 50	86
Fig. 2.	*Cyamocytheridea dertonensis* Ruggieri. Male right valve. Tefeli Formation (sample 6-119), Crete. x 50.	86
Fig. 3.	*Cyprideis* sp. cf. *C. sarmatica* Krstic. Left valve. Tefeli Formation (sample 6-12), Crete. x 50	86
Fig. 4.	*Cytheridea acuminata acuminata* Bosquet. Right valve. Apostoli Formation (sample 850-A), Crete. x 50	87
Fig. 5.	*Cytheridea acuminata neapolitana* Kollmann. Right valve. Kritika Formation (sample MUR 68), Rhodos. x 50	87
Fig. 6.	*Cytheridea paracuminata verrucosa* Kollmann. Right valve. Gavdos Formation (sample G 506), Gavdos. x 50	88
Fig. 7.	*Cnestocythere lamellicosta* Triebel. Left valve. Apostoli Formation (sample 850-G), Crete. x 50	88
Fig. 8.	*Callistocythere ennensis* Ruggieri. Right valve. Tefeli Formation (sample 7-155), Crete. x 100	89
Fig. 9.	*Leptocythere multipunctata multipunctata* (Seguenza). Left valve. Vasfi Formation (sample MUR 11), Rhodos. x 100	91
Fig. 10.	*Incongruellina (Incongruellina) semispinescens* Ruggieri. Right valve. Asteri Formation (sample 884-M), Crete. x 65	108
Fig. 11.	*Incongruellina (Lixouria) marginata* (Terquem). Left valve. Kritika Formation (sample MUR 63), Rhodos. x 65	109
Fig. 12.	*Incongruellina (Lixouria) marginata* (Terquem). Right valve. Kritika Formation (sample MUR 63), Rhodos. x 65	109
Fig. 13.	*Incongruellina (Lixouria) marginata* (Terquem). Right valve: dorsal view. Tsoutsouras Formation (sample T 214-3), Crete. x 65	109
Fig. 14.	*Incongruellina (Lixouria) keiji* n. sp. Holotype. Right valve: a) lateral view, b) dorsal view. Asteri Formation (sample 849-C), Crete. x 65	109

