



Written in Bones

**Studies on technological
and social contexts
of past faunal skeletal remains**

edited by
Justyna Baron
Bernadeta Kufel-Diakowska

Uniwersytet Wrocławski
Instytut Archeologii

Wrocław 2011

INSTITUTE OF ARCHAEOLOGY, UNIVERSITY OF WROCLAW, 2011

Editors

Justyna Baron and Bernadeta Kufel-Diakowska

Reviewers

Arkadiusz Marciniak, Jarosław Wilczyński

Layout

Janusz M. Szafran, Jarosław Michalak

Cover

Justyna Baron

© Institute of Archaeology, University of Wrocław and individual authors 2011

ISBN 978-83-61416-64-7

Wrocławska Drukarnia Naukowa PAN im. Stanisława Kulczyńskiego Sp. z o.o.
53-505 Wrocław, ul. Lelewela 4

Preliminary Data Concerning the Manufacturing of Animal Raw Materials in the Chalcolithic Cucuteni *B* Settlement of Poduri-Dealul Ghindaru, Romania

The archaeological research of the Chalcolithic settlement of Poduri, belonged to the Cucuteni culture, aims to research subsistence practices including the manufacturing of animal raw materials as reflected by archaeological analyses. The animal remains studied in the present paper represent bone, antler, tooth and shell artefacts, belonging to phase *B* of the Cucuteni culture, recovered from the archaeological excavations carried out in 2007-2008.

Among the finds, bone and antler artefacts are quite numerous, but we also identified pieces made of teeth and shells. The discussed artefacts include tools, ornaments (pendants) and probably gaming pieces (knucklebones). The mammal species identified are both wild and domestic: red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa ferus*), aurochs (*Bos primigenius*), cattle (*Bos taurus*), sheep/goat (*Ovis aries/Capra hircus*) and pig (*Sus scrofa domesticus*).

The artefacts have been identified in different stages of manufacturing and also having different wear levels. Our study emphasizes an important diversity in the typology of artefacts and also in the anatomical and taxonomical selection of raw materials.

Key words: bone, antler and tooth artefacts, Chalcolithic, Cucuteni culture, Poduri-Dealul Ghindaru, Romania

Introduction

The Cucuteni culture appeared and spread in the Eastern Romania, evolving in three chronological phases (*A*, *A-B* and *B*), between 4,600-3,500 cal BC (Mantu 1998:166). Over 125 years of research several settlements have been excavated, some of them integrally, and several hundred habitations have been studied (Monah, Cucos 1985:101-103).

The *Tell* of Poduri-Dealul Ghindaru, Bacau county (Fig. 1), has the following position: 45°28'953"

North latitude and 26°30'029" East longitude, with an absolute altitude of 429 m. The *Tell* is situated on a fragment of the terrace of 30 m on the right bank of the Tazlau Sarat river and it currently has a surface of around 1.2 ha. The high level of complexity of the stratigraphy was emphasized in the 28 archaeological excavations campaigns that have taken place so far. Levels were reported belonging to the Precucuteni and Cucuteni Chalcolithic cultures and to the



Fig. 1. Map showing the location of Poduri-Dealul Ghindaru tell in Eastern Romania

Bronze Age (Monah *et al.* 2003:33-42). The animal remains studied in the present paper represent bone, antler, tooth and shell artefacts, belonging to phase B of the Cucuteni Culture, recovered from the archaeological excavations carried out in 2007-2008. The artefacts were dated by the archaeologists according to the pottery (Monah *et al.* 2007:274-275;

Dumitroaia *et al.* 2008:230-231). The artefacts (represented by tools and jewels) belonged to cultural complexes, as well as to *tell*'s layers. The cultural complexes of Cucuteni phase B level, represented by six dwellings (L1-L6), two clay's platforms (4 and 5), and several pits (4-6 and 8-12) revealed archaeological and archaeozoological materials.

