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Original Contribution

MOLLUSCS (*Mollusca*: *Gastropoda*, *Bivalvia*) FROM THE AZMASHKA MOUND, UPPER TRAKIA PLAIN, SOUTH BULGARIA

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ABSTRACT

A total of 73 mollusc shells from the Azmashka Mound, from the Neolithic and Eneolithic ages were studied. Two gastropod species: *Helix figulina* (50 specimens), *Helix lucorum* (escargot) (1 specimen) and two bivalve (*Bivalvia*) species (one freshwater and one marine) – *Unio pictorum* (painter's mussel) (21 specimens) and *Cerastoderma glaucum* (lagoon cockle) (1 specimen) have been investigated. The gastropods found in the Azmashka Mound were probably not used as food source by the population. The relatively high share of naturally occurring *Helix figulina* shells indicated the presence of open fields with ***drought*** tolerant herbs and shrubs. The species *Helix lucorum* was represented by only one specimen that probably represented a worked up shell of unknown purpose, possibly a jewel. The freshwater species, *Unio pictorum*, was the commonest, and it was probably used as a foodstuff but also as a tool. The lines of effacing on the lower valve border clearly indicated that shells were moved transversely to their lengths, suggesting their use for mechanical abrasion of certain surfaces. The shell of the marine lagoon cockle *Cerastoderma glaucum* was used as a jewel, as evidenced by the opening in its upper part consequently to effacing.

Key Words: Azmashka, mollusk, neolith, eneolith

INTRODUCTION

Molluscs (*Mollusca*: *Gastropoda* et *Bivalvia*) are a good and frequently used indicator in the reconstruction of former environmental conditions in archaeology (1, 2) Many species are tied to specific habitats and their existence is closely related to humidity and vegetation type (for terrestrial species), the water basin type (for freshwater species) and the salinity (marine species). Possessing a hard mineralised exoskeleton, they provide an abundant material for archaeological investigations. Many big mollusc species were used in the past (and at present as well) for food or as tools or decorations, while others have resided in ancient settlements and their neighbourhood (1, 3-6).

The Azmashka Mound was studied during salvaging archaeological excavations in 1960-1963. The area was meant to be cleared for the construction of a nitrous fertilizer factory, 5 km east of Stara Zagora. The prehistoric settlement appeared on a 8-decare peninsula amongst the Azmak swamp. Its height was 7.5 m and its total area – 6 decares. The thickness of the cultural layers was 7,5 m with 3 m from the Neolith and 4.5 m from the Halcolith ages, with a 0.4 m hiatus between them. More than 11 000 ceramic findings (7) and animal bones (8) have been discovered. Tools made of bones were also described (9). Among excavation material from the Neolith and Eneolith age, a number of mollusc shells – gastropods (*Gastropoda*) and bivalves (*Bivalvia*) were present. These specimens are the subject of the present study aiming to determine their taxonomy and thus, to throw light on the environment of the prehistoric settlement (local fauna) and the presumable contacts of the population with more remote areas (non local fauna).

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MATERIAL AND METHODS

In this study, mollusc shells collected in the course of archaeological excavations in the period 1962-1963, were investigated. The material was stored in the Regional Historical Museum – Stara Zagora.

A total of 73 shell specimens from gastropods and bivalves were studied. The species were identified mainly according to methods of determination of form and size by Damyanov & Liharev (1975) and Gloer & Meier-Brook (2003), as well as using a comparative collection of mollusc shells. The measurement and more detailed investigations of shell surfaces were done by means of binocular lenses and calipre gauge.

RESULTS AND DISCUSSION

Helix figulina (Rossmässler 1839)

Material:

Neolithic age – 32 shells, Eneolithic age – 18 shells.

Age of individuals

Neolithic age – 3 juvenes, 3 subadultus/adultus, 26 adultus, Eneolithic age – 7 juvenes, 4 subadultus/adultus, 7 adultus.

