Статті

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UPPER PALAEOLITHIC OCCUPATIONS IN THE MIDDLE DNISTER VALLEY: ZOOARCHAEOLOGICAL STUDIES IN THE DOROSHIVTSI III SITE (UKRAINE) — CAMPAIGN 2019

In 2019, new excavations were carried out at Doroshivtsi III site, dated to the Last Glacial Maximum. Ten identifiable archaeological levels belong to the Gravettian technocomplex. In the article, detailed data about the faunal remains is presented. The remains of reindeer, horses, mammoths, a wolf, a vulpine, and also a crow have been identified. According to the data, the main species for hunting were reindeer, then horses. In comparison with the sector of earlier excavations, in 2007—2010, the same species are represented on the site as well as a wolf, but the remains are less concentrated in the area, which may indicate a different purpose for the sector of 2019.

K e y w o r d s: Upper Palaeolithic, Last Glacial Maximum, Gravettian, Subsistence, Taphonomy.

The archaeological site of Doroshivtsi III is a key site for understanding human occupations in the Dnister River valley during the Last Glacial Maximum. We focus here on the study of faunal remains coming from the new excavations in order to comprehend better the preservation of this sector and the human activities.

Introduction

During the Last Glacial Maximum (31.0 and 21.5 ka cal BP / 26.0—18.0 ka C^{14} BP), several occupations are known in the extra-Carpathian area, in the Siret, the Prut and Dnister River basins, mainly in the south part, in Romania and in the Republic of Moldova (Черныш 1959; Borziak 1994; Păunescu 1998; Cârciumaru 1999; Hae-

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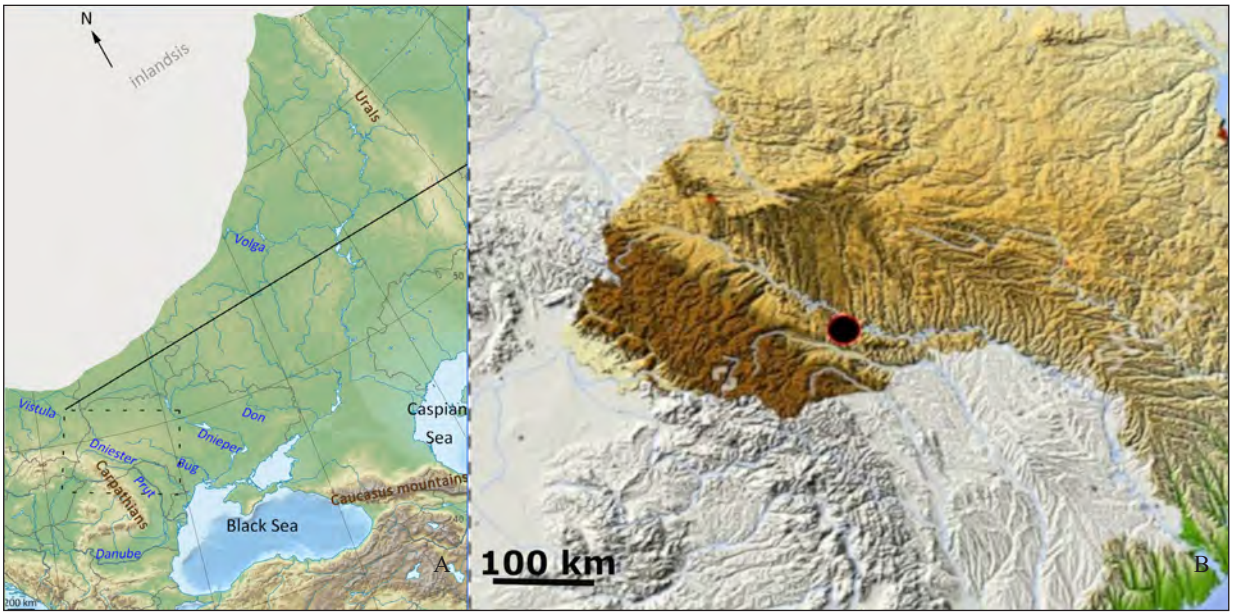

Fig. 1. The East European Plain (A) and the localisation of Doroshivtsi III in Ukraine (B)

saerts et al. 2003; Chirica, Borziak 2009; Noiret 2009; Anghelinu, Niţă, Murătoreanu 2018; Demay et al. 2021). Further to the north, in the middle Dnister area in Western Ukraine the site of Doroshivtsi III provided key results in this area about human activities during this period (Kulakovska et al. 2015). It is also during this period that the technocomplexes evolved from Gravettian to Epigravettian features.

It is evident from various works that cultural aspects in the region are quite homogeneous. These are human groups of small size, with high mobility, using local mineral resources, with hunting strategies focused on the reindeer migrations.

Lithic industries are characterised by specific tools, such as truncated elements, then large Gravettian points, and finally points with convex backs. These particularities are grouped under the same regional facies, as a late stage of the Molodovian, sometimes labelled as Molodova-Cosăuți-Cotu Miculinți cultural entity (Borziak et al. 2006) or Eastern Gravettian/Epigravettian of Ukraine (Борисковский 1953; Черныш 1954; 1973; 1985; Григорьев 1970; Otte et al. 1996; Борзияк 1998; Борзіяк, Кулаковська 1998; Djindjian 2002; Noiret 2007; Nuzhnyi 2009; Нужний 2015; Kulakovska et al. 2015). Nevertheless, we observe an intensification of bladelets and bone industry producing and the enlargement of the raw materials used (Anghelinu et al. 2019).

In this area, the main mammalian species present in archaeological sites are reindeer, horses and bison, often associated with a few canids. The woolly mammoth remains are used as artistic support, for osseous industry, especially ivory, as well as fuel (Demay et al. 2019). Therefore, it is important to specify the role of different species as food and non-food resources in the daily life of these populations.

The new excavations carried out in 2019 in Doroshivtsi III have yielded the following data (Połtowicz-Bobak et al. 2022) (fig. 1). Here we present detailed information about faunal remains, in order to describe in detail the faunal spectrum, the anatomical representation, the taphonomic conditions and the human activities.

History of research

The first prospections in Doroshivtsi were made in 1951 by A. P. Chernysh (1954) and he continued later in the 1960s (Черныш 1985). He discovered three open-air archaeological sites named Doroshivtsi I, II and III. From 2006 to 2010 new works had been conducted in Doroshivtsi III under the direction of L. V. Kulakovska (Кулаковська та ін. 2008). In 2019, a new project to excavate a bigger area was led by M. Połtowicz-Bobak and L. V. Kulakovska (fig. 2).

Location of the site

The site is located 26 m above the river on the terrace II of the Dnister. It was excavated over an area of 22,4 m².

Fig. 2. Localisation of the excavations of 2006—2010 and 2019 of Doroshivtsi III

Stratigraphic data and dating

In the first excavations made on around 50 m², seven archaeological layers were discovered in clay-sandy loess. The main layers (3, 6) were dated between around 20.6 and 22.4 ka C^{14} BP by charcoals (Кулаковська та ін. 2011; Kulakovska et al. 2015; Haesaerts et al. 2020). In 2019, ten layers with artefacts were identified (fig. 3).

The fieldwork reassumed in 2019 covered an area immediately to the east of the zone studied earlier. The topographic surface of the explored section is located at 157.86 m a.s.l., i.e. 1 m lower than the previously investigated profile (Кулаковская, Усик, Эзартс 2012). A detailed description of the Doroshivtsi III's section was prepared down to the depth ca. 7.15 m according to palaeopedological criteria (Guidelines for soil description, 2006), and a preliminary examination down to 8.3 m. In the studied sequence six (I—VI) main lithological units have been distinguished, plus — tentatively — unit VII. Layers with artefacts from A- to 4 are within the limits of litho-pedological subunits 4, 5, and 6 of unit V and in unit VI, while layers with artefacts 5, 5a, and 6 are located in the tri-segmented unit VII (fig. 3).

The upper, archaeologically sterile, part of the Doroshivtsi sequence of calcareous, layered sandy-clay sediments can be identified as aeolian loess (unit II) and colluvial-solifluction loess (units III—IV). The main layer of carbonate debris (unit III) is a record of a single, albeit visibly repeated, cycle of more intensive activity of solifluction processes. The OSL ages between 20.1 and 21.9 ka (but with inversions) of sediments within units II—IV suggest that they were formed over a relatively short period. The lack of younger deposits than 20 ka and thus corresponding to the main phase of loess sedimentation in the Dnister valley (Łanczont et al. 2021) may be a consequence of the significant activation of slope processes at the end of the Last Glacial period (Starkel et al. 2015).

The unit V illustrates a dynamic periglacial slope environment on terrace II in a period of rapid palaeoclimate changes (chiefly an increase in humidity), including — probably short — episodes of weakening of aeolian-slope processes and stabilisation of its surface, occurring between 25.5—23.7 ka BP. Such episodes of landscape stabilisation are evidenced by thin soils developed as weak humus or vegetation horizons with variable — yet always thin — thickness, and ultimately fading away. The lateral disappearance of soil horizons should be assigned to the post-pedogenic activity of destructive slope processes, spreading the soil material across the slope. The unit VI, formed ca. 27 ka ago, represents a period with relatively cool and wet climate conditions, as evidenced by small cryoturbation structures and gley signs. The preliminary explored soil ho-

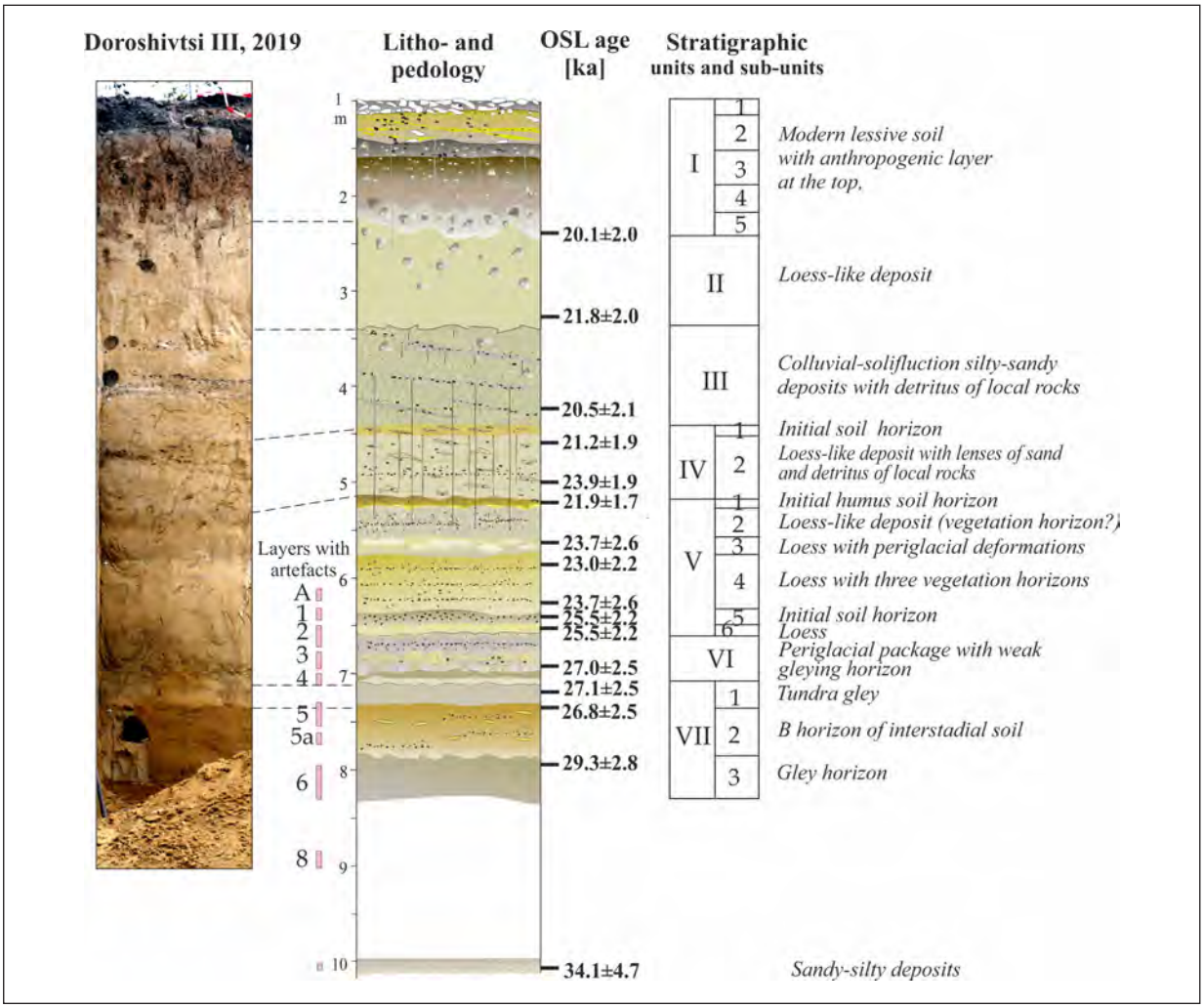

Fig. 3. Lithopedostratigraphy of the Doroshivtsi III section-2019 (after: Połtowicz-Bobak et al., 2022)

rizons forming unit VII in the lower part of the section are dated OSL to ca. 27—29 ka; they are continuous, relatively well developed, and testify to the existence of palaeoclimatic conditions more conducive to pedogenesis. However, the gleysol, which is the lowest horizon of unit VII, had developed in a rather cold climate.

The set of initial soils at the Doroshivtsi III site with OSL ages of ca. 27—21 ka (fig. 3) is likely to be an environmental response determined by the local lithology and relief in the site (including exposure and inclination etc.) to the hydroclimate variability of MIS 2. For these reasons, the soil horizons distinguished during the different excavation seasons at the site are difficult to correlate despite the generally small area surveyed. The differences are smaller in the lower part of the sequence. There is an interstadial cambisol (Poltowicz-Bobak et al. 2022), found also in all the previous studies of the site (Кулаковська та ін. 2011; Kulakovska et al. 2015; Haesaerts et al. 2020). It is a horizon probably of stratigraphic marker importance, representing the younger part of MIS 3.

Environmental data

In the previous excavations, typical species of the glacial period were present, such as *Mammuthus primigenius* (woolly mammoth) and *Rangifer tarandus* (reindeer) (Demay, Patou-Mathis, Kulakovska 2015). They are also present in the new excavations. Moreover, small mammals were studied in the new excavations coming from the units V, VI and VII. The most represented taxa are *Lasiopodomys anglicus* (European narrow-headed vole) and *Ochotona pusilla* (steppe pika). Then are present *Alexandromys oeconomus* (tundra vole), *Dicrostonyx torquatus* (Arctic lemming) and *Sicista* sp. (birch mouse). These species are typical for

the steppe-tundra community, living in treeless and bushy environments with a mosaic of grassy vegetation, quite wet (Połtowicz-Bobak et al. 2022).

During the previous excavations, the results were obtained on the malacofauna (Popiuk 2014). The species *Succinea oblonga elongata* and *Succinea putris* were present. They are eurythermal and can live in very cold environment, although they are hygrophilous; therefore, these species lived near a stream. Freshwater species, including *Anisus spirorbis* and *Lymnaea palustris*, are numerous and testify to the proximity of a calm and constant aqueous environment. A few amphibious species have also been identified. Terrestrial species are mainly represented by cryophilic species (*Pupilla loessica*, *Columella columella*, *Vallonia tenuilabris*). *Pseudotrichia rubiginosa* is typical for the Pleistocene tundra and *Columella columella gredleri* of the loess of the Carpathian region. Finally, the presence of *Trichia hispida* testifies to short periods of warming (see: Alexandrowicz et al. 2014).

According to the palynological studies from the preceding excavations (Кулаковська та ін. 2011), the indications are similar. Indeed, the vegetation is of the steppe-tundra type with herbaceous plants, shrubs and bushes adapted to the cold environment, but denoting a certain humidity. During the formation of humus soils, the vegetation is denser, with the presence of trees (birch, alder, willow, pine, oak), which testifies to an increase in temperature and humidity. The archaeological levels of Doroshivtsi III are characterised by a steppe-tundra environmental type with the presence of forest corridors and hygrophilous species.

Faunal data

During the previous excavations we identified a restricted faunal spectrum with few individuals in each layer, mainly dominated by *Rangifer tarandus* (reindeer), associated with *Equus* sp. (horse), *Mammuthus primigenius* (woolly mammoth) and *Vulpes vulpes* and *lagopus* (fox) (Demay, Patou-Mathis, Kulakovska 2015).

Lithic industry data

During the prior excavations, a total of 27920 pieces were counted (Кулаковская, Усик, Эзартс 2012). Layers 1 and 7 yielded very few pieces and layers 2 and 5 only a few tools, especially burins. Layers 3 and 4, rich in lithic artefacts, were the subject of a techno-typological analysis. Longitudinal and parallel longitudinal debitages, by hard and soft percussion, were used. The tools are diversified: scrapers, retouched blades, bladelets, backed microblades and burins. Layer 6 is the richest in lithic pieces. Longitudinal and parallel longitudinal debitages, by hard percussion, were used. End scrapers, blades, bladelets, retouched and backed microblades and shouldered points have been identified.

In the excavations of 2019, a total of 67 pieces were discovered, including 62 flint and five stone artefacts. A total of 25 pieces were observed in the layer 2 and between 2 and 15 pieces in the other layers. Surprisingly, we observed an almost complete lack of retouched tools and chips. The lithic industry uses local raw material and most of the finds were fragmented (Połtowicz-Bobak et al. 2022).

Osseous industry data

During the excavations of 2006—2010, layer 6 yielded five pieces of osseous industry (Рідуш 2008; Кулаковська, Усик, Эзартс 2012; Kulakovska et al. 2015; Demay, Patou-Mathis, Kulakovska 2015). There is an ivory point (116 × 7.9 mm) with an oval cross-section and presenting a series of fine transverse striations in the proximal part. Two pointed ivory fragments with deep transverse cutmarks were also found. Two points, probably awls, were made on reindeer metapodials. The first one (120 × 41 × 5.19 mm) has been polished and the second one (104.9 × 6.87 mm) has an oval section, more triangular at the base. In addition, a mammoth tusk was decorated with engraved patterns. It is 150 mm long and 50—20 mm in diameter. The surface was decorated with meanders and zoomorphic images made by very fine incisions.

Structure data

During the excavations of 2006—2010, layers 6 and 4 yielded undelineated ash deposits and layer 3 a constructed hearth. In 2019 no structures were identified.

Human behaviour data

In the previous results, small human groups came at different seasons, used local flint and mainly exploited reindeer for soft tissue, as well

as horses and foxes. Bones were used as fuel, also as mammoth ivory as artistic media and to make tools.

It is difficult to characterise the status of the woolly mammoth within the levels of Doroshivtsi III. Indeed, mammoth bones are present in all layers, but, no butchering marks were found on the bones. Moreover, these are too scattered to proceed with interpretations based on skeletal preservation. These findings are to be related to the large dimensions of this animal. Indeed, a mammoth is characterised by a large mass of fat and meat which, during cutting, generates little or no butchery marks on the bones. Similarly, as a result of the large size of the bones, it is possible that the meat would be cut, without human groups bringing the bones to the site. It is therefore possible that mammoth was consumed in Doroshivtsi III. It could be the acquisition of meat by scavenging on fresh carcasses, or only the collection of dry bones. The presence of young adults and juveniles suggests that these individuals came from a matriarchal herd. The low number of individuals makes it impossible to identify population profiles. We can note that it is relatively rare for young adults to be the most represented in the catastrophic or attritional mortality profiles, they could be individuals hunted by human groups. However, we cannot be certain about the status of this taxon in terms of acquisition and diet.

Occupation interpretation and technocomplexes

In the previous results, layers 7 and 1 were too poor in artefacts to allow cultural attribution. Layers 5, 4, 3 and 2 have been attributed to the Gravettian. With regard to layer 6, there are few burins, a frequent tool in the Gravettian, and a predominance of bladelets and microbladelets with a backed edge. This is the third site with Zamostje (Борисковский 1953; Kozłowski 1998; Noiret 2009) and Molodova V/7 (Kozłowski 1998; Noiret 2009; Кулаковська та ін. 2011) and Molodova 8 (Черныш 1987; Borziac 1998) having delivered shouldered points. However, those of Doroshivtsi III differ from those known in the Molodovian culture. If this industry has some similarities with those of the Epigravettian sites of Mezyn, Amvrosiivka, Borshchevo 1 and Kostyonki 21/III, the presence of a bone industry and an engraved defence, in particular meanders, makes it a singular site. It is currently difficult to define with certainty which culture belongs to layer 6 of the Doroshivtsi III/6 site. It would be Gravettian with very ancient Epigravettian features. In the excavations of 2019, the first nine layers are referred to the Gravettian. The last one cannot be clearly identified.

Methods and materials

The faunal remains of Doroshivtsi III of 2019 are stored in the Archaeological Museum in Kyiv. We conducted zooarchaeological research on this material.

The current study includes palaeontological analyses, the biology and ethology of the species, by means of actual comparisons. In addition, the description and quantitative analysis of the anatomical elements associated with taphonomy (climate and edaphic factors and non-human biological agents) will make it possible to identify the conditions that make up the fossil assemblage. The combination of these analyses in relation to the stigmas that may have been left by humans would lead to a better understanding of the anthropogenic impact on this assemblage (Poplin 1976; Behrensmeyer 1978; 1990; Binford 1979; Lyman 1994; Denys, Patou-Mathis (dir.), 2014; Fernández-Jalvo, Andrews (eds.) 2016). Taxonomic references and systematics are based on the zoological nomenclature code (ICZN 1999). The vernacular anatomical terms are used according to the criteria of Barone (1976) taking into account the current nomenclatures. Here we adopt the quantification units defined by Poplin (1976) and Lyman (2008). The skull (cranium and face) is considered as an element. The frontal appendages can also be regarded as a separate element. The hemi-mandible is counted as an element, except for the mammoth whose mandible is a complete element. A tooth, whether isolated or in place, is counted as an element. To estimate the Minimal Number of Individuals (MNI) we proceeded to reassembling, pairing, associations, according to the criteria of age and sex.

