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Editorial

With this issue, the AMG Newsletter approaches global coverage with contributions from both eastern and western hemispheres. Kat Szabó's research brief about her work on early worked shell in Southeast Asia opens new perspectives in archaeomalacology, particularly with regard to methodological and taphonomic issues. Hopefully, this will encourage others to describe their own fields of research in this and other parts of the world, leading to some mutually beneficial exchanges. I look forward to hearing from you!

Henk Mienis is a regular contributor to this newsletter and in this issue he and Burçin Gümüş discuss the occurrence of *Papillifera bidens* in North Africa, where it is believed to have been introduced in antiquity. Henk also describes the presence of another Italian clausiliid in the Roman amphitheatre at Nîmes, France, and provides us with some archaeomalacological data from prehistoric sites in Israel. This issue concludes with abstracts and reviews, and the first announcement of the archaeomalacology session to be held at the next ICAZ conference in Paris in August 2010.

Please send all items (articles, news, reviews, anything archaeomalacological) for the next newsletter to me at the above email address by mid-December 2009. Thanks are due, as always, to Kat Szabó of the ICAZ Archaeomalacology Working Group and to Aydın Örstan for posting this newsletter on their respective websites at <http://triton.anu.edu.au/> and <http://home.earthlink.net/~aydinslibrary/AMGnews.htm>, and to all this issue's contributors.
(JRS)

RESEARCH BRIEF

Early worked shell in Southeast Asia: 'eoliths' and a systematic agenda

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"As I see it, the situation repeats the ancient history of the Homo diluvii testis controversy. As in those days, when no one would get down to bed-rock & study anatomy, so now no one will ascertain the true facts of the dynamical geology of flaking. The explanation of this anomalous situation in science is not far to seek. The study of the dynamical geology of flaking is, in itself, purely geological & mineralogical, whereas its practical import - its theoretical application - is as exclusively archaeological. Thus the vital problem (the reliable recognition of the human industry) upon which the major conclusions of prehistory depend falls between two stools, & no one will touch it. The result of which is that prehistory is building a superstructure of castles-in-Spain before it has got in a scientific foundation to build upon." Warren (n.d.) in O'Connor (2003:258) on the 'eolith debate'.

Pleistocene Southeast Asia and Greater Australia* are not renowned for the complex stone tool technologies witnessed in association with either *Homo erectus* or early modern *Homo sapiens*. Indeed, the apparent simplicity and unchanging nature of regional lithic technologies has prompted hypotheses proposing the dominance of non-lithic raw materials; particularly

bamboo (e.g. Pope, 1989; Mellars, 2006). Regional ethnographic analogy would indeed suggest the centrality of plant materials such as bamboo and rattan in tool production, but accessing such technologies archaeologically presents clear difficulties. This is the backdrop against which the identification of a range of shell artefacts from 32,000 to 28,000 bp deposits at Golo Cave in the northern Moluccas, eastern Indonesia (see Szabó, Brumm and Bellwood, 2007), acquires considerable regional significance. For the first time, we had a clear view of the potential importance and complexity of non-lithic technologies relative to associated lithic technologies.

Whilst not wanting to either restate information from previously published papers (Szabó, Brumm and Bellwood, 2007; Szabó, 2008), or pre-empt results currently in press (Szabó, in press), the worked shell from the lowest cultural levels at Golo Cave is of four different types. These are circumferentially-knapped opercula of the large Green Snail (*Turbo marmoratus*), *Turbo marmoratus* shells with the aperture and apex reduced through fine chipping, cut fragments of the Chambered Nautilus (*Nautilus pompilius*) and small limpets (*Patella flexuosa*) with clear signs of edge-rounding around part of the margin. Collectively then, not only are diverse raw materials represented – each being sourced from a different habitat – but also diverse methods of reduction, including direct percussion, secondary percussion or pressure flaking, and cutting. In addition, some artefacts represent re-used midden refuse (*Patella flexuosa*), while some have no potential subsistence value at all (the pelagic *Nautilus pompilius* where only empty shells wash ashore). In short, at the time of the initial utilisation of Golo Cave shells were used as raw materials in diverse ways, employing a range of working techniques for which there is currently no local corollary in stone.

These findings, together with asserted *Homo erectus* shell tool use in western Indonesia (Choi and Driwantoro, 2007), are prompting us to rethink our analytical and interpretative presuppositions with regards to material culture in Island Southeast Asia. However, upon delving into the area of identifying and interpreting early shell-working, one quickly finds oneself teetering at the brink of a methodological chasm. ‘Shell’ is a complex and variable raw material; indeed, as a conceptual technological category it has very little utility. Different taxa lay down calcium carbonate in a variety of different microstructural types and combinations which respond in dissimilar ways to force and taphonomic processes. This variability is compounded by different solutions to the demands of life on the mollusc, such as withstanding the attacks of predators, which are often solved at the macrostructural level through sculpture, thickness, particular modes of fracture under pressure and shell/valve inflation.

At present, it is very difficult to make an effective argument for ancient shell-working given the absence of appropriate general criteria and a fundamental lack of understanding about the nature of shell (or indeed shells) as a raw material. How do we convincingly distinguish between a shell that was dropped or stood on versus one that was deliberately modified through human action? When is it appropriate (if at all) to transfer experimental work with one species to interpretation of another (e.g. Choi and Driwantoro, 2007)? How far are ‘common-sense interpretations’ sensical?

