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Banatian DeathMetals: Radiocarbon Dating of Cremation Burials of the Setting Bronze Age and Dawning Iron Age

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The lack of radiocarbon measurements of funerary contexts is a major shortcoming of the Late Bronze Age and Early Iron Age of the Eastern Carpathian Basin, especially in the Banat region. The present batch of samples tries to address these drawbacks, by detailing sampling strategies, employed pre-treatment and by providing a robust and coherent dataset of radiocarbon measurements. Implications of the new radiocarbon dates is discussed from a supra-regional perspective, while keeping aspects of typo-chronology, circulation of goods, and social nuances of employment of Bronze Age bronzes in the forefront. Ten burials were selected from four Banatian burial grounds according to the occurrence of metal finds in the funerary inventories. Beyond establishing a broad frame of absolute chronology for these sites of interment, the radiocarbon data provide reliable arguments for the precise attribution of metal discoveries. In addition, the data allow us to challenge some previously stated chronological assignments.

Keywords: Late Bronze Age, Early Iron Age, Eastern Carpathian Basin, Banat, cremation burials, radiocarbon dating, Bayesian modelling, absolute chronology, metalwork

INTRODUCTION

This paper presents the partial research results of the *DeathMetalsII. Metal finds in funerary contexts of the Eastern Carpathian Basin* archaeological project. *DeathMetalsII* focused on gathering all the Bronze Age (BA) burials with inventories of metals from the Eastern Carpathian Basin (ECB) in a single database in order to select and radiocarbon date graves with rare/unique or entire typological series of metal finds. The paper focuses on the Banat region of modern day Romania and Serbia, which is delimited on three sides by three rivers, Mureş/Maros, Tisza/Tisa, and Danube, and in the east by the southward running Carpathians (Fig. 1). Thus, its geomorphology has two major features: the Banat Lowland in the west and the Banat Mountains in the east, the former being a more dynamic landscape due to its network of rivers, despite the changing of its climate from wet to dry during the later Subboreal phase of the Holocene, which roughly coincides with the local Late Bronze Age (LBA) and Early Iron Age (EIA) (Daróczi 2015, 64–5, fig. 25).

Graves represent an excellent means to link metals and their typologies with absolute dates as, usually, metal hoards in the ECB lack sample-ready organic materials, while such metal finds are only seldomly seen in settlements. Therefore, a detailed typological discussion for the selected finds is an imperative. Moreover, the need for such a research arose not only out of multiple discrepancies of synchronisation of pottery and metal typologies, but out of the lack of reliable radiocarbon dates for these graves with metals. In fact, the only radiocarbon dated graves from the LBA Banat, erroneously attributed by Molloy *et al.* (2020, 299, table 2) to the Middle Bronze Age (MBA), are Graves 8 and 24 from Buđak Livade, Croatia.

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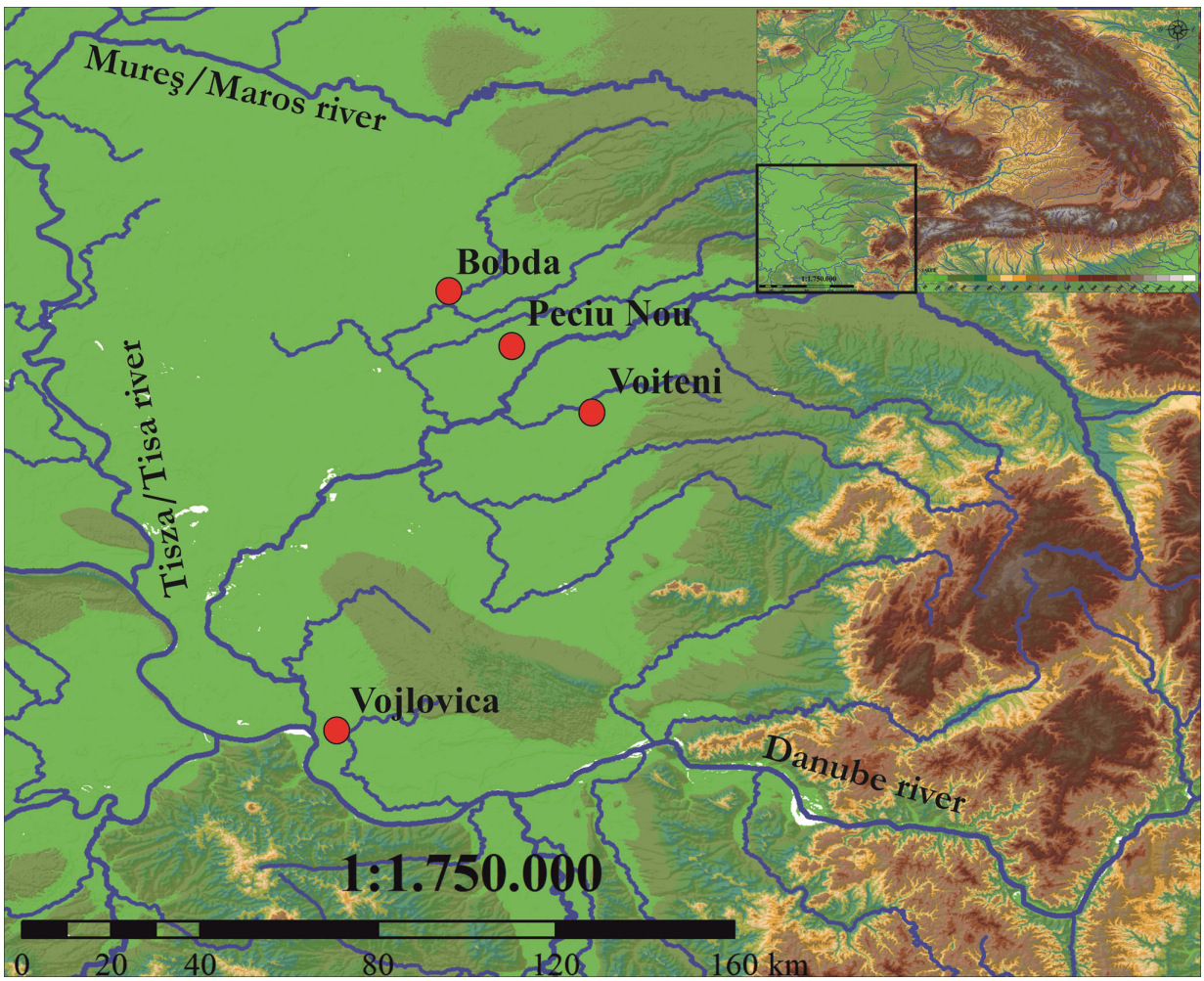

Fig. 1.
Locations of radiocarbon dated graves from Banatian LBA burial grounds in the ECB (DEM constructed and rendered by Tibor-Tamás Daróczi with ArcGIS (ArcMap10.8))

The best example of this lack of absolute dates is the region of Banat, especially during the LBA and EIA, where a recent synoptic study listed only four settlements with a total of ten radiocarbon dates, of which most of the samples are from charred, long-lived wood (Szentmiklosi 2021, 84). More importantly, none of the LBA graves was dated. Hence the LBA Banat seemed a prime candidate to target in order to produce meaningful results.

A first step in solving the problem of synchronising metals with absolute chronology was to gather information on all documented graves with funerary metals. In the following step, only funerary metals that are either unique/rare or are part of a typological series represented by several finds found in the LBA Banatian graves were selected. In the final step, the presence of associated skeletal remains was verified. Only ten interments of cremated and non-cremated human individuals from four burial grounds fitted the set sampling criteria. The low number is mostly due to the lack of surviving human remains, either because they were not collected during older archaeological excavations or because they could no longer be securely associated with a grave number. Nevertheless, the goal was to date, in absolute terms, the discoveries to as a narrow an age range as possible. For these reasons double burials were also selected. To further increase the confidence in the employed pretreatment methods and results, seven of the ten

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samples were subjected to a test to check for the accuracy of various procedures used with calcinated bones at the Aarhus Accelerator Mass Spectrometer (AMS) Centre (Olsen *et al.* forthcoming).

A detailed catalogue of the selected graves, their micro-regional location, grouping, body treatment, and dating is provided below. Metric data on the metal finds is put forth, on their closest and best analogies, and relative dating, either by employing various chronologies of metals or by the BA absolute-relative chronology of the ECB (Daróczi 2015, 27–8, 35–42, pl. 1; Daróczi & Ursuţiu 2015, 2–7, pl. i). Further, it is important to note that the present discussion does not intend to reconcile relative typo-chronologies of pottery and metals of the Banat or neighbouring areas, but rather highlights the need for radiocarbon dating graves with metal finds in a region which, before the dates presented here, had none. Finally, a cultural and chronological discussion will detail aspects related to the circulation of metal goods and their social consumption, underscoring the importance of the selected graves and their inventories in the light of the new AMS measurements.

ARCHAEOLOGICAL CONTEXTS & FINDS

The Banatian LBA burial grounds are generally of two major types: they can be, occasionally towards the end of the period in question, tumular or, more usually, they are flat cemeteries, without any visible surface markers or area delimitations. Hence, it is difficult to ascertain the clear association of a burial ground with one or more settlements, with the note that the world of the dead and that of the living was always kept separate. The most common body treatment practice is cremation, with the remains either in an urn placed in a pit or simply strewn in a pit without a receptacle. Most often they are located on small knolls, slightly elevated over the surrounding, flat area, which was prone to either occasional or seasonal floods (Motzoi-Chicideanu 2011; Daróczi 2015; Szentmiklosi 2021). A major synoptic study on the prehistoric funerary landscapes of the ECB defined the archeco-zones as the unique associations of changing Holocene environmental variables (vegetation, animals, geomorphology, hydrology, and climate) modelled for archaeological purposes. The research defined a total of five major and 15 medium-sized archeco-zones. Most of the western part of the Banat constitutes the F3 medium-sized archeco-zone (Daróczi 2015, 66–7, map 6). All burials discussed below are from this archeco-zone.