Quantitative measures followed by Poplin (1976) and Lyman (2008), where:

Qsp: specific coefficient, obtained from the frequency of occurrence of an element in the anatomy of species;

MAU: Minimum Animal Unit, specifying the degree of preservation of different anatomical elements of species, where MAU = MNE/Qsp, and MAU frequency (%) = MAU × 100/MAUmax;

Ps: percent survivorship, involving observation on three levels: each element; each anatom-

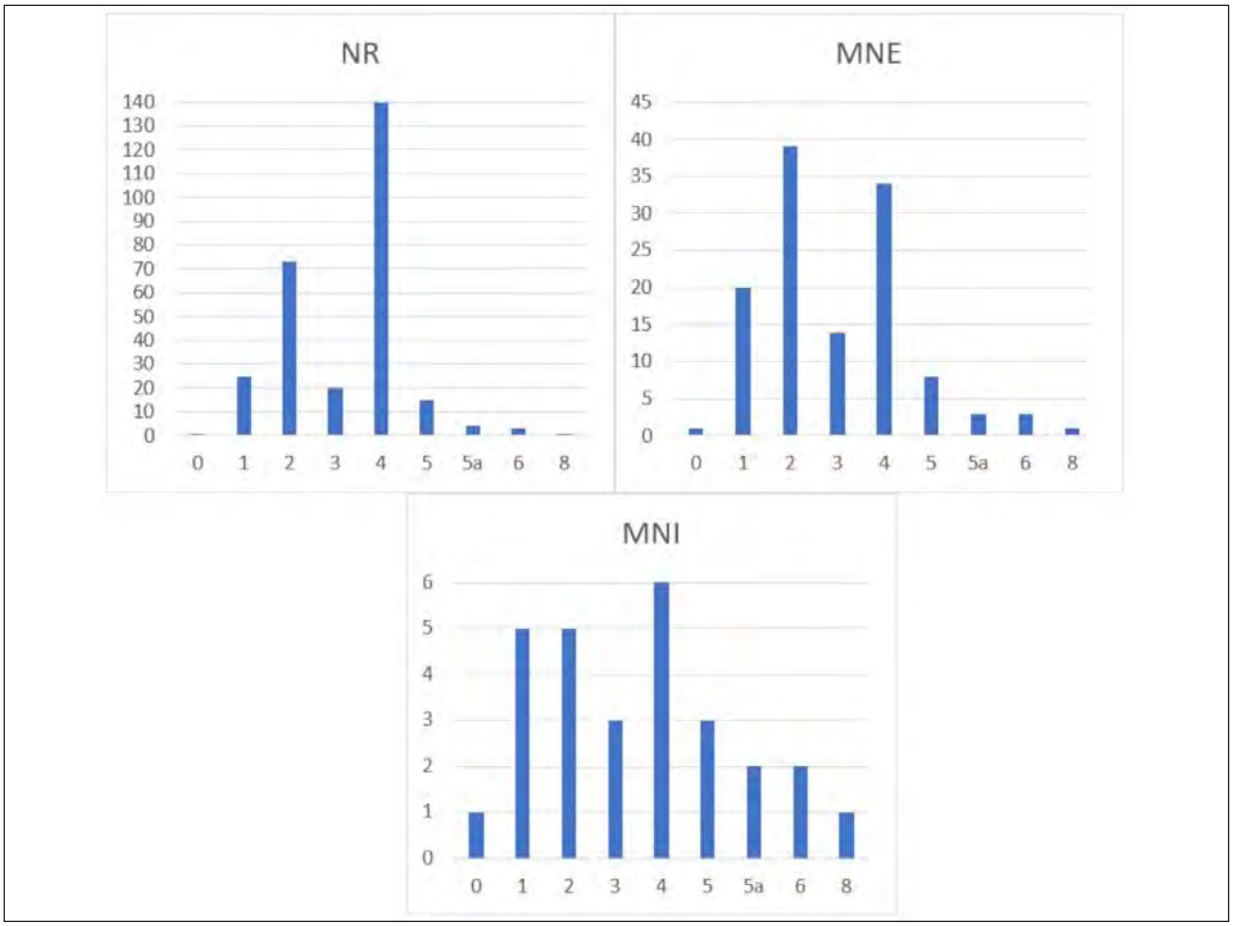

Fig. 4. Graphic representation of faunal remains from Doroshivtsi III-2019 in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)

ical region; and the overall deficit (total) of the species. It is calculated by elements. It takes into account the MAU which is based on the Minimum Number of Individuals evaluated by the cMNI. Ps = MNE × 100/Qsp × MNImax = MAU × 100/MNI max.

The rate of determination is: (specifically determined remains/total number of remains)*100

The index of fragmentation is: NR/MNE.

For the splinters we determined different size classes: class I (<2 cm), class II (2—5 cm), class III (5—10 cm), class IV (10—20 cm) and class V (20—40 cm).

We distinguish different mammal size classes: large-sized mammals (>200 kg, ex: *M. primigenius*, *Equus* sp.), medium-sized (> 20 kg—200 kg, ex: *R. tarandus*, *C. lupus*) and small-sized (< 20 kg, ex: *Vulpinae*).

Osteometric measurements follow the procedures of von den Driesch (1976), and concerning mammoth, of Agenbroad (1994), Lister (1996) and Göhlish (1998).

We identified the age of horses (*Equus* sp.) (Barone 1966), reindeer (*Rangifer tarandus*) (Bouchud 1954; 1966; Miller 1972; 1974; Hufthammer 1995; Enloe 1997) and a wolf (*Canis lupus*) (Barone 1976). For mammoths (*Mammuthus primigenius*), age and sex determination are based on epiphyseal stages of long bones and eruption and *eruption/wear* sequence of the *cheek teeth* (Osborn 1942; Vaufrey 1955; Coppens 1965; Laws 1966; Haynes 1991) and the morphometry of bones (Haynes 1991; Averianov 1996; Shoshani, Tassy (eds.) 1996; Lister 1999).

Concerning a mammoth, the references for osteometric comparisons are based on well-known specimens from Eurasia (Воллосович 1909; Felix 1912; Toepfer 1957; Siegfried 1959; Koenigswald 1989; Ziegler 1994; 2001; Lister 2009; Kirillova, Shidlovskiy, Titov 2012).

Concerning age classes, they are determined as: a juvenile, a young adult, an intermediate adult, a mature adult and an old adult. Patterns in the age at death (mortality profiles) of animals are used to in-

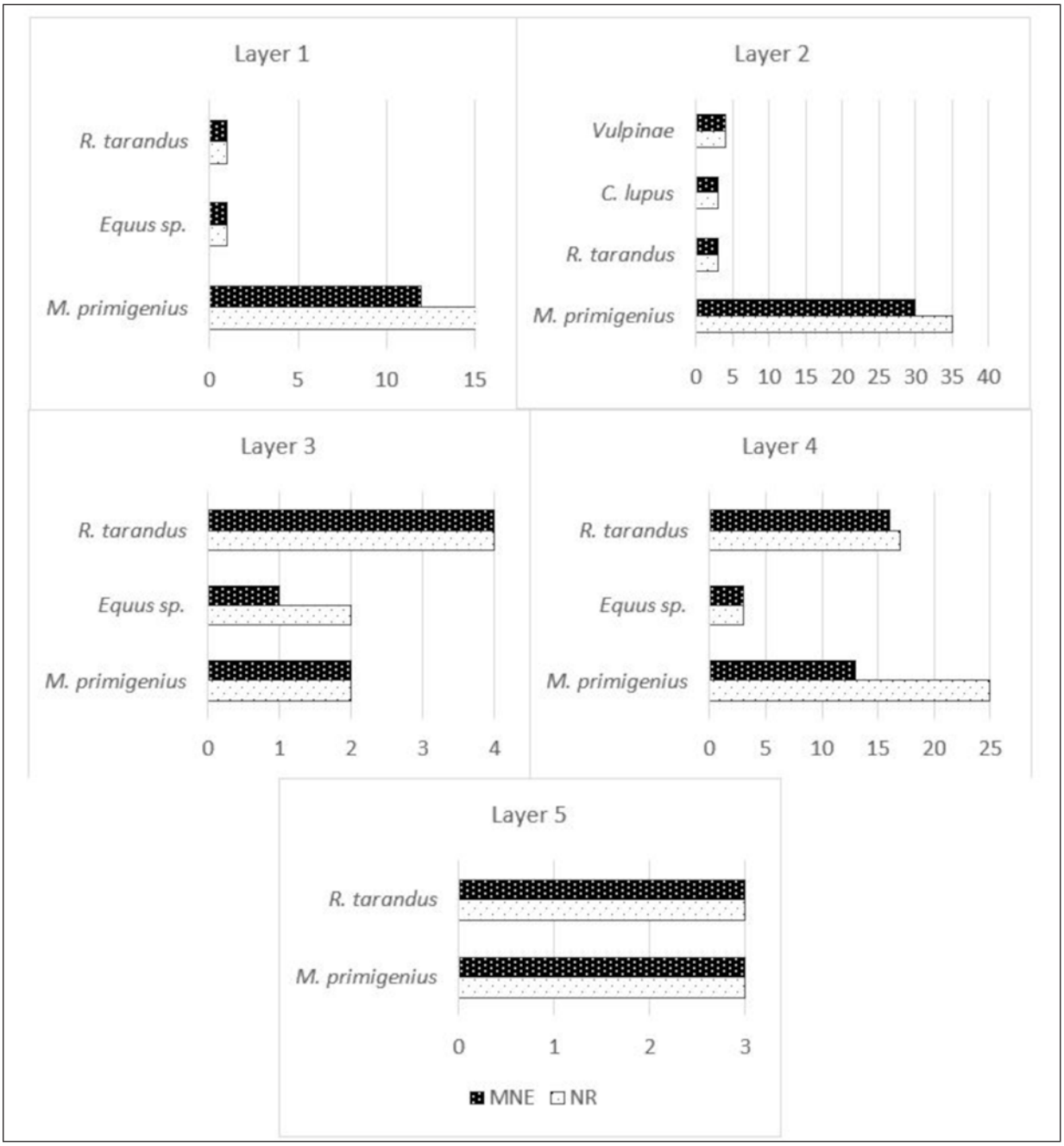

Fig. 5. Counting of the determined remains of mammals from Doroshivtsi III-2019 by main layers in number of remains (NR) and minimal number of elements (MNE)

fer the origins of assemblages (Klein, Cruz-Uribe 1984; Haynes 1987; Stiner 1990).

The skeletal preservation on %MAU by anatomical segments related with bones density (from Lam et al. 1998; Lam, Pearson, 2003) are used for reindeer to determine the origin of the assemblage according to the bone dispersion. The correlation testing is used to assess an association of dependence or independence between two variables. The correlation coefficient can be calculated using different methods. The Pearson correlation coefficient *r* makes it possible to analyse the linear relationships between two continuous quantitative characters.

if *r* is close to 0, there is no linear relationship between X and Y,

if *r* is close to –1, there is a strong negative correlation between X and Y,

if *r* is close to 1, there is a strong linear positive correlation between X and Y.

The nutritional strategies can be estimated (Binford 1978; 1987; Metcalfe, Jones 1988; Lyman 1994; Faith, Gordon 2007).

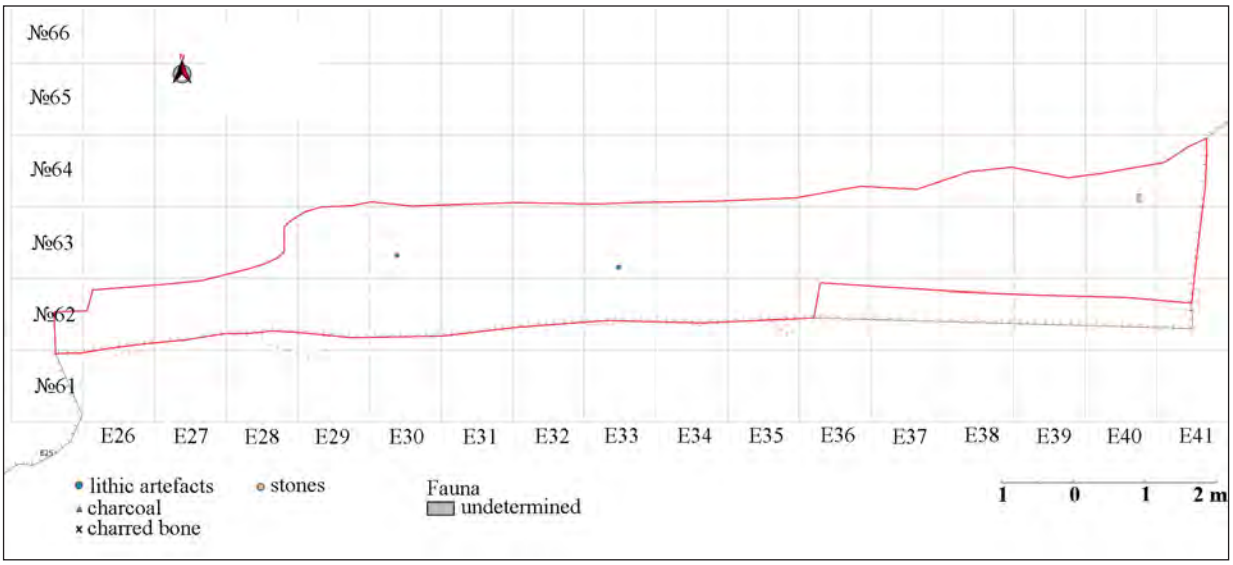

Fig. 6. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/0

Results

Global analysis. We recorded a total of 283 remains corresponding to at least 134 elements belonging to at least 30 individuals. We identified remains of reindeer, horses, mammoths, a wolf and a vulpine (table 1), as well as a crow.

Layers 2 and 4 are the richest in terms of number of remains, of elements and of individuals, then layers 1, 3 and 5. The layers 0, 5a, 6 and 8 furnished few remains (fig. 4).

All the main layers are characterised by the presence of reindeer and mammoths. Horses are present in the layers 1, 3 and 4. A vulpine and a wolf are present in the layer 2. Remains are a bit fragmented, more for mammoths (fig. 5).

Analysis by layers.

Layer 0. The layer 0 furnished a fragment (class II) of an epiphysis of a relatively young large- or medium-sized mammal. This bone had been affected by weathering and bears deposits of manganese. It is associated with two lithic artefacts (fig. 6).

Layer 1. The layer 1 contained 25 remains corresponding to at least 20 elements belonging to 5 individuals, three mammoths, a horse and a reindeer (table 2).

The rate of determination is 80%. Bones are relatively lightly fragmented (fracturing index: 1.25). We observed longitudinal, diagonal, step and helicoidal fracturing.

Concerning the taphonomic conditions (fig. 7; fig. 8; fig. 9) more than half of the remains are affected by weathering, mainly stages 4 and 5 for all species. Remains of the reindeer are a little bit less affected (stage 3). All remains bear deposits of iron and mainly manganese in large quantity due to percolation water. Remains of the reindeer and the horse bear few dissolution alterations due to run off water. Some bones of mammoths bear plant root marks. The fragments are mainly of size classes IV and V (fig. 10). So, the remains of the layer 1 had stayed in open air for a relatively long time, and were covered not so deep and then were affected by post-depositional percolation water. The fracturing shows fragmentations of dry and fresh bones.

Concerning **mammoths**, we identified 18 remains which correspond to at least 15 elements: cranial elements, ribs, girdle bones and a humerus. Except short bones, all the other anatomical parts are represented (fig. 11; fig. 12). We identified three individuals, a juvenile, a young adult and a mature adult (table 3).

Concerning the mandible, the left cheek teeth are characterised by an abnormal shape (fig. 13). Indeed, the teeth can develop malformed due to an unbalanced diet or a lack of fodder (Fowler, Mikota 2006). A **horse** adult s.l. is represented by a vestigial metapodial. Moreover, a bone fragment of a large-sized mammal was found.

A **reindeer** adult s.l. is represented by a left talus.

Furthermore, two fragments of a diaphysis of two different long bones were discovered, belonging to a medium-sized mammal, which

could be a reindeer. Another fragment of bone of a medium or small-sized mammal was found, also as undetermined fragments of bone. Bones are more or less scattered with lithic artefacts between both both small bone concentrations (fig. 14).

Layer 2. The layer 2 furnished 73 remains corresponding to at least 39 elements belonging to 5 individuals, 2 mammoths, a reindeer, a wolf and a fox (table 4).

We determined at least specifically 62 % of bone remains. The fragmentation index is 1.9. We observed longitudinal, perpendicular, diagonal, step and helicoidal fracturing.

Concerning the taphonomic conditions (fig. 15; fig. 16; fig. 17), almost all the bones were affected by weathering of different stages and percolation water. Mammoths remains were altered by plant root marks. The fragments are mainly of size classes II, III and IV (fig. 18). So, the remains of layer 2 had stayed in open air for a relatively long time and were covered not so deep and then were affected by post-depositional percolation water. The fracturing shows fragmentations of dry and fresh bones.

Concerning **mammoths**, they are represented by 35 remains which correspond to at least 27 elements belonging to 2 individuals. All the anatomical parts are represented, especially the axial skeleton, except the girdles (fig. 19). We identified at least 2 mammoths (table 5), a juvenile (fig. 20) and a young adult (figs. 21, 22, 23, 24).

A mammoth rib also has a pathology (fig. 25). Looking at the skeletal preservation in percentage

Table 1. **Counting of faunal remains from Doroshivtsi III-2019 in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

	Species	*M. primigenius*	*Equus sp.*	*Rangifer tarandus*	*C. lupus*	*Vulpinae*	large-sized mammal	large- or medium-sized mammal	medium-sized mammal	medium-sized mammal (*R. tarandus ?*)	medium- or small-sized mammal	small-sized mammal	Aves (Corvus corax)	undetermined	**TOTAL**
0	NR							1							**1**
	MNE							1							**1**
	MNI							1							**1**
1	NR	18	1	1			1			2	1			1	**25**
	MNE	15	1	1			1			2					**20**
	MNI	3	1	1											**5**
2	NR	35		3	3	4	11	8	3					6	**73**
	MNE	27		3	3	4	1	1							**39**
	MNI	2		1	2	1	2								**5**
3	NR	2	2	4			1	3	2	2				3	**20**
	MNE	2	1	4				2	2	2					**14**
	MNI	2	1	1											**4**
4	NR	25	3	17			22	30	24	9	1	1	1	10	**142**
	MNE	13	3	16			1	3	4	3	1	1	1		**45**
	MNI	1	1	3							1	1	1		**7**
5	NR	3		3			1	1	4					2	**14**
	MNE	3		3				1	1						**8**
	MNI	1		2											**3**
5a	NR	1		1			1	1							**4**
	MNE	1		1			1								**3**
	MNI	1		1											**2**
6	NR	1						1	1						**3**
	MNE	1						1	1						**3**

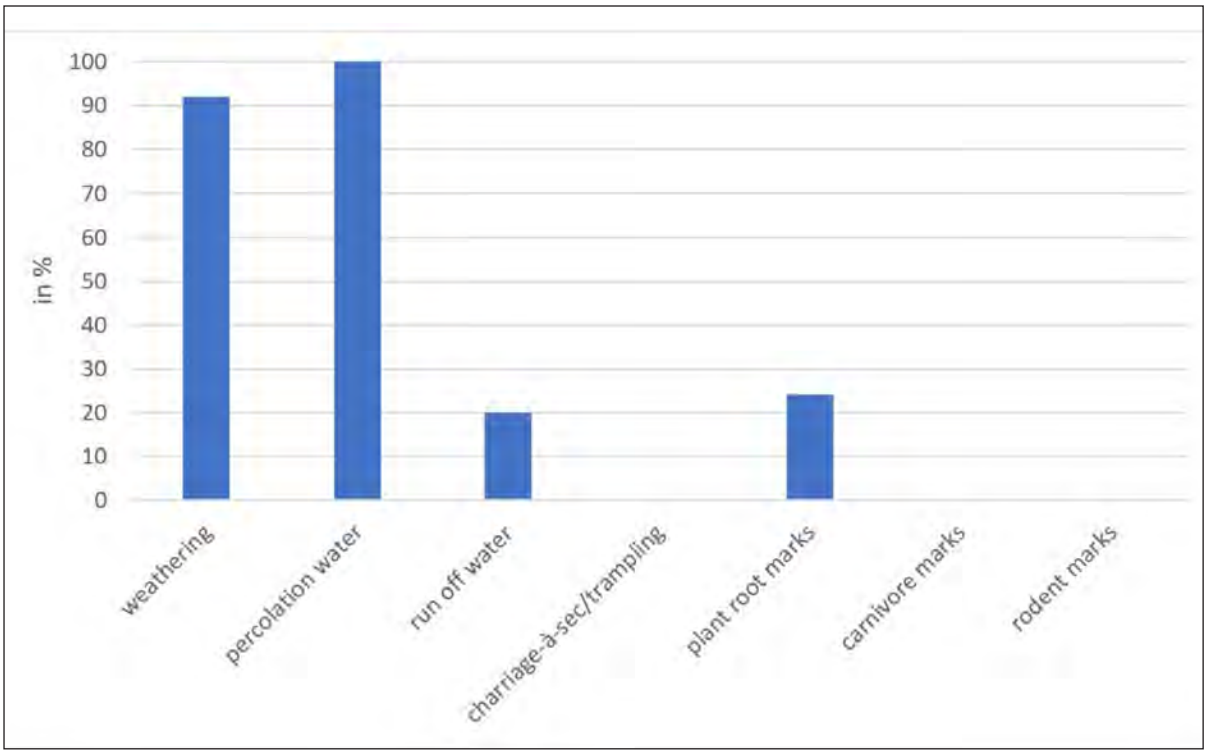

Fig. 7. Alterations due to climate-edaphic and non-human biological agents in percentage of number of remains from Doroshivtsi III-2019/1

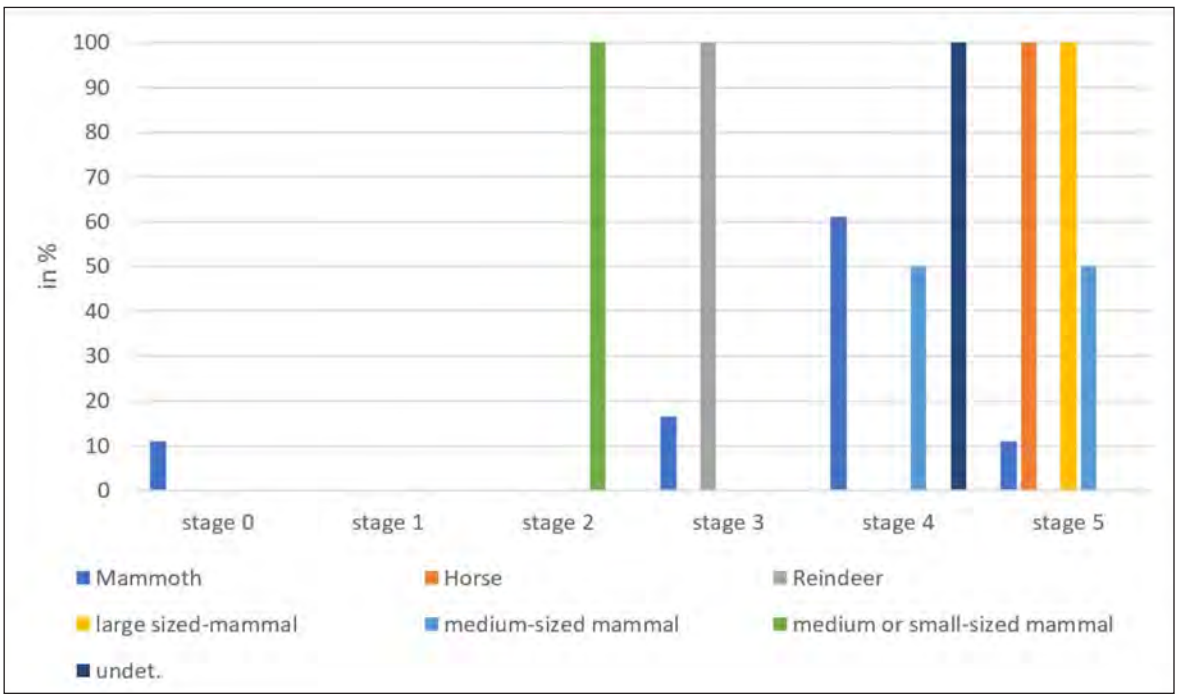

Fig. 8. Alterations due to weathering according to the different stages by species and categories of remains from Doroshivtsi III-2019/1