These questions are reminiscent of those that underpinned the ‘eolith’ debate of the late 19th and early 20th centuries. How does one firmly distinguish between natural and cultural modifications? As alluded to in the quote [written c.1905] from the geologist Samuel Hazzledine Warren prefacing this commentary, the answers cannot be found in any one scientific discipline, but rather in the spaces between many. With regards to molluscan shell, such disciplines include evolutionary and functional biology, crystallography and biomineralisation studies, biogeochemistry and palaeontology. The various manifestations of natural and cultural processes must be understood on their own terms in order for us to effectively distinguish between them and generate a narrative about the human past.

Going back to basics on the identification and interpretation of shell-working is of particular importance to the ‘eastern hemisphere’, where the nature of the stone tool record

and invisibility of the organic tool record have largely seen it at the periphery of evolutionary discussions. Over the course of the next five years, I will be investigating twelve tropical Indo-Pacific species which we either know or suspect were key raw materials. These include *Trochus niloticus*, *Turbo marmoratus*, *Patella flexuosa*, *Conus litteratus* and/or *Conus leopardus*, *Melo broderipii*, *Nassarius pullus* and/or *Nassarius globosus*, *Batissa violacea*, *Polymesoda erosa*, *Pinctada maxima* and/or *Pinctada margaritifera* and *Tridacna* spp. Fracture mechanics and responses to various types of forces, the nature of structural decay over time, responses to burning, and taphonomic patterns related to natural habitats (such as littoral environments) will all be investigated, along with experimental working based on ethnographic and archaeological information.

The shell evidence from Golo Cave already hints at diversity with regards to raw material choice, working techniques, and tool function. It is hoped that this research will start to map this diversity and provide a base-line for interpreting worked and putatively-worked shell from tropical Indo-Pacific sites. If there are others out there from various corners of the world looking at similar issues, I'd be really interested in hearing more about your research.

*Greater Australia, or Sahul, is the combined landmasses of the Australian continent and island of New Guinea which were joined by a landbridge in times of lower sea levels.

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Records of the *Papillifera bidens*-complex from ancient sites in North Africa (Mollusca, Gastropoda, Clausiliidae)

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During the past five years considerable attention has been given to the presence of *Papillifera bidens* (Linnaeus, 1758) outside the natural distribution range of this terrestrial snail in Italy, including its offshore islands and Malta (Ridout-Sharpe, 2005, 2007 and 2008; Örstan, 2006; Gümüş, 2006; Menez, 2007; Mienis and Gümüş, 2007; Dance, 2008). Most of these extra-territorial records were from either archaeological sites or historic buildings.

In addition, the International Commission for Zoological Nomenclature has finally made an end to the ongoing discussion as to whether the correct name for this species should be *Papillifera bidens* (Linnaeus, 1758) or *P. papillaris* (Müller, 1774) by rejecting the application for a conserved status of the latter name (Anonymous, 2007).

Although Giusti (1973) and Giusti *et al.* (1995) have pointed out that it is almost impossible to differentiate between the more-or-less smooth shells of *P. bidens bidens* and the ribbed shells of *P. bidens affinis* (Philippi, 1836) [= *virgata* (Rossmässler, 1836)] because of the presence of numerous intermediate forms, we follow Falkner *et al.* (2002) and recognise within the *bidens*-complex two subspecies which seem to have a different anthropogenic distribution with populations of the nominal subspecies mainly in the Eastern part of the Mediterranean (Croatia, Albania, Greece and Turkey) and populations of *P. bidens affinis* in the Western Mediterranean (France and Spain).

This globetrotting clausiliid species has also been recorded from several North African localities. In this study we have reviewed the literature and some samples of specimens in the National Mollusc Collection of the Hebrew University (HUI) in order to re-evaluate the presence of the *P. bidens* complex in North Africa.

Morocco

Hidalgo (1909: 212) recorded an unnamed variety of *Clausilia bidens* from Zeluán and Moulouya; the first locality (as Zélouan) has also been mentioned by Pallary (1923: 277). Both records were repeated by Llabador (1952: 126) without the addition of any further information. Since we have not seen specimens from these coastal localities, we have no idea to which subspecies they belong.

Algeria

Bourguignat (1864: 73-74, pl. 5, figs. 7-10) mentioned *Clausilia bidens* var. *virgata* from the small canyon of Chabet-Beinan, near Cape Cazine, about 14 km from Algiers. The text and the figures show that it belongs to *Papillifera bidens affinis*.

Studied material:

Papillifera bidens affinis: Annaba, Chetaibi on Cap Takouch (HUI 52279/2 ex. Coen).

Tunisia

Bourguignat (1868: 29) published the first Tunisian records of finds of shells belonging to the *P. bidens*-complex. He mentioned *Clausilia bidens* as occurring among the ruins of Carthage, where it seemed to be a rare species, and the variety *virgata* from among the ruins of the Roman baths near the thermal springs of Utique (Utica).

Letourneux and Bourguignat (1887: 114) raised the variety *virgata* to full species and recorded it again from the same ancient site of Utica, but mentioned it also from rocks near Porto Farina (=the ancient port of Utica), and the hills near Carthage and El-Aouina (just west of Carthage). *Clausilia bidens* was recorded by them only from among rocks near Carthage while referring to Bourguignat, 1867 (which should be 1868).

Pallary (1927: 246, pl. 4, fig. 11) described *Clausilia virgata* var. *tabarkana* from the 'Ile de Tabarka', where this taxon had been collected by Blanc. A study of paratypes present in the HUI collection showed that it is identical with *Papillifera bidens affinis*.