Bobda, jud. Timiş, RO

Micro-location: knoll; *Archeco-zone*: F3; *Grouping*: burial ground; *Type*: flat

GRAVE 30 (1959)

Dating: LBA III–EIA (Ha A); Body treatment: incineration – in urn

Ring (fragmentary)
Figure 2A; Diam: Ø; W: 13 mm; Th: 1.2 mm
A single spiral from a finger-ring with juxtaposed spiral ends. The best analogies for this find are from the Bodrogkeresztúr, Borsodgeszt, Felsődobsza, Kazincbarcika, and Pácin (Kemenczei 1984, 21, 32, pls 35/20, 45/6, 46/7–12, 48/9–10, esp. 62a/14–15), all dated to Bz D (Kemenczei 1984, 96, 115, 6, 8, 25, nos 8, 13a, 19, 46), that is LBA II (pl. 4). Mozsolics identifies these finger-rings as type B and dates them to her BIV phase (Mozsolics 1973, 54).

Peciu Nou – în irigat, jud. Timiş, RO

Micro-location: knoll; *Archeco-zone*: F3; *Grouping*: burial ground; *Type*: flat

GRAVE 25 (1988)

Dating: EIA (Ha B2-B2/3); *Body treatment*: incineration – in urn (standing)

Diadem (fragmentary)
Figure 2D; L: Ø; W: 40 mm; Th: 1.5 mm
A fragment from a broad and relatively thick, rectangular bronze frontlet. It is of the plate frontlet-type and is dated to the latest LBA, ie, Bz D (Novotná 1984, 66–7, esp. no. 370, pl. 61, fig. 1).

Lock-ring (complete)
Figure 2B; Diam: 14 mm; W: 10 mm; Th: 1.5 mm
A type B1b, complete bronze, gold plated lock-ring of circular shape with a slightly pointed middle part, ladle-shaped ends and with tapered tips (Zaharia 1959, 109–10, fig. 2/2–3).

Lock-ring (fragmentary)
Figure 2C; Diam: 13 mm; W: ~10 mm; Th: 1 mm
A type B1b, complete bronze, gold plated lock-ring of circular shape with a slightly pointed middle part, ladle-shaped ends and with tapered tips (Zaharia 1959, 109–10, fig. 2/2–3).

GRAVE 49 (1989)

Dating: LBA IIb–III; *Body treatment*: incineration – in urn (standing)

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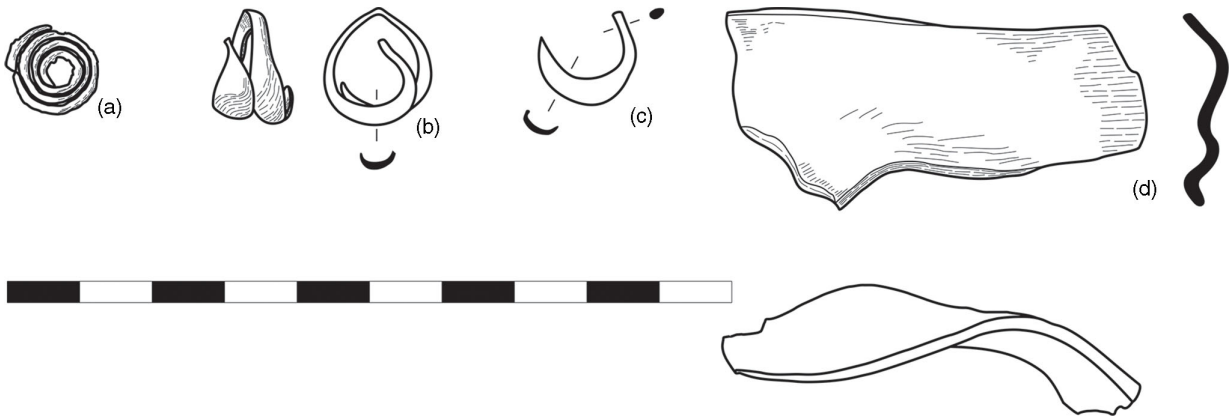

Fig. 2.
Bronze fragmentary ring from Bobda grave 30 (A), Bronze lock-rings (B–C) and bronze diadem (D) from Peciu Nou grave 25 (drawing: Andrei Bălărie, digital drawing: Tibor-Tamás Daróczi)

Pendant (complete)
Figure 3A; L: 97 mm; W: 32 mm; Th: 3.2 mm
A pendant made of bronze wire with a circular cross-section that is twisted at the ends into two, diagonally opposed spirals of 9–10 coils.

GRAVE 92 (1992)
Dating: LBA Ib; *Body treatment*: incineration – in urn (standing)

Pendant (fragmentary)
Figure 3B; L: Ø; W: Ø; Th: 2.4 mm
A fragmentary heart shaped pendant with circular cross-section. As the middle piece and hanger are missing the attribution to type is impossible. From its shape it is most likely of Hänsel's variety 3 (closed shape without middle piece), 5 (with V-shaped middle piece), or 7 (with middle piece; Hänsel 1968a, 116–9; 1968b, 222–4, lists 123, 125, 127). The best analogy comes from the northern part of the Carpathian Basin and it is the heart shaped pendant with bifurcated middle piece type, which is considered a local form and first appears in hoards of the Koszider horizon, ie, Bz B2, but is most commonly seen in Bz C1 (Furmánek 1980, 26–8, nos 360–74, pls 14–15), ie, LBA Ia. Further to the west the best analogies are the heart-shaped pendants of the Aying type, that is, closed examples with V-shaped middle pieces, dated to the Göggenhofen stage and only rarely found in eastern Bavaria (Wels-Weyrauch 1978, 63–5, nos 321–4A, pl. 14; 1991, 47–9, nos 335–76, pls 14–15). The circular cross-section is quite rare, as earlier examples are either of bronze sheet or semicircular in cross-section, but this type of cross-section is usually seen in Egyek-type semicircular shaped pendants of the ECB, dated from the MBA III to the LBA II (Daróczi 2021, 18). The present example must be considered a rarity on the basis of its circular cross-section.

Pin (fragmentary)
Figure 3C; Diam: 18 mm; L: 196 mm; Th: 6 mm
A pin with a flat, flaring head with two horizontal and parallel ribs just below it, also with a half-circle shaped stem broken into three pieces. It is considered a seal headed pin with decorated stem, usually encountered in the earlier part of the LBA (Vasić 2003, 37–9, nos 180–207, pls 12–14). In the northern part of the Carpathian Basin this variety is referred to as the Göggenhofen type, appearing as of the LBA in this region as well (Říhovský 1979, 59–63, nos 251, 254–6, 264, 269–74, 278–9, 285–6, pls 13–16; Novotná 1980, 78–9, 82–5, nos 440–52, pls 19–20). Moreover, a recent study of pins attributes this to the nail headed type, restating their long lived nature from the late MBA to the EIA (Innerhofer 2000, 137–8, 139–40, 143).

Sword (fragmentary)
Figure 3D–E; L: 386 mm; W: 24 mm; Th: 5 mm
A fragmentary, charred short sword which has the bone/antler handle still preserved with traces of patina visible on the inside (Fig. 3D). It is a rod-tanged sword of class A as it has parallel sides (McArdle 1969). In the area of the Po valley these characteristics define the Monza-type and are dated to the later part of the LBA (Bianco Peroni 1970, 50–1, esp. no. 8, pl. 8). In the central Alps and the regions north of it the best analogies are the rod-tanged swords of the Unterhaching type dated to the Ha A (Schauer 1971, 3, 83–5, nos 287–9, 279, pls 41–2; Wüstemann & Riederer 2004, 90–1, no. 279, pl. 41). In the regions west of the Alps the closest parallels are found in rod-tanged swords of the Mantoche type, C variety (Reim 1974, 24–6, no. 41, pl. 7). Finally, Kemenczei classifies these as rod-tanged sword,

