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PREHISTORIC AMBER ITEM AT ŽABALJ-NOVE ZEMLJE SITE (VOJVODINA, SERBIA)

ABSTRACT

Furholt K., Groß H., Schröder S., Serbe B., Medović I., Stanković Pešterac T., Riese E., Wilkes F., Medović A. and Furholt M. 2025. Prehistoric amber item at Žabalj-Nove Zemlje site (Vojvodina, Serbia). *Sprawozdania Archeologiczne* 77/2, 355-372.

This study focuses on a newly-discovered, perforated pendant from the Žabalj-Nove Zemlje site in Vojvodina, Serbia. The main settlement structure of this multiperiod site is primarily associated with the Late Neolithic Tisza and Vinča cultures (5400-4500/4450 BCE), where two burned houses were excavated from a total of 204 rectangular building anomalies detected archaeomagnetically. A unique, triangular-shaped and perforated pendant appeared on the top of the daub layer of one of the burned houses. The layer was disturbed in several parts by later pits; thus, the pendant cannot be directly linked to a closed Late Neolithic context. Material analysis, including Scanning Electron Microscopy with Energy-Dispersive X-Ray Spectroscopy (SEM-EDX) and Fourier-Transformed Infrared Spectroscopy (FTIR), confirmed the material to be amber, while excluding other likely options such as beeswax or citrine. The Žabalj amber pendant is contextualised within the local scale and in the broader framework of the Carpathian Basin to gain insight into prehistoric amber use, which was predominant during the Bronze Age. However, this pendant does not typologically fit with Bronze Age amber beads; thus, the possibility exists that it dates to the Neolithic.

Keywords: Amber, pendant, Prehistoric Vojvodina, provenance study, analytical measurement, exchange system

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INTRODUCTION

This paper presents a newly discovered perforated amber pendant from the Žabalj-Nove Zemlje site in southern Bačka, Vojvodina, located in northern Serbia. The site is a multiperiod one, representing the entire Neolithic (Starčevo, Tisza, Vinča pottery styles; 6100/6000-4500/4450 BCE (Borić 2009; Tasić *et al.* 2015; Hofmann *et al.* 2019; Marić and Mirković-Marić 2020; Marić *et al.* 2022). There is also evidence of activity here in the Late Copper Age (Baden; Bulatović and Linden 2017), Late Bronze Age (Dubovac-Žuto Brdo group; 1600/1500-1400/1200 BCE; Molloy *et al.* 2023), Iron Age (Bosut and La Tène periods; Tasić 2004a) and Roman periods (Vilotijević 1965, 31, 32; Medović 1998, 83, 84). The raw material of the pendant was unclear at the time of discovery, as the item was opaque and heavily worn. Based on the initial macroscopic observation, the object's raw material appeared to be amber, but the possibility of petrified beeswax was also considered. Accordingly, this paper focuses on the following questions:

(1) Is the pendant made of amber, a mineral like citrine, or beeswax?

(2) How many known amber finds have been recorded in Vojvodina and the broader context of the Carpathian Basin?

(3) What kinds of amber items are found in the region?

(4) How well does the pendant at Žabalj fit within this general find spectrum?

To answer these questions, we provide details on the archaeological context of the pendant, as well as a morphological description. Moreover, to investigate and identify its raw material, we used Scanning Electron Microscopy (SEM), including Energy-Dispersive X-Ray Spectroscopy (EDX) and Fourier-Transformed Infrared Spectroscopy (FTIR) to determine its elemental composition. A mineral origin could be ruled out after SEM-EDX measurements; the results were then compared to data from amber and beeswax, both acquired from the authors' own samples, as well as relevant literature. Finally, we aim to

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collect and compare known amber finds at the local and regional scales, specifically in the context of the Carpathian Basin, to offer insights into the prehistoric amber exchange system and use patterns.

THE SETTLEMENT SITE OF ŽABALJ-NOVE ZEMLJE

The site is situated on the south bank of the Jegrička River, a right tributary of the Tisza, 4 km northeast of the modern municipality (*opština*) of Žabalj (in Serbian: Жабаљ, in Hungarian: Zsablya) (Fig. 1). It was discovered in 1958 by Šandor Nađ and Bogdan Brukner. The first reconnaissance of the terrain was conducted in 1965 by Olga Brukner and Predrag Medović. Surface finds on the highest part of the Žabalj-Nove Zemlje site indicate traces of several prehistoric settlements with both vertical and horizontal stratigraphy. The most numerous finds were from the Neolithic period. It was discovered that this site represents the southernmost manifestation of the Tisza culture in Vojvodina and the first such site in the territory of Eastern Bačka (Medović 1998, 83, 84). The first preventative

