IJAYUSH
International Journal of AYUSH
AYURVEDA, YOGA, UNANI, SIDDHA AND HOMEOPATHY
http://internationaljournal.org.in/journal/index.php/ijayush/
International Journal
Panacea
Research library
ISSN: 2349 7025

Review Article | Volume 14 Issue 09 | September 2025

ROLE OF *PIPPALI DWAYA* IN AUTOIMMUNE DISORDERS IN PERSPECTIVE OF AYURVEDA

***Dr. Utsav Nimbark[1], Dr. Pallavi Varshney[2], Dr. Pooja Nautiyal[3], Vd. Disha K Chhatbar[4]**

[1]PG Scholar, P.G. Dept. of Dravya Guna, Himalayiya Ayurvedic (PG) Medical College and Hospital Uttarakhand

[2]Guide, P.G. Dept. of Dravya Guna, Himalayiya Ayurvedic (PG) Medical College and Hospital Uttarakhand

[3]Co-Guide, P.G. Dept. of Dravya Guna, Himalayiya Ayurvedic (PG) Medical College and Hospital Uttarakhand

[4]PhD Scholar, Dept of Agadtantra Evam Vidhi Vaidyaka, ITRA, Jamnagar, Gujarat

***Corresponding Author -** Dr. Utsav Nimbark, PG Scholar, P.G. Dept. of Dravya Guna, Himalayiya Ayurvedic (PG) Medical College and Hospital, Uttarakhand

ABSTRACT

Background: Autoimmune disorders represent a group of chronic, relapsing conditions where the body's immune system attacks its own tissues. Modern medicine explains these as immune dysregulations, while Ayurveda interprets them as outcomes of *Agni* derangement, *Ama* formation, and *Oja Kshaya*. *Pippali Dwaya* (a combination of *Pippali* – *Piper longum* fruit and root) has been described in classical texts for its *Rasayana*, *Deepana*, *Pachana*, and *Ojovardhana* properties. These actions make it relevant for correcting the root causes of autoimmune pathogenesis. **Objectives:** To explore the Ayurvedic rationale of *Pippali Dwaya* in the management of autoimmune disorders. To correlate the pharmacological actions of *Pippali* with immunomodulation and inflammation control. To evaluate the potential of *Pippali Dwaya* as a supportive therapeutic approach in chronic autoimmune conditions. **Methods:** This study is based on a literary review of *Brihattrayi*, *Laghutrayi*, Nighantus, and Rasayana-related texts, along with modern pharmacological studies on *Piper longum*. Research databases (PubMed, Scopus, AYUSH portals) were explored for experimental and clinical studies highlighting the immunomodulatory and anti-inflammatory effects of *Pippali*. A comparative analysis was performed to align Ayurvedic concepts of *Agni*, *Ama*, and *Ojas*

with modern autoimmune pathophysiology. **Results:** Ayurvedic analysis shows that *Pippali Dwaya* strengthens *Agni*, digests *Ama*, and enhances *Ojas*, thereby restoring systemic homeostasis. Modern studies indicate that *Piper longum* contains piperine and other alkaloids with proven immunomodulatory, anti-inflammatory, antioxidant, and hepatoprotective activities. These align with its Ayurvedic *Rasayana* effect. Evidence suggests its role in reducing inflammatory cytokines, modulating immune response, and improving tissue repair, making it a promising adjunct in autoimmune disorders like rheumatoid arthritis, ulcerative colitis, and psoriasis. **Conclusion:** *Pippali Dwaya*, through its dual classical and pharmacological properties, offers a holistic approach to managing autoimmune disorders. Its ability to correct *Agni*, remove *Ama*, and enhance *Ojas* correlates well with modern immunomodulation. Further preclinical and clinical studies are warranted to validate its efficacy as an integrative therapy.

Keywords: *Pippali Dwaya*, *Agni*, *Ama*, *Ojas*, Autoimmune Disorders, *Rasayana*

Introduction

Autoimmune disorders are complex conditions in which the immune system loses its ability to differentiate between self and non-self, resulting in chronic inflammation and tissue destruction. Modern medicine describes them as multifactorial diseases influenced by genetic predisposition, environmental triggers, and immunological imbalance. Disorders such as rheumatoid arthritis, ulcerative colitis, psoriasis, systemic lupus erythematosus, and multiple sclerosis reflect this self-destructive pathology. Despite advances in immunosuppressive therapies, long-term management remains challenging due to side effects, relapses, and compromised immunity.[1]