PLATE 6

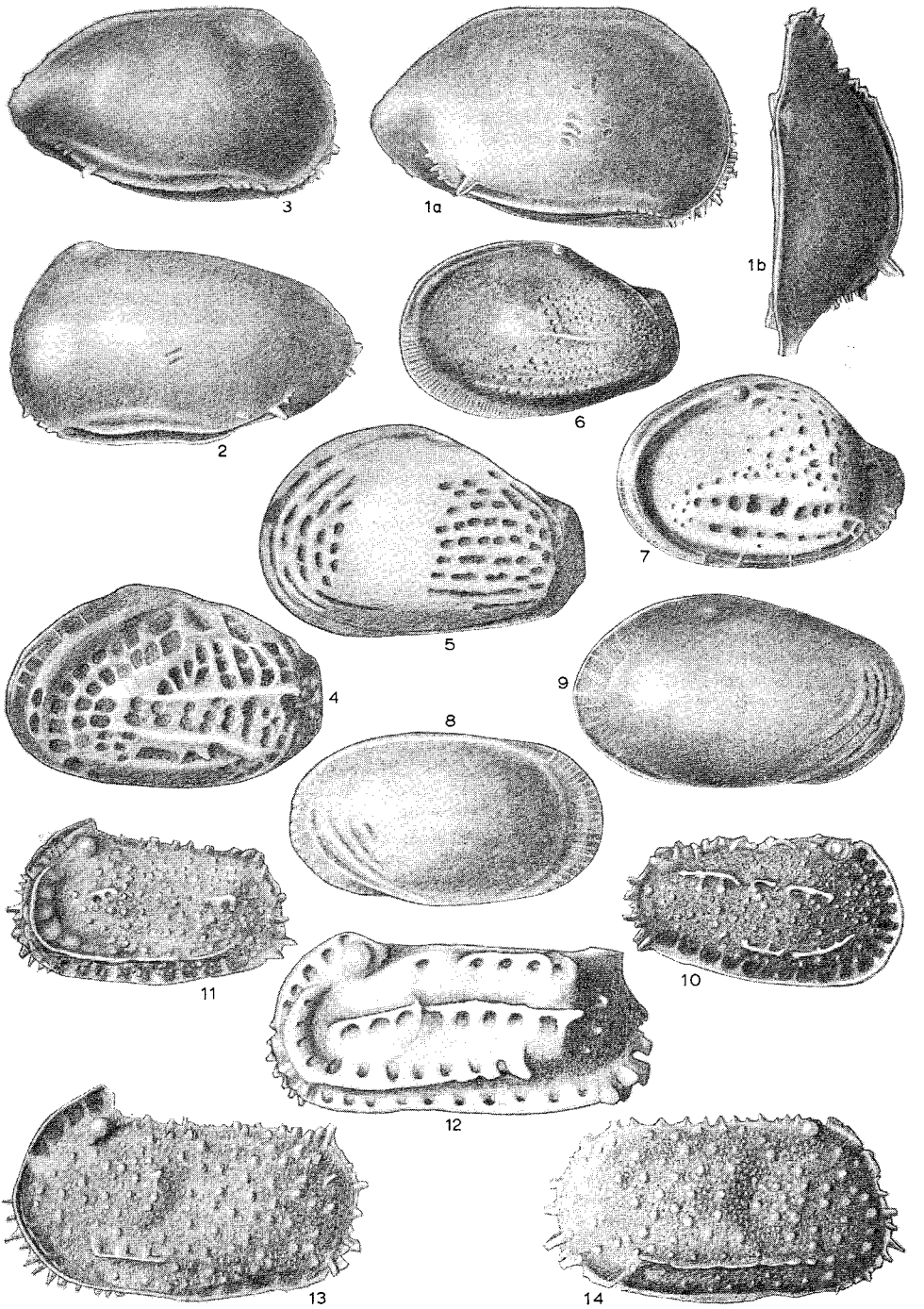


PLATE 6

		Page
Fig. 1.	*Bosquetina rhodiensis* n. sp. Holotype. Female right valve: a) lateral view, b) dorsal view. Vasfi Formation (sample MUR 12), Rhodos. x 40	93
Fig. 2.	*Bosquetina rhodiensis* n. sp. Paratype. Left valve. Pigadia Formation (sample VK 1), Karpathos. x 40	93
Fig. 3.	*Bosquetina rhodiensis* n. sp. Paratype. Male right valve. Vasfi Formation (sample MUR 12), Rhodos. x 40	93
Fig. 4.	*Buntonia (Buntonia) giesbrechtii robusta* Ruggieri. Left valve. Asteri Formation (sample 848-F), Crete. x 75	95
Fig. 5.	*Buntonia (Quasibuntonia) seguenziana* (Ruggieri). Left valve. Asteri Formation (sample 848-B), Crete. x 50	96
Fig. 6.	*Buntonia (Buntonia) sublatissima dertonensis* Ruggieri. Left valve. Kissamou Formation (sample M 795), Crete. x 75	95
Fig. 7.	*Buntonia (Buntonia) sublatissima sublatissima* (Neviani). Left valve. Asteri Formation (sample 848-A), Crete. x 75	95
Fig. 8.	*Buntonia (Rectobuntonia) subulata subulata* Ruggieri. Right valve. Asteri Formation (sample 848-F), Crete. x 75	97
Fig. 9.	*Buntonia (Rectobuntonia) subulata subulata* Ruggieri. Left valve. Asteri Formation (sample 848-F), Crete. x 75	97
Fig. 10.	*Carinocythereis antiquata* (Baird). Right valve. Kritika Formation (sample MUR 63), Rhodos. x 50	97
Fig. 11.	*Carinocythereis bairdi* Uliczny. Left valve. Kritika Formation (sample MUR 63), Rhodos. x 50	97
Fig. 12.	*Carinocythereis carinata* (Roemer). Left valve. Iraklion Formation (sample 9-16), Crete. x 50	98
Fig. 13.	*Carinocythereis meulenkampi* n. sp. Holotype. Left valve. Asteri Formation (sample 848-D), Crete. x 50	98
Fig. 14.	*Carinocythereis meulenkampi* n. sp. Paratype. Right valve. Asteri Formation (sample 848-D), Crete. x 50	98

