



AMH Revival and *Beejotsarga*: An Evidence-Based Evaluation of *Rasayana* Herbs (*Shatavari*, *Ashwagandha* and *Gokshura*) and *Uttarbasti* in Low Ovarian Reserve and Premature Ovarian Insufficiency- Narrative Review and Proposed Translational Research Framework.

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Abstract

Background- Diminished ovarian reserve (DOR) and premature ovarian insufficiency (POI) affect a substantial proportion of reproductive-age women and remain difficult to reverse using conventional endocrine or assisted-reproduction protocols. Anti-Mullerian hormone (AMH), an indirect marker of the growing follicle pool, has become the central biomarker against which any restorative intervention is judged, yet no pharmacological agent currently reverses the underlying decline in follicle number.

Objective- Ayurveda addresses this clinical picture under the framework of *Artavakshaya* (depletion of the ovarian/menstrual tissue) and *Dhatukshaya* (systemic tissue depletion), managed principally through *Rasayana chikitsa* (rejuvenation therapy) and *Uttarbasti* (intra-vaginal/uterine instillation of medicated oil). This paper undertakes an evidence-based evaluation of three widely used *Rasayana* herbs-*Shatavari* (*Asparagus racemosus*), *Ashwagandha* (*Withania somnifera*) and *Gokshura* (*Tribulus terrestris*)- and of *Uttarbasti*, in relation to AMH revival and *beejotsarga* (ovulation) restoration, and proposes a translational research framework to test these therapies rigorously.

Methods- Randomized trials, case series, systematic reviews and mechanistic studies are synthesised alongside the biomedical literature on oxidative stress, dehydroepiandrosterone (DHEA) and adjuvant nutraceutical therapy in DOR/POI.

Result- Early clinical signals are encouraging, including a measurable rise in AMH with standardized *Shatavari* extract and case-level improvements in AMH/antral follicle count following *Uttarbasti*-based protocols. However, evidence remains predominantly preclinical, uncontrolled, or drawn from perimenopausal rather than biochemically confirmed DOR/POI populations, limiting comparability with conventional adjuvants such as DHEA.

Conclusion- A novel, biomarker-anchored integrative protocol and a phase-appropriate randomized trial design- incorporating serial AMH/AFC measurement and follicular-fluid multi-omics- is proposed to test Ayurvedic rejuvenation therapy rigorously rather than anecdotally, while addressing herb-quality and heavy-metal safety concerns that have historically limited its acceptance in mainstream reproductive medicine.

Keywords: Premature ovarian insufficiency; Diminished ovarian reserve; Anti-Mullerian hormone; *Rasayana*; *Shatavari*; *Ashwagandha*; *Gokshura*; *Uttarbasti*; Ayurveda; integrative reproductive medicine

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1. Introduction

Loss of ovarian reserve- whether physiological ageing, iatrogenic (chemotherapy, pelvic surgery), autoimmune, genetic or idiopathic- culminates in two overlapping clinical entities: diminished ovarian reserve (DOR), in which reduced oocyte quantity and quality coexist with ongoing menstrual cycles, and premature ovarian insufficiency (POI), defined as loss of ovarian activity before 40 years of age, with amenorrhoea or oligomenorrhoea of more than four months' duration and two follicle-stimulating hormone (FSH) values above 25 IU/L measured four weeks apart [1]. POI affects approximately 4% of women, and DOR is now among the most common reasons for recourse to assisted reproductive technology (ART), frequently with donor oocytes [1,3]. No pharmacological agent currently reverses the underlying decline in follicle number; conventional management is largely substitutive- hormone replacement, fertility counselling and donor-oocyte IVF- rather than restorative [1]. This therapeutic vacuum has renewed scientific interest in traditional systems of medicine, particularly Ayurveda, whose *Rasayana* (rejuvenative) pharmacopoeia and procedures such as *Uttarbasti* have long been used for *Artavakshaya* (depletion of ovarian/menstrual tissue) and *Vandhyatva* (infertility) [3]. This paper critically appraises the current clinical, mechanistic and regulatory evidence for *Shatavari*, *Ashwagandha*, *Gokshura* and *Uttarbasti* in DOR/POI, and proposes an innovative, biomarker-driven integrative research and treatment framework capable of testing- rather than merely asserting- their restorative potential.

