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The Chronology of the Neolithic Settlement at Tepecik-Çiftlik, Central Anatolia (Türkiye), Based on Radiocarbon Dating



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Abstract

This study uses radiocarbon dating to evaluate the Neolithic occupation sequence of Tepecik-Çiftlik Höyük, located in Central Anatolia. A total of 50 radiocarbon samples, most of which are presented here for the first time, were collected from different archaeological levels of the mound between 2004 and 2024. These results have been analyzed in conjunction with stratigraphic data. The findings demonstrate that the excavated levels of the site were continuously occupied between 7078 and 5989 cal BC. The study also discusses potential causes of inconsistencies observed in some radiocarbon results and proposes strategies for future sampling. Through the case of Tepecik-Çiftlik, this research provides new contributions to the chronological framework of the Neolithic period in Central Anatolia.

Keywords

Neolithic • Tepecik-Çiftlik • Radiocarbon Dating • Chronology • Central Anatolia



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Introduction

Tepecik-Çiftlik is a Neolithic site located in the southeastern part of Central Anatolia, within the Volcanic Cappadocia region. Its proximity to the Melendiz Mountains and the obsidian sources at Göllüdağ has made it an important prehistoric settlement. Excavations carried out since 2000 have uncovered an area of approximately 1,750 square meters and documented a cultural deposit consisting of ten distinct layers. These layers reflect a long and continuous sequence of occupation, extending from the final phases of the Pre-Pottery Neolithic to the beginning of the Chalcolithic period.

Tepecik-Çiftlik Höyük, currently under excavation, provides a detailed reflection of regional cultural development through its uninterrupted stratigraphy. This study aims to evaluate the Neolithic settlement process using absolute dating methods. The research is based on 50 radiocarbon samples collected from different levels between 2004 and 2024, most of which have not been previously published¹.

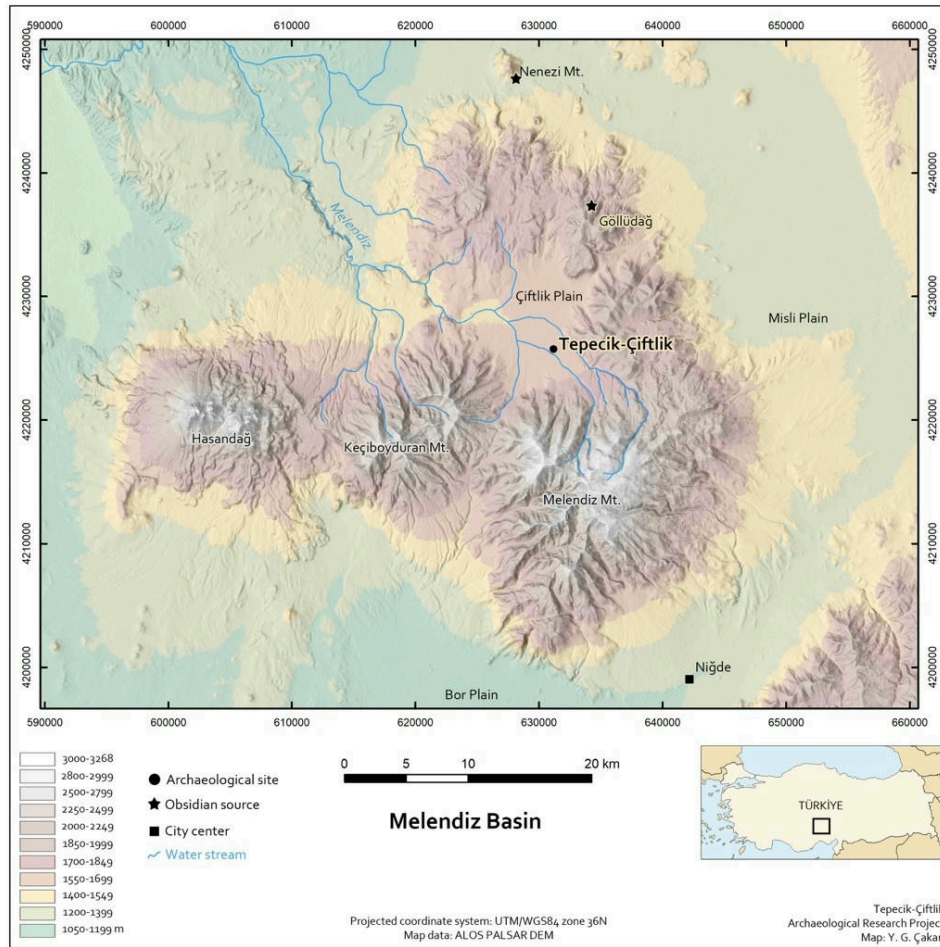
These data, evaluated in conjunction with stratigraphic information, allow a reassessment of the chronological order of the occupational phases, the continuity of the settlement, and the structural transformations observed at different levels. At the same time, the results contribute to broader discussions on the Neolithic chronology of the region.

The Site

The Tepecik-Çiftlik mound was discovered during prehistoric surveys conducted by Ian Todd in 1966 in the Central Anatolian region. The mound is situated in the Volcanic Cappadocia Region, south of the Central Anatolia Plateau, within the boundaries of the Çiftlik district of Niğde (Bıçakçı et al., 2012; Todd, 1966: 105). Excavations initiated by E. Bıçakçı in 2000 are still ongoing. The mound is positioned south of the Çiftlik Plain, which is surrounded by volcanic mountains and has an average altitude of 1,400 meters. Rivers originating from the Melendiz Mountains, encircling the plain, flow into the Çiftlik Plain and converge in the west to form the Melendiz River. The mound lies approximately 400 meters north of the Şekiller stream, one of the tributaries of the Melendiz River. This settlement is also significant due to its proximity to Göllüdağ, which contains a large portion of the obsidian deposits found in the Volcanic Cappadocia Region (Bıçakçı, 2022).