All the Tunisian finds and those elsewhere in North Africa were mapped by Sacchi (1955: 70, fig. 5). All these records should be considered of historic, more particularly of Phoenician, Roman or Arab, origin (Sacchi, 1955: 69).

Recently Ridout-Sharpe (2008: 7) confirmed the presence of *Papillifera bidens* at Carthage.

Studied material:

Papillifera bidens bidens: Carthage, 1911, (HUI 50991/1 ex. Monterosato, Tomlin, Coen);

Papillifera bidens affinis: Ile de Tabarka, leg. Blanc (HUI 52278/2 = paratypes of *Clausilia virgata* var. *tabarkana* Pallary, 1927 ex. Coll. Pallary, Peile & Blok); Bizerta, leg. P. Pallary (HUI 52280/2 ex. Peile & Blok).

Libya

Von Martens (1885: 188) reported that G. Ruhmer collected *Clausilia papillaris* near Bengasi in 1883. This record has been repeated by Gambetta (1925: 3 and map) without adding any further information. Most probably Zavattari (1934) and Sacchi (1955: 70) are referring to the same original record while including it among the terrestrial snails found in Bengasi. Since we were unable to see any actual specimen from that locality, it remains uncertain whether the material collected by Ruhmer belonged to *P. bidens bidens* or *P. bidens affinis*.

Conclusion

Literature records and material in the National Mollusc Collection of the Hebrew University of Jerusalem present strong indications that the *Papillifera bidens*-complex is represented in North Africa by both subspecies: *P. bidens bidens* and *P. bidens affinis*.

We agree with Sacchi (1955) that it has to be considered an introduced species in North Africa.

The nominate subspecies *P. bidens bidens* appears to be restricted to the Roman ruins in Carthage, Tunisia, while *P. bidens affinis* is more commonly encountered among coastal Phoenician, Roman and ancient Arab ruins in Algeria, Tunisia and Libya. The subspecific identity of the records of *Papillifera* from Morocco remain unknown.

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***Leucostigma candidescens* in the Roman amphitheatre of Nîmes, France (Gastropoda, Clausiliidae)**

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The terrestrial clausiliid snail *Leucostigma candidescens* (Rossmässler, 1835) [syn. *L. leucostigma* (Rossmässler, 1836)] is restricted in its distribution to several regions in Central Italy: Le Marche, Umbria, Lazio, Abruzzo and Campania, including two offshore islands: Capri and Li Galli (Alzona, 1971).

This species is represented in the National Mollusc Collection of The Hebrew University of Jerusalem (HUJ) by 36 samples from its natural range in Italy:

Le Marche: Ascoli Piceno (HUJ 52294/5 and 52307/5).

Umbria: Marmore near Terni (HUJ 6282/7); Perugia (HUJ 52303/4); Spoleto (HUJ 52293/5 and 52299/1); Terni (HUJ 52292/3 and 52296/2).

Lazio: Comunacque (HUJ 52304/4); Monte Cassino (HUJ 52287/3 and 52311/5); Morolo (HUJ 52313/1); Rome (HUJ 52291/4); Rome, Colosseum (HUJ 52290/2); Rome, gorge of San Cosimato (HUJ 52310/2); Terracina (HUJ 52297/2 and 52306/3); Tivoli (HUJ 52300/11); Velletri (HUJ 52302/1).

Abruzzo: Abruzzo (HUJ 52301/3); Caramanica (HUJ 52314/1); Isola del Gran Sasso (HUJ 52308/1); Monte Greco (HUJ 52295/4); Pescasseroli (HUJ 50831/65); Tagliacozzo (HUJ 52298/2).

Campania: Amalfi (HUJ 52282/3); Avella (HUJ 52285/3); Capri (HUJ 52305/3); Capua (HUJ 52281/3); Caiazzo (HUJ 52283/4); Caserta (HUJ 52284/1, 52286/3 and 52288/1); Napoli (HUJ 52315/7); Sorrento (HUJ 52309/4); Vico Equense (HUJ 52312/2).

In addition, the collection includes two samples of *L. candidescens* from outside its natural distribution area. One is also from Italy: **Puglia** (=Apulia): Gargano (HUJ 52316/14). This sample was identified originally as *Clausilia allyphanta* Monterosato and later on as *Clausilia inopinata* Monterosato and was registered in Coen's collection as *Papillifera inopinata* Monterosato types. Under that name it was also listed in his printed catalogue (Coen, 1945: 41). However, these names were never validly described by Monterosato. Unfortunately any additional information concerning a more exact locality is missing. However, I do not rule out the possibility that this species is indeed living somewhere among the numerous ancient buildings in the area of Gargano.

The most interesting sample comes, however, from France, from the Roman amphitheatre at Nîmes, (HUJ 52289/3, ex-coll. Peile/Blok). This amphitheatre, usually called the Arena (les Arènes), was built during the mid 1st-century AD. At some time the arena was filled with medieval housing, while the walls served as ramparts. In the time of Napoleon the original form of the amphitheatre was restored, but in 1863 it was remodelled into a bullring. It is considered the best preserved Roman arena in France and it is still regularly used for concerts and bullfights.

The first record of *L. candidescens* from the amphitheatre dates back to Coutagne (1908), who collected this species in the arena in large numbers on 3 November 1903. Additional

information was provided by Margier (1910a, 1910b). Interestingly this species was not mentioned by Germain (1930) in his monograph of the land- and freshwater molluscs of France.

