

NEWS ON OLD SITES: THE MIDDLE PALAEO LITHIC OCCUPATION AT CHEIA – LA IZVOR (SOUTHEASTERN ROMANIA)

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Keywords: Dobrogea, Middle Palaeolithic, radiocarbon, faunal analysis, lithic industry

Abstract: Our paper presents new information regarding the site of Cheia – La Izvor. New radiocarbon ages were obtained, and they confirm that the occupation was at around 36 ka BP (ca. 40 ka cal BP). The faunal analysis has revealed that the cave seems to have functioned as a shelter for carnivores, with the remains of cave bear predominating. Other carnivores, such as cave hyenas, wolves and foxes, most likely also contributed to the accumulation of bones, with large, middle and small prey species represented. No anthropogenic traces were identified on the bones. The very small lithic collection comprises mostly formal tools, thus accounting for a short-term, logistic occupation of the site.

Cuvinte-cheie: Dobrogea, Paleolitic Mijlociu, radiocarbon, analiză faunistică, industrie litică

Rezumat: Articolul de față prezintă noi date despre situl paleolitic de la Cheia – La Izvor. Au fost obținute noi date radiocarbon care confirmă vârsta sitului în jur de 36 ka BP (cca 40 ka cal BP). Analiza faunistică arată că peștera pare să fi funcționat ca un adăpost pentru carnivore, ursul de peșteră fiind predominant. La acumularea oaselor au contribuit cel mai probabil și alte carnivore, precum hienele de peșteră, lupii și vulpile care au introdus elemente de la animale de talie mare, medie și mică. Pe oase nu au fost identificate urme antropice. Industria litică, restrânsă numeric dar conținând aproape exclusiv unelte, indică una sau mai multe ocupări de scurtă durată.

INTRODUCTION

Throughout the history, the province of Dobrogea has been the setting of population dynamics, as it is testified both by numerous discoveries ranging from Neolithic settlements and Greek and Roman cities to medieval fortresses, and the present-day great ethnic diversity. Bordered by the Danube and the Black Sea, this territory is a very offering area for agriculture, shepherding, and naval trade. At the same time, Dobrogea proved fairly rich in Palaeolithic discoveries, many of them preserved under thick loess blankets, spanning from the Lower Palaeolithic to the end of the Pleistocene. The research on the Palaeolithic of Dobrogea, mostly carried out since the second half of the last century, has revealed numerous find-spots of scattered lithics, as well as about a dozen sites, both in open air and in caves (Dobrescu, Doboș in press; Nicolăescu-Plopșor *et alii* 1959; Păunescu *et alii* 1972; Cârțumaru, Păunescu 1976; Valoch 1993; Păunescu 1999; Păunescu *et alii* 1972; Iovita *et alii* 2012; Balescu 2013; Tuffreau *et alii* 2013; Iovita *et alii* 2014; Balescu *et alii* 2015; Fitzsimmons *et alii* 2020).

In this paper we report on two new radiocarbon dates coming from the site, and provide a new interpretation of the lithic collection and the faunal analysis of the pieces that are still available in the repositories.

PUBLISHED DATA ON THE SITE

The Cheia – La Izvor site is a cave located in the central part of the Casimcei Plateau, a region rich in Jurassic and Cretaceous limestone concentrations (Posea *et alii* 1974). The cave itself is situated in the Dobrogei Gorge, on the right side of the Cheia River, near its junction with the Casimcea River (Fig. 1).

It is a small cave with a single chamber, ca. 14 m × 5 m, with the entrance facing east (Fig. 2).

Excavations covering ca 35 m² were carried out in 1956 and 1957 by C. S. Nicolăescu-Plopșor, A. Păunescu, N. Harțuchi, and A. Bolomey; in 1970, another small excavation was made by P. Samson and C. Rădulescu. After 1970, the cave was completely emptied of sediment and turned into a bar (Nicolăescu-Plopșor *et alii* 1959; Păunescu *et alii* 1972; Păunescu 1999).

