Assessment of an Iron Age skeletal assemblage from Romania, Tărtăria *Podu Tărtăriei vest* (Alba County, Romania)

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Abstract: *A new archaeological site was discovered in 2012 in Romania in the river Mureș Valley, at Tărtăria (Alba County). Researchers have been able to date it during the first period of the Iron Age (middle Hallstatt, Basarabi culture). Excavation has revealed a collective burial containing the remains of seven individuals (six of which were articulated and a seventh only partially represented). Due to the very poor preservation and extreme degree of fragmentation of the material, anthropological analysis could only determine age at death for some of the individuals. This article discusses this common burial together with other individual funerary features have also been discovered in one of the trenches bordering the site. The skeletal assemblage from Tărtăria has analogies in other contemporary assemblages recovered from Hungary and Serbia and remains particularly important for our understanding of funerary rites during the early Iron Age in the Carpathian basin.*

Rezumat: *Un nou sit arheologic a fost descoperit în anul 2012 pe Valea Mureșului, la Tărtăria (jud. Alba). Datat de autorii cercetării în prima epocă a fierului (Hallstatt mijlociu, cultura Basarabi), așezarea prezintă o caracteristică specială și anume descoperirea în arealul acesteia a unui mormânt colectiv în care au fost depuse șapte schelete umane (șase aflate în conexiune anatomică și un schelet parțial reprezentat). Din cauza stării precare de conservare a materialului scheletic și/sau a gradului de fragmentare destul de ridicat, expertiza antropologică a permis doar estimarea vârstei la deces pentru unii dintre indivizi. Pe unul dintre șanțurile de delimitare a sitului, au fost descoperite și alte complexe funerare individuale, discutate, de asemenea, aici. Deosebit de interesant din punct de vedere al fenomenului funerar din perioada incipientă a epocii fierului din spațiul intracarpatic, materialul scheletic de la Tărtăria își găsește analogii cu alte serii de schelete descoperite în arealul extracarpatic din Ungaria sau Serbia, aflate pe același palier cronologic.*

Keywords: *middle Hallstatt (Basarabi culture), mass graves, age at death estimation.*

Cuvinte cheie: *Hallstatt mijlociu (cultura Basarabi), mormânt colectiv, estimarea vârstei la deces.*

◈ Introduction. Materials and methods

Following archaeological research around the village of Tărtăria (Sălișstea commune, Alba County) a mass grave containing six articulated human skeletons and a skull[1] was discovered (feature 114, fig. 1). The individuals were labelled M1-M7. Additional human remains were recovered from the southern part of the site as well as several pits, likely belonging to several other funerary features (M8-M16). Based on the associated material, researchers were able to date the site to the first Iron Age (middle Hallstatt, Basarabi culture, 9/8th-7th c. B.C.) (C. Borș 2013; C. Borș *et alii* 2014; L. Rumega-Irimuș 2015). Unfortunately, once excavated and washed in laboratory conditions, the skeletal material turned out to be

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[1] Several poorly preserved post-cranial elements were also recovered with M7 (see below).

extremely fragmented, resulting in specimens with a size range of 2 mm-20 mm (fig. 2), severely limiting our options for analysis. A first result of this was the impossibility of siding anatomical elements in most cases.

The problems posed by the high degree of fragmentation were compounded by the very poor surface preservation of the specimens, a situation visible *in situ* where site staff confirmed that several specimens were already friable and could not be recovered. Thus affected by taphonomic factors in the soil, most of the assemblage has been rated 4 (fig. 3) on the M. Brickley and J.I. McKinley (2004, p. 14-17) scale of surface preservation.

A high degree of fragmentation of the innominate and skull meant that age at death for most individuals could be determined almost exclusively by analysing the decidual or permanent dentition. For subadult individuals, eruption stages were analysed according to C.F.A. Moorrees *et alii* (1963) and D.H. Ubelaker (1980, p. 46-47), while wear stages of the molars were used to determine age at death where permanent teeth were identified (A.E.W. Miles 1962). In some cases where more complete specimens were present, epiphyseal fusion stages (D.H. Ubelaker 1980, p. 53) and auricular surface analysis according to the J.L. Buckberry and A.T. Chamberlain (2002) method (involving rating various aspects of the auricular surface according to a set scale and assigning an age interval according to the compound score of these marks) were also used in determining age at death.

◈ Skeletal inventory description

M1: The skeletal remains of two different individuals were identified. The first (M1a) is poorly represented anatomically, with very good surface preservation showing no obvious post-mortem changes (score 1 on the M. Brickley and J.I. McKinley scale) and a high degree of fragmentation. The skull was represented by numerous temporal bone fragments (under 50 mm), together with a maxilla and mandibular symphisis fragments. Post-cranial elements are represented by a distal humerus, one femur and one fibula fragment, all lacking any elements to help in siding.

