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11 Hand-collected shell

Matthew Law[1] *and Richard Madgwick*[2]

Introduction and methods

In addition to the shells extracted from bulk sediment samples (Veropoulidou, Chapter 10), a number of mollusc shells were hand-collected during the course of excavation. These were identified by RM during the 2007 and 2008 field seasons. Recording was undertaken as part of the faunal analysis without the benefit of a reference collection or laboratory conditions. This report has been written using information from the initial recording, but without access to the shells themselves, which remain in Albania. As a result of the methodology used for data collection at the time, the tables at the end of this report provide numbers of identified specimens present (NISP) for each taxon rather than minimum number of individuals (MNI). In some cases this will result in a number much higher than the actual number of individuals represented. MNI figures could only be calculated for *Spondylus gaederopus* (see Tables 11.9 and 11.10).

Taxa were identified to species level where possible. Fragments of *Hexaplex trunculus* and *Bolinus brandaris* which lacked diagnostic elements of the shell were recorded as Muricidae sp.. Nomenclature for marine species follows CLEMAM. As a result of taxonomic revision, *Tapes decussatus* of other authors is now known as *Ruditapes decussatus*.

Results

For the purposes of this report, discussions of chronological change have been simplified to comprise only two periods: Roman and late antique (Phases 1–10) and medieval (Phases 11–16). However, more detailed data on sub-phases are presented in the form of NISP values for taxa in Tables 11.1 – 11.8. MNI values by context of *Spondylus gaederopus* are presented in Tables 11.9 and 11.10. The taxa recorded have been arranged into five ecological groups. These are as follows:

- VrA are marine molluscs which live on soft substrate in lagoons, estuaries and other shallow waters. This group comprises *Cerastoderma glaucum* and *Ruditapes decussatus*.
- VrB are marine molluscs which live on hard or soft substrate in shallow waters of estuaries and lagoons. This group is represented by *Hexaplex trunculus* and *Cerithium vulgatum*.
- VrC are marine molluscs which live on hard substrate in shallow waters. This group is represented by *Bolinus brandaris* and *Mytilus galloprovincialis*.
- VrD are marine molluscs which live on hard substrate on mid- to lower shores. This group is represented by *Spondylus gaederopus*.
- VrE are terrestrial molluscs. This group is represented by *Helix pomatia*.

Discussion

The shells recovered are all likely to represent food waste or, in the case of the Muricidae *Hexaplex trunculus* and *Bolinus brandaris*, possible evidence of dye production. Interpretation of the shell assemblage in terms of wider significance can only be tentative because of the low numbers recovered and the bias of recovery inherent in hand-collected assemblages. Overall the assemblage shows fluctuations through time of a few dominant species (*Spondylus gaederopus*, *Cerastoderma glaucum* and *Mytilus galloprovincialis*) and presence or absence of small numbers of other species. Hand-collected shell assemblages from archaeological sites are invariably an incomplete representation of the molluscs brought onto a site during its use. Shells may be deposited outside of the excavation area, reused as structural inserts or in the manufacture of lime or mortar, or lost through other depletion processes such as chemical or mechanical degradation of shells in the burial environment. However, some general remarks may be made about the assemblage.

Changes through time

From Phases 1 to 9/10, the assemblage is dominated by the spiny oyster *Spondylus gaederopus*. This species is the only representative of an economically very important genus in the Mediterranean and Adriatic.[3] It is an edible species whose shell has also been used since prehistory in the manufacture of ornaments.[4] Indeed, it was also used ornamentally by

Table 11.1. NISP values for hand-collected shell, Phases 1–3a (mid-1st to late 3rd century AD)

Taxa	*Ecological group*	*Ecological notes*	*Context*	*5055*	*7120*	*3709*	*3945*	*7163*	*7316*	*7806*	*7911*
			Phase	*1*	*2*	*3a*	*3a*	*3a*	*3a*	*3a*	*3a*
Grooved carpet shell *Ruditapes decussatus* (Linnaeus, 1758)	VrA	Marine, shallow inlets & sand banks, sand & mud			1		4				
Lagoon cockle *Cerastoderma glaucum* (Bruguière, 1789)	VrA	Sandbanks, estuaries, lagoons & shallow bays & inlets, sand & mud					1				
Cerithium vulgatum Bruguière, 1792	VrB	Marine, shallow inlets & sand banks, sand & mud								1	1
Banded dye-murex *Hexaplex trunculus* (Linnaeus, 1758)	VrB	Marine, shallow inlets & sand banks, rocks, sand & mud					2			1	
Muricidae sp.	VrB/VrC	Marine					1				1
Mediterranean mussel *Mytilus galloprovincialis* Lamarck, 1819	VrC	Reefs, hard substrate				1					
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate		2	1		18	1	1		

