

**Studia Antiqua et Archaeologica, VII, Iași, 2000**

**LITHIC TOOLS IN THE CUCUTENI SETTLEMENT OF  
DOBRENI – MĂTĂHUIA HILL**

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In 1998, systematic researches began in the Cucuteni settlement of Dobreni-*Mătăhuia Hill*<sup>\*)</sup>, settlement which has been known since 1936, when Vl. Dumitrescu and C-tin Matasă carried out the first archaeological researches (MATASĂ 1938, 31-32; 1946, 5). The above-mentioned Cucuteni settlement lies within the Sub-Carpathian area, on the upper terrace, on the right bank of Cracău river, at 520 m absolute altitude.

The relative simple stratigraphy of the settlement and the scarcity of painted pottery provided by excavations in 1998 campaign evince habitation ascribed to Cucuteni A, probably A-B, and Cucuteni B phases. Further researches will certainly clear up these matters.

We do not intend to go into details referring to excavations and habitation complex description, since it has already been the subject of a preliminary report (DUMITROAIA, COTOI, URSU, NICOLA 1999, 25-26), but we will turn our attention on the thoroughly description of the lithic tools. Therefore, subsequent to the structural - typological and petrographical analysis<sup>\*\*)</sup> of the material, we shall finally review the source areas of rocks used as raw materials.

The material has been technologically and functionally divided into three categories: debitage products, polished stone tools, domestic tools.

**Debitage products** are the most numerous, including 161 pieces represented by 127 primary debitage pieces and 34 pieces that also present traces of secondary processing (Table I).

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<sup>\*)</sup> The archaeological staff was made up of Gheorghe Dumitroaia, Ovidiu Cotoi, Constantin Emil Ursu and Dorin Nicola.

<sup>\*\*)</sup> We wish to thank Prof. dr. Constantin Grasu and Prof. Dr. Constantin Catană who carried out the preliminary petrographic analyses on Dobreni-*Mătăhuia* lithic tools.

Blades and bladelets account for about 24% of the total number of pieces, most of them being fragmentary. More than a half of these pieces are processed by retouching. Retouching process is varied, including steep retouches (Pl. 1/2; 2/10), semi-steep retouches (Pl. 1/5; 2/1, 8), marginal retouches (Pl. 1/3, 8, 11-13), direct retouches (Pl. 1/2, 5, 9, 11-12), set on one or both sides of the pieces. Alterne (Pl. 1/3) and bifacial (Pl. 1/5) retouches have also been attested.

Stratigraphically, the blades and bladelets appear in all habitation levels, most of them coming of cultural layers. However, a predominance of blades can be noticed in the upper level ascribed to Cucuteni B habitation, while bladelets appear in all levels and in a larger number in the second level.

Flakes are the most numerous pieces discovered at Dobreni–*Mătăhuia Hill* accounting for 58.5% (Table I) of the total number of debitage products. Other 10 pieces (about 6,2%) processed by retouching can be added to these. Retouches are usually marginal (Pl. 2/12, 15) but steep and “enchoche” type retouches (Pl. 2/2, 14) appear occasionally. Also, among secondary debitage products on flakes, a bifacial piece with both sides processed by flat retouches is worth mentioning (Pl. 2/6).

Cores are less numerous, accounting for only 3.1% of the discovered pieces. Most of them are irregular and show traces of flake debitage (Pl. 3/5-6). Only one small flint core shows characteristics specific to blade debitage (Pl. 2/16).

Scrapers are scarcely represented at Dobreni–*Mătăhuia Hill*. There have been discovered only three pieces which make up for about 1.8% of the material. Two of them are made on flint flakes (Pl. 1/9, 18) and the third one is an end – scraper (Pl. 1/4).

Three borers have also been discovered, two of them are made on blades; one is actually a borer on retouched blade end (Pl. 2/10). The third piece is made of a marl flake, the pointed end is made by two “enchoche” type retouches (Pl. 2/11).

