



Natural dye plants in Sındırgı Yağcıbedir Carpets (Balıkesir, Turkey)

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Abstract

An ethnobotanical study was conducted between 2021 and 2023 in order to determine natural dye plants used in Sındırgı, Balıkesir. Sındırgı is the district of Balıkesir Province in the Marmara Region of Turkey. Yağcıbedir carpets hold a significant place among the handwoven carpets produced in the district of Sındırgı. Yağcıbedir carpets constitute an important part of our cultural heritage. With this study, we aimed to document traditional uses of dye plants in Yağcıbedir carpets. The primary goal of this research was to identify the natural dye plants traditionally used by the local people of Sındırgı district. Through interviews with local informants, traditional plant names, the plant parts utilized for dye extraction, the colors obtained, and the specific applications of these dyes were documented. The results revealed the usage of 11 plant species belonging to 10 families as sources of dyestuff. However, it was noted that one of these plant species is not of Anatolian origin and is employed in powdered form. Various plant parts such as roots, shoots, cupula, bark, and other above-ground components are employed in the dye extraction process, with one plant mixture identified for mordanting purposes. This article was reproduced from the master's thesis (Sinem Ünal).

Keywords: Natural dye, Ethnobotany, handcraft carpets, Yağcıbedir, Sındırgı, Balıkesir

Introduction

Turkey boasts remarkable potential in terms of plant diversity, with approximately 12.000 plant taxa and nearly one-third of this total is endemic (Güner et al. 2012). The vast array of plant species in Turkey has provided mankind with various opportunities for their utilization, including purposes related to food, health, dyestuff, and religious practices. The multifaceted use of plants by people for objectives has given rise to the discipline of ethnobotany (Kendir and Güvenç 2010).

Ethnobotany is the subfield of botany that explores the historical use of plants by societies that still adhere to traditional practices today. The term “ethno” pertains to study of people, while “botany” signifies the study of plants or plant science (Kendir and Güvenç 2010).

The utilization of plants from nature to obtain dyestuffs, one of the ways people benefit from natural resources, dates back to ancient times. The discovery of weaving in 5000 BC marked the emergence of dyeing fabrics, and extraction of dyestuffs from plants coincided with the beginning of the Bronze Age. The earliest recorded use of natural dyestuff was found in ground stones unearthed during archaeological excavations in the Indus Valley, dated to 3500 BC. Indigo dyestuff is among the oldest discoveries. Another excavation in the same region uncovered two colored money bags believed to have been dyed with root dye (Tüm Cebeci 2020).

The fact that the people of Anatolia have historically used plants collected from nature to color carpets, clothing, rugs, saddlebags, prayer rugs and bags serves as compelling evidence of longstanding tradition of natural dyeing in Anatolia. The influence of nomadic tribes' culture, along with the patterns and colors they employed, played a significant role in shaping this culture and influencing the items woven by Turkish society (Tüm Cebeci 2000).

Yağcıbedir carpets are classified into three main types: Sındırgı type Yağcıbedir carpets, Kepsut type Yağcıbedir carpets, and Bergama type Yağcıbedir carpets. The distinguishing features of Sındırgı type Yağcıbedir carpets from other varieties include the patterns, colors, and the raw material of the yarn used. The primary material for the carpet is yarn made solely from the wool of sheep grazed in the plains. The reason for this is that yarn obtained from sheep raised in open areas has a dye-absorbing capacity that is 50% higher (Ünsal 1991, Deniz 1999). Another important feature is that only 5 primary colors are used in Yağcıbedir carpets. These colors are red, navy blue, black, brown, and white. The naturalness of the colors comes from the fact that the plants providing these colors are collected from nature. The delicacy, elegance, and durability of Sındırgı Yağcıbedir carpets are based on the use of natural beauties, and the carpet becomes brighter as it is used. The lifespan of the carpet is around 150-200 years (Atış 1993, Ünsal 1991).

