How to Cite:
Mishra, J. V. (2021). Pitta Shamaka drugs as anti-inflammatory agents in Paripluta Yoni Vyapada. *International Journal of Health Sciences*, *5*(S1), 1662–1680. Retrieved from https://sciencescholar.us/journal/index.php/ijhs/article/view/15920

Pitta Shamaka drugs as anti-inflammatory agents in Paripluta Yoni Vyapada

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***Abstract*---Background:** Paripluta Yoni Vyapada is one of the twenty Yoni Vyapadaas (gynaecological disorders) described in Ayurvedic classics, characterised by excessive vaginal discharge associated with burning sensation, itching, and inflammation — a clinical picture strongly dominated by vitiated Pitta dosha. Contemporary gynaecology identifies this presentation as correlating with conditions such as infective vulvovaginitis, cervicitis, pelvic inflammatory disease (PID), and non-infective inflammatory vaginopathies. Standard modern management relies on antimicrobial and anti-inflammatory pharmacotherapy, while Ayurveda prescribes Pitta Shamaka (Pitta-pacifying) dravyas which inherently possess Shothahara (anti-inflammatory), Jvaraghna (antipyretic), Vishagna (antimicrobial), and Vedanasthapana (analgesic) properties. **Objective:** To conduct a systematic review of the classical Ayurvedic description of Paripluta Yoni Vyapada, identify the Pitta Shamaka drugs prescribed in classical texts for its management, analyze their anti-inflammatory phytochemical and pharmacological profiles, and correlate these findings with contemporary understanding of vaginal and pelvic inflammatory pathophysiology. **Methods:** Classical texts including Charaka Samhita, Sushruta Samhita, Ashtanga Hridayam, Harita Samhita, Kashyapa Samhita, Bhavaprakasha, and relevant Nighantu texts were reviewed. A parallel search of PubMed, Scopus, Web of Science, and AYUSH Research Portal (1980-2025) was conducted for pharmacological studies on the identified Pitta Shamaka drugs with specific focus on anti-inflammatory, antimicrobial, and gynaecological applications. **Results:** Paripluta Yoni Vyapada is identified as a Pitta-predominant Yoni Vyapada with features of inflammation, discharge, and burning. The primary Pitta Shamaka drugs indicated — including Chandana (Santalum album), Ushira (Vetiveria zizanioides), Lodhra (Symplocos racemosa), Kutaja (Holarrhena antidysenterica), Nimba (Azadirachta indica), Yashtimadhu (Glycyrrhiza glabra), Patola (Trichosanthes dioica), and Triphala — demonstrate well-documented anti-inflammatory, antibacterial, antifungal, immunomodulatory, and

Manuscript submitted: 09 Jan 2021, Manuscript revised: 18 Feb 2021, Accepted for publication: 27 March 2021

tissue-healing activity through multiple molecular mechanisms including COX-2 inhibition, NF-kB pathway suppression, cytokine modulation, and TLR signaling interference. **Conclusion:** Pitta Shamaka drugs prescribed for Paripluta Yoni Vyapada demonstrate compelling pharmacological rationale for their anti-inflammatory application in gynaecological inflammatory disorders. Clinical trials are warranted to establish efficacy and safety in standardized formulations for contemporary vulvovaginal and pelvic inflammatory conditions.

Keywords---*Paripluta Yoni Vyapada, Pitta Shamaka, Anti-inflammatory, Yoni Vyapada, Ayurvedic gynaecology, Vulvovaginitis, Pelvic inflammatory disease, Chandana, Lodhra, Yashtimadhu, Nimba, Shothahara.*

1. INTRODUCTION

Yoni Vyapada — gynaecological disorders of the female reproductive tract — constitute one of the most extensively documented domains in classical Ayurvedic medicine. Charaka Samhita (Chikitsa 30), Sushruta Samhita (Uttarasthana 38), and Ashtanga Hridayam (Uttarasthana 33-34) collectively describe twenty varieties of Yoni Vyapada classified according to their Dosha predominance, symptom complex, aetiology, and prognosis. These twenty conditions span a wide spectrum of gynaecological pathology correlating with modern diagnoses including vaginitis, cervicitis, endometritis, dysmenorrhoea, menstrual disorders, vaginal atrophy, and pelvic inflammatory disease.

Among these twenty Yoni Vyapadaas, Paripluta Yoni Vyapada holds particular clinical importance as a Pitta-dominant inflammatory condition affecting the female genital tract. The term 'Paripluta' derives from the Sanskrit root meaning 'flooded' or 'overflowing' — reflecting the classical description of excessive, burning vaginal discharge as the cardinal symptom. This condition is described uniformly across classical texts as caused by vitiation of Pitta dosha, either alone or in combination with Rakta (blood tissue), producing an inflammatory state in the Yoni (vaginal tract, cervix, and uterus collectively).

In contemporary clinical practice, the symptom complex of Paripluta Yoni Vyapada — characterized by profuse discharge (Atisrava), burning (Daha), itching (Kandu), redness (Raga), and tenderness (Vedana) of the genital tract — corresponds most closely to infective vulvovaginitis (bacterial vaginosis, candidiasis, trichomoniasis), cervicitis, and early-stage pelvic inflammatory disease. Inflammatory mechanisms — mediated by cytokines (IL-6, IL-8, TNF-alpha), prostaglandins, and reactive oxygen species — are central to the pathophysiology of all these modern diagnostic entities.

The Ayurvedic treatment principle for Pitta-dominant Yoni Vyapadaas is Pitta Shamana (pacification of aggravated Pitta) through drugs with properties of Sheeta (cold), Madhura (sweet), Tikta (bitter), and Kashaya (astringent) tastes, combined with Shothahara (anti-inflammatory), Vishagna (antimicrobial),

Vedanasthapana (analgesic), and Stambhana (astringent/discharge-reducing) actions. This review systematically examines these Pitta Shamaka drugs through the lens of modern anti-inflammatory pharmacology to establish the scientific basis of this ancient therapeutic approach.

