


Ethnobotanical Study of Medicinal Plants Used by Traditional Therapists for Headache Treatment in the Tafila Region, Jordan

Ahed J Alkhatib¹  , Farnoush Abdi² 

¹Department of forensic science and toxicology, Faculty of Medicine, Jordan University of Science and Technology, Jordan

²PhD in Biochemistry, Post-doctorate in Food and Diabetes, The Hospital for Sick Children, Institute of Medical Science, University of Toronto, Canada

Article Info	ABSTRACT
<p>Article type: Original Article</p> <p>Article History: Received: 09 Jan 2025 Revised: 12 Aug 2025 Accepted: 18 Aug 2025 Published Online:</p> <p> Correspondence to: Ahed J Alkhatib</p> <p>Email: ajalkhatibjust.edu.jo</p>	<p>Objective: Indigenous knowledge is taken as one of the important knowledge types about medicinal plants. This knowledge has a wide scope with various aspects, including the ethnobotany of medicinal plants. Ethnobotany refers to the human knowledge about botany and the ecology of plants.</p> <p>Methods: In this ethnobotanical study, the Tafila region in Jordan was studied. The data were collected using the questionnaire and interview method. The data about time, local name, therapeutic properties, traditional use method, and therapeutic organ utilized for the studied plants were recorded using questionnaire (50 respondents).</p> <p>Results: The obtained results indicated that medicinal plants, including <i>Unica granatum L.</i>, <i>Quercus coccifera L.</i>, <i>Salvia fruticosa Mill.</i>, <i>Rosmarinus officinalis L.</i>, <i>Sarcopoterium spinosum</i>, <i>Thymus vulgaris L.</i>, <i>Achillea fragrantissima</i>, <i>Ocimum basilicum L.</i>, <i>Anchusa strigosa</i>, <i>Aloe Vera (L.)</i>, <i>Nigella sativa L.</i>, <i>Varthemia iphionoides</i>, <i>Coriandrum sativum L.</i>, <i>Olea europaea L.</i>, and <i>Teucrium polium L.</i>, are used to treat headache. The family Lamiaceae was the most frequently used plant family. The leaf was the most frequently used plant organ (28%) for treating headache in this region. Decoction (41%) and infusion (35%) were the most widely used traditional methods for headache treatment in the Tafila region. The qualitative results showed that the medicinal plants <i>Achillea fragrantissima</i> (Forssk) Sch. Bip., <i>Unica granatum L.</i>, and <i>Salvia fruticosa Mill.</i> are among the most important effective plants against headache due to their higher UR, RCF, and PFU coefficients.</p> <p>Conclusion: The obtained results showed that the indigenous knowledge contains valuable therapeutic information relating to therapeutic properties of medicinal species. By identifying these ideas, steps can be taken toward production of plant-produced medicines.</p> <p>Keywords: Therapeutic plants, Ethnobotany, Tafila region, Jordan</p>
<p>➤ How to cite this paper Nazarbaghi S, Parsaei P. Ethnobotanical Study of Medicinal Plants Used by Traditional Therapists for Headache Treatment in the Tafila Region, Jordan. <i>Plant Biotechnology Persa</i>. 2026; 8(1): DOI: 10.61882/pbp.8.1.11</p>	

Introduction

Ethnobotanical study and knowledge refer to the documentation of non-written information in order to use it for therapeutic objectives [1]. In addition to providing information about medicinal plants and their various traditional applications by local communities, ethnobotanical study informs us about people's beliefs and values, and nature conservation methods [2,3]. Due to urbanization and the increasing use of chemical and modern therapies, ethnobotanical knowledge is seriously endangered and traditional medicinal data may be lost [4]. Ethnobotanical studies have played a key role in research studies on herbal therapy and medicinal plants over recent years [5]. These studies have been used for the discovery of new medications and new medication development [6]. Due to its low cost and fewer side effects, herbal therapy has received attention from researchers and pharmaceutical companies [7]. Moreover, high chemical drug prices and their complications have attracted lots of attention to the discovery of new medications using ethnobotanical knowledge [8]. Ethnobotanical studies are conducted to identify flora to treat diseases. Headache is the most common disease or disorder that everyone experiences during his life. Pain developed above the neck and felt in the head is known as headache. Headache is nervous in origin, and tissues and structures surrounding the brain become inflamed and painful [9]. Headaches can be regarded as one of the most common pains and disorders ranging from mild to severe [9]. According to the report presented by the International Headache Society, there are more than 150 types of headaches that occur due to different reasons. Generally, headache is a syndrome with different causes [10]. It occurs due to sleep deprivation, fatigue, migraine, viral infections, sinusitis, dental issues, etc [11]. It is also caused by the activation of certain nerves in blood vessels [11]. Mefenamic acid, aspirin, ibuprofen, acetaminophen, sumatriptan, ergotamine and naproxen are the most frequently used medications for the treatment of headache. These medications have chemical complications.

