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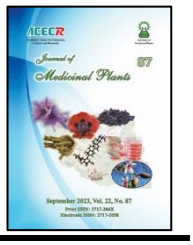

Research Article

Bibliometric and subject analysis of articles in the ethnobotanical field of Iranian medicinal plants (1999 – 2022)

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ABSTRACT

Background: Ethnobotanical knowledge studies the indigenous, local and traditional uses of plants by different people and cultures. **Objective:** Analysis of articles in the field of ethnobotanical characteristics of Iranian medicinal plants from the perspective of local people. **Methods:** The study is a retrospective bibliometric analysis and science mapping. The articles retrieved from five databases were examined and exteracted characteristics such as the name of the region, the number of species, the family with the highest number of species, the plant organ used, the method of using plants, and the therapeutic uses of medicinal plants. Then VOSviewer was used to draw a scientific map. **Results:** All 145 articles (325 authors and in 59 journals) are divided into three groups, including investigation of the ethnobotanical characteristics of medicinal plants in different regions, the ethnobotanical characteristics of a family/species, ethnobotanical characteristics of Iranian medicinal plants for the treatment/prevention of a disease/disorder. The keywords ethnobotany, medicinal plants, traditional medicine, and ethnopharmacology are among the most frequent keywords and digestive, cold, diabetes, dental, gynecological, respiratory and skin diseases were among the most frequent diseases reported in the articles. **Conclusion:** The people of different regions of Iran pay attention to the use of different types of medicinal plants to treat diseases. However, the ethnobotanical characteristics of medicinal plants in many regions of Iran have yet to be investigated. Only original research articles published in journals have been reviewed in this study. It is suggested that conference and systematic review articles be evaluated in future studies.

1. Introduction

Ethnobotany is the study of the indigenous, local and traditional uses of plants by different people, tribes and cultures. Ethnobotany is derived from the combination of the two words: “Ethno”, meaning people and “Botany”, which is a branch of biology that deals with the study of plants [1]. Therefore, ethnobotany is a method of scientific refinement of the information available in the public mind. The data of an ethnobotanical study is taken from the natural life of the people of a region and their attitude toward plants. In fact, in

Abbreviations: VOS, visualization of similarities

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ethnobotanical studies, the oral knowledge of local people, old residents and experienced informants is documented [2, 3].

Iran is one of the welthiest—regions of Southwest Asia in terms of plant biodiversity. The diversity of Iran's medicinal plants has made natives of different regions use them to treat many patients. For this reason, Iran is one of the leading countries in ethnobotanical knowledge [1]. The high knowledge of Iranians in the use of medicinal plants, the existence of reliable scientific centres in cities such as Isfahan, Shiraz and Ray, the existence of reliable scientific sources such as the Book of Law, and the existence of famous scientists such as Avicenna and Razi who popularized medicine with medicinal plants among Iranian people. The interest of Iranians in medicinal plants [4] and Iran's rich flora and wide climatic diversity, have paved the way to pay more attention to ethnobotanical science. Caspian Sea' temperate - areas along with plains and thick forests in the north of the country, mountainous regions of the Alborz and the Zagros, semi-desert to desert areas in the central parts of Iran, extensive steppe habitats and lowlands on the shores of the Persian Gulf and Oman sea indicate the significant biodiversity of Iran [2].

During the last two decades, many researchers have investigated the ethnobotanical characteristics of Iranian medicinal plants. Therefore, evaluating the research activities of this subject area is of great importance. Scientometrics is one of the methods that can help balance the budget and economic costs and thus increase the efficiency of research. In addition, examining the production of science provides a suitable tool for better policy making and planning and knowing the past situation. It can lead to targeting scientific movements and the determination of research priorities. At the same time, it may result in the identification of weak points and the shortcomings in the production of scientific information [5]. As a result, the quantitative study of scientific output, research articles in particular, is recognized as one of the most important indicators of research and science production. In this type of study, the quantitative measurements of scientific productions can determine the frequency of research in each country, each institution, each scientific field and each individual and its trend. The literature review results showed that some studies have reviewed the ethnopharmacology articles of India and Brazil [6-8]. Therefore, there is a shortage of research into a deep analysis of Iranian ethnobotanical studies. Bearing this in mind that this study sought to do an in-depth bibliometric and thematic analysis of articles that have examined the ethnobotanical characteristics of Iranian medicinal plants from the perspective of local people.

2. Materials and methods

The current study aims to conduct a detailed bibliometric and subject analysis of articles in the ethnobotany of Iranian medicinal plants. It is applied in terms of purpose and scientometric in terms of type, carried out through a library method and retrospective bibliometric analysis. Bibliometric analysis is a field of scientific study to build research performance indicators based on quantitative analysis of scientific productions [9].