The mound covers an area of 300 x 170 meters and consists of an oval-shaped cone with a terrace located to the east-southeast of the cone, its long axis extending in a southeast-northwest direction. In this section, the mound covers an area of 33,300 m². Surface finds are widely scattered across the area south of the mound and are used for agricultural purposes. Based on the distribution of surface finds, it is estimated that the mound covers an area of approximately 6 hectares, including this southern area. The elevation of the highest point of Tepecik-Çiftlik above the surrounding plain is 9.60 meters (Bıçakçı et al., 2007: 237). As a result of the excavations carried out so far, the deepest level reached is approximately -7.30 meters from the highest point of the mound; the main soil has not yet been reached.

¹For previously published radiocarbon results for Tepecik-Çiftlik, see: Godon, 2008; Bıçakçı et al., 2012; Clare & Weninger, 2014.

Figure 1*Location of Tepecik-Çiftlik.*

Materials and Methods

The cultural deposit at the mound, approximately 7.30 meters high, consists of 10 archaeological levels. Levels 10-7 were identified in the deep trench on the western side of the excavation area. Due to the limited size of the excavation area and the lack of architectural remains, these levels were distinguished based on differences in the color and composition of the deposits. Levels 6-2 were excavated in the widest section. Archaeological remains indicate that Level 10 dates to the end of the Pre-Pottery Neolithic and the beginning of the Pottery Neolithic, Levels 9-3 date to the Pottery Neolithic, and Level 2 dates to the Early Chalcolithic. Levels 10-7 were identified in a very narrow area, which limits the available data. Since no pottery was found in Level 10, it is assumed that this level corresponds to the end of the Pre-Pottery Neolithic. The available data indicate that the settlement process at the mound began in the Pre-Pottery Neolithic and continued uninterrupted until the end of the Early Chalcolithic.

Between 2004 and 2024, 50 samples from various contexts belonging to different levels of the mound were analyzed. Of these, 16 were human bones, 13 were animal bones from sheep, goats, equids, and cattle, 4 were burnt seeds, and 17 were charcoal (see Table 1). The samples were analyzed using the carbon-14 dating method at the University of Cologne-Centre for AMS (Germany), University of Erlangen-Nürnberg Institute of Physics (Germany), Carbon-14 Measurement Laboratory of CEA-CNRS (France), BETA Analytic Testing Laboratory (USA), and TÜBİTAK Marmara Research Center AMS Laboratory (Türkiye). This paper presents the results

in the form of a plot obtained using OxCal v.4.3.2 (Ramsey, 2017) with the IntCal13 atmospheric calibration curve (Reimer et al., 2013).

During the study, each sample related to radiocarbon results was evaluated, considering the layer it belonged to and its archaeological context. The samples were analyzed for stratigraphic compatibility, contextual reliability, and consistency with archaeological data. Using stratigraphically consistent samples, the approximate chronological range of each layer was determined. However, when discrepancies existed between the date and stratigraphy, potential reasons for these discrepancies were discussed. This methodological approach facilitated a reevaluation of the settlement's development process, integrating both radiocarbon results and contextual analysis. The study focuses on establishing the internal chronology of Tepecik-Çiftlik. Interregional comparisons, relationships with contemporary settlements, and the site's significance in Neolithic chronology will be addressed in a separate study.

Table 1

Results of ^{14}C dating of 50 samples from Tepecik-Çiftlik.

Samp. Code	Lab. Code	Estimated ^{14}C Age (BP)	^{14}C Date Range (cal BC 1σ)	Estimated ^{14}C Date (cal BC 1σ)	Level	Material
83	KN-5916	7160 \pm 45	6073-5985	6029 \pm 44	3-2	Charcoal
994	Beta-373270	7200 \pm 30	6091-5989	6040 \pm 51	2	Animal bone (Ovis)
1964	TÜBİTAK-2492	7349 \pm 37	6261-6077	6169 \pm 92	3	Animal bone
1276	Beta-410035	7370 \pm 30	6269-6209	6239 \pm 30	4	Human bone
TP12SK67	TÜBİTAK-3788	7403 \pm 30	6386-6222	6304 \pm 82	3	Human bone
276	KN-5967	7409 \pm 36	6395-6221	6308 \pm 87	3	Charcoal
TP12SK71	TÜBİTAK-3789	7423 \pm 32	6387-6231	6309 \pm 78	3	Human bone
1959	TÜBİTAK-2491	7430 \pm 35	6394-6231	6313 \pm 82	2	Animal bone (Ovis/Capra)
93	KN-5914	7420 \pm 80	6427-6207	6317 \pm 110	3	Charcoal
94	KN-5915	7454 \pm 41	6426-6207	6317 \pm 110	3	Charcoal
450	Col-1771	7428 \pm 49	6421-6221	6321 \pm 100	3	Burnt seed
327	Erl-14833	7451 \pm 39	6407-6236	6322 \pm 86	3	Burnt seed
TP12SK53	TÜBİTAK-3787	7460 \pm 30	6406-6240	6323 \pm 83	3	Human bone
719	TÜBİTAK-2489	7457 \pm 37	6410-6239	6325 \pm 85	4	Burnt seed
429	Col-1769	7460 \pm 46	6419-6236	6328 \pm 92	3	Charcoal
1553	TÜBİTAK-1677	7476 \pm 37	6421-6244	6333 \pm 89	3	Animal bone (Equid)
1412	Beta-410033	7490 \pm 30	6428-6333	6381 \pm 48	4	Human bone
1971	TÜBİTAK-3246	7495 \pm 32	6431-6334	6383 \pm 48	4-3	Animal bone (Equid)
1601	TÜBİTAK-0273	7502 \pm 38	6437-6331	6384 \pm 53	4-3	Burnt seed
TP12SK75	TÜBİTAK-3791	7497 \pm 30	6432-6335	6384 \pm 48	3	Human bone
1373	TÜBİTAK-696	7545 \pm 37	6467-6366	6417 \pm 50	5-4	Animal bone (Ovis/Capra)
1970	TÜBİTAK-3245	7571 \pm 31	6470-6392	6431 \pm 39	2	Animal bone (Capra)
1968	TÜBİTAK-3244	7597 \pm 32	6481-6399	6440 \pm 41	3	Animal bone (Bos)

