Received: 17 Jan 2026	Revised: 15 Feb 2026	Accepted: 15 March 2026

Review Article

IJAG
Lets Explore Ayurveda Gynaecology

ISSN: 3048-5592

"SHATAVARI (ASPARAGUS RACEMOSUS) IN FEMALE REPRODUCTIVE HEALTH: PHYTOCHEMISTRY, PHARMACOLOGY AND CLINICAL EVIDENCE"

Tushar Tapadiya[1]

AFFILIATIONS:
1. Research Assistant, Ira Consultancy & Research Organisation, Bhosari, Pune, Maharashtra 411026

CORRESPONDENCE:
Tushar Tapadiya

EMAIL ID:
tushartapadiya11@gmail.com

FUNDING INFORMATION:
Not Applicable

How to cite this article:
Tapadiya T. "Shatavari (Asparagus Racemosus) in Female Reproductive Health: Phytochemistry, Pharmacology and Clinical Evidence" International Journal of Ayurveda Gynecology. 2026;3(1):21-27
Sri. 2026.1008.ijag.01.04

ABSTRACT:
Background: Shatavari (*Asparagus racemosus* Willd.) is the most widely used Ayurvedic herb for women's health. Classical texts describe it as a Rasayana, galactagogue and tonic for the female reproductive system, and standardised root extracts are now marketed worldwide for lactation, fertility and menopausal symptoms. **Objective:** To review the classical descriptions, phytochemistry, experimental pharmacology and clinical evidence for Shatavari in female reproductive health, and to identify gaps in safety and quality data. **Methods:** Classical texts (Charaka Samhita, Kashyapa Samhita, Bhavaprakasha Nighantu) were reviewed. PubMed was searched up to October 2026 for reviews, experimental studies and clinical trials on Shatavari and female reproduction, lactation and menopause. Each record was checked for retraction status; one retracted perimenopause trial was excluded. Findings were synthesised narratively. **Results:** Shatavari roots contain steroidal saponins (shatavarins I to VI, especially shatavarin IV), flavonoids and other constituents. Experimental studies suggest oestrogen-like effects on the rat genital tract and mammary gland, antioxidant and adaptogenic activity, and immunomodulation. A recent placebo-controlled trial in 120 postpartum women found greater milk volume at 72 hours with a root extract, although a Cochrane review judged earlier galactagogue evidence to be of very low certainty. Three placebo-controlled trials of 70 to 135 women reported improvement in menopausal symptom scores over eight weeks or more. Evidence for fertility, polycystic ovary syndrome and menstrual disorders is largely preclinical. **Conclusion:** Shatavari has a coherent classical rationale and growing but still limited clinical support for lactation and menopausal symptoms. Larger, independent, longer trials with chemically standardised products, and specific safety data in pregnancy, are required.

KEYWORDS: Shatavari, Asparagus racemosus, shatavarin IV, galactagogue, menopause, Rasayana

This is an open access article, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

INTRODUCTION

Shatavari (*Asparagus racemosus* Willd., family Asparagaceae) is a climbing plant of tropical and subtropical India whose tuberous roots have been used in Ayurveda, Unani and Siddha medicine for centuries[1,2]. It is listed in the Indian and British pharmacopoeias and is often called the queen of herbs because of its reputation as a tonic for women at every stage of reproductive life[1,3]. In Ayurvedic gynaecology it is prescribed to regulate menstruation, to support conception and pregnancy, to promote breast milk, and to ease the transition through menopause[4,5].

Demand for Shatavari has risen sharply as standardised extracts have entered the global market for women's health supplements. This has led to destructive wild harvesting, and the plant is now considered threatened in its natural habitat[1]. At the same time, a growing number of clinical trials, mostly from India and often sponsored by manufacturers, have reported benefits for lactation and menopausal symptoms. The quality of this literature is variable, and in 2025 a widely cited randomised trial of a Shatavari extract in perimenopausal women was retracted. A careful appraisal of what is and is not known is therefore timely. This review summarises the classical Ayurvedic descriptions of Shatavari, its phytochemistry and experimental pharmacology relevant to female reproduction, and the clinical evidence, with attention to methodological quality and safety.