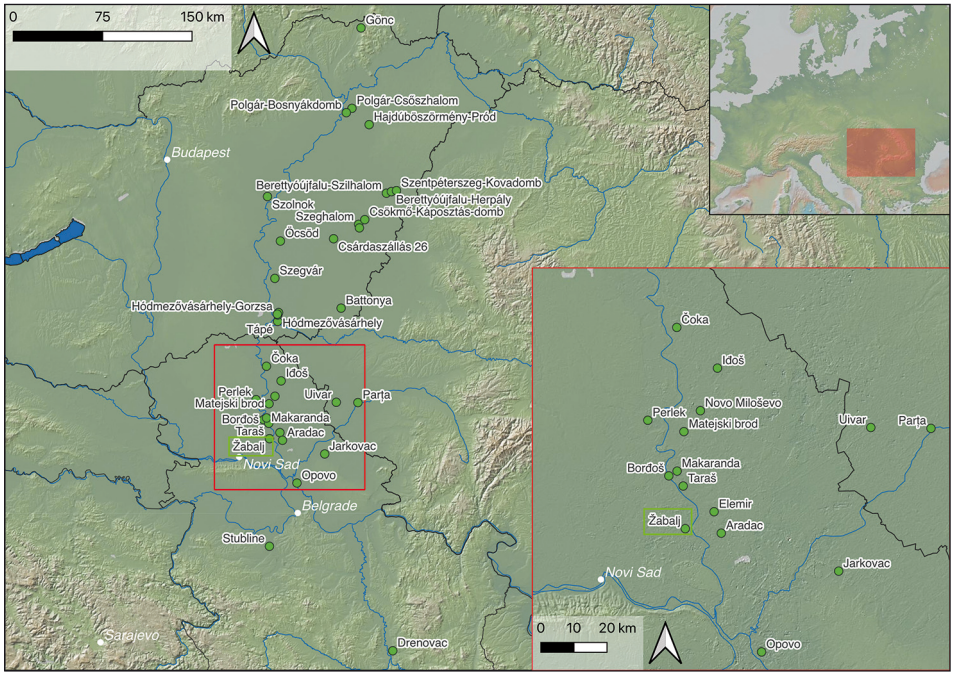

Fig. 1. The location of site Žabalj-Nove Zemlje (marked with a green rectangular frame) alongside other Tisza-Vinča tell and tell-like settlements (green dots) in the Carpathian Basin, as well as modern larger populated cities (white dots with white italic fonts). (Basic map: Global Multi-Resolution Topography (GMRT) Synthesis, source: https://www.gmrt.org/services/mapserver/wms_merc?, EPSG: 3857, made by Kata Furholt)

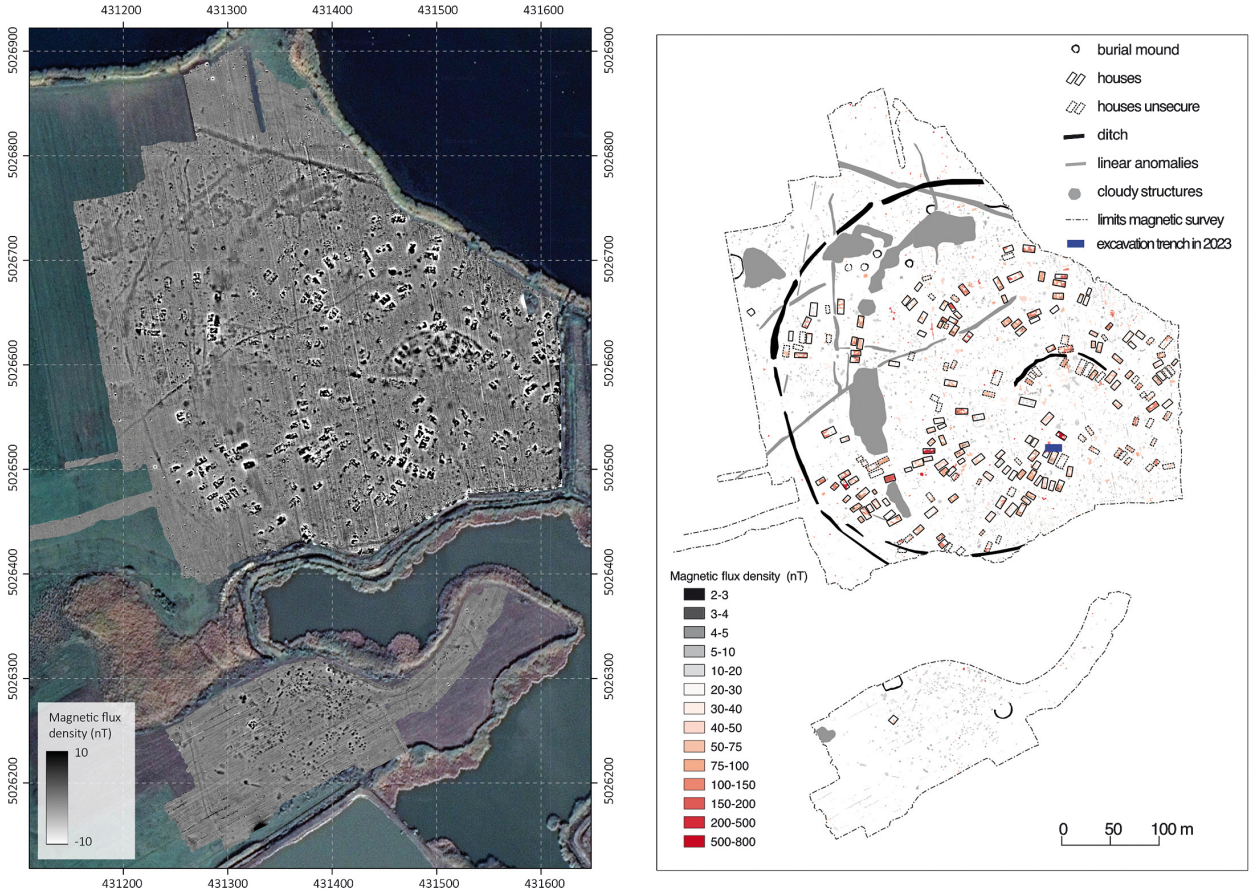

Fig. 2. Plan of the archaeomagnetic survey at Žabalj-Nove Zemlje (left side) and its interpretative plan with the excavation trench in 2023 (modified after Hofmann *et al.* 2025, 129, fig. 4, 131, fig. 5, made by Kata Furholt)