PLATE 7

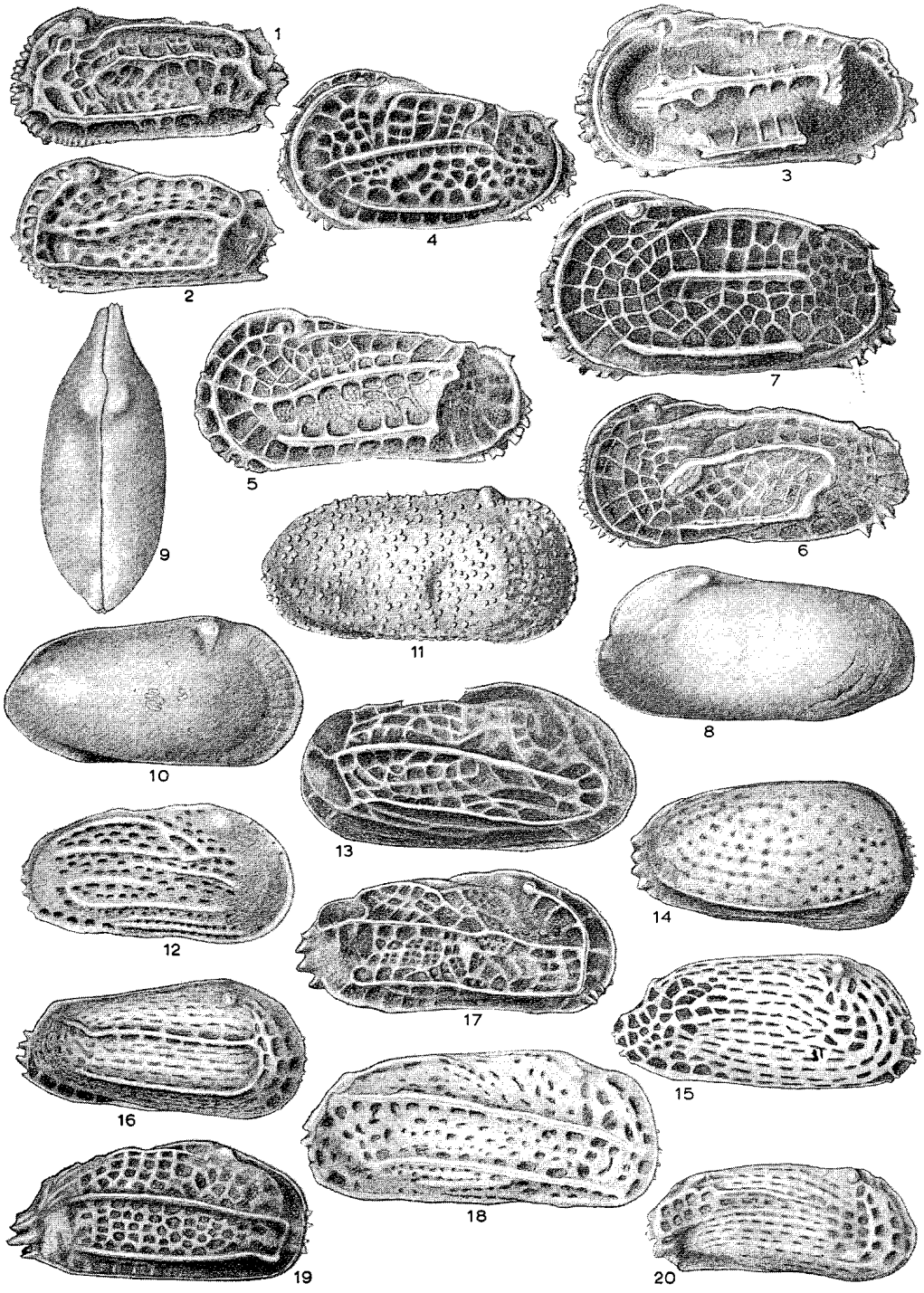


PLATE 7

		Page
Fig. 1.	*Cistacythereis caelatura* Uliczny. Left valve. Kritika Formation (sample MUR 63), Rhodos. x 50	99
Fig. 2.	*Cistacythereis* sp. cf. *C. pokornyi hellenica* Uliczny. Left valve. Asteri Formation (sample 884-H), Crete. x 50	99
Fig. 3.	*Costa batei batei* (Brady). Left valve. Kritika Formation (sample MUR 63), Rhodos. x 50	100
Fig. 4.	*Costa edwardsii* (Roemer). Left valve. Apostoli Formation (sample 814-H), Crete. x 50	100
Fig. 5.	*Costa punctatissima punctatissima* Ruggieri. Left valve. Asteri Formation (sample 884-K), Crete. x 50	101
Fig. 6.	*Costa runcinata* (Baird). Male left valve. Kritika Formation (sample MUR 63), Rhodos. x 50	101
Fig. 7.	*Costa* sp. Female left valve. Pigadia Formation (sample VK 1), Karpathos. x 50	101
Fig. 8.	*Echinocythereis (Rhodicythereis) ruggierii* n. sp. Paratype. Left valve. Vasfi Formation (sample MUR 13), Rhodos. x 40	103
Fig. 9.	*Echinocythereis (Rhodicythereis) ruggierii* n. sp. Paratype. Dorsal view complete carapace. Vasfi Formation (sample MUR 13), Rhodos. x 40	103
Fig. 10.	*Echinocythereis (Rhodicythereis) ruggierii* n. sp. Holotype. Right valve. Vasfi Formation (sample MUR 13), Rhodos. x 40	103
Fig. 11.	*Echinocythereis (Rhodicythereis)* sp. Right valve. Dhramia Formation (sample 778-A), Crete. x 40	103
Fig. 12.	*Falunia (Falunia) plicatula* (Reuss). Right valve. Gavdos Formation (sample G 507), Gavdos. x 50	104
Fig. 13.	*Falunia (Falunia) sphaerulolineata* (Jones). Right valve. Asteri Formation (sample 884-R), Crete. x 50	104
Fig. 14.	*Falunia (Falunia)* sp. aff. *F. stellata stellata* (Capeder). Larval right valve. Khairetiana Formation (sample M 860), Crete. x 50	104
Fig. 15.	*Falunia (Hiltermannicythere) cephalonica* Uliczny. Male right valve. Asteri Formation (sample 849-J), Crete. x 50	105
Fig. 16.	*Falunia (Hiltermannicythere) quadridentata* (Baird). Larval right valve. Asteri Formation (sample 848-P), Crete. x 50	106
Fig. 17.	*Falunia (Hiltermannicythere) retifastigata* (Jones). Larval right valve. Asteri Formation (sample 849-D), Crete. x 50	106
Fig. 18.	*Falunia (Hiltermannicythere) retifastigata* (Jones). Right valve. Asteri Formation (sample 884-H), Crete. x 50	106
Fig. 19.	*Falunia (Hiltermannicythere) rugosa* (Costa). Right valve. Asteri Formation (sample 849-H), Crete. x 50	106
Fig. 20.	*Falunia (Hiltermannicythere) zibinica* (Dieci & Russo). Male right valve. Gavdos Formation (sample G 480), Gavdos. x 50	107