Stratigraphy described by Păunescu (1999) was as follows (Fig. 3):

- Humic deposit, 0.1 to 0.5 m thick
- Loessoid deposit, 0.04 to 0.27 m thick. At the bottom of this layer were found a few (unspecified number) lithics that were assigned to the Aurignacian.
- Reddish paleosol, 0.20 to 0.6 m thick, with numerous calcareous concretions. Throughout this layer were discovered the Middle Palaeolithic (MP) artefacts and faunal remains.



Figure 1. The most important Middle Paleolithic discoveries from Dobrogea. 1. Cheia – La Izvor; 2. Saligny – La Ghiol; 3. Peștera – Dealul Peșterica; 4. Castelu – Dealul Cainar; 5. Cuza Vodă – ESE de Betonieră; 6. Lumina – Punct 1 Peninsulă; 7. Mamaia – Mamaia Sat; 8. Târgușor – La Adam.

The number of lithic artefacts reported by Păunescu was 128, mostly representing formal tools (ca. 87%). Faunal remains were dominated by *Ursus spelaeus* fragments (ca. 64%), and among the other identified species were *Equus caballus fossilis*, *Coelodonta antiquitatis*, *Crocota spelaea*, *Cervus elaphus*, *Rangifer tarandus*, *Bison* s. *Bison*, *Canis lupus*, *Vulpes vulpes*, *Felis leo spelaea*, *Sus scrofa*, and *Capra ibex*. Numerous micromammal remains have also been discovered: *Cricetus cricetus*, *Mesocricetus newtoni*, *Allocrietulus eversmanni*, *Cricetus migratorius*, *Lagurus lagurus dobrogeicus*, *Eolagurus luteus rumanus*, *Lagurus lagurus thracicus*, *Eolagurus luteus axshaenicus*. The occupation was dated at around 36 ka BP, as indicated by

a radiocarbon date. The lithic assemblage was assigned to a late typical Levallois Mousterian (Păunescu 1999).

REASSESSMENT OF THE SITE

The collection available for us to study is only partial: we could study 58 lithics, curated at the Museum of National History and Archaeology, Constanța and 173 faunal fragments curated at the “Vasile Pârvan” Institute of Archaeology, Bucharest. Moreover, reconstructing the spatial provenience of the available pieces was hampered by the ink labelling, which in many cases has worn off.