Jordan, an Asian country, is located in southwest Asia. This country possesses 120 medicinal plant species that are used in this region. So far, no specialized ethnobotanical study has been conducted on ethnobotany *for treatment of headache* in this region. This study aims to identify and report the

qualitative and quantitative analyses of the botanical information about *treatment of headache* in the Tafila region.

Materials and Methods

This cross-sectional ethnobotanical study was conducted between March 2023 and September 2023 in the Tafila region, Jordan. Tafila is a town with a population of 27,559 people in southern Jordan, located 183 kilometers southwest of Amman. It is the capital of Tafila Governorate. Tafila is well known for having green gardens replete with olive and fig trees, and grape-vines. Tafila was first built by the Edomites and called Tophel. There are more than 360 natural springs in al-the Tafila region. The map of the Tafila region is shown in Figure 1.

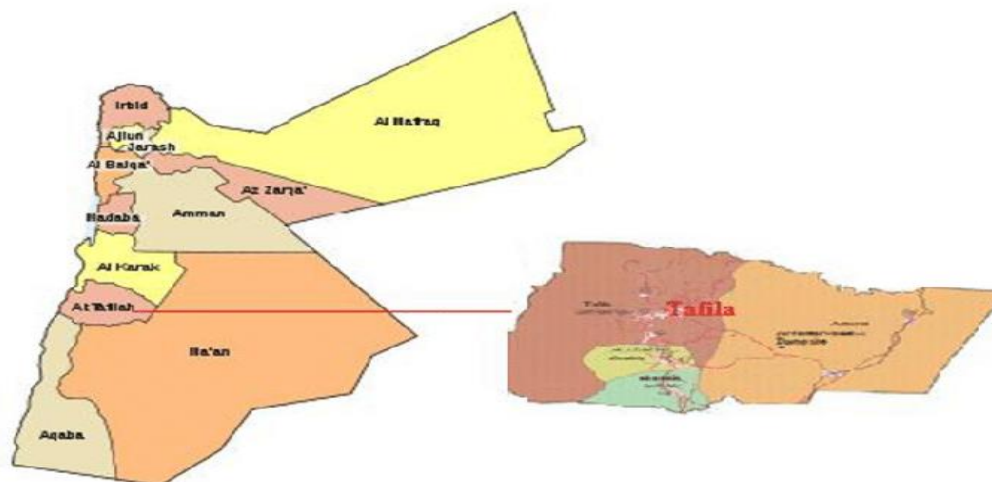


Figure 1: Map of the Tafila region

$$RFC = FC / N$$

The traditional therapeutic data about medicinal plants affecting headache were gathered using the ethnobotanical standard questionnaire. The interviewer personally conducted an interview by attending every *traditional medicine store* in the Tafila region. The questioner asked questions based on the standard questionnaire designed to collect traditional information about medicinal plants. The complete list of *traditional medicine stores* in the Tafila region was prepared by the deputy of food and drug. The questionnaire included demographic and personal information and the names of native plants, the organ used, how to use it, and the effect of traditional therapy.