METHODOLOGY

This narrative review was prepared in two parts. First, the primary classical texts of Ayurveda, namely Charaka Samhita (Sutra sthana, chapter 4), Kashyapa Samhita (Kalpa sthana, Shatapushpa Shatavari kalpa adhyaya) and Bhavaprakasha Nighantu (Guduchyadi varga), were studied with their standard commentaries for descriptions of Shatavari, its properties and indications[6–8]. Second, PubMed was searched for literature published up to October 2026 using combinations of the terms *Asparagus racemosus*, Shatavari, shatavarin, female reproduction, fertility, ovary, uterus, polycystic ovary syndrome, lactation, galactagogue, menopause and perimenopause. Reviews, meta-analyses, randomised controlled trials, experimental studies and phytochemical studies were considered. Every reference cited in this article was checked against its PubMed record for authors, title, journal, year, volume, pages and digital object identifier. Retracted publications identified during the search were excluded. The findings are synthesised narratively rather than statistically.

CLASSICAL AYURVEDIC PERSPECTIVE

1. Properties and actions

In Ayurvedic pharmacology Shatavari is described as sweet and bitter in taste (Madhura, Tikta rasa), heavy and unctuous in quality (Guru, Snigdha guna), cold in potency (Shita virya) and sweet in post-digestive effect (Madhura vipaka). It pacifies Vata and Pitta and is classed as a Rasayana (rejuvenative), Balya (strength-promoting), Medhya (intellect-promoting), Stanyajanana (galactagogue) and Shukrala (promoting reproductive tissue)[7,8]. Charaka includes Shatavari among the drugs that promote strength and among those that maintain youthfulness (Vayahsthapana), reflecting its classical role as a long-term tonic[6].

2. Gynaecological and obstetric indications

The classical gynaecological uses of Shatavari are extensive. Kashyapa Samhita devotes a chapter to Shatavari together with Shatapushpa, describing their use for menstrual disorders, infertility and the promotion of healthy conception[7]. Bhavaprakasha recommends Shatavari for disorders of breast milk, for weakness and for bleeding disorders of Pitta origin[8]. In practice, Shatavari is used alone as a powder in milk (Ksheerapaka), as a medicated ghee (Shatavari ghrita), or as an ingredient of compound formulations such as Phala ghrita and various antenatal and postnatal preparations[4,5]. Its sweet, unctuous and cooling properties make it particularly suited to conditions in which Vata and Pitta are aggravated, such as scanty milk after a difficult delivery, irregular menstruation associated with stress, and the dryness, heat and irritability of the menopausal transition.

PHYTOCHEMISTRY

The roots of Shatavari contain a wide range of constituents, of which steroidal saponins are considered the most important. These include shatavarins I to VI, of which shatavarin I and shatavarin IV are the most abundant; shatavarin IV is a glycoside of the aglycone sarsasapogenin with two rhamnose units and one glucose unit[3]. Other reported constituents include flavonoids, isoflavones, alkaloids, dihydrophenanthrene and furan derivatives, sterols, carboxylic acids and essential oils[2,3]. Older reviews already attributed the

pharmacological effects of the plant to its saponins and flavonoids, acting alone or in combination[2,9].

The content of active constituents varies widely. In a field study of twelve elite accessions grown under identical conditions, the shatavarin IV content of roots ranged up to about 152 µg/g in the best accession, almost twice that of the next best, with large differences in root yield as well[10]. A high-performance thin-layer chromatography comparison showed that dried Shatavari contained a richer concentration of steroidal saponins and flavonoids than the fresh root[11]. Such variation in source material, processing and extraction method means that products sold under the same name may differ substantially in composition, a point that is crucial when interpreting clinical trials. Several commercial extracts are now standardised to shatavarin IV or total saponin content, with one formulation claiming a shatavarin IV content above 7.4%[3].

