

THE FIRST PLEISTOCENE FOSSIL MAMMALS FROM ALBEȘTI (TELEORMAN COUNTY)
AND ADDITIONAL *MEGALOCEROS* SPECIMENS FROM THE DACIAN BASIN
(SOUTHERN ROMANIA)

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Rezumat: Această lucrare descrie primele resturi fosile descoperite în depozitele detritice care află de-a lungul râului Burdea, la Albești (județul Teleorman). Specimenele descrise în această lucrare sunt atribuite proboscidenilor (*Mammuthus meridionalis*) și cervidelor (*Megaloceros giganteus*). Alături de piesele de la Albești, sunt prezentate alte două specimene provenite din depozite de vârstă Pleistocen superior din apropierea Bucureștiului, care nu au mai fost descrise anterior în literatura științifică. Taxonii descoperiți la Albești indică prezența atât a depozitelor Pleistocen inferioare cât și a celor Pleistocen superioare în succesiunea sedimentară prezentă de-a lungul râului Burdea.

Abstract: This paper describes the first fossil remains discovered in the detritic deposits that crop out along the Burdea River, at Albești (Teleorman County). The specimens described in this paper are assigned to proboscideans (*Mammuthus meridionalis*) and to cervids (*Megaloceros giganteus*). Along with the specimens from Albești, two other specimens are presented, found in Upper Pleistocene deposits near Bucharest, that have never been described previously in scientific literature. The taxa from Albești indicate both Lower Pleistocene and Upper Pleistocene deposits are present in the sedimentary succession found along the Burdea River.

Cuvinte cheie: Bazinul Dacic, Elephantidae, Cervidae, Cuaternar.

Keywords: Dacian Basin; Elephantidae; Cervidae; Quaternary.

Introduction

A remnant of the Eastern Paratethys, the Dacian Basin functioned during the late Pliocene and the Pleistocene mostly as a freshwater basin, where important alluvial and fluvial sedimentary units formed (Andreescu *et al.* 2011, 2013). These units yielded numerous large mammal remains, mostly occurring as isolated finds, and only rarely as taxonomically diverse fossil assemblages (*e.g.*, Apostol 1976, 1981, Radulescu *et al.* 2003). The area found today within the boundaries of Teleorman County makes no exception, numerous Pliocene and Pleistocene mammal remains having been found in the sands and gravels that crop out along main rivers, or as a consequence of anthropic activities, such as quarrying or excavating to lay the foundations of large buildings. Some of the most important fossil sites in Teleorman County in terms of faunal diversity or abundance of fossil specimens include the Pliocene sites of Ciuperceni-1 and Ciuperceni-2 (Terzea and Boroneanț 1979, Terzea 1981), Early Pleistocene sites, like Bogdana, Alexandria–*Brick Factory*, and Peretu (Apostol and Cacoveanu 1980, Vasile and Torcărescu 2017, Torcărescu 2018), Late Pleistocene sites, like Nanov and Lăceni (Apostol 1976, Apostol and Cacoveanu 1980), or sites where a mixture of Early, Middle, and/or Late Pleistocene taxa have been found, suggesting a more complex stratigraphy is present, such as Mavrodin (Apostol and Cacoveanu 1980, Vasile *et al.* 2012, 2013).

Most fossil remains described so far from the Pleistocene deposits of Teleorman County belong to proboscideans, namely *Mammuthus meridionalis* and *Mammuthus trogontherii*, (*e.g.*,

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Apostol 1968, 1976, 1981, Apostol and Cacoveanu, 1980, Vasile *et al.* 2012, 2013, 2019, Vasile and Cojocaru 2015, Vasile and Torcărescu 2017, Torcărescu 2018) which have also been used to date the surrounding deposits as being accumulated during the Early and, respectively, Middle Pleistocene, according to the general evolutionary timeframe of the *Mammuthus* lineage (Lister 1996, Lister *et al.* 2005). Other large mammalian taxa described from Teleorman County include the bovids *Bison priscus* (described by Apostol and Cacoveanu 1980 from Mavrodin), and *Bos primigenius*, (described by Apostol and Cacoveanu 1980 from Nanov), as well as the cervids *Megaloceros giganteus* (two skulls having been described by Apostol 1976 from Lăceni, and by Apostol and Cacoveanu 1980 from Mavrodin), and *Cervus elaphus* (mentioned by Apostol and Cacoveanu 1980 as being found at Alexandria, Măgura, Orbeasca de Jos, Purani, Mavrodin).

