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"HERBAL ANTIMICROBIALS IN BACTERIAL VAGINOSIS AND VULVOVAGINAL CANDIDIASIS: AN AYURVEDIC AND PHARMACOLOGICAL REVIEW"

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ABSTRACT:
Background: Bacterial vaginosis and vulvovaginal candidiasis are the two commonest causes of abnormal vaginal discharge in women of reproductive age. Both recur frequently after standard antibiotic or azole therapy, and antimicrobial resistance and biofilm formation are now recognised contributors to treatment failure. Ayurveda describes discharge-dominant genital disorders mainly under Kaphaja (Shleshmala) yonivyapad, Upapluta yonivyapad, Acharana yonivyapad and the later term Shveta pradara, and treats them with oral drugs and local procedures such as Yoni prakshalana, Yoni pichu and Varti. **Objective:** To review the classical Ayurvedic understanding of infective vaginal discharge, correlate it with current knowledge of vaginal dysbiosis and candidal infection, and summarise the clinical and experimental evidence for herbal antimicrobials relevant to Ayurvedic practice. **Methods:** Classical texts (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya) were reviewed. PubMed was searched for reviews, systematic reviews and randomised trials of herbal and plant-derived treatments for bacterial vaginosis and vulvovaginal candidiasis, and for Ayurvedic clinical studies. Findings were synthesised narratively. **Results:** The classical description of Kapha-dominant yonivyapad, with white, slimy discharge, itching and mild pain, corresponds closely to the clinical picture of both conditions. Systematic reviews identify about 20 randomised trials of medicinal plants in bacterial vaginosis and a smaller number in candidiasis, most showing efficacy comparable to metronidazole or clotrimazole over short follow-up. Turmeric (curcumin) and dill, both used in Ayurvedic practice, have been tested in small trials. Ayurveda-specific evidence is limited to a single controlled trial of Dhatakyadi varti in pregnant women and indirect data on the antimicrobial and wound-cleansing action of Panchavalkala. **Conclusion:** Herbal antimicrobials are biologically plausible adjuncts in vaginitis, but trials are small, short and largely from a few centres. Standardised Ayurvedic formulations require rigorous, microbiologically confirmed trials with recurrence as a primary outcome.

KEYWORDS: Shleshmala yonivyapad, Shveta pradara, bacterial vaginosis, vulvovaginal candidiasis, Yoni prakshalana, Panchavalkala

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INTRODUCTION

Abnormal vaginal discharge is among the most frequent reasons for women to seek gynaecological care, and bacterial vaginosis (BV) and vulvovaginal candidiasis (VVC) account for most infective cases. BV is a disorder of the vaginal microbiome in which the normally dominant lactic acid-producing *Lactobacillus* species are replaced by a diverse community of anaerobic bacteria, particularly *Gardnerella* species. It affects about one woman in four worldwide, with the highest burden in resource-limited settings, and is associated with preterm birth, spontaneous abortion, increased acquisition of human immunodeficiency virus and other sexually transmitted infections, and reduced quality of life[1]. VVC, caused in most cases by *Candida albicans* and closely related species, is a disease of otherwise healthy, immunocompetent women that is most common during the child-bearing years and has a profound effect on quality of life despite being non-lethal[2].

Both conditions respond initially to standard treatment, but neither is reliably cured. For BV, metronidazole and clindamycin remain the only approved regimens, yet 50–80% of women experience a recurrence within a year of completing therapy[3]. Recent reviews attribute this in part to a *Gardnerella*-dominated polymicrobial biofilm that adheres to the vaginal epithelium and protects the organisms from antibiotics, as well as to antimicrobial resistance and failure of protective lactobacilli to recolonise after treatment[1,4]. In VVC, rising numbers of azole-resistant strains and a substantial group of women with recurrent infection have similarly prompted a search for alternative agents[5,6].