EXPERIMENTAL PHARMACOLOGY

1. Oestrogen-like effects on the reproductive tract

Shatavari has long been described as a phytoestrogen[1]. In an early study in pregnant rats, an alcoholic extract of the rhizome given orally for the first 15 days of gestation increased uterine weight and produced prominence of the mammary glands, proliferation and hypertrophy of ductal and glandular cells, hyperplasia of glandular and muscular tissue of the genital organs and increased glycogen in the genital parenchyma, while the ovaries showed no change; the authors interpreted these findings as an oestrogenic effect[12]. In ovariectomised rats, a combined extract of Shatavari and fenugreek reduced serum follicle-stimulating hormone, luteinising hormone and cortisol, increased oestradiol and progesterone, lowered skin temperature and reversed ovariectomy-induced changes in hypothalamic markers associated with hot flushes, including kisspeptin and neurokinin B[13]. Because the extracts were combined, the specific contribution of Shatavari in that study cannot be isolated.

2. Antioxidant and adaptogenic actions

A recurring hypothesis is that Shatavari protects reproductive function by reducing oxidative stress. Psychological and physiological stress increase reactive oxygen species, which may impair ovarian physiology, oocyte quality and follicular development. On the basis of existing studies, Pandey and colleagues proposed that Shatavari may improve hormonal imbalance, polycystic ovary syndrome, follicular growth and oocyte quality by lowering oxidative stress and raising antioxidant levels, while noting that the mechanism at the level of the ovary remains poorly understood[14]. Shatavari has also shown adaptogenic, anti-inflammatory, antioxidant and nootropic activity in preclinical studies, and its neuroactive effects are of potential relevance to the mood and sleep disturbances of the perimenopause and postpartum period[11,15].

3. Immunomodulation

A standardised aqueous root extract quantified for shatavarin IV produced mixed Th1 and Th2 cytokine responses, increased CD3-positive and CD4/CD8-positive T-cell percentages and raised antibody titres in sensitised mice, supporting an immunoadjuvant effect[16]. The relevance of these findings to reproductive conditions such as implantation failure or recurrent pregnancy loss, in which immune balance is thought to play a role, is speculative and has not been studied directly.

4. Galactagogue action

The galactagogue reputation of Shatavari is one of its oldest and most consistent attributes[9]. The oestrogen-like proliferation of mammary ducts and glandular cells observed in rats[12] offers one possible mechanism, and an early randomised trial of Shatavari in lactational inadequacy is indexed with prolactin as a subject term[17]. However, the precise mechanism by which Shatavari might increase milk production in women has not been established.

CLINICAL EVIDENCE

1. Lactation

The first randomised controlled trial of Shatavari as a galactagogue, conducted in women with lactational inadequacy in India, was published in 1996; its abstract is not available in PubMed and its results are therefore not discussed here[17]. A Cochrane review of oral galactagogues in mothers of healthy term infants, which included Shatavari among 27 trials of natural galactagogues, concluded that the evidence for natural galactagogues was of very low certainty because of high risk of bias, substantial heterogeneity and imprecise measurement, and that high-quality trials were urgently needed[18].

The most rigorous trial to date was a randomised, double-blind, placebo-controlled study in 120 postpartum

women who intended to breastfeed. Shatavari root extract 300 mg twice daily for the first 72 hours after delivery shortened the time to evident breast fullness after the last feed and increased the total milk volume expressed at 72 hours compared with placebo; maternal satisfaction with lactation was higher (53% against 25%) and no adverse events were recorded[19]. The trial was well designed in its blinding and use of an objective outcome, but it was short, involved a single product, did not report infant weight or breastfeeding continuation, and has not yet been replicated. Reviews of Shatavari for fertility and postpartum care have similarly concluded that its galactagogue effect is promising but that further comprehensive studies are required[4].

2. Menopausal and perimenopausal symptoms

Several placebo-controlled trials have evaluated Shatavari for menopausal symptoms. In a double-blind multicentre trial in 70 menopausal women, an Ayurvedic Shatavari formulation reduced hot flushes, night sweats, insomnia, anxiety, vaginal dryness and loss of libido and improved the Utian quality-of-life score compared with placebo, without significant adverse events[20]. In a double-blind trial in 80 perimenopausal women, Shatavari root extract 300 mg once daily for eight weeks improved the somato-vegetative, psychological and urogenital domains of the Menopause Rating Scale, perceived stress and hot flushes compared with placebo, with no adverse effects on liver or kidney function[21]. A three-arm trial in 135 women aged 45 to 65 years compared Shatavari alone, Shatavari with Ashwagandha, and placebo for eight weeks; the combination improved Menopause Rating Scale scores significantly more than either Shatavari alone or placebo, while Shatavari monotherapy was described as safe and effective, and adverse events were mild[22].

