



Advancements in Ethnobotanical Sciences

Bridging Traditional Knowledge and Modern Science

Online ISSN: 0000-0000
Journal homepage: <https://www.jaeps.com>



Ethnobotanical Study of Wild Edible Greens and Herbal Teas Used in Chaharmahal and Bakhtiari Province, Iran

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Article Info

Article type
Research

Article history
Received: 9 Jun. 2026
Accepted: 23 Aug. 2026
Published: 30 Sep. 2026

DOI
[10.34172/jaeps.2026.18](https://doi.org/10.34172/jaeps.2026.18)

Keywords
Edible greens
Ethnobotany
Herbal tea
Indigenous knowledge

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ABSTRACT

Background and Objective: Chaharmahal and Bakhtiari Province is characterized by considerable botanical diversity and local communities with a long history of using plants for food, beverages, and other traditional purposes. This study aimed to identify and document wild edible greens and plant species traditionally used to prepare herbal teas and infusions in the province.

Methods: A descriptive ethnobotanical survey was conducted using a structured questionnaire administered in 35 active herbal medicine shops across Chaharmahal and Bakhtiari Province. Information on scientific and local plant names, botanical families, plant parts used, and reported uses was recorded. No plant specimens or herbarium vouchers were collected. Scientific names were assigned by cross-checking reported names with authoritative botanical references. Data were analyzed descriptively based on the number of reported species and botanical families, plant parts used, and reported uses.

Results: Five species belonging to three botanical families were reported for the preparation of herbal teas and infusions. *Lamiaceae* was the most represented family, comprising three species: *Stachys lavandulifolia*, *Thymus daenensis*, and *Ziziphora tenuior*. Leaves and flowers were the most frequently reported plant parts used for herbal teas and infusions. In addition, six species representing five botanical families were reported as edible greens or flavoring plants. Notable species included *Mentha longifolia* and *Satureja bachtiarica* (*Lamiaceae*) and *Kelussia odoratissima* (*Apiaceae*). Leaves were the most commonly consumed plant part, whereas the bulb was used in *Allium hirtifolium* and both leaves and roots were reported for *Rheum ribes*.

Conclusions: The documented diversity of plant species, botanical families, plant parts, and uses highlights the richness of local ethnobotanical knowledge in Chaharmahal and Bakhtiari Province. Systematic documentation of such knowledge may contribute to the preservation of botanical and cultural heritage and provide a basis for further investigation of the nutritional and other potential uses of these plants.



Introduction

Wild and semi-domesticated edible plants have been part of human diets for centuries and remain important food resources in many parts of the world, particularly in regions with high botanical diversity. They may contribute to local food systems not only as vegetables and other edible ingredients but also as flavoring agents and sources of plant-derived products (Turner et al., 2011). The incorporation of wild greens into meals, soups, and other traditional foods reflects both their dietary relevance and the longstanding relationships that communities have developed with the plant resources available in their surrounding environments (Lewis-Stempel, 2012). Beyond their role as food resources, many of these plants contain nutrients and bioactive constituents and may have broader cultural and economic importance within local communities (Sánchez-Mata et al., 2012).

Herbal teas and plant infusions represent another widespread form of traditional plant use and are consumed in diverse cultural settings worldwide (Chandrasekara & Shahidi, 2018). A variety of plant parts, particularly leaves and flowers, may be used fresh or after drying to prepare these beverages (Chandrasekara & Shahidi, 2018). The choice of plant species, harvesting practices, plant parts selected, and preparation methods are often shaped by locally accumulated knowledge that has been maintained and transmitted across generations (Kuhnlein & Turner, 1991). Consequently, documenting plants used in traditional beverages can provide insights into local patterns of plant consumption while also contributing to an understanding of the cultural relationships between communities and their surrounding plant resources (Tingstad et al., 2018).

