



Phytotherapy in Prostatitis: a Review on the Most Important Medicinal Plants Affecting Prostatitis in Iranian Ethnobotanical Documents

Shaima Rabeea Banoon¹, Mohammad Narimani-Rad², Alireza Lotfi³, Samira Shokri⁴, Saber Abbaszadeh⁵, Sedef Özlman^{6*}

¹Department of Biology, College of Science, University of Misan, Maysan, Iraq

²Department of Biomedical Engineering, Central Tehran branch, Islamic Azad University, Tehran, Iran

³Department of Animal Physiology, Islamic Azad University, Iran

⁴Department of Pathobiology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

⁵Department of Biochemistry and Genetics, School of Medicine, Lorestan University of Medical Sciences, Khorramabad, Iran

⁶Department of Medicinal and Aromatic Plants, Atatürk Health Care Vocational School, Afyonkarahisar Health Sciences University, Afyonkarahisar, Turkey

Article Info

*Correspondence to:

Sedef Özlman
sedef.ozlman@afsu.edu.tr

Article History:

Received: 01 April 2021

Accepted: 29 April 2021

ePublished: 22 Nov 2021

Keywords: Genitourinary tract, Prostate, Prostatitis, herbal medicines, Iran

Abstract

*Prostatitis can occur at any age, after its enlargement, it puts pressure on the urinary tracts and causes urinary symptoms. Factors influencing the prevalence of prostatitis include age, genetic, diet, cancer, hormonal factors, and environmental factors. A microbial infection often causes prostatitis. In this systematic review, we tried to report the most important herbal medicines that have been mentioned for prostate treatment in Iranian ethnobotanical documents. Some keywords have been used, such as prostate, prostate inflammation, medicinal plants, ethnobotany, identification of medicinal plants. Also some Iranian Databases have been used, such as ISI Web Science, PubMed, Scopus, ISC, SID, and Google Scholar to review articles and resources. Ethnobotanical knowledge has a solution for treating this disease. Based on the results obtained in Iranian ethnobotanical documents, *Lamium album* L., *Origanum vulgare*, *Silybum marianum* (L.) Gaerth., *Sorghum halepense* (L.) Pers., *Polygonum aviculare* L., *Urtica dioica* L., *Alhagi persarum**

Boiss. & Buhse., Eremurus persicus (Jaub. & Spach) Boiss., Gundelia tournefortii, Myrtus communis L., Tribulus Terrestris L., and Physalis divaricata D. Don are the most important herbal medicines used in Iranian ethnobotanical sources for prostate treatment. Aim of this systematic review, was to report the most important medicinal plants for prostatitis treatment mentioned in Iranian ethnobotanical documents.

How to cite this paper

Rabeea BanoonSH, Narimani-Rad M, Lotfi A, Shokri S, Abbaszadeh S, Özlman S. *Phytotherapy in prostatitis: A review of the most important medicinal plants affecting prostatitis in Iranian ethnobotanical documents. Plant Biotechnology Persa 2021; 3(2): 68-74.*

Introduction

Anatomically, the prostate is located in the abdomen, in front of the rectum, and between the penis and the bladder. The prostate is involved in regulating sperm count in men. Sperm are excreted through the urethra through the prostate like urine, through the penis [1]. Diseases that affect this organ include inflammation of the prostate, benign prostatic hyperplasia(BPH), and cancer [2]. Gradual enlargement of this organ can put pressure on the urinary tract and cause signs and symptoms such as Urinary frequency, Urinary agency, Hesitancy, Straining, decreased force of stream, dribbling, nocturia, Dysuria, difficulty urinating, hematuria, etc [3]. Factors influencing the prevalence of this issue include age, genetics, diet, cancer, hormonal factors, and environmental factors [4,5]. Complaints of these symptoms are widespread in men aged between 50 to 70 years [6].

