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AN INVESTIGATION OF THE MEDICINAL FLORA IN THE ALGERIAN BREZINA REGION (ELBAYADH) USING FLORAL AND ETHNOBOTANICAL METHODS

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Abstract

Traditional medicine has been practiced in Algeria for centuries, thanks to the richness and diversity of its flora, which encompasses a veritable phylogenetic library of over 3,000 species from various plant families. The aim of our study is to explore people's interactions with medicinal plants through an ethnobotanical approach and document the traditional knowledge of medicinal flora in the steppe environments of the Brezina region. During the 2021-2022 period, ethnobotanical field surveys were conducted with medicinal plant informants using 300 questionnaires. We selected 15 stations and interviewed the same number of participants in each stratum (20). The collected data was then entered into a database and statistically processed and analyzed using Microsoft Office Excel 2020. The study's results reveal that leaves are the most commonly used part of medicinal plants. Infusion is the preferred method of preparation in most medicinal recipes. The majority of users of medicinal plants are married. These plants are primarily utilized to treat respiratory issues. The survey recorded 29 medicinal plant species across 16 botanical families, highlighting significant floristic diversity. The leading families included Lamiaceae at 32.7%, followed by Apiaceae at 12.11%, Amaranthaceae at 11.46%, and Asteraceae at 7.29%. The plant's usage value ranges from 0.03 to 0.97. The following species exhibited the highest usage value (UV) levels for treating disorders in the Brezina region: *Salvia rosmarinus* (0.97), *Mentha spicata* (0.94), *Ephedra foeminea* (0.92), *Mentha pulegium* (0.91), *Arthrophytum scoparium* (0.88), *Peganum harmala* (0.84), *Ziziphus lotus* (0.81), *Pimpinella anisum* (0.81), and *Thymus vulgaris* (0.76). Lamiaceae and Apiaceae are often prominent due to their fragrant and medicinal attributes. The primary application of these medicinal plants is in the treatment of respiratory disorders. Among the 29 species identified in the studied area, nine are more commonly utilised in traditional phytotherapy by the local community.

Key words: Investigation; Medicinal flora; Brezina region; Ethnobotanical and plant's usage value

Introduction

Medicinal plants have long played a crucial role in global healthcare systems, particularly in developing regions where access to modern medicine is limited. According to the World Health Organization, up to 80% of the population in some developing countries in Asia, Africa, and Latin America rely on traditional medicine for their primary healthcare needs (Zeggwagh *et al*., 2013; Menad *et al*., 2020). Despite advances in pharmacology and the widespread availability of synthetic drugs, the use of medicinal plants remains prevalent, especially in rural and underserved areas where conventional healthcare infrastructure is lacking (Tabuti *et al*., 2003).

Traditional knowledge of medicinal plants is increasingly recognized as a valuable resource for drug discovery and the development of new pharmaceuticals (Ghosh, 2003; Sharma *et al*., 2003). Ethnobotanical studies not only help to document this knowledge but also support its preservation in the face of rapid socio-economic and environmental changes. The conservation of such knowledge is essential, as it provides alternative therapeutic options and contributes to the cultural heritage of local communities. (Sibel *et al*., 2024).

Algeria, with its diverse flora comprising over 3,000 species from several plant families, offers a rich context for ethnobotanical research (Laifaoui & Aissaoui, 2019). Traditional medicine is deeply embedded in Algerian culture and continues to be widely practiced, particularly in rural and steppe regions where biodiversity is high and access to healthcare is limited.

The Brezina region, located in the El Bayadh province of southwestern Algeria, is characterized by its steppe environment and unique plant diversity. However, there is a lack of comprehensive ethnobotanical studies documenting the medicinal flora and traditional practices in this area. Understanding the interactions between local populations and medicinal plants is crucial for both the conservation of biodiversity and the safeguarding of traditional knowledge.

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The aim of this study is to investigate the ethnobotanical knowledge and use of medicinal plants among the inhabitants of the Brezina region**.** Specifically, we seek to (I) identify the medicinal plant species used in the region, (II) document their traditional uses and preparation methods, and (III) assess the quantitative importance of these species using ethnobotanical indices. By providing a detailed account of the medicinal flora and associated practices, this research contributes to the scientific community's understanding of traditional medicine in Algeria and supports efforts to preserve both plant biodiversity and cultural heritage.

Material and Methods

Study area: The study was conducted in the commune of Brezina, an ancient rural locality in southwestern Algeria, situated 87 km southeast of the capital of El Bayadh province (Fig. 1). The region covers an area of 15,702.80 km² at an altitude of 870 meters above sea level (coordinates: 33.098476°N, 1.2608796°E). The climate is semi-arid, characterized by significant temperature fluctuations and low annual rainfall averaging 132.83 mm, with 60% of precipitation occurring between October and April. The area is typified by steppe vegetation and supports a rich diversity of medicinal flora.

Ethnobotanical survey design: A stratified sampling strategy was implemented to ensure comprehensive coverage of the Brezina region's diverse habitats and communities. The study was conducted during 2021/2022. Fifteen stations were identified based on ecological, geographical, and demographic criteria, with 20 informants selected from each station, totalling 300 participants. Stratification allowed for the inclusion of various sub-regions and maximized the diversity of medicinal plant knowledge captured (González *et al*., 2010; Poudel *et al*., 2022).