Ethnobotany focuses on the relationships between people and plants and encompasses the documentation of knowledge, beliefs, practices, and uses associated with plant resources. In recent years, systematic documentation of traditional knowledge concerning edible and medicinal plants has gained increasing attention (Neisari & Abdi, 2026). Social and economic transformations, changing lifestyles, and weakening intergenerational transmission can contribute to

the gradual erosion of traditional knowledge related to plants and their uses (Alkhatib & Abdi, 2026). Ethnobotanical investigations can help document local plant names, species used, plant parts harvested, and modes of preparation or utilization, thereby providing valuable baseline information for subsequent research on nutritional properties, bioactive constituents, biodiversity conservation, and cultural heritage (Afsari, 2026). Chaharmahal and Bakhtiari Province, located within the Zagros Mountain range of western Iran, is characterized by substantial variation in elevation, climate, and vegetation. These environmental conditions contribute to considerable plant-resource diversity and, together with the longstanding use of plants by local communities, make the province a suitable setting for investigating traditional patterns of plant consumption and the use of plants in beverages. Nevertheless, information concerning plants incorporated into local diets and those traditionally used to prepare herbal teas or infusions remains fragmented. Systematic documentation is therefore needed to consolidate available knowledge and provide a clearer account of the plant resources used in everyday food and beverage practices in the region.

Against this background, the present study aimed to identify and document edible greens and plant species traditionally used to prepare herbal teas and infusions in Chaharmahal and Bakhtiari Province, Iran. Information on the reported species, botanical families, local names, plant parts used, and types of use was collected and presented descriptively. By documenting these plant-use practices, the study seeks to contribute to the preservation of a portion of the region's plant-related traditional knowledge and to provide baseline information for future research addressing the nutritional, cultural, and practical significance of these resources.

Methods

Study Area

The study was conducted in Chaharmahal and Bakhtiari Province, southwestern Iran, within the Zagros Mountain range. The province extends approximately from 31°10' to 32°45' N latitude and from 49°29' to 52°34' E longitude, covering an

area of approximately 10,893 km². The province has a marked altitudinal gradient, with elevations ranging from 1,009 to 4,250 m above sea level. A geographical map illustrating the location of Chaharmahal and Bakhtiari Province within Iran is provided in Figure 1.

The substantial variation in elevation, climatic conditions, and vegetation across the province, combined with the longstanding use of plant resources by local communities, provides a suitable setting for ethnobotanical research and the documentation of traditional plant-use practices.



Figure 1. Geographical map showing the location of Chaharmahal and Bakhtiari Province in Iran.

Data Collection

Data were collected using a structured questionnaire administered in 35 active herbal medicine shops located across Chaharmahal and Bakhtiari Province. The questionnaire was designed to document plants used as edible greens and those consumed as herbal teas and infusions, as well as their scientific and local names, botanical families, plant parts used, and reported uses. Information was obtained exclusively from herbal medicine shop owners, staff members, or other knowledgeable individuals working in the surveyed shops. No plant specimens were collected, and no herbarium vouchers were prepared during the study.

Accordingly, the findings represent the plant-use information and knowledge reported by participants in the surveyed herbal medicine shops

and should not be interpreted as direct botanical verification of the reported species in their natural habitats.

Species Identification and Data Analysis

The scientific names of the reported plants were assigned by cross-referencing the local and commercial names provided by respondents with authoritative botanical references. The corresponding botanical family was then recorded for each reported species. Because no physical specimens were collected, species identification was based on the reported names and their correspondence with established botanical nomenclature rather than on examination of voucher specimens.

The collected data were analyzed descriptively and summarized according to the number of reported species, botanical families, plant parts used, and reported culinary or beverage-related uses.

The study was conducted in Jambaló, an Indigenous territory located in northeastern Cauca in the Colombian Andes. The territory is predominantly inhabited by Nasa and Misak communities and comprises 35 settlements distributed across an altitudinal range of approximately 1,600–3,800 m above sea level. The marked variation in elevation and environmental conditions creates a diverse range of habitats that support the occurrence, collection, and traditional use of medicinal plant species.

Results

The survey documented several plant species reported by respondents for food and beverage-related purposes. In total, five plant species—*Anchusa italica*, *Hypericum scabrum*, *Stachys lavandulifolia*, *Thymus daenensis*, and *Ziziphora tenuior*—were reported as being used to prepare herbal teas or infusions.