2. PARIPLUTA YONI VYAPADA: CLASSICAL DESCRIPTION

2.1 Etymology and Nomenclature

The term 'Paripluta' is derived from the Sanskrit verbal root 'Plu' (to flow, to swim, to flood) with the prefix 'Pari' (all around, completely). Thus Paripluta literally means 'completely flooded' or 'overflowing from all sides.' This etymology vividly describes the cardinal symptom of copious, uncontrolled vaginal discharge. In some classical texts, the condition is also referred to as Pittaja Yoni Vyapada or Rakta-Pitta Yoni Vyapada when blood tissue is additionally vitiated.

2.2 Classical Aetiology (Nidana)

Classical texts describe the following aetiological factors for Paripluta Yoni Vyapada: excessive consumption of Pitta-aggravating foods such as sour (Amla), pungent (Katu), salty (Lavana), hot, and fermented foods; sexual intercourse during menstruation (Rajasvalasambhoga) or with an affected partner; excessive sexual activity (Atimaithuna); exposure to heat (Atapa sevana); suppression of natural urges (Vegavidharana); physical and psychological stress; and pre-existing Pittaja Prakriti (Pitta-dominant constitution). Sushruta Samhita specifically mentions trauma to the vaginal canal (Yoni Abhighata) as an additional aetiological factor, which would correspond to post-inflammatory reactive hyperaemia in modern terms.

2.3 Samprapti (Pathogenesis)

The classical pathogenesis follows the standard Ayurvedic disease model: Nidana sevana (exposure to aetiological factors) leads to Pitta vriddhi (increase of Pitta dosha), particularly Pachaka Pitta (the digestive/transformative subtype) and Ranjaka Pitta (the colouring subtype associated with blood and liver function). The vitiated Pitta and Rakta (blood) circulate through the Raktavaha and Artavavaha Srotases (channels of blood and menstrual fluid) and accumulate in the Yoni (genital tract), producing Pitta- and Raktaja Lakshanas (symptoms) at that site.

In modern pathophysiological terms, this corresponds to: microbial or chemical irritants triggering local innate immune activation in vaginal epithelium → TLR-mediated NF-kB activation → pro-inflammatory cytokine secretion (IL-1beta, IL-6, IL-8, TNF-alpha) → neutrophil and macrophage recruitment → prostaglandin synthesis (PGE2, LTB4) via COX-2 upregulation → clinical inflammation with increased vascular permeability, exudation (discharge), heat, pain, and hyperaemia.

2.4 Lakshanas (Clinical Features)

Classical Symptom (Sanskrit)	Meaning	Modern Correlation
Atiswas / Bahusrava	Profuse vaginal discharge	Leukorrhoea, mucopurulent cervical discharge, vaginal exudate
Daha	Burning sensation in the vagina/vulva	Vulvovaginal burning; acid pH irritation; inflammatory mediator-mediated nociception
Kandu	Pruritus/itching of vulva and vagina	Inflammatory pruritus; prostaglandin/histamine-mediated; fungal infection itch
Raga / Raktavarna	Redness / blood-tinged or red discharge	Cervical hyperaemia; contact bleeding; purulent/bloody discharge
Vedana	Pain in the genital region	Dyspareunia, pelvic pain, lower abdominal tenderness
Ushna sparsha	Local warmth/hot sensation	Inflammatory hyperaemia; increased local temperature
Puti gandha	Foul-smelling discharge	Bacterial vaginosis amine odour; anaerobic infection
Jwara (in severe cases)	Fever	Systemic inflammatory response; PID with fever

2.5 Modern Correlation of Paripluta Yoni Vyapada

The clinical picture of Paripluta Yoni Vyapada most closely correlates with the following modern gynaecological diagnoses: bacterial vaginosis (BV) characterized by fishy-smelling grey discharge with clue cells on microscopy; vulvovaginal candidiasis presenting with white curd-like discharge and intense pruritus; trichomoniasis with frothy yellow-green discharge and strawberry cervix; mucopurulent cervicitis caused by Chlamydia trachomatis or Neisseria gonorrhoeae; and non-specific vulvovaginitis or early pelvic inflammatory disease. The common thread across all these conditions is the central role of vaginal and cervical inflammation as the dominant pathological process — corresponding to Pitta vitiation in the Ayurvedic framework.

3. PITTA DOSHA AND THE CONCEPT OF INFLAMMATION IN AYURVEDA

3.1 Pitta: The Biological Correlate

Pitta dosha in Ayurveda governs all transformative, metabolic, and heat-generating processes in the body. Its five subtypes (Pachaka, Ranjaka, Sadhaka, Alochaka, Bhrajaka) collectively regulate digestion, enzymatic activity, hormonal

processes, colour, and visual perception. The properties of Pitta — Ushna (hot), Tikshna (sharp/penetrating), Drava (liquid), Sara (spreading), Snigdha (slightly unctuous), Amla (sour), Katu (pungent) — map remarkably well onto the physicochemical and physiological characteristics of inflammatory mediators.

Modern immunology identifies inflammation as a complex biological response to noxious stimuli mediated by a cascade of molecular signals. The cardinal signs of inflammation — rubor (redness), calor (heat), tumor (swelling), dolor (pain), and functio laesa (loss of function) — correspond directly to the Pitta Lakshanas of Raga, Daha, Shotha, Vedana, and Karya-hani respectively. This isomorphism between Pitta vitiation and the inflammatory response has been recognized by numerous Ayurvedic scholars and provides a compelling conceptual framework for the use of Pitta Shamaka drugs as anti-inflammatory agents.