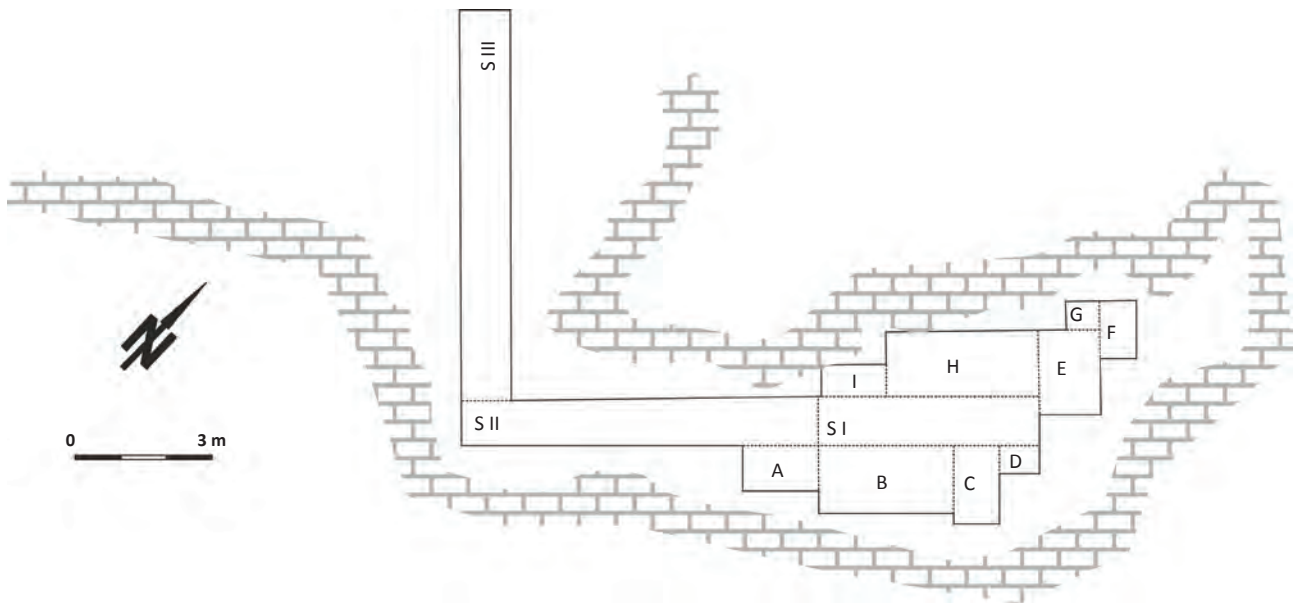


Figure 2. Cheia – La Izvor. Plan of the cave and the excavated trenches (redrawn after Păunescu 1999).

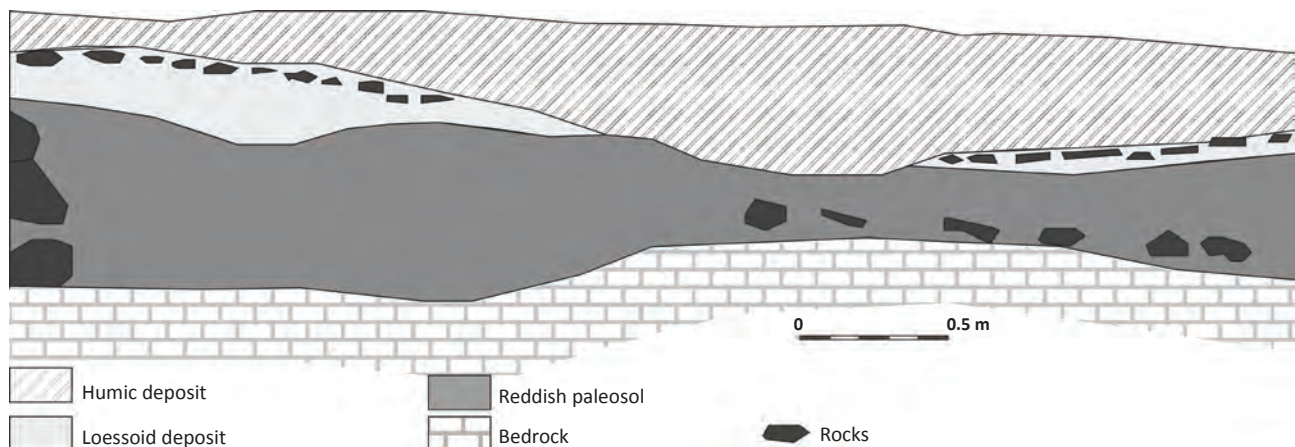


Figure 3. Cheia – La Izvor. Stratigraphy of the site (redrawn after Păunescu 1999).

Artefact density

Spatial information regarding the material is elusive. According to the plan (Fig. 2), three trenches were excavated, and S I, inside the cave was enlarged on the sides with small surfaces labelled A through H (dubbed *Caseta*, abridged *Cas.*). Thus, a total surface of ca. 33.5 m² can be assessed. We could only read the depths on 29 lithics and on 172 bone fragments; many of them had the depth written as interval, so in these cases we averaged it. In the table below (Table 1) we present them by 10 cm intervals.

In assessing the average thickness of the reddish paleosol, the deposit with MP finds, we averaged the difference between the uppermost and lowermost pieces (0.24 m and 0.99 m, respectively), and thus the resulting value for the deposit thickness was 0.37 m. The volume of

Depth	Lithics	Fauna
0.20–0.29 m	5	4
0.30–0.39 m	2	6
0.40–0.49 m	3	16
0.50–0.59 m	2	19
0.60–0.69 m	6	55
0.70–0.79 m	0	2
0.80–0.89 m	2	7
0.90–0.99 m	9	48
1.00–1.10 m	0	15
Total	29	172

Table 1. Number of artefacts and faunal fragments.

excavated sediment was calculated at 12.4 m³. Although about half of the lithics are missing, according to Păunescu were discovered 128 artefacts, therefore the artefact density is ca. 10.3 artefacts/m³. Provided that the original number of faunal fragments is unknown, we cannot calculate their density per cubic meter.

