

## ENDEMIC PLANTS OF IDA MOUNTAINS USED AS FOLK MEDICINE <sup>1</sup>

### KAZDAĞLARININ HALK İLACI OLARAK KULLANILAN ENDEMİK BİTKİLERİ

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#### ABSTRACT


This study was carried out in the villages of Kıracıba, Nusratlı, Arıklı, Yeşilyurt, Zeytinli, Tahtakuşlar, Mehmetalan, Küçükçetmi, Beyoba, Eskigüre, and Çamlıbel, neighboring the borders of the Ida Mountains in the Edremit district of Balıkesir province. Scientific studies identified the edible endemic plants growing in Mount Ida. Which of the endemic plants are used for medicinal purposes was determined with 445 questionnaire forms. The questionnaire and interviews aimed to identify the edible and medicinal uses of the endemic plants growing in Mount Ida. As a result of the research, endemic species; *Abies nordmanniana* subsp. *equi-trojani* jam, *Allium kurtzianum* pickle; *Silene vulgaris* food, *Achillea fraasii* subsp. *trojana*, *Achillea millefolium*, *Galium trojanum*, *Hypericum kazdaghensis*, *Sideritis trojana*, *Thymus pulvinatus*, *Dianthus barbatus*, *Saxifraga paniculata* and *Astragalus membranaceus* were determined to be consumed as tea. It has been determined that 83% of the endemic plants growing in the region are not recognized by the local people, while 17% are known. The most common endemic plants used by the respondents were fir cone jam (20%) and thyme tea (15%), while the use of other endemic species was below 5%.

#### ÖZET

Bu çalışmada; Balıkesir ili Edremit ilçesi Kazdağları sınırlarına komşu Kıracıba, Nusratlı, Arıklı, Yeşilyurt, Zeytinli, Tahtakuşlar, Mehmetalan, Küçükçetmi, Beyoba, Eskigüre ve Çamlıbel köylerinde gerçekleştirilmiştir. Kazdağlarında yetişen yenilebilir endemik bitkiler bilimsel çalışmalardan yararlanılarak tespit edilmiştir. Endemik bitkilerden hangilerinin tıbbi amaçlı kullanıldığı hazırlanan 445 anket formuyla belirlenmiştir. Anket ve görüşmeler sonucunda Kazdağlarında yetişen endemik bitkilerden hangilerinin yemeklik, hangilerinin tıbbi amaçlı kullanıldığı belirlenmeye çalışılmıştır. Araştırma sonucunda endemik türlerden; *Abies nordmanniana* subsp. *equi-trojani* reçel, *Allium kurtzianum* turşu; *Silene vulgaris* gıda, *Achillea fraasii* subsp. *trojana*, *Achillea millefolium*, *Galium trojanum*, *Hypericum kazdaghensis*, *Sideritis trojana*, *Thymus pulvinatus*, *Dianthus barbatus*, *Saxifraga paniculata* ve *Astragalus membranaceus*'un çay olarak tüketildiği belirlenmiştir. Bölgede yetişen endemik bitkilerin %83'ünün yöre halkı tarafından tanınmadığı, %17'sinin ise tanıdığı tespit edilmiştir. Katılımcıların en sık kullandığı endemik bitkiler göknar kozalağı reçeli (%20) ve kekik çayı (%15) olurken, diğer endemik türlerin kullanımını %5'in altında kalmıştır.

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## 1. Introduction

Eating has been a crucial aspect of human existence since the beginning of time. The term "gastronomy" was defined for the first time in 1825 (Navarro et al., 2012). Gastronomy is a field that contributes greatly to the preparation of edible substances by appealing to the eye and palate. All the cultural, political, social, and natural assets of the region feed tourism. Therefore, there is a direct connection between the concept of gastronomy and the concept of tourism. The World Tourism Organization (UNWTO) has defined gastronomy tourism as the whole of recreational experiential activities related to food and beverage that are carried out with the aim of having fun in gastronomic regions (Şahin & Ünver, 2015).

Local cuisine, which is an element of gastronomy tourism, has the potential to increase the value of multiple destinations in Turkey. Particularly, Turkey's regional differences and destination-specific local cuisine cultures can offer a significant advantage in various areas of gastronomy tourism. Today, it is important to introduce the richness of local cuisines to tourists who tend to do different searches in order to diversify the touristic product and extend the life span of the related product (Şengül & Türkay, 2016).