Ayurveda interprets autoimmune pathogenesis through the lens of *Agni* (digestive and metabolic fire), *Ama* (toxic byproduct of impaired metabolism), and *Ojas* (essence of immunity and vitality). Weak *Agni* leads to incomplete digestion and accumulation of *Ama*, which circulates and obstructs the *Srotas* (channels). Over time, this derangement causes depletion of *Ojas*, resulting in systemic vulnerability and self-destructive immune activity. Hence, the therapeutic strategy in Ayurveda emphasizes strengthening *Agni*, eliminating *Ama*, and preserving *Ojas*.[2]

In this context, *Pippali Dwaya*—a classical formulation consisting of *Pippali Phala* (fruit of *Piper longum*) and *Pippali Moola* (root of *Piper longum*)—has been described as a potent

Rasayana with *Deepana*, *Pachana*, and *Ojovardhana* properties. Its dual role in digestion and rejuvenation positions it as an important candidate for correcting the fundamental imbalances in autoimmune disorders. Acharyas have recommended *Pippali* preparations in conditions of chronic respiratory, digestive, and metabolic disorders, reflecting its systemic action on immunity and vitality.[3]

Modern pharmacological studies validate these classical claims. The bioactive compound piperine exhibits immunomodulatory, anti-inflammatory, antioxidant, and hepatoprotective actions. These effects are particularly beneficial in autoimmune disorders, where immune over-activity and oxidative stress drive tissue damage. Thus, integrating Ayurvedic principles with biomedical findings highlights *Pippali Dwaya* as a promising supportive therapy in the management of autoimmune disorders, offering both symptom relief and deeper correction of pathophysiological mechanisms.[4]

AIM AND OBJECTIVES

Aim

To assess the role of *Pippali Dwaya* in autoimmune disorders from Ayurvedic and modern perspectives.

Objectives

1. To review classical references of *Pippali Dwaya*.
2. To analyze *Agni*, *Ama*, and *Ojas* in autoimmune pathogenesis.
3. To correlate pharmacological actions of *Pippali* with immune modulation.
4. To evaluate its therapeutic potential in autoimmune disorders.

MATERIAL AND METHOD

The present study was carried out as a literary review based on classical Ayurvedic texts including *Brihattrayi* (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya), *Laghutrayi*, and Nighantus, with special reference to the description of *Pippali Dwaya*. Relevant Rasayana-related chapters were examined to understand its *Deepana, Pachana, Rasayana,* and *Ojovardhana* properties. Modern literature was explored through standard pharmacological textbooks, research databases such as PubMed, Scopus, and AYUSH portals to identify experimental and clinical studies on *Piper longum*. A comparative approach was used to align Ayurvedic concepts of *Agni*, *Ama*, *Ojas,* and *Srotodushti* with the modern pathophysiology of autoimmune disorders. The collected data were analyzed thematically to

highlight the therapeutic role of *Pippali Dwaya* in modulating immunity, reducing inflammation, and improving systemic health in autoimmune conditions.

DRUG REVIEW

PIPPALI (*PIPER LONGUM LINN.*)

Pippali is one of the most widely described drugs in Ayurveda, belonging to the group of *Trikatu* along with *Shunthi* and *Maricha*. It has been praised by *Acharya Charaka*, *Sushruta*, and *Vagbhata* for its *Deepana*, *Pachana*, *Rasayana*, and *Vata–Kaphahara* actions. Its dual use of fruit (*Pippali Phala*) and root (*Pippali Moola*) has given rise to the formulation known as *Pippali Dwaya*. In modern pharmacology, *Pippali* is recognized for its bioactive compound piperine, which exhibits immunomodulatory, antioxidant, hepatoprotective, and bioavailability-enhancing properties.[5]

Synonyms[6]

- Sanskrit: *Pippali*, *Kana*, *Magadhi*, *Kantari*.
- Hindi: Pipal, Piplamul.
- English: Long Pepper.
- Botanical: *Piper longum Linn.*
- Family: Piperaceae.

Varieties of Pippali

The fruits of Pippali or Long pepper as crude drug appears to be derived from two or more i.e. three species, including one which is Indonesian. Indian Long Piper is a product either of *Piper longum* Linn. or *Piper prepulioides*, while the Indonesian or Java Long Pepper imported from Malaysia is *Piper retrofractum*. The products of these species are used for the same purposes, though they vary in their effectiveness.

Indian Long Pepper is mostly procured from the wild plants grown in some particular regions of its availability in more or less quantity (with varying frequency). Some other relevant species include *Piper sylvaticum* Roxb.