Refuse bone assemblage

Out of the total of 16,643 faunal remains, identified in the level Cucuteni B of tell of Poduri, 9159 faunal remains (representing 55%) had been specific identifiable. This could be related to trampling and weathering and to the relatively slow sedimentation rates at the site. Of the 9159 faunal remains, 9121 belonged to mammals, 38 to other systematic classes (5 fish bones, 18 skeletal fragments of birds, 13 exoskeleton fragments of molluscs). Of the 9121 faunal remains of mammals, 154 belonged to a ritual deposition of dog and 8967 were assigned to different assemblage of level B Cucuteni of studied tell. Of the 8967 faunal remains of mammals, 8030 were assigned to domestic mammals (representing almost 89,55%) and 934 to the wild ones (10,45%). As the preliminary study (Bejenaru *et al.* 2009:225), the studied sample revealed the prevalence of cattle (38,64%) and sheep/goat remains (33,76%), fol-

lowed by pig (15,63%) within domestic mammals. In the level B Cucuteni of tell of Poduri, the prevalence of faunal remains of deer (*Cervus elaphus*) (43,35%), followed by those of wild boar (*Sus scrofa ferus*) (36,71%), roe deer (*Capreolus capreolus*) (10,71%) and aurochs (*Bos primigenius*) (representing 9,71%) were found within the wild mammals faunal remains.

We mention that the animal remains were recovered only "by hand", without sieving of the sediment, which may have caused the loss of some small pieces. The faunal analysis was done in the Laboratory of Archaeozoology, "Alexandru Ioan Cuza" University of Iasi. The study methodology was specific to archaeozoology, mainly consisting of anatomical, taxonomical and taphonomical identifications, encoding and quantification of data (Udrescu *et al.* 1999:44,145).

Raw material selection

In the level B Cucuteni of tell of Poduri, 8967 faunistic remains belonged to mammals, only 116 had been manufactured in tools or jewels. The frequency of the species that have been selected as source for raw materials is different to those recorded in the refuse bone assemblage (Table 1). Of these, 53 faunistic worked remains (representing 45,68%) belonged to domestic mammals: 25 being attributed to sheep/goat (*Ovis aries/Capra hircus*), 15 to the pig (*Sus scrofa domesticus*) and 13 to cattle (*Bos taurus*). The domestic mammal's long, short bones and teeth provided animal raw material in manufacturing household objects and jewels. In comparison with studied sample, in the level A Cucuteni of tell of Poduri was found a tooth of dog (*Canis familiaris*) worked as pendant.

Sixty three faunal remains of wild fauna (hunted or gathered), representing 54,32%, provided animal raw material represented by valve's shell, antlers,

long and short bones, as well as teeth, which had been used only in manufacturing of tools. Of the 62 faunal remains of wild mammals, 36 belonged to deer, 16 to roe-deer, 9 were assigned to the wild boar and one to the aurochs. The invertebrates were represented by a shell's valve, used as pendant.

The analysed animal raw material belonged only to adult individuals of domestic and wild mammals. Depending to the prevalence of mammal's skeletal elements used in manufacturing tools or jewels, in the level B of the tell of Poduri was recorded that 60% were produced from long bones (mostly metapodials, tibias, femurs, phalanges, radius, ulnas) and few from short bones (14%), antlers (12%), teeth (10%), ribs (4%). Over 60% of mammal's skeletal elements, used in processing of household objects were found in the dwellings, clay's platforms and Cucuteni B layer of the tell of Poduri. Less than 40% could be found in pits.

Typology and functions

The typology, the functionality and the degree of useness of the manufactured animal raw material, characteristic Cucuteni Culture area had been established according to the prehistoric bone industry studies (Beldiman 2007: 75-157). The tools made of long and short bones, teeth and antlers revealed

their multi-tasks in Chalcolithic community and displayed in many types in shape and function (Choyke 2005:134).

