A RICH OSTRACOD FAUNA FROM CAPE KALOGERAS (ZAKYNTHOS ISLAN D, GREECE)

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Abstract

Micropalaeontological analysis from Cape Kalogeras section revealed 63 ostracod species, belonging to 35 genera. 20 of the species are mentioned for the first time in the Pleistocene of Zakynthos Island. All the identified species were recorded and their taxonomic classification is presented here in and selected species are illustrated.

Two distinct assemblages were recognised designating a mixed character for the ostracod fauna: a) a deep water assemblage with species characteristic of the circalittoral and upper bathyal zone, which constitute about 20% of the total ostracod fauna and b) a shallower water assemblage (<50m depth) with species common in the infralittoral zone. Species of the second assemblage represent the largest part of the total ostracod fauna The synthesis of the ostracod populations, along with their age structure and the absence of complete carapaces, suggest that the above mentioned marine assemblages underwent a small transportation, forming the studied thanatocoenoses. They were formed in an open marine environment, probably located in the infralittoral zone. The present study constitutes part of an effort for the better documentation and understanding of Pleistocene ostracod faunas from Greece.

Keywords: marine microinvertebrates, ostracod taxonomy, palaeoecology

1. Introduction

Ostracoda are small aquatic arthropods with medium size 0.5-2mm, which construct a bivalve carapace from calcite. Their representatives occur in all aquatic environments and there is a rich fossil record extending back to the Cambrian (Lowe & Walker, 1987; Athersuch et al., 1989; Maddocks, 1992). They are of proven value for interpreting palaeoenvironmental conditions and for stratigraphical analysis.

Pleistocene ostracods from the Mediterranean region are well-known and additional data on such faunas contribute to the knowledge of past biodiversity, palaeoenvironmental analysis and consequently they add information to the climatic model for this period.

First evidence about eastern Mediterranean Ostracoda comes from Terquem (1878), who described a large number of ostracod species from the Pleistocene deposits of Rhodes Island. Tsapralis (1981) was the first who studied in his PhD thesis ostracod assemblages from the Pleistocene of Zakynthos Island. Moreover, there are several papers concerning previous studies on ostracods from other Pleistocene deposits of Greece: Sissingh (1972) performed a detailed study in his PhD thesis on several Greek localities as the Pleistocene deposits of Rhodes and Crete; Guernet et al. (1976) worked with ostracods from a classic Levantine series at Cape Phocas (Kos Island); Mostafawi (1981, 1986) studied Late Pliocene-Pleistocene marine ostracod faunas from Kos Island; Krstic & Dermitzakis (1981) presented the results of a micropalaeontological analysis

in terms of ostracods and foraminifers from the channel of Corinth; Zangger & Malz (1989) referred to Late Pleistocene ostracods from the Gulf of Argos; Fernandez-Gonzalez et al. (1994) studied Plio-Pleistocene ostracod faunas from Patras region and, finally, Guernet et al. (2003) performed a detailed study on Quaternary ostracods from Aigion.

A number of systematic works have been published on nannofossils (Triantaphyllou, 1996; Triantaphyllou et al., 1997), foraminifers (Blanc-Vernet et al., 1979; Van Hinsbergen, 2004) and dinoflagellate cysts (Papanikolaou, 2008) of the Zakynthos Plio-Pleistocene. The only work devoted particularly to Pleistocene ostracods of the island is that by Tsapralis (1981) who presented a detailed species list for the ostracods from Gerakas. It is therefore significant to report a second, enriched and based on modern systematics, Pleistocene ostracod fauna from Zakynthos Island and, in particular, from Cape Kalogeras.

Therefore, the present paper is an annotated species list which supplements the information on ostracods provided by Tsapralis (1981).

2. Geological Setting

Zakynthos Island (Fig. 1) is one of the seven Ionian Islands and is situated in the external part of today's Hellenides. The area belongs to the Paxos (Pre-Apulian) zone apart from the east part of the island, which belongs to the frontal part of the Ionian zone (Aubouin & Dercourt, 1962; Underhill, 1989).

The study area is situated on the Gerakas peninsula in the south-eastern part of Zakynthos (Fig. 1). The outcrops of Gerakas peninsula can be classified into three different formations: the Gerakas, Kalogeras and Agios Nikolaos formations, as first described by Dermitzakis et al. (1979), ranging in age from Upper Pliocene to Middle Pleistocene, each separated by an unconformity.

