



Traditional medicinal uses of *Origanum* (Lamiaceae) in Türkiye

Ahmet Ozan Cengiz, Yavuz Bülent Köse

Correspondence

Ahmet Ozan Cengiz^{1,2*}, Yavuz Bülent Köse³

¹Department of Pharmaceutical Botany, Faculty of Pharmacy, Suleyman Demirel University, Isparta, Türkiye.

²Department of Pharmaceutical Botany, Graduate School, Anadolu University, Eskisehir, Türkiye.

³Department of Pharmaceutical Botany, Faculty of Pharmacy, Anadolu University, Eskisehir, Türkiye.

*Corresponding Author: ahmetcengiz@sdu.edu.tr

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Review

Abstract

Background: The genus *Origanum* has numerous endemic species distributed in Türkiye, which is one of the main diversity centers. Documenting information on traditional uses is important for the conservation of cultural heritage and biodiversity, especially in genera with high endemism rates.

Methods: In this study, the traditional medicinal uses of *Origanum* species distributed in Türkiye were investigated through a comprehensive literature review using national and international databases. Ethnobotanical records were compiled from field-based studies, distribution and traditional use data on the species were mapped by provinces, and further ethnobotanical studies are recommended in provinces with high species diversity but limited ethnobotanical records.

Results: A total of 40 ethnobotanical studies reporting medicinal uses of *Origanum* species were evaluated, and 13 taxa were identified as being used in traditional medicine. It was determined that the aerial parts of *Origanum* species were most commonly used, prepared as infusions for colds, abdominal pain, and flu. Mersin, Muğla and Manisa were identified as the provinces with the highest number of reported traditional uses. Adana and Hatay were suggested as potential provinces for new studies.

Conclusions: The results demonstrate the importance of documenting traditional knowledge on *Origanum* species in Türkiye and highlight regions where further ethnobotanical studies are needed. This study provides a useful framework for future ethnobotanical and pharmacological research as well as for biodiversity conservation efforts.

Keywords: *Origanum*; Ethnobotany; Medicinal plants; Traditional medicine; Türkiye; Endemics; Biodiversity

Background

Origanum L. (Lamiaceae) is a genus with numerous endemic species distributed and diversified primarily in the Eastern Mediterranean region, including Türkiye. Ietswaart's speciation hypothesis suggests that ancestral species may have spread from the Irano-Turanian floristic region to Türkiye and neighboring regions during the Pliocene (Ietswaart 1980). As of 2026, 66 *Origanum* species are recognized worldwide, including 22 hybrid species. In Türkiye, 33 *Origanum* species are recognized,

11 of which are hybrid species. 26 of these species (approximately 40%) are endemic (WFO 2026). These figures support the idea that Türkiye is an important center of diversity for the *Origanum* genus as previously emphasized by Letswaart (1980). Throughout history, humans have used plants to meet their most basic needs, such as nutrition, shelter, clothing, heating, and healing. Folk medicine, which has developed around wild plants primarily used for healing and food, encompasses the knowledge of traditional medicinal uses of plants, and the scientific documentation of this knowledge represents significant potential, especially for the discovery of new bioactive compounds (Kendir & Güvenç 2010; Güner *et al.* 2022). In genera with high endemism rates, such as the *Origanum* genus, documenting traditional use information is of great importance for the sustainable management of biodiversity. In particular, the failure to document traditional usage information for narrowly distributed endemic species can lead to the irreversible loss of both cultural heritage and biodiversity (Reyes-García *et al.* 2013).

Plants of the Lamiaceae family are frequently used in traditional folk medicine for the treatment of various diseases, primarily respiratory system diseases, digestive system diseases, urogenital system diseases, and cardiovascular system diseases (Selvi *et al.* 2022). Although various ethnobotanical reviews have been conducted on a species basis regarding widely used species of the *Origanum* genus, such as *O. vulgare* L., *O. majorana* L., and *O. onites* L., to our knowledge, there is no systematic study compiling the traditional medicinal uses of all species naturally distributed in Türkiye (Tepe *et al.* 2016; Bouyahya *et al.* 2021; Al-Snafi 2024).

This study aims to compile the traditional medicinal uses of species belonging to the genus *Origanum*, which includes numerous endemic species in Türkiye and is the subject of ongoing scientific research regarding their traditional uses, phytochemical content, and biological activities; to systematically classify the categories of uses; and to reveal the differences between the distribution areas of the species and the regions where their uses have been identified, thereby guiding new potential ethnobotanical research. This study provides a holistic perspective on the traditional medicinal use of the genus and serves as a guide for future ethnobotanical and pharmacological research.