The domestic animal raw material, found in the level Cucuteni B of the tell of Poduri revealed the preponderance in processing of sharpen tools as



Fig. 2. Smoothers and scrapers on cattle ribs



Fig. 3. Bored centrotarsus of cattle

oblique and straight tips (8,62%), needles (0,86%), awls (1,72%), cutting blades (3,44%) were useful in perforating the slaughtered domestic animal's hides as well as in weaving and spinning. On the second place ranked the rounded tools made of skeletal elements of domestic mammals, were used in removing grease, wood- processing, grinding the pottery. We found with preponderance smoothers (10,34%), scrapers (3,44%), chisels (6,89%), handles and weight (0,82%). A few skeletal elements of domestic mammals were manufactured as ritual objects (1,72%) and pendants (3,44%).

Bos taurus. Of the 3465 skeletal elements of cattle, 13 (representing 0,37%) had been manufactured in tools and less in pendants. Long and short bones of cattle provided animal raw material in manufacturing rectangular plates, tips, chisels, smoothers, weight, handles and pendants. Two ribs of the cattle were flattened on the cranial-caudal surfaces and used as rectangular plates. These pieces weren't polished on their ends. If in the level Cucuteni A of the tell Poduri, the cattle's animal raw material used in manufacturing smoothers had been represented by the astragali polished on the cranial-caudal surfaces the, in the level B Cucuteni, where were found three ribs flattened also on the cranial-caudal surfaces, as well as in synchronous sample in Hungary. The scrapers were manufactured from two proximal fragments of metatarsus and another two distal fragments of metacarpus, which had been split and then flattened on the cranial-caudal surfaces and on the medio-lateral surfaces (Fig. 2). Three chisels had been worked in the level Cucuteni B of the tell of Poduri from the diaphysis of the long bones and the cranial elements (lower jaw) of cattle. Both diaphysal fragments of the cattle's femurs had been split in small parts. On one edge of each piece, on the cranial surface, these were rounded and flattened. The cattle's mandible (gonion fragment) had been polished on the vestibular and on the lingual surfaces. A centrotarsus of an adult individual of the cattle had been perforated complete and unpolished on the longitudinal ax. The piece could be used as a weight, being hanged on the fishing net (Fig. 3). This is the first archaeozoological evidence of a tool used in fishing, in the Cucuteni phase B area.



Fig. 4. Pointed pieces on sheep/goat long bones

A handle had been manufactured from a complete fused proximal phalanx of cattle, which had been incomplete perforated on the cranial surface. The whole is a big, central, unpolished. A complete fused medium phalanx of an adult individual of cattle had been perforated on the caudal surface and then slightly polished. The whole is small and centered. The piece had been used as pendant.

Ovis aries/Capra hircus. Of the 3029 faunal remains belonging to sheep/goat, only 25 (representing 0,82%) had been used in manufacturing in tools and less in ritual objects and pendants. The animal material raw had been represented by long and short bones. The skeletal elements were used mainly as smoothers, tips, chisels, ritual objects and pendants. The tips made of long bones were found in this sample. There were identified two types of tips: oblique and straight. A unique piece for Cucuteni phase B area was found in the tell of Poduri. The proximal fragment of a metacarpus belonging to sheep/goat had been double-worked. In the middle of the proximal epiphysis of the metacarpus was found a central and polished perforation. On the half of the diaphysis, this metacarpus had been oblique split (from the medio to lateral surface) and then rounded flattened. The piece could be used in spinning and weaving by chalcolithic communities. Of the eight long bones of sheep/goat, six were manufactured from proximal fragments of ulnas as awls; another two of radius as tips. These pieces were intensely used (Fig. 4). Two proximal fragments of radius of sheep/goat had been central perforated only on the cranial surface a small. The whole was slightly polished. The pieces could be used within the ritual ceremonies (Fig. 5). In comparison with level A, in the level B Cucuteni of the tell of Poduri were identified more astragali (7) of sheep/goat flattened on the medio-lateral surfaces. These knucklebones could be used in games or related to



Fig. 5. Bored radius of sheep/goat

ritual ceremonies of future's prediction (Fig. 6). The chisels were manufactured from two diaphysis of tibia of sheep/goat, which had been flattened on the cranial and caudal surfaces. Used as a chisels might have been the diaphysis of a humerus and a femur as well as a lower jaw, which had been slightly polished. A calcaneus of sheep/goat had been complete and central and complete perforated on the medio-lateral surfaces. The piece could be used as a pendant.