2. Biomedical Perspective on DOR and POI

2.1 AMH Biology and the Oxidative-Stress Hypothesis of Ovarian Ageing

AMH is secreted by granulosa cells of pre-antral and small antral follicles and declines progressively as the primordial follicle pool is depleted, making it — together with antral follicle count (AFC) — the most widely used indirect marker of ovarian reserve [2]. Follicular loss is accelerated by oxidative stress: physiological reactive oxygen species (ROS) are required for folliculogenesis and steroidogenesis, but when antioxidant defences are overwhelmed, ROS-mediated damage to oocyte mitochondria, granulosa-cell apoptosis and telomere attrition hasten the transition from DOR to POI [2]. This mechanistic insight is important because it converges with the pharmacological rationale advanced for *Rasayana* herbs, many of

which possess demonstrable free-radical-scavenging activity [12,14].

2.2 Current Standard of Care and Its Limits

The 2024 ESHRE/ASRM/ CREWHiRL/IMS evidence-based guideline on POI — 145 recommendations spanning diagnosis, hormone replacement, fertility counselling and bone/cardiometabolic surveillance — makes clear that no intervention has yet been shown to restore ovarian function once POI is established [1]. In DOR, adjuvant strategies such as DHEA and coenzyme Q10 (CoQ10) prior to IVF have been trialled extensively but with inconsistent results: meta-analyses report a modest improvement in clinical pregnancy rate with DHEA (odds ratio approximately 1.5–1.8) without consistent improvement in oocyte yield or ovarian-reserve markers themselves [4,6,7], and results attenuate further when analysis is restricted to randomized controlled trials (RCTs) alone [5]. Androgen-receptor-mediated mechanisms have been proposed but remain incompletely characterised [8]. In short, mainstream reproductive medicine has no agent that reliably 'revives' AMH; this is precisely the therapeutic gap into which Ayurvedic *Rasayana* therapy has been proposed as a complementary, mechanistically plausible option [3,9].

3. Ayurvedic Conceptual Framework

3.1 Artava, Beeja and Beejotsarga

Classical Ayurvedic gynaecology (Streeroga/Prasuti Tantra) describes *Artava* (the menstrual/ovarian tissue, an *upadhatu* of *Rakta dhatu*) and *Beeja* (ovum) as substrates necessary, together with *Ritu* (fertile period), *Kshetra* (uterus) and *Ambu* (nourishing fluid), for conception [10,29]. *Beejotsarga* — release of a competent ovum — is conceptually analogous to ovulation, and its failure or attenuation, together with reduced *Beeja* quantity or quality, is understood as a manifestation of *Artavakshaya* occurring within a broader *Dhatukshaya* (generalised tissue-depletion) state. Several contemporary authors correlate this presentation clinically with DOR/POI, given the shared features of oligomenorrhoea/amenorrhoea, infertility and diminished ovarian nourishment [29,30].

3.2 Rasayana Chikitsa: Pharmacological Rationale

Rasayana is one of the eight classical branches (ashtanga) of Ayurveda dedicated to rejuvenation, tissue nourishment and delay of degenerative change [12]. Contemporary pharmacological screening situates several *Rasayana* botanicals —

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Shatavari and *Ashwagandha* prominent among them — as potent free-radical scavengers and modulators of the hypothalamic-pituitary-gonadal (HPG) and hypothalamic-pituitary-adrenal (HPA) axes, supplying a mechanistic bridge between a centuries-old rejuvenation paradigm and the modern oxidative-stress model of ovarian ageing outlined above [12,13,14].