Radiocarbon ages

One radiocarbon age had been available, on an unburned bone sampled in 1956 from S I/3, at -0.58 m depth. The bone species is unknown. We took two samples from the same stratigraphic column, *i.e.* S I/3, both from the depth of 0.93 m as a caution, as one of the sample may not have yielded collagen. The samples were analysed at the Tandem Accelerator Complex operated by Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (Bucharest-Măgurele, Romania). The results are presented below, in Table 2.

The ages concur, indicating very close values, towards the second half of MIS 3, thus confirming the 'late' character of the MP occupation of the cave (see the Discussion).

LITHIC ASSEMBLAGE

The assemblage we could study was of only 58 items, of which a small flake (< 2.5 cm) and a shatter (Fig. 4).

The main features of the lithic industries are presented in the tables below. Although the number was fairly small, technological and typological indexes were calculated, because of the very high percentage of formal tools.

Most of the pieces are flakes whose cortical surface is absent of below 10% of the surface. Cortex ratio was calculated to 0.15, assuming a spherical model of the nodules (Dibble *et alii* 2005; Douglass *et alii* 2008). This indicates that very little knapping had taken place on the site, an assumption endorsed by the very high percentage of formal tools.

Provenance	Code	Age BP	Cal BP*	Publication
SI/3, cas. B, -0.58m	GrN 16987	36810 +790/-720	42445–40580	Păunescu 1999
SI/3, -0.93m	RoAMS 1176.53	36506 +/-772	42359–40219	this publication
SI/3, -0.93m	RoAMS 1177.53	37048 +/-823	42621–40651	this publication

* OxCal, Intcal 20 Curve

Table 2. Radiocarbon ages for Cheia – La Izvor.