Today, since most of the wild plants evaluated in the nutrition culture have herbaceous characteristics, every dish prepared with them in terms of gastronomy is called "herb dishes," and it is also described as a concept specified for dishes created by utilizing different parts of plants such as herbs (Çetinkaya & Yıldız, 2018). Many dishes, such as salads, soups, and vegetable dishes, especially leaf wraps, are made with these edible wild plants, and those with an aromatic taste are also used as tea and spices (Çetinkaya & Yıldız, 2018). Edible wild plants, which have been the subject of scientific studies in terms of health and ethnobotany, have recently started to form a field of study in gastronomy (Karadağ, 2015).

Looking at the plant diversity in the world, it is mentioned that there are more than 750000 plant species, and 20000 of them are utilized for various purposes. Turkey is one of the richest countries in the world in terms of plant species because it is located in an area where three floristic regions meet and has a very different geographical and climatic diversity (Sevgi & Akkemik, 2014). Plant diversity in Turkey is known to be 12460 in total, of which 4080 species are endemic (Özhatay et al., 2011). Scientific studies mention that Turkey uses 1000 plant species for the production of spices and medicines (Baytop, 1984).

People in many rural areas around the world are known to use medicinal plants in the treatment of diseases. According to a study by the World Health Organization (WHO), 95% of Africans still rely on medicinal plant-based treatment methods (Ullah et al., 2013). Turkey naturally harbors or cultivates many medicinal and aromatic plant species. Today, the growing significance of medicinal and aromatic plants enhances the value of Turkey, home to these species (Acbuca & Bostan Budak, 2018). Many regions in our country use various mixtures prepared from wild species for their digestive, chest-softening, carminative, bile- and diuretic, laxative, emollient, and sedative properties (Baydar, 2009).

The Ida Mountains, located in the northern part of the Edremit Gulf in the Edremit District of Balıkesir province in Turkey, have a unique and rich vegetation cover. Along with the climatic characteristics, geological formations, unique stones, and soil structure of this region, it has a geography surrounded by endemic and rare plants (Akalın, 2006). Floristic studies identified 32 endemic plant species in Mount Ida. Ida Mountains National Park distributes 29 of these endemic species (DKMP, 2017). When evaluated by plant diversity and culinary culture, Edremit Gulf, which is located in the Aegean Region, represents one of the important regions of our country in terms of the abundance of dishes made with herbs (İnci Aladı et al., 2019). Some of these are: Akkız, Bambul, Hibiscus, Radish Herb, Mustard Herb, Tanglehead, Nerve Herb, Poppy, Labada, Dandelion, Mühliye, Sorrel, Ivy, Nettle, Silcan, Wild Chard, Purslane, Watercress, and Kazayağı are among the plants consumed by the local

people (Göker, 2011). Regional cuisines heavily incorporate these wild species, consuming them raw, boiled, or roasted (Karaca et al., 2015).

This study aimed to examine the dishes made with endemic plants growing in Mount Ida and determine the medicinal-aromatic uses of these endemic plants.

## 2. Method

This study was conducted in the Edremit district of Balıkesir and the Ida Mountains National Park, Biga Peninsula. During the study, edible, endemic plants growing in the Ida Mountains were identified based on scientific studies (İnaltong, 2008; Dirmenci et al., 2007; Şahin & Kılıç, 2009). This study's main material comes from questionnaires and interviews with households in Kıracaoğlu, Nusratlı, Arıklı, Yeşilyurt, Zeytinli, Tahtakuşlar, Mehmetalan, Küçükçetmi, Beyoba, Eskigüre, and Çamlıbel villages, which are near the Ida Mountains in the Edremit district of Balıkesir province. The questionnaires and interviews were done between July and October 2022 to find out which native plants are used for food and health benefits. In addition, interviews were held with herbalists in Edremit district (Deva Baharat, Lokman Baharat, Körfez Baharat, Şifahane, Beyaz Aktar, Derman Baharat, and Merve Baharat) who sell local products. Additionally, we used materials such as research, compilations, theses, etc. in Turkish and foreign languages, along with data gathered from international research on endemic plants, edible flowers, and local dishes in Balıkesir.