4. Pharmacological and Clinical Evaluation of *Rasayana* Herbs

4.1 *Shatavari* (*Asparagus racemosus*)

Shatavari's principal bioactive, the steroidal saponin *Shatavarin* IV, functions as a phytoestrogen modulating ER- α /ER- β signalling and the HPG/HPA axes [15]. In a randomized, double-blind, placebo-controlled trial in 60 pre-, peri- and post-menopausal women, 100 mg/day of a standardized extract for eight weeks produced a small but statistically significant rise in serum AMH alongside increases in estrogen, progesterone and sex-hormone-binding globulin — an early clinical signal that a *Shatavari*-derived extract can shift this specific biomarker [15]. A separate 120-day RCT of a differently standardized extract (50–100 mg/day) in 75 perimenopausal women demonstrated an increased ovarian follicle count and favourable shifts in FSH, LH, AMH and estradiol alongside reduced vasomotor and menstrual symptom scores, establishing a direct association between endocrine biomarkers and symptomatic relief [16,17]. A three-arm RCT comparing *Shatavari* alone, a *Shatavari*-*Ashwagandha* combination, and placebo in menopausal women was specifically designed to test additive endocrine benefit of herb combination [18], supporting a rationale for combination rather than monotherapy regimens. A recent narrative review concluded that *Shatavari*'s saponin/flavonoid content plausibly enhances fertility-related hormone profiles, while cautioning that dedicated trials in biochemically confirmed DOR/POI populations — as opposed to general perimenopausal cohorts — are still lacking [19].

4.2 *Ashwagandha* (*Withania somnifera*)

Ashwagandha, historically termed a '*Rasayana*' and 'Indian ginseng,' is an adaptogen whose withanolide and sitoindoside constituents exert anti-stress, antioxidant and HPA-axis-modulating effects [20]. A 2025 systematic review of sex-specific fertility outcomes found consistent preclinical evidence that *Ashwagandha* modulates LH, FSH, estrogen and progesterone; a controlled animal study in Awassi ewes showed dose-

dependent estrogen elevation over a 60-day treatment period, reinforcing a genuine gonadotropic/steroidogenic effect rather than a purely symptomatic one [20,21]. In women without underlying endocrine disease, an eight-week RCT of standardized root extract (300 mg twice daily) improved sexual function and quality-of-life scores without adverse hormonal perturbation [22], and a four-week reproductive/developmental toxicity study in Wistar rats established a no-observed-adverse-effect level of 2,000 mg/kg body weight, supporting a favourable safety margin for further reproductive-indication trials [23]. In Ayurvedic terms, *Ashwagandha*'s *Ushna virya* (mild heating potency), *Balya* (strength-promoting), *Brihaniya* (tissue-building) and *Vrishya/Sukrala* (gamete-nourishing) properties are invoked to explain a proposed role in follicular maturation and *Beejotsarga* through pacification of vitiated *Apana Vata* within the *Artavavaha srotas*, the channel system governing menstrual and ovarian function [11]. A 2018 systematic review and a 2025 narrative review focused on polycystic ovary syndrome (PCOS) and premenstrual syndrome both concur that *Ashwagandha* modulates female reproductive hormones without raising androgen levels in women, unlike its effect in men, but both call explicitly for adequately powered RCTs, including in DOR/POI populations specifically, before firm clinical recommendations can be made [24,25].