There are seven pieces represented by arrowheads made on blades or flakes, most of them being fragmentary. Arrowheads on flake are thoroughly processed by bifacial retouches on both side edges providing a slightly denticulate appearance and on the proximal end in order to make hafting easier (Pl. 2/7, 9). In some cases retouching is very vigorous,

emphasizing edge denticulation (Pl. 3/7). Arrowheads on blade are made by semi-steep and marginal retouches (Pl. 2/4; 3/9) A peculiar piece, that is also an arrowhead in our opinion, is made on a blade fragment with a slightly concave marginally retouched active end and slightly denticulated side edges (Pl. 2/13).

Generally, the debitage products inventory show a certain “retardation”, reverting slightly to normal in the upper level. Our statement is based on the following arguments: typological relative scarcity, small sizes of blades even in the upper level, high percentage of tools made on flakes, less elaborate processing of some of these pieces, the use of some raw material rocks with physical – mechanical properties inferior to flint, etc.

At the moment, we can hardly specify the driving force that brought about this situation. We can presume the difficulties met with acquiring high quality raw materials; we might also take into account a possible organized leaving of the settlement, worn and/or unused tools being left on site.

**Polished stone tools** are the second category of tools in our classification and include adzes, chisels, unperforated axes, perforated axes and a scraper (Table II).

There have been discovered only nine adzes, trapezoidal in shape, with asymmetrical longitudinal section due to sharpening especially on one surface of the piece (Pl. 3/3, 4; 4/6). They were made by initial chipping followed by finishing (superficial sometimes) and sharpening by grinding. Most pieces are fragmentary and shows a high wear degree which is probably the cause that led to their abandonment (Pl. 3/8; 4/7).

In terms of shape, axes are comparable to adzes, but the first ones are larger and their longitudinal section shows a tendency to symmetry due to bifacial sharpening.

Two pieces from Dobreni–*Mătăhuia Hill* have a blunt end with clear signs of percussion that suggest their use as pestles or knappers after having been used as axes (Pl. 4/3). Similarities to such pieces can be found in the majority of Cucuteni sites.

Perforated axes are represented only by a fragment in the hole region discovered in the upper level ascribed to Cucuteni B habitation.

Six fragmentary, extremely worn-out chisels have also been discovered. Morphologically, chisels discovered till now belong to the

elongated, right-angled category (Pl. 3/1, 2). They are made on marl pebbles, polishing being used only for making the cutting edge (Pl. 3/1). In some cases, the piece was initially chipped (Pl. 4/1). Within this category, we should also mention a piece made of a trapezoidal marl plate with one of the longitudinal sides processed by chipping in order to achieve cutting edges (Pl. 4/2). The lateral dispose of the cutting edge make us suppose the use of this piece as scraper.

**Domestic tools** make up a distinct category of pieces used in domestic activities: querns and grinders.

The discovered grinders (twelve) are made on hard rock pebbles (Table IV). Wear surfaces are clearly defined and show traces of intense polishing (Pl. 4/5). Some pieces might also have been used as knappers as breaches and rough appearance of extremities suggest.

Querns are numerous, 71 pieces respectively, coming from all habitation levels and complexes. Most of them are fragmentary. These pieces are made on big sandstone pebbles or slabs, the grinding surface is ellipsoidal and clearly defined, with a more or less pronounced concavity (Pl. 4/4).

### **Petrographic observations**

The preliminary petrographic analysis of the material revealed a wide range of rocks used as raw materials. There could also be noted the various use of different rocks depending on tool type and its functionality (Table III).

Debitage tools are primarily made of silica within the siliceous accidents category (RĂDULESCU, ANASTASIU 1979, 373-374; GRASU mss), flints and chert<sup>\*)</sup> (*chaille*) but also of other silica rich rocks suitable for the debitage process, i.e. glauconitic quartz sandstones, silicified quartz sandstones, gaize- spongolites, lyddites (lydian stone). However, the small proportion of tools made of these rocks show their use as flint substituents only. Obsidian is present in small proportion, accounting for about 1.3% of the material (Table IV).