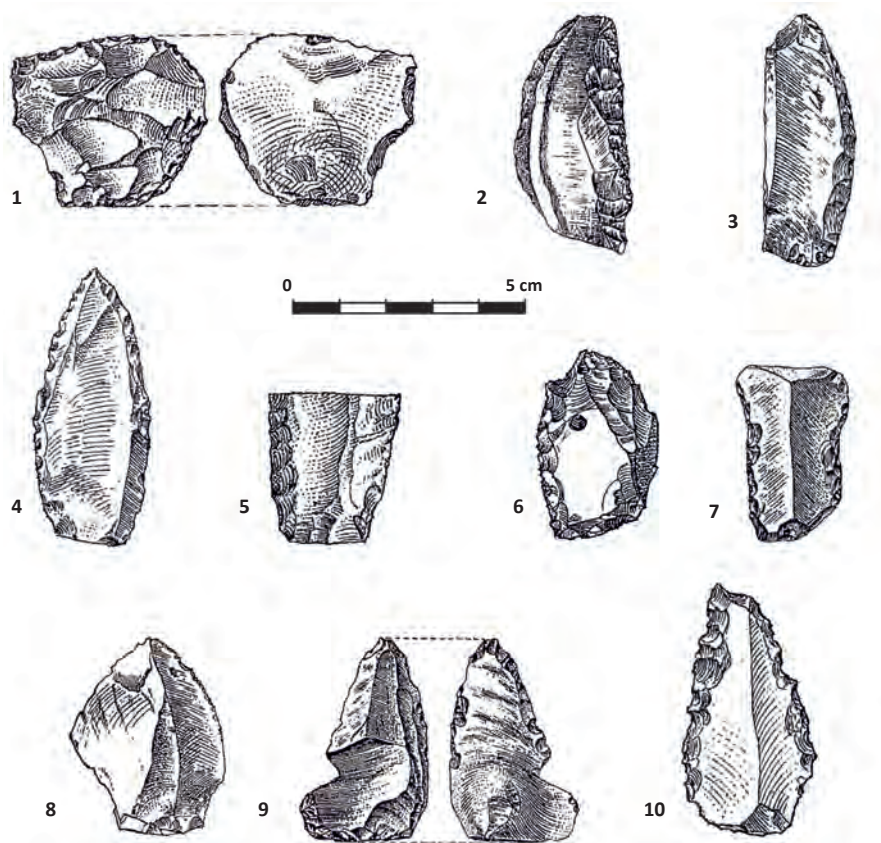


Figure 4. Cheia – La Izvor: 1. Transverse scraper; 2. Limace; 3, 6. Convex sidescrapers; 4. Mousterian point; 5, 7. Straight sidescrapers; 8. Retouched Levallois point; 9. Scraper on the interior; 10. Denticulate (modified from Paunescu 1999).

	Tool type	N	%
1	Typical Levallois flake	2	4.3
2	Atypical Levallois flake	4	8.7
3	Levallois point	1	2.2
4	Retouched Levallois point	1	2.2
5	Pseudo-Levallois point	1	2.2
7	Elongated Mousterian point	1	2.2
8	Limace	1	2.2
9	Single straight scraper	2	4.3
10	Single convex scraper	3	6.5
11	Single concave scraper	1	2.2
13	Double straight-convex scraper	3	6.5
15	Double convex scraper	2	4.3
21	Déjeté scraper	1	2.2
23	Convex transverse scraper	2	4.3
25	Scraper on interior surface	2	4.3
28	Scraper with bifacial retouch	1	2.2
30	Typical endscraper	1	2.2
34	Typical perçoir	1	2.2
37	Atypical backed knife	1	2.2
38	Naturally-backed knife	1	2.2
40	Truncation	1	2.2
42	Notch	6	13.0
43	Denticulate	1	2.2
46–49	Flake with abrupt and alternating retouch	4	8.7
54	End-notched flake	2	4.3
	Total	46	100

Table 3. Type-list of lithic tools.

Typological indices	%
Levallois typological index	17.4
Scraper index	37.0
Total Acheulean index	2.2
Unifacial Acheulean index	2.2
Bifacial index	0.0
Charentian index	10.9
Gr. I (Levallois)	17.4
Gr. II (Mousterian)	43.5
Gr. III (Upper Palaeolithic)	8.7
Gr. IV (Extended Denticulate)	15.2

Table 4. Typological indices.

Technological indices	%
Levallois index	39.6
Faceting index	60.4
Strict faceting index	60.4
Blade index	5.7
Quina index	0

Table 5. Technological indices.

Integrity of unifacial pieces	
(retouched or not)	
Complete	44
Proximal	9
Medial	0
Distal	0
Total	53

Table 6. Integrity of the unifacial pieces.

Dimensions			
		\bar{x}	σ
Complete unretouched flakes (13)	Length	47.4	11.2
	Width	30.4	6.6
	Thickness	7.9	3.6
	Weight	15.8	8.9
Scrapers (17)	Length	44.2	10.6
	Width	33.6	9.6
	Thickness	8.8	2.8
	Weight	18.5	7.5
Notches and denticulates (7)	Length	46.7	15.7
	Width	35.8	9.3
	Thickness	7.7	2.1
	Weight	22.7	15.6
Complete cores (2)	Length	67.8	26.2
	Width	48.9	.9
	Thickness	33.1	17.3
	Weight	182	131.6

Table 7. Dimensions of the main categories of lithics.

Cortical surface	N
0 %	40
1–10 %	5
10–40 %	5
40–60%	2
60–90%	1
Total	53

Table 8. Cortical surface.

Cores (2)

There are two flint cores. One is inform, with a single platform and a single striking plan. Cortical surface is within the interval 1–10%, and the dimensions are 49.4 × 48.3 × 20.8 mm. On the second one, inform as well, no platform or striking plans could be identified. The cortical surface falls within the interval 10–40%, and the dimensions are 86.4 × 49.6 × 45.3 mm.

Flake to core ratio

The minimum number of knapping products is 53, and the flake-to-core ratio is 26.5, calculated according to Hiscock (2002).

