

Cultivating Health: Advancing Medicinal Plant Management Strategies in Iraq

Mahir Essa Alsalihi

Medical Laboratory Technology Dep., Kifri Technical Institute, Garmian Polytechnic University, Kurdistan Region, Iraq

***Corresponding author:** Mahir Essa Alsalihi, Medical Laboratory Technology Dep., Kifri Technical Institute, Garmian Polytechnic University, Kurdistan Region, Iraq.

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Abstract

From ancient Mesopotamia, medicinal plants have been important to human health. Their use in Iraq is traced back to early cuneiform tablets and relies on local flora for health advantages. Despite its rich history, Iraq confronts environmental deterioration, socio-political instability, and insufficient research resources that threaten plant sustainability. Modern medicine employs Iraqi and worldwide plants. Illegal business and weak policies hinder resource management. Medical plants, a \$5 billion worldwide business, offer Iraq economic promise. Land and water management and value-added product development may boost the economy. The assessment recommends better market analysis and policymaking to promote sustainability and economic growth. Traditional healers, academics, and governments must work together to conserve Iraq's medicinal plant history and improve health. Research and community engagement will preserve these resources by integrating traditional and modern science.

Keywords: Traditional Medicine; Mesopotamian Civilization; Biodiversity; Ethno Botany; Environmental Challenges; Herbal Remedies; Plant Compounds; International Trade

Introduction

Mesopotamian times According to Sumerian and Babylonian cuneiform tablets, the “Cradle of Civilization,” used local flora for medicine. These early references show Iraqis’ deep connection to their natural environment, where medicinal plants were essential to healthcare [1].

Throughout history, medicinal plants have been used to heal humans. Traditional medicine worldwide uses these medicinal plants to treat ailments, improve health, and boost well-being . World pharmaceutical companies employ various plant components to manufacture current medications . The mix of traditional and modern research underscores medicinal plants’ value in healthcare and pharmacology [2, 3].

Old Iraqi medicine employs medicinal herbs. Humans used indigenous plants for medicine in ancient Mesopotamia. Sumerian and Babylonian cuneiform records reveal that plants were essen-

tial to healthcare and treated numerous maladies. Historic use shows Iraqis’ love of nature [4].

Using thyme (*Thymus vulgaris*) and aloe vera (*Aloe barbadensis*) for health benefits is rooted in factual observation and cultural significance . Iraqi medicinal plant usage is affected by ancient practices, cultural interactions, and geography. The country’s varied biodiversity includes medicinal species. Environmental degradation, socio-political instability, and limited research and development resources make these plants hard to preserve and exploit . The position of medicinal plants in Iraq must be examined from both traditional and modern perspectives [5, 6].

Many current drugs stem from traditional remedies, and studying medicinal plants can lead to new treatments . Second, Iraq’s environmentally stressed regions need sustainable management to maintain plant species and ecosystems. Finally, competent management can promote culturally relevant health and well-being by combining traditional wisdom with modern science [7, 8].

Loss of habitat, climate change, and pollution endanger medicinal plant biodiversity . Poor infrastructure and poverty make sustainable plant growing and maintenance challenging . Lack of policy and regulatory support for research and conservation can also delay progress [9, 10].

Phytochemical analysis and biotechnology enable medicinal plant research and use. Traditional knowledge combined with modern science can improve medicinal plant efficacy and sustainability. International cooperation and funding might aid research and conservation activities, overcoming difficulties. The study intends to analyze issues, explore management techniques, and suggest future development. This review draws on a variety of sources and case studies to enlighten and inspire medicinal plant management activities in Iraq, improving health outcomes and sustainable practice [11, 12].

Medicinal Plant Management

plant species are utilized ethnobotanically in Iraq. Around 360 of these plants are medicinal, offering rural healthcare. Their benefits go beyond health to the economy . Sustainable methods can maximize medicinal plant potential and improve lives. Ecosystem

management and preservation are essential for their use and a better future [13-15].

Economic Prospects and Market Trends

Iraq's herbal medicine expertise increases plant demand. Quality control requires diagnostic tools Standardized processes and scientific validation are important. GCC countries are top importers of herbal drugs, UAE imports 95% of medicinal drugs, with growth projected, Kuwait also has high demand [16,17].