This introduction, most likely dating back to the time when the amphitheatre was built with stones quarried in the Central Apennines, was again mentioned in a footnote by Sacchi (1955). Falkner *et al.* (2002) provided some information concerning recent observations. They also mentioned that, according to Hartmut Nordsieck (pers. com.), *Clausilia mongermonti* Bourguignat, 1877 described from St. Jean de Maurienne in Savoie, France (Bourguignat, 1876-1877), has to be considered a junior synonym of *L. candidescens*. It has, however, not been reported again from that locality.

Bertrand (2004) listed it among the introduced molluscs recorded for the malacofauna of Languedoc-Roussillon. Finally, Prié and Gargominy (2009) have provided some up-to-date information concerning the presence of this clausiliid species in Nîmes. From their excellent colour photographs and likewise the material in the HUI collection, it is clear that the specimens living in the Roman amphitheatre belong to the dark-brown colour form with clear white spots below the suture which has been described as *C. leucostigma* Rossmässler, 1836.

Prié and Gargominy (2009) have recommended reducing the use of herbicides for the control of plants growing in the cracks and fissures between the stones in the amphitheatre. In this way they hope to protect the presence of this ancient introduction, which has already survived for almost 2000 years at this site.

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A revised list of the shells from Ziqim, a Pottery Neolithic site in the southern coastal plain of Israel

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The results of the excavation of a Pottery Neolithic site near Ziqim, Israel, by the late Dr T. Noy, have been published in detail by Garfinkel *et al.* (2002) and include a report dealing with the 33 shells which were recovered during the excavation. After the so-called 'final

report' was published, another box with shells from Ziqim was found. This contained 30 specimens, which not only almost doubled the number of studied shells, but also added three species to the list of molluscs recovered.

A revised list of the archaeomalacological material is therefore given in this additional report.

Shells recovered during the excavation of the Pottery Neolithic site of Ziqim

New records are indicated with an asterisk (*).

Gastropoda

Family Strombidae

Conomurex fasciatus (von Born, 1778)

74/263 E2: one shell with a missing top and a man-made hole behind the lower part of the lip.

Family Cassidae

Phalium granulatum undulatum (Gmelin, 1791)

74/029 F1 surface: one small piece of the lower part of the labial lip;

74/149 I1: labial lip;

74/207 D1: one small fragment of the body- and penultimate whorl;

74/272 E2: one shell lacking the body whorl;

*74 or 76/without data: one fragment of the lip of the aperture.

Family Ranellidae

Charonia variegata (Lamarck, 1816)

74/137 L2 surface: small part of sutural rim.

Family Hygromiidae

Xeropicta vestalis joppensis (Schmidt, 1855)

74/295: one disintegrated shell;

74/296 D2: one shell.

Family Helicidae

Helix engaddensis Bourguignat, 1852

74/177 H2: one damaged shell;

*76/010 A2: tiny part of the body whorl;

*74 or 76/without data: five partly damaged shells.

**Theba pisana* (Müller, 1774)

*76/009 D3: large part of the body whorl.

Scaphopoda

Family Dentaliidae

Antalis inaequicostata (Dautzenberg, 1891)

74/164 N1: one shell.

Bivalvia

Family Glycymerididae

**Glycymeris bimaculata* (Poli, 1795)

*74/072 D1: one medium sized valve.

Glycymeris glycymeris pilosa (Linnaeus, 1758)

74/108 D1: one small complete valve.

Glycymeris insubrica (Brocchi, 1814)

74/035 I3: one valve with holed umbo;

*74/070 I2: one small fragment of the ventral margin;

*74/081 H1: one small fragment of the ventral margin;

74/115 E2: one valve, umbo holed;

74/160 M2: one valve;

*76/006 B2: two small fragments of the margin;

*76/009 D3: one complete valve;

*76/024: one slightly damaged, tiny valve with hole caused by predator near the umbo;

*76/C3: one large valve;

*74 or 76/without data: two valves of which one with a man-made hole in the umbo.

Family Ostreidae

Ostrea edulis Linnaeus, 1758

*74/077: one small part of the shell showing the adductor scar;

74/177 H2: one juvenile valve;

*76/024: one valve damaged ventrally and with a hole in the centre.

Family Cardiidae

**Acanthocardia tuberculata* (Linnaeus, 1758)

*74 or 76/without data: one complete valve.

Cerastoderma glaucum (Poiret, 1789)

74/001 D3 surface: one fragment of the ventral margin;

74/002 D3: one valve;

74/013 F2: one damaged valve;

74/025 D1 surface: one valve;

74/034 H3 surface: one valve and two fragments of the ventral margin;

74/038 surface: one fragment;

*74/067 D1: one slightly damaged valve;

*74/082 H2: one small valve;

74/115 E2: one fragment;

74/119 D2: one damaged valve with a man-made hole in the umbo;

74/141 D1: one large valve;

74/142 D2: one fragment;

74/164 N1: one umbonal fragment with man-made hole;

74/168 D1: one damaged valve, umbo holed;

74/193 E2: one fragment;

74/257 D2: one small fragment;

74/268 E2: one valve;

*76 C3: one valve, damaged ventrally;

*74 or 76/without data: one complete and two damaged valves, one fragment of the ventral margin and two umbonal fragment, of which one carried a man-made hole.

Family Donacidae

Donax trunculus (Linnaeus, 1758)

74/216 D2: one valve.