Selection of informants: Informants were chosen to represent a diverse array of ages, genders, educational qualifications, and socioeconomic standings. Random and purposive sample methods were employed: random selection facilitated comprehensive community representation, whereas purposive selection focused on key informants, including traditional healers and elderly inhabitants with substantial ethnobotanical expertise. All participants provided informed consent before to data collection, adhering to the ethical norms established by the International Society of Ethnobiology (Mekonnen *et al*., 2022).

Data collection methods: Data were collected using semi-structured questionnaires, direct interviews, group discussions, and field observations. The questionnaire included sections on:

- Demographic information (age, gender, education, marital status)
- Local names of medicinal plants
- Parts of plants used
- Methods of preparation and administration
- Ailments treated
- Frequency and context of use
- Sources and transmission of ethnobotanical knowledge

Field observations and guided walks with informants were conducted to verify plant identification and document habitats. Group discussions helped triangulate information and explore knowledge transmission within families and communities. (Worku *et al*., 2025).

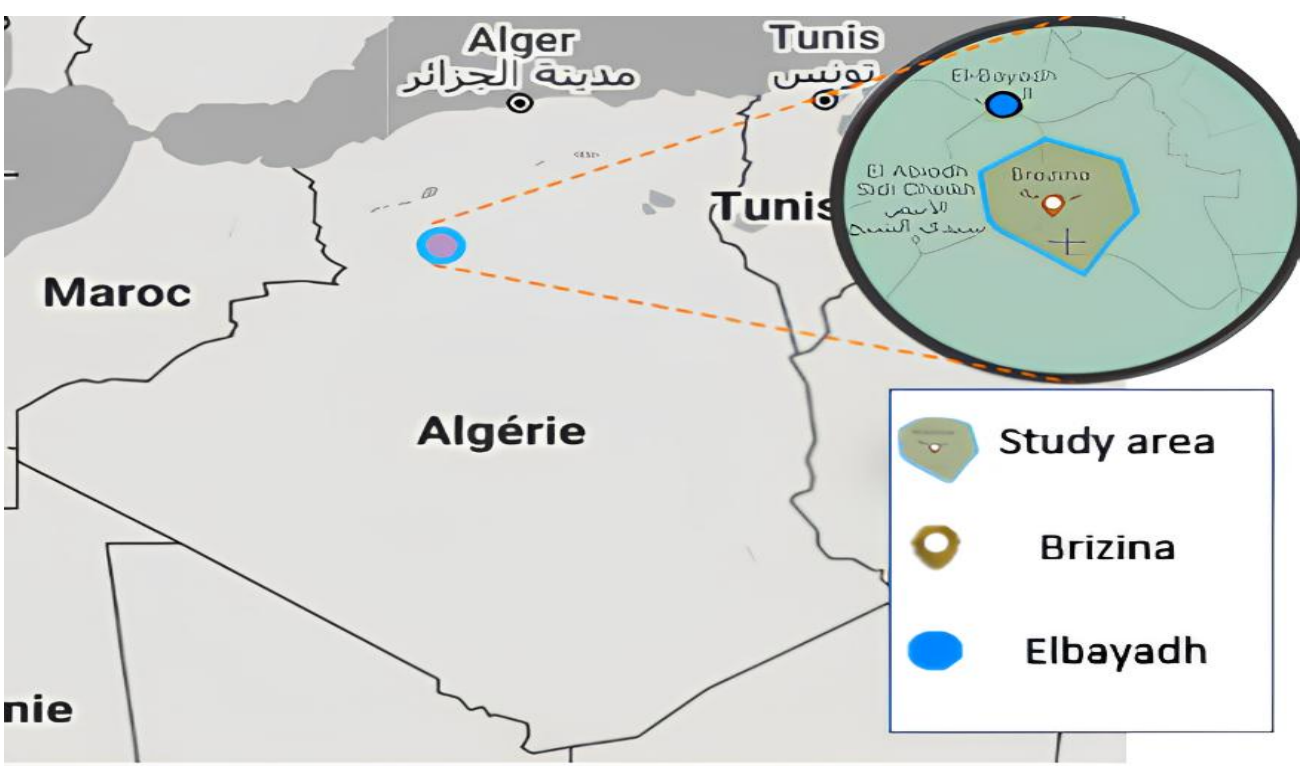

Fig. 1. Geographical Location of Brezina region.

Plant collection and identification: Medicinal plant specimens cited by informants were collected during field visits. Each specimen was pressed, dried, and mounted on herbarium sheets. Identification was carried out using regional floras and taxonomic keys, and the scientific names were verified according to The Plant List and APG IV (2016) standards. Voucher specimens were deposited at the Department of Biological Sciences, University of El Bayadh.

Data processing and statistical analysis: All collected data were entered into a database and analyzed using Microsoft Excel 2020. Descriptive statistics were used to summarize demographic data, plant parts used, preparation methods, and ailments treated. Ethnobotanical indices were calculated to identify the most significant medicinal species in the region. Results were compared with recent ethnobotanical studies from other regions to contextualize findings.