Sus domesticus. Of the 1402 skeletal elements belonging to pig in the level B Cucuteni of the tell of



Fig. 6. Polished astragals of sheep/goat

Poduri, 15 (representing 1,06%) had been manufactured in tools and less as pendants. The cranial elements (lower jaws and teeth), long and short bones of pig had been used as animal raw material used in manufacturing of the smoothers, chiesels, cutting blades, needles awls and pendants. Two astragali of pig were flattened on the medio-lateral surfaces. The pig's knucklebones could be used in games or in ritual ceremonies related to future's prediction. A diaphysal fragment of a tibia belonging to pig had been split on the caudal surface, then rounded and flattened from the cranial to caudal surface. The piece had been intensely used as a chiesel. Four diaphysal fragments of fibula belonging to mature individuals of pig had the cranial and caudal surfaces flattened. These pieces could be used as spatulas (Fig. 7). Five tusks belonging to mature individuals of pig had been manufactured as cutting blades. The teeth had been broken on the longitudinal ax and then flattened from their top to base (Fig. 8). If in level A Cucuteni of the tell of Poduri, a tooth was used as pendants, in the studied sample, two proximal phalanges of pig had been manufactured in jewels. The phalanges had been in the first third as well as in the middle of the caudal surface perforated.

The wild mammals material raw revealed the prevalence in manufacturing of sharpen tools as: soft-hammers, planters, tips, awls, needles, cutting blades, which were used in plat cultivation, perforating the wild animal's hides. Less faunal remains belonging to wild mammals were manufactured as chiesel, scrapers, smoothers and spatulas, used in wood-processing, removing grease. A pendant made of one phalanx of roe-deer had been discovered in level Cucuteni B of the studied tell.



Fig. 7. Artefacts from pig bones (astragal and fibulae)

Cervus elaphus. Of the 359 faunal remains of deer, only 36 were manufactured only in tools (representing 10,02%). As animal raw materials prehistoric community used antlers as well as long and short bones. Only the deer's antler provided raw material for 16 soft-hammers, 8 planters and one handle; in association with long and short bones, the antler had been used in achieving of 8 tips and scrapers, six smoothers and a chiesel. A handle had been manufactured from a fragment of a deer's beam. The external surface of the beam was pearled, only it's edges had been polished. The content of the beam was slightly emptied. The soft-hammers (16), identified in the level B Cucuteni of the tell of Poduri had been manufactured from the brow-tine, beam and crow-tine of the deer. There were identified eight soft-hammers made from brow-tines, another five from the beam, and one from the deer's crow-tine. Two of the eight soft-hammers made of brow-tines had been calcinated, burnt and chopped (Fig. 9:a-b). Almost all the soft-hammers had been perforated and intensely used. Eight bay-tines of deer were intensely used as planters. These pieces were broken away from the beam and then each piece flattened and rounded on the top and on it's base. The tips were made of the diaphysis of the metapodials, and deer's ulnae. A part of the beam had been cut on the longitudinal axis, then both edges intensely flattened in the V shape. The external surface of the beam hadn't been polished. The diaphysis of two metatarsi of the deer were split along the internanomial ridge and then flattened mainly on the medio-lateral and less on the cranial-caudal surfaces. The metapodials were intensely used as tips. Six diaphysal fragments of ulna of the red-deer had been split on their caudal faces and slightly flattened