Ecological features

A xerophilic species, inhabiting open field with herbaceous vegetation with single bushes or woody species. As the species is never encountered in forest, shadow or humid habitats, in this case it indicates the presence of open areas with drought tolerant herbaceous and woody vegetation.

Morphological description, size and discussion

The commonest pattern of fragmentation in the shells of this species is the break up of the external shell edge (28 specimens from the Neolith and 9 specimens from the Eneolith) (Figure 1). Occasional perforations with a sharp, irregular margin, various shape and number (most frequently 1) on the last and the next to the last coils (24 specimens from the Neolith and 4 from the Eneolith). Shells did not bear traces from any mechanical or thermal treatment, although this relatively small snail species is consumed nowadays (Sladun settlement, Sakar Mountain), so it could be presumed that people having inhabited this prehistoric settlement have consumed it as well. The fragmentation of shells is very similar to the natural fragmentation of contemporary shells found on the hills in the Sredna Gora Mountain or other íhabitats of the species. A small number of shells from adult individuals are completely preserved (4 from the Neolith; 2 from the Eneolith). The dimensions of these specimens (Òable 1) do not show any deviations from contemporary measurements as reported by (10).

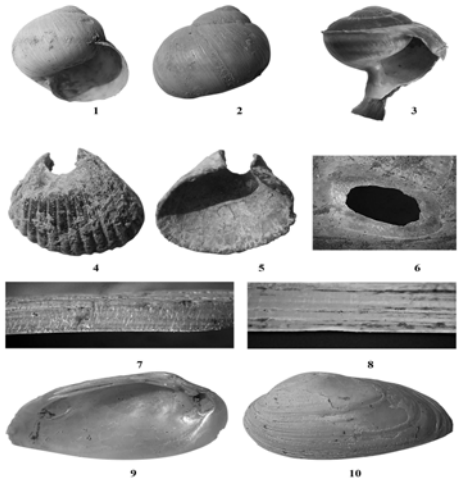

Figure 1: Molluscs from the Azmashka Mound, Neolith: 1,2 – *Helix figulina*, 3 – *Helix lucorum*, 4, 5 – *Cerastoderma glaucum*, 6 – opening in the shell of *Unio pictorum* by means of abrasion, 7 – lower border of a shell from the same species, effaced and blunted by repeated use, 8 – for comparison, a natural harp edge of a contemporary specimen is shown; 9, 10 – *U. pictorum* with strongly worn out lower valve edge, especially in the posterior part. Photographs courtesy by D. Georgiev, S. Stoycheva

The species belonging to the *Helix* genus spend the non-active winter period, burying themselves at a depth of about 50-60 cm, and some of them perish during the adverse season. Thus, a penetration of specimens from upper culture layers could be assumed. Due to the depth of the culture layer as outlined by (7), the presence of *H. figulina* of specific ages and the type pf shell fragmentation, we consider that this species was certainly

prevalent in the settlement and in the surrounding areas, and after the death if mollusks, they shells were naturally included in the respective culture layer. By now, the species is widely prevalent in the Stara Zagora region. The available shells did not bear signs of thermal processing (charring or peeling of the horny layer). Despite that, (12) reported a species of a similar size – *Helix vulgaris*, that was consumed by people of the late Paleolithic and the early Mesolithic age in settlements on the Black Sea coast of Ukraine. (5) reported about specimens of the *Helix* genus, probably collected as food from people or having inhabited the region of Eneolithic dwellings in Romania and Moldova. These specimens were few and the author calculated that to maintain a family, about 50 big snails from the *Helix* genus are necessary for one meal only. (13) reported about consumption of the species *Helix salomonica* in Neolithic settlements from south Iraq. Some other gastropod species of a size similar to that of *H. figulina* and consumed by people from the Mesolithic age in the Hungarian steppe are published by (14): the land snail *Cepaea vindobonensis* and the freshwater species *Viviparus acerosus* and *V. contectus*. Taking into consideration these facts, we assume that there is a possibility *H. figulina* to be used for consumption from the population of the Azmashka Mound as well.