To retrive persian articles related to the ethnobotany of medicinal plants of Iran, two researchers searched scientific information database (Sid.ir), Bank of Iranian Medical Articles (idml.research.ac.ir), Iran Journals Information Bank (magiran.com) and Google Scholar with the following keywords: Ethnobotany, ethnopharmacology, traditional medicinal use of plants, folk pharmacy, herbal ethnography and native pharmacology. As a result, a total of 150 Persian articles were retrieved.

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In addition, to retrieve English articles in the Scopus database, the following keywords were searched: Ethnobotanic, Ethnobotany, Ethnobotanical, Ethnopharmacologic, Ethnopharmacology, Ethnopharmacology in the field, "Title/Abstract/Keywords" along with the keyword "Iran" in the field "affiliation" or "Title/Abstract/Keywords":

(TITLE-ABS-KEY (ethnobotan* OR ethnopharmacolog* OR ethno-botanic* OR ethn-opharmacolog*) AND AFFILCOUNTRY (iran) OR TITLE-ABS-KEY (Iran)) AND (LIMIT-TO (SRCTYPE, "j"))

Through this search strategy, 563 English articles were retrieved, according to which the researchers investigated the articles based on inclusion criteria. To check the inclusion criteria, the title and abstract of 713 articles were studied. In the first step, the articles were included in the study that investigated the ethnobotanical and ethnopharmacological characteristics of medicinal plants in different regions of Iran through interviews with local people or questionnaires. Next, articles that dealt with the ethnobotanical investigation of medicinal plants from other countries, and review and systematic review articles were excluded from the study. Figure 1 shows the process of extraction and selection of articles. Finally, the full texts of 145 articles that met the inclusion criteria were investigated to extract items such as the region' name, the number of species, the family with the most sigificant number of medicinal plant species, the most used plant organs in treatment, the most common ways of consuming the plant, and the most therapeutic uses of medicinal plants.

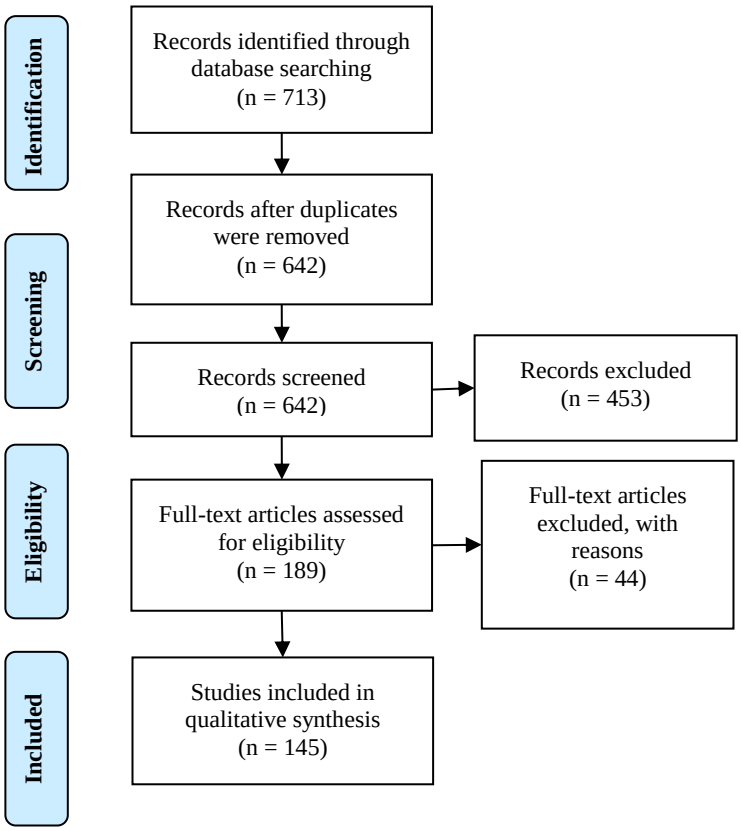

Fig. 1. The process of extracting and selecting articles

Next, to perform a co-word analysis, the keywords related to the selected articles were extracted and to make the different forms of writing uniform, the keywords were modified. After homogenizing the keywords, in the VOSviewer software, co-occurrence five was identified as suitable by examining different co-occurrences. VOSviewer (version 1.6.18) package programming is a type of software used for bibliometric analysis which many studies have used this software [10-12]. In the keyword co-occurrence map, the size of the circles shows the number of repetitions of the keywords. In other words, the larger the size of the circle, the higher the repetition frequency of words in that area. In this map, each of the subject clusters of the ethnobotanical field of medicinal plants of Iran is marked with a colour.