Age at death was estimated at 15-18 years old (D.H. Ubelaker 1980; C.F.A. Moorrees *et alii* 1963).

The second individual (M1b) is represented by nine teeth (see below, tab. 1) and has an estimated age at death of 6-7 years old.

M2: Poorly represented anatomically, with a surface preservation grade 4 and very highly fragmented. The skull was represented by frontal and parietal bone fragments (nine each), four temporal and two occipital fragments. The viscerocranium is absent, while the mandible is represented by a right vertical ramus fragment. Post-cranial elements are represented by a humeral head, four humerus and one femur diaphysis fragments and a middle phalanx from the hand. No siding was possible.

Age at death was estimated at 12-13 years old (C.F.A. Moorrees *et alii* 1963).

M3: Poorly represented anatomically, with a surface preservation grade 3 and very highly fragmented. The skull was represented by 11 frontal, 14 parietal, five temporal and four occipital fragments, together with a left zygomatic. The mandible is represented by a symphisis, right vertical ramus and condyle fragments. With the exception of an atlas fragment, a capitate and a third metacarpal, no other post-cranial elements were recovered.

Age at death was estimated at 18-25 years old (A.E.W. Miles 1962).

A single cavity was identified on RM_1, affecting two-thirds of the tooth all the way down to the root (fig. 4).

M4: Poorly represented anatomically, with a surface preservation grade 2 and very highly fragmented. The skull was represented by seven frontal, 15 parietal and one petrous pyramid fragments. The mandible is represented by a symphisis fragment, the right mandibular condyle and the right mandibular body: the broken roots of the incisors are still present, as are the canine and premolars. Seven fragment of a femoral diaphysis were also recovered.

Age at death was estimated at 9 years ± 24 month (D.H. Ubelaker 1980).

M5: Poorly represented anatomically, with a surface preservation grade 3 and very highly fragmented. The skull was represented by nine frontal, one parietal, one temporal, two petrous pyramids and one occipital fragments. The mandible is represented by two corpus fragments. Post-cranial elements are represented by several diaphysis fragments (17 femur, two right distal humerus and six ulna), as well as one fragment of the left calcaneus, one fragment of a metacarpal and six fragments of hand phalanges.

Age at death was estimated at 17-25 years old (A.E.W. Miles 1962).

M6: Poorly represented anatomically, with a surface preservation grade 4 and very highly fragmented. The skull was represented by 11 frontal, 12 parietal, four temporal and five occipital fragments, together with a left maxillary molar fragment (tab. 1). The mandible is represented by one condyle, two vertical ramus and one body fragments. Post-cranial elements were represented by a nearly complete left humeral diaphysis, a right humerus distal diaphysis fragment, two femoral heads, 12 femur diaphysis fragments (two of which were sided as belonging to the right femur), one fibula diaphysis fragment, one distal tibia epiphysis, one calcaneus and metatarsal fragment and another two fragments belonging to phalanges. The innominate was represented by 15 unidentified fragments together with two acetabulum and one ilium fragments, the latter including the auricular surface.

Based on the absence of the auricular sulcus, biological sex is probably male (J.E. Buikstra, D.H. Ubelaker 1994, p. 18-19). The recovered left auricular surface showed a morphology typical to phase III (score 10) on the J.L. Buckberry and A.T. Chamberlain (2002) scale, offering an age at death interval of 16-65 years old with an average of 37 years old. Estimation of age at death through the A.E.W. Miles (1962) method of molar wear indicates a narrower interval of age at death of 18-20. The two values lead to the conclusion that M6 was an adolescent/young adult.

Pathological lesions typical of *cribra orbitalia* were identified on the left orbital arch (fig. 5). One mandible fragment and three molars belonging to *Sus scrofa*/*Sus domesticus* were also identified.

M8, M9 & M10: Skeletal remains recovered from features CPL 004F, CPL 004H and CPL 004K were so poorly preserved that no analysis was possible.

At the bottom of sondage CPL 004H specimens belonging to three different skulls attributed to M11-M13 were recovered.

M11: Is represented by 12 unidentifiable skull fragments with a size range of 5-20 mm. Based on the thickness of these fragments the individual can be assumed to have fitted in the subadult/adult category.

M12: The following skull fragments, with a size range of 10-30 mm (most of which are 10 mm <), were recovered: four frontal, seven parietal and 13 unidentified. Based on the thickness of these fragments the individual can be assumed to have fitted in the subadult/adult category.

M13: Poorly preserved, with no elements recovered from site.

