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# The temporal framework of the Early-to-Late Bronze Age transition in Thrace and the adjacent regions

Zoï Tsirtsoni

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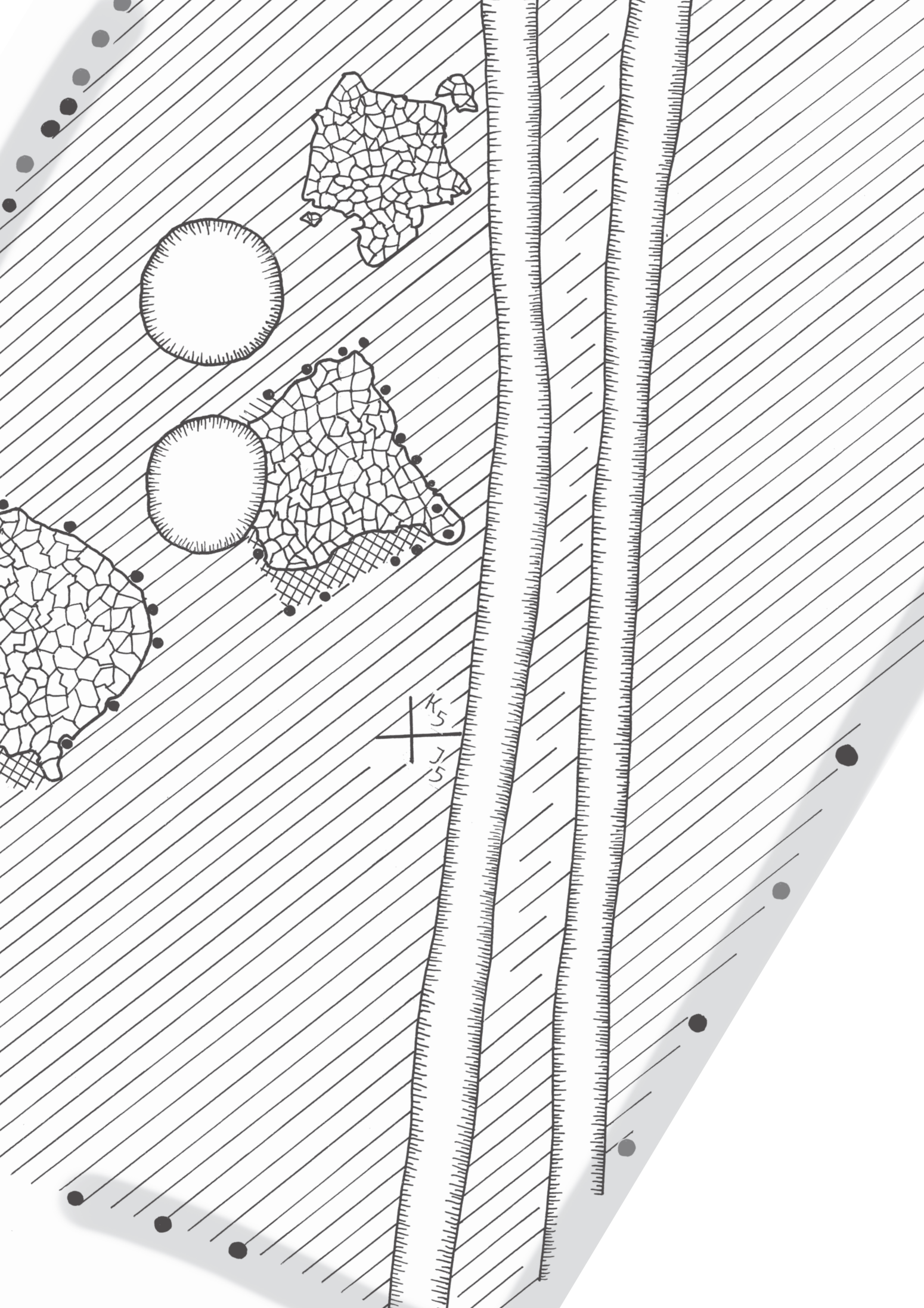
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**Galabovo in Southeast Europe and Beyond.  
Cultural Interactions during  
the 3rd-2nd Millennium BC**

*Proceedings of the International Conference  
24-27 October 2018 in the Town of Galabovo*







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*Edited by Krassimir Leshtakov, Mila Andonova*

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## **A BRIDGE THOUGH CENTURIES WAS BUILT**

*The History and the Future encountered each other during the first international conference held at Galabovo. Virtually and really, a prehistoric tell shed light at the Past, teaching us how to live the Present.*

*Galabovo is now a bright point upon the world map, because numerous international scientists are talking and writing about it. This is a significant event not only for the scholars, but for the future generations.*

*Tell "Asara" prove to be a demanding challenge for a few generations of archaeologists. The discoveries of the old European Schools, the aspiration of the new assertive generation of the Balkan countries, the inclusion of scholars from three continents – they all presented the most significant achievements of decades of work within the layers of time, to reveal the magnificent prehistoric culture "Galabovo".*

*I am pleased that in Thrace, nearby the Sazliya River mysteries have been unraveled and new horizons were drawn, where we are all striving to!*

**Nikolay Tonev,**  
**Mayor of the Galabovo Municipality**

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## FROM THE EDITORS

The archeological site „Asara” or „Galabovo”, as it is known in the literature, is a prehistoric settlement mound – one of the largest in the Upper Thrace. Whether there were later settlements and whether there was a fortress on the top of the tell in the Middle Ages, we may suggest relying on indirect archaeological evidence. Only the old name Asara (meaning „fortress”) and separate archeological materials without a certain context indicate habitation during the Roman era and the Middle Ages. Modern construction activities have destroyed the upper part of the cultural layer and any reconstruction of the original silhouette will be in the realm of conjecture. Until the middle of the last century, the settlement mound was over 10 m high and dominated the surrounding terrain in the valley of the rivers Sokolitsa and Sazliyka, but nowadays the mound does not exceed 7 m. Today, the archeological site is well hidden among piles of coal, industrial buildings, and chimneys! The Bronze Age layer, however, is fairly well preserved. Thus, the conference reports, published here, were dedicated to its research. The data obtained from the rescue excavations are rich, and our ambition is to place them in the background of what we know about Southeastern Europe and the northern part of the Eastern Mediterranean.

We are grateful to all authors that contributed to the success of the international conference and submitted their reports, that we are now able to present you in this volume. The organisation of the conference event was managed by Dr Vanya Petrova, Denitsa Ilieva and Nikolina Nikolova. They were supported by volunteer Archaeology students from Sofia University who were wildly enthusiastic about the project. The cleaning of the old excavated surface and the preparation of the site for visiting of the participants in the Conference was carried out by students in the bachelor's and master's degree in Archeology at Sofia University. This initiative received invaluable logistical assistance and support from the AES Galabovo management and the Municipality of the town of Galabovo. The Conference was accompanied by an exhibition, showing the most interesting artefacts from the tell, which remained for several months in the exhibition hall of the Municipality. It was initiated by the mayor of Galabovo Mr. Nikolay Tonev and his associates. The exhibition was widely covered by the social media, which contributed to its popularisation. It attracted hundreds of visitors from the cities of Galabovo, Radnevo and Stara Zagora, stimulating the growing interest in cultural monuments in Southeastern Bulgaria, and especially in the area of the energy complex „Maritsa-East”.

Institutions different in profile as Sofia University, Radnevo Archaeological Museum, Municipality of Galabovo, National Archaeological Institute with Museum and the AES Galabovo Thermal Power Plant were actively involved in organising the exhibition and conference events. The exhibition and a large part of the presented reports were supported by the Research Fund of the Ministry of Education and Science within the project „Social Dimensions of Technology in Prehistory: Ceramic Production in Southeastern Bulgaria in VI-II millennium BC” (Contract DN 10/8 2016). This also applies in full to the preparation for printing of the volume presented here.

We shall not introduce the subject matter and the scientific value of the papers published in this volume, as we strongly believe that they speak for themselves. We consider all contributions a step forward in the investigation of the Bronze Age not only in Galabovo and Upper Thrace, but also in the neighbouring territories.

### **Acknowledgments**

The editors of this volume would like to express their sincere gratitude for the excellent support provided by the Mayor Mr. N. Tonev and the administration of the Municipality of Galabovo in organising and hosting the exhibition and the Conference. Special thanks to the management of Sofia University “St. Kliment Ohridski” and in particular to the Assoc. Prof. Dr. Todor Popnedelev, as well as to Prof. Dr. Nadia Manolova. We are also grateful to NAIM BAS, and personally to the Director Assoc. Prof. Dr. Hristo Popov, as well as Assoc. Prof. Dr. Stefan Alexandrov; to the Ministry of Culture in the person of St. Ignatova-Terziyska and Atanas Koychev; to Archaeological Museum Radnevo with its Director Mr. Plamen Karailiev and the museum associates Dr. Tatyana Kancheva-Ruseva, Yana Valcheva, Elitsa Boneva, Margarita Bogdanova and the artist Rositsa Yorgova. We would also like to thank to the Ministry of Education and Science with its Research Fund. We highly appreciate the support from all Archaeology students and PhD students from Sofia University who helped the organisers of the exhibition and the Conference.

# The Temporal Framework of the Early-to-Late Bronze Age Transition in Thrace and the Adjacent Regions

Zoï Tsirtsoni

## Abstract

This paper compiles and analyzes the existent radiocarbon evidence (two hundred sixty <sup>14</sup>C dates altogether) from Bulgarian Thrace and neighbouring areas, especially Greek Eastern Macedonia and Turkish Thrace, for the period corresponding to the transition from the Early to the Late stages of the Bronze Age (late 3<sup>rd</sup> to mid-2<sup>nd</sup> millennium BC). Recent measurements from a number of flat sites in those regions – e.g. Chokoba, Bikovo, Tatul in Thrace, Agios Antonios in Thasos – fill indeed the gap that seemed to separate the end of occupation in most of the tells (e.g. Ezero, Yunatsite, Sitagroi), estimated at around 2300/2200 cal BC, from the LBA, starting around 1600/1500 cal BC in new localities. On the other hand, re-evaluation of the dates from tells (recalibration of available <sup>14</sup>C dates with the latest curves and modelling according to stratigraphy, when stratigraphy is known) might indicate that the true end of occupation took place there somehow later, and therefore the two settlement patterns (tells-flat sites) could have coexisted for some time. The reasons and modalities of this shift are not discussed in any detail, but we can observe that some of the new late-EBA/MBA sites are founded for the first time in those years (e.g. Chokoba, Bikovo), whereas others install themselves on top of previous layers (e.g. Tatul, Agios Antonios), although not necessarily in a continuous way. Small-scale movements (relocation) of sites from one spot to another can explain some of these phenomena.

**Keywords:** Bronze Age, Bulgarian Thrace, Turkish Thrace, Greek Eastern Macedonia, Settlement, Chronology, Radiocarbon, Bayesian modeling

## Introduction – State of the research

Our knowledge about Bronze Age settlement in Thrace and adjacent areas, especially Greek Eastern Macedonia to the South, presents some particularities. Whereas the first part of the period –the Early Bronze Age, corresponding roughly to the end of the 4<sup>th</sup> and the entire 3<sup>rd</sup> millennium BC– is very well documented thanks to a series of emblematic sequences on tells (e.g. Ezero, Yunatsite, Sitagroi), rich in architectural remains and finds and abundantly dated by <sup>14</sup>C, the later part –the Middle and Late Bronze Age, corresponding roughly to the 2<sup>nd</sup> millennium BC– is very poorly known. Layers of this period are, indeed, not only absent from almost all tells in Thrace, but also from other types of sites; in Greek Eastern Macedonia LBA layers are present on some tells (e.g. Dikili Tash, Dimitra), but the MBA is practically unknown. This was at least the dominant picture until a few years ago when evidence started arriving from a number of localities in South Bulgaria –flat sites in lowlands and peak sites in the mountainous area of the Rhodopes– that bridged the ‘gap’ of the 2<sup>nd</sup> millennium (Leshtakov & Tsirtsoni 2016; Popov 2016). The new data invite us to consider the possibility of an important change in settlement

pattern towards the end of the 3<sup>rd</sup> millennium, from long-lived and highly visible settlements to more “discrete” and shorter-lived ones, eventually reflecting broader changes in the natural or socio-economic environment of the Bronze Age populations. Whether this change is smooth or abrupt, and the different kinds of sites replacing one another or coexisting, are questions of crucial importance for our understanding of the phenomenon. The first thing to do then, before undertaking any further research on the conditions under which such a change might have occurred<sup>1</sup>, is to make sure that the temporal framework of the events is correctly assessed. This is what I attempt here with this paper. The aim is: a) to provide an up-to-date synthesis of the available radiocarbon evidence, useful to all scholars working on these areas and periods; b) proceed to a thorough re-evaluation of this evidence, through recalibration with the latest curve and modeling according to the stratigraphy of the dated samples (when a stratigraphy exists), in order to improve its resolution, or conversely pinpoint its limits.

### **Materials and methods**

The paper focuses on settlements and other sites of activities, cemeteries excluded, in the areas of Northern (Bulgarian) and Eastern (Turkish) Thrace, Greek Eastern Macedonia (including the island of Thasos) and the mountainous area between them (**Fig. 1**); no Bronze Age sites with radiocarbon dates are known from the coastal part of Thrace. Cemeteries are left out, as irrelevant to the immediate question of changes in settlement pattern.

The dates discussed have been collected in the archaeological literature or performed in the past years under my responsibility. Dates for which only

calibrated values are known have not been included, as it is not possible to exploit them any further without having the original age (BP) measurements.

I used the modeling program *Chronomodel* (version 1.5.0), which is best adapted to the treatment of large series of data (compared to the more frequently used *OxCal*) and allows visualizing more easily the different kinds of groupings, still offering the possibility to have very detailed zooms. Unlike *OxCal*, which proposes only one entry for ordering the chronological phenomena inside a sequence (“phase”), *Chronomodel* proposes an ordering with two entries: “phases” and “events” (Lanos *et al.* 2016; Lanos & Philippe 2018). “Events” can be defined around a single date, or around several dates that are taken to be more-or-less contemporaneous (e.g. a single inhumation, house destruction, or the more-or-less simultaneous destruction of several houses, commonly described as a destruction layer or horizon): in this case, the program proposes a unique distribution of probabilities, i.e. a unique time interval in which things have most probably happened. By contrast, “Phases” are defined as long periods of time, during which several “Events” took place. Accordingly, the program proposes not one distribution of probabilities, but two: one for the start and one of the end (recalling at this point the “boundaries” found at *OxCal*). Phases represented by only one Event cannot be properly delimited with a start and an end, and their distribution coincides with that of their Event. Like in all modeling programs, the results provided for each Phase or Event do not depend only on the dates contained in this particular Phase or Event, but also on the relation with *all the other* Phases and Events in the model. It is the ordering of things that improves the resolution more than the number, or even the quality of the individual dates.

The results presented here are obtained after a calculation with 1 million iterations, and using the atmospheric data from the IntCal13 curve (Reimer *et al.* 2013). All the distributions (whether graphical or numerical) are given at a probability of 95%. This is important to know, because in many publications the rate of 68% is preferred, which gives of course results that look more precise but leave out substantial parts (1/3) of the distribution. The intervals we propose here are less precise but more secure.

### **The situation in Bulgarian Thrace and the Rhodopes**

The analysis relies on 168 <sup>14</sup>C dates from 18 sites (**Table 1**) Ten more dates from Tatul (7 of which falling in the period that concerns us here: see *Λευακοβ* 2018) were still unpublished at the time of the Galabovo conference and have not been included in the analysis. They are listed however in **Table 1**. In terms of context, these are all from settlements, except for one group from Dabene, where the dated features are described as ritual structures (*Hristov* 2015), and the unique date from Radnevo, which is from a stray inhumation (*Саватинов* 1995; *Leshtakov & Tsirtsoni* 2016). Settlements belong to three types: tells, flat sites (including enclosures), and peak sites.

#### **Ezero**

The Ezero sequence is by far the richest, both in number of dates (n= 51) and in number of layers represented (n= 9) (*Георгиев et al.* 1979: 512–515; *Boyadzhiev* 1995: 153–155, 185–186; *Boydjiev* 1998: XX–XX; *Görsdorf & Bojadžiev* 1996: 137–142). The quality of contextual information gives the results a very good resolution, reflected in the very tight intervals proposed for each stage by the modeling program (**Fig. 2**). Indeed, it is not so much the quality of

individual measurement that is responsible for this excellent effect (the statistical errors are actually quite big, from 40 to 150 years BP), but their regular and rigorous constraining by the stratigraphic attribution (**Fig. 3: a–d**). In this respect, and given the coherence of the modeled results, we can legitimately suspect that the seemingly “bad dates” reflect samples which are simply not in the right position rather than any specific physical problems (*contrary to what has been suggested by Boyadzhiev* 1995: 153–154, and 1998).