PLATE 8

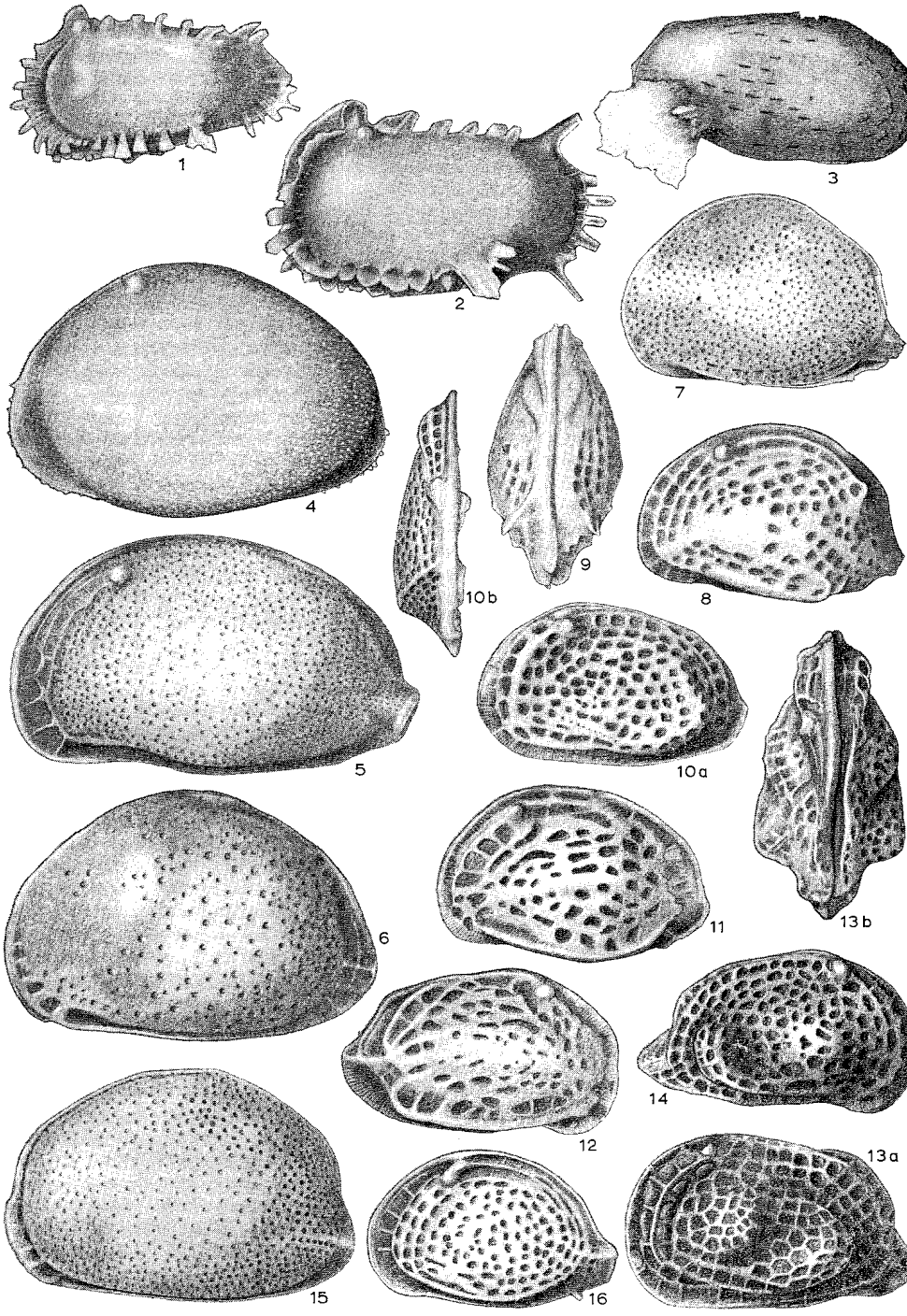


PLATE 8

		Page
Fig. 1.	*Pterygocythereis (Pterygocythereis) ceratoptera* (Bosquet). Left valve. Kritika Formation (sample MUR 63), Rhodos. x 40	111
Fig. 2.	*Pterygocythereis (Pterygocythereis) jonesii* (Baird). Left valve. Asteri Formation (sample 849-G), Crete. x 40	111
Fig. 3.	*Ruggieria (Keijella) hodgii* (Brady). Right valve with adhering matrix. Barbara Formation (sample 7-33), Crete. x 50	113
Fig. 4.	*Aurila albicans* (Ruggieri). Left valve. Tefeli Formation (sample 7-147), Crete. x 50	113
Fig. 5.	*Aurila aspidoides* Uliczny. Left valve. Francocastello Formation (sample 817-G), Crete. x 50	114
Fig. 6.	*Aurila cruciata cruciata* (Ruggieri). Left valve. Pigadia Formation (sample VK 14), Karpathos. x 50	114
Fig. 7.	*Aurila cruciata minor* Uliczny. Left valve. Kritika Formation (sample MUR 20), Rhodos. x 50	115
Fig. 8.	*Aurila diecii* n. sp. Holotype. Left valve. Tefeli Formation (sample 6-117), Crete. x 50	115
Fig. 9.	*Aurila diecii* n. sp. Paratype. Dorsal view complete carapace. Tefeli Formation (sample 6-117), Crete. x 50	115
Fig. 10.	*Aurila pigadiana* n. sp. Holotype. Left valve: a) lateral view, b) dorsal view. Pigadia Formation (sample VK 14), Karpathos. x 50	117
Fig. 11.	*Aurila venetiensis* (Uliczny). Left valve. Asteri Formation (sample 884-B), Crete. x 50	121
Fig. 12.	*Aurila venetiensis* (Uliczny). Right valve. Asteri Formation (sample 849-E), Crete. x 50	121
Fig. 13.	*Aurila ulicznyi* n. sp. Holotype. Complete carapace: a) lateral view left valve, b) dorsal view. Kritika Formation (sample MUR 63), Rhodos. x 50	120
Fig. 14.	*Aurila ulicznyi* n. sp. Paratype. Right valve. Francocastello Formation (sample 817-G), Crete. x 50	120
Fig. 15.	*Aurila cicatricosa* (Reuss). Left valve. Apostoli Formation (sample 850-N), Crete. x 50	114
Fig. 16.	*Aurila punctata plagia* Uliczny. Left valve. Pigadia Formation (sample VK 9), Karpathos. x 50	118

PLATE 9

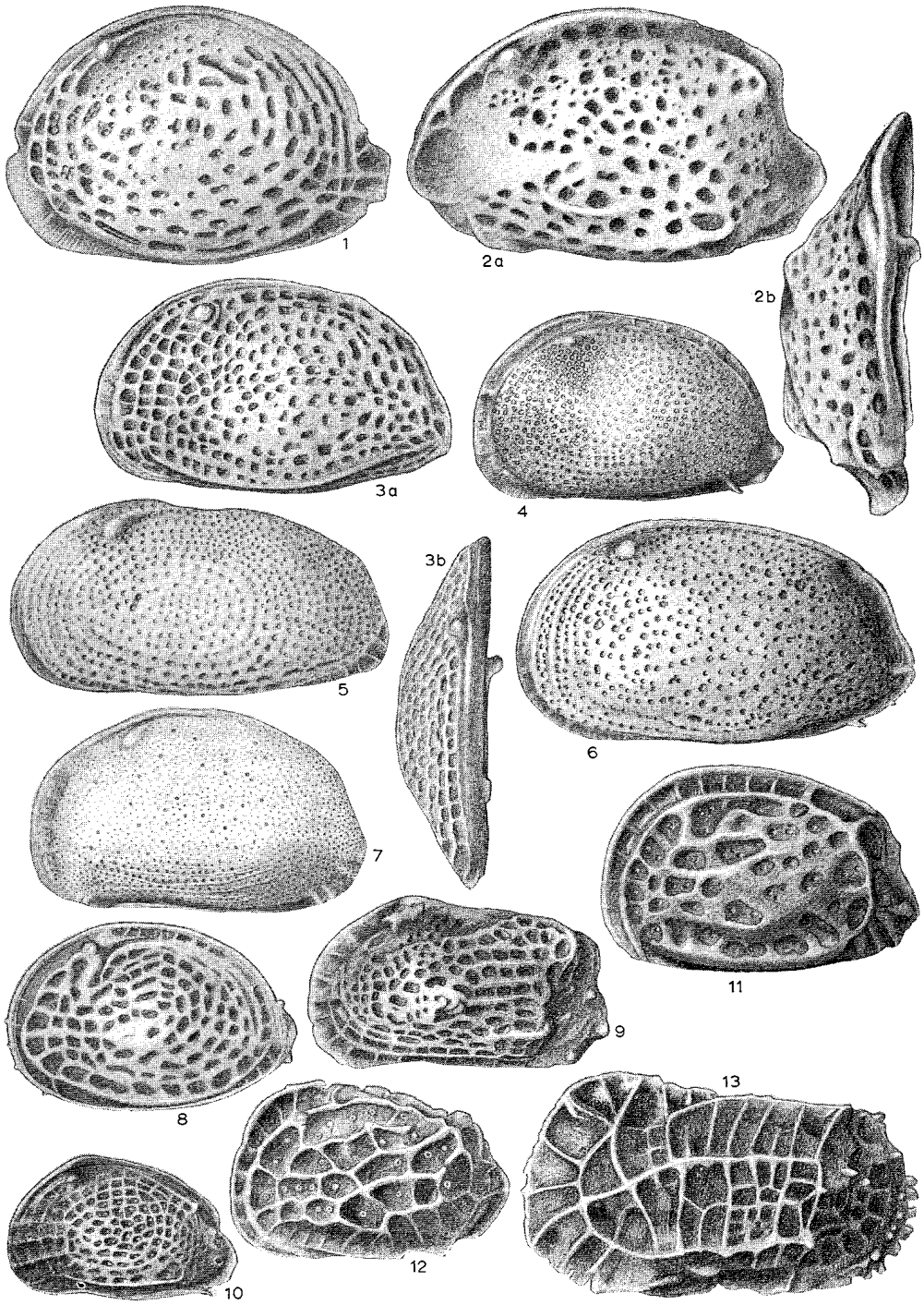
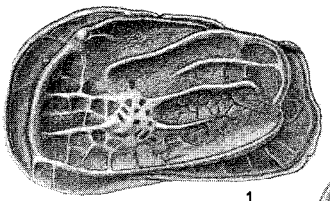
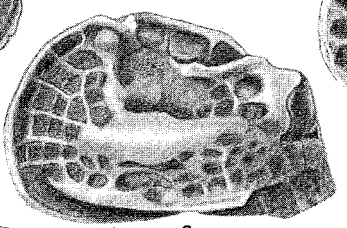


