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Metropolitan Veniamin Costachi's Relic Collection – the wooly rhinoceros from Râșca (Suceava County, Romania)

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Abstract: A prominent figure in Moldavia at the turn of the 18th and 19th centuries was Metropolitan Veniamin Costachi, born Vasile Costachi. He is known for his substantial contributions to church writings, which were valuable in his time and continue to hold significance. In addition to his ecclesiastical work, he had an interest in collecting relics unrelated to the church. Among these relics were remains of large Pleistocene mammals that he acquired from Râșca, Suceava County (Romania). These included remains of a woolly mammoth and a woolly rhinoceros, which he later donated to the newly established Society of Medicine and Naturalists of Iași (Romania). These specimens were subsequently housed in the collections of the Natural History Museum in Iași, the oldest natural history museum in the Romanian outer Carpathian region. Notably, these fossils were initially used as counterweights for a balance beam well until they were collected by the metropolitan, marking what seems to be a unique case. This paper focuses on the specific bones in question: a skull and two humeri, one complete and the other fragmentary. Only a few taphonomic and paleoenvironmental estimations are provided. Râșca thus joins the list of localities in Romania where the wooly rhinoceros *Coelodonta antiquitatis*, a large herbivore emblematic of the cold faunas of the Middle-Upper Pleistocene in Europe, has been reported. The intrinsic value of these fossils to our paleontological heritage is clear.

Keywords: Perissodactyla, *Coelodonta antiquitatis*, late Pleistocene, Moldavia, eastern Romania.

Introduction

The crossroads between the 18th and 19th centuries, particularly the first half of the latter, were turbulent times in Moldavia, aptly reflecting the words of chronicler Miron Costin: "*It is not the times that are under man, but the poor man under the times*" (edition P.P. Panaitescu, 1944). During this period, Vasile Costachi (born December 20, 1768, in Roșiești Fălciu; died December 18, 1846, at Slatina Monastery in Suceava County; Ionescu, 2018) lived and is better known by his monastic name, Veniamin, which he acquired in Huși from Bishop Iacob Stamati. He came from a noble lineage, a member of a family where poverty did not drive him to become a monk at a young age—he entered monastic life at 15

in 1784 to fulfill the wish of his ill father. He honored this wish, showcasing exemplary filial devotion. After entering the monastic world, he ascended through various ranks in the hierarchy of the Orthodox Church, ultimately becoming metropolitan on March 13, 1803 (Păcurariu, 2008, 2018). Illustrations typically depict him in his later years, often in deep old age, likely to emphasize the wisdom he gained over time. In contrast, we chose to portray

Fig. 1: The artwork portrays Metropolitan Veniamin Costachi in his mature years, created by Anonymous (oil on canvas, privately owned; photo V.A. Codrea).

him in the full vigor of his youth, thanks to an unprecedented painting discovered on private property identified in the Elan Valley (Vaslui County, Romania, see Fig. 1).

His family origins were notably advantageous: his father, of noble descent in the Boldur family (which politically transformed into Costachi – essentially a Hellenization of the name Costea; Melchisedek, 1875), was Moldavian. Through his mother, who belonged to the Cantacuzino family, he also inherited Byzantine roots (Beguni, 2015). Consequently, he likely learned Greek at a very young age, a skill that later proved invaluable for translating ecclesiastical writings. In this field, he distinguished himself and remains recognized in the history of Romanian literature as both an editor and, particularly, as a translator. Printed works emerged to satisfy the need for materials related to church regulations and to fulfill the people's desire for knowledge, aligning with the Enlightenment ideals of the time. This trend appeared earlier in Transylvania than in Moldavia, primarily through the Transylvanian School, which highlighted the Latin origins of the Romanian people in collective awareness. It became more pronounced in the principalities somewhat later, especially in the first half of the 19th century, due to the Phanariot rule and Ottoman oppression, which began to ease following Tudor Vladimirescu's movement.