In pregnancy the stakes are higher. A meta-analysis of 26 studies found that BV during pregnancy was associated with preterm birth, low birth weight, intrauterine infection, miscarriage and premature rupture of membranes[7]. At the same time, many women in pregnancy and outside it wish to avoid repeated courses of antibiotics or antifungals, and interest in plant-based alternatives is high[8,9].

Ayurveda has a well-developed account of genital tract disorders characterised by discharge and itching, and its local therapies, namely vaginal washes, medicated tampons and pessaries, are widely used in India for these complaints. The aim of this review is to present the classical concepts in a form accessible to an integrative readership, to correlate them with current understanding of vaginal dysbiosis and candidal infection, and to summarise critically what the published evidence shows for herbal antimicrobials used in or relevant to Ayurvedic practice.

METHODOLOGY

This narrative review was prepared in two parts. First, the primary classical texts of Ayurveda, namely Charaka Samhita (Chikitsa sthana, chapter 30), Sushruta Samhita (Uttara tantra, chapter 38) and Ashtanga Hridaya (Uttara sthana, chapter 33), were studied with their standard commentaries for descriptions of gynaecological disorders with discharge, itching and malodour, and for their local and systemic treatment[10–12]. Second, PubMed was searched for literature published up to October 2026 using combinations of the terms bacterial vaginosis, vulvovaginal candidiasis, vaginitis, leucorrhoea, herbal, plant, phytotherapy, Ayurveda, Ayurvedic, Panchavalkala, Yoni pichu and Shveta pradara. Reviews, systematic reviews, randomised controlled trials and Ayurvedic clinical 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 UNDERSTANDING OF INFECTIVE VAGINAL DISCHARGE

1. Yonivyapad with discharge and itching

The classical texts describe twenty gynaecological disorders (Yonivyapad), classified by the predominant Dosha and by specific causes[10–12]. Several of these have discharge and itching as their principal features. In Kaphaja or Shleshmala yonivyapad, Kapha aggravated by heavy, unctuous, cold and excessively sweet food produces a cold, slimy, whitish discharge with itching and only mild pain[10]. Acharana yonivyapad is attributed to lack of genital hygiene, which allows micro-organisms (Krimi) to grow and produce intense itching[10]. Upapluta yonivyapad, described in a pregnant woman in whom Kapha is aggravated, is characterised by pale or white discharge accompanied by pain, and contemporary Ayurvedic gynaecologists correlate it with vulvovaginitis during pregnancy[13]. Pittaja yonivyapad, with burning, inflammation and foul-smelling discharge, and

Paripluta yonivyapad, with inflammation and pain on intercourse, describe more inflammatory presentations[10,11].

Later authors and modern practice use the collective term Shveta pradara (white discharge) for non-haemorrhagic vaginal discharge, and regard it as a symptom that may arise from several of these Yonivyapad rather than as a single disease.

2. Samprapti (pathogenesis)

The pathogenesis is described mainly in terms of Kapha. Aggravated Kapha, often with Vata, localises in the reproductive tract (Artavavaha srotas) and produces excessive, sticky secretions, itching (Kandu) and a sense of heaviness. Poor genital hygiene, unsuitable sexual practices and impaired digestion (Agnimandya) leading to Ama are recognised predisposing factors[10,12]. The inclusion of Krimi as a cause of Acharana yonivyapad shows that the classical authors recognised a transmissible or organism-related component of genital itching and discharge[10].

3. Correlation with modern pathophysiology

The classical picture of Kapha-dominant discharge has clear functional parallels with current biomedical models. The thick white discharge and intense itching of Shleshmala and Acharana yonivyapad closely match the presentation of VVC, while the malodorous, thin discharge of Pitta-associated presentations is more in keeping with BV. The modern recognition of BV as a disturbance of the vaginal ecosystem, with loss of protective lactobacilli and overgrowth of anaerobes, rather than a single-organism infection[1], fits the Ayurvedic view of discharge as an expression of local imbalance rather than of a single cause. Similarly, the description of a biofilm that protects *Gardnerella* and other BV bacteria[4] provides a mechanistic counterpart to the classical concept of sticky, adherent Kapha in the channels. These parallels should be treated as heuristic rather than literal, but they help translate Ayurvedic treatment aims, namely Kapha reduction, cleansing (Shodhana) and healing (Ropana) of the genital tract, into testable actions such as antimicrobial, antibiofilm, anti-inflammatory and epithelial-protective effects.

