



Ethnobotanical Review of Iranian Medicinal Plants Traditionally Used for Cough

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ABSTRACT

Cough is one of the most common symptoms of respiratory disorders and may occur in acute or chronic forms as a result of infectious, inflammatory, or environmental irritants. Although medicinal plants are widely used in Iranian traditional medicine for cough management, a comprehensive synthesis of the ethnobotanical evidence concerning these plants has not yet been presented. This study aimed to identify, classify, and analyze medicinal plants traditionally used for cough in Iranian ethnobotanical sources. This study was conducted as an ethnobotanical review. Data were collected and analyzed from reliable scientific sources, including research articles and ethnobotanical reports. The literature search covered the period from 1990 to 2025 and included the Web of Science, PubMed, Scopus, ISC, and SID. Medicinal plants associated with cough management were extracted and classified according to scientific name, local name, plant part used, and method of preparation or administration. A total of 227 medicinal plant species belonging to 47 families were identified as having traditional applications for cough. Among the plant parts used, leaves were the most frequently reported, with 27 records, followed by flowers with 24 records and aerial parts with 20 records. In terms of plant family diversity, Lamiaceae, with 38 species, Asteraceae, with 37 species, and Brassicaceae, with 19 species, ranked highest. All 227 records reviewed were documented as having traditional applications for the treatment of cough and were classified under antitussive use. Among the methods of preparation and administration, decoction, with 98 records, and infusion, with 34 records, were the most commonly reported approaches. Geographically, northeastern Khuzestan, Fasa, and Zanjan accounted for the highest numbers of reports of medicinal plants traditionally used to treat cough. The findings provide a useful basis for identifying medicinal plants with potential for the development of antitussive preparations. However, their efficacy and safety require confirmation through pharmacological investigations and well-designed clinical trials.

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Introduction

Cough is one of the most common symptoms of respiratory disorders. Despite substantial advances in cough management, it remains a frequent and troublesome reason for seeking medical care (Dua et al., 2019). Epidemiological studies have estimated that 4–10% of the global population experiences cough (Abu-Zaid et al., 2021).

Cough is an important protective mechanism of the upper airways (Chung, 2002; Dicipinigaitis & Dobkin, 1997). At the same time, it is among the most common manifestations of pulmonary disease and one of the symptoms most frequently encountered by physicians. Patients may seek medical attention particularly when cough becomes chronic, generally defined as lasting more than eight weeks (Choudry & Fuller, 1992; French et al., 2002). Reported prevalence estimates for chronic cough have ranged from 3% to 40% in different studies (Cullinan, 1992, Fuller and Jackson, 1990, Morice et al., 2004).

Although cough serves as a defense mechanism that helps clear the tracheobronchial tract, it may become highly distressing and, in some circumstances, provide little practical benefit, making suppression desirable (Jasiem et al., 2016). Conventional antitussive therapies are generally classified as expectorants, cough suppressants, and antihistamines. Studies have reported adverse effects associated with these treatments, including nausea, vomiting, drowsiness, and dizziness (Smith et al., 2008). In addition, many cough-suppressant preparations contain codeine derivatives, which are not recommended for children younger than 12 years (Gardiner et al., 2016). Consequently, increasing attention has been directed toward simpler, more accessible approaches with fewer adverse effects (Hussain et al., 2021).

Medicinal plants have been an integral part of human health and well-being for centuries. They have served as important sources of food and medicine and continue to attract interest because of their natural characteristics. Medicinal plants, whether used as crude materials or processed products, are widely employed in the pharmaceutical, food, and cosmetic industries (Yang et al., 2024). Their use in traditional medicine dates back thousands of years, with

extensive applications documented in ancient civilizations such as Egypt, China, and India. Traditional knowledge and experience concerning medicinal plants have been transmitted across generations. Medicinal plants may also contribute to sustainable development, and Asian countries possess considerable potential for medicinal-plant production and related economic opportunities (Astutik et al., 2019).

Medicinal plants can provide natural alternatives to synthetic drugs and may contribute to environmental conservation and the sustainable use of natural resources. Their cultivation may also support sustainable livelihoods in local communities (Popoola, 2024).

Iran has a long and rich tradition of traditional medicine. Medicinal plants remain widely used throughout the country, and people from diverse cultural backgrounds incorporate them into their therapeutic practices (Kiasi et al., 2023; Hajipour et al., 2024). Research addressing cultivation, production, essential oils, extracts, active constituents, phytochemical composition, biological activity, clinical trials, herb–drug interactions, and dosage may contribute both to public health and to economic development (Delfani et al., 2017). This body of knowledge also has scientific and cultural value and may support the discovery and development of natural products with antimicrobial, anti-inflammatory, and immunomodulatory properties (Bahmani et al., 2015; Hajimonfarednejad et al., 2023).

Although numerous ethnobotanical studies have been conducted in different regions of Iran, information on medicinal plants traditionally used for cough remains scattered across individual publications, and a comprehensive national synthesis has not been presented. Collecting and analyzing these data may help identify the medicinal plants most frequently associated with cough, the dominant plant families, the parts used, and the traditional methods of preparation, thereby providing a basis for future pharmacological and clinical research.

Accordingly, the present study was undertaken to examine the flora of native Iranian medicinal plants traditionally used for cough and to analyze the associated ethnobotanical information, including plant families, parts used, and traditional methods of preparation and administration.

Methods

Study design

This study was designed and conducted as a systematic review and was reported in accordance with the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The review aimed to identify, assess, and synthesize scientific and ethnobotanical evidence concerning native Iranian medicinal plants with antitussive applications or relevance to respiratory disorders.

Eligibility Criteria

Eligibility criteria were defined a priori according to the objectives of the study. Studies were eligible if they investigated medicinal plants native to Iran and reported applications or effects related to cough, expectoration, or relief of respiratory symptoms. Eligible evidence included ethnobotanical studies, pharmacological investigations (in vitro and in vivo), clinical trials, and relevant scientific reviews, provided that extractable and citable information was available. Academic theses and specialized books were also considered when they contained reliable scientific references and usable information. Publications had to be available in Persian or English in full text and published between January 1990 and December 2025.