The inflammatory prostate disease has been identified and defined by the National Institutes of Health (NIH) since 1999, affecting half of all men in their lifetime [3]. This disease includes four syndromes: acute bacterial prostatitis, chronic bacterial prostatitis, chronic prostatitis and chronic pelvic pain syndrome (CPPS), and asymptomatic inflammatory prostatitis [7]. One of the most common factors that cause an increase in prostate inflammation is sexually transmitted diseases [8,9]. Usually, 25% of patients refer to urology clinics with

symptoms of genitourinary and urinary tract problems. A doctor makes a differential diagnosis of prostatitis based on the person's history, physical examination and increases Prostate-specific antigen (PSA) factor's level in the prostate fluid in the test because, in some cases, the PSA factor indicates cancer or BPH [10-12]. In chronic prostatitis, systemic symptoms are less common, and the pain persists for at least three months. Benign prostatic hyperplasia, chronic pain syndrome, bladder inflammation, erectile dysfunction, urinary tract stones, prostate, and testicular cancer are other observed symptoms [13].

Due to the side effects observed from chemical drugs, people are more inclined to use herbal medicines [14-19]. Herbal medicines are used in various diseases such as diabetes [20], hypertension [21], menstruation [22], gastrointestinal [23], hormonal problems, prostate cancer [14], etc. They have active ingredients such as flavonoids, glucosides, saponins, alkaloids, etc. In some cases, the structure them have been used for the design and marketing of chemical drugs [24]. The herbal medicine effect's therapeutics is due to their active ingredient with antioxidant properties, etc [25-28].

In this systematic review study, we tried to report the most important and most widely used herbal medicines for prostatitis treatment in Iranian ethnobotanical documents.

Materials and Methods

In this systematic review study, available articles in Iranian ethnobotanical sources were used. Keywords have been used such as prostate, prostatitis, herbal medicine, ethnobotany, identification of herbal medicine, and Iran. Databases were used such as ISI Web Science, PubMed, Scopus, ISC, SID, and Google Scholar to review articles and resources. In this study, 44 articles were searched and found. Two of them also lacked full text. Finally, 42 papers were reviewed for this review article. Out of 42 articles, only seven articles contained ethnobotanical information for prostate treatment.

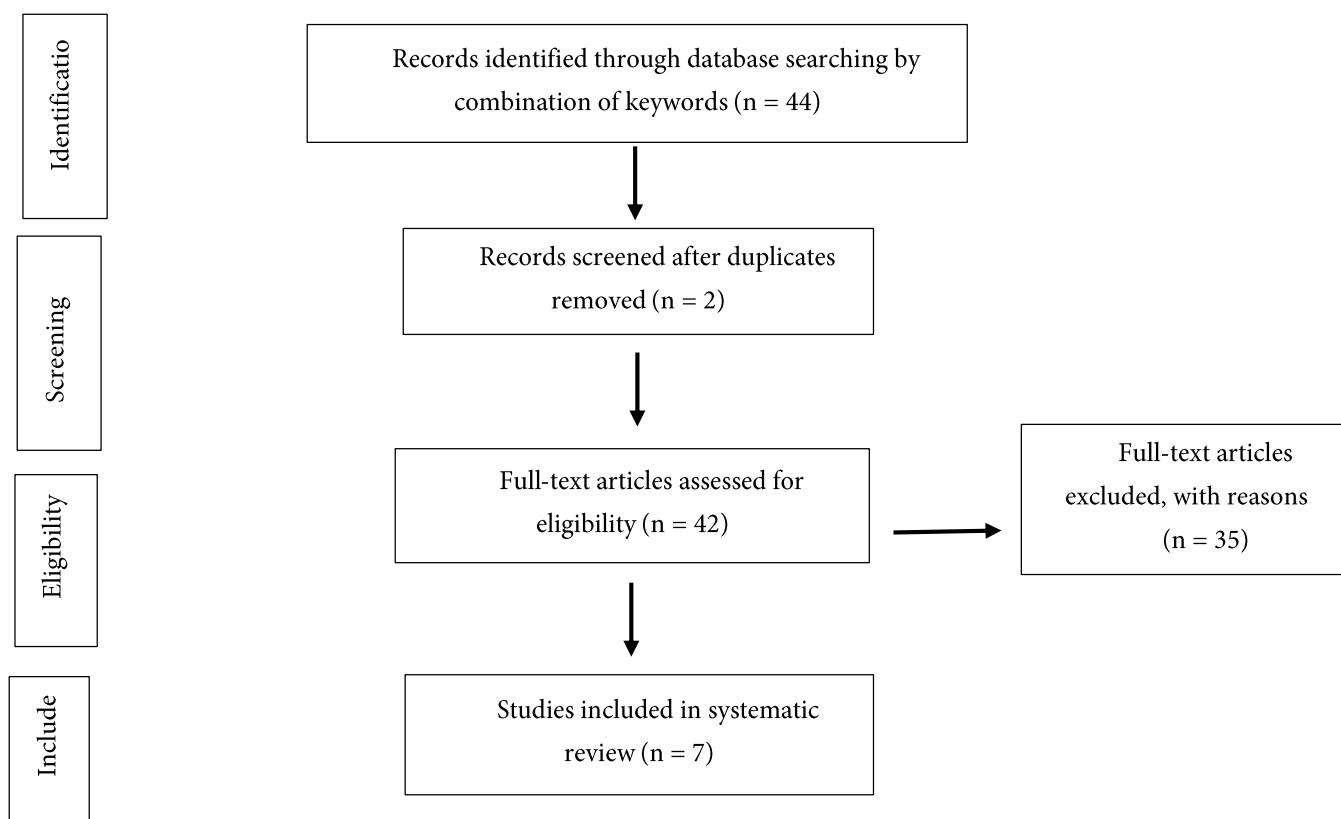
L., *Origanum vulgare*, *Silybum marianum* (L.) Gaerth., *Sorghum halepense* (L.) Pers., *Polygonum aviculare* L., *Urtica dioica* L., *Alhagi persarum* Boiss. & Buhse., *Eremurus persicus* (Jaub. & Spach) Boiss., *Gundelia tournefortii*, *Myrtus communis* L., *Tribulus Terrestris* L., and *Physalis divaricata* D. Don are the most important herbal medicine used in Iranian ethnobotanical sources to treat prostate. The list of plants, families, organs used, and the province in question is given in Table 1. The flowchart of the search strategy and the criteria for entering and leaving the articles are specified in Figure 1.