With the technological advancements and the emergence of synthetic dyestuffs due to industrial developments, people have gradually shifted away from natural dye plants in favor of synthetic alternatives. Sir William Henry Perkin, a scientist, played a pivotal role in development of synthetic dyestuffs (Erdem İşmal 2011). One of the primary reasons for this transition is that obtaining natural dyestuffs is often more complex, time-consuming, and demanding. Nevertheless, in recent times, concern recently, reasons such as the harm of synthetic dyestuffs to both human health and the environment have been a major factor in people turning back to products obtained from natural dye plants.

One of the key motivations for undertaking this study is the absence of prior research on natural dye plants in the Sındırgı region, with the plants used not being scientifically identified. This study distinguishes itself by aiming to promote the sustained use of select natural dye plants.

Material and Methods

Study area

Sındırgı is district located in the southeast of the Balıkesir province, situated in the Southern Marmara region and partially in the Aegean region (Figure 1). The district covers an area of 1433 km² and has

an elevation of approximately 250 meters above sea level. It is located 63 kilometers away from Balıkesir province center (Anonymous 2022). Sındırgı district is dominated by the Mediterranean climate. Summers are hot and dry, while winters are mild and rainy. Mediterranean climate features are reflected in the dominant vegetation elements of the maquis. The southern parts of Sındırgı have taken on a dry forest appearance due to degradation (Soykan 1993).

Sındırgı is surrounded by geographical features, with the Alaçam Mountains to the east, the Davullu and Kazan Mountains to the west, and the Kepez, Simav, and Seyhan Mountains to the south. The Ulus Mountain, with an altitude of 1769 meters, stands as the highest peak in the region and is situated to the north (Ünal 2018).

Methods

This article was reproduced from the master's thesis (Sinem Ünal). This study was conducted between 2021 and 2023 in the district center and five villages (Talcıkuyu, Kertil, Eşmedere, Karakaya and Küçükbüğü) of Sındırgı, covering different vegetation terms for nine times. Since natural dye plants in the region are primarily used for coloring Yağcıbedir carpet ropes, villages with a history of weaving were identified, and home visits

were arranged with individuals involved in weaving in these villages. Interviews were made with the local people. A total of 23 individuals (9 men, 14 women) interviewed in the area. After explaining the purpose of our study, questions were asked about the natural dye plants. In this study, the informants involved in the interviews are individuals engaged in carpet weaving and yarn dyeing. The dye plants collected by the help of the informants. Collected plant samples were pressed, dried, and kept in a deep-freeze for 5–7 days at $-20\text{ }^{\circ}\text{C}$ in accordance with standard herbarium techniques (Bridson ve Forman 2010). The voucher specimens are kept at the Botanical Research Laboratory of the Faculty of Arts and Sciences at Duzce University. The scientific identifications of the collected specimens were conducted by both authors using the Flora of Turkey and the East Aegean Islands (Davis 1965-1985, Davis et al. 1988, Güner et al. 2000).es) . Scientific plant names were checked by using The POWO 2024 (POWO 2024).