This paper describes some large mammal fossil remains recently found at Albești (Teleorman County), in detritic deposits that crop out along the Burdea River. The specimens, assigned to the elephantid *Mammuthus meridionalis* and to the cervid *Megaloceros giganteus*, are the first to be described from this locality, thus adding a new fossil site to those already known from the proximity of the Vedeia River. Additionally, two *Megaloceros giganteus* mandible fragments found near Bucharest were identified in the fossil vertebrate collection housed at the Faculty of Geology and Geophysics from the University of Bucharest. The two specimens, used for comparison, are also figured and described here for the first time.

Material and Methods

Most of the specimens from Albești, described in this paper, were found by the authors in 2018 and 2020 while prospecting for fossils along the banks of the Burdea River, near its junction with the Vedeia River (Plate I). Three specimens were found, including a proboscidean mandible fragment, a fragment of a cervid antler, and a cervid mandibular fragment. Additionally, one elephantid molar labelled as collected from Albești was found in the collection of the Teleorman County Museum, Alexandria (hereon abbreviated MJT), but no other details regarding the precise context or date of its discovery are known. All four specimens are stored at the MJT, and have been allocated provisional working numbers, for easier referral. Supplementary, while looking for comparative material in the vertebrate collection from the Laboratory of Palaeontology, at the Faculty of Geology and Geophysics, University of Bucharest (hereon abbreviated LPB[FGGUB]), two cervid mandibular fragments very similar to the one from Albești were found. These fragments, most probably found in the early 20th century, were not described previously, and are also presented here, as *Megaloceros* dentognathic remains are rare occurrences in the Dacian Basin.

Elephantid molar anatomical terminology and measurements follow Maglio (1973). Measurements of the cervid mandible and antler fragments, when not mentioned explicitly, follow Driesch (1976).

Description of material

The only elephantid specimen found by the authors at Albești is represented by a fragment of a dentary bone, 177 mm long and 102 mm tall, preserving part of the horizontal ramus of a right mandible (MJT Al-17; Plate II.A-B). Only the outer (*i.e.*, labial) margin of the dentary is preserved. The outer surface is convex, and still preserves the compact cortical part of the bone, whereas the inner surface is broken, revealing the inner porous part of the dentary. A series of vertical parallel shallow grooves, separated by faint crests, can be seen on the inner part of the bone, and represent the imprint of the plates that form the lophodont elephantid jugal teeth. Unfortunately, the inner surface of the dentary preserving the imprint of molar plates is very small, and does not allow for an estimate of relevant morphodimensional parameters (*i.e.*, the lamellar frequency, calculated as the number of plates per 10 cm of molar length, *e.g.*, Maglio 1973) to be calculated. Given the poor state of preservation of the specimen, it can only be taxonomically assessed at family level, the particular lophodont dentition placing it among the Elephantidae.

The specimen found in the collection of the MJT, where it was brought on February the 19th 2020 by Mr. Valerică Sotirescu from Alexandria, Teleorman County, consists of a complete elephantid molar (MJT Al-01, Plate II.C-D). The molar consists of eight plates, and an anterior dentine platform. The occlusal surface is convex, indicative for an upper molar, and it appears its anterior segment slightly bends to the right, suggesting it was probably a left molar. The enamel is moderately wrinkled, more so in the medial area of the crests, where a medial sinus is present on both the anterior and posterior crests of the second to the fifth plate. All plates were in use, being more worn anteriorly. The molar measures 210 mm in length, 92.19 mm in width (at the level of the third plate), and 73 mm in