Studies without a direct relationship to cough or respiratory diseases, studies for which full text was unavailable, and reports lacking sufficient methodological information were excluded. Sources that only provided general descriptions of medicinal plants without reference to antitussive effects, studies concerning non-Iranian plants without relevance to the medicinal flora of Iran, and non-scientific reports or studies without a clearly described methodology were also excluded.

Data Sources and Search Strategy

A comprehensive literature search was conducted in PubMed, Scopus, Web of Science, Google Scholar, SID, and Magiran. The final search was performed in December 2025. To improve comprehensiveness, the reference lists of relevant publications were also screened manually.

The search strategy combined Persian and English keywords using Boolean operators (AND and OR).

Core concepts included medicinal plants, ethnobotany, Iran, cough, antitussive activity, and respiratory disorders. An example search string was:

("Medicinal Plants" OR "Herbal Medicine") AND ("Cough" OR "Antitussive" OR "Respiratory symptoms") AND ("Iran") AND ("Ethnobotany")

Study Selection

All identified records were initially imported into reference-management software, and duplicates were removed. Screening was then performed in two stages. First, titles and abstracts were independently assessed by two researchers, and irrelevant studies were excluded. Second, the full texts of the remaining studies were evaluated against the eligibility criteria. Disagreements were resolved through discussion and consensus. The selection process followed the PRISMA 2020 framework.

A total of 56 studies were identified during the initial search. Following screening, 13 irrelevant studies were excluded. Subsequently, 43 articles were assessed in full text, of which 5 were excluded because of insufficient data or lack of complete access. Ultimately, 38 studies met the eligibility criteria and were included in the final analysis.

Data Extraction

Data were extracted using a standardized, predesigned form. Extracted information included scientific and common/local plant names, plant family, plant part used (e.g., leaf, root, or flower), reported therapeutic effect (e.g., antitussive, expectorant, or anti-inflammatory), method of use (traditional or experimental), study type, study location, and scientific source. The data were organized into structured tables to facilitate systematic comparison and analysis.

Data Analysis

Given the heterogeneity of the available studies, the data were analyzed descriptively and qualitatively. The analysis included assessment of the frequency of plant species and families, identification of the most frequently used plant parts, comparison of reported antitussive applications among species, and categorization of mechanisms of action described in pharmacological studies. The findings were

presented in descriptive tables and figures to provide an overall picture of native Iranian medicinal plants associated with antitussive use.

Results

A total of 227 medicinal plant species belonging to 47 plant families were identified. Lamiaceae and Asteraceae were the most frequently represented families, with 38 and 37 species, respectively. Analysis of the plant parts used showed that leaves were the most frequently reported. These findings demonstrate substantial diversity in native Iranian

medicinal plants and indicate the importance of aerial plant parts in traditional approaches to cough management.

Figure 1 illustrates the distribution of plant families represented in ethnobotanical reports concerning cough. Lamiaceae and Asteraceae contained the largest numbers of species.

Figure 4 shows the number of plant species reported for each family across the different provinces represented in the reviewed studies.

Table 1. Native Iranian medicinal plants with reported ethnobotanical applications for cough

Plant part used	Family	Scientific name	Method of use	Study location	Source
Fruit	Anacardiaceae	<i>Pistacia atlantica</i>	Decoction	Abadeh, Fars Province	Razmjooei et al., 2024
Fruit	Rosaceae	<i>Amygdalus lycioides</i>	Decoction	Abadeh, Fars Province	Razmjooei et al., 2024
Kernel	Rosaceae	<i>Amygdalus oreintalis</i>	Decoction	Abadeh, Fars Province	Razmjooei et al., 2024
Seed, Shoot	Asteraceae	<i>Artemisia aucheri</i>	Decoction	Abadeh, Fars Province	Razmjooei et al., 2024
Leaf; Flower, Root	Scrophulariaceae	<i>Verbascum cheiranthifolium</i>	Decoction	Abadeh, Fars Province	Razmjooei et al., 2024
Flowering Shoots	Asteraceae	<i>Achillea millefolium</i> L.	Infusion, Decoction, Extract, Poultice, Oil	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Whole plant	Asteraceae	<i>Achillea santolinoides</i> subsp. <i>wilhelmsii</i> (K.Koch) Greute	Infusion, Decoction, Raw	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Seed, Flower, Leaf	Brassicaceae	<i>Descurainia sophia</i> (L.) Webb ex Prant	Poultice, Infusion, Decoction, Oral/Edible	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Whole plant	Boraginaceae	<i>Anchusa azurea</i> Mil	Cooked, Infusion, Decoction, Extract	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Seed, Leaf	Lamiaceae	<i>Lallemantia iberica</i> (M.Bieb.) Fisch. & C.A.Mey	Infusion, Decoction, Oil, Raw, Cooked	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Leaf, Flowering Shoots, Aerial part (Stem)	Lamiaceae	<i>Mentha longifolia</i> (L.)	Raw, Infusion, Decoction	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Aerial part (Stem), Flowering Shoots, Leaf, Seed	Lamiaceae	<i>Ziziphora tenuior</i> L.	Infusion, Decoction	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Root; Stem (Rhizome)	Fabaceae	<i>Glycyrrhiza glabra</i> L.	Infusion, Decoction	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Seed, Leaf	Malvaceae	<i>Malva parviflora</i> L.	Extract, Poultice, Infusion, Decoction	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020