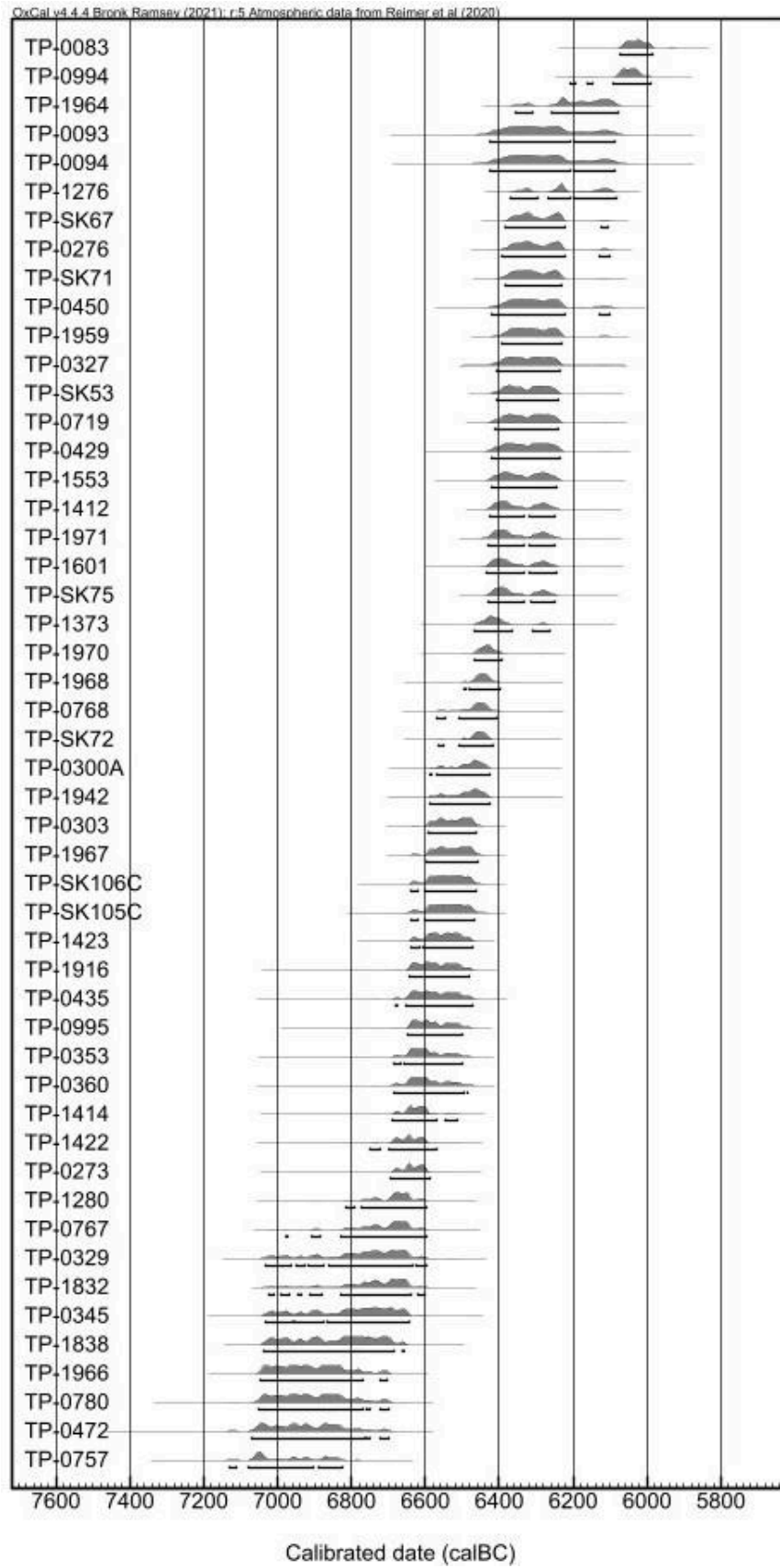


Samp. Code	Lab. Code	Estimated 14C Age (BP)	14C Date Range (cal BC 1σ)	Estimated 14C Date (cal BC 1σ)	Level	Material
768	SacA 32317	7615±35	6511-6410	6461±50	4-3	Charcoal
TP12SK72	TÜBİTAK-3790	7618±32	6509-6416	6463±46	3	Human bone
300A	KN-5964	7641±37	6572-6427	6500±72	4	Charcoal
1942	TÜBİTAK-2490	7643±41	6589-6428	6509±81	3	Animal bone
303	KN-5966	7690±30	6594-6462	6528±66	4	Charcoal
1967	TÜBİTAK-3243	7694±32	6596-6459	6528±68	3	Human bone
TP19SK106C	TÜBİTAK-2773	7710±34	6601-6465	6533±68	3	Human bone
TP19SK105C	TÜBİTAK-2772	7712±36	6601-6466	6534±67	3	Human bone
1423	Beta-410032	7730±30	6606-6475	6540±66	6-5	Human bone
1916	TÜBİTAK-1056	7752±37	6646-6480	6563±83	3	Human bone
435	Col-1770	7758±46	6653-6472	6563±89	4	Charcoal
995	Beta-373271	7760±30	6648-6498	6573±75	7/6	Animal bone (Ovis)
353	Erl-14832	7778±36	6657-6498	6578±79	4	Charcoal
360	Erl-14831	7779±40	6687-6497	6592±95	4	Charcoal
1414	Beta-410031	7800±30	6691-6568	6630±62	5	Human bone
1422	Beta-410034	7820±30	6701-6571	6636±65	5	Human bone
273	KN-5965	7811±25	6693-6590	6642±51	5	Charcoal
1280	Beta-410030	7850±30	6776-6597	6686±90	5	Human bone
767	SacA 32316	7860±35	6827-6597	6712±115	5	Charcoal
1832	TÜBİTAK-0495	7875±35	6831-6638	6735±96	6	Human bone
329	Col-1773	7880±49	6861-6636	6749±112	6-5	Charcoal
345	Col-1774	7902±50	6865-6644	6755±110	6-5	Charcoal
1838	TÜBİTAK-695	7934±37	7036-6687	6862±174	9-7	Animal bone (Ovis/Capra)
1966	TÜBİTAK-3242	7986±32	7049-6769	6909±140	10	Animal bone (Ovis/Capra)
780	TÜBİTAK-694	7994±41	7054-6768	6911±143	10	Animal bone (Ovis/Capra)
472	Col-1772	8021±50	7072-6767	6920±152	6-5	Charcoal
757	SacA 32318	8050±35	7078-6902	6990±88	10	Charcoal



Figure 2

The calibration results are seen in chronological order.



Results: The Chronology of the Site in Light of Radiocarbon Dating

Each radiocarbon sample was analyzed for its stratigraphic and archaeological context, stratigraphic consistency, material properties, and date correspondence with archaeological data. Based on these evaluations, an approximate absolute date range was proposed for each stratum.

Levels 10-7 (deep trench)

The earliest levels found at the mound belong to a period that is not well known in Central Anatolia. In Cappadocia, this period corresponds to the period immediately after the abandonment of Aşıklı Höyük and Musular, and to the partially uncovered upper levels at Sırçalıtepe (Özbaşaran et al., 2012; Özbaşaran et al., 2018; Balcı et al., 2021). Similarly, in the Konya Plain, it coincides with the poorly researched earliest phases of Çatalhöyük (Hodder, 2014) and the abandonment of Can Hasan III (Fairbairn et al., 2020). This phase, which coincides with the end of the Pre-Pottery Neolithic and the beginning of the Pottery Neolithic in Anatolian prehistoric chronology, has been excavated in a limited area at Tepecik-Çiftlik, but provides important data on this little-known period.