Materials and Methods

World Flora Online (WFO 2026) was used as a source for the current list of *Origanum* species distributed in Türkiye. Of the 66 *Origanum* species (44 species and 22 hybrid species) listed there, 33 (22 species and 11 hybrid species) grow naturally in Türkiye.

Field-based research articles in English or Turkish were searched between January and February 2026 in international and national databases (Web of Science, Scopus, PubMed, and TRDizin) using the species name and the keywords Turkey (or Türkiye), ethnobotanical, ethnopharmacological, traditional use, and folk medicine (for example: “*Origanum vulgare*” AND “Turkey” AND (“ethnobotanical” OR “ethnopharmacological” OR “traditional use” OR “folk medicine”)). The identified review articles were used to access the original research articles. Studies were included if they reported traditional medicinal uses of *Origanum* species naturally occurring in Türkiye and provided ethnobotanical data obtained through field-based research. Duplicate records, studies lacking original ethnobotanical data, studies not reporting medicinal uses, and publications conducted outside Türkiye were excluded.

Traditional medicinal uses were divided into 12 categories based on the main disease categories in the International Classification of Diseases 11th Revision (ICD-11). Similar clinical expressions were grouped under the same categories.

To determine the distribution areas of naturally occurring *Origanum* species in Türkiye on a provincial basis, Flora of Turkey and East Aegean Islands Volume 7 was used (Davis, 1982). The Datawrapper software was used to create distribution and ethnobotanical use maps.

Eligibility Criteria

Inclusion criteria

1. Reported traditional medicinal uses of *Origanum* species naturally occurring in Türkiye.
2. Presented original ethnobotanical data obtained through field-based studies.
3. Included sufficient information on plant identity and medicinal use.

Exclusion criteria

1. Lacked original ethnobotanical data.
2. Did not report medicinal uses.

3. Were duplicate publications.
4. Were review articles.

Data Extraction and Synthesis

From each eligible study, information on the species name, vernacular name, used plant parts, preparation methods, intended medicinal uses, study location, and reference were extracted. The extracted data were compiled into a database and categorized according to ICD-11 disease categories.

The frequency of reported uses was calculated, and the distribution of ethnobotanical studies and species occurrences was visualized using maps generated with Datawrapper.

Results

Ethnobotanical research articles reporting the traditional medicinal use of *Origanum* species were evaluated (n=40). Records were found for the following taxa: *O. acutidens* (Hand.-Mazz.) Ietsw., *O. bilgeri* P.H.Davis, *O. hypericifolium* O.Schwarz & P.H.Davis, *O. majorana* L., *O. minutiflorum* O.Schwarz & P.H.Davis, *O. onites* L., *O. rotundifolium* Boiss., *O. saccatum* P.H.Davis, *O. sipyleum* L., *O. syriacum* L., *O. syriacum* subsp. *bevanii* (Holmes) Greuter & Burdet, *O. vulgare* L. and *O. vulgare* subsp. *hirtum* (Link) A.Terracc.

The highest number of usage records were reported for *O. vulgare* (n=13), *O. majorana* (n=11), and *O. onites* (n=11). When subspecies taxa are included, *O. vulgare* (n=21) stands out as the species with the most usage records (Figure 1). The most commonly used plant parts were the aerial parts (52%), leaves (20%), flowering branches (10%) and flowers (10%) (Figure 2). The preferred preparation methods were infusion (58%) and decoction (22%). The species were mainly used for cold (15%), stomachache (10%), and flu (9%) (Figure 3).

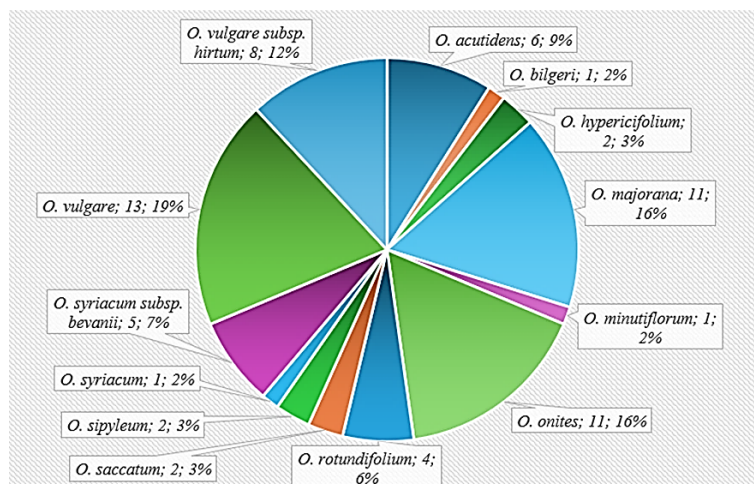


Figure 1. Usage records of *Origanum* taxa.