Plant part used	Family	Scientific name	Method of use	Study location	Source
Root, Leaf, Seed	Plantaginaceae	<i>Plantago major L</i>	Infusion, Decoction, Raw	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Seed, Bark Seed	Plantaginaceae	<i>Plantago ovata Forssk.</i>	Infusion, Decoction, Raw	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Seed, Fruit	Rosaceae	<i>Cotoneaster nummularioides Pojark.</i>	Infusion, Decoction	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Leaf, Flowering Shoots	Salicaceae	<i>Salix excelsa S.G.Gmel.</i>	Infusion, Decoction, Extract, ointment	Abhar –Zanjan Province	Vafadar and Toghranegar, 2020
Fruit	Asteraceae	<i>Echinops cephalotes DC.</i>	Decoction, Dried	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Seed	Brassicaceae	<i>Alyssum alyssoides (L) L</i>	Decoction	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Leaf, Stem	Elaeagnaceae	<i>Equisetum arvense L.</i>	Decoction, Dried	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Leaf, Stem, Flower	Lamiaceae	<i>Marrubium vulgar L.</i>	Decoction, Dried	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Seed	Papaveraceae	<i>Papaver dubium L.</i>	Dried	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Fruit, Leaf	Rosaceae	<i>Cydonia oblonga Mill.</i>	Decoction, Dried	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Leaf, Stem	Pteridaceae	<i>Adiantum capillus-veneris L.</i>	Decoction	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Fruit, bark	Simaroubaceae	<i>Ailanthus altissima (Mill.) Swingle</i>	Decoction	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Root	Amaryllidaceae	<i>Allium scabriscapum Boiss.</i>	Decoction	Ardestan, Isfahan Province	Haerinasab and Abbasi, 2019
Leaf	Lamiaceae	<i>Mentha pulegium</i>	Decoction	Urmia, West Azerbaijan	Yousefi et al., 2023
Seed	Brassicaceae	<i>Alyssum minute Schlttdi. ex DC</i>	Decoction	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Flower	Asteraceae	<i>Echinops ceratophorus Boiss.</i>	Decoction, Powder	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Leaf	Lamiaceae	<i>Ziziphora clinopodioides Lam</i>	Decoction, Spice	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Leaf, Flower, Aerial part	Lamiaceae	<i>Salvia officinalis L</i>	Decoction	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Aerial part	Malvaceae	<i>Malva sylvestris L.</i>	Decoction	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Leaf, Flower	Malvaceae	<i>Althaea officinalis L</i>	Decoction	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Leaf, Flower	Malvaceae	<i>Alcea rosea L.</i>	Decoction	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Leaf	Portulacaceae	<i>Portula caolerace L.</i>	Fresh consumption	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Flower	Rosaceae	<i>Rosa damascena Herrm</i>	Flower, Decoction	Almalicheh, Fars Province	Kiasi and Forouzeh, 2019
Seed	Brassicaceae	<i>Alysum comeptstre</i>	Decoction	Iranshahr, Sistan	Barahouei, 2024
Flower	Boraginaceae	<i>Anchusa strigose</i>	Infusion	Ahar, East Azerbaijan Province	Ebadi and Eftekharian, 2019
Seed	Rosaceae	<i>Cydonia oblonga</i>	Decoction	Ahar, East Azerbaijan Province	Ebadi and Eftekharian, 2019
Flower	Rosaceae	<i>Rosa canina</i>	Decoction	Ahar, East Azerbaijan Province	Ebadi and Eftekharian, 2019
Flower	Salicaceae	<i>Salix aegyptiaca</i>	Infusion	Ahar, East Azerbaijan Province	Ebadi and Eftekharian, 2019
Flower	LeGuminosae	<i>Cercis Silliquastrum</i>	Decoction	Qashqai tribal area, Fars Province	Fooladi et al., 2024

Plant part used	Family	Scientific name	Method of use	Study location	Source
Seed	Brassicaceae	<i>Alyssum minutum</i>	Decoction	Qashqai tribal area, Fars Province	Fooladi et al., 2024
Aerial part	Asteraceae	<i>Xanthium strumarium L.</i>	Decoction	Bazrejan, Markazi Province	Mohammadi et al., 2020
Seed	Brassicaceae	<i>Alyssum stapfii Vierh.</i>	Soaking in water	Bazrejan, Markazi Province	Mohammadi et al., 2020
Aerial part	Pteridaceae	<i>Adiantum capillus-veneris L.</i>	Infusion	Bazrejan, Markazi Province	Mohammadi et al., 2020
Aerial part		<i>Echinops ritro L.</i>	Distillate, Decoction	Behbahan-Khuzistan	Razmjooei et al., 2009
Aerial part	Fabaceae	<i>Alhagi mannifera Deaf</i>	Distillate, Decoction	Behbahan-Khuzistan	Razmjooei et al., 2009
Root	Fabaceae	<i>Astragalus adscendens Boiss. & Hausskn</i>	solution in water	Behbahan-Khuzistan	Razmjooei et al., 2009
Aerial part	Lamiaceae	<i>Thymus kotschyanus Boiss. & Hohen</i>	Infusion, Decoction, Poultice	Behbahan-Khuzistan	Razmjooei et al., 2009
Aerial part	Lamiaceae	<i>Zataria multiflora Boiss.</i>	Decoction, herbal tea/Infusion	Behbahan-Khuzistan	Razmjooei et al., 2009
Aerial part	Lamiaceae	<i>Salvia macrosiphon Boiss</i>	Infusion, Decoction	Behbahan-Khuzistan	Razmjooei et al., 2009
Seed	Plantaginaceae	<i>Plantago psyllium L.</i>	Infusion, Raw	Behbahan-Khuzistan	Razmjooei et al., 2009
Aerial part	Poaceae	<i>Cynodon dactylon (L.) Pers</i>	Decoction	Behbahan-Khuzistan	Razmjooei et al., 2009
Aerial part	Solanaceae	<i>Solanum nigrum L.</i>	Decoction	Behbahan-Khuzistan	Razmjooei et al., 2009
Aerial part	Ulmaceae	<i>Celtis australis L.</i>	Decoction, Powder, Poultice	Behbahan-Khuzistan	Razmjooei et al., 2009
Leaf	Asteraceae	<i>Artemisia haussknechtii Boiss</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Leaf	Asteraceae	<i>Centaurea virgate Lam. subsp. squarrosa(willd) Gugler</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Asteraceae	<i>Echinops elymaiticus Bornm.</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Asteraceae	<i>Echinops kotschy Boiss</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Asteraceae	<i>Echinops mosulensis Rech.f</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Asteraceae	<i>Echinops ritrodes Bunge</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Boraginaceae	<i>Onosma microcarpum Steven ex DC.</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part		<i>Alhagi persarum Biss.& Buhse</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Fabacea	<i>Lathyrus sativus L.</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Fabacea	<i>Lathyrus aphaca L.</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Fabacea	<i>Trifolium purpureum Loisel.</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Aerial part	Lamiaceae	<i>Lallemantia iberica (Stev.) Fisch.</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Flower	Malvaceae	<i>Alcea lineariloba I.</i>	Decoction	Beiranshahr-Lorestan	Delfan et al., 2020
Flower	Liliaceae	<i>Fritillaria imperialis L.</i>	Infusion	Beiranshahr-Lorestan	Delfan et al., 2020
Flower	Papaveraceae	<i>Glaucium corniculatum (L) Rudolph.</i>	Infusion	Beiranshahr-Lorestan	Delfan et al., 2020
Leaf	Plantaginaceae	<i>Plantago lanceolate L.</i>	Infusion	Beiranshahr-Lorestan	Delfan et al., 2020
Shoot, bark	Tamaricaceae	<i>Tamarix serotina</i>	Decoction	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017

