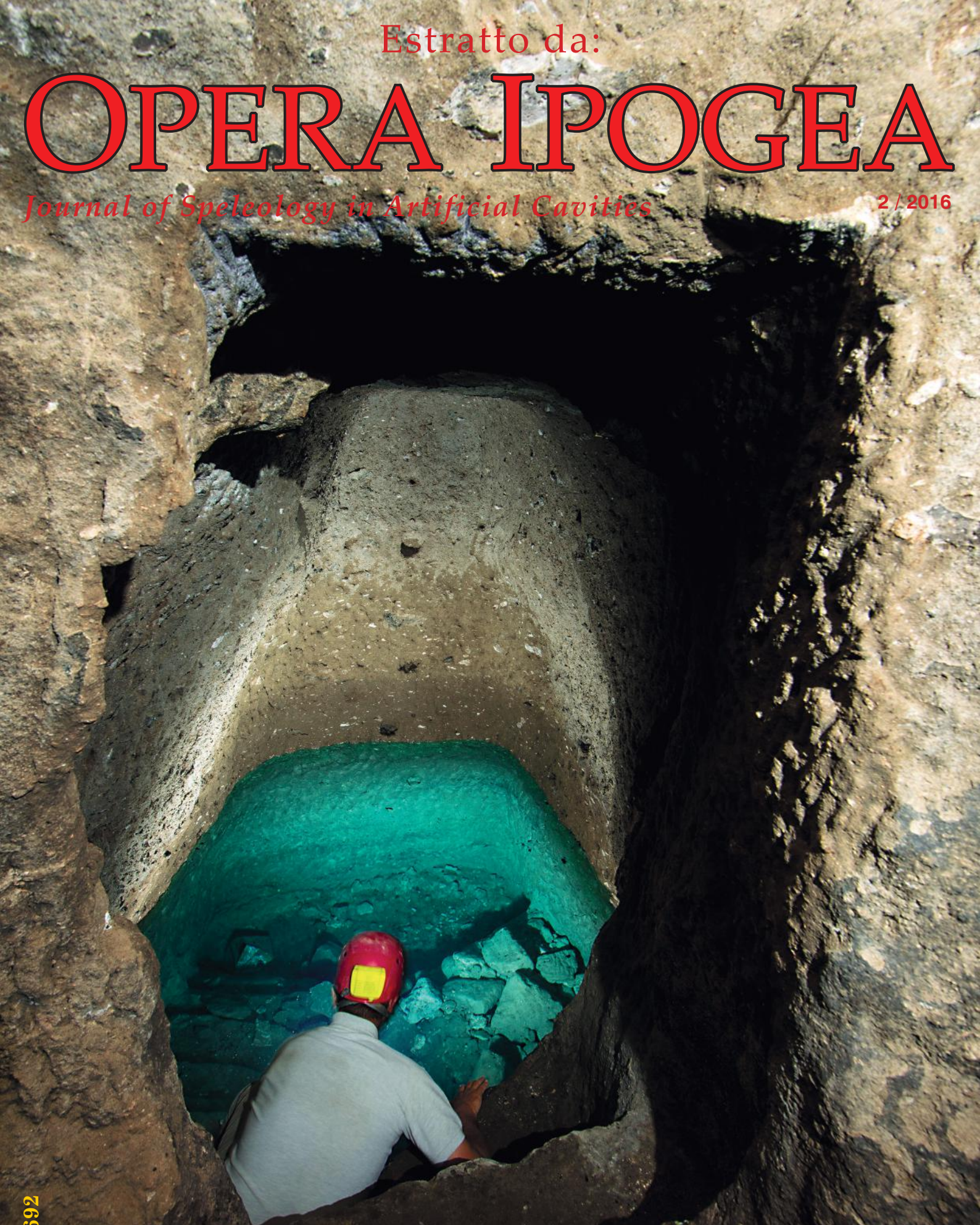
Estratto da:

Opera Ipogea

Journal of Speleology in Artificial Cavities

2 / 2016



ISSN 1970-9692

Rivista della Società Speleologica Italiana

Commissione Nazionale Cavità Artificiali

Doğanli underground shelter (Cappadocia – Turkey)

Ali Yamaç[1], Ezgi Tok[1,2]

Abstract

Today, the region known with its ancient name as "Cappadocia" includes the Turkish provinces of Nevsehir, Aksaray and Kayseri. In this region, different underground structures such as houses, barns and churches were excavated by the locals for centuries in the tuffaceous rocks spewed out of volcanoes active in the late Pliocene and Pleistocene period. However, the most interesting of these structures, without a doubt, are the underground shelters. These structures, carved for defensive purposes probably between 7th and 12th centuries, are found in almost every part of Cappadocia. Thus far, only a small part of those hypogea have been surveyed. This article describes surveys and explorations conducted by OBRUK Cave Research Group on Doğanli (Forty Steps) Underground Shelter located at a fairly remote place in the south of Kayseri, the capital of ancient Cappadocia.

