THE ARCHAEO+MALACOLOGY GROUP NEWSLETTER

Issue Number 21, June 2012

Coordinator: Janet Ridout-Sharpe, BSc ARCS
66 Radnor Road, Wallingford, Oxfordshire OX10 0PH, UK
Email: j.ridout-sharpe@cabi.org

Many thanks to everyone who has contributed to this newsletter – please keep items coming in and do encourage your colleagues to contribute as well. The newsletter welcomes short articles, abstracts, reviews and news items on all aspects of archaeomalacology: dietary studies, palaeoenvironmental reconstructions, elucidation of ancient trade routes, ornaments and jewellery, tools and containers, ritual and symbolism. Please use the newsletter as a forum to share your interests and expertise with others. All opinions expressed therein are those of the authors and not necessarily those of the Coordinator or online hosts.

As more and more archaeomalacological studies are appearing in the literature, a useful function of this newsletter might be to produce a regular ***Bibliography*** *of published items. This will depend on input from readers so, if you think this is a good idea, please send the bibliographic details of new publications to the Coordinator at the above email address.*

Current and previous issues of the newsletter are available at http://archaeomalacology.com and http://home.earthlink.net/~aydinslibrary/AMGnews.htm, with grateful thanks to the ICAZ Archaeomalacology Working Group and to Aydın Örstan, respectively.

The copy deadline for the next issue is 15 December 2012

Contents

Introduction and limited spread of *Papillifera bidens* in Catalonia

Cristian R. Altaba
Department of Philosophy & Social Work, Universitat de les Illes Balears, 07122 Palma, Balearic Islands, Spain
Email: cristianr.altaba@uib.cat

The clausiliid land snail *Papillifera bidens* (Linnaeus, 1758) is a strict calciphile rupicolous species with a wide range in the Mediterranean region. It is usually abundant on rocky hillsides and old walls. In dry weather it usually hides in crevices or under stones. Although it is native to a small area in the central Mediterranean, through millennia of navigation it has been dispersed passively through transportation of plant material and stonework (Örstan, 2006; Mienis and Gümüş, 2007, 2009; Gümüş and Mienis, 2010; Nordsieck, 2011). It has

recently been located in the south of England, likely introduced through the importation of statuary from Italy in the 18th and 19th centuries (Ridout-Sharpe, 2005, 2010), and very recently into southern Germany (Rosenbauer, 2011). In warm limestone regions it is well established, while it remains very localised in northern sites. Herewith I discuss the species' taxonomy and its occurrence in Catalonia, Spain, an interesting area that has also been treated by Gümüş and Mienis (2010) and Nordsieck (2011).

The correct name is *Papillifera bidens*

Three nomenclatural points must be addressed in the first place, concerning the species name that should be used according to the International Code of Zoological Nomenclature, the citation of a relevant early work, and the type species of the genus.

An issue that has caused much trouble is the confusion of the species' identity in its original description. Linnaeus (1758: 767) describes *Turbo bidens* as a terrestrial species from southern Europe diagnosed thus: "*T. testa turrita pellucida: anfractibus contrariis sutura subcrenata, apertura postice bidendata*". Along with this brief diagnosis he refers to figure C on plate 4 of Gualtierius (1742). Now, from the Linnean text it is obvious that it contains an error (either typographical or *lapsus calami*), because the above-mentioned traits are not depicted on figure C, being instead recognisable in figures D and E of that same plate (as already noticed by Schröter, 1784). Nevertheless, Forcart (1965) considers that the original description should be based solely on the reference to the illustration mentioned, and thus would not correspond clearly with the species. With this awkward reasoning, he proposed to use the name *Helix papillaris* Müller, 1774. Falkner *et al*. (2002) noticed the mistake and proposed to designate as neotype for *Turbo bidens* the specimen in Gualtierius' figure E. Such action is amazing, because it would have been of better use to designate an actual specimen. After a long argument, the International Commission on Zoological Nomenclature included this name through Opinion 2176 in the Official List of Species Names in Zoology, and decided that the name *Helix papillaris* should not be maintained (ICZN, 2007).

However, the validity of the designated neotype was not clarified. This loophole was used by Kadolsky (2009) to propose a new neotype, considering that the Linnean text would in fact refer to Gualtierius' figure C, and that this would then actually be what is currently called *Cochlodina incisa* (Küster,1876) from northern Italy. Such an interpretation is rather convoluted, adding unnecessary complexity to what seemed to be a closed issue. Moreover, Nordsieck (2011) has shown that it is not reasonable to interpret the Linnean diagnosis in a way such that "*sutura subcrenata*" could refer to the nearly smooth suture of *C. incisa*. Indeed, Gualtierius did not mention this character for either species, which is actually not shown in his figures. This fact underlines the precedence of the description given by Linnaeus over whatever (mistaken) reference to a previously published figure. Thus the designation of the second neotype is unacceptable and the species name must be *Papillifera bidens* (Linnaeus, 1758).

A minor issue that also needs clarification refers to the name used by Niccolò Gualtieri in his early impressive work. In the Latin title he is referred to as Nicolai Gualtieri, but this is because his name appears in the genitive case. After a beautiful frontispiece with male divers offering seashells to a resting Venus, all surrounded by little angels that study shells with the aid of hand lens, compass and ruler, there is a whole-page portrait of the author with periwig. Below this portrait the name Nicolaus Gualterius appears. It seems clear that there is a typographical erratum, because it should actually be Gualtierius, the Latinized form of the Italian family name Gualtieri that actually appears in the book's title. Thus the work must be cited as Gualtierius (1742).

The type species of *Papillifera* Hartmann 1842 is *P. solida*, through subsequent designation by Lindholm (1924). Although *P. papillaris* had been already designated as the type species of the genus by Albers and Martens (1860), this species is not included among those originally included in the genus by Hartmann (1840-1844), who referred to a list of nine species grouped into an unnamed section by Pfeiffer (1841).

