MOLLUSC SHELLS FOUND AT THE YARIMBURGAZ CAVE

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SUMMARY: The Yarimburgaz Cave is formed in the Eocene limestones located in the Catalca Peninsula of the Istanbul Province, near the northern shore of the Kücükcekmece lagoon, 2 km north from Altinsehir village. This study is on the systematics and ecology as well as environmental conditions of molluscs recovered in the clayey fill of the Chalcolithic layer of the cave.

Key Words: Mollucs shells, paleoecology, nutritional values.

INTRODUCTION

Yarimburgaz Cave is located in the Çatalca Peninsula comprising the European part of Istanbul Province approximately 20 km from the city center, on the northern shore of the Kucukcekmece lagoon near by the rote leading to the villages of Kayabasi and Çamlar. The cave is formed in Eocene age limestones. Escavations conducted in 1986 have evidenced that this cave was one of the earliest known human occupation sites (Figure 1). Escavators have denominated this complex cave in two parts, the lower and upper caves (1). In the upper cave, one of the chalcolithic layers, layer 3 (Figure 2), dated to the Chalcolithic period, as characterized by a distinct hand-made pottery, with uncallibrated C14 date of 6880±80 (GrN. 15528) has revealed within its clayey fill, amounts of mollusc shells.

REGIONAL GEOLOGY

The study area, known as the Yarimburgaz Cave district is located some 2 km north of Altinsehir. Oldest rocks in this region are recifal limestones and clayey limestones of Middle Eocene (Lutetian) age. On the top of these formations poorly cemented sediments of Miocene (Sarmatian) age containing pebbles, sands and clay are to be found.

The unit known as the Altinsehir formation (2) has two members: Recifal limestone on top (Yarimburgaz member) and clayey limestone on the bottom (Ikitelli member) Yarimburgaz limestone (Tayk):

It is observed most typically in the north of Altinsehir, around the villages of Samlar and Kayabasi. Its thickness is approximately 40-50 m and makes a lateral transition to the ŸIkitelli member. In some places, it is covered by discordant Miocene depositis. The unit is white and whitish, and it is rich in fossils (Foraminifera, bryozooa, corals) with karstic dissolution cavities. Eventhough it is well bedded in the vicinity of Yarimburgaz Cave elsewhere it is unstratified.

IKITELLI MEMBER (TAI)

It is observed best near the Yarimburgaz Cave and in the villages of Samlar and Azatli. Its thickness is approximately 40-50 m and makes a lateral transition to the Yarimburgaz member. On top of it, one finds discordant formations of Miocene (Sarmation) age. The bedding is of medium-thickness. The unit is rich in fossils (pelecypods, gastropods, foraminifers, crinoids and echinoids).

Yarimburgaz limestone (Middle Eocene) corresponds to deposits from the reef and the Ikitelli member to those of the fore reef. Among the two, the hard and resistant Yarimburgaz limestone let to the development of karstic features.

Yarimburgaz Cave, which is one of the karstic formats of this location, has revealed one of the earliest known horizons of human history. Solvage excavations

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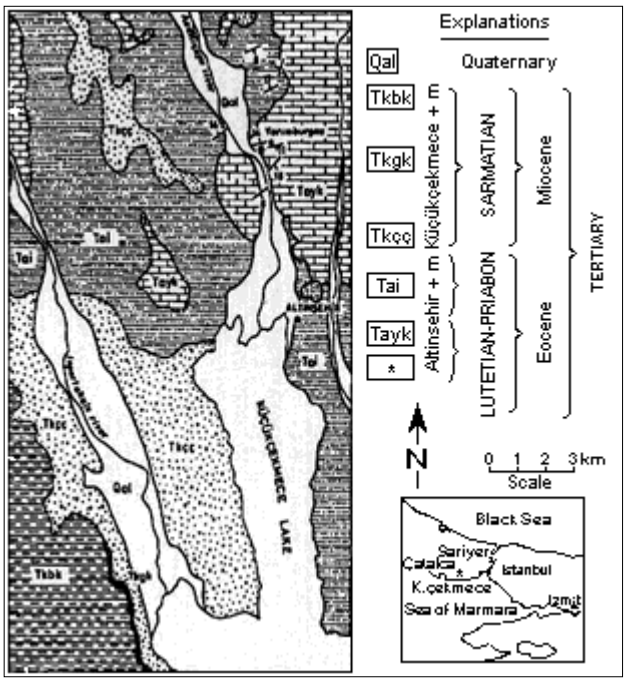
Figure 1: Geological map of the Yarimburgaz Cave (Küçükçekmece) and its surroundings (after Digis, 1986).



Qal: Allavrum, black, pebble, sand; Tkbk: Bakirköy limestone, clayey limestone; Tkgk: Gungoren member, mudstone, claystone; Tkçç: Çukurçesme member, Pebble, sand, silt; Tai: Ikitelli member, clayey limestone; Tayk: Yarimburgaz limestone; * : Yarimburgaz Cave.

executed in this partly destroyed cave in 1986, have also revealed archeological levels dated to the prehistoric periods (6500-7000 BP).