The study's population consists of 445 participant households living in villages bordering Mount Ida. The questionnaire, comprising 12 questions, asked the participants about medicinal or healing plants, their intended uses, the medicinal purposes for which they grow and/or cultivate them, the parts of the plant they use in the kitchen, how they prepare them, when they use them, where they purchase or obtain them if necessary, where they learn about plants, which plants they use for cooking, how they use them in local and non-local dishes, the collection and preparation techniques of plants, and whether they have any side effects. Considering the recognition status of the local people, the catalog created from the pictures of endemic plants was shown to the people surveyed, and it was tried to determine whether they recognized them and their local names.

The responses of the participants were compared using the t-test at a 95% confidence interval in SPSS version 22.0. Since the study was a qualitative study, frequency analysis was performed.

## 3. Results

### 3.1. Numerical and Proportional Evaluations According to Survey Results

The demographic characteristics of a total of 445 people for the endemic determinations used in Mount Ida are given in Table 1.

**Table 1.** Demographic Characteristics of the Resource Persons Interviewed in the Study Area

Demographic Characteristics		Number of resource persons	Percentage (%)
<b>Gender</b>	Woman	370	83.1
	Man	75	16.9
<b>Age</b>	40 -55	120	26.9
	56 – 71	270	60.6
	71 >	55	12.5
<b>Marital Status</b>	Married	410	92.1
	Single	35	7.9
<b>Education Status</b>	Illiterate	34	7.6
	Primary School	297	66.7
	Middle School	89	20
	High School	25	5.7

<b>Profession</b>	Housewife	142	31.9
	Retired	78	17.5
	Officer	45	10.1
	Farmer	120	26.9
	Tradesmen	60	13.6

The majority of the people living in the region are women over the age of 50. The demographic characteristics of the 445 participants who participated in the questionnaire surveys were as follows: 83.1% were female, 60.6% were in the 56-71 age range, 92.1% were married, 66.7% were primary school graduates, and 31.9% were housewives.

Table 2 shows whether the respondents know the plants that grow naturally in the region and are used for culinary and medicinal purposes. Most of the local people know the endemic plants. 91.9% of women and 81.3% of men surveyed knew if local plants are edible, medicinal, or healing. 55% of these individuals reported using these plants for food, 28% for their smell and taste, and 17% for therapeutic purposes.

**Table 2.** Knowledge of the Source Persons Interviewed in the Study Area about the Medicinal or Medicinal Plants Used for Cooking that Grow Naturally in the Region

Knowledge of Plants	Gender	Number of resource	Percentage (%)
<b>Knows</b>	Woman	340	91.9
	Man	61	81.3
<b>Doesn't know</b>	Woman	30	8.1
	Man	14	18.7

The Ida Mount uses 12 endemic plant species in its meals. Evaluation of the definition and use of endemic plants growing naturally in the region revealed that 83% of respondents did not recognize them, while only 17% did. The most commonly used endemic plants by the respondents are fir cones (20%) and thyme (15%), while the use of other endemic species is below 5%. Of the respondents who use endemic plants, 85% collect them themselves, and 15% buy them from markets and herbalists. Among those who use plants in gastronomy, 74% learned about them from their elders, 12% from the internet, 4% from books, and 10% from herbalists.

In talks with herbalists in the Edremit district (Deva Baharat, Lokman Baharat, Korfez Baharat, Şifahane, Beyaz Aktar, Derman Baharat, and Merve Baharat), it was found that they sold native plants like *Sideritis trojana*, *Abies nordmanniana* subsp. *equitrojani*, and *Sideritis athoa*. The herbalists stated that they consume these species medicinally as tea or add them to tea to treat gastric and flu infections. In the neighborhood markets, it was observed that jams made from the cones of *Abies nordmanniana* subsp. *equi trojani*, which is endemic to Mount Ida, were also sold.

### 3.2. Endemic Plants Used for Edible or Medicinal Purposes in the Region

Various findings have been obtained regarding endemic plants used for edible or medicinal purposes in the region. Table 3 shows that of the 12 endemic plants in Mount Ida, people consume one species as jam, one as pickles, one as food, and nine as tea.