The studied samples were collected from Kalogeras Formation which consists of three main lithofacies associations. The basal one (26 m thick) is composed of parallel-laminated calcareous sandstones alternating with yellow calcareous sandy silts and calcarenitic horizons, with fragments of shells, bryozoans and algae. According to Dermitzakis et al. (1979), the foraminiferal fauna provides evidence of reworking from the Miocene and Pliocene. The medium one (42 m thick) consists of clayey silts (marls) alternating with calcareous sandstones. Macrofossils including molluscs, corals and scaphopods, and planktonic foraminifers indicate a shallow-water environment (Tsapralis, 1981). Finally, the upper lithofacies association is 160 m thick and consists of blue clayey silts and marly clays with abundant foraminifera, dominated by the planktonic *Globigerina pachyderma* and a great variety of benthic species, including *Hyalinea balthica* (Triantaphyllou, 1996).

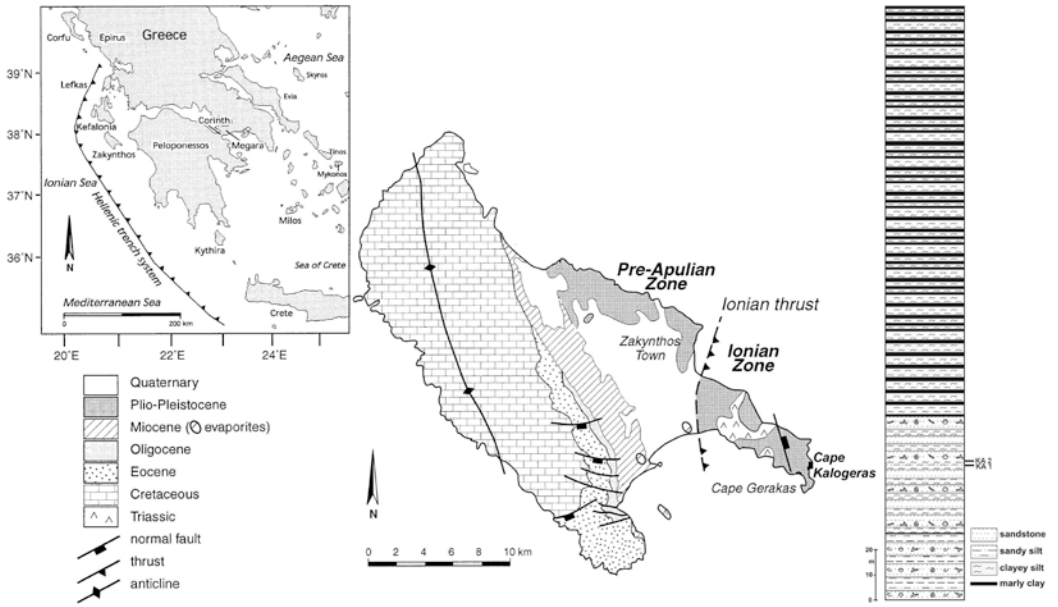

Fig. 1. Simplified geological map of Zakynthos Island according to Duermeijer et al. (1999). The study area is indicated and a general stratigraphic column of Kalogeras Formation is presented.

According to Papanikolaou (2008), the lithological character of the Kalogeras Formation indicates a progressive change from a very shallow (coastal) high-energy environment to a progressively deeper marine setting.

3. Methodology

The specimens documented herein were collected from two adjacent samples of an excellent marker bed in the middle part of Kalogeras section (Fig. 1), which consists of medium-sized partially cemented sandy silt with mottled structures and no visible stratification. The two samples were disaggregated with a 5% H_2O_2 solution, washed over 1 mm, 0.125 mm, and 63 mm mesh sieves and dried. The residues were oven-dried at approximately 40^{o}C. Micropalaeontological analysis took place under Leica stereomicroscopes and Scanning Electron Microscope (Jeol JSM 5600).

Ostracod systematic classification is based on the scheme proposed by Horne et al. (2002) and identification of ostracod species was based on several papers e.g. Sissingh (1972), Bonaduce et al. (1975), Tsapralis (1981), Mostafawi (1981, 1986), Guernet et al. (2003), Stambolides (1984), Hajjaji et al. (1998) and several papers of the Stereo Atlas of Ostracod Shells (e.g. Doruk, 1980; Athersuch & Whittaker, 1980; Athersuch, 1976).