Key words: Cappadocia, Kayseri, Doğanlı, underground shelter.

Riassunto

Rifugi sotterranei di Doğanli (Cappadocia – Turchia)

Oggi, la regione conosciuta con il nome antico di "Cappadocia" comprende le province turche di Nevsehir, Aksaray e Kayseri. In questa regione diverse strutture sotterranee, come case, stalle e chiese sono state scavate dalla popolazione locale per secoli nelle rocce tufacee prodotte dai vulcani attivi nel tardo Pliocene e nel Pleistocene. Tuttavia, le più interessante tra queste strutture, senza dubbio, sono i rifugi sotterranei. Queste opere, scavate a scopo difensivo, probabilmente tra il VII e il XII secolo, si trovano quasi in ogni parte della Cappadocia. Finora, solo una piccola parte di questi ipogei è stata rilevata e documentata scientificamente. Questo articolo descrive le indagini e le esplorazioni condotte dall'OBRUK Cave Research Group nel rifugio sotterraneo di Doğanlı ("quaranta passi") situato in un luogo abbastanza remoto nel sud della provincia di Kayseri, la capitale dell'antica Cappadocia.

Parole chiave: Cappadocia, Kayseri, Doğanlı, rifugio sotterraneo.

Introduction

Doğanlı Village is located at 90 km south of Kayseri (Caesarea) on the border of Nigde province (Fig. 1). Even though this region is a part of the ancient Cappadocia, this village is distant from all large and significant settlements (Fig. 2). Gergeme was the earlier name of this village, which is still referred to as by the locals (Hild, 1977; Hild & Restle, 1981).

The area lies in Mid Anatolian Volcanic Province and it's one of the most important volcanic areas of Turkey. Volcanic activity around this area continued during the Middle Miocene period, 16-11.6 million years ago and developed the post-clash regimes after the Upper Miocene period. Some volcanoes of the area were only small vents, but a total number of 68 volcanoes around Kayseri had been active until Pliocene-Pleistocene times. That eruption phase piled up more than 100 m of thick volcanic rock all around the region (Lepetit et al, 2014). In antique *Caesarea*, this soft rock was dug by the local people; houses, churches and underground settlements were built into those rocks and a troglodyte civilization had been established. Similar to the majority of other settlements of Cappadocia, also in the rock cliffs of Doğanlı Village there are many cave dwellings and rock-cut graves. Since no archeological

[1] OBRUK Cave Research Group
[2] ITU, Istanbul Technical University, EURASIA Institute of Earth Sciences
Autore di Riferimento: Ali Yamaç - Acikhava Apt. 16/7, Nisantasi, Istanbul, Turkey - ayamac@gmail.com



Fig. 1 - Location map showing Doğanlı Village and Doğanlı Underground Shelter (Google Maps and Google Earth).
Fig. 1 - Foto aerea con il posizionamento del villagio di Doğanlı e il rifugio sotterraneo di Doğanlı (Google Maps e Google Earth).

research has been conducted in the region, we do not have detailed knowledge about the construction dates or usages of these structures.

Almost all underground defense structures in Anatolia are very unique to ancient Cappadocia region. These defensive settlements dug into soft tuff rocks has long tunnels and living areas protected by millstone doors to defend the local people in case of an attack. Approximately 180 underground settlements and shelters have been found in Anatolia so far, and 90% of which are in Cappadocia. Unfortunately, the majority of these underground sites have not been explored and mapped; academic articles about these structures are very limited and only a few inventories had been made (Yörükoğlu et al, 1988; Ayhan, 2004; Bixio et al, 2012).

