

THE AURIGNACIAN IN EASTERN EUROPE

Pierre NOIRET

Abstract

In Eastern Europe, a few sites have yielded industries attributed to the Early Aurignacian between 33,000 and 29,000 BP, characterized by bladelet production from bladelet cores and/or from carinated core-tools. These industries have affinities with other local industries south of the expansion zone of this Early Aurignacian, but problems with relative and absolute chronologies currently prevent a satisfactory "historical" interpretation of the Aurignacian phenomenon.

Résumé

En Europe orientale, quelques sites ont livré des industries attribuées à l'Aurignacien ancien entre 33.000 et 29.000 BP, et caractérisées par une production lamellaire à partir de nucléus à lamelles et/ou à partir de nucléus-outils carénés. Ces industries présentent des affinités avec d'autres industries localisées au sud de la zone d'extension de cet Aurignacien ancien, mais des problèmes de chronologie relative et absolue empêchent à l'heure actuelle une interprétation "historique" satisfaisante du phénomène.

1. Introduction

A very early Aurignacian is attested before 40,000 BP in the Balkans, in the valley of the Middle and Upper Danube and along the western coasts of the Mediterranean¹. It is followed at 36,500 BP by the Early Aurignacian in Western, Central and Eastern Europe (Fig. 1).

This paper presents the eastern manifestation of the Typical Aurignacian in Romania and the Crimea, with which the Anatolian industries (represented by Karain B) have some affinities.

2. The Early Aurignacian in Western Europe (36,500-30,000 BP)

In Western Europe, the Aurignacian I-II of D. de Sonneville-Bordes and H. Delporte², present a development in the variation of certain "time-sensitive" tools in the La Ferrassie sequence (end-scrapers on blades

and Aurignacian end-scrapers, burins and busked burins, blades with Aurignacian retouch).

According to French researchers³, the Aurignacian I corresponds to the cooling phase following the Les Cottés climatic oscillation, between 34,000 and 31,500 BP. It is thus earlier than the Arcy oscillation. Reduction is laminar, with blades produced from volumetric (prismatic) cores. Retouched blades are numerous, carinated pieces rather rare. End-scrapers are produced on blades. Burins are rare, as are bladelets and Dufour bladelets. An important component of the assemblage consists of flakes, denticulates and side-scrapers. Sagaie points have split bases (Aurignac points) and aesthetic evidence is limited to a few pendants.

The Western sequence follows with the Aurignacian II, between 31,500 and 30,000 BP, during the Arcy oscillation with a temperate and humid climate. This was the

¹ Kozłowski 1979; Kozłowski – Otte 2000.

² Delporte 1994.

³ Djindjian 1993; Delporte 1994; see also Djindjian *et al.* 1999.

period of maximal expansion of the Aurignacian, which appear then in the northernmost zones of the continent, to the north of the western slope of the Urals (Zaozer'e, around 30,000 BP⁴). This Aurignacian II is no longer characterized by retouched blades, but rather by carinated and nosed end-scrapers, and by dihedral and carinated burins; archaic pieces, such as retouched blades, are less common than previously. Split-base points are replaced by lozenge-shaped points with massive bases, called Mladeč points.

Fr. Djindjian and H. Delporte also note that in several regions, two contemporaneous facies have been distinguished, one rich in end-scrapers, the other in burins: this is the case not only in France, but also in Belgium⁵, Moravia⁶ and Poland⁷.

3. The Early Aurignacian in Central Europe

In Germany, layer III of Geissenklösterle is dated between 41,800 and 28,300 BP and layer II between 37,800 and 29,600 BP⁸. The chronological ranges of 35,500-33,000 BP for layer III, and 33,500-31,500 BP for layer II have been accepted⁹. Layer II has yielded a split-base point, ivory beads, four ivory figurines and two bone flutes, dated to around 33,500 BP (37,000 BP according to thermoluminescence). Two kilometers away, the Aurignacian of layers III-IV at Hohle Fels is dated to between 33,000 and 30,000 BP. Similar results have been obtained at Hohlenstein-Stadel and Vogelherd (horizons V-IV)¹⁰.

In Lower Austria, the Krems-Hundsteig assemblage, dated to 35,200 BP, has yielded extremely numerous point retouched bladelets (Krems points) and Dufour bladelets¹¹, making this site the reference site for the "Krems-Dufour" facies. Other sites also exist: those of layer 4 at Willendorf II are dated to 32,000-31,210 BP¹²; at Stratzing, six dates have been obtained between 31,790 and 28,400 BP on charcoal and bone, for two cultural levels¹³.

The Early Aurignacian also exists between 32 and 31,000 BP in Poland. Here, we find an opposition between assemblages rich in end-scrapers (Kraków-Zwierzyniec, layers 12-13; Kraków-Spadizta A, C1 and C2/VII) and those rich in burins (Piekary IIa), with a third group rich in Dufour bladelets (Góra Puławska II)¹⁴.

In Moravia, the assemblages of Pod Hradem and of Stránská skála (sites IIa-4 and IIb-4) have been dated to 33,000-32,000 BP¹⁵. An Aurignacian presence is suspected by M. Oliva at the lower station of Dolní Věstonice I, mainly on the basis of early reports¹⁶.

4. The Early Aurignacian in Eastern Europe

4.1 Moldavia

In eastern Romania, on the border of the Prut River, the site of Mitoc-Malu Galben is of crucial importance for understanding of the development of the Aurignacian (and the Gravettian) in Eastern Europe. It is a huge open-air site, known since the 19th century and excavated many times by

⁴ Pavlov 2002.

⁵ Otte 1979.

⁶ Oliva 1985, 1987.

⁷ Kozłowski 1983.

⁸ Verpoorte 2005.

⁹ Teyssandier 2005.

¹⁰ See Conard – Bolus 2003, for a complete presentation of radiometric dates.

¹¹ Desbrosse & Kozłowski 1988, 56.

¹² Dambon *et al.* 1996.

¹³ Hahn 1991.

¹⁴ Kozłowski 1983.

¹⁵ Svoboda 1993.

¹⁶ Oliva 2000.

different researchers. Since 1990, research has been conducted conjointly between Romanian and Belgian institutions. In the archaeological sequence, three Aurignacian assemblages have been identified, overlain by four Gravettian assemblages, the seven assemblages dating from 33,000 to 20,000 BP. These assemblages are all remains of flint workshops¹⁷. The Typical Aurignacian appears around 32,700 BP due to a cold episode between the first two climatic improvements of the second half of the Middle Pleniglacial. It persists until around 27,500 BP, after another climatic oscillation¹⁸. It is also present at Corpaci-Mâs in the Republic of Moldavia, within a fossil soil that can be attributed to a similar oscillation, but for which the date is slightly young ($24,020 \pm 220$ [OxA-7000]¹⁹). The industries of the two sites are incontestably Aurignacian and the presence of Mladeč points is the best evidence, along with the carinated and busked burins of Mitoc²⁰.

