*Radiocarbon* (2025), **67**, pp. 857–870
doi:10.1017/RDC.2025.10113

CAMBRIDGE UNIVERSITY PRESS

CASE STUDY

# Dating the Late Neolithic of the central Morava region: The Bayesian chronological modeling of archival samples from the site of Stublina (Supska, Serbia)

Miroslav M. Marić[1], Jelena B. Bulatović[2], Vera Ž. Bogosavljević-Petrović[3] and Nemanja D. Marković[4]

[1]Institute of Balkan Studies, Serbian Academy of Sciences and Arts, Knez Mihailova 35/IV, 11000 Belgrade, Serbia, [2]Department of Historical Studies, University of Gothenburg, Renströmsgatan 6, 412 55 Gothenburg, Sweden, [3]National Museum of Serbia, Trg Republike 1, 11000 Belgrade, Serbia and [4]Archaeological Institute, Knez Mihailova 35/IV, 11000 Belgrade, Serbia.
**Corresponding author:** Miroslav M. Marić; Email: miroslav.maric@bi.sanu.ac.rs

**Received:** 23 September 2024; **Revised:** 03 February 2025; **Accepted:** 22 March 2025

**Keywords:** Bayesian chronological modeling; Central Serbia; Late Neolithic; radiocarbon dates; Stublina Supska; Vinča culture

**Abstract**
The site of Stublina, first excavated in 1956 by Milutin Garašanin of the Institute of Archaeology and Radoslav Galović of the National Museum Belgrade is located at the southeast outskirts of the Supska village near the town of Ćurpija, in Central Serbia. Its location on the edge of the flood plain of the Central Balkans' major waterway, the Velika Morava River, places it on a major corridor extending south to north, linking southern Europe and the Aegean with the Pannonian plains in the north. Based on material finds, the site predominantly belongs to the Late Neolithic and is attributable to the so-called Vinča culture complex; however, sporadic finds of Early Neolithic Starčevo type pottery and Late Medieval burials were also reported. The results of the excavation were published in a single monograph in 1979, containing information on roughly half of the excavated area. However, radiocarbon dating was never performed on the site. The site of Stublina, containing evidence for the life span of the so-called Vinča culture complex in the Velika Morava River basin, one of the most important corridors during the entire Neolithic period of Southeast Europe, is a valuable chronological beacon based on its vast material record of pottery fragments, traditionally used to construct relative chronological sequences in the past. In this paper, we present the results of contextual radiocarbon dating using Bayesian chronological modeling with 28 new AMS $^{14}C$ radiocarbon dates, selected from the material archive located in the depos of the National Museum of Serbia in Belgrade. The samples were chosen from stratigraphically well-defined contexts published in the 1979 Garašanin and Garašanin volume on Supska. These contexts provide secure chronological order of layers and features, representing the entire life span of the site in the Late Neolithic period. Our results provide strong validation for archival records originating from old archaeological excavations and breathe new life into their potential for contemporary archaeological research, using techniques and methods unavailable at the time of their creation.

## Introduction

### *Background*

The Vinča culture, flourishing in the Balkans (Figure 1) between 5300 and 4500 cal BC, represents one of the most sophisticated Neolithic cultures in Europe with its advanced social organization, complex large settlements, extensive trade networks and early use of copper metallurgy (Jovanović 1980; Radivojević 2012; Radivojević et al. 2021) and elaborate material culture and unique symbolic systems, sometimes referred to as proto-writing. On a European scale, the Vinča culture epitomizes the transformative processes of early sedentary life of the Early Neolithic Starčevo population into a community of prolonged sedentary character that forms large, structured settlements; applies agricultural intensification, and cultural interaction that laid the groundwork for later European

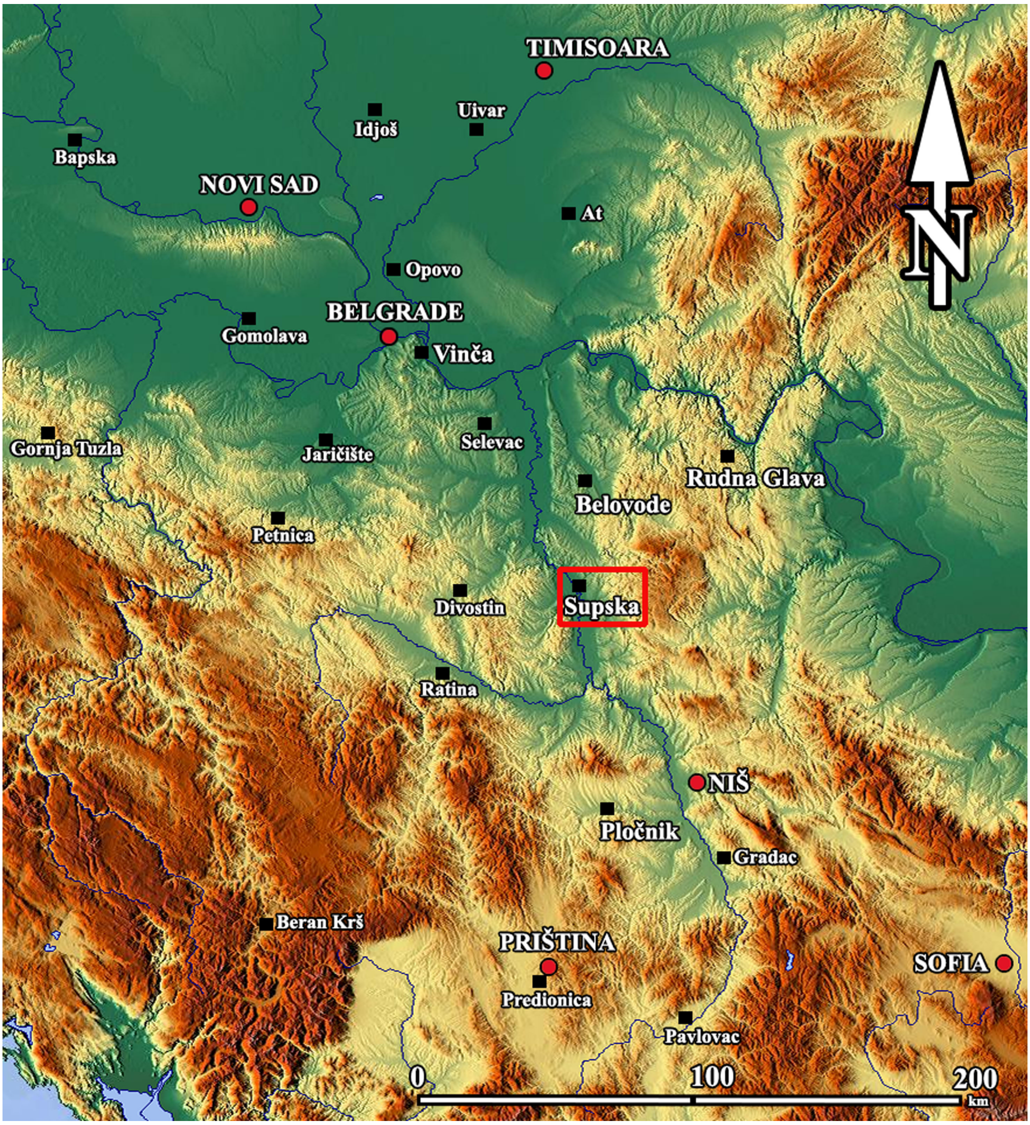


***Figure 1.*** *Map of Central Balkans with relevant sites of Vinča culture period (relief-map source https://maps-for-free.com/ distributed under Creative Commons CC0 license).*

civilizations. Its innovations and cultural complexity illustrate the dynamic interplay between local traditions and broader continental developments during the Late Neolithic period, often identified through the existence of exotic goods like obsidian, spondylus and glycymeris shells brought from afar. The introduction of the copper smelting in the latter half of its existence makes the population of the Vinča culture the earliest metallurgists of Europe. Several hundred sites of this material culture tradition are known, covering a vast territory and varying landscapes from the flats of the south edge of the Pannonian plain to the river valleys of the Central Balkans major flows nested between the hills and mountains. The long-lived settlements provide ample evidence of everyday lives, economy and of the Late Neolithic period in the Central Balkans but are also ideal for the creation of chronological sequences that further illuminate this millennial phenomenon.