The deep trench is located west of the excavation area, in the central part of the mound. During the excavations in different seasons, the initially wide area was narrowed as it deepened². The deepest level is -7.30 meters relative to the highest point of the mound. Levels 10-7 were identified only in this area. No architectural remains were found in these levels. In Level 10, at least four fills of different colors and compositions separated by horizontal ash bands were identified. Carbonized ashy lines are frequently observed in these fills.

Level 10 yielded no pottery sherds. On the other hand, stone, bone, horn tools, obsidian flakes, and various animal bones were abundant. Although the lack of pottery suggests that this phase may belong to the Pre-Pottery Neolithic, this may also be related to the narrow excavation area. Even if pottery was used during this period, it may not have been found in this narrow area.

With the end of Level 10, the earliest pottery samples of the Volcanic Cappadocia region appear in Levels 9-7. It is understood that these coarse wares made of poorly refined clay were fired in a low-oxidation environment. Within a few centuries after this phase, more robust and well-fired wares appear in the settlement (Godon, 2008; Godon, 2012). The fact that this development can be traced indicates that pottery was produced locally, and its use became widespread.

Four radiocarbon results were obtained from the deep trench (see Tables 1 and Figure 3). A sheep/goat mandible fragment (TP-1966) from the upper level of layer 10 was dated to 7049-6769 BC, and an animal bone fragment (TP-0780) from the lowest level was dated to 7054-6768 BC. When these two samples are evaluated together with their stratigraphic positions, they point to the end of the 8th millennium BC. The burnt plant remains (TP-0757) from the deepest point of the same area were dated to 7078-6902 BC, the earliest date obtained so far at Tepecik-Çiftlik. These three samples seem to be generally consistent with each other.

A sheep/goat bone (TP-1838) from levels 9-7 in the same deep trench area was dated to 7036-6687 BC. Although this date covers a wide range of about 350 years due to the plateau in the calibration curve, considering the context, it is likely to be dated to around 6800 BC.

These radiocarbon data suggest that levels 10-7 can be dated between 7100 and 6800 BC.

²Levels 9-7 were excavated in an area of 6.00x3.50 m and Level 10 in an area of approximately 4.00x2.00 m.

Levels 6-5

These levels were investigated in an area of approximately 650 square meters in the central part of the excavation area. This area was mainly used as an open area. Architectural remains are very limited. Ashy fills, pits of various sizes, dumping areas, and different types of burials were identified. The intersection of the pits and the scarcity of building traces make it difficult to understand the stratigraphic relationships clearly.