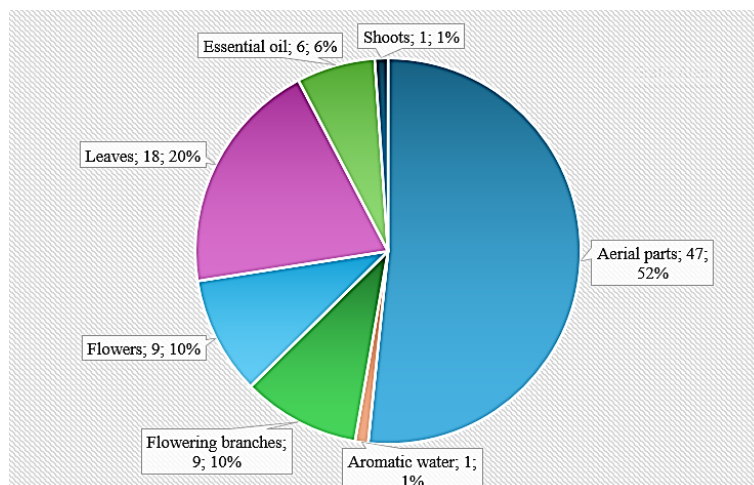


Figure 2. Most commonly used parts of the *Origanum* taxa.

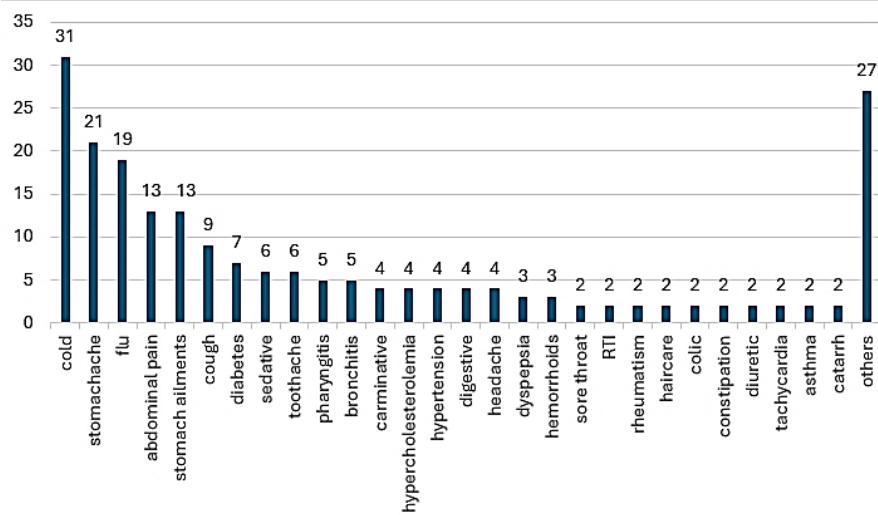


Figure 3. Traditional medicinal use records of reported *Origanum* taxa. *Others: Angina, anti-inflammatory, eczema, antiemetic, menstrual pain, breast cancer, dizziness, hepatitis, flatulence, herniated disc, UTI (urinary tract infections), diaphoretic, nail care, wound healing, pyrosis, baldness, diarrhea, immunogenic, expectorant, itching, anthelmintic, kidney stones, backache, laryngitis, diet, leukemia, hypotension (all uses with one usage record)

Table 1 presents information on the local names, used parts, preparation methods, and intended uses of *Origanum* species, as identified in ethnobotanical research.

Ethnobotanical studies reporting the traditional medicinal use of *Origanum* species were concentrated in the provinces of Mersin (n=13), Muğla (n=7), and Manisa (n=6) (Figure 4). In Flora of Turkey (Davis, 1982), the provinces with the highest species distribution for *Origanum* species were determined as Antalya (n=7), Mersin (n=6), Hatay (n=5), Adana (n=5), Denizli (n=5), and Isparta (n=5) (Figure 5).