The main occupations at Mitoc are the only ones known with certainty between 32,000 and 29,000 BP. They are not isolated, because they contain only remains of flint reduction; knappers coming to Malu Galben must have rejoined a base camp situated elsewhere, either in the immediate proximity (other Aurignacian sites, poorly studied, are known in the Mitoc area: Pîriul lui Istrati, Valea lui Stan)²¹, or further away and not yet identified. None have yielded specific habitation structures, with the exception of a slightly lowered surface at Corpaci-Mâs, where many characteristic artifacts, including the two Mladeč points, have been discovered.

In these Aurignacian assemblages, horse and bison dominate the remains of animals hunted²². The main assemblages (assemblage I, dated to around 31,100-31,000 BP) were deposited in part during early summer, between April and June. However, data is limited and associated with a specific context, that of a workshop where subsistence activities were secondary. Despite these reservations, nothing else suggests that other species were dominant in the Aurignacian diet. Reindeer, woolly rhinoceros and megaceros were perhaps hunted, but much more rarely than horse and bison. Some mammoth remains are also present.

Technological characteristics vary slightly between Mitoc and Corpaci-Mâs. In the main assemblages of Mitoc, blade technology is dominant and perfectly mastered, using prepared and maintained prismatic and sub-prismatic cores with one or two striking platforms. Blade production was aimed at producing blanks for transport from the site. Many tools were made on flakes or thick flakes (carinated and nosed end-scrapers), but numerous burins (dihedral, truncated, retouched) were made on blades (Fig. 2). Carinated burins are dominant; retouched blades are absent. At Corpaci-Mâs, tools are typically made on flakes. In both sites, Mladeč points are an excellent *fossile directeur* for the Typical Aurignacian (Fig. 3). We have suggested elsewhere the production of bladelet blanks for making Dufour bladelets in assemblage I of Mitoc, even if none of these particular tools were recovered²³.

In the Mitoc sequence, the lithic industry demonstrates development toward a decrease in burins (carinated included). Burins are strictly associated with Aurignacian assemblages I and II at Mitoc,

¹⁷ Chirica 1987, 1989, 2001; Haesaerts 1993; Otte – Chirica 1993; Otte *et al.* 1996a.

¹⁸ Haesaerts *et al.* 2003.

¹⁹ Borziac – Chetaru 1996; Bronk Ramsey *et al.* 2002.

²⁰ Noiret 2004.

²¹ Chirica 2001.

²² After I. López Bayón; see Noiret 2003-2004, 2004.

²³ Noiret in press.

prior to and during an interstadial ("MG 10"). The assemblage at Corpaci-Más is posterior; it is marked principally by end-scrapers and some side-scrapers, like assemblage III at Mitoc (both lacking Aurignacian burins), prior to and at the beginning of the next climatic oscillation ("MG 9"). These end-scrapers-rich industries seem to correspond to a more recent Aurignacian, being a second phase of Aurignacian occupation along the Prut River, less rich and less typical.

4.2 The Crimea

In the Crimea, the site of Siuren I has yielded Aurignacian assemblages with Dufour bladelets. Three statistically similar radiocarbon dates on bone are available: from top to bottom, 29,950 ± 700 BP (OxA-5155, Unit F); 28,450 ± 600 BP (OxA-5154, Unit G) and 28,200 ± 440 BP (OxA-8249, Unit H)²⁴. Faunal remains do not include cold species and indicate rather temperate steppe-forest conditions²⁵. Lithic materials are divided into two sub-types. The early sub-type is represented in Units H-G, characterized by bladelet production from bladelet and carinated cores; the toolkit includes retouched bladelets and microbladelets (including Dufour), followed by pseudo-Dufour and some Krems points. Burins are not carinated; end-scrapers are rare (with a few typical carinated pieces); some retouched blades are present (non-Aurignacian). Excavators have suggested an attribution to the Arcy interstadial, between 31,500 and 30,000 BP²⁶. The recent sub-type corresponds to Unit F, with highly pronounced bladelet production from bladelet cores and carinated pieces, but also from carinated tools (end-scrapers and particularly burins). Blanks obtained are often non-aligned with the axis and profiles are twisted;

microbladelets are more numerous than bladelets; tools are retouched bladelets and microbladelets (primarily Dufour with alternate retouch, the most often), with no Krems points. Carinated and nosed end-scrapers account for 30% of all end-scrapers; burins are above all dihedral, but carinated burins also exist, as well as a few busked burins; retouched blades are absent. Excavators suggest an attribution to the end of the Arcy interstadial (around 30,000 BP) or – more probably – to the Maisières interstadial (29,300-27,000 BP).

The site of Buran-Kaya III is also of interest. Evidence of Gravettian (horizons 10-19), Aurignacian (horizons 20-23), Micoquian (layers B-B1, of Kiik-Koba type), Streletskian (layer C) occupations and a non-differentiated blade industry (layer E) succeed on one another from the top to the base of the sequence²⁷. Five dates were obtained on bone samples provided by A.A. Yanevich, but are unreliable. Seven other results (on bone) were obtained from samples collected during summer 1996²⁸, but are also not entirely viable. The Gravettian is dated to 30,740 BP, the Aurignacian to 34,400 ± 1200 BP (OxA-6990), layer B1 to around 28-29,000 BP, and the Streletskian to 32,200-36,700 BP. Taking into account the stratigraphic succession of the industries and 2 SD, they only indicate a rapid succession of Streletskian, Aurignacian and Gravettian industries within the range of 36-30,000 BP. The Aurignacian assemblage is small and includes some bladelets with fine marginal retouch (including Dufour bladelets, similar to those at Siuren I).

²⁴ Pettit 1998; Demidenko – Otte 2000-2001.

²⁵ López Bayón 1998.

²⁶ Demidenko *et al.* 1998; Demidenko – Otte 2000-2001.

²⁷ See Yanevich *et al.* 1996, for presentation of the site; Pettitt 1998, for dates; Marks – Monigal 2000, for the Streletskian industry.

²⁸ Marks – Monigal in press.

4.3 The Russian Plain

On the Russian Plain, the site of Kostenki 1, layer III, has mainly yielded recent dates (10 dates, of which eight are between 24,500 and 26,200 BP, centred on 25,750 BP²⁹). Technology is laminar; intensely exploited cores were used to produce varied blanks (large, thick blades, medium-sized blades and microbladelets). The toolkit includes retouched blades, points, splintered pieces, burins (especially on retouched truncations, followed by dihedral burins), with a dominance of retouched microbladelets and end-scrapers (carinated end-scrapers are fairly common)³⁰, as well as at least 16 Dufour bladelets and a large number of pseudo-Dufour bladelets and possibly a few Krems points.

