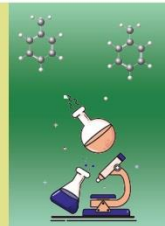
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Herbal Remedies for Polycystic Ovary Syndrome: A Concise Review from the Perspective of Traditional Iranian Medicine

Samira Jahangard ¹ , Hale Ayatollahi ^{1*} , Laya Tagipour ¹ , Elham Rajabi ¹ ¹ Department of Obstetrics and Gynecology, School of Medicine, Kowsar Woman's General University Hospital, Urmia University of Medical Sciences, Urmia, Iran

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Medicine*** Corresponding author:****E-mail:** hayatollahi@yahoo.com

ABSTRACT

Polycystic ovary syndrome (PCOS) is a common endocrine disorder in women of reproductive age, characterized by irregular menstruation, infertility, hirsutism, and insulin resistance. This review aims to explore the use of medicinal plants in the management and treatment of PCOS from the perspective of traditional Iranian medicine. The study was conducted in two phases to identify effective herbal therapies for PCOS within this framework. Authoritative traditional sources, including reference books, treatises, and historical texts, were systematically reviewed. Data on each plant including its scientific name, parts used, and methods of administration were extracted. To ensure the accuracy and validity of both traditional and contemporary scientific information, the data were independently evaluated by two researchers. A total of 32 medicinal plants from 20 botanical families were reviewed. The herbal remedies employed in traditional Iranian medicine for PCOS management include species from the Lamiaceae family such as *Mentha spicata* L., *Salvia officinalis* L., and *Thymus vulgaris* L., among others from diverse botanical families. This review demonstrates that traditional Iranian medicine utilizes a diverse array of herbal remedies for managing PCOS symptoms. These plants have been reported to regulate hormonal balance, restore menstrual regularity, and improve insulin sensitivity, highlighting their potential in mitigating PCOS-related complications. The findings support the integration of herbal therapies as complementary or adjunctive treatments in the clinical management of PCOS.

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Introduction

Women's diseases play a crucial role in women's physical health, fertility, and quality of life, and timely diagnosis and management can prevent

serious physical and psychological consequences (Rezapour et al., 2020; Bayrami et al., 2021; Mehr et al., 2021). One of the important and common

women's disorders is polycystic ovary syndrome (PCOS). Polycystic ovary syndrome (PCOS) is one of the most prevalent hormonal disorders among women of reproductive age, characterized by irregular menstrual cycles, impaired ovulation, multiple ovarian cysts, elevated androgen levels, and abnormal hair growth (Anagnostis et al., 2018). Beyond reproductive disturbances, women with PCOS are at increased risk of metabolic disorders, obesity, insulin resistance, type 2 diabetes, and cardiovascular diseases (Anagnostis et al., 2018). Although the precise etiology of PCOS remains unclear, studies suggest that an interplay of genetic factors, unhealthy lifestyle, mild chronic inflammation, insulin resistance, and hormonal imbalances plays a pivotal role (Azziz et al., 2016). The pathophysiology of PCOS involves hyperandrogenism, a high luteinizing hormone (LH) to follicle-stimulating hormone (FSH) ratio, insulin resistance, and low-grade chronic inflammation, all of which contribute to ovulatory dysfunction, infertility, and ovarian cyst formation (Tsilchorozidou et al., 2004; Balen, 2004). Insulin resistance not only exacerbates androgen production but also triggers systemic metabolic disturbances and inflammation, with genetic predisposition and lifestyle factors further intensifying the condition (Di Lorenzo et al., 2023). PCOS diagnosis is based on a combination of clinical examination, ovarian ultrasonography, and hormonal assessments (Sheehan, 2004). Although there is no definitive cure, interventions such as menstrual cycle regulation, androgen reduction, ovulation induction, and lifestyle modifications including weight management, healthy nutrition, regular physical activity, and stress management can mitigate symptoms and associated complications (Escobar-Morreale, 2018; Radosh, 2009). In recent years, interest in complementary and alternative therapies, particularly herbal medicine, has grown as a safe and supportive approach to managing PCOS (Della Corte et al., 2020; Moini Jazani et al., 2019). Bioactive phytochemicals present in these plants, such as flavonoids, phenolics, and saponins, can improve hormonal imbalances, reduce insulin resistance, and enhance ovarian function (Prabhu et al., 2019; Fijan, 2025). Evidence suggests that certain herbal remedies may effectively manage and treat PCOS (Yadav et al., 2020; Pachiappan et al., 2017). Given the high prevalence of PCOS and its multifaceted impact on women's health, scientifically investigating herbal medicines with potential therapeutic benefits is of considerable importance (Gade et al., 2022). A systematic review of existing studies can consolidate clinical and experimental evidence, providing valuable insights into mechanisms of action, optimal dosages, duration of administration, and safety, thereby guiding future research and clinical