excavations at the site were carried out in 1965. During this time, an area of about 100 m² was examined. The first trench was placed in the most prominent part of the settlement to identify the stratigraphical correlation of the Neolithic cultural layers, while the second trench aimed to determine the extent of the settlement along the Jegrička River. During the excavations, no settlement remains were found except for a small part of a disturbed house floor at the periphery of the settlement and a fragment of a hearth. The conclusion after the excavations was that two settlements were formed at this location during the Late Neolithic: an Early Vinča (Vinča A) culture settlement and a classic Tisza (Tisza II) culture settlement (Vilotijević 1965). In the broader area of the settlement, smaller numbers of pottery fragments were discovered, associated with the Starčevo pottery style, the Middle and Late Bronze Age (Dubovac-Žuto Brdo and Gava-Belegiš), the La Tène, and the Medieval periods. Only a brief report and drawings of the diagnostic finds from the excavations are available, which have been stored at the City Museum of Novi Sad (Novi Sad, Serbia; in Serbian: Muzej grada Novog Sada).

The site was recently investigated through a geomagnetic survey and systematic field walking between 2018 and 2022 (Hofmann *et al.* 2025, 128-131), followed by drillings and small trench excavation carried out in the autumn of 2023. The field project was part of an international collaborative research effort involving Kiel University (Kiel, Germany; in German: Christian-Albrechts Universität zu Kiel), the Museum of Vojvodina (Novi Sad, Serbia; in Serbian: Muzej Vojvodine) and National Museum Zrenjanin (Zrenjanin, Serbia; in Serbian: Narodni muzej Zrenjanin). The geomagnetic prospection revealed a complex settlement structure featuring two circular ditches and numerous burned house anomalies spanning over 20 ha. The layout and orientation of the burned houses indicate several phases of the settlement, which will be studied further in the near future. The surveyed area measures 18.5 ha, and the reconstructed settlement covers approximately 15.6 ha (Hofmann *et al.* 2025, 126, table 1, 128-130, figs 3-5) (Fig. 2). The Jegrička River served as a natural border that limited the geomagnetic survey, as the northeastern and southern parts of the site are submerged. The recent modification to the channel path has likely caused flooding, potentially destroying parts of the site. The southern part of the surveyed area did not reveal specific structures, so we can assume that settlement activity ended at the southern edge of the large circular ditch. The main prospected area shows a very dense settlement structure. There is one primary linear anomaly that encircles the settlement and is interrupted at several points. We interpret this anomaly as an enclosure ditch around the settlement, as we see similar settlement layouts along the Tisza River and in the Balkans (*e.g.*, Szegvár, Hódmezővásárhely-Kökénydomb, Borđoš, Belovode, Opovo, Oreskovica, *etc.*) (Borić *et al.* 2018; Hofmann *et al.* 2019; Rassmann *et al.* 2021; Raczky *et al.* 2024; 2025). There is another ditch fragment in the centre of the eastern part of the prospected area, which also exhibits a circular shape. However, only a tiny part of it is visible. A total of 204 rectangular anomalies can be identified as burned houses (Fig. 2). All are located within the main ditch, with the majority concentrated in the southern and

eastern areas. The centre of the settlement might be located in the eastern section of the prospected area, as indicated by 10 burnt houses arranged radially and a small segment of a ditch to the north of the houses. An intact area exists in the centre of the settlement, a common feature of the enclosed and burned-house layout of the Late Neolithic period. The structures are not completely symmetrical, though there is no visible overlapping or superposition. In general, the dimensions of the houses range from 8 to 10 m in length and 5 to 6 m in width (Fig. 2).

A systematic field-walking activity using a 50 × 50 meter grid system was conducted in 2022, 2023, and 2024. A large number of ceramic, stone, and bone finds were recorded. The finds belong to cultures already known at this site. The dominant material dates to the Late Neolithic period. The highest concentration of finds was recorded in the eastern half of the investigated area. The rich assemblage of anthropomorphic figurines, including a two-headed anthropomorphic figure with two faces (Medović *et al.* 2025), a miniature figurine, an anthropomorphic protome, aryballoi, and other ceramic objects, characterises the Vinča-Tordoš pottery style. The number of vessels of the Tisza pottery style is represented in much smaller quantities, concentrated in the northeastern part of the settlement, closer to the Jegrička River.