Just recently, an earlier industry was discovered at the base of the Kostenki 14 sequence (the lowest layer of the site, dated to 32,420 +440/-420 BP [GrA-18503]). This new cultural level contains a small lithic assemblage (n=340) with no cores and very few tools (barely 1%); however, among these tools are highly characteristic Dufour bladelets (retouched, twisted microbladelets)³¹. At Kostenki 1, two dates around 32,000 BP (on bone and charcoal) suggest that level III may also be contemporaneous; however, the series of dates around 26-25,000 BP leaves open this question.

4.4 Further east

Still in Eastern Europe, Y.E. Demidenko has attempted to find other sites with industries comparable to those at Siuren I. According to him, the assemblage at Chulek I (an open-air site in the lower Don valley) and the lower layer of Kamennomostkaya Cave (in the valley of the Kuban River, in northwest Caucasus)

present interesting similarities. These industries have not yet been dated, but demonstrate the expansion of the Aurignacian of Siuren type to the east, into the Caucasus, constituting a single geographic entity at the period when the Crimea was not a peninsula³². This entity would be the southern edge of European Aurignacian expansion.

5. Bladelet production

Data from Mitoc and Kostenki 14 reinforce those from Siuren I, that is, that there exist in Eastern Europe (between 32-29,000 BP) Aurignacian industries in which two techniques of bladelet production were utilized, one from regular bladelet cores for standardized rectilinear blanks (Siuren I, Units H-G) and the other from carinated tools (carinated and nosed end-scrapers and carinated burins) for blanks considered to be bladelets (Siuren I, Unit F; perhaps at Mitoc, certainly at Kostenki 14). The high representation of carinated burins at Mitoc distinguishes this assemblage from those at Siuren I (Fig. 4).

At Mitoc, the absence of screening during excavation must be mentioned in order to explain the low frequency of retouched bladelets: we have recently³³ found many unretouched bladelets in sediment samples collected from a hearth and still unstudied. The difference between Mitoc and Siuren I in the numeric representation of bladelets, retouched or not, corresponds to their function: a workshop for Mitoc (where one finds only rejected products, abandoned at their place of production), or intensively and repeatedly occupied short-term camps for Siuren I (where one finds a much higher frequency of retouched artefacts).

²⁹ Damblon *et al.* 1996; Sinitsyn 1999.

³⁰ Sinitsyn 1993.

³¹ Sinitsyn 2003.

³² Demidenko 2001-2002.

³³ December 2004

6. Chronological resolution

Based on the descriptions of the lithic assemblages and on the available radiocarbon dates, it is possible to envision one (or several) scenarios for the propagation of the Aurignacian in one direction or another. Unfortunately, in our current state of knowledge, it seems that such scenarios are illusory. The main problem resides in the degree of resolution offered by radiometric dates.

While the 36-30,000 BP range is not beyond the limits of the radiocarbon technique, it must be noted that in Eastern Europe the results are often unsatisfactory. Several cases exist: isolated dates seem to be too young (Siuren I); dates within a sequence are internally incoherent (Buran Kaya III); a single industry has yielded two series of dates with very different results (Kostenki 1). A. Verpoorte³⁴ remarks that for Geissenklösterle, priority should be accorded to stratigraphic observations and the relative date which leads N. Teyssandier³⁵ to the statement mentioned above. Only long sequences "patiently" dated appear to have valid data; thus, at Mitoc, more than half of the 60 dates have been discarded³⁶, leaving a series of valid dates that are coherent³⁷.

Too often, the nature and provenance of the samples pose problems, but this is not the only factor in Eastern Europe. Recent research has brought to light another phenomenon: that of the multiplicity of

paleoclimatic events during the period considered. The work of P. Haesaerts on the chronostratigraphy of open-air sites in Central and Eastern Europe has clearly demonstrated the great complexity of climatic and environmental change during the second half of the Middle Pleniglacial. For example, at Mitoc-Malu Galben³⁸, five positive events have been identified between 33,000 and 27,000 BP. In Siberia, an even more detailed sequence at Kurtak demonstrates that at least two of these positive events (around 33,000 and around 30,000 BP) are probably composed of respectively three and two distinct episodes³⁹.

7. The Aurignacian in Southern Europe

Without verified chronostratigraphic markers, it is thus difficult to evaluate the relative position of an archaeological assemblage by comparison to another and, in any case, it seems dangerous to rely only on radiocarbon results.

Moving to the south, we find only rare assemblages attributed to the Aurignacian before reaching the Near East (Levantine Aurignacian) and the Zagros (Baradostian).

The Early Aurignacian is clearly present in South-Eastern Europe, in Bulgaria (Bacho Kiro layers 9 [with split-base points], 7, 6b; Temnata layers 3g-3h), where industries are rich in end-scrapers, burins and retouched blades, with numerous carinated and nosed end-scrapers, dihedral and carinated burins and carenoid cores. Bladelets with fine retouch (Dufour) are also present⁴⁰. An equivalent of the Aurignacian II exists at Bacho Kiro in layers 8, 7 and 6. However, in the Balkans, the essential trait seems to

³⁴ Verpoorte 2005.

³⁵ Teyssandier 2005.

³⁶ Dambon *et al.* 1996.

³⁷ This situation is also known in more recent contexts. In Eastern Europe, at Cosăuți, samples collected in 1995 from the entire sequence made it possible to understand the succession of around twenty Epigravettian levels over a period of 2,000 years (between *ca.* 19,500 and 17,500 BP), while the dates previously obtained had contained several incoherencies (Otte *et al.*, 1996a; Haesaerts *et al.*, 1998). The case of the Epipaleolithic at Öküzini in Anatolia is similar (Otte *et al.*, 2003).

³⁸ Haesaerts *et al.* 2003.

³⁹ Haesaerts *et al.* 2005.

⁴⁰ Desbrosse – Kozłowski 1988; Kozłowski 1992, 2003.

be a direct relationship between the earliest Aurignacian and the Typical Aurignacian, demonstrated by the sequences at Bacho Kiro and Temnata.

Still in the Balkans, at Klisoura Cave (Peloponnesia), layer IV corresponds to the base of the Aurignacian, for which the date of $32,400 \pm 1600$ BP (Gd-10562) is considered relevant⁴¹. The lithic assemblage is only slightly laminar; flake production is predominant. Rare blades and bladelets were obtained from cores with two striking platforms, cores on radiolarite plaquettes and carinated core-end-scrapers. The toolkit is dominated by carinated end-scrapers and burins are rare; there are numerous splintered pieces, few retouched blades and no Dufour bladelets. Some fragments of Mladeč points have been recovered.

In Anatolia, in the Antalya region, the cave of Karain B has yielded, between Middle Palaeolithic and Epipaleolithic industries, an Early Upper Palaeolithic industry with carinated and nosed end-scrapers, accompanied by carinated burins, retouched blades and bladelets with fine retouch similar to the Dufour or Krems. A few bladelet cores were recovered; production of irregular flakes is also attested. Provisionally dated to around 28,000 BP, this industry has some differences in comparison to the Western Aurignacian; it is more similar to Klisoura and the Balkan Aurignacian⁴².