Table 11.2. NISP values for hand-collected shell, Phases 4–5 (late 4th to early 5th century AD)

Taxa	*Ecological groups*	*Ecological notes*	*Context*	*2149*	*3498*	*7228*
			Phase	*4*	*5*	*5*
Lagoon cockle *Cerastoderma glaucum* (Bruguière, 1789)	VrA	Sandbanks, estuaries, lagoons & shallow bays & inlets, sand & mud		7		1
Banded dye-murex *Hexaplex trunculus* (Linnaeus, 1758)	VrB	Marine, shallow inlets& sand banks, rocks , sand & mud			1	5
Purple dye-murex *Bolinus brandaris* (Linnaeus, 1758)	VrC	Marine, shallow water, rocks				2
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate		2	2	31
Edible snail *Helix pomatia* Linnaeus, 1758	VrE	Terrestrial, woods & open places		2		1

Table 11.3. NISP values for hand-collected shell, Phases 7–8 (early 6th to mid-6th century AD)

Taxa	*Ecological group*	*Ecological notes*	*Context*	*3804*	*7048*	*7097*	*3026*	*5056*	*5099*	*3088*
			Phase	*7*	*7*	*7*	*7/8*	*7/8*	*7/8*	*8*
Muricidae sp.	VrB/VrC	Marine					1			
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate		1	1	1		3	3	3
Edible snail *Helix pomatia* Linnaeus, 1758	VrE	Terrestrial, woods & open places				2				3

Table 11.4. NISP values for hand-collected shell, Phases 9–10 (late 6th to early 9th century AD)

Taxa	*Ecological group*	*Context Phase Ecological notes*	*5007 9/10*	*5026 9/10*	*77 10*	*108 10*	*3330 10*	*3430 10*	*3462 10*	*3998 10*	*7057 10*	*7059 10*	*7096 10*	*7159 10*
Lagoon cockle *Cerastoderma glaucum* (Bruguière, 1789)	VrA	Sandbanks, estuaries, lagoons & shallow bays & inlets, sand & mud	1	1					1					
Cerithium vulgatum Bruguière, 1792	VrB	Marine, shallow inlets & sand banks		1				1						
Banded dye-murex *Hexaplex trunculus* (Linnaeus, 1758)	VrB	Marine, shallow inlets & sand banks, rocks, sand & mud	2	1						1				
Muricidae sp.	VrB/ C	Marine							2					
Purple dye-murex *Bolinus brandaris* (Linnaeus, 1758)	VrC	Marine, shallow water, rocks		1								2		
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate	6	2	4	3	1		7		1		2	9
Edible snail *Helix pomatia* Linnaeus, 1758	VrE	Terrestrial, woods & open places	1						1					

Neanderthals.[5] The shells examined in this assemblage are unworked and are likely to represent food waste.

In Phases 11 and 12, the assemblage is dominated by the lagoon cockle, *Cerastoderma glaucum.* This has been a common find in archaeological sites in south-east Europe,[6] and is the dominant taxon recorded at Bronze Age Troia and other sites in the Aegean.[7] It is an infaunal species which lives in large populations on muddy, sandy and coarse sandy bottoms in closed or semi-open lagoons away from strong tidal influence.[8]

In Phase 12, there is also a rise in the number of mussels (*Mytilus galloprovincialis*), which becomes the dominant species in Phase 13. Mussels live on gravelly to rocky substrates on the middle shore down to depths of 6–9 m.[9] Mussel colonies can contain enormous numbers of individuals; as such, mussels are well suited to aquaculture. Mussel farming continues on Lake Butrint to the present day.[10] In Phases 14, 15 and 16, the assemblage is particularly small, mussels being completely absent in Phases 15 and 16.

It is tempting to see the changes in relative abundance of different taxa as evidence of changes in diet, perhaps determined by changing cultural preferences, or by changing availability of different species, and this may be the case. Caution should be exercised when drawing inferences from such a small sample, however, as the changes may reflect nothing more than incomplete recovery.

Environments exploited

The molluscs brought to the site are predominantly from shore and shallow water environments and are likely to have been harvested locally. Areas of both hard and soft substrate, suitable for *Mytilus galloprovincialis* and *Cerastoderma glaucum* respectively, may be found within Lake Butrint, while *Spondylus gaederopus* and *Bolinus brandaris* occur in the shallows of the open sea. The edible land snail *Helix pomatia* is found in woodlands, hedges and a variety of environments away from strong direct sunlight, and may have lived within the settlement. The Muricidae, *Hexaplex trunculus* and *Bolinus brandaris*, are carnivorous gastropods, and would have been caught using baited pots or baskets containing rotting meat or fish.

