Jomat

Journal of multidisciplinary academic tourism
*2025, 10 (2): 165-171*
*https://doi.org/10.31822/jomat.2025-10-2-165*

ISSN: 2645-9078

# Evaluation of thermal tourism potential of Şırnak **

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***Keywords:***
*Thermal Tourism,*
*Health Tourism,*
*Geothermal,*
*Şırnak.*

***Article History:***
*Submitted: 06.05.2024*
*Revised:17.08.2024*
*Revised: 10.03.2025*
*Accepted: 01.04.2025*
*Published Online: 02.04.2025*

***ABSTRACT***

*The aim of this study is to identify the existing geothermal resources in Şırnak Province, determine their characteristics, and assess their potential for thermal tourism. Fieldwork was conducted on two different dates during the research, and samples were taken from 10 sources at 5 different locations. The parameters of ECI, pH, and temperature were measured at the sources. The collected samples were then analyzed in accordance with the provisions of the "Hot Springs Regulation" published in the Official Gazette dated 24.07.2001 and numbered 24472, at the Diyarbakır Public Health Laboratory under the Provincial Health Directorate. The results were evaluated in terms of public health. As a result of the research conducted at 5 locations, it was determined that the Beytüşşebap-Ilıcak geothermal area (43.3°C) and the Güçlükonak-Belkıs Main Geothermal Area (62.8°C) are suitable for thermal tourism. It was also found that the other sources could be used for wellness purposes. Recommendations regarding the measures to be taken for these locations to become thermal tourism centers were also presented.*

## 1. Introduction

The impact of globalization, urbanization, advancements in technology, and the rise of online consumerism in 21st-century Western societies has led people to experience the illusion of a new paradigm known as the concept of eternal life. With the increasing emphasis on longevity and the adoption of healthy lifestyles by individuals, wellness has gained particular significance in postmodern daily life (Gustavo, 2010, p.127). This situation has transformed health tourism, which encompasses activities related to healthcare services and medical procedures, into a globally prominent healthcare delivery service. As a result, health tourism has garnered significant attention in popular media and has become an important topic in public policy forums (Loh, 2015, p.173). The growing importance of health tourism has encouraged and continues to encourage government institutions in many countries (such as the World Health Organization, American Medical Association, and India Tourism and Travel Management Institute) and consulting firms (such as Deloitte) to conduct research on the impact of health tourism on national economies (Letunovska *et al.*, 2020, p.11).

Both an academic and professional phenomenon of global interest, health tourism dates back to ancient times, including Egypt, Greece, and Rome, and has been practiced for thousands of years. For instance, during those periods, people traveled to benefit from thermal waters, pilgrimage to sacred places for spiritual rejuvenation, or indulge in hot thermal baths believed to be beneficial for the body (Ridderstaat *et al.*, 2019, p.270). Thus, it is known that since ancient times, many individuals have traveled to nearby rivers and mineral sources for their healing and relaxation properties. For example, it is said that people bathed in the Nile River in Egypt, the Ganges River in India, the Yangtze River in China, and the Jordan River in Jordan for physical and spiritual purification (Goodrich, 1994). Particularly in ancient Greece, people covered significant distances for medical treatment. Therefore, the quest for health and medical care has been a fundamental reason for travel for centuries (Zhong *et al.*, 2021).

Indeed, health tourism, which has existed since the era when the Sumerians built a healing place around a thermal spring that attracted many travelers, has emerged as a type of tourism focusing centrally on physical health while also

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*** This study was conducted within the scope of the project numbered "2021..ÖNAP.11.03.01," supported by the Şırnak University Scientific Research Projects Coordination*

enhancing developmental and spiritual well-being (Salehi-Esfahan *et al.*, 2021, p.36).

Health tourism product supply is greatly influenced by social, national, and cultural traditions and characteristics that are based on geographical locations as much as historical traditions (Romanova *et al.*, 2015, p.239). Therefore, countries have adopted different models of health service delivery depending on the characteristics, needs, and resources of their societies, as well as their economic situation and governance models. However, considering that not every country has a well-functioning healthcare delivery system, health tourism does not occur everywhere (COMCEC, 2020). The leading countries where health tourism takes place are as follows: in Asia and the Middle East, Thailand, India, Singapore, Israel, the Philippines, China, and Malaysia; in Europe, Spain, Germany, Hungary, Poland, France, and Austria; in Latin America, Mexico, Costa Rica, Panama, Argentina, Colombia, and Brazil; in Africa, South Africa, Zambia, Zimbabwe, Botswana, and Tanzania. Türkiye, being a country that connects both Asia and Europe, can be considered a leading country in both continents for health tourism (Özkan, 2020).