This revised section provides clear background, detailed methodology, explicit objectives, and comprehensive information on the study area and analytical approach, fully addressing the reviewer's concerns.

Utilise the concept of value (UV) and (RFC): The usage value was employed to ascertain the extent of utilisation of each species within the research area. The calculation was performed using the subsequent formula: The formula for UV is defined as the ratio of Ui to Ni, where Ui represents the number of use reports reported by each informant for a certain species, and Ni represents the total number of informants (Suroowan & Mahomoodally, 2016; Gogoi & Sen,2023).

The relative frequency of citations (RFC) was used to evaluate the relative importance of plant species cited by informants and calculated as previous investigators (Ahmad *et al.*, 2017) by the following formula:

RFC= FC/N (0< RFC<1); (FC, the number of informants mentioning the use of the species) (Maroof *et al*., 2025).

Results and Discussion

Use of medicinal plants according to age: Data processing has facilitated the creation of table 1, which demonstrates that the utilisation of medicinal plants in the Brezina region is prevalent among individuals of all age categories, with a significant majority among those aged 45 to 65 (75%). Following are the age categories in ascending order: individuals aged 25-45, individuals aged 65-85, and individuals aged above 85. The relative percentages for these age groups are 13%, 10%, and 2%. Examination of this data reveals that individuals in the age range of 45 to 65 and above exhibit a utilisation rate of medicinal plants at 75%, in contrast to the remaining age groups which have a rate of 25%. Understanding the use and characteristics of medicinal plants is typically gained via extensive practical knowledge and transmitted from one generation to another. The dissemination of this knowledge is presently at risk due to its uncertain guarantee. The findings from several studies on the use of medicinal plants support these characteristics (Benlamdini *et al*., 2014; Orch *et al*., 2015; Aribi *et al*., 2013; Ait*.,* 2015).

Undoubtedly, the knowledge acquired throughout time is the primary reservoir of information at the community level about the utilisation of plants in traditional medicine. It is worth mentioning that there is a decline in knowledge regarding the traditional therapeutic applications. This decline can be attributed to the scepticism exhibited by certain individuals, particularly the younger generation, who tend to have limited faith in this style of therapy. (Dif *et al*., 2022).

Use of medicinal plants to Gender or sex: In table 1; of those questioned, 73% were women and 23% men. This is justified by the fact that women are responsible for preparing recipes for their own skin care. This is logical, given that women are more concerned with phytotherapy than men. In light of this, Aribi *et al*., (2013) also discovers that women (68%) know more about medicinal species than men (32%), according to an ethnobotanical study of healing plants in the Jijel region.

Use of medicinal plants to level of education: The use of medicinal plants varies according to the level of education (Table 1). Illiterates are clearly represented, with a percentage of 64%, than educated individuals regarding the use of medicinal plants. However, individuals with a secondary education level have a significant percentage of use (28%), while those with a university education level use medicinal plants less (8%). This is explained by the fact that vigilance regarding the potential side effects that can be caused by herbal medicine increases with the level of education of individuals.

Use of medicinal plants to family situation: Married people (63%) use medicinal plants far more frequently than single people (8%), primarily due to the fact that they can avoid or reduce the costs associated with the materials needed to fill prescriptions from doctors and chemists. This can be explained by the fact that parents are in charge of their family members' health and administer first aid, particularly to their children. On the other hand, they turn to traditional medicine in order to reduce the high expense of prescription drugs and medical visits. Today modern medicine has become a heavy burden on small families. The same results were found in several studies, such as in Benin (Dougnon *et al*., 2016) and in Algeria (Dif *et al*., 2023).

Table 1. Typical characteristics of the users.

Age		Gender		Educational		Family situation	
[25-45] years	13%	Female	73%	Illiterate	22%	Married	63%
[45-65] years	75%			Primary school	42%	Single	8%
[65-85] years	10%	Male	27%	Secondary school	28%	Divorced	12%
[85-100] years	2%			University	8%	Widower	17%

Sociodemographic characteristics of informants: A total of 300 informants participated in the survey, representing a wide range of ages, genders, and educational backgrounds (Table 1). The majority of respondents were women (73%), reflecting their central role in the preparation and administration of traditional remedies, consistent with findings from other regions (Li *et al*., 2020; Bekele *et al*., 2024). Most users of medicinal plants were married (63%), and the largest age group was 45–65 years (75%), indicating that traditional knowledge is predominantly retained by middle-aged and older adults (Benkhnigue *et al*., 2011). Notably, illiterate individuals comprised 64% of users, suggesting that ethnobotanical knowledge is more deeply rooted among less formally educated populations, a trend also observed in similar studies in Ethiopia and Pakistan (Awoke *et al*., 2024; Megersa *et al*., 2023).