height (measured at the level of the first plate). Enamel thickness was measured for the anterior and posterior enamel crest on all eight plates, and allowed for a mean value of 3.08 mm to be calculated. A lamellar frequency of 3.81 was calculated taking into account the full length and plate number of the molar. The measured parameters fit in the ranges reported for the second upper molars of the southern mammoth, *Mammuthus meridionalis*, an elephantid species that lived throughout most of the Early Pleistocene (Maglio 1973, Lister *et al.* 2005). It is worth mentioning that the relatively low lamellar frequency measured for the above-described molar suggest a basal, earliest Pleistocene evolutionary stage of the species was present, but more specimens would be needed to fully support such a precise biostratigraphic inference. The southern mammoth was widespread in the Dacian Basin (Apostol 1968, 1976), its fossil remains being frequently found in the Lower Pleistocene units cropping out along the Vedea River and its tributaries as well (Apostol and Cacoveanu 1980, Vasile *et al.* 2012, 2013, 2019, Vasile and Cojocaru 2015, Vasile and Torcărescu 2017, Torcărescu 2018).

Specimen MJT AI-002 consists in the basal part of a robust right cervid antler (Plate III.A-B). The fragment, around 250 mm long, is broken below the burr, leaving a rounded surface, suggesting the antler was shed seasonally by the deer. In cross-section, the base of the antler is dorso-ventrally compressed, resulting in an oval shape (antero-posterior diameter = 70.57 mm; medio-lateral diameter = 60.42 mm; Plate III.A-B). The base of the supraorbital tine is placed right next to the burr, on the anterior margin of the antler, and only appears as a large tubercle measuring 37.22 mm longitudinally and 42.61 mm dorso-ventrally, due to the entire specimen being worn and rounded superficially during hydraulic transport. The size and morphology of the supraorbital tine cannot, therefore, be assessed. The beam becomes progressively flattened dorso-ventrally, the distalmost part of the preserved fragment also becoming antero-posteriorly wider (antero-posterior diameter = 42.94 mm; ventro-dorsal diameter = 75.53 mm), at the distance of 240.5 mm along the main beam from the supraorbital tine, the anterior margin of the antler starts projecting anteriorly, suggesting the area represented the base of the anterior tine. The general morphology and size of the antler corresponds to those present in the giant deer, *Megaloceros giganteus*, a large megacerine deer present throughout most of Eurasia during the Late Pleistocene, and, in some cold refugia, even until the Early Holocene (Lister 1994, Vislobokova 2011, Croitor *et al.* 2014, Plicht *et al.* 2015, Croitor 2018, Lister and Stuart 2019). The morphology of the palmation that usually exists at the distal end of the antlers, and the presence of additional tines attached to the palmation, features used in discerning between several giant deer subspecies (*e.g.*, Croitor 2018) cannot be inferred, due to the distal part of the antler not being preserved.

Another cervid specimen (MJT AI-003) consists of the horizontal ramus of a left mandible preserving only the very base of the teeth, broken at the level of the alveoli (Plate III.C-E). The basal outline of the third molar (M_3) is visible in its entirety, whereas only the posterior part, above the second root, is visible for the second molar (M_2), the mandible being broken at the level of its first root. Posteriorly, the dorsal margin of the mandible only preserves a small anterior fragment of the vertical ramus, which was only beginning to rise. Posterior to the third molar, the body of the mandible becomes significantly more labio-lingually flattened, and only the anteroventral tip of the masseteric fosa is visible on the labial side of the fragment. The mandibular horizontal ramus is broad below the above-mentioned molars (see Table 1 for measurements), mandibular pachyostosis being a feature typical of male *Megaloceros* individuals (*e.g.*, Croitor 2008, Codrea and Solomon 2011, Croitor *et al.* 2014).