In addition, six edible plant species—*Allium hirtifolium*, *Kelussia odoratissima*, *Lepidium draba*, *Mentha longifolia*, *Rheum ribes*, and *Satureja bachtiarica*—were reported as edible plants used in the local diet and traditional food preparation.

Detailed information on the scientific name, botanical family, local name, plant part used, and reported type of use is provided in Tables 1 and 2.

Table 1 presents the species reported for the preparation of herbal teas and infusions, whereas Table 2 summarizes the edible greens and other edible plants reported as components of the local diet and traditional culinary practices.

Table 1. Plants reported as being used for herbal teas and infusions in Chaharmahal and Bakhtiari Province, Iran

Scientific name	Botanical family	Local name	Plant part used	Reported use
<i>Anchusa italica</i>	Boraginaceae	Gol-e Gavzaban	Flowers	Herbal tea/infusion
<i>Hypericum scabrum</i>	Hypericaceae	Gol-e Ra'i	Leaves, flowers	Herbal tea/infusion
<i>Stachys lavandulifolia</i>	Lamiaceae	Chay-e Kuhi	Leaves, flowers	Herbal tea/infusion
<i>Thymus daenensis</i>	Lamiaceae	Avishan, Oshun	Leaves, flowers	Herbal tea/infusion
<i>Ziziphora tenuior</i>	Lamiaceae	Kakuti	Leaves, flowers	Herbal tea/infusion

Table 2. Edible plants reported as components of the local diet in Chaharmahal and Bakhtiari Province, Iran

Scientific name	Botanical family	Local name	Plant part used	Reported culinary use
<i>Allium hirtifolium</i>	Amaryllidaceae	Mooshir	Bulb	Edible green; flavoring
<i>Kelussia odoratissima</i>	Apiaceae	Kelus; Bakhtiari celery	Leaves	Edible green; flavoring
<i>Lepidium draba</i>	Brassicaceae	Mucheh	Leaves	Edible green; culinary use
<i>Mentha longifolia</i>	Lamiaceae	Pooneh	Leaves, flowers	Edible green; flavoring
<i>Rheum ribes</i>	Polygonaceae	Rhubarb	Leaves, roots	Edible green; flavoring
<i>Satureja bachtiarica</i>	Lamiaceae	Marzeh Kuhi	Leaves, flowers	Edible green; flavoring

Discussion

The present study documented plants reported as edible greens and as ingredients in herbal teas and infusions through a survey of herbal medicine shops across Chaharmahal and Bakhtiari Province. In total, 11 plant species were reported across the two main categories of use. Although the number of recorded species was relatively limited, they represented several botanical families and a range of plant parts and uses. This diversity suggests that the plant resources represented within the surveyed herbal medicine-shop network are used in more than one food- and beverage-related context. An important consideration in interpreting these findings, however, is that the data were obtained from herbal medicine shops and reflect the knowledge of individuals familiar with the plants traded or used in these establishments. The findings should therefore not be considered representative of the complete diversity of edible plants or plant-based beverages used throughout the province. Rather, they provide a snapshot of species represented within the local herbal supply system and the associated practical knowledge reported by respondents.

Among the plants reported for herbal teas and infusions, five species belonging to three botanical families were documented. Lamiaceae was the most represented family, with three species: *Stachys lavandulifolia*, *Thymus daenensis*, and *Ziziphora tenuior*. The prominence of Lamiaceae is consistent with the widespread use of aromatic plants in traditional beverages and other plant-based preparations. Members of this family are commonly used in traditional beverages and culinary practices, in part because of their characteristic aromas and essential-oil profiles. The present finding is therefore broadly consistent with reports emphasizing the importance of aromatic plants and herbal beverages in traditional plant-use systems (Chandrasekara & Shahidi, 2018). Leaves and flowers were the most frequently reported plant parts used for herbal teas and infusions. Their frequent use may partly reflect the practical suitability of these relatively soft plant parts for drying and preparation, as well as their contribution to the sensory and aromatic characteristics of the resulting beverages.