3. Results

This section provides information about the findings of 145 articles investigating the ethnobotanical characteristics of medicinal plants in different regions of Iran from the perspective of older adult people, local healers, grocers, nomads, shepherds, herders, farmers, housewives, sellers, and producers of medicinal plants, traditional botanists, gardeners and beekeepers. Regarding language, 90 articles were in English and 55 in Persian. They were published between 1999 and 2022. These articles were published with the cooperation of 325 authors. Table 1 shows the most prolific authors in the ethnobotanical field of Iranian medicinal plants.

Table 1 indicates that Mahmoud Bahmani has had the highest number of articles with 20. The results showed that these articles were published in 59 journals. Table 2 shows the titles of journals with more than three articles.

Based on Table 2, ***Journal of Medicinal Plants*** and *Journal of Ethnopharmacology* were ranked second and third with 20 and 11 articles each, respectively, and both journals were indexed in Scopus. Figure 2 shows the distribution of the articles by provinces of Iran.

Table 1. Authors with more than six articles

Author Name	Number of articles	Affiliation
Bahmani, M.	20	Food and Beverages Safety Research Center, Urmia University of Medical Sciences, Urmia, Iran
Rafieian-Kopaei, M.	15	Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran
Saki, K.	9	Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Nabipour, I	8	The Persian Gulf Marine Biotechnology Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr University of Medical Sciences, Bushehr, Iran
Delfan, B.	6	M.Sc. student, Dept. of Biology, Faculty of Sciences, Lorestan University, Khorramabad, Iran.
3 authors, each with 4 articles	12	
19 authors, each with three articles	57	
53 authors, each with 2 articles	106	
Authors, each with an article	240	

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Table 2. The titles of journals with more than three articles

Journal Name	Number of articles	Language
Journal of Islamic and Iranian Traditional Medicine	22	Farsi
Journal of Medicinal Plants	**20**	**English now**
Journal Of Ethnopharmacology	11	English
Journal of Medicinal Herbs	8	English now
Iranian South Medical Journal	8	Farsi
Indigenous Knowledge	6	Farsi
Eco-phytochemical Journal of Medicinal Plants	4	Farsi
Asian Pacific Journal Of Tropical Disease	3	English
Der Pharmacia Lettre	3	English
Iranian Journal Of Pharmaceutical Research	3	English
Plant Science Today	3	English
8 journals with 2 articles and 39 journals with one article	55	English and Farsi
Total		**145**

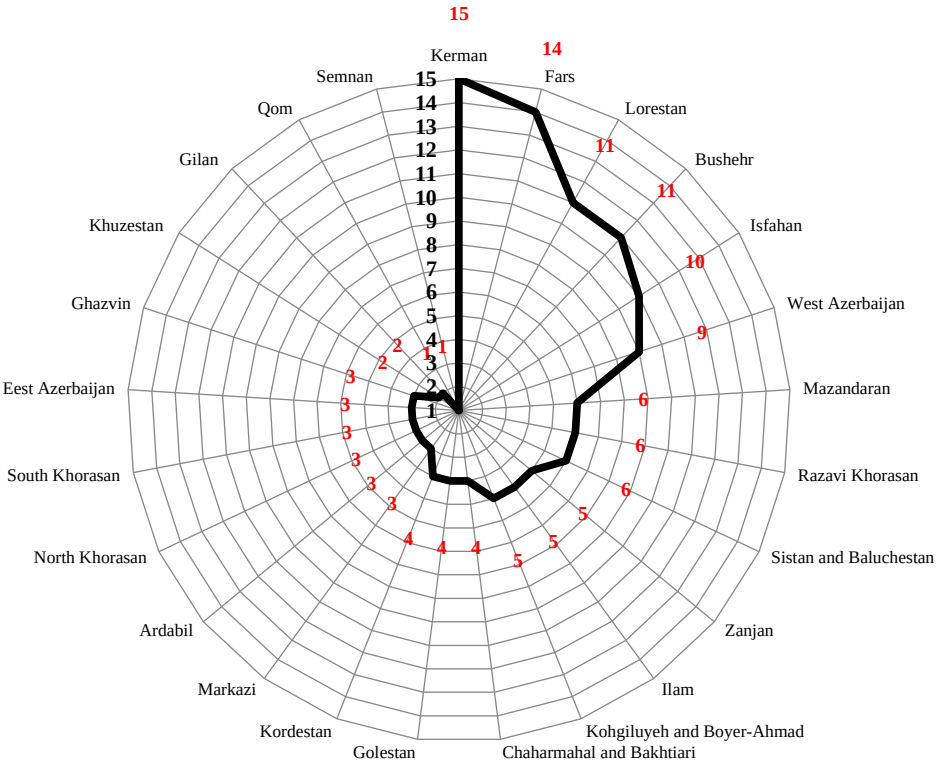

Fig. 2. Distribution of articles by province

The results show that these studies have investigated the ethnobotanical characteristics of medicinal plants in 25 provinces of Iran. According to Figure 3, 15 articles have examined the ethnobotanical characteristics of medicinal plants in different regions of Kerman province. The provinces, including Fars and Lorestan were ranked second and third with 14 and 11 studies, respectively. Figure 3 shows the other areas investigated in each province.