This writing, however, is not focused on extensively presenting his achievements as a translator and author of ecclesiastical writings (e.g., as in Spiridon, 2012). For those interested in these aspects, sufficient contributions have already been published, with a comprehensive overview provided by Păcurariu (2008, 2018, with related references). The focus here is on a lesser-known contribution to the general public: the donation of woolly rhinoceros fossils (*Coelodonta antiquitatis* (Blumenbach, 1799); Codrea, 2005) directed to the Natural History Museum in Iași (hereinafter, NHMI) by the Metropolitan. The museum itself has a rich history, having been established in the first half of the 19th century – specifically on February 4, 1834 – in the Principality of Moldavia, by members of the Society of Medicines and Naturalists of Iași (http://www.bio.uaic.ro/muzeu/muzeu.html). It is important to highlight that such a society reflects the scientific concerns of an era when the number of educated individuals was still quite limited throughout the Carpathian-Danubian region. Thus, the ecclesiastical figure should be appreciated in the context of a time when scientific pursuits were still in their infancy. The contributions of intellectuals like doctors Jacob von Czihák (Iacob Cihac) and Mihail Zotta, as well as writer Gheorghe Asachi and distinguished nobles such as Costache Negri and Constantin Sturdza, were particularly valuable in the development of an intellectual community in outer Carpathians' region.

The find of these fossils is intriguing, particularly in the context of their historical background, which imparts a distinctive quality to them in Romania. The bones of the wooly rhinoceros were gathered by locals from the village of Râșca (Rîșca), located near Fălticeni, alongside some remains of the wooly mammoth, *Mammuthus primigenius* (Blumenbach, 1799). These mammoth remains were also repurposed for practical use, serving as counterweights for a well with a beam. The Metropolitan recovered these bones, still shackled in the solid iron fittings that had kept them attached to the well's beam. Clearly, he recognized their value and later decided to donate them to the newly established museum mentioned earlier. However, it remains to be assessed how deeply he grasped their significance and the paleontological insights they might convey. It is important to note that Veniamin Costachi was a contemporary of Georges Cuvier, leading to the possibility that he regarded these bones as remnants of victims from ancient cataclysms, perhaps even the biblical flood. While we lack definitive evidence to support such an interpretation, it is still a perspective worth considering. The works of the French paleontologist circulated

widely throughout Europe, and it is plausible that a learned individual like Metropolitan Costachi was familiar with them.

On this occasion, we find it worthwhile to pause, even if only briefly, to explore the origin of wells with a balance beam, also known as yoke wells in local vernacular. Their origin appears to be quite ancient, dating back approximately three millennia to Mesopotamia. The device itself is remarkably simple, relying on the balance between the end that supports the bucket and the counterweight at the opposite end – typically a larger stone (see Fig. 2) – which generates the force necessary to lift the water-laden bucket. This type of well is particularly effective for accessing phreatic or shallow aquifer levels. In Romania, such wells are predominantly found in the extra-Carpathian region, but their presence in Transylvania is also important. In Romanian culture, drinking water is often regarded as a gift imbued with divine significance. Consequently, it is common to find shrines and crosses near these wells, which do not necessarily carry mortuary connotations but rather sanctify the location or symbolize a bond of brotherhood. Lastly, when an aquifer is abundant in terms of extractable water and relatively shallow, we can observe clusters of yoke wells.

In Râșca, the function of counterweights was taken over by the bones of large Pleistocene vertebrates (woolly rhinoceros and mammoth), as far as we know, a unique situation in the Romanian territory and possibly in Europe. It is worth mentioning that in other countries, when mammoth remains were encountered, as in Hungary, the Czech Republic, Slovakia, Austria, or Serbia, encased

Fig. 2: The painting depicts a well with a balance beam and was created by Iosif Steurer (oil painting on canvas, privately owned; photo V.A. Codrea).