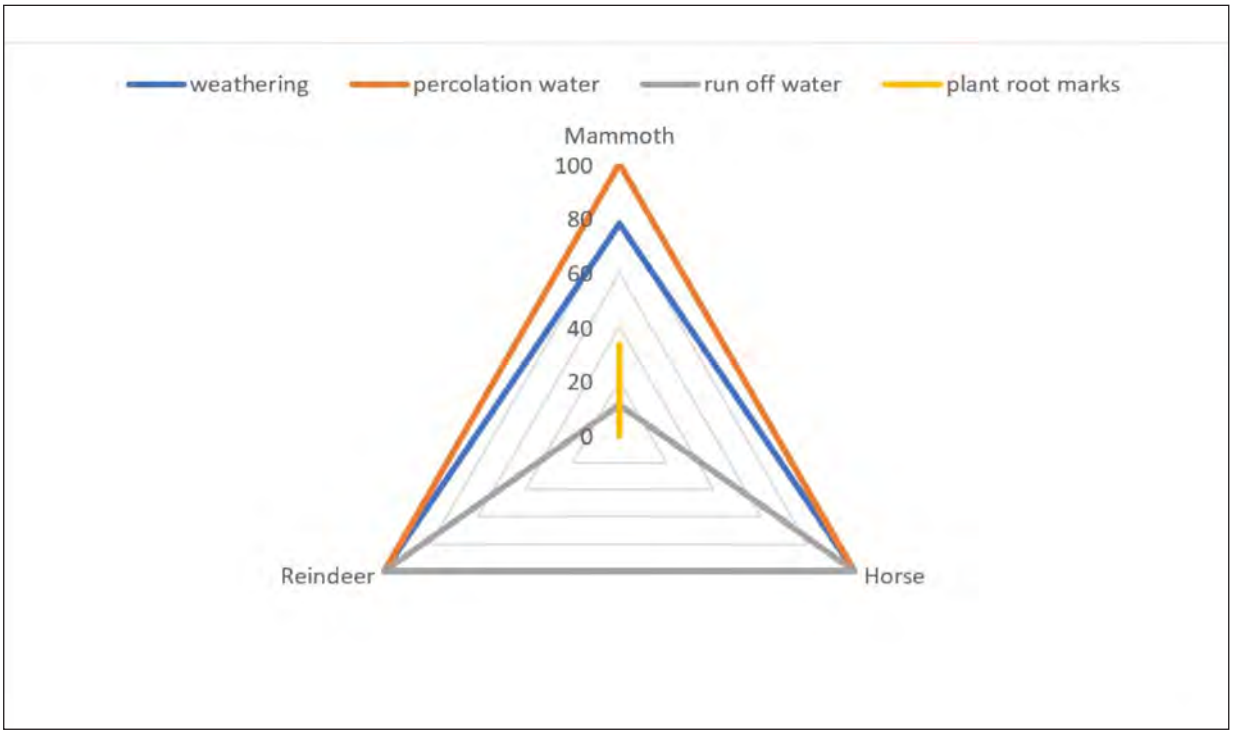

Fig. 9. Alterations due to climate-edaphic and non-human biological agents in percentage of the number of remains by species from Doroshivtsi III-2019/1

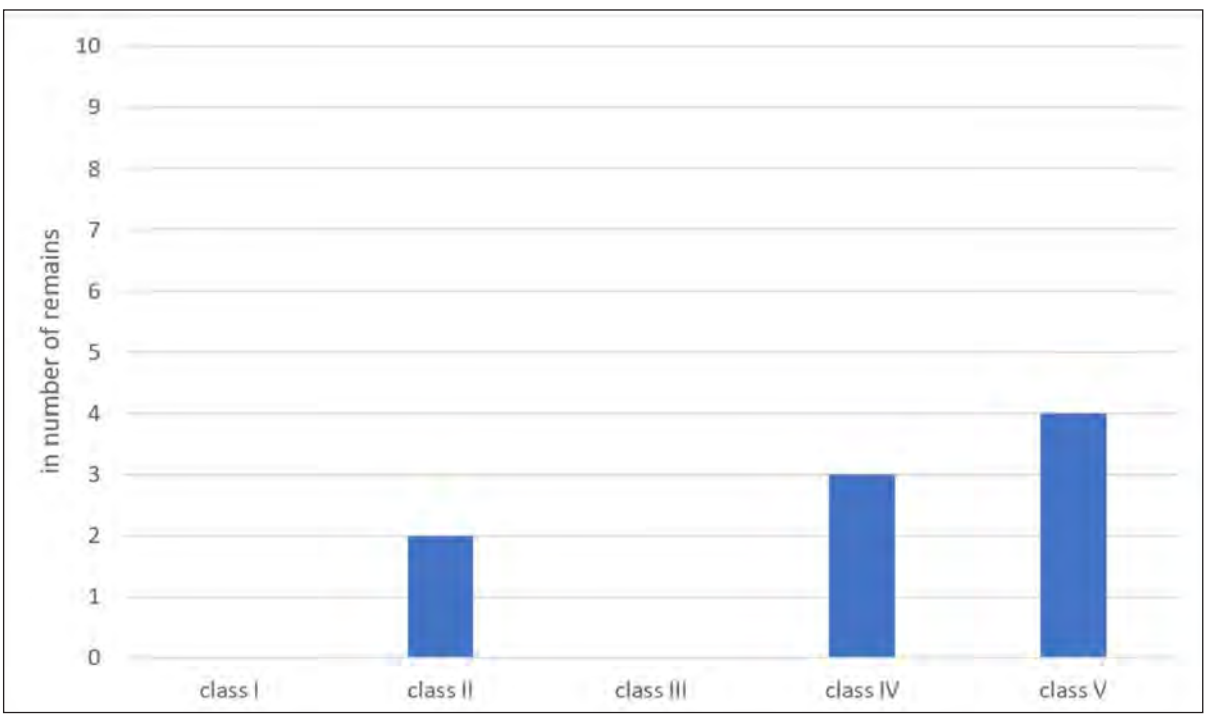

Fig. 10. Splinters by size classes from Doroshivtsi III-2019/1

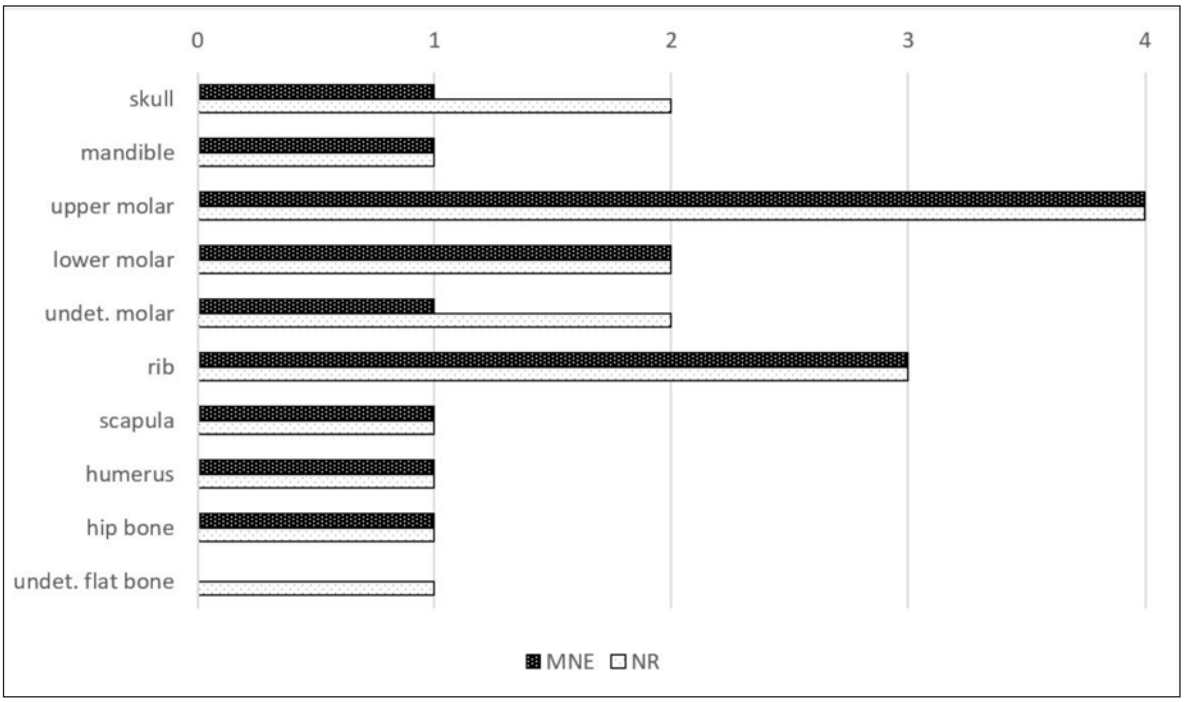

Fig. 11. Counting of mammoth bones in number of remains and in minimum number of elements from Doroshivtsi III-2019/1

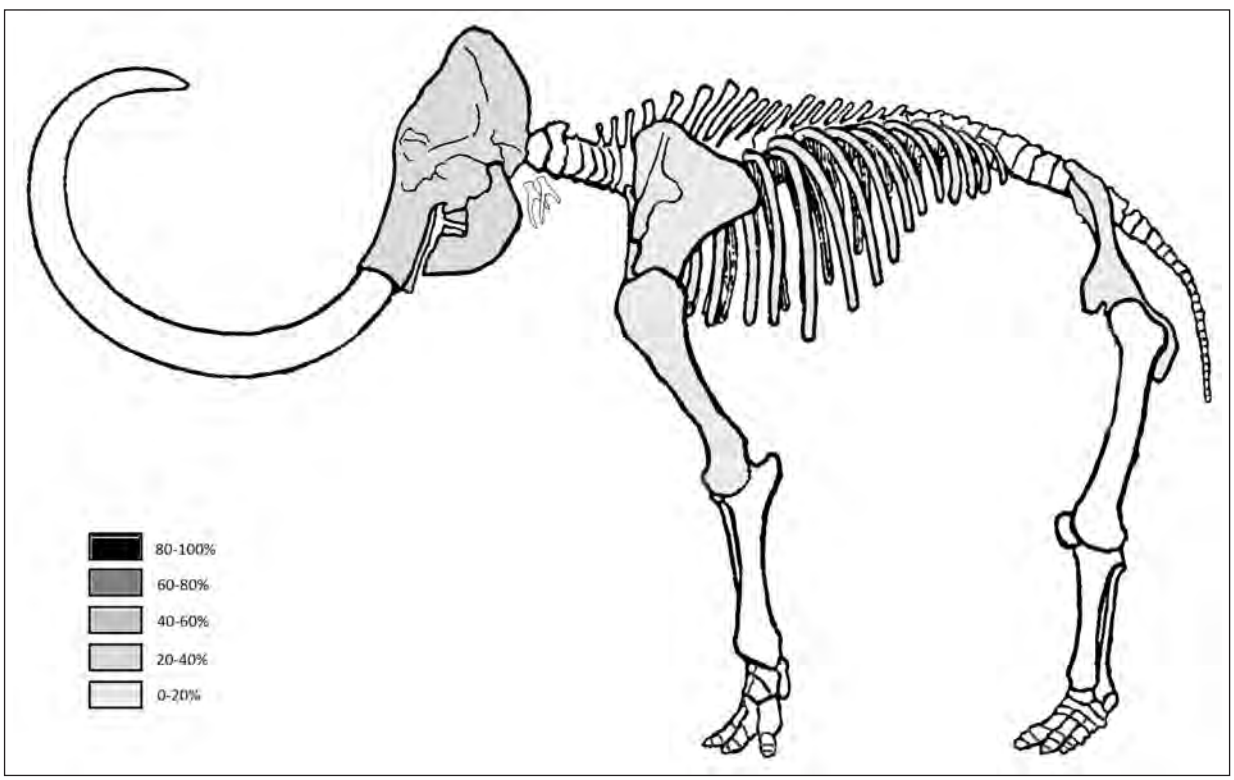

Fig. 12. Skeletal preservation by elements in percentage survival (Ps%) of mammoths (MNI: 3) from Doroshivtsi III-2019/1

Fig. 13. Mandible of a mammoth with left cheek teeth with abnormal shape from Doroshivtsi III-2019/1

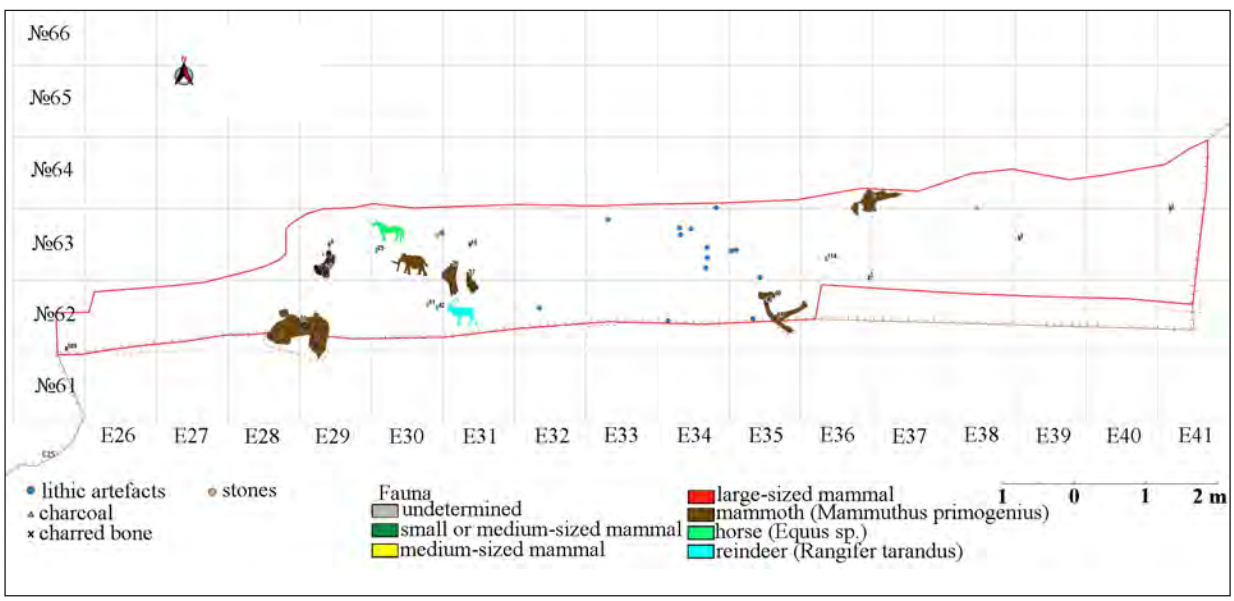

Fig. 14. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/1

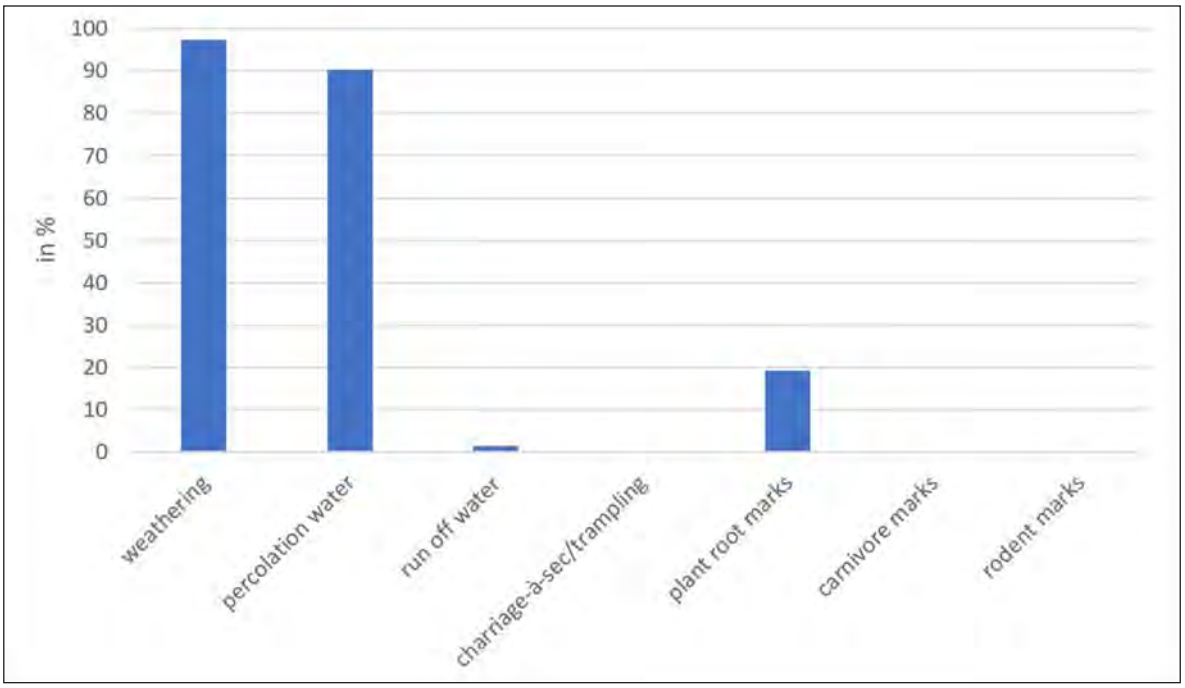

Fig. 15. Alterations due to climate-edaphic and non-human biological agents in percentage of number of remains from Doroshivtsi III-2019/2

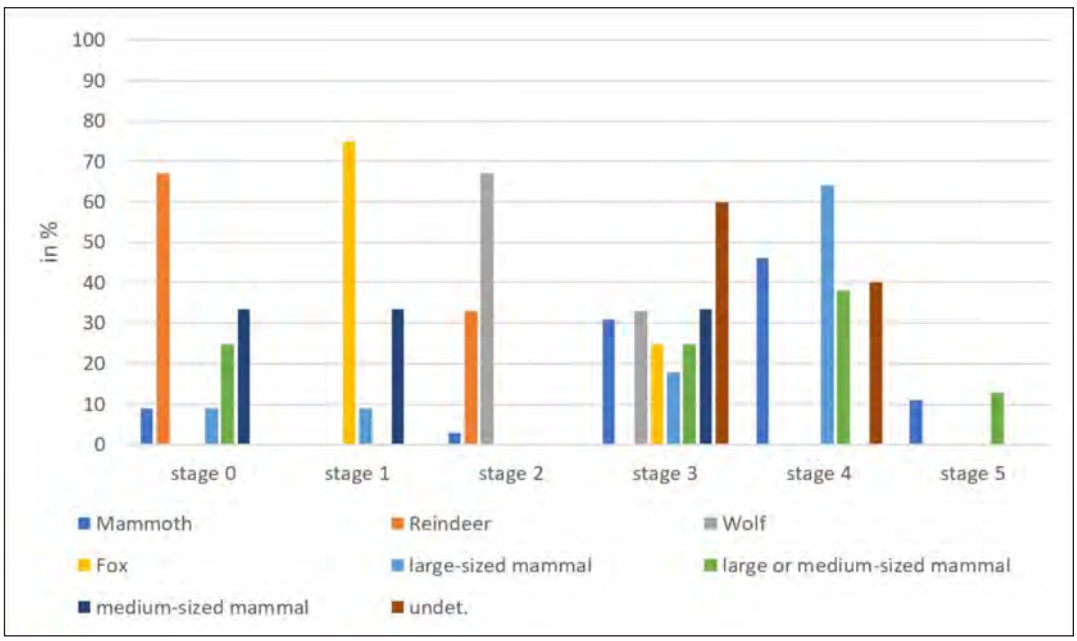

Fig. 16. Alterations due to weathering according to the different stages by species and categories of remains from Doroshivtsi III-2019/2

survival, cranial elements are the most represented, then limb bones, followed by vertebra, ribs and short bones (fig. 26).

Concerning a **reindeer**, there is a quite complete thoracic vertebra of an adult s.l. and a right radius with a fragment of ulna. The distal end is fused (>38—48 months old), so it is an adult s.l. (> young adult).

Concerning a **wolf**, there are right humerus (fig. 27), ulna and radius which can be paired. The radius and ulna were still in anatomical connection. This individual was 8—9 months old, so it was a juvenile (table 6).

Concerning a **fo**x, there are a right hip bone quite complete, a left femur, a right humerus and an I3 very worn of an adult s.l.