PRINCIPLES OF AYURVEDIC MANAGEMENT

The classical treatment of discharge-dominant Yonivyapad combines systemic and local measures. Systemically, Kapha-reducing, bitter and astringent drugs and correction of digestion are emphasised. Locally, the texts prescribe cleansing washes (Yoni prakshalana or Yoni dhavana) with astringent decoctions, insertion of medicated cotton tampons (Yoni pichu) and pessaries (Varti), and fumigation (Yoni dhupana) with aromatic drugs[10–12]. Decoctions of the barks of five Ficus and related trees, collectively called Panchavalkala, and of Triphala are commonly used for washes in current practice. Attention to genital hygiene, diet and sexual conduct is integral to treatment and prevention[10].

Many of the plants used in these preparations are rich in tannins, flavonoids, phenolic compounds and essential oils, which are expected on pharmacological grounds to have antimicrobial, astringent and anti-inflammatory activity. The sections below summarise the clinical evidence for herbal antimicrobials in BV and VVC, including plants outside the Ayurvedic pharmacopoeia where they illustrate what has been achieved with rigorous designs.

EVIDENCE FOR HERBAL INTERVENTIONS IN BACTERIAL VAGINOSIS

1. Systematic reviews

An early systematic review of complementary and alternative therapies for vaginitis found that inconsistent definitions, interventions and outcomes prevented meta-analysis and that the available evidence was of poor quality. Lactobacillus recolonisation showed promise, while tea tree oil and garlic had in vitro activity but lacked in vivo studies to justify recommendation. Importantly for traditional practice, the authors advised against vaginal douching because of its associated risks in the absence of well-documented benefits[14].

A 2024 systematic review of randomised trials of medicinal plants in BV identified 20 studies with 2,685 participants. Several herbal products used alone produced therapeutic effects similar to metronidazole, and some combinations of herbal medicines with metronidazole gave better results than metronidazole alone; propolis and Brazilian pepper tree were effective but less so than metronidazole[9]. The authors concluded that herbal agents may be useful as supportive treatments alongside conventional drugs, after the necessary regulatory approvals[9]. Nearly all included trials were conducted in Iran, and none tested a classical Ayurvedic formulation.

2. Individual randomised trials

The trials from which these conclusions are drawn are small and of short duration. In one trial in 90 women, a vaginal product based on *Cymbopogon olivieri* given for seven days reduced burning, itching, malodour, discharge, pH, clue cells and positive whiff test, with no significant difference from metronidazole in resolution of Amsel's criteria[15]. In a three-arm trial of 120 women, vaginal gels of *Myrtus communis* or *Berberis vulgaris* in a metronidazole base gave a better response than metronidazole gel alone, and no relapse was seen during three weeks of follow-up in the combination groups compared with 30% relapse with metronidazole alone[16]. *Berberis* is of particular interest because the related Ayurvedic drug Daruharidra (*Berberis aristata*) is a classical ingredient of local and systemic preparations for discharge; however, the trial used a different species, and its short follow-up does not establish a lasting reduction in recurrence.

3. Biofilm as a target

Because biofilm is now regarded as a central cause of treatment failure in BV[1,4], agents that disrupt it are a research priority. A systematic narrative review of 35 studies of anti-BV biofilm agents found that most work was preclinical, that plant extracts were one of seven groups of agents investigated, and that earlier reports of antibiotic activity against BV biofilm had not been confirmed[4]. Some non-antibiotic compounds showed promising activity in early studies, but none had yet been proven effective and safe in human trials[4]. This is a natural point of entry for the polyphenol- and tannin-rich decoctions used in Ayurvedic Yoni prakshalana, which have not yet been tested against BV biofilms.