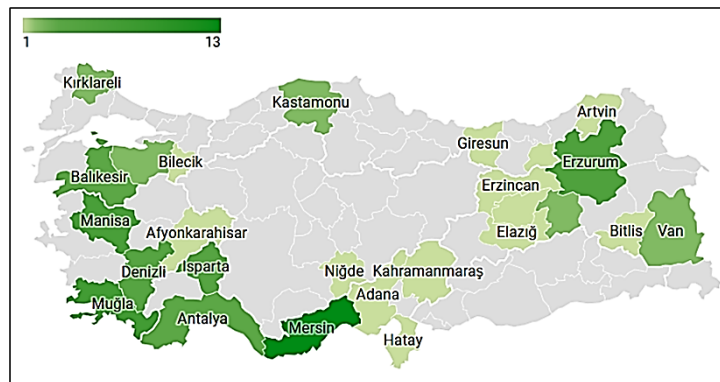


Figure 4. Distribution by province of studies reporting traditional medicinal uses of *Origanum* species.

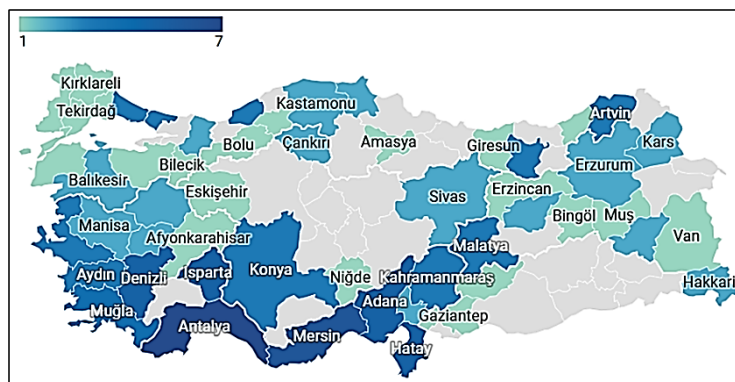


Figure 5. Province-based distribution of *Origanum* species determined based on Flora of Turkey (Davis, 1982).

Table 1. Vernacular names, used parts, preparation methods and intended uses of *Origanum* species reported in ethnobotanical studies.

Species	Vernacular name	Part used	Preparation	Ethnobotanical uses	Study area	Reference
<i>O. acutidens</i>	Anık, anıx, onıx	Lea	Inf	Cold, flu, sedative	Bingöl	(Polat 2019)
	Anıh	Aer	Inf	Cough, sedative, stomach ailments	Erzurum	(Karakaya <i>et al.</i> 2019)
		Flo	Dec	Cough, flu, stomach ailments		
	Anıh	Aer	Inf	Cold, bronchitis	Erzurum	(Ergül Bozkurt 2025)
	Anux, zembul	Aer	Inf	RTI, cold, carminative, abdominal pain	Tunceli	(Dogan 2024)
	Koç anığı	Lea, Flo	Inf	Abdominal pain, hemorrhoids	Bayburt	(Kadioğlu <i>et al.</i> 2021)
	Annuk, zahter	Aer	Inf	Catarrh	Erzincan	(Gözcü <i>et al.</i> 2024)
<i>O. bilgeri</i>	Kekik	Aer	Inf	Cold	Antalya	(Senkardes & Tuzlaci 2014)
<i>O. hypericifolium</i>	Acımık, kekik, kozalı kekik	Aer	Inf	Abdominal pain, cold	Denizli	(Bulut <i>et al.</i> 2017)
	Mercan köşkü, çökelek kekiği	Lea, Flo	Dec	Breast cancer	Muğla	(Sağiroğlu <i>et al.</i> 2013)
<i>O. majorana</i>	Mercanköşk, nane kekiği	Lea	Inf, Cat	Cold, flu, asthma	Manisa	(Sargın, Selvi & López 2015)
	Kekik, püren kekiği	Fib	Inf	Cold, flu, stomachache	Mersin	(Sargın & Büyükcengiz 2019)
	Daş kekik, çorba kekiği	Aer	Inf	Hypotension	Mersin	(Sargın, Selvi & Büyükcengiz 2015)
	Çorba kekiği, yağ kekiği	Fib	Inf	Cold, flu, pharyngitis, stomachache	Mersin	(Sargın 2015)
	Mercanköşk, nane kekiği	Lea	Inf	RTI, flu, asthma	Manisa	(Sargın <i>et al.</i> 2013)
	Mercanköşk	Aer	Inf	Cough, sedative	Denizli	(Bulut <i>et al.</i> 2017)
	Kekik, yağ kekiği	Aer	Inf	Sore throat, cold	Antalya	(Senkardes & Tuzlaci 2014)
	Mercanköşk	Aer	Inf	Abdominal pain	Mersin	(Emre <i>et al.</i> 2021)
	Mercan köşkü	Lea, Sho	Dec	Stomachache	Muğla	(Sağiroğlu <i>et al.</i> 2013)
	Guyotu	Aer	Inf	Cold, catarrh	Mersin	(Yeşilada <i>et al.</i> 1993)
	Eşekkekiği, bilyalı, sakarkekik	Aer	Inf	Cold, stomachache	Isparta	(Yeşilada <i>et al.</i> 1995)
<i>O. minutiflorum</i>	Eşekkekiği	Aer	Dec	Stomachache	Isparta	(Yeşilada <i>et al.</i> 1993)