Table 1. Medicinal plants affecting prostritis and additional information about the organ used, Persian name, region used

Results

A review of Iranian ethnobotanical sources showed that herbal medicine such as *Lamium album*

Figure 1. The criteria and the number of entry and exit articles



Scientific names	Family	Persian name	Organ used	Region used	Bioactive compounds	Chemical formula
<i>Lamium album</i> L.	Labiatae	Gazaneh sefid	Flowering branch	Arasbaran [19]	6,10,14-trimethyl-2-pentadecanone	C ₁₈ H ₃₆ O
<i>Origanum vulgare</i>	Labiatae	Marzanjoush	Flowering branch	Arasbaran [19]	Hypericin	C ₃₀ H ₁₆ O ₈
<i>Silybum marianum</i> (L.) Gaerth.	Asteraceae	Kharmaryam	Seed	Bushehr [20]	Silymarin	C ₂₅ H ₂₂ O ₁₀
<i>Sorghum halepense</i> (L.) Pers.	Poaceae	Sorghom	Seed	Behbahan [21]	p-Cimene	C ₁₀ H ₁₄
<i>Polygonum aviculare</i> L.	Polygonaceae	Alafe haftband	Aerial organs	Behbahan [21]	Liquiritin	C ₂₁ H ₂₂ O ₉
<i>Urtica dioica</i> L.	Urticaceae	Gazaneh dopayeh	Aerial organs	Behbahan [21]	Hydroxycinnamic acid	C ₉ H ₈ O ₃
<i>Alhagi persarum</i> Boiss. & Buhse.	Fabaceae	Dava	Root, Flower	Zanjan [22]	Quercetin	C ₁₅ H ₁₀ O ₇
<i>Eremurus persicus</i> (Jaub. & Spach) Boiss.	Xanthorrhoeaceae	Cherish	Root, Flower	East of Khuzistan [23]	Limonene	C ₁₀ H ₁₆
<i>Gundelia tournefortii</i>	Asteraceae	Kangar	Leaf	Fasa [24]	Threonine	C ₄ H ₉ NO ₃
<i>Myrtus communis</i> L.	Myrtaceae	Mord	Leaf	Fasa [24]	1,8-cineole	C ₁₀ H ₁₈ O
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Kharkhasak	Fruit	Fasa [24]	Quercetin	C ₁₅ H ₁₀ O ₇
<i>Physalis divaricata</i> D. Don	Solanaceae	Arosak poshtepardeh	Aerial organs	Kazeroun [25]	Physalin A	C ₂₈ H ₃₀ O ₁₀

Discussion

Today, natural products from living microorganisms, including plants and secondary metabolites, are used as one of the most widely used sources of prevention and treatment in the prostate.