Quantitative methods used in ethnobotanical studies allow researchers to use these formulas to select the most important species of medicinal plants for starting medicinal research during clinical studies. In order to analyze the data obtained from the interviews and in line with the objectives of this study, indicators, such as the usage report (UR) index and quantitative index of the relative frequency of citation (RFC) were reported. UR is the total number of usage reports for any item reported by informants. The RFC quantitative index was calculated for the relative importance of species for local medicines of the region. The RFC index is obtained by the following formula:

The RFC index indicates the number of people who indicated the use of a particular species. In relation to the mentioned FC, the number of Ba is equal to the informants and interviewees who mentioned a specific species and N is equal to the total number of people who were interviewed. The RFC index varies from zero (when no local knowledgeable person has stated the application for the plant in question) to one (when all local knowledgeable persons have stated the medicinal use for the plant in question).

Ethical considerations

The written consent to participate in the study was obtained from interviewees and they were assured that their personal information is kept confidential.

Results

According to the obtained results, the medicinal plants: *Unica granatum* L., *Quercus coccifera* L., *Salvia fruticosa* Mill., *Rosmarinus officinalis* L., *Sarcopoterium spinosum*, *Thymus vulgaris* L., *Achillea fragrantissima*, *Ocimum basilicum* L., *Anchusa strigosa*, *Aloe Vera* (L.), *Nigella sativa* L., *Varthemia iphionoides*, *Coriandrum sativum* L., *Olea europaea* L., *Teucrium polium* L. are used for treating headache in the Tafila region. In this study, *the botanical knowledge held by the traditional therapists*

and knowledgeable people in this region, especially with regard to the medicinal plants effective against headache, was acquired. The results are shown in Table 1.

Table 1: Traditional Herbal Remedies for Headache: Local Plants, Parts Used, and Methods of Administration

The plant local name	Scientific name	Herbal family	Organ used	Traditional way of using	Traditional therapeutic effect
Rumman	<i>Unica granatum L.</i>	Lythraceae	Fruit	Decoction	Headache
Baloot	<i>Quercus coccifera L.</i>	Fagaceae	Fruit and Root	Decoction	Headache
Meirameieh	<i>Salvia fruticosa Mill</i>	Lamiaceae	Leaf	Decoction, Infusion	Headache
Hasa alban	<i>Rosmarinus officinalis L.</i>	Lamiaceae	Leaf	Infusion	Headache
Billan	<i>Sarcopoterium spinosum (L.) Spach</i>	Rosaceae	Root	Poultice	Headache
Zaatar	<i>Thymus vulgaris L.</i>	Lamiaceae	Leaf	Infusion	Headache
Kaisoom	<i>Achillea fragrantissima (Forssk) Sch. Bip.</i>	Asteraceae	Aerial parts	Infusion	Headache
Baseil	<i>Ocimum basilicum L.</i>	Lamiaceae	Aerial parts	Decoction, Poultice	Headache
Himhim	<i>Anchusa strigosa Banks and Sol.</i>	Boraginacea	Aerial parts	Decoction	Headache
Saber	<i>Aloe Vera (L.)</i>	Asphodelaceae	Leaves and fruit	Sap	Headache

Habit el- Baraka	<i>Nigella sativa</i> L.	Ranunculaceae	Seeds	Decoction	Headache
Ktaile	<i>Varthemia iphionoides</i> Boiss and Blanche	Asteraceae	Flowering tops	Infusion	Headache
Kuzbara	<i>Coriandrum sativum</i> L.	Apiaceae	Leaves and Seed	Decoction	Headache
Zaitoon	<i>Olea europaea</i> L.	Oleaceae	Fruit	Oil	Headache
Jeada	<i>Teucrium polium</i> L.	Lamiaceae	Aerial parts	Infusion	Headache

This study showed that there are 15 medicinal plant species from 12 families in the Tafila region that are used for headache

treatment. The results of plant families' distribution are presented in Figure 2.