M14: Skeletal remains recovered from pit CPL 186 and the fill of trench 004K. Poorly represented anatomically, with a surface preservation grade 5 and very highly fragmented. The skull was represented by six frontal, seven parietal, six temporal and one occipital fragments, together with the right zygomatic, two mandible and five maxilla fragments. Post-cranial elements are represented by two ulna diaphysis fragments, one femoral lateral condyle, one diaphysis fragment of the left tibia and several fragments of the right tibia: two diaphyses, the tibial plateau and another 15 unidentified fragments.

Age at death was estimated at 30 years (A.E.W. Miles 1962) based on the wear stage of a single molar.

M15: Skeletal remains recovered from pit CPL 242. Poorly represented anatomically, with a surface preservation grade 4 and very highly fragmented. The skull was represented by five frontal, 13 parietal and six occipital fragments, together with the 10 unidentified fragments. The mandible is represented by one symphisis and one right vertical ramus fragments. Post-cranial elements are represented by 37 femur diaphysis fragments (two of which have been attributed to the right femur). A wormian bone, most likely lambdoid, was also identified.

Age at death was estimated at 14-18 years old (A.E.W. Miles 1962).

M16: Skeletal remains recovered from pit CPL 199, during the post-excavation analysis. Poorly preserved.

Skeleton	Dental inventory	No.
M1	M1a: I^1-I^2, P^1, M^1-M^2 left; I^1-M^1 right; I_1-M_3 left; I_1-I_2, P_1-P_2 right; M1b: I^1, M^2 left; I^1, M^2 right; M_1-M_2 left; M_1-M_2 right and 1x C#, unsided	23 9
M2	M^1-M^2 left; M^2 right and 1x P, unsided; M_1-M_2 left; $C_\#$, M_1-M_2 right and P_1-P_2, unsided	11
M3	I^1-M^3 left; I^2-M^3 right; I_2-M_3 left; I_1-M_3 right	30
M4	I^1-P^2 left; I^1-P^2 right and M^1, unsided; I_1-M_2 left; I_1-M_2 right and 4x decidual molars and 3x M3 crowns, unsided	28
M5	$C_\#$-M_2, unsided	5
M6	2x P1 and 1x P2, with a broken root (unsided) and 6x molars with broken roots, in alveoli, 2x M3 crowns with underdeveloped roots	11
M7	N.A.	0
M8	N.A.	0
M9	N.A.	0
M10	N.A.	0
M11	N.A.	0
M12	N.A.	0
M13	N.A.	0
M14	2x I^1, 2x $C_\#$, $C^\#$ left, 3x P1, 3x P2, 2x M1, 3x M2 and 2x unidentified molar fragments, (highly degraded teeth)	16
M15	2x C#, 2x P1, P2 right, 1x M1 și 2x M2	8
M16	N.A.	0

Tab. 1. Dental inventory of the Tărtăria *Podu Tărtăriei vest* skeletal assemblage.
Inventarul dentar al indivizilor descoperiți la Tărtăria *Podu Tărtăriei vest*.

◈ Results and discussion

Despite attempts at conservation, the highly advanced state of degradation of the material, together with logistical difficulties pertaining to the nature of the site, meant that fragmentation of the material could not be avoided. In hindsight it becomes evident that *in situ* action was necessary to preserve the assemblage (eg. specialized adhesive such as Paraloid B-72 could have been applied on fragile bones in order to avoid further fragmentation).

All of the 16 analyzed individuals[2] are poorly represented on an anatomical level. Post-cranial bones were very poorly preserved with the exception of few skull fragments and long bone diaphyses, and the occasional specimen which could be identified as belonging to the axial skeleton. Cranial fragments and teeth make up the most significant part of the assemblage. One case (M7) yielded faunal elements as well in the form of three *Sus scrofa*/*Sus domesticus* molars.

The absence of diagnostic features on most bones made determination of biological sex impossible, with the exception of M6 which was determined as 'probably male' based on the absence of the auricular sulcus in the one ilium fragment recovered. Height could not be estimated due to any intact long bones not being recovered.

The situation described above resulted in a limitation of the information which could be extracted from the bones regarding age at death (tab. 2). Two juveniles, three adolescents, three adolescents/young adults, three subadults/adults and a young adult were identified. With the exception of the one adult (M14, 30 years old), all other individuals were under 30 years old.

Investigation of pathological bone changes have revealed a considerable carious lesion on the right mandibular molar of skeleton M3 and a case of healed *cribra orbitalia* on skeleton M7. *Cribra orbitalia* is characterized by sieve-like lesions on the orbital roof and is most commonly associated with iron deficiency anaemia (V.A. Walker *et alii* 2009, p. 109), though other aetiologies have been put forward such as inflammatory conditions or osteitis (U. Wapler *et alii* 2004, p. 335). Both carious lesions and *cribra orbitalia* are some of the most frequently encountered palaeopathological lesions in human remains. While the identification of a single case does not allow for generalization, it does seem likely that the Tărtăria individuals were no strangers to dietary deficiencies associated with these pathological conditions.