In this approach, we come up with a very fine dating of the different occupation levels (represented here as “Events”), which results from an optimisation of the probability densities based on stratigraphical ordering — and not from an “archaeological wiggle-matching” built on a presumably regular rate of sediments accumulation, as proposed by *Boyadzhiev* 1995: 152–153. It seems in fact quite risky to admit that sediments accumulation in anthropogenic environments — and more particularly in complex “living organisms” like tells— would show any kind of regularity, as there are too many factors that interfere (building materials, mode of destruction, reworking, horizontal movement of living plots, etc.). It is interesting however to note that our results do not differ much from those proposed by *Boyadzhiev*. Indeed we propose the following intervals:

- Phase A1 (levels 13 to 11): start between 3114–2968 BC, end between 3054–2930 BC.
- Phase A2 (levels 10 to 9): Start: 3027–2920, End: 3008–2908 BC
- Transition A/B (levels 8 to 7): Start: 2989–2898, End: 2970–2881 BC
- Phase B1 (levels 6 to 4): Start: 2954–2787, End: 2906–2630 BC. The large “spreading” of the interval given for the end of the phase is due to the absence of any constraint at this end, and we should probably admit a true end before or around 2800 BC.

The last occupation levels excavated on the tell (levels 3 to 1) have not provided any dates. This means that the actual sequence was definitely a little longer, or maybe even much longer, if we consider the effects of erosion on the uppermost part of the tell. This point will be discussed more thoroughly below.

Ezero is one of the few sites where the quality of contexts allows overcoming partly the 4500/4400 BP (= 3300–2900 cal BC) “plateau”. This “plateau” (a chain of rapid variations in the calibration curve) has been pinpointed already in the archaeological literature as one of the obstacles to overcome in order to circumscribe better the start of the EBA period in the area (Boyadzhiev 1995: 153–155; Boyadjiev 1998: 354–355; Maniatis & Papadopoulos 2011: 153–155; Maniatis et al. 2014: 47; Tsirtsoni 2016c: 461). Although this point is beyond the immediate scope of this paper, which deals mainly with the later phases of the Bronze Age, it is worth underlining it for the methodological “promises” it gives towards similar phenomena in other parts of the curve.

#### **Karanovo**

Only 8 <sup>14</sup>C dates are surely or tentatively assigned to the Bronze Age part of the Karanovo sequence. We distinguish two series (modeled here as two ‘phases’: **Fig. 4**): one taken from samples that are possibly coming from mixed deposits (4 dates), and one from properly stratified samples (4 dates) taken from a control trench opened for this purpose (Nikolov & Petrova 2016)<sup>2</sup>. As one would expect, the latter offers a better modeled sequence than the former, as they are better constrained by the stratigraphic (actually hypsometric) succession of the samples. According to them, phase Karanovo VII starts somewhere between 3482–3127 BC, and ends between 3373–2594 BC. This result agrees with the suggested general synchronism of phase Karanovo VII with the BA sequence of neighbouring Ezero, but no

fine parallelism can be proposed. Regretfully, there exist no dates for the upper part of the sequence, marked by the remains of an apsidal house, assigned to Sveti Kirilovo phase.

#### **Dyadovo**

The 10 <sup>14</sup>C dates published so far, i.e. until the date of the Conference (Görsdorf & Bojadžiev 1996: 164; Nikolova & Görsdorf 2002), do not offer the possibility for fine modeling, as they lack detailed contextual information. Indeed, the two series of dates come from only two levels (5 and 10), each assigned to a different phase represented by a unique distribution (see *supra*, Methods: single-event phases). Phase I would extend in the interval 3336–2966 BC, phase II in the interval 2858–2528 BC (**see synthetic Fig. 11**). Thankfully, new data are now added in the record, which should improve considerably the picture (**Semoto, this volume**).

#### **Razkapanitsa**

Only two dates are known, from good short-lived samples (charred seeds in situ) but with large errors ( $\pm 100$  years BP), taken from two distinct levels assigned to the second (lower) phase of the tell’s sequence (Görsdorf & Bojadžiev 1996: 163). The date from the upper level 4 (Bln–813) is older than the one from the lower level 3 (Bln–814), and seems non-compatible with the relative chronology of the associated material. Modeling under these conditions gives as expected very poor –not to say unusable– results: the distributions proposed for the start and the end of the phase (**see Fig. 11**) cover more than 1500 years each and overlap over a period that exceeds 1000 years (start 3710–2067, end 3360–1222 BC). But the more reliable of the two dates Bln–814 has a modeled distribution that falls in the 3<sup>rd</sup> millennium (2840–2154 BC), and most probably (90%) in the

years between 2699–2124 BC. Under these circumstances, the hypothesis of maintenance of the Bronze Age settlement until the end of the millennium, or beyond, appears plausible.<sup>3</sup>

### Karasura

Deposits assigned to various stages of the Bronze Age have been excavated under some of the antique walls and the Byzantine basilica that occupies the summit of the hill. Twelve of the available <sup>14</sup>C dates fall indeed in this timeframe (Görsdorf & Bojadžiev 1996: 167–168); they are modeled here in two groups (conventionally labeled “phases”) according to their provenance. The results confirm occupation between the 4<sup>th</sup> and the end of 3<sup>rd</sup>, or the end of 2<sup>nd</sup> millennium respectively (see **Fig. 11**), but are unusable for any further analysis.

### Yunatsite

The tell’s Bronze Age sequence is represented by 30 <sup>14</sup>C dates coming from 12 different occupation levels, most of them with errors between 50 and 70 years BP (Boyadzhiev 1995: 155–157, 186–187; Görsdorf & Bojadžiev 1996: 158; Мевнепм 2007: 234, tabl. 1; Boyadzhiev & Aslanis 2016). Like in the case of Ezero, the big number of measurements and dated levels offers the possibility to improve considerably the overall resolution of the results. Unfortunately, the dating of the start of the period (sub-phase IIA) is compromised by the relatively poor quality of the unique date from the earliest level (IGAN–2794 from level 16–17) (**Fig. 5a**). In fact, more than the quality of the measurement, it is its solitude and its position in the sequence that is a problem, for there is nothing to constraint it there<sup>4</sup>; dates with same or bigger errors are indeed completely ‘neutralized’ when found in other parts of the sequence. In addition, the date falls precisely on the 4400 BP “plateau” of the calibration curve (*supra*), thus producing a

huge calibrated interval. Removing it from the discussion is hardly better, for in this case we lose completely information about the earliest Bronze Age level and, as all the remaining dates are from the same level (level 15), we find ourselves with a single-event phase, i.e. a unique distribution of probabilities. Accordingly, when the date IGAN–2794 is included, we obtain for phase IIA a start between 3475–2773 BC and an end between 2899–2638 BC (**Fig. 5b**), when it is excluded, we obtain a unique distribution from 2901–2640 BC (but without the earliest levels 16–17) (**Fig. 5c**). Whatever the option, it seems reasonable to admit that the BA sequence did not start here before 3000 BC, as suggested also by Boyadzhiev 1995. There are practically no consequences for the chronological clustering of the next phases, which are those that interest us more in this paper. Phase IIB is given a start between 2759–2550 and an end between 2644–2477 BC, Phase IIC a start between 2624–2436 and an end between 2247–1644 BC. Once again, the lack of constraints at the end produces a “spreading” of the modeled distribution well beyond the lower limits of the individual dates assigned to this sub-phase (none goes indeed beyond 2000/1950 cal BC). Like in the case of Ezero, *Chronomodel* “corrects” some of the deviating dates with respect to their stratigraphic position and their clustering with other dates from the same levels (**Fig. 5d**).

The jump in dates observed by Boyadzhiev 1995 between levels 6 and 5, and connected with a hypothetical sharp change of atmospheric <sup>14</sup>C around 2500/2400 BC, is seen here as well. But *Chronomodel* accommodates the possibility of a smooth evolution, proposing for level 6 a distribution between 2538–2264 BC, and for level 5 a distribution between 2352–2070 BC. The aforementioned ‘jump’ could also be an effect of the different nature of the dated samples: those of level 6 are indeed charcoals, i.e. potentially older than the true

age of the events, whereas those of level 5 are charred fruits, i.e. short-lived samples, most certainly coeval with the destruction (see discussion in Maniatis et al. 2016).

In the model proposed by Boyadzhiev 1995, based on the estimated rate of sediments' accumulation (and admitting the "anomalous" recording of ages due to the previous hypothetical sharp change of atmospheric  $^{14}\text{C}$ ), the dates of the last three dated levels (5 to 3) are maintained within the years 2450–2300 BC. This is an extrapolation, however, which is supported neither by the calibrated values of the individual  $^{14}\text{C}$  dates nor by their stratigraphical ordering. For example, the date Bln-3658 from level 5 has a value between 2347–2034 cal BC at 92,9% probability; the date Bln-3659 from the same level a value between 2206–1945 cal BC at 93,7%; and the date Bln-3656 from level 3 a value between 2309–2027 cal BC at 93%.

The end of the sequence is much later for *Chronomodel* than the one given by Boyadzhiev: level 4 is given at 2282–1976 BC, and level 3 after 2250 BC (2247–1644 BC). Even if the lower limit of the interval suggested for the end of phase IIC (1644 cal BC) is certainly too low due to the absence of constraints, we are far from the years 2360–2330 inferred by Boyadzhiev's analysis. We would rather see an end close to 2000 BC, not including of course the last two building levels which have not been dated, neither all those that might have been wiped off by erosion.

### **Nova Zagora**

The 11 radiocarbon dates from the tell of Nova Zagora (Görsdorf & Bojadžiev 1996: 160) are obtained from good quality samples (charred seeds, short-lived), but have big statistical errors ( $\pm 100$  years BP) and are concentrated in only three levels. As a result, the final quality of the modeled sequence (**Fig. 6**) is not very good. The earlier phase I, represented by only one level (8), is given with a unique

distribution between 2708–2298 BC, whereas the next phase II, represented by two levels (6–5), is given with a start between 2512–2203 and an end between 2423–1986 BC. Two of the dates fall entirely in the 2<sup>nd</sup> mill. BC but are canceled by the other dates from the same levels. Actually, the overall duration of the dated sequence could be rather short, and placed at virtually any point during the second half of the 3<sup>rd</sup> millennium (i.e. not necessarily its end). Therefore, in the present state of things phase II should be more properly described as late Early Bronze Age and not as Middle Bronze Age (see also Leshtakov & Tsirtsoni 2016), although of course, it is perfectly possible that its end is situated in the 2<sup>nd</sup> millennium (there are two more levels of this phase undated). We can say nothing about the transition to the next phase III (assigned to Late Bronze Age), as the corresponding deposits are also undated.

### **Nebet Tepe**

We dispose of 12 radiocarbon dates, which are retrieved from four distinct levels belonging to two phases: levels 11 to 10 belong to phase IV (assigned to the EBA), levels 9 and 8 to phase III ("Middle Bronze Age"). There exist no dates from levels 7 to 4, which represent the end of phase III and the next phase II (assigned to the LBA), but there exist two dates from level 3, which represents phase I, assigned to the Early Iron Age following the local terminology<sup>5</sup> (Görsdorf & Bojadžiev 1996: 162). According to *Chronomodel* (**Fig. 7**), the start of phase IV should be placed around 2998–2597 and its end around 2693–2512 BC, whereas phase III should start at ca. 2687–2376 and end somewhere between 2689–1782 BC (if we do not consider the dates from level 3), or between 2676–1892 BC (if we add them).



### Dabene

We have altogether 7 <sup>14</sup>C dates from this site, coming actually from two different locations representing also different contexts (**Fig. 8**). Four dates are from the tell settlement, where two Bronze Age phases have been distinguished on top of a layer with mixed Chalcolithic and EBA material (Nikolova & Görsdorf 2002); the other three dates are from a group of structures which are associated to the nearby tumuli, but have not any obvious funerary character themselves and have been therefore qualified as ritual (Hristov 2015).

The dates from the settlement cover roughly the first half of the 3<sup>rd</sup> mill. BC, and are in good agreement with the relative chronology suggested by the archaeological material to the EBA 1 and 2 period. Phase IIA is given with a unique distribution at 3010–2552 BC, whereas phase IIB is given a start between 2690–2442 and an end between 2606–2295 BC. The ritual structures have no stratigraphy properly speaking and are therefore modeled as three individual “events”, grouped inside a single conventional “Phase”. The three “events” provide different distributions, spanning the years between 2700/2300 and 1900/1500 cal BC. If their complementarity is real, the duration of use of this area would go well into the MBA, beyond the (apparent) duration of the neighbouring settlement. But this is a fragile statement, for each “event” is represented by only one measurement. More dates would be needed in order to consolidate it.

### Galabovo

The two available <sup>14</sup>C dates come from the same level (4), which is the last of those assigned to the EBA (Панайотов *et al.* 1991; Leštakov 1993; Görsdorf & Bojadžiev 1996: 163). The uppermost levels 3 to 1, assigned to the MBA on the basis of the archaeological material (including

some imports from Anatolia with secure parallels in Troy VI), have not been radiocarbon dated yet. In fact, they were not dated at the time of the Conference. Radiocarbon dates in those levels are now performed in the laboratories of Lyon and Tokyo. Their results will be published elsewhere. The dates are modeled as a single-event phase, with a unique distribution between 2480–2018 BC (see **Fig. 11**). This result authorizes the hypothesis of maintenance of the settlement in the first half of the 2<sup>nd</sup> mill. BC, as indicated by the material.

### Tatul

With Tatul we move beyond the Thracian lowlands and at the same time beyond the ‘tell’ pattern. The site has been qualified as a peak sanctuary, based on its impressive natural location and the presence in later times of a temple at the same spot (Leshtakov *et al.* 2016), but nothing confirms that this was the case in prehistoric times as well. The Bronze Age sequence comprises two phases, documented by 5 <sup>14</sup>C dates (**Fig. 9**): the first one corresponds to an advanced stage of the EBA (start: 2851–2470, end: 2584–2267 BC), and the second one at the MBA (start: 2040–1679, end: 1896–1515 BC). The correctness of these dates – which might seem ‘suspect’ because of their rarity – is supported by the associated finds and also by the fact that they are produced with two different dating methods (see Leshtakov & Tsirtsoni 2016). The dates produced later from the laboratory of Glasgow (code SUERC-) provided almost identical results: (see Леуцаков 2018) and (**Table 1**) at the end of the present paper.

### Cherna Gora

The site belongs to the type of enclosure, i.e. a flat area with ditches and dug structures, presumably of ritual purpose. Although not a settlement

properly speaking, it has obviously “held a crucial position in the settlement pattern of the region” (Leshtakov 2006, 428). The two available dates come from two different areas but which are thought to represent the same stage in the site’s life (*ibid.*, 420) and have therefore been modeled as two distinct events in the same phase. *Chronomodel* proposes a start at 2479–2027 and an end at 2263–1872 BC (see **Fig. 11**), which agrees with the proposed relative chronology (EBA 3–beginning MBA).

### **Bikovo**

The site is again an enclosure, presumably of ritual purpose (Хрустова *et al.* 2009; Хрустова & Иванов 2010). According to the pottery collected in the fill of the ditch and the other pits, its overall use should date to the MBA and LBA. The six samples given for dating (animal bones) came from contexts assigned to the MBA and the results agree with this attribution (Leshtakov & Tsirtsoni 2016). The modeled distributions for the corresponding phase are 2228–1835 BC for the start and 1813–1431 BC for the end (see **Fig. 11**).

### **Chokoba 18**

The first of the two neighbouring sites excavated in 2009–2010 near the village of Chokoba appears as a flat settlement with houses built above the ground, sometimes preserving their hearths or ovens and part of their household assemblages (Петрова & Каурапов 2010). Two <sup>14</sup>C dates were made from samples (charcoal, seeds) taken in a pit associated in one of the houses (Leshtakov & Tsirtsoni 2016). The results are almost identical and are modeled as a single event, with a distribution from 2179 to 1973 cal BC (see **Fig. 11**).

### **Chokoba 18A**

The second site, situated a few hundred meters away, is again flat

but comprises only shallow dug-in structures, which contained large amounts of daub fragments and pottery assigned to the MBA and LBA periods (Λευακοβ 2010, Λευακοβ 2011). In total six <sup>14</sup>C dates were made from short-lived samples (animal bones, seeds) collected in different structures: five of them were discussed already in Leshtakov & Tsirtsoni 2016, whereas the sixth (Lyon-13680) is presented here for the first time.<sup>6</sup> Since there is no stratigraphy properly speaking, they are modeled as six distinct events inside a single “phase”, whose start is placed between 2317–1868 and its end between 1495–1120 BC (**Fig. 10**). These results suggest that the site was not simply occupied during a short period at the interface between MBA and LBA, as one might think considering the paucity of material remains, but actually has known several occupation episodes spanning several centuries. We have no means though to check whether the apparent continuity of occupation is real or hides some breaks.

