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A GEOPARK CANDIDATE, BOZKIR-CENTRAL TURKEY

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ABSTRACT: Bozkır is an old town established on the skirts of the Taurus Mountains, and contain various tectonic units, eg. Bozkır unit, extending laterally several hundreds of kilometres. The Bozkır unit typically crops out and hence named around Bozkır district. It is formed by deep sea sediments, ophiolites and submarine basic volcanic rocks, all of which overlied by well-exposed Paleogene and Neogene? units. Bozkır is rich not only for its geological occurrence, but also for its culture, history and nature. Bozkır is in a central position of ancient Isauria and represented by Zengibar castle. The town has also a bridge of Seljuk period and various Seljuk and Ottoman Mosques. Çarşamba stream, source of the life in the region, is originated from Taurus Mountains both as Aygır spring, and as leakage from Sarıot lake. It crosses from various villages and town up to Mavi Gorge to meet with the water channel. All of which suggest that Bozkır district should be declared as a Geopark.

Keywords: *Ophiolite, Melange, Geopark, Isauria, Bozkır*

Bir Jeopark Adayı, Bozkır-Orta Anadolu

ÖZ: Bozkır, Toros dağlarının eteklerinde yer alan ve Bozkır birliği gibi bir kaç yüz km yatay olarak uzanan çeşitli tektonik birimler içeren eski bir ilçedir. Bozkır birliği tipik olarak Bozkır bölgesinde yer aldığından dolayı bu yörede adlanır. Birlik iyi yüzeylemiş Paleojen ve Neojen? birimleri tarafından üzerlenen derin deniz tortulları, ofiyolitler ve deniz altı bazik volkanik kayaçlardan oluşur. Bozkır sadece jeolojik oluşumlarca değil aynı zamanda kültür, tarih ve tabiat açısından da zengindir. Bozkır antik İzauria'nın merkezi konumunda olup Zengibar kalesi ile temsil edilir. İlçe Selçuklu köprüsü ile çeşitli Selçuklu ve Osmanlı camilerine sahiptir. Yaşam kaynağı olan Çarşamba çayı, Toros dağlarından hem Aygır kaynağı ve hem de Sarıot gölünden sızıntı olarak doğmakta, çeşitli köyleri, kasabaları ve ilçeyi kesmekte ve Mavi boğazında su kanalıyla buluşmaktadır. Tüm bunlar Bozkır 'ın jeopark olarak ilan edilmesi gerektiğini ileri sürer.

Anahtar Kelimeler: *Ofiyolit, Melanj, Jeopark, Izauria, Bozkır*

1. INTRODUCTION

Geotourism is a rapidly evolving topic and getting substantial in recent years (Galas *et al*., 2018; Justice, 2018; Kaygili *et al*., 2018; Miraj *et al*., 2019; Pal and Albert, 2018; Serrato *et al*., 2019; Tavera-Escobar and Alvarez-Ramirez, 2019). It is defined as tourism that sustains or enhances the distinctive geographical character of a place—its environment, heritage, aesthetics, culture, and the well-being of its residents.

UNESCO definition of Global Geopark is unified geographical areas with a geological heritage of international significance. The name Geopark is given to large areas that encompass several Geosites, as well as other natural and cultural heritage elements, museums and administration centres (Çiftçi and Güngör, 2016). The number of sites in the Global UNESCO Geoparks Network is 169 in 44 countries. Even though there are so many geological heritage and sites in Turkey, such as Pamukkale travertines, Cappadocia fairy chimneys with underground city, Tınaztepe karstic cave and Salda lake with living hydromagnesite stromatolites, which shares similar mineralogy and geology as the dry Martian lake bed (Figure 2), there is only one geopark in Turkey (Figure 2), namely Kula-Salihli UGGp (formerly known as Kula Volcanic UGGp, extended and renamed in 2020). This paper suggests the nomination of a new Geopark " Bozkır " located in Central Taurus Mountains.

The study area is located around town of Bozkır, ~120 km SSW of Konya (Figure 3). It is also found on the Mediterranean region of Turkey.