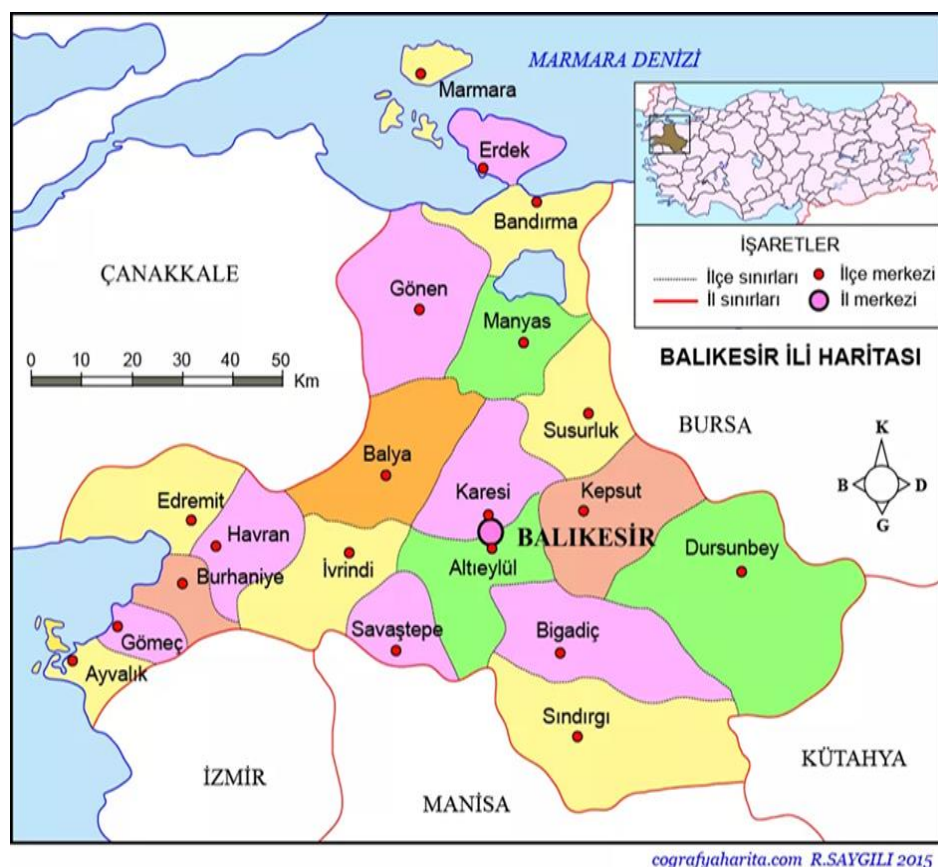


Figure 1. Map Sındırgı, Balıkesir and Turkey

Results

11 plant taxa from 11 families used in natural dyeing were discovered as a result of research conducted in Sındırgı district center and five villages. It was determined that six of the identified taxa were herbaceous, one was a shrub, and four were woody plant species. It has been found that the *Indigofera tinctoria* species, used to obtain the blue color, is not of Anatolian origin and is purchased from individuals involved in dyeing. Detailed information, including scientific names, the specific parts employed for dye extraction, areas of application, and the resulting colors, has been meticulously documented and is presented in Table 1.

It was further observed that a plant mixture was created using five of the plant species employed in dye production. Threads were subjected to a boiling process within this plant mixture, resulting in the attainment of some primary colors. The constituents of this mixture, their applicants, and the colors achieved have been cataloged in Table 2.

Table 1. Information recorded in the study area

Plants species	Family	Local names	Used part	Application	Color obtained
<i>Cistus laurifolius</i> L.	Cistaceae	Murt	Above ground part	Mordanting	Yellow Green
* <i>Indigofera sphaerocarpa</i> A. Gray	Fabaceae	İndigo	Above ground part	For coloring the wool yarns of woven carpets	Blue
<i>Isatis tinctoria</i> L.	Brassicaceae	Çivit otu	Root,stem,leaf and flower	Coloring of woven carpet yarns	Blue
<i>Juglans regia</i> L.	Juglandaceae	Ceviz	Green shell	For coloring carpet threads For hardening the nails of wrestlers	Black Brown
<i>Origanum vulgare</i> L.	Lamiaceae	Dağ kekiği Boylu kekik Güvelik otu	Above ground part	Mordanting	Yellow Green
<i>Populus alba</i> L.	Salicaceae	Kavak Ak kavak	Sprouts	Mordanting	Green Yellow
<i>Reseda lutea</i> L.	Resedaceae	Sarı kız otu	Above ground part	Mordanting	Yellow Yellow
<i>Rubia tinctorum</i> L.	Rubiaceae	Yapışkan otu Boyalık otu Dil kanatan otu	Shoot	Coloring of hand woven materials For coloring carpet threads	Red Camel hair Pomegranate flower Blue
<i>Rumex patientia</i> L.	Polygonaceae	Labada Alabada	Root	Mordanting	Blue
<i>Salvia tomentosa</i> Mill.	Lamiaceae	Adaçayı Boşyaprağı	Above ground part	Mordanting	Yellow Green
<i>Quercus pyrenaica</i> Willd.	Fagaceae	Saçlı meşe Meşe	Cupula	Coloring carpet ropes	Brown Black