4.3 *Gokshura* (*Tribulus terrestris*)

Gokshura fruit contains protodioscin, a steroidal saponin proposed to enhance endogenous DHEA synthesis, providing a plausible link to the adrenal-androgen pathway implicated in ovarian follicular recruitment [27]. A comprehensive review of 23 studies on *Tribulus terrestris* and female reproductive health reported improved ovarian and uterine histology and ameliorated PCOS-related ovarian cyst burden, with protodioscin identified as the dominant active principle [26]. Clinical human data specific to *Gokshura* and AMH or ovarian reserve remain sparse; most available evidence derives from animal models, PCOS populations, or case-report settings such as a *Gokshura* intervention for sex-hormone imbalance in chronic liver disease [28]. *Gokshura* is nonetheless a near-universal constituent of Ayurvedic *Rasayana* formulations aimed at *Shukra/Artava dhatu* nourishment [27], and its inclusion within combination protocols, rather than as monotherapy, is the pattern observed in essentially all published Ayurvedic case series addressing DOR.

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5. *Uttarbasti*: Procedure, Rationale and Clinical Evidence

Uttarbasti is the per-vaginal (or, in classical male indications, per-urethral) instillation of a measured quantity of medicated oil or ghee, typically following a course of *Shodhana* (bio-purification, e.g. *Virechana* or *Vamana*) and often combined with *Yoga* or *Kala Basti* (a defined series of therapeutic enemas) [3,29]. It is proposed to act locally on the *Artavavaha srotas*, improving the endometrial and follicular microenvironment and receptor-level hormonal responsiveness [31]. Available clinical evidence is currently limited to case reports and small case series rather than controlled trials. One published case of confirmed POI (FSH 29.48 mIU/mL, AMH 0.23 ng/mL) treated with *Rasayana* and *Brimhana* (nourishing) therapy alongside supportive management reported symptomatic and endocrine improvement sufficient to reconsider fertility options [29]. A single-arm case study of DOR-related infertility using *Yoga Basti* and *Uttarbasti* alongside *Shamana* (palliative) herbal therapy reported a rise in AMH and antral follicle count with eventual spontaneous conception and a full-term live birth [30]. A separate case series using *Shatapushpa* and *Shatavari taila Uttarbasti* in anovulatory cycles reported improved ovulation and endometrial thickness [31]. A further case report described improvement in a woman with low-AMH infertility unresponsive to prior ART after treatment with *Matra basti*, a related oleation-enema procedure [32]. An ongoing exploratory single-arm study protocol from an Amrita University-affiliated centre is now testing a structured Ayurveda protocol, including preconception-care *basti* procedures, as a prerequisite for IVF in women with DOR, incorporating follicular-fluid multi-omics analysis to identify therapeutic targets — the first design in this space explicitly built to generate mechanistic, rather than purely anecdotal, evidence [3]. Collectively, this evidence base is promising but preliminary: uncontrolled designs, small samples, heterogeneous outcome definitions and publication predominantly within Ayurveda-specific journals limit external validity, and no randomized controlled trial of *Uttarbasti* against sham or standard care in biochemically confirmed DOR/POI has yet been published.

6. Towards an Innovative Integrative Protocol

6.1 A Proposed Combined Ayurveda-Biomedicine Model

Building on the mechanistic convergence between *Rasayana* pharmacology (antioxidant, HPG/HPA-

modulatory) and the oxidative-stress model of ovarian ageing [2,12], an integrative protocol can be constructed combining: (i) a fixed-dose, standardized triple-herb *Rasayana* formulation (*Shatavari* with *Ashwagandha* and *Gokshura*) selected for complementary phytoestrogenic, adaptogenic and androgen-precursor actions [15,20,27]; (ii) a defined course of *Uttarbasti* — typically three to seven sittings per cycle across three consecutive cycles, mirroring published case-series protocols [30,31] — preceded by individualised *Shodhana* where clinically indicated; and (iii) concurrent biomedical monitoring of serum AMH, AFC by transvaginal ultrasound, and FSH/LH/oestradiol at baseline, mid-treatment and post-treatment, mirroring the outcome sets used in the *Shatavari* RCTs [16,17] and the monitoring parameters recommended by the ESHRE guideline for DOR/POI [1].