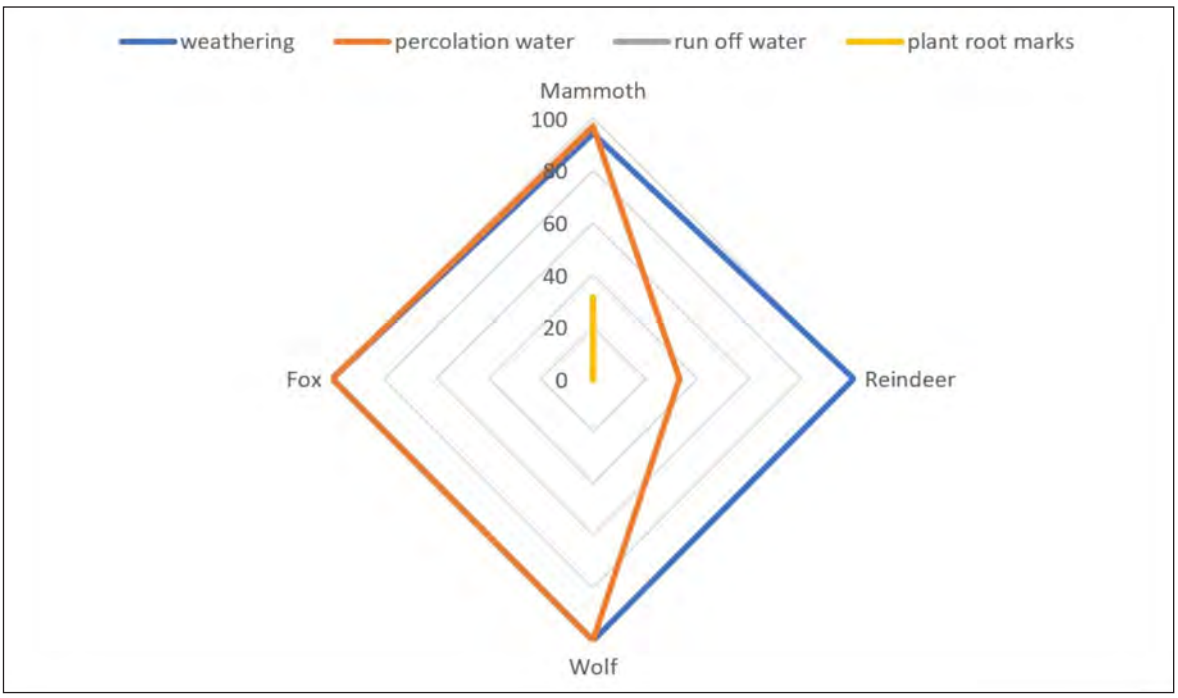

Fig. 17. Alterations due to climate-edaphic and non-human biological agents in percentage of the number of remains by species from Doroshivtsi III-2019/2

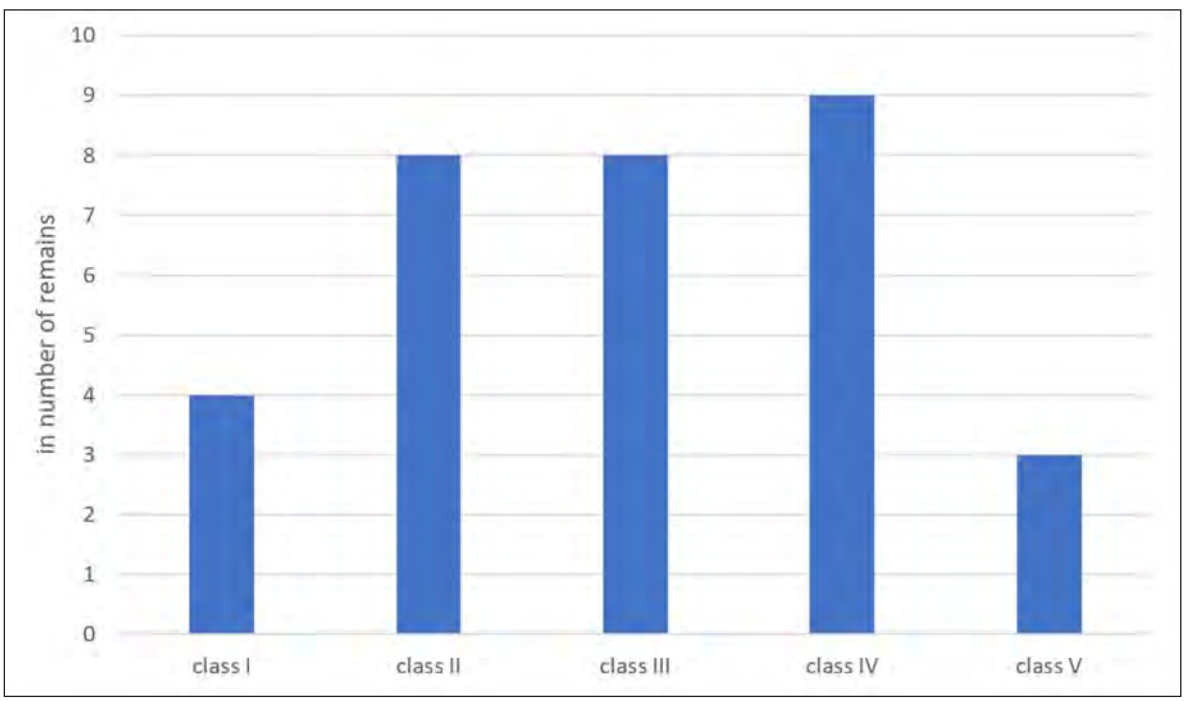

Fig. 18. Splinters by size classes from Doroshivtsi III-2019/2

We also identified a sesamoid of a large-sized mammal, as well as a long bone diaphysis (tibia?) of a large or medium-sized mammal. A fragment of a large-sized mammal rib bears cutmarks of deflashing and impacts which could be due to human activities (fig. 28). Bones are associated with lithic artefacts and stones. They are scattered. Mammoth bones are more concentrated in two areas (fig. 29).

Layer 3. The layer 3 contained 20 remains corresponding to at least 14 elements belonging to 4 individuals, 2 mammoths, a horse and a reindeer (table 7).

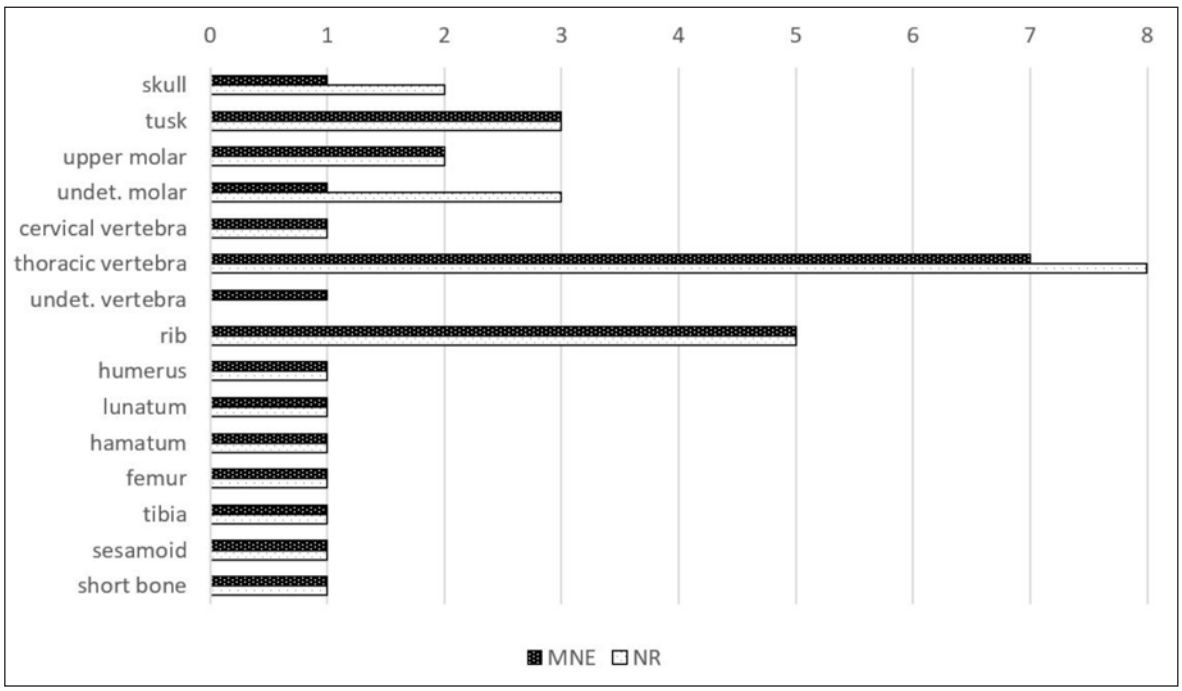

Fig. 19. Counting of mammoth bones in number of remains and in minimum number of elements from Doroshivtsi III-2019/2

Fig. 20. Skull of a juvenile mammoth from Doroshivtsi III-2019/2

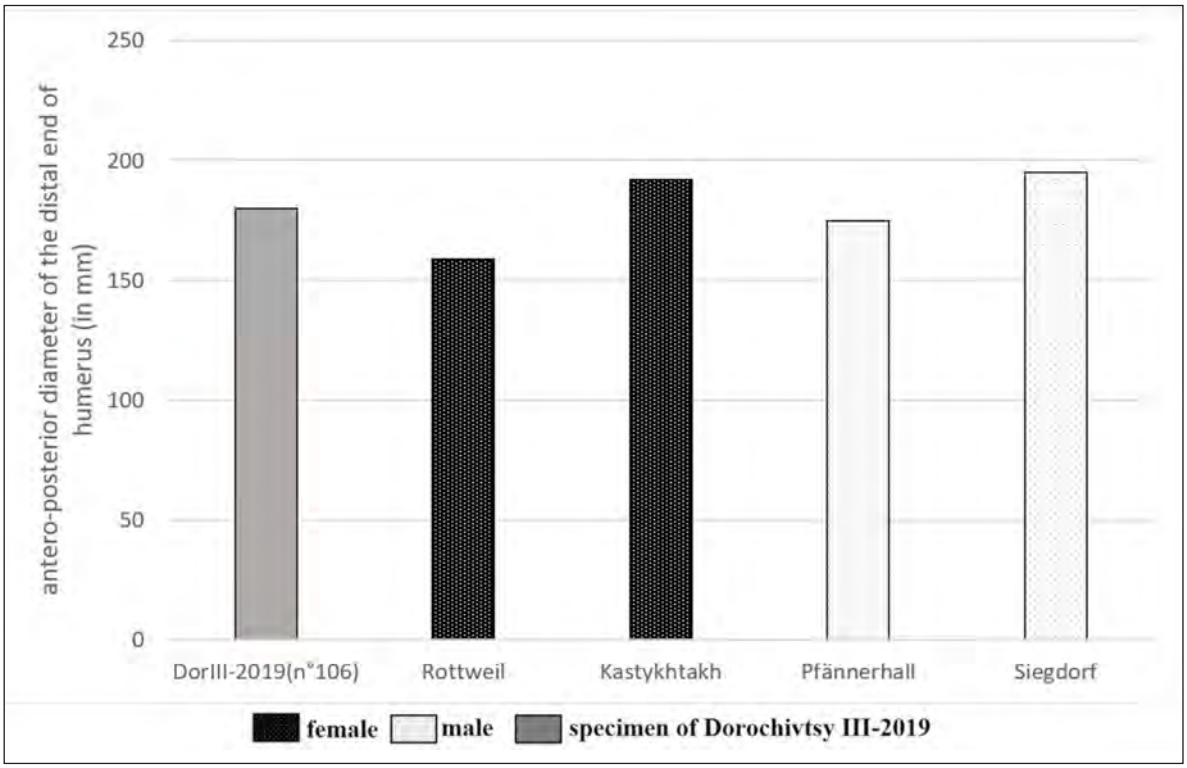

Fig. 21. Osteometry of humerus of mammoths from Doroshivtsi III-2019/2 and specimens of references

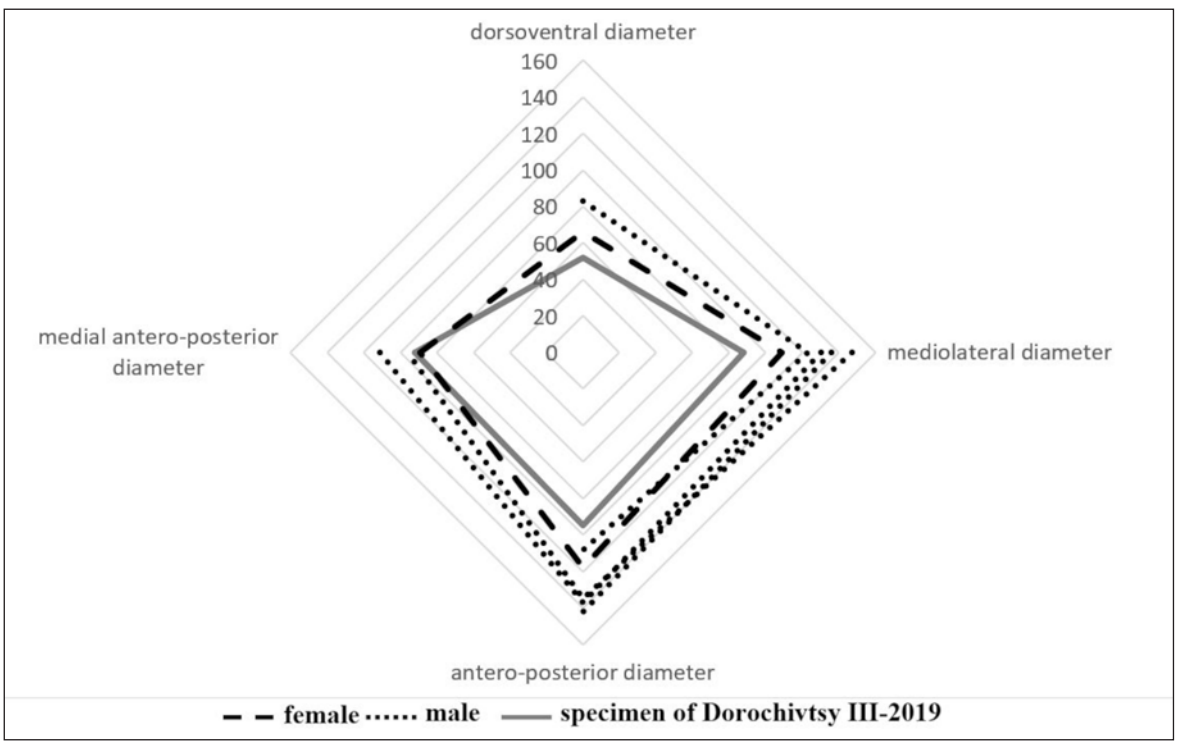

Fig. 22. Osteometry of lunatums of mammoths from Doroshivtsi III-2019/2 and reference specimens

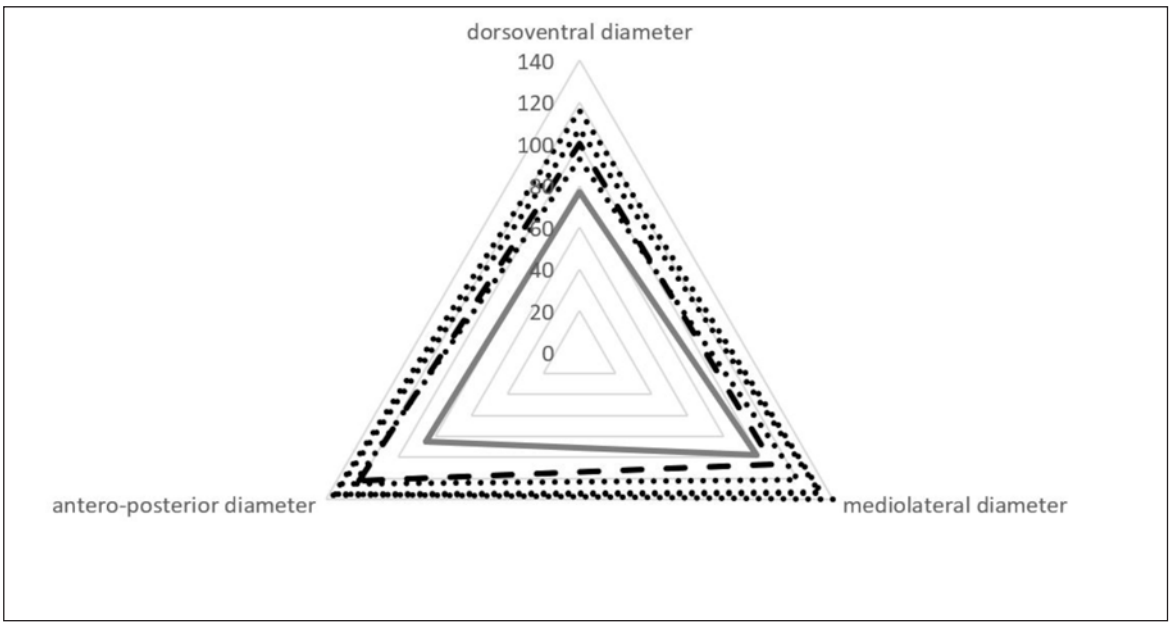

Fig. 23. Osteometry of hamatums of mammoths from Doroshivtsi III-2019/2 and specimens of references

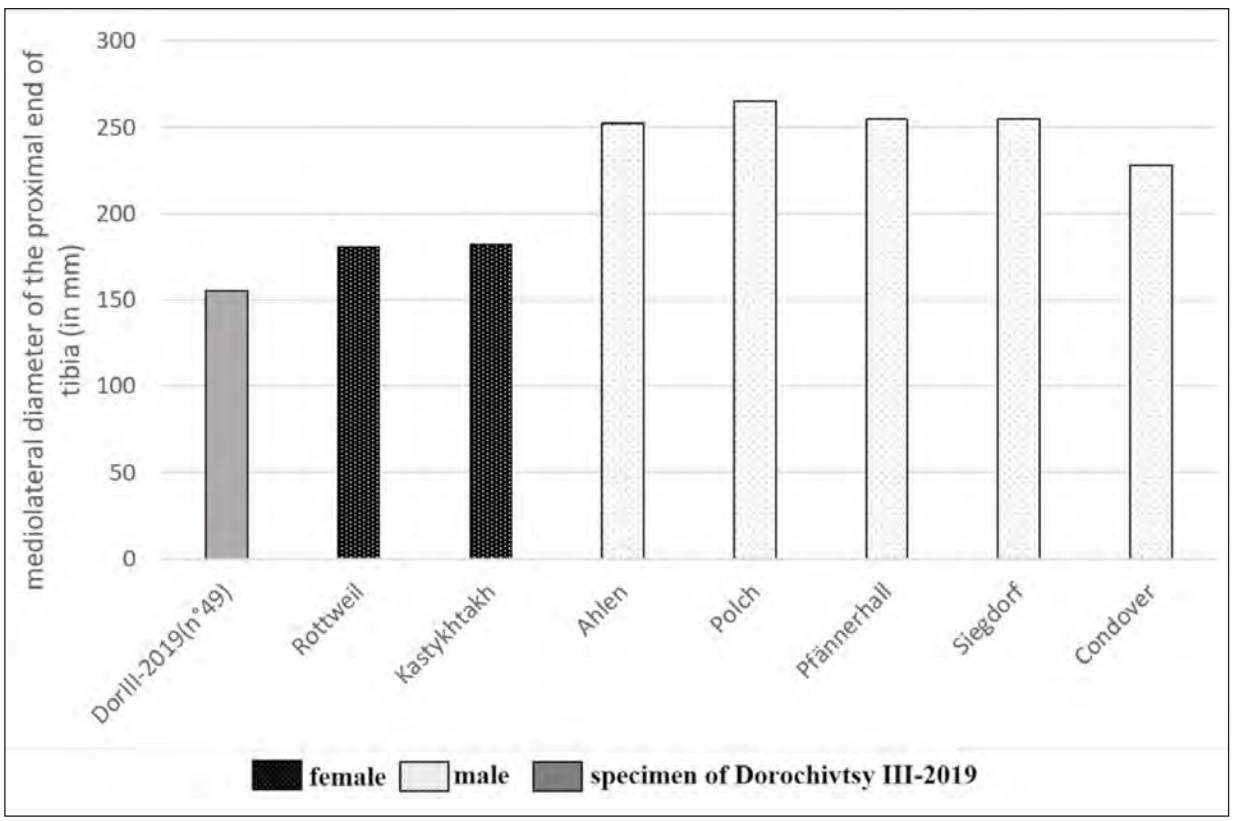

Fig. 24. Osteometry of tibias of mammoths from Doroshivtsi III-2019/2 and specimens of references

We determined at least specifically 40 % of the bone remains. The fragmentation index is 1.4. We observed longitudinal, perpendicular, diagonal, step and helicoidal fracturing.

Concerning the taphonomic conditions, all bones (100 %) were affected by weathering (stages 1, 2 and 3) and percolation water (fig. 30). So, the remains of the layer 3 had stayed in open air for a relatively short time and were affected by post-depositional percolation water. The fracturing shows fragmentations of dry and fresh bones.

Concerning **mammoths**, we identified 2 remains which correspond to 2 elements (table 8), a fragment of tusk which would correspond to an adult male and a quite complete left scapula that would correlate with a young adult (fig. 31; fig. 32).

A **horse** (adult s.l.) is represented by two fragments of a diaphysis of a left humerus. A **reindeer** is represented by 4 elements, a left metatarsal, a left radius with a fragment of ulna and a quite complete lumbar vertebra. From the epiphysation stages, this individual was more than 38—48 months old, so an adult s.l. The measurements of the distal end of the radius (46 mm × 29 mm) shows that it was a quite robust individual. Moreover, a cervical vertebra and a fragment of a long bone diaphysis were found, belonging to a medium-sized mammal, which could be a reindeer. A fragment of an epiphysis and a rib head belong to a large-sized mammal. A fragment of a skull and a fragment of a long bone diaphysis

Table 3. **Bones of mammoths and determination of growth stages and age classes from Doroshivtsi III-2019/1**

Number (labels)	Bone	Lateralisation	Stage/ age	Age classes	Sex
21	skull and left and right DP4 and left and right M^1		VIII / 6-8 y.o.	juvenile	/
58	mandible and left and right M_3		XIV-XV / 40-50 y.o.	mature adult	/
9	undet. molar ≥ M1)	/	> IX	adult s.l.	/
3	rib	right	/	adult s.l.	/
90	rib	right	/	adult s.l.	/
68	rib	right	/	adult s.l.	/
1	scapula	right	/	adult s.l.	/
36	humerus (PE unfus)	left	<XVIa / <18-26 y.o.	young adult	/
69	hip bone	right	/	adult s.l.	/

Table 2. **Counting of faunal remains from Doroshivtsi III-2019/1 by number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

Species	NR	MNE	MNI
M. primigenius	18	15	3
Equus sp.	1	1	1
Rangifer tarandus	1	1	1
large-sized mammal	1	1	
medium-sized mammal (*R. tarandus ?*)	2	2	
medium- or small-sized mammal	1		
undetermined	1		
TOTAL	**25**	**20**	**5**

Table 4. **Counting of faunal remains from Doroshivtsi III-2019/2 in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

Species	NR	MNE	MNI
M. primigenius	35	27	2
Rangifer tarandus	3	3	1
C. lupus	3	3	1
Vulpinae	4	4	1
large-sized mammal	11	1	
large- or medium-sized mammal	8	1	
medium-sized mammal	3		
undetermined	6		
TOTAL	**73**	**39**	**5**

Fig. 25. Mammoth rib with pathology from Doroshivtsi III-2019/2

Fig. 26. Skeletal preservation by elements in percentage survival (Ps%) of mammoths (MNI: 2) from Doroshivtsi III-2019/2

Table 5. **Bones of mammoths and determination of growth stages and age classes of Doroshivtsi III-2019/2**

Number (labels)	Bone	Lateralisation	Stage/age	Age classes	Sex
108	skull with two tusks and left and right dP3		III / 1 y.o.	juvenile	/
30	molar	/	adult s.l.		/
106	humerus (DE unfused)	/	< XVIa si F ou M	young adult	undet.
45	lunatum	right		~young adult	undet.
28	hamatum	right		~young adult	undet.
44	femur (PE and DE fused)	left	> XVIa-XVIII si F; > XVIII-XX si M	adult s.l.	undet.
49	tibia (PE unfused)	right	< XVIa-XVII si F; < XVIIIa-XX si M	~young adult	undet.

which belong to a large- or medium-sized mammal were also discovered. A rib and a long bone or a metapodial belong to a medium-sized mammal.