*not natural, purchased from the market

Table 2. Herbal mixture used for the mordanting of certain colors

Mixture	Plant species	Application	Color
Mixture 1	<i>Cistus laurifolius</i> <i>Origanum vulgare</i> <i>Populus alba</i> <i>Reseda lutea</i> <i>Salvia tomentosa</i>	Handwoven carpet yarns are boiled in this mixture in order to get their main colors better and to make them brighter and more durable.	Yellow

Table 3. The yeast mixture used to get the blue color

Mixture	Mixture ingredients	Application	Color
Mixture 2	<i>Rumex patientia</i> root, <i>Quercus pyrenaica</i> wood ash, sourdough, water	Yeast mixture used for carpet yarns to take on the blue color better	Blue

Moreover, an exploration of the fermentation mixture utilized to produce the color blue has been detailed in Table 3.

To provide visual documentation of the products resulting from these natural dye plants, a series of photographs were captured, showcasing items such as Yağcıbedir carpets, prayer rugs, regular rugs, saddlebags, bags, local clothing, and mats, all of which have been adorned with the vibrant hues achieved through natural dyeing process (Figure 2).



Figure 2. Items colored with nature dye plants A:Yağcıbedir carpet, B,C: Bag, D: Prayer rugs, E:Saddlebag, F: Weist belt (Sinem Ünal)

Discussion and Conclusion

This study was focused on natural dye plants in the Sındırgı district of Balıkesir province and aimed to compare its findings with existing ethnobotanical studies, studies on natural dyeing plants, and studies on weaving in the broader Balıkesir province area.

In the past, carpet weaving was practiced in almost every village in the Sındırgı region. Nowadays, weaving is only done in the villages of Karakaya, Alaklı, Çakıllı, and Eğridere (Deniz 1999). In our fieldwork, besides these villages, it has been observed that carpet weaving is also carried out with very few representatives in the villages of Talçıkuyu, Kertil, Eşmedere, Karakaya and Küçükükü.

This thesis compares the usage areas of plants recorded in 6 different ethnobotanical studies conducted in the districts near Sındırgı and in the vicinity of Balıkesir province (Onar 2006, Poyraz Kayabaşı 2011, Nath 2016, Erdem 2018, Kaya 2021, and Tanaydın 2021). As a result of the comparisons made, it was determined that some taxa have similar usage areas, while others differ. It was revealed in this study that the usage of *Indigofera tinctoria*, *Isatis tinctoria*, and *Reseda lutea* species, recorded in this study, did not appear in other studies. When plants with recorded uses for different purposes were evaluated, it was observed that *Cistus laurifolius*, *Quercus pyrenaica* (Nath 2016), and *Rubia tinctorum* (Nath 2016, Batı Erdem 2018) species were also used for dyeing purposes in other studies, while other species were used for medicinal, food, or different purposes (Onar 2006, Poyraz Kayabaşı 2011, Nath 2016, Erdem 2018, Kaya 2021, and Tanaydın 2021).

When examined, it is observed that *Juglans regia*, *Isatis tinctoria*, *Indigofera tinctoria* (Karadağ 2007), *Rubia tinctorum* (Karadağ 2007, Önal 2020, Tüm Cebeci 2020), and *Isatis tinctoria* (Tüm Cebeci 2020) species are similarly used in works written on natural dyeing in Turkey.

The study stands out in its field as it explored a region that had not been previously studied in terms of natural dye plants used in Sındırgı Yağcıbedir carpets. Its objective is to promote the sustainable use of natural dye plants and broaden their utilization by the general public. The insights gained from this study are expected to guide individuals working in this region and in fields related to natural dyeing in the future.

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