Plant part used	Family	Scientific name	Method of use	Study location	Source
Aerial part, Seed	Fabaceae	<i>Alhagi comelerum</i>	Poultice, Decoction	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017
Leaf	Lamiaceae	<i>Thymus transcaspicus</i>	Infusion, Decoction	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017
Leaf, Flower	Scrophulariaceae	<i>Verbascum songaricum</i>	Decoction	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017
Seed, Leaf	Malvaceae	<i>Malva neglecta</i>	Decoction	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017
Seed, Leaf	Lamiaceae	<i>Lallemanti a royleana Benth</i>	Dried	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017
Flower	Asteraceae	<i>Anthemis nobilis L</i>	Decoction, Infusion	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017
Aerial part, Seed	Brassicaceae	<i>Erysimum schnostylus m</i>	Infusion, Decoction	Chehel Kaman – Razavi Khorasan	Mirzaei et al., 2017
Root	Brassicaceae	<i>Raphanus Sativus L.</i>	Raw	Darab, Fars Province	Moein et al., 2015
Plant branch	Chenopodiaceae	<i>Mentha Spicata L.</i>	Infusion	Darab, Fars Province	Moein et al., 2015
Seed, Flower	Asteraceae	<i>Helianthus annuus L.</i>	Decoction	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Flower	Asteraceae	<i>Matricaria recutita L.</i>	Infusion	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Fruit; Leaf	Boraginaceae	<i>Cordia myxa L.</i>	Oral, Edible Fruit Raw, Leaf, Infusion	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Seed	Lamiaceae	<i>Origanum basilicum L.</i>	Decoction	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Flower, Leaf	Lamiaceae	<i>Salvia sp.</i>	Infusion	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Leaf	Lamiaceae	<i>Thymus cf.lancifolius Celak</i>	Infusion	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Flower, Leaf, Root	Malvaceae	<i>Malva nicaeensis All</i>	Raw, Cooked	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Flower, Leaf, Root	Malvaceae	<i>Malva rotundifolia L.</i>	Raw, Cooked	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Leaf	Myrtaceae	<i>Eucalyptus globulus Labill.</i>	Inhalation, Steam	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Leaf	Fabaceae	<i>Medicago sativa L.</i>	Distillate	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Seed, Leaf	Plantaginaceae	<i>Plantago ovata Forssk</i>	Infusion	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Flower	Rutaceae	<i>Citrus aurantium L.</i>	Infusion	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Aerial part	Zygophyllaceae	<i>Tribulus terrestris L.</i>	Infusion	Dashtestan-Bushehr	Dolatkhahi and Ghorbani Nohooji, 2013
Fruit	Rhamnaceae	<i>Rhamnus pallasii Fisch. & C. A. Mey</i>	Oral, Edible	Dehloran and Abdanan — Ilam	Ghasemi et al., 2013
Leaf	Chenopodiaceae	<i>Atriplex leucoclada (Boiss.) Aellen</i>	Oral, Edible	Dehloran and Abdanan — Ilam	Ghasemi et al., 2013

Plant part used	Family	Scientific name	Method of use	Study location	Source
Fruit	Canabinaceae	<i>Cannabis sativa</i> L.	Oral, Edible	Dehloran and Abdanan — Ilam	Ghasemi et al., 2013
Bulb	Asteraceae	<i>Echinops viscidulus</i> Mozaff.	Oral, Edible	Dehloran and Abdanan — Ilam	Ghasemi et al., 2013
Fruit	Moraceae	<i>Ficus carica</i> L.	Oral, Edible	Dehloran and Abdanan — Ilam	Ghasemi et al., 2013
Flower, Leaf	Lamiaceae	<i>Thymbra spicata</i> L.	Oral, Edible	Dehloran and Abdanan — Ilam	Ghasemi et al., 2013
Fruit	Fabaceae	<i>Vicia angustifolia</i> L.	Oral, Edible	Dehloran and Abdanan — Ilam	Ghasemi et al., 2013
Aerial part	Lamiaceae	<i>Nepeta persica</i> Boiss.	Oil	Dehloran and Abdanan — Ilam	Vakili Shahrabaki, 2016
Root, Leaf, Flower	Boraginaceae	<i>Anchusa italica</i> Retz.var. <i>italica</i> .	Decoction, Infusion	Zarivar, Kurdistan Province	Tabad and Jalilian, 2015
Leaf, Flower	Malvaceae	<i>Malva neglecta</i> Wallr	Infusion	Zarivar, Kurdistan Province	Tabad and Jalilian, 2015
Fruit	Rosaceae	<i>Cydonia oblong</i> Mail.	Infusion	Zarivar, Kurdistan Province	Tabad and Jalilian, 2015
Whole plant	Amaryllidaceae	<i>Allium cepa</i> L.	Raw, Fresh, Cooked, Extract	Zanjan Province	Toghranegar and Vafadar, 2018
Flower, Seed	Asteraceae	<i>Helianthus annuus</i> L.	Raw, Fresh, Oil	Zanjan Province	Toghranegar and Vafadar, 2018
Aerial part	Asteraceae	<i>Lactuca serriola</i> L.	Raw, Fresh, Cooked, Extract	Zanjan Province	Toghranegar and Vafadar, 2018
Seed	Brassicaceae	<i>Alyssum simplex</i> Rudolphi	Decoction, Infusion, Poulitice	Zanjan Province	Toghranegar and Vafadar, 2018
Root, Seed	Brassicaceae	<i>Brassica rapa</i> L.	Raw, Fresh, Cooked	Zanjan Province	Toghranegar and Vafadar, 2018
Aerial part	Convolvulaceae	<i>Convolvulus arvensis</i> L.	Decoction, Infusion, Extract, Poulitice	Zanjan Province	Toghranegar and Vafadar, 2018
Aerial part	Lamiaceae	<i>Marrubium Parviflorum</i> Fisch. & C.A.Mey.	Decoction, Infusion, Extract	Zanjan Province	Toghranegar and Vafadar, 2018
Fruit	Rhamnaceae	<i>Ziziphus jujuba</i> Miller	Raw, Fresh, Decoction, Infusion	Zanjan Province	Toghranegar and Vafadar, 2018
Leaf; Flower, Seed	Scrophulariaceae	<i>Verbascum cheiranthifolium</i> Boiss	Decoction, Infusion, Poulitice	Zanjan Province	Toghranegar and Vafadar, 2018
Aerial part, Flower	Violaceae	<i>Viola odorata</i> L.	Decoction, Infusion	Zanjan Province	Toghranegar and Vafadar, 2018
Rhizome	Zingiberaceae	<i>Curcuma longa</i> L.	Spice, Decoction, Infusion, Extract, Poulitice	Zanjan Province	Toghranegar and Vafadar, 2018
Flower	Malvaceae	<i>Alcea biennis winter</i> L.	Decoction	sajazoroud_Zanjan Province	Pour et al, 2017
Leaf, Stem, Tuber	Amaryllidaceae	<i>Allium Akaka</i> S.G.Gmel.	Soup, Decoction	sajazoroud_Zanjan Province	Pour et al, 2017
Seed	Brassicaceae	<i>Alyssum capestre</i> L.	Decoction	sajazoroud_Zanjan Province	Pour et al, 2017
Fruit, Leaf	Rosaceae	<i>Amigdalus scoparia</i> Spach.	Decoction	sajazoroud_Zanjan Province	Pour et al, 2017
Stem	Asteraceae	<i>Centaurea depressa</i> L.	Decoction	sajazoroud_Zanjan Province	Pour et al, 2017
Fruit, Root, Leaf	Apiaceae	<i>Foeniculum vulgare</i> L.	Decoction	sajazoroud_Zanjan Province	Pour et al, 2017
Flowering Shoots	Lamiaceae	<i>Thymus kotchyanus</i> L.	Decoction	sajazoroud_Zanjan Province	Pour et al, 2017