Medicinal plants used by informants

Mode to use of medicinal plants: The decoction, infusion, powder, or maceration are the many treatment techniques we employed to make the active component delivery fluid (Fig. 2). We found that the population of the Brezina region uses more preparation modes when the administrator works on the principles that contain the medicinal plants. The infusion is the extraction mode of the most used devices with a concentration of 39%, followed by decoction (26%). The people in the area think this kind of preparation is good for neutralising the harmful effects of some recipes by warming the body and disinfecting the plant. According to numerous ethnobotanical investigations, the decoction is the most popular in the Wilaya of Bouira, Algeria (Laifaoui & Aissaoui, 2019).

Part of plants used: The most significant components that convey the plant's sensitivity are its roots, bark, and flowers. The remaining components are its leaves, stem, and combined fruits and grains. The results (Fig. 3) show that leaves are used in the majority, with a percentage of 44%, followed by seeds 21%, leafy stems 13%, and rhizomes 17%. This high frequency of use of leaves and seeds (65%) can be explained by the ease and speed of harvesting (Bistindou, 1986), but also, according to users, by the fact that these organs are exposed to the sun, which provides them with virtues and benefits. The scientific explanation is the phenomenon of photosynthesis, which promotes biosynthesis and the storage of metabolites. (Bouayyadi *et al*., 2015).

The principal methods of remedy preparation in Brezina were infusion (39%) and decoction (26%), followed by powder and maceration (Fig. 2). This preference for infusion and decoction aligns with findings from other North African and sub-Saharan ethnobotanical studies, where these methods are favored for their efficacy and simplicity (Benchohra *et al*., 2025). Leaves were the most commonly used plant part (44%), followed by seeds (21%), leafy stems (13%), and rhizomes (17%) (Fig. 3). The predominance of leaves and seeds is attributed to their accessibility and the high concentration of bioactive compounds resulting from photosynthesis, as reported in previous research (Chiu *et al*., 2025).

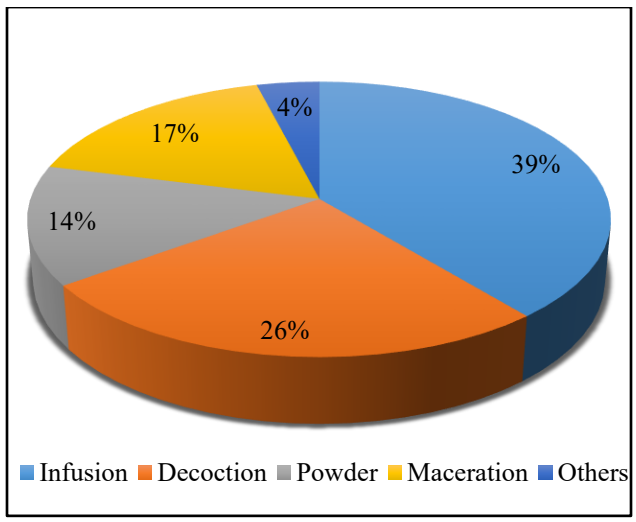

Fig. 2. Distribution of medicinal plant usage frequency in the Brézina region according on preparation technique.

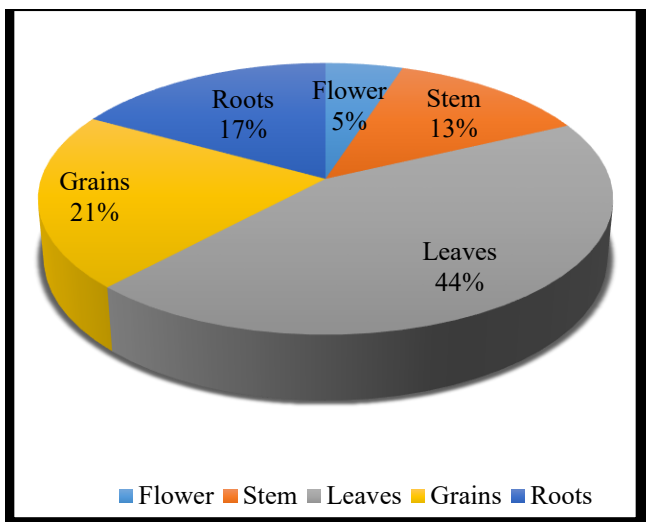

Fig. 3. Distribution of medicinal plant usage frequency in the Brézina region based on the portion of the plant used.

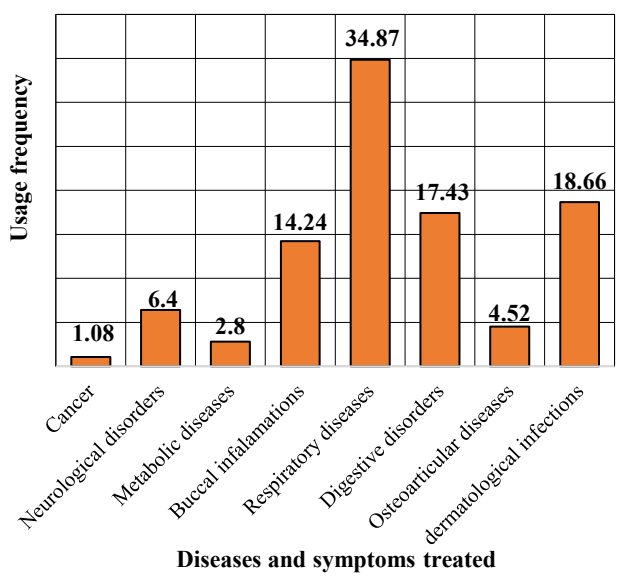

Fig. 4. Distribution of medicinal plant usage frequency in relation to disorders treated in the Brézina region.