One such important long-lived Vinča period settlement, the site of Stublina, on the outskirts of the Supska village in central Serbia (43°58'25.2”N, 21°22'48.3”E, 135 m a.s.l.), lies at the edge of the Velika

https://doi.org/10.1017/RDC.2025.10113 Published online by Cambridge University Press

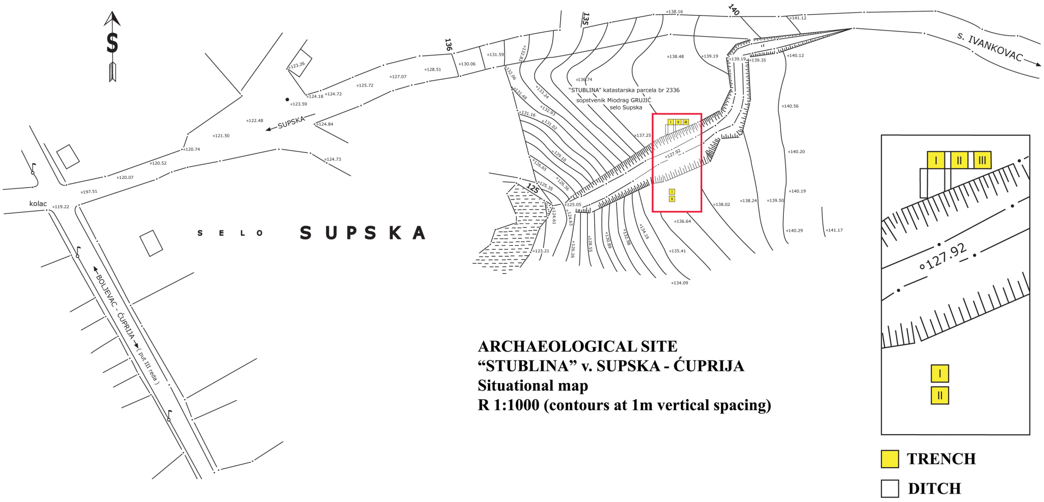


***Figure 2.*** *Situational map of Supska (adapted from Garašanin and Garašanin 1979).*

Morava flood plain not far from its paleomeander. The settlement was nested on a slightly elevated hillock on both sides of a gully, which was, most likely formed by a stream in the past, but is now dried out (Figure 2). The site is located in the southeastern part of the village and is partially covered by the contemporary village. Geographically, it is situated in the central part of the upper Pomoravlje region and is best known in regional archaeological literature as one of only a few excavated Late Neolithic sites that contain a complete sequence of the so-called Vinča cultural complex, a prominent phenomenon of the Central Balkans area. The site was already known prior to the Second World War, first detected by archaeologists of the Niš museum during their surveys of the territory under their jurisdiction. However, archaeological excavations would only take place a decade after the end of the Second World War, in August 1956. The research on the site was split between two institutions, the Institute of Archaeology which excavated on the north side of the ravine, and the National Museum from Belgrade excavating the south side. In total, about 45 square meters were excavated, 27 on the north side (a row of three 3 × 3 m-sized trenches dubbed blocks I–III spread west to east) and 18 $m^2$ on the south side of the gully (two 3 × 3 m trenches named blocks I and II, positioned north to south), by different excavators (Figure 1). A 1-meter-wide control profile was retained between each individual excavation block. Another, longitudinal, 10.5-m profile was created parallel to the gully profile in order to easily track stratigraphic changes. The excavation methodology employed arbitrary mechanical excavation layers, but true stratigraphy was observed and recorded in the profiles of trenches, linking the material to exact relative stratigraphy. Between 3.3 and 3.8 m of archaeological stratigraphy were recorded in the north part of the excavation area and around 3.4 m in the south (Garašanin and Garašanin 1979, 9). Sadly, the material from this sole excavation season would, only partially, be published over two decades later (the finds from the southern blocks I and II were never published). Besides the Late Neolithic settlement three inhumations belonging to the Late Medieval period were discovered (Jovanović et al. 2023) in the northern section, and the Late Starčevo culture layer was confirmed in the southern section, albeit with no detected features.

This partially published material from the site (Garašanin and Garašanin 1979), in addition to the material record of the eponymous site of Belo Brdo in Vinča (Vasić 1932, 1936a, 1936b), still represents an important local reference point for the Velika Morava area in general, with close ties to pottery assemblages of nearby sites like Slatina-Turska Česma near Drenovac and Slatina-Motel near Paraćin, but also other Late Neolithic sites found further east like Belovode (Mirković-Marić et al. 2021) or further west like Grivac, Selevac and Divostin (Madas 1988; Nikolić 2004; Vukmanović and Radojčić 1990). The published volume of Milutin and Draga Garašanin (1979) contained a detailed description of pottery finds recovered in the three blocks of the northern sector, divided into separate plates at the back

https://doi.org/10.1017/RDC.2025.10113 Published online by Cambridge University Press

of the volume and organized by stratigraphic layers observed during the excavation. In total, Milutin Garašanin devised 9 stratigraphic strata, consisting of 21 arbitrary excavation layers unequally split between the strata. Certain stratigraphic strata contained multiple features, mostly incomplete (e.g. strata 4 contained dark yellow soil next to western profile, surface A, daub near corner C, light colored soil near corner A, finds beneath charring, and oven 1), while others had none associated with them (Garašanin and Garašanin 1979, 11–15). Based on these strata, Garašanin published carefully selected chronologically sensitive pot fragments, in order to best illustrate the whole of the relative stratigraphy of the site. In his work, Garašanin relied on linking the detected contexts and features found in Stublina with already defined phases of the Vinča culture complex. Starting from the available relative chronological divisions devised by previous authors like Vasić (1936b), Holste (1939), Milojčić (1949) and himself (Garašanin 1951), Milutin Garašanin dissected the pottery assemblage of Supska layer by layer fitting it into his proposed relative chronological scheme, which would remain a very significant part of his professional career throughout the following decades and which he fine-tuned until the very end (Garašanin 1979, 1990, 1993, 1995).

In 2019, a geophysical survey was performed on parts of the site, covering approximately 8.5 hectares, revealing the existence of enclosure ditches and rectangular wattle and daub structures both on the inside and the outside of the enclosure, only recently published (Obradović et al. 2025).

## ***Material and methods***

In 2020, a project named Regional Absolute Chronologies of the Late Neolithic in Serbia (RACOLNS), set to obtain new AMS radiocarbon dates for a larger number of the Late Neolithic Vinča sites from the territory of Serbia, obtained samples from the site of Supska stored in the National Museum of Serbia. The importance of this site for the absolute chronology of the Velika Morava basin during the Late Neolithic cannot be overemphasized due to its perfect position in the central part of this prominent south to north corridor that must have played a very significant role in the Neolithic social and economic networks of the Central Balkans, evident for instance in the finds of Carpathian obsidian on Supska itself and neighboring sites of Motel Slatina, Turska Česma–Drenovac, Crnokalačka bara and other (Tripković and Milić 2016, 129). In total, 28 samples of animal and human bone were taken from the available material records stored in the National Museum of Serbia in Belgrade (Table 1). Owing to the fact that the majority of animal bones found during the excavations (Figure 3) were reburied with the backfill of the trenches in 1956 (no archaeozoologists operated in Serbia at that time), the pool of preserved animal bones was rather small, consisting of several boxes of usually smaller-sized bones that were often preserved due to being misidentified in the material finds triage process in the field. However, save for stratum 6, even this limited pool provided enough potential animal bone samples. Preserved excavation documentation, consisting of multiple field logs, black and white photo negatives, scale maps and plans provided the basis, alongside the published monograph, for the stratigraphic analysis of sample positions. Combined, the existing documentation enabled us to construct a relative stratigraphy of radiocarbon samples facilitating the construction of a model within a Bayesian chronological framework. The bone fragments originated from various sectors, which made the section plan containing the schematic for equalizing excavation layers against strata, published in the 1979 volume, an essential document (Garašanin and Garašanin 1979). The bones were identified, where possible, to species level, with domestic cattle (Bos taurus) dominating the sample with 14 individual fragments, followed by red deer (Cervus elaphus)—7 fragments, wild boar (Sus scrofa)—2 fragments, and sheep/goat (Ovis/Capra sp.)—2 fragments. Sadly, no exact contextual information other than stratum data existed for the majority of the bones. Being forced to choose samples from a limited number of available animal bones, an effort was made to choose the likeliest of them to provide well-preserved collagen, and it is our understanding that the measurements obtained are the best possible results from the available pool. Obviously, the stratigraphic positioning of the bones also played a significant role in their good state of preservation, as Neolithic layers begun to emerge only at about 40 cm relative depth and extend down to 3.5 m depth, decreasing possible later period contamination of samples.