Especially with the "health transformation program" in 2003, health tourism has developed in Türkiye, where cooperation between the private sector and the public sector began under the coordination of the Ministry of Health (Aslanova, 2013). Today, Türkiye is not behind global standards in therapeutic healthcare services and is among the best in Europe (Gümüş & Polat, 2012). Particularly, Türkiye has significant potential in terms of geothermal resources. It ranks first in Europe in terms of resource potential and third in terms of spa applications (Gülen & Demirci, 2012). Türkiye's thermal resources are distributed across regions, with the number of resources decreasing from highest to lowest in the Aegean Region (123), Central Anatolia Region (91), Eastern Anatolia Region (64), Marmara Region (53), Black Sea Region (45), Mediterranean Region (24), and Southeastern Anatolia Region (10) (Özşahin & Kaymaz, 2013).

However, literature studies related to the geology, natural resources, and active tectonics of Southeastern Anatolia are limited, with most studies conducted by institutions such as MTA, TPAO, and universities focusing on specific areas and topics (e.g., petroleum). Therefore, comprehensive research aiming to determine the relationship between the region's geodynamics and the development of geothermal systems is lacking (Baba *et al.*, 2015, p.208). Thus, the number of resources mentioned in the literature for Southeastern Anatolia Region (10) may vary. In this context, the aim of this research is to examine the status of thermal tourism (spa and wellness tourism) globally and in Türkiye within the scope of health tourism and to reveal the thermal tourism potential of Şırnak province in the Southeastern Anatolia Region.

## 2. Conseptual Framework

### *Thermal Tourism and Its Importance*

A thermal source is defined as an underground water source that emerges from the Earth's crust, containing beneficial minerals and components for the human body, with a temperature of 25 degrees Celsius or above (Kusdibyo, 2022, p.382). Thermal sources, also known as hot springs, have maintained their reputation and allure throughout the ages and have been one of the oldest reasons for travel for health purposes (Boekstein, 2014, p.2). Therefore, these sources represent one of the oldest forms of tourism used for recreation and tourism purposes (Wang & Lin, 2021, p.4). This form of tourism, which is considered a healing source for the body and mind and has a popular tradition dating back to pre-Roman times, is now referred to as thermal tourism (spa tourism) in modern times (Esiyok *et al.*, 2018, p.531).

Thermal tourism, which is not limited to the use of natural resources for healthcare, is a type of tourism that improves tourist health and prevents health risks by offering services that reduce stress, psychological, and physiological imbalances caused by modern life (Brandão *et al.*, 2021, pp.3-4). Unlike other types of tourism such as sports, recreation, and culture, thermal tourism is more associated with spending time outdoors and utilizing the environment in addition to spa activities (Chrobak *et al.*, 2020, p.1). Thermal tourism encompasses therapeutic and healing methods under the umbrella of balneology, balneotherapy, hydrotherapy, and krenotherapy, which utilize natural mineral and geothermal waters known for their healing properties (Erfurt-Cooper, 2010, p.2).

With the increasing awareness of the value of thermal treatment methods, people, especially tourists, have begun to prioritize the commercial and economic value of spas due to their behavior and demand characteristics, as well as their travel motivations (Mi *et al.*, 2019, pp.3-4). Consequently, thermal resources have created a potential for economic and social benefits that contribute to local and national employment by extending the tourism season to a longer period (Nikoli & Lazakidou, 2019, pp.318-319). Thermal resources play a significant role in the evaluation of natural water sources, particularly due to their healing value. Numerous hot springs that have become cultural symbols on every continent have been utilized by many individuals for their mineral content, relaxing properties, suitable temperatures, and visual appeal. As a result, destinations with hot springs have gained importance in tourism, contributing to the growth of this industry from a tourism perspective (Erfurt-Cooper, 2010, p.1).

Yu (2015) emphasized the need for protective practices to conserve thermal tourism resources, fully showcase the cultural characteristics of thermal tourism, establish branding, utilize geothermal waters with appropriate methods to protect the environment, strengthen personnel training, and enhance service quality to ensure sustainable

thermal tourism. Lee & King (2009) highlighted that among the specific features that attract tourists in evaluating the destination competitiveness of hot spring tourism in Taiwan are natural resources, cultural assets, distinctive places of interest, accommodation, culinary culture, transportation, and safety/security. Wu (2023) stated that high-quality hot springs are the foundation of all holiday destinations, emphasizing the importance of improving the facilities and equipment of hot spring resorts and enhancing service quality. Yen et al. (2017) noted that hot spring hotels are being developed based on specific geographical features, should have direct access to hot springs, and should incorporate different physical and abstract features to meet visitors' needs.