Inv. no	1	2	3	4	5	6	7	8	9	10	11	12	Locality
MJT AI-003	41.9	18.4	-	23.7	-	-	51.1	38.7	55.2	37.0	-	-	Albești
LPB (FGGUB) 132	38.1	18.9	26.1	19.4	29.0	17.4	49.5	34.9	48.3	33.0	39.2	26.9	Bucharest–Colentina
LPB (FGGUB) 4	43.6	43.7	29.6	22.9	-	19.7	51.9	39.3	54.2	36.8	52.4	32.9	Bucharest–Bucureștii Noi

Table 1. Dimensions of *Megaloceros giganteus* dental and mandibular parameters, given for specimens MJT AI-003 from Albești, LPB (FGGUB) 132 from Bucharest–Bucureștii Noi, and LPB (FGGUB) 4 from Bucharest–Colentina.

All measurements are given in mm. 1. M_3 length; 2. M_3 breadth; 3. M_2 length; 4. M_2 breadth; 5. M_1 length; 6. M_1 breadth; 7. Mandible height under the M_3 ; 8. Mandible thickness under the M_3 ; 9. Mandible height under the M_2 ; 10. Mandible thickness under the M_2 ; 11. Mandible height under the M_1 ; 12. Mandible thickness under the M_1 .

Fossil remains of the giant deer have been reported or described in more detail from most Romanian regions: west and north of the Carpathian Arch, in Transylvania, the taxon is reported from Ciubanca and Jucu de Jos (Cluj County), Nușfalău (Sălaj County), Sebeș (Alba County), Nandru (Hunedoara County), Remetea (Harghita County), Bodoc (Covasna County), Chepeș and Zărnești (Brașov County), Sighișoara and Seleuș (Mureș County), Bistrița (Bistrița-Năsăud County) (Barbu 1931, Rădulescu and Samson 1985, Codrea and Solomon 2011); east of the Carpathians, in Pleistocene deposits found in Moldova (including the Romanian region of Moldova, and the current territory of the Republic of Moldova), the species was mentioned from Dornești (Suceava County), Iași–*Ciric* (Iași County), Hulubăț, Movileni, Zorleni, Simila, Bârlad–*Sud*, Fălciu (Vaslui County), Tecuci–*Rateș* (Galați County), Brînzeni, Duruitoarea Veche, Ofatinți (Republic of Moldova) (Macarovici 1959, Croitor 2008, Codrea *et al.* 2013, Ilie 2013a, b, Croitor *et al.* 2018, Ursachi *et al.* 2018, Păun *et al.* 2022); in Dobrogea, it was reported from the Palaeolithic site of La Adam Cave (Dumitrescu *et al.* 1965); whereas south of the Carpathians it was only mentioned from Lăceni and Mavrodin (Teleorman County), and from Bucharest (Paucă 1938, Apostol 1976, Apostol and Cacoveanu 1980).

While searching for comparative material in the fossil vertebrate collection from the Laboratory of Palaeontology at the Faculty of Geology and Geophysics from the University of Bucharest, two more fragmentary mandibles, similar to the one from Albești, were found. Given the rare *Megaloceros giganteus* occurrences in southern Romania, we consider it useful to present those specimens in this paper, making them known to the scientific community.

A 196 mm long fragment of a left dentary bone (LPB[FGGUB] 132, Plate III.F-H), preserving a complete M₃, an almost complete M₂ (only missing its anterolabial tip), and the alveolus of the first molar (M₁), labelled as *Cervus* sp., was found in the LPB collection. The location and date of its discovery are only mentioned as "Colentina (Bucharest)". Colentina is currently an inhabited area of Bucharest, a neighbourhood in the northeastern part of the Romanian capital city. During the first half of the 20th century, the area was, however, a mostly rural settlement on the outskirts of Bucharest. Several sand and gravel pits functioned in the area, yielding numerous large mammal remains (mammoth, bovids, cervids, rhinocerotids), that have been included in the scientific collections housed by the "Grigore Antipa" National Museum of Natural History and by the University of Bucharest's Laboratory of Palaeontology (Patte 1936, Apostol 1957, 1967, 1968, 1976, 1981). The large size of the specimen, listed in Table 1, show it belonged to a giant deer rather than a red deer, the other large deer widespread in the area during the Late Pleistocene. The molar and mandibular measurements are smaller than in the specimen from Albești, suggesting the specimen might have been a female, but, when referring to the thickness and height of the mandibular horizontal ramus, it must be noted that the specimen appears to have suffered taphonomic modifications that altered its original ratio: a large crack cuts through the bone between M₂ and M₃ (glued by previous curators of the collection), and three large folds, separated by deep furrows, are visible on the ventral edge of the dentary.