Level 6 yielded a limited amount of architectural remains. In Level 5, the use of the open area continued, and new structures were added to the northern and southern edges of the area. The buildings were built with mudbrick walls on a stone subbasement, but were largely destroyed. The best preserved example in this level is a small, one-room building (Building-27) built with stone subbasement walls. This building is one of the rare examples with preserved mudbrick walls on a stone subbasement (Çakan, 2024: 102).

Another noteworthy building in Level 5 is a small structure built for burial purposes (Building-28), which contains many human bones belonging to individuals. Repair phases were observed on the walls of the building, and the burial process was repeated multiple times (Çakan, 2024: 104). Other burials from the same period are also in the open area around this building (Büyükkarakaya et al., 2019).

The settlement pattern consists of detached buildings arranged around open spaces. Various fireplaces and waste areas, such as ovens and cooking pits, were found in the open area in the center of the excavation area. These features indicate that the area was used for daily activities and burial rituals. The fact that the burials are intertwined with cooking and food preparation areas suggests that these activities were not separated.

The burnt wooden remains (TP-0767) found in the open area north of Building-27, belonging to Level 5, were dated to 6827-6597 BC. The human bone sample (TP-1832) from the secondary burial, numbered SK-98, in an open area belonging to Levels 6-5 was dated to 6831-6638 BC. Considering the stratigraphic level, it is more likely that this sample belongs to Level 6. To the south of the open area at level 6-5, a sample of burnt wood fragments (TP-0329) was dated to 6861-6636 BC, and another sample of burnt wood (TP-0345) in the fill of Level 5 was dated to 6865-6644 BC. Both samples can be stratigraphically assigned to Level 5.

The dates presented up to this point are generally consistent with the archaeological context in which they were found. On the other hand, a sheep or goat bone with sample number TP-0995 from this area was dated to 6648-6498 BC, although based on the context in which it was found, it was expected to belong to the early phases of Level 6 or Level 7. This date is not consistent with the stratigraphic context.

Although Levels 6 and 5 can be separated in areas where the remains of buildings are relatively more dense, these two levels are stratigraphically mixed in the parts used as open spaces. Therefore, it is not possible to distinguish these strata with precise boundaries. Nevertheless, the available radiocarbon data suggest that Levels 6 and 5 can be dated to approximately 6800-6600 BC.

Level 4

Level 4 is characterized by individual buildings located north and south of an open area extending east-west (Çakan, 2024: 119). These structures were built on the remains of the previous layer. The walls surrounding the open area serve as both a garden boundary and a 4.5-meter-wide corridor between the buildings. The repairs on the walls indicate that this area was used in a planned manner.

In the early phases of the level, new buildings were constructed to the north and south of the area that had been used as an open space in the previous level. The walls of these buildings have been preserved at the stone sub-basement level. Fire traces and debris indicate that some of the buildings were subjected to a significant fire.

One of the best preserved buildings of this level is Building-17, a multi-room complex (Çakan, 2024: 118). Built with thick stone walls, this building yielded many artifacts in its central space, and the rooms were added later to the east, along with traces of intense fire. Among these finds are burnt grains, plant processing areas, figurines, obsidian tools, potsherds, painted plaster fragments, bone, and stone objects. At least 48 graves, most of them belonging to infants, were found under the floor of the building and in the debris fill. This suggests that the building served a crucial function in both daily life and rituals related to death.

Another building with similar characteristics in Level 4 is Building-20, located in the northwest corner of the excavation area (Çakan, 2024: 128). It is understood that this building was also a multi-room complex. Finds such as burnt grains, obsidian, bone tools, figurines, and grinding stones were recovered from the interior. In situ pots and storage units were found in some rooms of the building. These data suggest that both production, storage, and ritual activities may have been carried out in the same building complexes in Level 4.

Level 4 represents a planned and intensive occupation phase that developed around open areas, with multi-roomed dwellings and burial sites. The layout and the artifacts reveal that daily life and death rituals were intertwined in this phase.

Most of the radiocarbon results from Level 4 were obtained from Building-17, located south of the excavation area. The radiocarbon analysis of the burnt wood remains found on the floor of the AK room in this building yielded a date range of 6572-6427 BC (TP-300A). One of the burnt wood fragments (TP-0353) found on the floor of the same room was dated to 6657-6498 BC, and the other (TP-0360) to 6687-6497 BC. Both samples were consistent with the other radiocarbon samples found in the room.

The burnt grain remains found on the floor of the AK were dated to 6410-6239 BC (TP-0719). This date range is slightly later than that obtained from the charcoal, but more in line with the results from the human bones in Room AY, which will be discussed below.

The human bone fragment belonging to an adult individual recovered from burial TP10-SK-37 under the floor of Room AY in the northeast room of Building-17 has been dated to 6428-6333 BC (TP-1412). It is more likely to be dated to approximately 6400 BC, based on the archaeological context in which it was found. Another sample from the AY is a bone fragment belonging to a child in burial TP10-SK21 and dated to 6269-6209 BC (TP-1276). The date obtained from the context in which it was found is much later than expected and, therefore, interpreted as incompatible with the context in which it was found. A 30 cm long and 6 cm wide burnt wood fragment (TP-0435) found in the room's northwest corner was dated to 6653-6472 BC. This result is consistent with the other burnt wood remains analyzed in Building-17.

The date range obtained from the burnt wood remains found in another room (BA) of Building-17 is 6594-6462 BC (TP-0303). This is consistent with the results of burnt wood remains in the AK and AY rooms. Some radiocarbon samples found in Building-17 (TP-300A, TP-0303, TP-0435, TP-0353, TP-0360) belong to the burnt wood remains discovered inside the building. Considering that these woods may have been used as building material, the possibility of "old wood effect" in these samples should be taken into consideration. Since there may be a time difference between when the trees were felled and when they were used in the building, it is possible that such samples may yield dates earlier than the actual time of use.