## 3. Method

In this research, geothermal sources believed by the public in Şırnak province to have healing properties were first identified by utilizing both the literature and input from local residents. Subsequently, samples were collected twice, in September 2021 and October 2022, from these identified sources. The samples were analyzed at the Diyarbakır Public Health Laboratory, under the regulations outlined in the "Spa Regulations" published in the Official Gazette dated 24.07.2001, in collaboration with our research team and the Şırnak Provincial Health Directorate. Additionally, parameters such as temperature, flow rate, and ECI values were measured at the source. The resulting analyses were evaluated from the perspective of public health by Associate Professor Dr. Kağan ÖZKUK from the Department of Medical Ecology and Hydroclimatology at Uşak University Faculty of Medicine.

This research is derived from the project results titled "Şırnak's Geothermal Tourism Potential," which was supported by the Şırnak University Research Fund (BAP unit). The data in this article has been evaluated in terms of thermal tourism potential.

## 4. Findings

The research has identified 10 sampling points from 5 source locations within the borders of Şırnak province, and samples have been taken from these locations (Table 1).

The pH values of water samples taken from the project area range from 6.56 to 9.4 in September 2021 and from 7.15 to 9.46 in October 2022. It can be said that groundwater in the study area varies between acidic and alkaline. The electrical conductivity (EC) values of the water samples in the study area were measured between 795-2095 µS/cm in September 2021 and between 756-1900 µS/cm in October 2022. The most important geothermal area in Şırnak is the Güçlükonak-Hısta field (Özel, 2001, p.76). The temperature of the source is 63.5°C. Additionally, the temperature of Beytüşşebap-Ilıcak source is 43.3°C, Balveren-Besta source is 29.3°C, and Kumçatı sources are around 22°C.

### *Güçlükonak-Belkıs Ana (Hısta) Geothermal Area*

The Güçlükonak geothermal area takes its name from the Hısta village in the Güçlükonak district of Şırnak province. The Hısta hot springs, located 10 km from the Güçlükonak district, are situated 250 meters west of Hısta village and along the banks of the Tigris River (Bekişoğlu & Özel, 2002, p.99). The hot springs area includes two separate baths for men and women. The source located between these two baths, called Kaptajı, is situated 30–40 meters above the level of the Tigris River, measuring 3x1.5 meters with a depth of 50 cm. Three sources converge at this Kaptajı and flow towards the baths. However, recently, the source water is directed to the new pool through pipes (Güven, 2010, p.234). The Hısta hot springs have the highest temperature among the thermal sources in Şırnak province. Although temperatures vary depending on the season, the average temperature is measured at 62-63°C. The spring water contains calcium and sulfide with a discharge rate of 7 lt/s, and a pH of 7.15. The hydrogeological conditions indicate the potential to

**Table 1: Source data**

| Sample No | Place | Description | September-2021 | | | | October-2022 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | pH | EC* (µS/cm) | Temperature (°C) | Flow rate (l/s) | pH | EC (µS/cm) | Temperature (°C) | Flow rate (l/s) |
| **1** | Besta Meryema 1 /Balveren Village | Source 1/Male side/pool | 7,46 | 1452 | 29,3 | 3 | 7,82 | 1159 | 27,3 | 3 |
| **2** | Besta Meryema 2 /Balveren Village | Source 2/ Upper level | 8,09 | 1138 | 28,5 | 1 | 8,07 | 1355 | 29,1 | ~1 |
| **3** | Balveren/Germav Siftiye Area | Spurce 3 /Pool | 7,27 | 863 | 23,3 | 1 | 8,19 | 1050 | 24,5 | ~1 |
| **4** | Beytüşşebap Zümrüt Thermal Springs | Source-1 | 6,79 | 1881 | 43,3 | 1 | 7,15 | 1704 | 43 | 20-25 |
| **5** | Beytüşşebap Zümrüt Thermal Springs | Source-2 | 7,05 | 1450 | 42,6 | 12 | 7,29 | 1651 | 42,8 | 20-25 |
| **6** | Güçlükonak Belkıs Ana (Hısta) Thermal Spring | Source 2 (Main output) | 6,56 | 2095 | 62,8 | 1,7 | 7,2 | 1900 | 63 | 1,7 |
| **7** | Kumçatı Area Kaynak-1 | Source 1 | 8,05 | 1430 | 21,8 | 0,1 | 7,99 | 1337 | 20,9 | ~0,15 |
| **8** | Kumçatı Area Kaynak-2 | Source 2/Bath | 7,69 | 795 | 22,5 | 0,05 | 8,12 | 756 | 20,8 | ~0,05 |
| **9** | Kumçatı Area Kaynak-3 | Source 3/Bath | 9,13 | 2093 | 21,7 | 0,03 | 9,28 | 1893 | 19,7 | ~0,06 |
| **10** | Başağaç Area | Source | 9,4 | 1098 | 16,5 | 1,5 | 9,46 | 1041 | 13,5 | ~0,24 |