			Cat	Toothache, stomachache, rheumatism		
<i>O. onites</i>	Kekik, eşek kekiği, deli kekik, beyaz kekik, kara kekik	Aer	Inf	Diabetes, hypercholesterolemia, dizziness, hypertension, stomach ailments, leukemia	Muğla	(Gürdal & Kültür 2013)
		Lea	Fre	Headache		
		Flo	Inf	Cold		
		Aro	Dis	Digestive, stomachache, diabetes, hypercholesterolemia, stomach ailments, diarrhea, flatulence		
	Taş kekiği, dağ kekiği, akbaş kekik	Aer, Flb, Lea	Inf, Dec	Abdominal pain, toothache, headache, diabetes, itching	Balıkesir	(Polat & Satil 2012)
		Oil	Dis			
	Kırkbaş kekik, kaya kekiği, koca kekik, tokalı kekik, bilya kekik, karakekik, topbaş kekik, eşek kekiği, arı kekiği	Aer, Oil	Inf, Dis	Cold, flu, pharyngitis, laryngitis, bronchitis, angina, tachycardia, hypertension, headache, constipation, carminative, dyspepsia, diabetes, haircare, nail care	Manisa	(Sargın, Selvi & López 2015)
	Dağ kekiği, kekik	Aer	Inf	Abdominal pain, cough, stomach ailments	Denizli	(Bulut <i>et al.</i> 2017)
	İncir kekiği, kekik, yemiş kekiği	Aer	Inf	Stomach ailments, digestive	Manisa	(Bulut & Tuzlaci 2013)
	Tulu kekik, fakir katığı, kara kekik, dağ kekiği	Flo, Lea	Inf	Bronchitis	Manisa	(Ugurlu & Secmen 2008)
Kekik	Aer	Inf	Abdominal pain, stomach ailments	Muğla	(Kıncal <i>et al.</i> 2021)	
	Oil	Dis	Abdominal pain			
İzmir kekiği	Flo, Lea	Inf	Cold, stomachache, digestive	Muğla	(Akbaş <i>et al.</i> 2024)	
Kekik	Aer	Dec	Stomachache, bronchitis, anti-inflammatory,	Muğla	(Sağiroğlu <i>et al.</i> 2013)	