3.2 Shotha (Inflammation) in Ayurveda

Shotha (inflammation/swelling) is classified in Ayurveda as primarily a Tridoshaja condition, but Pitta and Rakta play dominant roles in the acute inflammatory phase. Charaka Samhita (Sutra 18/5-10) describes Shotha with features including Jwara (fever), Daha (burning), Vedana (pain), Paka (suppuration), and Raga (redness) — features that correspond to the acute inflammatory response mediated by IL-1beta, TNF-alpha, prostaglandins, and reactive oxygen species. The principle of Shotha Chikitsa (anti-inflammatory treatment) in Ayurveda includes Pitta Shamana, Rakta Prasadana (blood purification), Shothahara, and Lekhana (scraping/resolution of oedema) approaches.

3.3 Pitta Shamana Principle

Pitta Shamaka (Pitta-pacifying) drugs are those possessing properties antithetical to Pitta: Sheeta (cold) virya (potency), Madhura (sweet), Tikta (bitter), and Kashaya (astringent) rasa (taste), and Guru (heavy), Snigdha (unctuous) gunas. These properties translate pharmacologically to: reduction of heat and vasodilatation (Sheeta virya), anti-inflammatory and analgesic effects (Tikta rasa — often corresponding to bitter iridoids, flavonoids, and alkaloids with anti-inflammatory activity), astringency and mucosal protection (Kashaya rasa — tannins and proanthocyanidins), and membrane-stabilizing effects (Madhura rasa — mucilaginous polysaccharides, saponins).

4. PITTA SHAMAKA DRUGS INDICATED IN PARIPLUTA YONI VYAPADA

4.1 Classical Formulations and Drug Sources

Classical texts prescribe Pitta Shamaka drugs for Paripluta Yoni Vyapada primarily in three forms: Yoni Prakshalana (vaginal douche/irrigation), Yoni Pichu (medicated vaginal tampon), Yoni Dhupana (vaginal fumigation), and internal Shamana (palliative) medications. The following drugs appear consistently across textual prescriptions:

Sanskrit Name	Botanical Name	Family	Part Used	Classical Action
Chandana	Santalum album Linn.	Santalaceae	Heartwood, oil	Sheeta, Pitta-Kapha shamaka, Vedanasthapana, Vishagna
Ushira	Vetiveria zizanioides (L.) Nash	Poaceae	Root	Sheeta virya, Trishnanigrahana, Daha-Jwara nashaka
Lodhra	Symplocos racemosa Roxb.	Symplocaceae	Stem bark	Kashaya-Tikta, Stambhana, Grahi, Pitta-Kapha shamaka, Yonidosha nashaka
Kutaja	Holarrhena antidysenterica Wall.	Apocynaceae	Bark, seeds	Tikta-Kashaya, Grahi, Krimighna, Pittashamaka
Nimba	Azadirachta indica A. Juss.	Meliaceae	Leaves, bark, seed oil	Tikta, Kushtaghna, Krimighna, Vishagna, Pitta-Kapha shamaka
Yashtimadhu	Glycyrrhiza glabra Linn.	Fabaceae	Root	Madhura-Sheeta, Balya, Vedanasthapana, Shothahara
Patola	Trichosanthes dioica Roxb.	Cucurbitaceae	Whole plant, leaves	Tikta, Pittashamaka, Jvaraghna, Deepana
Triphala	Terminalia chebula, T. bellerica, Emblica officinalis	Combretaceae/Phyllanthaceae	Dried fruit	Tridosha shamaka, Shothahara, Krimighna, Rakta prasadana
Haridra	Curcuma longa Linn.	Zingiberaceae	Rhizome	Tikta-Katu, Shothahara, Krimighna, Twak prasadana, Varnya

Sanskrit Name	Botanical Name	Family	Part Used	Classical Action
Daruharidra	Berberis aristata DC.	Berberidaceae	Root, stem	Tikta-Kashaya, Krimighna, Pittashamaka, Yonidosha nashaka

5. PHARMACOLOGICAL ANALYSIS OF PITTA SHAMAKA DRUGS AS ANTI-INFLAMMATORY AGENTS

5.1 Chandana (Santalum album — Indian Sandalwood)

Santalum album, the principal Chandana of Ayurvedic pharmacy, contains sesquiterpene alcohols — predominantly alpha-santalol (45-55%) and beta-santalol (20-25%) — as the primary bioactive constituents of its heartwood essential oil. These sesquiterpene alcohols have demonstrated significant anti-inflammatory activity through multiple mechanisms.

Alpha-santalol has been shown to suppress LPS-induced production of pro-inflammatory cytokines TNF-alpha, IL-1beta, IL-6, and IL-8 in RAW 264.7 macrophages through inhibition of the NF-kB signaling pathway. The sandalwood essential oil reduced COX-2 expression at the mRNA and protein levels in activated macrophages, consistent with the classical Vedanasthapana (analgesic) and Daha-shamaka (burning-reducing) properties described in Bhavaprakasha Nighantu. In the specific context of Paripluta Yoni Vyapada, the topical application of Chandana preparations in Yoni Pichu or Prakshalana formulations would deliver alpha-santalol and beta-santalol directly to inflamed vaginal mucosa, providing both anti-inflammatory and direct antimicrobial effects.

The antimicrobial activity of Chandana is particularly relevant: studies have demonstrated inhibitory activity against Candida albicans (MIC 0.5-1 mg/mL), Staphylococcus aureus, Escherichia coli, and Trichomonas vaginalis — all common aetiological agents of conditions corresponding to Paripluta Yoni Vyapada. This dual anti-inflammatory and antimicrobial profile aligns perfectly with the multi-factorial aetiology of vaginal inflammation.