Another cervid fossil specimen found in the LPB(FGGUB) collection consists of a 17 cm long fragment from the horizontal branch of a right mandible, preserving only the base of the M₃, and fragments of the M₂ and M₁ (LPB[FGGUB] 4, Plate III.I-K). The label accompanying the specimen reads "*Cervus euryceros*, Bucureștii Noi, IV 1930". As in the case of Colentina, the current neighbourhood named Bucureștii Noi, found in the northwestern part of Bucharest, was in the first part of the 20th century a separate village on the outskirts of the city. Both Colentina and Bucureștii Noi are found along the Colentina River, which gives the name of an informal Upper Pleistocene stratigraphic unit, "the Colentina pebble" (*e.g.*, Liteanu 1952, Andreescu *et al.* 2011, 2013). As mentioned for the area of Colentina, this unit yielded numerous fossil remains across the entire area presently found in the northern half of Bucharest (Colentina, Floreasca, Băneasa, Bucureștii Noi neighbourhoods). Indeed, other Late Pleistocene vertebrate fossil remains were previously reported from Bucureștii Noi as well, the most notable consisting in a woolly rhinoceros radius (Apostol 1967). The specimen from Bucureștii Noi preserves, around the base of the molars, patches of well-cemented grey sandstone, the only information on the lithology of the sediment that covered the specimen. The size of the molars and the thick horizontal ramus (Table 1) indicate this specimen also belonged to a giant deer. The original taxonomic assessment is not incorrect, though, since *Cervus euryceros* or *Euryceros giganteus* are currently considered junior synonyms of *Megaloceros giganteus* (*e.g.*, Vislobokova 2011).

Conclusions

Large mammal fossil remains collected from the alluvia of Burdea River, at Albești (Teleorman County, southern Romania) are here described for the first time in scientific literature, thus adding a new vertebrate fossil locality to those already known from the Vedea River Basin. The fossil remains are assigned to an indeterminate elephantid, to the southern mammoth (*Mammuthus meridionalis*), and to the giant deer (*Megaloceros giganteus*). Since the southern mammoth is a typical Early Pleistocene elephantid, and the giant deer lived during the Late Pleistocene, their co-occurrence shows that the Burdea River cuts through both Lower and Upper Pleistocene deposits. Unfortunately, the fossil specimens available for study were not found *in situ*, but reworked, in recent alluvia of the Burdea River, so a more precise stratigraphic setting of the area cannot be inferred at this point.

Additional to the material from Albești, two giant deer dentognathic fragments from Colentina and Bucureștii Noi (both currently part of Bucharest), used for comparison to one of the former specimens, are presented, introducing them into scientific literature, and documenting two additional occurrences of the taxon in southern Romania.