The radiocarbon dates of the short-lived organic materials recovered from Building-17 (e.g., the burnt grain remains numbered TP-0719 and the human bones in the AY space) indicate a later period than the timbers. This suggests that the construction and use of Building-17 was concentrated around 6500 BC.

Apart from the radiocarbon samples obtained from Building-17, results were also obtained from the open areas of the settlement. A sheep or goat bone fragment found in the open area belonging to Level 4 in the

central part of the excavation area was dated to 6467-6366 BC (TP-1373). The burnt plant remains in the same area were dated 6511-6410 BC (TP-0768).

When all these data are evaluated together, it appears more consistent to date Level 4 to approximately 6600-6400 BC and Building-17 to the middle of this period, circa 6500 BC.

Level 3

Level 3 at Tepecik-Çiftlik indicates a dynamic settlement process. The construction of new buildings, the addition of new spaces to existing buildings, and the repair phases observed in the buildings reflect this transformation. This Late Neolithic level is divided into two phases: Level 3.2 and 3.1.

In the first phase (3.2), there are individual buildings with open spaces between them. These open spaces are occupied by newly constructed buildings and rooms added to existing structures. After the large, multi-room buildings seen in Layer 4, a distinct building type emerges in Level 3.2. These buildings are typically single-space dwellings, with sizes ranging from 25 to 45 m². Small rooms (alcoves) opening to the main space were used for oven or storage purposes, and this plan type, defined as "building with oven", is unique to Level 3.2 (Çakan, 2014, 2019). The buildings were constructed with mudbrick walls on a stone sub-basement. Features such as ovens and storage areas are frequently found in these buildings. The floors are usually plastered. The mudbrick walls were elevated above the ground, and for this purpose, sub-bases made of volcanic stones such as andesite, rhyolite, and basalt were used. The stones were generally unprocessed and placed in double rows with smooth edges facing outwards. The width of the sub-base varies between 0.50 and 0.70 m in this level (Çakan, 2024: 175).

In this phase, the settlement pattern developed irregularly. New rooms were added to the buildings, gaps between buildings were closed, and passages were narrowed. It is believed that these arrangements were designed to regulate access to the southern common courtyard (Çakan, 2024: 205). The building group, consisting of four buildings arranged around the courtyard, looks like a settlement pattern shaped around a common area.

In this open area at Level 3.2, there are two burials with plastered skulls (Büyükkarakaya et al., 2024). A human bone fragment recovered from one of these burials was dated to 6646-6480 BC (TP-1916). On the other hand, a sample taken directly from one of the plastered skulls was dated to 6596-6459 BC (TP-1967). A skull from grave SK106, where the plastered skulls were found, was dated to 6601-6465 BC, while another skull from SK105 was dated to 6601-6466 BC. These data suggest that the plastered skulls belong to an earlier period than the Level 3 in which they were found, probably to Level 4.

To clarify the dating of the plastered skulls, samples taken from five different burials in the vicinity of the burial where the plastered skulls were found were analyzed and the following dates were obtained: 6386-6222 BC (TP-SK67), 6387-6231 BC (TP-SK71), 6406-6240 BC (TP-SK53), 6432-6335 BC (TP-SK75) and 6509-6416 BC (TP-SK72). These dates indicate that the burials belong to Level 3 and confirm that the plastered skulls date back to an earlier period than these burials.

In an area thought to represent the transition period between Level 4 and 3.2, a metacarpus bone of an equid found among the demolished stones was dated to 6431-6334 BC (TP-1971). This date indicates that this material belongs to the early phases of Level 3. Similarly, a bovine tibia found in the BO room of Building-16 was dated to 6481-6399 BC (TP-1968). This result suggests that Building-16 may be one of the earliest structures of Level 3 (for detailed information on Building-16 see Çakan, 2024). An animal bone found in the CZ space in Building-7 of Level 3.2 has also been dated to 6589-6428 BC (TP-1942). This sample provides a reliable date range for both this building and Level 3.2.

An equid bone found in the open area associated with Building-20 in the northern part of the excavation area was dated to 6421-6244 BC (TP-1553). Burnt grains stored in the AA of Building-20 were also dated to 6437-6331 BC (TP-1601). However, it is not certain whether this building belongs to Level 3.2 or Level 4; unfortunately, the date obtained is not decisive, as it covers both levels.

In the final phase (Level 3.1), the buildings are less well-preserved, and the settlement layout is not fully understood. However, some well-preserved buildings also reveal the presence of single-place buildings and building complexes developed around a central space. The construction techniques are similar to those of the previous phase; however, the building type with an oven/alcove disappears in this phase (Çakan, 2024: 137).

The new buildings constructed on Level 3.1 changed the previous settlement pattern. The open area in the central part of the excavation area, which was used for a long time, fell out of use with the construction of Building-2 in this phase. The buildings were generally constructed with a single room; some had rooms added later. It is observed that the use of ovens decreased and their sizes were reduced during this phase. Slab stone pavement was used for the first time on the floors of the building spaces.

The burnt grain remains taken from the silos in the AW space in Building-5 of Level 3.1 were dated to 6421-6221 BC (TP-0450), while the burnt wood fragment found in the same area was dated to 6419-6236 BC (TP-0429). Both samples are consistent with their context and dated to ca. 6200 BC. Burnt grain remains found around an in situ necked jar in an area associated with Building-5 were dated to 6395-6221 BC (TP-0276). Considering the context in which it was found, the date of this sample is estimated to be around 6200 BC. Other burnt grains in the same area were similarly dated to 6407-6236 BC (TP-0327).