According to Figure 3, the ethnobotanical characteristics of medicinal plants in some provinces have not been investigated. In terms of plant species, the 145 studies were categorized into three groups (Table 3).

Fig. 3. Different areas investigated in each province

Table 3. Classification of studies

No	Category	No. of articles	Description
1	The ethnobotanical characteristics of Iranian medicinal plants	100	Investigating the ethnobotanical characteristics of medicinal plants in different regions of Iran (urban, rural, tribal)
2	The ethnobotanical characteristics of a plant family/species in Iran	13	Lamiaceae, Rosaceae [13], Lamiaceae [14, 15] , *Anethum graveolens* L. [16], *Tanacetum parthenium* L. [17], *Achillea micrantha* Willd. [18], *Amygdalus lycioides* var. *horrida* (Spach) Browicz [19], *Nepeta binaludensis* Jamzad [20], *Nepeta bracteata* Benth. [21], *Perovskia abrotanoides* Karel. [22, 23], *Citrus aurantium* L. [24], Solanum section Solanum [25]
3	Ethnobotanical characteristics of medicinal plants for the treatment/prevention of a disease/disorder in Iran	32	Skin [26-28], diabetes [29-31], respiratory [32], covid-19 [33], cold [34, 35], sinusitis [36], toothache [37-39], oral microsites [40], baby jaundice [41], cardiovascular [42] , stomach disorders [43], diarrhea [[44], flatulence [45], parasites [46, 47], kidney stones and kidney pain [48-50], burning urine [51], reproductive system disorders [52]، gynecological diseases [22, 53], burn wounds [54] and digestive disorders [55-58]

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According to Table 2, most studies have investigated the ethnobotanical characteristics of medicinal plants of a city/village/region.

How to use medicinal plants was one of the questions that native people were asked in the studies. The results showed those boiled, brewed, raw and fresh, poultices, extracts, and oils had higher statistics.

Other uses of medicinal plants such as Poultice, extract, Oil, spice, powder, Ointment, gargle, sap, gum, Syrup, resin, and latex had a smaller number.

VOSviewer software was employed to draw the co-occurrence map of keywords. In this software, it is possible to draw a word co-occurrence map based on the author's keywords and database (Fig. 4). In the initial map drawn, there were 1140 keywords. After taking the output and homogenizing the keywords, the thesaurus was prepared from the homogenized keywords, including 275 ones. Next, a co-occurrence map was drawn for the keywords that were repeated five times each, as shown in Figure 4. The size of the circles indicates the amount of knowledge available for each concept. Nodes indicate concepts, and lines show how they are interrelated. The results showed that the word co-occurrence map of the scientific products in the field of ethnobotany of Iran's medicinal plants is categorized into four clusters.

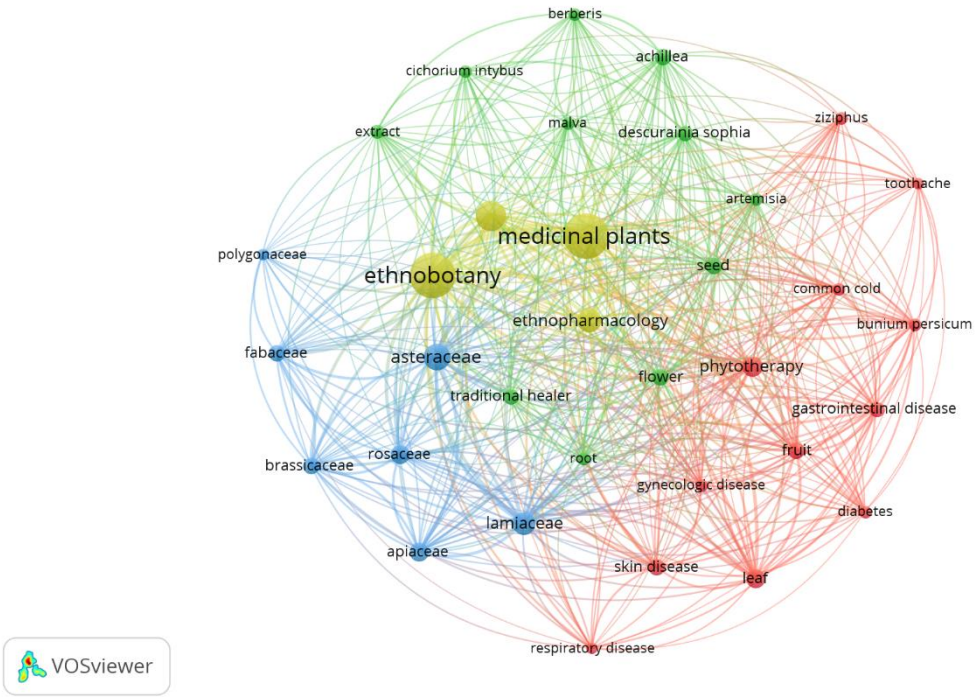

Fig. 4. Word Co-occurrence map of the articles in the field of the ethnobotany of Iranian medicinal plants