Plant part used	Family	Scientific name	Method of use	Study location	Source
Tuber	Orchidaceae	<i>Orchis latifolia L.</i>	Cooked, Decoction	sajazoroud_Zanjan Province	Pour et al, 2017
Flower	Lamiaceae	<i>Ziziphora spp</i>	Decoction	Sardasht, West Azerbaijan Province	Azizi and Keshavarzi, 2015
Leaf	Nymphaeaceae	<i>Nymphaea alba L.</i>	Decoction	Sardasht, West Azerbaijan Province	Azizi and Keshavarzi, 2015
Leaf	Brassicaceae	<i>Brassica Napus L.</i>	Decoction	Sardasht, West Azerbaijan Province	Azizi and Keshavarzi, 2015
Leaf	Asteraceae	<i>Artemisia aucheri Boiss.</i>	Decoction	Sardasht, West Azerbaijan Province	Azizi and Keshavarzi, 2015
Leaf	Apiaceae	<i>Eryngium campestre</i>	Herbal tea, Infusion ,Fresh, Infusion	Sareyn, Ardabil Province	Derakhshan et al., 2017
Flower	Asteraceae	<i>Centaurea virgate</i>	Infusion	Sareyn, Ardabil Province	Derakhshan et al., 2017
FlowerLeaf	Asteraceae	<i>Carthamus oxiantha</i>	Decoction, Dried	Sareyn, Ardabil Province	Derakhshan et al., 2017
Seed, Flower	Capparidaceae	<i>Capparis spinosa</i>	Infusion	Sareyn, Ardabil Province	Derakhshan et al., 2017
Flower, Leaf, Root, Fruit	Papaveraceae	<i>Papaver orientale</i>	Infusion, Decoction	Sareyn, Ardabil Province	Derakhshan et al., 2017
Seed,Leaf	Plantaginaceae	<i>Plantago atrata</i>	Decoction, soaking in water Seed	Sareyn, Ardabil Province	Derakhshan et al., 2017
Seed, Leaf	Plantaginaceae	<i>Plantago lanceolata</i>	Decoction, soaking in water Seed	Sareyn, Ardabil Province	Derakhshan et al., 2017
Flower, Leaf, Root	Scrophulariaceae	<i>Verbascum gossypinum</i>	Infusion, Powder	Sareyn, Ardabil Province	Derakhshan et al., 2017
Flower, Rhizome, Leaf	Violaceae	<i>Viola suavis</i>	herbal tea/Infusion	Sareyn, Ardabil Province	Derakhshan et al., 2017
Leaf	Malvaceae	<i>Alcea kurdica</i>	Infusion, Decoction	Saqqez, Kurdistan Province	Derakhshan et al., 2017
Aerial part	Euphorbiaceae	<i>Euphorbia amygdaloides</i>	Infusion, Decoction	Saqqez, Kurdistan Province	Derakhshan et al., 2017
Leaf	Malvaceae	<i>Malva neglecta</i>	Infusion, Decoction	Saqqez, Kurdistan Province	Derakhshan et al., 2017
Leaf	Malvaceae	<i>Malva sylvestris</i>	Infusion, Decoction	Saqqez, Kurdistan Province	Derakhshan et al., 2017
Aerial part	Lamiaceae	<i>Thymus eriocalyx</i>	Infusion, Decoction	Saqqez, Kurdistan Province	Derakhshan et al., 2017
Stem, Leaf, Flower	Asteraceae	<i>Centaurea balsamita Lam.</i>	Distillate	Shirvan, North Khorasan Province	Habibi et al., 2014
Flowering Shoots, Seed	Malvaceae	<i>Abutilon theophrasti Medic.</i>	Decoction	Shirvan, North Khorasan Province	Habibi et al., 2014
Leaf	Plantaginaceae	<i>Plantago major L.</i>	Infusion	Shirvan, North Khorasan Province	Habibi et al., 2014
Leaf	Asteraceae	<i>Artemisia scoparia Waldst & Kit</i>	Decoction	Northeastern Persian Gulf – Bushehr	Dolatkhahi and Nabipour, 2014
Resin, Root	Apiaceae	<i>Ferula assa-foetida L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Whole plant	Apiaceae	<i>Kelussia odoratissima Mozaff</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Flowering Shoots	Asteraceae	<i>Artemisia maritima L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014