Remarks

The archaeomalacological material recovered at Ziqim consists of 63 shells belonging to 14 species, which originated from the following three zoogeographical areas:

- Local terrestrial snails (9): *Xeropicta vestalis joppensis* (1), *Helix engaddensis* (7) and *Theba pisana* (1);
- Mediterranean marine molluscs (53): *Phalium granulatum undulatum* (5), *Charonia variegata* (1), *Antalis inaequicostata* (1), *Glycymeris bimaculata* (1), *Glycymeris glycymeris pilosa* (1), *Glycymeris insubrica* (12), *Ostrea edulis* (3), *Acanthocardia tuberculata* (1), *Cerastoderma glaucum* (27) and *Donax trunculus* (1);
- Marine gastropod from the Red Sea (1): *Conomurex fasciatus* (1).

The three land snails are still living near the site today and might even be of recent origin.

According to their state of preservation, most of the Mediterranean species were probably collected on the beach as empty shells. However, the cockle *Cerastoderma glaucum* was most likely collected in the estuary of Nahal Shiqma. *Cerastoderma glaucum* is a brackish water species which is often encountered in large numbers in or near the mouth of rivers. All the cockles encountered at Ziqim give the impression that they were collected alive and were most probably exploited as food.

A small number of the Mediterranean species (*Antalis inaequicostata*, *Glycymeris insubrica* and *Cerastoderma glaucum*) and the single species from the Red Sea (*Conomurex fasciatus*) might have been used as shell beads or pendants.

Reference

Garfinkel, Y., Dag, D., Horwitz, L.K., Lernau, O. and Mienis, H.K., 2002. Ziqim, a Pottery Neolithic site in the southern coastal plain of Israel – a final report. *Mitekufat HaEven, Journal of the Israel Prehistoric Society*, 32: 73-145.

Shells from Khirbat el-'Asfura (B), an Early Chalcolithic (Wadi Rabah) site near Kibbutz Hafez Hayyim, Israel

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In August 2004 Dr Edwin van den Brink carried out an excavation at Khirbat el-'Asfura (B), a site near Kibbutz Hafez Hayyim, on behalf of the Israel Antiquities Authority (Permit No. A-4231) (van den Brink, 2006). The site turned out to date back to the Early Chalcolithic period (Wadi Rabah).

Among the archaeozoological items found during the excavation were a few remains of shells. This archaeomalacological material is dealt with in this report.

Material

The material consisted of only seven shells or fragments. These items were all greater than 1 cm in size and had been collected most probably by eye. The identification of the shells took place in the Mollusc Collection of the Tel Aviv University. Where necessary the archaeological material was compared with recent shells in the collection.

Results

The shells belonged to only two species of bivalves:

Family Glycymerididae

Glycymeris insubrica (Brocchi, 1814) – Violet Bittersweet

-Area B; square Axxx; locus 203; basket 2005: one small fragment;

- Area B; square A182; locus 212; basket 2038: one valve missing the ventral margin; there is a man-made hole in the umbo;
- Area B; square A182; locus 212; basket 2082: one valve with a man-made hole in the umbo;
- Area B; square A181; locus 212; basket 2098: one valve with a large man-made hole in the umbo.

Family Cardiidae

Acanthocardia tuberculata (Linnaeus, 1758) – Tuberculate Cockle

- Area A, square C2; locus 2; basket 1002: one small valve, which is heavily damaged near the ventral margin; it has a small man-made hole in the umbo;
- Area B; square A181; locus 212; basket 2083: one valve, which is slightly damaged near the ventral margin; it shows a small man-made hole in the umbo;
- Area B; square A182; locus 212, basket 2082: one fragment of the ventral margin.

Discussion and Conclusion

The archaeomalacological material recovered at the Early Chalcolithic (Wadi Rabah) site of Khirbat el-'Asfura (B) near Kibbutz Hafez Hayyim belonged to two marine bivalve species: *Glycymeris insubrica* (4 items) and *Acanthocardia tuberculata* (3 items).

Both are common species found throughout the Mediterranean Sea and all along the Levant coasts. The nearest place to find such shells today is situated only 14 km west of the site near Hafez Hayyim. According to the state of preservation of these shells, they were collected as empty shells on the beach.

All the shells which retained the umbonal part (3 *Glycymeris insubrica* and 2 *Acanthocardia tuberculata*) showed a man-made hole in the umbo. This can be interpreted as a sign that these valves had been used most probably as either a personal pendant or another form of ornamentation.

Acknowledgement

I would like to thank Dr Edwin C.M. van den Brink (Israel Antiquities Authority) for giving me the opportunity to look at the discussed material.

Reference

Brink, E.C.M. van den, 2006. Khirbat el-'Asfura (B). *Hadashot Arkheologiyot – Excavations and Surveys in Israel*, 118: 2 pp.

ABSTRACTS

Colonese, A.C. and Martini, F., 2007. Molluschi terrestri e disturbi antropici: evidenze epigravettiane a Grotta del Romito (Cosenza). [Terrestrial molluscs and anthropic disturbance: Epigravettian evidence at Grotta del Romito (Cosenza.) *Bullettino di Paleontologia Italiana (Roma)*, 96 (2005-2007): 1-15.

ABSTRACT: The study of the terrestrial molluscs from the Late Glacial deposit at the Grotta del Romito (Papasidero, Cosenza) has enabled the development of the vegetation cover in the vicinity of the cave to be described during the intense occupation of the final Epigravettian. At first the palaeoenvironment of the area surrounding the cave was represented by a sparse tree cover (D13-D), later subdivided into two phases, followed by a period of rapid expansion of woodland (C4-C). Rather than a climatic cause for subsequent changes in the plant cover being demonstrated by the malacofauna, the terrestrial molluscs instead indicated an intense anthropisation of the area adjacent to the cave during the formation of the palaeosurface of layer D, which presumably came about by deforestation. During the formation of layer C, the anthropic disturbance was reduced and allowed the gradual restoration of the plant cover.

