



## MOLLUSCS IN THE PREHISTORIC DODECANESE

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Received: 21-11-2002

Accepted: 12-7-2003

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### ABSTRACT

This paper presents results of malacological of shells from prehistoric Rhodian cave settlements. The bibliographical data and analysis of the shells are based on findings from the excavations at the cave of Ag. Georgios at Kalythies and the cave at Koumelo Archaggelou. The present research seeks to define the significance and use of the shells. It will be shown that the malacological material of the neolithic layers of the caves in Rhodes and Kos enrich our knowledge both about the paleoenvironment and life in the Dodecanese.

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**KEYWORDS:** Dodecanese, Shell, Molluscs, Spoon-shaped, Shell ornament

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### INTRODUCTION

Most archaeological reports aim at the reconstruction of some characteristics of life of past societies through the remains of their material culture. Buildings, stone and terracota objects are mostly studied and they are the primary sources for dating and studying of the technology of past societies. They can also define the cultural borders of civilisations. Art objects have always attracted the attention of researchers because of their aesthetic value and of the conclusions to which one can arrive about the artistic and cultural life of their manufacturers and owners.

Nowadays all findings of an excavation are considered valuable, especially all the paleoenvironmental and bioarchaeological remnants. The study of animal remains is mainly connected with the diet of ancient societies and with the present and past climatic conditions (Karali 1999, 2-3). The most important stage of an environmental study is the interpretation of the material studied in order to understand the people's life. In Greece and more precisely in the region of the Dodecanese due to its geographical position there is a large quantity of malacological material. From the study of the malacological material information is

provided for the life of people and their relations with the environment (Karali 1979, 3-20). The natural environment does not seem to have changed a lot by man because Neolithic settlements are scattered over a broad area (Sampson 1980, 1984, 1987, 1988). An important source of information for the archaeologists is the discipline of ethnoarchaeology which helps to detect a continuity in the traditional ways of eating and working. There are only a few studies about objects made out of shell using ethnographic parallels. At some point shells may have been used in many ways, for example, in the exchange of food and other essential goods. As man-made objects they were important for their aesthetic and cultural value, as other artefacts. Furthermore their presence in burials confirms their symbolic meaning. In general, shells tell us about the economical and social life of past societies (Karali 1999, 79).

Rhodes has an exceptional landscape with unique geomorphology, with a variety of species of marine molluscs and land snails. In the south coast where the sea is calm most of the year and less windy, population is denser than the other parts of the island. This is an ideal place to live and this is the case for most of the Dodecanese islands. The economy of the neolithic settlements of Rhodes was based mainly on agriculture and cattle breeding and secondarily on fishing and other wild resources. The island had many woods and wild animals' bones have been found in the area (Sampson 1987). Caves were in use for temporary habitation because the climatic conditions were good for open-air settlements. Big amounts of molluscs are not likely to be found in caves because they can not be preserved for a long time. Food (meat, plants and seeds), which can be longer preserved, was stored in the caves as is confirmed by the discovery of jars.

## METHODOLOGY

The present publication is based on bibliographical data and detailed study and analysis of the shells collected during the excavations at the cave of Ay. Georgios at Kalythies and the cave at Koumelo Archaggelou. The material is stored in the Archaeological Museum of Rhodes. Any analysis that hopes to develop an understanding of palaeoenvironmental or subsistence issues depends on the quality of the evidence that is retrieved archaeologically and the extent to which such evidence truly reflects both the past environment that produced it and the people whose behaviour contributed to the formation of the archaeological assemblage. A complete sub-discipline in archaeology (taphonomy, Cameron 1978) has been developed in order to study the processes involved in archaeological site deposits and to attempt to understand particular problems resulting from various processes that occur before, during and after initial deposition. The factors that influence what is left as part of an archaeological assemblage are numerous.

Methods of collecting malacological material are fully described elsewhere (Karali 1999, pp.,5-8). Special treatment relating both to the retrieval of faunal material and to the analysis of such material was applied at the Koumelo Archaggelou Cave and Ay. Georgios Cave at Kalythies, excavated material was partly sieved. Therefore problems occurred concerning the quantity of mollusks, the variety of their scales (Claassen 1998) and differential retrieval quality because of a range of people, experienced and inexperienced. The vertical dimension, critical for any understanding of chronology and the horizontal relationship of various components of each stratum was not always easy. Due to the complex stratigraphy of the sites, stratigraphic integrity was sometimes lost.