The material yield of the assemblage makes it possible to infer on the subsistence patterns as well as of pertaining environmental conditions of the period.

CULTURAL SIGNIFICANCE OF THE MOLLUSC BEARING THIRD LAYER OF YARIMBURGAZ CAVE

The third cultural layer of Yarimburgaz has revealed a hitherto unknown cultural assemblage, with some affinities of the Linear Band Ceramic Cultures of Central Europe. The stratified deposit of the upper gallery is due to a deposition of archeological material in a doline-like sink hole that already existed in the cave. The actual habitation layers had been destroyed by the intensive building activity of the Byzantine remodeling of the cave. Accordingly, the stratified layers of the cave are mostly residual debris, washed or thrown into this depression. Archeologically, it is also clear that the sequence is not continuous, but interrupted by substantial periods; particularly there is a clear hiatus between layers 4 and 3.

The molluscs were found in a grayish clayey lance of soil within the context of layer 3. This pocket of earth was almost completely compacted with mollusc fragments, but it also yielded some sherds and bone. Elsewhere within the deposit of layer 3 there were also some molluscs. Accordingly, this mollusc bearing pocket of earth may also indicate a short break in the occupation.

The use of molluscs for subsistence is a common practice for the so called neolithic or chalcolithic communities of the region of Marmara. This is best evidenced in the Fikirtepe culture, which is at least half a Millennium earlier than the layer 3 of Yarimburgaz. As it is the case elsewhere in the general area, the utilization of molluscs decreases in time.

SYSTEMATICS OF THE MOLLUSCS

Class : Pelecypoda GOLDFUSS
Order : Mytiloida FERUSSAC
Family : Mytilidae RAFINESQUE
Genus : Mytilus LINNE
Species : Mytilus galloprovincialis LAMARCK

Class : Pelecypoda GOLDFUSS
Order : Veneroida H. ADAMS and A. ADAMS
Family : Cardiidae LAMARCK
Genus : Cerastoderma POLI
Species : Cerastoderma edule (LINNE)

Class : Pelecypoda GOLDFUSS
Order : Pterioida NEWEL
Family : Ostreidae LAMARCK
Genus : Ostrea LAMARCK
Species : Ostrea edulis (LINNE)

Class : Gastropoda CUVIER
Order : Stylomathopora A.SCHMIDT
Family : Helicidae RAFINESQUE
Genus : Helix LINNE
Species : Helix pomatia LINNE

PALEOECOLOGY

The following species have been recovered among the clayey content of Layer 3 of the upper cave, Özdogan and Koyunlu (1): Pelecypods Mytilus galloprovinicialis LAMARCK, Cerastoderma edule (LINNE), Ostrea edulis (LINNE); bryozoans Schizoporella linearis (HASSAL), Cryptosula pallasiana (MOLL), Electra crustulenta (PALLAS) (mosty on Ostrea shells); and a land gastropod Helix pomatia LINNE. These shells bear no sign fossilization and 90% of them belong to Mytilus galloprovincialis LAMARCK.

With the exception of Helix pomatia LINNE, all of these species are of coastal marine types indicating a habitat of small bays with some freshwater input or open lagoonal types. They from benthic communities in sandy or in partially rock sections of such environments.

In these environments the energy of tidal waves in high. They also experience high seasonal salinity variability due to the mixing of sea water with fresh waters from creeks. As a result forms like Mytilus galloprovincialis LAMARCK and Ostrea edulis (LINNE) develop in sections of lagoons and bays with marine influence. On the other hand, Cerastoderma edule (LINNE) prefers mouths of rivers or creeks, i.e. environments with diminished marine influence.

Based on these ecological data, one may conclude that the Kücükçekmece Lagoon was, at the Chalcolithic times, a lagoonal bay experiencing tidal activity and fed by streams running north to south.

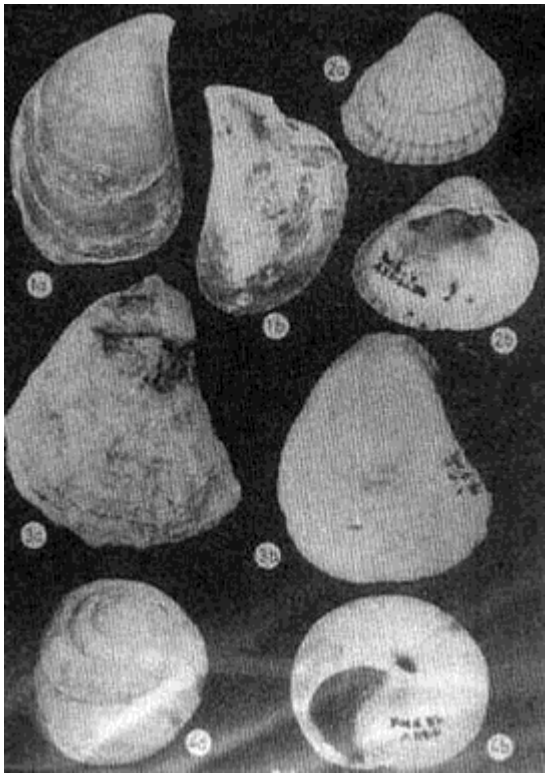
The lagoon's northern border was further north than of today and in due time the material depositat by the rivers has filled the northern coast, and the areas of the lake was reduced. It is possible that by 7000 BP, the lagoon was still extending up to the cave. Due to southerly wave activity, a barrier accumulated, isolating the lagoon from the open sea; and therefore forming the present day Küçükçekmece Lagoon.