***Table 1.*** *List of radiocarbon determinations and related stable isotopic measurements from Supska*

| Laboratory code | Sample code | Species | Bone | Excavation layer | Stratum | Ceramic phase | $^{14}C$ age (BP) | ± | $\delta^{13}C$ (‰) | $\delta^{15}N$ (‰) | C:N | Collagen yield (%) | Cal BC (2σ) (OxCal v4.4) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRAMS-5663 | SU 56/33/1 | Bos taurus | Mandibula | Block 1, Spit 3 | 1 | Vinča D2 | 5826 | 26 | –22.21 | 7.86 | 3.2 | 3.0 | 4786–4603 |
| BRAMS-5664 | SU 56/118/1 | Bos taurus | Ulna | Block 1, Spit 4 | 2 | Vinča D1 | 5837 | 26 | –24.28 | 9.16 | 3.2 | 11.1 | 4788 (84.4%) 4650<br>4642 (11.1%) 4612 |
| BRAMS-5665 | SU 56/1/1 | Bos taurus | Metacarpal | Block 1, Spit 5 | 3 | Vinča D1 | 5820 | 26 | –21.34 | 7.76 | 3.2 | 10.2 | 4783 (6.6%) 4746<br>4730 (87.5%) 4596<br>4566 (1.4%) 4555 |
| BRAMS-5668 | SU 56/61/1 | Cervus elaphus | Mandibula | Block 3, Spit 7 | 3 | Vinča D1 | 5935 | 26 | –22.33 | 7.8 | 3.1 | 9.1 | 4896 (8.3%) 4867<br>4850 (87.2%) 4722 |
| BRAMS-5669 | SU 56/3/1 | Cervus elaphus | Maxilla | Block 1, Spit 8–9 | 4 | Vinča C | 5856 | 26 | –23.0 | 7.85 | 3.2 | 10.9 | 4796 (91.9%) 4670<br>4665 (0.6%) 4658<br>4635 (2.9%) 4617 |
| BRAMS-5672 | SU 56/69/1 | Bos taurus | Upper M3 | Block 3, Spit 11 | 5 | Gradac phase | 6052 | 26 | –21.86 | 8.48 | 3.2 | 2.2 | 5037 (87.2%) 4887<br>4871 (8.3%) 4847 |
| BRAMS-5675 | SU 56/76/1 | Bos taurus | Humerus | Block 3, Spit 16 | 7 | Vinča B1 | 6164 | 26 | –22.24 | 7.6 | 3.2 | 13.7 | 5212–5029 |
| BRAMS-5676 | Su 56/77/1 | Bos taurus | Scapula | Block 3, Spit 17–18 | 8 | Vinča A | 6642 | 26 | –21.14 | 6.76 | 3.2 | 9.1 | 5627 (91.8%) 5521<br>5496 (3.7%) 5484 |
| BRAMS-5678 | Su 56/26/1 | Cervus elaphus | Ulna | Block 1, Spit 18 | 9 | Vinča A | 6186 | 26 | –22.82 | 8.87 | 3.2 | 2.8 | 5216–5042 |
| DeA-31064 | SU 56/34/1 | Sus scrofa | Femur | Block 2, Spit 2 | 1 | Vinča D2 | 5950 | 60 | –21.7 | 10.1 | 3.4 | 4.6 | 4993–4709 |
| DeA-31065 | SU 56/31/1 | Bos taurus | Metacarpal | Block 1, Spit 4 | 2 | Vinča D1 | 5696 | 53 | –22.3 | 8.4 | 3.4 | 5.9 | 4688 (92%) 4443<br>4421 (2.5%) 4398<br>4382 (0.9%) 4371 |
| DeA-31066 | SU 56/42/1 | Sus scrofa | Humerus | Block 2, Spit 5 | 3 | Vinča D1 | 6012 | 40 | –20.9 | 9.8 | 3.2 | 7.7 | 5003–4794 |
| DeA-31067 | SU 56/1/2 | Cervus elaphus | Metatarsal | Block 1, Spit 5 | 3 | Vinča D1 | 6019 | 64 | –20.9 | 7.1 | 3.6 | 5.2 | 5203 (2.0%) 5181<br>5060 (90.8%) 4771<br>4761 (2.7%) 4726 |
| DeA-31068 | SU 56/2/1 | Cervus elaphus | Phalanx 2 | Block 1, Spit 10 | 4 | Vinča C | 6014 | 49 | –21.1 | 6.1 | 3.3 | 7.2 | 5042–4785 |
| DeA-31069 | SU 56/62/1 | Bos taurus | Upper M3 | Block 1, Spit 10 | 4 | Vinča C | 6068 | 45 | –21.8 | 11.0 | 3.2 | 2.3 | 5207 (6.9%) 5164<br>5120 (1.6%) 5097<br>5078 (86.8%) 4836<br>4809 (0.2%) 4805 |
| DeA-31070 | SU 56/51/1 | Bos taurus | Lower M2 | Block 2, Spit 11 | 4 | Vinča C | 6307 | 54 | –22.9 | 9.4 | 3.4 | 1.0 | 5468 (2.3%) 5444<br>5382 (86.5%) 5206<br>5170 (4.7%) 5116<br>5101 (2.0%) 5074 |

(*Continued*)

***Table 1.*** (*Continued*)

| Laboratory code | Sample code | Species | Bone | Excavation layer | Stratum | Ceramic phase | $^{14}$C age (BP) | ± | $\delta^{13}$C (‰) | $\delta^{15}$N (‰) | C:N | Collagen yield (%) | Cal BC (2σ) (OxCal v4.4) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DeA-31071 | SU 56/70/1 | Bos taurus | Phalanx 3 | Block 3, Spit 11 | 5 | Gradac phase | 6099 | 32 | –22.4 | 8.6 | 3.3 | 7.5 | 5208 (13.5%) 5162<br>5121 (2.5%) 5096<br>5079 (79.5%) 4905 |
| DeA-31072 | SU 56/8/1 | Canis familiaris | Mandible | Block 1, Spit 12 | 5 | Gradac phase | 5948 | 54 | –20.5 | 8.3 | 3.5 | 9.1 | 4987 (1.9%) 4967<br>4955 (93.6%) 4712 |
| DeA-31073 | SU 56/60/1 | Bos taurus | Metatarsal | Block 3, Spit 6 | 3 | Vinča D1 | 5992 | 43 | –22.5 | 6.9 | 3.4 | 9.6 | 4999 (94.2%) 4783<br>4746 (1.2%) 4732 |
| DeA-31074 | SU 56/73/1 | Ovis/Capra | Upper M1 | Block 3, Spit 13 | 6 | Vinča B2/ Gradac phase | 6382 | 67 | –21.1 | 10.2 | 3.4 | 1.2 | 5477 (80.9%) 5287<br>5274 (14.6%) 5217 |
| DeA-31075 | SU 56/16/1 | Cervus elaphus | Phalanx 2 | Block 1, Spit 14 | 7 | Vinča B1 | 6195 | 49 | –23.2 | 7.0 | 3.3 | 6.1 | 5300 (9.6%) 5254<br>5223 (85.9%) 5004 |
| DeA-31076 | SU 56/78/1 | Bos taurus | Upper M1 | Block 2–3, Ctrl. Prof. | 8 | Vinča A | 6198 | 49 | –22.8 | 8.8 | 3.3 | 1.6 | 5301 (10.7%) 5252<br>5224 (84.7%) 5005 |
| DeA-31077 | SU 56/19/1 | Ovis/Capra | Astragalus | Block 1, Spit 16 | 8 | Vinča A | 6218 | 49 | –20.4 | 8.1 | 3.0 | 6.8 | 5306–5041 |
| DeA-31078 | SU 56/77/1 | Bos taurus | Scapula | Block 3, Spit 17–18 | 8 | Vinča A | 6728 | 52 | –21.2 | 6.8 | 3.4 | 8.3 | 5729–5555 |
| DeA-31079 | SU 56/54/1 | Bos taurus | Phalanx 2 | Block 2, Spit 17 | 8 | Vinča A | 6201 | 56 | –23.0 | 8.4 | 3.5 | 4.4 | 5305 (14.1%) 5242<br>5229 (81.3%) 5001 |
| DeA-31080 | SU 56/55/1 | Bos taurus | Phalanx 1 | Block 2, Spit 18 | 8 | Vinča A | 6290 | 64 | –21.4 | 8.2 | 3.5 | 4.5 | 5467 (1.8%) 5446<br>5381 (73.6%) 5201<br>5185 (20.1) 5055 |
| DeA-31081 | SU 56/23/1 | Cervus elaphus | Metacarpal | Block 1, Spit 18 | 9 | Vinča A | 6212 | 47 | –23.1 | 8.9 | 3.4 | 8.0 | 5306 (17.6%) 5237<br>5231 (77.8%) 5033 |