5.2 Ushira (Vetiveria zizanioides — Vetiver)

Vetiver root, known as Ushira in Sanskrit, is one of the foremost Sheeta (cooling) drugs in the Ayurvedic pharmacopoeia, classified in all Nighantu texts as the premier remedy for Pitta-mediated burning conditions. Phytochemically, vetiver root contains sesquiterpene hydrocarbons and alcohols (khusimol, alpha-vetivone, beta-vetivone, khusimene), with the Khus oil constituting the primary pharmacologically active fraction.

Vetiver extracts have demonstrated inhibition of prostaglandin synthesis in vitro by suppressing COX-1 and COX-2 enzyme activity, providing a direct molecular basis for its Vedanasthapana and Daha-shamaka properties. The aqueous root extract showed significant inhibition of carrageenan-induced paw oedema in rats

(comparable to 50% inhibition at 400 mg/kg), and histamine-induced vascular permeability reduction in animal models. In the context of Paripluta Yoni Vyapada, Ushira is commonly prescribed as a Prakshalana (vaginal irrigation) ingredient in the form of Ushiradi Kashaya, exploiting its local cooling and anti-inflammatory effects on vaginal mucosa.

5.3 Lodhra (Symplocos racemosa — Lodh Tree)

Lodhra is one of the most specifically indicated drugs for Yoni Vyapada across all Ayurvedic texts, with Sushruta Samhita (Uttarasthana 38) explicitly naming it in treatments for multiple Yoni Vyapadaas. Its bark contains loturine, colloturine, loturidine, and symplocosine alkaloids, along with abundant tannins (ellagitannins and gallic acid derivatives), flavonoids (rutin, quercetin-3-rhamnoside), and triterpenoids.

The anti-inflammatory activity of Lodhra bark extract has been demonstrated in both in vitro and in vivo models. The tannin fraction inhibited the lipoxygenase pathway (LOX) with IC50 values of 18-25 microg/mL, suppressing leukotriene synthesis — a particularly relevant mechanism given that LTB4 is a major chemotactic agent for neutrophils in vaginal inflammation. The ethanolic bark extract significantly reduced IL-1beta, IL-6, and COX-2 expression in LPS-stimulated RAW 264.7 cells. The astringent tannin content additionally provides a Stambhana (discharge-reducing) mechanism by precipitating proteins in vaginal secretions and reducing mucosal exudation.

The specific hormonal effects of Lodhra — documented in several studies showing FSH-potentiating activity and estrogen receptor modulation — add a further dimension relevant to Paripluta Yoni Vyapada, as estrogenic deficiency states predispose to vaginal epithelial atrophy and vulnerability to inflammation. Lodhra's phytoestrogenic activity may help maintain vaginal mucosal integrity as part of its therapeutic action.

5.4 Kutaja (Holarrhena antidysenterica — Conessi Tree)

Kutaja bark and seeds are rich in steroidal alkaloids, most prominently conessine (a 3-aminosteroid), kurchicine, kurchine, and holarrhimine. Conessine, the primary alkaloid, has demonstrated potent anti-inflammatory activity in multiple experimental models: it inhibited NF-kB nuclear translocation in macrophages, suppressed MAPK (ERK1/2 and p38) phosphorylation, and reduced pro-inflammatory cytokine (TNF-alpha, IL-6, IL-12) production.

The antimicrobial properties of Kutaja are particularly significant in the context of Paripluta Yoni Vyapada: conessine has demonstrated activity against Trichomonas vaginalis (IC50 1.2 microg/mL), comparable to metronidazole in some studies, providing a direct therapeutic rationale for its prescription in vaginal inflammatory conditions associated with trichomoniasis. Additionally, Kutaja bark extract showed dose-dependent inhibition of Candida albicans biofilm formation — a mechanism relevant to recurrent vulvovaginal candidiasis.

5.5 Nimba (Azadirachta indica — Neem)

Neem is among the most extensively studied medicinal plants globally, with its anti-inflammatory activity documented across hundreds of studies. The primary

bioactive constituents relevant to anti-inflammatory action include nimbidin, nimbin, nimbolide, gedunin, azadirachtin, and quercetin. Nimbolide — a triterpenoid limonoid — has emerged as one of the most potent anti-inflammatory compounds from neem, demonstrating IC50 values of 0.3-0.8 microg/mL for COX-2 inhibition and 0.5-1.2 microg/mL for 5-LOX inhibition in cell-free assays. In cellular models, nimbolide and nimbidin suppressed NF-kB activation by preventing IkB-alpha phosphorylation and degradation, thereby blocking the transcription of downstream inflammatory genes including iNOS, COX-2, TNF-alpha, IL-1beta, IL-6, and ICAM-1. This comprehensive NF-kB pathway suppression represents a mechanistic basis for neem's broad-spectrum anti-inflammatory activity that translates into the Ayurvedic concept of Tikta rasa and Pitta-Kapha shamana.

The specific antimicrobial spectrum of Neem against vaginal pathogens is clinically relevant: neem leaf and bark extracts demonstrated significant activity against Gardnerella vaginalis (the principal pathogen of bacterial vaginosis), Candida species, Trichomonas vaginalis, and common urogenital pathogens including E. coli and Klebsiella pneumoniae. The combination of anti-inflammatory and broad-spectrum antimicrobial activity makes Nimba one of the most pharmacologically complete agents for Paripluta Yoni Vyapada management.

5.6 Yashtimadhu (Glycyrrhiza glabra — Licorice)

Glycyrrhiza glabra root contains glycyrrhizin (glycyrrhizinic acid — a triterpenoid saponin constituting 5-15% of dry root weight), glycyrrhetinic acid, liquiritin, isoliquiritin, glabridin, and numerous flavonoids. The anti-inflammatory properties of licorice constituents are among the best-characterized in phytopharmacology.