A fourth trial, in which a standardised Shatavari root extract (CL22205) was reported to reduce menopausal symptoms, improve menstrual symptoms and markedly alter follicle-stimulating hormone, luteinising hormone and anti-Müllerian hormone levels in 50 perimenopausal women, was retracted in 2025 and is not relied upon in this review. Its retraction is relevant because the reported hormonal changes were large and had been cited as evidence of an ovarian effect of Shatavari.

Taken together, the remaining trials are consistent in direction, but they share important limitations: small samples, short durations of eight weeks to a few months, different products and doses, reliance on symptom scales, and in most cases industry involvement. The hormonal findings are inconsistent; one trial reported increases in oestradiol, follicle-stimulating hormone and triiodothyronine[21], whereas another reported that hormone levels were maintained within normal ranges[22]. Long-term endometrial and breast safety, which is essential for any agent with possible oestrogenic activity, has not been assessed.

3. Fertility, polycystic ovary syndrome and menstrual disorders

Despite the prominence of Shatavari in Ayurvedic fertility practice, controlled clinical evidence for its use in female infertility, polycystic ovary syndrome or menstrual disorders is lacking. Narrative reviews describe its traditional use for these conditions and attribute potential benefit to saponins and flavonoids acting through antioxidant and hormonal pathways, but they rely largely on experimental data and consistently call for clinical trials[4,5,14]. Some reviews go further and describe shatavarin IV as facilitating folliculogenesis and ovulation, preparing the uterus for conception and preventing miscarriage[3]; these claims are not yet supported by controlled human studies and should be regarded as hypotheses.

4. Postpartum mood

A recent mini-review proposed that Shatavari, through prebiotic and neurotransmitter-modulating effects of its saponins and flavonoids, might act as a botanical psychobiotic in postpartum depression[11]. This is an interesting hypothesis that links the classical Medhya and Rasayana actions with current interest in the gut-brain axis, but it has not been tested clinically.

SAFETY AND QUALITY

In the published trials, Shatavari root extracts were well tolerated over periods of three days to eight weeks, with only mild gastrointestinal complaints, dizziness or headache reported[19–22]. These trials were not powered to detect uncommon adverse effects, and data on long-term use are lacking.

Several specific concerns deserve attention. First, the oestrogen-like effects seen in animals[12,13] imply that caution is warranted in women with oestrogen-sensitive conditions, such as hormone-dependent breast

cancer, endometrial hyperplasia, endometriosis and fibroids, until specific data are available. Second, the use of Shatavari in pregnancy, which is common in Ayurvedic antenatal care, is supported by tradition rather than by modern reproductive and developmental toxicity studies, and reviewers have advised that pregnant and breastfeeding women should consult health professionals before use because of potential interactions and contraindications[4]. Third, wild collection, adulteration with other *Asparagus* species and wide variation in saponin content threaten product quality[1,10]; chemoprofiling, molecular markers and cultivation of elite accessions have been proposed to address these problems[1,10]. Finally, much of the recent clinical literature comes from a small number of sponsors and contract research organisations, and the retraction of one trial underlines the importance of independent replication and data transparency.

DISCUSSION

Shatavari occupies a central place in Ayurvedic women's health, and its classical attributes as a sweet, cooling, nourishing Rasayana and galactagogue are consistent across the major texts[6–8]. Modern research has identified a plausible chemical basis in its steroidal saponins and flavonoids[2,3], and experimental work has shown oestrogen-like, antioxidant, adaptogenic and immunomodulatory effects[12–16].