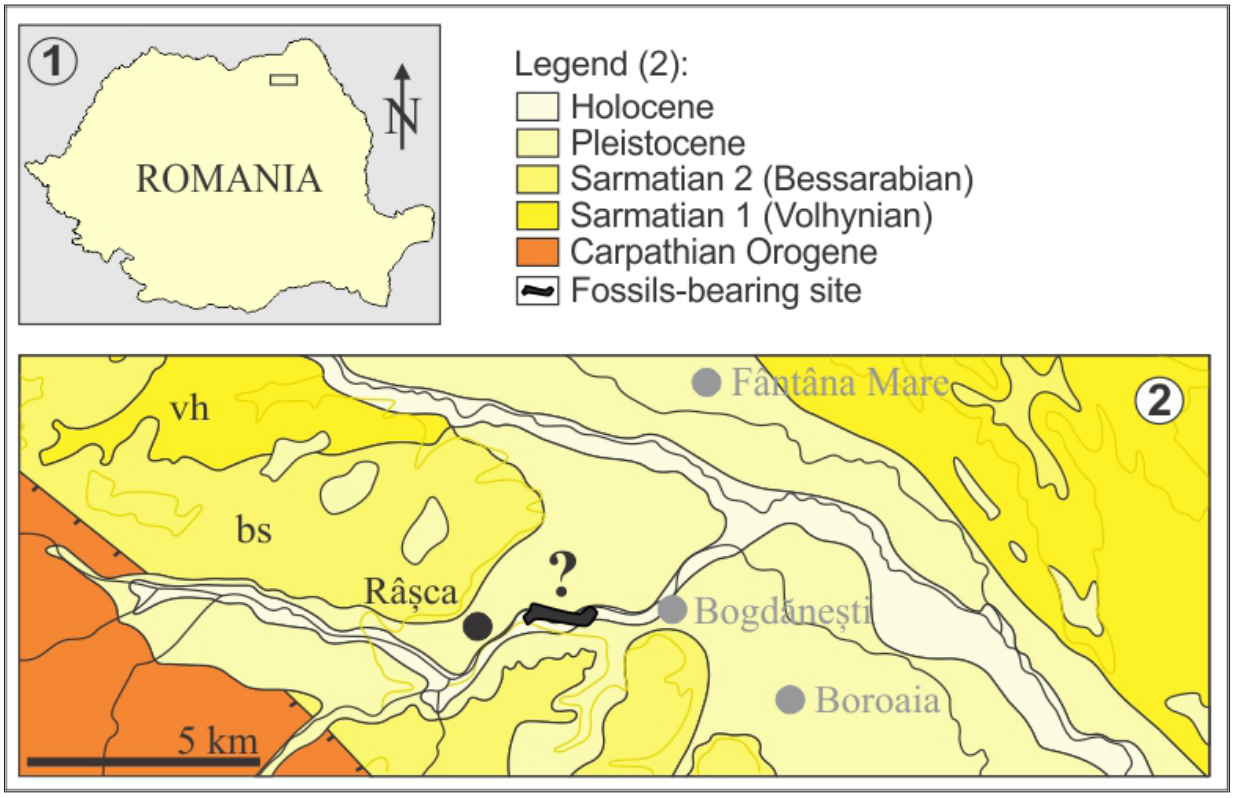

Fig. 3: Geological map of the Râșca area (according to the geological map 1:200,000 Suceava sheet, Saulea et al., 1966).

in metal frames (various teeth, ribs, pelvis, and femur), they were hung in official buildings (city or fair towers, castles, public halls, and churches) in Győr or Pásztó (Vörös, 1983, Abbs: 1–4), where they were viewed only as curiosities, without having any comparable functionality to that of the one we mention in Moldavia. It seems that such fossils were similarly exhibited in Timișoara (= Temeswar, Temesvár, Темишвар; Griselini, 1780), Sibiu (= Hermannstadt, Nagyszeben; Vette, 1673), or in the gymnasium museum in Aiud (= Nagyenyed, Straßburg am Mieresch; Kubacska, 1928, 1929a, b) as curiosities. It was, moreover, the era of cabinets of curiosities (Boda, 2008; Sasu, 2017), in which such fossils could find a purpose, especially when their sizes were not particularly large.

Geological setting and age

From a geological-structural perspective, the area surrounding the mentioned locality is situated at the boundary between the thrust nappes of the Eastern Carpathians, the Carpathian Foreland, and the East European Platform (Săndulescu, 1984; referred to as the "Moldavian Platform" in Ionesi, 1994). This region exhibits a thrusting of the Carpathian units over the components of the foreland and platform (see Fig. 3). The latter descends in successive steps, deepening from east to west (see section A 11 in Ștefănescu et al., 1998; this aspect is less apparent in the older sections related to the 1:200,000 Suceava sheet by Saulea et al., 1966).

We were unable to access any details regarding the exact location of the fossils' origin within the territory of the locality of Râșca. If they weren't found during the digging of the well in question, then we are justified in presuming that they were accidentally uncovered from the terrace deposits of the Râșca River. According to the geological map of Romania, scale 1:200,000 (Saulea et al., 1966), the age of these deposits is Upper Pleistocene, which is consistent with the fossils currently held in the custody of the specified museum in Iași. Both

the woolly rhinoceros and the mammoth are indicative elements for a cold climate, being characteristic mainly of the Weichsel (Würm). Other data regarding the deep stratigraphic succession on this margin of the platform are not of interest for this work, as they are detailed in various monographic approaches written on this structure (e.g. Ionesi, 1994; Ionesi et al., 2005). We can summarize, however, that in such a discussion, reference can be made to a Proterozoic basement (metamorphosed, crossed by faults, eroded, and faulted), overlaid by three sedimentary megasequences, the last of which was completed at the level of the Late Miocene (in Meotian, according Ionesi, 1994).