According to the map of ethnobotanical studies of Iranian medicinal plants, the keywords of ethnobotany, medicinal plants, traditional medicine, and ethnopharmacology were among the most frequently used keywords that were located in a cluster. According to the information examined in 145 studies, plant families had the highest number of reported medicinal plant species. The results showed that the plant family with the most medicinal plant

species included Lamiaceae, Asteraceae, Apiaceae, Fabaceae, Rosaceae, Brassicaceae, and Poaceae, respectively.

Other plant families, such as Liliaceae, Malvaceae, Chenopodiaceae, Papaveraceae, Rutaceae, Solanaceae, Polygonaceae, Plantaginaceae, Rhamnaceae, and Apocynaceae had less number of medicinal species.

The blue cluster was dedicated to plant families with the highest frequency, such as Lamiaceae, Asteraceae, Apiaceae, Fabaceae, Brassicaceae, and Rosaceae.

Plant genera/species commonly used in treating diseases, such as *Achillaea* sp., *Chiorium intybus*, *descurainia Sophia*, *Malva* sp., *Artemisia* sp., and *Berberis sp.* were in the green cluster.

Diseases with the highest frequency such as digestive disease, cold, diabetes, toothache, gynecology, respiratory disease, and skin disease were placed in the red cluster.

Herbal medicine was one of the keywords with a high frequency in this cluster. Among the other diseases mentioned in the studies were infectious diseases, cardiovascular diseases, general health (correction of temperament and body weakness), kidney and urinary tract, ear and nose, skin and hair, rheumatology, gynecology and obstetrics, anti-inflammatory, eye, orthopaedics, psychiatry and neurology.

Among the information examined in 145 studies, a category refers to the plant organs used to treat or prevent of diseases.

The keywords leaf, flower, seed, fruit, and root were among the keywords with a high frequency on the map. The results of the studies also showed that leaves, flowers, fruits, stems, roots, seeds, and aerial parts have higher statistics. Other plant organs such as Rhizome, bark, sap, whole plant, gum, bulb, bud, thorn, and resin were mentioned in the studies.

4. Discussion

The results showed that 145 articles in the ethnobotany of Iranian medicinal plants were published between 1999 and 2022 with the collaboration of 325 authors and in 59 journals. *Journal of Islamic and Iranian Traditional Medicine* and The *Journal of Medicinal Plants* and the *Journal of ethnopharmacology* were ranked first, second and third, respectively, and achieved the third rank. The result of a study that examined articles in the field of ethnopharmacology in India between 2011 and 2020 also showed that the Journal of *ethnopharmacology* was ranked first with 522 articles [6]. Bibliometric analysis of Indian ethnobotanical studies indexed in WoS also demonstrated that this journal was ranked second with 258 articles [7]. This journal is indexed as one of the most reliable journals in this subject area in Scopus, WoS, and PubMed databases. Ritter et al. also reviewed Brazilian ethnobotanical studies published in 4 Brazilian journals between 1988 and 2013 [8].

As mentioned earlier, the 145 studies could be divided into three groups in terms of plant species. The first category comprises the studies investigating the ethnobotanical characteristics of Iran's medicinal plants, where most of the studies are related to this group. The results showed that these studies have examined the ethnobotanical characteristics of medicinal plants in 25 provinces of Iran. Kerman province was ranked first with 15 articles. Fars and Lorestan provinces were ranked second and third, and Bushehr, Isfahan, and West Azarbaijan provinces achieved the following ranks. Kerman province with a seven thousand-year-old civilization and diverse climatic conditions (Mediterranean, cold and dry, hot and dry, and desert) is a suitable platform for the growth of all kinds of plants. Over the years,

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it has accumulated traditional pharmacological information [59]. The ethnobotanical survey of medicinal plants in Sirjan [60], Khabr National Park of Baft [61], Bardsir region [62], Darbe Anar region Kohpayeh [63], and Narmashir and Baravat [64] are among these studies. Ethnobotanical studies regarding the medicinal plants of this province could collect and record the accumulated ethnobotanical knowledge of this region and become a suitable model and clue for providing new herbal medicines [59].

