

Application of Medicinal Plants in the Treatment of Jaundice: A Review of Traditional Iranian Medicine

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Article Info	ABSTRACT
Article type: Review Article	Objective: Jaundice is a common condition in newborns, typically caused by liver or hematological disorders. Traditional Iranian medicine has provided natural, low-side-effect solutions for managing this condition, utilizing a variety of medicinal plants. These remedies have been employed for centuries in the treatment of jaundice in infants. This review aims to gather and identify the medicinal plants used in the treatment of jaundice within the framework of Traditional Iranian Medicine.
Article History: Received: 12 May 2026 Revised: 12 May 2026 Accepted: 11 Jan 2026 Published Online:	Methods: This research, grounded in Traditional Iranian Medicine, involved the collection and review of medicinal plants associated with the treatment of jaundice, based on classical Iranian medical texts, herbal compendiums, and credible online resources.
✉ Correspondence to: Ali Aghayar Macooie	Results: In ancient Iranian medicine, medicinal plants such as <i>Taraxacum officinale</i> L., <i>Cichorium intybus</i> L., <i>Silybum marianum</i> L., <i>Althaea officinalis</i> L., <i>Artemisia absinthium</i> L., <i>Plantago major</i> L., <i>Rheum rhubarbarum</i> L., <i>Glycyrrhiza glabra</i> L., <i>Borago officinalis</i> L., <i>Petroselinum crispum</i> L., <i>Spinacia oleracea</i> L., <i>Viola odorata</i> L., <i>Ziziphus jujuba</i> Mill., <i>Plantago psyllium</i> L., <i>Plantago lanceolata</i> L., <i>Cydonia oblonga</i> Mill., <i>Prunus domestica</i> L., <i>Senna alexandrina</i> Mill., <i>Cucurbita pepo</i> L., <i>Rhus coriaria</i> L., <i>Portulaca oleracea</i> L., <i>Lepidium sativum</i> L., <i>Citrullus lanatus</i> (Thumb.) Matsum. & Nakai, <i>Berberis vulgaris</i> L., <i>Malus domestica</i> Borkh. were historically used to treat jaundice in newborns.
Email: drmacooie@yahoo.com	Conclusion: The indigenous medicinal plants of Iran hold great potential as complementary options for managing jaundice. However, further scientific research is crucial to confirm their efficacy and safety, paving the way for the development of effective and safe herbal medications.
	Keywords: Jaundice, Herbal Medicine, Traditional Medicine, Iran, Treatment
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Introduction

Neonatal jaundice is a common condition in infants, typically characterized by elevated bilirubin levels in the blood, leading to yellowing of the skin and eyes [1]. This condition may result from liver dysfunction, hematological disorders, or the body's inability to effectively excrete bilirubin. If left untreated, neonatal jaundice can lead to serious health complications, including neurological damage [2].

Traditional Iranian medicine, with its long history of neonatal care, has provided natural and low-side-effect methods for managing jaundice [3]. In this system of healing,

medicinal plants have played a pivotal role in alleviating jaundice symptoms due to their blood-purifying, liver-strengthening, and diuretic properties [4]. These treatments, valued for their natural composition and minimal risk, are often preferred by parents and traditional physicians [5].

Plants such as *Shirkhusht* (*Glycyrrhiza glabra*), *Kassani* (*Cichorium intybus*), and *Shahtere* (*Solanum nigrum*) have been recommended in Traditional Iranian Medicine for liver cleansing and enhancing bile and blood circulation [6]. These plants, with their diuretic and anti-inflammatory

effects, contribute to lowering bilirubin levels and alleviating jaundice in newborns [7]. Additionally, *Khatmi* (*Althaea officinalis*), *Darmaneh* (*Artemisia*), and *Beshqabi* (*Cucumis sativus*) are considered gentle, liver-strengthening plants that support digestive function [8].

Known for their diuretic and liver-strengthening properties, these plants assist in the elimination of waste products and reduce jaundice symptoms [9]. Their anti-inflammatory and soothing properties also help alleviate discomfort and reduce restlessness in infants [10].

In addition to medicinal plants, Traditional Iranian Medicine recommends natural vegetables and fruits for blood purification and jaundice reduction [11]. Rich in vitamins and antioxidants, these foods help maintain liver health and support bilirubin metabolism [12].