In his book, Ionesi (1994) briefly mentions the terrace deposits of the rivers in the region, specifying the existence of up to 7–8 terrace levels. He notes that "the highest being is at 190–200 m (on Moldova), 160–170 m (on Bistrița, in the platform sector), and 180 m (on Suceava)." For terrace levels below 100 m, the fossil remains – including "*Mammuthus primigenius*, *Rhinoceros leptorhinus*, *Megaceros hybernicus*, *Bos primigenius*", etc. – allow for their attribution to the "Early Pleistocene" (*sic*!; Ionesi, 1994, p. 48). It is likely that this geologist erred, possibly confusing the upper Pleistocene with its basal portion, where mammal associations differ significantly. For instance, the narrow-nosed rhinoceros, now known as *Stephanorhinus hemitoechus* (Falconer, 1859), probably existed in Europe only around the Middle Pleistocene, approximately half a million years ago (Pandolfi, 2023). Additionally, *Megaloceros giganteus* (Blumenbach, 1799) (also known as *Cervus* (*Megaceros*) *hibernicus* Owen, 1844) lived in Eurasia from the late Middle Pleistocene until the Holocene (Stuart et al., 2004; Vislobokova, 2011; Croitor, 2021). Ionesi himself acknowledges the challenges in determining the geological ages of the terraces in question, citing the potential for some fossil mammals to have been reworked.

The Pleistocene deposits result from the erosion of orogenic structures to the west of Râșca by watercourses, which led to the accumulation of terrace deposits, including detrital rocks such as gravel and sand. Unfortunately, the long-ago date of the discovery of the vertebrate fossils prevents a detailed reconstruction of their taphonomic history. The presence of mammoth remains alongside those of woolly rhinoceros indicates that they originate from multiple individuals of varying ages at the time of death (for instance, the two right humeri from adult specimens support this claim). We have enough evidence to suggest that a pile of bones was assembled by the locals for practical purposes, who selected the larger and heavier bones to enhance the functionality of the well. This practical use ultimately preserved the paleontological material from certain destruction; otherwise, it might have been regarded merely as a curiosity linked to the existence of "dragons", leading to its misplacement, neglect, and eventual loss. It is reasonable to assume that the farmers who discovered the fossils had no intention of organizing these bones into a formal collection.

The Râșca discovery has largely been forgotten, as evidenced by Simionescu's (1990) list of Pleistocene sites, which does not include it. One of the authors of this work referenced these materials in his doctoral thesis (Codrea, 1995), although, regrettably, the section concerning Pleistocene faunas remains mostly unpublished. A decade later, the locality was briefly mentioned in a repertoire of sites featuring woolly rhinoceros in Romania, presented in a list that provided limited details (Codrea, 2005).

These points have been discussed by one of us primarily as information aimed at the general public (Codrea, 2018, 2021, 2022). In the following sections, we will present the paleontological data related to the woolly rhinoceros from Râșca, including all pertinent details.

Materials and methods

The woolly rhinoceros fossils in the NHMI collection are exceptionally preserved, which likely accounts for their longevity while

suspended from the well's balance through various seasons and temperature fluctuations. There is no need for professional polymer impregnation, and even the metal bands that surround or penetrate the bones show no signs of rust.

Photographs were taken using a Nikon D90 camera equipped with an 18–55 mm lens, mounted on a professional tripod. The measurements adhere to the standards set by Guérin (1980), and the anatomical terminology follows the conventions outlined by Borsuk-Białinicka (1973) and Guérin (1980, 2010).

The fossils are on display in a public showcase at the museum, in Iași, which makes it hard to do a thorough study (see Fig. 4). Furthermore, the metal components surrounding the skull or piercing the long postcranial bones create difficulties in photographing the specimens from certain angles.

Systematic paleontology

Order Perissodactyla Owen, 1848
Superfamily Rhinocerotoidea Gray, 1821
Family Rhinocerotidae Owen, 1845
Genus *Coelodonta* Bronn, 1831
Coelodonta antiquitatis (Blumenbach, 1799)

Materials: skull (NHMI 32), two right humeri (NHMI 30 – whole bone, NHMI 31 – distal fragment).