4. Results

The studied ostracod assemblages present a significant species diversity and abundance. Approximately 300 specimens were collected from each sample and, totally, 63 species were identified, belonging to 35 genera. As the two studied samples are coming from the same stratigraphic horizon, they show similar faunal content and, therefore, they are not considered separately. The complete species list of the identified taxa is presented in Table 1 following the classification scheme proposed by Horne et al. (2002) and selected ostracod species are illustrated in two plates (Plate 1, 2).

It is important to point out that adults and several juveniles are present in the ostracod population, but not from all the instars. Furthermore, the assemblages consist of disarticulated valves and not complete carapaces. The age structure of a population can indicate transportation (Whatley, 1988): the presence of adults and all juvenile instars indicates that there was not significant transportation, while the absence of adults or earlier instars from an assemblage suggests that there has been transportation. Furthermore, valves to carapace ratios of adult specimens reflect the degree of transport, as disarticulation of adult ostracods will tend to occur in higher-energy environments (Holmes, 2001). Therefore, according to these remarks, the observations about the structure of the ostracod populations studied herein indicate that post mortem transportation took place.

The following 20 species are mentioned for the first time in the Pleistocene of Zakynthos Island: *Bosquetina rhodiensis*, *Hiltermannicythere turbida*, *Pterygocythereis jonesii*, *Loxoconcha affinis*, *L. gibberosa*, *Xestoleberis communis*, *X. decipiens*, *Aurila interpretis*, *A. convexa*, *Aurila* cf. *glyptica*, *Tyrrhenocythere* sp., *Tenedocythere salebrosa*, *Semicytherura acuta*, *S. sulcata*, *Paracytheridea depressa*, *P. hexalpha*, *Pontocythere turbida*, *Krithe bartonensis*, *Bairdia formosa*, *Neonesidea longevaginata*.

Table 2 shows the distribution of the species identified herein in the Pleistocene marine sediments of Greece, based on all the relevant literature. It is evident that, besides the equivalent fauna presented by Tsapralis (1981) from Gerakas section, there is a significant number of common ostracod species between this study and the Pleistocene fauna from Rhodes Island described by Sissingh (1972).

Two distinct assemblages were recognised, designating a mixed character for the ostracod fauna in the samples from Cape Kalogeras (Yassini, 1979; Tsapralis, 1981; Fernandez-Gonzalez et al., 1994; Hajjaji et al., 1998; Guernet et al., 2003; Dall'Antonia et al., 2005):

a) A deep water assemblage with species characteristic of the circalittoral and upper bathyal zone such as *Cytheropteron* spp., *Krithe* spp., *Bairdia* spp., *Polycope* spp., *Bosquetina rhodiensis*, *Cytherella vulgata*, *Henryowella asperrina* and *Pterygocythereis jonesii*, which constitute about 20% of the total ostracod fauna. These species indicate a deep water environment of low energy with a fine sediment substrate.

b) a shallower water assemblage (<50m depth) with species characteristic of the infralittoral zone. The dominant species of this assemblage are *Aurila* spp., *Loxoconcha* spp., *Xestoleberis* spp., *Semicytherura* spp. and *Callistocythere* spp. which represent about 50% of the total ostracod fauna and accompanied species *Hemicytherura* spp., *Leptocythere* spp. and *Pontocythere turbida.*

The other identified ostracod species do not present significant participation in the ostracod fauna (≤1%).

5. Conclusions

The micropalaeontological analysis of samples from Cape Kalogeras section revealed a rich ostracod fauna of 63 species, where 20 of them are mentioned for the first time in the Pleistocene of Zakynthos Island, completing Tsapralis (1981) species list. All the identified species were recorded and their taxonomic classification is presented herein (Table 1) and selected species are illustrated (Plates 1, 2). In addition, Table 2 resulted from the comparative presentation of bibliographic data and it was observed that the fauna from Rhodes Island recorded by Sissingh (1972) had several common species with the one from Cape Kalogeras.

Consequently, the synthesis of the ostracod assemblages, along with their age structure and the absence of complete carapaces, suggest that marine assemblages –an infralittoral and a circalittoral to upper bathyal one- underwent a small transportation, forming the studied thanatocoenoses. They were formed in an open marine environment, probably located in the infralittoral zone.

The present study constitutes part of an effort for the better documentation and understanding of Pleistocene ostracod faunas from Greece.