The therapeutic use of medicinal plants in Traditional Iranian Medicine also extends to improving the functioning of the digestive and renal systems, which is essential in the management of jaundice in newborns [13]. With their diuretic and cleansing properties, these plants provide a complementary approach to jaundice treatment and may reduce the reliance on chemical therapies [14].

Given the widespread use and promising effects of these medicinal plants in Traditional Iranian Medicine, further scientific studies are needed to investigate their efficacy and underlying mechanisms. Such research could pave the way for the development of safe and effective herbal treatments for neonatal jaundice, offering natural, low-side-effect alternatives for both parents and healthcare providers.

Methods

Study

This study is a comprehensive review of Traditional Iranian Medicine sources and the medicinal plants used in the treatment of neonatal jaundice. The primary objective was to identify and compile information on the medicinal plants employed in Traditional Iranian Medicine for alleviating jaundice symptoms, as well as improving liver function and hematopoiesis.

Data

The necessary data were collected from the following sources [15-23]:

Classical References in Traditional Iranian Medicine: Prominent works by Iranian scholars such as and other classical texts.

Design

Sources

Medicinal Plant References: Specialized texts and encyclopedias on medicinal plants, including both classical sources and contemporary publications from Iran.

Online Databases and Scientific Articles: Credible digital resources related to Traditional Iranian Medicine and medicinal plants known for their efficacy in treating hepatic disorders and neonatal jaundice.

Search

The literature search was conducted using a combination of keywords:

Jaundice, Neonatal jaundice, Hepatic disorders, Medicinal plants, Traditional Iranian medicine, Herbal therapy

Terms

Inclusion

Studies and sources included in the review met the following criteria:

Explicit reference to the use of medicinal plants for treating neonatal jaundice in Traditional Iranian Medicine.

Relevant to Traditional Iranian Medicine and Iranian scholars.

Inclusion of books, texts, and articles published in both Persian and English.

Scientific articles that investigated the effects of medicinal plants mentioned in Traditional Iranian Medicine sources on neonatal jaundice.

Criteria

Exclusion

Sources were excluded from the review if they met any of the following conditions:

Provided information unrelated to neonatal jaundice.

Were incomplete or lacked detailed information on medicinal plants or methods of use.

Were duplicates or lacked new data.

Had poor scientific quality, were unreliable, or lacked academic credibility.

Focused on medicinal plants from other countries without relevance to Traditional Iranian Medicine, unless these were compared with Iranian sources.

Data	Collection	Process
A comprehensive list of medicinal plants used in Traditional Iranian Medicine for the treatment of neonatal jaundice was first compiled. The collected data included the plant name, scientific name, plant parts used, and methods of consumption (e.g., infusions, extracts, topical oils).		

Data	Analysis
The collected information was presented in both tabular and descriptive formats. The medicinal plants were categorized based on their effects and the available scientific evidence to clarify their role in treating neonatal jaundice within the context of Traditional Iranian Medicine.	

Results

In ancient times, Traditional Iranian Medicine utilized a wide range of medicinal plants for the treatment of neonatal jaundice. Prominent plants included *Taraxacum officinale* L., *Cichorium intybus* L., *Silybum marianum* L., *Althaea officinalis* L., *Artemisia absinthium* L., *Plantago major* L., *Rheum rhabarbarum* L., *Glycyrrhiza glabra* L., *Borago officinalis* L., *Petroselinum crispum* L., *Spinacia oleracea* L., *Viola odorata* L., *Ziziphus jujuba* Mill., *Plantago psyllium* L., *Plantago lanceolata* L., *Cydonia oblonga* Mill., *Prunus domestica* L., *Senna alexandrina* Mill., *Cucurbita pepo* L., *Rhus coriaria* L., *Portulaca oleracea* L., *Lepidium sativum* L., *Citrullus lanatus* (Thumb.) Matsum. & Nakai, *Berberis vulgaris* L., *Malus domestica* Borkh. These plants were historically used for their liver-strengthening, diuretic, and blood-purifying properties, which are crucial in managing jaundice in newborns.