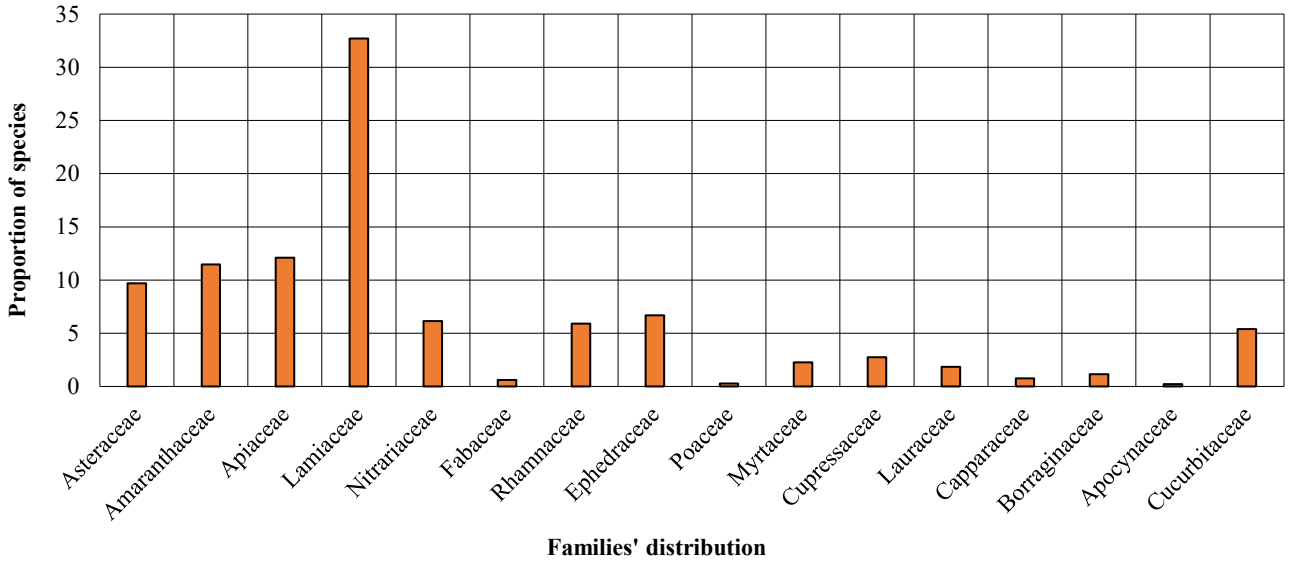

Fig. 5. Families' distribution according to the proportion of species in the area.

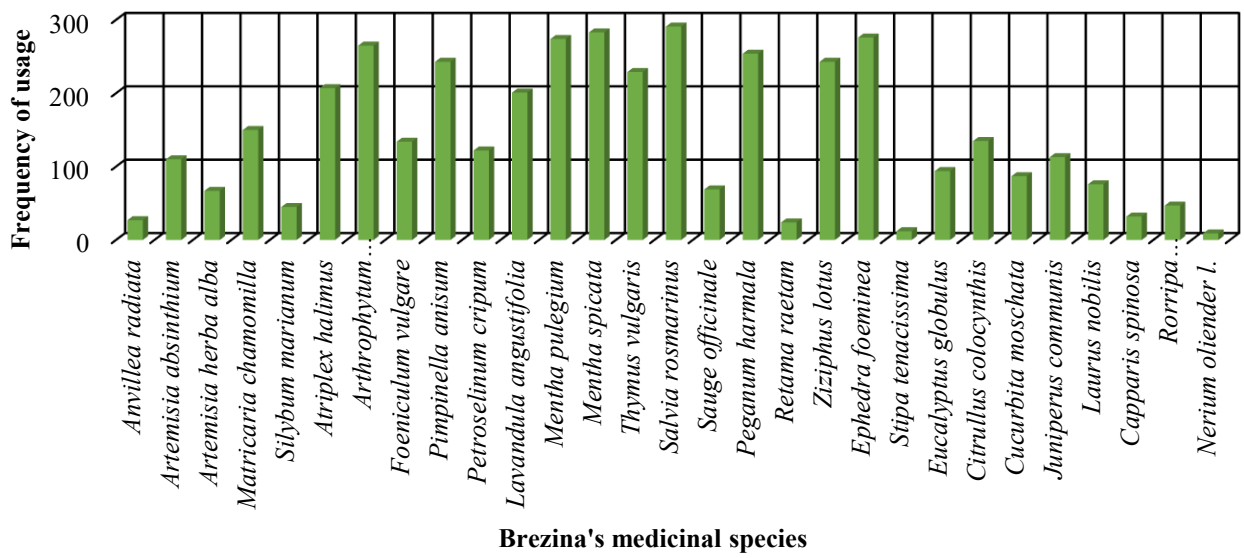

Fig. 6. Distribution of Brezina's medicinal species' frequency of usage.

