

A Review of Medicinal Plants Used for the Treatment of Hyperlipidemia: An Ethnobotanical Survey in Southern Iran

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Article Info	ABSTRACT
<p>Article type: Review Article</p> <p>Article History: Received: Jan. 29, 2025 Revised: Mar. 08, 2025 Accepted: May. 18, 2025 Published Online: July. 27, 2025</p> <p>✉ Correspondence to: laya.Hooshmand.Garehbagh</p> <p>Email: Laya.Hooshmand58@gmail.com</p>	<p>Objective: Hyperlipidemia refers to a condition characterized by an abnormally high level of lipids (fats) in the blood. This disorder typically involves elevated triglycerides and low-density lipoprotein (LDL) cholesterol, commonly known as "bad cholesterol," which can increase the risk of cardiovascular diseases, strokes, and other serious health issues. This ethnobotanical review aims to identify medicinal plants used in the ethnobotanical knowledge of southern Iran for the treatment of hyperlipidemia.</p> <p>Methodology: In this review, articles were searched using keywords such as medicinal plants, ethnobotany, hyperlipidemia, and the names of the provinces of Sistan and Baluchestan, Bushehr, Hormozgan, Khuzestan, Fars, and Kerman. For source collection, reliable databases such as Google Scholar, SID, Magiran, PubMed, and Scopus were consulted. Relevant ethnobotanical studies were selected and used in the analysis.</p> <p>Results: The study found that the following medicinal plants are used in the ethnobotanical knowledge of southern Iran to treat hyperlipidemia: <i>Lepidium latifolium</i> L., <i>Cichorium intybus</i> L., <i>Achillea millefolium</i> L., <i>Silybum marianum</i> (L.) Gaertn., <i>Arum elongatum</i> subsp. <i>alpinariae</i> Alpinar & R.R. Mill, <i>Glycyrrhiza glabra</i> L., <i>Rheum ribes</i> L., <i>Amygdalus lycioides</i> Spach, <i>Amygdalus scoparia</i>, <i>Withania somnifera</i>, <i>Caralluma edulis</i>, <i>Rumex acetosa</i> L., <i>Coriandrum sativum</i>, <i>Allium sativum</i>, <i>Sesamum indicum</i>, <i>Anethum graveolens</i> L., <i>Anthriscus sylvestris</i>, <i>Gundelia tourneforti</i> L., <i>Tragopogon aureus</i> Boiss, <i>Trigonella foenumgraecum</i> L., <i>Solanum nigrum</i> L., <i>Phoenix dactylifera</i> L., <i>Achillea eriophora</i> DC., <i>Artemisia sieberi</i> Besser, <i>Bienertia cycloptera</i>, and <i>Teucrium polium</i> L. The leaves of these medicinal plants are the most commonly used plant part for lowering blood lipids.</p> <p>Conclusion: This study highlighted the widespread use of various medicinal plants in southern Iran's ethnobotanical knowledge for reducing blood lipids. These findings underscore the therapeutic potential of these plants in managing hyperlipidemia. However, clinical and pharmacological studies are essential to confirm the efficacy and safety of these herbal compounds.</p> <p>Keywords: Hyperlipidemia, Medicinal Plants, Traditional Medicine, Iran</p>
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Introduction

Hyperlipidemia, or high blood cholesterol, is a condition where the level of cholesterol in the blood increases to abnormal levels, potentially leading to fat accumulation in blood vessel walls and vessel blockages. Cholesterol is an essential lipid for cell membrane construction, hormone production, and the synthesis of vitamins [1]. Excessive cholesterol production can lead to heart diseases and strokes. Therefore, regulating cholesterol levels through proper diet and treatment is crucial to prevent associated complications [2].

Blood lipids consist of three main types: LDL cholesterol (bad cholesterol), HDL cholesterol (good cholesterol), and triglycerides. LDL is responsible for plaque formation in blood vessel walls, leading to arterial blockages and an increased risk of cardiovascular diseases. On the other hand, HDL helps remove excess cholesterol from the bloodstream [3]. Triglycerides, which are produced from calorie-dense foods, can also elevate blood lipid levels if consumed in excess. Managing these lipids through diet and a healthy lifestyle is necessary to prevent heart issues [4].

