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# Chemo-profiling of aqueous extract of *Nauclea latifolia* using GC-XX

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**Abstract**
The concept of *Pratinidhi Dravya* (substitution of drugs) occupies a vital place in Ayurvedic pharmaceutics, ensuring therapeutic continuity when genuine herbal resources are scarce or unavailable. Rooted in classical texts such as *Bhaishajya Ratnavali* and *Bhavaprakasha Nighantu*, substitution is based on the principle of selecting herbs with comparable *rasa* (taste), *guna* (properties), *virya* (potency), and *karma* (therapeutic actions). Ancient physicians devised systematic substitution methods to address challenges of regional availability, overharvesting, and ecological degradation. Modern pharmacognosy further validates these classical practices through phytochemical, pharmacological, and analytical studies, confirming the therapeutic equivalence of several traditional substitutes. While substitution supports sustainability and accessibility in Ayurvedic practice, it demands scientific justification and regulatory oversight to maintain safety and efficacy. This review explores the historical foundations, classical documentation, pharmacological rationale, and modern perspectives on herbal substitution, emphasizing its role as a bridge between traditional wisdom and contemporary scientific validation in herbal medicine.

**Keywords:** Pratinidhi Dravya, Ayurveda, herbal substitution, pharmacognosy, therapeutic equivalence, sustainable medicine

## Introduction
The concept of *Pratinidhi Dravya*—or substitution of drugs—is a time-honored practice within the Ayurvedic pharmacopeia. The Sanskrit term *Pratinidhi* translates to "representative" or "substitute." According to *Bhaishajya Ratnavali*, when a specific drug prescribed in a formulation is not available, another herb possessing similar *guna* (qualities), *karma* (therapeutic actions), and *rasa* (taste) may be used in its place [1].

**कदाचिद् द्रव्यमेकं वा योगेयत्र न लभ्यते I**
**तत्तद्गुणयुतं द्रव्यं परिवर्त्तेन गृह्यते II**
(B.P.N. 143, Haritakyadi varga)

This verse signifies that substitution should not be random but based on scientific reasoning, ensuring that the therapeutic efficacy of the formulation remains unaffected.
Historically, the concept of substitution arose from the unavailability of certain genuine drugs due to overexploitation, climatic changes, regional restrictions, and trade limitations. During the *Nighantu* period, scarcity of genuine herbs was well-recognized, prompting *Acharyas* to identify suitable alternatives that shared similar therapeutic actions. Ancient texts emphasized *karma* (function) over *rupa* (form), highlighting the practical nature of Ayurvedic pharmaceutics [2].
*Bhavaprakasha Nighantu*, an important medieval text, explicitly mentions the difficulty in obtaining rare species known as *Ashtavarga Dravyas*—a group of eight valuable rejuvenating herbs used in Rasayana formulations.

**राज्ञामप्यष्टवर्गस्तु यतोऽयमतिदुर्भः I**
**तस्मादस्य प्रतिनिर्धि गृण्हीयात्तद्गुणं भिषक् प्प् I**
(B.P.N. 143, Haritakyadi varga)

Even royal physicians found these drugs scarce, necessitating the identification of equivalent substitutes [1]. Hence, substitution was institutionalized as a legitimate practice in Ayurvedic pharmaceutics to ensure therapeutic continuity.

**Classical References and Examples**

The *Bhavaprakasha Nighantu* lists substitutes for each of the *Ashtavarga* herbs, ensuring that pharmacological efficacy was preserved despite unavailability. The following table summarizes classical pairs of genuine and substitute herbs [3].

**Table 1:** Asta Varga and Their Substitute Dravyas

| S. No. | Genuine Drug | Botanical Name | Substitute | Botanical Name |
|---|---|---|---|---|
| 1. | Jivaka, Rishabhaka | *Microstylis musifera, Microstylis wallichii* | Vidarikanda | *Pueraria tuberosa* |
| 2. | Meda, Mahameda | *Polygonatum arifolium* | Shatavari | *Asparagus racemosus* |
| 3. | Kakoli, Ksheer Kakoli | *Lilium polyphyllum, Fritillaria roylei* | Ashwagandha | *Withania somnifera* |
| 4. | Ridhi, Vriddhi | *Habenaria spp.* | Varahikanda | *Dioscorea bulbifera* |

These substitutions were carefully selected based on similarities in their pharmacodynamic actions, particularly their *Balya* (strength-promoting) and *Rasayana* (rejuvenating) effects. Further, *Bhavamishra* also mentions alternatives for other unavailable herbs:

**चित्रकाभावो दन्ती क्षारः शिखिरोजाऽथवा I**
**अभावो धन्वयासस्य प्रक्षेप्या तु दुरालभा प्प् II**
**तगरस्यप्यभावे तु कुष्ठं दध्यात् भिषग्वर I**
**मूर्वाऽभावे ग्राह्या जिङ्गीनीप्रभा बुधैः प्प् II**
(B.P.N. 6/138-139)

Accordingly, *Chitraka* may be substituted with *Danti* or *Apamarga Kshara*, *Dhanvayasa* with *Duralabha*, *Kustha* with *Tagara*, and *Murva* with *Jingini* [4].