Plant part used	Family	Scientific name	Method of use	Study location	Source
Flower	Asteraceae	<i>Carthamus tinctorius L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Flower	Boraginaceae	<i>Echium amoenum Fisch & Mey.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Seed, Root	Brassicaceae	<i>Brassica napus L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Seed	Brassicaceae	<i>Alyssum campestre L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Fruit	Fagaceae	<i>Quercus brantii Lindl.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Flowering Shoots	Lamiaceae	<i>Hyssopus officinale L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Flower, Stem, Seed	Lamiaceae	<i>Lavandula angustifolia mill.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Aerial part	Lamiaceae	<i>Thymus serpyllum L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Aerial part	Lamiaceae	<i>Thymus vulgaris L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Leaf	Myrtaceae	<i>Myrtus communis L.</i>	Infusion	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Flower	Papaveraceae	<i>Papaver rhoeas L.</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Leaf	Fabaceae	<i>Alhagi pseudalhagi.</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Gum/resin	Fabaceae	<i>Astragalus gossypinus Fisch.</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Flower, Seed	Fabaceae	<i>Trifolium pratense L.</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Aerial part	Primulaceae	<i>Angalis arvensis L.</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Seed	Ranunculaceae	<i>Nigella sativa L.</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Seed	Rosaceae	<i>Amygdalus communis L.</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Gum/resin	Rosaceae	<i>Amygdalus scoparia Spach</i>	Decoction	Northeastern Khuzestan-Khuzestan	Khodayari et al., 2014
Fruit, Seed	Lamiaceae	<i>Acinus graveolens.</i>	Decoction	Sirjan-Kerman	Sharififar et al., 2010
Flowering Shoots	Lamiaceae	<i>Origanum majorana L.</i>	Decoction	Ajab Shir, East Azerbaijan	Maleki-Khezerlu et al., 2017
Flowering Shoots	Lamiaceae	<i>Hyssopus officinalis L.</i>	Decoction	Ajab Shir, East Azerbaijan	Maleki-Khezerlu et al., 2017

Plant part used	Family	Scientific name	Method of use	Study location	Source
Seed	Brassicaceae	<i>Alyssum homalocarpum</i> L.	Decoction	Ajab Shir, East Azerbaijan	Maleki-Khezerlu et al., 2017
Aerial part	Brassicaceae	<i>Alyssum persicum</i> Boiss.	Decoction	Fereydunshahr, Isfahan Province	Sajjadi et al., 2016
Leaf	Asteraceae	<i>Centaurea officinalis</i> L.	Decoction	Fereydunshahr, Isfahan Province	Sajjadi et al., 2016
Aerial part	Asteraceae	<i>Centaurea virgate</i> Lam.	Decoction	Fereydunshahr, Isfahan Province	Sajjadi et al., 2016
Aerial part	Brassicaceae	<i>Conringia perfoliata</i> (C.A.Mey.) Busch	Decoction	Fereydunshahr, Isfahan Province	Sajjadi et al., 2016
Aerial part	Asteraceae	<i>Echinops macrophyllus</i> Boiss Hausskn.	Decoction	Fereydunshahr, Isfahan Province	Sajjadi et al., 2016
Leaf	Apiaceae	<i>Ferula persica</i> Willd . Var . <i>Latsecta</i>	Decoction	Fereydunshahr, Isfahan Province	Sajjadi et al., 2016
Flower	Asteraceae	<i>Centaureacyanus</i> L	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Gum/resin	Asteraceae	<i>Echinops aucheri</i> Boiss.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Flowering Shoots	Asteraceae	<i>Matricaria recutita</i> L.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Flower	Convolvulaceae	<i>Ipomoea tricolor</i> Cav.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Leaf; Flower	Lamiaceae	<i>Mentha longifolia</i> (L) Huds	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Seed	Lamiaceae	<i>Salvia macrosiphon</i> Boiss.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Leaf	Lamiaceae	<i>Thymus daenensis</i> Celak.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Seed	Linaceae	<i>Linum itatissimum</i> L	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Fruit	Myrtaceae	<i>Eucalyptus camaldulensis</i> Dehnh.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Fruit	Rosaceae	<i>Amygdalus lycioides</i> Spach.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Fruit	Rosaceae	<i>Amygdalus scoparia</i> Spach	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Fruit	Zygophyllaceae	<i>Tribulus terrestris</i> L.	Decoction	Fasa – Fars	Ramezani and MinaeiFar, 2016
Fruit	Rosaceae	<i>Amygdalus elaeagnifolia</i> Spach,Ann.	Decoction	Kazerun, Fars Province	Dolatkhahi et al., 2012
Aerial part	Lamiaceae	<i>Thymus daenensis</i> Čelak	Infusion	Kohgiluyeh and Boyer-Ahmad	Hatami and Jahantab, 2018
Flower	Boraginaceae	<i>Anchusa italic</i> Rets	Infusion	Kohgiluyeh and Boyer-Ahmad	Hatami and Jahantab, 2018
Root, Flower	Malvaceae	<i>Alcea hohenackeri</i> Boiss	Decoction	Kohgiluyeh and Boyer-Ahmad	Sisakht, 2022
Gum/resin	Anacardiaceae	<i>Pistacia spp</i>	Raw, Inhalation smoke	Kohgiluyeh and Boyer-Ahmad	Sisakht, 2022
Seed, Leaf	Fabaceae	<i>Trigonella foenum graecum</i>	Decoction	Mobarakeh, Isfahan	Mardaninejhad and Vazirpour, 2012
Root, Seed	Apiaceae	<i>Foeniculum vulgare</i> L.	Decoction, Distillate, ointment	Meshgin Shahr – Ardabil	Dehsan et al., 2021
Flowering Shoots, Aerial part	Asteraceae	<i>Artemisia abaensis</i> Y.E.Ling & C.Y.Zhao	Herbal tea, Infusion, Decoction	Meshgin Shahr – Ardabil	Dehsan et al., 2021
Root	Asteraceae	<i>Tragopogon pratensis</i> L.	Decoction, Extract	Meshgin Shahr – Ardabil	Dehsan et al., 2021