EVIDENCE FOR HERBAL INTERVENTIONS IN VULVOVAGINAL CANDIDIASIS

1. Reviews

A review of clinical trials of natural products in vulvovaginal *C. albicans* infection identified 13 trials, mostly randomised with azoles as controls, testing 11 products. Because of the small number of trials, the authors concluded that no consistent judgement on effectiveness could be made[5]. A 2024 narrative review of phytotherapy in VVC highlighted dill, turmeric and berberine as promising, noted that phytotherapy had not been approved by regulatory agencies, and proposed it mainly for strains resistant to existing treatments[6].

2. Herbs used in Ayurvedic practice

Three herbs familiar to Ayurvedic practitioners have been tested in small randomised trials. Haridra (*Curcuma longa*) is a classical Kapha-reducing and wound-healing drug. In a trial of 94 women with VVC, a 10% curcumin vaginal cream used nightly for one week did not differ from 1% clotrimazole cream in discharge, itching, irritation or erythema; the authors concluded that curcumin could relieve clinical symptoms but, like clotrimazole in that study, did not clearly affect vaginal culture[17]. Shatapushpa or dill (*Anethum* species) is used in Ayurvedic gynaecology mainly for menstrual and reproductive disorders. In a single-blind trial of 60 women with microbiologically confirmed VVC, 2% dill (*Anethum graveolens*) vaginal suppositories were as effective as 100 mg clotrimazole tablets for leucorrhoea, burning, itching and culture positivity, although the authors called for larger studies[18]. Sage (*Salvia officinalis*), while not a classical Ayurvedic drug, belongs to the aromatic Lamiaceae used for fumigation and local application. In a triple-blind trial of 111 women, a sage vaginal tablet combined with clotrimazole produced fewer positive wet tests than clotrimazole with placebo, whereas sage alone did not differ significantly from clotrimazole[19].

Another trial compared a polyherbal Mycozin cream with clotrimazole in 126 women and found comparable pH and microscopic findings but more persistent itching and more adverse effects in the herbal group[8]. These trials suggest that herbal products can approach the short-term efficacy of azoles, but they also show that the herbal arm is not always better tolerated.

3. Oral polyherbal formulations

Oral polyherbal treatment is closer to Ayurvedic practice, in which local therapy is usually combined with systemic medication. In a study from the Eastern medicine tradition, a polyherbal formulation (Candicure) was first tested for acute and subacute toxicity in rodents without adverse findings, and then compared with fluconazole in 150 women with acute VVC. *C. albicans* was eradicated in 78% of the polyherbal group and 74% of the fluconazole group, a difference that was not statistically significant[20]. This study is one of the few to combine preclinical safety

testing with a randomised clinical comparison, a sequence that Ayurvedic formulations could usefully follow.

AYURVEDIC LOCAL THERAPIES: VARTI, PICHU AND YONI PRAKSHALANA

1. Dhatakyadi varti in pregnancy

The most directly relevant Ayurvedic study is a controlled trial of Dhatakyadi varti, a classical vaginal pessary, in Upapluta yonivyapad, interpreted as vulvovaginitis during pregnancy. Eighty pregnant women aged 19–40 years received either Dhatakyadi varti or a conventional vaginal suppository intravaginally at bedtime for 14 days. The Varti group showed highly significant relief in fungal infection and significant relief in Gram-negative bacterial infection and pus cells on vaginal smear, and complete remission was reported in 34.9% of the Varti group and 33.3% of the control group, with fewer unchanged cases in the Varti group[13]. The trial is valuable because it used microbiological as well as symptomatic outcomes in pregnancy, where drug choice is constrained. Its limitations include the absence of blinding, unequal group sizes, a combined fungal and bacterial case mix and lack of follow-up for recurrence or pregnancy outcome.