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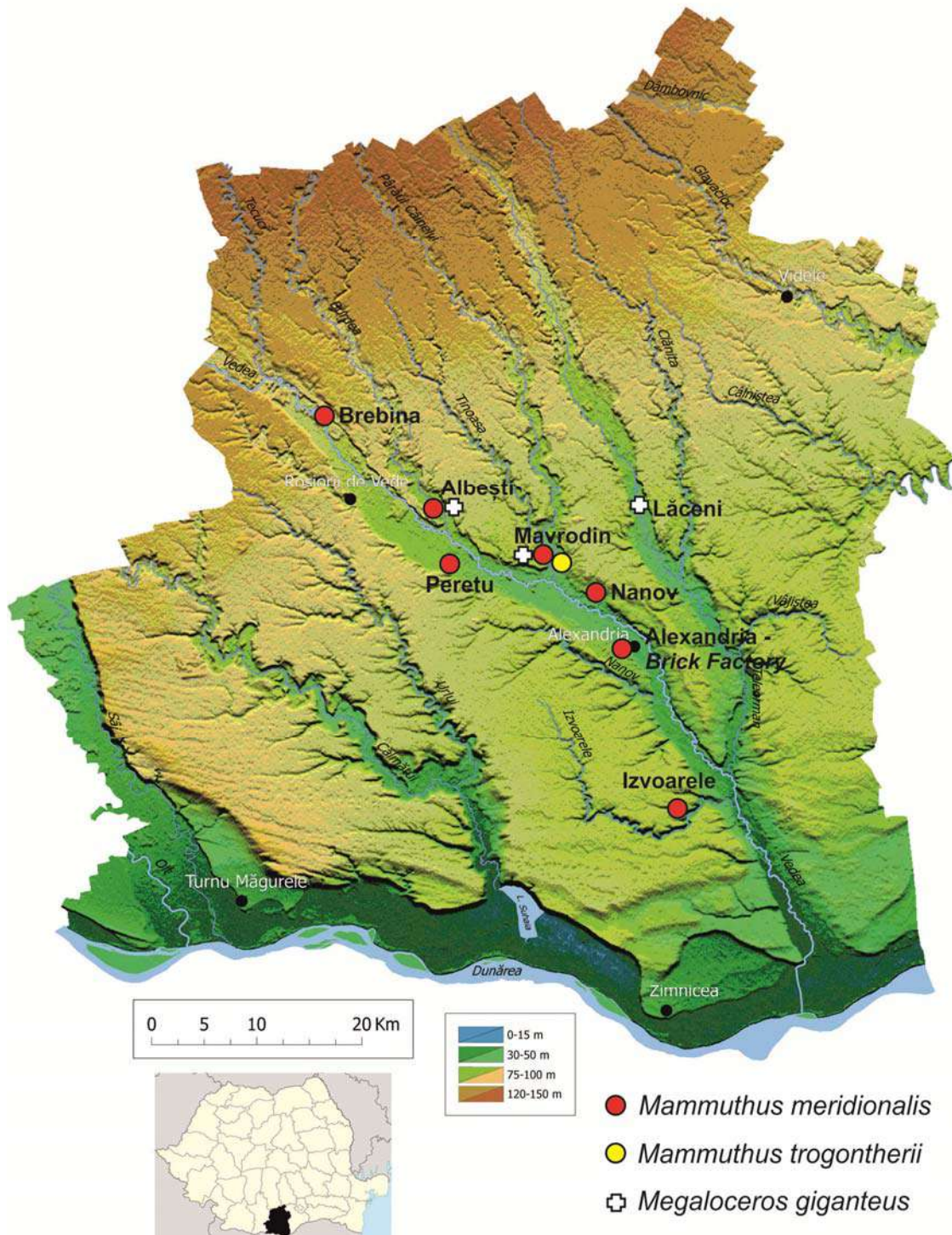


Plate I. Pleistocene fossil sites located along the Vedeia River or along its tributaries, close to the confluence. Inset in the bottom left corner indicates where Teleorman County is positioned in southern Romania.

Situri fosilifere Pleistocene amplasate de-a lungul Râului Vedeia sau a afluenților acestuia, în apropierea confluenței. Medalionul din colțul din stânga jos indică poziția județului Teleorman în sudul României.