Another interesting point is the overlapping between the sequence of Chokoba 18A and the occupation of neighbouring Chokoba 18. Of course, it is impossible to say whether the two settlements actually coexisted, and if this were the case, what would be their relation. It might seem more ‘logical’ to assume that Chokoba 18 was settled first, but the spot was rapidly abandoned and the population moved to Chokoba 18A, where the conditions proved better. Other scenarios are possible as well: the settlers of Chokoba 18A could be different from those of Chokoba 18, the people who left from Chokoba 18 might have moved to another location, etc. Whatever the truth, it is clear that all flat sites are not necessarily short-lived, neither their duration proportional to the nature or state of their material remains. This invites us to be more careful when trying to draw

settlement patterns at a regional scale, assuming, for example, a lesser or greater mobility of populations on the basis of such (non-)evidence (see also Popov 2016).

### Radnevo

The individual inhumation excavated here could be part of a necropolis or connected with a settlement from which nothing was left (Саватинов 1995). The excavator dated it in the LBA on the basis of its possible association with some characteristic pottery of this period, but the <sup>14</sup>C dates from two distinct parts of the skeleton (Leshtakov & Tsirtsoni 2016) agree for dating it at the end of the MBA (modeled joint distribution 1886–1646 BC; see Fig. 11). This would indicate that the inhumation was preceding the LBA installation, providing at the same time additional evidence about the area's occupation during the first half of the 2<sup>nd</sup> millennium.

### Chorkvata

This is one of the rare known LBA settlements in the Central/West Rhodope Mountains and so far the sole with a radiocarbon date, made from a charcoal sample collected on the floor of a well-built rectangular building (Леуќаков 2006; Leshtakov & Tsirtsoni 2016). With a calibrated value at 1394–1216 BC, it fits well the emerging picture of a region that would be quite attractive in the 14<sup>th</sup>–13<sup>th</sup> century BC, attested by the richer evidence from Eastern Rhodopes (Popov 2016) and the Pirin/Rila area (Atanassov et al. 2012; Атанасов et al. 2015).

Before moving to the next regions, it is useful to consider briefly the general picture that is outlined now for Bulgarian Thrace and the Rhodopes (Fig. 11). A simple look is enough to see that no tell provides dates after 2000 BC, although we have good reasons to suspect that at least some of them were occupied during the first centuries of the 2<sup>nd</sup> millennium. Sites

with definite activity in the 2<sup>nd</sup> millennium are essentially flat, whether they are found in lowlands (Bikovo, Chokoba, Radnevo, Dabene) or the mountains (Tatul, Chorkvata); sites with more important sedimentation on natural hills (Nebet Tepe, Karasura) are also attested.

Many of these spots (Dabene, Nebet Tepe, Tatul, Karasura) were also occupied earlier, during the 3<sup>rd</sup> millennium BC,<sup>7</sup> although continuity properly speaking is not proved. Among the newly founded sites (Bikovo, Chokoba, Radnevo), one seems to be relocated from a nearby point, suggesting that horizontal movements might have replaced to some degree the previous vertical development.

### The situation in Turkish Thrace

The low mound of Kanlıgecit is so far the only site of this period in the area that has provided radiocarbon dates (Görsdorf 2002: 559; Görsdorf 2005: 468; Görsdorf 2007: 312; Özdoğan & Parzinger 2012: 276–277 and tabl. 64). We dispose in total of 15 dates assigned to four successive phases<sup>8</sup>; they have been modeled as distinct events inside each phase and provided the following distributions (Fig. 12):

- for the earliest phase 4, a start between 3082–2521 and an end at 2728–2509 BC;
- for phase 3, a start at 2648–2491 and an end at 2486–2314 BC;
- for phase 2, a start at 2458–2284 and an end at 2352–2074 BC;
- for phase 1 (represented by only one event), a unique distribution at 2233–1829 BC.

These results confirm the chronological parallelism of Kanlıgecit with the sequences of Nova Zagora and Galabovo, suggested already by the affinities in material culture.

Moreover, the site seems to follow the same general trend as that observed in Bulgarian Thrace, where tells end before or little after 2000 cal BC.

## The situation in Greek Eastern Macedonia

The situation in Greek Eastern Macedonia is presented here only in a synthetic manner, in order to allow comparisons with that in Northern and Eastern Thrace. The analysis is based on 77 <sup>14</sup>C dates from 12 sites (**Table 2**), namely: Agios Antonios (Maniatis et al. 2015; Maniatis et al. 2016; Koukouli-Chryssanthaki & Papadopoulos 2016), Agios Ioannis (Maniatis & Papadopoulos 2011), Angista (Κουκούλη-Χρυσανθάκη 1980), Dikili Tash (Treuil 1992; Maniatis et al. 2016; Tsirtsoni 2016b; Darcque et al. in press), Dimitra (Γραμμένος 1997), Kastri (Koukouli-Chryssanthaki & Papadopoulos 2016; Maniatis et al. 2016), Kryoneri (Malamidou 2016), Limenaria (Μανιάτης & Φακορέλλης 2012), Pentapolis (Γραμμένος 1981; Manning 1995), Sidirokastro (Siros & Miteletsis 2016), Sitagroi (Renfrew et al. 1986), and Skala Sotiros (Κουκούλη-Χρυσανθάκη 1990). These are all settlements, belonging to four types: tells, flat sites<sup>9</sup>, peak sites, and caves. Some ‘peculiarities’ of the proposed model (**Fig. 13**) are explained by the lack of adequate contextual information for some of the dates, or by the absence of dates for some of the phases known archaeologically. We can mention as examples, respectively, the grouping of all dates from Skala Sotiros under a unique “phase” (although we know that the excavator has distinguished three phases), or the absence from our diagram of phases II and IV of Agios Antonios (which have not been <sup>14</sup>C dated).

The first thing to note is that in this area too, sites with dates well after 2000 BC are much fewer in number. But unlike Northern Thrace, they belong to various types, including tells (Dikili Tash, Dimitra). On the other hand, we observe that, like in Bulgaria, almost all the settlements with occupation in

the 2<sup>nd</sup> millennium were occupied also in earlier periods, though not always in a continuous way. Discontinuity is ascertained for Dimitra and Kastri (where the previous occupation dates back to the Late Neolithic), whereas continuity is sure at Agios Antonios, and possible but not certified at Dikili Tash<sup>10</sup>.

## Conclusions

The above analysis allows making a number of statements concerning the evolution of settlement between the late 4<sup>th</sup> and the late 2<sup>nd</sup> millennium BC in the area under consideration, at least as far as this is reflected in the presently available <sup>14</sup>C dates.

Comparing the situations in the different regions, it appears that things are less binary in Greek Eastern Macedonia. Indeed, the apparent break at the end of 3<sup>rd</sup> millennium BC does not concern here only tells, as is more-or-less the case in Bulgarian and Turkish Thrace, and the opposite is not true either, i.e. not all tells are abandoned at the end of 3<sup>rd</sup> or the very beginning of the 2<sup>nd</sup> millennium BC. From a historical point of view, it would be very interesting to see also if there are any flat settlements in Bulgarian and Turkish Thrace already in the early centuries of the 3<sup>rd</sup> millennium, and if their distribution or their destiny meets those of the coeval tells.

We have to be aware though that there can be a serious discrepancy between the “apparent” and the “real” state of things. Indeed, much of the situation that we see in the archaeological and/or the radiocarbon record could be due to problems of conservation and taphonomy. We know that the upper parts of tells are systematically weathered, and even removed, by erosion or later disturbances. To take only the example of Sitagroi, for which no dates

exist after the second half of the 3<sup>rd</sup> millennium (end of phase Sitagroi Vb at 2511-2110 BC), it is clearly said (Sherratt 1986: 440) that LBA material was collected in the uppermost disturbed levels of the main area. It is impossible to know how much further in time could get us such evidence and if the sequence would be continuous, but it is something that we need to keep in mind when we try to set the time of abandonment of such settlements. On the other hand, the same factors (erosion, ploughing, later works, or conversely thick sedimentation in areas with strong alluvial dynamics) could have entirely wiped off or masked many flat sites (about this issue see also Lespez et al. 2017). It is not surprising that practically all

the known flat sites (including enclosures) have been discovered “by accident” in the frame of rescue excavations.

Two things are therefore needed in the following years if we want to improve substantially our knowledge about the Bronze Age settlement in the area:

a) more, and more systematic geoarchaeological research, both intra-site and off-site, including in areas that have been less privileged by archaeological research so far, that should help us reduce the discrepancy between the apparent and the real picture of settlements density/nature in the study area;

b) more, more precise, and better contextualized <sup>14</sup>C dates from the sites known already and from those to come.

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<sup>1</sup> We will not discuss therefore here at all the question of a possible local impact of the 4.2 cal BP Rapid Climate Change event. On this issue see Meller et al. 2015; Lespez et al. 2016 (with further bibliography).

<sup>2</sup> A fifth date from the control trench (Lyon-8846), although fitting the EBA timespan in terms of result, does not seem to be in the right place in terms of altitude. This is why it is not included in the count proposed by Nikolov & Petrova 2016, 136, neither in the model proposed here.

<sup>3</sup> The following phase I is assigned to the EIA; but no <sup>14</sup>C dates are available.

<sup>4</sup> Dates from underlying Chalcolithic levels stand more than 1000 years back: see Boyadzhiev & Aslanis 2016.

<sup>5</sup> In Greece, this would be assigned to the Late Bronze Age, which is taken to end towards 1100/1050 BC (see Andreou et al. 1996; Treuil et al. 2008).

<sup>6</sup> I wish to thank K. Lehstakov and V. Petrova for allowing me to include it in the present discussion.

<sup>7</sup> And sometimes also before, during the Chalcolithic period (e.g. Tatul, Karasura).

<sup>8</sup> I have not managed to find information about the nature of all the samples. Some of them come certainly from short-lived plants (lentils, barley, cress), but the majority is not identified.

<sup>9</sup> Only 'normal' settlements, no sites with ditches (enclosures) being reported here. One of the settlements (Skala Sotiros) is surrounded by a massive stone wall.

<sup>10</sup> The works of J. Deshayes at the summit of the tell did not provide any evidence about the existence of a Middle Bronze Age layer. But this part of the stratigraphy was seen only in a very limited area. The new excavations started in 2019 should allow checking again this point.

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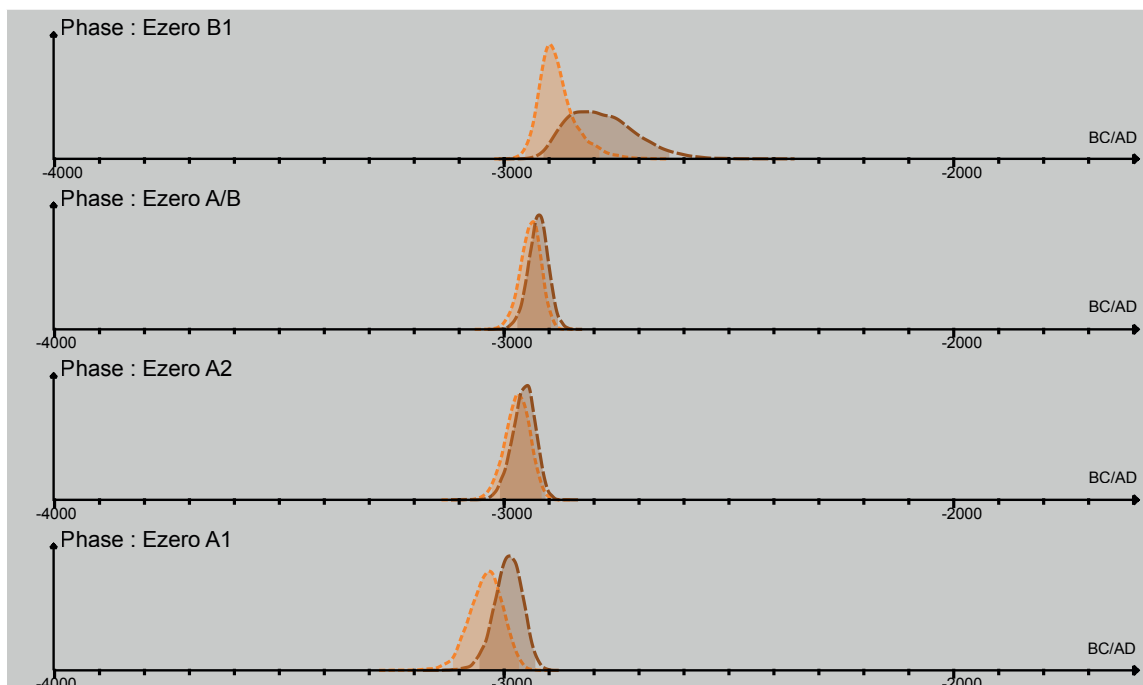
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**Figure 1.** Map of the area with the sites having  $^{14}\text{C}$  dates in the Bronze Age period (cemeteries excluded); in bold the sites whose dates are exploited in the present study, in italics those whose raw (BP) values were not available at the time of the study.



**Figure 2.** Diagram with the overall phasing of Tell Ezero (program Chronomodel v1.5.0; calibration curve IntCal13).

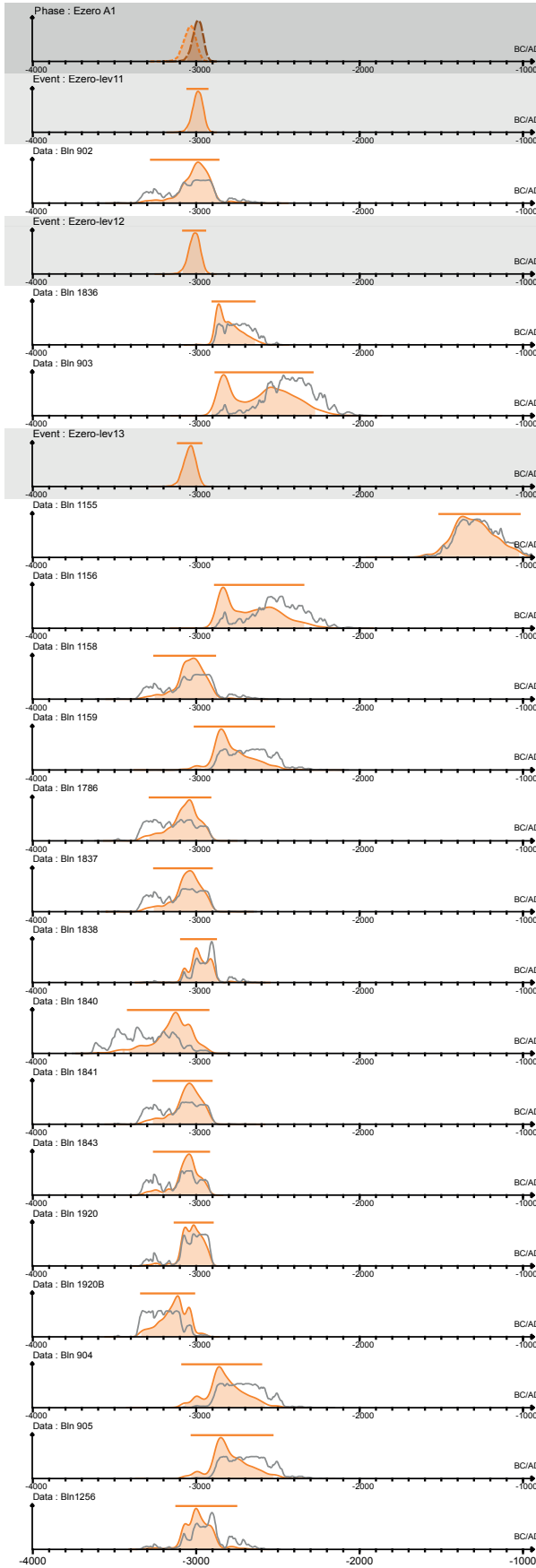


Figure 3a.

**Figure 3.** Modelled diagrams of the  $^{14}\text{C}$  dates from Tell Ezero according to their stratigraphical order:  
**a)** levels 13 to 11 (phase A1),  
**b)** levels 10 and 9 (phase A2);  
 Under each level (“Event”) are shown the individual dates with their original calibrated (unmodelled) distribution in outline, and their modelled distribution filled.