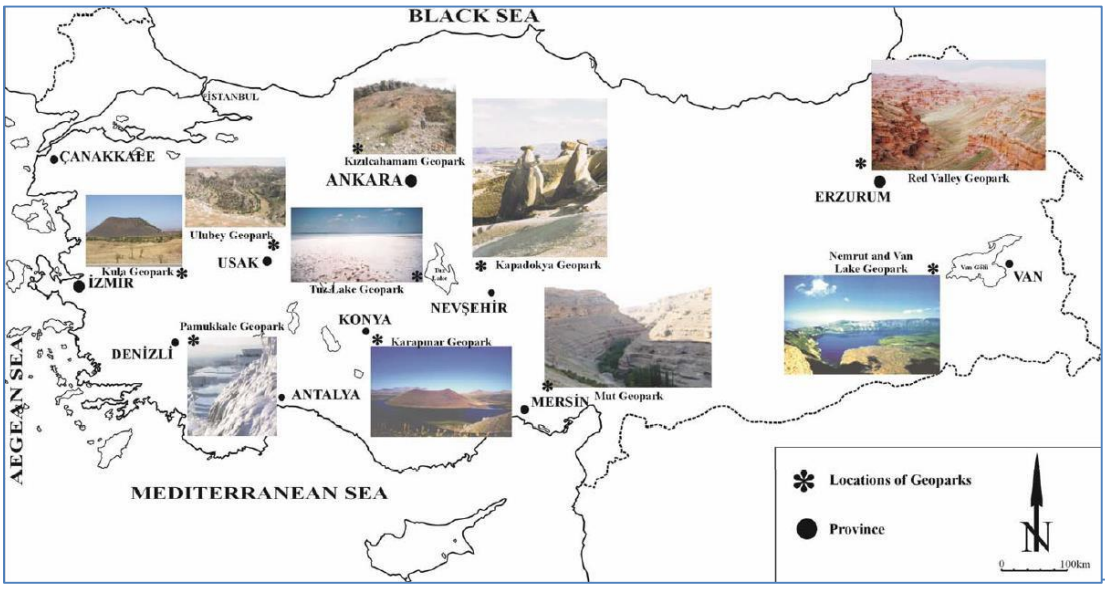

Figure 1. Geopark candidates of Turkey (except Kula).

Figure 2. Location of geoparks in Europe.