6. Acknowledgements

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Table 1. Ostracod classification (after Horne et al., 2002) and species reference list.

Class : **Ostracoda**	
Subclass : **Myodocopa**	
Order : **Halocyprida**	
Suborder : **Cladocopina**	
Superfamily : **Cladocopoidea**	
Family : **Polycopidae**	
Genus : ***Polycope*** **SARS, 1866**	
Polycope**spp.**	
Subclass : **Podocopa**	
Order : **Podocopida**	
Suborder : **Cytherocopina**	
Superfamily : **Cytheroidea**	
Family : **Trachyleberididae**	
Genus : ***Bosquetina*** **KEIJ, 1957**	
Bosquetina rhodiensis **SISSINGH**	*Bosquetina rhodiensis* n. sp. Sissingh, 1972, p. 92, Pl. 6: figs 1-3.
Genus :***Henryhowella*** **PURI, 1957**	
Henryhowella asperrina **(REUSS)**	*Cypridina asperrina* n. sp. Reuss, 1850, p. 74, pl. 10: fig. 5.
Genus : ***Hiltermanicythere*** **BASSIOUNI, 1970**	
Hiltermannicythere turbida **(MÜLLER)**	*Cythereis turbida* n. sp. Müller, 1894, p. 371–372, Pl. 28: figs 22, 27; Pl. 31: fig. 7.
Genus : ***Pterygocythereis*** **BLAKE, 1933**	
Pterygocythereis jonesii **BAIRD**	*Cythereis jonesi* n. sp. Baird, 1850, p. 175, pl. 20: fig. 1.
Genus :***Costa*** **NEVIANI, 1928**	
Costa **sp.**	
Family :**Loxoconchidae**	
Genus :***Loxoconcha*** **SARS, 1866**	
Loxoconcha affinis **(BRADY)**	*Normania affinis* n. sp. Brady, 1866, p. 382, pl. 61: figs 12a-d.
Loxoconcha gibberosa **TERQUEM**	*Loxoconcha gibberosa* n. sp. Terquem, 1878. p.95, pl. 10: figs 20a-e.
Loxoconcha rubritincta **RUGGIERI**	*Loxoconcha rubritincta* n. sp. Ruggieri, 1964, p.521, pl.63: fig. 8-11.
Loxoconcha tumida **BRADY**	*Loxoconcha tumida* n. sp. Brady, 1869, p. 48, pl. 8: figs 11, 12.
Genus : ***Palmoconcha*** **SWAIN & GILBY, 1981**	
Palmoconcha turbida **(MÜLLER)**	*Loxoconcha turbida* n. sp. Müller, 1912, p. 308.
Loxoconcha **sp.**	
Genus: ***Sagmatocythere*** **ATHERSUCH, 1976**	
Sagmatocythere versicolor **(MÜLLER)**	*Loxoconcha versicolor* n. sp. Müller, 1894, p. 346, pl. 27: fig. 4; pl. 28: figs 5, 10.
Family :**Cytheridae**	
Genus : ***Microcytherura*** **MÜLLER, 1894**	
Microcytherura **sp.**	
Genus :***Paijenborchella*** **KINGMA, 1948**	
Paijenborchella malaiensis **KINGMA**	*Paijenborchella malaiensis* n.sp. Kingma, 1948, p. 87, pl. 8: fig. 13.
Genus: ***Tetracytherura*** **RUGGIERI, 1952**	
Tetracytherura angulosa **(SEGUENZA)**	*Cytheridea angulosa* n. sp. Seguenza, 1880, p. 363, pl. 17: figs 47, 47a.
Family :**Xestoleberididae**	
Genus :***Xestoleberis*** **SARS, 1966**	
Xestoleberis communis **MÜLLER**	*Xestoleberis communis* n. sp. Müller, 1894, p. 338, pl. 25: figs 32, 33, 39; pl. 26: figs 1, 6.
Xestoleberis decipiens **MÜLLER**	*Xestoleberis decipiens* n. sp. Müller, 1894, p.337, pl.25: fig.10; pl.26: figs 4, 8.
Xestoleberis dispar **MÜLLER**	*Xestoleberis dispar* n.sp.Müller,1894, p.334, pl.25: figs2,3,9,35