2. Panchavalkala

Panchavalkala, the combined bark of five trees, is the most widely used decoction for Yoni prakshalana and Yoni pichu in contemporary Ayurvedic gynaecology, but published clinical evidence for its use in vaginitis was not found in PubMed. Indirect evidence comes from wound care. In a clinical study of chronic infected non-healing wounds, a cream prepared from the water extract of Panchavalkala significantly reduced slough, swelling, discharge and malodour, and tissue biopsies showed a progressive and significant reduction in microbial load during treatment[21]. Such data support the classical description of Panchavalkala as a cleansing and healing (Shodhana and Ropana) agent with antimicrobial activity, but extrapolation from skin wounds to the vaginal environment, with its unique microbiome, should be made cautiously.

3. Safety of vaginal washes

Yoni prakshalana raises a specific concern. Routine vaginal douching is discouraged in biomedical practice because it may disrupt the protective lactobacillus-dominated flora, and an early systematic review advised against recommending it for vaginitis[14]. Ayurvedic Yoni prakshalana differs from cosmetic douching in being a time-limited therapeutic procedure with specific decoctions, but its effect on vaginal pH and lactobacilli has not been studied. Until such data are available, Yoni prakshalana should be confined to symptomatic disease, given for short courses, and avoided in pregnancy unless supervised, and Pichu and Varti, which deliver drug without irrigation, may be preferable.

DIET, HYGIENE AND RECURRENCE

Ayurveda attributes Kaphaja yonivyapad partly to heavy, sweet and excessively unctuous food and to poor genital hygiene[10]. A recent systematic review of diet and BV found that deficiencies of vitamins A, C, E and D, high glycaemic diets and obesity were associated with increased BV risk, whereas fruit and vegetables, whole grains and fibre were associated with lower risk; the authors noted the need for longitudinal studies to establish causality[22]. These associations are consistent with the classical emphasis on avoiding sweet, heavy and Kapha-aggravating foods, although structured trials of Ayurvedic dietary regimens in recurrent vaginitis are lacking. Behavioural measures such as condom use, smoking cessation and attention to vaginal products are also recognised components of BV prevention[3].

DISCUSSION

This review shows that the classical Ayurvedic description of Kapha-dominant and hygiene-related Yonivyapad provides a coherent clinical framework for the two commonest infective causes of vaginal discharge. The concepts of adherent Kapha, local imbalance and organism-related itching parallel modern descriptions of vaginal dysbiosis, polymicrobial biofilm and candidal overgrowth[1,2,4,10]. The therapeutic principles of Kapha reduction, local cleansing and healing map onto antimicrobial, antibiofilm, astringent and anti-inflammatory actions that can be measured.

The strength of the evidence, however, is limited. Systematic reviews of herbal treatments in BV and VVC consistently find small, short, single-centre trials, often from a single country, with heterogeneous products and outcomes[5,9,14]. Within these limits, several plant preparations, including curcumin and dill, appear to match azoles or metronidazole over one to three weeks[15,17,18]. Combinations of herbal extracts

with standard drugs may be more promising than herbal monotherapy, as seen with *Myrtus*, *Berberis* and sage[16,19]. Ayurveda-specific evidence is confined to a single trial of Dhatakyadi varti in pregnancy[13] and indirect wound-healing data on Panchavalkala[21].

Several priorities follow. First, trials must use standard microbiological diagnosis, namely Nugent score or molecular methods for BV and culture with species identification for VVC, rather than symptoms alone, since mixed and non-infective discharges are common. Second, recurrence over at least three to six months should be a primary outcome, because high recurrence is the main unmet need[1,3]. Third, classical preparations such as Panchavalkala, Triphala and Dhatakyadi varti should be standardised and tested for antibiofilm activity against *Gardnerella* and for effects on lactobacilli, to ensure that local therapy does not worsen dysbiosis[4]. Fourth, safety outcomes, including local irritation, should be reported systematically, since herbal arms are not always better tolerated[8]. Finally, combined oral and local Ayurvedic regimens, which reflect real practice, deserve pragmatic trials against standard care.