Under these conditions, the inclusion of lithic assemblages such as those at Klisoura and Karain B in a scenario of expansion of the Aurignacian from an area to another is still problematic. Similarities and differences do not appear to constitute relevant patterns. For example, similarities

exist between Klisoura and layer II of Kostenki I (presence of splintered pieces, end-scrapers more common than burins, absence or rarity of carinated burins), but there are also differences (greater degree of blade technology at Kostenki, absence of Dufour bladelets at Klisoura). Similarly, Karain B presents similarities with assemblage I at Mitoc-Malu Galben (presence of carinated end-scrapers and burins, bladelet cores), but also differences (presence of retouched blades and bladelets in Anatolia and not in Romania, where flake production is less marked).

Along the eastern Mediterranean coast, the Levantine Aurignacian⁴³ derives perhaps from the Baradostian⁴⁴. While there are similarities with Karain B (although again the identification is not total), the break seems clear with the Aurignacian of Eastern Europe: flake production is more important in the Near East (and in Anatolia). There also seems to have been an inverse development of the end-scrapers-burin ratio: burins become rarer in time at Mitoc, while the inverse is true at Ksar Akil.

8. Conclusions

We see that using these techno-typological variables and the radiocarbon dates to interpret the industry observed at Karain B has little meaning. There is no way to satisfactorily integrate the Early Upper Paleolithic industry of this site in a global schema of the development of the Aurignacian at the scale of Europe and the Near East. The industries of Klisoura and Karain B have some similarities with the European Aurignacian, but also with the Levantine Aurignacian, and likely also with the Baradostian (bladelet production at all

⁴¹ Koumouzelis *et al.* 2001.

⁴² Yalçınkaya – Otte 2000.

⁴³ Bar-Yosef – Belfer-Cohen 1988; Gilead 1991; Bar-Yosef 2000.

⁴⁴ Otte – Kozłowski 2004.

of the sites, next to the presence of carinated tools, particularly end-scrapers, although not necessarily burins); however, all of the traits of these facies are not present. The difficulty of interpretation of Karain B and the still unresolved question of its origin (in the Near East? In South-Eastern Europe?) should not prevent us to attribute it to the Aurignacian *sensu lato*.

Translated from French by Rebecca Miller

Figure captions

Fig. 1. Location of sites mentioned in the text.

Fig. 2. Mitoc-Malu Galben, Aurignacian assemblage I. Blade core (1), bladelet core (2), end-scraper on flake (3), carinated end-scraper (4), nosed end-scraper (5), dihedral burin (6), burin on truncation (7), carinated burin (8) (after Otte & Chirica 1993; Noiret 2004).

Fig. 3. Mladeč points from Mitoc-Malu Galben (Aurignacian assemblage I) (1) and from Corpaci-Mâs (2-3) (after Noiret 2004; Borziac & Chetaru 1996).

Fig. 4. Aurignacian of the "Krems-Dufour" type. Siuren I/F (1-5), Siuren I/G-H (6-9), Mitoc-Malu Galben/Auri I (10-14), Kostenki 1/III (15-19), Kostenki 14/inf (20-25) (after Otte *et al.* 1996b; Noiret 2004; Sinitsyn 1993, 2003.)

Dr. Pierre Noiret

University of Liège
Prehistory Department
7 place du XX août, bât. A1, B-4000
Liège - BELGIQUE
e-mail: pnoiret@ulg.ac.be

REFERENCES

- Bar-Yosef 2000 O. Bar-Yosef, "The Middle and Early Upper Palaeolithic in Southwest Asia and neighbouring regions". In: O. Bar-Yosef and D. Pilbeam (ed.), *The Geography of Neanderthals and Modern Humans in Europe and the Greater Mediterranean*, Harvard University, Peabody Museum, (2000) 107-156.
- Bar-Yosef-Belfer Cohen 1998 O. Bar-Yosef - A. Belfer-Cohen, "The Early Upper Palaeolithic in Levantine caves". In: J.D. Hoffecker (ed.), *The Early Upper Palaeolithic*, Oxford, BAR International Series 437, (1998) 23-42.
- Borziac - Chetaru 1996 I.A. Borziac - N.A. Chetaru, "La zone Dniestr-Prut". In: V. Chirica, I.A. Borziac and N.A. Chetaru, *Gisements du Paléolithique supérieur ancien entre le Dniestr et la Tissa*. Iași, Bibliotheca Archaeologica Iassiensis V, (1996) 6-69.

- Bronk Ramsey *et al.* 2002 C. Bronk Ramsey - T.F.G. Higham - D.C. Owen - A.W.G. Pike - R.E.M. Hedges, "Radiocarbon dates from the Oxford AMS System: Archaeometry datelist 31", *Archaeometry*, 44(3), Supplement 1, (2002) 1-149.
- Chirica 1987 V. Chirica, "La genèse et l'évolution des cultures du Paléolithique supérieur dans la zone du Prut moyen d'après les recherches récentes". In: V. Chirica (ed.), *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie*, Iași, Bibliotheca Archaeologica Iassiensis II, (1987) 25-40.
- Chirica 1989 V. Chirica, *The Gravettian in the East of the Romanian Carpathians*, Iași, Bibliotheca Archaeologica Iassiensis III, 239 p., (1989).
- Chirica 2001 V. Chirica, *Gisements paléolithiques de Mitoc. Le Paléolithique supérieur de Roumanie à la lumière des découvertes de Mitoc*. Iași, Bibliotheca Archaeologica Iassiensis XI, 216 p., (2001).
- Conard – Bolus 2003 N.J. Conard - M. Bolus, "Radiocarbon dating the appearance of modern humans and timing of cultural innovations in Europe: new results and new challenges", *Journal of Human Evolution*, 44, (2003) 331-371.
- Damblon *et al.* 1996 Fr. Damblon - P. Haesaerts - J. van der Plicht, "New datings and considerations on the chronology of Upper Palaeolithic sites in the Great Eurasian Plain", *Préhistoire européenne*, 9, (1996) 177-231.
- Delporte 1994 H. Delporte, "Observations sur l'Aurignacien de la Ferrassie". In: F. Bernaldo de Quirós (ed.), *El cuadro geocronológico del Paleolítico superior inicial*. Madrid, Instituto de Conservación y Restauración de Bienes Culturales (Museo y Centro de Investigación de Altamira, Monografías 13), (1994) 165-171.
- Demidenko 2000-2001 Y.E. Demidenko, "The European Early Aurignacian of Krems-Dufour type industries: a view from Eastern Europe", *Préhistoire européenne*, 16-17, (2000-2001) 147-162.
- Demidenko – Otte 2001-2002 Y.E. Demidenko - M. Otte, "Siuren-I (Crimea) in the context of an European Aurignacian", *Préhistoire européenne*, 16-17, (2001-2002) 133-146.
- Demidenko *et al.*, 1998 Y.E. Demidenko - V.P. Chabai - M. Otte - Al.I. Yevtushenko