The most interesting part of the assemblage is represented by the mass burial, a fairly uncommon situation in the Hallstatt period. As in most other periods, the dead were reserved a specially defined place, called necropolis. However, for the early period of the Iron Age, there are numerous discoveries of a different funerary character[3]: depositions within the settlement of partial or fully articulated skeletons. It should be noted that it seems no strict rules regarding the number of dead or their orientation in a burial were observed (S.C. Ailincăi 2008, p. 30).

Within the Carpathian basin several other similar collective burials have been discovered. Amongst the most well-known is the one in Pusztataskony-Ledence 1 (Kalakača culture), Hungary. As in the case of the Tărtăria (Basarabi culture) mass grave, the depositions here are represented only by partial skeletons, despite the high number of buried individuals (at least 20) (A. Király *et alii* 2013). A similar discovery was found at Hrtkovci-Gomolava in the Serbian province of Voivodina, belonging to the Bosut III culture which is contemporary with

[2] Of which only 12 could be recovered from site.

[3] We have avoided describing these depositions as 'non-funerary,' which seems inappropriate in the case of in settlement deposition.

the Basarabi culture in Romania. Unlike the Tărtăria and Pusztataskony-Ledence 1 cases, at Gomolava two collective burials containing complete skeletons together with disarticulated anatomical elements were discovered, containing an impressive 78 individuals (N. Tasić 1974, p. 465-466). In Romania, another mass burial containing 13 individuals was discovered at Jurilovca (Tulcea county), ancient Orgame/Argamum, belonging to the Babadag culture (8th-7th c. B.C.) (S.C. Ailincăi *et alii* 2003, p. 308).

The nature of the burial (mass grave containing articulated skeletons), together with the lack of information regarding biological sex, height or pathologies make us recommend the use of DNA analysis as the best way of obtaining more information, especially regarding kinship (fig. 6).

Skeleton	Sex	Age at death (in years)	Age category	Pathology	Non-metric traits
M1a	–	15-18	adolescent	–	–
M1b	–	6-7	juvenile	–	–
M2	–	12-13	adolescent	–	–
M3	–	18-25	adolescent/young adult	Carious lesion	–
M4	–	9	juvenile	–	–
M5	–	17-25	adolescent/young adult	–	–
M6	♂	18-20	adolescent/young adult	–	–
M7	–	> 13-19	subadult/adult	*Cribra orbitalia*	–
M8	–	–	–	–	–
M9	–	–	–	–	–
M10	–	–	–	–	–
M11	–	–	subadult/adult	–	–
M12	–	–	subadult/adult	–	–
M13	–	–	–	–	–
M14	–	30	young adult	–	–
M15	–	14-18	adolescent	–	Wormian bone
M16	–	–	–	–	–

Tab. 2. The Tărtăria *Podu Tărtăriei vest* assemblage.
Principalele caracteristici ale indivizilor descoperiți la Tărtăria *Podu Tărtăriei vest*.

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Fig. 1. Overview, *in situ*, of collective tomb discovered at Tărtăria (photo by Luciana Irimuș, 2012, © Corina Borș & NRMH).
Privire de ansamblu, *in situ*, a mormântului colectiv descoperit la Tărtăria (fotografie realizată de Luciana Irimuș, 2012, © Corina Borș & MNIR).

Fig. 2. High degree of fragmentation of the skull of M2.
Gradul ridicat de fragmentare al craniului din M2.

Fig. 3. Taphonomic changes at skull bones (endo- and exocranian) at the individual of M2.
Modificări tafonomice la nivelul oaselor craniene (endo- și exocranian) la individul din M2.

Fig. 4. Carious lesions identified at the first right mandibular molar (M3 individual).
Leziuni carioase identificate la nivelul primului molar mandibular dreapta (individul M3).

Fig. 5. Healed *cribra orbitalia* at left *pars orbitalis* on the M7 individual.
Cribra orbitalia vindecată la nivelul *pars orbitalis* stânga al individului M7.

Fig. 6. Subfossil DNA analysis of individuals assign to M5 and M6 can edify us on the relationships of biological relatedness (photo by Luciana Irimuș, 2012 © Corina Borș & NRMH)
Analiza ADN-ului subfosil al indivizilor atribuiți M5 și M6 ne poate edifica asupra relațiilor de înrudire biologică (fotografie realizată de Luciana Irimuș, 2012, © Corina Borș & MNIR).