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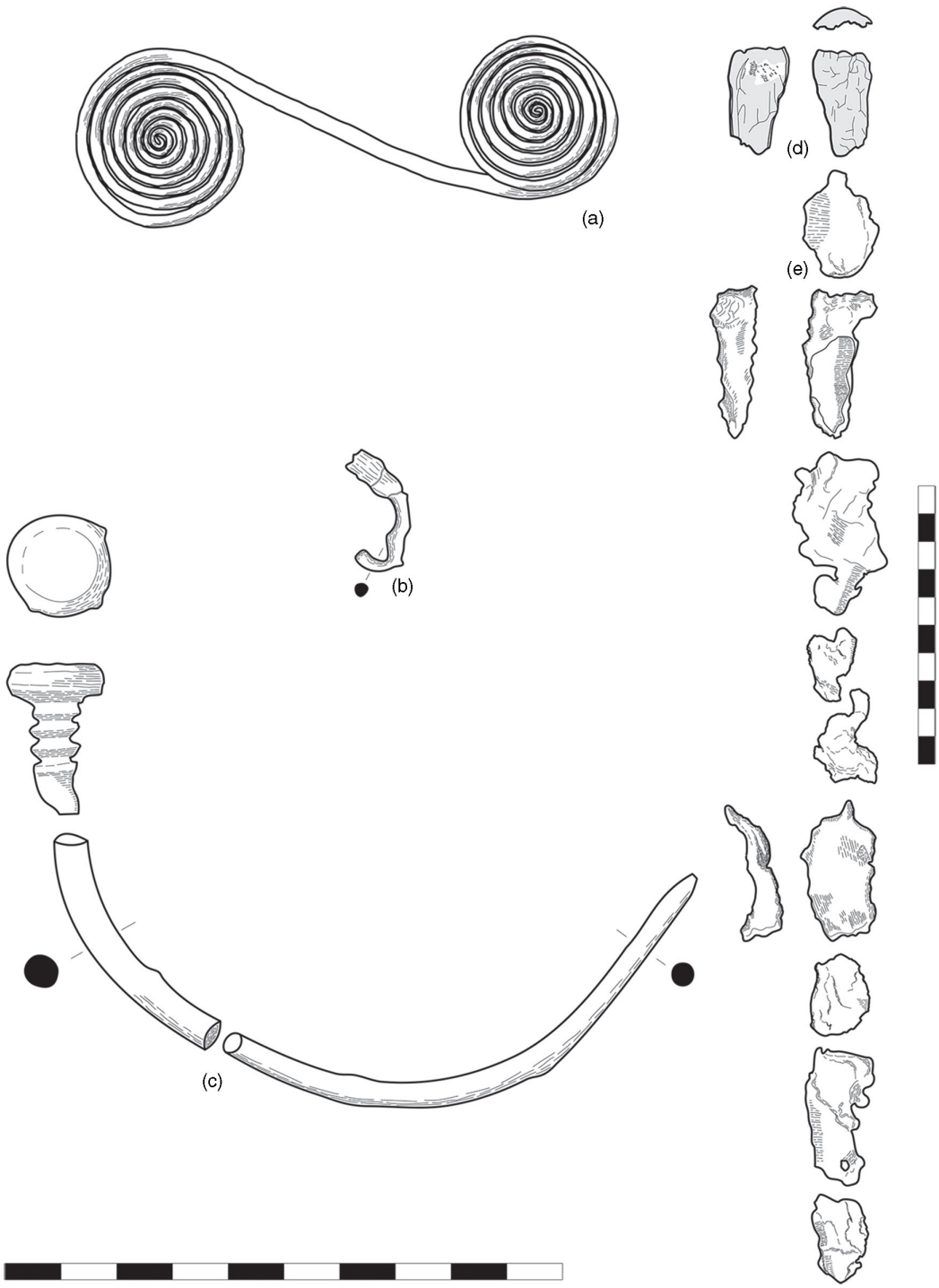

Fig. 3.
Bronze spiral pendant (A) from Peciu Nou grave 49, bronze pendant (B), bronze pin (C) and bronze sword (D–E) from Peciu Nou grave 92 (drawing: Andrei Bălărie, digital drawing: Tibor-Tamás Daróczi)

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Fig. 4.
Bronze ear-rings (A–D) from Voiteni grave 7 (drawing: Andrei Bălărie, digital drawing: Tibor-Tamás Daróczi)

variety 2, dated to Bz C2–Ha A (Kemenczei 1988, 34–5, nos 143–5, pl. 11).

Voiteni – groapa de împrumut lut, jud. Timiş, RO

Micro-location: knoll; *Archeco-zone*: F3; *Grouping*: burial ground; *Type*: flat

GRAVE 7 CHILD (1998)

Dating: Migration period; *Body treatment*: inhumation

An inhumation of a child was discovered among the incinerated remains in the stores of National Banat Museum. After dating the three burials, it became clear that the remains were erroneously associated with the LBA graves. The dating of the bones places the time of death of the child sometimes between cal AD 1037 and 1160 (see Fig. 9A).

GRAVE 7A&B (1998)

Dating: EIA (Ha A2); *Body treatment*: incineration – in urn (standing)

Ear-ring (fragmentary)
Figure 4D; Diam: ~19 mm; W: 4 mm; Th: 1 mm
A stretched-out, bronze ear-ring with a missing tip.

Ear-ring (complete)
Figure 4C; Diam: 19 mm; W: 4 mm; Th: 1 mm
A complete, bronze ear-ring with a concave lower part.

Ear-ring (fragmentary)
Figure 4B; Diam: 16 mm; W: 3 mm; Th: 1 mm
A fragmentary, bronze ear-ring with a missing top and a concave preserved lower part.

Ear-ring (fragmentary)
Figure 4A; Diam: 18 mm; W: 3 mm; Th: 1 mm
A fragmentary, bronze ear-ring with a missing top and concave preserved lower part.

All four examples are of the small hollowed-out ear-ring type, encountered even during Ha D on the upper Danube, near the regions bordering Bohemia (Nagler-Zanier 2005, 138–41, nos 2667–86, pls 171, 213B). The earliest examples in Banat appear in the MBA (Girić 1971, pls 36/123-1, 2, 37/121-1, 76/287-7).

GRAVE 15 (1986)

Dating: EIA (Ha A2–B1); *Body treatment*: incineration – in urn (standing)

Bangle (fragmentary)
Figure 5D; Diam: Ø; W: 0.45 cm; Th: 0.22 cm
A circular bangle, broken intro four pieces, showing heavy fire damaged. It has a triangular (equal-sided) cross-section and is carinated. In the Banat, these are called 'roof-shaped' bangles, documented mostly in the LBA II–III, ie, Bz D–Ha A1 (Petrescu-Dîmboviţa 1998, 168–71, nos 1979, 1981, pl. 146).

Ring (fragmentary)
Figure 5G; Diam: 25 mm; W: Ø; Th: 2.6 mm
This is a finger-ring with juxtaposed spiral ends of which only a single spiral is preserved. The best analogies are from Bodrogkeresztúr, Borsodgeszt, Felsődobsza, Kazincbarcika and Pácin (Kemenczei 1984, 21, 32, pls 5/20, 45/6, 6/7–12, 48/9–10, esp. 62a/14–15), all dated to Bz D (Kemenczei 1984, 96, 115, 116, 118, 125, nos 8, 13a, 19, 46), that is LBA II (fig. 7). Mozsolics identifies these finger-rings as type B, dated to her BIV phase (Mozsolics 1973, 54).

Lock-ring (complete)
Figure 5E; Diam: 35 mm; W: 8 mm; Th: 2 mm
This lock-ring is made from a thin, bronze wire of four coils with one of the ends twisted backward.

Lock-ring (complete)
Figure 5F; Diam: 31 mm; W: 3 mm; Th: 2 mm
This lock-ring is made of thin, bronze wire of four coils with one of the ends twisted backward.

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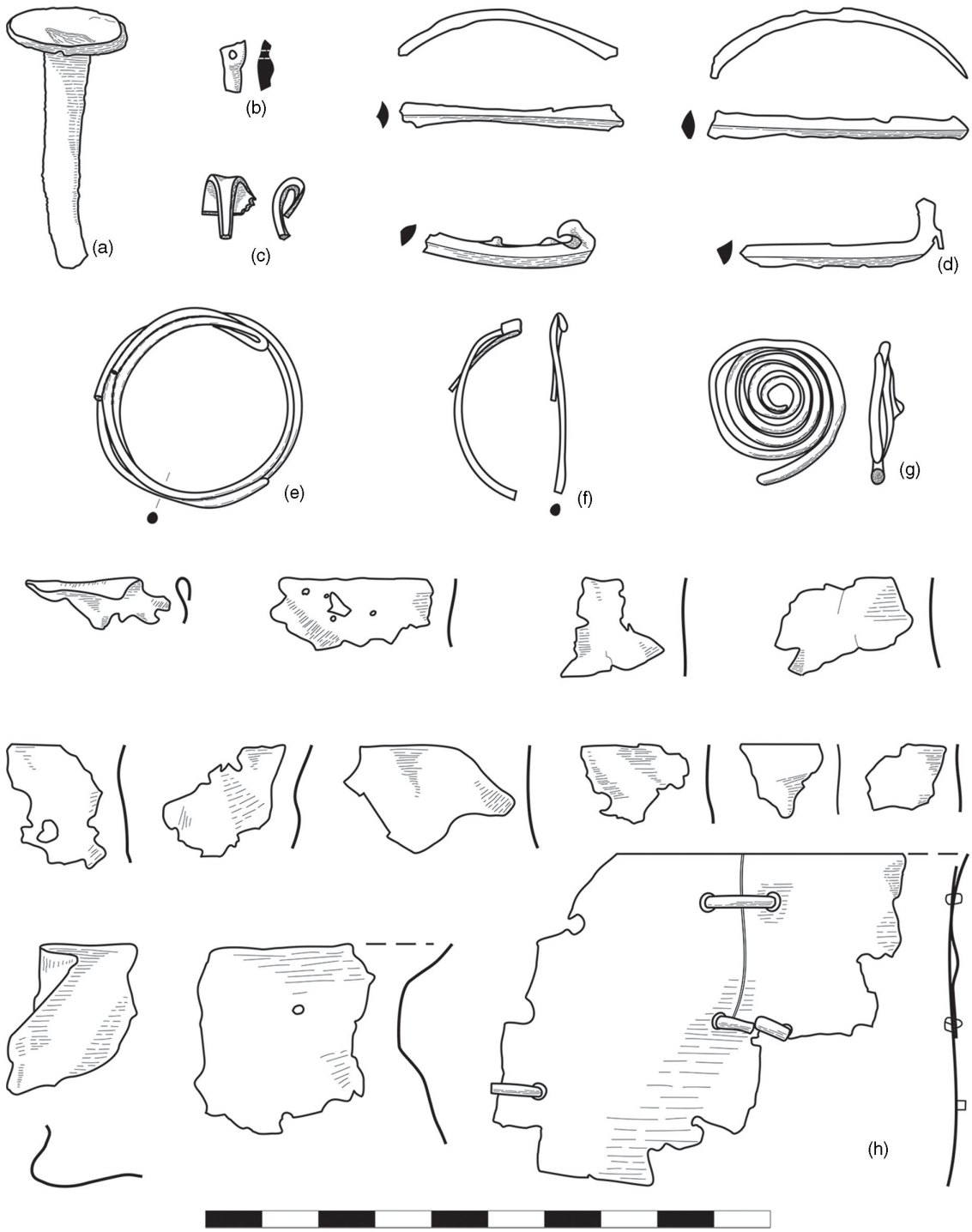

Fig. 5.
Bronze pin (A), bronze lock-rings (B–C, E–F), bronze bangle (D), bronze ring (G), and bronze cauldron (H) from Voiteni grave 15 (drawing: Andrei Bălărie, digital drawing: Tibor-Tamás Daróczi)

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These two lock-rings are of the Noppenring type (Olshausen 1886, 441–6; Schmdit 1904, 618, fn 4, fig. 13; Hänsel 1968a, 114), but also considered as type A in Zaharia's typology (Zaharia 1959, 107, esp. fig. 1/7–8). It has been claimed that they are only seen during the MBA (Schumacher-Matthäus 1985, 96).