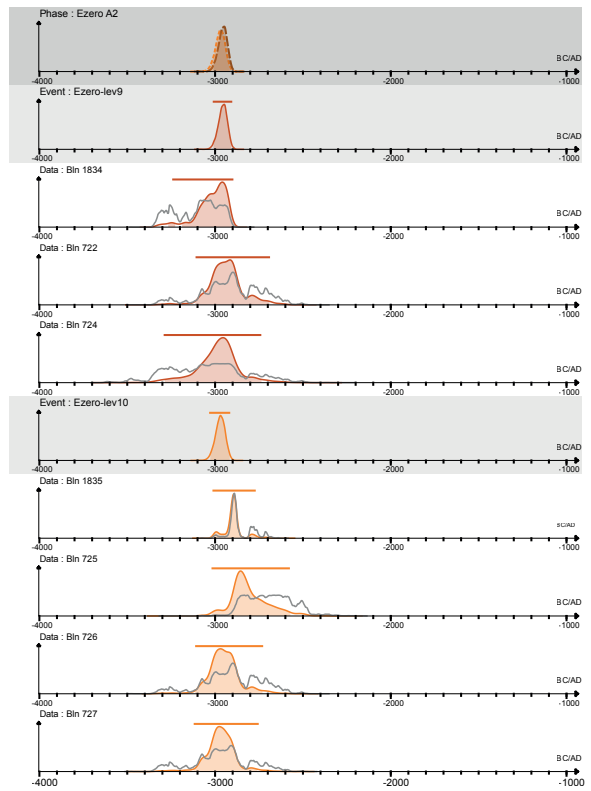
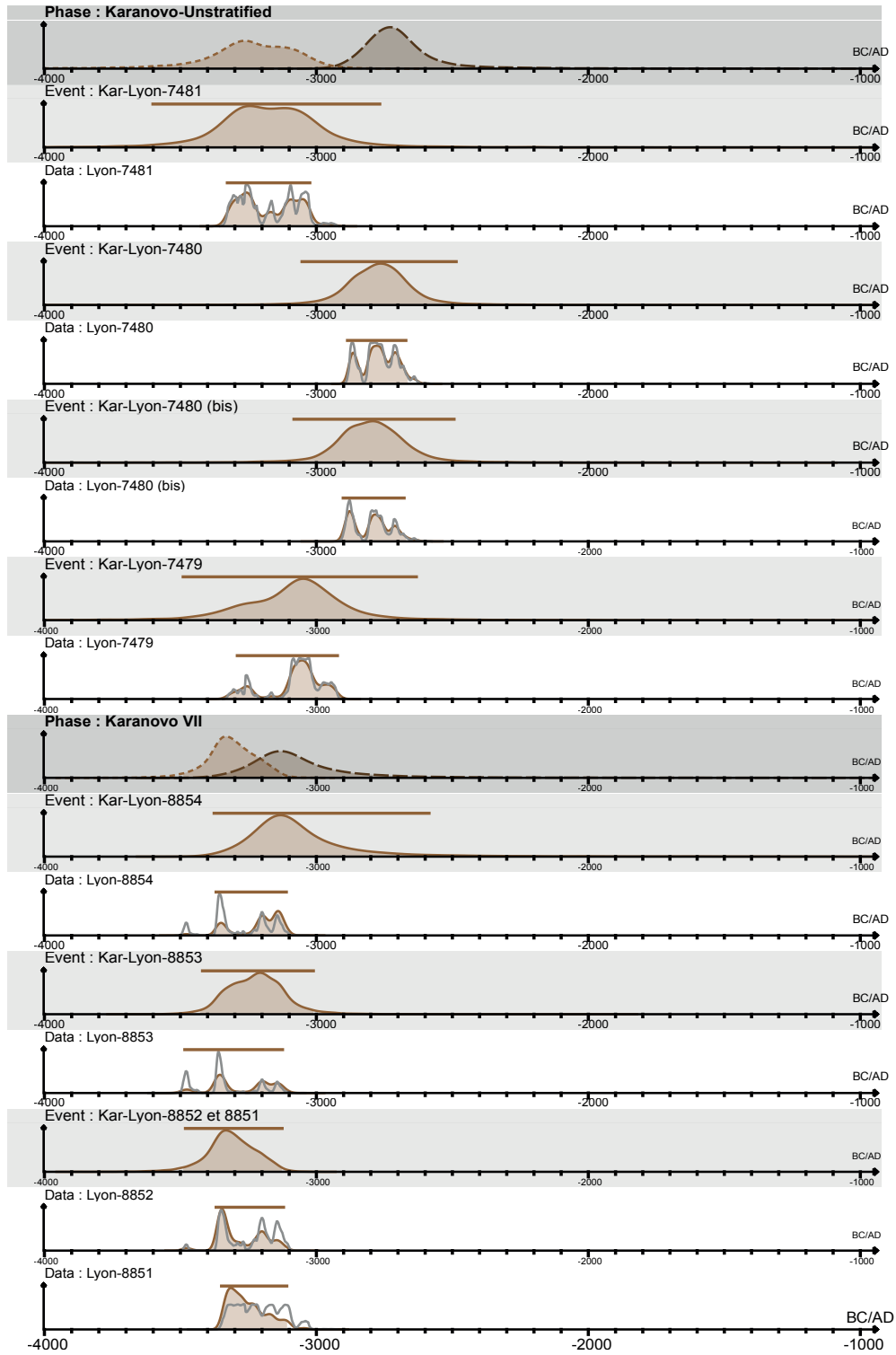
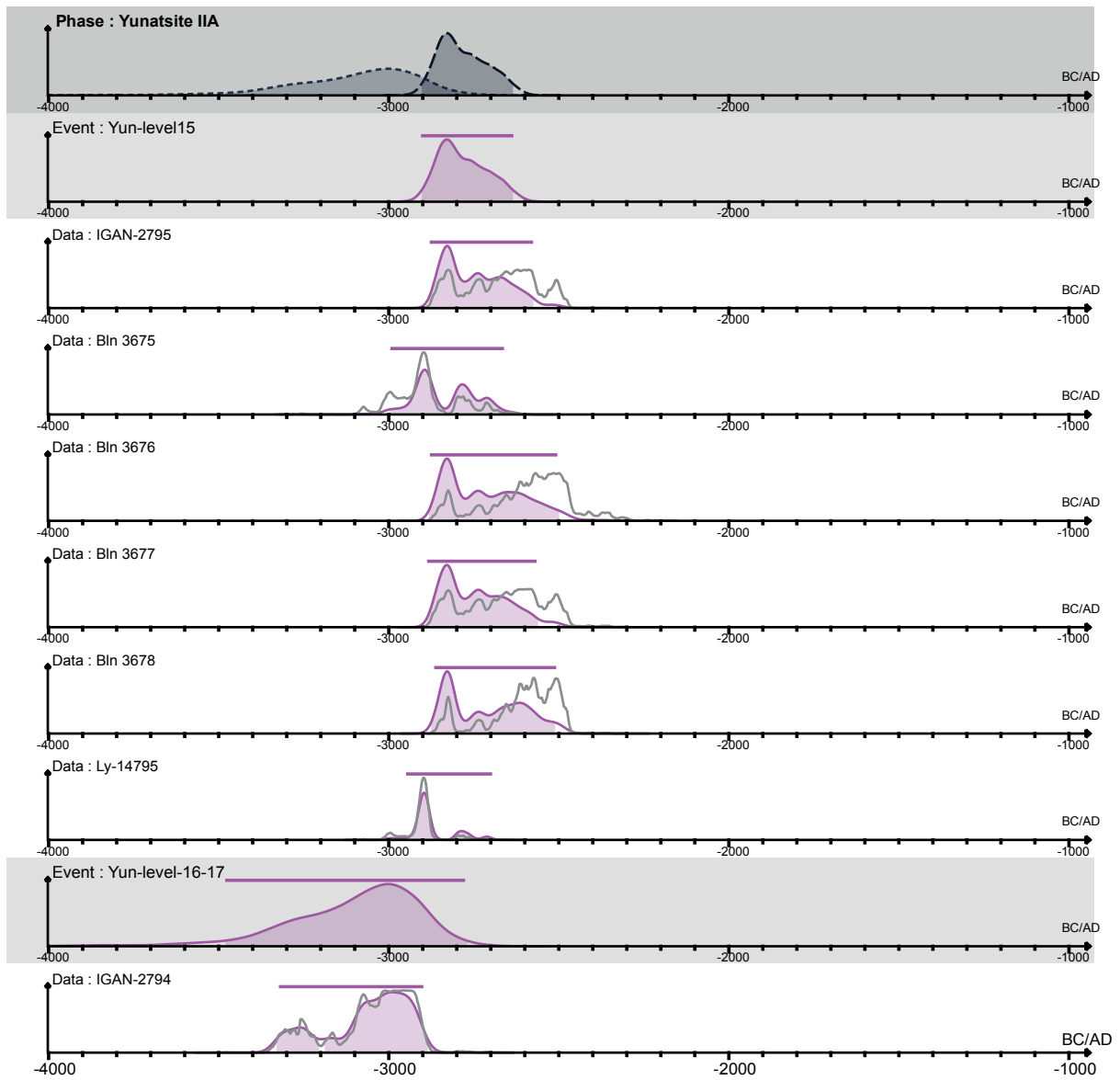


Figure 3b.

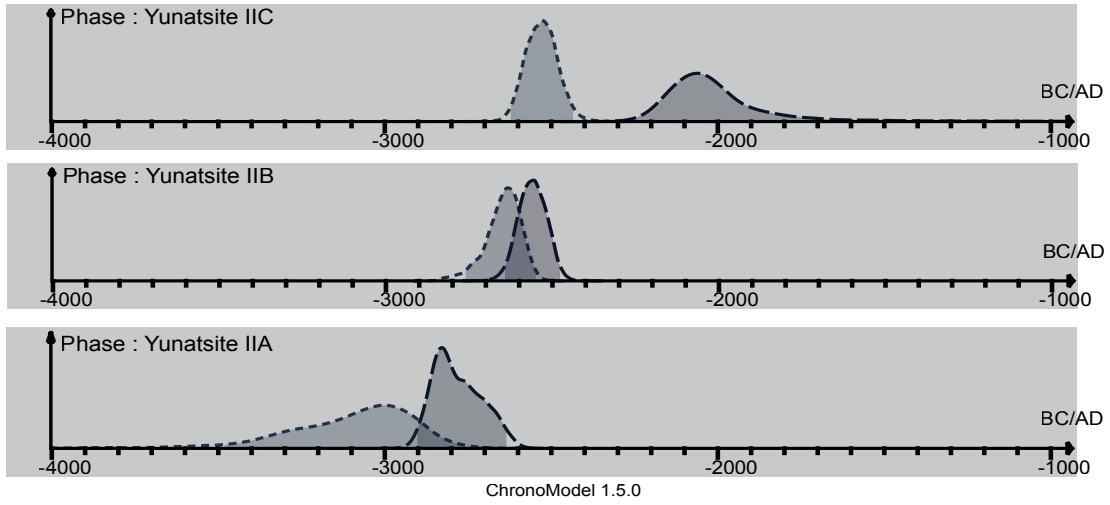




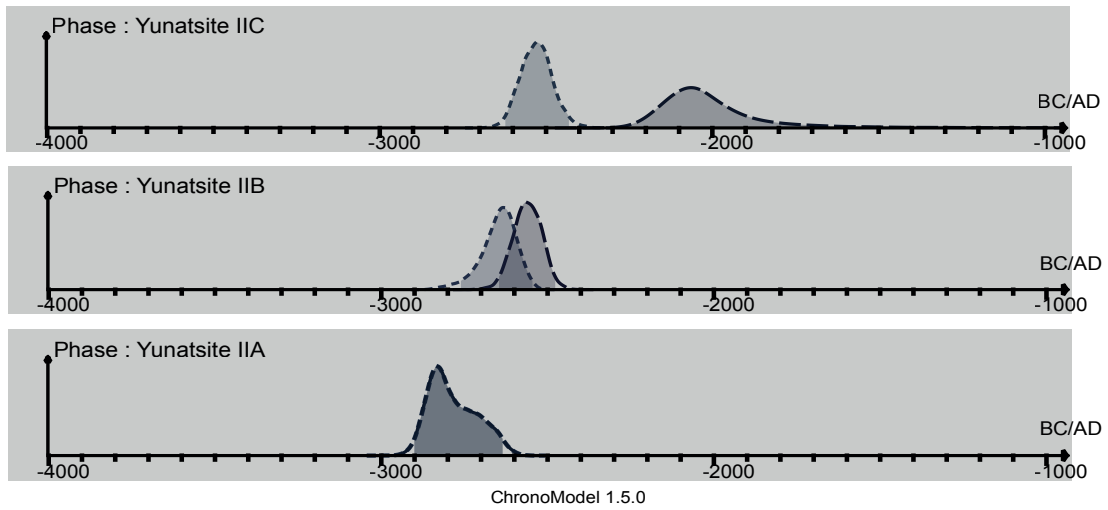
**Figure 4.** Modelled diagram of the  $^{14}\text{C}$  dates from Karanovo assigned to the Bronze Age. Dates assigned to the 'phase' "Karanovo unstratified" are from possibly mixed contexts, those assigned to phase Karanovo VII are from a control trench opened in 2012. For graphic conventions see caption of **Fig. 3**.



**Figure 5.** Bronze Age sequence of Tell Yunatsite:  
**a)** Modelled diagram of the beginning of the sequence



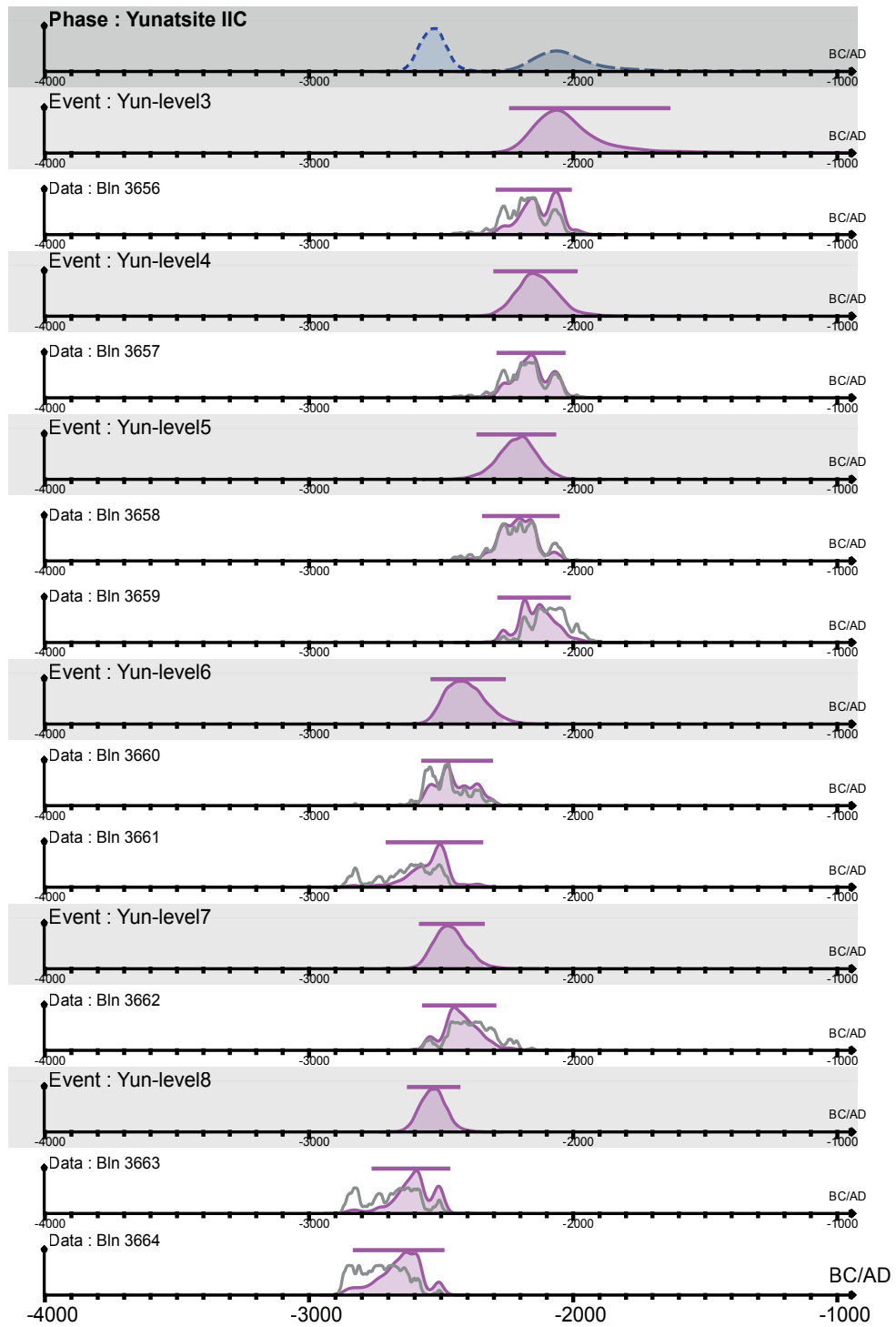
**Figure 5b.** Overall phasing with the date IGAN-2174;