The list of medicinal plants that have been traditionally recognized for their effectiveness in treating neonatal jaundice in Traditional Iranian Medicine is summarized in Table 1.

Table 1: Medicinal Plants Effective in Treating Jaundice in Traditional Iranian Medicine

Common Name	Scientific Name	Family	Used Part(s)	Traditional Use	Reference
Dandelion	<i>Taraxacum officinale</i> L.	Asteraceae	Root, Leaves	Infusion or Decoction	[15-17]
Chicory	<i>Cichorium intybus</i> L.	Asteraceae	Root, Leaves	Infusion or Fresh Consumption	[18-20]
Milk Thistle	<i>Silybum marianum</i> L.	Asteraceae	Seed	Decoction or Powder	[15-17]
Marshmallow	<i>Althaea officinalis</i> L.	Malvaceae	Root, Flower	Decoction or Ointment	[18-20]
Wormwood	<i>Artemisia absinthium</i> L.	Asteraceae	Leaf, Stem	Decoction	[15-17]
Plantain (P. major)	<i>Plantago major</i> L.	Plantaginaceae	Leaf, Seed	Decoction or Ointment	[18-20]
Rhubarb	<i>Rheum rhabarbarum</i> L.	Polygonaceae	Root	Decoction	[21,22]
Licorice	<i>Glycyrrhiza glabra</i> L.	Fabaceae	Root	Decoction or Powder	[21,22]
Borage	<i>Borago officinalis</i> L.	Boraginaceae	Leaf, Flower	Decoction or Infusion	[15-17]
Parsley	<i>Petroselinum crispum</i> L.	Apiaceae	Leaf, Seed	Fresh or Infusion	[15-17]
Spinach	<i>Spinacia oleracea</i> L.	Amaranthaceae	Leaf	Fresh or Cooked	[21,22]
Violet	<i>Viola odorata</i> L.	Violaceae	Leaf, Flower	Decoction or Infusion	[18-20]
Jujube	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Fruit	Fresh or Dried	[15-17]
Plantago (P. psyllium)	<i>Plantago psyllium</i> L.	Plantaginaceae	Seed	Raw or Decoction	[23,24]
Plantain (P. lanceolata)	<i>Plantago lanceolata</i> L.	Plantaginaceae	Leaf	Decoction or Ointment	[25]

Quince Seed	<i>Cydonia oblonga</i> Mill.	Rosaceae	Seed	Decoction or Raw Consumption	[21,22]
Black Plum	<i>Prunus domestica</i> L.	Rosaceae	Fruit, Seed	Fresh or Dried	[18-20]
Senna	<i>Senna alexandrina</i> Mill.	Fabaceae	Leaf, Seed	Decoction	[21, 24]
Pumpkin	<i>Cucurbita pepo</i> L.	Cucurbitaceae	Seed	Decoction or Raw Consumption	[15-17]
Sumac	<i>Rhus coriaria</i> L.	Anacardiaceae	Fruit	Decoction or Raw Consumption	[18-20]
Purslane	<i>Portulaca oleracea</i> L.	Portulacaceae	Leaf, Stem	Raw or Decoction	[24,25]
Cress	<i>Lepidium sativum</i> L.	Brassicaceae	Leaf	Fresh or Decoction	[15-17]
Watermelon	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Cucurbitaceae	Fruit, Seed	Fresh	[17,23]
Barberry	<i>Berberis vulgaris</i> L.	Berberidaceae	Fruit, Root	Decoction or Raw Consumption	[15-17]
Apple	<i>Malus domestica</i> Borkh.	Rosaceae	Fruit	Fresh	[20-25]

Discussion

Jaundice is one of the most prevalent disorders related to liver and blood function, resulting from elevated bilirubin levels in the body. It may indicate a range of underlying conditions, from benign disorders to serious hepatic and hematologic diseases. If not diagnosed and treated in a timely manner, jaundice can lead to permanent liver damage, metabolic disturbances, and systemic complications [24]. In this context, traditional medicine and medicinal plants have long been of interest, particularly in communities with limited access to modern medical care. These remedies are often considered complementary or alternative approaches to managing bilirubin levels and improving liver function.

