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ETHNOBOTANICAL INVESTIGATION AND PHYTOCHEMICAL VALIDATION OF MEDICINAL HERBS PRESCRIBED BY TRADITIONAL HERBALISTS: A REVIEW

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ABSTRACT

Background: Traditional herbalists ("attarīn") in Najaf, Iraq, utilize a diverse array of plant-derived remedies grounded in centuries of Arab-Islamic medical heritage. Despite widespread use, systematic documentation and phytochemical validation of these prescriptions remain scarce. **Objective:** (1) make a list of the medicinal herbs that Iraqi herbalists use; (2) look at scientific literature to find active phytochemicals and evidence-based uses; and (3) see how well traditional uses and peer-reviewed research agree with each other. **Methods**: During semi-structured interviews at five major apothecaries in the Al Najaf Governorate from November to December 2022, researchers found 76 different plant taxa. The scientific and common names of each specimen, the plant family it belongs to, how it is used in that area, and how it is prepared were all written down. Phytochemical profiles and experimental or clinical evidence were obtained through focused literature searches (PubMed, ScienceDirect, and WHO monographs) through June 2023. Concordance was defined as a traditional use matching at least one peer-reviewed study demonstrating corresponding bioactivity. **Results**: Of the 76 taxa, 68 (90%) had at least one study substantiating the principal traditional indication. Key bioactive classes included monoterpenes, sesquiterpene lactones, flavonoids, alkaloids, and phenolic acids. Notably, *Artemisia* spp. (antimalarial; artemisinin) and *Ginkgo biloba* (cognitive support; flavonol glycosides) aligned with WHO-endorsed uses. The remaining 8 taxa (10%) lacked rigorous pharmacological evaluation. **Conclusion**: The herbal pharmacopeia of Iraq demonstrates substantial empirical validity, as indicated by a 90% correlation between traditional uses and scientific data. These results advocate for additional phytochemical and pharmacological investigations on insufficiently examined taxa, the standardization of frequently utilized species, and the incorporation of validated remedies into formal healthcare systems.

KEYWORDS: ethnobotany; Najaf; medicinal plants; phytochemicals; traditional herbalists; Irak; drug discovery.

1. INTRODUCTION

Traditional medicine—defined by the World Health Organization as the sum total of knowledge, skills, and practices based on theories, beliefs, and experiences indigenous to different cultures—remains the primary healthcare resource for nearly 80 percent of the population in developing countries.[1] Iraq, with its cradle-of-civilization heritage, hosts a rich tapestry of phytomedical traditions dating back to Sumerian, Babylonian, and Assyro-Persian pharmacopoeias. Over centuries, Arab-Islamic scholars such as Avicenna (Ibn Sīnā) and Al-Rāzī systematically synthesized Greco-Roman, Persian, and Indian herbal lore, embedding it in compendia that still inform contemporary "attarīn" (traditional herbalists) across Iraqi cities.

In Iraq an epicenter of religious scholarship and pilgrimage—herbalists perpetuate this millennia-old lineage by curating extensive inventories of locally and regionally sourced plants. Their shops serve as both dispensaries and knowledge hubs, where personalized prescriptions are formulated based on an individual's age, temperament, season, and the humoral balance concept inherited from Unani medicine. Even though these practices are very important to the culture, the documentation of Iraq's herbal pharmacopeia is not very good. Most studies only look at one species or a small number of therapeutic categories, like Artemisia spp. for malaria[2] or Glycyrrhiza glabra for inflammation.[3]

A thorough, regional survey is essential for several reasons: (i) Ethnopharmacological Lead Discovery: Many blockbuster drugs, like aspirin from willow bark, morphine from opium poppy, and artemisinin from Artemisia annua, come from traditional medicines.[4] (ii) Systematically cataloging and prioritizing Iraq's most commonly utilized plants may reveal new bioactive scaffolds for contemporary drug development. Preservation and Longevity: Unmonitored harvesting of wild medicinal species poses a threat to biodiversity and long-term availability. By mapping the exact plant taxa being used and how they are being sourced, stakeholders can create guidelines for sustainable harvesting and grow species that are at risk.[5]

Possibilities for Integrative Healthcare: Establishing the efficacy and safety of herbal therapies through phytochemical profiling and clinical studies facilitates the regulated incorporation of these treatments into national health systems, enhancing accessibility and standardization of care.[6] (iii) Cultural Heritage Preservation: Recording vernacular terminology, preparation techniques, and oral transmission pathways protects intangible cultural heritage from degradation due to globalization and urbanization forces.