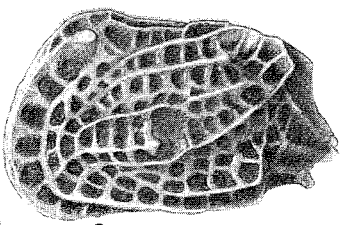
PLATE 9

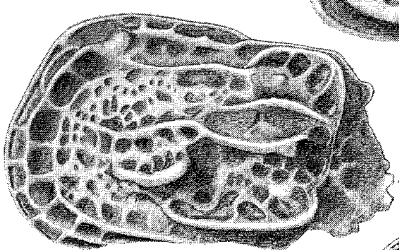
		Page
Fig. 1.	*Aurila convexa emathiae* Uliczny. Left valve. Asteri Formation (sample 884-K), Crete. x 50	114
Fig. 2.	*Aurila deformis deformis* (Reuss). Left valve: a) lateral view, b) dorsal view. Apostoli Formation (sample 850-O), Crete. x 50	115
Fig. 3.	*Aurila freudenthali* n. sp. Holotype. Left valve. a) lateral view, b) dorsal view. Apostoli Formation (sample 850-B), Crete. x 50	116
Fig. 4.	*Aurila vena* (Seguenza). Left valve (pre-adult?). Pigadia Formation (sample VK 1), Karpathos. x 50	120
Fig. 5.	*Aurila* sp. 1. Left valve. Khairetiana Formation (sample M 870), Crete. x 50	119
Fig. 7.	*Aurila veniliae* Uliczny. Left valve. Lindos Formation (sample MUR 42), 13), Rhodos. x 50	119
Fig. 7.	*Aurila veniliae* Uliczny. Left valve. Lindos Formation (sample MUR 42), Rhodos. x 50	121
Fig. 8.	*Aurila praeapuliana* Uliczny. Left valve. Kritika Formation (sample MUR 70), Rhodos. x 50	118
Fig. 9.	*Aurila* sp. 2. Left valve. Apostoli Formation (sample 850-L), Crete. x 50	119
Fig. 10.	*Aurila* sp. aff. *A. vitrocincta* (Ruggieri). Larval left valve. Asteri Formation (sample 849-D), Crete. x 50	121
Fig. 11.	*Mutilus dohrni* Uliczny. Left valve. Francocastello Formation (sample 817-B), Crete. x 50	124
Fig. 12.	*Mutilus retiformis* (Terquem). Left valve. Asteri Formation (sample 848-O), Crete. x 50	124
Fig. 13.	*Bradleya* ? sp. Left valve. Asteri Formation (sample 849-G), Crete. x 50	122