Description. The skull (Fig. 5) belongs either to a "young" specimen (Group I, based on the age stages defined by Borsuk-Białinicka, 1973), or to initial stages of a "young adult" (Group II). A strong indicator of this age classification is the nasal septum, which shows progressive ossification from anterior to posterior (Figs. A and B in Text-fig. 3 in Borsuk-Białinicka, 1973). Thus, the nasal septum is not fully ossified. The dorsal view of the nasal bones outlines a similar age for the specimen from Râșca (Text-fig. 2C in Borsuk-Białinicka, 1973). Conversely, a significant number of cranial bone sutures remain visible, indicating they are not in an advanced stage of closure (e.g., the interpalatine suture and the junction from the jugal to the squamosal). The lacrimal bone appears indistinct.

At the same time, the insertion rugosities of the two horns are relatively poorly developed; each is distinct, forming small domes that create convexities in the lateral skull profiles. The anterior horn is larger and features a pronounced roughness along a midline ridge that runs in an anteroposterior direction, in contrast to the smoother adjacent lateral areas. The posterior horn is smaller but still visible in lateral view. A constriction is present between the insertion points of the anterior and posterior horns, which is observable from a dorsal perspective.

Measurements (mm)

Skull (NHMI 32)	
Length occipital-intermaxillar	700
Length nasal-acrocranion	75
Length of the nasal opening	238
Distance acrocranion-postorbitar process	345
Idem acrocranion-supraorbitar process	400
Idem ante-orbitar	420
Distance between the nasal notch-orbit	157
Distance post-M3-condile	305
Distance nasal-orbit	385
Width of the lambdoid crest	202
Breath between mastoid apophysis	266
Minimal width between the fronto-parietal crests	106.5
Width at post-orbitary processes	163
Width at suraorbitary processes	210
Width at anteorbitary processes	234
Maximal width at zygomatic arches	343
High of occipital face	170
Width of palatine at P2	80
Width of palatine at P4-M1	86
Transverse diameter of foramen magnum	54
Transverse diameter at occipital condyles	158

Unfortunately, the dentition was not preserved. One can observe only small portions of some crowns. Seemingly, some of the cheek

teeth were lost due to transport processes caused by water currents prior to deposition, that is, during the pre-burial history. On the left side, in the posterior region of the dental arch, it appears that a malformation occurred during the eruption of the cheek teeth.

The skull is generally well-preserved. However, there are areas of damage, particularly in the palatal bones on the right side and the maxillaries that support both dental rows, with the left side being especially affected. There are no noticeable bone rugosities on the skull surface.

The cranial morphology aligns with descriptions already established for the species, as detailed in the works of Borsuk-Białinicka (1973) and Guérin (1980, 2010). The skull exhibits a dolichocephalic shape, evidenced by a bizygomatic width to maximum length ratio of 0.44, along with an elongated facial region. The ante-orbital processes are well-developed and located approximately at the midpoint of the posterior horn insertion surface. The supraorbital processes are visible behind the anteorbital ones, with the left side being particularly distinct. The postorbital processes are less extensive laterally and situated at a short distance posteriorly relative to the anteorbital processes. The parietal crests are spaced apart and nearly parallel for a significant portion, although they diverge markedly both anteriorly and posteriorly. The jugals are low and do not have postorbital processes. The auditory pseudo-conduct is closed, featuring a pear-shaped opening, consistent with Guérin's observations (2010). The occipital face displays a contour that leans towards being quasi-square rather than trapezoidal, inclined posteriorly and overhanging the occipital condyles, which is characteristic of this species. As a result, the occipital face forms an acute angle with the parietals. The profile of the nuchal crest is wavy, featuring two lateral convexities separated by a median depression. The overall appearance is straight and slightly convex. Just below the nuchal crest, there are pronounced insertion rugs. The median crest is poorly defined, while the lateral occipital and external lateral crests are more pronounced. The occipital foramen has a subtriangular opening.

The evidence documenting the presence of the woolly rhinoceros at Râșca is further supported by the two previously mentioned humeri. The specimen that has undergone complete preservation is the most significant (Fig. 6). Both bones originate from the right side of the animals, indicating the presence of at least two individuals. Furthermore, the bones are completely epithelialized, demonstrating that they came from adult, mature specimens. Guérin (1980) notes that the fusion of bone epiphyses in the proximal portion is among the latest events in the animal's life, unlike the distal portion, which fuses earlier. He also emphasizes the rarity of complete specimens, as they were often targeted by scavenging carnivores. Consequently, a complete humerus is considered a valuable addition to any museum collection.

As noted by other authors, the bone is robust (gracility index: 19.29), featuring a large, subspherical articular condyle and an expansive olecranon fossa that extends laterally and distally. It has a subtriangular outline and a deltoid tuberosity positioned high. These characteristics align with those of a graviportal rhinoceros.