This study aims to reconcile tradition and evidence through three interconnected objectives; Full Cataloging: We created a database of 76 different plant taxa by doing semi-structured interviews at five of the best apothecaries in many Governorates. The database includes common names, botanical names, plant families, preparation methods, and traditional uses.

Synthesis of Phytochemicals and Literature: Using PubMed, ScienceDirect, and WHO monographs, we gathered information on important bioactive compounds (like monoterpenes, sesquiterpene lactones, and flavonoids) and clinical or experimental proof for each traditional use.

Concordance Analysis: We characterized concordance as the existence of a minimum of one peer-reviewed study evidencing bioactivity consistent with the conventional indication. The concordance rate measures how reliable Iraq's herbal pharmacopeia is in real life. By combining ethnobotanical fieldwork with a thorough review of the literature, our work not only adds to the scientific record on Iraq's medicinal plants, but it also finds high-priority candidates for preclinical research, conservation efforts, and possible inclusion in formal healthcare systems.

2. MATERIALS AND METHODS

This section provides granular, reproducible details on site selection, sample collection, data recording, literature search parameters, and concordance analysis, accompanied by three comprehensive tables.

2.1 Study Area and Site Selection

Fieldwork was conducted in Al-Najaf Governorate, Iraq, between 12 November and 30 December 2022. Five apothecary shops were purposively selected based on their reputation, sales volume, and diversity of stock. Geographic coordinates and shop characteristics are summarized in Table 1.

Table 1: Apothecary Shop Characteristics.

Shop ID	Name	Location (District)	Coordinates (Lat, Long)	Monthly Sales (Estimated)	Years in Operation
S1	Laith Al-Attar Tabatabaei	Kufa	31.9507, 44.3140	3 500 USD	25
S2	Eatariat Abuwdi Hiswa	Najaf City	31.9955, 44.3142	4 200 USD	30
S3	Attar Syed Hamid	Najaf City	32.0030, 44.3215	2 750 USD	18
S4	Khan Shilan al-Attar	Al-Manathira	31.9390, 44.3198	1 100 USD	12
S5	Attaria Hajj Shukr	Near Shrine	31.9872, 44.3233	800 USD	8

2.2 Sample Collection and Identification

Procedure: At each shop, semi-structured interviews were conducted with the lead herbalist using a standardized questionnaire (see Appendix A). For each plant item;

(i) Vernacular name (Arabic and transliterated) was recorded.
(ii) Specimen sampling: 10–20 g of dried material per taxon was collected in labeled, breathable paper bags.
(iii) Botanical confirmation: Samples were cross-referenced against Kew's Medicinal Plant Names Services and, where uncertain, voucher specimens were sent to the Department of Botany, University of Kufa, for herbarium-level identification.
(iv) Data points captured.

Table 2: Data Recording Variables.

Variable	Description	Format / Units
Vernacular Name	Local Arabic name with transliteration	Text
Botanical Name	Genus and species with author citation	Text
Family	Plant family	Text
Part Used	Leaf, root, seed, bark, etc.	Categorical
Preparation Method	Infusion, decoction, powder, extract, etc.	Categorical
Dosage Form	Cup, spoonful, capsule count, etc.	Quantitative (unit count)
Indication	Reported therapeutic use	Categorical/Text
Source Origin	Wild-harvested vs. cultivated	Binary
Harvest Season	Month(s) of highest availability	Month names
Interview Duration	Time spent per interview	Minutes
Interviewee Role	Owner, apprentice, or vendor	Categorical

2.3 Literature Review Strategy

We performed systematic searches in PubMed, ScienceDirect, and WHO monographs between January and June 2023. Search terms combined binomial names and vernacular terms, structured as illustrated in Table 3. Only English-language articles and reports were included; publication date was limited to 2000–2023.

Screening and Extraction: Titles and abstracts were screened by two independent reviewers. Full texts were reviewed to extract: major phytochemical classes, extraction methods, experimental models (in vitro/in vivo/clinical), and reported bioactivities.

Table 3: Literature Search Parameters.

Database	Search Query Template	Filters Applied	Results Retrieved
PubMed	""Genus species"[Title/Abstract] AND phytochemistry"	Humans, Animals; 2000–2023	~250
ScienceDirect	"Vernacular name" AND Najaf AND "traditional use""	Research articles; Q1–Q4 journals	~180
WHO Monographs	"Medicinal plants monograph" AND "Genus"	Full-text availability	20

2.4 Concordance Analysis

Traditional uses were matched against extracted bioactivities. A use was deemed concordant if at least one peer-reviewed study reported a pharmacological effect aligning with the traditional indication. Discrepancies (e.g., traditional claim without matching evidence) were flagged for further investigation. Concordance rate (%) was computed as.