Fars province was ranked second in terms of number of articles. Fars province, especially Shiraz, has historically been an important centre of the herbal medicine trade in Iran. Furthermore, Shiraz was the centre of medical education in the Middle Ages, and famous medieval doctors such as Hally Abbas, Ibn Ilyas Mansuri, Ghotboddin Shirazi, and Aghili Alavi Shirazi studied in Shiraz [30]. Among these studies, we can mention the ethnobotanical investigation of Sepidan [65], Kazeron [66] and Jahrom [67]. In addition, the results showed that Lorestan and Bushehr provinces were ranked third with 11 studies each. Isfahan province with 10 studies and West Azarbaijan province with 9 studies were ranked fourth and fifth.

Moreover, some articles have investigated the ethnobotanical characteristics of the nomadic areas of Iran. Among these studies, it is possible to examine the ethnobotanical characteristics of 70 species belonging to 30 plant families of the Dilegan rangeland in Kohgiloye and Boirahmad province [68], 51 species from 26 families of the pastures of the rangelands' of Chehel-Kaman, North Khorasan Province [69] and 36 species and their results pointed out the medicinal properties of Goghar Baft rangelands, Kerman province [70].

Some studies have also investigated the ethnobotany of medicinal plants in rural areas. Among other things, the investigation of 34 plant species in Jubon village of Guilan province showed that the plant species of *Malva sylvestris* L., *Echium amoenum* Fisch & C.A. Mey*; Urtica dioica* L.*, Eryngium planum* L.*, and Foeniculum vulgare* Mill. have the most therapeutic uses. In addition, the results of this study showed that the most common purpose of the therapeutic use of plants was for gastrointestinal diseases, which were mainly used orally in cooking [71].

An ethnobotanical survey of 56 species from 20 plant families in 4 forest villages of the Arasbaran area, northwestern Iran, also demonstrated that colds, coughs and infections are among the diseases for which medicinal plants are mainly used for their treatment [72].

The second category belongs to the studies investigating the ethnobotanical characteristics of a plant family/species in Iran. Investigating the ethnobotanical characteristics of the Lamiaceae family plant species has drawn the attention of many researchers. The results of the investigation of the therapeutic properties of 22 plant species from 10 genera of the Lamiaceae family in Shazand, in Markazi Province, showed that the most used forms of the studied plants were brewed and boiled from their aerial parts, especially leaves, flowers, fruits, and seeds, most of which were used to treat cough and gastrointestinal diseases [14]. The results of the investigations of 25 plant species from the same family in the Aliguderz region of Lorestan province also revealed that the most therapeutic use of plants of this family is to treat colds and digestive disorders [15]. Another study also examined 11 plant species from the Lamiaceae family and ten species from the Rosaceae family in the Alamut region of Qazvin. The results showed some species, such as *Mentha pulegium* L., *Stachys lavandulifolia* Vahl., *Thymus*

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vulgaris L., *Ziziphora tenuior* L., and *Rosa damascena* Mill. were used for therapeutic purposes in most villages [13].

In some other studies, a plant species from the Lamiaceae family was investigated. The therapeutic properties of *Perovskia abrotanoides* Karel. belonging to the Lamiaceae family growing wild on the side of the mountainous roads in the dry and cold climate of northern regions of Iran shows that this plant is mainly used as fortifier, antiseptic, rheumatic pains, anti-inflammatory, leishmaniasis, anthelmintic, as well [23, 73, 74]. In addition, this plant has been investigated in another study in Semnan province. The results showed that this plant has the potential productivity of total flavonoid and total phenol constituents with suitable anti-Candida, antibacterial, and antioxidant activities. Therefore it can be used as a natural anti-infective to treat many infectious diseases, such as vaginal infections [22].

The third category includes those studies that have examined the ethnobotanical characteristics of Iranian medicinal plants for the treatment/prevention of a disease/disorder. Investigation of suitable plants for treating digestive disorders [55, 56], diabetes [29-31], kidney stones and pain [48-50], and toothache [37-39] are listed in this category.

Most of Shiraz's ethnobotanical studies have explored the ethnobotanical properties for the treatment of diseases such as dysuria [51], toothache [37], sinusitis [36], colds [34], and diabetes [30].

Moreover, the studies that have been conducted in Uremia City are mainly about the treatment of those diseases related to reproductive system disorders [52], cardiovascular disorders [42], and respiratory disorders and diseases [32].

In most of the reviewed studies, the most common type of consumption of medicinal plants has been reported as boiled and brewed [65, 72, 75, 76]. Some studies ranked raw and fresh consumption first [70, 77]. Among other forms of consumption, we can refer to Poultice, extract, Oil, spice, powder, Ointment, gargle, sap, gum, Syrup, resin, and latex.