Analysis of diseases and symptoms treated: Figure 4 shows the various illnesses that medicinal plants in the research area address. It is evident that the respiratory system's pathologies receive the greatest amount of treatment (34,87%), with dermatological infections (18,66%), digestive disorders (17,43%), neurological disorders, and other conditions presenting in smaller percentages following suit. That demonstrates the variety of illnesses that plants in Brezina may treat.

Medicinal plants in Brezina are used to address a broad spectrum of ailments, with respiratory disorders being the most commonly treated (34.87%), followed by dermatological infections (18.66%) and digestive disorders (17.43%) (Fig. 4). This pattern reflects the high prevalence of these health issues in the region and is consistent with ethnobotanical data from other arid and semi-arid environments, where respiratory and digestive ailments are prominent targets for traditional therapies (Belhacini *et al*., 2024).

Flora analysis: A floristic analysis of the species recorded shows (Figs. 5 and 6) that 29 medicinal species are used. They are divided into 16 botanical families, which clearly reflects the great wealth of medicinal plants in the region studied. The botanical families that dominate the medicinal flora of the Brezina region are Lamiaceae (32.7%), Apiaceae (12.11%), Amaranthaceae (11.46%) and Asteraceae (7.29%). The result is in line with that obtained by Benkhnigue *et al*., (2011) who carried out studies on towns in the Gharb region (Morocco).

The survey documented 29 medicinal plant species belonging to 16 botanical families, demonstrating substantial floristic diversity (Figs. 5 and 6). The dominant families were Lamiaceae (32.7%), Apiaceae (12.11%), Amaranthaceae (11.46%), and Asteraceae (7.29%). This distribution mirrors patterns reported in other Mediterranean and North African ethnobotanical studies, where Lamiaceae and Apiaceae are frequently represented due to their aromatic and therapeutic properties (Djahafi *et al*., 2021).

Table 2. Ethnomedicinal data of plants used in traditional medicine in Brezina (Elbayadh, Algeria).

Family	Botanical name	Local name	Part used	Method of preparation	Uses medicinal	FC Number of informants citing a given plant species	UR	RFC	UV
Asteraceae	*Anvillea radiata*	نقد Nugd	Aerial part	Infusion Decoction	Dermatological infections Buccal infalamations	27	33	0.09	0.11
	Artemisia absinthium	شيح Chih	Leaves and flowering tops	Infusion	Osteoarticular diseases	110	195	0.36	0.56
	Artemisia herba alba	شيح أبيض Chih labyed	Leaves and flowering tops	Infusion	Digestive disorders Respiratory diseases	67	123	0.22	0.41
	Matricaria chamomilla	بابونج Babunj	Flowers	Decoction Infusion Maceration	Dermatological infections Buccal infalamations	150	145	0.50	1.15
	Silybum marianum	شوك الجمل Chok jamel	Flowers	Powdered and mixed with olive oil	Cancer	45	135	0.15	0.33
Amaranthaceae	*Atriplex halimus*	قطف Guetef	Aerial part	Maceration Infusion	Rhematism	207	261	0.69	0.87
	Arthrophytum scoparium	رمث Remth	Aerial part	Infusion decoction	Respiratory diseases Dermatological infections Neurological disorders	265	121	0.88	1.07
Apiaceae	*Foeniculum vulgare*	بسباس Basbas	Aerial part	Infusion decoction	Dermatological infections	134	189	0.44	0.63
	Pimpinella anisum	حَبة الحلوة Haba holwa	Grain	Maceration	Digestive disorders Respiratory diseases	243	297	0.81	0.99
	Petroselinum cripum	بقدونس Bakdunes	Aerial part	Infusion Maceration	Dermatological infections	122	285	0.40	0.59
Lamiaceae	*Lavandula angustifolia*	خزامى Khozama	Leaves and flowering tops	Infusion Poudre	Osteoarticular diseases Respiratory diseases Dermatological infections	201	255	0.67	0.85
	Mentha pulegium	الفليو Fluo	Aerial part	Infusion maceration Decoction	Respiratory diseases Digestive disorders	274	230	0.91	1.1
	Mentha spicata	نَّعْنَاع Naanaa	Aerial part	Infusion maceration Decoction	Respiratory diseases Digestive disorders	283	239	0.94	1.13
	Thymus vulgaris	زعتر Zaater	Aerial part	Infusion Maceration Poudre	Respiratory diseases Digestive disorders	229	285	0.76	0.95
	Salvia rosmarinus	إكليل الجبل Yazir	Leaves	Infusion maceration Decoction	Respiratory diseases Buccal infalamations Metabolic diseases Neurological disorders	291	245	0.97	1.15
	Sauge officinale	مريمية Maramya	Leaves	Infusion	Dermatological infections	69	123	0.23	0.41

Table 2. (Cont'd.).