Domestic and International Market Analysis

MAPs and their byproducts are globally traded for their bioactive compounds . The medicinal plant trade is valued at \$5 billion annually, dominated by European and American markets . Research on Iraqi MAPs, production, and trade is limited, SWOT analyses are recommended to evaluate and identify trade opportunities . This report recommends land and water management to maintain MAP market supply. Many businesses employ aromatic plant products. Valueable aromatic plants are underused. Trade policy requires species diversity, quantity, and value baselines. Products trade data is available. Marketing stresses value-added processes Aromatic plants have valuable chemicals [18-25].

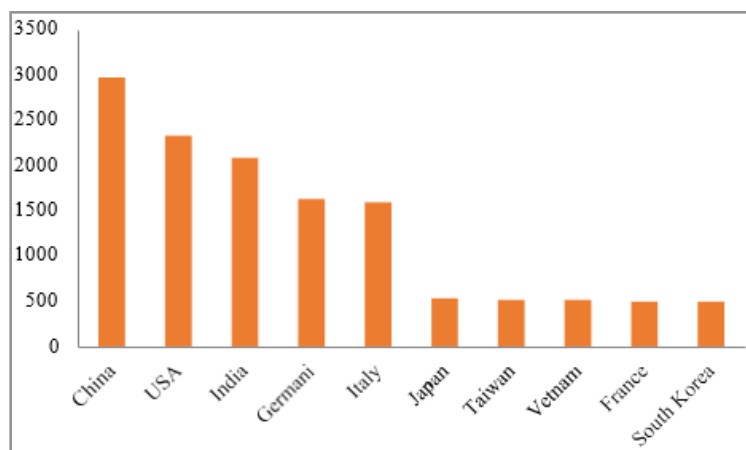


Figure 1. The Most Important Medicinal Plants Countries in the World in 2016 (Billion Dollars).

Recent Applications

Medical plants are employed in ancient and modern medicine. Thyme and mint are common respiratory and gastrointestinal remedies. Pomegranate (*Punica granatum*) is becoming known for its antioxidant and cardiovascular effects . Additionally, immune-boosting *Nigella sativa* is being studied for its ability to

treat many health issues. Integrating medicinal herbs with contemporary Fenugreek and rosemary (*Rosmarinus officinalis*) are utilized in supplements and alternative treatments. This integration shows that modern health practices are increasingly using these plants as therapeutics [26-29].

Table 1. Examples of Medicinal Plants to be used in Traditional Practices from Iraq.

Name	Scientific Name	Traditional Uses
Garlic	<i>Allium sativum</i>	Antibacterial, antifungal, cardiovascular health, immune boost
Thyme	<i>Thymus vulgaris</i>	Respiratory conditions, digestive issues, antiseptic
White Wormwood	<i>Artemisia herba-alba</i>	Anti-parasitic, anti-inflammatory, gastrointestinal disorders
Licorice Root	<i>Glycyrrhiza glabra</i>	Anti-inflammatory, expectorant, sore throats, coughs
Jujube	<i>Ziziphus jujuba</i>	Sedative, anti-anxiety, digestive issues, anti-inflammatory, antimicrobial
Mastic Gum	<i>Pistacia lentiscus</i>	Gastrointestinal health