According to participant responses, *Abies nordmanniana* subsp. *equi trojani* is the most commonly used plant in the region. *Abies nordmanniana* subsp. *equi trojani* is the dominant tree species in the region and is abundant in the Ida Mountains. People collected and used the green, fresh cones of this tree species. Interviews with the locals revealed that pine cone jam is the most commonly made dish in

*Abies nordmanniana* subsp. *equi trojani*. Local markets and sales points also offered the jams for commercial purposes.

The region widely uses *Allium kurtzianum* both in cooking and medicinally. Many dishes, especially pickles, use it as a sauce. Local people frequently used it in pickle making. The region consumes *Thymus pulvinatus* as tea and also uses it as a spice in meals. It is the most well-known plant species in the region. People used *Silene vulgaris*, an endemic species, as food. It is used in the preparation of Gıvışkan herb roast.

The region grows nine endemic plant species, which people consume as tea. People collect these in season, dry them, and then consume them as tea. *Achillea fraasii* subsp. *trojana* is called Ayvadana Tea, *Galium trojanum* is called Yoğurt Otu Tea, *Hypericum kazdaghensis* is called Kantaron Tea, *Sideritis trojana* is called Sarıkız Tea, *Dianthus barbatus* is called Hüsnüyusuf Tea, *Saxifraga paniculata* is called Taş Kiran Otu Tea, *Astragalus membranaceus* is called Geven Tea, and *Achillea millefolium* is called Civanperçemi Tea.

**Table 3.** Consumption Methods of Endemic Plants

Endemic Plants	Tea	Jam	Boiling	Roasting	Pickles
1 <i>Abies nordmanniana</i> subsp. <i>equi-trojani</i>		X			
2 <i>Achillea fraasii</i> subsp. <i>trojana</i>	X				
3 <i>Allium kurtzianum</i>					X
4 <i>Galium trojanum</i>	X				
5 <i>Hypericum kazdaghensis</i>	X				
6 <i>Sideritis trojana ehrend</i>	X				
7 <i>Thymus pulvinatus</i>	X				
8 <i>Silene vulgaris</i>				X	
9 <i>Dianthus barbatus</i>	X				
10 <i>Saxifraga paniculata</i>	X				
11 <i>Astragalus membranaceus</i>	X				
12 <i>Achillea millefolium</i>	X				

Table 4 lists the endemic plants used for medicinal purposes and their intended uses. People consume endemic plants as tea for the treatment of colds, bronchitis, liver disorders, anemia, urinary problems, insomnia, sedation, earache, jaundice, headache, antipyretic, stomach upset, ulcers, abscess maturation, wound healing, and cancer. *Abies nordmanniana* subsp. *equi-trojani* jam is the most consumed and commercially sold in the region. Add a teaspoon of dried herbs to a glass of hot water, then wait 10–15 minutes to make the tea. Herbal teas are optionally consumed by adding honey.

**Table 4.** Intended Uses of Endemic Plants Used for Medicinal Purposes

Plant name	Method of use	Medical intended use
<i>Abies nordmanniana</i> subsp. <i>equi-trojani</i>	Cone Jam	Asthma
<i>Achillea fraasii</i> subsp. <i>trojana</i>	Tea	Colds, bronchitis, appetite stimulant, diuretic, prostate,

		earache, jaundice, headache, abscess ripening and wound healing
<i>Allium kurtzianum</i>	Pickles	Intestinal and stomach problems, gas pains, kidney disease, constipation, heart palpitations, high blood pressure, dizziness, bronchitis and skin diseases
<i>Galium trojanum</i>	Tea	Liver disorders, anemia, urinary problems, insomnia, sedation
<i>Hypericum kazdaghensis</i>	Tea	Stomach, gastritis and ulcer problems, rheumatic pain
<i>Sideritis trojana ehrend</i>	Tea	Treatment of colds, pain relief, antipyretic, stomach upset, ulcers
<i>Thymus pulvinatus</i>	Tea	Flu, stomach pain
<i>Saxifraga paniculata</i>	Tea	Liver disease, diarrhea relief, gall bladder disease
<i>Astragalus membranaceus</i>	Tea	Cancer disease