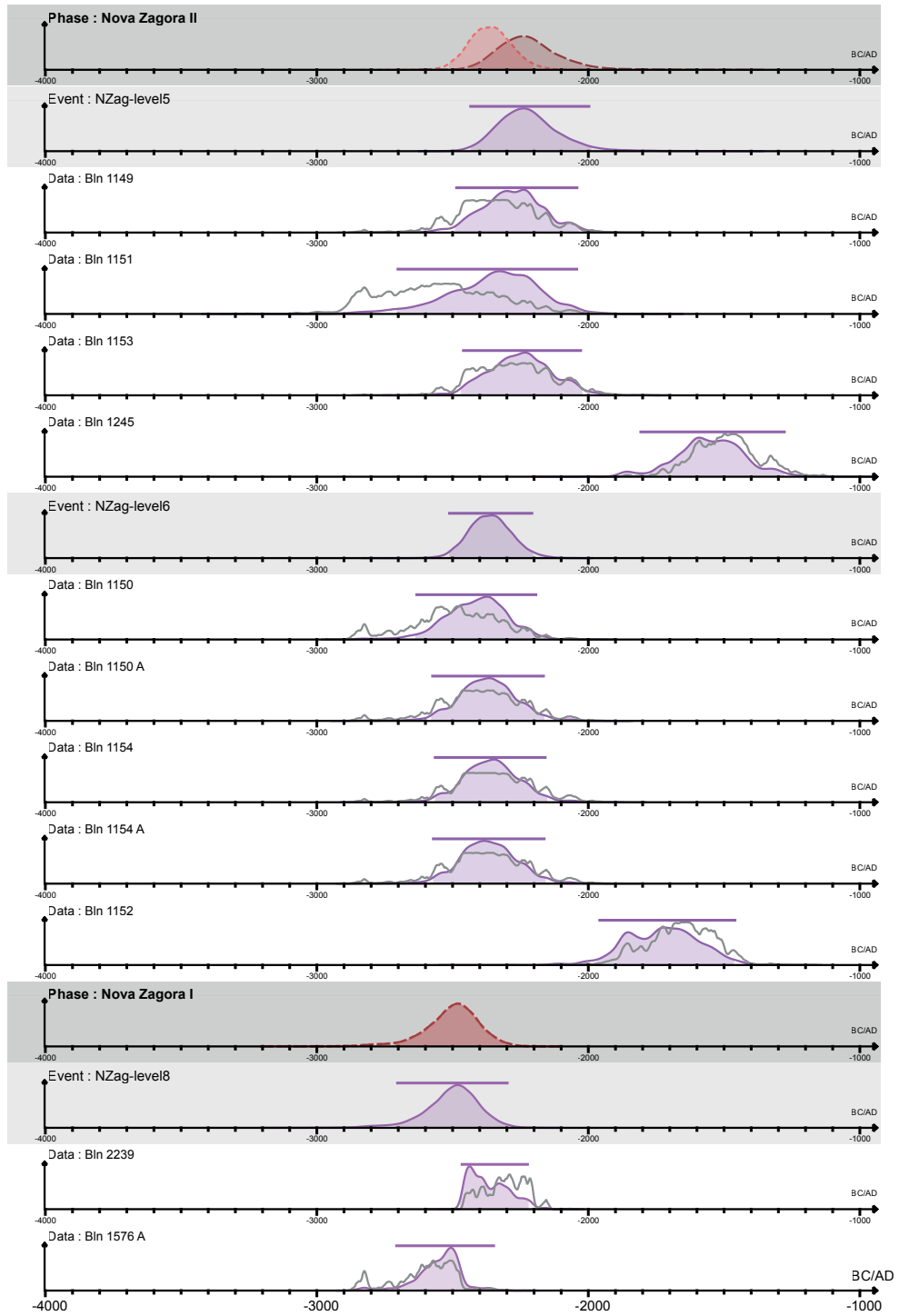
**Figure 5c.** Overall phasing without IGAN-2174;



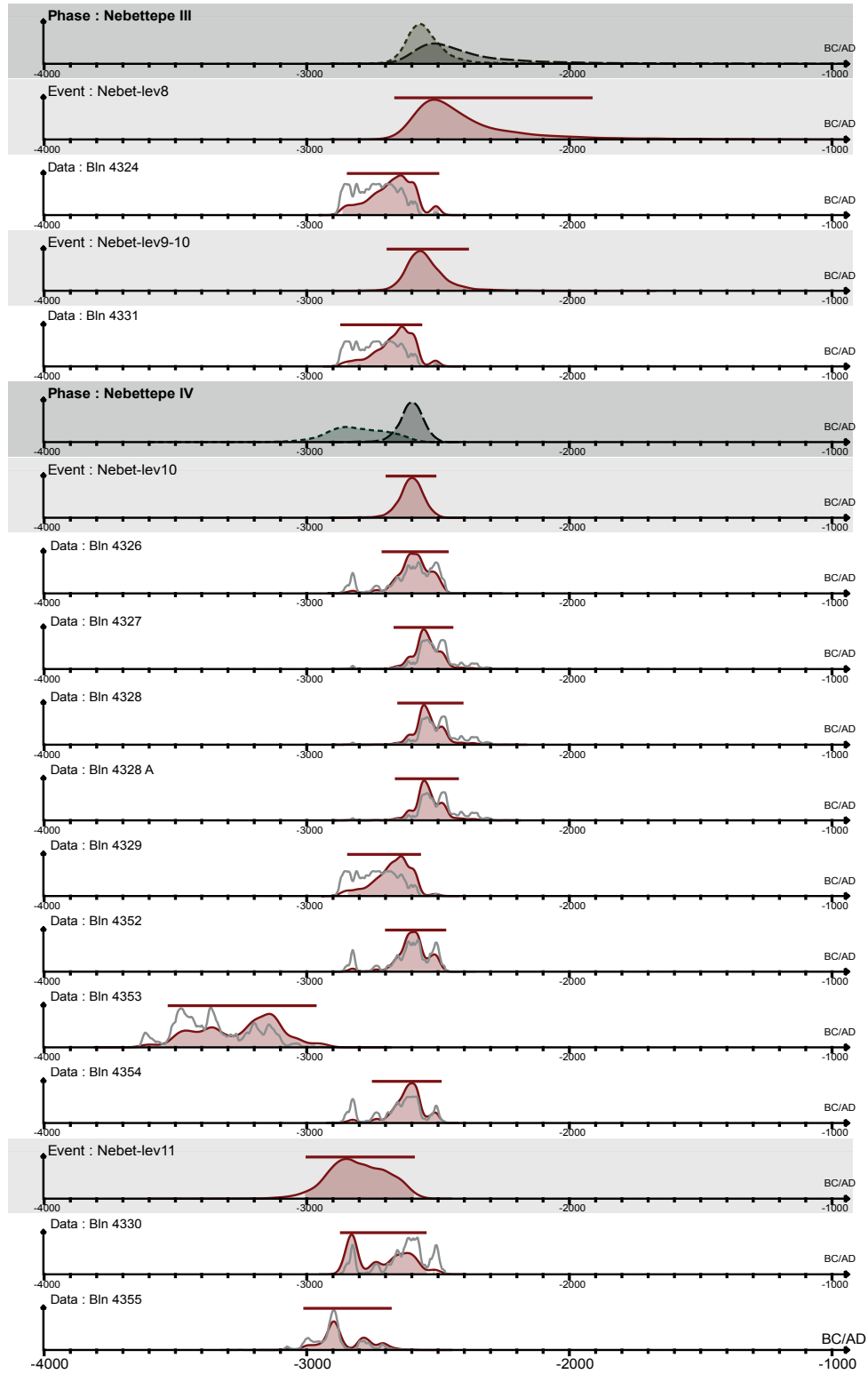




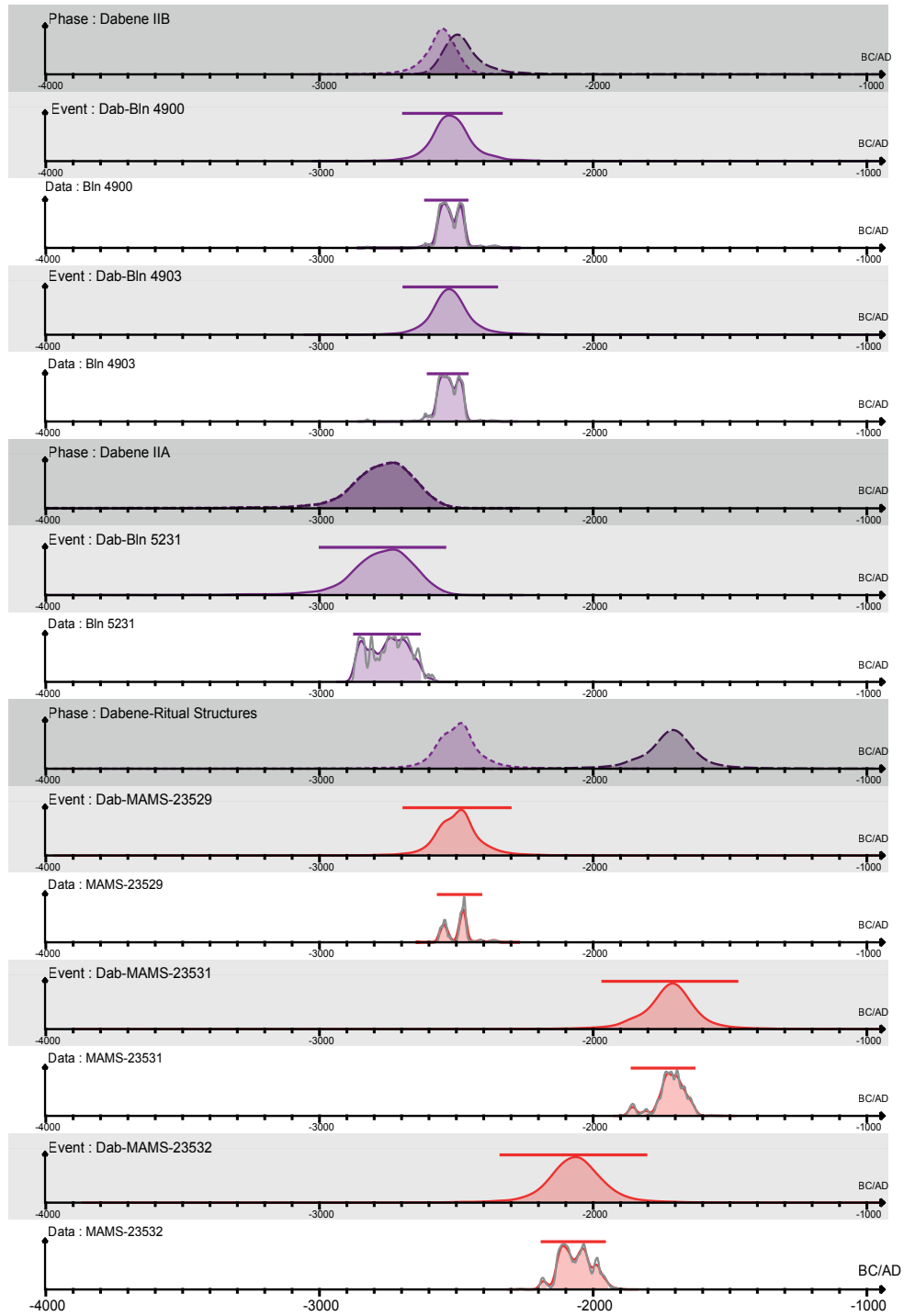
**Figure 5d (contin.).** Yunatsite, modelled diagram of the levels assigned to phase IIC (levels 8 to 3).



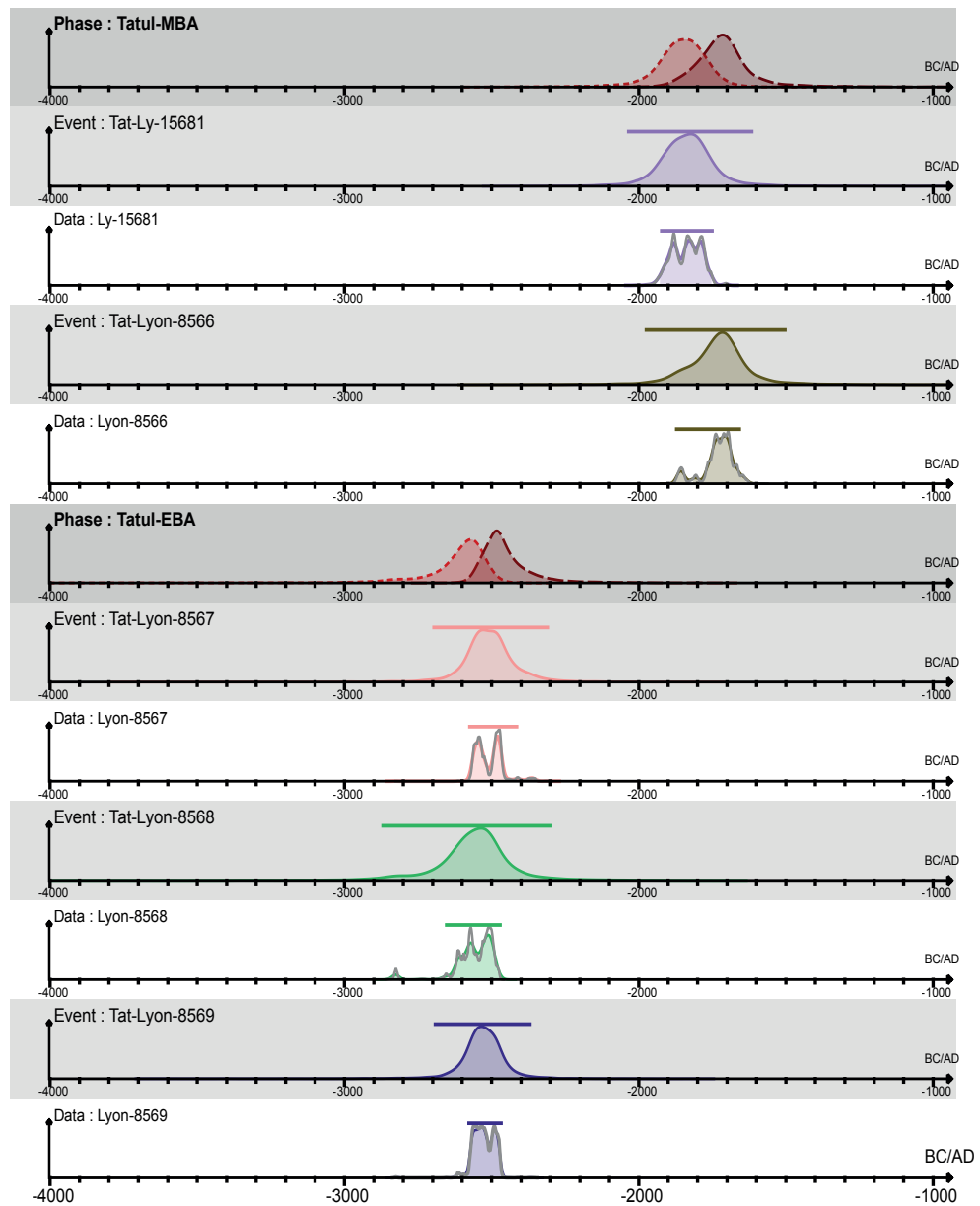
**Figure 6.** Modelled diagram of the  $^{14}\text{C}$  dates from Nova Zagora.