There are four kinds of Pippali as incorporated in textual sources of Indian medicine (materia medica) i.e.

- Pippali
- Gajapippali

- Saimhali
- Vanapippali- Chavika which are indicated (Raja Nighantu, Prabhadradi, 13-20) with medicinal properties in particular.
- Gajapippali is classically named Chavya which is botanically identified as *Piper chaba* Hunter.
- Pippali Mula forms the roots and thicker parts of the stem are cut and dried (which are collected from plants other than fruits) for trading and utilization as a drug having an individual place in medicine.

Botanical Description

- **Morphology:** A slender, aromatic, creeping shrub. Leaves are ovate, alternate, and cordate at the base. Flowers are unisexual, borne in dense cylindrical spikes. Fruits are small, ovoid, green when unripe, and blackish when mature. Roots are slender and aromatic.
- **Distribution:** Widely found in India, especially in Assam, Bengal, Bihar, Madhya Pradesh, and the Western Ghats. Also cultivated in Sri Lanka and Indonesia.[6]

Rasa–Guna–Veerya–Vipaka

- *Rasa*: Katu
- *Guna*: Laghu, Snigdha
- *Veerya*: Anushna (mildly hot)
- *Vipaka*: Madhura
- *Prabhava*: Rasayana, Yogavahi (enhances bioavailability of other drugs)

Classical References

- *Charaka Samhita*: Mentioned in *Trikatu*, *Shirovirechana*, *Kasa Chikitsa*, and *Rasayana Adhyaya*.
- *Sushruta Samhita*: Indicated in *Shwasa*, *Kasa*, *Hikka*, and as *Deepana–Pachana*.
- *Ashtanga Hridaya*: Emphasized its role in *Rasayana Prayoga* and respiratory disorders.

Pharmacological Actions[7]

- *Deepana*: Enhances digestive fire.
- *Pachana*: Digests *Ama*.
- *Rasayana*: Rejuvenative, enhances *Ojas*.
- *Vatanulomana*: Regulates *Vata*.
- *Shwasahara* and *Kaphahara*: Useful in respiratory disorders.

Modern Pharmacology[8]

- **Active principles:** Piperine, piplartine, volatile oils, lignans, and alkaloids.
- **Actions:**
    - Immunomodulatory and anti-inflammatory.
    - Antioxidant and hepatoprotective.
    - Bioavailability enhancer for drugs like curcumin, rifampicin, and resveratrol.
    - Antimicrobial, antiasthmatic, antidiabetic, and neuroprotective activities.

Therapeutic Uses[9]

- **Classical:** *Kasa* (cough), *Shwasa* (asthma), *Hikka* (hiccup), *Jwara* (fever), *Krimi* (helminthiasis), *Arsha* (piles), and as a *Rasayana*.
- **Modern:** Rheumatoid arthritis, asthma, bronchitis, tuberculosis, ulcerative colitis, psoriasis, diabetes, and neurodegenerative conditions.

Formulations

- *Pippali Rasayana*
- *Chyawanprasha*
- *Trikatu Churna*
- *Pippalyasava*
- *Pippali Dwaya*

Safety and Toxicity

In therapeutic doses, *Pippali* is safe. High doses may cause gastric irritation. Prolonged excessive use should be avoided, especially in conditions of *Pitta* aggravation.[10]

AUTOIMMUNITY

Autoimmune disorders are a group of conditions in which the body's own immune system mistakenly attacks healthy cells, tissues, or organs. Normally, the immune system protects against infections and harmful invaders. However, in these disorders, it fails to distinguish between "self" and "non-self." This misdirected response leads to chronic inflammation, tissue damage, and dysfunction in various organs. Examples include rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis, and type 1 diabetes. Each of these conditions has unique features, but they all share the common underlying mechanism of autoimmunity.[11]

The exact causes of autoimmune disorders remain unclear, but research suggests that genetic predisposition, environmental triggers, infections, and hormonal influences play a role. Family history often increases susceptibility, while external factors such as viral infections, toxins, or stress may trigger the onset of disease in genetically vulnerable individuals. Women are disproportionately affected, likely due to hormonal and chromosomal differences, making autoimmune diseases one of the leading health concerns for females in their reproductive years.[12]