The clinical evidence is strongest, though still preliminary, for two indications. For lactation, a single well-conducted placebo-controlled trial found greater milk volume in the first 72 hours after delivery[19], but systematic review evidence for herbal galactagogues as a group remains of very low certainty[18]. For menopausal symptoms, three placebo-controlled trials of eight weeks or more reported improvements in symptom scores[20–22], but they were small, short and heterogeneous in their interventions. For fertility, polycystic ovary syndrome and menstrual disorders, the conditions for which Shatavari is perhaps most often prescribed in Ayurvedic practice, there is as yet no controlled clinical evidence[4,5,14].

Several research priorities follow. Trials should use products standardised to defined marker compounds, report their chemical profile, and be registered prospectively with published protocols. Lactation trials should measure clinically meaningful outcomes such as infant weight gain and duration of exclusive breastfeeding, as recommended by the Cochrane review[18]. Menopause trials should run for at least six to twelve months, include endometrial and breast safety monitoring, and compare Shatavari with established treatments as well as with placebo. Trials in polycystic ovary syndrome and infertility should use validated endpoints such as ovulation, pregnancy and live birth. Ayurvedic preparations such as Shatavari ghrita and Ksheerapaka, which differ from modern aqueous or alcoholic extracts, also deserve evaluation in their own right. Independent replication, outside the sponsor networks that have produced most of the current trials, is particularly important.

The review has limitations. It is narrative rather than systematic, is restricted to PubMed-indexed literature, and may therefore have missed relevant Indian studies published in non-indexed journals. Several of the included reviews are themselves narrative and may overstate the evidence.

CONCLUSION

Shatavari is a classically well-founded and widely used herb for female reproductive health, with a plausible phytochemical and pharmacological basis. Current clinical evidence offers preliminary support for its use as a galactagogue and for relief of menopausal symptoms, but not yet for infertility, polycystic ovary syndrome or menstrual disorders. The retraction of a prominent perimenopause trial is a reminder that the evidence base is still fragile. Larger, longer and independent trials with standardised products, together with specific safety data in pregnancy and in oestrogen-sensitive conditions, are needed before firm clinical recommendations can be made.

REFERENCES

1. Bopana N, Saxena S. *Asparagus racemosus*—ethnopharmacological evaluation and conservation needs. J Ethnopharmacol 2007;110(1):1–15. https://doi.org/10.1016/j.jep.2007.01.001
2. Jahnavi P, Kumar AK, Prema S, Singamaneni VR, Vidiyala N, Sunkishala P, et al. Recent progress in heterogeneous catalysis for sustainable chemical processes. J Chem Rev. 2026;8(2):154-79.
3. Banerjee P, Das A, Kumar P, Chakraborty S, Jalan K. An updated insight on the chemistry, ethnobotany, and health benefits of *Asparagus racemosus* (Shatavari): with a special emphasis on shatavarin IV. J Am Nutr Assoc 2025;44(8):681–92. https://doi.org/10.1080/27697061.2025.2496945