Fig. 8. Split lower canines of wild boar



Fig. 9. Artefacts from red deer antlers (a. pointed ended tine; b. soft-hammer)

to their proximal ends. These left long bones might be considered waste material in manufacturing tips. Six astragali and two fragments of deer's beam were manufactured as smoothers. In the level Cucuteni B of the tell of Poduri, the deer's astragali were flattened on the medio-lateral surfaces. Many black-burnt and cut-marks on the deer's astragali revealed their useness as gaming pieces or in ritual ceremonies, in analogy with the deposit of cattle and deer astragali found in the level A Cucuteni of the same tell (Bejenaru *et al.* 2010). Both deer's beam had been in half broken and then flattened only on the internal part; the external part of the deer's beam had been kept pearled. Eight proximal and distal ends of the deer's metatarsi were manufactured as scrapers. The pieces were split along the intercanonial ridge and then flattened on the cranio-caudal as well as on medio-lateral surfaces. One proximal fragment of a metatarsus had been black-burnt and another distal had a cut-mark. A distal fragment of a deer's metacarpus had been flattened on the cranio-caudal and on the medio-lateral surfaces. The piece had been black-burnt marks and had been used as a chiesel.



Capreolus capreolus. Of the 89 skeletal elements belonging to roe-deer in the level B Cucuteni of the tell of Poduri, 16 had been manufactured in tools and less as pendants. The animal raw material of roe-deer was represented by long (mostly ulna and metapodals) and short bones. Seven distal fragments of roe-deer's metapodials, had been split and then flattened on the cranio-caudal and on the lateral surfaces in obtaining the awls (Fig. 10). Two fragments of meta-



Fig. 10. Perforating tools from roe deer metapodium

carpus (one distal and another proximal) of the roe-deer, which had been split on the cranial face and then the intercanonial ridge polished and widened, represented the animal raw material in manufacturing needles. Two proximal fragments of a metacarpus and a metatarsus, belonging to roe-deer had been in V shape flattened: the first on the cranial and the second on the caudal surface, in manufacturing the tips. Four proximal fragments of ulna belonging to roe-deer had been intensely flattened on the cranial-caudal surfaces and used as spatulas; one of them had the active part broken. In the level B Cucuteni of the tell of Poduri had been identified a medium phalanx of roe-deer, manufactured as pendant. The piece had been complete perforated on the medio-lateral surfaces.

Sus scrofa ferus. Of the 304 skeletal elements belonging to wild boar in the level B Cucuteni of the tell Poduri, nine had been worked (representing 2,96%) in tools. Boar's animal raw material used in manufacturing process was represented by long bone and tusks. The faunal remains of wild boar were mostly manufactured as cutting blades,



Fig. 11. Bored shell of the painter's mussel (*Unio pictorum*)

needles, smoothers and spatulae. There four tusks of wild boar were manufactured as cutting blades. The pieces were broken on the longitudinal ax and then flattened from the root to their top. Also, there was found a right-side, lower incisor of wild boar used as needle. Their manufacturing process is opposite than that used in boar's tusks. A diaphysis and two proximal fragments of wild boar's ulna had been flattened on the cranial-caudal surfaces. These pieces could be used as smoothers. A distal fragment of a fibula of wild boar had been slightly flattened. The piece could be used as a spatula.

Bos primigenius. In the level B Cucuteni of the tell Poduri was identified a long bone worked of aurochs (representing 1,31%) of the total of 76 identified. An astragalus of had been smoothed on the cranial-caudal surfaces. The piece was intensely used as smoother.

Unio pictorum. In the studied sample, there were identified faunal remains assigned to invertebrates. A shell valve, mostly entire had a central perforation on the longitudinal ax. The piece could be used as pendant (Fig. 11).

Conclusions

The examination of the artefacts from Cucuteni B level of Poduri-Dealul Ghindaru tell reveals different stages of manufacture and shows a diversity of products obtained by simple and laborious manufacturing methods. Raw material selection in this studied assemblage follows practical considerations mainly relating to material strength, shape and size. The artefacts have been identified in different stages of manufacturing and they also have different wear levels.