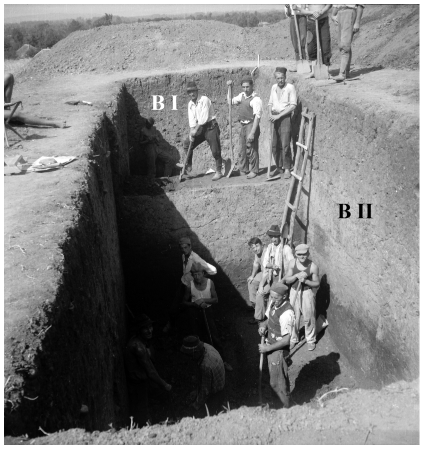


***Figure 3.*** *Excavations of Milutin Garašanin in 1956 (documentation of the National Museum of Serbia).*

The animal bones sent to the Hertelendi Laboratory of Environmental Studies were prepared according to their self-developed continuous-flow bone sample preparation equipment, using Omnifits® columns as flow cells to automate the ABA cleaning systems (Bronk Ramsey et al. 2004). The clean sample is inserted into a test tube, placed in a heating block at 75ºC for 24 hr, after which the dissolved collagen is filtered and freeze-dried for 1–2 days (Molnar et al. 2013). The bone samples sent to the Bristol Radiocarbon AMS Facility (BRAMS) were treated using a modified Longin method (Longin 1971) as outlined by Brock et al. (2017). Coarse bone powder was demineralized in 10 mL 0.5 M HCl (about 18 hr) before being rinsed in deionized water and then treated to remove "humic acids" in 0.1 M NaOH (30 min). After further rinsing and an acidic wash, followed by another rinsing, the samples were gelatinized (pH 3, 75ºC for 20 hr), then filtered through pre-combusted tightly packed glass fiber plugs and lyophilized. AMS 14C analysis is performed on the BrisMICADAS device designed and built by the Laboratory of Ion Beam Physics, ETH, Zurich (Knowles et al. 2019).

Calibrations of the obtained measurements and the Bayesian modeling presented were done according to IntCal20 (Reimer et al. 2020) using the OxCal v4.4.4 software (Bronk Ramsey 2009).

The integrity of the extracted collagen was proven to be adequate, with collagen yield above 1.0% for all sampled bones and C/N ratios between 2.9 and 3.6 (Table 1), indicating well-preserved bones (Brock et al. 2010; van Klinken 1999). The good quality of samples obtained was rather unexpected, due to the fact that the samples were pooled from leftover animal bones originating from a much larger contingent that was kept separate after excavations in 1956 and never processed or published (Garašanin and Garašanin 1979, 10) and is now lost to us.

## Results

The 27 new Late Neolithic dates from the Stublina site near Supska are presented in Table 1. While their range is generally in the traditional span of the Vinča culture complex, as evidenced by previous work on the subject (Tasić et al. 2016; Whittle et al. 2016), without Bayesian modeling it was impossible to obtain a finer insight into the detailed chronology of the site. The results were modeled using a Bayesian chronological framework (Bronk Ramsey 2009; Buck et al. 1996) which enabled combining the knowledge of the relative stratigraphy of the excavated part of the site, published in Garašanin's book on Supska (Garašanin and Garašanin 1979), with the radiocarbon dates obtained on material from individual phases identified during excavations and in the processing of finds.

In his seminal book on the site results, after the detailed description of selected pottery finds from individual strata found in three excavated trenches, Garašanin presented the relative stratigraphic

https://doi.org/10.1017/RDC.2025.10113 Published online by Cambridge University Press

sequence elaborated in great detail (Garašanin and Garašanin 1979, 37–41) based on typological and stylistic traits of discovered pottery. For the purpose of this paper, it is only summarily presented here. Starting from the very bottom of the excavated trenches, the two deepest strata, strata 9 and strata 8 Garašanin dated to the late Vinča Tordoš I phase (Vinča A), towards the beginning of the Vinča Tordoš II phase (Vinča A/B), as defined in his proposed Vinča chronological scheme defined over several decades (Garašanin 1979, 1995). The following, stratum 7 Garašanin dates to Vinča Tordoš II phase (Vinča B1), more precisely to its early part, while stratum 6 is put towards the developed part of Vinča Tordoš II phase (Vinča B2/Gradac phase), and the beginning of the Gradac transitionary phase (Jovanović 2006). Stratum 5, which Garašanin defined based exclusively on finds from closed contexts, is linked to the start of the Gradac phase, a transitory phase from non-metallic Vinča Tordoš phases (Vinča A-B) to metallic Vinča Pločnik (Vinča C-D) phases. Stratum 4, with a wide variety of biconical bowls, is dated by Garašanin to the Early Vinča Pločnik I phase (Vinča C), further supported by the discovery of numerous stamped decorations on pots, a very typical characteristic for this phase. A somewhat different assemblage of bowl types and scarcity of ornaments in stratum 3 made Garašanin date it to the beginning of the Vinča Pločnik IIa phase (Vinča D1), similar to stratum 2 which also contains novel ribbon shape handles that do not exceed the rim of the vessel, previously unattested on the site. Finally, stratum 1 is dated by Garašanin to the Vinča Pločnik IIb (Vinča D2), or to the very end of the Late Neolithic Vinča material culture in Serbia.

Based on this relative stratigraphy, our Bayesian model is relatively simple and straightforward (Figure 5) when plotted against the stratigraphic record. Each stratum is recorded as an individual phase within a longer sequence of the entire site. The overall agreement of the model (Amodel) is 55. The overall agreement is somewhat higher (Aoverall) at 60. Out of the 28 radiocarbon dates available, 6 proved to be outliers (either intrusive or residual samples from undetected disturbances), most critical the single date from Stratum 6 (DeA-31074), which hampered the creation of the absolute chronological sequence a bit. However, even the problematic samples, i.e. the samples which yielded radiocarbon dates out of the correct chronological position and with bad agreements (like DeA-31065, DeA-31072 or DeA-31080) were kept in the model as their collagen yield and C/N ratio showed good bone preservation (Table 1) indicating with a high degree of certainty that the measured radiocarbon dates are correct, even if potentialy misplaced in the stratigraphic sequence.