Family	Botanical name	Local name	Part used	Method of preparation	Uses medicinal	FC Number of informants citing a given plant species	UR	RFC	UV
Nitrariaceae	*Peganum harmala*	حَرْمَلْ Harmel	Aerial part and grains	Decoction Pouder Infusion	Metabolic diseases Digestive disorders Buccal infalamations	254	209	0.84	1.03
Fabaceae	*Retama raetam*	رتم. R'tem	Aerial part	Caplasme Huile	Metabolic diseases	24	78	0.08	0.26
Rhamnaceae	*Ziziphus lotus*	سدر Sadr	Aerial part Fruit and grains Roots	Infusion Poudre	Respiratory diseases Cancer Neurological disorders Digestive disorders	243	230	0.81	1.10
Ephedraceae	*Ephedra foeminea*	علندة. Alinda	Aerial part	Infusion	Cancer Metabolic diseases	276	230	0.92	1.1
Poaceae	*Stipa tenacissima*	حلفاء Halfa	Aerial part	Compresse Poudre	Metabolic diseases	12	66	0.04	0.22
Myrtaceae	*Eucalyptus globulus*	كالبتوس Kalitus	Leaves	Bain Infusion Decoction	Respiratory diseases	94	150	0.31	0.5
Cucurbitaceae	*Citrullus colocynthis*	حَدج Hadj	Fruit Grains	Huile Poudre	Metabolic diseases	135	189	0.45	0.63
	Cucurbita moschata	ليقطين El yaketin	Fruit Grains	Pouder Infusion	Metabolic diseases	87	141	0.29	0.47
Cupressaceae	*Juniperus communis*	عرعار Araar	Aerial part	Maceration Decoction Infusion	Dermatological infections Respiratory diseases	113	168	0.37	0.56
Lauraceae	*Laurus nobilis*	رند Rend	Leaves	Maceration Decoction Infusion	Metabolic diseases	76	132	0.25	0.44
Capparaceae	*Capparis spinosa*	كبار Kabar	Aerial part	Maceration	Dermatological infections Digestive disorders Metabolic diseases	32	276	0.10	0.29
Borraginaceae	*Rorripa nasturtiurnaquaticum*	جرجير Djardjir	Seeds/ leaves/ aerial part	Infusion	Metabolic diseases	47	90	0.15	0.34
Apocynaceae	*Nerium oliender l.*	دفلى Defla	Leaves/ aerial part/ underground part	Maceration	Metabolic diseases	9	13	0.03	0.21

Most commonly used medicinal plants: The results presented in the table show that of the 29 species found in the region studied, nine are used relatively more than other species in traditional phytotherapy by the local population. The use value of the plant cited varies between 0.03 and 0.97. The highest UV were recorded for the following species: *Salvia rosmarinus* (0.97), *Mentha spicata* (0.94), *Ephedra foeminea* (0.92), *Mentha pulegium* (0.91), *Arthrophytum scoparium* (0.88), *Peganum harmala* (0.84), *Ziziphus lotus* (0.81), *Pimpinella anisum* (0.81) and *Thymus vulgaris* (0.76) are used to treat diseases in the Brezina region. (Table 2).

These indices facilitate objective comparison with other studies and underscore the high cultural value of certain species in Brezina. (Leonti *et al*., 2022).

This species of plant is aromatic and therapeutic. Their medicinal qualities have been utilised in traditional medicine as an oral preparation to alleviate muscle spasms, dysmenorrhea, and renal colic. They possess antioxidant, antifungal, antiviral, antibacterial, anti-inflammatory (Al-Sereiti *et al*., 1999; Begum *et al*., 2013), anticancer, antithrombotic, antinociceptive, antidepressant, and antiulcerogenic properties. (Ribeiro-Santos *et al*., 2015; Ojeda-Sana *et al*.,2015 and Motjotji, 2023).

Some species are widely grown all over the world for their valuable commercial properties and amazing aroma. For instance, *M. spicata* is well recognised for its traditional medical uses, specifically for the treatment of colds, coughs, asthma, fevers, obesity, jaundice, and digestive issues. It is also used as a flavouring component in traditional cuisines. Ganesan *et al*., (2021) The Arabic name for a low, stalky Eurasian shrub belonging to the Ephedraceae family, which is widely distributed in northern Palestine and the southeast Mediterranean, is alanda (*Ephedra foeminea* or *Ephedra campylopoda*). It is a treatment for skin rash and agitation in Oriental Arab medicine. Furthermore, it has been demonstrated that the aerial parts of certain Ephedra species contain active alkaloids, including phenylpropylamino, alkaloids, ephedrine, and pseudoephedrine (Ismail *et al*., 2023).

Use value (UV), frequency of citation (FC), and use report (UR): The quantitative analysis results, specifically UV and UR, indicate that the plant species most commonly utilized in traditional medicine (refer to Table No2) include *Pimpinella anisum* (Apiaceae) with UR=297 and UV=0.99, followed by *Thymus vulgaris* (Lamiaceae) with UR=285 and UV=0.95, and *Lavandula angustifolia* (Lamiaceae) with UR=255 and UV=0.85. Regarding citation frequency, the plant species with the highest citation counts, listed in descending order, are *Salvia rosmarinus* (Lamiaceae) with a frequency count of 291, *Mentha spicata* (Lamiaceae) with a frequency count of 283, and *Arthrophytum scoparium* (Amaranthaceae) with a frequency count of 265.