Taxonomy and distribution of *Papillifera*

The genus *Papillifera* is native to a quite small area encompassing the southern third of the Italian peninsula, the neighbouring islands of Sicily and Malta, and adjacent smaller islands and islets (Giusti *et al*., 1996; Nordsieck, 2007). It includes two species, *P. bidens* (Linnaeus, 1758) and *P. solida* (Draparnaud, 1805), both exhibiting subtle variations among populations. According to Nordsieck (2007, 2011), two main groups can be distinguished within *P. bidens*: those having a peristome that is almost always united in its upper part to the last whorl, and those where the peristome is clearly detached, providing a trumpet shape to the whole aperture.

The former group constitutes the subspecies *P. bidens bidens*, which is probably native only to the southernmost continental regions of Puglia and Basilicata, although it now also lives in anthropic environments throughout the Italian peninsula, as well as in several coastal cities on the northern Mediterranean shores. Besides the peristome, *P. b. bidens* is characterised by exhibiting a less developed basal keel, the subcolumellar lamella is more or less sunken inside the aperture (often to the point of being invisible in frontal view) and the surface sculpture is barely marked.

The second group, *P. bidens affinis* (Philippi, 1836), includes a complex of forms living in the south of Calabria, Sicily and Malta. Within this group, several more or less defined phylogeographic units can be distinguished and deserve closer attention (Boettger, 1878; Paulucci, 1878). This subspecies has been introduced throughout the central and southern Mediterranean region: Tunisia and Algeria, Sardinia, southern Greece, the Balearic Islands, and Gibraltar and Catalonia in the Iberian peninsula (Gasull, 1964; Altaba, 1993; Örstan, 2006; Menez, 2007; Mienis and Gümüş, 2007, 2009; Gümüş and Mienis, 2010; Nordsieck, 2011).

Populations in Catalonia

In Catalonia, *Papillifera bidens* has been recorded since the earliest malacological surveys, given that it was found in the cities of Barcelona and Tarragona (Haas, 1929). However, samples from each of these two cities (and nearby places) actually belong to separate subspecies (Nordsieck, 2007, 2011).

The findings of *Papillifera bidens* in Tarragona were always limited to the ancient city walls. Tarraco was indeed one of the most important cities of the Roman Empire, and its great walls were built on top of pre-existing Iberian defences. The latter are the so-called "cyclopean walls", mentioned by Bofill i Poch (1917). Direct relationships existed between Tarraco and Rome, thus it is not surprising that the subspecies introduced here was *P. b. bidens*, which is common in old buildings throughout much of central Italy. A later arrival can be dismissed, because the species has never been collected on the Medieval city walls or any other post-Roman building.

As has often been observed, in many places where it was introduced *P. b. bidens* proved unable to become invasive, remaining instead limited to the site of arrival. However, the species was found at El Vendrell by Bofill (1888). This town is located inland from Tarragona,

so it is likely that *P. b. bidens* was carried from there. No further records exist in that area, so this secondary introduction was probably short-lived.

In 1979 I found *P. b. bidens* at another site inland of Tarragona. The monastery of Santes Creus is of late Medieval origin, but it was used as the prison for the city of Tarragona between 1870 and 1921 (Aguilera, 2009). The ensuing reforms and transportation of materials from the coastal city probably account for this isolated occurrence.

Early malacologists were puzzled by the presence of *Papillifera* in Barcelona, so far from Italy, and thus described two presumed endemics: *Clausilia catalonica* Fagot, 1884 and *Clausilia* (*Papillifera*) *virgata* [=*bidens*] var. *barcinensis* Westerlund, 1893, the latter considered a variety of the former by Westerlund (1901) as *Clausilia catalonica* f. *barcinensis*. As shown by Bofill i Poch (1917, 1919), these names are actually synonyms of *P. bidens*. More recently, Nordsieck (2007, 2011) and Gümüş and Mienis (2010) have shown that the Barcelona snails belonged to *P. bidens affinis*.

In the old Ciutadella and the castle in Montjuïc, two fortresses built after Catalonia's defeat in 1714 in order to control Barcelona, *P. bidens* was abundant in the late 19th century. Much of the material used for building those two fortresses came from the razing of old quarters of the city. Thus it can be safely assumed that the species was present in Barcelona much earlier. The Ciutadella was demolished by 1878 and the castle was included in a major remodelling of Montjuïc hill for the Universal Exhibit in 1929. The species has never been recorded again from Barcelona. It must be noted that the timing of its introduction is unlikely to have been in the Roman Empire, because Barcino was a minor city separated from the sea by extensive lagoons. Moreover, more important Roman cities like Baetulo (present Badalona) existed on the coast, yet *P. bidens* has never been recorded there.

An interesting locality of *P. bidens affinis* is the castle of Gelida, above the small village of that name inland from Barcelona. The castle is not Roman and its construction started in the 9th century. It formed part of a defence line along the Catalan-Muslim border that lasted for nearly three centuries until the late 1100s, dividing what would become Old and New Catalonia. Once it lost its strategic position, it was progressively abandoned. In 1367 a banker from Barcelona, named Berenguer Bertran, bought the ruined castle from the noble family that had inherited that possession and rebuilt it as a sumptuous palace. This palace was destroyed soon after 1714, so thoroughly that in 1780 the town's chaplain asked to use the stones for building the bell tower, and obviously did so (Monreal and Riquer, 1958). Thus there was only once an input of materials that could carry the snails to Gelida, which most probably came along with stonework directly from Barcelona.

A similar case might have taken place in the Ermita de Sant Onofre, near Santa Coloma de Gramenet in the outskirts of Barcelona, where *P. bidens affinis* was found by Vilella (1967). That small hermitage was founded in 1501 under the patronage of rich merchants from nearby Barcelona (Aymar i Ragolta, 2003). Thus the land snails were probably also carried over with stonework from the city.