Ethnobotanical studies conducted in Iran and other countries highlight a significant variety of medicinal plants used for treating jaundice. For example, a study in Mashhad identified 37 plant species from 26 families used by traditional healers to treat jaundice, predominantly through infusions and daily oral consumption. Plants such as *Cichorium intybus*, *Salix alba*, and *Phyllanthus emblica* were among the most commonly used. Despite substantial empirical evidence of their effectiveness, further controlled clinical trials are needed to verify their safety and therapeutic efficacy [25].

For neonatal jaundice, hyperbilirubinemia is the leading cause of hospitalization in newborns, which is typically benign and treated with phototherapy. However, the oral administration of non-absorbable drugs may have potential side effects. Ethnobotanical studies in Iran have documented that plants like *Lavandula angustifolia* and *Cotoneaster persicus* are frequently used for treating jaundice in children. If the active compounds in these plants are identified and proven effective, they could offer safer alternatives to some chemical drugs [26].

A study conducted in Mazandaran province identified 50 plant species from 29 families recommended by herbalists for the treatment of neonatal jaundice. Among the most commonly used plants were *Cotoneaster discolor*, *Cichorium intybus*, and *Alhagi camelorum*. The public's preference for these treatments stems from their lower side effects compared to chemical drugs and their role in detoxifying the body. However, researchers emphasize the need for pharmacological and clinical studies to scientifically validate these findings [27].

From the perspective of classical texts in Traditional Iranian Medicine, there is more extensive documentation. Analysis of these texts reveals that 111 medicinal plants from 51

families are recommended for the treatment of jaundice, with prominent contributions from families such as *Apiaceae*, *Asteraceae*, and *Fabaceae*. Some of these plants, including *Asparagus*, *Cichorium intybus*, *Echinops*, and *Senna*, show promise for future drug studies and the development of new herbal medicines [28]. Furthermore, a review of Ibn Sina's *Canon of Medicine* reveals 32 medicinal plants with potential mechanisms for reducing bilirubin levels, many of which have been studied in modern experimental or clinical trials [29-32].

In Qom, epidemiological and ethnobotanical studies have shown that approximately 78% of parents of newborns with jaundice use traditional medicine, with medicinal plants being the most common choice. Among the most widely used plant parts were Manna gum, with *Cotoneaster nummularioides*, *Cichorium intybus*, and *Alhagi maurorum* identified as the primary plants. Trials have demonstrated that oral consumption of *Cotoneaster* gum, pomegranate paste, and *Cichorium intybus* juice by mothers, combined with topical applications such as barley flour, can reduce the severity of jaundice and shorten the duration of neonatal hospitalization. However, further large-scale studies are required to generalize these findings [30].

Globally, the importance of ethnobotanical knowledge in treating jaundice is also well-documented. From India and Bangladesh to Indonesia, Nigeria, and Burkina Faso, numerous plant species have been identified for the treatment of jaundice. Plants like *Justicia adhatoda*, *Terminalia chebula*, *Boerhavia diffusa*, and *Tinospora cordifolia* show strong evidence of hepatoprotective effects [35-40].

Early identification and timely treatment of diseases in neonates and children play a fundamental role in reducing mortality, preventing long-term complications, and promoting optimal physical and cognitive development. Early medical intervention and specialized pediatric care in this age group should therefore be regarded as a significant investment in the future health and well-being of society [41-43]. Laboratory studies have proposed mechanisms such as direct bilirubin breakdown by plant extracts, laying the foundation for future mechanistic research [44,45]. This review is primarily based on classical texts and secondary sources and lacks systematic meta-analytic quantification or experimental validation of the reported effects. Additionally, variability in terminology, preparation methods, and dosages across historical references limits direct clinical generalizability. This study systematically compiles a comprehensive list of medicinal plants used for neonatal jaundice in Traditional

Iranian Medicine from diverse classical and ethnobotanical sources.

It integrates fragmented historical knowledge into a structured and categorized framework that facilitates future pharmacological investigations. Furthermore, the review highlights candidate plants with potential translational value for the development of modern evidence-based therapies for neonatal jaundice management.