Believed to be carved by local Christian communities between 7th and 11th centuries with defensive pur-

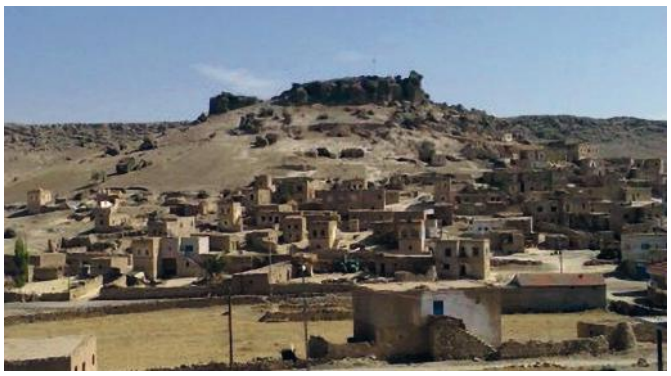


Fig. 2 - Doğanlı Village (photo O. Demir).
Fig. 2 - Villaggio di Doğanlı (foto O. Demir).

poses against attacks from Arab invasions and local raids, these structures have a unique and special architecture. Tunnels and, with their varying diameters and thicknesses differ, millstone doors that used for blocking these tunnels and protecting the rooms behind them, are unvarying specifications of these underground defense structures (Bixio & Castellani, 2002). Even though some structures like Derinkuyu are quite large in size to earn the name "yeraltı şehri" i.e. "underground City", some defensive structures in smaller villages consist of only a few rooms and are rather named as "underground redoubts" or "underground shelters" (Bixio & Castellani 1995; Bixio & Castellani 1996), like Golgoli (Yamac & Gilli, 2016). They are either dug exactly underneath or at a close proximity to a settlement and host rooms for those families who took shelter in them as well as large chambers available only in very few underground cities. Large underground cavities need to be dug with columns supporting the ceiling. Both due to the difficulty of such a work as well as the risk of collapsing and unnecessity of large spaces in a defensive structure, large underground chambers in Cappadocia are very few (Bixio et al, 2012).
When all these architectural specifications are taken in consideration, located at 2 km east of Doğanlı Village, on a plateau called Arapsin Hill, the structure known as Doğanlı (or Forty Steps) Underground Shelter is probably one of the most unusual and interesting structures of all Cappadocia.

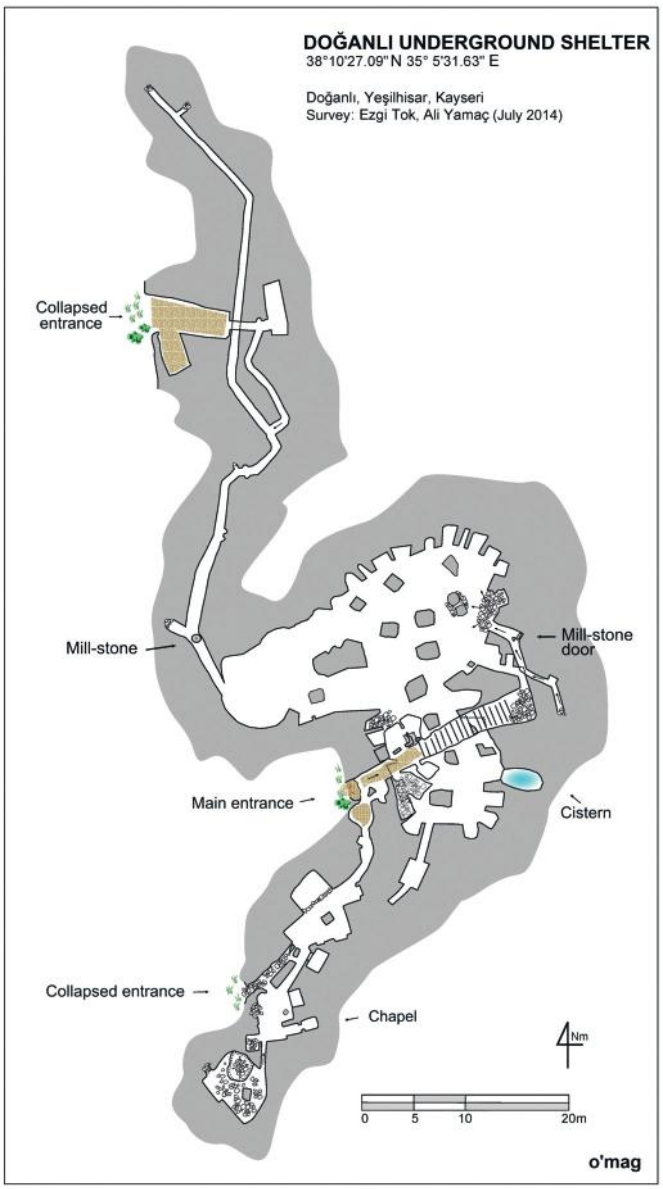


Fig. 3 - Plan of Doğanlı Underground Shelter (drawing by E. Tok and A. Yamac).
Fig. 3 - Pianta del rifugio sotterraneo di Doğanlı (disegno di E. Tok e A. Yamac).