Platform preparation

The most numerous platforms are faceted, followed by plain ones (Table 9).

Facetted	Plain	Cortical	Missing	Indet.	Total
32	9	1	10	1	53

Table 9. Types of platforms.

Retouched tools

In selecting the blanks for modification, the preference was evident towards the Levallois and tertiary¹ blanks. One tool was on a primary flake. Most of the scrapers are heavily retouched. Notched tools feature, with one exception, retouched notches. The only combined tools are notch-naturally backed knife and distal notch-naturally backed knife.

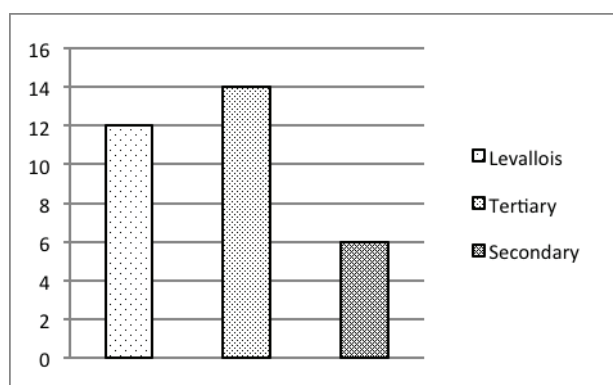


Figure 5. Cheia – La Izvor. Blanks selected for modification.

When comparing the size (length × width) of the pieces of the essential assemblage to the unretouched pieces, the difference between the surface areas of the two categories is not statistically significant ($p = 0.83$), therefore there is no clear preference towards the modification of larger blanks.

FAUNA

Of the 173 remains identified, three have taphonomic characteristics indicating that they are much more recent than the Palaeolithic faunal specimens (as indicated by their colour and the fossilization degree). These are two bones of *Bos taurus* (a phalanx 1 and a distal metatarsus) and a lower first molar of *Ovis / Capra*, very worn. Both elements of *Bos taurus* show signs of burning, and the metatarsus also has cut marks – skinning. Having the certainty that these remains have entered the Palaeolithic level through subsequent disturbances, most probably caused by animals, we will remove them from the sample.

Taxonomic composition of the faunal accumulation

The sample is dominated by cave bear remains (*Ursus spelaeus*) (almost 60% as NISP and more than 40% as weight), mainly dentition and a few metapodials and phalanges. The majority of the skeletal remains, about 66%, come from young individuals, as indicated by the unerupted or freshly erupted teeth. In addition to bears, very rare remains of wolves, foxes and cave hyenas have

¹ We called primary flakes those with cortical surface over 90%, secondary flakes those with cortical surface between 10% and 90%, and tertiary flakes those with cortical surface below 10%.

been identified (teeth and distal limbs). The wolf (*Canis lupus*) is represented by three dental remains and a phalanx. From the fox (*Vulpes vulpes*) we identified an incomplete mandible, a lower tooth and a metacarpal. The cave hyena (*Crocota spelaea*) is represented only by a tooth fragment (the first lower molar).

The largest herbivore identified is the woolly rhinoceros (*Coelodonta antiquitatis*) indicated by nine molar fragments. The horse (*Equus* sp.) is represented by ten dental fragments and a maxillary with an almost complete tooth row. In terms of weight, the horse holds second place after the cave bear, as the best represented herbivore.

Ruminants are represented by large bovids (*Bison priscus* or *Bos primigenius*), medium-sized bovids (*Capra ibex*) and deer (*Rangifer tarandus* or *Cervus elaphus*). This group exceeds 20% as number of remains and, similar to the other species, dentition and distal elements of the limbs predominate.

Rare species, present only with a skeletal remnant or two, include the wild boar (*Sus scrofa*), the European hare (*Lepus europaeus*) and the beaver (*Castor fiber*).