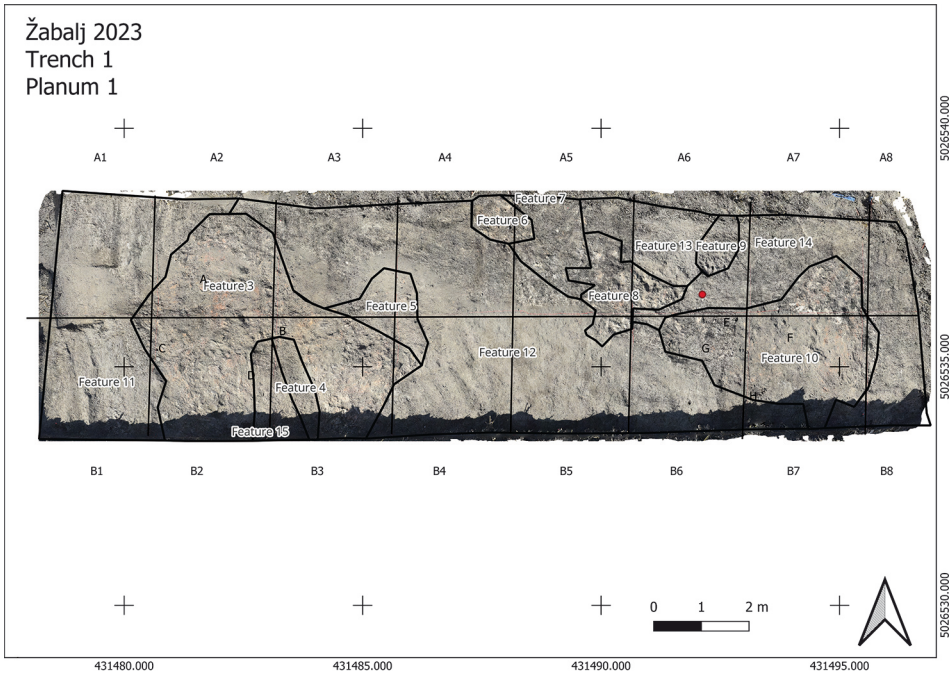

Fig. 3. The photogrammetry of the first excavated layer (Planum 1), the red point indicates the location where the amber item was discovered (level/spit 2) (made by Erik Riese)

In October 2023, a small trench excavation measuring 18 by 5 meters and oriented east-west was conducted at the proposed centre of the settlement (see the right side of Figure 2, marked with a blue rectangle). The trench was placed where two identifiable burned houses were probably situated near each other, and these were arranged towards an open area with no visible archaeological anomalies in the core settlement area. These burned houses (the western house is Feature 17 and the eastern house is Feature 22) align in a northeast-southwest direction and are part of the radially arranged house accumulation positioned towards the inner, smaller circular ditch. Based on radiocarbon dating, the Late Neolithic site was settled between 5060 and 4830 cal. BCE.

The amber pendant discussed in this text was discovered in Feature 14, which is identified as a feature in Planum 1, located in the eastern part of the excavated area. Feature 14 is bordered by Feature 9 to the northwest, Feature 8 to the west, and Feature 10 to the southwest (Fig. 3). The area of Feature 14 was documented in Planum 2 as Features 22, 26, 28, 30 and 31, from which Feature 22 is identified as the eastern house based on its heavily burned daub structure, which was scattered across A4-A8; B5-B8 quadrats (excavation grid units; Figs 3 and 4). Features 26, 28 and 30 were pits that cut the eastern house (Feature 22). Feature 31 is a mixture of burned daub and soil, which is also related to the eastern

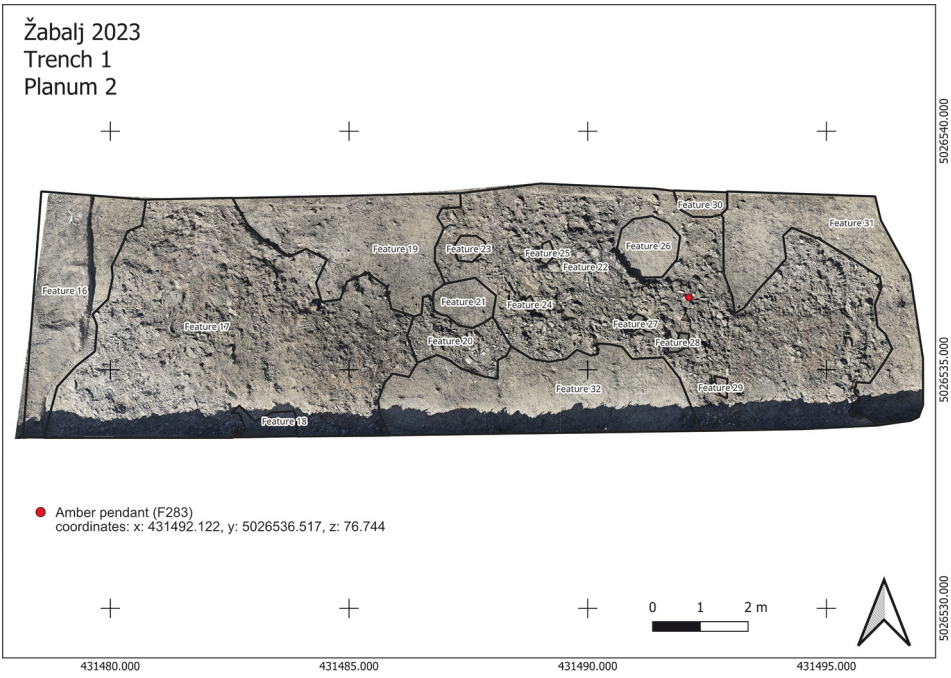

Fig. 4. The photogrammetry of the second excavated layer (Planum 2, the red point indicates the location where the amber item was discovered (level/spit 2), with its coordinates (made by Erik Riese)