So, the arrival of *P. bidens affinis* in Barcelona must have taken place after the fall of Rome in the 5th century and before the works at Gelida in the late 14th century. An obvious possibility is after the Catalans' arrival at Sicily in 1282, starting a close relationship that would last for five centuries. Land snails could have been carried along this new pathway and this may account for the presence of the Sicilian *Murella muralis* on the island of Menorca (Altaba, 1991). However, *P. bidens affinis* is just one of a handful of originally Sicilian (and south Italian) species of land snails occurring in the Balearics since at least Roman times. In

exchange, no Balearic species was introduced into Sicily. This asymmetry can be explained taking into account that pre-Roman Sicily had major merchant cities of either Greek or Carthaginian fidelity. From there vessels would travel throughout the Mediterranean, trading goods on beaches with locals. Thus, the landed snails were directly placed on natural habitats, while those returning to Sicily arrived at inhospitable urban harbours (Altaba, 1991, 1999, 2000). *P. bidens affinis* thus arrived on the Balearics and spread widely into all kinds of agricultural and human environments, in stark contrast to what happened in continental settings. This may be due to the insular environment lacking natural enemies that are common on the continent (Altaba, 2004). Eventually, from the Balearics, *P. bidens affinis* would have been carried to Barcelona. This path was also followed by the Mallorcan endemic helicid *Iberellus companyonii*, which survived in Medieval buildings in Barcelona until the early 20th century (Haas, 1929).

The record from Lleida given by Gümüş and Mienis (2010) on the basis of a shell collected in 1934 is probably wrong. Although summers there are hot and dry, just as they are in Sicily, winters are very cold and foggy, often with several days of unbroken mist, making the survival of this coastal Mediterranean species unlikely. There has never been any other record from that inland city. Indeed, I have never collected it there, in spite of focusing on old walls and ruins, and it is assumed that the record from Lleida was based on an error in labelling.

The presence of *Papillifera bidens affinis* in Barcelona and nearby sites in central Catalonia is not due to dispersal during Roman times. Instead it was carried over from Sicily in a stepping-stone fashion through the Balearics, first in pre-Roman times and then in the late Middle Ages. The existence of *P. b. bidens* in Tarragona can be traced to direct importation from Imperial Rome, followed later on by local spread, again in a stepping-stone fashion.

Acknowledgements
I am grateful to Francisco Welter-Schultes and Hartmut Nordsieck for most valuable discussions.

References

Aguilera, G., 2009. La Renaixença de Santes Creus. *Sàpiens*, 76: 32-37.
Albers, J. C. and Martens, E. von, 1860. *Die Heliceen nach natürlicher Verwandtschaft systematisch geordnet. Zweite Ausgabe.* Leipzig, Engelmann. xviii + 359 pp.
Altaba, C. R., 1991. Molluscs. In: Altaba, C. R. and Ros, J. (eds), *Història Natural dels Països Catalans, vol. 8: Invertebrats no artròpodes.* Barcelona, Enciclopèdia Catalana, pp. 375-416, 427-470.
Altaba, C. R., 1993. Els caragols i llimacs terrestres (Mollusca: Gastropoda). In: Alcover, J. A., Fornós, J. J. and Ballesteros, E. (eds), *Història Natural de l'Arxipèlag de Cabrera*. Palma, Moll & CSIC, pp. 409-426.
Altaba, C. R., 1999. *La diversitat biològica: una perspectiva des de Mallorca*. Palma, Moll.
Altaba, C. R., 2000. Are all mass invasions alike? *Trends in Ecology and Evolution*, 15: 248.
Altaba, C. R., 2004. Biodiversity of the Balearic Islands: A paradigm for conservation. In: Vilà, M., Rodà, F. and Ros, J. (eds), *Seminar on biodiversity and conservation*. Barcelona, Institut d'Estudis Catalans, pp. 169-188, 371-389.
Aymar i Ragolta, J., 2003. El monestir de Sant Jeroni de la Murtra. In: Bracons i Claplés, J. and Freixas i Camps, P. (eds), *L'art gòtic a Catalunya, Arquitectura II: Catedrals, monestirs i altres edificis religiosos.* Barcelona, Enciclopèdia Catalana, pp. 217-223.
Boettger, O., 1878. Systematisches Verzeichniss der lebenden Arten der Landschnecken-Gattung *Clausilia* Drap. mit ausführlicher Angabe der geographischen Verbreitung der einzelnen Species. *Bericht über die Thätigkeit des Offenbacher Vereins für Narturkunde*, 17/18: 18-101.
Bofill, A., 1888. *Catálogo de la colección conchiológica que fué de D. Francisco Martorell y Peña legada por dicho señor á la Ciudad de Barcelona y existente en el Museo Martorell de la propia ciudad*. 94 pp. Barcelona, N. Ramírez y Ca.
Bofill i Poch, A., 1917. Moluscos ingressats en el museu desde el mes de juny de 1916. *Anuario de la Junta de Ciències Naturals de Barcelona*, 2: 533-549.