Family : **Hemicytheridae**	
Genus :***Aurila* POKORNY, 1955**	
***Aurila interpretis* ULICZNY**	*Aurila interpretis* n.sp. Uliczny, 1969, Pl.2: fig.6; Pl.12:figs.2-3
***Aurila convexa* (BAIRD)**	*Cythere convexa* n. sp. Baird, 1850, pl. 21: fig. 3.
***Aurila* cf. *glyptica* BARBEITO-GONZALEZ**	*Aurila glyptica* n. sp. Barbeito-Gonzalez, 1971, p. 277, pl. 12: figs 1b, 2b, 3b; Pl. 46: figs 13-18.
Genus: ***Tyrrhenocythere* RUGGIERI, 1955**	
***Tyrrhenocythere* sp.**	
Genus :***Urocythereis* RUGGIERI, 1950**	
***Urocythereis margaritifera* (MÜLLER)**	*Cythereis margaritifera* n. sp. Müller, 1894, p.368, pl. 32: figs. 26, 29, 32, 35-37.
***Urocythereis* sp.**	
Genus : ***Tenedocythere* SISSINGH, 1972**	
***Tenedocythere prava* (BAIRD)**	*Cythere prava* Baird, 1850, p. 256, Pl. 18: figs 13-15.
***Tenedocythere salebrosa* (ULICZNY)**	*Quadracythere prava salebrosa* Uliczny, 1969, p.70, pl.4: figs 3-4.
***Tenedocythere* sp.**	
Family : **Cytheruridae**	
Genus :***Hemicytherura* ELOFSON, 1941**	
***Hemicytherura videns* (MÜLLER)**	*Cytheropteron videns* n.sp. Müller, 1894, p. 303, pl. 20:figs2, 8.
***Hemicytherura gracilicosta* RUGGIERI**	*Hemicytherura videns gracilicosta* n. sp. Ruggieri, 1953, p. 50, textfigs 5, 7.
Genus : ***Eucytherura* MÜLLER, 1894**	
***Eucytherura complexa* (BRADY)**	*Cythere complexa* n. sp. Brady, 1866, p. 210.
***Eucytherura mistrettai* SISSINGH**	*Eucytherura mistrettai* n. sp. Sissingh, 1972, p. 140.
Genus: ***Pseudocytherura* DUBOWSKY, 1939**	
***Pseudocytherura* cf. *calcarata* (SEGUENZA)**	*Cytheropteron calcaratum* n. sp. Seguenza, 1880, p. 365, pl. 17: figs 53, 53a.
Genus : ***Semicytherura* WAGNER, 1957**	
***Semicytherura acuta* (MÜLLER)**	*Cytherura nigrescens* n. sp. Müller, 1894, p. 290, pl. 18: figs 3, 11, 14; pl. 19: fig. 14.
	Cytherura acuta n. sp. Müller, 1912, p. 264 (new name)
***Semicytherura acuticostata* (SARS)**	*Cytherura acuticostata* n. sp. Sars, 1866, p. 76.
***Semicytherura alifera* RUGGIERI**	*Cytherura alata* n. sp. Müller, 1894, p. 288, pl. 18: figs 1, 7, 8; Pl. 19: fig. 9.
	Semicytherura alifera n. sp. Ruggieri, 1959, p. 204 (new name).
***Semicytherura* aff. *Semicytherura incogruens* (MÜLLER)**	*Cytherura incogruens* n. sp. Müller, 1894, p. 296, pl. 17: figs 2, 7, 8; pl. 19: fig. 7.
***Semicytherura paradoxa* (MÜLLER)**	*Cytherura paradoxa* n. sp. Müller, 1894, p. 294, pl. 17: figs 3, 9; pl. 19: fig. 12.
***Semicytherura psila* BARBEITO-GONZÀLEZ**	*Semicytherura psila* n. sp. Barbeito-Gonzàlez, 1971, p. 298, pl. 25: figs 1e, 2e.
***Semicytherura rara* (MÜLLER)**	*Cytherura rara* n. sp. Müller, 1894, p. 299, Pl. 17: figs 14, 15; Pl. 19: fig. 20.
***Semicytherura ruggierii* (PUCCI)**	*Cytherura ruggierii* n. sp. Pucci, 1956, p. 167, pl. 1, figs. 3, 4, textfig. 1.
***Semicytherura sulcata* (MÜLLER)**	*Cytherura sulcata* n. sp. Müller, 1894, p. 297, Pl. 17: figs 4, 10; Pl. 19: fig. 19.
Genus :***Pedicythere* EAGER, 1965**	
***"Pedicythere" tessellata* BONADUCE, CIAMPO & MASOLI**	*"Pedicythere" tessellata* n. sp. Bonaduce, Ciampo & Masoli, 1975, p. 88, pl. 36: figs 12-15.