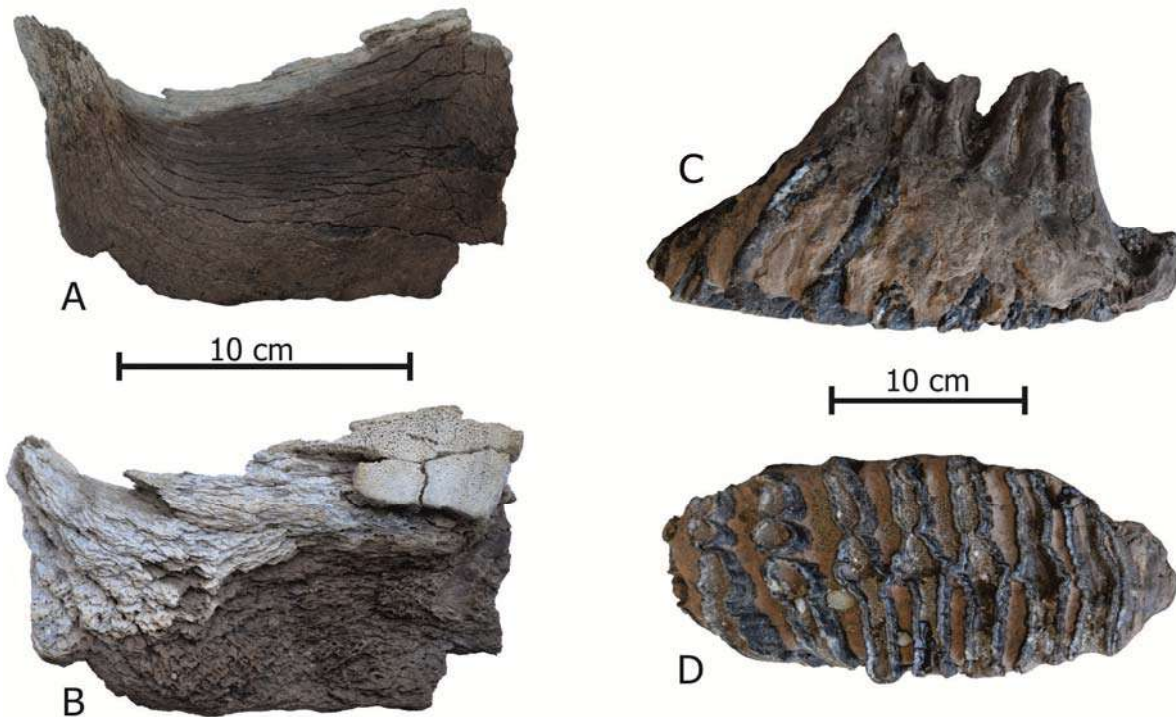


Plate II. Elephantid fossil remains from Albești (Teleorman County): MJT Al-17 – Elephantidae indet. right mandible fragment in outer (A), and inner (flipped horizontally for symmetry) (B) views; MJT Al-01 – *Mammuthus meridionalis* left second upper molar in lingual (C), and occlusal (D) views. In all pictures, the anterior end of the specimens is oriented to the right.

Resturi fosile de elephantide de la Albești (județul Teleorman): MJT Al-17 – Elephantidae indet., fragment de mandibulă dreaptă în vedere externă (A), și internă (imagine în oglindă, pentru simetrie) (B); MJT Al-01 – *Mammuthus meridionalis*, al doilea molar stâng în vedere linguală (C) și ocluzală (D). În toate imaginile, capătul anterior al speciemenelor este orientat către dreapta.