applications. Accordingly, this study aims to review the herbal remedies employed in PCOS management and to identify their therapeutic effects, underlying biological mechanisms, and supporting scientific evidence.

Methods

This study was conducted as a to identify and analyze herbal remedies effective in the management of PCOS from the perspective of traditional Iranian medicine.

In the first phase, authoritative sources of traditional Iranian medicine including reference books, treatises, and historical texts related to herbal medicine were systematically reviewed to identify plants traditionally used for alleviating PCOS-related symptoms. Extracted information included the scientific name of each plant, the part used, and methods of traditional preparation and administration. All data were independently extracted and verified by two researchers. Furthermore, the credibility of both traditional and scientific sources was assessed to ensure accuracy and reliability of the information (Avicenna, 2005; Razi, 2006; Anyazma, 2000; Aghili Khorasani, 2012; Abu Mansur Harawi, 2008; Hekmat Mo'men, 2009; Hekmat Arzani, 2010; Imami, 2010).

Results

In this study identified several herbal species traditionally used in the management of polycystic ovary syndrome (PCOS), including *Mentha spicata* L., *Salvia officinalis* L., *Achillea millefolium* L., *Mentha pulegium* L., *Ocimum basilicum* L., *Origanum majorana* L., *Thymus vulgaris* L., *Hyssopus officinalis* L., *Matricaria chamomilla* L., *Taraxacum officinale* F.H. Wigg., *Rosa damascena* Mill., *Foeniculum vulgare* Mill., *Kelussia odoratissima* Mozaff., *Coriandrum sativum* L., *Pimpinella anisum* L., *Trigonella foenum-graecum* L., *Trifolium pratense* L., *Glycine max* (L.) Merr., *Zingiber officinale* Roscoe, *Curcuma longa* L., *Rubus idaeus* L., *Malus domestica* Borkh., *Prunus avium* L., *Cornus mas* L., *Satureja hortensis* L., *Vitis vinifera* L., *Nigella sativa* L., *Serenoa repens* (W. Bartram) Small, *Paeonia lactiflora* Pall., *Adiantum capillus-veneris* L., *Cucurbita pepo* L., *Silybum marianum* (L.) Gaertn., *Aloe barbadensis* Mill., *Asparagus officinalis* L., *Crocus sativus* L., *Berberis vulgaris* L., and *Aloysia citrodora* Paláu.

Detailed findings are summarized in Table 1, where the plant species are categorized according to their respective botanical families. This organization provides a clear overview of the diversity of herbal remedies traditionally employed for the management of PCOS and facilitates understanding of their potential therapeutic roles.