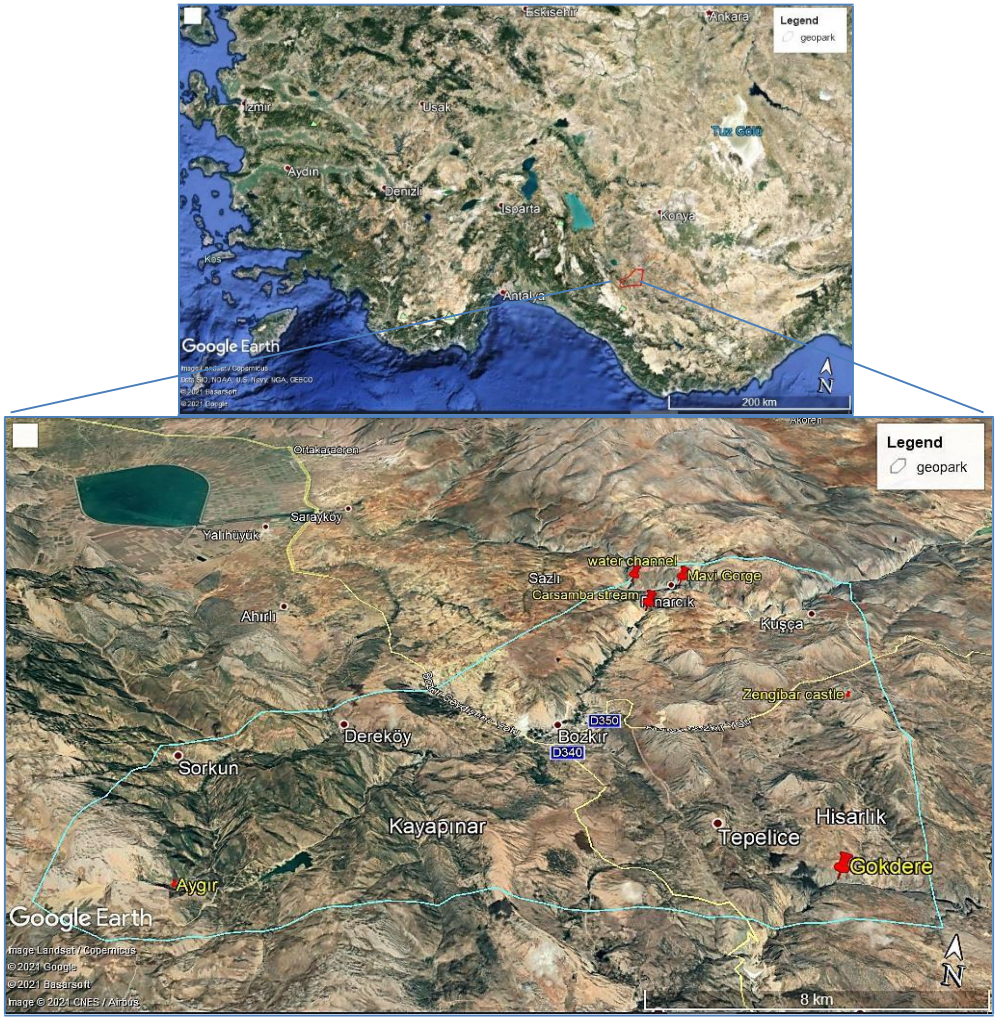

Figure 3. Boundaries of the possible geopark location, A Google Earth map.

2. DATA & METHODOLOGY

The area is chosen based on its geological, cultural and natural characteristics. It covers a surface area of 308 km^2, with an attitude ranging from 1071m to 1917 m (Figure 3). It contains many villages (>20) a town and a few streams.

3. GEOLOGY

The Central Taurus Mountains includes rock unit assemblages with tectonic contact with each other, which reflect different environmental conditions in terms of stratigraphy, metamorphism and structural features, and show continuity throughout the belt (Blumenthal, 1944; Blumenthal, 1947; Blumenthal, 1956; Brunn *et al.*, 1971; Gutnic *et al.*, 1979; Monod, 1977; Özgül, 1971; Özgül, 1976; Özgül, 1984; Özgül and Arpat, 1973). It contains several tectonic units, namely Bolkardağı unit, Aladağ unit, Geyikdagi unit, Alanya unit, Bozkır unit and Antalya unit (Brunn *et al.*, 1971; Gutnic *et al.*, 1979; Monod, 1977; Özçelik, 1984; Özgül, 1976, Özgül, 1984; Özgül, 1997; Özgül and Arpat, 1973; Takçı, 2015; Turan, 1990, Figure 4-5).

The Bozkır unit represents the northern edge of the Taurus Belt, and was named in Bozkır district by (Özgül, 1976) due to being crop out typically there. The unit appears as huge melange, which contains different blocks and slices of rocks, namely, various Triassic- Cretaceous deposits of basin, slope and

platform; basic submarine volcanics; tuff; diabase and serpentinite (Özgül, 1997, Figure 5, 6). The Bozkır Unit contains Upper Triassic Korualan Group (Kayabaşı Formation, Başkışla Complex), Upper Triassic-Upper Cretaceous Huğlu Group (Dedemli Formation, Mahmut Tepesi Limestone / Formation, Kovanlık Complex) and Jurassic-Cretaceous Boyalı Tepe Group (Soğucak / Kuztepe Limestone and Asar Tepe Limestone) (Takçı, 2015). It is overlied with a tectonic contact by Triassic-? Dedemli formation, which is made up of green tuffite, basalt and radiolarite, with gray and thick-bedded limestone levels. Upper Cretaceous Erenlertepe formation typically represented mostly by massif limestone (biyopelintrasparit) with aragonite levels and karstic space. It overlied the Dedemli formation, and unconformably underlied Oligocene Çatkoy formation, which includes red and gray polygenic conglomerates (Figure 7) with sandstone levels and mudstone, claystone lenses (Figure 8a). Upper Miocene-Pliocene Gündüğün formation, tufa and Quaternary alluvium are the youngest units in the area. Angular discordance exists between Çatköy formation and alluvium (Figure 8b). The Gündüğün formation is composed of loose- cemented conglomerate, sandstone, siltstone, argillaceous limestone, and marl alternations.

The Bozkır district also appears as a natural laboratory for geological studies since it has well-developed geological structures such as fault, folding and discordance (Figure 6, 8).