Bofill i Poch, A., 1919. Report dels treballs efectuats en la secció Malacològica des de 1.er de juliol de 1917, fins a 31 de desembre de 1918. *Anuario de la Junta de Ciències Naturals de Barcelona*, 3: 199-224.
Falkner, G., Ripken, T.E.J. and Falkner, M., 2002. Mollusques continentaux de la France: liste de référence annotée et bibliographie. *Patrimoines Naturels*, 52: 1-350.
Forcart, L., 1965. Rezente Land- und Süsswassermollusken der süditalienischen Landschaften Apulien, Basilicata und Calabrien. *Verhandlungen der Naturforschenden Gesellschaft Basel*, 78 (1): 59-184.
Gasull, L., 1964. Algunos moluscos terrestres y de agua dulce de Baleares. *Boletín de la Sociedad de Historia Natural de Baleares*, 9 (1963): 3-82.
Giusti, F., Manganelli, G. and Schembri, P., 1996. The non-marine molluscs of the Maltese Islands. *Monografie del Museo Regionale di Scienze Naturali di Torino*, 15: 1–607.
Gualtierius, N., 1742. *Index testarum conchyliorum quae adservantur in museo Nicolai Gualtieri philosophi et medici collegiati florentini Regiae Botanices Florentinae Academiae socii in Pisano Athenaeo Medicinae professoris emeriti et methodice distributae exhibentur tabulis CX.* Florentia, Caietano Albizzino. pp. i-xxiii, i-cx + tab. 1-110.
Gümüş, B. A. and Mienis, H. K., 2010. Records of *Papillifera papillaris affinis* in continental Spain and their connection with walls and ruins from the Roman period. *Archaeo+Malacology Group Newsletter*, No. 18: 1-4.
Haas, F., 1929. Fauna malacológica terrestre y de agua dulce de Cataluña. *Trabajos del Museos de Ciencias Naturales de Barcelona*, 13: 1-491. (Reprinted 1991 as *Treballs del Museu de Zoologia,* 5: 1-491, pls. I-LXV.)
ICZN (International Commission on Zoological Nomenclature), 2007. Opinion 2176 (Case 3319). *Helix papillaris* Müller, 1774 (currently *Papillifera papillaris*; Mollusca, Gastropoda): specific name not conserved. *Bulletin of Zoological Nomenclature*, 64 (3): 195.
Hartmann, J. D. W., 1840-1844. *Erd- und Süsswasser-Gasteropoden der Schweiz. Mit Zugabe einiger merkwürdigen exotischen Arten. I. Band.* St. Gallen, Scheitlin and Zollikofer. xx + 227 pp. + 84 pls.
Kadolsky D., 2009. *Turbo bidens* Linnaeus 1758 (Gastropoda: Clausiliidae) misidentified for 250 years. *Journal of Conchology*, 40 (1): 19-30.
Lindholm, W. A., 1924. A revised systematic list of the genera of the Clausiliidæ, recent and fossil, with their subdivisions, synonymy, and types. *Proceedings of the Malacological Society of London,* 16 (2): 53-80.
Linnaeus, C., 1758. *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Vol. 1.* Holmia [Stockholm], Laurentius Salvius. 824 pp.
Menez, A., 2007. *Papillifera papillaris* (Müller, 1774) in Gibraltar. *Mollusc World*, No. 13: 6-7, 9.
Mienis, H. K. and Gümüş, B. A., 2007. More notes on the extra-territorial distribution of *Papillifera papillaris*, a species often associated with archaeological sites. *Archaeo+Malacology Group Newsletter*, No. 11: 4-7.
Mienis, H. K. and Gümüş, B. A., 2009. Records of *Papillifera bidens*-complex from ancient sites in North Africa (Mollusca, Gastropoda, Clausiliidae). *Archaeo+Malacology Group Newsletter*, No. 15: 3-6.
Monreal, L. and Riquer., M. de, 1958. *Els castells medievals de Catalunya, vol. 2*. Barcelona, Ariel, 309 pp.
Nordsieck, H., 2002. Contributions to the knowledge of the Delimini (Gastropoda: Stylommatophora: Clausiliidae). *Mitteilungen der deutschen malakozoologischen Gesellschaft*, 67: 27-39.
Nordsieck, H., 2007. *Worldwide door snails (Clausiliidae), recent and fossil.* Hackenheim, ConchBooks, 214 pp. + 20 pls.
Nordsieck, H., 2011. *Papillifera bidens* (Linné 1758) (Clausiliidae, Alopiinae), a common, but little known species. http://www.hnords.de (04/10/2011).
Örstan, A., 2006. The clausiliid snail *Papillifera papillaris* in Istanbul, Turkey. *Archaeo+Malacology Group Newsletter*, No. 9: 6-7.
Paulucci, M., 1878. *Matériaux pour servir à l'étude de la faune malacologique terrestre et fluviatile de l'Italie et de ses îles.* Paris, Savy, iv + 54 pp.
Pfeiffer, L., 1841. *Symbolae ad historiam heliceorum*. Fisher, Cassel, 88 pp.
Rosenbauer, A., 2011. *Papillifera papillaris* and other snails imported with stones into south-west Germany. *Archaeo+Malacology Group Newsletter*, No. 20: 2-4.
Ridout-Sharpe, J., 2005. *Papillifera papillaris* (Gastropoda: Clausiliidae): a new record for Britain. *Archaeo+Malacology Group Newsletter*, No. 7: 6-7.
Ridout-Sharpe, J., 2010. *Papillifera papillaris*: a second colony is discovered in England. *Archaeo+ Malacology Group Newsletter*, No. 18: 4-6.
Schröter, J. S., 1784. *Einleitung in die Conchylienkenntniß nach Linné. Zweyter Band. Nebst vier Kupfertafeln.* Halle, Gebauer, viii + 726 pp. + pls IV-VII.
Vilella, M., 1967. Notas malacológicas. *Miscelánea Zoológica*, 2 (2): 17-21.
Westerlund, C.A., 1901. Synopsis molluscorum in regione palaearctica viventium ex typo *Clausilia* Drap. *Mémoires de l'Académie Impériale des Sciences de St.-Pétersbourg*, VIIII, Vol. XI (11 and final): 37 + 203 pp.

Molluscs from two test pits at a Pottery Neolithic site near Hazorea, Jezreel Valley, Israel

Henk K. Mienis
National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem
and The Steinhardt National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, Israel
Email: mienis@netzer.org.il

More than 15 years ago two test pits were dug into two adjacent sites near Hazorea, Jezreel Valley, Israel. Both sites, "Anati" and "Electricity Pole", are so close to each other that they most probably form part of one continuous complex dating back to the Pottery Neolithic period. Among the zoological remains found in those pits were several molluscs, which are dealt with in this report.

The shell finds

The molluscs recovered from the test pits are enumerated in Tables 1 and 2.