Chemical drugs used for prostatitis treatment: Antibiotics, antivirals, antifungals for infection, [9,29] NSAIDs for reducing pain and inflammation, and alpha-blockers for reducing the obstructive

symptoms of the urinary bladder [30]. Lifestyle changes are one of the critical, influential factors in preventing and controlling this disease [31].

Due to the side effects observed from chemical drugs, people are more inclined to use herbal medicines. For example, alpha-blocker drugs show many side effects such as dizziness, headache, weakness, tachycardia, palpitations, hypotension.

The herbs used in prostatitis are diverse, and it is predicted that their active ingredients affect this

disease with a mechanism like chemical drug's mechanisms.

Pygeum africanum, *Serenoa repens*, and *Cucurbita pepo* are showed anti-adrenergic properties similar to alpha-blockers. They are acted on androgen receptors in humans to prevent the growth prostate [32].

Organum Vulgare L. is probably effective in this disease with its anti-inflammatory and antibacterial properties [33].

Silybum marianum with antioxidant and anti-inflammatory properties can efface prostate cancer cells [34].

Urtica dioica is one of the well-known plants in prostate problems, used with antioxidant and anti-inflammatory properties in cases such as the treatment of benign prostatic hyperplasia (BPH) and the elimination of prostate cancer cells. It inhibits the 5-alpha reductase to prevent the conversion of testosterone to dihydrotestosterone. This action is caused to reduce dihydrotestosterone in the blood and subsequently in the prostate tissue [35,36].

References

1. Gao D, Vela I, Sboner A, Iaquina PJ, Karthaus WR, Gopalan A, et al. Organoid Cultures Derived from Patients with Advanced Prostate Cancer. *Cell* 2014; 25; 159(1):176–87.
2. Stamey Thomas A., Caldwell Mitchell, McNEAL JOHN E., Nolley Rosalie, Hemenez Marci, Downs Joshua. The prostate specific antigen era in the united states is over for prostate cancer: what happened in the last 20 years? *J Urol* 2004; 1; 172(4 Part 1):1297–301.
3. Krieger JN, Nyberg L, Curtis N. NIH Consensus Definition and Classification of Prostatitis | JAMA | JAMA Network. :236–7.
4. Khan FU, Ihsan AU, Khan HU, Jana R, Wazir J, Khongorzul P, et al. Comprehensive overview of prostatitis. *Biomed Pharmacother* 2017; 1;94:1064–76.
5. Morozov A, Bazarkin A, Babaevskaya D, Taratkin M, Kozlov V, Suvorov A, Spivak L, McFarland J, Russo GI, Enikeev D, EAU-YAU Polyextract of *Orthosiphon stamineus*, *Arctostaphylos uva-ursi*, *Polygonum aviculare*, *Calendula officinalis*, and *Glycyrrhiza uralensis* extracts are contained flavonoids (quercetin, rutin, luteolin-7-glycoside, myricetin), phenolic carboxylic acids (Gallic and chlorogenic), and arbutin. It affects chronic prostatitis with anti-inflammatory properties and causes normalization of prostate functioning and the FSH level in laboratory animals [37].

Authors' contribution

All authors contributed equally to the manuscript.

Conflicts of interest

The authors declared no competing interests.

Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication, etc.) have been completely observed by the author.

Funding/Support

None.

Sexual and Reproductive Health Working Group. A systematic review and meta-analysis of placebo effect in clinical trials on chronic prostatitis/chronic pelvic pain syndrome. *Prostate* 2022; 82(6):633-56.