Taxon	NISP	%	W (g)	%
<i>Bos/Bison</i>	12	7.2	86	6.2
<i>Capra ibex</i>	16	9.6	78	5.7
<i>Cervidae</i>	8	4.8	93	6.7
<i>Equus</i> sp.	11	6.6	448	32.5
<i>Coelodonta antiquitatis</i>	9	5.3	82	5.9
<i>Lepus europaeus</i>	1	0.6	5	0.4
<i>Castor fiber</i>	2	1.2	11	0.8
<i>Ursus spelaeus</i>	99	59.3	563	40.8
<i>Canis lupus</i>	4	2.4	4	0.3
<i>Vulpes vulpes</i>	3	1.8	3	0.2
<i>Crocota spelaea</i>	1	0.6	5	0.4
<i>Sus scrofa</i>	1	0.6	2	0.1
Total identified	167	100	1380	100
Unidentified large sized mammals	3	-	25	-
Total unidentified	3	-	25	-
TOTAL	170	-	1405	-

Table 10. Taxonomical distribution of mammal fossil remains from Cheia – La Izvor as NISP and Weight (W, in grams).

Bone modifications

In addition to their skeletal remains, the presence of carnivores is also indicated by the traces on the bones that attest to their activity: acid corrosion caused by digestion and tooth marks. Rodent gnawing was also identified on a bone fragment (Tab. 12). Human modifications on animal bones were not observed.

Bone modifications	NISP
Acid-etching (carnivore digestion)	6
Carnivore tooth marks	2
Rodent gnawing	1

Table 12. Fossil bones from Cheia – La Izvor presenting various modifications.

Element	<i>Bos/ Bison</i>	<i>Capra ibex</i>	Cervidae	<i>Equus sp.</i>	<i>Coelodonta antiquitatis</i>	<i>Lepus europaeus</i>	<i>Castor fiber</i>	<i>Ursus spelaeus</i>	<i>Canis lupus</i>	<i>Vulpes vulpes</i>	<i>Crocota spelaea</i>	<i>Sus scrofa</i>
Antler	-	-	3	-	-	-	-	-	-	-	-	-
Skull	-	1	-	-	-	-	-	1	-	-	-	-
Maxillary and upper teeth	2	3	-	4	-	-	1	21	1	-	-	1
Mandible and lower teeth	4	4	2	1	-	-	-	25	2	2	1	-
Isolated, unassigned teeth	5	2	1	6	9	-	-	36	-	-	-	-
Axis	-	1	-	-	-	-	-	-	-	-	-	-
Metacarpal	-	2	-	-	-	-	-	-	-	1	-	-
Metapodial	-	-	-	-	-	-	-	8	-	-	-	-
Femur	-	-	-	-	-	1	-	-	-	-	-	-
Astragalus	-	1	-	-	-	-	1	-	-	-	-	-
Calcaneus	-	1	-	-	-	-	-	-	-	-	-	-
Sesamoids	1	-	-	-	-	-	-	-	-	-	-	-
Phalanx 1	-	-	-	-	-	-	-	5	1	-	-	-
Phalanx 2	-	1	2	-	-	-	-	3	-	-	-	-
Total NISP	12	16	8	11	9	1	2	99	4	3	1	1

Table 11. Skeletal distribution of the anatomically identifiable fossil remains from Cheia – La Izvor as NISP.

DISCUSSION

Understanding Middle Palaeolithic occupations in Dobrogea is a complex matter. To date there are ca. 30 find spots with surface lithic collections, ranging from one to ca. 50 lithics potentially assigned to the period according to their typology (Păunescu 1999). At the same time, there are sites with richer collections (see the map in Fig. 1), but most of them were also reworked. We refer here to Peștera – *Dealul Peșterica*, Saligny – *La Ghiol*, Castelu – *Dealul Cainar*, Lumina – *Punctul 1 Peninsulă*. The collections here range from ca. 80 to several hundred pieces, so we assume they account for richer archaeological levels. Unfortunately, the sole type of study that can be carried out is just techno-typological in nature. These lithic industries were worked at variable degrees in the Levallois technique, are flake-dominated, and among tools the most numerous are the sidescrapers, notches and denticulates (Doboș 2010; Păunescu 1999). A more fortunate situation is encountered at the site of Cuza Vodă – *ESE de Betonieră*, where was reported a lithic collection of ca. 1300 lithics (Doboș 2010; Păunescu 1999); a core was found *in situ* during a visit of the site in 2010, in a trench made for industrial purposes, and it was dated through IRSL in a time bracket of ca. 55 ka–95 ka (Iovita *et alii* 2014). Although this age provides valuable information, it remains unclear if the surface lithic collection was coming from one or multiple discrete levels. The sites with *in situ* discoveries are very few. One is Târgușor – *La Adam*, where the total number of lithics is unknown (in the dozens according to the published sources) and it is unclear if they really make one or more discrete Middle Palaeolithic levels (Păunescu 1999; Tuffreau *et alii* 2013). The other one is Mamaia – *Sat*,