- S.V. Tatartsev, "Siuren-I, an Aurignacian site in the Crimea (the investigations of the 1994-1996 field seasons)". In: M. Otte (dir.), *Préhistoire d'Anatolie. Genèse de deux mondes*, Proceedings of the International Colloquium in Liège (April 28–May 3, 1997), Liège, University of Liège (ERAUL 85), vol. 1, (1998) 367-413.
- Desbrosse – Kozłowski 1988 R. Desbrosse - J.K. Kozłowski, *Hommes et climats à l'âge du mammouth. Le Paléolithique supérieur d'Eurasie centrale*, Paris, Masson, 144 p., (1988).
- Djindjian 1993 Fr. Djindjian, "Les origines du peuplement aurignacien en Europe". In: *Aurignacien en Europe et au Proche-Orient*, Proceedings of the 8th Commission Colloquium, XIIth International UISPP Congress (Bratislava, September 1-7, 1991), Bratislava, (1993) 136-154.
- Djindjian et al. 1999 Fr. Djindjian - J.K. Kozłowski - M. Otte, *Le Paléolithique supérieur en Europe*, Paris, Armand Colin, 474 p., (1999).
- Gilead 1991 I. Gilead, "The Upper Palaeolithic in the Levant", *Journal of World Prehistory*, 5 (1991) 105-154.
- Haesaerts 1993 P. Haesaerts, "Stratigraphie du gisement paléolithique de Mitoc Malul Galben (District de Botoșani, Roumanie): étude préliminaire", *Préhistoire européenne*, 3 (1993) 67-71.
- Haesaerts et al. 1998 P. Haesaerts - I.A. Borziac - J. van der Plicht - Fr. Damblon, "Climatic events and Upper Paleolithic chronology in the Dniestr basin: new 14C results from Cosautsi", *Radiocarbon*, 40(2) (1998) 649-657.
- Haesaerts et al. 2003 P. Haesaerts - I.A. Borziac - V. Chirica - Fr. Damblon - L. Koulakovska - J. van der Plicht, "The East Carpathian loess record: a reference for the Middle and Late Pleniglacial stratigraphy in Central Europe", *Quaternaire*, 14(3): (2003) 163-188.
- Haesaerts et al. 2005 P. Haesaerts - V.P. Chekha - Fr. Damblon - N.I. Drozdov - L.A. Orlova - J. van der Plicht, "The loess-palaeosol succession of Kurtak (Yenisei basin, Siberia): a reference record for the Karka Stage (MIS 3)", *Quaternaire*, 16(1) (2005) 3-24.
- Hahn 1991 J. Hahn, "Europe centrale méridionale". In: *Le Paléolithique supérieur européen. Bilan quinquennal 1986-1991*, Liège, University of Liège (ERAUL 52), (1991) 87-94.

- Koumouzelis *et al.*, 2001 M. Koumouzelis - J.K. Kozłowski - C. Escutenaire - V. Sitlivy - Kr. Sobczyk - H. Valladas - N. Tisnerat-Laborde - P. Wojtal - B. Ginter, "La fin du Paléolithique moyen et le début du Paléolithique supérieur en Grèce: la séquence de la Grotte 1 de Klissoura", *L'Anthropologie*, 105 (2001) 469-504.
- Kozłowski 1979 J.K. Kozłowski, "Le Bachokirien. La plus ancienne industrie du Paléolithique supérieur en Europe (Quelques remarques à propos de la position stratigraphique et taxonomique des outillages de la couche 11 de la grotte Bacho Kiro)". In: J.K. Kozłowski (ed.), *Middle and Early Upper Palaeolithic in the Balkans*, Cracovie, Université Jagellon (Prace Archeologiczne 28), (1979) 77-99.
- Kozłowski 1983 J.K. Kozłowski, "Le Paléolithique supérieur en Pologne", *L'Anthropologie*, 87(1) (1983) 49-82.
- Kozłowski 1992 J.K. Kozłowski, "The Balkans in the Middle and Upper Palaeolithic: the gate to Europe or a cul-de-sac?" *Proceedings of the Prehistoric Society*, 58 (1992) 1-20.
- Kozłowski 2003 J.K. Kozłowski, "The first half of the last Interpleniglacial: chronology, environment and cultures". In: Fr. Widemann and Y. Taborin (ed.), *Chronologies géophysiques et archéologiques du Paléolithique supérieur*, Proceedings of the International Colloquium in Ravello (May 3-8, 1994). Bari, Eudipuglia, (2003) 197-204.
- Kozłowski - Otte 2000 J.K. Kozłowski - M. Otte, "La formation de l'Aurignacien en Europe", *L'Anthropologie*, 104(1) (2000) 3-15.
- López Bayón 1998 I. López-Bayón, "La faune de Siuren I (Crimée): analyse préliminaire". In: M. Otte (dir.), *Préhistoire d'Anatolie. Genèse de deux mondes*, Proceedings of the International Colloquium in Liège (April 28-May 3, 1997), Liège, University of Liège (ERAUL 85), vol. I, (1998) 415-425.
- Marks - Monigal 2000 A.E. Marks - K. Monigal, "The Middle to Upper Paleolithic interface at Buran-Kaya III, Eastern Crimea". In: J. Orschiedt and G.-C. Weniger (ed.), *Neanderthals and Modern Humans - Discussing the Transition: Central and Eastern Europe from 50.000-30.000 BP*, Proceedings of the International Workshop in the Neanderthal Museum (March 18-21, 1999), Mettmann, Neanderthal Museum (Wissenschaften Schriften des Neanderthal Museums 2), (2000) 212-226.