The main source of information for this study is mollusc shells. The data are processed in the following order:

- *The shells were identified at species level.*  
The first step was the identification of the shell species. The importance of defining shells at species level is that in most cases this definition determines the provenience of the shell. In order to carry out this task, comparative collections (personal) and various monographs and guides have been used (Vardela, Delamotte 1994, Abbot & Dance 1982.) As the taxonomy of molluscs is constantly revised, the order of the genera, as presented in Tables I, II as well as all other tables in this dissertation, follow Vaught (1989).
- *The artifactual type was determined.*  
Studying the shell artifacts involves two basic steps: the description of the end result and the analysis of the techniques used to achieve the end product. Observations of the various techniques are based mainly on the work of Karali (1999). Four main techniques of working have been used in the Aegean: grinding, sawing, hammering and drilling. The easiest method is to use naturally abraded shells. In some cases it is impossible to determine the technique, because worn or broken artifacts don't bear any clear evidence. In addition to this, wear is caused also by various depositional and post depositional processes in any archaeological site. For shell artifacts a basic terminology is important in order to compile a type list, necessary for the classification and understanding of the uses.
- The species type and information available from the excavation were entered into a database program. Computations and percentages were calculated using Microsoft Excel 2000. There are two

common procedures for presenting quantitative data analysis: NISP (number of identified specimens) or MNI (minimum number of individuals, Lyman 1994). When studying mollusks that were used as food, it is important to calculate the MNI, as every two valves of a bivalve represent one animal, and the MNI is more indicative of how much mollusks meat was consumed. It is, thus, assumed that the NISP reflects the actual number of artifacts. However, the natural tendency of larger specimens to break (Claassen 1998, 68) the use of NISP in shell analysis present a distorted impression of the actual numbers of shells collected by ancient groups.

## RESULTS

The first study of the prehistoric Dodecanese was led by Professor Doro Levi in the island of Kos, concerning the cave of Aspri Petra (Levi 1925-6, 235-312). There are also mollusc remains which have not yet been studied in other neolithic sites in the Dodecanese. Many shell species have been identified in the coast region of Partheni on the island of Leros. The species *Patella* seems to dominate, and follow the species *Cardium*, *Pinna* and *Tonna*. Sampson excavated and published the sites, which provided the malacological material examined in this study: the cave of Ay. Georgios at Kalythies and the cave at Koumelo Archaggelou (Sampson 1987, 21-77).

In the cave of Koumelo Archaggelou 215 marine molluscs and land snails have been examined (this material was collected as a sample). There have been identified 213 shells of 4 marine molluscan species. In terms of quantity the family Patellidae comes first with 209 shells of the species *Patella caerulea* (Linne). This is followed by the species *Monodonta turbinata* (Born) with 2 shells and

Table. 1: Koumelo Archaggelou Cave (Shells total: 215)

A. Sea mollusks (Total: 213)		
SPECIES	QUANTITY	PERCENTAGE
<i>Patella caerulea</i> (Linne)	209	97,2%
<i>Monodonta turbinata</i> (Born)	2	0,93%
<i>Tritonium nodiferum</i> (Lamarck)	1	0,47%
<i>Cassidaria echinophora</i> (Linne)	1	0,47%
B. Land snails (Total: 2)		
SPECIES	QUANTITY	PERCENTAGE
<i>Helicella bolenencic</i> (Locard)	1	0,47%
<i>Helix aspersa</i> (Muller)	1	0,47%