**Table 2:** Examples of Classical Substitutes

| Genuine Drug | Botanical Name | Substitute | Botanical Name |
|---|---|---|---|
| Chitraka | *Plumbago zeylanica* | Danti / Apamarga Kshara | *Baliospermum montanum / Achyranthes aspera* |
| Dhanvayasa | *Fagonia cretica* | Duralabha | *Alhagi pseudalhagi* |
| Kustha | *Saussurea lappa* | Tagara | *Valeriana wallichii* |
| Murva | *Marsdenia tenacissima* | Jingini | *Lannea coromandelica* |

Similarly, *Bhaishajya Ratnavali* recommends that *Kustha* may serve as a replacement for *Pushkarmoola*, and *Chavya* or *Gajapippali* can be used in place of *Pippalimoola* when required [5].

**Evolution and Scientific Basis of Substitution**

The system of substitution evolved further during the medieval and modern eras. As new botanical species were identified, physicians such as *Yogaratnakara*, *Gorakshanatha*, and *Bhavamishra* expanded the list of suitable substitutes. This diversification enabled practitioners to choose drugs that were not only pharmacologically similar but also geographically available and cost-effective [1].

In modern pharmacognosy, the scientific validation of substitution involves analyzing phytochemical profiles, pharmacological activities, and therapeutic equivalence. For instance, *Withania somnifera* (Ashwagandha) has been shown to exhibit adaptogenic and anti-inflammatory effects comparable to *Lilium polyphyllum* (Kakoli), validating its traditional substitution [2].

Substitution is now viewed as a scientific adaptation—a means to preserve therapeutic efficacy, ensure sustainability, and promote rational drug use in Ayurveda. Importantly, the emphasis has shifted from morphological similarity to functional and pharmacological equivalence.

**Types of Substitution**

Substitution in Ayurveda can occur at various levels depending on the rationale used—therapeutic similarity, family relation, or chemical composition. The primary categories are described below:

**Using Totally Different Drugs**

**Example:** *Bharangi* (*Clerodendrum indicum*) and *Kantakari* (*Solanum xanthocarpum*).

Both possess *Kaphavatahara* (anti-phlegmatic and anti-vata) properties and exhibit significant antihistaminic action. Their active constituents—verbascoside in *C. indicum* and solasonine, solasurine, and solamargine in *S. xanthocarpum*—have been shown to modulate histamine pathways, making them therapeutically interchangeable in respiratory conditions [4].

**Substitution Within the Same Family**

**Example:** *Datura metel* and *Datura stramonium*.

Both species belong to the Solanaceae family and contain tropane alkaloids such as atropine, scopolamine, and hyoscyamine. These compounds produce bronchodilatory and anticholinergic effects. Hence, *D. metel* can be safely substituted for *D. stramonium* in formulations targeting bronchial asthma or chronic obstructive pulmonary disease [6].

**Using Different Species of the Same Genus**

**Example:** *Tribulus terrestris* and *Pedalium murex* (both known as *Gokshura*).

Although taxonomically distinct, both species show nephroprotective, diuretic, and lithotriptic activities. *T. terrestris* contains diosgenin, rutin, and alkaloids, while *P. murex* possesses ursolic acid, vanillin, and flavonoids. Their pharmacological overlap supports interchangeable therapeutic application in urinary disorders, *Mutraroga* and *Ashmari* (urolithiasis) [6].

**Using Different Parts of the Same Plant**

**Example:** *Sida cordifolia*—its root is traditionally used for *Balya* (strength-promoting) and *Shothahara* (anti-inflammatory) purposes, but research has shown that aerial parts possess similar bioactive constituents like ephedrine, fatty acids, and glycosides. Both parts exhibit antioxidant, hepatoprotective, and cardio-stimulant properties, making the whole plant a viable substitute for the root [6].

**Substitution Based on Similar Therapeutic Actions**

**Example:** *Emblica officinalis* (*Amalaki*) and *Semecarpus anacardium* (*Bhallataka*).

Both herbs function as *Rasayana* (rejuvenators). *Amalaki* demonstrates antioxidant, hepatoprotective, and hypoglycemic properties, while *Bhallataka* exhibits anticancer and cytotoxic effects. Depending on the clinical condition—metabolic disorders or malignancies—either may serve as a functional substitute [6].