				immunogenic, antiemetic, carminative, expectorant, cough, hypertension		
			Oin	Eczema		
		Oil	Dis	Toothache		
	Taşkekik	Aer	Dec	Cold, stomachache	Antalya	(Yeşilada <i>et al.</i> 1993)
	Kekik	Aer	Cat	Abdominal pain	Muğla	(Honda <i>et al.</i> 1996)
		Oil	Dis	Rheumatism, backache		
<i>O. rotundifolium</i>	Anıh	Aer	Inf	Cough, sedative, stomach ailments	Erzurum	(Karakaya <i>et al.</i> 2019)
	Anıh	Aer	Inf	Cold, bronchitis	Erzurum	(Ergül Bozkurt 2025)
	Dağ kekiği, anık	Aer	Inf	Cough, sedative, stomachache	Erzurum	(Karakaya <i>et al.</i> 2020)
	Aylık otu	Aer	Dec	Colic	Artvin	(Erşen Bak & Çıfci 2020)
<i>O. saccatum</i>	Cıngıllı ot	Aer, Flb	Inf	Cold, flu	Mersin	(Sargın & Büyükcengiz 2019)
	Cıngıllı kekik	Aer, Flb	Inf	Cold, flu, stomachache	Mersin	(Sargın 2015)
		Oil	Dis	Herniated disc		
<i>O. sipyleum</i>	Sümbüllü çay, çay otu	Lea, Flo	Inf	Cold	Afyonkarahisar	(Kargioğlu <i>et al.</i> 2008)
	Ak kekik	Aer	Dec	Stomachache	Bursa	(Albayrak & Daşkın 2018)
<i>O. syriacum</i>	Dağ nanesi	Aer	Inf	Stomachache	Adana	(Güneş <i>et al.</i> 2017)
<i>O. syriacum</i> subsp. <i>bevanii</i>	Eşek kekiği, güve kekiği, boz kekik, sahilin kekiği	Aer, Flb	Inf	Cold, flu, pharyngitis, stomachache, pyrosis	Mersin	(Sargın 2015)
	Eşek kekiği	Aer	Inf	Cold, flu, pharyngitis, stomachache	Mersin	(Sargın, Selvi, and Büyükcengiz 2015)
	Sahilin kekiği, sihilin kekiği, eşek kekiği	Aer, Flb	Inf	Cold, flu, pharyngitis, stomachache	Mersin	(Sargın & Büyükcengiz 2019)
	Zahter halil, kekik, halil ibrahim kekiği	Flo	Inf	Cold, flu, cough, colic, menstrual pain	Hatay	(Güzel <i>et al.</i> 2015)
	Kekik	Aer	Dec	Abdominal pain	Mersin	(Emre <i>et al.</i> 2021)
<i>O. vulgare</i>	Deli kekik, kara kekik, güve kekiği	Lea, Flb	Inf, Fre	Cold, flu, toothache, headache	Balıkesir	(Polat & Satil 2012)
	Kekikotu, keklivotu, keklik	Aer	Dec	Cold, flu	Kırklareli	(Kültür 2007)
	Dağ kekiği, yayla kekiği	Lea	Dec	Cold, flu, hypercholesterolemia	Giresun	(Polat <i>et al.</i> 2015)

	Anık, onıx, anıx	Lea	Inf	Cold, flu, sedative	Bingöl	(Polat <i>et al.</i> 2013)
	Kekik	Lea	Dec	Cold, flu, UTI	Elazığ	(Cakilcioglu <i>et al.</i> 2011)
	Kaya kekiği, taş kekik, kokulu kekik, sarı kekik, tapan kekiği, yayla kekiği	Aer, Flb	Inf, Gar, Lot, Hai	Carminative, constipation, dyspepsia, diet, anthelmintic, tachycardia, toothache, baldness, haircare	Manisa	(Sargın, Selvi & López 2015)
	Kekik	Lea	Dec	Hypertension, hypercholesterolemia	Elâzığ	(Hayta <i>et al.</i> 2014)
	Arigani, kekik, merdus	Aer	Dec Inf	Abdominal pain Stomachache, cough	Mersin	(Emre <i>et al.</i> 2021)
	Kekikotu, canter	Aer	Pow	Wound healing	Van	(Tabata <i>et al.</i> 1994)
	Kekik	Aer	Dec	Stomach ailments, abdominal pain	Mersin, Isparta	(Yeşilada <i>et al.</i> 1993)
	Karakekik, yaylakekiği, Gevriyek çayı	Aer	Inf	Cold, stomachache Stomach ailments	Isparta Kahramanmaraş	(Yeşilada <i>et al.</i> 1995)
	Kekik	Aer	Inf	Diuretic, stomach ailments	Kastamonu	(Sezik <i>et al.</i> 1992)
<i>O. vulgare</i> subsp. <i>hirtum</i>	Kekik	Aer	Inf	Stomach ailments	Denizli	(Bulut <i>et al.</i> 2017)
	Yer kekiği, kekikotu, keklükotu, keklük	Aer	Dec	Cold, flu, abdominal pain, kidney stones, stomach ailments	Kırklareli	(Kültür 2007)
	Yavşan	Aer	Inf	Diabetes	Niğde	(Özdemir & Alpınar 2015)
	Mercan köşk, kekik	Lea, Flo	Inf	Diabetes, hemorrhoids	Bilecik	(Koyuncu <i>et al.</i> 2010)
	Kekik otu, keklük otu, ayaklı keklük	Lea	Inf	Hemorrhoids, stomachache, digestive, hepatitis, toothache, diabetes	Balıkesir	(Tuzlacı & Eryaşar-Aymaz 2001)
	Güvey otu, kekik	Aer	Inf	Cold, sore throat, diaphoretic, diuretic	Bursa	(Albayrak & Daşkın 2018)
	Güvey otu	Aer	Dec	Dyspepsia	Kastamonu	(Sezik <i>et al.</i> 1992)
	Cantır, cantirik	Aer	Dec	Stomachache	Van, Bitlis	(Tabata <i>et al.</i> 1994)

*Used Parts: Aer, Aerial parts; Aro, Aromatic water; Flb, Flowering branches; Flo, Flowers; Lea, Leaves; Oil, Essential oil; Sho, Shoots.