house. This eastern house exhibits evidence of intensive disturbance, as several pits (Features 21, 26, 32, 37, and 42; see Fig. 4) show superposition and cut entirely through the house structure. The amber item was discovered in the second level/spit of quadrat A6, underneath Feature 14 (Planum 1) and above Feature 22 (Planum 2) in the daub structure of the eastern house. This means that the amber item did not come from a securely closed archaeological context but from the top of the burned daub structure of the Late Neolithic eastern house. The pendant item is registered as F283 (Find ID) and measured as a single find.

MATERIAL AND METHODS

The amber pendant

The object is made of a homogeneous, semi-transparent material in an orange-brown to honey-brown colour. The surface is carefully polished and heavily worn, as evidenced by the waxy, shiny edges. The item has a triangular shape (equilateral triangle); two sides are longer, and the acute angle is where the item was perforated. The third side is slightly

Fig. 5. The perforated pendant from the front, back and side views (made by Anna Sara Jagiolla)

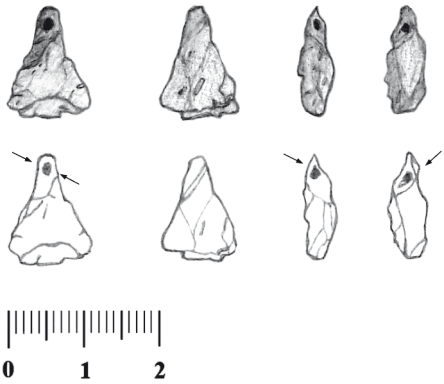

Fig. 6. The drawings of the perforated pendant (made by Finn Hülbrock)

curved and shows multiple minor areas of damage, which are worn and covered with a waxy, shiny surface. The middle part of the item is thicker than the perforated part and the curved bottom side. The perforation was made in a transverse direction, approximately 1 mm in diameter (Figs 5 and 6). The maximum length is 14.92 mm, the mesial width is 6.31 mm, and the thickness in the mesial part is 4.3 mm. The upper part with the perforation is 3.78 mm wide, while the bottom with the curved side measures 10.92 mm. The total weight is 0.6 grams.

Applied material measurement

To investigate and identify the material of the pendant, Scanning Electron Microscopy (hereinafter SEM), including Energy-Dispersive X-Ray Spectroscopy (hereinafter EDX), as well as Fourier-Transformed Infrared Spectroscopy (hereinafter FTIR), have been applied. The former is used to analyse the specific element composition and to rule out a possible mineral origin (*i.e.*, quartz or citrine). The latter is used to identify organic content, such as amber, to compare the object with previously investigated amber samples and to exclude the possibility that the object is composed of beeswax.

SEM-EDX measurements were performed in a Zeiss Gemini Ultra 55 with an Oxford Instruments EDX detector. The sample was used as-is, placed on an aluminium holder with a carbon adhesive pad and contacted with copper tape to reduce surface charging effects.

FTIR investigations were carried out on a Bruker Invenio R in total reflection mode (ATR). The required sample material was scraped from the bottom of the pendant, and the resulting powder was placed and measured in a stainless steel 2 × 2 mm holder. Three measurements were performed in total, and the resulting data were consecutively processed to compensate for atmospheric contaminants (H_2O, CO_2).

RESULTS

Elemental Composition

The elemental composition was determined via SEM-EDX over 14 data points (DP). Element detections below 1 atom percent (at%) are excluded due to being within the method's uncertainty (Table 1).

EDX was primarily performed to exclude the possibility of the object being quartz or its yellow variety citrine. These would be comprised of SiO_2, with citrine including Fe or Fe oxides. The respective elements could not be found in sufficient amounts. Traces of Al may originate from the sample holder, while other trace elements, such as Si and Ca, are commonly found in objects that have been in contact with soil. The source of P is unknown.

Table 1. Summary of EDX point measurements on the pendant, taken at data points 1-14. Results are given in at%. Elements detected below 1 at% are excluded, and values are rounded to whole numbers. Trace elements of Al, Si, P and Ca were found regularly, with a single data point further including K. An averaged composition of the object is given in the last column

Element/ DP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Ø
C	27	29	33	26	33	52	13	26	30	28	47	22	40	29	**31**
O	60	59	57	63	56	42	60	59	56	58	44	62	49	57	**56**
Al							6	2	3	3	2		2	2	**2**
Si							13	4	5	5	2	23	2	3	**3**
P	5	5	4	5	4	2	1	3	2	2	1	4	3	3	**3**
K							2								
Ca	7	7	5	6	6	3	2	4	3	3	3	6	4	5	**5**