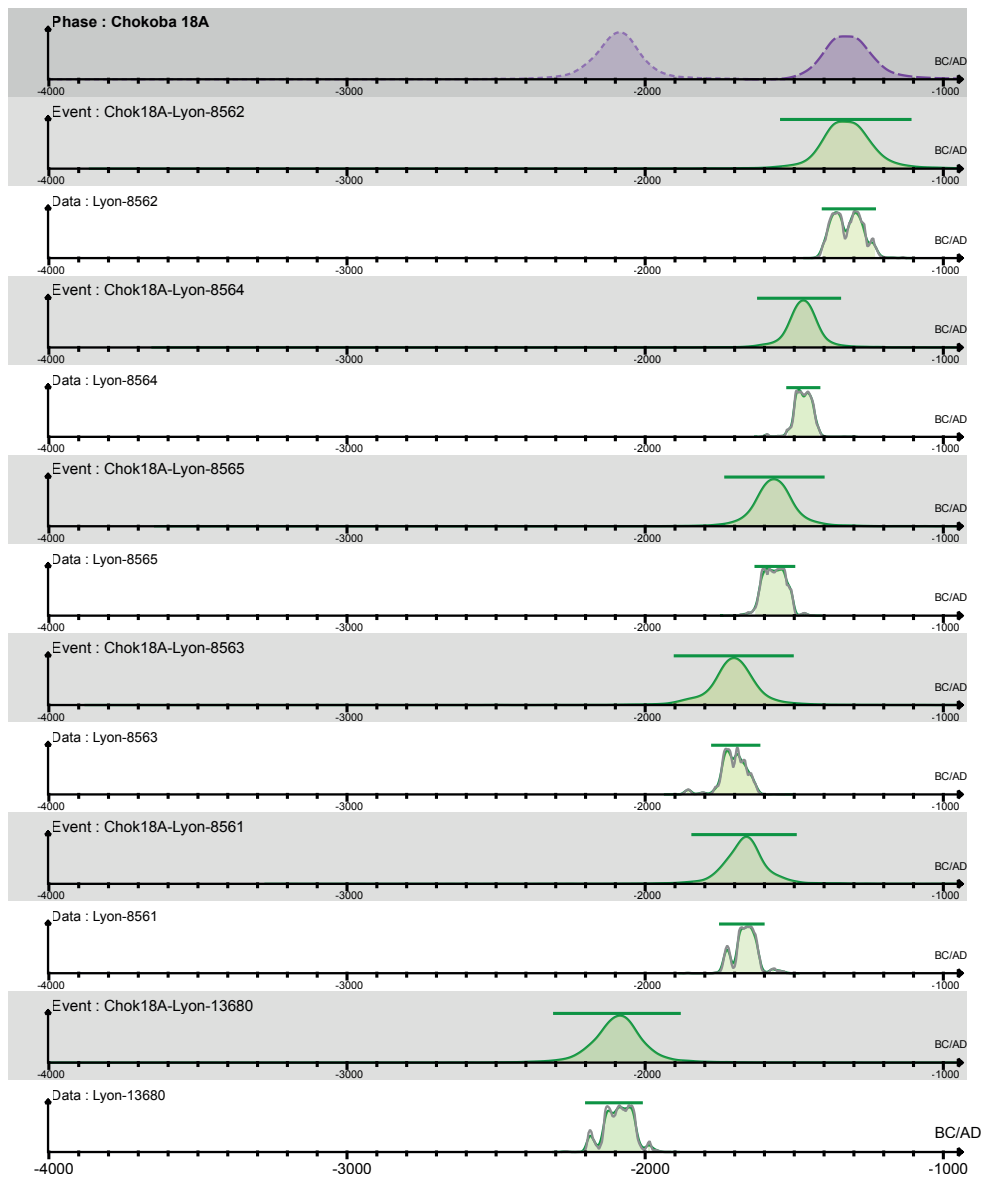
**Figure 7.** Modelled diagram of the  $^{14}\text{C}$  dates from Nebet Tepe, phases IV and III (the option shown here for the end of phase III does not take into consideration the dates from level 3, assigned to the EIA).



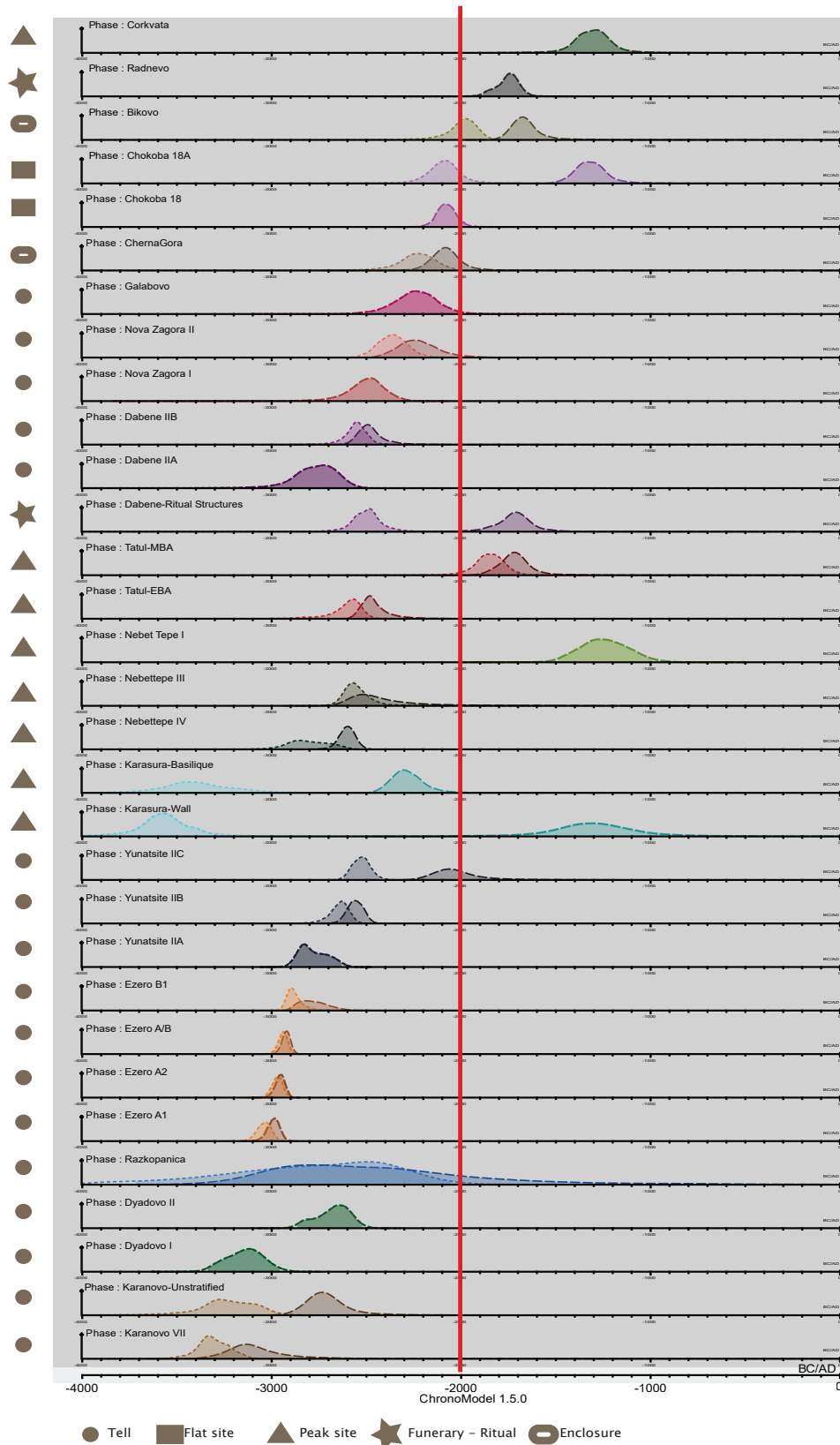
**Figure 8.** Modelled diagram of the  $^{14}\text{C}$  dates from Dabene.



**Figure 9.** Modelled diagram of the  $^{14}\text{C}$  dates from the Bronze Age levels at Tatul.

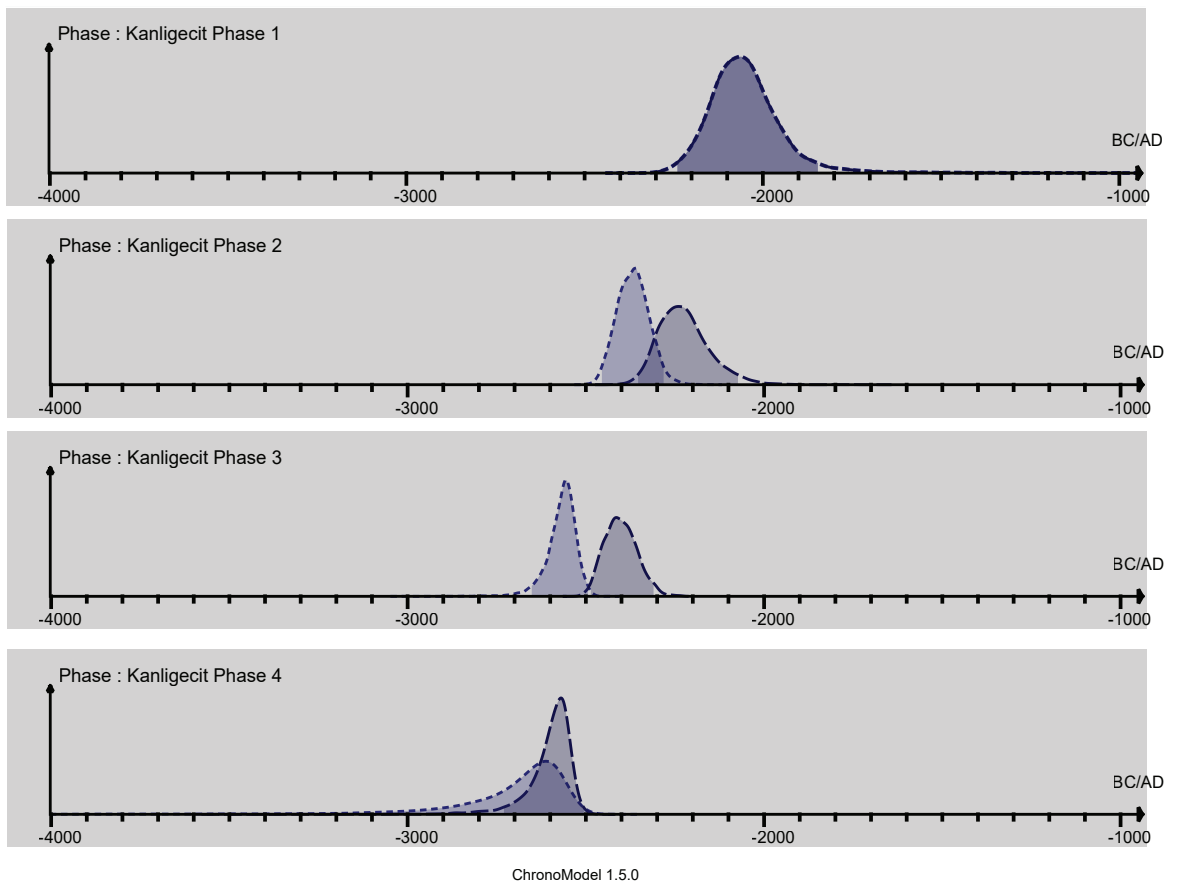


**Figure 10.** Modelled diagram of the  $^{14}\text{C}$  dates from Chokoba 18A.

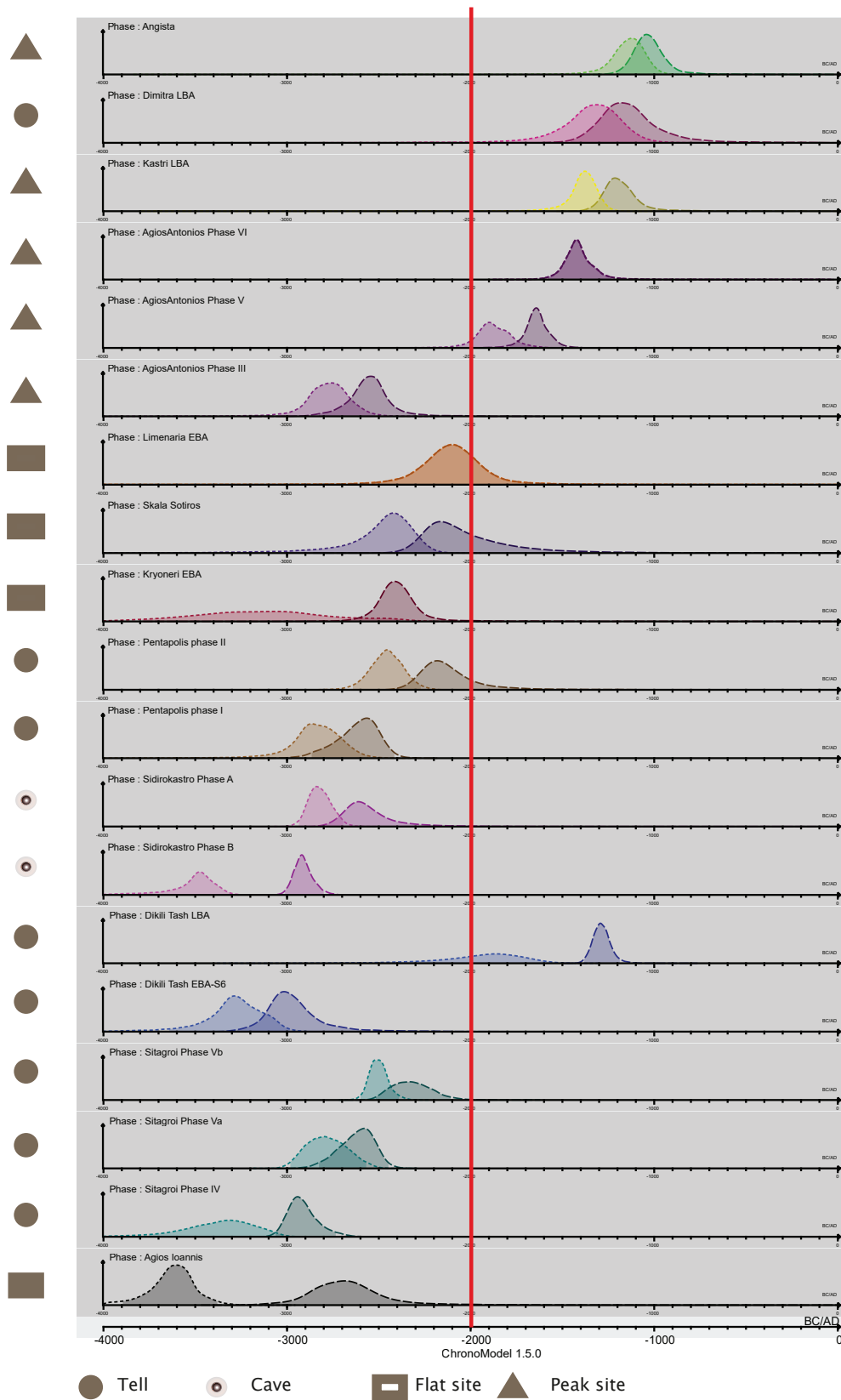


**Figure 11.** Synthetic diagram with the evolution of settlement in South Bulgaria according to the <sup>14</sup>C dates.





**Figure 12.** Diagram with the overall phasing of Kanligecit.



**Figure 13.** Synthetic diagram with the evolution of settlement in Greek Eastern Macedonia according to the <sup>14</sup>C dates.

**Table 1.** Available <sup>14</sup>C dates from Bronze Age sites in Bulgarian Thrace and the Rhodopes. Abbreviations used for the dating methods: AMS = Accelerated Mass Spectrometry, GPC = Gas Proportional Counting, LS = Liquid Scintillation. All the dates are calibrated at 2s (95,4% probability) with the curve IntCal.13 (Reimer et al. 2013).