***Source:*** *Authors elaboration*


**Figure 1. Location of the Belkis Ana thermal spring sampling point on the satellite image**
***Source:*** *Authors elaboration*

increase the current discharge, and it is said that the Hısta hot springs are beneficial for rheumatic and women's diseases (Çelik & Çoşkun, 2015). The satellite image showing the sample collection area of Belkıs Ana hot springs is shown in Figure 1. According to the Medical Balneological Evaluation report, the Belkıs Ana hot springs fall into the category of thermo-mineral, sulfate, and fluorine-containing waters. They can be used for degenerative joint diseases, inflammatory rheumatic diseases, soft tissue rheumatism, chronic lower back pain, orthopedic conditions, and drinking cures.

### *Kumçatı (Ikizce) Geothermal Area (Nasfaran hot spring)*

In the Kumçatı District, located 2 km from the center of Şırnak, there are three separate springs. Makeshift structures have been built by the local community at the spring outlets and made available for use. This spa has two sources, one used for mud baths and the other for bathing and drinking. It is said that the mud bath treats acne, eczema, and fungal diseases (Oyuryüz Şenel & Gürel, 2012, p.355; DİKA, 2018, p.218). The other spring is believed by locals to be beneficial for stomach ailments and itching. The average temperature of the springs is measured at 20°C. Sample collection points in the Kumçatı location are shown in Figure 2. According to the Medical Balneological Assessment report, the spring, which falls into the group of termomineral waters, can be used for hypothermal bath applications. It can be used for degenerative joint diseases, inflammatory rheumatic diseases, soft tissue rheumatisms, chronic lower back pain, and orthopedic conditions. The second source in the Kumçatı area needs to be cleaned for use in bathing applications.


**Figure 2. Satellite image of Kumçatı (Ikizce) sampling locations**
***Source:*** *Authors elaboration*

### *Balveren-Besta Geothermal Area*

In the rural area of Balveren, located 30 km northeast of the city center, there are two natural springs. These thermal waters, ranging from 24-29°C, do not have any facilities for their use. They have been made available for public use by the local community through the construction of pool systems. Sample collection points in the Besta location are shown in Figure 3. In this location, there are three different springs with similar characteristics. It is noted in the Medical Balneological Assessment Report that these springs are exposed to organic pollution, and after necessary arrangements are made to eliminate pollution, they can be used particularly for hypothermal bath treatments and applications, especially for musculoskeletal disorders.

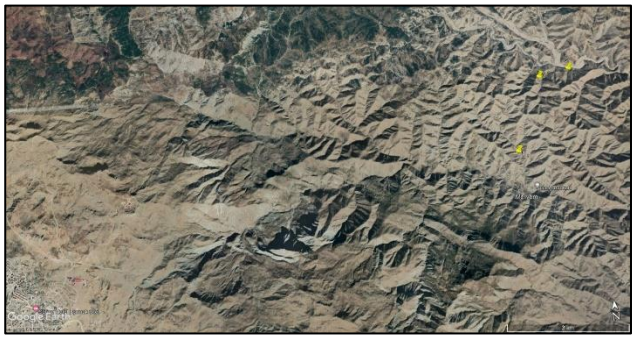

**Figure 3. Satellite view of Besta Meryema sampling locations**
*Source: Authors' owns elaboration*

Beytüşşebap-Ilıcak Geothermal Area (Emerald hot spring)

In the village of Ilıcak, located 7 km from the Beytüşşebap district, there is the Zümrüt hot spring. The thermal water of this spring, known for its healing properties for skin, kidney, and rheumatic diseases, is not consumed due to its turbidity (Akın *et al.,* 2006, p.11). The average temperature of the spring water is recorded as 43.3°C. It is known as the spring with the highest discharge (1273 mg/l) among the thermal waters within the borders of Şırnak province. There is a facility built by the Provincial Administration for the use of the public. Sample collection points in the Beytüşşebap location are shown in Figure 4. In the Medical Balneological Assessment Report, it is mentioned that the Zümrüt Hot Springs in Beytüşşebap can be used in appropriate bath treatments. These treatments can be used not only for leisure and recreational purposes but also for the treatment and rehabilitation of musculoskeletal system disorders.