Genus : ***Cytheropteron* SARS, 1866**	
***Cytheropteron inornatum* BRADY & ROBERTSON**	*Cytheropteron inornatum* n. sp. Brady & Robertson, 1872, p. 61, Pl. 2: figs 1-3, in Athersuch et al. (1989), p. 226.
***Cytheropteron sulcatum* BONADUCE, CIAMPO & MASOLI**	*Cytheropteron sulcatum* n. sp. Bonaduce, Ciampo & Masoli, 1975, p. 97, Pl. 57: figs 1-8, textfig. 37.
Genus :***Kangarina* CORYELL & FIELDS, 1937**	
***Kangarina abyssicola* (MÜLLER)**	*Cytheropteron abyssicolum* n. sp. Müller, 1894, p. 302, Pl. 20: figs 5, 11; Pl. 21: figs 4-9.
Family : **Paracytherideidae**	
Genus :***Paracytheridea* MÜLLER, 1894**	
***Paracytheridea depressa* MÜLLER**	*Paracytheridea depressa* n. sp. Müller, 1894, p.341, Pl.29: fig.4
***Paracytheridea hexalpha* DORUK**	*Paracytheridea hexalpha* n. sp. Doruk, 1980, p. 147-150.
***Paracytheridea* sp.**	
Family :**Leptocytheridae**	
Genus : ***Callistocythere* RUGGIERI, 1953**	
***Callistocythere littoralis* (MÜLLER)**	*Cythere littoralis* n. sp. Müller, 1894, p. 353, Pl. 28: fig. 18.
***Callistocythere pallida* (MÜLLER)**	*Cythere pallida* n. sp. Müller, 1894, p. 354, Pl. 28: fig. 17.
Genus: **Leptocythere SARS, 1925**	
***Leptocythere multipunctata* (SEGUENZA)**	*Cythere multipunctata* n. sp. Seguenza, 1884, p. 29, Pl. 1: fig 1.
***Leptocythere tenera* (BRADY)**	*Cythere tenera* n. sp. Brady, 1868, p. 399, Pl. 28: figs 29-32.
Family : **Cushmanideidae**	
Genus : **Pontocythere DUBOWSKY, 1939**	
***Pontocythere turbida* (MÜLLER)**	*Cytheridea turbida* n. sp. Müller, 1894, p. 361, Pl. 30: figs 28, 31-33, 40-45, 47.
Family : **Neocytherideidae**	
Genus : **Neocytherideis PURI, 1952**	
***Neocytherideis fasciata* (BRADY & ROBERTSON)**	*Cytherideis fasciata* n. sp. Brady & Robertson, 1874, p. 117, Pl. 6: figs 1-5.
Family : **Krithidae**	
Genus :***Krithe* BRADY, CROSSKEY & ROBERTSON, 1874**	
***Krithe bartonensis* (JONES)**	*Krithe bartonensis* (JONES) in Sars 1928, p. 165, pl. 76.
***Krithe monosteracensis* (SEGUENZA)**	*Ilyobates bartonensis* (JONES) *monosteracensis* Seguenza, 1880, pp. 194, 290, 325, Pl. 17: figs 29, 29a.
***Krithe*sp.**	
Family : **Bythocytheridae**	
Genus: Pseudocythere SARS, 1866	
***Pseudocythere caudata* SARS**	*Pseudocythere caudata* n. sp. Sars, 1866, p. 88.
Suborder : **Bairdiocopina**	
Superfamily : **Bairdioidea**	
Family : **Bairdiidae**	
Genus : ***Bairdia* Mc COY, 1844**	
***Bairdia formosa* BRADY**	*Bairdia formosa* n. sp. Brady, 1868, p. 221, Pl. 14: figs 5-7.
Genus :***Neonesidea* MADDOCKS, 1969**	
***Neonesidea longevaginata* (MÜLLER)**	*Bairdia longevaginata* n. sp. Müller, 1894, p. 271, Pl. 13: figs 30-33; Pl. 14: figs 6, 7, 27.
Suborder: **Cypridocopina**	
Superfamily : **Pontocypridoidea**	
Family : Pontocyprididae	
Genus :***Pontocypris* SARS, 1866**	
***Pontocypris acuminata* (MÜLLER)**	*Erythrocypris acuminata* n. sp. Müller, 1894, p.259, Pl. 11: figs 5, 6, 40-42.
Order: **Platycopida**	
Suborder: **Platycopina**	
Superfamily : **Cytherelloidea**	
Family : **Cytherellidae**	
Genus : ***Cytherella* JONES, 1849**	
***Cytherella vulgata* RUGGIERI**	*Cytherella vulgata* n. sp. Ruggieri, 1962, p. 9, Pl. 1: figs 9-10.