Concerning anthropogenic modifications, a diaphysis of humerus of the horse bears impacts of fracturation. Furthermore, two remains of a large- or medium-sized mammal were burned, almost totally calcined. Bones are very scattered. They are associated with lithic artefacts and charcoals (fig. 33).

Layer 4. The layer 4 furnished 142 remains corresponding to at least 45 elements belonging to 7 individuals, a mammoth, a horse, three reindeer, a small-sized mammal and a crow (table 9).

Table 6. **Bones of a wolf and determination of growth stage and age classes of Doroshivtsi III-2019/2**

Number (labels)	Bone	Lateralisation	Stage/ age	Age classes
33	humerus (DE fused; PE in fusion)	right	<12-15 months; >7-8 months	juvenile
34	ulna (PE fused)	right	>7-8 months	juvenile
34	radius (PE unfused)	right	<9-10 months	juvenile

We determined at least specifically 32 % of bone remains. The fragmentation index is 3.4. We observed longitudinal, perpendicular, step and helicoidal fracturing.

Concerning the taphonomic conditions (figs. 34—36), almost all the bones were affected by weathering of different stages (mainly stages 1, 2 and 3) and percolation water. The horse remains were altered by run-off water. The fragments are mainly of size classes II, III and IV (fig. 37). So, the remains of the layer 4 had stayed in open air for a relatively short time and were affected by post-

Table 7. **Counting of faunal remains from Doroshivtsi III-2019/3 in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

Species	NR	MNE	MNI
M. primigenius	2	2	2
Equus sp.	2	1	1
Rangifer tarandus	4	4	1
large-sized mammal	2	1	
large- or medium-sized mammal	3	2	
medium-sized mammal	2	2	
medium-sized mammal (*R. tarandus* ?)	2	2	
undetermined	3		
TOTAL	**20**	**14**	**4**

Fig. 27. Right humerus of *C. lupus* from Doroshivtsi III-2019/2

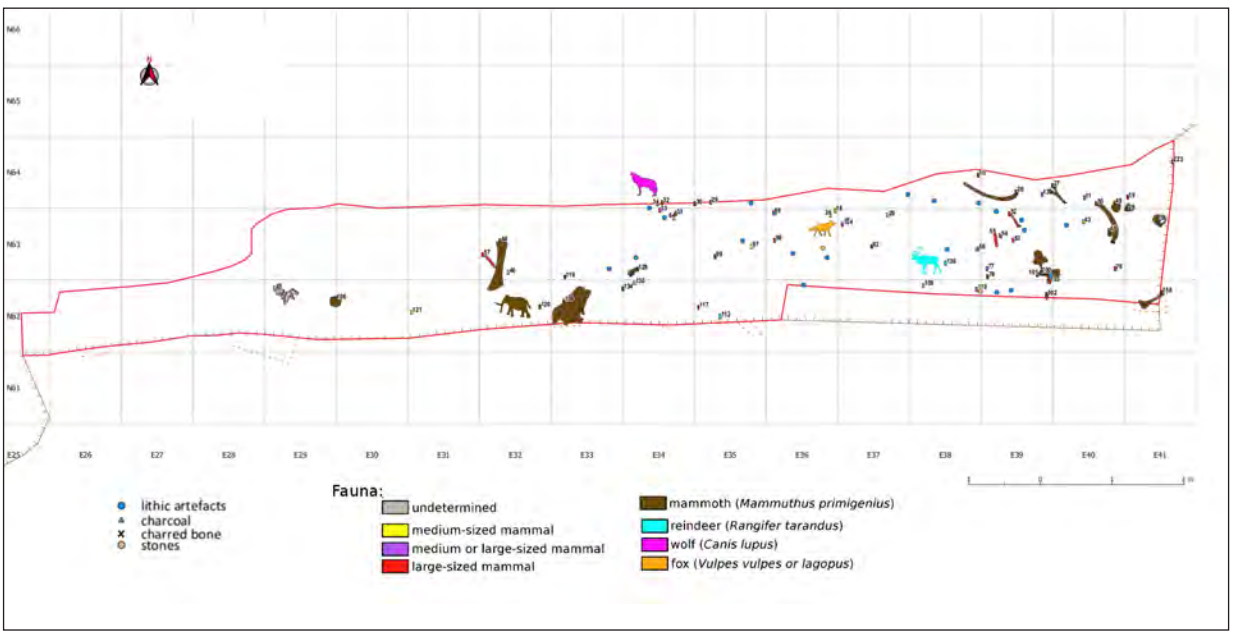

Fig. 28. Large-sized mammal rib with cutmarks from Doroshivtsi III-2019/2

depositional percolation water. The fracturing show fragmentations of dry and fresh bones.

Concerning a **mammoth**, it is represented by 25 remains corresponding to at least 13 elements belonging to 1 individual. All the anatomical parts are represented, especially the axial skeleton, except the girdles (fig. 38). We identified at least one mammoth, probably an adult male not totally mature (table 10; figs. 39 and 40).

Table 8. **Bones of mammoths and determination of growth stage and age classes from Doroshivtsi III-2019/3**

Number (labels)	Bone	Laterali-sation	Stage/ age	Age classes	Sex
122	tusk	/	/	adult s.l.	male
129	scapula	left	/	young adult	/

Concerning a **horse**, it is represented by 3 remains corresponding to at least 3 elements belonging to 1 individual. There is a fragment of a diaphysis of a left humerus of a young individual. There is also a diaphysis of a right radius with an unfused proximal extremity which means this individual was less than 15—18 months old, so it was a juvenile. There is a vestigial metacarpal of a young individual.

Concerning **reindeer**, they are represented by 17 remains corresponding to at least 16 elements belonging to 3 individuals. Almost all the

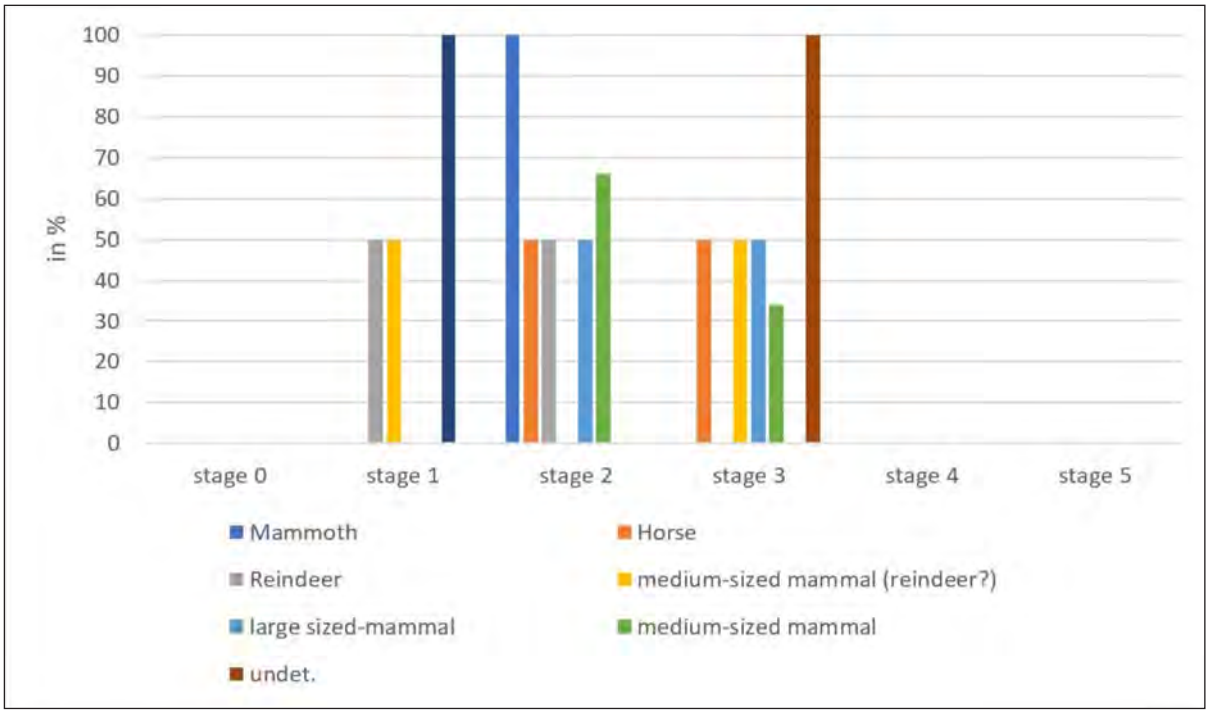

Fig. 29. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/2

anatomical parts are represented, particularly cranial remains, except girdles (figs. 41 and 42). We identified a juvenile, a young adult and a more mature adult (table 11).

According to the index of density (r = 0,22) there is no correlation between X and Y, we cannot obtain significant statistic interpretation.

Table 9. **Counting of faunal remains from Doroshivtsi III-2019/4 in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

Species	NR	MNE	MNI
M. primigenius	25	13	1
Equus sp.	3	3	1
Rangifer tarandus	17	16	3
large-sized mammal	22	1	
large- or medium-sized mammal	30	3	
medium-sized mammal	24	4	
medium-sized mammal (*R. tarandus* ?)	9	3	
small-sized mammal	1	1	1
Aves (*Corvus corax*)	1	1	1
undetermined	10		
TOTAL	142	45	7

Concerning the nutritive strategies, we have few remains to obtain a significant model. However, the general curve (fig. 43) is relatively close to a reverse 'bulk' strategy, which means that nutrients are least represented. Nevertheless, the richest parts in meat (sternum and femur) are present (fig. 44). Moreover, 3 ribs were found, belonging to a medium-sized mammal, which could be a reindeer. There is also a fragment of the left femur of a crow *Corvus corax* (fig. 45). A rib of a large-sized mammal was found. We also discovered 3 caudal vertebrae of a large- or medium-sized mammal. Fragments of a phalanx, a thoracic vertebra and 2 ribs belonging to a medium-sized mammal were discovered. A fragment of a long bone diaphysis belongs to a small-sized mammal. A fragment of ivory bears anthropogenic modifications with grooves and an edge was abrased (fig. 46) and bones of different species have traces of fracturing (fig. 47). A fragment of bone is totally calcified. Bones are very scattered. They are associated with lithic artefacts and charcoals (fig. 48).

Layer 5. The layer 5 consisted of 14 remains corresponding to at least 8 elements belonging to 3 individuals, a mammoth and reindeer (table 12).

We determined at least specifically 40 % of the bone remains. The fragmentation index is 1.75.

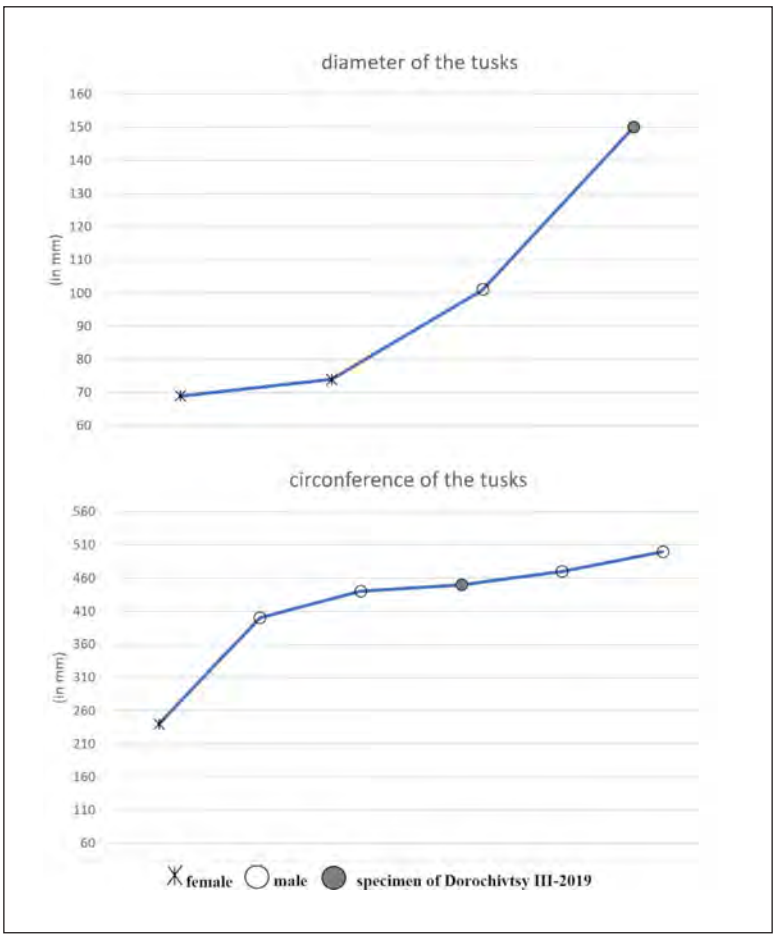

Fig. 30. Alterations due to weathering according to the different stages by species and categories of remains from Doroshivtsi III-2019/3

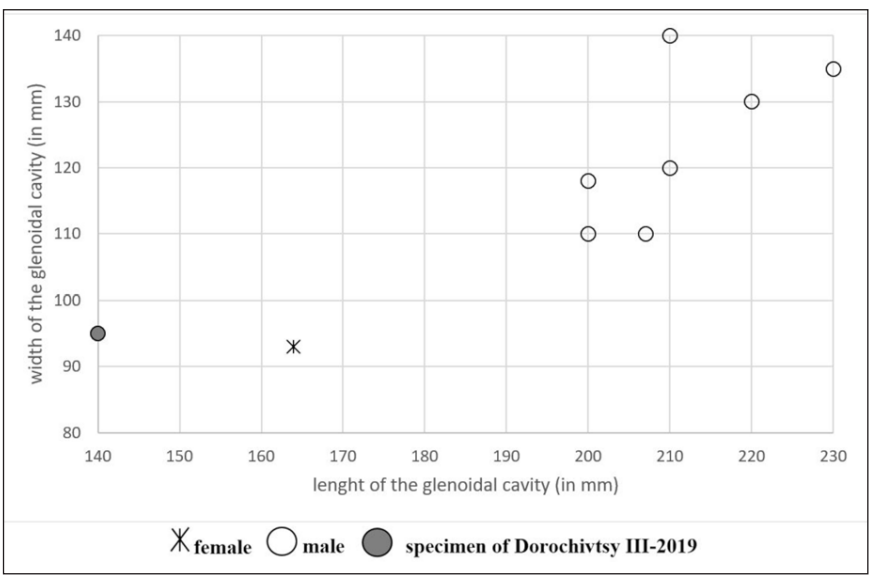

Fig. 31. Osteometry of tusks of mammoths from Doroshivtsi III-2019/3 and specimens of references

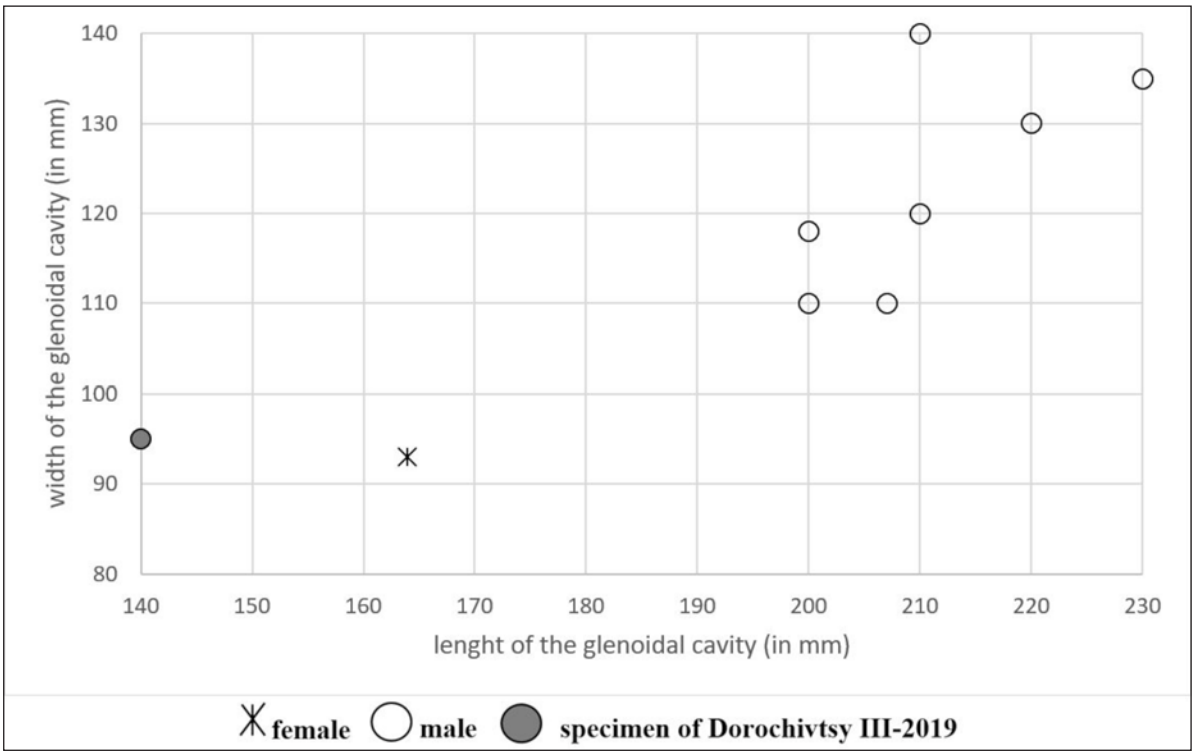

Fig. 32. Osteometry of scapulas of mammoths from Doroshivtsi III-2019/3 and specimens of references

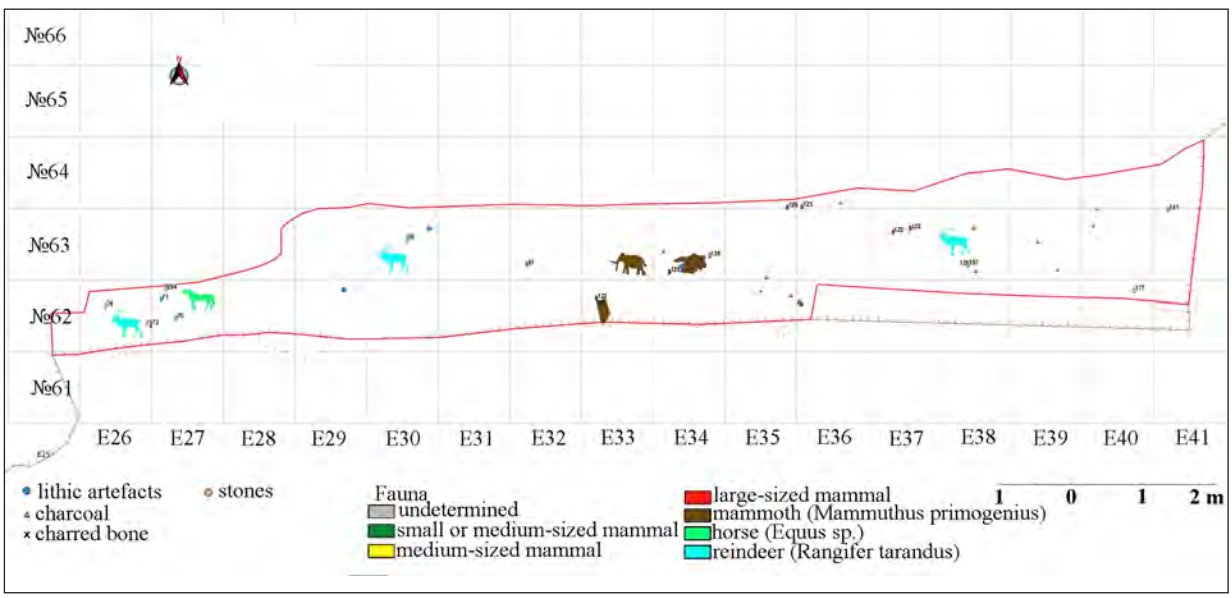

Fig. 33. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/3

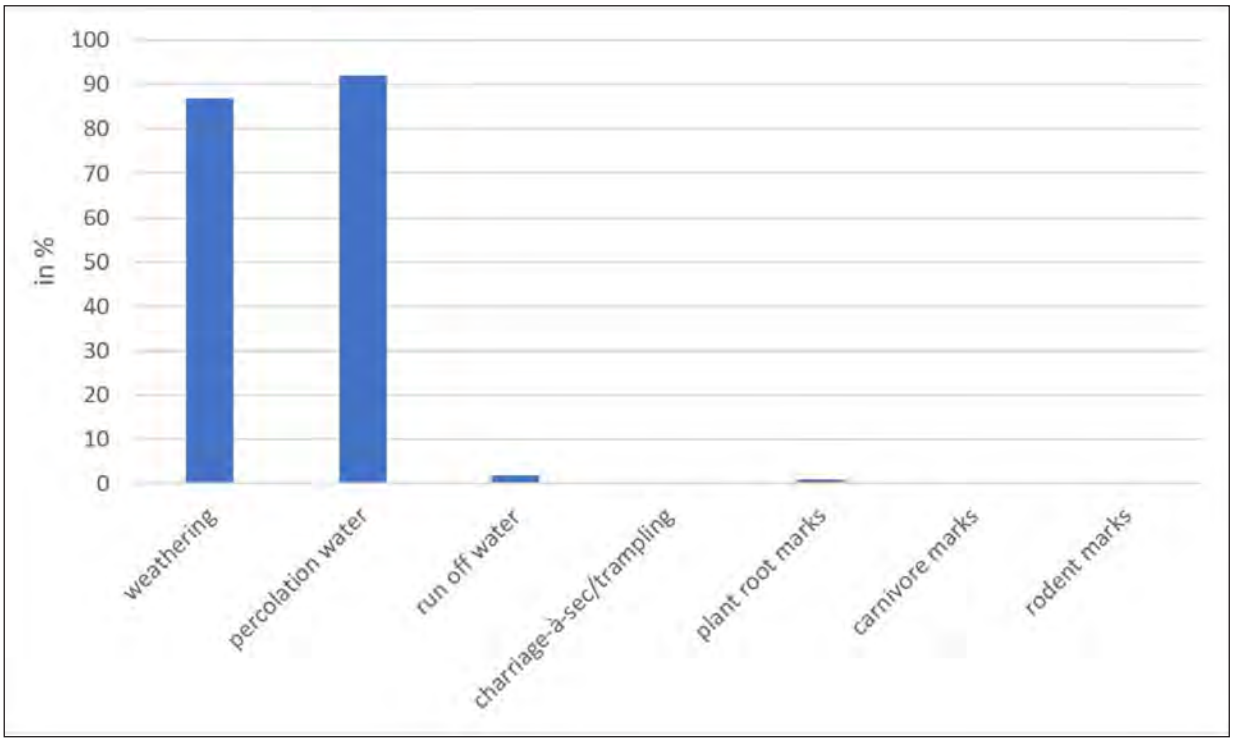

Fig. 34. Alterations due to climate-edaphic and non-human biological agents in percentage of number of remains from Doroshivtsi III-2019/4