Dimensions are crucial for comparisons, particularly since we are discussing adult specimens. Comparing the data provided by Guérin (2010), the humeri from Râșca correspond to large-sized specimens, with dimensions exceeding previously recorded averages. Nevertheless, due to the modest sample size, making inferences about the evolutionary grade would be imprudent. We believe these bones belong to adult male specimens, likely quite old.

Fig. 4: Remains of a rhinoceros from Râșca are on display at the Natural History Museum in Iași (photo C. Onel).

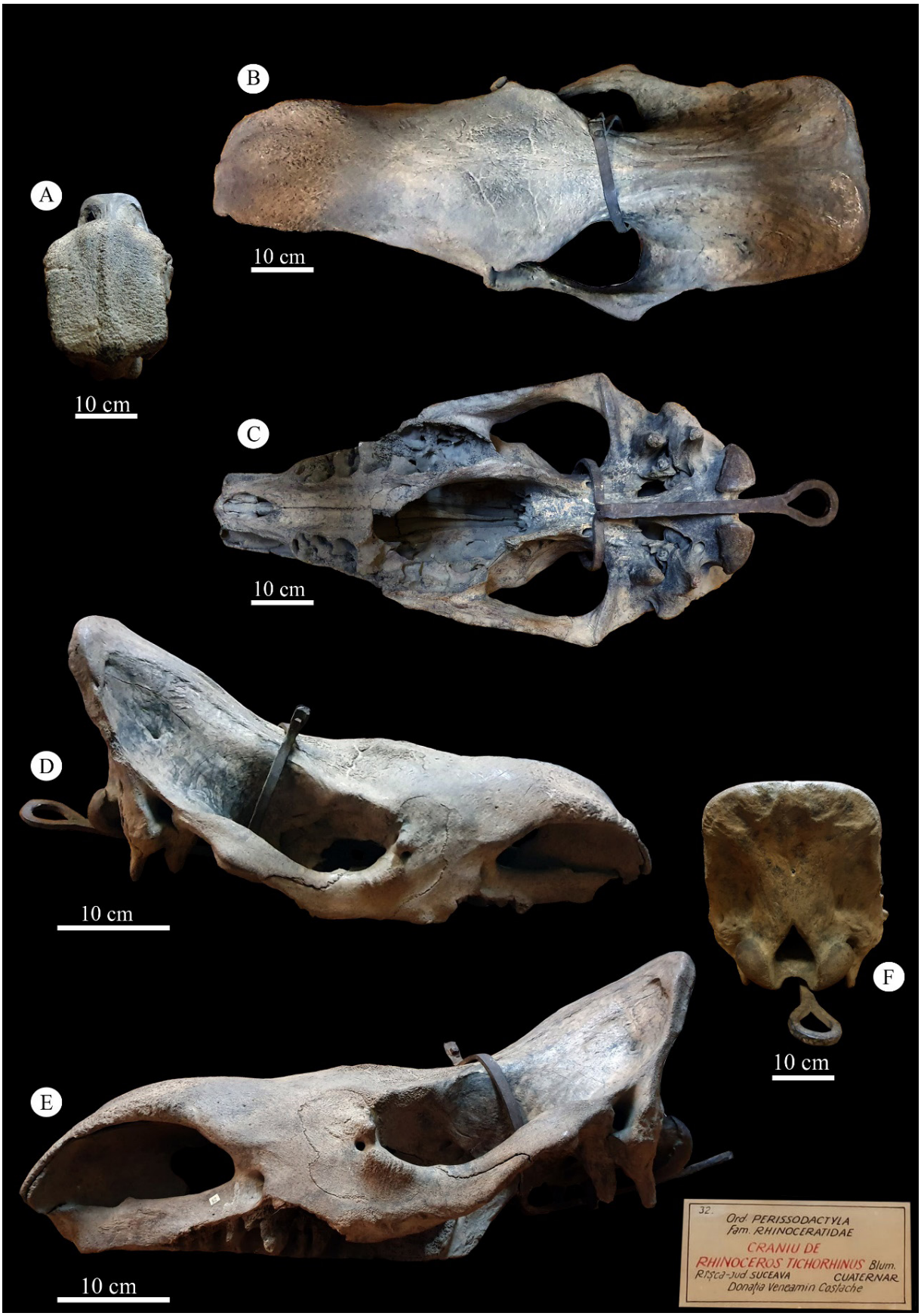

Fig. 5: NHMI 32, wooly rhinoceros from Râșca, skull: A. anterior view; B. dorsal view; C. ventral view; D. right lateral view; E. left lateral view and F. occipital view; Note the iron fittings without rust; Scale bars equal 10 cm.