Site	Lab code	Type of sample	Provenance	Method	BP date	±BP	Date cal. BC (95,4%)
Bikovo	Lyon-8571/ SacA-26544	animal bone	Ditch, sector 19 N, central part; stratum 1; depth 0.52m	AMS	3605	30	2031-1889
Bikovo	Ly-15755	animal bone	Ditch, sector 19 E, south part; stratum 4; depth 1.44-1.64m	LS	3530	30	1939-1767
Bikovo	Ly-15756	animal bone	Ditch, sector 19 M, central part; stratum 2; depth 0.98m	LS	3520	35	1939-1748
Bikovo	Lyon-8570/ SacA-26543	animal bone	Ditch, sector 19 D; depth 1.20-1.27m	AMS	3505	30	1909-1745
Bikovo	Ly-15754	animal bone	Ditch, sector 19 C, central part; stratum 4; depth -1.41-1.64m	LS	3475	30	1885-1693
Bikovo	Ly-15757	animal bone	Ditch, sector 19 G, stratum 2; depth 1.33m	LS	3390	30	1748-1618
Cherna Gora	Bln-5368	charcoal	Sector 2A; depth -3-3.20m	GPC	3790	37	2397-2050
Cherna Gora	Bln-5346	charcoal	Sector 3, Trench 3A1	GPC	3701	27	2197-1984
Chokoba 18A	Lyon-13680/ Sac 48686	charred seeds	sq. H10-H10, pit 1, depth -4.90-5m; Triticum monococcum	AMS	3700	30	2199-1981
Chokoba 18A	Lyon-8563/ SacA-26536	animal bone	Sq. A41, depth -2.15m, accumulation of pottery	AMS	3405	30	1753-1627
Chokoba 18A	Lyon-8561/ SacA-26534	animal bone	Sq. A40, pit 1, N1/2; depth -2.45-3.25m	AMS	3370	30	1739-1609
Chokoba 18A	Lyon-8565/ SacA-26538	animal teeth	sq. C41, pit 3, depth -2.20-2.40 m	AMS	3290	30	1629-1498
Chokoba 18A	Lyon-8564/ SacA-26537	animal bone	Sq. A42, depth -1.70 m, subterranean structure	AMS	3200	30	1518-1419
Chokoba 18A	Lyon-8562/ SacA-26535	animal bone	Sq. B40, pit 2, N1/2; depth -2.33-2.45m	AMS	3055	30	1408-1260
Chokoba 18	Lyon-8559/ SacA-26532	charred seeds	Sq. K18, depth -1.90 m, subterranean structure	AMS	3695	30	2194-1980
Chokoba 18	Lyon-8560/ SacA-26533	charcoal	Sq. K18, depth -1.85-1.90 m, control trench, subterranean structure	AMS	3680	30	2186-1976
Chorkvata	Ly-15664	charcoal	Under accumulation of stones, pottery concentration and charred material	LS	3040	30	1401-1213
Dabene	MAMS-23529	charcoal	Ritual structure 5	AMS	3963	23	2569-2353
Dabene	MAMS-23532	animal bone	Ritual structure 16	AMS	3676	37	2194-1948
Dabene	MAMS-23531	animal bone	Ritual structure 14	AMS	3414	35	1873-1621
Dabene	Bln-5231	charcoal	H18-4, hearth floor associated to a burnt level with pottery; depth -1.39m	GPC	4145	29	2880-2590
Dabene	Bln-4903	charcoal	K12; depth -1.39m	GPC	4003	36	2630-2450
Dabene	Bln-4900	seeds	F16; depth -1.39m	GPC	3993	36	2620-2400
Dyadovo	Gak-20464	charcoal	Level 10	GPC	4510	60	3486-3017
Dyadovo	Gak-20465	charcoal	Level 10, floor A	GPC	4510	60	3321-2874
Dyadovo	Gak-20466	charcoal	Level 10, floor B	GPC	4510	60	3365-2942
Dyadovo	Gak-20467	charcoal	Level 10, pithos 1	GPC	4510	60	3624-2914
Dyadovo	Bln-3867	charcoal	Sq. D, level 5; depth -1.89m	GPC	4410	50	3331-2909
Dyadovo	Bln-3871	charcoal	Sq. 26, level 5; depth -1.89m	GPC	4220	50	2915-2634
Dyadovo	Bln-3870	charcoal	Level 5; depth -1.89m	GPC	4110	50	2875-2500
Dyadovo	Bln-3866	charcoal	Sq. D, level 5	GPC	4105	50	2875-2497
Dyadovo	Bln-3868	seeds	Sq. Q19, level 5; depth -2.06m	GPC	4010	50	2840-2348
Dyadovo	Bln-3869	seeds	Sq. Q19, level 5; depth -2.04m	GPC	3960	60	2829-2235
Ezero	Bln-1841	charcoal	Sq. D11/D12, level 13; depth -3.45m	GPC	4420	80	3341-2907
Ezero	Bln-1156	charcoal	Sq. D11/D12, level 13; depth -3.35m	GPC	3980	100	2866-2204
Ezero	Bln-1920B	charcoal	Sq. D11, level 13; depth -3.35m	GPC	4500	50	3362-3027
Ezero	Bln-1920	charcoal	Sq. D11, level 13; depth -3.35m	GPC	4390	50	3325-2901
Ezero	Bln-1843	charcoal	Sq. D11, level 13; depth -3.35m	GPC	4430	50	3335-2919
Ezero	Bln-1159	charcoal	Sq. D11, level 13; depth -3.35m	GPC	4099	100	2907-2351
Ezero	Bln-1786	charcoal	Sq. D8, level 13; depth -3.35m	GPC	4450	80	3351-2920
Ezero	Bln-1158	charcoal	Sq. D8, level 13; depth -3.35m	GPC	4363	100	3357-2705

Ezero	Bln-1840	charcoal	Sq. C6, level 13; depth -3.35m	GPC	4590	100	3633-3023
Ezero	Bln-1256	charcoal	Sq. C6, level 13; depth -3.35m	GPC	4300	80	3322-2635
Ezero	Bln-1155	charcoal	Sq. C6, level 13; depth -3.35m	GPC	3040	100	1503-1007
Ezero	Bln-1837	charcoal	Sq. E7/E6, level 13; depth -3.20m	GPC	4415	80	3340-2905
Ezero	Bln-904	charcoal	Sq. E7/E6, level 13; depth -3.20m	GPC	4143	100	2922-2467
Ezero	Bln-1838	charcoal / seeds	Sq. E5, level 13; depth -3.20m	GPC	4305	60	3262-2701
Ezero	Bln-905	charcoal / seeds	Sq. E5, level 13; depth -3.20m	GPC	4113	100	2915-2410
Ezero	Bln-1836	charcoal	Sq. B1, level 12; depth -3.05m	GPC	4160	55	2888-2581
Ezero	Bln-903	charcoal	Sq. B1, level 12; depth -3.05m	GPC	3935	100	2855-2139
Ezero	Bln-902	charcoal	Sq. A7, level 11; depth -2.70m	GPC	4360	100	3357-2702
Ezero	Bln-1835	seeds	Sq. C11, level 10; depth -2.45m	GPC	4260	45	3012-2696
Ezero	Bln-727	seeds	Sq. C11, level 10; depth -2.45m	GPC	4315	100	3337-2635
Ezero	Bln-726	seeds	Sq. C9, level 10; depth -2.45m	GPC	4285	100	3328-2581
Ezero	Bln-725	seeds	Sq. A9, level 10; depth -2.45m	GPC	4120	100	2917-2461
Ezero	Bln-1834	charcoal / seeds	Sq. E11, level 9; depth -2.20m	GPC	4420	60	3336-2911
Ezero	Bln-722	seeds	Sq. E11, level 9; depth -2.20m	GPC	4285	100	3328-2581
Ezero	Bln-724	charcoal	Sq. C10, level 9; depth -2.02m	GPC	4365	150	3497-2581
Ezero	Bln-527	seeds	Sq. A6, level 8; depth -1.80m	GPC	4390	80	3338-2891
Ezero	Bln-1830	charcoal / seeds	Sq. A6, level 8; depth -1.80m	GPC	4335	45	3090-2886
Ezero	Bln-1831	charcoal	Sq. A6, level 8; depth -1.80m	GPC	4360	60	3324-2883
Ezero	Bln-528	charcoal	Sq. A6, level 8; depth -1.80m	GPC	4445	100	3483-2894
Ezero	Bln-1832	charcoal	Sq. B7, level 8; depth -1.80m	GPC	4245	50	3009-2636
Ezero	Bln-529	charcoal	Sq. B7, level 8; depth -1.80m	GPC	4375	100	3361-2761
Ezero	Bln-1828	charcoal	Sq. B3, level 7; depth -1.75m	GPC	4400	50	3328-2906
Ezero	Bln-525	charcoal	Sq. B3, level 7; depth -1.75m	GPC	4280	100	3326-2580
Ezero	Bln-1103	charcoal	Sq. D1, level 7; depth -1.65m	GPC	4280	100	3326-2580
Ezero	Bln-1826	charcoal	Sq. D1, level 7; depth -1.65m	GPC	4310	45	3086-2876
Ezero	Bln-1827	charcoal	Sq. E4, level 7; depth -1.65m	GPC	4475	60	3358-2936
Ezero	Bln-524	seeds	Sq. E4, level 7; depth -1.65m	GPC	4460	100	3489-2900
Ezero	Bln-523	charcoal	Sq. D1, level 7; depth -1.65m	GPC	4400	100	3366-2876
Ezero	Bln-1829	charcoal	Sq. D10, level 7; depth -1.60m	GPC	4165	40	2886-2624
Ezero	Bln-526	charcoal	Sq. D10, level 7; depth -1.60m	GPC	4135	100	2919-2467
Ezero	Bln-522	charcoal	Sq. D5, level 7; depth -1.55m	GPC	4455	100	3487-2898
Ezero	Bln-1825	charcoal	Sq. D5, level 7; depth -1.55m	GPC	4290	50	3085-2705
Ezero	Bln-423	charcoal	Sq. E5, level 7; depth -1.35m	GPC	4440	80	3347-3918
Ezero	Bln-424	charcoal	Sq. C4, level 7; depth -1.35m	GPC	4575	80	3625-3026
Ezero	Bln-422	charcoal	Sq. A7, level 6; depth -1.30m	GPC	4310	80	3328-2671
Ezero	Bln-1822	charcoal	Sq. A7, level 6; depth -1.30m	GPC	4275	65	3090-2639
Ezero	Bln-421	seeds	Sq. D8, level 6; depth -1.30m	GPC	4335	80	3336-2702
Ezero	Bln-427	charcoal	Sq. D10, level 4; depth -0.85m	GPC	4365	80	3339-2877
Ezero	Bln-428	charcoal	Sq. D10, level 4; depth -0.80m	GPC	4260	80	3092-2620
Ezero	Bln-1824	seeds	Sq. C10, level 4; depth -0.70m	GPC	4135	65	2888-2500
Ezero	Bln-429	seeds	Sq. C10, level 4; depth -0.70m	GPC	4130	100	2916-2466
Galabovo	Bln-4101	charcoal	Building level 4, sq. N6, house 1; depth -0.85m	GPC	3890	80	2575-2139
Galabovo	Bln-4102	charcoal	Building level 4, sq. O6; depth -0.80m	GPC	3745	50	2332-1980
Karanovo	Lyon-7481/ SacA-21369	animal bone	Central sector, K15/II-III, u.s. 27	AMS	4455	30	3332-3020
Karanovo	Lyon-7480/ SacA-21368	animal bone	Central sector, L15/II, u.s. 24	AMS	4180	30	2885-2638
Karanovo	Lyon-7480 (bis)/ SacA-24566	animal bone	Central sector, L15/II, u.s. 24	AMS	4215	40	2907-2671
Karanovo	Lyon-7479/ SacA-21367	animal bone	Central sector, K15/IV, u.s. 20	AMS	4425	30	3310-2926
Karanovo	Lyon-8851/ SacA-27819	animal bone	Central sector, K16/III, 217.70-217.60 masl	AMS	4490	35	3351-3027
Karanovo	Lyon-8852/ SacA-	animal bone	Central sector, K16/III; 217.70-217.60 masl	AMS	4555	35	3488-3103

	27820							
Karanovo	Lyon-8853/ SacA-27821	animal bone	Central sector, K16/III; 217.75-217.70 masl	AMS	4585	35	3500-3111	
Karanovo	Lyon-8854/ SacA-27822	animal bone	Central sector, K16/III; 217.80-217.75 masl	AMS	4570	35	3496-3104	
Karasura	Bln-3429	charcoal	Rampart layer II, North trench; depth -3m	GPC	4790	60	3692-3376	
Karasura	Bln-3447	charcoal	Under the basilica, sq. S10/O30; depth -3.30m	GPC	4620	60	3629-3106	
Karasura	Bln-3773	charcoal	Rampart layer III, North trench; depth -3.25m	GPC	4250	150	3339-2478	
Karasura	Bln-3427	charcoal	Rampart layer IV, North trench; depth -4m	GPC	4050	70	2876-2459	
Karasura	Bln-3420	charcoal	Under the basilica, sq. S10/O30; depth 3.50m	GPC	3960	50	2577-2298	
Karasura	Bln-4227	seeds	Sq. S 85/1, area of Basilica; depth -1.15m	GPC	3940	50	2573-2291	
Karasura	Bln-3423	seeds	North trench, Sq. S10 /O30, depth -3.30m	GPC	3870	50	2472-2202	
Karasura	Bln-3505	seeds	North trench, Sq. S10 /O30, depth -3.30m	GPC	3860	50	2471-2153	
Karasura	Bln-4216	seeds	Sq. S 85/1, area of Basilica; depth -1.15m	GPC	3810	60	2464-2050	
Karasura	Bln-3428	charcoal	Rampart layer V (base), North trench; depth -4m	GPC	3800	60	2461-2043	
Karasura	Bln-3426	charcoal	Rampart section, North sector; depth 7.50-7.70m	GPC	3690	50	2271-1937	
Karasura	Bln-4067	charcoal	North Tower, depth -5.16-5.40m	GPC	3070	100	1528-1020	
Nebet tepe	Bln-4330	charcoal	Sq. Z2-3, level 11; depth -2.60m	GPC	4070	40	2859-2486	
Nebet tepe	Bln-4355	charcoal	Sq. E 5, level 11; depth -2.20m	GPC	4280	55	3086-2679	
Nebet tepe	Bln-4329	charcoal	Sq. L6, level 10; depth -4.20m	GPC	4145	45	2879-2581	
Nebet tepe	Bln-4353	charcoal	Sq. L5, level 10; depth -3.80-3.90m	GPC	4610	80	3631-3095	
Nebet tepe	Bln-4354	charcoal	Sq. K7, level 10; depth -3.70m	GPC	4080	40	2863-2489	
Nebet tepe	Bln-4327	charcoal	Sq. K5, level 10; depth -3.20m	GPC	3990	50	2833-2342	
Nebet tepe	Bln-4352	charcoal	Sq. L5, level 10; depth -3m	GPC	4060	40	2852-2476	
Nebet tepe	Bln-4328	charcoal	Sq. K5, level 10; depth -2m	GPC	3980	50	2828-2308	
Nebet tepe	Bln-4328 A	charcoal	Sq. K5, level 10; depth -2m	GPC	3980	50	2828-2308	
Nebet tepe	Bln-4326	charcoal	Sq. J4, level 10; depth -1.53m	GPC	4050	50	2859-2469	
Nebet tepe	Bln-4331	charcoal	Sq. R5, level 9-10; depth -3.10m	GPC	4140	45	2877-2581	
Nebet tepe	Bln-4324	charcoal	Sq. K4, level 8; depth -2.90m	GPC	4145	45	2879-2581	
Nebet tepe	Bln-4322	charcoal	Sq. A3, level 3; depth -6.15m	GPC	3135	50	1508-1272	
Nebet tepe	Bln-4323	charcoal	Sq. A3, level 3; depth -5.60m	GPC	2890	50	1259-927	
Nova Zagora	Bln-1576 A	charcoal	Sq. G6, level 8; depth -2.80m	GPC	4041	60	2866-2461	
Nova Zagora	Bln-2239	charcoal	Sq. H7, level 8; depth -2.80m	GPC	3840	40	2461-2155	
Nova Zagora	Bln-1150	seeds	Sq. Y12, level 6; depth -2.20m	GPC	3972	100	2866-2201	
Nova Zagora	Bln-1150 A	seeds	Sq. Y12, level 6; depth -2.20m	GPC	3913	100	2839-2046	
Nova Zagora	Bln-1152	seeds	Sq. Z9, level 6; depth -2.10m	GPC	3358	100	1892-1435	
Nova Zagora	Bln-1154	seeds	Sq. Z9, level 6; depth -2.10m	GPC	3886	100	2829-2036	
Nova Zagora	Bln-1154 A	seeds	Sq. Z9, level 6; depth -2.10m	GPC	3900	100	2834-2041	
Nova Zagora	Bln-1149	seeds	Sq. K13, level 5; depth -1.90m	GPC	3872	100	2619-2033	
Nova Zagora	Bln-1151	seeds	Sq. K13, level 5; depth -1.90m	GPC	4020	150	2917-2135	
Nova Zagora	Bln-1153	seeds	Sq. Z9, level 5; depth -1.90m	GPC	3826	100	2568-1980	
Nova Zagora	Bln-1245	seeds	Sq. K13, level 5; depth -1.90m	GPC	3217	100	1741-1265	
Radnevo	Lyon-8572/ SacA-26545	human bone (femur)	Grave 1, depth -0.30m	AMS	3460	35	1883-1688	
Radnevo	Lyon-8573/ SacA-26546	human bone (skull fr.)	Grave 1, depth -0.30m	AMS	3430	30	1870-1681	
Razkopanitsa	Bln-813	seeds	Level 4, inside a storage vessel on a house floor; depth -2.30m	GPC	4350	100	3355-2697	
Razkopanitsa	Bln-814	seeds	Level 3, house 2; depth -3m	GPC	3886	100	2829-2036	
Tatul	Lyon-8568/ SacA-26541	charcoal	Sq. F4, hearth 20, base level, 392.00 masl	AMS	4040	30	2655-2475	