Symptoms of autoimmune disorders vary widely depending on the organ system involved. Some conditions, like vitiligo or psoriasis, primarily affect the skin, while others, like ulcerative colitis, involve the gastrointestinal tract. Many disorders cause systemic symptoms such as fatigue, low-grade fever, joint pain, and general malaise. Because these signs overlap with other conditions, diagnosis can be challenging. Laboratory markers such as antinuclear antibodies (ANA), rheumatoid factor, and other specific autoantibodies are useful in supporting diagnosis and monitoring disease activity.[13]

Management of autoimmune disorders generally focuses on controlling symptoms, reducing inflammation, and preventing further tissue damage. Conventional approaches include immunosuppressive drugs, corticosteroids, and biologics that target specific immune pathways. Alongside modern medicine, lifestyle modification, stress management, and dietary adjustments have been found helpful in reducing flare-ups. In Ayurveda, such conditions are often correlated with *Ojakshaya* and *Srotodushti*, and therapies aim at restoring immune balance, strengthening *Agni*, and promoting *Ojas*. A multidisciplinary approach combining modern and traditional strategies holds promise for improving quality of life in individuals with autoimmune diseases.[14]

***Pippali Dwaya* in Autoimmune Disorders[15]**

Autoimmune Disorders

↓

Ayurvedic View

- *Ojakshaya* (depletion of immunity)
- *Agni Mandya* (weak digestive/metabolic fire)
- *Ama Utpatti* (toxin accumulation)
- *Srotodushti* (obstruction and vitiation of channels)

↓

Therapeutic Need

- Deepana (*Agni–enhancing*)
- Pachana (*Ama–digesting*)
- Rasayana (*Rejuvenation and Ojas–promotion*)

↓

Role of *Pippali Dwaya* (*Pippali* + *Pippalimoola*)

- ***Agni Deepana*** → Improves digestion and metabolism
- ***Ama Pachana*** → Reduces toxins, clears channels
- ***Srotoshodhana*** → Restores channel integrity
- **Rasayana** → Enhances *Ojas* and immunity

↓

Clinical Impact

- Reduction in inflammation
- Modulation of immune response
- Symptom relief (fatigue, joint pain, GI disturbances)
- Improved quality of life

RESULT AND FINDINGS

- *Pippali Dwaya* shows significant potential in autoimmune disorders by improving *Agni*, digesting *Ama*, and promoting *Ojas*.

- It acts as *Deepana*, *Pachana*, *Rasayana*, and *Srotoshodhaka*, which helps correct the underlying pathology of *Ojakshaya* and *Srotodushti*.
- Clinical impact includes reduction of chronic inflammation, better immune regulation, and improvement in systemic symptoms like fatigue, joint pain, and gastrointestinal disturbances.
- Findings suggest that *Pippali Dwaya* may serve as a supportive therapy in autoimmune conditions, improving quality of life when integrated with holistic Ayurvedic management.

DISCUSSION

Autoimmune disorders present a complex challenge because they involve the immune system attacking the body's own tissues, resulting in chronic inflammation and progressive organ damage. From an Ayurvedic perspective, such conditions are rooted in *Ojakshaya* (depletion of vital immunity), *Agni Mandya* (weak digestive fire), and *Ama Utpatti* (toxin accumulation). The obstruction and vitiation of *Srotas* further aggravate the pathology, leading to multi-systemic manifestations. Understanding these conditions through both modern immunology and Ayurvedic *Samprapti* allows for a holistic management approach.[16]

Pippali Dwaya (a combination of *Pippali* and *Pippalimoola*) plays an important role in correcting the underlying imbalances. Its *Deepana* (digestive fire stimulating) and *Pachana* (detoxifying) properties help in breaking down *Ama*, which is considered the key pathogenic factor in autoimmune disorders. By enhancing *Agni*, it restores proper metabolism and prevents the formation of further toxins. In modern terms, this may be correlated with its immunomodulatory and anti-inflammatory actions, which contribute to the regulation of an overactive immune response.[17]

Beyond *Ama* management, *Pippali Dwaya* acts as a *Rasayana*, rejuvenating the body and improving *Ojas*, which is the essence of immunity and vitality in Ayurveda. Strengthening *Ojas* is particularly crucial in autoimmune disorders, as it enhances resistance against self-damage and reduces susceptibility to flare-ups. Studies on *Pippali* and its phytoconstituents support its antioxidant, immunomodulatory, and adaptogenic effects, which align well with the classical Ayurvedic interpretation. This dual action—clearing toxins and strengthening immunity—positions *Pippali Dwaya* as a unique therapeutic tool.[18]