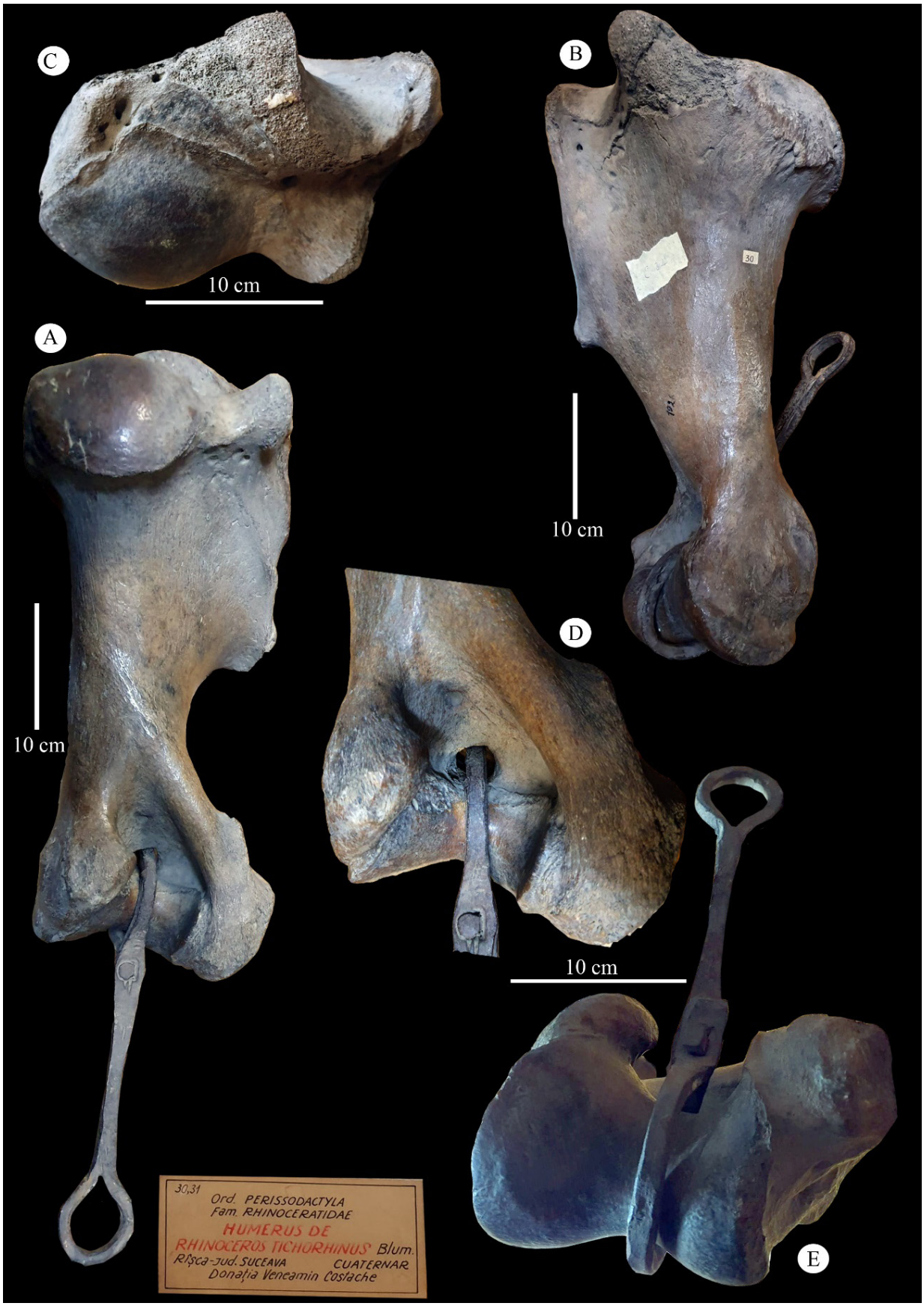

Fig. 6: NHMI 30, wooly rhinoceros from Râșca, right humerus: A. caudal view; B. lateral view; C. view of proximal articulation; D. detail on oleocranon fossa; E. view of the distal articulation; Note the iron fittings without rust; Scale bars equal 10 cm.