Tatul	SUERC-63780/ GU-39074	charcoal	Sq. F4, hearth 20, base level, 392.00 masl	AMS	4034	34	2621-2477
Tatul	SUERC-63777/ GU-39070	charcoal	Sq. F4, hearth 20, ceramic stand, 392.00 masl	AMS	4063	26	2672-2250
Tatul	SUERC-63778/ GU-39072	charcoal	Hearth 14, Western part; 392.00 masl	AMS	4049	29	2637-2478
Tatul	Lyon-8569/ SacA-26542	charcoal	Sq. D6, control trench, NW part, near hearth 39, 392.25 masl	AMS	4005	30	2577-2468
Tatul	SUERC-63741/ GU-39069	charcoal	Sq. E5, destruction layer	AMS	4099	31	2710-2569
Tatul	SUERC-63787/ GU-39078	animal bone	Sq. E5, layer around hearth 42; alt. 392 masl	AMS	3941	33	2498-2337
Tatul	Lyon-8567/ SacA-26540	charcoal	Sq. E5, hearth 27, 392.77 masl	AMS	3975	30	2575-2355
Tatul	SUERC-63781/ GU-39075	charcoal	Hearth 19, between two layers of clay; alt. 392 masl	AMS	3517	29	1923-1752
Tatul	SUERC-40110/ GU-25554	antler	Sq. D5	AMS	2925	30	1216-1019
Tatul	Lyon-8566/ SacA-26539	charcoal	Sq. E5/D5, Hearth 4, under the second floor, 393.33 masl	AMS	3425	30	1872-1638
Tatul	Ly-15681	charcoal	Sq. C5, hearth 1, E. part, under the floor, 393.68 masl	LS	3520	30	1924-1753
Yunatsite	IGAN-2794	charcoal	Central section, level 16-17; depth -5m	GPC	4380	70	3333-2889
Yunatsite	IGAN-2795	charcoal	Central section, level 15-17; depth -5m	GPC	4090	60	2872-2490
Yunatsite	Bln-3675	seeds	Level 15, house 31; depth -4.66m	GPC	4280	60	3089-2675
Yunatsite	Bln-3676	seeds	Level 15, house 31; depth -4.66m	GPC	4030	70	2869-2348
Yunatsite	Ly-14795	seeds	Sq. K7-8, level 15, house 34; depth -4m	GPC	4280	40	3018-2762
Yunatsite	Bln-3677	seeds	Level 15, house 34; depth -4.64m	GPC	4080	70	2872-2476
Yunatsite	Bln-3678	seeds	Level 15, house 34; depth -4.64m	GPC	4050	50	2859-2469
Yunatsite	Bln-3671	seeds	Level 13, house 22, inside a storage vessel; depth -4.30m	GPC	4180	50	2896-2621
Yunatsite	Bln-3672	charcoal	Level 13, house 22, inside a storage vessel; depth -4.30m	GPC	4040	50	2857-2467
Yunatsite	Bln-3672 A	charcoal	Level 13, house 22, inside a storage vessel; depth -4.30m	GPC	4040	50	2857-2467
Yunatsite	Bln-3673	seeds	Sq. E9, level 13, house 20; depth -4.45m	GPC	3990	60	2837-2298
Yunatsite	Bln-3674	seeds	Sq. E9, level 13, house 20; depth -4.45m	GPC	4020	60	2860-2348
Yunatsite	Bln-3670	seeds	Sq. C7/C8, level 11, house 11, inside a storage jar ; depth -3.70m.	GPC	3990	50	2833-2342
Yunatsite	Bln-3679	seeds	Sq. C7/C8, level 11, house 11, inside a storage jar; depth -3.70m.	GPC	4000	70	2858-2297
Yunatsite	Bln-3668	seeds	Sq. C8, level 10, house 10; depth -3.35m	GPC	3830	60	2470-2064
Yunatsite	Bln-3669	seeds	Sq. U8, level 10; depth -3.35m	GPC	4090	50	2872-2491
Yunatsite	IGAN-2799	charcoal	Central section, level 9-10; depth -3.30- 3.60m	GPC	4070	150	3013-2154
Yunatsite	Bln-3665	charcoal	Sq. P7, level 9; depth -3.10m	GPC	4100	50	2873-2496
Yunatsite	Bln-3666	seeds	Sq. P7, level 9; depth -3.10m	GPC	4070	60	2867-2473
Yunatsite	Bln-3667	charcoal	Sq. L9, level 9, beam; depth -3.10m	GPC	4050	50	2859-2469
Yunatsite	IGAN-2798	charcoal	Central section, level 8-9; depth -3.30m	GPC	4180	250	3507-2046
Yunatsite	Bln-3663	seeds	Sq. O8/M6, level 8, inside a storage jar; depth -2.80m	GPC	4100	50	2873-2496
Yunatsite	Bln-3664	seeds	Sq. O8/M6, level 8, inside a storage jar; depth -2.80m	GPC	4140	50	2878-2581
Yunatsite	Bln-3662	charred fruit(s)	Sq. O9, level 7, inside a storage jar; depth - 2.60m	GPC	3910	60	2568-2206
Yunatsite	Bln-3660	charcoal	Sq. Z9/K6, level 6; depth -2.35m	GPC	3970	50	2620-2299
Yunatsite	Bln-3661	charcoal	Sq. Z9/K6, level 6; depth -2.35m	GPC	4060	60	2866-2469
Yunatsite	Bln-3658	charred fruit(s)	Sq. O6/O8, level 5, inside a storage jar; depth -1.95m	GPC	3780	50	2433-2035
Yunatsite	Bln-3659	charred fruit(s)	Sq. O8/O9, level 5, inside a storage jar; depth -1.95m	GPC	3700	50	2274-1946
Yunatsite	Bln-3657	charred fruit(s)	Sq. Z9, level 4; depth -1.70m	GPC	3760	50	2345-2025
Yunatsite	Bln-3656	charred fruit(s)	Sq. K6, level 3; depth -1.45m	GPC	3760	50	2345-2025

**Table 2.** Available <sup>14</sup>C dates from Bronze Age sites in Greek Eastern Macedonia. Abbreviations used for the dating methods: AMS = Accelerated Mass Spectrometry, GPC = Gas Proportional Counting, LS = Liquid Scintillation. All the dates are calibrated at 2s (95,4% probability) with the curve IntCal.13 (Reimer et al. 2013).

Site	Lab Code	Type of sample	Provenience	Method	BP date	±BP	Date cal. BC (95,4%)
Aghios Antonios Potos	DEM-2169	animal bone	Trench ΓΘ-ΓΔ, layer 8/7, unit 41-44; alt. 29.30-28.96m	GPC	4169	30	2880-2632
Aghios Antonios Potos	DEM-2133	animal bone	Trench ΓΘ, layer 8, unit 45; alt. 29.03-28.93m	GPC	4043	30	2833-2475
Aghios Antonios Potos	DEM-2240	animal bone	Trench ΑΥ, ΒΕ/4-5 and ΒΔ/3-5 layer 2/4, unit 35/39; alt. 30.33-30.17m	GPC	3545	30	1964-1770
Aghios Antonios Potos	DEM-2333/ OxA-22621	charcoal	Trench ΒΠ, sq. ΒΓ/0-4, layer 10, unit 96; alt. 27.93m	AMS	3348	25	1735-1530
Aghios Antonios Potos	DEM-2241	animal bone	Trench ΑΗ, sq. ΑΒ/2-5, layer 3, unit 28, building ΙΧ; alt. 31.24-31.12m	GPC	3145	30	1496-1322
Aghios Ioannis	DEM-848	charcoal	I, Trench ΒΒ, sq. Β-Ε/0-3, layer 3 unit 30; depth 1.84m	GPC	4816	51	3705-3380
Aghios Ioannis	DEM-849	charcoal	I, Trench ΒΒ, sq. Β-Ε/2-3, layer 9, unit 36; depth 1.80m	GPC	4598	117	3640-2940
Aghios Ioannis	DEM-1072	charcoal	I, Trench ΒΠ, sq. Β-Ε/0-1, layer 4, unit 10; depth 1,28-1,16m	GPC	4563	68	3520-3025
Aghios Ioannis	DEM-932	animal bone	I, Trench ΒΒ, sq. Β-Ε/0-4, layer 12, unit 42; depth 1,82-1,62m	GPC	4530	43	3365-3095
Aghios Ioannis	DEM-933	animal bone	I, Trench ΒΒ, sq. Α-Ε/3-5, layer 11, unit 38; depth 1,78-1,58m	GPC	4513	54	3370-3025
Aghios Ioannis	DEM-931	animal bone	I, Trench ΒΒ, sq. Β-Ε/2-5, layer 3, unit 8; depth 1,82-1,70m	GPC	4113	54	2880-2495
Angista	Bln-2103	charred organic material	North Trench, layer 5, pithos 1, Γ-Δ/1-2	GPC	2900	45	1217-939
Angista	Bln-2104	charcoal	North Trench, layer 5, pithos 3, Γ-Δ/2-3	GPC	2890	65	1258-909
Angista	Bln-2134	charred organic material	North Trench, layer 5, pithos 1, Γ-Δ/1-2	GPC	2890	45	1210-935
Dikili Tash	DEM-2347	charred fruits	Sector 6, level 6-2, unit 6526; pit 6-094; alt. 63,74-63,30m	GPC	4453	30	3337-3013
Dikili Tash	Lyon-6012/ SacA-15581	charred fruits	Sector 6, level 6-2, unit 6010; pit 6-003; alt. 64,21m	AMS	4445	30	3328-3015
Dikili Tash	DEM-552	seeds	Sector 6, level 6-2, pit 6-142; alt. 63,42-63,25m	GPC	4419	28	3300-2920
Dikili Tash	Ly-1602	charcoal	Sector Α2, sq. Τ 24, layer 12; alt. 65,78-66m	LS	3700	230	2854-1529
Dikili Tash	Ly-1063	charcoal	Sector Α2, sq. Q 25, layer 2/3; alt. 67,61-67,74m	LS	3430	120	2035-1451
Dikili Tash	DEM-2033	charred fruits	Sector 7, level 7-10, unit 7128; alt. 67,87-67,97m	GPC	3242	30	1610-1440
Dikili Tash	Lyon-6017/ SacA-15586	charcoal	Sector 7, level 7-9, unit 7092; alt. 68,05-68,10m	AMS	3100	30	1430-1310
Dikili Tash	DEM-2032	charcoal	Sector 7, level 7-6, unit 7124; alt. 68,68m	GPC	3078	50	1455-1135
Dikili Tash	Lyon-6016/ SacA-15585	charcoal	Sector 7, level 7-8, unit 7159; alt. 68,26-68,42m	AMS	3075	30	1414-1266
Dikili Tash	Lyon-6019/ SacA-18607	charcoal	Sector 7, level 7-6, unit 7150; alt. 68,68m	AMS	3065	35	1414-1250
Dikili Tash	Lyon-6015/ SacA-15584	seeds	Sector 7, level 7-11, unit 7169; alt. 67,93m	AMS	3020	30	1384-1133
Dikili Tash	Ly-1306	charcoal	Sq. Q 25/26, layer 2; alt. 67,61-67,74m	LS	2890	370	2119-201
Dimitra	Bln-2479	charcoal	Trench I, unit 28/8; "burnt house"; depth 3.75m	GPC	3020	100	1496-997
Dimitra	Bln-2478	sediment with charcoal	Trench I, unit 41/16; "burnt house"; depth 3.54m	GPC	3000	50	1399-1057
Kastri Theologos	Lyon-7913/ SacA-23516	animal bone	Sector T12, sq. O-A/23-24; depth 2.13m	AMS	3090	30	1425-1300
Kastri Theologos	Lyon-7916/ SacA-23519	animal bone	Sector T1, sq. O-D/2-3	AMS	3045	30	1402-1216
Kastri Theologos	Lyon-7912/ SacA-23515	animal bone	Sector T12, sq. A-B/22-23; depth 1.96m	AMS	2985	30	1311-1125
Kryoneri	DEM-790	charcoal	Sector I3-I4-1d	GPC	4461	181	3640-2670

Kryoneri	Lyon-6029/ SacA-15598	charcoal	Sector III, depth 0.30-0.40m	AMS	3925	30	2429-2151
Limenaria	DEM-770	charcoal	Plot Markoulis, sq. O-C/0-3, unit 4; depth 0.70m	GPC	3707	64	2290-1920
Limenaria	DEM-771	charcoal	Plot Markoulis, sq. C-O/1-4, unit 11; depth 0.71m	GPC	3026	189	1680-810
Pentapolis	Bln-2392	charcoal	Unit 24B, depth 2.90m	GPC	4235	50	2925-2634
Pentapolis	Bln-2393	charcoal	Unit 18N, depth 2.60m	GPC	4025	50	2856-2460
Pentapolis	Bln-2395	charcoal	Unit 7N, depth 1.40m	GPC	3955	55	2620-2287
Pentapolis	Bln-2454	charcoal	Unit 11N, depth 1.75m	GPC	3850	50	2468-2151
Pentapolis	Bln-2394	charcoal	Unit 11N, depth 1.75m	GPC	3820	55	2466-2064
Pentapolis	Bln-2396	charcoal	Unit 4N, depth 1.10m	GPC	3805	50	2459-2060
Sidirokaastro-Katarraktes	Lyon-6004/ SacA-15573	burnt animal bone	Trench E4, layer 3, building B4; alt. 96,85 m	AMS	4635	30	3509-3358
Sidirokaastro-Katarraktes	DEM-1933	charcoal	Trench I7, layer 3, building B3; alt. 96,89-96,66 m	GPC	4530	30	3370-3100
Sidirokaastro-Katarraktes	DEM-1520	charcoal	Trench IA8, layer 4a; alt. 96,74 m	GPC	4471	25	3340-3020
Sidirokaastro-Katarraktes	Lyon-6003/ SacA-15572	charcoal	Trench IH7, layer 6; alt. 96,76-96,74 m	AMS	4465	35	3341-3020
Sidirokaastro-Katarraktes	DEM-1519	charcoal	Trench IZ 20, layer 3; alt. 96,64 m	GPC	4459	25	3340-3020
Sidirokaastro-Katarraktes	DEM-1931	charcoal	Trench E4, layer 2c, building B4; alt. 96,72 m	GPC	4459	30	3340-3020
Sidirokaastro-Katarraktes	DEM-1521	charcoal	Trench IA7, layer 3; alt. 96,85 m	GPC	4447	25	3330-2920
Sidirokaastro-Katarraktes	DEM-1932	charcoal	Trench I7, layer 3, building B3	GPC	4442	30	3330-2930
Sidirokaastro-Katarraktes	DEM-1930	charcoal	Trench O9, layer 3, building B2; alt. 96,84 m	GPC	4402	30	3265-2915
Sidirokaastro-Katarraktes	DEM-1909	charcoal	Trench O7, layer 3, building B3; alt. 96,58 m	GPC	4388	30	3095-2915
Sidirokaastro-Katarraktes	DEM-1908	charcoal	Trench IZ 19, layer 3, building B1; alt. 96,55 m	GPC	4374	30	3090-2910
Sidirokaastro-Katarraktes	Lyon-7022/ SacA-19573	burnt animal bone	Trench E4, layer 3, building B4; alt. 96,85 m	AMS	4355	35	3084-2900
Sidirokaastro-Katarraktes	Lyon-8908/ SacA-26441	charred fruits	Trench O2, layer 3, building A2	AMS	4200	35	2893-2674
Sidirokaastro-Katarraktes	DEM-1910	charcoal	Trench I8, layer 2a, building A1; alt. 97,04 m	GPC	4166	30	2880-2630
Sidirokaastro-Katarraktes	Lyon-6001/ SacA-15570	charred fruits	Trench O2, layer 3, building A2	AMS	4105	30	2860-2573
Sidirokaastro-Katarraktes	Lyon-6001bis/ SacA-24079	charred fruits	Trench O2, layer 3, building A2	AMS	4105	30	2860-2573
Sitagroi	Bln 879	charcoal	ZA 31, floor 14	GPC	4550	100	3622-2930
Sitagroi	Bln 880	charcoal	ZB 112	GPC	4510	100	3510-2915
Sitagroi	Bln 878	charcoal	ROc 59	GPC	4395	100	3367-2872
Sitagroi	Bln 773	seeds	ZA 29	GPC	4390	100	3365-2780
Sitagroi	Bln 1102	charcoal	ZB 112	GPC	4380	80	3338-2886
Sitagroi	BM 650a	charcoal	ZB 112	GPC	4363	56	3322-2886
Sitagroi	BM 651	seeds	ZB 108	GPC	4332	79	3335-2701
Sitagroi	Bln 782	charcoal	ZA 16, depth 2.00-2.50m	GPC	4310	100	3336-2632
Sitagroi	Bln 877	charcoal	PO 158, Burnt House	GPC	4170	100	3010-2473
Sitagroi	Bln 781	seeds	QO 8, Bin Complex	GPC	4085	150	3022-2202
Sitagroi	LJ-2715	charcoal	PN/C 81, Long House	GPC	4005	40	2832-2459
Sitagroi	LJ-2714	charcoal	PN/C 81, Long House	GPC	3971	40	2579-2345
Sitagroi	Bln 876	charcoal	PO 23, Long House	GPC	3965	100	2865-2152
Sitagroi	Bln 780	charcoal	PO 9, Bin Complex	GPC	3870	100	2618-2033
Sitagroi	BM 652	charcoal	PO 162, Burnt House	GPC	3803	59	2461-2046
Sitagroi	BM 653	seeds	QO 8, Bin Complex	GPC	3790	78	2467-2026
Skala Sotiros	DEM 103-84	charcoal	I-IIA-30K, 1987 excavation	GPC	3867	63	2561-2142
Skala Sotiros	DEM 106-87	charcoal	IV-47K, 1988 excavation	GPC	3845	37	2462-2148
Skala Sotiros	DEM 105-86	charcoal	I-II37K, 1988 excavation	GPC	3802	39	2454-2138
Skala Sotiros	DEM 104-85	charcoal	I-IIA/88- 1K	GPC	3752	154	2590-1750