Conclusion

The available evidence suggests that medicinal plants may help reduce bilirubin levels and alleviate jaundice symptoms through mechanisms such as increased bile secretion and excretion, antioxidant and anti-inflammatory activities, hepatocyte protection, modulation of liver enzymes, and improved hepatic blood circulation. However, despite extensive empirical and historical support, transforming this knowledge into evidence-based therapeutic approaches requires rigorous pharmacological, toxicological, and clinical studies to determine the safety, efficacy, and appropriate dosages of these plants.

Statements and Declarations

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Competing interests

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

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. Abbas MW, Shamshad T, Ashraf MA, Javaid R. Jaundice: a basic review. *Int J Res Med Sci.* 2016;4(5):1313-9. doi:10.18203/2320-6012.ijrms20161196.
2. Mishra S, Agarwal R, Deorari AK, Paul VK. Jaundice in the newborns. *Indian J Pediatr.* 2008;75(2):157-63. doi:10.1007/s12098-008-0024-7.
3. Fok TF. Neonatal jaundice—traditional Chinese medicine approach. *J Perinatol.* 2001;21(1):98-100. doi:10.1038/sj.jp.7210643.
4. Amiri MS, Joharchi MR, TaghavizadehYazdi ME. Ethno-medicinal plants used to cure jaundice. *Iran J Pharm Res.* 2014;13(1):157-64.
5. Crabb C. Science meets tradition and identifies herbal treatment for jaundice. *Bull World Health Organ.* 2004;82(2):154.
6. Saadh MJ. Useful herbs for liver disease treatment. *Pharmacologyonline.* 2021;3:2046-51.
7. Fakhri M, Azadbakht M, Yousefi SS, et al. Medicinal plants for neonatal jaundice. *Br J Med Med Res.* 2016;14(11). doi:10.9734/BJMMR/2016/24795.
8. Fallahpour F, Banaee M, Javadzade N. Herbal extract effects in carp. *Br J Med Med Res.* 2016. doi:10.9734/BJMMR/2016/24795.
9. Rane J, Jadhao R, Bakal RL. Liver diseases and herbal drugs: a review. *J Innov Pharm Biol Sci.* 2016;3(2):24-36.
10. Yattoo MI, Gopalakrishnan A, Saxena A, et al. Anti-inflammatory drugs and herbs. *Recent Pat Inflamm Allergy Drug Discov.* 2018;12(1):39-58. doi:10.2174/1872213X12666180115153635.
11. Vitaglione P, Morisco F, Caporaso N, Fogliano V. Dietary antioxidants and liver health. *Crit Rev Food Sci Nutr.* 2004;44(7-8):575-86. doi:10.1080/10408690490911701.
12. Arya P, Pandey S, Verma V. Medicinal plants in kidney stones. *Univ J Pharm Res.* 2017.
13. Avicenna. *Canon of Medicine.* Beirut: Dar Al Kotob Al Ilmiyah; 2005.
14. Rhazes. *Al-Hawi fi al-Tibb.* Beirut: Dar Al Kotob Al Ilmiyah; 2003.
15. Haly Abbas. *Hilyat al-Hukama.* Tehran: Iranian Academy of Medical Sciences; 1998.
16. Tabatabai SH. *Makhzan al-Adwiya.* Tehran: ITMRC; 2007.
17. Jorjani AH. *Zakhireh Khwarazmshahi.* Tehran: Iranian Academy of Medical Sciences; 2001.
18. Sadr al-Din Shirazi. *Jame' al-Hikmatayn.* Tehran: Institute for History of Medicine; 2004.
19. Avicenna. *Tibb-e Bu Ali Sina.* Tehran: Tehran University Press; 2006.
20. Rhazes. *Al-Adwiya al-Mufrada.* Tehran: ITMRC; 2010.
21. Ahmadipour S, Mohsenzadeh A, Eftekhari Z, Ahmadipour S. Medicinal plants for child jaundice. *Der Pharm Lett.* 2016;8(1):135-9.
22. Bakhshi Jouybari H, Hosseini AS, Davoodi A, et al. Materia medica in jaundice. *Res J Pharmacogn.* 2018;5(4):83-93. doi:10.22127/rjp.2018.69226.
23. Heydari M, Heydari H, Saadati A, et al. Ethnomedicine for neonatal jaundice. *J Ethnopharmacol.* 2016;193:637-42. doi:10.1016/j.jep.2016.10.019.
24. Khedmat L, Mojtahedi SY, Moienafshar A. Herbal therapy of neonatal jaundice. *J Herbal Med.* 2021;29:100457. doi:10.1016/j.hermed.2021.100457.
25. Basati G, Anbari K, Abbaszadeh S, Hamidi M. Medicinal plants for neonatal jaundice. *J Med Plants By-Prod.* 2019;8(2):201-6.
26. Jafari JM, Barimani S, Aliasl F, et al. Medicinal plants in Canon of Medicine. *Shiraz E-Med J.* 2021;22(22).