Sage	<i>Salvia officinalis</i>	Antimicrobial, astringent, sore throats, digestive issues
Rosemary	<i>Rosmarinus officinalis</i>	Memory enhancement, respiratory health, digestive aid
Mint	<i>Mentha spp.</i>	Digestive issues, respiratory conditions, antispasmodic
Juniper	<i>Juniperus communis</i>	Diuretic, antiseptic, digestive aid
Cumin	<i>Cuminum cyminum</i>	Digestive aid, carminative, anti-inflammatory
Fennel	<i>Foeniculum vulgare</i>	Digestive issues, anti-inflammatory, antimicrobial
Coriander	<i>Coriandrum sativum</i>	Digestive health, anti-inflammatory, antimicrobial
Nigella	<i>Nigella sativa</i>	Immune support, anti-inflammatory, respiratory health
Pomegranate	<i>Punica granatum</i>	Antioxidant, anti-inflammatory, cardiovascular health
Aloe Vera	<i>Aloe barbadensis</i>	Skin healing, digestive health, anti-inflammatory
Ginger	<i>Zingiber officinale</i>	Digestive issues, anti-nausea, anti-inflammatory
Turmeric	<i>Curcuma longa</i>	Anti-inflammatory, antioxidant, digestive health
Dandelion	<i>Taraxacum officinale</i>	Diuretic, liver health, digestive aid
Chamomile	<i>Matricaria chamomilla</i>	Sedative, digestive issues, anti-inflammatory
Valerian	<i>Valeriana officinalis</i>	Sedative, anxiety relief, sleep aid
Hawthorn	<i>Crataegus monogyna</i>	Cardiovascular health, anti-inflammatory, antioxidant
Eucalyptus	<i>Eucalyptus globulus</i>	Respiratory health, antiseptic, anti-inflammatory
Lavender	<i>Lavandula angustifolia</i>	Relaxation, sleep aid, skin health
Parsley	<i>Petroselinum crispum</i>	Digestive health, diuretic, anti-inflammatory
Lemon Balm	<i>Melissa officinalis</i>	Anxiety relief, digestive aid, sleep aid
Dill	<i>Anethum graveolens</i>	Digestive issues, antimicrobial, anti-inflammatory
Caraway	<i>Carum carvi</i>	Digestive aid, carminative, antimicrobial
Elecampane	<i>Inula helenium</i>	Respiratory conditions, anti-inflammatory, expectorant
Mallow	<i>Malva sylvestris</i>	Soothing mucous membranes, anti-inflammatory
Milk Thistle	<i>Silybum marianum</i>	Liver health, antioxidant, detoxification
Burdock	<i>Arctium lappa</i>	Detoxification, skin health, anti-inflammatory
Yarrow	<i>Achillea millefolium</i>	Wound healing, anti-inflammatory, digestive aid
Feverfew	<i>Tanacetum parthenium</i>	Migraine relief, anti-inflammatory, digestive aid
Plantain	<i>Plantago lanceolata / major</i>	Wound healing, respiratory health, digestive aid
Astragalus	<i>Astragalus membranaceus</i>	Immune support, anti-inflammatory, antioxidant
Ginseng	<i>Panax ginseng</i>	Immune support, energy boost, stress relief
Echinacea	<i>Echinacea purpurea</i>	Immune support, anti-inflammatory, respiratory health
Schisandra	<i>Schisandra chinensis</i>	Adaptogen, liver health, stress relief
Gotu Kola	<i>Centella asiatica</i>	Cognitive function, skin health, wound healing
Horsetail	<i>Equisetum arvense</i>	Diuretic, urinary health, skin health
Nettle	<i>Urtica dioica</i>	Anti-inflammatory, diuretic, allergy relief
Red Clover	<i>Trifolium pratense</i>	Hormonal balance, skin health, detoxification
Raspberry Leaf	<i>Rubus idaeus</i>	Women's health, menstrual support, digestive aid
Willow Bark	<i>Salix alba</i>	Pain relief, anti-inflammatory, fever reduction
Avena Sativa	<i>Avena sativa</i>	Nervous system support, skin health, digestive aid
Blueberry	<i>Vaccinium corymbosum</i>	Antioxidant, cardiovascular health, urinary tract health
Ginkgo Biloba	<i>Ginkgo biloba</i>	Cognitive function, circulation, antioxidant
Rhodiola	<i>Rhodiola rosea</i>	Adaptogen, stress relief, cognitive function
Elderberry	<i>Sambucus nigra</i>	Immune support, antiviral, respiratory health
Prickly Pear	<i>Opuntia ficus-indica</i>	Digestive health, anti-inflammatory, antioxidant
Olive Leaf	<i>Olea europaea</i>	Antimicrobial, cardiovascular health, antioxidant
Poppy	<i>Papaver somniferum</i>	Pain relief, sleep aid, anxiolytic
Lobelia	<i>Lobelia inflata</i>	Respiratory health, anti-asthmatic, expectorant
Catnip	<i>Nepeta cataria</i>	Relaxation, digestive aid, mild sedative