High cholesterol is often asymptomatic, but in cases of atherosclerosis (artery narrowing) and cardiovascular complications, symptoms such as chest pain, blocked vessels in the heart and brain, high blood pressure, heart attacks, strokes, shoulder stiffness, yellowing eyelids, and leg pain may appear [5]. A high cholesterol level is usually caused by consuming fatty foods. Saturated fats in animal products and trans fatty acids in processed foods can increase LDL (bad) cholesterol while lowering HDL (good) cholesterol levels [6].

Certain medical conditions may lead to elevated blood lipids. These include diabetes, hypothyroidism, metabolic syndrome, Cushing's syndrome, pancreatic disease, polycystic ovary syndrome (PCOS), multiple myeloma, primary biliary cirrhosis, chronic kidney disease, lupus, sleep apnea, and AIDS [7,8].

High cholesterol can be diagnosed using a lipid panel or cholesterol test, which measures the levels

of four key factors: total cholesterol, LDL (bad cholesterol), HDL (good cholesterol), and triglycerides. For more accurate results, it is typically recommended to fast for 9 to 12 hours before the test, consuming only water [7,8].

High cholesterol can lead to atherosclerosis, which is the buildup of cholesterol deposits in the vessel walls. These plaques block blood flow, leading to serious health issues [9]. Its complications include chest pain (angina) from blocked coronary arteries, heart attacks from disrupted blood flow, and strokes due to blockages in the brain's blood vessels [10].

The initial treatment for high cholesterol involves lifestyle changes, such as a healthy diet and regular exercise [11]. If these measures are insufficient, medications such as statins (atorvastatin), cholesterol absorption inhibitors (ezetimibe), bempedoic acid, bile acid sequestrants (cholestyramine), and PCSK9 inhibitors (Repatha) may be prescribed to lower LDL levels. The choice of medication depends on individual conditions, side effects, cost, and accessibility [11].

Traditional medicine and herbal remedies have long been used to treat various disorders [12], including high blood cholesterol [13]. In recent years, due to fewer side effects and the natural properties of these treatments, there has been increased interest in using herbal remedies to lower blood cholesterol and triglyceride levels [14,15]. Herbal medicines, as complementary treatments with fewer side effects and greater safety, can have positive effects in reducing the risk of cardiovascular diseases [16] and serve as a natural and effective option for managing high blood lipids [17,18]. This ethnobotanical review aims to identify herbal plants used in the ethnobotanical knowledge of southern Iran to treat hyperlipidemia.

Methodology

In this review, articles were searched using keywords such as "medicinal plants," "ethnobotany," "blood lipids," and the names of

provinces including Sistan and Baluchestan, Bushehr, Hormozgan, Khuzestan, Fars, and Kerman. To collect resources, reputable databases such as Google Scholar, SID, Magiran, PubMed, and Scopus were reviewed. Relevant articles related to ethnobotanical studies were selected and used for the analysis.

Results

The results of this study showed that medicinal plants such as *Lepidium latifolium* L., *Cichorium intybus* L., *Achillea millefolium* L., *Silybum marianum* (L.) Gaertn., *Arum elongatum* subsp. *alpinariae* Alpinar & R.R. Mill, *Glycyrrhiza glabra* L., *Rheum ribes* L., *Amygdalus lycioides* Spach, *Amygdalus scoparia*, *Withania somnifera*,

Caralluma edulis, *Rumex acetosa* L., *Coriandrum sativum*, *Allium sativum*, *Sesamum indicum*, *Anethum graveolens* L., *Anthriscus sylvestris*, *Gundelia tourneforti* L., *Tragopogon aureus* Boiss, *Trigonella foenumgraecum* L., *Solanum nigrum* L., *Phoenix dactylifera* L., *Achillea eriophora* DC., *Artemisia sieberi* Besser, *Bienertia cycloptera*, and *Teucrium polium* L. are used in the ethnobotanical knowledge of southern Iran for treating hyperlipidemia. Additional information on these medicinal plants and their effects on blood lipids in southern Iran's ethnobotanical knowledge is provided in Table 1.