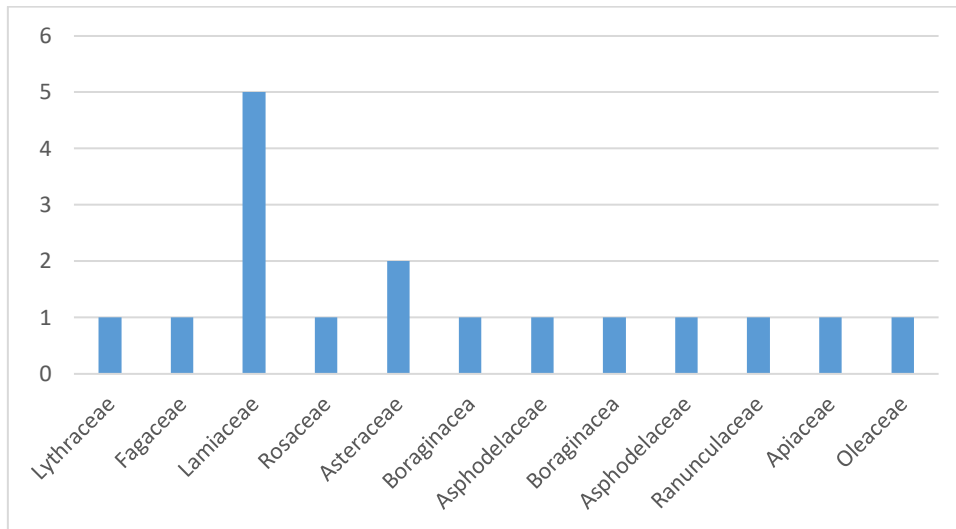


Figure 2: Distribution of effective plant families against headache

As shown in Figure 3, the leaf is the most frequent plant organ (28%) used for treating headache in this region.

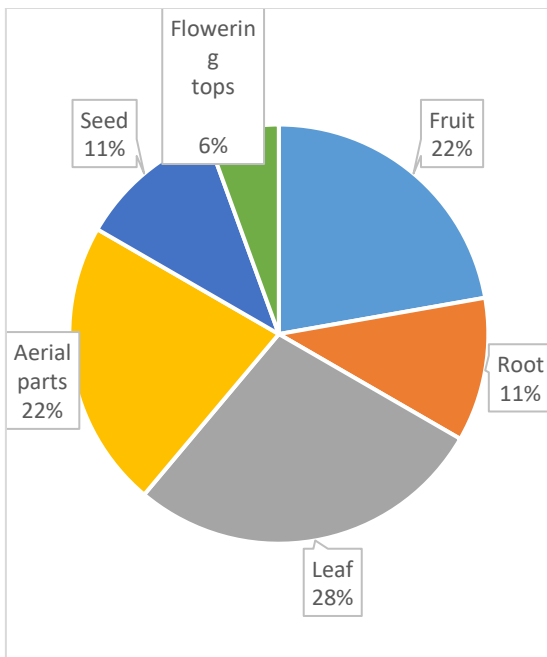


Figure 3: Percentage of plant organs used in this study

As shown in Figure 4, decoction (41%) and infusion (35%) are the most widely used traditional methods for headache treatment in the Tafila region.

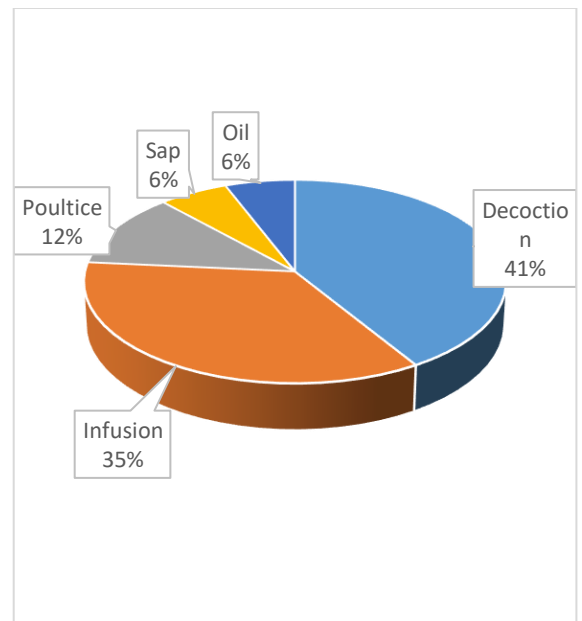


Figure 4: Percentage of the traditional use of medicinal plants effective against headache

The results of qualitative analysis and UR, RCF, and PFU items are presented in Table 2.