The animal bone found near a hearth in the AD room of Building-2 was dated 6261-6077 BC (TP-1964). This date coincides with Level 3.1 to which Building-2 belongs. Two burnt wood samples found in the transitional fill between Levels 3.1 and 3.2 were dated to 6427-6207 BC (TP-0093) and 6426-6207 BC (TP-0094). These samples are consistent with the transitional fills and date to ca. 6300 BC.

When all these radiocarbon data are evaluated together, it can be concluded that Level 3 was occupied between 6400 and 6200 BC. The dates from Level 3.1 correspond to the later part of this interval, while the data from Level 3.2 correspond to the earlier phases. The plateau in the calibration curve around 6300 BC caused the spread of dates to be relatively wide. Moreover, the radiocarbon analysis of the plastered skulls recovered from Level 3 indicates that these finds date to an earlier period than the level in which they were found. These plastered skulls may have been kept for a long time, passed down through generations, or used for ritual purposes. In the last stage, it is understood that they were buried during the Level 3 period.

Level 2

The remains of Level 2, located west of the excavation area at the highest point of the mound, are divided into two phases. Level 2.1 is close to the surface, and its fills are largely destroyed. There are very few architectural remains in this phase. In Level 2.2, the earlier phase, relatively well-preserved structures were uncovered. These buildings were constructed at least twice above the structures in Level 3. This indicates that a new construction process started at the beginning of the 6th millennium BC (Çakan, 2024: 207).

The buildings were built adjacent to each other and leaned against their neighbors' walls in some places. During this period, the importance of ovens decreased, and storage activities increased. Stone-walled storage units became an essential part of the buildings and were generally used for storing grain. Some rooms have features such as ovens and benches.

The stone walls of the buildings in this phase are preserved up to 7-8 rows high. One of the buildings has a storage unit with two cells and the other with four cells. The interior surface of one of these storage units

is plastered. In addition to the storage units, the BY room, a special space used for storage purposes, was unearthed in Building-23. There are three cylindrical silos in this area, one of which is poorly preserved and two of which are well preserved. A rich assemblage of over twenty pots and bowls of various sizes was found next to the silos. Most of the pots are almost complete and were found in the position they were placed. Some of the pots are decorated with reliefs of human, animal, and plant figures. The BY room and the two-cell storage unit next to it suggest that this part of the building was used as a cellar (Çakan, 2024: 165-166). This is clear evidence that storage gained importance in this phase.

After the end of Level 2.2, the mound was inhabited for a short period of time. However, the architectural remains from this phase are very limited, consisting of a few wall fragments, hearths, and stone pavements. This phase stands out as a period of cultural change. This change is particularly evident in the pottery. The sudden appearance of dark-surfaced, incise-decorated Gelveri-type sherds at Level 2.1, along with the presence of paint-decorated sherds known from Can Hasan I and the settlements of Hacilar, Bademağacı, and Kuruçay in the Lakes Region, indicates that extensive cultural interactions began during this period (Çakan, 2024: 231).

There are four radiocarbon dates from Level 2. A sample from the early phase of Level 2 (TP-0083) was dated between 6073 and 5985 BC. The stratigraphic relationships are unclear in the area where the sample was taken, as the fills of Level 2 cut through the fills of Levels 3 and 4, and the stratigraphic positions of the archaeological layers are not well-defined. Although stratigraphically belonging to the early phase of Level 2, the date of this sample is later than expected. On the other hand, an animal bone (TP-0994) from the late phase of Level 2, found near the surface of the mound, was dated to between 6091 and 5989 BC. Although both samples were found at stratigraphically very different levels, the dates are very close to each other. For this reason, it is not possible to accept both results as reliable.

To resolve this uncertainty, a sheep or goat bone found in the BY space of Building-23, Level 2.2, was analyzed (TP-1959). However, this sample was also dated much earlier than expected: 6394-6231 BC. To date the abandonment of the settlement, another sheep or goat bone (TP-1970) found near an oven belonging to Level 2.1 was analyzed. Although this sample was found in a context related to the abandonment of the settlement, it was dated between 6470 and 6392 BC. The result is clearly incompatible with the context in which it was found.

In conclusion, although we have four radiocarbon dates for Level 2, the absolute dating of this level is still problematic. Moreover, it is unclear when Level 3 ended, as there are insufficient absolute dates from the late phases of Level 3. Therefore, the transition between Levels 3 and 2 remains chronologically uncertain. However, stratigraphic observations indicate that there was continuity between these two levels, rather than an interruption.

Considering the available dates TP-0083, TP-0994, and TP-1959, Level 2 dates to the end of the 7th millennium BC and the beginning of the 6th millennium BC. Sample TP-1970, obtained from the fills thought to belong to the abandonment of the settlement, cannot be considered due to its inconsistency. However, the archaeological context suggests that this phase may also date to the early 6th millennium BC, probably around 5800 BC.

Figure 3

Results of calibration for individual levels. The summed probability distribution for a particular level is marked at the top of each group.