The remaining dates provide a solid basis for the establishment of a precise chronological sequence in the three trenches excavated during the 1956 campaign, which, most likely, adequately represent the life span of the Vinča period settlement in its entirety. The Bayesian modeling of the start of the Late Neolithic occupation on the site, defined by the Supska Tau_Boundary expression, indicates that initial settling occurred at 5731–5076 cal BC (95.4% prob.), likely between 5286 and 5101 cal BC (68.3% prob.). This places the start of the Late Neolithic occupation (stratum 9) on Supska well within the Vinča Tordoš I span in its later half (Whittle et al. 2016, 37), which corresponds with Garašanin's assumptions made on the stylistic analysis of material finds, mentioned above. The end of Stratum 9 and the beginning of Stratum 8 is modeled at 5182–5026 cal BC (95.4% prob.), or potentially 5158–5088 cal BC (68.3% prob.), which can be related to the end of the Vinča Tordoš I and the first half of the Vinča Tordoš II phase, again as predicted in his relative stratigraphy by Garašanin. A chronologically relatively close end of Stratum 8 and the onset of Stratum 7, modeled at 5154–5051 cal BC (95.4% prob.), probably 5125–5065 cal BC (68.3%) correlates to the end of the first half of Vinča Tordoš II phase (Whittle et al. 2016: 37), somewhat later than Garašanin's relative dating into the early part of Vinča Tordoš II phase. The modeled end of Stratum 7 and the beginning of Stratum 6 is set at 5126–4986 cal BC (95.4% prob.), probably 5090–5021 cal BC (68.3% prob.), which would correspond to the beginning of the Vinča Tordoš II phase, a somewhat earlier estimate than Garašanin's "developed part of the Vinča Tordoš II phase."

The following Stratum 6 is problematic, primarily since the sole bone sample from this stratum appears to be a residual Bos taurus M2 tooth, radiocarbon dated to 5477 (80.8% conf.) 5287 cal BC or 5275 (14.6% conf.) 5217 cal BC (95.4% prob.). This made the dating of this stratum highly dependent on the modeled ends of Stratum 7 and 5 in respect to the radiocarbon date measurements belonging to these previous and following phases. The modeled boundary for the end of Stratum 6 and the beginning

https://doi.org/10.1017/RDC.2025.10113 Published online by Cambridge University Press

of Stratum 5 is 5065–4936 cal BC (95.4% prob.), probably 5022–4959 cal BC (68.3% prob.), which falls towards the latter half of the Vinča Tordoš II, and the beginning of the transitional Gradac Phase, usually dated to a period between 5050 and 4950 cal BC (Borić 2009: 232). This coincides well with the relative phasing of Garašanin, as the end of Stratum 5—the start of Stratum 4 is modeled at 4997–4877 cal BC (95.4% prob.), probably 4978–4918 cal BC (68.3% prob.), a period that coincides well with the end of the Gradac phase and the onset of Vinča Pločnik I period. The end of Stratum 4, dated to Vinča Pločnik I phase by Garašanin, is radiocarbon dated to 4967–4828 cal BC (95.4% prob.), probably 4941–4864 cal BC (68.3%), well inside the Vinča Pločnik I phase.

The late sequence of the Vinča period occupation on Supska starts with Stratum 3, spanning between 4967–4828 cal BC (95.4% prob.) and 4781–4653 cal BC (95.4% prob.), probably 4742–4678 cal BC (68.3% prob.). This time span corresponds to the period of late Vinča Pločnik I (Vinča C) and the beginning of Vinča Pločnik IIa (Vinča D) period (Whittle et al. 2016: 37), somewhat earlier than Garašanin's proposed relative chronology dating. Stratum 2, dated to full Vinča Pločnik IIa by Garašanin, can be radiocarbon dated from 4781–4653 cal BC (95.4% prob.) to 4720–4605 cal BC (95.4% prob.), probably 4705–4648 cal BC (62.1%) or 4641–4634 cal BC (6.1% prob.). This span falls towards the latter half of the Vinča Pločnik IIa (Vinča D) period, which correlates well with Garašanin's dating. Finally, the very end of the Late Neolithic occupation in Supska, at least in 3 trenches excavated by Garašanin, the so-called Stratum 1, can be radiocarbon dated between 4720–4605 cal BC (95.4% prob.) and 4712–4491 cal BC (95.4% prob.), probably 4692–4597 cal BC (68.3% prob.). This period does indeed fall into the Vinča Pločnik IIb chronological span, as proposed by Garašanin, but it is surprisingly not towards its very end, usually dated to around 4550–4500 cal BC in the Danubian region (Tasić et al. 2016) and 4450–4350 cal BC for the southern Serbian parts (Marić et al. 2021). The modeled posterior density estimate boundary for the end of all Late Neolithic occupation on Supska is set between 4712–4491 cal BC and 4703–4287 cal BC (95.4% prob.), probably 4676–4507 cal BC (68.3% prob.), still a generation or so earlier than the eponymous site of Belo Brdo in Vinča (Tasić et al. 2015), but well towards the end of Vinča Pločnik IIb phase.

## Discussion and conclusion

The exact timing and origin of the onset of the Vinča material traditions in the Central Balkans area are, even after a century of research, still elusive. The ideas of Milutin Garašanin (1951, 1979, 1990, 1993), Jovanović (1962, 1984, 1995; Stefanović and Jovanović 1996, 2006) and others (Lazarovici 1973; Tasić and Petrović 1988) presented us with a variety of options and timetables (Figure 4), however until radiocarbon dating became widely available and the corpus of radiocarbon dates started to enlarge, the absolute chronology was rather vague. The first systematic analysis on the absolute chronological framework of the Belo Brdo site in Vinča itself, published by Schier (1996) almost 30 years ago (Figure 4), provided the first firm glimpse at the fact that the name site itself was not among the earliest inhabited Vinča period settlements, albeit based only on evidence from the surviving part of the site (an unknown part of the site was eroded by the Danube in the past). More recent studies (Borić 2009; Tasić et al. 2016; Whittle et al. 2016) confirmed this fact again, and work on two other important Vinča tell sites, Belovode and Pločnik produced similar results (Marić et al. 2021).

Where does then the site of Supska lie in the absolute chronological scheme of the Late Neolithic Vinča period? The results obtained by modeling of 27 available dates (Figure 5) provide a good estimate of the lifespan of the site. Gathered from the radiocarbon dating and Bayesian modeling of the Supska sequence, it is safe to say that the site was indeed already occupied in the Early Neolithic Starčevo period, as shown by the two outlying dates (DeA-31078 and BRAMS-5676) found in Stratum 8, however, as no secure contexts associated with this period exist in the published trenches of Milutin Garašanin we can only speculate about the true nature of the Early Neolithic settlement at the site. At the beginning of his book on Supska Garašanin acknowledges that the south part of the site, the one excavated by Galović, contains evidence of Starčevo period settlement (Garašanin and Garašanin 1979),

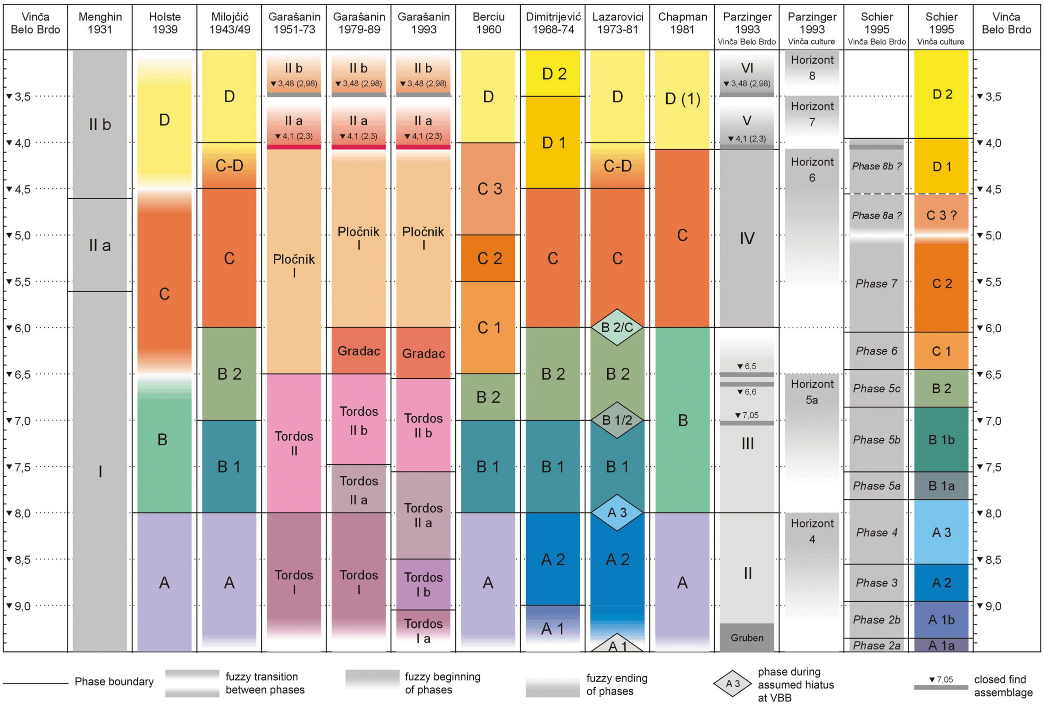


***Figure 4.** Alternative typological schemes for Vinča ceramics typology (after Schier 1996; Whittle et al. 2016; Figure 2).*