Table 1: Molluscs found in a test pit at the site "Anati" near Hazorea
PN = Pottery Neolithic (undefined phase)
WR = Wadi Rabah – Late Pottery Neolithic Phase

Basket	Period	Identification	Remarks
1	PN	*Erosaria spurca*	1 shell with the dorsum removed
		Helix (*Pelasga*) *engaddensis*	1 shell
2	PN	*Melanopsis buccinoidea*	1 shell
		Helix (*Pelasga*) *engaddensis*	2 fragments
9	PN	*Melanopsis buccinoidea*	1 shell
		Glycymeris insubrica	1 fragment of the ventral margin
28	PN-WR	*Melanopsis buccinoidea*	2 shells

Table 2: Molluscs found in a test pit at the site "Electricity Pole" near Hazorea
WR = Wadi Rabah – Late Pottery Neolithic Phase

Basket	Period	Identification	Remarks
4	WR	*Hexaplex trunculus*	1 shell with a large hole in the body whorl
5	WR	*Unio terminalis terminalis*	1 small fragment
18	WR	*Unio mancus eucirrus*	1 fragment
28	WR	*Phalium granulatum undulatum*	1 fragment of the outer lip

Discussion and conclusion

The 13 shells or fragments were identified as belonging to eight different species, which had their origin in three different biotopes: terrestrial, freshwater and marine.

The land snail *Helix* (*Pelasga*) *engaddensis* Bourguignat, 1852 is still living quite commonly at the site today and part of the material might be of recent origin, since this species burrows deeply into the soil in order to aestivate.

The gastropod *Melanopsis buccinoidea* (Olivier, 1801) and the mussels *Unio terminalis terminalis* Bourguignat, 1852 and *Unio mancus eucirrus* Bourguignat, 1857 are inhabitants of perennial freshwater biotopes. *Melanopsis* is still living today in local springs. The freshwater

mussels originated without doubt from the nearby Qishon River; unfortunately both species disappeared from this stream due to pollution in the 20th century.

Erosaria spurca (Linnaeus, 1758), *Phalium granulatum undulatum* (Gmelin, 1791), *Hexaplex trunculus* (Linnaeus, 1758) and *Glycymeris insubrica* (Brocchi, 1814) are all from the Mediterranean Sea. The single *Hexaplex* is of a particular form (*pseudopagodus*) not known to occur today in the Eastern Mediterranean.

Some of the marine shells show signs of manipulation. The dorsum of the shell of *Erosaria spurca* was artificially removed by man. Such altered cowry shells have functioned as shell beads or as votive objects throughout the history of mankind. The body whorl of the *Hexaplex trunculus* shows a large man-made hole, turning it into a pendant or other ornamental item. The outer lip of *Phalium granulatum undulatum* is also a classic example of man-made alterations (Reese, 1989), although the purpose of these so-called 'cassid lips' is still surrounded with uncertainties.

A further excavation at the site may considerably boost our still imperfect knowledge of the role of molluscs during the Pottery Neolithic in Israel.

Acknowledgements
I would like to thank Dr A. Gopher, Dr E. Meyerhof and Dr L. Kolska Horwitz for allowing me to study the discussed material.

Reference
Reese, D.S., 1989. On cassid lips and helmet shells. *Bulletin of the American Schools of Oriental Research*, 275: 33-39.

Shells from the excavation of a Chalcolithic site near the Shoqet Junction, Negev, Israel

Henk K. Mienis
National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem and The Steinhardt National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, Israel
Email: mienis@netzer.org.il

A Chalcolithic site (4000-3150 BC) near the Shoqet Junction, Negev, Israel, was excavated by Y. Guvrin of the Israel Antiquities Authority (permit # 1417). Among the archaeo-zoological finds were some 20 remains of molluscs. These shells are dealt with in this report.

The archaeomalacological finds
The material consisted of 11 samples comprising 20 shells or fragments, belonging to four species.

GASTROPODA
Family Hygromiidae
Xerocrassa seetzenii seetzenii (Pfeiffer, 1847). Locus 15, basket 77: three shells; locus 17, basket 90: three shells.

Family Helicidae
Helix (*Pelasga*) *engaddensis* Bourguignat, 1852. Locus 4, basket 58: two shells; locus 14, basket 82: one shell; locus 15, basket 77: one shell; locus 17, basket 90: one shell; locus 17, basket 96: one shell; locus 19, basket 84: one shell.

BIVALVIA
Family Glycymerididae
Glycymeris insubrica (Brocchi, 1814). Locus 4, basket 58: one valve with a man-made hole in the umbo; locus 4, basket 76: one valve with a man-made hole in the umbo; locus 14, basket 74: one damaged valve, burnt; locus 17, basket 86: one valve with a man-made hole in the umbo.

Family Mutelidae
Chambardia rubens arcuata (Cailliaud, 1823). Locus 4, basket 76: one disintegrated fragment in four tiny pieces; locus 17, basket 87; one fragment; locus 17, basket 96: one fragment.

Discussion and conclusion

The 20 remains of molluscs recovered during the excavation of the Chalcolithic site near the Shoqet Junction were identified as belonging to four species, namely two species of land snails (*Xerocrassa seetzenii seetzenii* and *Helix engaddensis*), one species of marine bivalve (*Glycymeris insubrica*) and one species of freshwater mussel (*Chambardia rubens arcuata*). While the land snails both represent local species and might even be of recent origin, *Glycymeris* and *Chambardia* are, respectively, from the Mediterranean Sea and the River Nile in Egypt.

Interestingly, the same *Helix*, *Glycymeris* and *Chambardia* species were the only molluscs found during the excavation of a Chalcolithic site near Ben Shemen (Mienis, 1980). The Nilotic mussel has been recorded from two other Chalcolithic sites in the vicinity of the Shoqet Junction, Tell Abu Matar and Horvat Beter, which points to the existence of an intensive exchange of cultural items with areas as far away as the River Nile during the Chalcolithic period.

The valves of *Glycymeris* were used most probably as pendants. However, the *Chambardia* material is too fragmentary to allow any further interpretation concerning its possible use at the site.

Acknowledgements

I would like to thank Dr Y. Guvrin and Dr Liora Kolska Horwitz for entrusting me with the discussed material.

Reference

Mienis, H.K., 1980. Molluscs. In: Perrot, J. and Ladiray, D. (eds), Tombes à ossuaires de la région côtière Palestinienne au IVe millénaire avant l'ère Chrétienne. *Mémoires et Travaux du Centre de Recherches Préhistoriques Français de Jérusalem*, 1: 94.