Cauldron (fragmentary)
Figure 5H; Diam: Ø; H: Ø; Th: 0.5 m
Several fragments of a bronze cauldron, which is at least 59 mm tall and has a diameter of more than 85 mm. It was mended at many locations with short bronze wires that were pulled though circular holes of the individual plates.

Pin (fragmentary)
Figure 5A; Diam: 21 mm; L: Ø; Th: 7 mm
This undecorated fragmentary pin has only its upper part preserved, it is of the nail headed with undecorated stem type and is dated mostly to the LBA in Banat (Vasić 2003, 43–6, nos 221–43, pl. 16) (see also pin 481cc2, above).

Lock-ring(?) (fragmentary)
Figure 5C; Diam: Ø; W: 11 mm; Th: 1.5 mm
A fragment from a possible bronze lock-ring, which ought to be of willow-leaf-shape, type 3α, usually encountered during the later MBA and earlier LBA (Zaharia 1959, 107, 11, fig. 3/esp. 1).

Lock-ring(?) (fragmentary)
Figure 5B; Diam: Ø; W: 04 mm; Th: 2 mm
This is probably a fragment from a bronze lock-ring of willow-leaf-type. The best analogy for this piece is from the north-central Carpathian Basin, from the earlier LBA at Pácin–Alsókenderhomokdűlő (Kemenczei 1984, pl. 62a/13).

Vojlovica – Rafineria nafte-nekropola II, okr. Južni Banat, SRB

Micro-location: knoll; *Archeco-zone*: F3; *Grouping*: burial ground; *Type*: flat

GRAVE 69/A

Dating: LBA IIb–III; *Body treatment*: incineration – in urn (standing); *Sex*: Ø; *Age*: infans I (0–7 years)
The cremated human remains of an infant were found in an urn with those of a woman.

GRAVE 69/B

Dating: LBA IIb–III; *Body treatmen*t: incineration – in urn (standing); *Sex*: ♀; *Age*: adult–senile (20–60+ years)

Diadem (fragmentary)
Figure 6; Diam: 108 mm; W: 16 mm; Th: 2 mm

Fig. 6.
Bronze diadem from Vojlovica grave 69b (drawing: Miroslav Birclin, digital drawing: Tibor-Tamás Daróczi)

This semicircular, bronze, undecorated diadem is heavily damaged by fire and is broken into four fragments. It was discovered in the same urn as the remains of the infant (Bukvić 2000, 161–2, pl. 24/5, 9). It is of the plate frontlet type and is dated to the latest LBA, ie, Bz D–Ha A1 (Novotná 1984, 66–7, esp. no. 370, pl. 61, fig. 1).

MATERIALS AND METHODS

The metal finds described above were selected either because they were rare/unique, hence their relative dating was nearly impossible as they lacked analogies, or because they were part of specific typological series. The former is best exemplified by the discovery of an as yet unpublished sword in a grave, the first of its kind in the Bronze Age of the ECB, and the latter by juxtaposed spiral finger-rings. Although, *DeathMetalsII* identified a little over 130 LBA Banatians burials in the literature as having inventories of metals, most of these contained fragmentary saltaleoni beads or semispherical scales. A further challenge, even after the elimination of the two mentioned extremely common types of finds, was either the lack of associated human remains or their insecure association with individual graves. The ten interments detailed above are the only ones that fitted the set sampling standard and represent the very first Banatian metals from LBA graves to have AMS measurements associated with them.

A recent PhD thesis focused on comparing the results of pretreatment methods of radiocarbon dating of cremated bones from three different laboratories (Agerskov Rose 2020). Agerskov Rose concluded that no significant differences exist (Agerskov Rose *et al.* 2019, 7–10), but the published table shows differences in results, especially in calibrated age ranges (Agerskov Rose *et al.* 2019, table 2), which can only be related to

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the use of sulfix vs copper oxide in the purification through heating stage of the protocols for the removal of sulphur compounds (Agerskov Rose *et al.* 2019, 3–4, fig. 1). Thus, it was important to test the procedure employed: results are pending publication (Olsen *et al.* forthcoming). At the radiocarbon laboratory of Aarhus University (AARAMS), after testing the alternative pretreatment protocols on the same ten samples, the purification method through sulfix was employed. The pretreatment of cremated bones followed previously established and published steps (Olsen *et al.* 2008; 2011, 262) and for the measurement of ancient radiocarbon a HVE 1MV multi-element AMS was used (Klein *et al.* 2014; Heinemeier *et al.* 2015; Olsen *et al.* 2017).

In the first step of pretreatment procedure for uncharred bones they are drilled-out to achieve homogenisation of the sample. Usually a weight of 200 mg is targeted but, in case of samples of poor quality, as much as 900 mg were used. No removal of preservatives occurred, as none was suggested through the Fourier-transform infrared spectroscopy (FTIR) analysis. In the following step samples were decalcified with cold (5°C) and 1 M HCl acid over several hours. Decalcified sampled were washed twice with demineralised, ultra-pure water (EMD Millipore. 2013. Milli-Q® Integral Water Purification Systems. Darmstadt, Germany: Merck KGaA) after which the removal of humates occurred with NaOH base of 0.2 M concentration for several tens of minutes. Samples were washed again twice with EMD Millipore 2013 water, followed by the gelatinating of collagen through addition of HCl acid of 0.01 M strength. The goal was to reach a pH range of 2.0–2.5; afterwards they were placed in an oven at 58°C for three days. Ezee-filters and ultra-filters were used to separate the collagen extract, to which 800 µl of EMD Millipore 2013 water was added. The collagen extract was first frozen overnight with an overnight freeze-drying process the following day (Nielsen *et al.* 2018, 3–5).

Samples that yielded sufficient collagen were weighed into tin-capsules for stable isotope analysis. As $\delta^{13}C$ values and C/N ratios did not indicate any anomalies in the sampled sources, 2.2–2.5 mg of collagen was transferred into pre-burned pyrex vials containing 180–220 mg of CuO and a single, short strain of Ag. After a vacuum was created in these vials they were hermetically sealed by a propane flame and burnt for 3 hours at 900°C to transform the collagen from solid state to gas. CO_2 samples were transferred to graphite in the presence of H_2 at a temperature of 550°C for 4 hours. Finally, the graphite was mounted into cathodes and amounts of ^{13}C and ^{14}C isotopes measured by the AMS of Aarhus University (Klein *et al.* 2014; Heinemeier *et al.* 2015; Olsen *et al.* 2017).

RESULTS

Only one of the ten samples did not comprise cremated bone, where apparently two graves from the burial ground of Voiteni were erroneously double numbered, either in the field or in storage. The double cremation burial is of the early EIA, while the interment of the child (Grave 7/ child) is of the Early Middle Ages. No remains from the two double burials analysed in this paper were mixed, as the respective $\delta^{13}C$ values are very different (Table 1). The further five single cremation burials produced some surprising results in terms of absolute chronology and are chronologically coherent as no outliers can be identified. The AMS measurements from the two double burials, Vojlovica Grave 69a & b (Fig. 9C–F) and Voiteni Grave 7a & b (Fig. 8E–H), yielded extremely close values, which again confirms the accuracy and appropriateness of the methods employed.

Grave 92 from Peciu Nou is the oldest, with the radiocarbon measurement (Fig. 8D) placing the interment in the LBA Ib period of the ECB (Fig. 7). From the same burial ground, Grave 49, and the double burial from Grave 69 at Vojlovica are placed by their radiocarbon dating (AAR-31642 and AAR-31656/AAR-31657, respectively), in the LBA IIb–III. In the case of the latter, where the cremation of both individuals must have occurred at the same time, a significant decrease of the modelled, calibrated age range with agreement indexes above 90% (Fig. 9C, D, F) is achieved, as a direct result of the combination of the two radiocarbon measurements. The measured radiocarbon values for Grave 30 at Bobda (AAR-31612), date the incineration of the individual to the watershed between the LBA and EIA, ie, HA A2, while the double burial of Grave 7a & b at Voiteni (AAR-31653/AAR-31564), is securely and precisely placed at the dawn of the Banatian EIA. The combined AMS measurements of the double burial at Voiteni resulted in a shorter calibrated age range, while the very high agreement index of over 110%, ensures the accuracy of the model (Fig. 8E, F, H). Grave 15 from the burial ground of Voiteni is chronologically very close to the latter double burial, based on the AMS measurements (AAR-31655), and is dated into the EIA but in a later

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Table 1. Attributes of Samples and Ams Measurements from Lba Banatian Burial Grounds

Burial ground/grave	*Anthropological determination*	*Dated material*	*AARAMS Lab ID*	*BP determination*	*68.3% cal* BC	*95.4% cal* BC	$\delta^{13}C$	$\delta^{15}N$	C:N
Bobda grv 30	human	bone (calcined)	AAR-31612	3000±27	1283–1133	1379–1126	−18.7	–	–
Peciu Nou grv 25	human	bone (calcined)	AAR-31641	2806±22	998–923	1014–901	−12.6	–	–
Peciu Nou grv 49	human	bone (calcined)	AAR-31642	3069±28	1394–1285	1415–1236	−23.0	–	–
Peciu Nou grv 92	human	bone (calcined)	AAR-31643	3224±32	1509–1447	1538–1421	−16.4	–	–
Voiteni grv 7 (child)	human	bone	AAR-31652	937±21	AD 1045–1158	AD 1037–1160	−16.0	13.3	3.2
Voiteni grv 7a	human	bone (calcined)	AAR-31653	2979±24	1256–1130*	1260–1126*	−16.5	–	–
Voiteni grv 7b	human	bone (calcined)	AAR-31654	2972±24	1256–1130*	1260–1126*	−23.4	–	–
Voiteni grv 15	human	bone (calcined)	AAR-31655	2970±26	1256–1126	1280–1056	−23.1	–	–
Vojlovica II grv 69a	human ♀ adult–sen	bone (calcined)	AAR-31656	3049±29	1394–1297*	1406–1280*	−24.9	–	–
Vojlovica II grv 69b	human Ø inf I	bone (calcined)	AAR-31657	3089±23	1394–1297*	1406–1280*	−17.5	–	–