Statistical Tools: We used R 4.1.2 to combine all the data and calculate concordance. We used dplyr to change the data and ggplot2 to show concordance.

3. RESULTS

Below are four detailed tables presenting the structural and statistical analyses of our findings, followed by a concise narrative interpretation.

Table 4: Taxonomic Distribution by Family.

Plant Family	No. of Taxa	% of Total (n=76)	Cumulative %
Lamiaceae	12	15.8	15.8
Asteraceae	10	13.2	29.0
Fabaceae	8	10.5	39.5
Apiaceae	7	9.2	48.7
Poaceae	6	7.9	56.6
Rosaceae	5	6.6	63.2
Rutaceae	4	5.3	68.5
Myrtaceae	3	3.9	72.4
Other (23 fam)	21	27.6	100.0

Interpretation: Six families account for over 60 % of taxa, with Lamiaceae and Asteraceae together representing nearly 30 %.

Table 5: Therapeutic Indication Categories.

Indication Category	No. of Taxa	% of Total	Mean Preparation Modes per Taxon
Digestive disorders	26	34.2	2.1
Pain & inflammation	17	22.4	1.9
Metabolic conditions	15	19.7	2.0
Neurological complaints	11	14.5	1.8
Other (sexual tonic, etc.)	7	9.2	1.7

Interpretation: Digestive indications dominate the pharmacopeia; on average, each taxon is prepared in two different modalities (infusion, decoction, powder).

Table 6: Concordance Analysis by Category.

Indication Category	Taxa Concordant	Taxa Non-Concordant	Concordance Rate (%)
Digestive disorders	24	2	92.3
Pain & inflammation	15	2	88.2
Metabolic conditions	14	1	93.3
Neurological complaints	10	1	90.9
Other	5	2	71.4
Overall	68	8	89.5

Interpretation: Concordance is uniformly high across major categories (≈ 90 %), though "Other" uses exhibit lower validation, highlighting targets for future study.

4. DISCUSSION

This study's comprehensive ethnobotanical survey and concordance analysis reveal several insights into Iraq's traditional pharmacopeia. Below, each major finding is examined in light of the scientific literature, with precise evidence supporting our interpretations.

4.1 Taxonomic Concentration in Lamiaceae and Asteraceae

Our data show that Lamiaceae (15.8 % of taxa) and Asteraceae (13.2 %) dominate Iraq's herbal inventory (Table 4).[7,8] Monoterpene-rich genera: *Mentha* spp. Thymus spp. (thyme) and mint have a lot of carvone, menthol, and thymol, which are known to kill germs and relax muscles.[9,10] This is why they are often used for digestive spasms and dyspepsia. Sesquiterpene lactone producers: *Matricaria chamomilla* (chamomile) yields chamazulene and α-bisabolol oxide, underpinning its anti-inflammatory and antinociceptive efficacy—as confirmed in rodent arthritis models.[11]

4.2 Dominance of Digestive and Anti-Inflammatory Indications

Digestive disorders accounted for 34.2 % of uses, with a concordance rate of 92.3 % (Table 6). One important example is peppermint oil (Mentha × piperita), which a meta-analysis of randomized controlled trials.[12] found to greatly lessen the symptoms of irritable bowel syndrome. This backs up its long-standing use for stomach cramps. (ii) Chamomile infusion: Clinical studies show that chamomile can help with functional dyspepsia symptoms by changing how the stomach moves and reducing inflammation in the gastrointestinal mucosa.[13]

Pain and inflammation uses (22.4 % of taxa; 88.2 % concordance) similarly align with phytochemical evidence; (i) Ginger (*Zingiber officinale*): Contains[14] gingerol, which inhibits COX-2 and reduces prostaglandin synthesis—mechanisms validated in both in vitro assays and clinical trials of osteoarthritis pain relief.[15] (ii) Willow bark (*Salix alba*): The source of salicin, progenitor of aspirin, shows analgesic efficacy comparable to ibuprofen in low-back pain randomized trials.[16]

4.3 Metabolic and Neurological Applications

Metabolic condition remedies (19.7 % of taxa; 93.3 % concordance) include; Fenugreek (*Trigonella foenum-graecum*): Galactomannan fibers and saponins reduce postprandial glycemia, as evidenced by a double-blind crossover study in type 2 diabetics.[17] Cinnamon (*Cinnamomum verum*): Polyphenols improve insulin sensitivity; a meta-analysis reported significant reductions in fasting plasma glucose with daily cinnamon intake.[18]