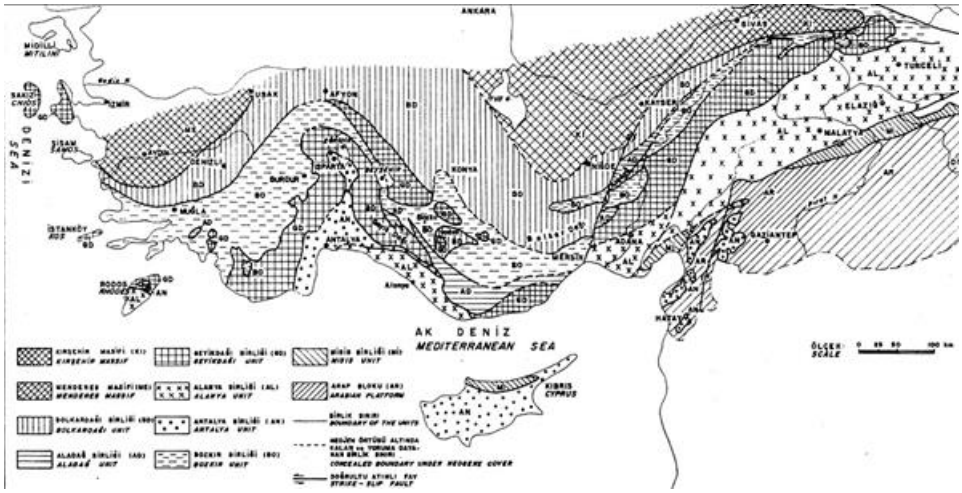

Figure 4. The schematic map showing the distribution of units in the Taurus belt (Özgül, 1976).

4. CULTURE

The study area contains not only spectacular geological occurrences, but also various historical structures. Bozkır was capital of ancient Isauria, which generally covers the district of Bozkır and its surroundings, or the core of the Taurus Mountains, as evidenced by Zengibar castle (Figure 9-10). The Isauria name derives from the contentious Isaurian tribe and twin settlements Isaura Palaea (Old Isaura) and Isaura Nea (New Isaura). The castle is also a significant centre during the Roman and Byzantine era. The city was known as Leontopolis and Isauropolis throughout Byzantine times, possible alternative names of the differing settlements of Palaia and Nea Isaura (Mitchell, 1979).

Bozkır district also have various historical mosques, namely, Hisarlık Mosque (1283), Harmanpınar Büyük Mosque (1793), Üçpınar kurşunlu mosque (1816), Yolören Mosque (1849), Çarşı Mosque (1872), Dere Büyük Mosque (1872), Akçapınar Mosque (1892), Karacaardız Çeşme Mahallesi Mosque (19th century), Sorkun Lower Street Mosque (20th century); and bridge (Figure 10b). The Hisarlık Mosque is characterized by unique wooden decorations in their internal areas (Apa, 2009), with excellent paintings (Figure 11b).

5.NATURE

The area is characterized by high mountains and streams following deep valleys. The Carsamba stream is the source of life in the region. It is originated from the Taurus Mountains both as Aygır spring, and as leakage from Sarıot lake during spring. It crosses from various villages and town (Figure 12), up to Mavi Gorge to meet with the water channel, which was built in 1913 between Mavi Gorge and Beysehir Lake, the largest freshwater lake within Turkey. Both Sarıot lake and Aygır are destinations for not only local people but also travellers. The Mavi Gorge is a canyon worth seeing with its long narrow and wide passages covered with steep rocks on both sides. The stream finally reaches Apa Dam, which was built for irrigation of Konya plain, the largest one in Turkey.