6.2 Multi-Omics and Biomarker-Guided Personalisation: The Innovative Element

The genuinely novel contribution proposed here is to move beyond symptom- or single-biomarker outcomes toward follicular-fluid and serum multi-omics (metabolomic and proteomic) profiling before and after *Rasayana/Uttarbasti* therapy, following the template established by the Amrita multi-omics protocol [3]. This would allow identification of candidate molecular mediators — for example, changes in follicular steroidogenic-enzyme substrates, oxidative-stress markers, or granulosa-cell androgen-receptor and FSH-receptor expression, paralleling the mechanism proposed for DHEA [8] — through which Ayurvedic *Rasayana* therapy might act, converting an empirical clinical tradition into a testable, mechanistically anchored hypothesis rather than leaving it as an unexplained clinical observation.

7. Comparative Evaluation with Conventional Adjuvant Therapy

DHEA remains the most extensively trialled biomedical adjuvant for DOR, with meta-analyses showing a significant but modest improvement in clinical pregnancy rate (odds ratio 1.47, 95% confidence interval 1.09–1.99) [5] and a pooled odds ratio of 1.8 (95% CI 1.29–2.51) for pregnancy likelihood in another analysis [6], but no consistent improvement in oocyte number, ovarian-reserve markers, or endometrial thickness [4,7,8], with the pregnancy-rate benefit attenuating when analysis is restricted to RCT-only data [5]. A 2025 systematic review of oral nutritional supplements (vitamins, CoQ10, DHEA) in DOR concluded only a ‘weak’ recommendation for adjuvant use, citing small trial

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sizes and heterogeneous protocols ^[9] — an evidentiary profile strikingly similar to that of the Ayurvedic *Rasayana/Uttarbasti* literature reviewed here. This parity is instructive: neither conventional nor Ayurvedic adjuvant therapy currently meets a high evidentiary bar in DOR/POI, and both fields face the same need for larger, better-designed randomized trials rather than either being categorically more or less ‘proven’ than the other.

8. Safety, Standardisation and Quality-Control Considerations

Any integrative protocol of this kind must confront documented safety and quality issues affecting herbal *Rasayana* products. Independent chemical analysis of Ayurvedic herbal medicines purchased over the internet found detectable lead, mercury or arsenic in a substantial proportion of products, occasionally at concentrations capable of producing toxicity if used as directed ^[33], a risk compounded by a wider literature on the safety of non-allopathic Indian medicines ^[34]. More recent testing of adaptogenic supplements, including *Ashwagandha*, found lead and nickel levels exceeding international safety limits in a majority of tested products, disproportionately in tablet formulations ^[35]. Separately, chronic (180-day) toxicity testing of the herbo-mineral *Rasayana* formulation *Gandhaka rasayana* in rats found no organ-level toxicity at therapeutic-equivalent doses, illustrating that toxicity risk is formulation- and manufacturing-specific rather than inherent to the *Rasayana* category as a whole ^[36]. For any clinical trial or clinical use of the *Shatavari-Ashwagandha-Gokshura* combination proposed here, batch-level heavy-metal testing (inductively coupled plasma mass spectrometry or atomic absorption spectroscopy), marker-compound quantification by high-performance liquid chromatography, and DNA-barcoding-based species authentication should be treated as mandatory quality gates, given documented rates of species substitution in commercial herbal raw material ^[35].

9. Research Gaps and a Proposed Novel Trial Design

The evidence reviewed reveals four consistent gaps: (a) an absence of randomized, sham- or placebo-controlled trials of *Uttarbasti* specifically in biochemically confirmed DOR/POI, existing data being limited to case reports and case series ^[29,30,31,32]; (b) reliance on perimenopausal rather than DOR/POI-diagnosed cohorts in the strongest available *Shatavari* RCTs ^[15,16,17]; (c) minimal human, female-specific dose-ranging data