- Marks – Monigal (in press) A.E. Marks - K. Monigal, “Origins of the European Upper Paleolithic, seen from Crimea: simple myth or complex reality?” In: *The Early Upper Paleolithic East of the Danube*, 20 p.
- Noiret 2003-2004 P. Noiret, *Le Paléolithique supérieur de la Moldavie: essai de synthèse d’une évolution multi-culturelle*, Ph.D. Dissertation, University of Liège, 645 p., 3 vol. (2003-2004).
- Noiret 2004 P. Noiret, “Le Paléolithique supérieur de la Moldavie”, *L’Anthropologie*, 108(3-4) (2004) 425-470.
- Noiret (in press) P. Noiret, “Productions lamellaires aurignaciennes à l’est des Carpates”. In: F. Le Brun-Ricalens (ed.), *Productions lamellaires attribuées à l’Aurignacien*, Proceedings of the Colloquium 6.7, XIVth UISPP International Congress (Liège, September 2-8, 2001), *Archéo Logique*, 1, 23 p.
- Oliva 1985 M. Oliva, “La signification culturelle des industries paléolithiques: l’approche psychosociale”. In: M. Otte (ed.), *La signification culturelle des industries lithiques*, Proceedings of the International Colloquium in Liège (October 3-7, 1984), Oxford, BAR International Series 239, (1985) 92-114.
- Oliva 1987 M. Oliva, *Aurignacien na Moravé*, Studie Muzea Kroměřížska ‘87, 128 p., (1987).
- Oliva 2000 M. Oliva, “Dolní Věstonice I. Une révision de la stratigraphie culturelle”, *Anthropologie*, XXXVIII(3) (2000) 283-290.
- Otte 1979 M. Otte, *Le Paléolithique supérieur ancien en Belgique*, Bruxelles, Musées royaux d’Art et d’Histoire, 684 p., (1979).
- Otte – Chirica 1993 M. Otte - V. Chirica, “Atelier aurignacien à Mitoc Malul Galben (Moldavie roumaine)”, *Préhistoire européenne*, 3 (1993) 55-66.
- Otte – Kozłowski 2004 M. Otte - J.K. Kozłowski, “La place du Baradostien dans l’origine du Paléolithique supérieur d’Eurasie”, *L’Anthropologie*, 108(3-4) (2004) 395-406.
- Otte et al. 1996a M. Otte - I. López Bayón - P. Noiret - I.A. Borziac - V. Chirica, “Recherches sur le Paléolithique supérieur de la Moldavie”, *Bulletin de la Société royale belge Anthropologie et Préhistoire*, 107 (1996) 45-80.

- Otte *et al.* 1996b M. Otte - P. Noiret - S.V. Tatartsev - I. López Bayón, "L'Aurignacien de Siuren I (Crimée): fouilles 1994 et 1995". In: A. Montet-White, A. Palma di Cesnola and K. Valoch (ed.), *The Upper Palaeolithic. Colloquium XI: The Late Aurignacien*, Proceedings of the XIIIth UISPP International Congress (Forlì, September 8-14, 1996), Series Colloquia (Vol. 6), Forlì, ABACO, (1996) 123-137.
- Otte *et al.* 2003 M. Otte - I. López Bayón - P. Noiret - O.Bar-Yosef - I. Yalçinkaya - M. Kartal - J.-M. Léotard - P. Pettitt, "Sedimentary deposition rates and Carbon-14: the Epi-paleolithic sequence of Öküzini cave (Southwest Turkey)", *Journal of Archaeological Science*, 30 (2003) 325-341.
- Pavlov 2002 P.Y. Pavlov, "Zaozer'e, un nouveau site du Paléolithique supérieur ancien dans le nord-est de l'Europe. Rapport préliminaire", *L'Anthropologie*, 106(5) (2002) 731-743.
- Pettitt 1998 P. Pettitt, "Middle and Early Upper Palaeolithic Crimea: the radiocarbon chronology". In: M. Otte (dir.), *Préhistoire d'Anatolie. Genèse de deux mondes*, Proceedings of the International Colloquium in Liège (April 28-May 3, 1997), Liège, University of Liège (ERAUL 85), vol. 1, (1998) 329-338.
- Sinitsyn 1993 A.A. Sinitsyn, "Les niveaux aurignaciens de Kostenki 1". In: *Aurignacien en Europe et au Proche-Orient*, Proceedings of the 8th Commission Colloquium, XIIth International UISPP Congress (Bratislava, September 1-7, 1991), Bratislava, (1993) 242-259.
- Sinitsyn 1999 A.A. Sinitsyn, "Chronological problems of the Palaeolithic of Kostenki-Borschevo area : Geological, palynological and ¹⁴C perspectives". In: J. Evin, Chr. Oberlin, J.-P. Daugas and J.-Fr. Salles (ed.), *¹⁴C et Archéologie*, Proceedings of the 3rd International Congress in Lyon (April 6-10, 1998), Paris-Rennes, Mémoires de la Société préhistorique française (t. XXVI) – Supplement 1999 to the *Revue d'Archéométrie*, (1999) 143-150.
- Sinitsyn 2003 A.A. Sinitsyn, "A Palaeolithic 'Pompeii' at Kostenki, Russia", *Antiquity*, 77 (2003) 9-14.
- Svoboda 1993 J. Svoboda, "The Aurignacian of Stránská skála", In: *Aurignacien en Europe et au Proche-Orient*, Proceedings of the 8th Commission Colloquium, XIIth International UISPP

The Aurignacian in Eastern Europe

- Congress (Bratislava, September 1-7, 1991), Bratislava, (1993) 216-223.
- Teyssandier 2005 N. Teyssandier, "Les débuts de l'Aurignacien en Europe. Résumé de thèse", *Bulletin de la Société préhistorique française*, 102(1) (2005) 211-216.
- Verpoorte 2005 A. Verpoorte, "The first modern humans in Europe? A closer look at the dating evidence from the Swabian Jura (Germany)", *Antiquity*, 79 (2005) 269-279.
- Yalçinkaya – Otte 2000 I. Yalçinkaya - M. Otte, "Débuts du Paléolithique supérieur à Karain (Turquie)", *L'Anthropologie*, 104(1) (2000) 51-62.
- Yanevich *et al.* 1996 A.A. Yanevich - V.N. Stepanchuk - V.P. Cohen, "Buran Kaya III and Skalistiy rockshelter: two new dated Late Pleistocene sites in the Crimea", *Préhistoire européenne*, 9 (1996) 315-324.