The findings suggest that *Pippali Dwaya* can serve as an effective supportive intervention in the management of autoimmune disorders. It does not merely suppress the immune response, as many modern drugs do, but works by restoring balance and strengthening the body's inherent defense mechanisms. When combined with appropriate dietary regulation, lifestyle modifications, and other Ayurvedic therapies, it may offer a sustainable approach to managing these chronic conditions. Future clinical studies are needed to validate these classical claims and integrate *Pippali Dwaya* more effectively into comprehensive treatment protocols for autoimmune diseases.[19]

CONCLUSION

Pippali Dwaya offers a promising Ayurvedic approach in the management of autoimmune disorders by addressing the fundamental pathological factors of *Agni Mandya*, *Ama Utpatti*, *Srotodushti*, and *Ojakshaya*. Through its *Deepana*, *Pachana*, *Rasayana*, and *Srotoshodhana* properties, it not only reduces inflammation and toxin load but also strengthens *Ojas* and modulates immune function. Unlike conventional therapies that mainly suppress immunity, *Pippali Dwaya* works to restore balance and resilience in the body, thereby improving quality of life and long-term health outcomes.

CONFLICT OF INTEREST –NIL

SOURCE OF SUPPORT –NONE

REFERENCES

1. Rose NR, Bona C. Defining criteria for autoimmune diseases (Witebsky's postulates revisited). Immunol Today. 1993;14(9):426–30.
2. Sharma PV. *Charaka Samhita* (Vol I–IV). Varanasi: Chaukhambha Orientalia; 2014.
3. Shastri AD. *Sushruta Samhita with Ayurveda Tatva Sandipika Hindi Commentary*. Varanasi: Chaukhambha Sanskrit Sansthan; 2012.
4. Kumar S, Kamboj J, Sharma S. Overview for various aspects of the health benefits of Piper longum Linn. fruit. J Acupunct Meridian Stud. 2011;4(2):134–40.
5. Sharma RK, Dash B. *Agnivesha's Charaka Samhita: Text with English Translation & Critical Exposition*. Varanasi: Chaukhambha Sanskrit Series Office; 2015.
6. Nadkarni KM. *Indian Materia Medica*. Vol 1. Mumbai: Popular Prakashan; 2002. p. 1000–2.
7. Warrier PK, Nambiar VPK, Ramankutty C. *Indian Medicinal Plants: A Compendium of 500 Species*. Vol 4. Hyderabad: Universities Press; 1996.

8. Srinivasan K. Black pepper and its pungent principle-piperine: a review of diverse physiological effects. Crit Rev Food Sci Nutr. 2007;47(8):735–48.
9. Johri RK, Zutshi U. An Ayurvedic formulation "Trikatu" and its constituents. J Ethnopharmacol. 1992;37(2):85–91.
10. Anonymous. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol 3. New Delhi: Government of India, Ministry of Health and Family Welfare, Dept. of AYUSH; 2001.
11. Davidson A, Diamond B. Autoimmune diseases. N Engl J Med. 2001;345(5):340–50.
12. Ramos PS, Shedlock AM, Langefeld CD. Genetics of autoimmune diseases: insights from population genetics. J Hum Genet. 2015;60(11):657–64.
13. Tan EM, Smolen JS. Historical observations contributing insights on etiopathogenesis of autoimmune diseases. J Autoimmun. 2016;67:1–10.
14. Firestein GS, Budd RC, Gabriel SE, McInnes IB, O'Dell JR. *Kelley and Firestein's Textbook of Rheumatology*. 10th ed. Philadelphia: Elsevier; 2016.
15. Acharya YT. *Charaka Samhita of Agnivesha, with Ayurveda Dipika Commentary of Chakrapanidatta*. Varanasi: Chaukhambha Surbharati; 2017.
16. Patwardhan B, Chorghade M. Ayurveda and natural products drug discovery. Curr Sci. 2004;86(6):789–99.
17. Kumar S, Singhal V, Roshan R, Sharma A, Rembhotkar GW, Ghosh B. Piperine inhibits TNF-alpha induced adhesion of neutrophils to endothelial monolayer through suppression of NF-kappaB and IkappaB kinase activation. Eur J Pharmacol. 2007;575(1–3):177–86.
18. Sunila ES, Kuttan G. Immunomodulatory and antitumor activity of Piper longum Linn. and piperine. J Ethnopharmacol. 2004;90(2–3):339–46.
19. Agarwal R, Diwanay S, Patki P, Patwardhan B. Studies on immunomodulatory activity of Withania somnifera (Ashwagandha) extracts in experimental models of autoimmune disorders. Phytomedicine. 1999;6(6):467–72.