Table 2. Distribution of the ostracod species, identified in this study, in the Pleistocene marine sediments of Greece, based on literature, with taxonomical remarks.

This study Kalogeras, Zakynthos Island	Sissingh 1972		Tsapralis 1981 Zakynthos	Mostafawi 1986 Kos island	Krstic & Dermitzakis 1981 Channel of Corinth	Zangger & Malz 1989 Gulf of Argos	Fernandez-Gonzalez et al. 1994 Patras region	Guernet et al.2003 Aigion
	Crete	Rhodes						
Aurila convexa				x		x		x
Aurila cf. *glyptica*								
Aurila interpretis				x				
Bairdia formosa	x	x						
Bosquetina rhodiensis		x						
Callistocythere littoralis			x		x			x
Callistocythere pallida	x	x	x		x			
Cytherella vulgata	x	x	x					
Cytheropteron inornatum			*C.* ex. gr. *rotundatum*					x
Cytheropteron sulcatum			x					
Eucytherura complexa		x	x					
Eucytherura mistrettai		x	x					
Hemicytherura videns			x					
Hemicytherura gracilicosta	x		x					
Henryhowella asperrina		x	x					
Hiltermannicythere turbida						x		x
Kangarina abyssicola		x	x					
Krithe bartonensis								
Krithe monosteracensis		x	x					
Leptocythere multipunctata		x	x					
Leptocythere tenera		x	x					
Loxoconcha affinis								
Loxoconcha gibberosa				x				
Loxoconcha rubritincta			x					
Loxoconcha tumida	x	x	x		x			
Neocytherideis fasciata			x					
Neonesidea longevaginata				x		x		
Paijenborchella malaiensis			x					
Palmoconcha turbida			*Loxoconcha turbida*	*Lindisfarnia turbida*			*Loxoconcha* cf. *turbida*	*Lindisfarnia turbida*
Paracytheridea depressa								
Paracytheridea hexalpha				x				
"Pedicythere" tessellata			x					
Pontocypris acuminata			x					
Pontocythere turbida						x		
Pseudocythere caudata		x	x					
Pseudocytherura cf. *calcarata*		x	x	x				
Pterygocythereis jonesii		x				x		x
Sagmatocythere versicolor		*Loxoconcha versicolor*	*Loxoconcha versicolor*					x
Semicytherura acuta								
Semicytherura acuticostata	x	x	x				x	
Semicytherura alifera			x	x				
Semicytherura aff. *S. incogruens*			x	x				
Semicytherura paradoxa		x	x			x		
Semicytherura psila			x					
Semicytherura rara			x					
Semicytherura ruggierii			x	x			x	x
Semicytherura sulcata								x
Tenedocythere prava		*Quadracythere (T.) prava*	x	x		x		
Tenedocythere salebrosa								
Tetracytherura angulosa			x					
Urocythereis margaritifera			x		x			
Xestoleberis communis				x	x			
Xestoleberis decipiens								
Xestoleberis dispar		x	x					x

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Plate 1. Lateral exterior views of selected ostracod species. RV: right valve, LV: left valve. **1** *Bairdia formosa*, LV; **2** *Neonesidea longevaginata*, RV; **3** *Bosquetina rhodiensis*, RV; **4** *Krithe bartonensis*, LV; **5** *Krithe monosteracensis*, LV; **6** *Hiltermannicythere turbida*, LV; **7** *Pontocythere turbida*, LV; **8** *Leptocythere tenera*, LV; **9** *Leptocythere multipunctata*, RV; **10** *Loxoconcha gibberosa*, LV; **11** *Palmoconcha turbida*, LV; **12** *Loxoconcha tumida*, LV.