6. Crawford ED. Epidemiology of prostate cancer. *Urol* 2003; 22;62(1):3–12.
7. Pontari M. Definition and epidemiology of chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS). https://books.publisso.de/de/publisso_gold/publishing/books/overview/52/103 [Internet]. 2020 Aug 26 [cited 2021 Jul 3]; Available from: https://books.publisso.de/de/publisso_gold/publishing/books/overview/52/103
8. Papeš D, Pasini M, Jerončić A, Vargović M, Kotarski V, Markotić A, et al. Detection of sexually transmitted pathogens in patients with chronic prostatitis/chronic pelvic pain: a

- prospective clinical study. *Int J STD AIDS* 2017; 1;28(6):613–5.
9. Workowski KA, Bolan GA. Sexually Transmitted Diseases Treatment Guidelines, 2015. *MMWR Recomm Rep Morb Mortal Wkly Rep Recomm Rep* 2015; 5; 64(03):1–137.
 10. Donovan DA, Nicholas PK. Prostatitis: diagnosis and treatment in primary care. *Nurse Pract.* 1997 Apr 1;22(4):144–6, 149–56.
 11. Carter HB. Use of 2.6 NG/ML prostate specific antigen prompt for biopsy in men older than 60 years: Editorial comment. *J Urol* [Internet]. 2005;174(6). Available from: <https://jhu.pure.elsevier.com/en/publications/use-of-26-ngml-prostate-specific-antigen-prompt-for-biopsy-in-men-4>
 12. Collins MM, Stafford RS, O’Leary MP, Barry MJ. How common is prostatitis? A national survey of physician visits. *J Urol* 1998; 159(4):1224–8.
 13. Polackwich AS, Shoskes DA. Chronic prostatitis/chronic pelvic pain syndrome: a review of evaluation and therapy. *Prostate Cancer Prostatic Dis* 2016; 19(2):132–8.
 14. Basati G, Ghanadi P, Abbaszadeh S. A review of the most important natural antioxidants and effective medicinal plants in traditional medicine on prostate cancer and its disorders. *J Herbmed Pharmacol* 2020; 14; 9(2):112–20.
 15. Nouri A, Heidarian E, Amini-khoei H, Abbaszadeh S, Basati G. Quercetin through mitigation of inflammatory response... - Google Scholar. *J Pharmacog Res* 2019; 200–12.
 16. Alizadeh M, Safarzadeh A, Bahmani M, Beyranvand F, Mohammadi M, Azarbaijani K, et al. Brucellosis: Pathophysiology and new promising treatments with medicinal plants and natural antioxidants. *Asian Pac J Trop Med* 2018; 1; 11(11):597.
 17. Naghdi DN. Folklore medicinal plants used in liver disease: A review. *Int J Green Pharm IJGP* [Internet] 2018;12(03). Available from: <http://greenpharmacy.info/index.php/ijgp/article/view/2006>
 18. Bahmani M, Jalilian A, Salimikia I, Shahsavari S, Abbasi N. Phytochemical screening of two Ilam native plants *Ziziphus nummularia* (Burm.f.) Wight & Arn. and *Ziziphus spinachristi* (Mill.) Georgi using HS-SPME and GC-MS spectroscopy. *Plant Sci Today* 2020; 6; 7(2):275–80.
 19. Abbasi N, Khalighi Z, Eftekhari Z, Bahmani M. Extraction and phytoanalysis of chemical compounds of *Eucalyptus globulus* leaf native to Dehloran, Ilam province, Iran by HS-SPME and GC-MS. *Adv Anim Vet Sci* 2020; 8(6):647–52.
 20. Diabetes saber abbaszadeh - Google Scholar [Internet]. [cited 2021 Jul 2]. Available from: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=diabets+saber+abbaszadeh&btnG=
 21. Pourjabali M, Mohammadrezaei-Khorramabadi R, Abbaszadeh S, Naghdi N, Naji-Haddadi S, Bahmani F. Medicinal Plants Used For Hypertension. *J Pharm Sci* 2017;9:5.
 22. Tajallaie-Asl F, Mardani M, Shahsavari S, Abbaszadeh S. Menstruation Phytotherapy According To Iran Ethnobotanical Sources. *J Pharm Sci Res* 2017; 1;9(6):986–90.
 23. Anbari K, Hasanvand A, Andevvari AN, moghadasi M, Abbaszadeh S. Concise overview: A review on natural antioxidants and important herbal plants on gastrointestinal System. *Res J Pharm Technol* 2019;12(2):841.
 24. Uchiyama N, Kikura-Hanajiri R, Ogata J, Goda Y. Chemical analysis of synthetic cannabinoids as designer drugs in herbal products. *Forensic Sci Int* 2010; 20; 198(1):31–8.
 25. Aidy ali, Karimi E, Ghaneialvar H, Mohammadpour S, Abbasi N. Protective effect of *Nectaroscordum tripedale* extract and its bioactive component tetramethylpyrazine