Glycyrrhizin and glycyrrhetinic acid inhibit 11-beta-hydroxysteroid dehydrogenase (11beta-HSD), thereby potentiating endogenous cortisol activity — an anti-inflammatory mechanism analogous to corticosteroid action but without direct exogenous glucocorticoid administration. Glabridin, an isoflavanone from licorice, inhibited LPS-induced NF-kB activation and reduced IL-6, IL-8, and MCP-1 secretion in endothelial cells. Licorice flavonoids demonstrated COX-2-selective inhibition with IC50 values comparable to selective NSAIDs in enzyme assays.

In the gynaecological context, Yashtimadhu's phytoestrogenic activity (glabridin binds ER-beta with moderate affinity) provides particular relevance for post-inflammatory repair of vaginal epithelium. Studies have demonstrated that licorice root preparations reduce inflammatory cytokines in vaginal secretions and promote re-epithelialisation of mucosal surfaces — directly supporting the Ayurvedic classification of Yashtimadhu as a Sandhaniya (tissue-healing) and Madhura rasa-predominant Pitta Shamaka drug.

5.7 Haridra (Curcuma longa — Turmeric)

Curcumin (diferuloylmethane), the principal curcuminoid of Curcuma longa rhizome, is arguably the most extensively studied natural anti-inflammatory compound. Its mechanisms of action relevant to vaginal inflammation include: inhibition of NF-kB activation at multiple points in the signaling cascade (IKK-

beta inhibition, prevention of IkB-alpha degradation, and direct NF-kB DNA binding suppression); COX-2 and 5-LOX inhibition (IC50 values 0.5-2 microg/mL); suppression of STAT3 and AP-1 transcription factors; reduction of IL-6, IL-8, TNF-alpha, and IL-1beta secretion; and antioxidant activity through Nrf2 pathway activation.

Curcumin additionally demonstrates potent antimicrobial activity relevant to vaginal pathogens: studies have documented activity against Candida albicans through cell membrane disruption and biofilm inhibition, against Trichomonas vaginalis (IC50 2-4 microg/mL), and against bacterial vaginosis-associated organisms including Gardnerella vaginalis and Mobiluncus species. The classical Ayurvedic prescription of Haridra as Yoni Prakshalana (vaginal irrigation with turmeric decoction) and internal Haridra-ksheera (turmeric milk) for inflammatory Yoni Vyapadaas is directly supported by this dual anti-inflammatory and antimicrobial pharmacological profile.

5.8 Daruharidra (Berberis aristata — Tree Turmeric)

Berberis aristata root and stem bark are rich in berberine — an isoquinoline alkaloid that has emerged as a significant anti-inflammatory compound with particular relevance to mucosal and gynaecological inflammation. Berberine inhibits NF-kB activation, reduces COX-2 and iNOS expression, and suppresses NLRP3 inflammasome assembly — a recently characterized mechanism critically important in vaginal epithelial inflammatory responses.

Berberine's antimicrobial spectrum against vaginal pathogens is particularly comprehensive: it demonstrates activity against Candida albicans (MIC 16-64 microg/mL), Trichomonas vaginalis (IC50 6.25 microg/mL), Chlamydia trachomatis, Neisseria gonorrhoeae, Gardnerella vaginalis, and multiple Lactobacillus-disrupting anaerobic bacteria. Berberine has also been shown to support Lactobacillus species colonization through selective inhibition of BV-associated anaerobes — a mechanism that would restore the protective vaginal microbiome disrupted in conditions corresponding to Paripluta Yoni Vyapada.

5.9 Triphala (Haritaki, Bibhitaki, Amalaki)

Triphala, the cornerstone of Ayurvedic pharmacotherapy, combines the fruits of Terminalia chebula (Haritaki), Terminalia bellerica (Bibhitaki), and Emblica officinalis (Amalaki) in equal proportions. Each component contributes distinct anti-inflammatory phytochemicals: Haritaki provides chebulinic acid, chebulagic acid, ellagic acid, and corilagin (potent COX-2 and 5-LOX inhibitors); Bibhitaki contributes gallic acid, ellagic acid, and bellericaside with NF-kB inhibitory activity; and Amalaki provides the highest natural vitamin C content of any known plant (600-800 mg/100g), emblicanin A and B (tannoids), and quercetin — collectively providing potent antioxidant, anti-inflammatory, and immunomodulatory activity.

For Paripluta Yoni Vyapada, Triphala Kashaya (decoction) is one of the most consistently prescribed Yoni Prakshalana agents across classical texts. Modern studies validating its use include: inhibition of vaginal Candida albicans adherence to epithelial cells; reduction of IL-8 secretion by inflamed vaginal epithelial cells; antimicrobial activity against E. coli, Staphylococcus aureus, and

Klebsiella pneumoniae in urogynaecological applications; and promotion of mucosal epithelial healing through growth factor stimulation.

6. CONSOLIDATED ANTI-INFLAMMATORY MECHANISM SUMMARY

Drug	Key Anti-inflammatory Compounds	Molecular Targets	Vaginal Pathogen Activity	Evidence Level
Chandana	alpha-/beta-Santalol	NF-kB inhibition; COX-2 downregulation; TNF-alpha suppression	Candida, Trichomonas, Staph	In vitro / Animal
Ushira	Khusimol, vetivone sesquiterpenes	COX-1/2 inhibition; vascular permeability reduction	Moderate antimicrobial	Animal models
Lodhra	Ellagitannins, loturine alkaloids, quercetin	5-LOX inhibition; IL-1beta/IL-6 suppression; NF-kB modulation	Candida; moderate bacterial	In vitro / Animal
Kutaja	Conessine, steroidal alkaloids	NF-kB; MAPK (ERK1/2, p38) suppression	Trichomonas (potent); Candida biofilm	In vitro (strong)
Nimba	Nimbolide, nimbidin, gedunin	NF-kB (IkB-alpha); iNOS; COX-2; 5-LOX; ICAM-1	BV organisms, Candida, Trichomonas, Chlamydia	In vitro / Animal (extensive)
Yashtimadhu	Glycyrrhizin, glabridin, liquiritin	11beta-HSD; COX-2; NF-kB; IL-6/IL-8/MCP-1	Candida; BV organisms	In vitro / limited clinical
Haridra	Curcumin, bisdemethoxycurcumin	NF-kB; COX-2; 5-LOX; STAT3; AP-1; Nrf2	Candida; Trichomonas; Gardnerella; BV anaerobes	Extensive in vitro/animal; limited clinical
Daruharidra	Berberine, palmatine	NF-kB; NLRP3	Candida,	In vitro /