Table 2: Medicinal plants for headache

The name of the plant	UR	RCF	Percentage of frequency of use (PFU)
<i>Unica granatum L.</i>	0.73	28	56%
<i>Quercus coccifera L.</i>	0.69	24	48%
<i>Salvia fruticosa Mill</i>	0.73	28	56%
<i>Rosmarinus officinalis L.</i>	0.59	14	28%
<i>Sarcopoterium spinosum (L.) Spach</i>	0.62	18	36%
<i>Thymus vulgaris L.</i>	0.63	20	40%
<i>Achillea fragrantissima (Forssk) Sch. Bip.</i>	0.77	30	60%
<i>Ocimum basilicum L.</i>	0.69	24	48%
<i>Anchusa strigosa Banks and Sol.</i>	0.65	22	44%
<i>Aloe Vera (L.)</i>	0.69	24	48%
<i>Nigella sativa L.</i>	0.62	18	36%
<i>Varthemia iphionoides Boiss and Blanche</i>	0.63	20	40%
<i>Coriandrum sativum L.</i>	0.59	14	28%
<i>Olea europaea L.</i>	0.62	18	36%
<i>Teucrium polium L.</i>	0.62	18	36%

According to the results presented in Table 2, the qualitative results showed that the medicinal plants *Achillea fragrantissima* (Forssk) Sch. Bip., *Unica granatum L.*, and *Salvia fruticosa Mill* are the most important plants effective against headache due to their higher UR, RUF, and PFU.

Discussion

Medicinal plants with their wide genetic diversity and unique ability to synthesis can provide humans with a wide range of natural chemical compounds with various applications from foods to medications and perfumes.

Ethnobotany science is the study of the behavior of people or culture in a specific region with plants native to that region. This study evaluates the indigenous knowledge about medicinal plants in the Tafila region. The study by Abdelhalim (2017) et al., in Jordan showed that medicinal plants are used for treating *digestive system problems, respiratory infections, cardiovascular diseases, skin disorders*, etc. This study showed that medicinal plants, such as *Achillea fragrantissima* and *Nigella sativa* are used for treatment of migraine and headache [12]. The results of a study in Italy showed that *Sambucus nigra*, *Beta vulgaris* L., *Allium cepa* L., *Foeniculum vulgare*, *Pimpinella anisum* L., *Convallaria majalis* L., *Achillea atrata* L., *Achillea millefolium* L., *Arnica montana* L., *Artemisia absinthium* L., *Glebionis coronaria* (L.), and *Tanacetum balsamita* L. are amongst the effective medicinal plants against headache [13]. Results of a study showed that *Acacia ataxacantha* DC, *Acacia brevispica* Harms, *Acacia karroo* Hayne, *Acacia macrostachya* DC, *Acacia nilotica* (L.) Delile, *Acacia oerfota* (Forssk.) Schweinf., *Cacia pennata* (L.) Wild, *Aerva lanata* (L.) Juss., *Ageratum conyzoides* (L.) L., *Albizia amara*, *Allium cepa* L., *Allium sativum* L., *Anthonotha macrophylla* P Beauv, *Artemisia absinthium* L., *Artemisia afra*, *Asparagus plumosus* Baker, *Dysphania ambrosioides*, *Eucalyptus citriodora*, *Flueggea virosa*, *Griffonia simplicifolia*, *Halocnemum strobilaceum*, and *Jacaranda mimosifolia* D. Don are amongst medicinal plants used for treating headache in African continent [14]. The results of a study in Lorestan province southwest of Iran found the medicinal plants:

Echeveria elegans, *Alhagi persarum*, *Allium haemanthoides*, *Althaea officinalis*, *Anchusa italica*, *Artemisia annua*, *Cichorium intybus*, *Daphne mucronata*, *Falcaria vulgaris*, *Ferula angulata*, *Matricaria recutita*, *Paliurus spina*, *Papaver rhoeasa*, *Viola tricolor*, and *Ziziphus jujuba* to be used for headaches and migraines treatment [15]. Some of the plant species mentioned in other studies had an anti-headache effect and these studies were in agreement with our study in this respect. In this study, the Laminaceae family assigned the largest number of anti-headache medicinal plants to itself. In some of the other studies, the Laminaceae family assigned the largest number of ethnobotanical studies to themselves due to the weather conditions and soil characteristics [16, 17]. Severe changes in climatic conditions and recent droughts have definitely been effective in reducing the species richness of the region. Our study showed that decoction is the most frequent traditional method of using medicinal plants. In other ethnobotanical studies, the most commonly traditional method to use medicinal plants was reported to be decoction [18]. The ease of access to traditional medicine sources and their cost effectiveness have made people tend highly to use traditional and medicinal plants. People hold the indigenous knowledge of using these valuable medicinal resources (medicinal plants) and this knowledge is transferred from generation to generation. These valuable studies should thus be recorded and kept to preserve this indigenous knowledge [19]. The bioactive compounds and antioxidants present in medicinal plants can effectively help prevent and treat various disorders and diseases, including anemia, cardiovascular diseases, diabetes, and chronic inflammation, by neutralizing free radicals and reducing oxidative stress [20-25].

Conclusion

Considering the diversity of medicinal plants in this region and the importance of medicinal plants in the advancement of Iran's pharmaceutical industry, we had better find a solution to preserve and protect these valuable resources and prevent the loss and destruction of plants. These valuable resources can be used to produce effective anti-headache medicinal plants.

Statements and Declarations

Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

Funding

None.

Ethics approval

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

Consent to participate

Informed consent was obtained from all individual participants included in the study.

References

1. Pardo-de-Santayana M, Pieroni A, Puri RK. Ethnobotany in the New Europe: people, Health and Wild Plant Resources. New York, NY, Berghahn Books, 2010.
2. Bahmani E, Bahmani F, Abbaszadeh S. Ethnobotanical Study of Effective Medicinal Plants as Laxative (Anti-constipation): A Case Study in Arasbaran Forests, Northwest Iran. *Journal of Biochemicals and Phytomedicine*. 2023; 2(2): 59–63. doi: 10.34172/jbp.2023.12.