- against acetaminophen-induced hepatotoxicity in rats. *Adv Trad Med* 2020; 20: 471–7.
26. Pirhadi M, Shahsavari S. An Overview of the Most Important Medicinal Plants Used in Iranian Traditional Medicine for the Treatment of Kidney Stones: A mini-review article. *Plant Biotechnol Pers* 2021; 1–4.
 27. Karimi E, Abbasi S, Abbasi N. Thymol polymeric nanoparticle synthesis and its effects on the toxicity of high glucose on OEC cells: involvement of growth factors and integrin-linked kinase. *Drug Des Devel Ther* 2019; 25; 13:2513–32.
 28. Abbasi N, Khosravi A, Aidy ali, Shafiei M. Biphasic Response to Luteolin in MG-63 Osteoblast-Like Cells under High Glucose-Induced Oxidative Stress. *Iran J Med Sci* 2016; 41.
 29. Centers for Disease Control and Prevention (CDC). Update to CDC's sexually transmitted diseases treatment guidelines, 2006: fluoroquinolones no longer recommended for treatment of gonococcal infections. *MMWR Morb Mortal Wkly Rep* 2007; 13; 56(14):332–6.
 30. Nickel JC. α -Blockers for Treatment of the Prostatitis Syndromes. *Rev Urol* 2005; 7(8):S18–25.
 31. Wang Y, Chen C, Changcai Z, Liang C, Qingrong H, Huarong Y. Social Determinants of Chronic Prostatitis/Chronic Pelvic Pain Syndrome Related Lifestyle and Behaviors among Urban Men in China: A Case-Control Study - PubMed. 2016; Available from: <https://pubmed.ncbi.nlm.nih.gov/27579305/>
 32. Schleich S, Papaioannou M, Baniahmad A, Mastusch R. Extracts from *Pygeum africanum* and Other Ethnobotanical Species with Antiandrogenic Activity. *Planta Med* 2006; 19; 72(9):807–13.
 33. Bioactivities of *Origanum vulgare* L.: an update | SpringerLink [Internet]. [cited 2021 Jul 2]. Available from: <https://link.springer.com/article/10.1007/s1101-017-9535-z>
 34. Elyasi S. Chapter 43 - *Silybum marianum*, antioxidant activity, and cancer patients. In: Preedy VR, Patel VB, editors. *Cancer* (Second Edition) [Internet]. San Diego: Academic Press; 2021; 483–93. Available from: <https://www.sciencedirect.com/science/article/pii/B9780128195475000432>
 35. Ghorbanibirgani A, Khalili A, Zamani L. The efficacy of stinging nettle (*urtica dioica*) in patients with benign prostatic hyperplasia: a randomized double-blind study in 100 patients. *Iran Red Crescent Med J* 2013; 1; 15(1):9–10.
 36. Asadi-Samani M, Rafieian-Kopaei M, Lorigooini Z, Shirzad H. A screening of growth inhibitory activity of Iranian medicinal plants on prostate cancer cell lines. *BioMed* 8(2): 8-12.
 37. Nikolaev SM, Nikolaeva GG, Mondodoev AG, Markaryan AA, Nikolaeva IG, Nagaslaeva OV. Anti-Inflammatory Action of Polyextract of *Orthosiphon stamineus* (Leaves), *Arctostaphylos uva-ursi* (Leaves), *Polygonum aviculare* (Herbs), *Calendula officinalis* (Flowers), and *Glycyrrhiza uralensis* (Root) on the Rat Prostate. *Pharm Chem J* 2018; 1; 52(2):117–21.