According to the map of ethnobotanical studies of Iranian medicinal plants, the keywords ethnobotany, medicinal plants, traditional medicine, and ethnopharmacology were among the most frequently used keywords in a cluster. Besides, the results showed that the plant families of Lamiaceae, Asteraceae, Apiaceae, Fabaceae, Brassicaceae, and Rosaceae had the highest number of frequencies. The review of the articles also indicates that in most studies, the Lamiaceae family [65, 72, 75, 78, 79] and Asteraceae [76, 80-84] have the largest number of plant species. In some studies, the Asteraceae family has the first rank in the number of medicinal plant species [68, 71, 85, 86]. Other plant families, such as Liliaceae, Malvaceae, Chenopodiaceae, Papaveraceae, Rutaceae, Solanaceae, Polygonaceae, Plantaginaceae, Rhamnaceae, and Apocynaceae have fewer medicinal species.

The most widely used medicinal plants have also been investigated in some studies, among which we can mention *Thymus vulgaris* L. [79, 80, 87-91], *Descurainia sophia* Webb ex Prantl [87, 88, 92], *Mathricaria chamomila* L. [2, 87, 88, 91, 93], *Achillea eriophora* DC. [87, 88, 92, 94]، *Glycyrrhiza glabra* L. [79, 90, 93, 95], *Plantago psyllium* L. [87, 88, 96], *Mallva sylvestris* L. [69, 71, 89, 95, 96], *Artemisia sieberi* Besser [59, 90, 97], *Teucrium polium* L. [87-89, 92-94], *Carum carvi* L. [69, 89, 94] ،*Echium amoenum* Fisch & Mey. [71, 89, 91,

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98], *Cichorium intybus* L. [2, 66, 79, 88, 93, 95, 96, 98] and *Achilleae millefolium* L. [2, 65, 69].

Furthermore, the results showed that digestive diseases, cold, diabetes, toothache, gynecology, respiratory diseases, and skin diseases were among the most frequently reported diseases in the articles. Among these studies, we can mention the studies of medicinal plants for the treatment of gastrointestinal disease [65, 70, 75, 78, 79, 81, 82, 87, 88, 99-103], respiratory [4, 70, 82, 89, 100, 104-107], and cold and cough [72, 75, 93, 108-114].

Some valuable information mentioned in the studies could be gained with regard to the knowledge of local people about the difference in the therapeutic properties of a plant species due to its consumption method. A study showed that the brew of the axial flower of the *Ziziphora tenuior* L. is appropriate for strengthening the nerves and its infusion is suitable for Hyperthermia. Another valuable result of these studies is the indigenous knowledge of the local people concerning the consumption of medicinal plants. According to people's beliefs, the age and sex of the patient have an essential impact on the consumption of plants [75]. In addition, the local people believe combining some plants is more effective and strengthens the person's immune system [86].

Furthermore, the results indicated that the opinions of local people regarding some uses of plants are only sometimes in line with scientific sources. On the one hand, this inconsistency can be because of the new uses of these plants, and on the other, it can be due to the transmission of wrong knowledge from one generation to another, which requires further studies [76, 78]. Considering the incorrect use of some plants in traditional medicine and the danger of some people's lives due to these mistakes, ethnobotanical science can be employed to correct those mistakes. For example, there are poisonous plants that people still believe in using, such as *Aristolochiea boottae* Jaub. & Spach. which is used in Kurdistan province as a plant to reduce cholesterol. Therefore, the local applications of plants should be known to improve public awareness, prevent diseases and improve community health [105].

Some studies also indicate that local people need more knowledge about the use of many plants. For example, *Artemisia sieberi* Besser and *Acanthophyllum bracteatum* Boiss. are grown widely in YahyaAbad in Natanz, an area in Isfahan province where its people have no idea about the healing properties of these plants and only mentioned that they would be use for washing only. However, the results of some studies show that people of different regions believe in different therapeutic uses of plants. For example, in Kashan and Isfahan, two old Iranian cities, their people referred to the anti-cough property of the thyme plant [111, 115], whereas in YahyaAbad, they use this plant to relieve stomach aches [76].

The results of the reviewed studies also revealed that indigenous knowledge is not just limited to the expression of medicinal properties of medicinal species. The knowledge of these people in connection with the ecological characteristics of plants (ethnoecological) is of great value and can be used to estimate their approximate distribution even without the need for environmental operations and spending a great deal of money and time for plotting [110]. Furthermore, the results of the studies in some areas indicated that some plant species are exposed to extinction due to excessive harvest and livestock grazing [65, 116, 117].

In general, teaching proper usage and informing people about the results of the human indiscriminate harvest of plants, identifying

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medicinal plants for plant breeding and domestication to maximizing the function of plants and increasing the quality of effective substances, preventing extinction, preserving genetic reserves, helping the medicinal independence of the country, cultivating based on the needs of the domestic and foreign markets, informing and making culture for the protection of natural resources, and creating an appropriate platform for investment for exports are among the suggestions for further studies in the ethnobotanical field of Iran are among the most important points that were emphasized in most of the reviewed articles.