Colonese, A.C., Troelstra, S., Ziveri, P., Martini, F., Lo Vetro, D. and Tommasini, S., in press. Mesolithic shellfish exploitation in SW Italy: seasonal evidence from oxygen isotopic composition of *Osilinus turbinatus* shells. *Journal of Archaeological Science*. ([doi:10.1016/j.jas.2009.04.021](https://doi.org/10.1016/j.jas.2009.04.021))

ABSTRACT: Oxygen isotope analyses were carried out on the topshell *Osilinus turbinatus* from archaeological sites with the aim to investigate the temporal exploitation patterns by Mesolithic groups inhabiting coastal caves in SW Italy. In order to assess the present day *O. turbinatus* intra-annual $\delta^{18}\text{O}$ variability, living specimens were collected monthly at Marina di Camerota (SW Italian peninsula). Their shell-edges were analysed and the seasonal results were compared with archaeozoological material. Our findings show that Mesolithic *O. turbinatus* exploitation was carried out almost exclusively during the colder and intermediary seasons (e.g. autumn, winter, spring), with very sporadic harvesting during the warmer seasons. Results suggest a possible seasonal exploitation pattern of *O. turbinatus* by Mesolithic groups inhabiting this region.

Colonese, A.C., Zanchetta, G., Fallick, A.E., Martini, F., Manganelli, G. and Lo Vetro, D., 2007. Stable isotope composition of Late Glacial land snail shells from Grotta del Romito (Southern Italy): palaeoclimatic implications. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 254 (3-4): 550-560. ([doi:10.1016/j.palaeo.2007.07.005](https://doi.org/10.1016/j.palaeo.2007.07.005))

ABSTRACT: The stable isotope composition of living and fossil land snail shells was determined at Grotta del Romito (Southern Italy) with the aim to reconstruct environmental and climatic variation in the area during the Late Upper Palaeolithic. The investigated succession comprised 15 different excavated layers spanning between c. 13,000 and 14,500 yr cal BP. The oxygen isotope composition of the snail shells indicated a marked decrease at layer D8, suggesting a climatic deterioration consistent with the GI 1d climatic event (Older Dryas). This climate deterioration may have been related to a substantial decrease of mean annual temperature with associated changes in the regional atmospheric circulation. However, the environmental conditions at the time of shell growth in the other intervals sampled suggested conditions comparable to the present day. The carbon isotope composition of fossil snail shells is in agreement with other records, which indicate a general increase of the $\delta^{13}\text{C}$ values of organic matter during the Pleniglacial to Late Glacial caused by substantially lower atmospheric CO_2 concentrations at that time.

Dupont, C. and Marchand, G., 2008. Coastal exploitation in the Mesolithic of western France: la Pointe Saint-Gildas (Préfaïlles). *Environmental Archaeology*, 13 (2): 143-152.

ABSTRACT: Shell deposits were previously discovered at two out of three Mesolithic sites on a headland separating the southern flank of the Loire estuary from Bourgneuf bay in north-western France. Subsequent investigation showed that one of the deposits had since eroded away but that of the central site was dominated by *Scrobicularia plana*, represented by more than 95% (MNI=208) of shells, followed by *Patella* sp. at more than 1% (4); other species included *Ostrea edulis* (1), *Mytilus edulis* (2), *Littorina littorea* (1), *Ruditapes decussatus* (1) and *Cerastoderma glaucum* (1). A statistical analysis of the size of the *S. plana* shells showed that larger individuals (average length 40 mm) had been selected as joined valves, probably as food. The predominance of this species indicated the exploitation of a muddy shore, whereas the sites now overlook a rocky one. A bathymetric analysis suggested that these shells were probably collected from the now submerged estuary of the present-day ria of Pornic, which was lost during the Holocene transgression. Dating of the shells yielded ages between 6600 and 6400 BC. The small size of the deposit, the predominance of a single species of mollusc and the absence of bones imply that the site was a temporary base used specifically for the exploitation of *S. plana*.

[Mienis, H.K.], 2008. [Shells.] In: Tal, O. and Taxel, I., Ramla (South): an early Islamic industrial site and remains of previous periods. *Salvage Excavation Reports*, 5: 203-204. Tel Aviv University, Sonia and Marco Nadler Institute of Archaeology.

ABSTRACT: The presence of various species of marine shells, including fragments, on many of the mortar-paved working surfaces at this site suggests that they were used as building material and not consumed as foodstuff. The fact that many of the shells were collected dead supports this argument; however, some may have been used as personal ornaments or to decorate wooden articles. Only 13 shells and seven species were recorded: *Hexaplex trunculus* (4), *Bolinus brandaris* (2), *Semicassis granulata undulata* [= *Phalium granulatum undulatum*] (1), *Acanthocardia tuberculata* (3), *Spondylus gaederopus* (1), *Glycymeris insubrica* (1) and *Pinctada margaritifera* (1). All are from the Mediterranean Sea with the exception of the last, which is found in the Red Sea.

Mienis, H.K., 2009. Shells and crabs. In: Gadot, Y. and Yadin, E. (eds), *Aphek-Antipatris II. The remains on the acropolis: the Moshe Kochavi and Pirhiya Beck excavations*. Tel Aviv University, Institute of Archaeology. (Emery and Claire Yass Publications in Archaeology.) pp. 562-568.