Table 1: Herbal medicines effective in the management of polycystic ovary syndrome (PCOS)

Botanical Family	Common Name	Scientific Name	Mechanism of Action in PCOS	Plant Part Used	Traditional Use
Lamiaceae	Mint	<i>Mentha spicata</i> L.	Reduces testosterone levels, improves menstrual regularity (Ataabadi et al., 2017)	Leaves	Infusion/tea
	Sage	<i>Salvia officinalis</i> L.	Regulates LH and FSH hormones, anti-inflammatory effect (Amini et al., 2020)	Leaves	Infusion
	Yarrow	<i>Achillea millefolium</i> L.	Improves insulin resistance, enhances ovarian function (Hadijafari et al., 2020)	Aerial parts	Decoction
	Pennyroyal	<i>Mentha pulegium</i> L.	Regulates menstrual cycle and hormonal balance (Nickavar et al., 2023)	Leaves	Infusion
	Basil	<i>Ocimum basilicum</i> L.	Antioxidant effect, reduces androgen levels (Firdous et al., 2025)	Leaves	Infusion
	Marjoram	<i>Origanum majorana</i> L.	Improves insulin sensitivity, regulates hormones (Majeed et al., 2025)	Leaves	Tea/infusion
	Thyme	<i>Thymus vulgaris</i> L.	Modulates sex hormones, antioxidant activity (Jafaristani et al., 2016)	Leaves	Infusion
Asteraceae	Hyssop	<i>Hyssopus officinalis</i> L.	Anti-inflammatory effect, enhances ovarian function (Prabhu et al., 2021)	Aerial parts	Decoction
	Chamomile	<i>Matricaria chamomilla</i> L.	Regulates female hormones, reduces anxiety and oxidative stress (Alahmadi et al., 2020)	Flowers	Tea/infusion
	Dandelion	<i>Taraxacum officinale</i> F.H. Wigg.	Hepatic detoxification, improves estrogen metabolism (Kania-Dobrowolska et al., 2022)	Roots/Leaves	Decoction/infusion
Apiaceae	Damask Rose	<i>Rosa damascena</i> Mill.	Antioxidant effect, reduces ovarian oxidative stress (Farhadi-Azar et al., 2025)	Flowers	Infusion/rose water
	Fennel	<i>Foeniculum vulgare</i> Mill.	Increases estrogen, regulates menstrual cycle (Ghavi et al., 2019)	Seeds	Tea/infusion
	Wild Celery	<i>Kelussia odoratissima</i> Mozaff.	Reduces inflammation, regulates sex hormones (Prabhu et al., 2021)	Aerial parts	Decoction
	Coriander	<i>Coriandrum sativum</i> L.	Improves glucose metabolism, reduces androgens (Meghdadi et al., 2025)	Seeds/Leaves	Tea/culinary
Fabaceae	Anise	<i>Pimpinella anisum</i> L.	Phytoestrogenic effect, improves menstrual cycle (Mahood et al., 2012)	Seeds	Tea/infusion
	Fenugreek	<i>Trigonella foenum-graecum</i> L.	Reduces testosterone, improves insulin resistance (Swaroop et al., 2015)	Seeds	Soaked/infusion
	Red Clover	<i>Trifolium pratense</i> L.	Contains phytoestrogens, regulates hormonal balance (Mangale et al., 2025)	Flowers	Tea/infusion
	Soybean	<i>Glycine max</i> (L.) Merr.	Phytoestrogens, regulates menstrual cycle (Ahmed et al., 2023)	Seeds	Roasted/boiled