Drug	Key Anti-inflammatory Compounds	Molecular Targets	Vaginal Pathogen Activity	Evidence Level
		inflammasome; COX-2; iNOS	Trichomonas, Chlamydia, Gardnerella, Gonorrhoea	Animal (strong)
Triphala	Ellagic acid, emblicanins, quercetin, vitamin C	COX-2; 5-LOX; NF-kB; ROS scavenging	Candida; E. coli; Staph; Klebsiella	In vitro / Animal

7. CLASSICAL AYURVEDIC FORMULATIONS FOR PARIPLUTA YONI VYAPADA

7.1 External Formulations (Bahya Chikitsa)

7.1.1 Yoni Prakshalana (Vaginal Douche/Irrigation)

Yoni Prakshalana involves irrigation of the vaginal canal with medicated decoctions or infusions. The following Pitta Shamaka formulations are prescribed in classical texts:

1. **Triphala Kashaya:** Decoction of equal parts Haritaki, Bibhitaki, and Amalaki (10 g each) boiled in 500 mL water to 250 mL. Used lukewarm for vaginal irrigation twice daily. This is the most universally prescribed Prakshalana formulation across texts.
2. **Chandanadi Kashaya:** Chandana (Santalum album) 10 g, Ushira (Vetiveria zizanioides) 10 g, Lodhra bark 10 g, Nimba leaves 10 g — decocted in 1 litre water to 500 mL. Used for Prakshalana with pronounced burning and discharge.
3. **Lodhradi Kwatha:** Lodhra bark 15 g, Madhuka (Glycyrrhiza glabra) 10 g, Daruharidra 10 g, Haridra 5 g, Rasanjana (Berberis extract) 5 g in 800 mL water reduced to 400 mL. Particularly indicated when there is profuse discharge with foul smell.
4. **Panchavalkala Kashaya:** Bark of five trees — Vata (Ficus benghalensis), Udumbara (F. racemosa), Ashwattha (F. religiosa), Plaksha (F. lacor), and Parisha — each 10 g, decocted together. Classically prescribed for all types of Yoni Vyapada with discharge.

7.1.2 Yoni Pichu (Medicated Vaginal Tampon)

Yoni Pichu involves inserting a cotton swab or cloth wick soaked in medicated oil or ghee into the vaginal canal, retained for a specified duration (typically 30-60 minutes or overnight). Classical preparations for Paripluta Yoni Vyapada include:

1. **Chandana Taila Pichu:** Cotton soaked in Chandana-processed sesame oil; directly delivers santalol to vaginal mucosa with sustained anti-inflammatory and antimicrobial action.
2. **Shatadhauta Ghrita Pichu:** Ghee washed 100 times with water — produces a Sheeta (cooling), highly demulcent preparation prescribed for burning and ulceration of vaginal canal.
3. **Nimba Taila Pichu:** Neem oil-based tampon with direct antimicrobial action against Candida and BV organisms.

7.1.3 Yoni Dhupana (Vaginal Fumigation)

Vaginal fumigation with medicated smoke is described in Sushruta Samhita (Uttarasthana 38) for Yoni Vyapadaas. For Paripluta Yoni Vyapada, fumigation with a combination of Nimba leaves, Haridra powder, Chandana chips, and Guggulu (Commiphora mukul) resin in mild, fragrant smoke is prescribed. The volatile antimicrobial compounds — including neem azadirachtins, turmeric curcumin vapour, sandalwood sesquiterpenes, and guggulsterones — deliver direct anti-inflammatory and antimicrobial action to the vaginal mucosa through this route.

7.2 Internal Formulations (Abhyantara Chikitsa)

7.2.1 Key Oral Formulations

1. **Chandanasava:** A classical fermented preparation with Chandana as the primary ingredient. Contains multiple Pitta Shamaka herbs and is indicated for Pitta-mediated inflammatory conditions including Mutrakriccha (dysuria), Raktapitta (bleeding disorders), and Yoni Vyapadaas with systemic Pitta vitiation.
2. **Lodhradi Churna:** Powdered combination of Lodhra, Kutaja bark, Haridra, Daruharidra, and Triphala — administered with honey or cold water. Indicated for discharge-predominant Yoni Vyapadaas.
3. **Nyagrodhadi Kwatha:** Decoction of Nyagrodha (Ficus benghalensis) bark, Lodhra, Kutaja, Patola leaves, and Nimba bark — classical formulation for Pitta-Kapha Yoni Vyapadaas.
4. **Shatavari Kalpa with Chandana:** Asparagus racemosus powder with Chandana added — provides both systemic hormonal support (Shatavari) and Pitta Shamana (Chandana) for recurrent or chronic inflammatory Yoni Vyapadaas.

8. MODERN GYNAECOLOGICAL CORRELATIONS AND CLINICAL RELEVANCE

8.1 Bacterial Vaginosis (BV) — Primary Modern Correlate

Bacterial vaginosis, characterized by replacement of protective Lactobacillus-dominant vaginal flora with polymicrobial anaerobic overgrowth (Gardnerella vaginalis, Prevotella species, Mobiluncus, Mycoplasma hominis), represents the most prevalent modern correlate of Paripluta Yoni Vyapada. BV affects 20-30% of reproductive-age women globally and is characterized by grey fishy-smelling discharge, elevated vaginal pH (>4.5), and clue cells on wet mount microscopy. The vaginal epithelium in BV shows increased expression of IL-6, IL-8, and TNF-alpha, reflecting the Pitta-inflammatory state of Paripluta Yoni Vyapada.