*Preparation: Cat, Cataplasm; Dec, Decoction; Dis, Distillation; Fre, Fresh; Gar, Gargle; Hai, Hair bath; Inf, Infusion; Lot, Lotion; Oin, Ointment; Pow, Powder.

Discussion

In this study, 40 different research articles identifying the traditional use of *Origanum* species in Türkiye were evaluated, and a total of 13 different *Origanum* taxa were determined to be used for medicinal purposes among the public. Considering that the dozens of different uses identified may be different expressions of similar disease conditions, the purposes of use were grouped under twelve ICD-11 categories, and the usage rates were calculated as percentages (Table 2).

Table 2 shows that *Origanum* species are most frequently used in traditional medicine in Türkiye for disorders related to the respiratory and digestive systems. Flu is classified as an infectious disease but is also related to the respiratory system. Some unclassified but significantly recorded uses, such as stomachache and abdominal pain, may be related to the digestive system, but it is quite difficult to say anything definitively without a diagnosis. These findings largely coincide with the general trend of medicinal plant use among the public (Baytop 2021). However, the traditional usage records for *O. onites* and *O. hypericifolium*, both reported from Muğla mention leukemia and breast cancer. The reported usage of leukemia and breast cancer may reflect the incorporation of modern disease terminology into folk medicine. However, whether that usage truly reflects traditional knowledge remains uncertain. In addition to the possibility that researchers may have interpreted or categorized local disease terms using biomedical terminology, the increasing adoption of biomedical concepts by local communities and the influence of external sources of medical knowledge should also be considered.

Table 2. ICD-11 categories and percentage distributions for traditional medicinal uses of *Origanum* taxa.

ICD-11 category	Related traditional medicinal uses	Percentage (%)
01- Certain infectious or parasitic diseases (n=20)	Flu (influenza), anthelmintic	9.6
02- Neoplasms (n=2)	Breast cancer, leukemia	0.9
04- Diseases of immune system (n=1)	Immunogenic	0.5
05- Endocrine, nutritional or metabolic diseases (n=12)	Diabetes, hypercholesterolemia, diet	5.8
06- Mental, behavioral or neurodevelopmental disorders (n=6)	Sedative	2.9
11- Diseases of the circulatory system (n=8)	Hypertension, diuretic, angina, hypotension	3.8
12- Diseases of the respiratory system (n=49)	Cold, pharyngitis, bronchitis, RTI (respiratory tract infections), asthma, catarrh, expectorant, laryngitis	23.5
13- Diseases of the digestive system (n=31)	Toothache, stomach ailments, carminative, digestive, hemorrhoids, hepatitis	15.0
14- Diseases of the skin (n=6)	Haircare, eczema, nail care, wound healing, baldness	2.9
15- Diseases of the musculoskeletal system or connective tissue (n=1)	Herniated disc	0.5
16- Diseases of the genitourinary system (n=3)	Menstrual pain, UTI (urinary tract infections), kidney stones	1.4
21- Symptoms, signs or clinical findings, not elsewhere classified (n=69)	Cough, stomachache, abdominal pain, headache, dyspepsia, sore throat, rheumatism, constipation, tachycardia, anti-inflammatory, antiemetic, dizziness, flatulence, diaphoretic, pyrosis, diarrhea, itching, backache	33.2
Total	n=208	100.0

When the uses were evaluated individually, the top 5 most frequently reported uses were: cold (n=31), stomachache (n=21), flu (n=19), abdominal pain (n=13), and stomach ailments (n=13). We observed that in the original Turkish articles, the expressions "karın ağrısı" (abdominal pain) and "mide ağrısı" (stomachache) were sometimes used by informants in similar contexts. In the English translation, these were recorded as "stomachache," "abdominal pain," and "stomach ailments." Therefore, these usages may partially overlap.