Doğanli (Forty Steps) Underground Shelter

Mentioned previously in different sources (Yorukoglu et al, 1988; Gulyaz & Yenipinar, 2003; Bixio et al, 2012), the structure has been examined in detail, surveyed and mapped by us for the first time (Fig. 3). One of the first and the most important characteristics and architectural specifications of Doğanlı (Forty Steps) Underground Shelter that distinguishes this settlement from all other aforementioned defensive structures is the fact that it was located 2 km away from today's settlement and situated on an empty plateau. Judging by the ancient cave dwellings in its vicinity, it is evident that Doğanlı Village was an old settlement. If that was the case, it must have been quite difficult to seek shelter in a defensive structure 2 km away from this settlement during a raid. The only reasonable explanation of the curious location of Doğanlı Underground Shelter is perhaps the plateau on which it was situated. There had been an old settlement with no remains left today. This, however, is a question which can only be answered by conducting a comprehensive area survey and an archaeological research.
Another architectural oddity of Doğanlı Underground Shelter is its main chamber. Named as "Forty Steps" by the local people due to its stairs located at the main entrance carved from rocks with a slope of 38° (Fig. 4), the main chamber of this underground structure reached after those steps is very impressive. Supported by 15 columns, this chamber with its 500 m² floor area is far larger than any other similar underground chambers (Figs. 5, 6). For example, larg-



Fig. 4 - Main entrance of Doğanlı Underground Shelter; the local name of the structure "Forty Steps" derived from those stairs (photo A.Yamac).
Fig. 4 - Ingresso principale del rifugio sotterraneo di Doğanlı; il nome locale della struttura "quaranta passi" è derivato dai gradini visibili in foto (foto A.Yamac).



Fig. 5 - Main Chamber of Doğanlı Underground Shelter (photo A.E. Keskin).
Fig. 5 - Camera principale del rifugio sotterraneo di Doğanlı (foto A.E. Keskin).

est two underground chambers thought to be used as churches in Cappadocia; Kemer Oren is 400 m² and Church of Derinkuyu is 300 m². While their purposes of construction still remain disputed, the two main chambers of Tatlarin Underground Shelter is approximately 140 m² each, as inferable from the plan (Bixio et al, 2012).



Fig. 6 - Main Chamber; cistern is in the center of photo and, to the right two of the many small 'sections' are visible (photo A.E. Keskin).
Fig. 6 - Camera principale; la cisterna si trova nel centro della foto e, a destra, due delle molte piccole 'sezioni' (foto A.E. Keskin).

In addition to its large size, some of the architectural details of this chamber are also quite interesting. There are 14 different sections carved from rocks on the north and the east walls of the chamber. The reason why we call these structures 'sections' rather than 'rooms' is the fact that they appear to be divisions separated by thin walls. During our studies, the perfectly clean water found in 2 m depth with 3x2 m dimensions on the east wall of the chamber is perhaps the proof of the architectural superiority of this centuries-old structure (Fig. 7).
Whether its main settlement is the current Doğanlı Village or another untraceable village today, it still remains a mystery why it was considered necessary to have a 500 m² big chamber supported by 15 columns in an underground structure carved for defense purposes in such a remote area far away from all of the major settlements.
From the two tunnels situated in two different directions of this chamber, the one continued towards the east is blocked by debris after a short distance. The north tunnel, on the other hand, continues for a total of 74 m and is blocked after narrowing down. Another sub-branch of this northern tunnel reaches to the upper level and alongside a fairly large room, connects to the surface. All tunnel connections reaching to the surface are protected by millstone doors (Fig. 8). Despite the fact that some of those millstone doors no longer exist, the operation rooms and door slots on the walls of the tunnels are the proof of their existence.
The third branch which reaches to the surface, is the continuation of the tunnel that turns to the south at the beginning of the stairs on the main entrance. In this tunnel; there are four carved rooms in fairly large sizes, different than the ones found on the walls of the chamber. The surface connection of this branch is from the collapsed ceiling of one of the small rooms. (Fig. 9). Despite the observations showing that there used to be another door in the last room, it was not possible to conduct any research due to collapsing. To the



Fig. 7 - Cistern in the Main Chamber (photo A.E. Keskin).
Fig. 7 - Cisterna nella camera principale (foto A.E. Keskin).