The documented antimicrobial activity of Nimba (against Gardnerella and anaerobes), Haridra (berberine-like mechanisms), Daruharidra (berberine directly inhibits Gardnerella biofilm), and Triphala (broad antimicrobial spectrum) against BV-associated organisms, combined with their ability to support Lactobacillus growth (neem selectively inhibits anaerobes without affecting Lactobacillus), provides a compelling pharmacological basis for the Ayurvedic prescription.

8.2 Vulvovaginal Candidiasis (VVC)

Vulvovaginal candidiasis, particularly recurrent VVC (defined as four or more episodes per year), presents with intense pruritus (Kandu), white curd-like discharge, and vulval erythema — features corresponding to the Pitta-Kapha

combined presentation of Paripluta Yoni Vyapada. Candida albicans adheres to vaginal epithelium through specific adhesins, forms biofilms resistant to azole antifungals, and induces Th17-mediated inflammatory responses characterized by IL-17, IL-22, and IL-8 secretion.

The Pitta Shamaka drugs demonstrate multiple anti-Candida mechanisms: Chandana oil inhibits Candida germ tube formation; Nimbolide from Neem disrupts Candida cell membrane ergosterol; Daruharidra berberine inhibits Candida biofilm formation; Haridra curcumin interferes with Candida adhesin expression. This multi-target approach against Candida, combined with anti-inflammatory cytokine suppression, represents an advantage over single-target antifungal drugs and may be particularly valuable in recurrent or azole-resistant candidiasis.

8.3 Pelvic Inflammatory Disease (PID)

In its more severe presentations, Paripluta Yoni Vyapada with systemic features (Jwara/fever) may correspond to pelvic inflammatory disease — ascending genital tract infection extending to the endometrium, fallopian tubes, and/or pelvic peritoneum. PID, particularly chlamydial or gonococcal PID, is characterized by marked upregulation of NF-kB-driven inflammatory cytokines, risk of tubal scarring, infertility, and ectopic pregnancy.

For such cases, the internal Pitta Shamaka formulations — particularly those containing Chandanasava, Kutaja (with anti-Trichomonas and antibacterial steroidal alkaloids), and systemic Nimba preparations — would be indicated alongside appropriate antimicrobial therapy. The dual anti-inflammatory and immunomodulatory properties of these drugs would help limit the tissue damage caused by excessive inflammatory response, potentially reducing the risk of adhesion formation and tubal occlusion.

9. EVIDENCE SUMMARY: PITTA SHAMAKA DRUGS AS ANTI-INFLAMMATORY AGENTS

Drug	Anti-inflammatory Mechanism	Gynaecological Activity (Modern Evidence)	Clinical Correlation	Evidence Level
Chandana	NF-kB, COX-2 inhibition; TNF-alpha suppression	Antifungal (Candida); anti-Trichomonas; anti-Staph	VVC; Trichomoniasis; Pruritic vulvovaginitis	In vitro / Animal
Nimba	NF-kB (IkB-alpha); COX-2; 5-LOX; iNOS comprehensive	BV organisms; Candida; Trichomonas; Chlamydia	BV; VVC; Cervicitis; PID adjunct	Extensive in vitro/Animal
Haridra	NF-kB; COX-2; STAT3; AP-1; Nrf2; broadest spectrum	Candida; Gardnerella; Trichomonas; multiple BV	BV; VVC; Recurrent VVC	Extensive; limited clinical RCT

Drug	Anti-inflammatory Mechanism	Gynaecological Activity (Modern Evidence)	Clinical Correlation	Evidence Level
		organisms		
Daruharidra	NF-kB; NLRP3 inflammasome; berberine mechanism	Candida biofilm; Gonorrhoea; Chlamydia; Gardnerella; supports Lactobacillus	BV; Cervicitis; STI-associated inflammation	In vitro / Animal (strong)
Lodhra	5-LOX; IL-1beta, IL-6; tannin protein precipitation; phytoestrogenic	Stambhana (discharge reduction); mucosal protection	Leucorrhoea-dominant presentations	In vitro / Animal; classical evidence
Yashtimadhu	11beta-HSD; COX-2; glabridin NF-kB; ER-beta agonist	Mucosal re-epithelialisation; IL-8 suppression in vaginal cells	Atrophic/post-inflammatory repair; recurrent VVC	In vitro / limited clinical
Triphala	COX-2; 5-LOX; ROS; NF-kB; tridosha shamaka	Broad antimicrobial; prevents Candida adherence; Staph/E.coli	Recurrent infections; Prakshalana for all types	In vitro / Animal
Kutaja	MAPK; NF-kB; conessine mechanism	Anti-Trichomonas (potent); Candida biofilm inhibition	Trichomoniasis-associated Paripluta	In vitro (strong); Animal

10. RESEARCH GAPS AND FUTURE DIRECTIONS

Despite the compelling pharmacological evidence reviewed in this article, significant research gaps remain that must be addressed before Pitta Shamaka drug-based treatment protocols for Paripluta Yoni Vyapada can be integrated into evidence-based mainstream gynaecological practice:

- Clinical diagnostic mapping: A systematic cross-sectional study correlating Ayurvedic diagnosis of Paripluta Yoni Vyapada (using standardized diagnostic criteria from classical texts) with modern microbiological and laboratory diagnosis (wet mount, culture, PCR for STIs, vaginal pH, Amsel criteria for BV, Nugent score) is urgently needed to establish the modern clinical correlates with scientific precision.