Table 1. Dimensions of completely preserved *Helix figulina* shells from the Neolith and Eneolith found in the Azmashka Mound

№	Age	Height	Width
1	Neolithic	28.0	25.3
2	Neolithic	29.6	27.0
3	Neolithic	28.7	26.2
4	Neolithic	29.8	26.7
5	Eneolithic	26.5	25.2
6	Eneolithic	27.2	25.1
Mean		28.3	25.9
SD		1.3	0.8
Var		1.7	0.7

Helix lucorum (Linnaeus 1758)

Ìaterial

Eneolith – 1 shell.

Age of individual

Subadultus/adultus.

Ecological features

Mesophilic, drought-resistant species. It is more humidophilic than *Helix figulina*, encountered mainly in high grass fields near to river habitats, various anthropogenic habitats and open dry areas.

Morphological description, size and discussion

Highly fragmented shell with only the first 3.5 coils and a part of the columela preserved. The pigmentation of the shell is perfectly preserved, with a shining horny layer. The fragmentation could be due to natural reasons, but more likely, it resulted from a purposeful handling by men, i.e. for decoration purpose (Figure 1). The height was 27.9 mm, and the width 24.0 mm. Due to the widespread consumption of this species at present, and probably in prehistoric times, this single finding among the studied material showed that the species was rare or was not encountered in the region of the prehistoric settlement. Possible reasons for this could be the excessive use of the species for food, the worsening of habitat's conditions from the anthropogenization of the region. If the studied shell has been used for decoration, it could originate from more distant locations. By now, the species is widely prevalent in the Stara Zagora region.

***Unio pictorum* (Linnaeus, 1758)**

Ìàterial

Neolithic age – 19 shells (6 right and 13 left valves), Eneolithic age– 2 left valves.

Age of individuals

Neolithic age – 16 adultus, 2 subadultus, 1 juvenes, Eneolithic age – 2 adultus.

Ecological features

A rheophilic species, inhabiting sand-bed or sand-slimy bed medium-sized and big rivers.

Morphological description, size and discussion

All shells from the Neolithic age had signs of abrasion, result of their utilization by men. The shells were moved transversely to their lengths, suggesting their use for abrasion of certain surfaces (Figure 1). Fifteen valves were fragmented and one of them had an opening, with clear evidence of purposeful puncturing by abrasion – an opening 8.7 mm long and 5.5 mm high. A *Unio pictorum* specimen similar to ours with the valve opening, was reported by (15) in the Sadievo Halcolithic Mound – a completely preserved

specimen, with horizontal round opening in its upper part, without traces of any treatment, 4.5 cm long, 2.5 cm wide, 0.5 mm opening. It should be noted that the posterior, sharper edge of valves was always the fragmented one (two valves had also broken anterior edges) and this, the damage could be attributed to the utilization of shells as tools. The same pattern of abrasion and fragmentation was observed for both specimens from the Eneolithic age. Although fragmented, shells were obviously smaller than contemporary ones, and the four preserved valves had a average height of 26.1 mm and length of 51.7 mm (Òable 2). The horny layer of shells was lacking (unlike layers of *H. figulina* specimens), that could be due to a thermal processing (boiling) or abrasion from utilization. It is likely that studied specimens have been first used for food, and then – as a tool. Multiple archeological investigations have outlined freshwater clams as an alternative source of food during the Neolithic and Eneolithic ages (*U. pictorum*, *U. timidus*, *U. crassus* in Europe and *U. tigridis* in Asia) (3, 6, 13, 14). Some authors reported the use of shells in pottery making. Freshwater *Unio* bivalves have been used for food and their shells – for tools, in Eneolithic settlements in Romania and Moldova (Cucuteni culture) as reported by (5). In Bulgaria, (16) found out traces of clay and water-soluble dye on 50 out of 206 shells in the Neolithic Mound. Similar traces were not seen in the specimens studied by us.