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for *Gokshura* ^[26,27]; and (d) the absence, to date, of any trial combining herbal *Rasayana* therapy with *Uttarbasti* and multi-omic mechanistic endpoints within a single controlled design. A two-arm, assessor-blinded, randomized controlled trial is therefore proposed, enrolling women aged 21–37 years meeting Bologna/POSEIDON criteria for DOR or ESHRE criteria for early-stage POI, comparing (i) standardized triple-herb *Rasayana* plus *Uttarbasti* plus standard counselling against (ii) standard counselling alone, over three menstrual cycles. Serum AMH and AFC would serve as co-primary outcomes; FSH/LH/estradiol, follicular-fluid metabolomics, and validated quality-of-life instruments would serve as secondary outcomes; and independent, blinded batch analysis of study medication for heavy metals and marker-compound content would serve as a mandatory safety co-endpoint. Such a design would, for the first time, test the ‘AMH revival’ hypothesis embedded in the Ayurvedic literature ^[29,30] against the same evidentiary standard now applied to DHEA and CoQ10 in mainstream reproductive endocrinology ^[1,4,5,6,7,8,9].

10. Conclusion

Shatavari, *Ashwagandha* and *Gokshura* possess plausible, partially validated phytoestrogenic, adaptogenic and androgen-precursor-modulating mechanisms relevant to ovarian reserve, and early clinical signals — a measurable rise in AMH with standardized *Shatavari* extract, and case-level AMH/AFC improvement with *Uttarbasti*-based protocols — are genuinely encouraging. However, the evidence base remains predominantly preclinical, uncontrolled, or drawn from perimenopausal rather than DOR/POI populations, and is not yet comparable in rigour to the also-modest evidence supporting DHEA or CoQ10 in conventional reproductive medicine. The innovative path forward is not to promote *Rasayana* therapy or *Uttarbasti* as proven treatments, but to subject them — through multi-omics-anchored, quality-controlled, randomized trials — to the same standard of evidence increasingly demanded across reproductive endocrinology, so that any genuine restorative benefit for AMH and *Beejotsarga* can be reliably distinguished from natural fluctuation, placebo response, or publication bias.

AI Disclosure: “The authors used AI GEMINI for language and grammar purpose only. The content, interpretation, and JOURNAL FOR RESEARCHES IN AYURVEDA AND MEDICAL SCIENCES conclusions are solely the responsibility of the authors.”