Zingiberaceae	Ginger	<i>Zingiber officinale</i> Roscoe	Anti-inflammatory, reduces LH, improves ovulation (Gupte et al., 2023)	Rhizome	Decoction/tea
	Turmeric	<i>Curcuma longa</i> L.	Regulates insulin, strong antioxidant effect (Gupte et al., 2023)	Rhizome	Powder/infusion
Rosaceae	Raspberry Leaf	<i>Rubus idaeus</i> L.	Regulates uterus, improves ovulation (Li et al., 2023)	Leaves	Tea/infusion
	Apple	<i>Malus domestica</i> Borkh.	Natural antioxidant, improves lipid metabolism (Prabhu et al., 2021)	Fruit	Raw/juice
	Cherry	<i>Prunus avium</i> L.	Reduces inflammation, improves hormonal profile (Prabhu et al., 2021)	Fruit	Raw/juice
	Cornelian Cherry	<i>Cornus mas</i> L.	Strong antioxidant, anti-inflammatory (Prabhu et al., 2021)	Fruit	Raw/confection
Rutaceae	Savory	<i>Satureja hortensis</i> L.	Anti-inflammatory, improves insulin resistance (Muthukumar et al., 2023)	Leaves	Tea/infusion
Vitaceae	Grape	<i>Vitis vinifera</i> L.	Regulates LH and FSH, high antioxidant activity (Sedighi et al., 2020)	Fruit	Raw/juice
Ranunculaceae	Black Cumin	<i>Nigella sativa</i> L.	Regulates LH and FSH, anti-inflammatory effect (Mahmoudian et al., 2024)	Seeds	Oil/tea
Arecaceae	Saw Palmetto	<i>Serenoa repens</i> (W. Bartram) Small	Inhibits 5 α -reductase enzyme, reduces androgens (Zeng et al, 2022)	Fruit	Powder/extract
Paeoniaceae	Peony	<i>Paeonia lactiflora</i> Pall.	Increases estradiol, reduces testosterone (Park et al., 2020)	Root	Decoction
Plantaginaceae	Maidenhair Fern	<i>Adiantum capillus- veneris</i> L.	Enhances ovarian function, regulates hormones (Prabhu et al., 2021)	Leaves	Tea/infusion
Cucurbitaceae	Pumpkin	<i>Cucurbita pepo</i> L.	Reduces insulin resistance, improves lipid profile (Irfan et al., 2021)	Seeds	Roasted/powder
Euphorbiaceae	Milk Thistle	<i>Silybum marianum</i> (L.) Gaertn.	Liver detoxification, improves estrogen metabolism (Negm et al., 2023)	Seeds	Infusion/extract
Aloeaceae	Aloe Vera	<i>Aloe barbadensis</i> Mill.	Improves insulin resistance, regulates blood glucose (Maharjan et al., 2010)	Gel/Leaves	Juice/topical
Asparagaceae	Asparagus	<i>Asparagus officinalis</i> L.	Increases estrogen, regulates hormones (Al-masoudi et al., 2023)	Shoots	Boiled/infusion
Iridaceae	Saffron	<i>Crocus sativus</i> L.	Reduces oxidative stress, regulates ovarian hormones (Tiwari et al., 2023)	Stigmas	Tea/infusion
Berberidaceae	Barberry	<i>Berberis vulgaris</i> L.	Anti-inflammatory, regulates glucose and insulin (Ashkar et al., 2020)	Root/Bark	Decoction/tea
Verbenaceae	Lemon Verbena	<i>Aloysia citrodora</i> Paláu	Calming effect, regulates menstrual cycle (Díez Echave, 2021)	Leaves	Infusion

A total of 32 medicinal plants from 20 botanical families were reviewed. The most species-rich families were Lamiaceae (8 species), Apiaceae (4 species), Rosaceae (4 species), Asteraceae (3 species), and Fabaceae (3 species). The remaining species were distributed across fifteen other families.

Discussion

Traditional medicine and herbal remedies have long been employed in the management of hormonal and reproductive disorders in women. The anti-inflammatory, hormone-regulating, and antioxidant properties of these plants enable them to effectively alleviate symptoms of PCOS. The use of herbal therapies not only reduces the side effects associated with conventional pharmaceuticals but also improves patients' quality of life. In this context, herbal medicine can be considered a natural and low-risk strategy for managing PCOS.