4. Srinivasarao DA, Vidiyala N. Stimuli-responsive polymeric nanoparticles for cancer therapy. In: Advances in stimuli-responsive nanosystems for cancer therapy. Singapore: Springer Nature; 2026. p. 39-63.
5. Patibandla S, Gallagher JJ, Patibandla L, Ansari AZ, Qazi S, Brown SF. Ayurvedic herbal medicines: a literature review of their applications in female reproductive health. Cureus 2024;16(2):e55240. https://doi.org/10.7759/cureus.55240
6. Vidiyala N, Sunkishala P, Mandati P, Parupathi P, Nyavanandi D. Integrating 3D printing and additive manufacturing into personalized medicine for pharmaceuticals: opportunities, limitations, and future perspectives. Sci Pharm. 2025;93(4):61.
7. Vriddha Jivaka. Kashyapa Samhita, revised by Vatsya, with Vidyotini Hindi commentary. Kalpa sthana (Shatapushpa Shatavari kalpa adhyaya). Edited by Hemaraja Sharma. Varanasi: Chaukhambha Sanskrit Sansthan; 2010.
8. Bhavamishra. Bhavaprakasha Nighantu, with Vidyotini Hindi commentary by K.C. Chunekar. Guduchyadi varga. Edited by G.S. Pandey. Varanasi: Chaukhambha Bharati Academy; 2010.
9. Goyal RK, Singh J, Lal H. *Asparagus racemosus*—an update. Indian J Med Sci 2003;57(9):408–14.
10. Saran PL, Singh S, Solanki VH, Devi G, Kansara RV, Manivel P. Identification of potential accessions of *Asparagus racemosus* for root yield and shatavarin IV content. Heliyon 2020;6(12):e05674. https://doi.org/10.1016/j.heliyon.2020.e05674
11. D D, Krishnarajabhatt HS, Unnikrishnan P. Phytochemical insights and neuro-gut axis modulation of *Asparagus racemosus* (Shatavari) in postpartum depression: a mini review with HPTLC-based justification. Front Nutr 2025;12:1677952. https://doi.org/10.3389/fnut.2025.1677952
12. Kumar RKT, Dharmamoorthy G, Vasavi DD, Vidiyala N, Bagade OM, Elumalai S, et al. Phytoconstituent-based green synthesis of nanoparticles: sources and biomedical applications in cancer therapy. Asian J Green Chem. 2025;9(3):329-54.
13. Erten F, Er B, Ozmen R, Tokmak M, Gokdere E, Orhan C, et al. Effects of integrated extracts of *Asparagus racemosus* and *Trigonella foenum-graecum* on hot flash-like symptoms in ovariectomized rats. Antioxidants (Basel) 2025;14(3):355. https://doi.org/10.3390/antiox14030355
14. Pandey AK, Gupta A, Tiwari M, Prasad S, Pandey AN, Yadav PK, et al. Impact of stress on female reproductive health disorders: possible beneficial effects of shatavari (*Asparagus racemosus*). Biomed Pharmacother 2018;103:46–9. https://doi.org/10.1016/j.biopha.2018.04.003
15. Majumdar S, Gupta S, Prajapati SK, Krishnamurthy S. Neuro-nutraceutical potential of *Asparagus racemosus*: a review. Neurochem Int 2021;145:105013. https://doi.org/10.1016/j.neuint.2021.105013
16. Gautam M, Saha S, Bani S, Kaul A, Mishra S, Patil D, et al. Immunomodulatory activity of *Asparagus racemosus* on systemic Th1/Th2 immunity: implications for immunoadjuvant potential. J Ethnopharmacol 2008;121(2):241–7. https://doi.org/10.1016/j.jep.2008.10.028
17. Sharma S, Ramji S, Kumari S, Bapna JS. Randomized controlled trial of *Asparagus racemosus* (Shatavari) as a lactogogue in lactational inadequacy. Indian Pediatr 1996;33(8):675–7.
18. Foong SC, Tan ML, Foong WC, Marasco LA, Ho JJ, Ong JH. Oral galactagogues (natural therapies or drugs) for increasing breast milk production in mothers of non-hospitalised term infants. Cochrane Database Syst Rev 2020;5(5):CD011505.
19. Ajgaonkar A, Debnath T, Bhatnagar S, Debnath K, Langade J. Shatavari (*Asparagus racemosus* Willd) root extract for postpartum lactation: a randomised, double-blind, placebo-controlled study. J Obstet Gynaecol 2025;45(1):2564168. https://doi.org/10.1080/01443615.2025.2564168
20. Gudise VS, Dasari MP, Kuricheti SSK. Efficacy and safety of Shatavari root extract for the management of menopausal symptoms: a double-blind, multicenter, randomized controlled trial. Cureus 2024;16(4):e57879. https://doi.org/10.7759/cureus.57879

21. Laxmiprasanna P, Chandan RS, Nagidi HR, Vidiyala N. Analytical method development and validation of a novel RP-HPLC method for simultaneous quantification of xanomeline and trospium chloride in pharmaceutical dosage form. Int J Drug Deliv Technol. 2025;15(1).

22. Ademola J, Ajgaonkar A, Debnath T, Debnath K, Langade J. Efficacy and safety of Shatavari root extract (*Asparagus racemosus*) for menopausal symptoms: a randomized, double-blind, three-arm, placebo-controlled study. Front Reprod Health 2025;7:1654503.