Fig. 8 - A mill-stone door at the northern passage (photo H. Elmaagac).
Fig. 8 - Una porta-macina in pietra al passaggio nord (foto H. Elmaagac).



Fig. 9 - Southern collapsed entrance of Doğanlı Underground Shelter (photo A.Yamac).
Fig. 9 - Ingresso meridionale crollato del rifugio sotterraneo di Doğanlı (foto A.Yamac).

east of this last room there is a very small chapel with 3x2 m dimensions. With the high probability of never been reused since it was built, there are many architecturally and archaeologically unanswered questions in this amazing underground Shelter. In our opinion, with all these questions which cannot not be answered without an excavation and cleaning, mysteries are doomed to remain unsolved in this remote settlement.

Conclusion

According to the protocol signed three years ago with Kayseri Municipality and CEKUL Foundation, we continue our underground structures and cave dwellings explorations and surveys in this province as OBRUK Cave Research Group. During these studies, majority of which remain unknown, 26 underground cities and shelters and four different cave settlements were explored and surveyed. Two of them were also published at Opera Ipogea (Yamac & Tok, 2015a; Yamac & Tok, 2015b). The results of our studies were published as two separate preliminary reports. Our explorations in Kayseri will continue in 38 different, predetermined spots.

On the other hand; like innumerable other sites located in the depths of Anatolia's solitude, this thousand years old underground shelters and cave dwellings are not immune to destruction of time and the illegal diggers due of their unprotected, abandoned status. The question of how all these underground shelters and cave dwellings that we find one or more in every research can be saved and carried to the future continues to be an issue preoccupying and disturbing us.

Acknowledgements

As the members of OBRUK Cave Research Group, we express our gratitude to Prof. Osman Ozsoy, Kayseri Coordinator of CEKUL Foundation. This project and research could not be realized without his dedicated attitude and extraordinary efforts.

References

Ayhan A., 2004, *Geological and Morphological Investigations of the Underground Cities of Cappadocia Using GIS*. PhD Thesis (unpublished), ODTU, Ankara.

Bixio R. (ed.), 2012, *Cappadocia: Schede dei siti sotterranei/ Records of underground sites*, Archaeopress publisher of British Archaeological Report (BAR), International Series 2413, Oxford.

Bixio R., Castellani V., 1995, *Tipologia delle strutture sotterranee della Cappadocia*, in Le città sotterranee della Cappadocia, Erga, Genova, pp. 106-120.

Bixio R., Castellani V., 1996, *New typologies in Cappadocian undergrounds: the redoubts and the hydric installations*, Proceedings 17th International Symposium of Excavations, Surveys and Archaeometry, Turkish Ministry of Culture, Ankara, pp. 271-287.

Bixio R., Castellani V., 2002, *Dispositivi di difesa nei sotterranei cappadoci*, in Cappadocia, le città sotterranee, pp.265/278, Istituto Poligrafico e Zecca dello Stato, Roma.

Gulyaz, M. E., Yenipinar, H., 2003, *Rock Settlements and Underground Cities of Cappadocia*, Nevşehir.

Hild F., Restle M., 1981, *Kappadokien, Tabula Imperii Byzantini*, band 2, Verlag der Österreichischen Akademie der Wissenschaften, Wien. p.183.

Hild F., 1977, *Das byzantinische Strassensystem in Kappadokien*, Verlag der Österreichischen Akademie der Wissenschaften, Wien. p.101

Lepetit P. et al, 2014, *40Ar/39Ar dating of ignimbrites and plinian air-fall layers from Cappadocia, Central Turkey: Implications to chronostratigraphic and Eastern Mediterranean palaeoenvironmental record*, Chemie der Erde no.74, pp. 471–488.

Yamac A., Gilli E., 2016, *Underground shelters of Golgoli (Cappadocia - Turkey)*, Opera Ipogea 1 – 2016, pp. 33-40.

Yamac A., Tok E., 2015 a, *An Architect's underground Shelter*, Opera Ipogea 1 – 2015, pp. 37-46.

Yamac A., Tok E., 2015 b, *Cave dwellings and underground cities of Belagasi village and Otedere Valley (Kayseri – Turkey)*, Opera Ipogea 2 – 2015, pp. 41-50.

Yorukoglu, O. et al., 1988, *Les sites souterrains de Cappadoce*, Aşık Ofset, Ankara.