Clove	<i>Syzygium aromaticum</i>	Analgesic, antimicrobial, digestive aid
Cinnamon	<i>Cinnamomum verum</i>	Digestive health, anti-inflammatory, antimicrobial
Alfalfa	<i>Medicago sativa</i>	Nutrient-rich, digestive aid, anti-inflammatory
Anise	<i>Pimpinella anisum</i>	Digestive aid, carminative, antimicrobial
Grape Seed	<i>Vitis vinifera</i>	Antioxidant, cardiovascular health, anti-inflammatory
Angelica	<i>Angelica archangelica</i>	Digestive aid, respiratory health, anti-inflammatory
Asafoetida	<i>Ferula assa-foetida</i>	Digestive aid, anti-inflammatory, antimicrobial
Marshmallow Root	<i>Althaea officinalis</i>	Soothing mucous membranes, digestive aid, anti-inflammatory
Devil's Claw	<i>Harpagophytum procumbens</i>	Pain relief, anti-inflammatory, joint health
Ephedra	<i>Ephedra sinica</i>	Respiratory health, stimulant, anti-asthmatic
Bitter Melon	<i>Momordica charantia</i>	Blood sugar regulation, digestive health, antimicrobial
Moringa	<i>Moringa oleifera</i>	Nutrient-rich, anti-inflammatory, antioxidant
Sarsaparilla	<i>Smilax officinalis</i>	Detoxification, skin health, anti-inflammatory
Damiana	<i>Turnera diffusa</i>	Libido enhancement, mood support, digestive aid
Chaga	<i>Inonotus obliquus</i>	Immune support, antioxidant, anti-inflammatory
Baikal Skullcap	<i>Scutellaria baicalensis</i>	Anti-inflammatory, antioxidant, liver health
Horny Goat Weed	<i>Epimedium spp.</i>	Libido enhancement, bone health, anti-inflammatory
Shatavari	<i>Asparagus racemosus</i>	Women's health, reproductive support, adaptogen
Jatamansi	<i>Nardostachys jatamansi</i>	Stress relief, cognitive function, sleep aid
Holy Basil	<i>Ocimum sanctum</i>	Stress relief, immune support, anti-inflammatory
Betony	<i>Stachys officinalis</i>	Nervous system support, digestive aid, anti-inflammatory
Oregano	<i>Origanum vulgare</i>	Antimicrobial, digestive health, respiratory aid
Golden Seal	<i>Hydrastis canadensis</i>	Immune support, antimicrobial, digestive aid
Eleuthero	<i>Eleutherococcus senticosus</i>	Adaptogen, immune support, stress relief
Indian Ginseng	<i>Withania somnifera</i>	Adaptogen, stress relief, cognitive function
Kudzu	<i>Pueraria lobata</i>	Alcohol withdrawal, digestive health, anti-inflammatory
Wild Cherry Bark	<i>Prunus serotina</i>	Cough suppressant, respiratory health, anti-inflammatory
Wormwood	<i>Artemisia absinthium</i>	Digestive aid, anti-parasitic, antimicrobial
Celery Seed	<i>Apium graveolens</i>	Diuretic, anti-inflammatory, digestive aid
Chervil	<i>Anthriscus cerefolium</i>	Digestive health, detoxification, anti-inflammatory
Black Cohosh	<i>Cimicifuga racemosa</i>	Hormonal balance, menstrual support, menopausal symptoms
Mistletoe	<i>Viscum album</i>	Immune support, cardiovascular health, anti-inflammatory
Andrographis	<i>Andrographis paniculata</i>	Immune support, anti-inflammatory, digestive aid

Challenges and Preservation

Modern medical and environmental developments threaten conventional knowledge. This information is being documented and preserved through ethno botanical surveys and community engagement. The Iraq Medicinal Plant Database catalogs and protects traditional knowledge while fostering sustainability [30,31].

Medicinal Plant Species Threats

Deforestation and climate change threaten species. Agriculture, industry, energy extraction, forestry, residential growth, and urban expansion cause these concerns. Intensive farming and agribusiness with synthetic chemicals threaten forests and biodiversity due to population growth this leads to loss of traditional ecological knowledge and practices, including deforestation and limited plant usage. In Iraq, land use changes have caused biodiversity loss and decline in traditional knowledge [32-34].