Shells from an excavation at Ma'ale Shaharut, Uvda Valley area, Israel

Henk K. Mienis

National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem and The Steinhardt National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, Israel
Email: mienis@netzer.org.il

Excavations at Ma'ale Shaharut, east of the Uvda Valley, Israel by Uzi Avner (Israel Antiquities Authority) in 1986 and 1987 (Avner, 1986, 1989) yielded a number of archaeomalacological remains. These shells consisted of 55 beads made out of tusk shells (Scaphopoda) found in an Early Bronze Age burial (I), while 14 additional shells were

encountered in a Middle Bronze Age burial (V). The latter belonged to at least seven different taxa. This molluscan material is here enumerated in systematic order.

GASTROPODA
Family Neritidae
Nerita (*Theliostyla*) *sanguinolenta* Menke, 1829. Burial V; basket 6: three shells with a man-made hole left of the columellar area, and one complete specimen. All belonged to the black-and-white colour morph.

Family Strombidae
Canarium mutabilis (Swainson, 1821). Burial V; basket 6: one very small adult specimen with a man-made hole just behind the lip of the aperture.

Family Columbellidae
Mitrella albina (Kiener, 1841). Burial V; basket 6: three shells all with a man-made hole behind the lip of the aperture. A single one also showed a second, natural hole in the body whorl.

Family Mitridae
Mitra (*Nebularia*) *rueppellii* Reeve, 1844. Burial V; basket 6: one shell with a man-made hole behind the lip.

Family Costellariidae
Vexillum (*Costellaria*) *cadaverosum* (Reeve, 1844). Burial V; basket 6: one shell with a man-made hole behind the lip.

SCAPHOPODA
Family Dentaliidae
Dentalium clavus Cooke, 1886. Burial I; basket 9: 55 shell beads; Burial V; basket 6: three shell beads.

UNSPECIFIED
Mollusc species. Burial V; basket 6: one bead made from a shell. This bead was so abraded that the source of the shell material could not be identified.

Some remarks
All the material which could be identified to specific level belonged to commonly encountered species in the Red Sea, more particularly in the nearby Gulf of Aqaba.

All of the gastropods, except one, had been transformed into shell beads by either perforating the shells behind the lip of the aperture (*Canarium*, *Mitrella*, *Mitra* and *Vexillum*) or left of the columellar area (*Nerita*). The *Dentalium* beads consisted of small pieces ranging in size from 3 to 7 mm and showed traces where the longitudinal ribs on the shells had been filed away.

References
Avner, U., 1986. Ma'ale Shaharut. *Excavations and Surveys in Israel*, 5: 62-63.
Avner, U., 1989. Ma'ale Shaharut, Survey. *Excavations and Surveys in Israel*, 7-8: 114-116.

British Archaeological Reports

British Archaeological Reports are archaeological monographs published in two series: British and International. Starting in 1974, over 2900 titles have been published covering all aspects of archaeology, all periods and most of the world.

BARs are published by **Archaeopress** (http://www.archaeopress.com/) based in Oxford, UK. Recent titles include some archaeomalacological studies:

Ifantidis, F. and Nikolaidou, M. (eds), 2011. Spondylus *in prehistory: new data and approaches. Contributions to the archaeology of shell technologies*. BAR International Series 2216. xiv + 237 pp.

This book presents a broad and up-to-date discussion on the social and symbolic significance of *Spondylus* shells in archaeological contexts in Europe and the New World. It presents new data, new methodologies and new interpretations. The core of the book consists of papers that were presented at a special session on *Spondylus* at the EAA meeting held at Zadar, Croatia, in September 2007 (see *AMG Newsletter*, No. 11: 12).

Table of contents

Peacock, E., Jenkins, C., Jacobs, P.F. and Greenleaf, J., 2011. *Archaeology and biogeography of prehistoric freshwater mussel shell in Mississippi*. BAR International Series 2297. xii +181 pp.

Archaeologists routinely excavate the remains of animals and plants from prehistoric sites. In recent years, efforts have been made to use those remains to provide historical baselines for conservation biology, an approach referred to as 'applied archaeozoology'. This monograph offers a unique contribution to the field by compiling all available data on freshwater mussel shells from archaeological sites in the state of Mississippi, USA. Over 77,000 shells representing 69 taxa are reported for 42 sites in 18 counties, with species range maps and photographs of representative specimens. Broad patterns in space and time in shell-bearing sites are discussed. In particular, basic size and form data are provided for over 60 freshwater mussel 'shell rings' in the Mississippi River alluvial valley, with aerial photographs of several of these remarkable sites.

Abstracts

Alarashi, H., 2010. Shell beads in the Pre-Pottery Neolithic B in Central Levant: Cypraeidae of Tell Aswad (Damascus, Syria). *Munibe* (Suplemento), No. 31: 88-98.
ABSTRACT: Excavations at the PPNB site of Tell Aswad in Syria from 2001-2007 yielded more than 238 beads, of which 46 (19.3%) were made of shell. These included 14 cowries: 12 *Erosaria spurca* and one *Luria lurida* from the Mediterranean and one *Monetaria moneta* from the Red Sea. Three principal forms of modification were defined: dorsum removal (13 shells), perforations (five shells) and incisions (two shells). Grinding and hammering techniques were identified for the first category, and drilling for ventral perforations. In one shell, holes were made by percussion on the non-removed dorsum. Relatively deep and long incisions had been engraved on the ventral and lateral faces of two specimens: in one case the incisions were arranged radially around the aperture in such a way as to emphasise the natural teeth. This is the first report of engraved cowry shells from the Neolithic Near East. Local surface wear on some of the shells could indicate the mode of attachment or threading of the beads.