The occurrence of *Anchusa italica* and *Hypericum scabrum* among the reported tea and infusion plants further indicates that beverage-related plant use in the study area is not limited to members of Lamiaceae. The selection of species may be influenced by a combination of local tradition, availability, sensory characteristics, and knowledge transmitted within communities. Thus, the diversity observed in the present study reflects not only taxonomic variation but also differences in local preferences and plant-use practices. Similar observations have been reported in studies of traditional herbal beverages in the eastern Mediterranean, where the selection and combination of plants used for beverages are closely associated with regional traditions and knowledge transmitted across generations (Obón et al., 2021).

The edible-plant group comprised six species representing six botanical families. Despite the relatively small number of species, their distribution among different families indicates taxonomic breadth within the plants reported for food-related use. *Allium hirtifolium*, *Kelussia odoratissima*, *Lepidium draba*, *Mentha longifolia*, *Rheum ribes*, and *Satureja bachtiarica* represent plants with different sensory characteristics and culinary roles, including use as edible greens and flavoring ingredients. Leaves were the most frequently reported plant part in this group. This pattern is consistent with findings from numerous ethnobotanical studies of wild edible plants, in which leaves and young aerial parts are among the most commonly utilized plant organs (Jalali et al., 2024, Nedelcheva, 2013).

Jalali et al. reported considerable diversity of wild edible plants in mountainous areas of Semnan Province, with leaves and young aerial parts making an important contribution to local food use (Jalali et al., 2024). The number of species documented in that study was substantially higher than that recorded in the present investigation. This difference should not, however, be interpreted as evidence of lower edible-plant diversity in Chaharmahal and Bakhtiari Province. Differences in study design, sample size, informant characteristics, and sampling setting can substantially influence the number of species recorded. In particular, the present study was conducted through herbal medicine shops rather

than through direct fieldwork with communities in their villages or natural-resource environments. Plants used primarily at the household level but not traded through herbal medicine shops may therefore have been less likely to appear in the present dataset. Comparisons of species richness should consequently take the sampling framework and social context of each study into account.

Several species documented in the present study have also been reported as edible plants elsewhere in Iran and the Middle East. For example, *Mentha longifolia* and *Lepidium draba* were reported among edible plants in Yeşilli District of Mardin, Türkiye (Yeşil et al., 2019). Their occurrence in geographically distinct traditional food systems may reflect the continued recognition of these species as useful food resources in different communities. Nevertheless, the presence of the same species in different regions does not necessarily imply identical patterns of use. Plant parts consumed, preparation methods, frequency of consumption, and culinary roles may vary according to local environmental conditions, cultural practices, and dietary traditions.

Yeşil et al. documented 74 edible taxa belonging to 31 families in the Mardin study, substantially exceeding the number recorded in the present investigation (Yeşil et al., 2019). The plants in that study were consumed in diverse forms, including raw, cooked, dried, pickled, as beverages, and as spices. Such differences further demonstrate the influence of sampling strategy and study population on ethnobotanical inventories. Mardin is characterized by considerable cultural diversity and a longstanding tradition of wild-plant consumption among Kurdish, Arab, and Assyrian communities, whereas the present study specifically examined information available within herbal medicine shops. Direct comparisons of the number of taxa are therefore best made cautiously and in conjunction with differences in social context, research setting, and data-collection methods.

The findings can also be considered alongside the work of Nedelcheva in Bulgaria, which documented 88 wild edible plant species and reported leaves and fruits among the most frequently used plant parts (Nedelcheva, 2013). Although the species richness reported in that study was considerably greater, the prominence of leaves as an edible plant

part was comparable to the pattern observed in the present study. The frequent use of leaves may partly reflect their accessibility, ease of harvesting, and suitability for direct or simple culinary preparation. At the same time, differences in species composition and the range of plant parts utilized are likely influenced by regional flora, climate, food traditions, and cultural preferences. Salehi likewise documented substantial knowledge of wild edible plants among local communities in Kurdistan Province, Iran, recording 49 edible species and emphasizing the role of local knowledge in the use of plant resources (Salehi, 2022). Although the present study was conducted in a different setting and involved a different sampling strategy, the findings indicate that herbal medicine shops may represent an additional source of information about locally recognized plant resources. Such establishments can function at the interface of traditional knowledge, plant supply, and consumer practices. Information documented in these settings may therefore complement, rather than replace, field-based ethnobotanical research involving villages, households, pastoralists, and other community groups.