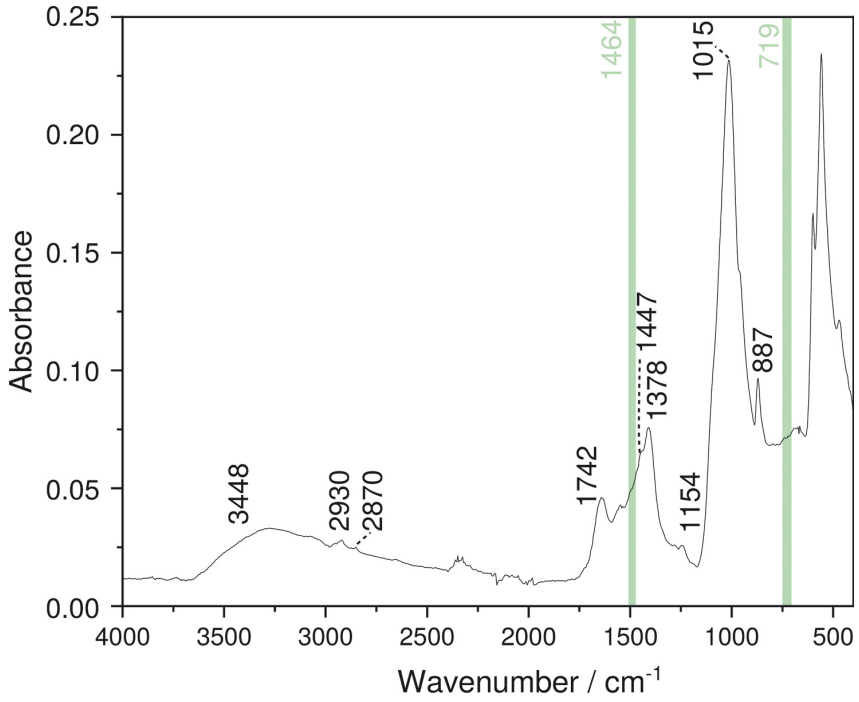

Fig. 7. FTIR spectrum of the pendant, averaged over 64 measurements and subsequently processed to compensate for the atmospheric contaminants.

Indexed bands correspond to: C-O stretches at 887 and 1154 cm^{-1}, C-OH stretch at 1015 cm^{-1}, C-H in-plane scissoring (bending) stretches at 1378 cm^{-1} and 1447 cm^{-1}, C=O stretch at 1742 cm^{-1}, C-H sp^3 hybrid stretches at 2870 and 2930 cm^{-1}, as well as the O-H stretch at ~ 3448 cm^{-1}. All of these correspond well to amber (Saleem 2023). Additional bands at ~700 cm^{-1} and ~2300 cm^{-1} stem from residual atmospheric CO_2. Bands at 719 cm^{-1} and 1464 cm^{-1}, marked in green, correspond to significant positions for beeswax (Chatzipanagis *et al.* 2024) (made by Stefan Schröder and Hendrik Groß)

FTIR spectroscopy

Previous work on (Baltic) amber (Saleem 2023) indicates that the central peaks identifying amber are at 887, 1015, 1154, 1378, 1447, 1742, 2870, 2930 and 3448 cm^{-1}, respectively (see indexed bands in Fig. 7). All of those, except one at 3448 cm^{-1}, are clearly present, giving a strong indication that the object is comprised of amber. The missing peak at 3448 cm^{-1} may be included within the broad peak between 3000 and 3500 cm^{-1}. An additional peak at ~2300 cm^{-1} and ~700 cm^{-1} stems from residual CO2 in the measurement atmosphere.

According to the literature, Chatzipanagis *et al.* (2024) found that beeswax shows significant peaks at 719, 1170, 1464, 1740, 2856, and 2922 cm^{-1}. Most of these overlap with peaks corresponding to amber. However, two peaks at 719 cm^{-1} and 1464 cm^{-1} are exclusive to beeswax and distinguishable from those of amber. In the object, both are present (green markers in Fig. 7), albeit barely identifiable, indicating that the sample is amber rather than beeswax. This is further supported by the high intensity of the peak at 1742 cm^{-1}, indicating a strong presence of carbonylic groups. This corresponds well with the composition of amber, mainly including succinine (Mills *et al.* 1985), which exhibits two carbonylic groups. In beeswax (myricyl palmitate), the long C-H backbone would constitute the majority of the signal and suppress the signal of the carbonylic group.

DISCUSSION

The applied SEM-EDX and FTIR spectroscopy confirmed that the pendant was made of amber, allowing us to rule out the possibility that it was either beeswax or citrine. The next step in the research is to collect additional prehistoric amber items in Vojvodina and, on a much broader scale, across the Carpathian Basin, to contextualise the Žabalj amber pendant. Amber items have been discovered in the archaeological materials of the Carpathian Basin dating to the Bronze Age (2700/2500-900/750 BCE) (Bouzek 1993; 141-144; Barta 2001; Gogâltan 2017; Staniuk 2021, Jaeger *et al.* 2023; Molloy *et al.* 2023).

The first appearance of amber is uneven across the Carpathian Basin. In some regions, the emergence of amber items dates to the Early Bronze Age, 2700/2500-2000/1900 BCE, and some of them to the Middle Bronze Age, 2000/1900-1600/1450 BCE (Jaeger *et al.* 2023; 2024; Ljuština 2019a; Staniuk 2021; Gogâltan 2016). The number of Early Bronze Age amber finds is very low; only Gligoreşti from Romania, HornýJatov from Slovakia, Csepreg, Budakalász, Százhalombatta and Szigetszentmiklós from Hungary were recorded (Gogâltan 2016, 147, fig. 2; Jaeger *et al.* 2024; Serbe 2024; 2025; Fig. 8).