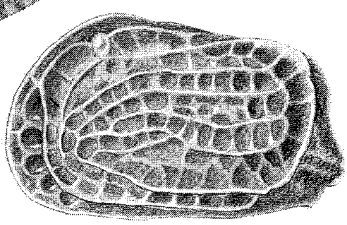
PLATE 10

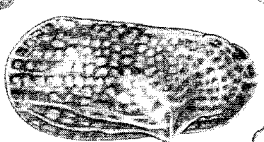

1

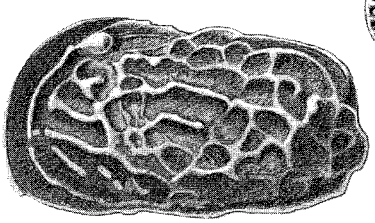

2

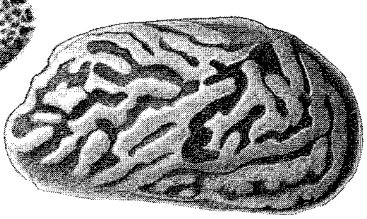

3

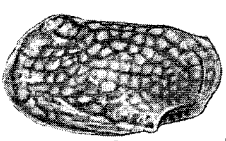

4

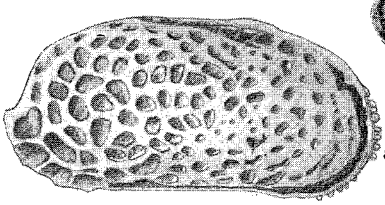

5

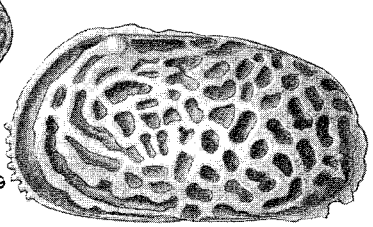

15

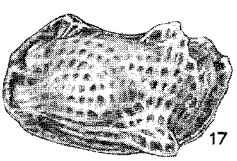

6

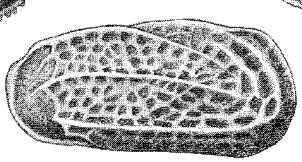

7

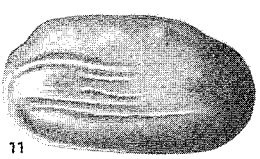

16

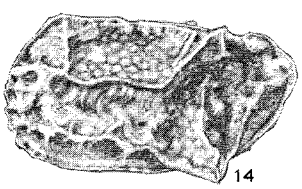

8

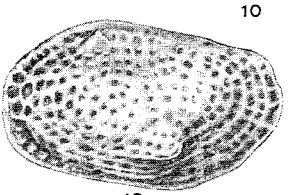

9


17


10


11


14


13

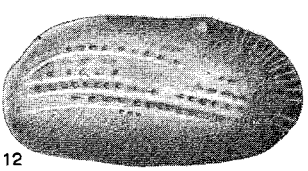

12

PLATE 10

		Page
Fig. 1.	*Pachycaudites ? h-scripta* (Capeder). Left valve. Asteri Formation (sample 884-B), Crete. x 50	125
Fig. 2.	*Pachycaudites ungeri ungeri* (Reuss). Left valve. Asteri Formation (sample 884-F), Crete. x 50	125
Fig. 3.	*Quadracythere (Tenedocythere) mediterranea* Ruggieri. Left valve. Tefeli Formation (sample 6-117), Crete. x 50	126
Fig. 4.	*Quadracythere (Tenedocythere) prava* (Baird). Left valve. Vasfi Formation (sample MUR 13), Rhodos. x 50	126
Fig. 5.	*Quadracythere (Tenedocythere) salebrosa* Uliczny. Left valve. Asteri Formation (sample 884-K), Crete. x 50	127
Fig. 6.	*Urocythereis favosa exedata* Uliczny. Left valve. Asteri Formation (sample 884-C), Crete. x 50	127
Fig. 7.	*Urocythereis lumbricularis* (Terquem). Right valve. Vasfi Formation (sample MUR 13), Rhodos. x 50	128
Fig. 8.	*Urocythereis margaritifera margaritifera* (Mueller). Right valve. Kritika Formation (sample MUR 67), Rhodos. x 50	128
Fig. 9.	*Urocythereis sororcula* (Seguenza). Left valve. Vasfi Formation (sample MUR 13), Rhodos. x 50	128
Fig. 10.	*Protocytheretta obtusa* Ruggieri. Right valve. Asteri Formation (sample 849-H), Crete. x 50	131
Fig. 11.	*Cytheretta (Cytheretta) semiornata* (Egger). Male right valve. Roka Formation (sample M 648), Crete. x 40	130
Fig. 12.	*Cytheretta (Cytheretta) semiornata* (Egger). Female right valve. Apostoli Formation (sample 814-A), Crete. x 40	130
Fig. 13.	*Loxoconcha alata* Brady. Male left valve. Vasfi Formation (sample MUR 13), Rhodos. x 50	132
Fig. 14.	*Loxoconcha cristatissima* Ruggieri. Left valve. Tefeli Formation (sample 7-155), Crete. x 50	132
Fig. 15.	*Loxoconcha hodonica* Pokorny. Male left valve. Khairetiana Formation (sample M 862), Crete. x 50	133
Fig. 16.	*Loxoconcha hodonica* Pokorny. Female left valve. Khairetiana Formation (sample M 858), Crete. x 50	133
Fig. 17.	*Loxocorniculum quadricornis* (Ruggieri). Left valve. Gavdos Formation (sample G 485), Gavdos. x 50	136