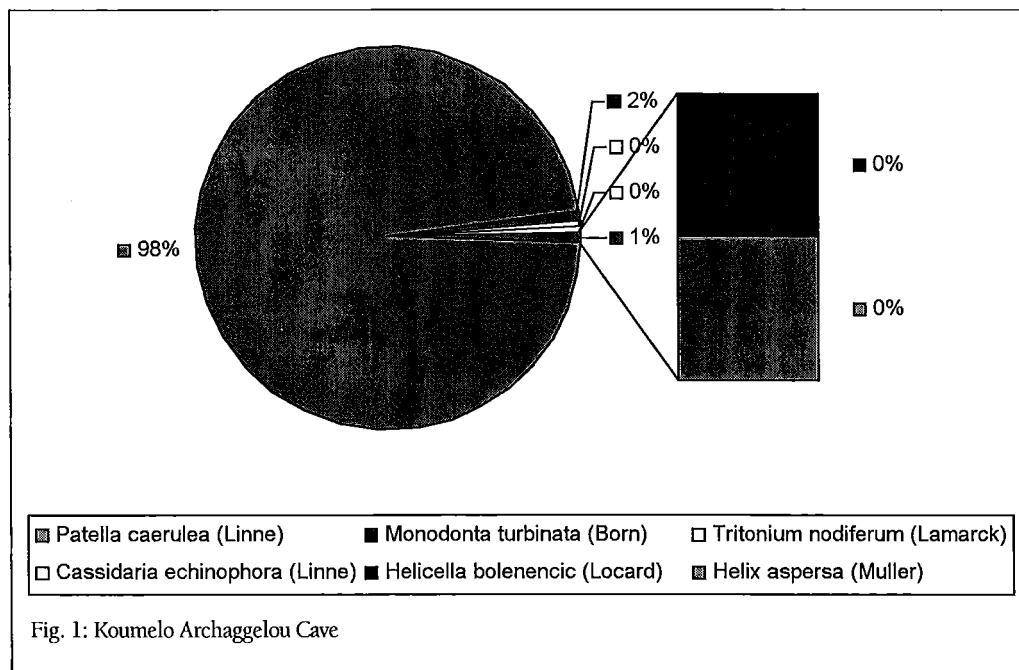
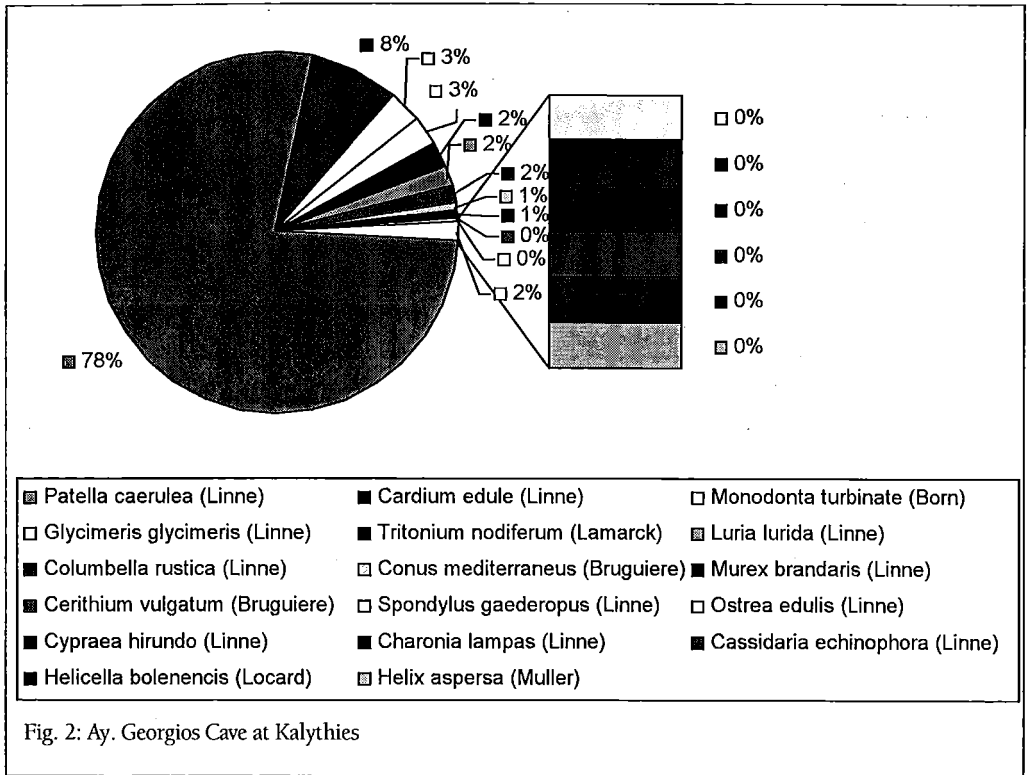


Table. 2: Ay. Georgios Cave at Kalythies (Shells total: 370)  
v Sea mollusks (Total: 368)