The elevated use values of plant species indicate their greater prevalence in a certain location, making them more familiar and more likely to be harvested compared to less frequently encountered plants (Giday *et al*., 2003).

While plant species with high RFC and UV were the most favored in the research locations, those with low RFC and UV should not be overlooked, as they also convey valuable information for future generations. Additionally, community-level conservation actions are essential for the safeguarding of endangered species.

The results from Brezina are consistent with recent ethnobotanical surveys in Ethiopia, Pakistan, and Morocco, where similar methods, plant parts, and families dominate traditional medicine (Shekarchi *et al*., 2012). However, the high UV and RFC values for certain species, such as *Salvia rosmarinus* and *Mentha spicata*, highlight the unique local adaptations and preferences in Brezina. The decline in traditional knowledge among younger generations, observed here and in other studies, underscores the urgent need for documentation and conservation efforts (Ramirez *et al*., 2007).

Table 3. Use reports, number of taxa and Informant Consensus Factor for each therapeutic use category.

Category	Nt	Nur	ICF
Dermatological infections (Di)	9	41	0.8
Buccal infalamations (Bi)	4	32	0.9
Osteoarticular diseases (Od)	2	19	0.94
Digestive disorders (Dd)	8	183	0.96
Respiratory diseases (Di)	10	**142**	0.93
Cancer (C)	2	2	0
Rhematism (R)	1	1	0
Metabolic diseases (Md)	11	49	0.79
Neurological disorders (Nd)	**3**	**5**	**0.5**

Legend: IFC=Informants' consensus factor; Nur=Number of use-reports; Nt=Number of taxa; IFC: 1=100% Consensus; 0.5-0.9 = High consensus; 0.1-0.4: Low consensus; 0: Absence of consensus (Disagreement)

The data in Table 3 illustrates the quantity of usage reports and the number of species utilized for each category. The examination of the results derived from the ICF calculations indicates that the category of digestive illnesses exhibited the greatest ICF (ICF=0.96), followed in descending order by osteoarticular diseases (ICF=0.94) and respiratory diseases (ICF=0.93).

The results were analogous to the documented ethnobotanical use of plant species in the Humla District of Western Nepal (Rokaya *et al*., 2010). This signifies that the majority of individuals employed a considerable variety of plant species to address gastrointestinal diseases, while only a minority utilized plant species for Neurological disorders

This results is consistent with findings related to medicinal herbs use in Jeddah, Saudi Arabia (digestive ICF=0.92 and respiratory ICF=0.89) (Alqethami *et al*., 2020). Digestive and respiratory disorders were the most prevalent conditions treated with medicinal plants among the investigated population.

All of the ICFs identified in this study exceed 0.5. The elevated ICF values suggest a satisfactory level of informant reliability regarding the utilization of plant species. The consensus values from informants revealed a shared understanding of the key medicinal plant species utilized for addressing the most commonly encountered diseases in the study region. Consequently, species exhibiting elevated ICF should be given priority for subsequent pharmacological and phytochemical investigations (Njoroge & Bussmann, 2006).

Conclusion

With all the development of the chemical drug industry, herbal medicine remains a source of remedy par excellence and especially with fewer side. The local population of the Brézina region is using phytotherapy. It also seems that there is still an involvement in the conservation of folk know-how in traditional herbal medicine.

Moreover, analysis of the results obtained shows that the leaves are the most widely used part. Infusion is the most popular method of preparation in most medical recipes. Most medicinal plant users are married people. These medicinal plants are mainly used to treat respiratory ailments.

The twenty-nine species found in the region studied, nine are used relatively more than other species in traditional phytotherapy by the local population.

Several of the most cited species, including *Salvia rosmarinus*, *Mentha spicata*, and *Ephedra foeminea*, possess well-documented pharmacological properties (antioxidant, anti-inflammatory, antimicrobial, etc.), supporting their continued use in traditional medicine. The strong informant consensus for these species suggests both efficacy and cultural entrenchment.

This study provides a comprehensive quantitative and qualitative assessment of medicinal plant use in the Brezina region, contributing valuable data to the broader field of ethnobotany. The integration of quantitative indices and comparison with global literature enhances the scientific rigor and relevance of the findings. The results highlight the importance of safeguarding traditional knowledge and plant biodiversity, particularly in regions where such practices are at risk of erosion due to modernization and changing lifestyles.

Acknowledgements

Our goal is to contribute to the development of new natural medicines by providing the scientific community with a comprehensive database of medicinal plants from the Brezina region. Additionally, we aim to raise awareness among decision-makers about the importance of safeguarding plant biodiversity.

Although some plants possess medicinal properties, further studies are necessary to investigate the mechanisms by which these plants exert their effects on the body and to identify the active ingredients involved in this process.

Future research and development on selected plant species, including ethnopharmacological studies (both *In vitro* and *In vivo*), is essential for the scientific confirmation and authentication of their applications. This scientific foundation will ultimately facilitate the establishment of a herbal-based sector and contribute to the protection and sustainable management of many plant species.

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