With the fast development of ethnopharmacology and its global importance, especially in the fast-developing economies of Asia, Yeung et al. assessed the most influential articles and identified important research drivers and trends in this field, and the results showed anti-oxidant effects appeared to be a recurring and highly cited topic, whereas the links into drug discovery and neuropharmacology seemed to be less robust [118].

5. Conclusion

This research examined the studies in the field of ethnobotany in Iran, where the knowledge of local people was explored through questionnaires and interviews. The results of this study show that the people of different regions of Iran pay attention to the use of different types of medicinal plants in the treatment of different diseases. However, the ethnobotanical characteristics of medicinal plants in many regions of Iran have not yet been investigated, which can be considered in research planning. In this study, only original research articles published in journals have been reviewed. It is suggested that conference and systematic review articles be evaluated in future studies. The results of the present study showed that few articles have been published in the field of ethnopharmacology of medicinal plants in Iran, which can be among the important topics of future studies.

Author contributions

H.B.: Conceptualization; Data curation, Supervision, Validation, Visualization, Roles/Writing - original draft, Writing - review & editing; Z.B.: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Software, Supervision, Validation, Visualization, Roles/Writing - original draft, Writing - review & editing; S.N.R.: Data curation, Formal analysis, Investigation, Roles/Writing - original draft, Writing - review & editing.

Conflicts of interest

The authors declare no conflicts of interest.

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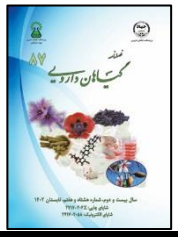

مقاله تحقیقاتی

تحلیل کتابسنجی و محتوایی مقالات حوزه اتنوبوتانی گیاهان دارویی ایران (۱۹۹۹-۲۰۲۲)

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اطلاعات مقاله

گل‌واژگان:
اتنوبوتانی
اتنوفارماکولوژی
گیاهان دارویی
ایران
تحلیل کتابسنجی
تحلیل موضوعی

چکیده

مقدمه: دانش اتنوبوتانی به مطالعه کاربردهای بومی، محلی و سنتی افراد و فرهنگ‌های مختلف از گیاهان می‌پردازد. **هدف:** تحلیل مقالاتی است که ویژگی‌های اتنوبوتانی گیاهان دارویی ایران را از منظر مردم محلی بررسی کرده است. **روش بررسی:** این مطالعه با استفاده از روش تحلیل کتاب‌سنجی گذشته‌نگر و ترسیم نقشه علم انجام شده است. مقالات بازیابی شده از پنج پایگاه اطلاعاتی مورد بررسی قرار گرفت و آیتم‌های نام منطقه، تعداد گونه، تیره-های با بیشترین تعداد گونه گیاه دارویی، اندام گیاهی، نحوه مصرف گیاهان دارویی و استفاده‌های درمانی گیاهان دارویی با بیشترین فراوانی استخراج شد. نرم‌افزار VOSviewer به منظور تحلیل هم‌رخدادی واژگان و ترسیم نقشه استفاده شد. **نتایج:** ۱۴۵ مقاله (با ۲۳۵ نویسنده در ۵۹ مجله) در سه گروه تقسیم‌بندی می‌شوند: بررسی ویژگی‌های اتنوبوتانی گیاهان دارویی، بررسی ویژگی‌های اتنوبوتانی یک خانواده/یک گونه گیاهی و بررسی ویژگی‌های اتنوبوتانی گیاهان دارویی ایران جهت درمان/پیشگیری یک بیماری/اختلال. مطابق نقشه، کلیدواژه‌های اتنوبوتانی، گیاهان دارویی، طب سنتی و اتنوفارماکولوژی از جمله کلیدواژه‌های پربسامد و بیماری‌های گوارشی، سرماخوردگی، دیابت، دندان درد، و همچنین بیماری‌های زنان، تنفسی و پوستی از جمله بیماری‌های پربسامد در مقالات هستند. **نتیجه‌گیری:** مردم مناطق مختلف ایران به استفاده از گیاهان دارویی در درمان بیماری‌ها توجه دارند. با این‌حال ویژگی‌های اتنوبوتانیکی گیاهان دارویی برخی مناطق ایران هنوز مورد بررسی قرار نگرفته است. در این مطالعه مقالات پژوهشی مجلات بررسی شده است. پیشنهاد می‌شود در مطالعات آتی، مقالات کنفرانسی و مقالات مرور نظام‌مند نیز ارزیابی شود.

مخففها: VOS، مصورسازی شباهت‌ها

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