SPECIES	QUANTITY	PERCENTAGE
<i>Patella caerulea</i> (Linne)	287	77,57%
<i>Cardium edule</i> (Linne)	30	8,11%
<i>Monodonta turbinata</i> (Born)	10	2,7%
<i>Glycimeris glycimeris</i> (Linne)	10	2,7%
<i>Tritonium nodiferum</i> (Lamarck)	8	2,16%
<i>Luria lurida</i> (Linne)	7	1,9%
<i>Columbella rustica</i> (Linne)	6	1,62%
<i>Conus mediterraneus</i> (Bruguiere)	2	0,54%
<i>Murex brandaris</i> (Linne)	2	0,54%
<i>Cerithium vulgatum</i> (Bruguiere)	1	0,27%
<i>Spondylus gaederopus</i> (Linne)	1	0,27%
<i>Ostrea edulis</i> (Linne)	1	0,27%
<i>Cypraea hirundo</i> (Linne)	1	0,27%
<i>Charonia lampas</i> (Linne)	1	0,27%
<i>Cassidaria echinophora</i> (Linne)	1	0,27%
B. Land snails (Total: 2)		
SPECIES	QUANTITY	PERCENTAGE
<i>Helicella bolenencis</i> (Locard)	1	0,27%
<i>Helix aspersa</i> (Muller)	1	0,27%



*Tritonium nodiferum* (Lamarck) with 1 shell. The ratio of gastropods and bivalves is 4 to 1. Marine molluscs appear in the following proportions: As one can see from the Fig. 1, *Patella* is the dominant species followed by extremely small quantities of other locally common species. They're characteristic of rocky shores and the presence of *Tritonium* sp. indicates deep water and therefore the use of boats.

In the cave of Ay. Georgios at Kalythies 370 marine molluscs and land snails have been examined (this material was collected as a sample). There have been identified 368 shells of 15 marine molluscan species. In terms of quantity the family Patellidae comes first with 287 shells of the species *Patella caerulea* (Linne). This is followed by the

species *Cardium edule* (Linne) with 30 shells, *Monodonta turbinata* (Born) and *Glycimeris glycimeris* (Linne) with 10 shells, *Tritonium nodiferum* (Lamarck) with 8 shells, *Luria lurida* (Linne) with 7 shells, *Columbella rustica* (Linne) with 6 shells, *Conus mediterraneus* (Bruguere) and *Murex brandaris* (Linne) with 2 shells, *Cerithium vulgatum* (Linne), *Spondylus gaederopus* (Linne), *Ostrea edulis* (Linne), *Cypraea hirundo* (Linne) and *Charonia lampas* (Linne) with 1 shell. The ratio of gastropods and bivalves is 10 to 4. Marine molluscs appear in the following proportions: As one can see from the Fig. 2, *Patella* is again the dominant species followed by *Cardium*, *Monodonta*, *Glycimeris*, *Tritonium*, *Luria*, *Columbella*. Small quantities of other

common species in Rhodes follow. They are characteristic of rocky shores, of sandy beach, while the presence of *Tritonium* sp. indicates deep water and therefore the use of boats.

## DISCUSSION

These tables show that the quantity and the variety of species are not considerable. They are mainly gastropods which live in rocky shores and big depths and they are common still today.

Similar information derives from the marine molluscs and the land snails from the cave Aspri Petra in the island of Kos, although there is no malacological study. According to the excavator (Levi 1925-6, 235-312) the species *Patella* sp. and *Tritonium nodiferum* (Lamarck) prevail. These are commonly found in all the other sites. For example, in Partheni on the island of Leros, among other species most frequently found are those of *Patella*, *Cardium*, *Pinna*, *Tonna*. Generally the species *Patella* seems to dominate in the Dodecanese.

**Uses:** Most of the shells found at the above sites were **food** remains. They are species easily fished and collected. Some of them such as the limpet are common in the coastal zone and others are common in big depths. Therefore they require different ways of fishing, i.e. the first one by hand, the second one by boat etc. Therefore the samples from these caves help to understand the morphology of the coasts and the animals' habitat, the transition from hunting and collecting food to the domestication of plants and animals, and at last the passage to a more organized community life. However during the Neolithic Age the presence of water and fauna and flora are the main poles of attraction for humans. Therefore molluscs reflect the basic changes which occurred in the history of man during the Neolithic Age (Karali 1990, 421), to which the shells belong.

The existence of groups of people living by

hunting and collecting food and the simultaneous development of the new way of life is very interesting. The production and the utilization of similar objects, technologically and typologically, prove the exchange of ideas and the contact with the wider environment. The presence of molluscs which belong to different environments shows that these groups of people moved freely in the area and they were not dependent on other groups to acquire goods. These first farmers were trying to be self-sufficient, although in some cases we have indications of the existence of commerce and exchanges with other social groups. This is the time when crafts appear as part time professions. The same seems to apply to commerce and this gives man the opportunity to incorporate objects and institutions (such as clothing, ornaments, terracota objects, tools etc., which nomadic life could not offer to him) into his life. This way of life is characteristic of farmers and cattle breeders, as archaeological and ethnographic evidence proves.