Douka, K., 2011. An Upper Palaeolithic shell scraper from Ksar Akil (Lebanon). *Journal of Archaeological Science*, 38 (2): 429-437.
ABSTRACT: A valve of *Glycymeris bimaculata* excavated from the Upper Palaeolithic level of the Ksar Akil rock shelter in Lebanon in the 1940s has been re-examined and shown to have been modified using the lithic technique of edge retouch to form a scraper-type tool. Dating indicated that this shell was older (~37 ka BP) than its context (~30 ka BP), suggesting that a sub-fossil shell had been selected for modification.

Douka, K., Higham, T.F.G. and Hedges, R.E.M., 2010. Radiocarbon dating of shell carbonates: old problems and new solutions. *Munibe* (Suplemento), No. 31: 18-27.
ABSTRACT: Marine shell carbonates are often considered problematic for radiocarbon dating for reasons including the reservoir effect and uncertainties over its quantification and temporal variability, the calibration of the radiocarbon age, the hard-water effect, and the possibilities of samples being derived from fossil sources. However, the state of preservation, in chemical and physical terms, is the key parameter affecting the radiocarbon dating of shell carbonates. The state of the art is reviewed, with reference to recent developments at the Oxford Radiocarbon Accelerator Unit (ORAU), University of Oxford. New protocols include more effective pretreatment and rigorous screening to determine whether or not marine shells have been diagenetically altered and are suitable for dating. The application of the new approaches to the current dating of the Middle to Upper Palaeolithic transition is discussed, with a view to elucidating the Neanderthal extinction and the initial dispersal of anatomically modern humans along the Mediterranean rim. (Based on authors' summary.)

Galili, E., Sevketoglu, M., Salamon, A., Zviely, D., Mienis, H.K., Rosen, B. and Moshkovitz, S., 2011. Late Pleistocene beach deposits, tectonics and sea-level changes on Cyprus, and their possible association with Neolithic colonization and settlement. *18th INQUA Congress, Bern, 21-27 July 2011* (Session 49, Climate and sea-level changes during the last 140 ka in the Mediterranean): 2 pp.
ABSTRACT: Twenty beach deposits exposed on coastal cliffs around Cyprus comprised Pleistocene sediments, four of which contained *Persististrombus latus*, an index fossil for the MIS 5e high sea stand in the Mediterranean. Uplift values for the north and west coasts (16 and 12 m in the last 125 ka, respectively) were higher than in the south (6 m) but the inferred tectonic uplift during the last 12 ka (the date of the earliest known human colonisation of the island) has only been about 1 m. Post-glacial sea level rise in that period was about 50 m and

represents the dominant factor in coastal modification. The porous Pleistocene deposits overlie impervious Pliocene marls and the spring line thus formed may have attracted the earliest Neolithic settlements.

Mienis, H.K., 2012. Shells from the Cardo and the Nea Church. pp. 475-478. In: Gutfeld, O. (ed.), *Jewish Quarter excavations in the Old City of Jerusalem conducted by Nahman Avigad, 1969-1982. Volume V: The Cardo (Area X) and the Nea Church (Areas D and T). Final report*. Jerusalem, Israel Exploration Society and Institute of Archaeology, Hebrew University of Jerusalem.
ABSTRACT: Nine shells were recovered from the excavation of a Byzantine street (cardo) and church in Jerusalem. Of these, three *Pinctada margaritifera* from the Red Sea and two *Chambardia rubens arcuata* and one *Mutela dubia nilotica* from the River Nile are thought to have been prized for their mother-of-pearl and to have been imported over distances of at least 242 and 450 km, respectively. Three shells, comprising beach-worn *Hexaplex trunculus* and *Glycymeris glycymeris pilosa* shells and a possibly fresh *Ostrea edulis*, had been brought from the Mediterranean Sea 55 km away. The shells cannot be absolutely assigned to a single period but fall within the Herodian-Byzantine-Crusader-Mamluk time span.

Reese, D.S., 2009. Faunal remains from Block AF. pp. 131-142. In: Betancourt, P.P. (ed.), *Pseira X: the excavation of Block AF*. Philadelphia, INSTAP Academic Press (Prehistory Monographs 28).
ABSTRACT: This chapter presents a catalogue of the faunal remains recovered from the excavation of several buildings in a Middle and Late Minoan settlement on the island of Pseira in north-east Crete. Marine invertebrates comprised the most important food source after fish. *Patella* predominated in five samples of 296, 661, 291, 210 and 169 remains (45.5-79.4%), followed by *Monodonta* [=*Osilinus*] (2.4-14.8%) and *Hexaplex trunculus* (4.1-10%). Other marine species (including 23 species of gastropods, 14 of bivalves, one cephalopod and one chiton) accounted for 11-30.2% of the samples. Most of these occurred in low numbers; more frequent species included *Columbella* (68), *Pisania* (31), *Littorina* (30), *Tonna* (16) and *Charonia* (11). Six *Tonna galea* and two *Semicassis saburon*, which had all been collected live, were found in a group on a Late Minoan paved surface. One *Charonia* was complete with a slightly broken apex, length 255 mm. A few fossil bivalves were also found.

Reese, D.S., 2011. Recent shells and a fossil sea urchin from Umm al-Biyara. pp. 110-113. In: Bienkowski, P. (ed.), *Umm al-Biyara: excavations by Crystal M. Bennett in Petra 1960-1965*. Oxford, Oxbow Books and Council for British Research in the Levant (Levant Supplementary Series 10).
ABSTRACT: The excavations at Umm al-Biyara produced 119 marine shells, comprising 106 cowries (mostly *Cypraea annulus* [=*Monetaria annulus*]), four *Glycymeris*, two *Tridacna*, two *Conus*, one *Turbo radiatus* operculum, one *Cerithium erythraeonense*, one *Strombus decorus persicus*, one cassid and one disintegrated shell. All these species originated in the Red Sea. Most (68%) of the shells came from Phase 1 and were dated to the 7th-6th centuries BC. Of the cowries, 69 were unholed, 21 had been holed by grinding the dorsum and 16 were not seen by the author. All four *Glycymeris* were holed at the umbo, two of them by grinding. The cerith was a worn shell with a carefully made hole opposite the mouth and was probably worn as a pendant. The other shells were unworked.