with two levels with over 1500 lithics that were assigned to the Middle Palaeolithic (Păunescu 1999; Valoch 1993), but for which was hypothesized an older age, dating from the Middle Pleistocene (Balescu *et alii* 2015).

In the context presented above, the cave of Cheia – *La Izvor* appears as a unique site; despite its incomplete collections, both lithic and faunal, it preserves reasonable information regarding the stratigraphy and benefits from radiocarbon ages.

The radiocarbon ages indicate that it was occupied towards the end of the Middle Palaeolithic, during the MIS 3. The depths which could be read on the pieces, both lithic and faunal, show a fairly even distribution throughout the stratigraphic sequence, with a slightly higher concentration of faunal remains in the 0.60–0.69 m and 0.90–0.99 m intervals.

It is hard to assess the intensity of the post-depositional processes; however, the predominance of the cave bear bones, corroborated by the presence of fragments of Holocene bones indicates that the site had been affected by denning activities.

Both the accounts by Păunescu (1999) and by us indicate that the site was used for short-term, logistic occupations, carried out for completing a specific task while carrying a small number of finished tools. The lithic assemblage, mainly comprising formal tools, is dominated by sidescrapers. Most of the tools are made on Levallois and non-cortical flakes.

The occupation(s) occurred around 41 ka cal. BP, thus belonging to the late MP. Cheia – *La Izvor* aligns chronologically with most of the MP cave occupations: Baia de Fier – *Peștera Muierii* (Doboș *et alii* 2009; Doboș *et alii* 2010), Boroșteni – *Peștera Cioarei* (Cârciumaru

2000), Râșnov – *Gura Cheii* (Cârciumaru et alii 2008), Moieciu – *Peștera Mare/Lilieciilor Moieciu – Peștera Valea Coacăzei* (Cârciumaru et alii 2010), Ohaba Ponor – *Bordu Mare* (Cârciumaru, Nițu 2008), Nandru – *Peștera Curată*, Nandru – *Peștera Spurcată* (Păunescu 2001), generally dated within the second half of MIS 3 (for a comprehensive list of absolute ages, see the tables compiled in earlier publications (Cârciumaru et alii 2007; Doboș 2017; Doboș, Chu 2019). It is interesting to note that all these cave sites, except for Cheia – *La Izvor* have lithic industries on quartz/ite and other coarse grained rocks, a fact that can most likely be explained through the raw material availability (Doboș, Chu 2019).

CONCLUSION

Cheia – *La Izvor* is an important Palaeolithic site, despite the small size of the lithic and faunal assemblages. Like other caves in the region, it seems to have functioned as a shelter for carnivores, with cave bear predominating in number of remains and weight. Other carnivores, such as hyenas, wolves and foxes, most likely contributed to the accumulation of bones. They introduced into the cave parts of large animals (woolly rhinoceros, bison / aurochs, horse), medium (deer, goats) and small (hare, beaver).

There is evidence that some animals that temporarily occupied the cave disturbed the old archaeological levels, as indicated by three post-Palaeolithic bone fragments interspersed with the Palaeolithic ones.

It is hard to assess if the lithic assemblages accounts for a single, discrete occupation or for several episodes. Regardless, the relatively few formal tools are elaborate, which indicate that when the cave was available was used for short-term visits sheltering hominins carrying out specific tasks.

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