#### 4. Conclusion and Discussion

Human beings have used plants as a source of food and healing since the beginning of time. Urbanization and migration from rural areas have led to a decrease in the use of natural plants over time, with some regions even forgetting their existence. Chemical drugs have replaced the use of natural healing plants in treating diseases. The study conducted a survey with local people in 11 villages near the Ida Mountains in the Edremit district of Balıkesir province, revealing the use of 12 endemic plant species for medicinal and aromatic purposes. The elderly population primarily uses endemic plants for jam, tea, and, to a lesser extent, food on the table. Among the 12 endemic plant species found in Mount Ida, one is utilized for jam production, another for pickling, one serves as a food source, and nine are employed in the preparation of tea. People living in the region consume most of the endemic plants as tea. People used endemic plants as tea for medicinal purposes to treat colds. *Abies nordmanniana* subsp. *equi-trojani*, asthma; *Achillea fraasii* subsp. *trojana*, colds, bronchitis, appetite stimulant, diuretic, prostate, earache, jaundice, headache, abscess ripening and wound healing; *Allium kurtzianum*, intestinal and stomach problems, gas pains, kidney disease, constipation, heart palpitations, high blood pressure, dizziness, bronchitis and skin diseases; *Galium trojanum*, liver disorders, anemia, urinary problems, insomnia, sedation; *Hypericum kazdaghensis*, stomach, gastritis, and ulcer problems, rheumatic pain; *Sideritis trojana* ehrend, treatment of colds, pain relief, antipyretic, stomach upset, ulcers; *Thymus pulvinatus*, flu, stomach pain; *Saxifraga paniculata*, liver disease, diarrhea relief, gall bladder disease, and *Astragalus membranaceus*, cancer disease, are used as folk medicines in the treatment of cancer.

Selvi and Dağdelen (2013) assert, in line with the study's data, that local markets heavily sell the jam of *Abies nordmanniana* subsp. *equi trojani*, an endemic species in the area. Similar reports indicate that local markets sell and consume *Sideritis trojana* as herbal tea.

Excessive consumption of endemic plants on the Ida Mount is also harmful. No literature has been found on the damages that may be seen if the endemic species *Sideritis trojana*, *Silene vulgaris*, *Dianthus barbatus*, *Saxifraga paniculata*, and *Astragalus membranaceus* are used. It is stated that stomach problems can be seen if *Abies nordmanniana* subsp. *equi trojani* cone jam is made from immature cones (Nefis Yemek Tarifleri, 2023). Some skin allergies may result from excessive

consumption of *Achillea fraasii* subsp. *trojana*. It is stated that disruptions in heart rhythm and diarrhea can be seen (Aktar Diyarı, 2023).

People may develop allergic reactions (contact dermatitis, conjunctivitis, rhinitis, and bronchospasm) as a result of excessive use of pickled wild garlic. Problems such as weakness and headaches may also occur as a result of excessive consumption. Due to their blood-thinning properties, it is stated that patients using blood-thinning drugs should never use them without consulting their doctors (Hossein & Hosseinzadeh, 2015). As a result of excessive consumption of *Galium trojanum*, it may interact with some drugs, reducing or increasing their effect (Memorial, 2023). Excessive consumption of *Hypericum kazdaghensis* may cause headaches, dry mouth, sweating, palpitations, constipation, and nausea. It is stated that it would be inconvenient for Alzheimer's, asthma, and hypertension patients to consume this tea (Nefis Yemek Tarifleri, 2023). Thyme tea can cause various side effects when consumed excessively. Consumption during pregnancy may increase the risk of miscarriage. It can reduce the effects of medications used by people with high blood pressure. The use of *Astragalus membranaceus* in some medicines can reduce the drug's effect. Excessive consumption can lead to negative side effects like headaches, insomnia, and restlessness. People with high blood pressure and those who use blood thinners should not use this plant together (Sağlıklıyım, 2023).

Investigating the pharmacological activity of these plants, which the region also consumes for healing purposes, is crucial. It is important to create consumption prescriptions for these herbs and to pass them on to future generations. Local cuisines must incorporate endemic plants, despite the prohibition on their collection and trade. Studies are also necessary to incorporate dishes from endemic and natural species grown in this region into national and global cuisines. In this context, priority should be given to scientific studies in addition to promotional and informational activities, and new articles should be produced.

**Ethics Declaration:** Permission was obtained for the survey method used in this study from the Istanbul Topkapı University Ethics Committee at its meeting dated 21.11.2022 with the decision document number E-31675095-100-2200015018. In the event that a contrary situation is detected, JOSGAT Journal has no responsibility, and all responsibility belongs to the authors of the study.

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