3. Baharvand Ahmadi, B., Khajoei Nejad, F., Papi, S., Eftekhari, Z. Phytotherapy for heart tonic: An ethnobotanical study in Dehloran City, Ilam Province, Western Iran. *Caspian Journal of Environmental Sciences*, 2023; (): 1-5. doi: 10.22124/cjes.2023.6192
4. Ahmadi M, Khajoei Nejad F, Dastyar N. Identification of important herbs for anti-fever treatment: an ethnobotanical study of Sojas Rud, northwest Iran. *Journal of Biochemicals and Phytomedicine*. 2023; 2(2): 54–58. doi: 10.34172/jbp.2023.11.
5. Dastyar N, Lysiuk R. Identification of the most important medicinal plants used for wound healing: An ethnobotanical study of Sistan and Baluchestan province, Southeastern Iran. *Journal of Biochemicals and Phytomedicine*. 2023; 2(1): 16–19. doi: 10.34172/jbp.2023.4.
6. Negahdari S. Ethnobotanical study of medicinal plants used for management of diabetes mellitus in the east of Khuzestan, southwest Iran. *Journal of Biochemicals and Phytomedicine*. 2023; 2(1): 7-10. doi: 10.34172/jbp.2023.3.
7. Abbaszadeh S, Karami N, Bahmani F, Abbasi N, Atefi E. Headache and Herbal Medicine: An Ethno-botanical Study of Shahrekord, Southwest of Iran. *pbp* 2019; 1 (1) :4-9. doi: 10.29252/pbp.1.1.4
8. Rabea Banoon S, Narimani-Rad M, Lotfi A, Shokri S, Abbaszadeh S, Özliman S. Phytotherapy in Prostatitis: a Review on the Most Important Medicinal Plants Affecting Prostatitis in Iranian Ethnobotanical Documents. *pbp* 2021; 3 (2) :68-74. doi: 10.52547/pbp.3.2.68
9. Robbins, M. S. (2021). Diagnosis and management of headache: a review. *Jama*, 325(18), 1874-1885.
10. Sanin, L. C., Mathew, N. T., Bellmeyer, L. R., & Ali, S. (1994). The International Headache Society (IHS) headache classification as applied to a headache clinic population. *Cephalalgia*, 14(6), 443-446.
11. Foroughipour, M., Sharifian, S. M. R., Shoebibi, A., Ebdali Barabad, N., & Bakhshae, M. (2011). Causes of headache in patients with a primary diagnosis of sinus headache. *European archives of oto-rhino-laryngology*, 268, 1593-1596.
12. Abdelhalim A, Aburjai T, Hanrahan J, Abdel-Halim H. Medicinal plants used by traditional healers in Jordan, the The Tafila Region. *Phcog Mag* 2017;13:95-101.
13. Mazzei, R., De Marco, E. V., Gallo, O., & Tagarelli, G. (2018). Italian folk plant-based remedies to heal headache (XIX-XX century). *Journal of ethnopharmacology*, 210, 417-433.
14. Frimpong, E. K., Asong, J. A., & Aremu, A. O. (2021). A review on medicinal plants used in the management of headache in Africa. *Plants*, 10(10), 2038.
15. Delfan, B., Bahmani, M., Hassanzadazar, H., Saki, K., & Rafieian-Kopaei, M. (2014). Identification of medicinal plants affecting on headaches and migraines in Lorestan Province, West of Iran. *Asian Pacific journal of tropical medicine*, 7, S376-S379.
16. Sajjadi SE, Bakhshiani M, Nekukhu M and Zolfaghari, B. Ethnobotanical study of medicinal plants city Fereidoonshahr (In Persian). *JITM* 2016; 7(3): 359-70.
17. Abbasi S, Afsharzadeh S and Mohajeri A. Ethnobotanical study of medicinal plants in Natanz region (Kashan), Iran. *J. Herbal Drugs* 2012; 3(3): 147-156.
18. Iranmanesh M, Najafi S and Yousofi M. Ethnobotanical survey of medicinal plants of Sistan region. *J. Herbal Drugs* 2010; 2: 61-8.
19. Gholipour A, Ghorbaninohooji M, Rasuli N and Habibi M. Ethnobotanical study on the medicinal plants of Zarm-rood Rural district of Neka (Mazandaran Province) *JMP*. 2014; 4 (52): 101-21.
20. Akbary P. Determination of antioxidant and phytochemical properties of premix extract of brown macroalgae *Padina australis*, *Sargassum licifolium*, and *Stoechospermum marginatum* from Chabahar coast, Southeastern Iran. *Aquat Anim Nutr*. 2024;10(1):27–41. doi: 10.22124/janb.2024.26283.1229.
21. Shahsavari S, Sarkar S, Sen DJ, Mandal SK. Determination of total antioxidant activity of methanolic extract of *Falcaria vulgaris*. *Journal of Biochemicals and Phytomedicine*. 2022; 1(1): 8–12. doi: 10.34172/jbp.2022.3.
22. Shoribei R, Mohammadiazarm H, Hedayati A, Maniat M. Effects of different levels of aqueous extract from date palm (*Phoenix dactylifera*) waste on growth performance, immune parameters, and antioxidant activity in juvenile red tilapia (*Oreochromis mossambicus* × *Oreochromis niloticus*). *Aquat Anim Nutr*. 2024;10(4):89–104. doi: 10.22124/janb.2025.29241.1264.
23. Eishi Oskuie A, Abdi F. Medicinal Plants Effective Against Anemia in Northwest Iran: A Review of Hematopoietic Medicinal Plants. *Plant Biotechnology Persa* 2024; 6 (2) :46-50
URL: <http://pbp.medilam.ac.ir/article-1-231-en.html>
24. Raoofi M, Akbarzadeh A, Noori A, Niroomand M, Abdoli L. Effect of diet containing the purple coneflower, *Echinacea purpurea* extract and powder on innate immune-antioxidant factors in the hemolymph of Pacific white shrimp, *Litopenaeus vannamei* under pH stress. *Aquat Anim Nutr*. 2025;11(1):1–17. doi: 10.22124/janb.2025.29579.1271.
25. Dayani S, Jafari V, Safari R, Hoseinifard SH. Effects of using different levels of dietary chitosan on some immune indices and antioxidant defense system in *Vannamei* shrimp, *Litopenaeus vannamei*. *Aquat Anim Nutr*. 2024;10(1):43–55. doi: 10.22124/janb.2024.27503.1244.