*combined dates. IntCAL20 (Reimer *et al.* 2020) and OxCal (Bronk Ramsey 2017) were used for calibration and rendering

phase of Ha A2–B1. Lastly, the youngest prehistoric grave from the present batch is Grave 25 from Peciu Nou which, according to its radiocarbon dating (AAR-31641), is placed in the setting early EIA, ie, Ha B2–B2/3. A more accurate modelling of radiocarbon dates will become possible, and implicitly age ranges will be significantly shortened, once several interments are dated from each of the four Banatian burial grounds. Similar approaches were crowned with success for the burial grounds with cremated bones at Dumbrăviţa–Stricata in north-eastern Transylvania (Daróczi *et al.* 2023) and those at Békés 103 in the lower Körös basin (Duffy *et al.* 2019). The former is dated to the MBA IIIb–LBA I, while most of the graves from the latter are also framed, in our opinion, in that period.

The death of the infant from Grave 7/child at Voiteni occurred sometime at the beginning of the 2nd millennium AD. Further, stable isotopes confirm that the bone fragments dated are from a human, while the low ^{13}C and very high ^{15}N values (Table 1) suggest a low carbohydrate–high protein diet, respectively, indicative of a not yet, or just barely, weaned individual.

DISCUSSION

Peciu Nou: Grave 92

Heart shaped pendants: heart shaped pendants with bifurcated middle piece, like that from Peciu Nou Grave 92, appear in the northern Carpathian Basin from the Koszider horizon, ie, MBA IIIb, but are most common in the following chronological stage and spread to Moravia and western Bohemia from here (Furmánek 1980, 26–8, nos 360–74, pls 14–15). The western limit for the heart shaped pendants with V-shaped middle pieces, locally called the Aying type, seems to be eastern Bavaria (Wels-Weyrauch 1978, 64–5; 1991, 49). Bronze sheet, heart shaped pendants, although without a mid-piece, in the Wesser basin were only found in a burial mound on the skeleton of a woman from Fallingbostel and they are considered imports from the Carpathian Basin (Laux 2016, 146–8, nos 806–12, pl. 92). They regarded as products of the middle Danube basin, from where they mostly spread into the neighbouring regions (Hänsel 1968a, 115, 8; Wels-Weyrauch 1978, 65). The earliest examples of heart or crescent shaped pendants with circular cross-section, ie, Egyek type (Daróczi 2021, 18), appear from the latest phase of the MBA in the

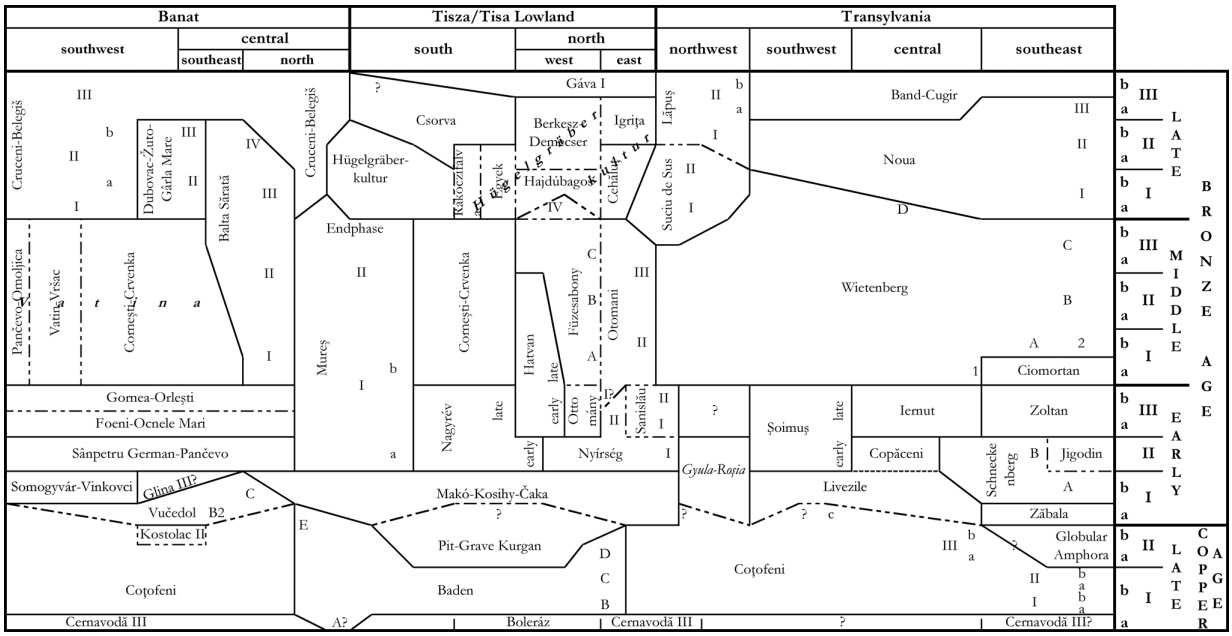

Fig. 7.
Bronze Age relative chronological chart of the ECB (drawing: Tibor-Tamás Daróczi)

ECB, the hoard of Nagyhangos being most representative (Mozsolics 1967, 89, esp. pl. 31/16-8; 1973, 52). With the onset of the LBA they appear as grave goods at Ebed, Zagyvapálfalva, and Hetény, but also in hoards like that from Dreveník (Mozsolics 1973, 52). It is important to note that, when the sex of the buried individual associated with such a find in the BA Carpathian Basin could be determined, it was always that of a woman (Schumacher-Matthäus 1985, 105).

Furthermore, possible analogies for heart shaped pendants from the Carpathian Basin of the Koszider horizon with middle piece are identified on frescoes from Thera in the Aegean (Furmánek 1997, 317–8, fig. 7). One of the Stern Cabin panels from Room 4, which is the continuation through a door of the Ship Procession frieze from Room 5 and dated to the end of the LM IA, has stylised hybrid papyrus-lily flowers on top of three stems, referred to as the 'waz' emblem, adopted from the Nile valley (Evans 1921, 201, figs 150; 1928, 480, fig. 287; Morgan 1988, 23, 140–1, fig. 97). Researchers recognised that these symbols are consecrated and accompany ritual processions (Rutkowski 1977; 1978, 663–4; 1981, 62–4), albeit in the Aegean these are not associated with funerary ones (Morgan 1988, 138). The hybrid papyrus-lilies appear as early as MM I on seals and from the MM II on pottery, which pre-date the recognisable and naturalistic papyrus flowers that are commonly seen later in the LM I Aegean visual repertoire (Morgan 1988, 23).

Seal headed pins: The seal headed pins with decorated stems from the LBA Banat have ties to similar shapes of the Carpathian Basin and Central Europe, also referred to as Göggenhofen type, althoughconsidering the ranges of their variety in the region, local productions seem likely (Vasić 2003, 38–9). Around the middle of the 20th century this type was categorised in Central Europe as 'one with a thick and flat head and two groups of flutes', appears as of the C1 phase and is coined as the Göggenhofen type (Torbrügge 1959a, 38–40, 65–6, no. 65, pl. 11/6; 1959b, 70–1). Although two decades later it was concluded that they are common in the Bz B2–C1 time-span (Benkovsky-Pivovarová 1976, 331), it has since become clear that these pins are extremely long lived (Říhovský 1979, 62–3; 1983, 15). The highest concentration is in Central Europe and they tend to be less common towards the south-east, in the Carpathian Basin (Novotná 1980, 85). A recent synthesis offers a detailed account on their