however, no animal bones for radiocarbon dating were available from these trenches. Relying on two samples (DeA-31078 and BRAMS-5676) dated to 5728–5555 cal BC (95.4% prob.) and 5627–5521 cal BC (92.3% prob.) or probably 5496–5485 cal BC (3.2%), it can be estimated that the Early Neolithic settlement on Supska existed in the second half of the Starčevo period. The Debrecen dated sample parallels the approximate timeframe of the onset of Starčevo burials in Ossuary pit Z on Vinča itself (Tasić et al. 2016, 128) and the Bristol one toward the end of the same period. Garašanin in his book correctly asserts the discovered Starčevo period material to Starčevo III phase (Garašanin and Garašanin 1979, 10) based on the relative chronology devised by Draga Garašanin (1954). Sadly, nothing can be said of the settlement belonging to this period, similar to the settlement of the premiere Vinča period, which, according to the modeled radiocarbon dates, appeared between 5731–5076 cal BC (95.4% prob.), likely between 5286–5101 cal BC (68.3% prob.). These dates broadly correspond to the start of similar Vinča sites like Versend in southern Hungary (Jakucs et al. 2018), Potporanj IV (Whittle et al. 2016: 13; Marić et al. 2023, 104), Jaričište 1 (Marić 2013) and is somewhat later than Belo Brdo in Vinča (Whittle et al. 2016, 19). Of the sites in its immediate vicinity, Vinča A on Supska is somewhat later than the available early phase dates from the site of Grivac, albeit dates made on bulk charcoal (Whittle et al. 2016, 21) where the terminus post quem for the end of Vinča A is set to 5480–5040 cal BC (95% prob.), probably 5470–5400 cal BC (12% prob.) or 5390–5205 cal BC (56% prob.). The site of Belovode, found north of Supska, on the banks of a tributary stream of the Mlava River, produced a significantly better chronological sequence than Grivac, providing a posterior density estimate of 5452–5318 cal BC (95.4% prob.) for the beginning of the Vinča A period in the Belovode 4b horizon of trench 18 (Marić et al. 2021, 445). This date is significantly earlier than that of Supska, indicating earlier Vinča A occupation at Belovode, and is comparable to the results from a previous study on the chronological span of Vinča culture (Whittle et al. 2016, 22). However, with the limited sized excavations in Supska, it is difficult to say with a high degree of certainty whether the location of Garašanin's trenches represents

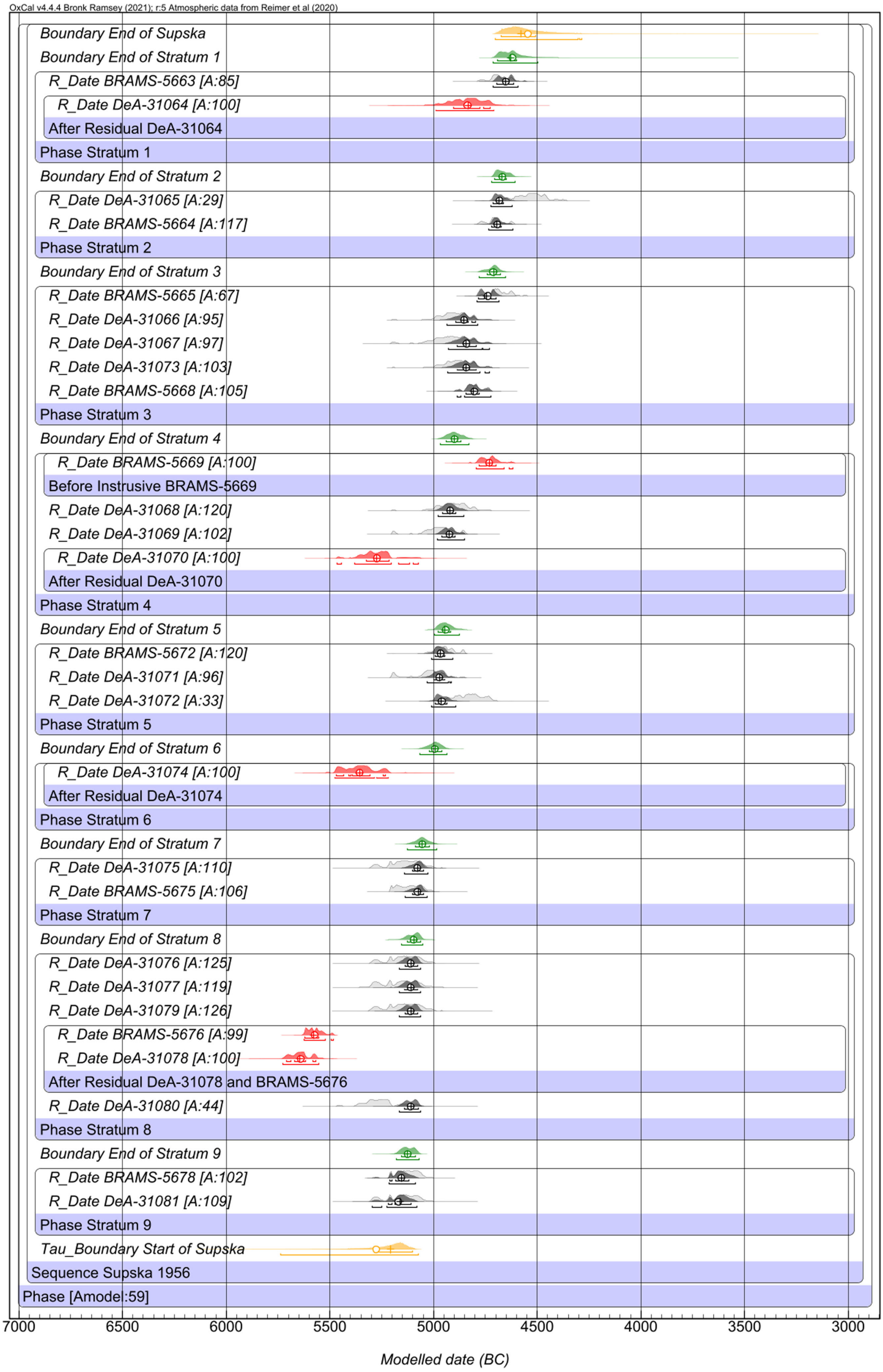


***Figure 5.*** *Probability distributions of radiocarbon dates from Supska. Red tone indicates that the sample has been excluded from the model due to possible intrusive or residual character (OxCal 4.4.4).*

the exact location containing the earliest settlement phase, as it was already mentioned that the earliest features were attested only to the south of the gully and not where Garašanin's trenches were positioned.

The modeled posterior density estimate for the end of the Vinča period occupation (End of Supska Boundary) on the site of Stublina in Supska is set to 4703–4287 cal BC (95.4% prob.), probably 4676–4507 cal BC (68.3% prob.), which is earlier by at least a generation or even two than on the site of Belo Brdo in Vinča (Tasić et al. 2016, 128) where the highest posterior density estimate for the end of Vinča D occupation is at 4570–4460 cal BC (95.4% prob.). A similar later posterior density estimate to that of the Belo Brdo site in Vinča can be established for the end of the Vinča occupation at the site of Belovode, which is located close to Supska (about 40 km to the north of it); 4601–4383 cal BC (95.4% prob.), probably 4571–4482 cal BC (68.3% prob.), indicating a slightly earlier abandonment of Stublina in Supska (Marić et al. 2021, 445). Perhaps this variance illustrates the gradual nature of the process of decline of regional centers in the late Vinča period, with smaller settlements being progressively abandoned in favor of larger ones located nearby, leading to the creation of larger population hubs that could have caused a strain on the resources and environment in their immediate vicinity. Such a process could have been the initiating spark of social strife resulting in the end of the Vinča culture. It would be of great value if nearby sites like Drenovac Slatina or Crnokalačka Bara, which also contain an extensive chronological sequence of the Vinča period, were to be dated and modeled in the same manner as Supska. The modeling of their lifespans could provide more insight into the idea of gradual abandonment of smaller sites in favor of larger centers established in the region over the millennia-long Vinča occupation of the Velika Morava valley.