Many previous studies have shown that the essential oils of *Origanum* species are rich in volatile monoterpenes such as carvacrol and thymol. The antimicrobial and antiviral activities for many *Origanum* species have often been associated with their high carvacrol and thymol content (Tepe *et al.* 2016; Bina and Rahimi 2017; Nurzyńska-Wierdak and Walasek-Janusz

2025). However, the biological activity of *Origanum* species cannot be explained solely by their essential oils. Studies on solvent extracts have demonstrated that non-volatile compounds may also contribute substantially to the observed biological effects. For example, ethanol, methanol, hexane, and chloroform extracts of *O. onites* have been reported to exhibit significant antioxidant activity (Tepe *et al.* 2016). Likewise, the antioxidant activity of *O. majorana* has been attributed to compounds such as hydroxycinnamic acid, ursolic acid, carnosic acid, carnosol, rosmarinic acid, and caffeic acid present in its extracts (Bina and Rahimi 2017). In contrast, the antimicrobial activity of *O. vulgare* essential oil has been linked to its ability to disrupt microbial biofilms (Nurzyńska-Wierdak and Walasek-Janusz 2025). The traditional use of *Origanum* species for common cold and influenza may therefore be associated with multiple biological properties. In addition to their antimicrobial effects, antiviral activity against respiratory pathogens and anti-inflammatory effects that may help relieve symptoms could contribute to their widespread use in folk medicine. Nevertheless, further *in vitro* and *in vivo* studies are needed to clarify the mechanisms involved and to clinically confirm these traditional uses.

Abdominal pain is a common symptom that can stem from a wide variety of causes. It can be sudden, or have rapid, or slow onset; pain can be transmitted by visceral nerves or somatic nerves (Sherman 1990). In terms of its use in traditional folk medicine, the use of herbal teas to treat acute, severe, and sharp pain is less likely than its use for treating widespread, non-localized pain caused by tension or spasms. This suggests that the abdominal pain symptoms reported for traditional use are more likely related to visceral pain caused by spasms. Studies supporting this view exist in literature (Çam *et al.* 2020). For example, in a study measuring the *in vitro* antispasmodic activity of *O. compactum* aqueous extract on smooth muscles, it was found that the extract exhibited a significant muscle relaxant effect against many different types of stimuli. Thymol and carvacrol were identified as active components, and it was suggested that the antispasmodic activity was due to a reduction in calcium bioavailability (Van Den Broucke and Lemli 1980). The reported traditional use of *Origanum* species for abdominal pain/stomachache/stomach ailments appears consistent with their previously identified antispasmodic activity. However, further pharmacological studies are needed to confirm this relationship in an evidence-based manner.

The fact that only 11 out of 22 *Origanum* species (excluded hybrids) found in Türkiye have been recorded for traditional use may stem from the difficulty in documenting most of these species due to their local and narrow distribution (Ietswaart 1980). Furthermore, the need for detailed examination of the characters used in identifying *Origanum* species, and the difficulty of conducting in-depth assessments regarding species identification in a comprehensive ethnobotanical study, may also have contributed to some problems in accurately reflecting species diversity. While Hatay and Adana provinces are among those with high concentrations of *Origanum* species according to the distribution areas listed in the Flora of Turkey, very limited studies identifying the uses of *Origanum* species in these provinces have been found in the relevant databases. More ethnobotanical research in these provinces could reveal significant findings regarding the traditional uses of *Origanum* species. If sufficient studies are not conducted in these provinces, which also host endemic *Origanum* species, there is a risk of irreversible loss of both cultural heritage and biodiversity.

Another important consideration regarding endemic species is the potential impact of harvesting associated with their traditional use. According to the Red Book of Turkish Plants published in 2000, among the species identified for traditional use, *O. acutidens* and *O. sipyleum* are classified as LR (lc), *O. minutiflorum* as LR (nt), and *O. hypericifolium* and *O. saccatum* as LR (cd) (Ekim *et al.* 2000). However, these species are not yet included in the "IUCN Red List of Threatened Species" database. Therefore, updated conservation assessments would be valuable for better understanding their current conservation status. Considering their traditional use and endemic nature, sustainable harvesting practices may be important for the long-term conservation of these taxa.

Conclusion

This study shows that *Origanum* species distributed in Türkiye are most frequently used for cold, stomachache, flu, abdominal pain, and stomach ailments. The study's findings indicate that despite a rich biodiversity in the region, documented knowledge of traditional plant uses is insufficient. These findings highlight the need for further ethnobotanical investigations, particularly in provinces where *Origanum* diversity is high, but traditional use records are limited. Also, these findings could contribute to identifying priority research areas for pharmacological activity studies and could contribute to the discovery of novel bioactive compounds or extracts. Furthermore, this study demonstrates that recording data on the traditional uses of plants is important for the preservation of cultural heritage and, especially for endemic species, for the sustainability of biodiversity.

Declarations

List of abbreviations: ICD-11 - International Classification of Diseases, 11th Revision; RTI - Respiratory Tract Infections; UTI - Urinary Tract Infections

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