From a clinical perspective, Ayurvedic and herbal interventions may reasonably be offered as adjuncts to standard therapy, or as alternatives in mild, uncomplicated cases in women who prefer them, provided the diagnosis is confirmed and sexually transmitted infections are excluded. BV in pregnancy, recurrent or severe VVC, and any discharge with pelvic pain, fever or bleeding require conventional assessment and treatment because of their association with adverse outcomes[1,7].

CONCLUSION

The Ayurvedic concepts of Shleshmala, Acharana and Upapluta yonivyapad offer a clinical model of vaginal discharge that aligns well with current understanding of bacterial vaginosis and vulvovaginal candidiasis. Herbal antimicrobials, including several drugs familiar to Ayurvedic practice, show short-term efficacy comparable to standard drugs in small trials, and a classical vaginal pessary has shown benefit in pregnant women. Adequately powered, microbiologically confirmed trials of standardised Ayurvedic local and systemic formulations, with recurrence and vaginal microbiome outcomes, are needed before these approaches can be firmly recommended in integrative gynaecological care.

REFERENCES

1. Bradshaw CS, Plummer EL, Muzny CA, Mitchell CM, Fredricks DN, Herbst-Kralovetz MM, et al. Bacterial vaginosis. Nat Rev Dis Primers 2025;11(1):43. https://doi.org/10.1038/s41572-025-00626-1
2. Willems HME, Ahmed SS, Liu J, Xu Z, Peters BM. Vulvovaginal candidiasis: a current understanding and burning questions. J Fungi (Basel) 2020;6(1):27. https://doi.org/10.3390/jof6010027
3. Abbe C, Mitchell CM. Bacterial vaginosis: a review of approaches to treatment and prevention. Front Reprod Health 2023;5:1100029. https://doi.org/10.3389/frph.2023.1100029
4. Gao M, Manos J, Whiteley G, Zablotska-Manos I. Antibiofilm agents for the treatment and prevention of bacterial vaginosis: a systematic narrative review. J Infect Dis 2024;230(3):e508–17. https://doi.org/10.1093/infdis/jiae134
5. Lokeshvar R, Ramaiyan V, Nithin V, Pavani S, Vinod Kumar T. Nanotechnology-driven therapeutics for liver cancer: clinical applications and pharmaceutical insights. Asian J Pharm Clin Res. 2025;18(2):8-26.
6. Picheta N, Piekarz J, Burdan O, Satora M, Tarkowski R, Kułak K. Phytotherapy of vulvovaginal candidiasis: a narrative review. Int J Mol Sci 2024;25(7):3796. https://doi.org/10.3390/ijms25073796
7. Vidiyala N, Sunkishala P, Parupathi PR, Nyavanandi D. Stem cell-derived exosomes in wound healing and skin regeneration: emerging therapeutic strategies and mechanisms. Cells. 2026;15(10):872.
8. Hajizadeh K, Alivand Z, Rahmani V, Mehrannia L, Nami S, Shokouhi B, et al. Comparing the effects of Mycozin and Clotrimazole 1% creams on vaginal candidiasis: a triple-blinded randomized controlled trial. Sci Rep 2025;15(1):2356. https://doi.org/10.1038/s41598-024-84389-x
9. Kamali M, Sarhadynejad Z, Tajadini H, Keikha M, Salari Z, Dehesh T, et al. Evaluation of the efficacy of medicinal plants in treating bacterial vaginosis: a comprehensive systematic review of interventional studies. Iran J Nurs Midwifery Res