Another recently established chronological phenomenon of the late Vinča period, the significantly later radiocarbon dates for the final Vinča period occupation found further south, on the site of Pločnik, modeled at 4446–4231 cal BC (95.4% prob.), probably 4431–4324 cal BC (68.2% prob.) (Marić et al. 2021, 453), is also an important indicator for the end of the Vinča Culture. This later southern chronological marker attributes the demise of Supska to the same process that appears to occur on sites centered on the Danubian axis of the Vinča culture further north at the turn of the 46th century BCE. The chronological difference between the abandonment of Vinča settlements in the northern reaches of its core territory and its southern variants appears at least a century long and was first hinted at by Borislav Jovanović (1994) solely on the difference in the appearance of ceramic assemblages of the late Vinča period between the north and the south. Jovanović correctly identified regional changes in the material of the southern regions of the Late Vinča period that could not be adequately paralleled in the north, and attributed this to the continued regional evolution of the southern late period Vinča settlements, which, according to several available radiocarbon dates became awash with the influences from the material culture of the expanding Bubanj-Salçuta-Krivodol traditions of the early Chalcolithic pushing from the eastern Balkans regions (Marić et al. 2021; Vander Linden and Bulatović 2020, 241). While this phenomenon is still underexplained and presents another in the string of questions connected with the end of Vinča material culture in the Central Balkans, more future research in the southern and specifically southeast parts of the Vinča occupied territories may lead to better understanding of this problem.

New radiocarbon dating of samples from all strata identified during the excavations, combined with the use of Bayesian modeling, has produced, for the first time, a high-precision chronology of a complex Vinča period site in this region that shows the gradual evolution of the region during the Late Neolithic period. This new chronological sequence has broader regional implications as it provides a new temporal node in a gradually growing network of excavated long-lived multilayered settlements that are found in the wider area of central Serbia during the Late Neolithic period.

It is also important to notice that, even though the samples were based on a rather limited amount of archival animal bone finds, radiocarbon measurements provided comparable results that fit into the currently available scheme on other nearby sites of the same period, validating further the method of using partially preserved archival records through a process of meticulous selection. The results also broaden the base for the better understanding of processes taking place in an extremely important communication route that connects the Aegean area with the Central Europe (the Vardar-Morava axis) and enables a temporal comparison by proxy (through pottery seriation) of all nearby sites of the same period. While the presented Bayesian chronological model of Supska will not introduce revolutionary changes in the understanding of the processes of the Vinča complex at the end of the Late Neolithic in the Central Balkans, it will serve as a new chronological beacon to shed additional light on the almost millennia-long Vinča material culture presence in the Velika Morava valley, one of the key corridors between south and central Europe that enabled diverse processes and material practices to be exchanged during this crucial period in the solidification of sedentary life and practices in the 46th century BCE.

**Supplementary material.** To view supplementary material for this article, please visit https://doi.org/10.1017/RDC.2025.10113

**Acknowledgments.** The research presented in this paper was supported by the Science Fund of the Republic of Serbia, PROMIS grant #6062361, project RACOLNS. The authors extend gratitude to the National Museum of Serbia for providing full access to the finds and the surviving archaeological documentation in the dire times during the COVID-19 pandemic.

**Declaration of interests.** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## References

Borić D (2009) Absolute dating of metallurgical innovations in the Vinča culture of the Balkans. In Kienlin TL, Roberts BW (eds), *Metals and Societies. Studies in Honour of Barbara S. Ottaway*. Bonn: Verlag Dr. Rudolf Habelt GmbH. (Universitätsforschungen zur Prähistorischen Archäologie), 191–245.

Jovanović Borislav (2006) Early and Late Neolithic of the Danube Valley–Relations. In Brukner B (ed), *Problemi prelaznog perioda Starčevačke u Vinčansku kulturu*. Zrenjanin, 21–23 oktobar 1996. godine. Zrenjanin: Narodni muzej Zrenjanin, 53–62.

Brock F, Dee M, Hughes A, Snoeck C, Staff RA and Bronk Ramsey C (2017) Testing the effectiveness of protocols for removal of common conservation treatments for radiocarbon dating. *Radiocarbon* **60**(1), 35–50. https://doi.org/10.1017/RDC.2017.68.

Brock F, Higham T and Bronk Ramsey C (2010) Pre-screening techniques for identification of samples suitable for radiocarbon dating of poorly preserved bones. *Journal of Archaeological Science* **37**(4), 855–865. https://doi.org/10.1016/j.jas.2009.11.015.

Bronk Ramsey C (2009) Bayesian analysis of radiocarbon dates. *Radiocarbon* **51**(1), 337–360.

Bronk Ramsey C, Higham TFG and Hedges REM (2004) Improvements to the pretreatment of bone at Oxford. *Radiocarbon* **46**(1), 155–163.

Buck CE, Cavanagh WG and Litton CD (1996) *Bayesian Approach to Interpreting Archaeological Data (Statistics in Practice)*. Chichester: John Wiley & Sons.

Garašanin D (1954) *Starčevačka kultura*. Ljubljana: Univerza v Ljubljani.

Garašanin D and Garašanin M (1979) *Supska. "Stublina"–praistorijsko naselje vinčanske grupe*. Beograd: Narodni muzej.

Garašanin M (1951) *Hronologija vinčanske grupe*. *Arheološki seminar*. Ljubljana: Univerza v Ljubljani.

Garašanin M (1990) Vinča und seine Stellung im Neolithikum Südosteuropa. In Srejović D and Tasić N (eds), *Vinča and Its World*. Belgrade: Serbian Academy of Sciences and Arts and Centre for Archaeological Research, Faculty of Philosophy, 11–16.

Garašanin M (1993) Zu den Problemen der Vinča-Gruppe in Rumaenien. *Balcanica* **24**, 7–20.

Garašanin M (1995) Die Gradac-Stufe der Vinča-Gruppe und der Beginn des Aeneolithikums. *Dacia* **38–39**, 9–17.

Garašanin M (1979) Centralnobalkanska zona. In Benac A (ed), *Praistorija Jugoslavenskih Zemalja, Tom II*. Vol. **2**. Sarajevo: Svjetlost, 79–212.

Holste F (1939) Zur chronologische Stellung der Vinča-Keramik. *Wiener Prähistorische Zeitschrift* **26**, 1–21.

Jakucs J, Oross K, Banffy E, Voicsek V, Dunbar E, Reimer P, Bayliss A, Marshall P and Whittle A (2018) Rows with the neighbours: The short lives of longhouses at the Neolithic site of Versend-Gilencsa. *Antiquity* **92**(361), 91–117. https://doi.org/10.15184/aqy.2017.218.

Jovanović B (1962) Postanak keramičkih tipova balkansko-podunavskog neolita i eneolita. *Starinar* **13–14**, 9–25.

Jovanović B (1980) The origins of copper mining in Europe. *Scientific American* **242**(5), 152–167.

Jovanović B (1994) Gradac Phase in the relative chronology of the late Vinča culture. *Starinar (new series)* **43–44**, 1–12.

Jovanović B (1995) Anadolija i Balkan–Mlađi Neolit. *Glasnik Srpskog Arheološkog Društva* **11**, 117–120.

Jovanović B (2006) Gradac Phase of the Vinča culture: Origin of a typological innovation. In Tasić N and Grozdanov C (eds), *Homage to Milutin Garašanin*. Belgrade: Serbian Academy of Sciences and Arts and Macedonian Academy of Sciences and Arts, 221–233.