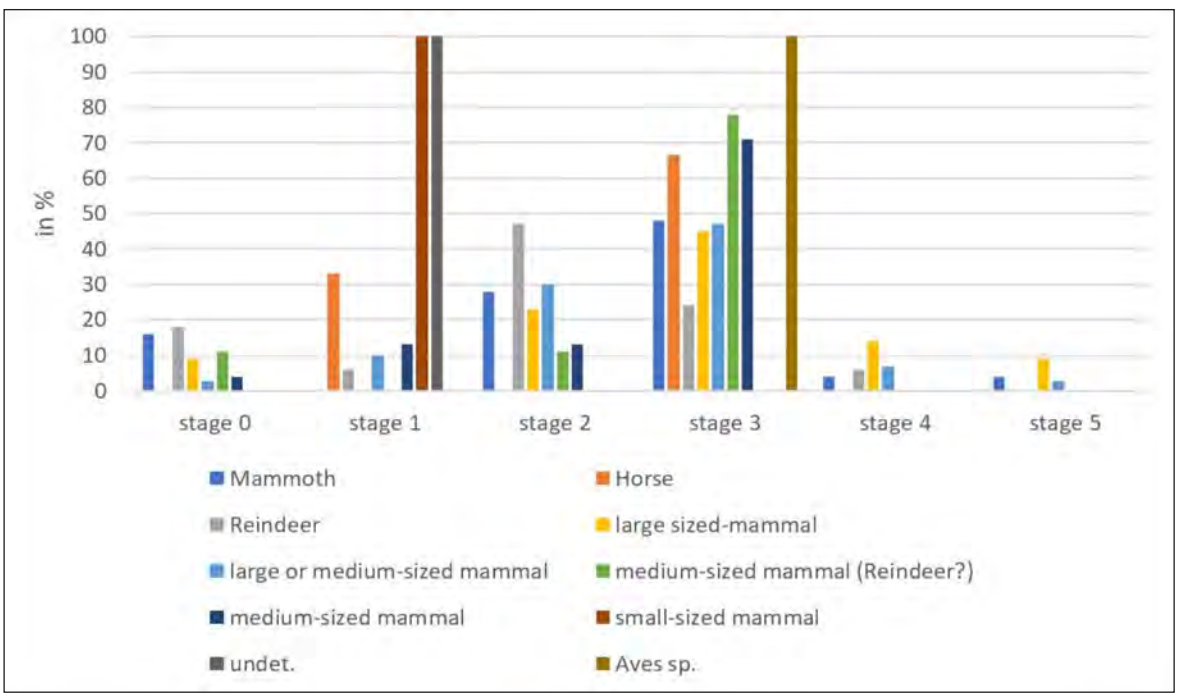

Fig. 35. Alterations due to weathering according to the different stages by species and categories of remains from Doroshivtsi III-2019/4

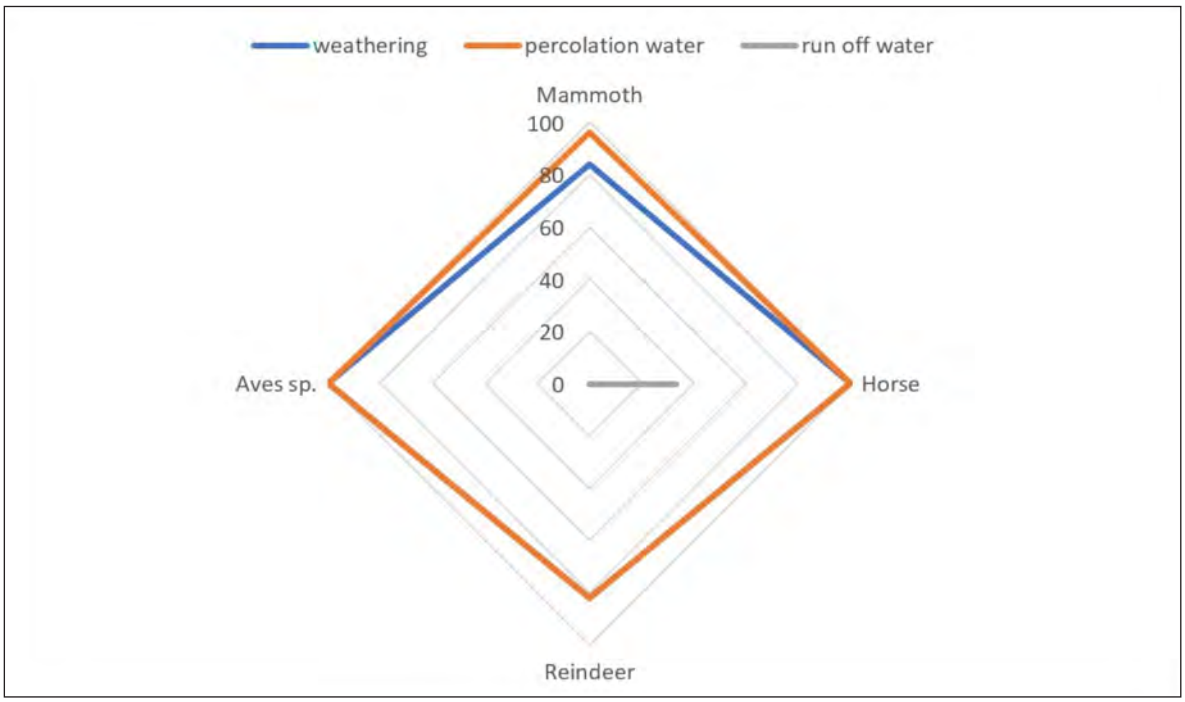

Fig. 36. Alterations due to climate-edaphic and non-human biological agents in percentage of number of remains by species from Doroshivtsi III-2019/4

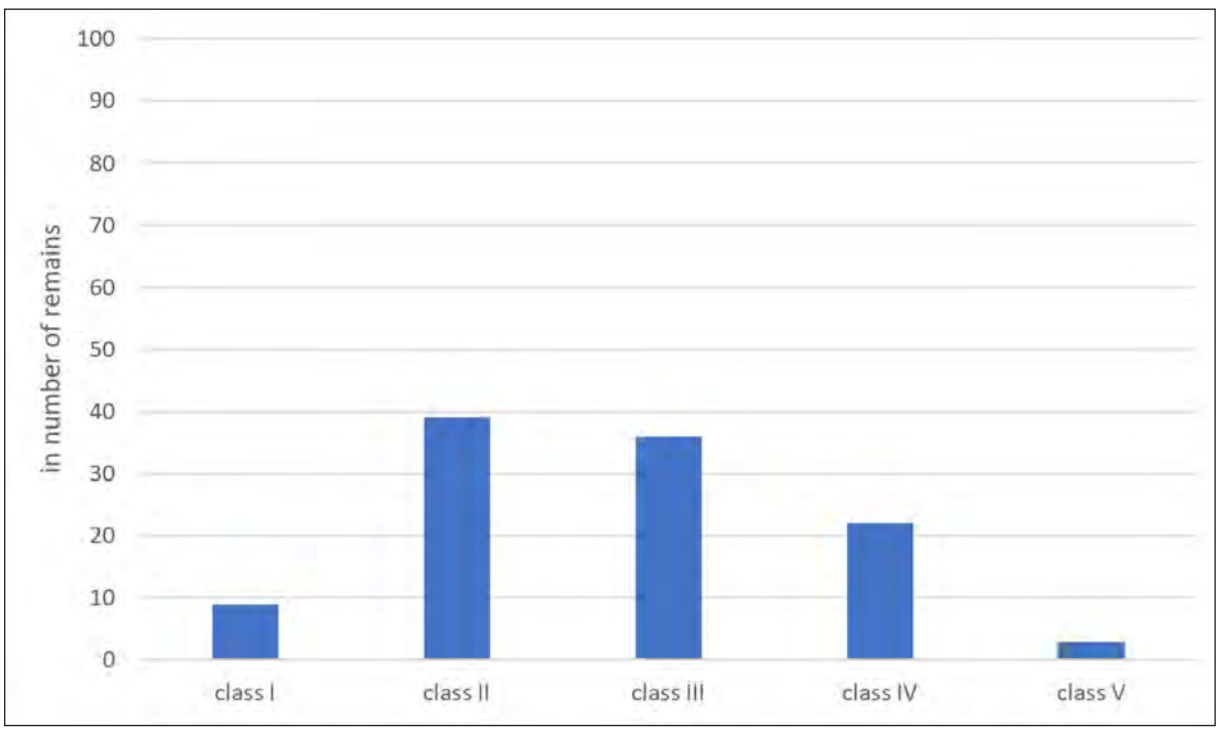

Fig. 37. Splinters by size classes from Doroshivtsi III-2019/4

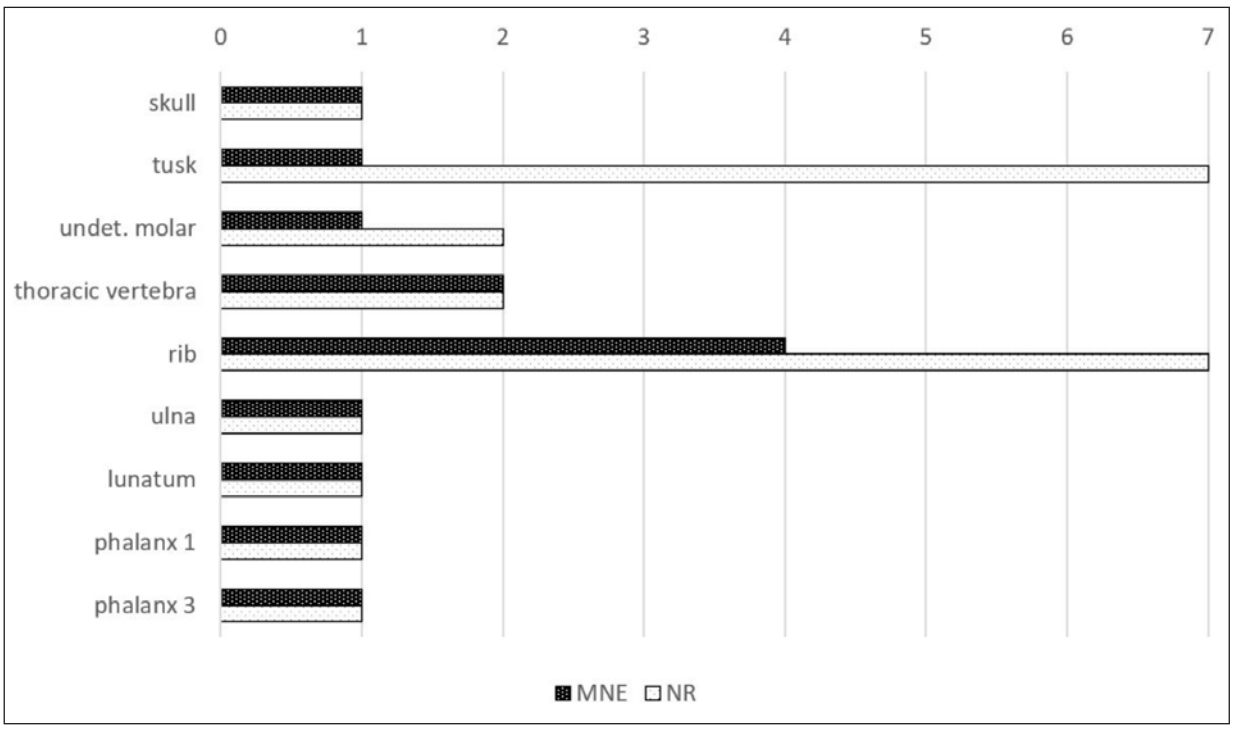

Fig. 38. Counting of mammoth bones in number of remains and in minimum number of elements from Doroshivtsi III-2019/4

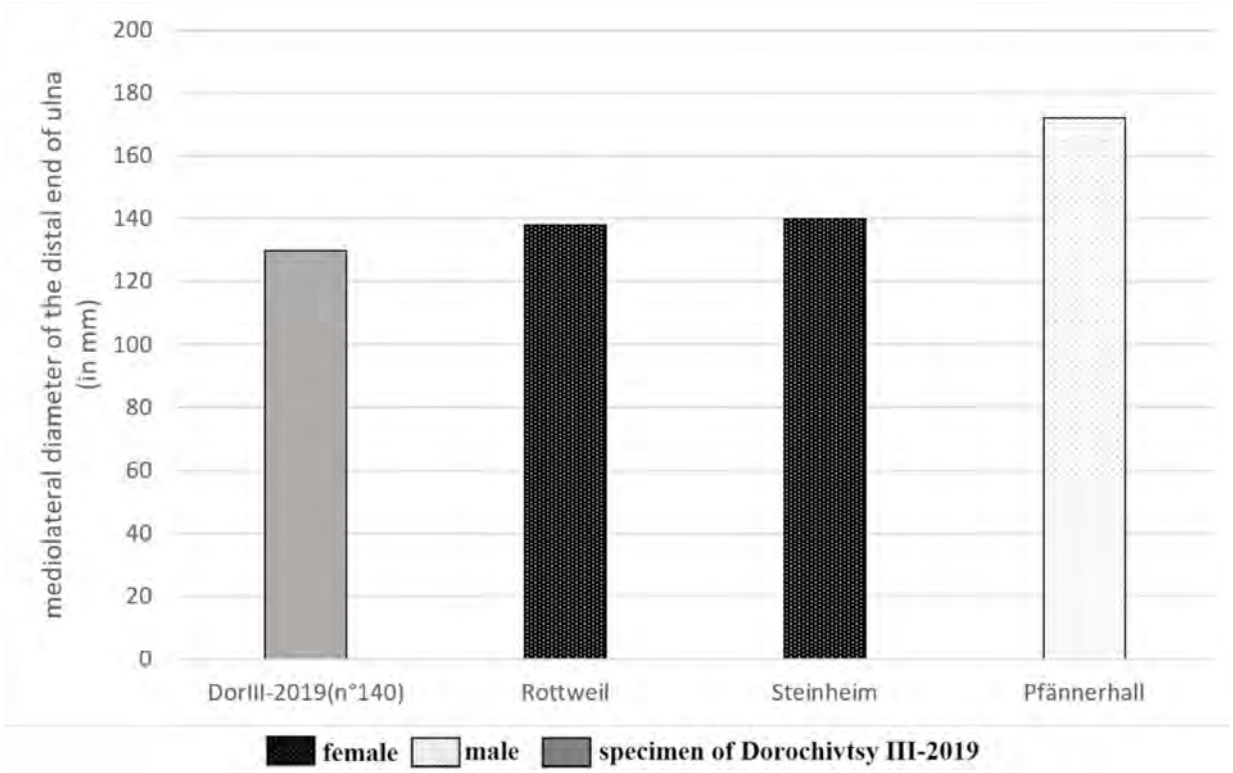

Fig. 39. Osteometry of ulnas of mammoths from Doroshivtsi III-2019/4 and specimens of references

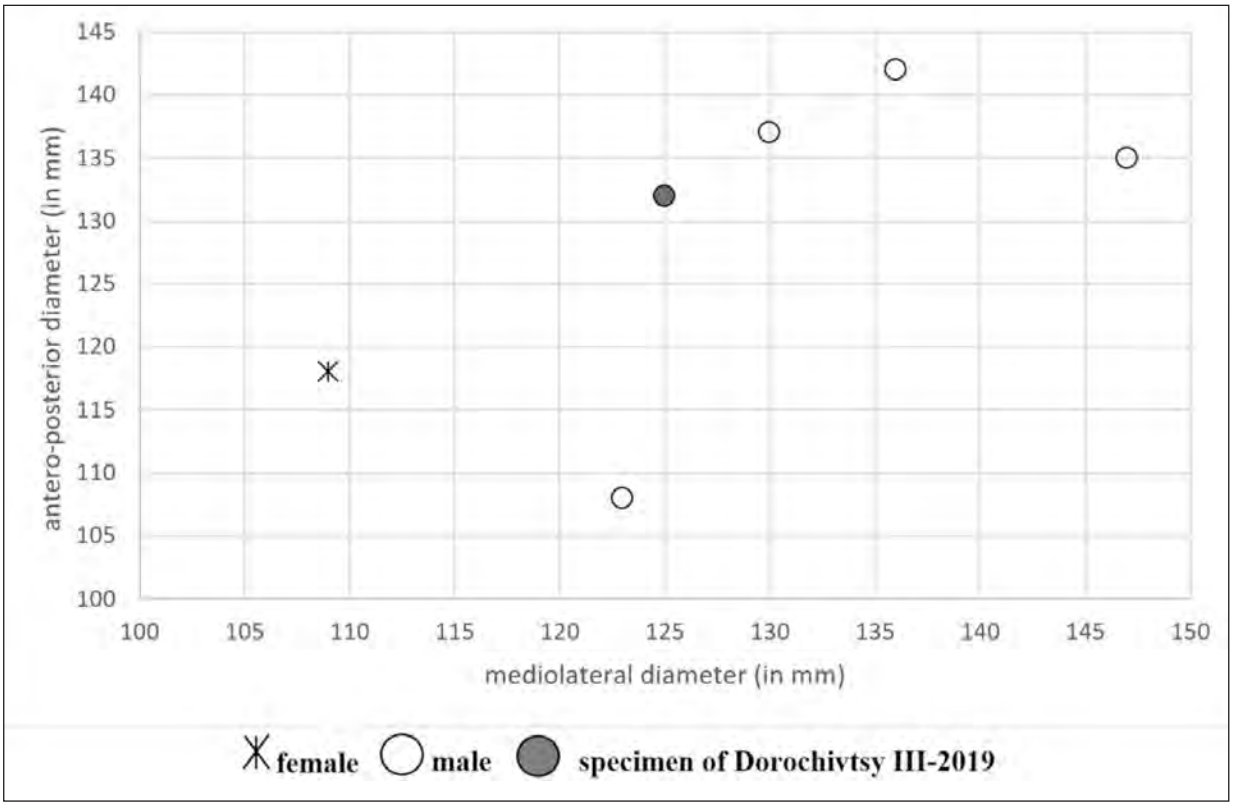

Fig. 40. Osteometry of lunatums of mammoths from Doroshivtsi III-2019/4 and specimens of references

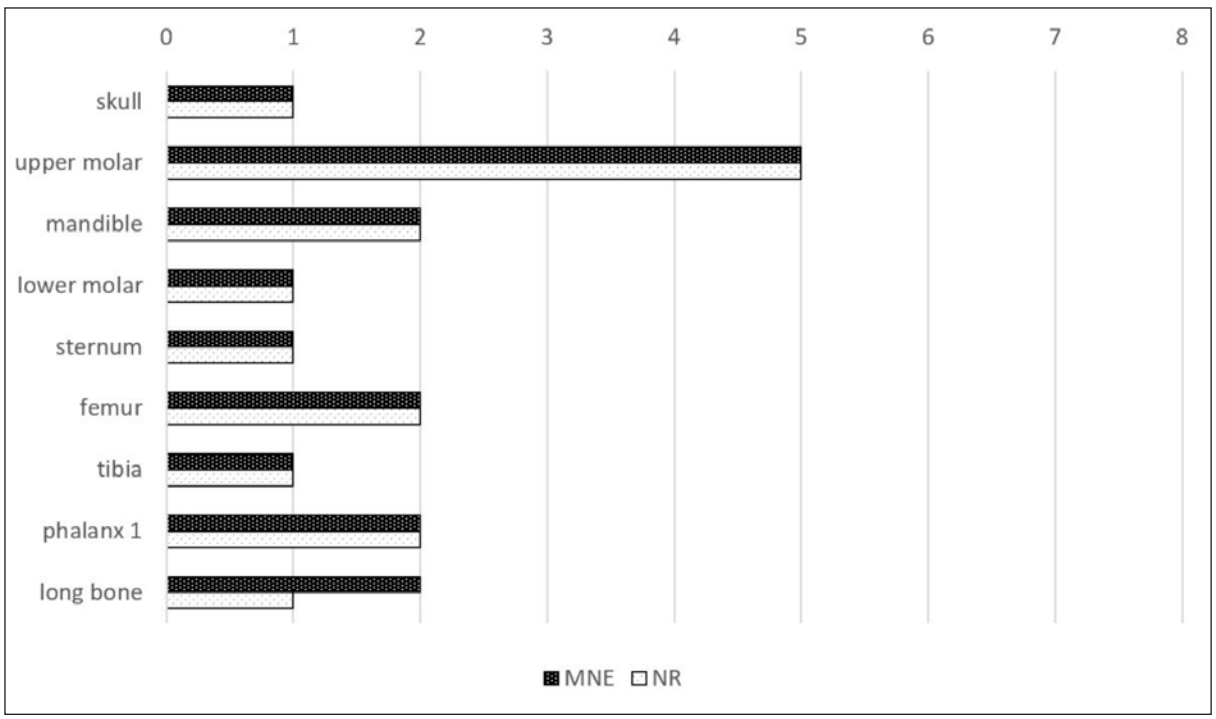

Fig. 41. Counting of reindeer bones in number of remains and in minimum number of elements from Doroshivtsi III-2019/4

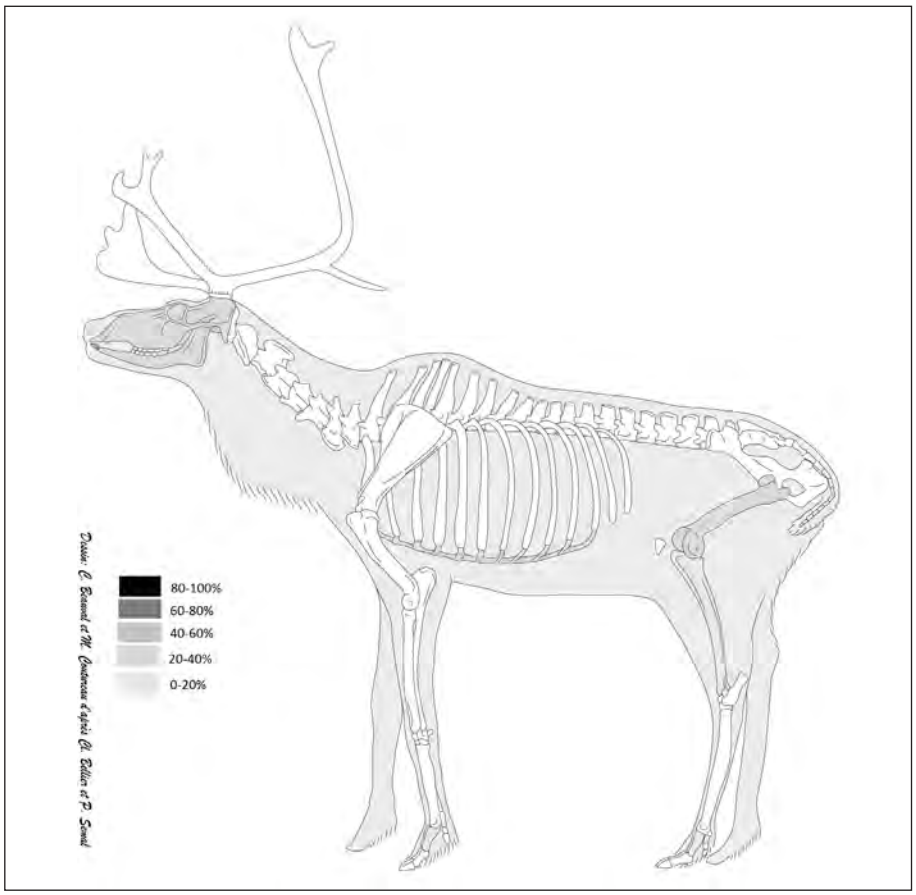

Fig. 42. Skeletal preservation by elements in percentage survival (Ps%) of reindeer (MNI: 3) from Doroshivtsi III-2019/4