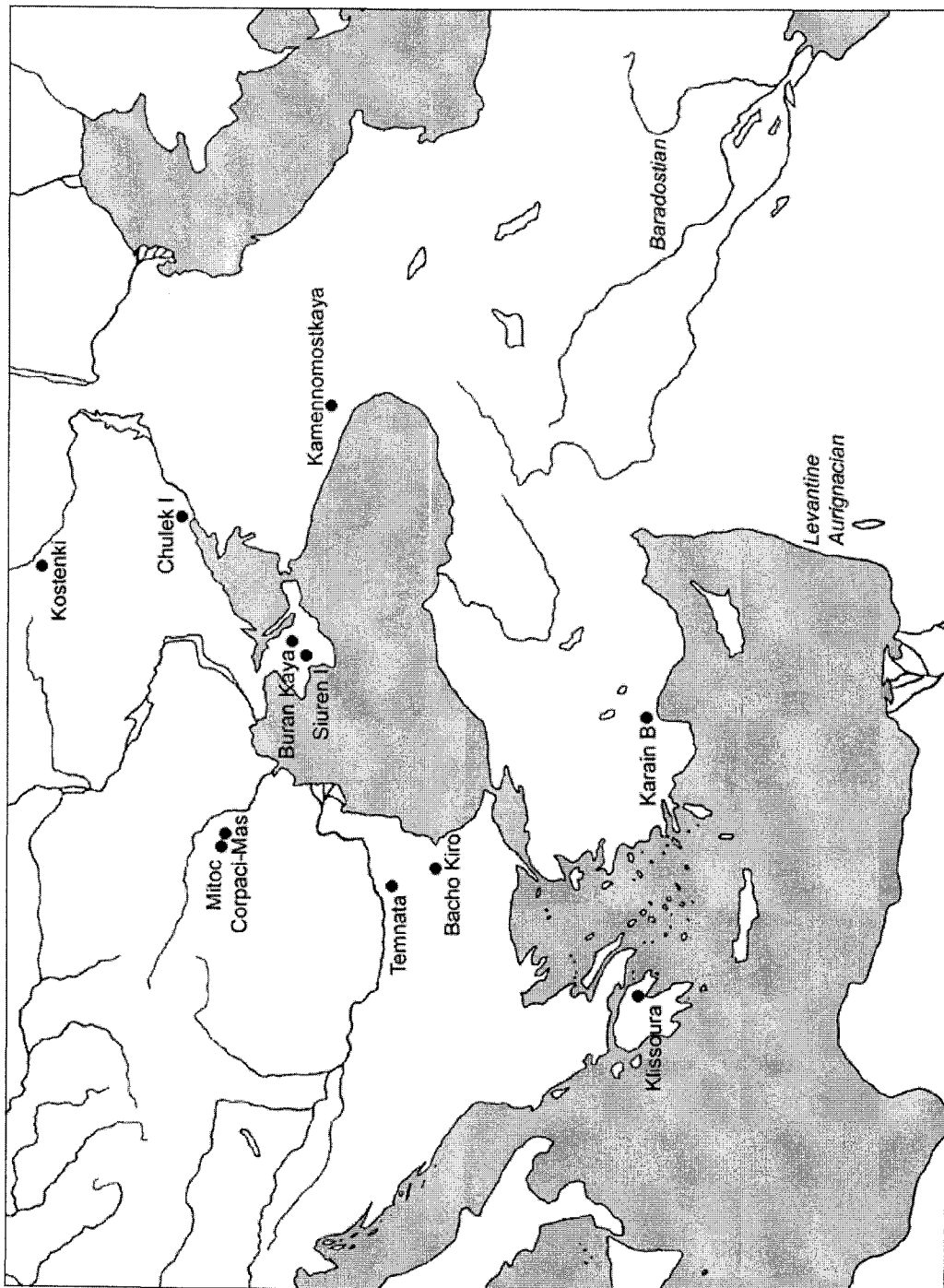


Figure 1: Location of sites mentioned in the text.

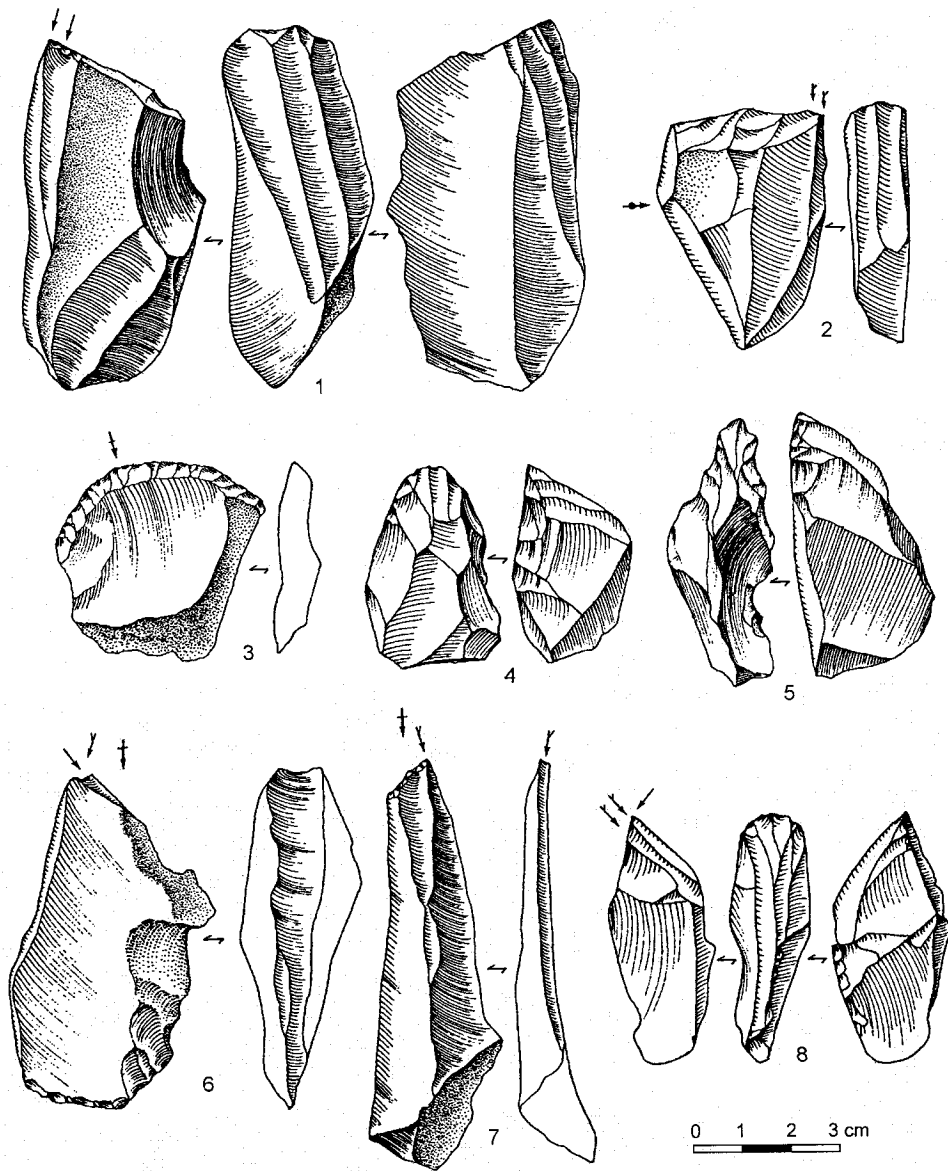


Figure 2: Mitoc-Malu Galben, Aurignacian assemblage I. Blade core (1), bladelet core (2), end-scraper on flake (3), carinated end-scraper (4), nosed end-scraper (5), dihedral burin (6), burin on truncation (7), carinated burin (8) (after Otte & Chirica 1993; Noiret 2004).