**Other uses:** Apart from the uses already mentioned, molluscs from the three studied sites and especially their shells were also used a lot in the manufacture of ornaments and tools:

- In the cave of Ay. Georgios, layer 5-9, a cone was found with a broken and smoothed edge. Its size is approximately 1,4cm. It could have been used as a bead (Karali 1999, 42, Reese 1982, 125-129).
- A fragment of Triton with a smoothed and worn surface from the action of water is approximately 8,5cm. It could have been used as a spoon or a small open bowl.
- A fragment of the species *Charonia Lampas* probably had a similar use. Its size is 7,5cm. It bears a hole for hanging on its right edge.

This group of objects, although not well

preserved, is connected with some examples from the cave of Aspri Petra in the island of Kos. According to the excavator (Doro Levi 1925-6, 236-7) many perforated limpets (*Patella sp.*) were found, the use of which as ornaments is doubtful, as they were beside a fireplace mixed with animal bones. Other shells were also perforated and they might have had a double use (as food and ornaments). As Levi himself underlines four fragments of processed shell of Triton were discovered. They are spoon-shaped with an irregular edge. The first one is perforated in its wider edge, and the other one has two perforations. These spoon-shaped shells are similar to some terracota objects with a double use: spoons and pendants. Strangely enough few processed objects made out of Spondylus shell have been found in the prehistoric sites of the Aegean.

A group of *Cyprea sp.* shells were all perforated with one or more holes in the body of the shell. The violent technique of the direct striking was used. This technique often leads to the cracking and shattering of shells not having a flat surface (Karali 1999, 27). So the hole has an irregular polygonal shape because the percussion creates cracks on the surface of the shell. The dimensions of the hole vary from 0,6cm to 0,10cm and its opening is graded. These holes are present in the shell of the species *Cardium edule Linne* and *Luria lurida Linne* (Reese 1989, 33-39, Kommos 2000, 163-277, Karali 1999, 33-35). Such objects are rarely used as ornaments. Therefore the shells of the species *Cyprea* found in the prehistoric caves of Rhodes are food remains and may have been occasionally used as ornaments.

It is known that in the prehistoric Aegean molluscs were consumed. They were also used as ornaments, tools, trumpets, musical instruments, raw material for textile dyes and for many other purposes. They were

sometimes objects of commerce, tools and objects of prestige and wealth. Offerings in graves or sanctuaries and some species were chosen either because of their shape or their symbolic meaning. But these utilizations are not easily detected. Evidence comes from mainland Greece, the Cyclades, Crete and the other islands (Karali 1999).

## CONCLUSION

Conclusions drawn from the study of the malacological material of the neolithic layers of the caves in Rhodes and Kos enrich our knowledge both about the paleoenvironment and life in the Dodecanese.

- The same species of molluscs are found today on the same coasts
- The same species appear in all layers
- No shell ornaments were found made of the known type of shells of the Neolithic period in Greece. This is perhaps due to the incomplete study of the material and the lack of malacological studies.
- Spoon-shaped objects from Triton are found. These objects belong to the group of "tools" which are simultaneously ornaments. Spoon-shaped objects were found in the prehistoric Aegean. They belong to the species *Mytilus* and they were found mainly in the North Aegean and in the Cyclades. Spoon-shaped objects made of limpet were found in the cave of Cyclopes in Gioura. The spoon-shaped objects from Triton found in the site of Saliagos in the Cyclades are typical. Big species such as Tritons are more common in the Dodecanese. This field requires further study in order to understand and interpret these objects as well as the special use of some of them.

Our knowledge is incomplete because the malacological material studied is still limited (number of sites and number of samples). One can say that all shells are local and on the



species' level no change has been observed. Conclusions can be drawn about the general social and economic context in which they belong (Karali 1990, 1993, 1995, 1999). However one can assume from the archaeological findings that at the Neolithic period human groups collect mollusks, fish, corals etc. from the coasts. They also cultivate

the land and domesticate animals (Halstead 1987, Sampson 1987, 314), living in peace as there are not discovered any objects or traces of possible attacks or violent deaths. Systematic research in the area will provide more information about life in the prehistoric Aegean.

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