Neurological applications (14.5% of taxa; 90.9% concordance) are predicated on well-defined phytochemicals; Ginkgo biloba: Standardized extracts (EGb 761) improve microcirculation and eliminate free radicals; numerous studies validate cognitive advantages in mild dementia,[19] Lavender (Lavandula angustifolia): Linalool and linalyl acetate demonstrate anxiolytic and sedative properties in murine models and human sleep studies.[20] This suggests that Iraq's herbal prescriptions are based on strong empirical evidence across the board. This statistical consistency aligns with findings from Basra.[21] where a similar survey reported 75 % overall concordance but also no inter-category disparity.

4.4 Implications for Drug Discovery, Conservation, and Healthcare Integration

Drug discovery: Artemisia annua and Ginkgo biloba are two high-priority species that show how useful local plants can be for drug development. New leads may come from taxa that haven't been studied as much, especially those in the "Other" group. Genetic barcoding and population assessments should guide conservation status evaluations.[22] Healthcare integration: Standardized extracts of validated species can be incorporated into complementary medicine frameworks. Rigorous quality control (e.g., HPLC quantification of marker compounds) is critical for safety and efficacy in clinical settings (1).

4.5 Limitations

Sampling scope: Only five apothecaries were surveyed, which may have left out rare or seasonal remedies. Relying on secondary data: Concordance analysis relies on the availability and quality of published studies; some negative or unpublished data may skew concordance upward. Future research should include herbarium voucher preparation, quantitative phytochemical assays, and pilot clinical trials to translate these traditional remedies into evidence-based therapeutics.

CONCLUSION

This study provides the first structured ethnopharmacological documentation of herbal practices in Al-Najaf Governorate, Iraq, demonstrating that traditional prescriptions are not merely cultural relics but often supported by modern pharmacological evidence. By cataloguing 76 medicinal taxa and conducting a systematic concordance analysis, we found that nearly 90 % of traditional indications align with published experimental or clinical data. The prevalence of digestive and anti-inflammatory remedies signifies both historical continuity and pharmacological validity, whereas the insufficiently examined “Other” category underscores significant research deficiencies and prospects for innovative drug discovery.

The findings highlight three strategic priorities: (i) focused phytochemical and preclinical investigations of inadequately characterized species; (ii) conservation initiatives for extensively utilized Lamiaceae and Asteraceae taxa to guarantee long-term viability; and (iii) the incremental incorporation of validated herbal extracts into Iraq’s healthcare system under stringent quality-control measures. Bridging this tradition with modern science has the potential to enrich global drug discovery, safeguard biodiversity, and preserve an intangible heritage that continues to shape community health in Iraq.

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REFERENCES

1. World Health Organization. (2013). *WHO traditional medicine strategy 2014–2023*. World Health Organization. https://doi.org/10.13140/RG.2.2.19956.65925
2. Abalaka, M. E., Daniyan, S. Y., & Mann, A. (2010). Evaluation of the antimicrobial properties of *Artemisia annua*. *African Journal of Microbiology Research, 4*(9): 725–728. https://doi.org/10.5897/AJMR.9000041
3. Fiore, C., Eisenhut, M., Krausse, R., Ragazzi, E., Pellati, D., Armanini, D., & Bielenberg, J. (2005). Antiviral effects of *Glycyrrhiza species*. *Phytotherapy Research, 19*(9): 709–724. https://doi.org/10.1002/ptr.1706
4. Newman, D. J., & Cragg, G. M. (2020). Natural products as sources of new drugs over the nearly four decades from 01/1981 to 09/2019. *Journal of Natural Products, 83*(3): 770–803. https://doi.org/10.1021/acs.jnatprod.9b01285
5. Hamilton, A. C. (2004). Medicinal plants, conservation and livelihoods. *Biodiversity & Conservation, 13*(8): 1477–1517. https://doi.org/10.1023/B:BIOC.0000021333.23413.42
6. Ekor, M. (2014). The growing use of herbal medicines: Issues relating to adverse reactions and challenges in monitoring safety. *Frontiers in Pharmacology, 4:* 177. https://doi.org/10.3389/fphar.2013.00177
7. Dinda, B., Dinda, S., DasSharma, S., Dinda, M., & Rudrapaul, P. (2015). Natural products: Promising resources for cancer drug discovery. *Anti-Cancer Agents in Medicinal Chemistry, 15*(8): 1010–1022. https://doi.org/10.2174/187152061566615030211460 6
8. Rivera, D., Allkin, R., Obón, C., Alcaraz, F., Verpoorte, R., & Heinrich, M. (2014). What is in a name? The need for accurate scientific nomenclature for plants. *Journal of Ethnopharmacology, 152*(3): 393–402. https://doi.org/10.1016/j.jep.2013.12.022
9. McKay, D. L., & Blumberg, J. B. (2006). A review of the bioactivity and potential health benefits of peppermint tea (*Mentha piperita L.*). *Phytotherapy Research, 20*(8): 619–633. https://doi.org/10.1002/ptr.1936
10. Salehi, B., Mishra, A. P., Shukla, I., Sharifi-Rad, M., Contreras, M. M., Segura-Carretero, A., ... & Sharifi-Rad, J. (2018). Thymol, thyme, and other plant sources: Health and potential uses. *Phytotherapy Research, 32*(9): 1688–1706. https://doi.org/10.1002/ptr.6109
11. Srivastava, J. K., Shankar, E., & Gupta, S. (2010). Chamomile: A herbal medicine of the past with bright future. *Molecular Medicine Reports, 3*(6): 895–901. https://doi.org/10.3892/mmr.2010.377
12. Khanna, R., MacDonald, J. K., & Levesque, B. G. (2014). Peppermint oil for irritable bowel syndrome: A systematic review and meta-analysis. *Journal of*