During the Middle Bronze Age, the number of amber items increased, primarily found in the Danube and Tisza River Valleys and further south in the Drina and West Morava River Valleys (Belotić-Šumar, Bela Crkva-Cerik Bandera, Banjevac-Jovanin Breg, Brezjak-

Paulje, Vranjani-Veliki Lug and Jančići-Ravnine) (Palavestra 1993, 289, 290; Gogâltan 2016, 150, fig. 5; Jaeger 2016; Ljuština 2019a, 88; Serbe 2024; Fig. 8).

The distribution of amber finds shows a more scattered and non-clustered pattern in the Late Bronze Age (1600/1450-1000/900 BCE) (Molloy *et al.* 2023; Bruyčre *et al.* 2024), which is related to the smaller tributaries of the Danube (Hron/Garam, Váh/Vág) and the Tisza Rivers (Bodrog, Hernád/Hornád, Zagyva, Körös, Maros/Mureş, Bega/Begej, Timiş/Tamiš), in the foothill region of the Southern Carpathian Mountains and the Banat region in Vojvodina (Palavestra 1993, 289, 290; 2006, 32-40; Gogâltan 2016; Ljuština 2019a; 2022; Serbe 2024) (Fig. 8). It is worth mentioning regarding the chronology of Serbian territory that Nikola Tasić emphasised how difficult it is to clearly describe the distinction between the Middle and Late Bronze Ages in Vojvodina, particularly along the Tisza and Danube rivers, where strong influences are visible in the material culture, indicating interregional connections (Tasić 2004b, 28-30). The peak of the distribution of amber finds in the Carpathian Basin is dated to approximately 2000/1900 and 1600/1500 BCE, a period that is displayed in multi-layered settlements and necropolises with burial mounds (Brukner *et al.* 1974; Falkenstein 1998; Tasić 2004b; Ljuština 2022; Molloy *et al.* 2023).

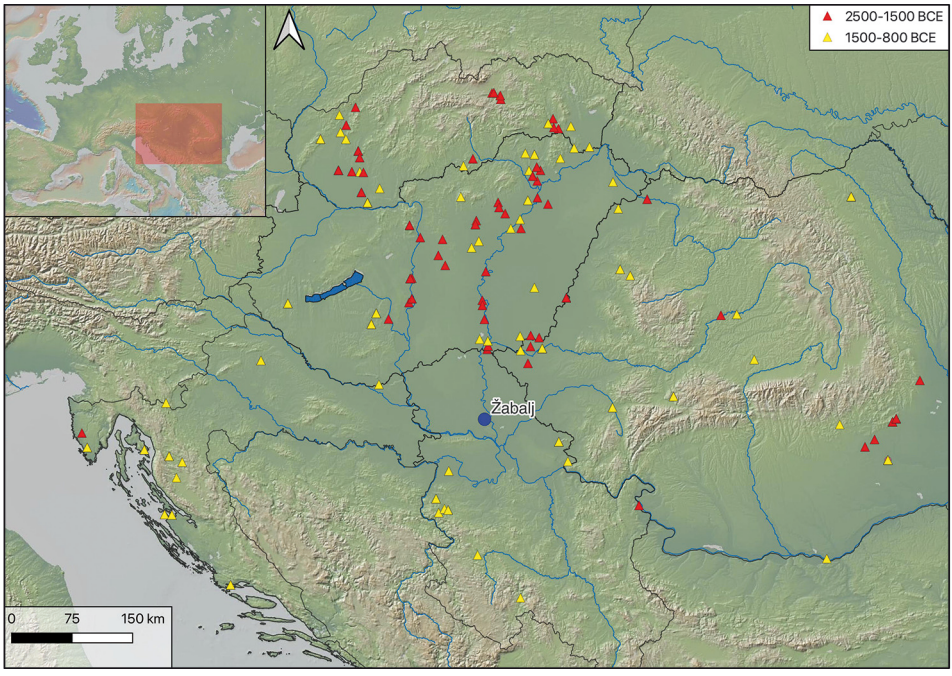

Fig. 8. Bronze Age amber finds in the Carpathian Basin and its surrounding area (made by Kata Furholt based on Gogâltan 2016, 152, fig. 6, 157, fig. 12; Ljuština 2019a, 88; Serbe 2024)

The vast majority of the Bronze Age amber finds were discovered as grave goods and hoards. The grave items, without exception, are essentially solely part of jewellery; the various kinds of beads were probably components of necklaces or armlets, although some might have served as clothing ornaments. In the case of cremations, we do not have information about the use of amber beads, which are often heavily damaged by fire, despite being placed in the urns. The common characteristic of these amber beads is the distinct circular perforations, which are often relatively large compared to the overall size of a bead. Their forms are diverse, like spherical, conical, biconical, prismatic, tabular, and flat cylindrical (Ljuština 2019b; 2020). In most cases, these beads are carefully polished, providing a nice shiny surface for these items. However, some of them have an amorphous shape and a rough, unpolished surface (*e.g.*, several perforated amber beads from the Jovanin Breg site in Banjevac) (Palavestra and Krstić 2006, 289, 290; Ljuština 2019a, 91, fig. 5).