Table 1: Medicinal Plants Effective on Hyperlipidemia in the Ethnobotanical Knowledge of Southern Iran

Scientific Name	Common Name	Plant Family	Used Part(s)	Study Area	Reference
<i>Lepidium latifolium</i> L.	Broad-leaved Pepperweed	Brassicaceae	Leaf	Abadeh, Shiraz	[19]
<i>Cichorium intybus</i> L.	Chicory	Asteraceae	Leaf, Root	Abadeh, Shiraz	[19]
<i>Achillea millefolium</i> L.	Yarrow	Asteraceae	Leaf, Flower	Abadeh, Shiraz	[19]
<i>Silybum marianum</i> (L.) Gaertn.	Milk Thistle	Asteraceae	Leaf, Seed	Abadeh, Shiraz	[19]
<i>Arum elongatum</i> subsp. <i>alpinariae</i>	Long-spurred Arum	Araceae	Leaf	Abadeh, Shiraz	[19]
<i>Glycyrrhiza glabra</i> L.	Licorice	Fabaceae	Leaf, Root	Abadeh, Shiraz	[19]
<i>Rheum ribes</i> L.	Turkish Rhubarb	Polygonaceae	Leaf, Stem	Abadeh, Shiraz	[19]
<i>Amygdalus lycioides</i> Spach	Spiny Almond	Rosaceae	Fruit, Wood	Abadeh, Shiraz	[19]
<i>Amygdalus scoparia</i>	Wild Almond	Rosaceae	Fruit	Baluchestan	[20]
<i>Withania somnifera</i>	Ashwagandha	Solanaceae	Leaf, Fruit	Baluchestan	[20]
<i>Carolluma edulis</i>	Marmot Plant	Apocynaceae	Fruit	Baluchestan	[20]
<i>Silybum marianum</i> (L.) Gaertn.	Milk Thistle	Asteraceae	Leaf, Seed	Behbahan	[21]
<i>Cichorium intybus</i> L.	Chicory	Asteraceae	Aerial Parts	Behbahan	[21]

<i>Rumex acetosa</i> L.	Sorrel	Polygonaceae	Leaf, Stem	Behbahan	[21]
<i>Coriandrum sativum</i>	Coriander	Apiaceae	Leaf	South Kerman	[22]
<i>Allium sativum</i>	Garlic	Amaryllidaceae	Leaf, Bulb	Dashtestan, Bushehr	[23]
<i>Coriandrum sativum</i>	Coriander	Apiaceae	Leaf, Fruit	Sirjan	[24]
<i>Sesamum indicum</i>	Sesame	Pedaliaceae	Seed	Sirjan	[24]
<i>Anethum graveolens</i> L.	Dill	Apiaceae	Leaf, Seed	Northeast Khuzestan	[25]
<i>Anthriscus sylvestris</i>	Wild Chervil	Apiaceae	Leaf, Root	Northeast Khuzestan	[25]
<i>Gundelia tourneforti</i> L.	Gundelia	Asteraceae	Stem	Northeast Khuzestan	[25]
<i>Silybum marianum</i> L.	Milk Thistle	Asteraceae	Fruit, Root	Northeast Khuzestan	[25]
<i>Tragopogon aureus</i> Boiss	Yellow Goat's Beard	Asteraceae	Leaf, Fruit	Northeast Khuzestan	[25]
<i>Trigonella foenumgraecum</i> L.	Fenugreek	Fabaceae	Seed	Northeast Khuzestan	[25]
<i>Solanum nigrum</i> L.	Black Nightshade	Solanaceae	Aerial Parts, Fruit	Northeast Khuzestan	[25]
<i>Phoenix dactylifera</i> L.	Date Palm	Arecaceae	Fruit	Fasa	[26]
<i>Achillea eriophora</i> DC.	Yellow Yarrow	Asteraceae	Flower	Fasa	[26]
<i>Artemisia sieberi</i> Besser	Sieber's Wormwood	Asteraceae	Aerial Parts	Fasa	[26]
<i>Cichorium intybus</i> L.	Chicory	Asteraceae	Aerial Parts	Genaveh	[27]