Jovanović B (1984) Naselje vinčanske kulture. In Ćelić S (ed), *Vinča u Praistoriji i Srednjem Veku*. Belgrade: Srpska Akademija Nauka i Umetnosti, 23–34.

Jovanović J, Bogosavljević-Petrović V, Bulatović J, Marković N and Marić M (2023) A Medieval Burial from the Site of Supska: An anthropological and contextual analysis of the skeletal remains from Grave 1. *Zbornik Narodnog Muzeja u Beogradu* **XXVI**(1), 461–485. https://doi.org/10.18485/znms_arh.2023.26.1.20.

Knowles TDJ, Monaghan PS and Evershed RP (2019) Radiocarbon sample preparation procedures and the first status report from the Bristol Radiocarbon AMS (BRAMS) Facility. *Radiocarbon* **61**(5), 1541–1550. https://doi.org/10.1017/RDC.2019.28.

Lazarovici G (1973) Tipologia şi cronologia culturii Vinca în Banat. *Banatica* **2**, 25–55.
Longin R (1971) New method of collagen extraction for radiocarbon dating. *Nature* **230**, 241–242.
Madas D (1988) Ceramic vessels from the Divostin II house floors. In McPherron A and Srejović D (eds), *Divostin and the Neolithic of Central Serbia*. Kragujevac, Pittsburgh: Narodni muzej Kragujevac, Department of Anthropology, University of Pittsburgh (Ethnology Monographs), 143–173.
Marić M (2013) Zaštitna arheološka istraživanja na lokalitetu Jaričište 1. In Filipović V, Arsić R and Antonović D (eds), *Rezultati novih arheoloških istraživaja u severozapadnoj Srbiji i susednim teritorijama*. Beograd, Valjevo: Srpsko arheološko društvo, Zavod za zaštitu spomenika kulture Valjevo, 17–32.
Marić M, Bulatović J, Marković N and Pantović I (2023) Late Neolithic chronology in the contact zone between the south edge of the Carpathian Mountains and the Pannonian plain—the case study of the Vršac region. In Marić M, Bulatović J and Marković N (eds), *Relatively Absolute. Relative and Absolute Chronologies in the Neolithic of Southeast Europe*. 156th ed. Beograd: Institute for Balkan Studies, Serbian Academy of Sciences and Arts, 97–118.
Marić M, Radivojević M, Roberts BW and Orton D (2021) Relative and absolute chronology of Belovode and Pločnik. In Radivojević M, Roberts BW, Marić M, Kuzmanović-Cvetković J and Rehren T (eds), *The Rise of Metallurgy in Eurasia. Evolution, Organisation and Consumption of Early Metal in the Balkans*. Oxford: Archaeopress Publishing LTD, 439–454.
Milojčić V (1949) *Chronologie der Jüngeren Steinzeit Mittel- und Südosteuropas*. Berlin: Gebr. Mann.
Mirković-Marić N, Savić M and Rajičić M (2021) Pottery from Trench 18 at Belovode. In Radivojević M, Roberts BW, Marić M, Kuzmanović Cvetković J and Rehren T (eds), *The Rise of Metallurgy in Eurasia. Evolution, Organisation and Consumption of Early Metal in the Balkans*. Oxford: Archaeopress Publishing LTS, 152–169.
Molnar M, Janovics R, Major I, Orsovszki J, Gönczi R, Veres M, Leonard A, Castle SM, Lange T, Wacker L et al. (2013) Status report of the new AMS 14C sample preparation lab of the Hertelendi laboratory of environmental studies (Debrecen, Hungary). *Radiocarbon* **55**(2–3), 656–676.
Nikolić D (2004) Keramičko posuđe. In Bogdanović M (ed), *Grivac. Naselja protostarčevačke i vinčanske kulture*. Kragujevac: Centar za naučna istraživanja Srpske akademije nauka i umetnosti i Univerziteta u Kragujevcu, Narodni muzej Kragujevac, 205–318.
Obradović Đ, Meyer C and Savić R (2025) Geophysical prospection at the Neolithic site of Stublina-Supska, Serbia. In Perić S (ed), *The Neolithic in the Middle Morava Valley* No. 4. Belgrade: Institute of Archaeology, Regional Museum Paraćin, Regional Museum Jagodina, 147–160.
Radivojević M (2012) *On the Origins of Metallurgy in Europe: Metal Production in the Vinča Culture*. London: UCL Institute of Archaeology.
Radivojević M, Roberts BW, Marić M, Kuzmanović-Cvetković J and Rehren Th (2021) *The Rise of Metallurgy in Eurasia: The Archaeology of Early Metallurgy and Society in the Central Balkans*. London: UCL Press.
Reimer P, Austin W, Bard E, Bayliss A, Blackwell P, Bronk Ramsey C, Butzin M, Cheng H, Edwards R and Friedrich J (2020) The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon* **62**(1), 1–33.
Schier W (1996) The relative and absolute chronology of Vinča: New evidence from the type site. In Draşovean F (ed), *The Vinča Culture, Its Role and Cultural Connections*. Timişoara: National Museum, 141–162.
Stefanović M and Jovanović B (1996) Stratigraphy of Vinča-Belo Brdo reconsidered. *Starinar* **47**, 193–204.
Tasić N and Petrović J (1988) *Gomolava: Hronologija i stratigrafija u praistoriji i antici Podunavlja i jugoistočne Evrope*. Belgrade, Novi Sad: Arheološki Institut, Muzej Vojvodine.
Tasić NN, Marić M, Bronk Ramsey C, Kromer B, Barclay AJ, Bayliss A, Beavan N, Gaydarska B and Whittle A (2016) Vinča-Belo Brdo, Serbia: The times of a tell. *Germania* **93**, 1–75.
Tasić NN, Marić M, Penezić K, Filipović D, Borojević K, Russell N, Reimer P, Barclay A, Bayliss A, Borić D et al. (2015) The end of the affair: Formal chronological modelling for the top of the Neolithic tell of Vinča-Belo Brdo. *Antiquity* **89**(347), 1064–1082. https://doi.org/10.15184/aqy.2015.101.
Tripković B and Milić M (2016) Obsidian from the sites of Motel-Slatina and Turska česma—Slatina (Drenovac) in the Middle Morava valley. In Perić S (ed), *The Neolithic in the Middle Morava Valley 2*. Belgrade: Institute of Archaeology, 127–138.
van Klinken GJ (1999) Bone collagen quality indicators for palaeodietary and radiocarbon measurements. *Journal of Archaeological Science* **26**(6), 687–695. https://doi.org/10.1006/jasc.1998.0385.
Vander Linden M and Bulatović A (2020) Bubanj. The absolute chronology. In Bulatović A and Milanović D (eds), *Bubanj. The Eneolithic and the Early Bronze Age Tell in Southeastern Serbia*. Vienna: Austrian Academy of Sciences Press, 239–243.
Vasić M (1932) *Preistoriska Vinča 1*. Beograd: Državna štamparija Kraljevine Jugoslavije.
Vasić M (1936a) *Preistoriska Vinča 2*. Beograd: Državna štamparija Kraljevine Jugoslavije.
Vasić M (1936b) *Preistoriska Vinča 4*. Beograd: Državna štamparija Kraljevine Jugoslavije.
Vukmanović M and Radojčić N (1990) Quantitative analysis of pottery. In Tringham RE and Krstić D (eds), *Selevac: A Neolithic Village in Yugoslavia*. Los Angeles: University of California Press (Monumenta Archaeologica), 289–321.
Whittle A, Bayliss A, Barclay A, Gaydarska B, Bánffy E, Borić D, Draşovean F, Jakucs J, Marić M, Orton D et al. (2016) A Vinča potscape: Formal chronological models for the use and development of Vinča ceramics in south-east Europe. *Documenta Praehistorica* **43**, 1–60.

**Cite this article:** Marić MM, Bulatović JB, Bogosavljević-Petrović VŽ, and Marković ND (2025). Dating the Late Neolithic of the central Morava region: The Bayesian chronological modeling of archival samples from the site of Stublina (Supska, Serbia). *Radiocarbon* **67**, 857–870. https://doi.org/10.1017/RDC.2025.10113