**Need and Relevance of Substitution**

The need for substitution arises from multiple interrelated factors:

1. **Non-availability of Genuine Drugs:**
   Overharvesting, ecological degradation, and restricted access to forest areas have made several herbs scarce, such as those of *Ashtavarga*.
2. **Uncertain Botanical Identity:**
   Variations in vernacular nomenclature often cause confusion. For example, the term *Lakshmana* refers to different species like *Aralia quinquefolia* and *Ipomoea sepiaria*, depending on the region [7].
3. **Economic Constraints:**
   High-cost drugs, such as *Kumkuma* (saffron), are often substituted by *Kusumbha* (*Carthamus tinctorius*) to reduce production expenses.
4. **Geographical Distribution:**
   The herb *Rasna* is identified as *Pluchea lanceolata* in northern India, while southern regions use *Alpinia galanga* as a substitute [7].
5. **Toxicity and Contraindications:**
   Some herbs, like *Visha* (Aconitum ferox), though potent in treating certain disorders, are avoided in pregnancy due to abortifacient effects. Safer alternatives such as *Ashoka* or *Laksha* are preferred.
6. **Conservation and Sustainability:**
   The modern herbal industry emphasizes sustainable harvesting. Substitution allows for reduced pressure on endangered species while maintaining therapeutic value.

Thus, substitution not only addresses scarcity but also supports biodiversity conservation and cost-effective drug production.

**Pharmacological and Phytochemical Correlations**

Modern analytical tools such as chromatography, spectroscopy, and pharmacodynamic profiling have validated many traditional substitutions. For instance:

- *Withania somnifera* shares adaptogenic and anti-stress properties with *Polygonatum cirrhifolium*, its classical counterpart in *Ashtavarga*.
- *Pueraria tuberosa* exhibits anabolic and spermatogenic activity comparable to *Microstylis wallichii* [2].
- *Dioscorea bulbifera* mimics *Habenaria intermedia* in rejuvenative properties due to overlapping steroidal saponin profiles [7].

These scientific validations affirm that Ayurvedic substitution principles were empirically accurate and therapeutically sound.

**Limitations of Substitution**

Despite its significance, substitution has well-recognized limitations. The *Bhaishajya Ratnavali* cautions:

**योगे यदप्रधानं स्यात्तस्य प्रतिनिधिर्मतः I**
**यत्तु प्रधानं तस्यापि सदृशं नैव गृह्यते II**
(B.R 4/100)

This verse implies that substitutes should only replace secondary or supportive ingredients, not the primary drug responsible for the formulation's core action [7]. Additionally, no substitute can fully replicate the original drug's comprehensive pharmacological profile, as subtle variations in *rasa*, *virya* (potency), and *vipaka* (post-digestive effect) influence therapeutic outcomes.

Therefore, substitution should be applied judiciously, supported by both classical rationale and scientific validation.

**Modern Perspectives on Herbal Substitution**

In the 21st century, the practice of substitution aligns with global efforts toward standardization, quality assurance, and sustainability in herbal medicine. The Government of India, through bodies like the Central Council for Research in Ayurvedic Sciences (CCRAS) and Pharmacopoeial Laboratory for Indian Medicine (PLIM), has initiated guidelines to authenticate substitutes through morphological, microscopic, and chromatographic evaluations [8].

Pharmacognostic parameters such as macroscopic features, fluorescence analysis, and thin-layer chromatography (TLC) are employed to ensure that substituted drugs meet official standards. Moreover, Good Manufacturing Practices (GMP) regulations mandate that substitutions be justified through documented equivalence in safety and efficacy.

**Conclusion**

Substitution (*Pratinidhi Dravya*) embodies Ayurveda's scientific pragmatism and adaptability. Rooted in the principles of *guna*, *karma*, and *dravyata*, it ensures continuity of therapeutic practice even amidst ecological and logistical challenges. Ancient scholars pioneered this concept to counter scarcity, while modern science reinforces it with analytical validation. When practiced responsibly—guided by pharmacological equivalence, regulatory compliance, and ecological ethics—substitution not only safeguards traditional knowledge but also promotes sustainable healthcare solutions. Thus, the *Pratinidhi Dravya* system continues to serve as a bridge between classical Ayurvedic wisdom and modern pharmacological innovation.

**References**

1. Sharma PV. Dravyaguna Vigyana. Vol II. Varanasi: Chaukhambha Bharati Academy; 2017.

2. Baragi UC, Ganer DS. Substitution of herbs in Ayurveda: a scientific approach. J Ayurveda Integr Med. 2022;13(3):100-10.
3. Bhavamishra. Bhavaprakasha Nighantu (Haritakyadi Varga). Varanasi: Chaukhambha Surbharati Prakashan; 2015.
4. Kirtikar KR, Basu BD. Indian Medicinal Plants. Vols I-IV. Dehradun: International Book Distributors; 2018.
5. Nadkarni KM. Indian Materia Medica. Vol II. Mumbai: Bombay Popular Prakashan; 2016.
6. Pandey G, editor. Bhaishajya Ratnavali of Govind Das Sen. Varanasi: Chaukhambha Bharati Academy; 2019.
7. Sharma A, Singh R. Critical review on herbal substitution in Ayurvedic pharmaceutics. AYU. 2021;42(4):240-8.
8. Sane RT. Standardization and Quality Control of Herbal Drugs. Hyderabad: PharmaMed Press; 2014.
9. Tiwari N, Shukla V. Scientific rationale of herbal substitution in Ayurveda. J Drug Res Ayurvedic Sci. 2020;5(1):25-34.