Reese, D.S., 2012. Inventory of marine and freshwater shells. pp. 443-450. In: Lightfoot, C.S. and Ivison, E.A. (eds), *Amorium reports 3: The Lower City Enclosure. Find reports and technical studies*. Istanbul, Ege Yayınları.
ABSTRACT: The shell assemblage from the Lower City Enclosure at Amorium is dated to the Medieval period (6th-11th centuries) and provides rare evidence for the use of both

imported marine and local freshwater molluscs in inland Anatolia in historical times. Sixteen marine shells (two *Bolinus brandaris*, two *Hexaplex trunculus* (one holed), two *Cerithium vulgatum*, one *Luria lurida* (holed), one *Tonna galea*, one *Acanthocardia tuberculata*, one *Glycymeris insubrica* (holed), five *Mytilus galloprovincialis* and one *Ostrea edulis*), 41 freshwater bivalves (four *Anodonta* cf. *palustris* and 37 *Unio* sp.) and one mother-of-pearl inlay (possibly *Pinctada margaritifera*) were recorded.

Reese, D.S., Mylona, D., Bending, J. and Ntinou, M., 2011. Fauna and flora. pp. 125 *et seq*. In: Soles, J.S. *et al*. (eds), *Mochlos IIC: Period IV: The Mycenaean settlement and cemetery. The human remains and other finds*. Philadelphia, INSTAP Academic Press (Prehistory Monographs 32).
ABSTRACT: This chapter discusses the organic remains that were recovered from the excavation of individual houses and rooms in a Late Minoan settlement on the island of Mochlos, north-east Crete, and which are catalogued elsewhere. There were some large deposits of shells, mostly representing food species: of 812 shells found in the North Corridor leading to Houses M and B (LMII-III), 387 were *Patella*, 314 were *Monodonta* [=*Osilinus*] and 37 were 'Murex'. This deposit also included a holed *Conus*. Murex shells were frequently associated with limpets and topshells and were the third most frequent shell type. Also recorded were *Glycymeris* (one, water-worn and holed), several *Charonia* (including almost complete shells that could have been used as scoops), an *Astraea* operculum, and numbers of *Cerithium, Nassarius* and *Pisania*.

Soles, J.S., Nicgorski, A.M., Kopaka, K., Carter, T., Giumlia-Mair, A., Reese, D.S. and Soles, M.E., 2011. Jewelry and other small finds. In: Soles, J.S. *et al*. (eds), *Mochlos IIC: Period IV: The Mycenaean settlement and cemetery. The human remains and other finds*. Philadelphia, INSTAP Academic Press (Prehistory Monographs 32).
ABSTRACT: Six shell beads (four *Conus* holed at the apex, one *Glycymeris* holed at the umbo and one *Monodonta* [=*Osilinus*] ground down at the apex to form a ring blank) were found in LMIII deposits in a Late Minoan settlement on the island of Mochlos, north-east Crete. Four of the beads came from House A and may have belonged to a single necklace. Six *Charonia sequenzae* [=*C. variegata*], of which five shells were virtually complete, appeared to have been collected live for food; one of them and a *Tonna galea* shell were found as tomb offerings, as were two fossil (Pliocene/Pleistocene) gastropods.

Conferences

Past conferences

Association for Environmental Archaeology, Autumn Meeting 2011
This meeting was held at the VU University, Amsterdam, on 21-22 October 2011 with the theme 'Subsistence and surplus production'.

The first session, 'Self-subsistent societies', was opened with a presentation by James Walker (Durham University, UK) entitled *Finding the famine? An integrated approach to testing hypotheses of shellfish as a starvation food*. Applying stable oxygen isotope analysis on periwinkles (*Littorina littorea*) from Mesolithic shell middens on the island of Oronsay, Argyll, Scotland, he was able to show that harvesting took place during the season when, according to studies on modern populations, their flavour and calorific value were both at a peak. He concluded that the periwinkles had been preferentially harvested, thus challenging the common perception that shellfish represent 'famine food'.

ICAZ Archaeomalacology Working Group, 3rd Independent Meeting 2012
This AMWG meeting was held at Cairns, Queensland, Australia, from 18-23 June 2012.

Preliminary indications on the grapevine suggest that this meeting was a great success. Look out for a report in the next issue of the *AMG Newsletter*!

Future conferences

Conference on the Bioarchaeology of Egypt
This conference will be held at the American University in Cairo, Egypt, from 31 January to 2 February 2013.

Knowledge of ancient Egypt has long been based on its spectacular material culture, but increasing attention is now being given to the bioarchaeological remains that concern human health and nutrition, animal husbandry, agriculture and the natural environment. The second day of the conference will be divided equally between papers on archaeozoology and archaeobotany: topics may include anything in these fields relating to the archaeology of Egypt. For details, please see http://conf.aucegypt.edu/BAE2013.

Not just for show: The archaeology of beads, beadwork and personal ornaments
This is the title of a symposium being organised by Daniella E. Bar-Yosef Mayer (Tel Aviv University) and Alice M. Choyke (Central European University) that will be held at the 78th Annual Meeting of the Society for American Archaeology in Honolulu, Hawaii, from 3-7 April 2013. More details of this meeting can be found on the SAA website at http://saa.org/AbouttheSociety/AnnualMeeting.

Beads, beadwork and personal ornaments are topics of growing interest. Recent research based on microscopy and various analytical procedures have enhanced the archaeological understanding of exchange networks, technological advances, mortuary practices, symbolism, and so on. Beads also have a fractal nature, meaning that ornaments can be broken up and redistributed to serve a variety of purposes related to social enchainment. Beads made of materials of biological origin, stones and minerals, and composite materials will be included. The geographical and chronological scope is open. The aim is to present cutting edge research on beads and personal ornaments using various approaches.

Please send your name and affiliation, and the title and abstract (no more than 250 words) of your paper to baryosef@post.tau.ac.il or choyke@ceu.hu by **15 August 2012**.