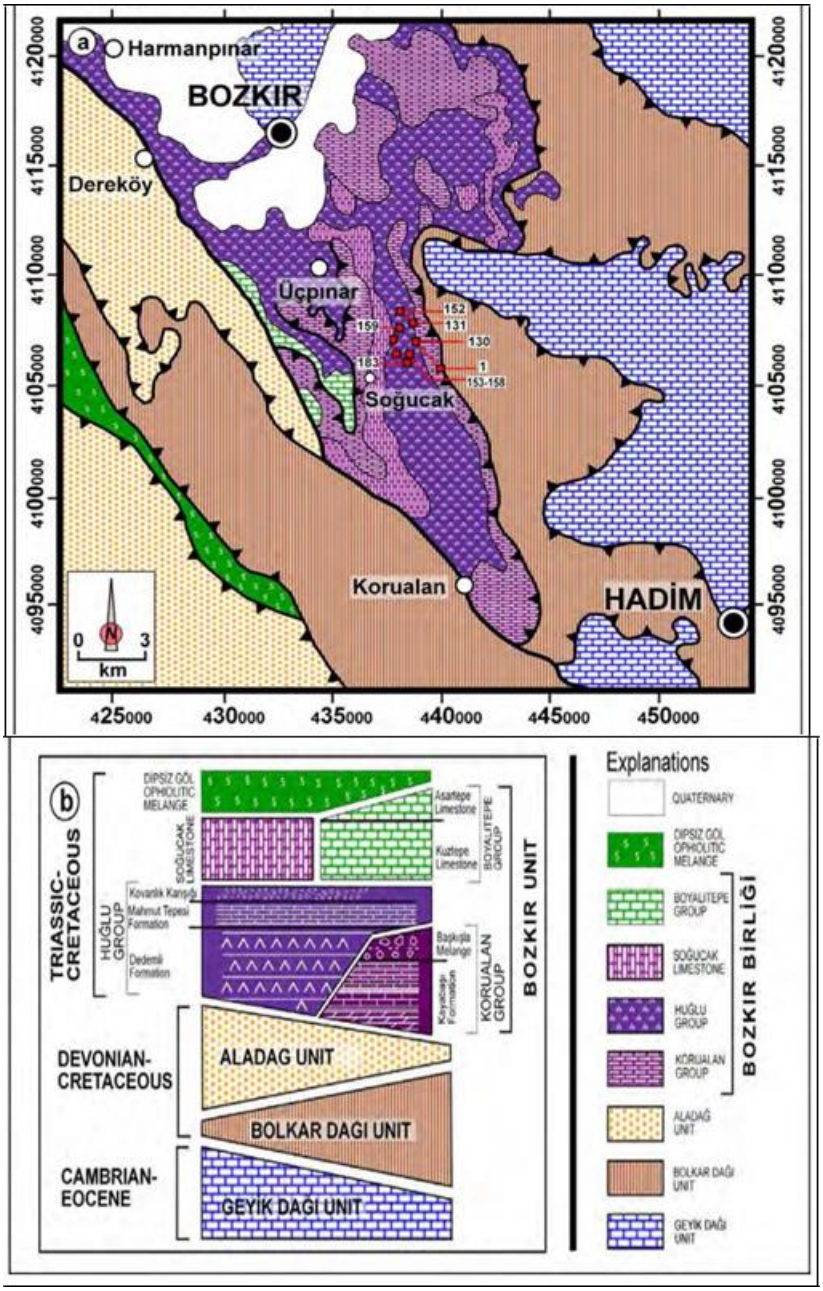

Figure 5. a) Geology map of the area between Bozkır and Hadim towns (adapted from MTA, 2002), b) The relative settings of the units (arranged from Özgül, 1997).

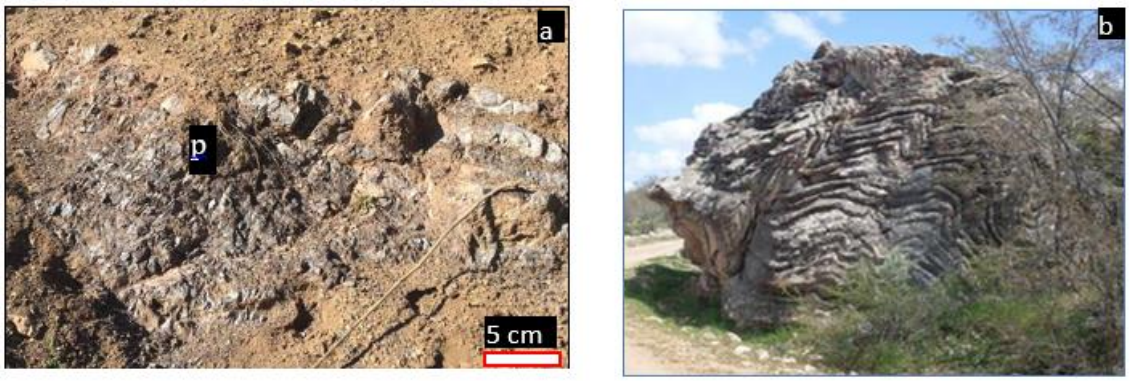

Figure 6. A field view from peridotite (p) and folded limestone of the Bozkır unit.