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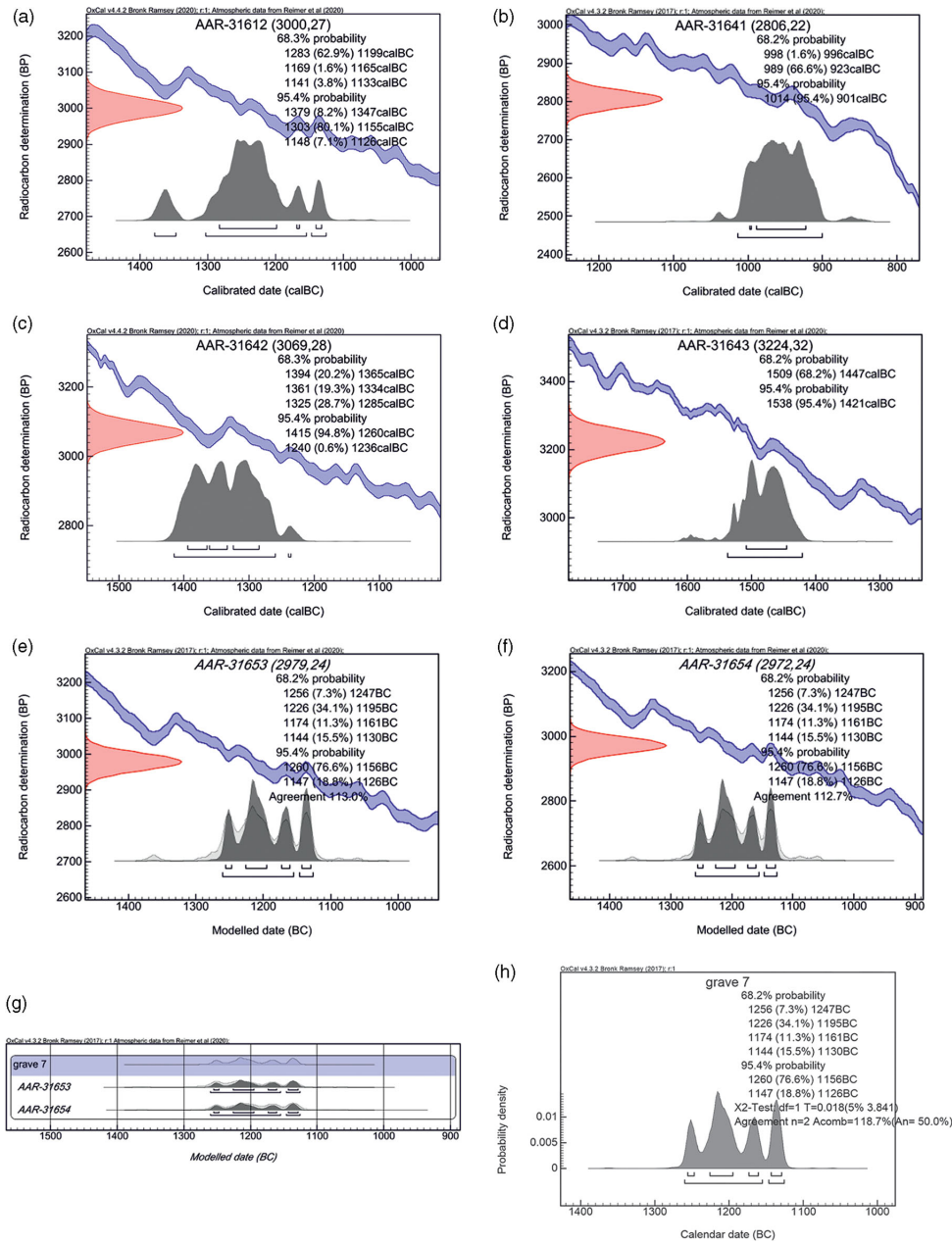

Fig. 8.
Plots of dated, calibrated and modelled radiocarbon samples: A) single plot of AAR-31612 sample from Bobda grave 30; B) single plot of AAR-31641 sample from Peciu Nou grave 25; C) single plot of AAR-31642 sample from Peciu Nou grave 49; D) single plot of AAR-31643 sample from Peciu Nou grave 92; E) single plot of AAR-31653 sample from Voiteni grave 7a modelled (combined); F) single plot of AAR-31654 sample from Voiteni grave 7b modelled (combined); G) multi-plot of AAR-31653 and AAR-31654 samples from Voiteni grave 7 modelled (combined); H) single plot with agreement indexes of AAR-31653 and AAR-31654 samples from Voiteni grave 7 modelled (combined) (rendering in OxCal v. 4.3.2 (Bronk Ramsey 2017) employing atmospheric information from Reimer *et al.* (2020) by Tibor-Tamás Daróczi)

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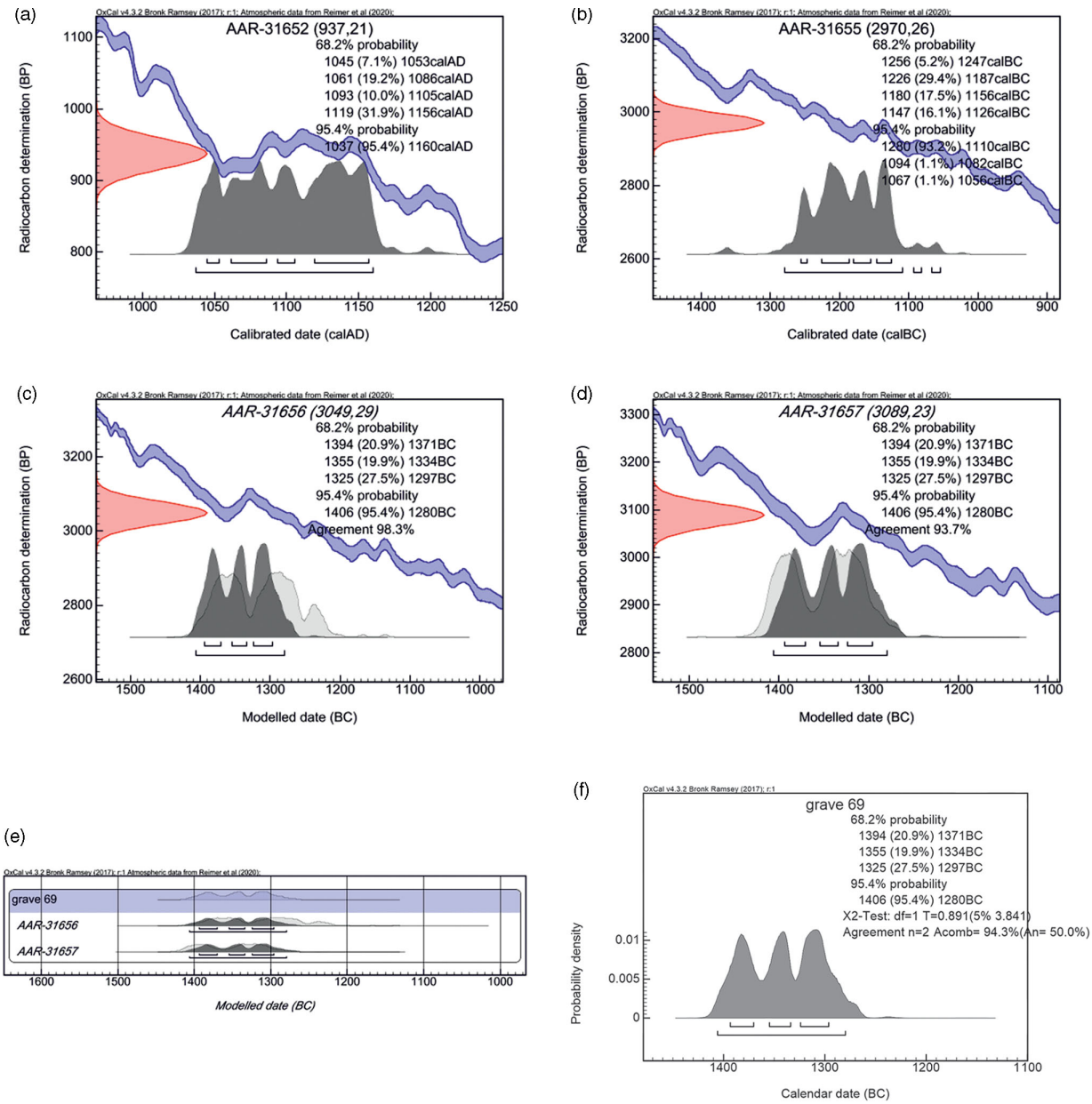

Fig. 9.
Plots and attribute list of calibrated and modelled radiocarbon dated samples: A) single plot of AAR-31652 sample from Voiteni grave 7 child; B) single plot of AAR-31655 sample from Voiteni grave 15; C) single plot of AAR-31656 sample from Vojlovica-Rafineria nafte-nekropola II grave 69a modelled (combined); D) single plot of AAR-31657 sample from Vojlovica-Rafineria nafte-nekropola II grave 69b modelled (combined); E) multi-plot of AAR-31656 and AAR-31657 samples from Vojlovica-Rafineria nafte-nekropola II grave 69 modelled (combined); F) single plot with agreement indexes of AAR-31656 and AAR-31657 samples from Vojlovica-Rafineria nafte-nekropola II grave 69 modelled (combined) (rendering in OxCal v. 4.3.2 (Bronk Ramsey 2017) employing atmospheric information from Reimer *et al.* (2020) by Tibor-Tamás Daróczi)

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emergence, occurrence, and relative chronological attributions in the BA Carpathian Basin (Heinrich 2009, 305–8). They are quite commonly encountered in the middle Danube basin, mostly in burials along swords, axes, and arrowheads (Hänsel 1968a, 89; Innerhofer 2000, 140), but not in the BA ECB (Innerhofer 2000, 139). The only instances where a sword with a seal headed pin is documented is the one discussed in this paper, although such pins are encountered with daggers in the region, eg, Cx_098 from the burial ground of Pecica – Site 14 (Sava & Andreica 2013, 57, fig. 6). A major synthesis of BA nail headed pins, to which our example is also attributed, concludes that these are relatively rare in Transdanubia, but are present in large numbers in the LBA burial grounds on the Tisza river (Innerhofer 2000, 139, 377–8, map 41). Moreover, nail headed pins with a single decoration on the stem are only encountered in the region of the Alps and in the upper Tisza basin (Innerhofer 2000, map 41). While some claim that they are usually seen in burials of women (eg, Vasić 2003, 38), a detailed analysis indicates that they are more often seen in pairs in burials of women, especially the long stemmed ones, and individually in those of men (Blischke 2002, 66–70).