PLATE 11

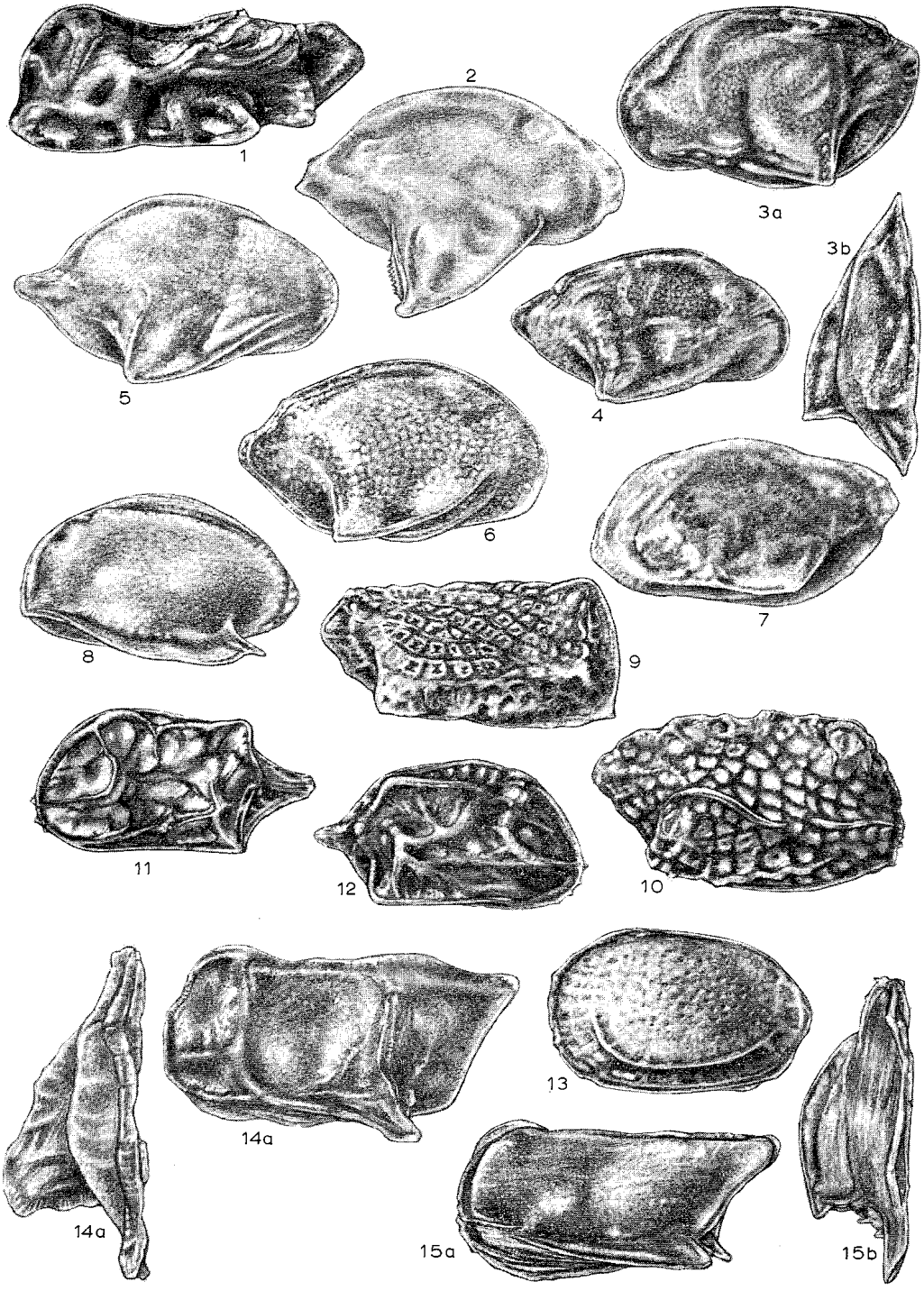


PLATE 11

		Page
Fig. 1.	*Paracytheridea* sp. Left valve. Kissamou Formation (sample M 795), Crete. x 100	137
Fig. 2.	*Cytheropteron (Cytheropteron) alatum* Sars. Right valve. Vasfi Formation (sample MUR 7), Rhodos. x 65	137
Fig. 3.	*Cytheropteron (Cytheropteron) apostoliensis* n. sp. Holotype. Left valve: a) lateral view, b) dorsal view. Apostoli Formation (sample 814-B), Crete. x 100	138
Fig. 4.	*Cytheropteron (Cytheropteron) apostoliensis* n. sp. Paratype. Right valve. Apostoli Formation (sample 814-B), Crete. x 100	138
Fig. 5.	*Cytheropteron (Cytheropteron) latum* Mueller. Right valve. Vasfi Formation (sample MUR 13), Rhodos. x 100	138
Fig. 6.	*Cytheropteron (Cytheropteron) punctatum* Brady. Right valve. Vasfi Formation (sample MUR 12), Rhodos. x 100	138
Fig. 7.	*Cytheropteron (Cytheropteron) rotundatum* Mueller. Left valve. Vasfi Formation (sample MUR 12), Rhodos. x 100	139
Fig. 8.	*Cytheropteron (Aversovalva) lancei* Carbonnel. Left valve. Apostoli Formation (sample 814-B), Crete. x 100	139
Fig. 9.	*Eucytherura patercoli* Mistretta. Right valve. Asteri Formation (sample 849-H), Crete. x 100	141
Fig. 10.	*Eucytherura pygmaea* (Reuss). Right valve. Apostoli Formation (sample 814-C), Crete. x 100	141
Fig. 11.	*Hemicytherura hellenica* n. sp. Holotype. Left valve. Asteri Formation (sample 884-C), Crete. x 100	142
Fig. 12.	*Hemicytherura hellenica* n. sp. Paratype. Right valve. Asteri Formation (sample 884-J), Crete. x 100	142
Fig. 13.	*Saida* sp. Right valve. Pigadia Formation (sample VK 14), Karpathos. x 100	154
Fig. 14.	*Semicytherura raulini* n. sp. Holotype. Left valve: a) lateral view, b) dorsal view. Apostoli Formation (sample 814-B), Crete. x 100	146
Fig. 15.	*Semicytherura spratti* n. sp. Holotype. Left valve: a) lateral view, b) dorsal view. Asteri Formation (sample 849-E), Crete. x 100	146