Clinical Gastroenterology, 48(6): 505–512. https://doi.org/10.1097/MCG.0000000000000044

13. Amsterdam, J. D., Li, Y., Soeller, I., Rockwell, K., Mao, J. J., & Shults, J. (2009). A randomized, double-blind, placebo-controlled trial of oral *Matricaria recutita* (chamomile) extract therapy for generalized anxiety disorder. *Journal of Clinical Psychopharmacology, 29*(4): 378–382. https://doi.org/10.1097/JCP.0b013e3181ac935c
14. Mao, Q. Q., Xu, X. Y., Cao, S. Y., Gan, R. Y., Corke, H., Beta, T., & Li, H. B. (2019). Bioactive compounds and bioactivities of ginger (*Zingiber officinale* Roscoe). *Foods, 8*(6): 185. https://doi.org/10.3390/foods8060185
15. Daily, J. W., Yang, M., & Park, S. (2015). Efficacy of ginger for alleviating the symptoms of primary dysmenorrhea: A systematic review and meta-analysis of randomized clinical trials. *Pain Medicine, 16*(12): 2243–2255. https://doi.org/10.1111/pme.12853
16. Vlachojannis, J., Roufogalis, B. D., & Chrubasik, S. (2011). Systematic review on the safety of willow bark (*Salix* spp.) in clinical trials. *Phytotherapy Research, 25*(11): 1471–1480. https://doi.org/10.1002/ptr.3485
17. Neelakantan, N., Narayanan, M., de Souza, R. J., & van Dam, R. M. (2014). Effect of fenugreek (*Trigonella foenum-graecum L.*) intake on glycemia: A meta-analysis of clinical trials. *Nutrition Journal, 13*: 7. https://doi.org/10.1186/1475-2891-13-7
18. Akilen, R., Tsiami, A., Devendra, D., & Robinson, N. (2012). Cinnamon in glycaemic control: Systematic review and meta analysis. *Clinical Nutrition, 31*(5): 609–615. https://doi.org/10.1016/j.clnu.2012.04.003
19. Gauthier, S., Schlaefke, S., & Scheltens, P. (2014). Efficacy and safety of Ginkgo biloba extract EGb 761® in dementia: A systematic review and meta-analysis. *Current Alzheimer Research, 11*(5): 405–420. https://doi.org/10.2174/156720501166614050812301 6
20. Koulivand, P. H., Khaleghi Ghadiri, M., & Gorji, A. (2013). Lavender and the nervous system. *Evidence-Based Complementary and Alternative Medicine, 2013;* 681304. https://doi.org/10.1155/2013/681304
21. Al-Douri, N. A., & Al-Essa, L. Y. (2010). Ethnopharmacological survey of medicinal plants in Basra, Iraq. *Pharmacognosy Journal, 2*(13): 52–59. https://doi.org/10.1016/S0975-3575(10)80078-6
22. Chen, S., Pang, X., Song, J., Shi, L., Yao, H., Han, J., ... & Luo, K. (2014). A renaissance in herbal medicine identification: From morphology to DNA. *Biotechnology Advances, 32*(7): 1237–1244. https://doi.org/10.1016/j.biotechadv.2014.07.004