Both human and animal studies have demonstrated that herbs such as *Mentha spicata*, *Cinnamomum zeylanicum*, *Grifola frondosa*, *Origanum majorana*, *Trigonella foenum-graecum*, *Phoenix dactylifera*, *Glycyrrhiza glabra*, *Mentha piperita*, *Vitex agnus-castus*, *Marrubium vulgare*, *Camellia sinensis*, *Rubus idaeus* × *strigosus*, *Chamaemelum nobile*, *Pergularia daemia*, *Foeniculum vulgare*, *Glycine max*, *Atractylodes macrocephala*, *Corylus avellana*, *Bambusa vulgaris*, *Aloe vera*, *Labisia pumila* var. *alata*, *Heracleum persicum*, *Cocos nucifera*, and *Punica granatum* possess anti-androgenic, phytoestrogenic, and antioxidant activities that can alleviate PCOS symptoms while improving hormonal function, menstrual cycles, and ovarian health. Their reported effects include reducing testosterone levels, normalizing the LH:FSH ratio, decreasing insulin resistance, and enhancing ovarian follicular structure (Abasian et al., 2018).

PCOS is a common metabolic-hormonal disorder characterized by polycystic ovaries, menstrual irregularities, hyperandrogenism, and complications such as infertility and hirsutism. Herbs like *Asparagus racemosus*, *Grifola frondosa*, *Lepidium meyenii*, and *Tinospora cordifolia* demonstrate anti-diabetic, anti-obesity, and PCOS symptom-reducing effects, highlighting their preventive and therapeutic potential. Evidence suggests that combining these herbs with lifestyle management is more effective than conventional monotherapies (Pachiappan et al., 2017).

Conventional PCOS medications primarily focus on symptom control; however, bioactive compounds

in herbal medicines such as flavonoids, polyphenols, phytoestrogens, and polyunsaturated fatty acids can improve infertility and hormonal imbalances, reduce insulin resistance and excess androgen levels, and modulate ovarian function (Prabhu et al., 2021).

In a systematic review of 361 studies, 38 articles were included in the final analysis. The results indicated that herbs such as *Aloe vera*, *Chamomile*, *Cinnamomum zeylanicum*, *Camellia sinensis*, *Mentha spicata*, *Foeniculum vulgare*, *Glycyrrhiza glabra*, and *Marrubium vulgare* play a significant role in PCOS management by modulating lipid profiles, insulin resistance, blood glucose, hormonal levels, and ovarian tissue (Ashkar., 2021).

Additionally, herbs including *Bauhinia variegata*, *Phyllanthus emblica*, *Terminalia bellirica*, *Terminalia chebula*, *Commiphora wightii*, *Cinnamomum cassia*, *Tribulus terrestris*, *Hypericum perforatum*, *Commiphora myrrha*, *Nigella sativa*, *Saraca asoca*, *Asparagus racemosus*, *Tinospora cordifolia*, and *Ocimum sanctum* can improve hormonal function and fertility without causing adverse effects, either individually or in combination, as part of natural PCOS therapy (Wal et al., 2021).

Clinical and preclinical studies further demonstrate that herbs such as *Vitex agnus-castus*, *Cimicifuga racemosa*, *Cinnamomum cassia*, *Tribulus terrestris*, *Glycyrrhiza glabra*, *Glycyrrhiza uralensis*, and *Paeonia lactiflora* can reduce testosterone and LH levels, increase FSH and progesterone, improve the FSH:LH ratio, and regulate ovarian cycles and ovulation, thereby effectively managing infertility and hormonal disturbances associated with PCOS (Arentz et al., 2014).

Given the complex and multisystemic nature of PCOS and the limitations of conventional therapies, herbal medicines and spices have garnered attention as alternative treatments with minimal side effects. Their bioactive compounds such as flavonoids, terpenoids, and phenolic acids contribute to both the prevention and treatment of PCOS, highlighting the potential of novel plant-based therapeutic strategies (Kumar et al., 2022).