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<sup>\*)</sup> We used the term *chert* for the siliceous accidents which adhere completely to the host rock, having the same meaning as the French *chaille*. Al. Păunescu defined cherts almost identically but he distinguished them from *chailles* (PĂUNESCU 1998, 48)

Polished stone tools are almost exclusively made of brown bituminous marl (95.2%) (Tables III and IV). A single piece, a fragmentary chisel, is made of lydian stone (Pl. 3/2), a variety of black radiolarite rich in organic matter and argillaceous minerals (*Ibidem*, 373, 377) with properties similar to flint. Due to their stratiform and lenticular nature, these rocks are appreciated raw materials for polished tools finishing.

As regards grinders, there can be noted a preference for hard magmatic (microdiorite) rocks (Table IV) and metamorphic rocks –quartz chlorite schists and quartzites. Sedimentary rocks such as quartz sandstones (especially Kliwa variety) were used occasionally.

Querns were exclusively made of sedimentary rocks with a wide range of particle sizes and abrasive properties. Other rocks discovered at Dobreni-*Mătăhuia Hill* include: silts, rocks characterized by particle size fractions ranging between 1/16 and 1/256 mm (*Ibidem*, 240); psamitic rocks such as quartz sandstones and lithic sandstones. Querns made of paraconglomerate and microconglomerate slabs are very numerous. Depending on physical-mechanical properties of each type of rock, tools could have had a wide range of uses from cereal grains grinding to bone and stone tools processing, finishing, sharpening etc.

### **Source Areas**

Knowing the petrographic structure of the lithic inventory from Dobreni – *Mătăhuia Hill* one can establish the source areas for raw materials exploited by Cucuteni community.

Flint, the basic raw material for debitage products, largely comes from cretaceous deposits from Moldavian Platform (PĂUNESCU 1970, 83; BOGHIAN 1996, 279; GRASU mss); this is the so called “Pruth flint”, the most frequently used in the Cucuteni lithic industry. Some authors also mention a Carpathian source related to limestones from crystalline - Mesozoic area in Eastern Carpathians, as well as to Ceahlău conglomerates (PĂUNESCU 1970, 84; GRASU mss).

Cherts (Chailles) originate in flysch formations and are incorporated in limestones or marls (RĂDULESCU, ANASTASIU 1979, 376; GRASU mss). They frequently appear in Sarata Formation from Vrancea Nappe, in limestones from Sucevița and Tazlău Formation, in Doamna limestones from Tarcău and Vrancea Nappes (GRASU mss).

Gaize - spongolites, sporadically used at Dobreni–*Mătăhuia Hill*, originate in Tarcău and Vrancea Nappes and in Audia and Straja Formations (*Ibidem*).

Lyddites (lydian stones) appear in Audia Formation, Tarcău Nappe, Sarata and Streiu Formations (*Ibidem*).

Brown bituminous marls (B.B.M.) originate in Tarcău and Vrancea Nappes, and sandstones appear in all Carpathian flysch formations. We can mention here Audia, Sarata and Straja Formations for glauconite quartz sandstones and silicified quartz sandstones used for debitage; Tarcău–Fusanu Nappe for paraconglomerate and microconglomerate lithic sandstones; external flysch formations for Kliwa sandstone (*Ibidem*).

Microdiorites appear in Neogene igneous rocks in Eastern Carpathians, and the metamorphic rocks such as quartzites and quartz schists originate in crystalline – Mesozoic zone but they appear in Almașu and Pleșu conglomerates, as well.

We can conclude that the majority of raw material rocks used by the Cucuteni community from Dobreni–*Mătăhuia Hill* come from Carpathian sources which stand for the primary sources.

However, we should consider the fact that all these geological units are crossed by most of the Carpathian rivers, so that the petrographic varieties mentioned above appear in terrigenous material in the major riverbeds of these water flows, standing for the secondary sources of raw materials.

We believe that these sources were primarily exploited by Cucuteni communities within the Sub–Carpathian area and also by the inhabitants of Dobreni–*Mătăhuia Hill* settlement, considering that the majority of rocks could be easily found in large amounts in close vicinity of settlements. Other types of rocks such as obsidian or different varieties of flint were the object of some intense and regular exchanges.