Rod-tanged sword: In the middle of the last century it was suggested that rod-tanged swords might be a shape that originated from the casting tails left of Vernaison type swords (McArdle 1969). Further, two origins have been put forward for these types of swords. One places their beginnings in the central Alpine regions and northern Italy, seen as spin-offs on the peripheries of the large Vollgriffschwerter production centres (Colquhoun & Burgess 1988, 12), the other relates them to Cypriot and Levantine tanged daggers of the EBA and MBA eastern Mediterranean (Gimbutas 1965, 33–5, figs 3/1, 4/2; Kemenczei 1988, 33–4). The first has a major problem in chronology, as the swords from the Alps and circum-Alpine region are dated to the Bz D and Ha A1 (Novák 1975, 12; Colquhoun & Burgess 1988, 12–3) while the present discovery from Peciu Nou is clearly far earlier. The latter theory lacked evidence from southern or south-eastern Europe from around the 16th or 15th centuries BC that would bridge the two hubs (Colquhoun & Burgess 1988, 12). MBA Cypriot rod-tanged daggers usually have rhomboid sections, which did not significantly influence the emergence and shapes of Aegean blades (Sandars 1961, 19). The lack of influence in the Greek archipelago in terms of tanged daggers of the EBA and MBA is also illustrated by the absence of such discoveries during the 3rd and earlier half of the 2nd millennium BC in the region (Branigan 1967; 1968, 12–27, 71–88, figs 1–7). In fact, the best example for an Aegean occurrence of such daggers with parallel sides of the blade are only found on the north-eastern periphery at EBA Thermi (type XVI) (Branigan 1974, 13, 161, no. 326, pl. 8), or with very close analogies with elongated, triangular shaped blades at EBA 2 (Red phase) Poliochni (type XV) (Branigan 1974, 12, 161, nos 317, 319, pl. 8), or at Troy in levels IIg and II–V (type XVI) (Branigan 1974, 13, 161, nos 324–5, pl. 9). Shorter rod-tanged blades (type 27), ie, daggers, from major Levantine sites like Tell Ajjūll, Tell Fara, Jerusalem, or Jericho are also documented mostly in the later MBA and represent a distinct, well-defined group (Maxwell-Hyslop 1946, 27–8, pl. iii). During the LBA this type still preserves its individuality and continues (type 2A) a local tradition on the eastern coast of the Mediterranean, which fades out during the EIA (Shalev 2004, 9–13, nos 20, 21, 32, 40, pls 2–3).

Wider chronological and social implications: It is precisely here, in this late MBA and early LBA social landscape, where our sword and warrior from Peciu Nou fits perfectly. Traveling warriors in the eastern Mediterranean, as soldiers of fortune or even as pirates, have been argued for (Hitchcock & Maeir 2016; Daróczi 2018, 125–33), which would explain the scarce traces left through the Aegean and Balkans to central Europe. Moreover, the east–central European ties demonstrated by the single pin in the grave (Fig. 3C) and the Carpathian Basin origins of the fragmentary heart shaped pendant (Fig. 3B) make a strong case for a travelling warrior returned home and buried with a sword that she learnt to use during her eastern voyages. As it pointed out above, such pendants are only documented in burials of women, which would make the present burial an extremely important and interesting one, especially since it would continue local, ECB traditions of warrior women armed with either light or foreign weapons (Daróczi 2017). The sword of Peciu Nou is slightly longer than its eastern Mediterranean counterparts but also shorter than its western analogies which are, at the same time, younger examples. The vectoring from Cyprus through the Danube basin to the Alps seems to have a clear directionality and indicates, if

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not an eastern influence in the development of rod-tanged central European swords, then at least a double sourced origin, a local and an eastern Mediterranean one. The latter seems especially likely, as the earliest examples in the Carpathian Basin appear at least as of Bz C2 (Kemenczei 1988, 33–4), ie, earlier than their Alpine and circum-Alpine analogies (see above). The sword from Peciu Nou Grave 92 represents the missing link between MBA Cypriot daggers and the LBA rod-tanged Central European swords, which is further cemented by the radiocarbon dating of Grave 92 (AAR-31643) to 1538–1421 cal BC (2 σ, Table 1, Fig. 8D).

Peciu Nou: Grave 49

Analogies are lacking for the pendant (Fig. 3A) made from a bronze wire with diagonally opposed, spiral ends from this grave. The radiocarbon dating of the calcined human bone sample (AAR-31642) places the time of disposal between 1415 cal BC and 1236 cal BC (2σ, Table 1, Fig. 8C). The calibrated age range dates the pendant in the LBA IIb–III period (Fig. 7).

Vojlovica II: Grave 69

The oldest copper/bronze diadems in the Carpathian Basin are dated to the Late Copper Age (LCA; Banner 1956, pl. 87/1–2, 4, 8). Later, during the MBA, metal frontlets appear in the region and are usually seen with children or women (Novotná 1984, 64–5, esp. no. 362). During the Banatian MBA copper and bronze frontlets are usually seen in burials of women (Foltiny 1941, 32, 36, 47, nos 141, 162, 221, pls 21/39, 21/53-4, 22/23; Girić 1971, pls 26/85-4, 27/80-1, 31/104-1, 42/140-1, 61/235-1). Diadems of the middle Danube basin peak on the watershed of the LBA to the EIA, ie Mozsolics's Kurd hoard horizon, and resonate with styles and renderings of the age (Mozsolics 1985, 59). The diadem (Fig. 6) from Vojlovica Grave 69b is not decorated, which is atypical for this time, but its presence does not come as a surprise as it falls in line with the trends in the region. In the middle Danube basin and the north-eastern part of the Adriatic coast half-finished or roughly finished metal objects are quite common around the end of the LBA, where they mostly comprise possible belt-plates (Kilian-Dirlmeier 1975, 115–6), but could also be interpreted as undecorated diadems or frontlets (Mozsolics 1985, 58–9; Schumacher-Matthäus 1985, 95). The radiocarbon samples (AAR-31656 and AAR-31657) from both individuals are very close (Fig. 9C–D), suggesting the simultaneous incineration of the bodies. The modelled and calibrated age range of both samples is 1406–1280 cal BC (2σ, Table 1, Fig. 7), ie, LB IIb–III.

Bobda: Grave 30

Circular finger-rings with two spiral ends, like the one from Bobda Grave 30, are usually seen in hoards and graves of the Bz D or BIV (Mozsolics) period, that is, dated to the LBA II (Fig. 7), and they disappear in the following BV (Mozsolics) phase (Mozsolics 1973, 55). This chronological attribution is recently confirmed by two radiocarbon dates (UGAMS-23656 & 23659), of Graves 78 and 518 from the burial ground of Tápé (Trogmayer 1975, 25–6, 115–16, pls 7, 46; O'Shea *et al.* 2019, table 3). They appear as early as the latest MBA, as the hoard of Rákospalota demonstrates (Mozsolics 1967, pl. 59/8). Furthermore, they are regarded as typical funerary goods of the earlier LBA, especially in Central Europe, from where this practice probably spread to the Carpathian Basin (Kemenczei 1965a, 114–15). In this context the radiocarbon date (AAR-31612) from Grave 30 from Bobda, represents one of the latest examples of this custom, as the 1379–1126 cal BC (2σ, Table 1, Fig. 8A) interval places the finger-ring at least in the latest LBA, if not to the earliest EIA, ie, Ha A2.

Voiteni grave 7a&b

Each of the burials of the double interment from Voiteni grave 7a&b contains a pair of small, hollowed-out, bronze ear-rings. The earliest examples of this type are documented in the Aegean, at Troy IIa and Drakhmani, dated to the later EBA and the earliest MBA (Branigan 1974, 45, 189–90, nos 2741, 2749, 2751, pl. 23). Burial grounds of the Banat contain ear-rings of this type, as early as the MBA (Girić 1971, pls 36/123-1, 2, 37/121-1, 76/287-7). Similar finds of the later EBA from northern Banat and from the earlier LBA in central Transylvania are also reported (Popescu 1956, 200, 6, figs 118/5, 123/6-7). They seem to have been enduring shapes in the Carpathian Basin as they stretch even beyond the temporal boundaries of the

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present examples, into the latest Hallstatt period (Nagler-Zanier 2005, 138–41, nos 2667–86, pls 171, 213B). The two radiocarbon measurements (AAR-31653 and AAR-31654), one from each of the two buried individuals, are extremely close, almost identical, which confirm their simultaneous incineration (Fig. 8E–F). The modelled and calibrated time range of the two dates significantly reduces their span, to the interval of 1260–1126 cal BC (2σ, Table 1), which would place the grave into the EIA, ie Ha A2.

Voiteni: Grave 15

The chronological reasoning presented above concerning finger-rings with two spiral ends must also be applied to the similar discovery from Voiteni Grave 15 (Fig. 5G) and dated to the EIA (Ha A/B). The nail headed pin (Fig. 5 A) from the grave is seen throughout the Banatian LBA (Vasić 2003, 44–5) with very good analogies in the north-central Carpathian Basin during the earlier LBA, just north of the Mátra mountains at Vizslás and Pétervására (Kemenczei 1984, pls 15/9, 12, 20, 25, 51/20-6; see above). Noppenringe are seen in the earlier BA of the north Pontic steppes (Antoniewicz 1929, 144, figs 22–5) and areas north-west of the Carpathian basin (Zaharia 1959, 108). They appear in Banatian graves as early as the later EBA (Popescu 1956, 206, fig. 123), albeit that they are smaller than the present ones (Fig. 5E–F). These types of lock-rings are also documented during the earlier LBA, at Muhi–Princtanya in the north-central Carpathian Basin (Kemenczei 1965b, 8, 10, fig. 6/1). In our grave, especially with the radiocarbon dating at hand, they attest the long lasting nature of this type even after the dusk of the BA, especially since they have been considered specific elements of the costume in the MBA of the upper Tisza basin (Schumacher-Matthäus 1985, 96). The willow-leaf shaped lock-rings, like the fragmentary ones discussed (Fig. 5B–C), have good analogies in hoards of the north Pontic steppes of the earlier BA (Antoniewicz 1929, figs 13–19), but also in the Uioara de Sus hoard of the latest LBA in Transylvania (Petrescu-Dîmboviţa 1977, 114–7, pl. 268/11; 1978, 50, pl. 206/1314). An early EIA dating by means of radiocarbon measurements sheds more light on the possible durable nature of these types.