Table 11.5. NISP values for hand-collected shell, Phase 11 (mid-9th to mid-10th century AD)

Taxa	*Ecological group*	*Context* / *Phase* / *Ecological notes*	*101* *11*	*121* *11*	*3495* *11*	*3566* *11*	*3920* *11*	*5017* *11*	*7003* *11*
Lagoon cockle *Cerastoderma glaucum* (Bruguière, 1789)	VrA	Sandbanks, estuaries, lagoons & shallow bays & inlets, sand & mud	1	1	8			76	
Grooved carpet shell *Ruditapes decussatus* (Linnaeus, 1758)	VrA	Marine, shallow inlets & sand banks, sand & mud						2	
Banded dye-murex *Hexaplex trunculus* (Linnaeus, 1758)	VrB	Marine, shallow inlets & sand banks			1				
Muricidae sp.	VrB/C	Marine			1	1	1		
Mediterranean mussel *Mytilus gallo provincialis* Lamarck, 1819	VrC	Reefs, hard substrate		1					1
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate			1			10	

Dye manufacture

Both *Hexaplex trunculus* and *Bolinus brandaris* have historically been used in the manufacture of dye. *Hexaplex trunculus* yields a rich purple dye known as Tyrian purple, while that of *Bolinus brandaris* is more of a crimson or wine colour.[11] The process of extracting the dye was described by Pliny the Elder in his *Natural History*.[12] In order to produce the dye, the shells were smashed so that the hypobranchial gland could be extracted. The mucus this gland produces is not initially purple – it passes through a yellowish colour and blue to become purple in reaction to sunlight. The extracted gland and mucus were then put in a covered pot containing sea water. The mixture would be steeped for three days, heated, then steeped again.[13] In experiments, Ruscillo found that a blue dye can also be produced by immersing textiles immediately after gland extraction in an unsteeped mixture of glands and mucus with sea water for ten minutes before drying in the sun.[14] As Carranante notes, a growing number of scholars favour the idea that small, domestic-scale dye manufacture may not require large numbers of snails, although it should be noted that the practice creates an unpleasant, and persistent, smell, which may have meant that the process was not carried out in the home.[15] The shells may alternatively represent food waste, although the fragmented nature of many of the unidentifiable Muricidae seems more consistent with dye extraction. Both species are present throughout all phases, except Phase 12. Their absence in this phase may simply be an absence of shell recovery rather than an indication of a hiatus in their use. Both species occur in higher numbers in the Roman and late antique periods than the medieval, however.

Concluding remarks

Although small, the Vrina Plain hand-collected shell assemblage offers an insight into the past economic use of molluscs. Shellfish were harvested in Lake Butrint, with choice taxa being sought on the shores and shallows of the open sea. *Spondylus gaederopus*, *Cerastoderma glaucum* and *Mytilus galloprovincialis* especially were favoured. The popularity of *Spondylus* appears to decline through time, although this may be the result of bias in the assemblage rather than a reflection of changing tastes or availability. More data from comparable sites are needed to build a more complete picture of changes in shellfish exploitation in the region.

Comparison with the shell assemblage from the bulk sediment samples (Veropoulidou, Chapter 10) allows some more definite trends to be described. In particular, *Mytilus galloprovincalis* grows in significance in the medieval period, to the notable detriment of *Spondylus gaederopus*. It may be that this coincides with the development of aquaculture in Lake Butrint. There is evidence in the assemblage to suggest that dye manufacture was carried out on a small, household scale, and continued into, and perhaps beyond, the 12th century. Taking into account the findings from the bulk sediment samples, it does appear that dye manufacture was more significant before the medieval period, lending support to Veropoulidou's suggestion that the household dye industry ceased when tighter regulations about purple-dye use were put into place.

Table 11.6. NISP values for hand-collected shell, Phase 12 (late 10th to 11th century AD)

Taxa	*Ecological group*	*Context* *Phase* *Ecological notes*	*3037* *12*	*3048* *12*	*3060* *12*	*3094* *12*	*3107* *12*	*3222* *12*	*3224* *12*	*3230* *12*	*3233* *12*	*3333* *12*	*3343* *12*	*3344* *12*	*3362* *12*	*3371* *12*	*3380* *12*	*3425* *12*	*3705* *12*	*3711* *12*	*3717* *12*	*3761* *12*
Lagoon cockle *Cerastoderma glaucum* (Bruguière, 1789)	VrA	Sandbanks, estuaries, lagoons & shallow bays & inlets, sand & mud						3	11	3					2	9	6			89	8	15
Mediterranean mussel *Mytilus galloprovincialis* Lamarck, 1819	VrC	Reefs, hard substrate	1	1								2	1		6				1		42	10
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate		1	1	1	2	2		1	5	2	2	1				1				
Edible snail *Helix pomatia* Linnaeus, 1758	VrE	Terrestrial, woods & open places			1																	