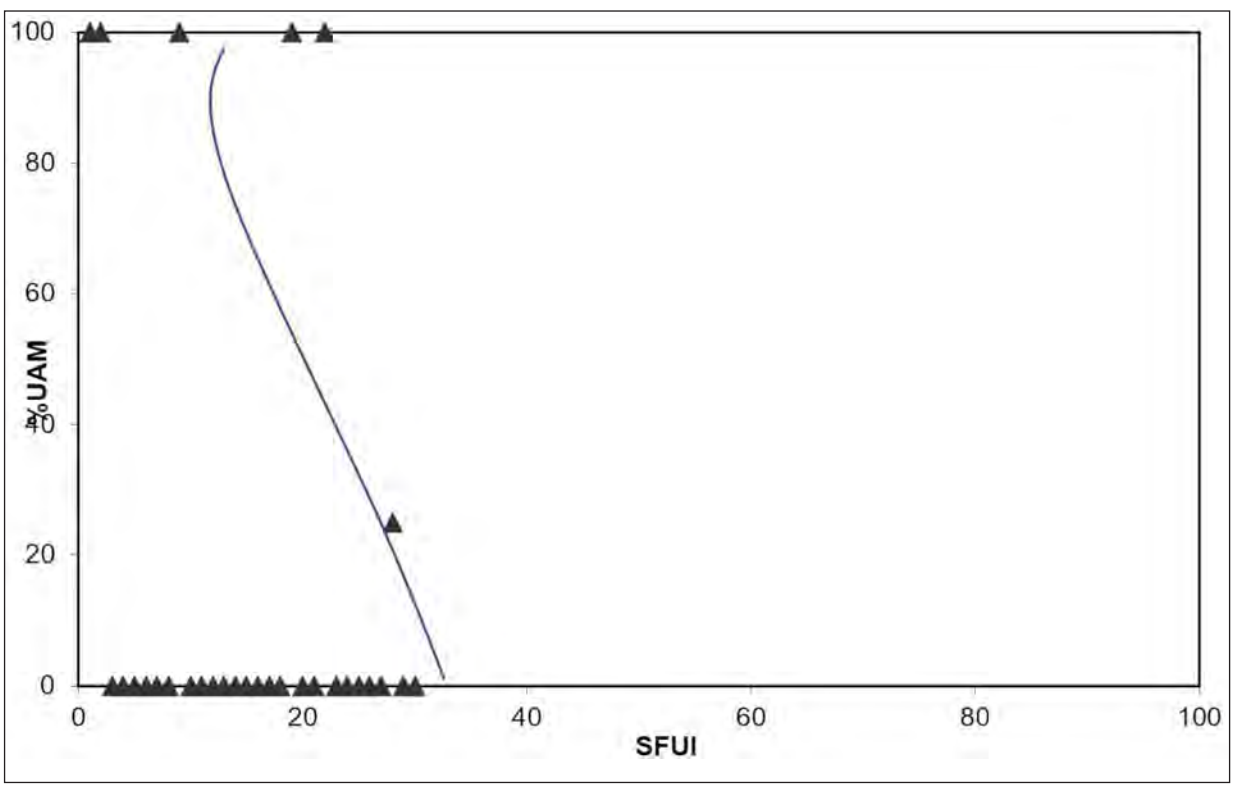

Fig. 43. Skeletal preservation of reindeer remains in relation to nutritional values from Doroshivtsi III-2019/4

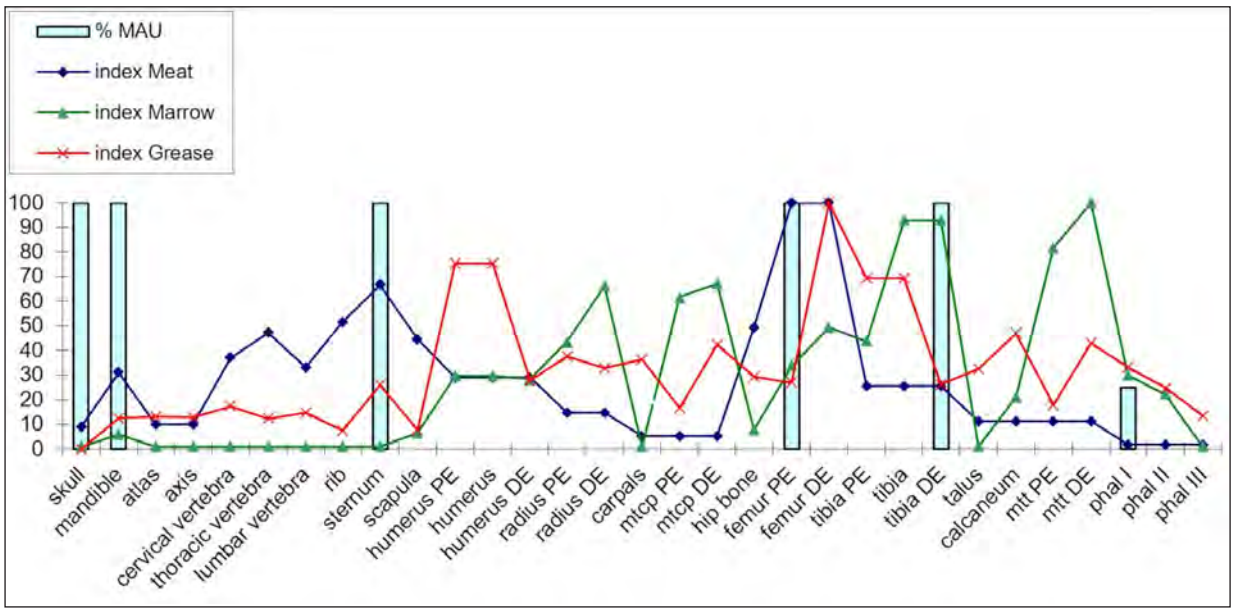

Fig. 44. Skeletal preservation of reindeer bones in percentage of minimum animal unit (%MAU) by anatomical parts, according to indexes "grease", "meat" and "marrow" from Doroshivtsi III-2019/4

We observed longitudinal, step and helicoidal fracturing.

Concerning the taphonomic conditions (figs. 49 and 50), an important part of the bones was affected by weathering of different stages (mainly stages 1, 2 and 3) and percolation water. The fragments are mainly of size classes III (fig. 51). So, the remains of the layer 5 had stayed in open air for a relatively short time and were affected by post-depositional percolation water. The fracturing show fragmentations of dry and fresh bones.

Concerning a **mammoth** there is a fragment of a molar of an adult s.l., a fragment of ivory and another fragment of bone. **Reindeer** are represented by a femur, a metacarpal and a left radius. They are two individuals, an adult s.l. and a young adult (table 13).

There is also a bone of a large- or medium-sized mammal and several bone fragments. A rib of a medium-sized mammal is also present. Two remains of diaphyses of a medium-sized mammal bear anthropogenic impacts of fracturing. Bones are associated with few lithic artefacts and

Table 10. **Bones of a mammoth and determination of growth stage and age classes from Doroshivtsi III-2019/4**

Number (labels)	Bone	Latera-lisation	Stage/age	Age classes	Sex
140	ulna	left	< XVIIIa-XX if female / < 30-35 y.o.;	adult s.l. maybe quite young	/
201	luna-tum	right	< XXII-XXX if male / < 36-60 y.o.	adult s.l.	male

Table 11. **Bones of reindeer and determination of growth stages and age classes from Doroshivtsi III-2019/4**

Number (labels)	Bone	Latera-lisation	Stage / age	Age classes
133	maxillar and P2 P3 P4 M1 M2	right	F / 15 months old	juvenile
249	mandible and M3	right	I / 30 months old	young adult
188	femur (PE fused)	right	> 36-48 months old	adult s.l. (> young adult)
292	tibia (DE fused)		>18-30 months old	adult s.l.

Fig. 45. Left femur of *C. corax* from Doroshivtsi III-2019/4

Fig. 46. Anthropogenic modifications on an ivory fragment from Doroshivtsi III-2019/4

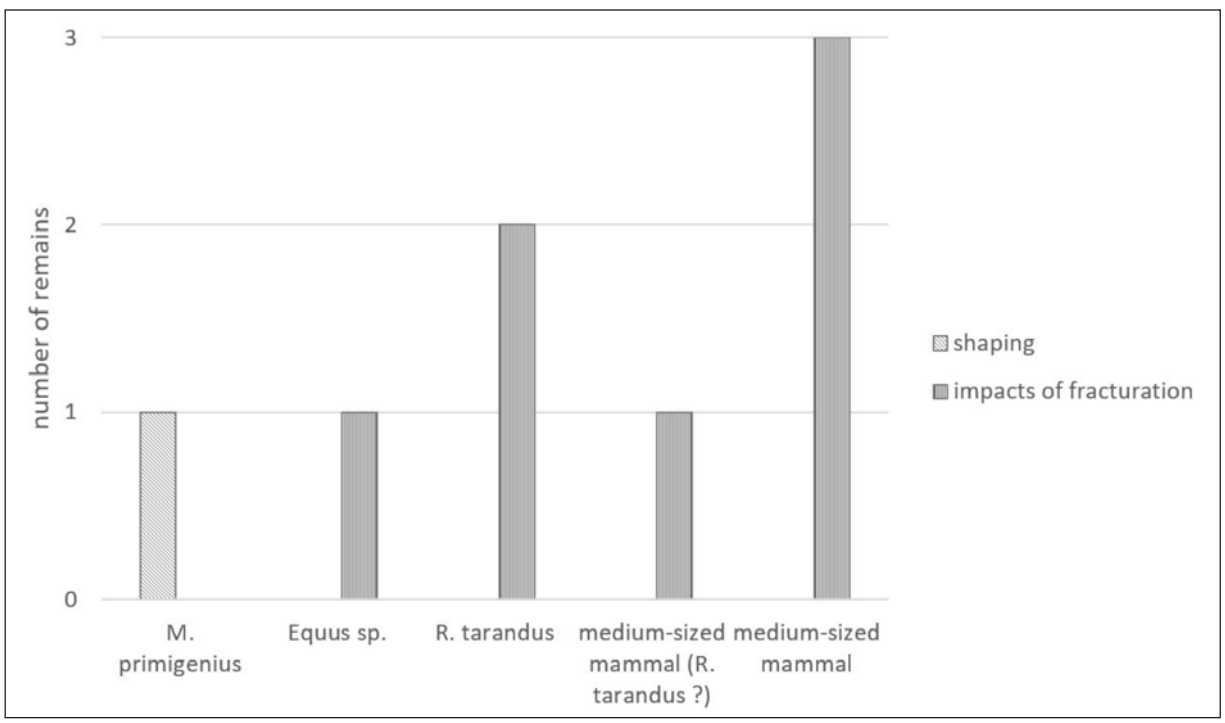

Fig. 47. Anthropogenic modifications on bones from Doroshivtsi III-2019/4

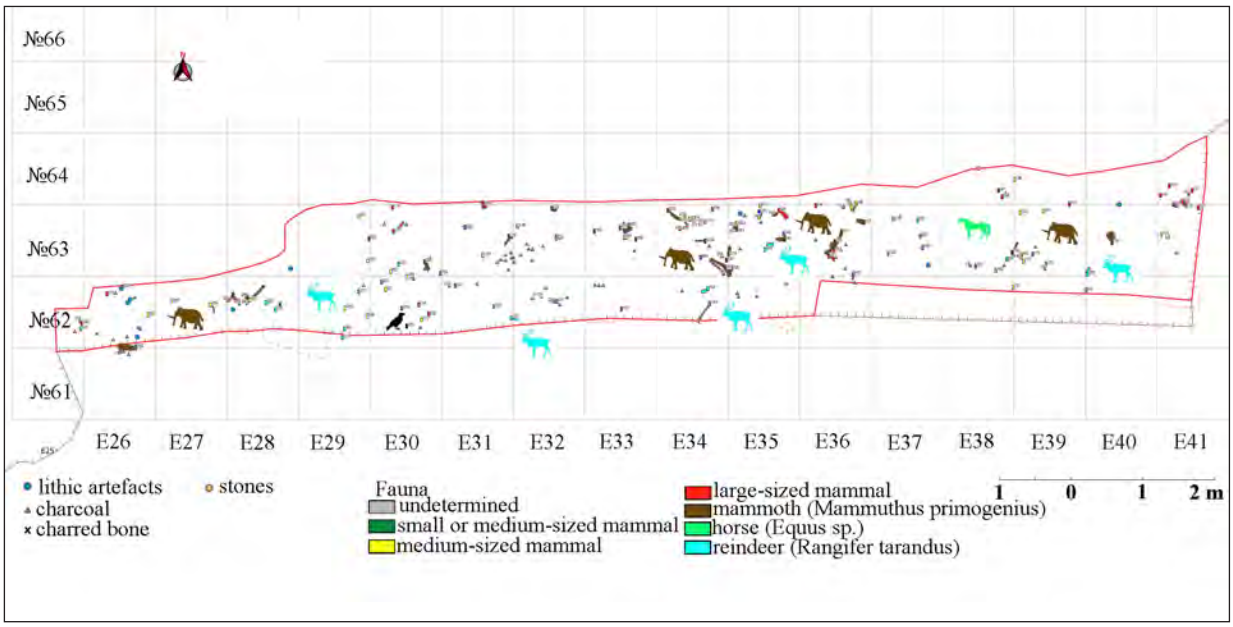

Fig. 48. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/4

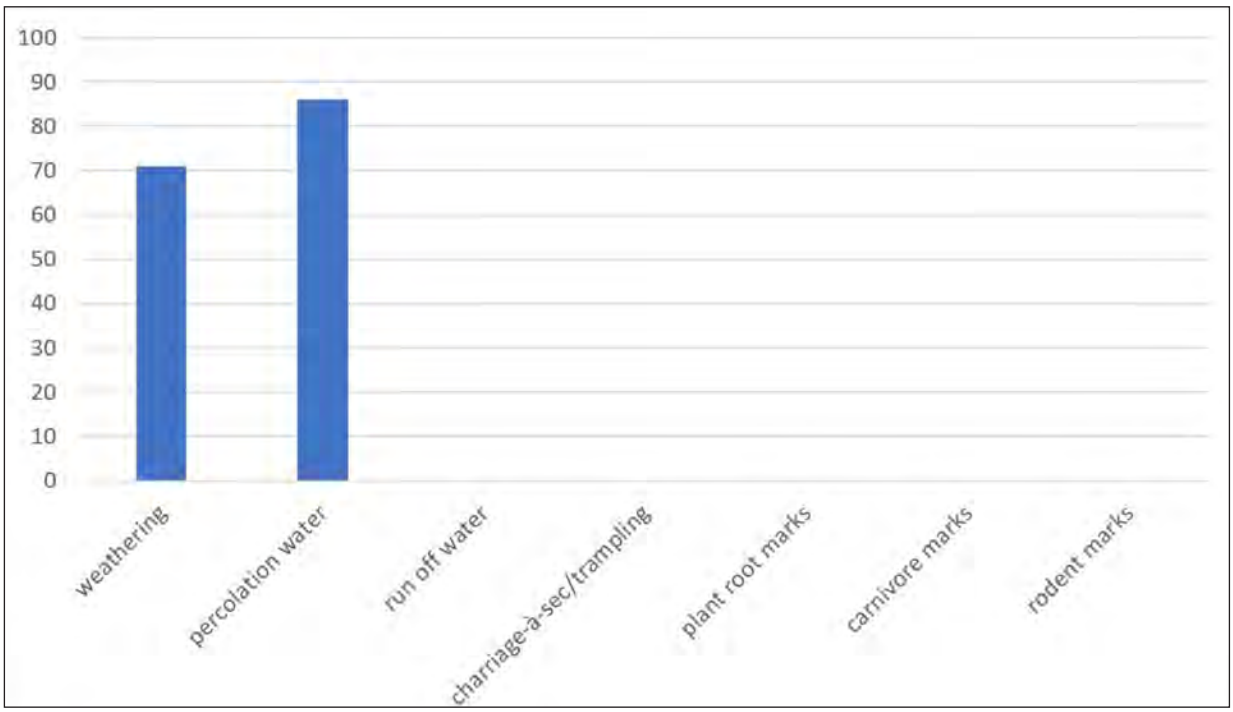

Fig. 49. Alterations due to climate-edaphic and non-human biological agents in percentage of number of remains from Doroshivtsi III-2019/5

charcoals. They are concentrated on the east part of the excavation (fig. 52).

Layer 5a. The layer 5a furnished 4 remains corresponding to at least 3 elements belonging to 2 individuals (table 14).

Bones were affected by weathering effects (stages 2 and 4) and iron and manganese deposits due to percolation water. There is a fragment of a mammoth rib and a fragment of a flat bone of a large-sized mammal. There is also a left talus of an adult s.l. a reindeer (46.8 × 30.0 mm). Bones are concentrated on the east part of the excavation and associated with few lithic artefacts and charcoals (fig. 53).

Layer 6. The layer 6 included 3 remains corresponding to at least 3 elements belonging to

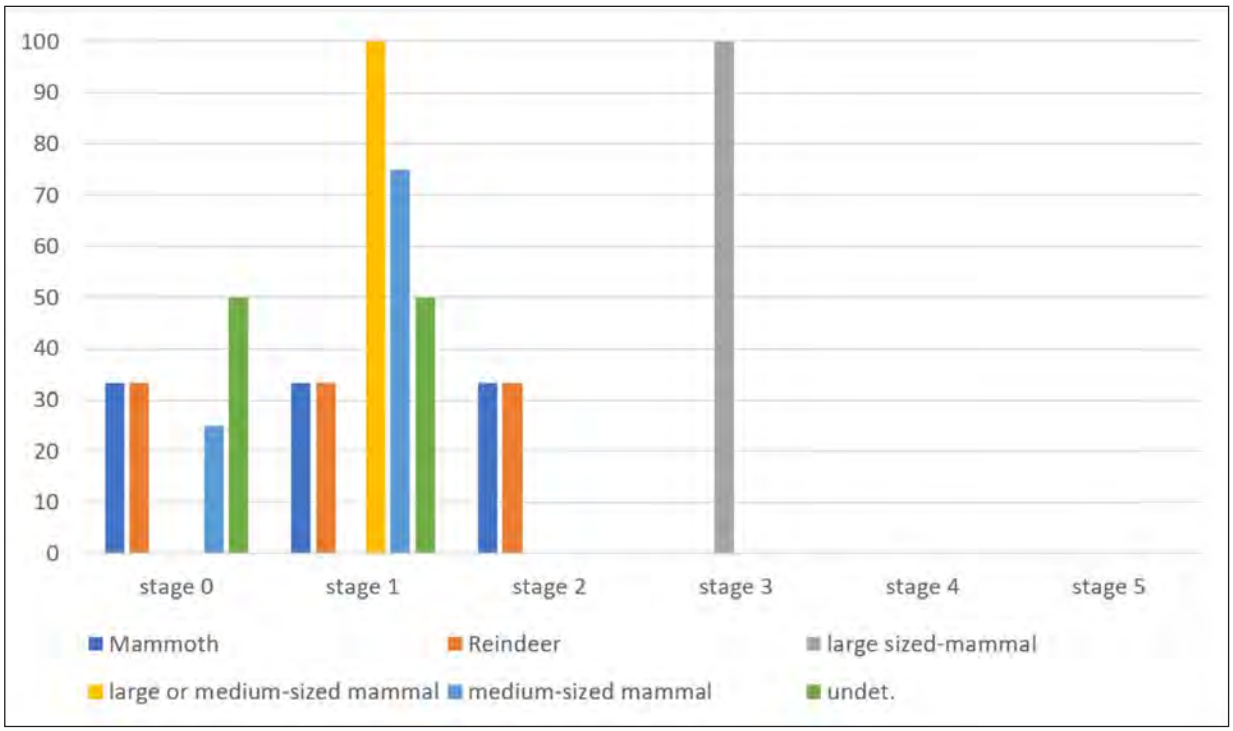

Fig. 50. Alterations due to weathering according to the different stages by species and categories of remains from Doroshivtsi III-2019/5