Analogies for the fragmentary bronze cauldron (Fig. 5H) are lacking and its mending technique also seems to be unique. The so-called bangles with roof-shaped cross-sections (Fig. 5D) are documented in the Banat and Oltenia during the LBA II–III, ie, Bz D–Ha A1 (Petrescu-Dîmboviţa 1998, 168–71, nos 1979, 81, pl. 146), but examples of leg bangles are encountered in Transylvania and Oltenia only in the period of Ha B–C (Petrescu-Dîmboviţa 1998, 171–2, nos 2013–4, 2017, 2022, 2029, 2039, 2054, pls 147–50). Two more examples of this type are documented in the region of the Alps during the later LBA, with their origin pinned west of these mountains in the later MBA (Pászthory 1985, 157, nos 910–11, pl. 76). One of the latest instances where bronze bangles with triangular cross-sections, although not carinated, are seen is Grave 684 from Hallstatt, which is dated after the Ha D3 period (Siepen 2005, 122–3, nos 1338–9, pl. 76). While some of the finds from the grave 15 at Voiteni are clearly datable to the later part of the EBA and the MBA, some only appear as of the LBA II. The radiocarbon dating of the incinerated human remains (AAR-31655) places the cremation sometime in the interval of 1280–1056 cal BC (2σ, Table 1, Fig. 9B), that is, in the EIA, ie, Ha A2–B1.

Peciu Nou: Grave 25

The diadem (Fig. 2D) from Peciu Nou Grave 25 is undecorated, which is quite uncommon for this period, but nevertheless fits in the local trends of the age (see above). Lock-rings (Fig. 2B–C), like the ones from this grave, already appear in the later part of the MBA in north-western Transylvania at the site of Oarţa de Sus – Ghiile Botii (Kacsó 1987, 70, fig. 22–3; 2015, fig. 209). Similarly, at burial ground 1 of Sărata Monteoru, in the third phase of interments dated also in the latest phase of the MBA, several graves of the later MBA contain such discoveries (Zaharia 1959, 118–20, fig. 7/5-6). Several sites of the later MBA middle Danube valley and the Alföld have lock-rings with ladle ends, eg, Újhartyán – Vatya, Tiszaug – Keménytető, Tiszafüred – Ásotthalom and Mokrin (Girić 1971, pls 9/20-1, 10/21-6, 70/267-3; Bóna 1975, pl. 35/2-3, 198B/2-6, C/1-10). Slightly later, at Bijelo Brdo, on the right bank of the Danube, a similar lock-ring of gold is also reported in an early LBA grave (Åberg 1932, 56–7, fig. 93; Şandor-Chicideanu 2003, 221, no. 21). The earliest examples of the type are dated to the middle of the LBA (Hänsel 1968a, 114; 1968b, 220, list 119, esp. pl. 27/2-3, 5-6). They represent a long

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tradition in the ECB, which is uniquely specific for the customs of the region (Schumacher-Matthäus 1985, 96). It is precisely against this background that the present two lock-rings (Fig. 2B–C) and, especially, their absolute dating (Fig. 8B), bring new perspectives, as these shapes seemed to have been extremely enduring (Schumacher-Matthäus 1985, 96). The radiocarbon dating of the incinerated individual in grave 25 (AAR-31641) yielded the time span of 1014–901 cal BC 2σ, Table 1), which would place the interment and implicitly the grave goods in the latest EIA, ie, Ha B2–B2/3.

CONCLUSIONS

The radiocarbon dating of Grave 92 from Peciu Nou provides a three-pronged contribution, one more significant than the others. The most meaningful is that it provides chronologically secure proof for the missing link and vectoring in the spread of MBA Cypriote tanged daggers to LBA and EIA Alpine rod-tanged swords. Secondly, it is the only BA burial with a sword documented in the ECB. Thirdly, given that heart shaped pendants are only seen in burials of women in the BA Carpathian Basin (Schumacher-Matthäus 1985, 105), this grave represents the first documented case dated to the LBA, which follows a long tradition in the ECB of warrior women armed with light or foreign weapons (Daróczi 2017). The radiocarbon dating of Grave 49 from the same burial ground, places the discoveries in the LBA IIb–III period, which is all the more surprising as it is an early example of a pendant with double spirals of a unique shape (Fig. 3A). The long-lived nature of the the documented types of lock-rings (Figs 4, 5B–C, E–F) and ear-rings (Fig. 2B–C) is confirmed by accurate AMS measurements (Table 1).

The radiocarbon dating of Grave 30 from Bobda (Fig. 8A) contradicts some of the previous claims which placed the burial ground into the LBA II–III period (Motzoi-Chicideanu 2011, 78, no. 107; Szentmiklosi 2021, 258–9, no. 29), while confirming other assertions of LBA III–EIA (Ha A2) date, ie 13th–12th century cal BC (Gumă 1995, 105, pl. 19; 1997, 65–6; Sava 2020, 259; Sava & Ursuţiu 2021, 104). Furthermore, the burial grounds of Peciu Nou and Voiteni were dated to the LBA I–II in the past decade by two major synthesis (Motzoi-Chicideanu 2011, 135, 65, nos 709, 1070; Szentmiklosi 2021, 318, 51–2, nos 186, 277), to which the radiocarbon dating of Grave 49 from Peciu Nou, but especially the two graves from Voiteni and Grave 25 from Peciu Nou (Fig. 8B–C, E–H) come as major game changers, as they clearly show that interments continued in these two burial grounds well beyond the first two thirds of the LBA and into the EIA, even into the Ha B2/3. Lastly, the burial ground of Vojlovica II is attributed to the LBA II period by some (Motzoi-Chicideanu 2011, 134, no. 695; Szentmiklosi 2021, 352–3, no. 279), which is contested by the present dating of the double burial from Grave 69 (Fig. 9C–F), hence confirming the claims of the excavator of the site (Bukvić 2000, 146).

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RÉSUMÉ

DeathMetal Banatien : datation radiocarbone des sépultures à incinération du début de l'âge du Bronze à l'aube de l'âge du Fer, par Tibor-Tamás Daróczi, Andrei Bălărie, Jesper Olsen et Miroslav Birclin

Le manque de datations radiocarbones en contexte funéraire est une lacune majeure concernant l'âge du Bronze récent et l'âge du Fer ancien dans l'est du bassin carpatique, particulièrement dans la région du Banat. La présente série d'échantillons cherche à combler ce manque, en précisant les stratégies d'échantillonnages et des prétraitements employés, et en fournissant un ensemble robuste et cohérent de datations radiocarbones. Les implications des nouvelles dates radiocarbones sont abordées dans une perspective extrarégionale, tout en gardant au premier plan les questions de typo-chronologie, de circulation des biens, et des nuances sociales dans l'emploi des bronzes de l'âge du Bronze. Dix sépultures ont été sélectionnées dans quatre cimetières Banatiens en fonction de la présence de mobilier métallique dans les inventaires funéraires. En plus d'établir un cadre général de chronologie absolue pour ces sites de déposition, les données radiocarbones fournissent des arguments fiables pour l'attribution précise des objets métalliques découverts. De plus, les données nous permettent de remettre en question des attributions chronologiques établies auparavant.

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ZUSAMMENFASSUNG

DeathMetal im Banat: Radiokarbondatierung von Brandbestattungen der ausgehenden Bronzezeit und beginnenden Eisenzeit, von Tibor-Tamás Daróczi, Andrei Bălărie, Jesper Olsen und Miroslav Birclin

Das Fehlen von Radiokarbondaten aus Bestattungskontexten ist ein großes Manko für die Erforschung der Spätbronzezeit und der frühen Eisenzeit des östlichen Karpatenbeckens und insbesondere der Banatregion. Mit der vorliegenden Probenserie sollen diese Lücken gefüllt werden durch die detaillierte Erörterung der Beprobungsstrategien, angewandte Vorbehandlung und durch einen robusten und kohärenten Datensatz von Radiokohlenstoffmessungen. Die Auswirkungen der neuen Datierungen werden aus einer überregionalen Perspektive diskutiert, wobei Aspekte der Typochronologie, des Güterkreislaufs und der sozialen Nuancen der Verwendung bronzezeitlicher Bronzeartefakte im Vordergrund stehen. Aus vier Gräberfeldern im Banat wurden zehn Bestattungen anhand des Vorkommens von Metallfunden in den Grabinventaren ausgewählt. Neben der Etablierung eines breiten absolutchronologischen Rahmens dieser Bestattungsplätze liefern die Radiokarbondaten zuverlässige Argumente für die genaue Zuordnung der Metallfunde. Darüber hinaus erlauben es uns die Daten, einige der zuvor gegebenen chronologischen Zuordnungen in Frage zu stellen.

RESUMEN

Banatian DeathMetals: dataciones radiocarbónicas de enterramientos de cremación durante la Edad del Bronce e inicios de la Edad del Hierro, por Tibor-Tamás Daróczi, Andrei Bălărie, Jesper Olsen y Miroslav Birclin

La ausencia de dataciones radiocarbónicas de los contextos funerarios es una deficiencia importante de la Edad del Bronce final e inicios de la Edad del Hierro en la cuenca de los Cárpatos orientales, especialmente en la región de Banat. El conjunto de muestras que presentamos pretende afrontar estas insuficiencias detallando las estrategias de muestreo, el pretratamiento empleado, y proporcionando un conjunto de datos sólido y coherente de dataciones radiocarbónicas. Las implicaciones de estas nuevas dataciones radiocarbónicas se discuten desde una perspectiva supra-regional, mientras que se mantienen en primer plano los aspectos relacionados con la tipo-cronología, la circulación de bienes y los matices sociales del uso de los bronces durante la Edad del Bronce. Se seleccionaron 10 enterramientos de cuatro necrópolis de Banat en función de la aparición de los objetos de metal en sus inventarios funerarios. Más allá de establecer un marco de cronología absoluta para estos lugares de entierro, los datos de radiocarbono aportan argumentos fiables para una atribución precisa de los descubrimientos metálicos. Además, los datos nos permiten cuestionar algunas de las asignaciones cronológicas establecidas anteriormente.

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