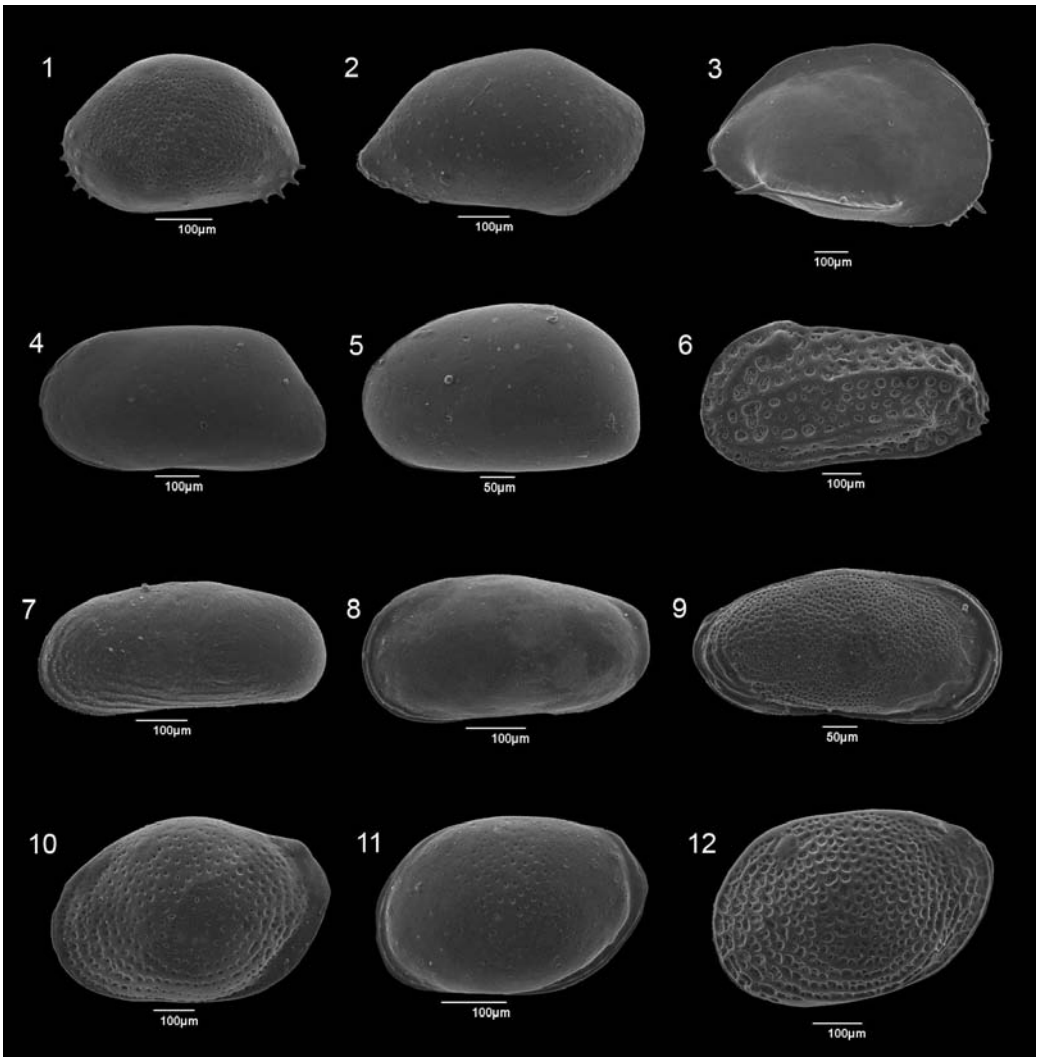

Plate 2. Lateral exterior views of selected ostracod species. RV: right valve, LV: left valve. **1** *Eucytherura complexa*, LV; **2** *Eucytherura mistrettai*, LV; **3** *Pseudocythere caudata*, RV; **4** *Paracytheridea depressa*, LV; **5** *Semicytherura acuta*, RV; **6** *Semicytherura sulcata*, LV; **7** *Semicytherura ruggierii*, RV; **8** *Urocythereis margaritifera*, RV; **9** *Kangarina abyssicola*, LV; **10** *Paijenborchella malaiensis*, LV; **11** *Hemicytherura gracilicosta*, LV; **12** *Hemicytherura videns*, LV; **13** *"Pedicythere" tessellata*, LV; **14** *Cytheropteron sulcatum*, RV; **15** *Cytheropteron inornatum*, LV.