### *Başağaç Jeotermal Area*

The old name of the village is recorded as Mendikeran in the records of 1928. The village, evacuated by security forces in 1987, was resettled in 1999 and is known among the locals as 'Ecevit Village' (Index Anatolicus, 2023). The spring water within the village boundaries is recorded as the source with the lowest temperature among the springs within Şırnak province. Its average temperature is measured as 16.5°C. The villagers have built a pool for use. Sample collection points in the Başağaç location are shown in Figure 5. The Medical Balneological Assessment report states that the water is exposed to organic pollution and can be used for bath treatments after cleaning.

**Figure 5. Satellite image of Başağaç local sampling location**
*Source: Authors' elaboration*

## 5. Conclusion and Recommendations

In this study, geothermal sources in Şırnak province have been considered in terms of thermal tourism. Within this scope, measurements and microbiological, chemical analyses, and Medical Balneological Evaluation have been taken into account at 10 sources in 5 different areas. The findings obtained indicate that especially Güçlükonak Belkısana Thermal Spring and Beytüşşebap Zümrüt

**Figure 4. Satellite image of Zümrüt thermal spring sampling locations**
*Source: Authors' owns elaboration*

Thermal Spring are suitable for thermal tourism considering their accessibility, location, and water properties. However, the current usage of other springs for thermal tourism would be quite costly due to issues such as transportation difficulties and water pollution, considering their accessibility, location, and water content.

Güçlükonak and Beytüşşebap thermal springs stand out as prominent sources when considering their flow rates and temperatures. Indeed, these springs, which are highly popular among the local population and visitors from neighboring provinces, have not yet completed their infrastructure development processes. There are significant deficiencies in terms of service quality. Additionally, the fact that people use these thermal springs without a doctor's supervision and report poses serious health risks. Although there is accessibility to the springs, it is not adequate as it should be. Therefore, infrastructure and superstructure improvements are necessary. Other geothermal sources are not considered suitable for thermal tourism due to their distance and poor road conditions. However, they may be reevaluated in the future.

The thermal sources in Şırnak province can become a significant thermal tourism destination when activated. National and local policymakers need to draw attention to this matter. The Ministry of Culture and Tourism can facilitate private sector involvement by implementing encouraging policies for the development of these resources in the region. This way, Şırnak can experience rapid progress in thermal tourism.

Thermal tourism is a highly sought-after tourism type globally and in Türkiye. Conducting feasibility studies for the thermal sources in Türkiye and preparing them for use in the tourism sector will lead to an increase in both domestic and international tourist numbers. This, in turn, is expected to have a significant impact on regional development. The development of tourism can contribute to employment in Şırnak, which is among the provinces with high unemployment rates, and lead to increased female employment, among other positive effects. In this context, it is believed that some progress can be made in overcoming Şırnak's low economic development ranking.

This research has certain limitations, as it only addresses the current situation. Future research could involve quantitative and qualitative studies with local residents, visitors benefiting from thermal sources, and personnel from relevant public institutions. These types of studies can lead to a deeper understanding of thermal tourism and the identification of more effective strategies.

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Jomat

**Journal of multidisciplinary academic tourism**

2025, 10 (2): 165-171

*https://doi.org/10.31822/jomat.2025-10-2-165*

ISSN: 2645-9078

# INFO PAGE

## Evaluation of thermal tourism potential of Şırnak

## Abstract

*The aim of this study is to identify the existing geothermal resources in Şırnak Province, determine their characteristics, and assess their potential for thermal tourism. Fieldwork was conducted on two different dates during the research, and samples were taken from 10 sources at 5 different locations. The parameters of ECI, pH, and temperature were measured at the sources. The collected samples were then analyzed in accordance with the provisions of the "Hot Springs Regulation" published in the Official Gazette dated 24.07.2001 and numbered 24472, at the Diyarbakır Public Health Laboratory under the Provincial Health Directorate. The results were evaluated in terms of public health. As a result of the research conducted at 5 locations, it was determined that the Beytüşşebap-Ilıcak geothermal area (43.3°C) and the Güçlükonak-Belkıs Main Geothermal Area (62.8°C) are suitable for thermal tourism. It was also found that the other sources could be used for wellness purposes. Recommendations regarding the measures to be taken for these locations to become thermal tourism centers were also presented.*

**Keywords:** *Thermal Tourism, Health Tourism, Geothermal, Şırnak.*

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***Author statement:*** *Author(s) declare(s) that All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.* ***Declaration of Conflicting Interests:*** *The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article*

**This paper does not required ethics committee report**

**Justification: The methodology of this study does not require an ethics committee report.**