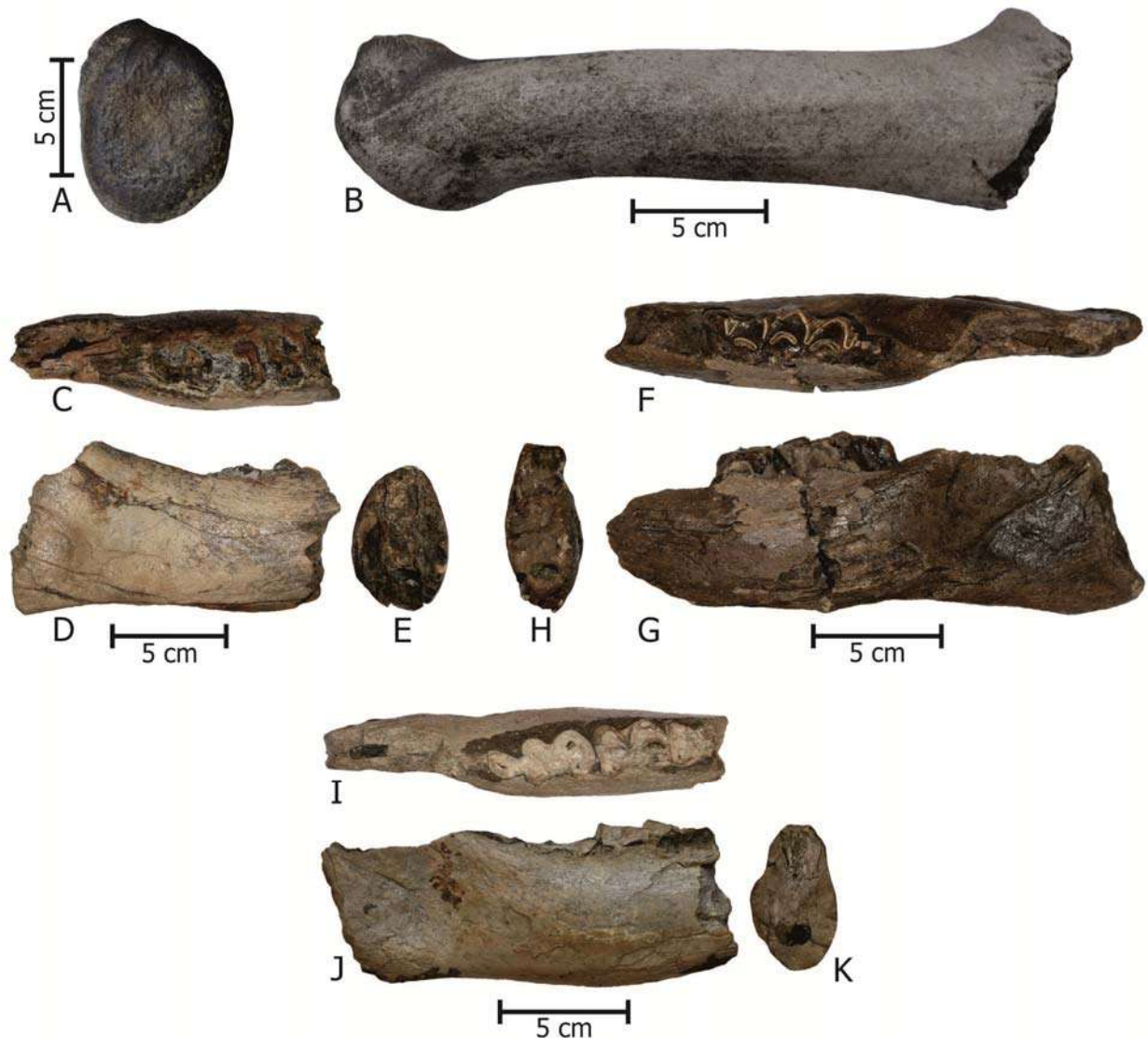


Plate III. *Megaloceros giganteus* fossil remains from Albești (Teleorman County) (A-E) and Bucharest (F-K): Al-002 – left antler fragment in basal (A), and anterior (B) views; Al-003 – right mandible fragment in occlusal (C), labial (D), and anterior (E) views; LPB(FGGUB) 132 – left mandible fragment in occlusal (F), labial (G), and anterior (H) views; LPB(FGGUB) 4 – right mandible fragment in occlusal (I), labial (J), and anterior (K) views.

Resturi fosile de *Megaloceros giganteus* de la Albești (județul Teleorman) (A-E) și București (F-K): Al-002 – fragment de corn stâng în vedere bazală (A), și anterioară (B); Al-003 – fragment de mandibular dreaptă în vedere ocluzală (C), labială (D), și anterioară (E); LPB(FGGUB) 132 – fragment de mandibular stângă în vedere ocluzală (F), labială (G), și anterioară (H); LPB(FGGUB) 4 – fragment de mandibular dreaptă în vedere ocluzală (I), labială (J), și anterioară (K).