ABSTRACT: Fifty-six mollusc shells or fragments and one fragment of a freshwater crab were recovered from excavations (2002-2006) in Late Bronze and Iron Age levels at Tel Aphek, Israel. All these fragments were relatively large (more than 1 cm); systematic sieving, which would undoubtedly have produced many more fragments, was not carried out. Eleven molluscan taxa were identified. Six, representing 82% of the shells, were from the Mediterranean Sea: *Phalium granulatum undulatum* (2 'cassid lips'), *Bolinus brandaris* (1), *Hexaplex trunculus* (2, one with a man-made hole behind the apertural lip), *Glycymeris glycymeris pilosa* (1), *Glycymeris insubrica* (40, of which 15 had man-made holes at the umbo) and *Sepia officinalis* (1). Three species were from the nearby Yarqon River: *Melanopsis buccinoidea* (5), *Potomida littoralis delesserti* (1) and *Unio mancus eucirrus* (1). Two were terrestrial: *Buliminus labrosus* (1) and *Helix engaddensis* (1). The small size of the sample precluded detailed analysis. However, the land and freshwater species suggest a climate similar to that of today, and the marine shells indicate contacts with people living nearer to or directly on the coast.

Mienis, H.K., 2009. 13. A report concerning the shells from the excavation of H. Shallale. In: Dar, S. (ed.), *Shallale – ancient city of Carmel*. Oxford, Archaeopress. (BAR International Series, 1897.) pp. 421-426.

ABSTRACT: Archaeological remains unearthed at Horvat Shallale in the Carmel Mountains, Israel, span the Late Bronze Age to Ottoman periods. Molluscan samples were collected from Early Roman to Mamluk (14th-16th century) levels by eye rather than by sieving, so that only the larger shells and fragments (more than 1 cm) were represented. Twelve taxa were identified: five land snails, two freshwater mussels, four marine gastropods and one marine bivalve. The land snails were: *Pomatias olivieri* (11), *Sphincterochila cariosa* (1), *Metafruticicola fourousi* (2), *Helix engaddensis* (57) and *Levantina spiriplana caesareana* (15); the last species may have been collected from elsewhere in the Carmel range for food. The freshwater mussels were represented merely by two fragments of *Potomida littoralis* and one damaged valve of *Unio mancus eucirrus*. The marine gastropods comprised single specimens of the cowries *Erosaria spurca* (unstratified) and *Luria lurida* (Mamluk) which were probably utilised as beads, two *Bolinus brandaris* (Roman) and one *Stramonita haemastoma* (Mamluk). Fifteen of the 56 valves of *Glycymeris insubrica* were holed at the umbo and may have served as pendants dating from the Roman to Mamluk periods; the remainder may have been utilised as building material.

Mienis, H.K., 2009. 14. Terrestrial snails from a burial cave in Nahal Oren near H. Shallale. In: Dar, S. (ed.), *Shallale – ancient city of Carmel*. Oxford, Archaeopress. (BAR International Series, 1897.) pp. 427-428.

ABSTRACT: Shells and shell fragments were recovered by sieving during the excavation of a burial cave east of Horvat Shallale in Nahal Oren, Israel, in 2006. The cave was in use during the Early and Late Roman, Byzantine and Late Ottoman periods. Overall, 437 shells or fragments were found, representing seven different species of land snails: *Pomatias olivieri* (355), *Sphincterochila cariosa* (5), *Metafruticicola fourousi* (3), *Monacha syriaca* (3), *Xeropicta vestalis joppensis* (2), *Helix engaddensis* (65) and *Levantina spiriplana caesareana* (4). The species composition and the large proportion of damaged shells (36.1%) suggest that the snails were introduced into the cave, not by human agency, but by small mammals (probably the spiny mouse, *Acomys cahirinus*) which exploit these molluscs as a source of both food and water.

BOOKS

Two British Archaeological Reports (BAR) have recently been published on aspects of archaeomalacology. These Reports are available from Oxbow Books – visit their website at www.oxbowbooks.com, email: oxbow@oxbowbooks.com.

Laurie, E.M., 2008. *Investigation of the Common Cockle: collection practices at the kitchen midden sites of Norsminde and Krabbesholm, Denmark*. Oxford, Archaeopress. (BAR, 1834.) 304 pp. ISBN 9781407303185, pbk £47.00.

The aim of this investigation was to determine to what extent the exploitation of cockles changed across the Mesolithic-Neolithic transition in Denmark. The following three research questions were addressed: to what extent did shellfish consumption change through time; what is the evidence for changing cockle exploitation through time; and were there any seasonal patterns in the exploitation of cockles?

After the introduction in Chapter 1, the first part of Chapter 2 briefly explores the relationships between people and marine molluscs in the past, and then looks at the morphology, physiology, behaviour and general biology of the Common Cockle (*Cerastoderma edule*), including a historical review of growth line research. Chapters 3 and 4 describe the methodology used in this study, including the selection and preparation of both modern and archaeological shells for comparison. The Danish midden sites of Norsminde and Krabbesholm are described in Chapter 5, and the results of the analysis of cockles excavated from these sites are presented in Chapter 6. The final two Chapters (7 and 8) discuss these results in relation to the questions posed in Chapter 1, and suggest further avenues for research. Whereas the site at Norsminde showed a relatively straightforward Mesolithic-Neolithic transition, the evidence from Krabbesholm showed a more complex transition with Mesolithic practices continuing into the Neolithic. It is concluded that all sites are different, and the results obtained from one midden site cannot necessarily be applied to other, apparently similar, sites in the same region and archaeological time span.