2024;29(6):649–59. https://doi.org/10.4103/ijnmr.ijnmr_311_23
10. Prasad PL, Govindaraj S, Jahnavi P, Popatrao TP, Tummala T, Vidiyala P, et al. Metal oxide functionalized nanoparticles for the treatment of bacterial infection: synthesis, characterization, and therapeutic applications. J Appl Organomet Chem. 2025;5(3):232-57.
11. Sushruta. Sushruta Samhita, with Nibandhasangraha commentary of Dalhana. Uttara tantra, chapter 38. Edited by Yadavji Trikamji Acharya. Varanasi: Chaukhamba Orientalia; 2014.
12. Gundeti M, Vidiyala N, Dalvi S, Girase R, Thota SK, Paudel KR, et al. Next-generation Pluronic micelles for advanced drug delivery application. Macromol Mater Eng. 2026;311(9):e70344.
13. Shaikh NMS, Dei L, Donga S. Dhatakyadi Varti – an effective local treatment for Upapluta Yonivyapad (vulvovaginitis during pregnancy): a standard controlled randomized clinical trial. Ayu 2016;37(2):98–104. https://doi.org/10.4103/ayu.AYU_54_15
14. Van Kessel K, Assefi N, Marrazzo J, Eckert L. Common complementary and alternative therapies for yeast vaginitis and bacterial vaginosis: a systematic review. Obstet Gynecol Surv 2003;58(5):351–8.
15. Esmaili M, Sarhadynejad Z, Salari Z, Dehesh T, Lashkarizadeh M, Tajadini H, et al. Effect of *Cymbopogon olivieri*-based herbal vaginal product on bacterial vaginosis. Rev Assoc Med Bras (1992) 2024;70(6):e20231788. https://doi.org/10.1590/1806-9282.20231788
16. Masoudi M, Miraj S, Rafieian-Kopaei M. Comparison of the effects of *Myrtus communis* L, *Berberis vulgaris* and metronidazole vaginal gel alone for the treatment of bacterial vaginosis. J Clin Diagn Res 2016;10(3):QC04–7. https://doi.org/10.7860/JCDR/2016/17211.7392
17. Abouali N, Moghimipour E, Mahmoudabadi AZ, Namjouyan F, Abbaspoor Z. The effect of curcumin-based and clotrimazole vaginal cream in the treatment of vulvovaginal candidiasis. J Family Med Prim Care 2019;8(12):3920–4. https://doi.org/10.4103/jfmpc.jfmpc_584_19
18. Hechhu R, Krishnan K, Singamaneni V, Raju PVN, Erukulla P, Kandimalla KV, et al. GC-MS-based phytochemical analysis, in-depth ADMET screening and molecular docking targeting EGFR for anticancer potential. Chem Methodol. 2026;10(5):465-88.
19. Ahangari F, Farshbaf-Khalili A, Javadzadeh Y, Adibpour M, Sadeghzadeh Oskouei B. Comparing the effectiveness of *Salvia officinalis*, clotrimazole and their combination on vulvovaginal candidiasis: a randomized, controlled clinical trial. J Obstet Gynaecol Res 2019;45(4):897–907. https://doi.org/10.1111/jog.13918
20. Sultana S, Qureshi T, Asif HM, Akram M, Ayaz S, Shah SMA. Acute and sub acute toxicity study and randomized clinical trial of polyherbal coded drug candicure in the management of acute vulvovaginal candidiasis. Pak J Pharm Sci 2019;32(1 Suppl):315–22.
21. Bhat KS, Vishwesh BN, Sahu M, Shukla VK. A clinical study on the efficacy of Panchavalkala cream in Vrana Shodhana w.s.r to its action on microbial load and wound infection. Ayu 2014;35(2):135–40. https://doi.org/10.4103/0974-8520.146216
22. Ram D, Julakanti P, Atiquzzaman NT, Nagy S, Lin AY, Kesselman MM. Dietary influence on bacterial vaginosis. Cureus 2025;17(9):e93506. https://doi.org/10.7759/cureus.93506