Plant part used	Family	Scientific name	Method of use	Study location	Source
Leaf	Brassicaceae	<i>Nasturtium officinalis</i> L.	Infusion, Fresh	Meshgin Shahr – Ardabil	Dehsan et al., 2021
Flower	Iridaceae	<i>Crocus abantensis</i> T.Baytop & B.Mathew.	Decoction	Meshgin Shahr – Ardabil	Dehsan et al., 2021
Seed, Leaf	Portulacaceae	<i>Portulaca oleracea</i> L.	Ointment, Chewed	Meshgin Shahr – Ardabil	Dehsan et al., 2021
Fruit, Leaf, Flowering Shoots	Araceae	<i>Solanum nigrum</i> L	Decoction	Meshgin Shahr – Ardabil	Dehsan et al., 2021
Aerial part, Seed	Papaveraceae	<i>Glaucium oxylobum</i> Boiss & Buhse.	Decoction	Mehriz, Yazd	Minaeifar et al., 2024
Leaf	Solanaceae	<i>Datura innoxia</i> Miller.	Decoction	Mehriz, Yazd	Minaeifar et al., 2024
Leaf	Asteraceae	<i>Lactuca serriola</i> L.	Decoction	Mehriz, Yazd	Minaeifar et al., 2024
Aerial part	Asteraceae	<i>Sonchus maritimus</i> L.	Decoction	Mehriz, Yazd	Minaeifar et al., 2024
Seed	Brassicaceae	<i>Allyssum minus</i> var. <i>micrantha</i> (C.A.Mey.) Dudley.	Decoction	Mehriz, Yazd	Minaeifar et al., 2024
Aerial part	Ephedraceae	<i>Ephedra procera</i> Fish & Mey.	Decoction	Mehriz, Yazd	Minaeifar et al., 2024
Aerial part	Ephedraceae	<i>Ephedra strobilacea</i> Bge.	Decoction	Mehriz, Yazd	Minaeifar et al., 2024
Aerial part	Ephedraceae	<i>Ephedra intermedia</i> Schr.	Decoction	Mehriz, Yazd Province	Minaeifar et al., 2024
Aerial part	Lamiaceae	<i>Marrubium vulgare</i> L.	Decoction	Mehriz, Yazd Province	Minaeifar et al., 2024
Stem, Leaf	Ephedraceae	<i>Ephedra intermedia</i> Schrenk C.A. Mey.	Decoction	Natanz, Kashan	Shabnam et al, 2012
Gum/resin	Fabaceae	<i>Astragalus gossypinus</i> Fisch..	Mucilage	Natanz, Kashan	Shabnam et al, 2012
Gum/resin	Fabaceae	<i>Astragalus verus</i> Olivier.	mucilage	Natanz, Kashan	Shabnam et al, 2012
Flower	Malvaceae	<i>Alcea lenkoranica</i> Iljin	Infusion, Decoction, with henna	Neka, Mazandaran Province	Gholipour et al., 2014
Leaf, Flower	Lamiaceae	<i>Origanum vulgare</i> L.	Infusion	Neka, Mazandaran Province	Gholipour et al., 2014
Aerial part	Aspleniaceae	<i>Asplenium adiantum-nigrum</i> L	Infusion	Neka, Mazandaran Province	Gholipour et al., 2014
Aerial part	Aspleniaceae	<i>Asplenium trichomanes</i> L.	Infusion, inhalation/steam	Neka, Mazandaran Province	Gholipour et al., 2014
Tuber	Orchidaceae	<i>Orchis coriophora</i> L.	Infusion	Hezar, Kerman Province	Rajaei and Mohamadi, 2012
Flower	Lamiaceae	<i>Nepeta bracteata</i> Benth.	Decoction	Hezar, Kerman Province	Rajaei and Mohamadi, 2012
Leaf, bulb	Amaryllidaceae	<i>Allium oschaninii</i> O.Fedtsch.	Raw, Cooked	Neyshabur, Razavi Khorasan Province	Morvarid et al, 2019
Leaf, Flower	Violaceae	<i>Viola tricolor</i> L	Decoction	Neyshabur_ Khorasan, R.Z.	Morvarid et al, 2019
Leaf, Shoot Fresh	Lamiaceae	<i>Ziziphora tenuior</i> L.	Oral/Edible	Neyshabur_ Khorasan, R.Z.	Morvarid et al, 2019
Leaf, Stem	Asteraceae	<i>Artemisia persica</i> Boiss	Powder, Herbal tea/Infusion	Neyshabur_ Khorasan, R.Z.	Morvarid et al, 2019
Leaf, Shoot Fresh	Lamiaceae	<i>Nepeta bracteata</i> Benth	Decoction, Herbal tea, Infusion, Distillate	Neyshabur_ Khorasan, R.Z.	Morvarid et al, 2019

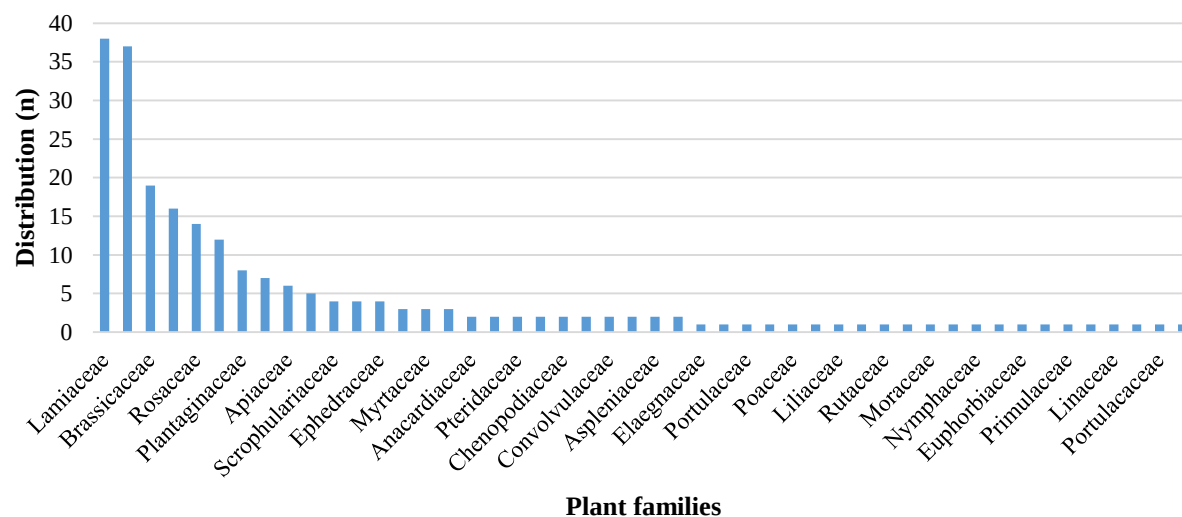


Figure 1: Distribution of plant families containing ethnobotanical plants used against cough