	Râșca		Various localities (Guérin, 2010)		
	NHMI 30	NHMI 31	mean	min	max
Length	451	-	435.69	382	475
Transverse diameter prox.	205	-	196.52	172	218
Transverse diameter diaphysis	87	87.5	83.63	68	99
Transverse diameter dist.	180	184	166.19	135	194
Antero-posterior diameter dist.	122.5	130	127.45	101	141

Discussions

Guérin (1980, 1982a, b) identifies the temporal distribution of this rhinoceros as spanning zones 24–26, which corresponds to the late Middle Pleistocene (MIS 8) to the Upper Pleistocene, concluding at the end of this epoch. Within this timeframe, he proposed two subspecies: *C. antiquitatis praecursor* Guérin, 1980, which Kahlke & Lacombat (2008) later regarded as a junior synonym of *Coelodonta tologoijensis* (Beliajeva, 1966), and the nominative subspecies, *C. antiquitatis antiquitatis* (Blumenbach, 1799). If we accept Guérin's classification at the subspecies level, there are valid reasons – such as the large size of the humeri and other characteristics – to suggest that the nominative subspecies was present at Râșca.

Guérin (1980, 1982a, b) proposed that this rhinoceros species originated in Asia before migrating to Europe during the Middle Pleistocene. In contrast, Kahlke & Lacombat (2008) contended that the woolly rhinoceros inhabited Central Europe approximately 400–460 thousand years ago, tracing its lineage to *Coelodonta tologoijensis*, which migrated from Asia. Subsequently, the woolly rhinoceros spread from Central Europe across a vast region, encompassing nearly all of Eurasia and extending to China and Siberia. Genetic evidence suggests that it reached China and North Asia relatively swiftly (Yuan et al., 2014), including Wrangel Island (Yuan et al., 2023).

Due to the uncertainty surrounding the discovery site's data, we can only make estimates regarding certain aspects of its taphonomy and paleoenvironmental reconstructions.

The fossils likely originate from terrace deposits along the Râșca River, specifically from sands and gravels. There may have been a concentration of large Pleistocene vertebrate bones in this area, with these bones being transported and accumulated due to an active hydrodynamic regime and the river's morphology, which is conducive to such processes. It is plausible that local peasants selectively collected these fossils for practical purposes. In this context, other interpretations related to taphonomy would remain speculative at this stage of research. However, based on the condition of the skull and postcranial bones, it appears that their transport by the water occurred over very short distances. It's possible that large herbivores' decomposed carcasses were disassembled by floodwaters upstream. The bones show no signs of predation by Pleistocene carnivores, such as hyenas.

In Râșca, we lack data on the flora associated with the woolly rhinoceros, so we must rely on information from existing specialized references. Guérin (1980, 2010) identified the woolly rhinoceros as a species primarily inhabiting steppe landscapes characterized by grasses and composite plants. However, he also noted that this rhinoceros was not unfamiliar with somewhat sparse coniferous and angiosperm forests (both mixed and deciduous) and could also be found in tundra areas. Additionally,

this species was capable of reaching relatively high altitudes (Codrea & Lázár, 1994) and traversing mountain ranges by following river courses (e.g., Codrea, 2005). The presence of woolly mammoths alongside woolly rhinoceroses in Râșca suggests an open landscape resembling a cold steppe, likely indicative of a late Pleistocene cold stage or substage.

Finally, in Râșca, there are no signs of human intervention on the bones, nor have any elements suggesting the presence of primitive human communities – such as lithic or osteodontokeratic artifacts – been reported. Therefore, hunting of woolly rhinoceroses in this area is currently considered highly unlikely.

Conclusion

The bones of the woolly rhinoceros from Râșca, which were acquired by Metropolitan Veniamin Costachi and later donated to the Natural History Museum in Iași, hold exceptional heritage value for Romania, potentially representing the oldest collection in the outer Carpathian region.

These fossils provide evidence of the presence of this large herbivore (see Fig. 7) in the extreme western part of the East European Platform. The woolly rhinoceros from this site appears to belong to an advanced form associated with Guérin's nominative subspecies. It could serve as a marker for a cold climate, likely dating from a phase or sub-phase of the Upper Pleistocene (Weichsel). The bones were probably transported short distances by water currents and do not show signs of prior degradation due to carnivores like hyenas. There are no indications of human intervention, which rules out the possibility of hunting the woolly rhinoceros at Râșca. Thus, Râșca is recognized

Fig. 7: Wooly rhinoceros reconstruction created by V. Constantinescu (oil painting on canvas, property of the Museum of Paleontology, Babeș-Bolyai University Cluj-Napoca; photo V. A. Codrea).

as a locality from which the woolly rhinoceros has been reported in our country (Codrea, 1995, 2005, 2018, 2022).

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