Table 11.7. NISP values for hand-collected shell, Phases 13–14 (11th to 13th century AD)

Taxa	*Ecological group*	*Context* / *Phase* / *Ecological notes*	*3033* / *13*	*3216* / *13*	*3323* / *13*	*3326* / *13*	*3345* / *13*	*5014* / *13*	*5015* / *13*	*7058* / *13*	*3047* / *13/14*	*3401* / *13/14*	*3457* / *13/14*	*3482* / *13/14*	*3391* / *14*	*3715* / *14*	*5096* / *14*
Lagoon cockle *Cerastoderma glaucum* (Bruguière, 1789)	VrA	Sandbanks, estuaries, lagoons & shallow bays & inlets, sand & mud			8		5										
Banded dye-murex *Hexaplex trunculus* (Linnaeus, 1758)	VrB	Marine, shallow inlets & sand banks					3	1			1	1					
Muricidae sp.	VrB/C	Marine											1				
Purple dye-murex *Bolinus brandaris* (Linnaeus, 1758)	VrC	Marine, shallow water, rocks												1			
Mediterranean mussel *Mytilus gallo-provincialis* Lamarck, 1819	VrC	Reefs, hard substrate				23									1	2	
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate	1	1			6	3	10	4			3				1
Edible snail *Helix pomatia* Linnaeus, 1758	VrE	Terrestrial, woods & open places							3								

Table 11.8. NISP values for hand-collected shell, Phases 15–16 (13th century AD)

Taxa	Ecological group	Context / Phase / Ecological notes	99 15	5000 15	5001 15	5002 15	7701 15
Lagoon cockle *Cerastoderma glaucum* (Bruguière, 1789)	VrA	Sandbanks, estuaries, lagoons & shallow bays & inlets, sand & mud		1		2	
Muricidae sp.	VrB/C	Marine				2	
Spiny oyster *Spondylus gaedoropus* Linnaeus, 1758	VrD	Reefs, rocky substrate	1		1	6	1
Edible snail *Helix pomatia* Linnaeus, 1758	VrE	Terrestrial, woods & open places				1	

Table 11.9. MNI values for Spondylus gaederopus*, by context (Roman and late antique periods)*

Phase	Context	MNI	No. right hinges	No. left hinges
1	5055	1		1
2	7120	2	2	
3	3709	1	1	
	3945	2	2	1
	5112	1		1
4	2149	1	1	1
5	3498	1	1	1
	7224	1	1	1
7	3804	1		1
	7048	1	1	
	7097	1		1
7/8	5056	1	1	
	5099	1	1	1
9/10	5007	3	3	2
	5026	1	1	1
10	77	1	1	1
	108	3	3	
	3330	1		1
	3462	3	3	1
	7057	1		1
	7096	1		1
	7159	1		1
	Total	30	23	18

Table 11.10. Survival of left and right valves of Spondylus gaederopus*, by context (medieval period)*

Phase	Context	MNI	No. right hinges	No. left hinges
11	3495	2	1	2
	5017	4	4	1
	7003	1		1
12	121	2	2	
	3037	1	1	
	3048	1	1	1
	3060	1		1
	3094	1		1
	3107	2		2
	3222	1	1	1
	3230	1	1	
	3333	1		1
	3343	2		2
	3344	2		2
	3362	2	2	2
	3380	2	2	
	3425	2	2	
	3711	2	1	2
	3761	2	2	2
13	3033	1		1
	3216	1		1
	3345	1	1	1
	5014	2		2
	5015	2	1	2
	7058	1		1
13/14	3457	2	1	2
14	3715	1	1	
	5096	1		1
15	99	1	1	
	5000	1		1
	5001	1		1
	5002	1		1
	7701	1		1
	Total	49	25	36

Notes

1 Department of Geography, Bath Spa University.
2 School of History, Archaeology and Religion, Cardiff University.
3 Çakirlar 2009, 64.
4 Nikolaidou and Ifantidis 2011.
5 Zilhao *et al.* 2010.
6 Çakirlar 2008, 92.
7 Çakirlar 2009, 65.
8 Çakirlar 2008, 95.
9 Çakirlar 2009, 63.
10 Pers. comm., Joss Davis.
11 Ruscillo 2005, 100.
12 Pliny *IX, 60.*
13 Ruscillo 2005, 103–4; Carranante 2011, 11.
14 Ruscillo 2005, 104–5.
15 Carranante 2011, 11, 14–15.