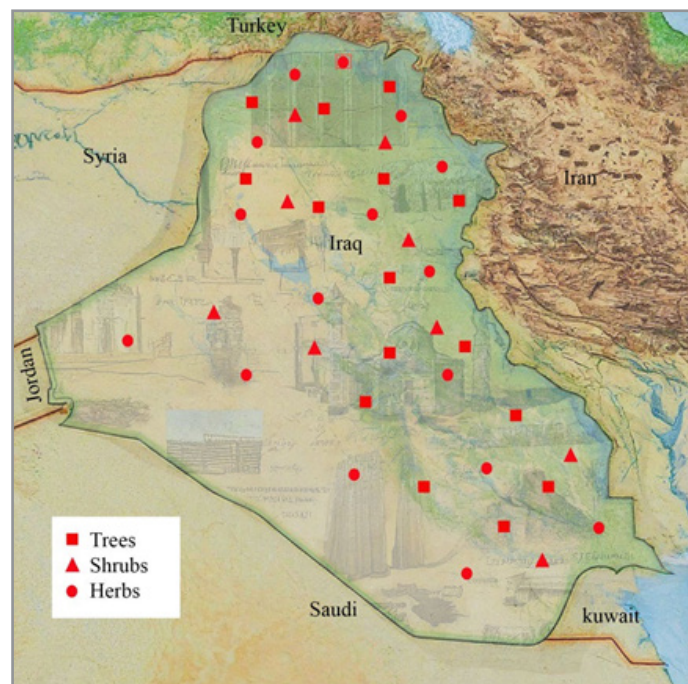


Figure 2. Plants (Trees, Shrubs and Medicine Herb) Distribution in Iraq.

Policy Gaps

In Iraq, legislative gaps exist regarding medicinal plant resources. Policies at national and sub-national levels are needed to address management. Conservation efforts are necessary to protect these plants from destructive activities. Iraq has a diverse range of medicinal plant species, but lacks formal legislation and regulation for their preservation. Traditional medicinal plant cultivation on animal farms is viable. Illegally selling rare medicinal plants threatens biodiversity, conservation, and ecosystems [35-39].

Sustainable Harvesting

Polymaking and enforcement of wild medicinal plant protections need collaboration between governments, NGOs, and local populations [40]. Iraq has many medicinal plant species, but unsustainable collection causes loss. Sustainable management is essential. Agroforestry conserves medicinal plants, promotes sustainable development, and provides jobs. The conventional approach to community management, a great number of medicinal plants are sold over international borders, which makes it challenging to keep restrictions in place. Wild populations are often harvested for medicinal plants, destroying ecosystems, biodiversity, and natural resources. Rapid medicinal plant collection can cause species extinction, ecological disruption, and a decline in environmental resources for other species. Large-scale agriculture may degrade soil, deplete water supplies, and consume chemical fertilizers and pesticides, which harms the ecosystem. Monoculture farming, which is common in medicinal plant agriculture, reduces biodiversity and makes crops more susceptible to diseases and pests [41-44].

Alternatives

These include growing medicinal plants under controlled settings, using synthetic or semi-synthetic counterparts, and ex-

ploring new natural resources that do not harm the environment. Sustainable agricultural practices can reduce medicinal plant farming's environmental impact. These include agroforestry, organic farming, and indigenous wisdom. Methods improve biodiversity, soil health, and pollution reduction. Synthetic alternatives can protect natural populations and provide a steady supply of medicinal substances. Plant management is improved by digital technology that captures occurrences, evaluates treatment success, and enables adaptive reactions. They include basic data entry keyboards to advanced satellite sensing. Prioritizing digital interfacing and knowledge transfer is key for better medicinal plant management [45-49].

Research and Development

Researchers are documenting wild medicinal plant management in rural Iraq using social science. We explore harvesting reasons amid communities. In 2017, we managed medicinal plants in rural Diyala, Nineveh, and Salah al-Din, Iraq. By 2019, we returned to consult key informants in other provinces, engaging with ecotourists, landowners, herders, and communities to explore their practices and cultural influences. Land ownership and weak regulations. Similarly, investigations into the anti-inflammatory properties of aloe vera (*Aloe barbadensis*) are ongoing. Traditional uses of *Ziziphus spina-christi* (Christ's thorn) include analgesia and anti-inflammatory effects [50-53].

Conservation and Future Plans

Overharvesting, habitat degradation, and climate change threaten medicinal plant species. Conserving medicinal plants requires habitat protection and sustainable collection. More collaboration between traditional healers and scholars can help conserve and investigate these resources [54,55].

Conclusion

Finally, Iraqi medicinal plants show old and modern medicine. Essential to ancient Mesopotamia, rural healing, and worldwide pharmacology. Environmental deterioration, socio-political instability, and inadequate regulations hinder natural resource utilization in Iraq. Iraqi land and water management, value-added processing, and market efficiency might boost medicinal plant commerce locally and worldwide. Preserving these resources needs harvesting, cultivation, scientific investigation, and international cooperation. Traditional knowledge and modern science must be combined, rules established, and research funded to protect Iraqi medicinal plants. Iraq can preserve its ethnobotanical tradition and profit from medicinal plants.

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