NUTRITIONAL VALUES OF THE MOLLUSCS

High molluscs shell content of the layer 3 can be interpreted as a strong evidence for the consumption of molluscs by the cave's inhabitants. Molluscs like Ostrea edulis (LINNE) (Plate 1, Figure 3), Cerastoderma edule (LINNE) (Plate 1, Figure 2), Helix pomatia LINNE (Plate 1, Figure 4) and especially Mytilus galloprovencialis LAMARCK (Plate 1, Figure 1) must have constituted an important part of their diet.

Furthermore, the relative scarcity of Helix pomatia LINNE shells among those recovered during the excavations, indicates a lack of culinary interest for land gastropods.

Plate 1: 1. Mytilus galloprovincialis LAMARCK. 1a, external view, x 1.5; 1b, internal view, x 1.5, Yarimburgaz Cave; 2. Cerastoderma edule LINNE. 2a, external view, x 1.5; 2b internal view, x 1.5, Yarimburgaz Cave; 3. Ostrea edulis LINNE. 3a, external view, x 1.5; 3b, internal view, x 1.5, Yarimburgaz Cave; 4. Helix pomatia LINNE. 4a, spiral side, x 1.5; 4b, ombili cal side, x 1.5, Yarimburgaz Cave.



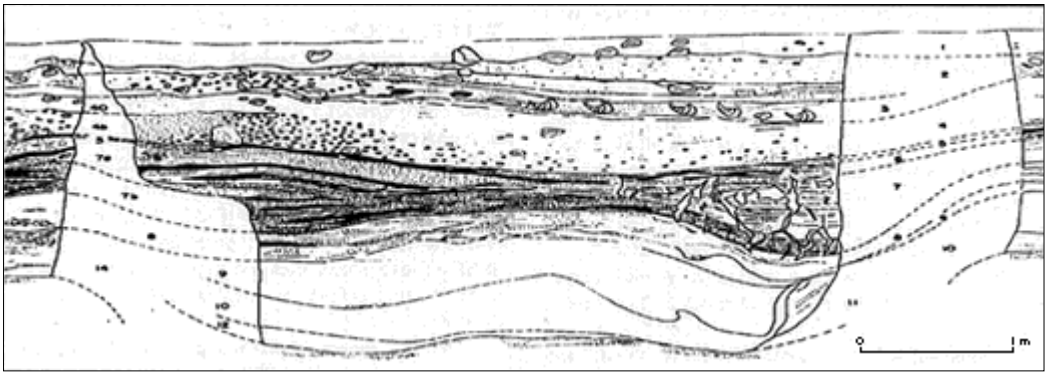


Figure 2: Archaeological section of the northern sector of the Yarimburgaz Cave (after Özdogan and Koyunlu, 1986).

Mussels which is widely consumed in Turkiye as well as all over the world, feed on microorganisms (diatoms, algae etc.) in suspension in sea water (3). Depending on the particular species, muscles are consumed cooked or raw, and with their high content in proteins and minerals, have a nutritional value per hundred grams (4, 6). The content in nutritional elements of mussels (6-8) are listed below:

Water (%) 78-83	Sodium (mg) 289-296
Energy (Kcal) 70-95	Magnesium (mg) 36
Protein (g) 9.8-14.4	Chlorine (mg) 463
Fats (g) 1.3-2.2	Iodine (mg) 0.13
Carbohydrates (mg) 3-3-3-9	Selenium (mg) 0.39
Ash 1.4-1.7	Vitamin A (mg) 0.054
Calcium (mg) 27-88	Vitamin E (mg) 0.74
Iron (mg) 3.4-5.1	Vitamin B1 (mg) 0.16
Phosphorus (mg) 236-246	Vitamin B2 (mg) (0.21)
Potassium 277-315	Niacin (mg) 1.6

Studies have been indicating that molluscs constitute an important protein source (9) and in that respect they can be used to alleviate protein deficiency problems in developing countries (10). Furthermore, it has been reported that high quality proteins from mussels have a high essential amino acid indice and a biological value (higher than beef) and that these nutritional values increase after cooking. It has been demonstrated that when cooked in water or fried, the nutritional value of mussels (which is rich in fundamental amino acids like lysine, methionine, cysteine, threonine, tyrosine, tryptophan and arginine) increases (11). Even though at present, mussels can be contaminated with heavy metals (mercury, cadmium, lead etc.), no marine pollution, therefore no such problem existed at 7000 BP. Of course, there has been always the danger of poising due to toxin producing micro algae that mussels might have fed on but the fact this mossucs is found in large quantities, indicates by 7000 BP people exploited this food resource voluminously.

In general, one can observe that inhabitants of this region preferred mostly mussels together with various other kinds of molluscs as food and this probably helped them for a balanced diet.

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