PLATE 12

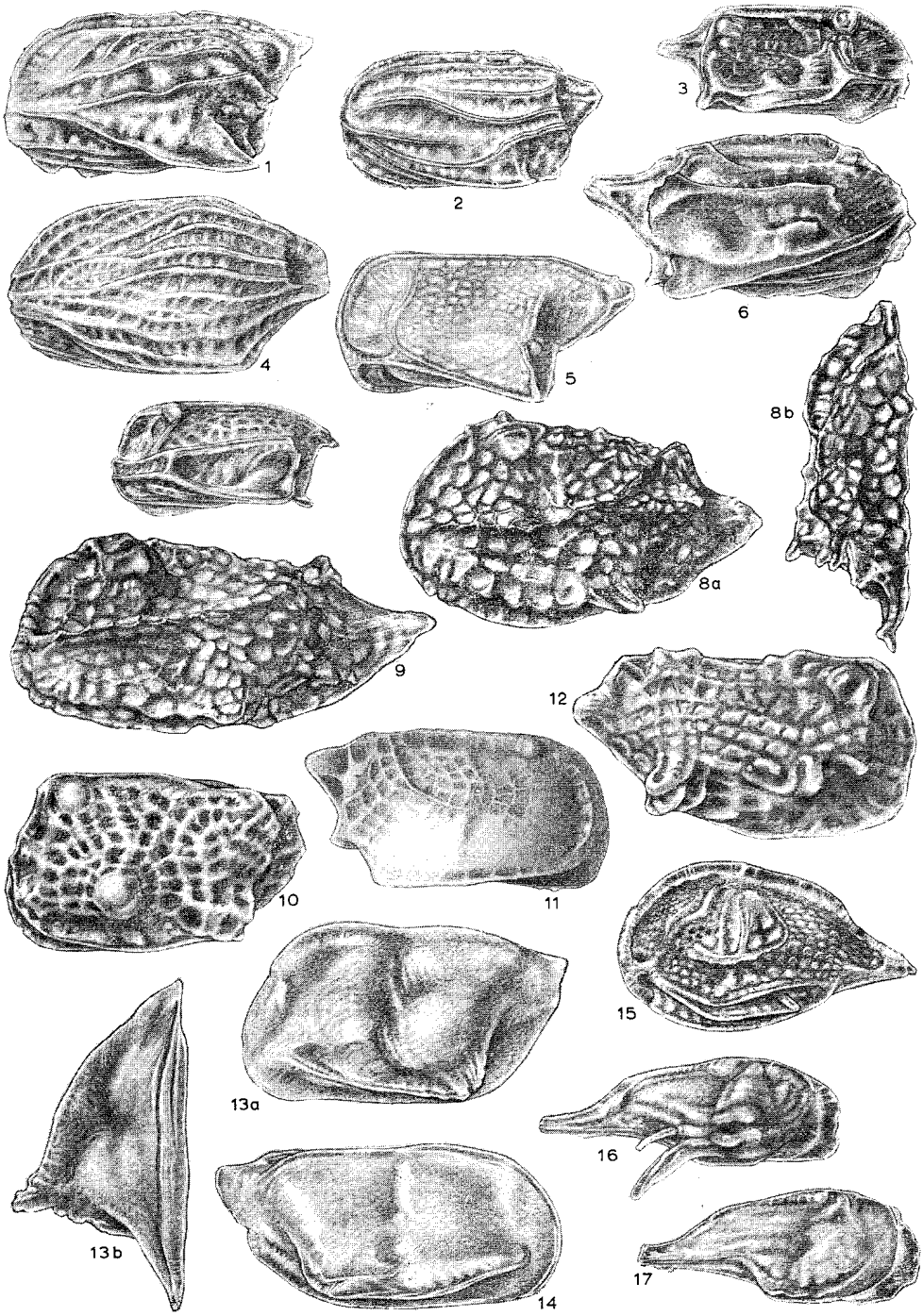


PLATE 12

Page

Fig. 1. *Semicytherura acuminata* (Mueller). Left valve. Lindos Formation (sample MUR 42), Rhodos. x 80 144

Fig. 2. *Semicytherura acuticostata* (Sars). Left valve. Vasfi Formation (sample MUR 13), Rhodos. x 80 144

Fig. 3. *Semicytherura dispar* (Mueller). Right valve. Pigadia Formation (sample VK 5), Karpathos. x 80 145

Fig. 4. *Semicytherura inversa* (Seguenza). Left valve. Asteri Formation (sample 884-G), Crete. x 80 145

Fig. 5. *Semicytherura mediterranea* (Mueller). Left valve. Kritika Formation (sample MUR 62), Rhodos. x 80 145

Fig. 6. *Semicytherura paradoxa* (Mueller). Right valve. Asteri Formation (sample 849-E), Crete. x 80 145

Fig. 7. *Semicytherura* sp. cf. *S. punctata* (Mueller). Left valve. Pigadia Formation (sample VK 5), Karpathos. x 80 145

Fig. 8. *Neomonoceratina mouliana* n. sp. Holotype. Female left valve: a) lateral view, b) dorsal view. Tefeli Formation (sample 6-27), Crete. x 80 148

Fig. 9. *Neomonoceratina mouliana* n. sp. Paratype. Male left valve. Tefeli Formation (sample 6-27), Crete. x 80 148

Fig. 10. *Eucytherura complexa* (Brady). Left valve. Vasfi Formation (sample MUR 13), Rhodos x 120 140

Fig. 11. *Pseudocytherura calcarata* (Seguenza). Right valve. Asteri Formation (sample 884-G), Crete. x 50 144

Fig. 12. *Eucytherura gibbera* Mueller. Right valve. Pigadia Formation (sample VK 3), Karpathos. x 120 140

Fig. 13. *Monoceratina mediterranea* n. sp. Holotype. female left valve: a) lateral view, b) dorsal view. Vasfi Formation (sample MUR 7), Rhodos. x 50 152

Fig. 14. *Monoceratina mediterranea* n. sp. Paratype. Male right valve. Pigadia Formation (sample VK 1), Karpathos. x 50 152

Fig. 15. *Paijenborchella (Eopaijenborchella) malaiensis* Kingma. Left valve. Francocastello Formation (sample 817-A), Crete. x 80 150

Fig. 16. *Paijenborchella (Paijenborchella) iocosa* Kingma. Right valve. Asteri Formation (sample 848-B), Crete. x 80 149

Fig. 17. *Paijenborchella (Paijenborchella) solitaria* Ruggieri. Right valve. Apostoli Formation (sample 814-N), Crete. x 80 149

In the same series will be published:

Bulletin 7:

GRADSTEIN, F. M. — Mediterranean Pliocene Globorotalia - a biometrical approach (Statistical analysis, relationship and stratigraphic application of the *Globorotalia margaritae, G. crassaformis, G. puncticulata, G. bononiensis* and *G. inflata* groups, on material from localities of Crete, Italy, Gulf of Mexico and New Zealand).
approximately 140 pages, 8 plates with SEM photographs, 44 textfigs.
Dfl. 60,— (36)* ISBN 90 300 2566 2

The following titles are planned in the near future:

WAMEL, W. A. van — On the stratigraphy and environments of deposition of the Lower Ordovician limestones of NW Oland, Sweden. (Biostratigraphy by means of conodonts). ISBN 90 300 2596 4

FELIX, R. — Oligo-Miocene stratigraphy of Malta and Gozo.
ISBN 90 300 2586 7

HARDENBOL, J. — Stratigraphy and Foraminifera of the Type Priabonian, Northern Italy. ISBN 90 300 2576 x

Editorial and production office:

Schotanus Publishing Cy., Hoeve Lunenburg, Langbroek-Utrecht.

Salesoffice and warehouse:

Meulenhoff-Bruna N.V., P.O. Box 197, Amsterdam, The Netherlands,
Telex 13408 - Tel.adr. Scriptum.

Other publications:

BUTT, A. A. — Late Oligocene Foraminifera from Escornebéou, SW France.
124 pages, 8 plates, 15 text figs. Dfl. 35,— ISBN 90 300 2505 0

VERVLOET C. C. — Stratigraphical and Micropaleontological data on the Tertiary of Southern Piemont (Northern Italy).
88 pages, 12 plates, 6 text figs., 5 maps, 11 tables.
Dfl. 35,— ISBN 90 300 2545 x

* The prices between brackets refer to the series at the office of the editorial staff and are excl. postage and handling costs.