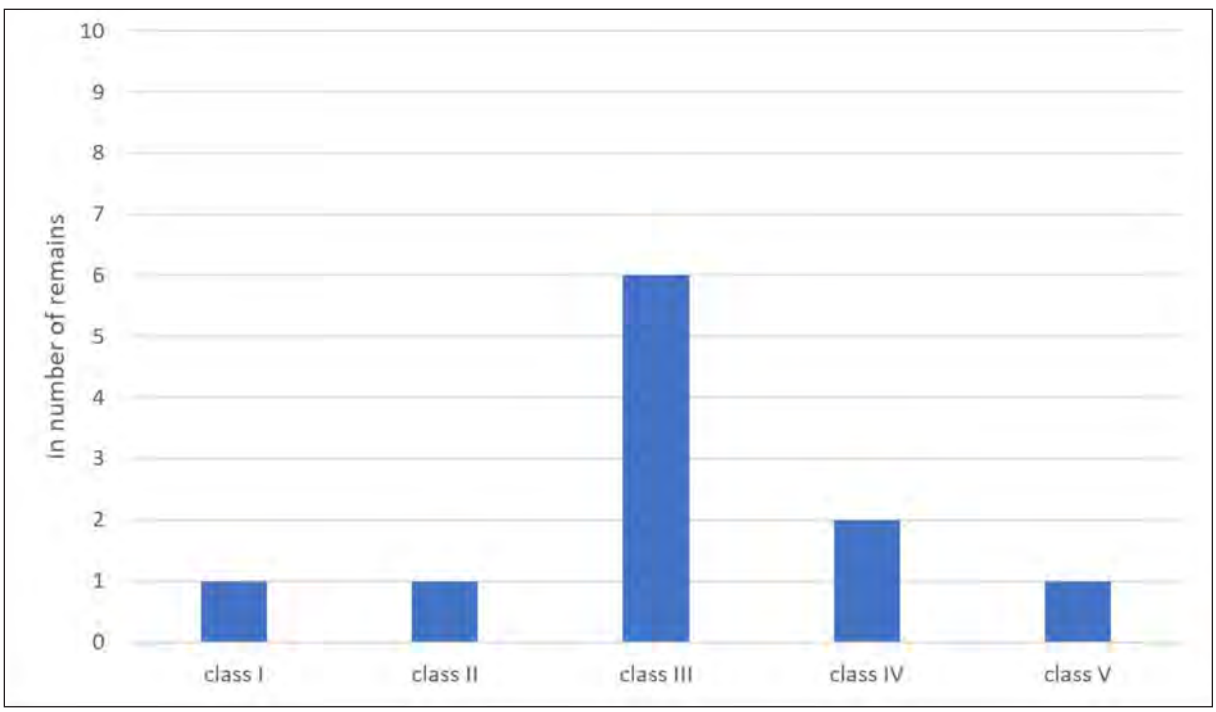

Fig. 51. Splinters by size classes from Doroshivtsi III-2019/5

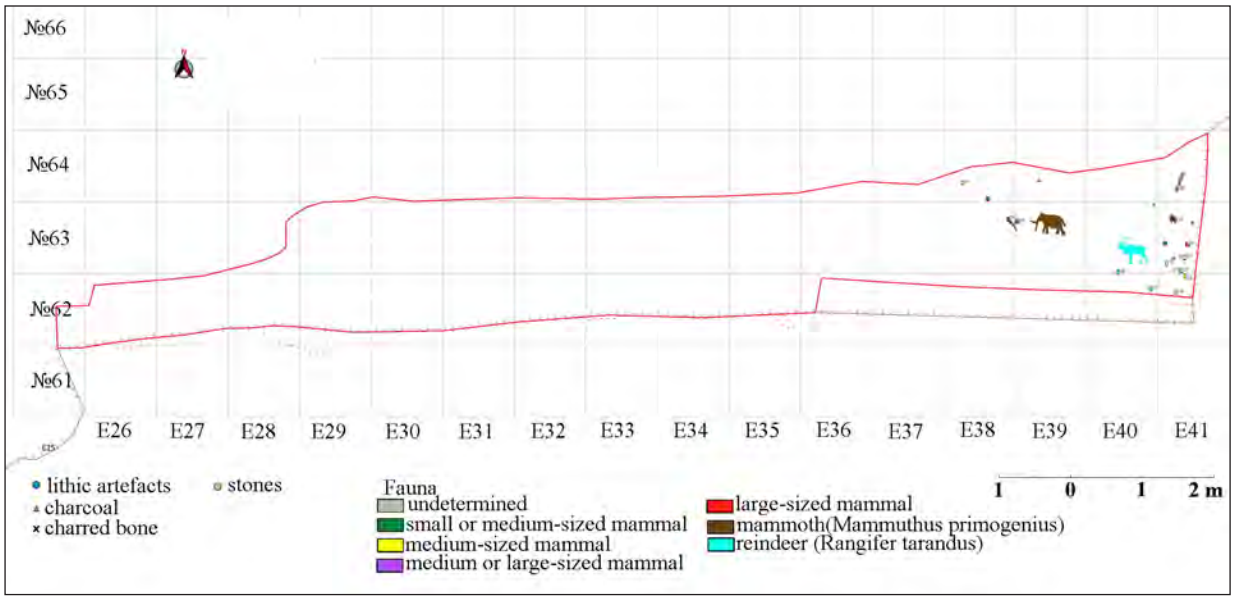

Fig. 52. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/5

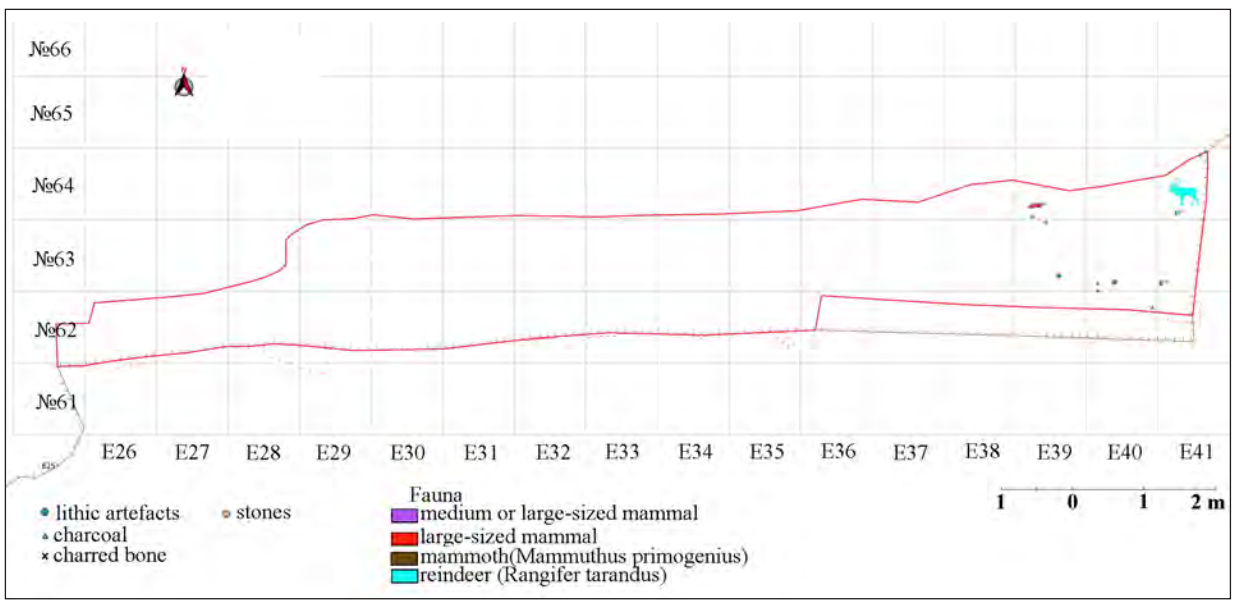

Fig. 53. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/5a

2 individuals. There is a fragment of a mammoth bone, a fragment of a bone of a medium-sized mammal and a fragment of a spinal disc of a medium-sized mammal (table 15).

These remains are affected by weathering (stage 3) and percolation water (iron and manganese deposits). Bones are associated with few lithic artefacts and charcoals and concentrated on the east part of the excavation (fig. 54).

Layer 8. The layer 8 furnished a fragment of a bone of a large-sized mammal. The surface is abraded, affected by weathering and deposits of iron and manganese due to percolation water.

Discussion

Taphonomy. The bones of Doroshivtsi III-2019 are generally well preserved. In all layers they are affected by post-depositional percolation water. The bones are also affected by weathering sometimes of different stages between bones and/or species which could be due to different phases of accumulation, various modalities of burying

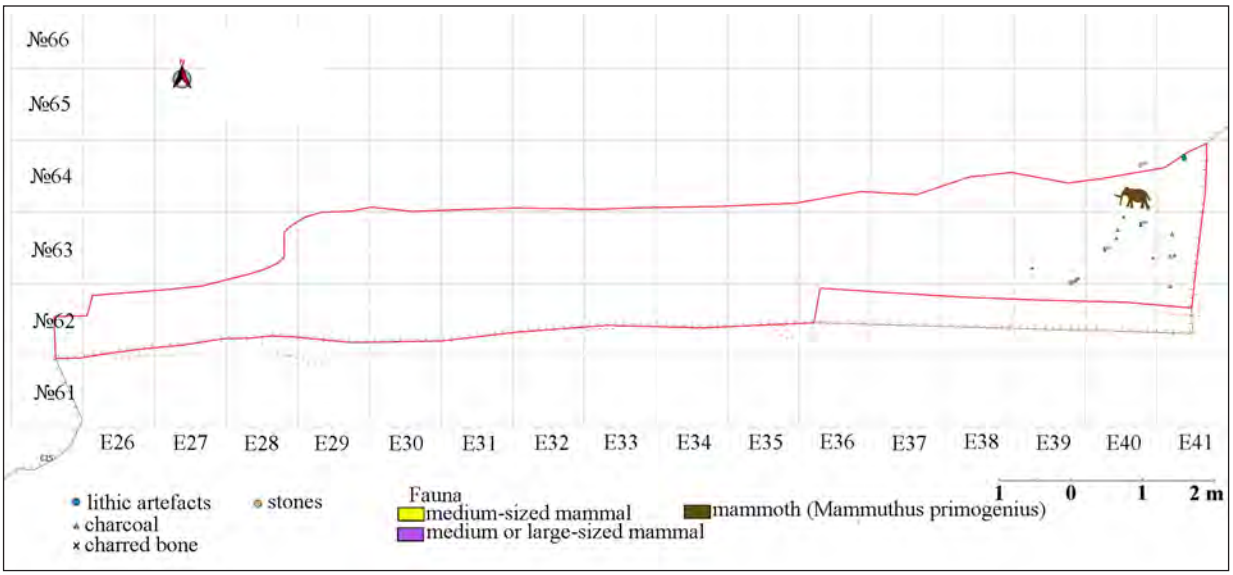

Fig. 54. Spatial distribution of the archaeological remains from Doroshivtsi III-2019/6

and due to the size of bones according to the species.

We have few data about layers 0, 5a, 6 and 8. In other layers according to the size classes of fragments and the type of fracturing we observed modification due to freeze-thaw actions. The remains of the layer 1 had stayed in open air for long time, also as the layer 2, whereas the others were quite quickly buried (table 16). Some mammoths bones bear plant root marks, which could mean bones were buried in subsurface or were collected in another place.

Table 12. **Counting of faunal remains from Doroshivtsi III-2019/5 in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

Species	NR	MNE	MNI
M. primigenius	3	3	1
Rangifer tarandus	3	3	2
large-sized mammal	1		
large- or medium-sized mammal	1	1	
medium-sized mammal	4	1	
undetermined	2		
TOTAL	14	8	3

Table 13. **Bones of reindeer and determination of growth stages and age classes from Doroshivtsi III-2019/5**

Number (labels)	Bone	Laterali-sation	Stage/ age	Age classes	Sex
236	tusk	/	/	adult s.l.	male
311	scapula	left	/	young adult	/

Table 14. **Counting of faunal remains from Doroshivtsi III-2019/5a in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

Species	NR	MNE	MNI
M. primigenius	1	1	1
Rangifer tarandus	1	1	1
large-sized mammal	1	1	
large- or medium-sized mammal	1		
TOTAL	**4**	**3**	**2**

Table 15. **Counting of faunal remains from Doroshivtsi III-2019/6 in number of remains (NR), minimal number of elements (MNE) and minimal number of individuals (MNI)**

Species	NR	MNE	MNI
M. primigenius	1	1	1
large- or medium-sized mammal	1	1	
medium-sized mammal	1	1	1
TOTAL	**3**	**3**	**2**

Fig. 55. Radius of reindeer of layers 2 and 3 from Doroshivtsi III-2019

The layers 2 and 3 are hard to distinguish in some places. We identified two radii with different modalities of preservation, but showing exactly the same measurements and anatomical particularities. They could belong to the same individual (fig. 55).

Faunal populations. The main species in Doroshivtsi III-2019 are reindeer, horses and mammoths. Reindeer are mainly adults with young individuals (fig. 56). That could correspond for the layers 4 and 5 to the grouping of herds in summer. Horses are represented by adults and a juvenile (fig. 57). It could correspond to mixed herds. Mammoths are represented by adults and young individuals (fig. 58). It could correspond to different groups of mammoths, herds of females with young individuals and herds of male or solitary males.

Human behaviours. We identified impacts of fracturing on long bones of horses and reindeer linked to marrow removal. In the layer 4, a juvenile reindeer could have been slaughtered in summer. Concerning mammoths, we have few data, but the rib in the layer 2 with impacts and cutmarks could belongs to a mammoth. So, the main games are reindeer, then horses. Mammoths remains could have been collected on more or less fresh carcasses.

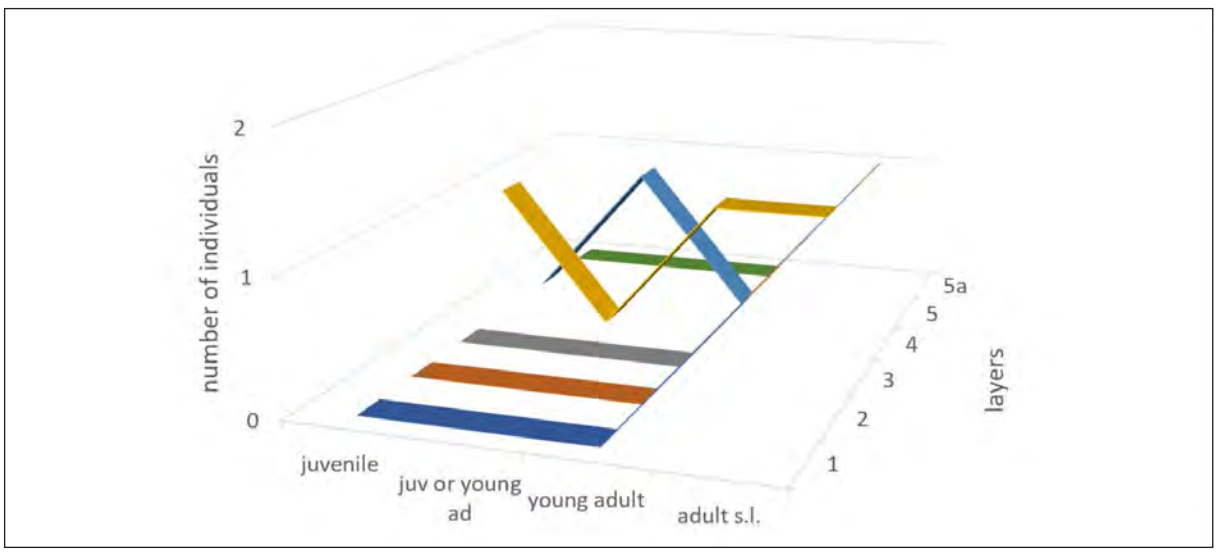

Fig. 56. Age classes of reindeer from Doroshivtsi III-2019

Table 16. **Main taphonomic processes according to the layers of Doroshivtsi III-2019**

Layer	Taphonomic processes
0	few remains/no reliable data
1	long time in open open air; freeze-thaw action
2	relatively long time in open open air; freeze-thaw action
3	short-time; freeze-thaw action
4	short-time; freeze-thaw action
5	short-time; freeze-thaw action
5a	few remains/no reliable data
6	few remains/no reliable data
8	few remains/no reliable data

Comparisons with Doroshivtsi III-2007—2010

In comparison with the sector of excavations 2007—2010 (Кулаковська та ін. 2011; Кулаковская, Усик, Эзартс 2012; Kulakovska et al. 2015; Demay, Patou-Mathis, Kulakovska 2015), we have

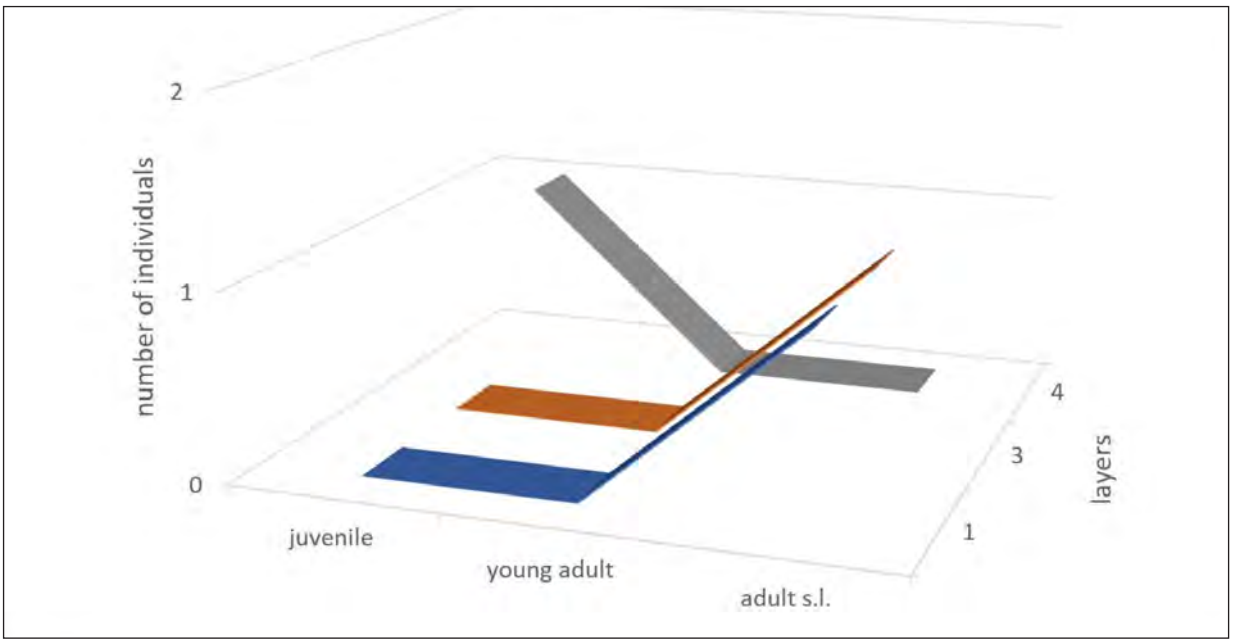

Fig. 57. Age classes of horses from Doroshivtsi III-2019

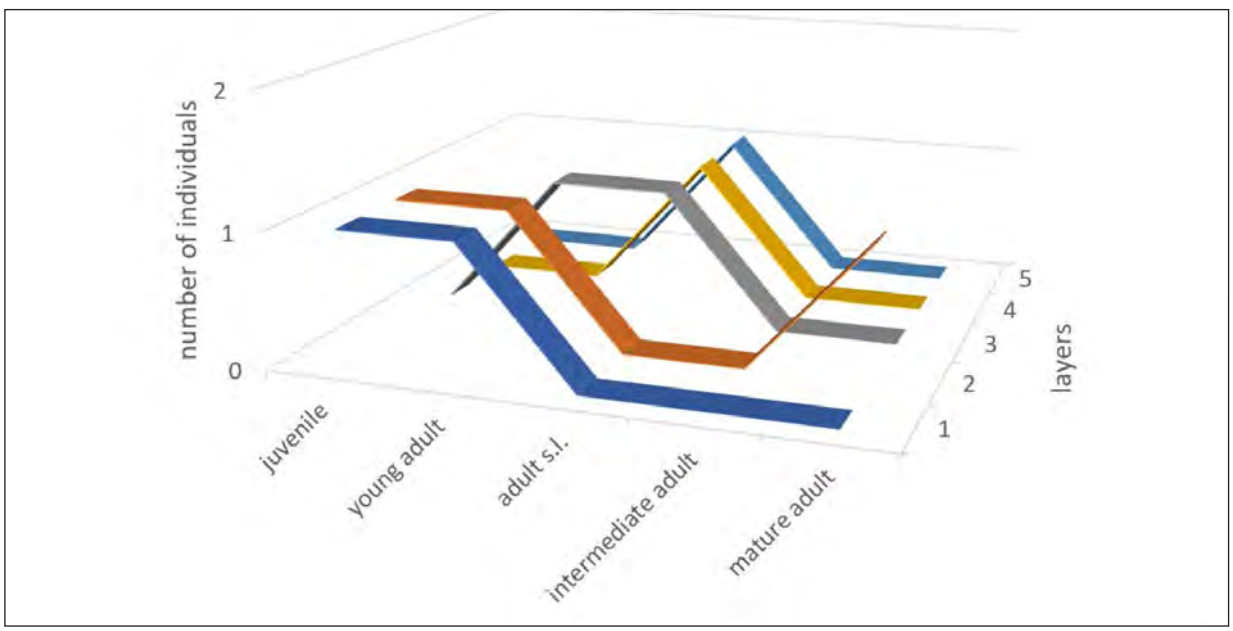

Fig. 58. Age classes of mammoths from Doroshivtsi III-2019

the same species, but the remains are less dense. We also have few remains of a fox. Moreover, we have remains of a young wolf in layer 2. And mammoths are represented more than expected with idividuals dead in situ.

Conclusions

The excavations at Doroshivtsi III of 2019 furnished well preserved faunal remains (mainly reindeer, horses and mammoths) associated with lithic remains and few charcoals and burned bones. The density of remains being less compactly arranged than at the previously excavated sector, could correspond to another functional area — the camps. The status of mammoths needs to be better understood.

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ВЕРХНЬОПАЛЕОЛІТИЧНІ ПОСЕЛЕННЯ В ДОЛИНІ СЕРЕДНЬОГО ДНІСТРА: ЗООАРХЕОЛОГІЧНІ ДОСЛІДЖЕННЯ НА СТОЯНЦІ ДОРОШІВЦІ III (УКРАЇНА) − РОЗКОПКИ 2019 р.

У прикарпатській зоні, у південній частині басейнів Серету, Прута та Дністра, зокрема на палеолітичних пам'ятках Румунії та Республіки Молдова, засвідчено різноманітну діяльність первісної людини у час останнього льодовикового максимуму (LGM). Північніше, в районі середнього Подністров'я, на заході України, при дослідженні стоянки Дорошівці III було отримано нові результати, які підтвердили попередні дані, а також стали ключовими для відтворення людської діяльності в найбільш холодний відрізок часу.

У 2019 році поновилися дослідження верхньопалеолітичної стоянки Дорошівці III, яка існувала в часи останнього льодовикового максимуму. Зафіксовано десять археологічних шарів з артефактами граветського технокомплексу.

У статті представлено результати детального археозоологічного аналізу фауністичних решток. Загалом, можна говорити про добру збереженість кісткового матеріалу. У процесі досліджень було ідентифіковано останки північного оленя, коня, мамонта, вовка та лисиці, а також ворону. Наразі ми маємо небагато даних для шарів 0, 5а, 6 і 8. Фауністичні рештки у шарах 1 та 2 довгий час перебували просто неба. Результати аналізу фауністичних решток свідчать, що

основними видами полювання були північні олені та потім — коні. Довгі кістки коней і оленів мають сліди переломів що пов'язано з добуванням кісткового мозку. У археологічних шарах 4 і 5 північний олень був представлений переважно дорослими особинами та дитинчатами. Подібний склад типовий для літніх стад тварин. Коні представлені дорослими особинами та молоддю, що загалом характерно для змішаних табунів. Рештки мамонтів належать також дорослим і молодим особинам.

Кістки мамонтів могли бути зібрані із недавно впольованих тварин. Склад фауни тотожний матеріалам із розкопок 2007—2010 рр. (розкоп І). Також варто зауважити, що в колекції 2019 р (розкоп ІІ) вперше ідентифіковано кістки вовка. Щільність кісток у цій частині поселення менша порівняно з розкопом І. Неочікувано з'ясувалося, що у цьому секторі краще представлений мамонт. Імовірно, що тварини помирали на місці. Невелика кількість фауністичних решток та крем'яних артефактів свідчить про відмінне від сусіднього сектора призначення ділянки.

К л ю ч о в і с л о в а: верхній палеоліт, останній льодовиковий максимум, гравет, життєзабезпечення, тафономія.

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