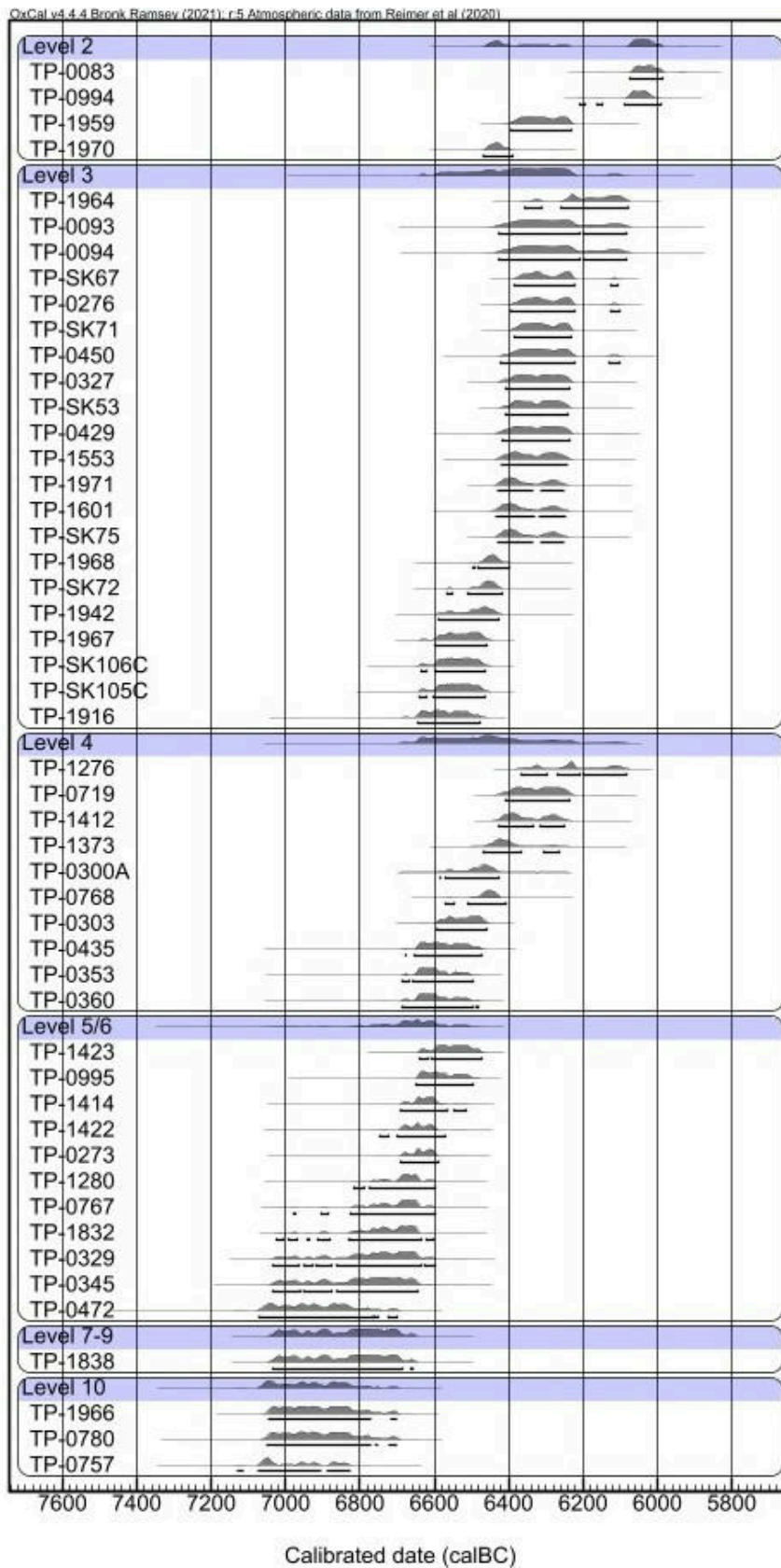


Table 2*General periodisation of Tepecik-Çiftlik, based on absolute dating.*

Level	Period	Date (cal BC)
2	Late Neolithic/Early Chalcolithic	6100-5800
3	Late Neolithic	6400-6100
4	Late Neolithic	6650-6400
5	Late Neolithic	6800-6650
6		
9-7	Late Neolithic	7000-6800
10	Early/Late Neolithic transition	7100-7000

Conclusion

The excavations at Tepecik-Çiftlik indicate that the settlement was inhabited mainly during the Neolithic period. According to radiocarbon data, the site was occupied between 7078 BC and 5989 BC. Although no direct radiocarbon data exists for the period after 5989 BC, architectural remains and stratigraphic observations indicate that the settlement continued shortly after this date. It should be noted that the above date range is based on the archaeological deposits excavated so far. The earliest levels of the mound have not yet been excavated, and the bedrock has not yet been reached. This suggests that occupation of the mound began earlier than 7078 BC.

Both archaeological findings and radiocarbon dating indicate that the settlement was continuously occupied for over a thousand years (Table 2). Although there are differences in architectural form and settlement pattern in almost every settlement layer, stratigraphic continuity is preserved. This indicates that people continued to reside in the same area without abandoning it, despite changes in the settlement over time. From this perspective, the site serves as an essential example of not only chronological but also cultural continuity.

On the other hand, some dates in the radiocarbon data do not exactly match the stratigraphic context. There may be several reasons for these discrepancies, including contamination of the samples, the "old wood" effect, movement of archaeological material between different layers, or the use of various types of material (such as charcoal, burnt seed or grain, human or animal bone), which can yield different results. Additionally, the samples were analyzed in different laboratories, which may have caused minor discrepancies; however, the consistency of results across laboratories also provided a significant advantage in terms of cross-validation of the dates.

A more systematic sampling strategy is planned for future research, with the aim of minimizing inconsistencies and constructing a more robust chronological framework. In particular, the aim is to better understand all phases of the settlement by taking samples from levels with few or no dates.



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AI Note I used the AI-powered Grammarly app to translate the article into English.

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