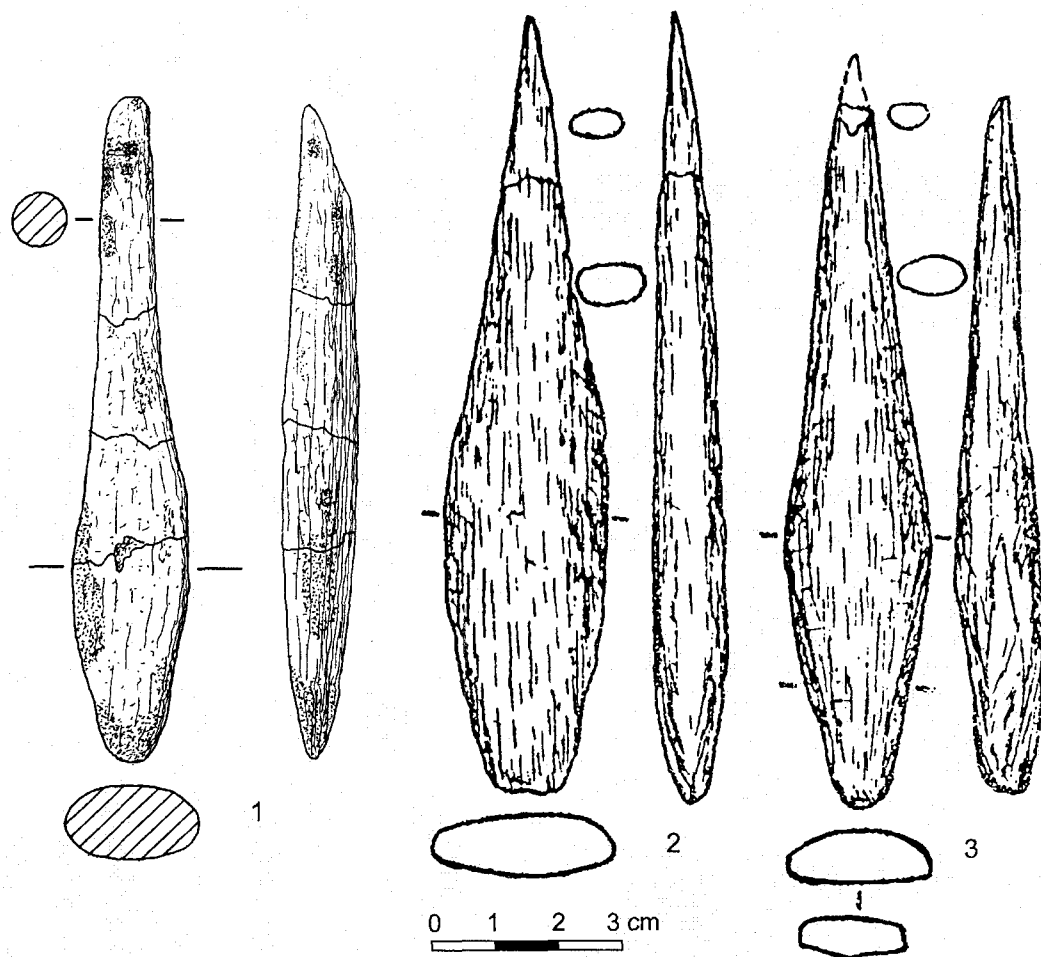


Figure 3: Mladeč points from Mitoc-Malu Galben (Aurignacian assemblage I). (1) and from Corpaci-Măs (2-3) (after Noiret 2004; Borziac & Chetaru 1996).

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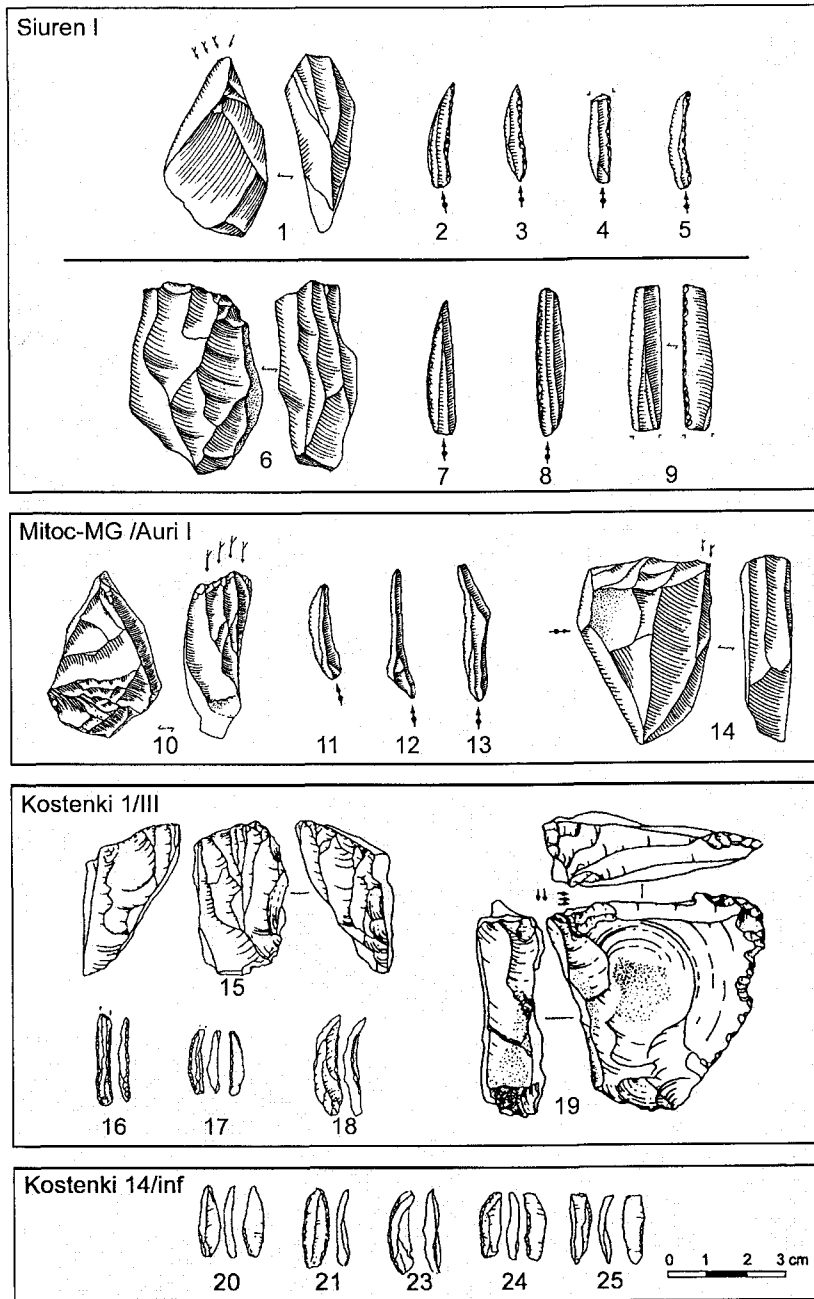


Figure 4: Aurignacian of the "Krems-Dufour" type. Siuren I/F (1-5), Siuren I/G-H (6-9), Mitoc-Malu Galben /Auri I (10-14), Kostenki 1/III (15-19), Kostenki 14/inf (20-25) (after Otte *et al.* 1996b; Noiret 2004; Sinitsyn 1993, 2003.)