The ten appendices provide useful data for researchers in this area of study: a full catalogue of modern cockle collections in Great Britain (Essex, Lincolnshire, Scotland and Wales) including shell measurements and age and growth line counts; a catalogue of archaeological material containing the same information; a catalogue of modern cockle acetate peels and growth lines; a similar catalogue of archaeological cockle acetate peels; modern and archaeological cockle age and size data percentage conversion tables; Norsminde and Krabbesholm bag lists from which cockle samples were obtained; Norsminde C¹⁴ dates;

full cockle and oyster seasonality, age and size comparison figures for Norsminde and Krabbesholm; and a species list. (JRS)

Antczak, A. and Cipriani, R. (eds), 2008. *Early human impact on megamolluscs*. Oxford, Archaeopress. (BAR, 1865.) 254 pp., ISBN 9781407303482, pbk £41.00.

This volume presents 19 papers from an international workshop on the Early Human Impact on Megamolluscs (EHIM), held at Isla de Margarita, Venezuela, on 26-28 September 2005. This workshop explored a range of issues related to human exploitation of molluscs in the past. The papers are global in scope and aim to provide a synthesis of recent research in this subject area, looking at man and mollusc interactions from environmental, bioecological and sociocultural perspectives.

Following an introductory chapter by the editors, there are 17 chapters presenting papers relating to specific geographical areas and/or species. The location of the workshop is reflected in a relatively large proportion of contributions from the Americas (9), but Europe and the Mediterranean (4), Asia (2), the Pacific (1) and South Africa (1) are also represented.

Three papers describe studies in North America: 'Trends and strategies in shellfish gathering on the Pacific Northwest coast of North America' (Aubrey Cannon, Meghan Burchell and Rhoda Bathurst); 'Human exploitation of the Quahog *Mercenaria mercenaria* in eastern North America: historical patterns and controls' (Harold B. Rollins, Robert S. Prezant and Ronald B. Toll); and 'Shell symbolism in pre-Columbian North America' (Cheryl Claassen).

Central and northern South America are covered by four papers: 'Shellfish use in pre-Columbian Panama' (Diana Rocio Carvajal Contreras); 'Qualitative effects of pre-Hispanic harvesting on Queen Conch: the tale of a structured matrix model' (Roberto Cipriani and Andrzej Antczak); 'A history of human impact on the Queen Conch (*Strombus gigas*) in Venezuela' (Andrzej Antczak, Juan M. Posada, Diego Schapira, Ma. Magdalena Antczak, Roberto Cipriani and Irene Amarilis Montano); and 'Between food and symbol: the role of marine molluscs in the late pre-Hispanic north-central Venezuela' (Ma. Magdalena Antczak and Andrzej Antczak). Geographically further south we find: 'A recipe for a sambaqui: considerations on Brazilian shell mound composition and building' (Levy Figuti) and 'Exploitation of Loco, *Concholepas concholepas* (Gastropoda: Muricidae), during the Holocene of Norte Semiárido, Chile' (Pedro Baez R. and Donald Jackson S.).

Europe and the Mediterranean are represented by papers on: 'Molluscan archives from European prehistory' (Geoff Bailey and Nicky Milner); 'Shell middens ("Kkenmdinger"): the Danish evidence' (Sen H. Andersen); 'Marine molluscs in Danish Stone Age middens: a case study on Krabbesholm II' (Nina Nielsen); and 'Mediterranean, Red Sea and Nilotic shell artefacts in the Levant: indicators of trade routes in the Bronze Age' (Daniella E. Bar-Yosef Mayer).

The remaining papers, representing the rest of the world, are: 'Limpet sizes in Stone Age archaeological contexts at the Cape, South Africa: changing environment or human impact?' (John Parkinton); 'Archaeomalacological research in India with special reference to early historic exploitation of the Sacred Conch Shell (*Turbinella pyrum*) in Western Deccan' (Arati Deshpande-Mukherjee); 'Palaeobiomass estimation and collecting pressure on molluscs in Japan' (Hiroko Koike); and 'From prehistoric to present: Giant Clam (Tridacnidae) use in Papua New Guinea' (Jeff Kinch). The final chapter draws the volume to a suitable conclusion: 'The study of ancient human-mollusc interactions as an interdisciplinary challenge' (Roberto Cipriani, Andrzej Antczak and Ma. Magdalena Antczak). (JRS)

Conferences: ICAZ 2010 and archaeomalacology update

The next conference of the International Council for Archaeozoology (ICAZ) will be held 23-28 August 2010 in Paris, hosted by the Muséum National d'Histoire Naturelle and Université P. et M. Curie (Paris VI).

The previous two ICAZ conferences (Mexico City and Durham) have had dedicated archaeomalacology sessions, and the Paris meeting will continue this trend. Sessions and timetabling are still to be finalised, but the current working model for archaeomalacology is a full-day session broken down into three sub-sessions. Different people will take responsibility for the various sub-sessions, with me taking responsibility for overall session co-ordination. The sub-sessions and organisers are as follows:

- **Acquisition and use of shell raw materials in prehistory**
Vesna Dimitrijevic, Catherine Dupont, Sándor Gulyás, Nathalie Serrand
- **Shell middens and shells as a food resource**
Adrián Velázquez Castro and Luis Gómez Gastélum
- **Shells as indicators of palaeoenvironment, site formation and transformation**
Katherine Szabó

When details are finalised, a call for papers will be issued. In the interim, information about the ICAZ 2010 conference can be found at the conference website: <http://www.alexandriaarchive.org/icaz/ICAZ2010/ICAZ%202010%20-%20home%20page.htm> (Kat Szabó)