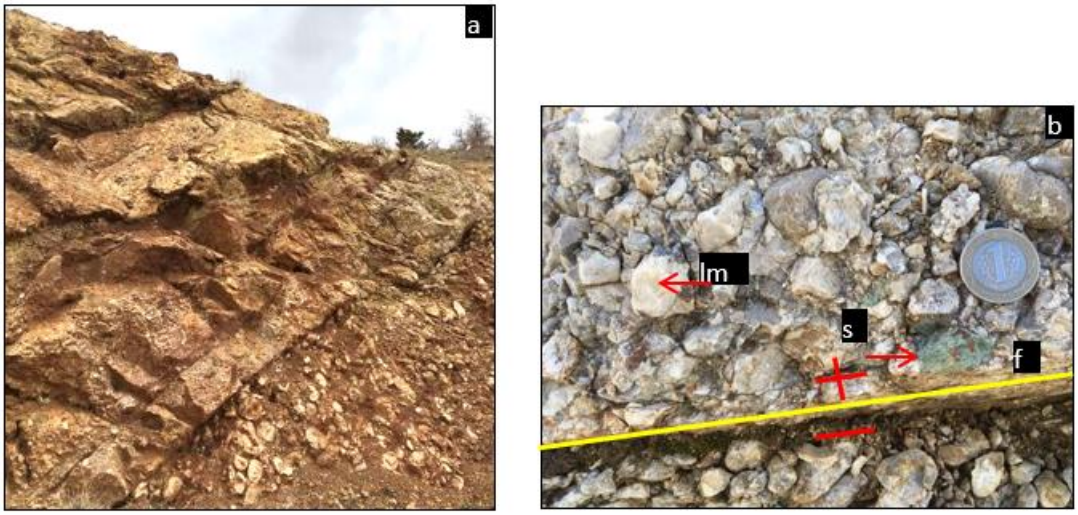

Figure 7. a) A field view of conglomerate of Çatköy formation. b) Close view of the polygenic conglomerate with limestone (lm) and serpantinite (s), with fault (f). Money has diameter of ~2.5cm

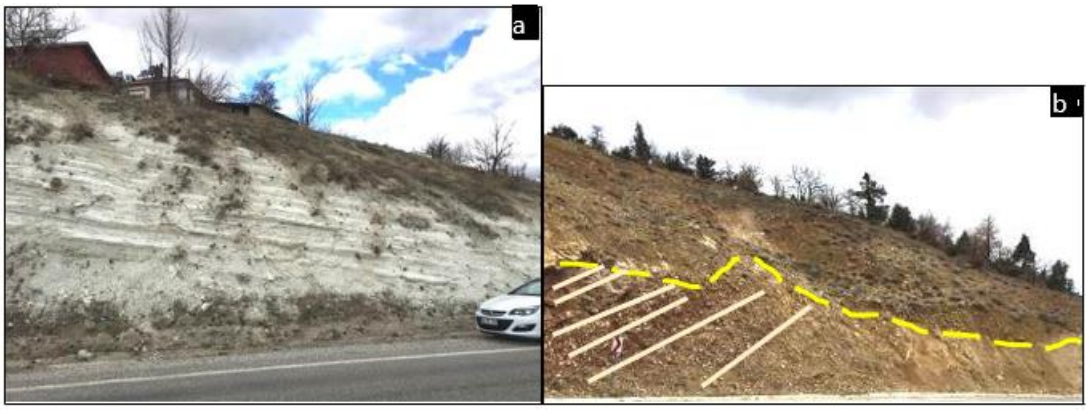

Figure 8. A field view from (a) clay stone and (b) Angular discordance between conglomerate of Çatkoy formation and alluvium.