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Debitage products	No.	Types of pieces	No. of pieces	%
Primary debitage	1	Unretouched blades	8	4,9
	2	Unretouched bladelets	11	6,8
	3	Cores	5	3,1
	4	Flakes	93	57,7
Secondary debitage	5	Retouched blades	12	7,4
	6	Retouched bladelets	8	4,9
	7	Retouched flakes	10	6,2
	8	Scrapers	4	2,4
	9	Borers	3	1,8
	10	Arrowheads	7	4,3
	11	Total	161	100

**TABLE I.** Debitage products.

No.	Types of pieces	No. of pieces	%
1	Adzes	9	42,85
2	Chisels	6	28,57
3	Unperforated axes	4	19,04
4	Perforated axes	1	4,76
5	Scrapers	1	4,76
6	Total	21	100

**TABLE II.** Polished stone tools.



Categories of tools	Type of rock	1	4	2	4	2	2	2	2	3	4	4	4	4	4	2	2	2	2	2
	Type of tool	1	4	2	4	2	2	2	2	3	4	4	4	4	4	2	2	2	2	2
Primary debitage products	Cores	•	•																	
	Unretouched blades	•		•	•				•		•									
	Unretouched bladelets	•		•	•				•											
	Flakes	•	•	•				•		•	•									
Secondary debitage products	Retouched blades	•																		
	Retouched bladelets	•																		
	Retouched flakes	•						•												
	Scrapers	•	•																	
	Borers	•									•									
	Arrowheads	•																		
Polished stone tools	Adzes										•									
	Chisels		•								•									
	Lateral scraper										•									
	Unperforated axes										•									
	Perforated axes										•									
Domestic tools	Querns										•	•	•	•	•	•	•	•	•	•
	Grinders					•				•		•						•	•	•

TABLE III. Varieties of rocks found at Dobreni-Mățăhuia Hill.

LEGEND:  
 B.B.M. - brown bituminous marl  
 L.S.Q.M- lithic sandstones with quartzite and muscovite  
 L.S.G.M.- lithic sandstones with glauconite and muscovite  
 S.Q.S.-silicified quartz sandstones

CATEGORIES	RAW MATERIAL	NO. PIECES	%
DEBITAGE PRODUCTS	Flint	107	66,4
	B.B.M.	36	22,3
	Silicified quartz sandstones	3	1,8
	Lyddites	5	3,1
	Audia sandstone	2	1,2
	Obsidian	2	1,2
	Gaize- spongolites	3	1,8
	Chert (Chaille)	3	1,8
POLISHED STONE TOOLS	B.B.M:	20	92,5
	Lyddites	1	4,7
QUERNS	L.S.Q.M.	17	23,9
	Kliwa sandstone	4	5,6
	Tarcău-Fusaru lithic sandstone	24	33,8
	Paraconglomerates	14	19,7
	Microconglomerates	7	9,8
	L.S.G.M.	4	5,6
	Silt	1	1,4
GRINDERS	Microdiorites	5	41,6
	Kliwa sandstone	2	16,6
	Quartzite	1	8,3
	Silt	1	8,3
	Chlorite quartz schist	3	25

**TABLE IV.** Percentage table of rock varieties found at Dobreni-*Mătăhuia Hill.*

LEGEND:

B.B.M- brown bituminous marls

L.S.Q.M.- lithic sandstones with quartzite and muscovite

L.S.G.M.- lithic sandstones with glauconite and muscovite

**PLATE 1.** 1, 7: Unretouched blades; 2-3, 5, 8, 11-12: Retouched blades; 4: End-scraper; 6, 10, 14-15, 17: Unretouched bladelets; 13: Retouched bladelets; 16: Core; 9, 18: Scrapers.

**PLATE 2.** 1, 8: Retouched blades; 2, 12, 14, 15: Retouched flakes;  
3: Unretouched blade; 4, 7, 9, 13: Arrowheads; 5: Unretouched bladelet;  
6: Bifacial tool; 10: Borer on retouched blade end; 11. Borer.

**PLATE 3.** 1-2: Chisels; 3-4: Adzes; 5-6: Cores; 7, 9: Arrowheads;  
8: Axe.

**PLATE 4.** 1: Chisel; 2: Scraper; 3, 7: Axes; 4: Quern; 5: Grinder;  
6: Adze.