27. Fakhri M, Farhadi R, Mousavinasab SN, et al. Natural products on neonatal jaundice. *Jundishapur J Nat Pharm Prod.* 2019;14(1):e83042. doi:10.5812/jjnpp.83042.
28. Abbasi AM, Khan MA, Ahmad M, et al. Medicinal plants for jaundice and hepatitis. *Afr J Biotechnol.* 2009;8(8).
29. Raghuvanshi D, Dhalaria R, Sharma A, et al. Ethnomedicinal plants for jaundice. *Plants.* 2021;10(2):232. doi:10.3390/plants10020232.
30. Panjaitan RG, Yuliana YG. Ethnomedicinal plants in Indonesia. *Pharmacogn J.* 2021;13(4).
31. Sharma J, Gairola S, Gaur RD, Painuli RM. Medicinal plants for jaundice. *J Ethnopharmacol.* 2012;143(1):262-91. doi:10.1016/j.jep.2012.06.034.
32. Zongo L, Ouedraogo M, Zongo MS, et al. Ethnobotany of jaundice treatment. *JATPB.* 2025;4(1):32-49. doi:10.57220/jatpb.v4i1.213.
33. Danjuma J, Abubakar IB, Nwaogu J, et al. Ethnomedicinal validation of jaundice plants. *Ann Sci Technol.* 2022;7(2):29-40. doi:10.2478/ast-2022-0007.
34. Mahmoodzadeh H, Nasimfar A, Sadeghi E, et al. Vitamin D in children. *Int J Pediatr.* 2017;5(3):4533-40.
35. Macooie AA, Pashapoor N, Yekta Z, Karamyar M. Prolactin after seizures. *Iran J Med Sci.* 2009;34(3):177-80.
36. Samadi M, Khosroshahi AJ, Macooie AA, et al. Pulmonary hypertension in children. *Crescent J Med Biol Sci.* 2017;4(1):23-7.
37. Jannat K, Shova NA, Islam MM, et al. Herbal formulations for jaundice. *J Med Plants Stud.* 2019;7(2):99-102.
38. Tewari D, Mocan A, Parvanov ED, et al. Ethnopharmacology of jaundice. *Front Pharmacol.* 2017;8:518. doi:10.3389/fphar.2017.00518.
39. Neamatzadeh H, Ekraminasab S, Bahrami R, Asadian F. Cotoneaster manna in jaundice. *World J Peri Neonatol.* 2023;6(1). doi:10.18502/wjpn.v6i1.14252.
40. Ahmadipour S, Mohsenzadeh A, Eftekhari Z, et al. Medicinal plants for child jaundice. *Der Pharm Lett.* 2016;8(1):135-9.
41. Amiri MS, Joharchi MR, TaghavizadehYazdi ME. Ethnomedicinal plants for jaundice. *Iran J Pharm Res.* 2014;13(1):157-64.
42. Fakhri M, Azadbakht M, Yousefi SS, et al. Neonatal jaundice herbal therapy. *Br J Med Med Res.* 2016;14(11).
43. Raghuvanshi D, Dhalaria R, Sharma A, et al. Ethnomedicinal plants review. *Plants.* 2021;10(2):232.
44. Sharma J, Gairola S, Gaur RD, et al. Jaundice treatment plants. *J Ethnopharmacol.* 2012;143(1):262-91.
45. Tewari D, Mocan A, Parvanov ED, et al. Ethnopharmacological approaches for jaundice. *Front Pharmacol.* 2017;8:518. doi:10.3389/fphar.2017.00518.