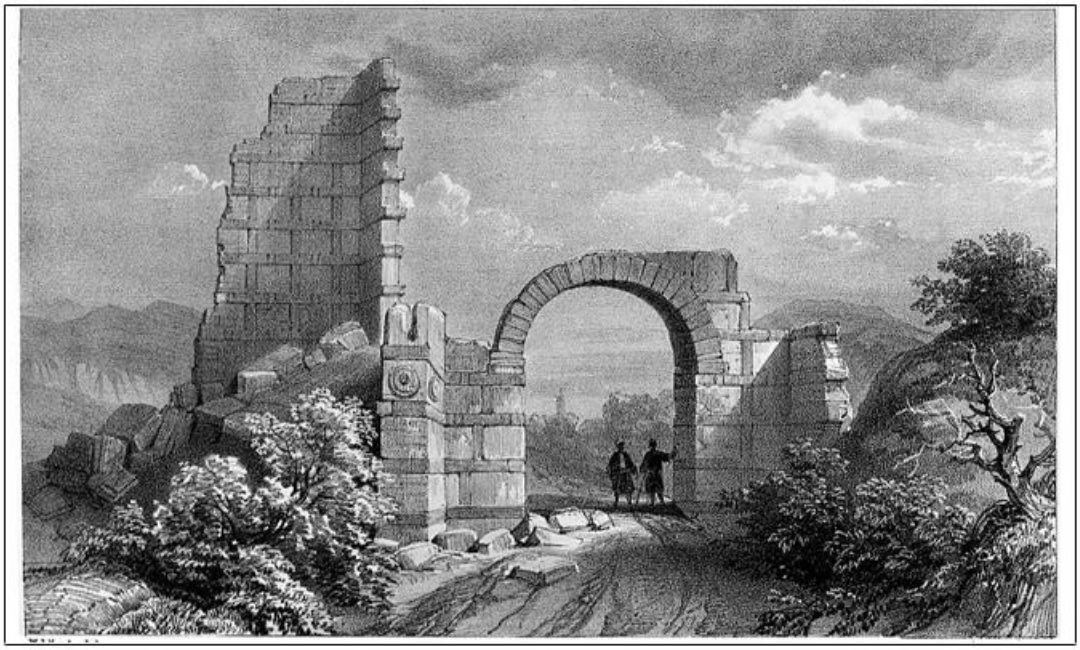

Figure 9. Zengibar castle in 1842 (Hamilton, 1842)

Figure 10. a) Ruins of Zengibar castle, b) Historical Seljuk Bridge and Ottoman Mosque in the center of Bozkır.

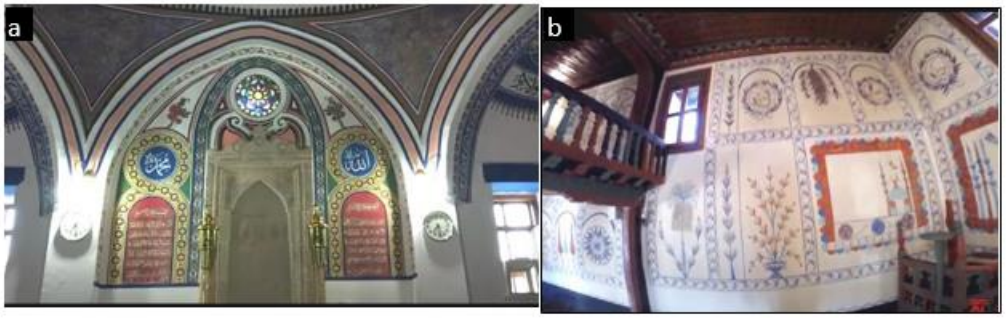

Figure 11. a) Üçpınar kursunlu Mosque, b) Hisarlık Mosque

Figure 12. Çarsamba stream crossing Bozkır

6. DISCUSSION & CONCLUSION

The region for possible geopark candidate covers a surface area of 308 km^2, with an attitude ranging from 1071m to 1917 m (Figure 3). It contains many villages (>20) a town and a few streams. It is rich in historical structures such as the Isauria castle, bridge and various mosques of Seljuk and Ottoman periods. It has also well-known and well-exposed geological units and structures as well as excellent natural beauties such as Sarıot lake, Aygır, Carsamba stream and Mavi Gorge. All of which suggests that the Bozkır district should be declared as a Geopark.

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