Table 2. Dimensions of non fragmented and slightly worn out shells from *Unio pictorum* found in the Azmashka Mound

№	Age	Valve	Height	Width
1	Neolithic	right	27.0	54.2
2	Neolithic	right	27.4	57.4
3	Neolithic	left	24.5	45.8
4	Neolithic	left	25.6	49.3
Mean			26.1	51.7
SD			1.3	5.1
Var			1.8	26.4

***Cerastoderma glaucum* (Poiret 1789)**

Ìàterial

Neolithic age – 1 shell.

Age of individual

Adultus.

Ecological features

The species is encountered in saltwater habitats – oceans, seas, salt lakes and lagoons.

Morphological description, size and discussion

The shell showed signs from processing by people, with mechanical abrasion of the upper back part, probably with the intention of making an opening for hanging the valve (Figure 1). There was also an opening in the same upper part, that was broken. The specimen had a grey-violet colour, height 31.8 mm, and length 33.1 mm. This specimen originated probably from the Aegean Sea or the Black Sea, where it is encountered now. The relatively thick shell wall shows that it originated from a more salty water basin, probably from the Aegean Sea. A similar relocation of mollusk shells from this area is frequently encountered during excavations of prehistoric settlements in south Bulgaria, for instance, the snail *Truncullariopsis trunculus* from the late Neolithic waste in the Kapitan Dimitrievo Mound (Peshtera region) (17) and the multiple ornaments made of *Spondylus* clam shells in many regions in the country (15, 17-20). During the Neolithic and Eneolithic ages, Mediterranean mollusk and other animal species have been transported by men far to the north, as found out in Romanian province Dobrudzha (21). In the Neolithic Dwellings Exposition of the Regional Historical Museum in Stara Zagora (20) there is an amulet from the Azmashka Mound made of mollusk shell, not specific fro the Black Sea and probably coming from the Aegean Sea. Similar movements of the population are logical with regard to using rivers from the Maritsa catchments' area as more convenient means of relocation and the relatively close proximity to the Aegean Sea. (22) reported migrations of the population of the Thrace from the upstream to the lower stream of Maritsa. On the basis of available literature sources it could be concluded that bivalves of *Cerastoderma* (*Cardium = syn.*) genus were preferred for making ornamentations after *Spondylus* bivalves from prehistoric men. Data about the occurrence of *Cerastoderma* in various Neolithic or Halcolithic mounds in Bulgaria are reported by (15, 16, 20). Multiple mollusks species, including *Cerastoderma glaucucm,* have been found out during excavations of settlements from the Eneolithic age in Cyprus by (23). In Turkey (Izmir region) (24) reported the use of this species for making medallions.

CONCLUSION

The gastropods found out in the Azmashka Mound were not used as a food source from

settlement's population, or at least, not frequently. The relatively high share of naturally occurring *Helix figulina* shells indicated the presence of open fields with *drought* tolerant herbs and shrubs. This landscape was probably local and was proper only for the peninsula of the settlement and its neighbourhood, as the village was surrounded by the Azmak swamp. The species *Helix lucorum* was represented by only one specimen, that probably represented a worked up shell of unknown purpose, possibly used for decoration. As this snail species is more humidophilic than H. figulina and the fact that is was rarely encountered in this location confirmed the presence of open dry fields.

Bivalves are represented by two species. The freshwater clam *Unio pictorum*, was the commonest, and it was probably used as a foodstuff but also as a tool. The lines of effacing on the lower valve border clearly indicated that shells were moved transversely to their lengths, suggesting their use for mechanical abrasion of certain surfaces. A single specimen of the marine lagoon cockle *Cerastoderma glaucum* was found out, and its shell was used as a jewel, as evidenced by the opening in its upper part consequently to effacing. In general we established a reduction in the number of bivalves in the Eneolithic culture layer compared to the Neolithic layer, probably due to the less frequent use of clam shells as tools.

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