<i>Bienertia cycloptera</i>	Mangk	Chenopodiaceae	Aerial Parts	Genow, Bandar Abbas	[28]
<i>Teucrium polium</i> L.	Polemonium	Lamiaceae	Aerial Parts	Kazeroon	[29]
<i>Solanum nigrum</i> L.	Black Nightshade	Solanaceae	Fruit	Kazeroon	[29]

Discussion

Iranian medicinal plants play a significant role in the management of hyperlipidemia. These plants, with their active compounds, have the potential to lower harmful blood lipids and increase beneficial cholesterol. As natural therapies with minimal side effects, they are effective in preventing and controlling cardiovascular diseases [30]. A study conducted in Iran highlighted the use of medicinal plants such as artichoke, alfalfa, fenugreek, garlic, soybean, and milk thistle for managing blood lipid levels [31]. Research has shown that milk thistle, either alone or in combination with other herbs, can contribute to the reduction of blood lipids, with no significant side effects reported [32]. According to another study, various medicinal plants, including thyme (*Thymus vulgaris*), celery (*Apium graveolens*), chicory (*Cichorium intybus*), fumitory (*Fumaria officinalis*), Bermuda grass (*Cynodon dactylon*), wild parsnip (*Heracleum rawianum*), tall chamomile (*Anthemis altissima*), Gundelia (*Gundelia tournefortii*), wild parsley (*Anthriscus sylvestrianum*), black nightshade (*Solanum nigrum*), common barberry (*Berberis vulgaris*), licorice (*Glycyrrhiza glabra*), long-leafed Arum (*Arum elongatum*), rhubarb (*Rheum ribes*), and spearmint (*Mentha spicata*) are used for lowering blood lipids [33]. A review of the effectiveness and safety of medicinal plants in reducing blood lipids reveals that plants like thyme, celery, chicory, barberry, and spearmint, through mechanisms such as inhibiting fat absorption and increasing metabolism, are effective in controlling hyperlipidemia. The growing attention to traditional medicine and the reduction of side effects from synthetic drugs emphasize the need for more research in this field [34]. Another study confirmed that plants like fenugreek, garlic, milk thistle, dill, and artichoke play a role in reducing blood cholesterol levels, and these herbs have been analyzed in this article [35]. In Lorestan, medicinal plants such as *Anethum graveolens* L., *Cichorium intybus* L., *Lactuca sativa* L., *Malva neglecta* Wallr., *Allium tripedale* Trautv., *Ocimum bacilicum* L., *Olea europea* L., *Urtica dioica* L., and *Vitis vinifera* L. are used to manage high blood lipid levels [36]. In Bushehr, medicinal plants like *Cichorium intybus* L. and *Silybum marianum* L. Gaertn. are most commonly applied in managing hyperlipidemia [37]. Medicinal plants play a significant role in traditional medicine due to their active compounds, and their therapeutic effects are primarily attributed to these bioactive constituents [38-40].

In many diseases and disorders [41-46], turning to nature and embracing traditional or natural therapeutic approaches can serve as a beneficial and complementary

strategy helping to alleviate symptoms, support overall well-being, and enhance patients' quality of life [47,48].

Conclusion

The results of this study indicate that in the ethnobotanical knowledge of southern Iran, a wide variety of medicinal plants are used to manage blood lipid levels. These findings highlight the therapeutic potential of these plants in hyperlipidemia management. However, clinical and pharmacological studies are necessary to confirm the effectiveness and safety of these medicinal plants.

Conflict of Interest

The author declares no conflict of interest related to the publication of this article.

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Consent for Publication

The author confirms that the final version of the manuscript has been reviewed and approved for publication.

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LHGH and MT was responsible for conceptualization, data collection, analysis, and manuscript preparation.

Ethical

As this study is a review article, it does not involve human or animal subjects and therefore does not require ethical approval or informed consent.

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Contributions

Considerations

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