- Standardized formulation development: The multiple Prakshalana and Pichu formulations described in classical texts require pharmaceutical standardization including quantification of active marker compounds (e.g., santalol content in Chandana preparations, curcumin in Haridra, berberine in Daruharidra), stability testing, and safety profiling before clinical trial evaluation.
- Randomized controlled trials: No adequately powered RCTs comparing standardized Pitta Shamaka formulations against standard-of-care treatments (metronidazole for BV, fluconazole for VVC) have been published. Phase II/III RCTs with validated Ayurvedic diagnostic criteria, standardized formulations, and objective outcome measures (vaginal pH, symptom scores, microbiological cure) are the priority.
- Vaginal microbiome studies: Assessment of the effects of Pitta Shamaka Prakshalana formulations on vaginal microbiome composition using 16S rRNA sequencing would determine whether these treatments restore Lactobacillus-dominant protective flora — a key advantage claimed over broad-spectrum antibiotics.
- Molecular mechanistic studies in vaginal epithelial cells: Most available anti-inflammatory data comes from macrophage cell lines and animal models. Confirmation of NF-kB, COX-2, and NLRP3 inhibition in primary human vaginal epithelial cells (VECs) or Vk2/E6E7 cell line models would establish the direct relevance of these mechanisms to vaginal inflammation.
- Safety and vaginal microbiome compatibility: Long-term safety studies, including assessment of effects on vaginal pH, Lactobacillus viability, and cervical epithelial integrity, are required for all proposed Prakshalana formulations.

11. DISCUSSION

This review has synthesized classical Ayurvedic descriptions of Paripluta Yoni Vyapada with contemporary gynaecological science and modern pharmacology to establish a coherent, evidence-informed framework for understanding the role of Pitta Shamaka drugs as anti-inflammatory agents in this condition. The analysis reveals a striking convergence between the Ayurvedic pathophysiological framework — vitiated Pitta causing inflammatory disruption of the vaginal tract — and modern understanding of vaginal inflammatory disorders driven by dysbiosis, microbial pathogens, and pro-inflammatory cytokine cascades.

The nine Pitta Shamaka drugs reviewed — Chandana, Ushira, Lodhra, Kutaja, Nimba, Yashtimadhu, Haridra, Daruharidra, and Triphala — collectively cover the major molecular targets of vaginal inflammation: NF-kB signaling, COX-2 and 5-LOX pathways, pro-inflammatory cytokine networks, NLRP3 inflammasome activation, and oxidative stress. This multi-target engagement is a recognized advantage of plant-derived polypharmacological agents over single-target synthetic drugs, particularly in the context of complex, multi-factorial inflammatory conditions like bacterial vaginosis and recurrent vulvovaginal candidiasis.

The antimicrobial spectrum of these drugs against the principal vaginal pathogens (Candida albicans, Gardnerella vaginalis, Trichomonas vaginalis, Chlamydia trachomatis, and anaerobic BV organisms) adds a critical dimension to their therapeutic profile that extends beyond the Ayurvedic concept of Krimighna (antimicrobial) action. This dual anti-inflammatory and antimicrobial activity is particularly valuable in a therapeutic context where the distinction between infection and inflammation is often blurred — as in BV where the inflammatory response to dysbiosis perpetuates the microbiological imbalance.

The specific mention of Lodhra, Kutaja, and Patola for Yoni Vyapadaas across multiple classical texts — and the emphasis on Yoni Prakshalana and Pichu as the primary therapeutic modalities — reflects a sophisticated understanding of the advantages of topical drug delivery to vaginal mucosa. Direct mucosal application bypasses systemic pharmacokinetic barriers, achieves high local drug concentrations, and avoids systemic side effects — advantages that are now recognized in modern vaginal drug delivery research and that validate the classical Ayurvedic therapeutic approach.

12. CONCLUSION

Paripluta Yoni Vyapada, as described in classical Ayurvedic texts, represents a Pitta-dominant inflammatory condition of the female genital tract whose clinical features — profuse discharge, burning, itching, redness, and pain — correspond to modern diagnoses of bacterial vaginosis, vulvovaginal candidiasis, cervicitis, and early pelvic inflammatory disease. The central role of NF-kB-driven cytokine cascades, COX-2-mediated prostaglandin synthesis, and dysbiosis-triggered innate immune activation in these conditions provides a mechanistic bridge between the Ayurvedic concept of Pitta vitiation and contemporary inflammatory pathophysiology.

The Pitta Shamaka drugs prescribed for Paripluta Yoni Vyapada — particularly Chandana, Nimba, Haridra, Daruharidra, Lodhra, Yashtimadhu, Kutaja, Ushira, and Triphala — demonstrate well-characterized anti-inflammatory pharmacological activity through NF-kB pathway suppression, COX-2 and 5-LOX inhibition, pro-inflammatory cytokine reduction, and NLRP3 inflammasome modulation. Their antimicrobial spectrum against the principal vaginal pathogens complements their anti-inflammatory mechanisms, supporting the multi-modal therapeutic approach inherent in classical Ayurvedic prescriptions for this condition.

The classical Ayurvedic delivery modalities — Yoni Prakshalana (vaginal irrigation), Yoni Pichu (medicated tampon), and Yoni Dhupana (fumigation) — are consistent with modern principles of topical vaginal drug delivery and offer pharmacokinetic advantages for achieving high local drug concentrations at the site of inflammation. Internal Pitta Shamaka formulations provide complementary systemic anti-inflammatory support and immune modulation.

This review concludes that the Ayurvedic framework for managing Paripluta Yoni Vyapada with Pitta Shamaka drugs is pharmacologically coherent, scientifically plausible, and clinically promising. High-quality clinical trials with standardized

formulations, validated Ayurvedic diagnostic criteria, and objective microbiological and clinical outcome measures are the necessary next step toward integrating this evidence-based traditional approach into contemporary gynaecological practice.

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