The other groups of amber finds stem from Late Bronze Age hoards, but actually only one is known from Vršac-Majdan in the Serbian Banat (Ljuština 2019a). However, it is worth noting that altogether 18 hoards are known from the Carpathian Basin, dating to around 1600 BCE or later. The hoard from Vršac-Majdan contains 45 pieces of roughly polished amber beads as part of a necklace; many beads have biconical, flat-cylindrical, prismatic, elongated biconical, and amorphous forms. In 2008, a single small globular amber bead was discovered from a settlement pit context at the Banatski Dvor site, the neighbouring village of Žabalj (Ljuština 2019a, 97, 98).

Amber pendants – defined as objects with clearly off-centred perforation – have not until now been recorded for the Bronze Age in the Carpathian Basin. Mateusz Jaeger has noted typological and technological differences between Middle and Late Bronze Age amber beads in the Hungarian archaeological context, particularly that the later ones were produced using a more elaborate technique and displayed sophisticated forms such as cylinder beads with sharp edges and truncated biconical beads (Jaeger *et al.* 2023).

During the Middle and Late Bronze Age, a Baltic amber exchange system connected the North European region with the Balkans (Serbe in 2025, 211-215), integrating external influences into local traditions (Czebreszuk 2007; 2011; Jaeger *et al.* 2023). Chemical analyses have confirmed that most amber items in present-day Hungary (Jaeger 2016; Jaeger *et al.* 2023) and some amber beads from the Serbian sites (Ljuština 2019b; 2020) originated from the Baltic region, specifically the southern shores of the Baltic Sea. There is a Romanian amber variant called Romanite or Rumanite, which is chemically very similar to the Baltic amber (it is thermally altered succinite) (Stout *et al.* 2000; Teodor *et al.* 2009). The only difference between them is related to thermal alteration rather than botanical origin (Stout et al. 2000). Rumanite often exhibits a wide range of colours from light yellow to dark reddish brown. The core area of the original raw material source is in regions of Buzău and Colți in the historical region of Muntenia (often called Greater Wallachia), located between the Danube and the South Carpathians (Stout *et al.* 2000, 666). The Romanian amber type and its Southern Carpathian geological sources, which were distributed

towards Moldavia, Transylvania and probably other regions along the tributaries of the Danube and Maros/Mureş Rivers, have not yet been integrated into the common archaeological knowledge as a potential raw material (Stout *et al.* 2000, 665, 666, 676).

After an overview of Bronze Age amber finds in the Carpathian Basin, we can conclude that the Žabalj amber pendant does not align with the morphology of regional Bronze Age amber objects. It appears to be a raw piece that was polished and perforated for use as an ornament or a component of a necklace. The rarity of amber finds in Vojvodina, coupled with the fact that the Žabalj amber pendant is unlike Bronze Age amber beads, and amber pendants are not recorded in the Carpathian Basin. In addition to its discovery on top of a Late Neolithic burned house, this raises the possibility that the pendant is of Neolithic origin.

Further analytical studies are currently underway to identify the source of this amber pendant, including comparisons with potentially traded Baltic amber samples and more regional examples such as Simetite from Sicily and Rumenite from the southeastern Carpathian. The research focuses on determining a potential connection between northern Baltic amber and the source areas of eastern Romanian amber, as well as the distributed communities.

CONCLUSION

The discovery of a perforated amber pendant at the Žabalj-Nove Zemlje site in Vojvodina offers an outstanding opportunity to examine the significance of the socio-economic, temporal, and ritual dimensions of prehistoric amber use in the southern Carpathian Basin. According to the analytical measurements, including SEM-EDX and FTIR spectroscopy, the pendant was confirmed to be comprised of amber, ruling out alternative materials such as beeswax. Unfortunately, the Žabalj amber pendant was not uncovered from a securely closed archaeological context, which could have provided absolute chronological information about its date. Although the pendant is likely related to a Late Neolithic burnt house, we cannot completely rule out the possibility of younger (*e.g.*, Bronze Age) disturbances (pits which cut through the Late Neolithic house). The typological and contextual characterisation of the Bronze Age amber finds in the Carpathian Basin has identified general characteristics; however, the Žabalj pendant does not fit into this spectrum of amber beads, and the possibility that it dates back to the Neolithic remains valid. The Banatski Dvor and Vršac-Majdan sites are the only ones in Vojvodina where amber beads have been published, while more than a hundred sites with amber items are known in the Carpathian Basin. Most of the compared, typologically distinct Bronze Age beads were made of Baltic amber, which could explain the high degree of formal similarity. Some recent analytical studies have better defined Romanian amber and its archaeological use in the historical region of Muntenia, opening the possibility of identifying eastern connections between Bačka, Vojvodina, the Lower Danube, and the South Carpathian Mountain regions. The

Žabalj amber pendant requires further chemical analysis to determine its geological origin, which might assist in its chronological determination. This further provenance analysis could significantly expand our current knowledge of the early amber exchange system and the role of amber in the symbolic, economic, and social systems of prehistoric communities in Vojvodina.

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