A closer analysis reveals that different herbs act through various mechanisms to manage PCOS effectively. For example, *Vitex agnus-castus* and *Curcuma longa* enhance ovulatory cycles and reduce cyst formation, while anti-androgenic herbs such as *Glycyrrhiza glabra*, *Linum usitatissimum*, *Mentha spicata*, *Cocos nucifera*, and *Punica granatum* lower androgen levels, regulate hormones, and alleviate hirsutism and related androgenic symptoms. Moreover, *Cinnamomum cassia* and *Aloe vera* improve insulin sensitivity

and enzyme activity, playing a key role in controlling metabolic and hormonal disturbances in PCOS. Certain herbs, including *Foeniculum vulgare*, *Panax ginseng*, *Cimicifuga racemosa*, *Pimpinella anisum*, and *Trigonella foenum-graecum*, enhance FSH while reducing LH, regulating pituitary-ovarian hormones to support ovulation and fertility. Additionally, ovulation-stimulating herbs such as *Zingiber officinalis* and *Tribulus terrestris* strengthen ovarian function and hormonal balance, potentially improving fertility outcomes in PCOS patients.

These diverse mechanisms suggest that combining multiple herbs can simultaneously target several pathways associated with PCOS, including androgen reduction, hormonal balance restoration, insulin sensitivity improvement, and enhancement of ovarian follicular structure (Lakshmi et al., 2023).

Natural products containing bioactive compounds such as flavonoids, terpenoids, and phenolic acids can improve blood glucose, sex hormones, and lipid profiles in women with PCOS. Their anti-inflammatory, antioxidant, and anti-androgenic properties also mitigate ovarian histopathological changes. Consequently, natural products may serve as safe and effective complementary or alternative therapies in PCOS management (Jung et al., 2023).

This article provides a comprehensive synthesis of medicinal plants effective in managing polycystic ovary syndrome (PCOS) from the perspective of traditional Iranian medicine. It highlights how these plants may contribute to hormonal regulation, improvement of menstrual cycles, and reduction of insulin resistance.

The study is based on a review of existing literature and evidence. A notable limitation is the scarcity of large-scale clinical trials and the lack of direct comparisons between these medicinal plants and standard treatments.

Conducting well-designed, controlled clinical trials with larger populations is recommended to assess the efficacy and safety of these plants. Additionally, evaluating their integration with lifestyle interventions could provide more robust scientific evidence to support their clinical application.

Conclusion

Based on current evidence, herbal medicines and natural compounds play a significant role in improving hormonal disorders, reducing insulin resistance, regulating menstrual cycles, and alleviating PCOS symptoms. Their use not only minimizes the side effects of conventional pharmaceuticals but also provides a comprehensive,

multi-targeted approach for managing this syndrome. Combining herbs with different mechanisms of action alongside lifestyle modifications may offer the most effective strategy to enhance quality of life and fertility outcomes for women with PCOS.

Declarations

Conflict of Interest

The authors declare there is no competing interests.

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Authors' contributions

Conceptualization: Samira Jahangard, Hale

Ayatollahi, Laya Tagipour, Elham Rajabi

Data curation: Laya Tagipour

Formal analysis: Hale Ayatollahi

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Investigation: Laya Tagipour

Methodology: Laya Tagipour

Project administration: Laya Tagipour

Resources: Laya Tagipour

Software: Laya Tagipour

Supervision: Hale Ayatollahi

Validation: Hale Ayatollahi

Visualization: Samira Jahangard, Hale Ayatollahi,

Laya Tagipour, Elham Rajabi

Writing – original draft: Samira Jahangard, Hale

Ayatollahi, Laya Tagipour, Elham Rajabi

Writing – review & editing: Laya Tagipour

Ethical considerations

Ethical issues (including plagiarism, misconduct, data fabrication, falsification, double publication or submission, redundancy) have been completely observed by the authors.

AI Use Disclosure

The authors confirm that as non-native speakers have utilized ChatGPT-4.0 to enhance the writing and readability of this manuscript. The content has been carefully reviewed and edited where necessary, and we take full responsibility for its accuracy and integrity.

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