Among the plant parts used, leaves were the most frequently reported, with 27 records, followed by flowers with 24 records and aerial parts with 20 records. In terms of plant family diversity, Lamiaceae, with 38 species, Asteraceae, with 37 species, and Brassicaceae, with 19 species, ranked highest. All 227 records reviewed were documented as having traditional applications for the treatment of cough and were classified under antitussive use. Among the methods of preparation and administration, decoction, with 98 records, and infusion, with 34 records, were the most commonly reported approaches. Geographically, northeastern Khuzestan, Fasa, and Zanjan accounted for the highest numbers of reports of medicinal plants traditionally used to treat cough.

Discussion

In the present study, an ethnobotanical review was undertaken to identify and analyze native Iranian medicinal plants traditionally used for cough. The findings demonstrated substantial diversity in the medicinal species, plant families, and plant parts represented in traditional cough-related practices. Among the identified families, Asteraceae, Lamiaceae, Brassicaceae, and Rosaceae were the most frequently represented.

The findings are broadly consistent with ethnobotanical studies conducted in different regions of Iran, including Jiroft, Kazerun, the Zarm-rood rural district of Neka, the Zarivar region of Marivan, Gilan, and northwestern Tarom in Zanjan, suggesting relatively persistent patterns in medicinal-plant use across different parts of the country (Bibak, 2017; Akbarzadeh et al., 2010; Musavi et al., 2003). The high representation of Asteraceae and Lamiaceae in the present dataset may reflect their importance in local knowledge and their widespread use for respiratory symptoms, including cough.

Previous studies have likewise identified Asteraceae as one of the dominant plant families in Iranian ethnobotanical research (Dolatkhahi et al., 2012). In a study conducted in Kerman Province, Lamiaceae was also reported among the dominant families, in agreement with the present findings. Such convergence may be related to the broad distribution of these families and the occurrence of bioactive constituents across their constituent species.

Analysis of plant-part use showed that aerial parts, particularly leaves, flowers, and fruits, were frequently employed for cough and were commonly prepared as decoctions. This observation is consistent with previous reports

identifying decoction as one of the most common methods of medicinal-plant preparation in different regions (Abbasi et al., 2012; Ranmanesh et al., 2010). The widespread use of decoctions may be related to their simplicity of preparation and their ability to extract water-soluble plant constituents.

Studies from Pakistan, Cameroon, and several African countries have also documented extensive use of medicinal plants in the management of diseases and infections of the respiratory tract (Rehman et al., 2025; Molonge et al., 2025; Makgobole et al., 2023). Similarities in medicinal-plant use across geographically distinct populations may reflect partially shared ethnobotanical knowledge and comparable therapeutic experiences.

Leaves accounted for the largest proportion of the plant-part records in the present study, with 21.4% uses. This finding is consistent with reports from Nigeria and other African settings in which leaves have also been identified as the most commonly used plant part (Hosseini et al., 2021; Komakech et al., 2019; Suja et al., 2024; Oyeniyi et al., 2025). The frequent use of leaves may, at least in part, be associated with the presence of bioactive constituents such as flavonoids and phenolic compounds in many medicinal plants (Komakech et al., 2019; Suja et al., 2024).

In the study by Gholipour et al. in the Zarm-rood rural district of Neka, leaves were likewise reported as the most frequently used plant part, in agreement with the present findings and other ethnobotanical reports (Gholipour et al., 2014). This convergence may indicate recurring preferences for certain plant parts in traditional medicinal practices.

Despite the importance of these plants in traditional cough management, excessive harvesting and inappropriate exploitation may reduce genetic resources, diminish wild populations, and threaten the persistence of medicinal species in their natural habitats. Several studies have therefore emphasized the need for conservation and sustainable management of medicinal plant resources (Jalili and Jamzad, 1999; Amoli et al., 2005; Ahmad et al., 2006; Hosseini et al., 2009; Hoshidari, 2009).

Several limitations should be considered when interpreting these findings. The reviewed studies

differed in reporting methods and geographic coverage, and some ethnobotanical records were incomplete. In addition, the present review is based primarily on ethnobotanical evidence; clinical efficacy, safety, and mechanisms of action of the plants identified were not evaluated directly.

Conclusion

This ethnobotanical review indicates that native Iranian medicinal plants represent substantial diversity in species, families, and traditional applications for cough. Asteraceae and Lamiaceae were among the most prominent families identified. Recurrent patterns of use across different studies may reflect the importance of these plants within indigenous knowledge and traditional medical practice. Overall, native Iranian medicinal plants may provide a valuable starting point for natural-product development and future pharmaceutical research addressing respiratory symptoms such as cough. Nevertheless, phytochemical, pharmacological, and clinical investigations are required to establish their efficacy, safety, and mechanisms of action.

Declarations Conflict of Interest

The authors declare no conflict of interest.

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Consent for Publications

The authors certify that that this work in its final form has been thoroughly reviewed and approved for publication.

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Authors' Contributions

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Formal analysis: Mahsa Keshvari

Funding acquisition: Mahsa Keshvari

Methodology: Mahsa Keshvari
 Project administration: Mahsa Keshvari
 Resources: Mahsa Keshvari
 Software: Mahsa Keshvari
 Supervision: Mahsa Keshvari
 Validation: Mahsa Keshvari
 Visualization: Mahsa Keshvari
 Writing – original draft: Mahsa Keshvari
 Writing – review & editing: Mahsa Keshvari

Ethical Considerations

Not applicable. This letter does not report new studies involving human participants, animal subjects, or patient data.

AI Use Disclosure

AI was used only for language editing and improving clarity. The authors take full responsibility for the scientific content.

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