The mammalian bones attest to the concern of Chalcolithic community to produce mostly tools, which were used in weaving, removing grease, wood processing, pottery finishing and plant cultivation. Phalanges and long bones of domestic and wild mammals as well as the exoskeleton shell's fragments were raw materials in manufacturing of jewels and ritual objects.

Table 1. Frequency of refuse remains compared with artefacts
(NISP=number of identified specimens, N tools = number of tools)

Taxon	Refuse assemblage		Artefacts (Tools)	
	NISP	%	N tools	%
Domestic mammals	8030	89,55	53	45,68
Cattle (<i>Bos taurus</i>)	3452	38,64	13	11,20
Sheep/Goat (<i>Ovis aries</i> / <i>Capra hircus</i>)	3004	33,76	25	21,55
Pig (<i>Sus domesticus</i>)	1389	15,63	15	12,93
Wild mammals	934	10,42	62	44,32
Red deer (<i>Cervus elaphus</i>)	323	4	36	31,03
Roe deer (<i>Capreolus capreolus</i>)	73	0,99	16	13,79
Wild boar (<i>Sus scrofa ferus</i>)	295	3,39	9	7,75
Aurochs (<i>Bos primigenius</i>)	75	0,84	1	0,86
Shell (<i>Unio pictorum</i>)	7	0,02	1	0,86
Total	16527	100	116	100

Acknowledgements

We wish to thank archaeologists Dr. Dan Monah (Archaeological Institute of Iasi) and Dr. Gheorghe Dumitroaia (International Centre of Cucuteni Culture Research, Piatra Neamt) for providing us with the animal remains they excavated and important data used in this study.

This study was supported by the Romanian research programs CNCSIS-BD 304/2008-2010, and CNCSIS - PN II Idei_2116/2008.

References

- Bejenaru, L., C. Oleniuc and S. Stanc 2009. A faunal assemblage from the Chalcolithic settlement of Poduri-Dealul Ghindaru (Bacau County). Preliminary data on subsistence patterns associated with Cucuteni-phase B level, Analele stiintifice ale Universitatii "Alexandru Ioan Cuza" din Iasi, Biologie animala LV, 223-8.
- Bejenaru, L., D. Monah and G. Bodi 2010. A deposit of astragali at the Copper Age tell of Poduri-Dealul Ghindaru, Romania, Antiquity, Project Gallery, 084/323, <http://www.antiquity.ac.uk/projgall/bejenaru323/>
- Dumitroaia, Gh., R. Munteanu, C. Preoteasa, D. Garvăn, L. Uță, D. Nicola and D. Monah 2008. Poduri, com. Poduri, jud. Bacău. Punct: Dealul Ghindaru, Cronica Cercetărilor Arheologice din România. Campania 2006, 230-231.
- Mantu, C.M. 1998. Cultura Cucuteni: evoluție, cronologie, legături, Piatra Neamt: Editura Constantin Matasa.
- Monah, D. and St. Cucuș 1985. Așezările culturii Cucuteni din Romania, Iași: Editura Junimea.
- Monah, D., Gh. Dumitroaia, F. Monah, C. Preuteasa, R. Munteanu and D. Nicola 2003. Poduri-Dealul Ghindaru. O troie in Subcarpatii Moldovei, Piatra-Neamt: Editura Constantin Matasa.
- Monah, D., Gh. Dumitroaia, R. Munteanu, C. Preoteasa, D. Garvăn, L. Uță and D. Nicola 2007. Poduri, com. Poduri, jud. Bacău. Punct: Dealul Ghindaru, Cronica Cercetărilor Arheologice din România. Campania 2006, 274-275.
- Udrescu, M., L. Bejenaru and C. Hriscu 1999. Introducere in arheozoologie, Iasi: Editura Corson.