From a conservation perspective, documenting edible and beverage-related plants may be relevant to both biological and cultural heritage. Wild plant resources can be affected by changes in land use, habitat degradation, harvesting pressure, and changes in dietary practices. Previous work has emphasized the value of documenting plant species together with their associated traditional knowledge as a basis for identifying conservation priorities and supporting the management of plant resources (Darbyshire et al., 2017, Tingstad et al., 2018). In this context, documenting species such as *Kelussia odoratissima* and other locally important plants with culinary uses may contribute to establishing a baseline for future studies addressing the conservation of plant diversity and associated traditional knowledge. However, the present study did not assess population status, harvesting intensity, or conservation risk, and no direct conservation conclusions can therefore be drawn from the current dataset.

The occurrence of plants with more than one reported use also illustrates the fluid boundaries between food, flavoring, and beverage use in

traditional plant-use systems. Some plants, particularly members of Lamiaceae, may be used as edible greens, flavoring agents, or herbal infusions depending on the species, plant part, and preparation method. Such multifunctionality indicates that the practical value of a plant within a local knowledge system may extend beyond a single category of use. Recording these overlapping uses can therefore provide a more complete picture of how plant resources are incorporated into everyday food and beverage practices.

Several limitations should be considered when interpreting the findings. First, the study was based on information obtained from 35 herbal medicine shops and therefore does not necessarily represent the full range of plant-use knowledge held by rural, pastoral, or nomadic communities throughout the province. Second, no plant specimens or herbarium vouchers were collected. Consequently, the scientific names reported in this study were assigned by matching names provided by respondents with botanical references rather than through direct examination of voucher specimens. Future studies should therefore incorporate voucher collection and taxonomic verification whenever feasible. Third, the analysis was descriptive and did not include quantitative ethnobotanical indices such as use value, cultural importance, or informant consensus. Broader community-based field studies involving rural and nomadic populations, local markets, and households could provide a more comprehensive assessment of plant-use diversity. Such studies could additionally document harvesting seasons, preparation methods, frequency of use, quantities consumed, and quantitative measures of cultural importance.

Conclusion

Overall, the present study documented a range of edible plants and plants used for herbal teas and infusions within the herbal medicine-shop network of Chaharmahal and Bakhtiari Province. Although the number of reported species was relatively limited, the findings encompassed several botanical families, plant parts, and culinary and beverage-related uses. The occurrence of some species in ethnobotanical reports from Iran, Türkiye, and Europe indicates that some of these

plants are recognized as useful resources across geographically distinct regions. Particularly the use of leaves and aromatic plants, may be shared across geographically distinct regions. At the same time, differences in species composition and reported uses highlight the influence of local flora, food traditions, and knowledge-transmission systems. The findings should be interpreted within the specific methodological context of the study, as the data were obtained from herbal medicine shops and were not supported by field-based botanical sampling or herbarium vouchers. Nevertheless, the study provides baseline information on a portion of the plant-use knowledge associated with food and beverage practices in the province. Future research integrating direct community-based ethnobotanical surveys, voucher-based taxonomic verification, quantitative ethnobotanical analyses, and documentation of preparation and harvesting practices could provide a more comprehensive understanding of the nutritional, cultural, phytochemical, and conservation significance of these plant resources.

Declarations Conflict of Interest

The authors declare no conflicts of interest.

Acknowledgments

The author gratefully acknowledges the cooperation and support of the participating herbal medicine retailers in conducting this study.

Consent for Publications

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

Funding Support

The authors did not receive support from any organization for the submitted work.

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Writing original draft: Mohammad-Taghi Moradi

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Ethical Considerations

This study was performed in line with the principles of the Declaration of Helsinki.

AI Use Disclosure

The author declares that AI tools were not used to generate or develop the scientific content of this manuscript. AI was used solely for English language editing, grammar correction, and improving sentence clarity and readability. The authors take full responsibility for the final content.

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