References

1. ESHRE, ASRM, CREWHiRL and IMS Guideline Group on POI, Panay N, Anderson RA, et al. Evidence based guideline: premature ovarian insufficiency. Climacteric. 2024;27(6):510–520.
2. Shi YQ, Zhu XT, Zhang SN, Ma YF, Han YH, Jiang Y, Zhang YH. Premature ovarian insufficiency: a review on the role of oxidative stress and the application of antioxidants. Front Endocrinol (Lausanne). 2023;14:1172481.
3. Amrita School of Ayurveda and Amrita Institute of Medical Sciences. An exploratory single arm study to evaluate the role of an Ayurvedic treatment protocol as a prerequisite for in vitro fertilization in women with diminished ovarian reserve incorporating multi-omics approaches: study protocol. Front Med (Lausanne). 2025.
4. Efficacy of dehydroepiandrosterone to improve ovarian response in women with diminished ovarian reserve: a meta-analysis. Reprod Biol Endocrinol. 2013.
5. The effect of dehydroepiandrosterone (DHEA) supplementation on women with diminished ovarian reserve (DOR) in IVF cycle: evidence from a meta-analysis. Eur J Obstet Gynecol Reprod Biol. 2016.
6. DHEA use to improve likelihood of IVF/ICSI success in patients with diminished ovarian reserve: a systematic review and meta-analysis. 2018.
7. Dehydroepiandrosterone supplementation improves the outcomes of in vitro fertilization cycles in older patients with diminished ovarian reserve. Front Endocrinol (Lausanne). 2019.
8. The effect of dehydroepiandrosterone supplementation on ovarian response is associated with androgen receptor in diminished ovarian reserve women. 2017.
9. The auxiliary effect of oral nutritional supplements on fertility in women with diminished ovarian reserve: a systematic review and meta-analysis. 2025.
10. Nutritional therapies for enhancing reproductive tissues (Shukra and Artava Dhatu). 2026.
11. Management of infertility w.s.r. to PCOS through Ayurvedic herbal approach. J Ayurveda Integr Med Sci.
12. Critical evaluation of Ayurvedic plants for stimulating intrinsic antioxidant response. 2012.
13. Beyond reverse pharmacology: mechanism-based screening of Ayurvedic drugs. 2011.
14. Evaluation of free-radical quenching properties of standard Ayurvedic formulation Vayasthapana Rasayana. 2011.
15. SheVari4®, a proprietary root extract from Asparagus racemosus, ameliorates menopausal health: insights from a randomized, double-blind, placebo controlled clinical trial. 2025.
16. Clinical assessment of CL22209, a standardized proprietary extract of Asparagus racemosus, for mitigating vasomotor and menstrual symptoms in perimenopausal women: a randomized, double-blind, placebo-controlled study. Funct Foods Health Dis. 2025 Jul.
17. A standardized Asparagus racemosus root extract improves hormonal balance and menstrual health and reduces vasomotor symptoms in perimenopausal women: a randomized, double-blind, placebo-controlled study. J Am Nutr Assoc. 2025;44(8).
18. 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.
19. Shatavari (Asparagus racemosus): a promising ally for fertility. 2025.
20. Effects of Ashwagandha on reproductive health: a systematic review of sex-specific hormonal and fertility outcomes. Phytother Res. 2025.
21. Effect of ashwagandha (Withania somnifera) on endocrine and reproductive traits in Awassi sheep. 2025.
22. Ajgaonkar A, Jain M, Debnath K. Efficacy and safety of Ashwagandha (Withania somnifera) root extract for

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- improvement of sexual health in healthy women: a prospective, randomized, placebo-controlled study. *Cureus*. 2022.
23. Reproductive and developmental safety assessment of Ashwagandha (*Withania somnifera*) root extract in Wistar rats. 2025.
24. Effects of *Withania somnifera* on reproductive system: a systematic review of the available evidence. 2018.
25. *Withania somnifera* in women's hormonal modulation: a narrative review with implications for polycystic ovary syndrome and premenstrual syndrome. 2025.
26. *Tribulus terrestris* and female reproductive system health: a comprehensive review. *Phytomedicine*. 2021.
27. A comprehensive overview of Gokshura (*Tribulus terrestris* Linn.). *J Ayurveda Integr Med Sci*. 2019;4(6).
28. Effect of Gokshura (*Tribulus terrestris* L.) on gynecomastia and levels of sex hormone in chronic liver disease: a case report. 2022.
29. Ayurveda management protocol for primary infertility due to premature ovarian failure. *J Ayurveda Case Rep*. 2024.
30. Effect of Ayurvedic treatment protocol on diminishing ovarian reserve. 2020.
31. Uttarbasti in the management of infertility w.s.r. to anovulation — case series. 2016.
32. Infertility due to low ovarian reserve — treated by Matra basti: a case report. *Indian J Ayurveda Integr Med KLEU*. 2023;4(2).
33. Saper RB, Kales SN, Paquin J, et al. Heavy metal content of Ayurvedic herbal medicine products. *JAMA*. 2004;292(23):2868–2873.
34. Gogtay NJ, Bhatt HA, Dalvi SS, et al. The use and safety of non-allopathic Indian medicines. *Drug Saf*. 2002;25:1005–1019.
35. Heavy metal contamination in adaptogenic herbal dietary supplements: experimental, assessment and regulatory safety perspectives. 2025.
36. Chronic toxicity studies of Gandhaka rasayana — a herbo-mineral preparation used in Ayurvedic practice. *J Ayurveda Integr Med*. 2021.