

A review on Concept of Pratinidhi Dravya in Rasa Shastra

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ABSTRACT

Substitution of herbal drugs is a major problem in the herbal drug industry and it has caused major treat in the research on commercial natural products. Many Pratinidhi Dravyas (Substitute Drugs) are mentioned in Ayurvedic texts. This article advocates similar action regarding Pratinidhi Dravyas without any adverse effect. In the current situation endangered plant list is increasing gradually so that implementation of Pratinidhi Dravyas may be the right option. The Pharmacopoeial or extra Pharmacopoeial drug should be assessed on the basic fundamentals of Dravyaguna like Rasa, Guna, Virya, Vipaka etc. This review throws light on the concept of Substitution given by our preceptors & analyze these with the relevance and impact in treatment aspects and the present day trend of substitution. In Ayurveda pharmacology and pharmaceuticals, use of substitute drugs is mentioned, in case of non-availability of the drugs. To get the desired property and therapeutic action the substitute drugs are added and the formulation is designed. The uses of substitutes selected are such that they give the desired benefit without compromising the efficacy of the end product.

KEYWORDS : Pratinidhi Dravyas, Rasa, Guna, Virya, Vipaka, Substitute drugs.

I. INTRODUCTION

Rasashastra is the science of Indian alchemy where drugs of mineral, metallic, marine origin drugs, gemstones, etc. are used for the purpose of therapeutics. These drugs are subjected to purification, incineration, etc. before employing in various formulations. Some drugs are very expensive, may not be available in few places or may not be affordable. To overcome these drawbacks substitute drugs have been mentioned in Ayurveda pharmaceuticals and this holds good even for rasadravya in Rasashastra as well. Thus, the concept of pratinidhi dravya is not restricted to plant drugs alone but one can come across the practice of it in rasashastra too.

Demand of medicinal plants is ever increasing but fails to meet supply with authentic drug giving rise to irrational substitution affecting efficacy and safety of herbal medicines. Adulteration and substitution of herbal drugs is the burning problem faced by herbal industry at present. The degradation and destruction of habitats leading to deforestation and extinction of many species is a major cause of the loss of medicinal plant resources. Several plants in use today are substitutes for genuine ones. Such substitution is necessitated by incorrect identification of many drugs and the unavailability or dire shortage of the genuine medicinal herbs.

Most of the times substitutes are deliberately selected and rationally used to bring desired effect. The principle to select substitute drugs is based on similarity of properties (Rasa, Guna, Virya and Vipaka) but most important factor is therapeutic action.¹ In terms of pharmacy, substitute is generally used when original drugs are not available or may be available in small quantity. In ancient time, Vaidya had to collect the drug by own. The drugs which were less available in local area were replaced by other drugs known as Substitute drugs (Pratinidhi Dravyas). Ayurvedic classics like Charaka and Sushruta have not mentioned direct reference for Pratinidhi Dravyas, whereas Acharya Vagbhata have given references for preparation of Compound formulations. Pratinidhi Dravya had been dealt in detail in the Mishrakavargaprakarana of Bhavaprakashanighantu² and Abhavavarga of Yogaratanakara³ and Bhaishajya Ratnavali has also compiled valuable information regarding Pratinidhi Dravyas.⁴ There is need to analyse these concepts with the present trend of substitution so that we can adopt the drug in preparation of formulation and treatment.

CONCEPT OF PRATINIDHI DRAVYA “Pratinidheeyate Sadrusheekriyateiti”

According to Abhavavarga of Yogaratanakara Pratinidhi Dravya or Substitutes

means the Substance having Similar Pharmacological activities as like that of Genuine drug but may not have similar appearance.

QUALITIES OF SUBSTITUTES¹

- Substitutes should have similar pharmacological actions like that of genuine drugs.
- Substitutes should be available easily and in large quantity.
- Substitutes should be easy to prepare the required formulations.

CRITERIA FOR SUBSTITUTION⁵

1. If any drug is unavailable, another drug with similar properties may be substituted and any drug which seems to be appropriate can be excluded.
2. A drug to be considered as substitute should fulfill following criteria;
 - Exhibit Similarity in Rasapanchaka
 - Exhibit Similar therapeutic effect
3. In a formulation, the Pradhana Dravya should never be substituted.

Eg: Nisha and Katakain Nishakatakaadi Kashaya should not be substituted. Trivritin Avipattichoornam can never be replaced with another drug. Haritaki and Agastya haritaki should never be substituted.

NEED FOR SUBSTITUTION^{6,7}

1) NON AVAILABILITY OF THE DRUG

In case of non availability of drugs; Eg: Substitution of Ashtavarga Dravyas.

Ashtavarga Plants having their natural habitats in Himalayas is the important ingredient of various formulations such as Chyavanaprasha, Jeevaniyagana Kashaya etc. The major reason being unavailability and identity of Astavarga includes; Difficulty in finding natural habitat, Lack of knowledge about specific ecological conditions, Difficulty in access and scarce availability, Deforestation, Lack of Developmental Programmes, Environmental changes, Geographical & Climatic changes etc. So in order to meet this Conservation and Sustainable utilization strategies should be followed. These species which are categorized as Endangered for the Globe deserves to be "Critically Endangered for the Globe".⁸

2) UNCERTAIN IDENTITY OF THE DRUG

Due to uncertainty different species such as **Aralia quinquefolia, Ipomea sepiaria** etc. are considered for the herb Lakshmana.

3) COST OF THE DRUG

Kumkuma (Crocus sativus) being costly herb is substituted by Kusumbha (Carthamus tinctorius). Expensive Drugs can be substituted with cheaper drugs having the same qualities. The main requirement for an appropriate Pratinidhi Dravya is to possess similar guna and karma to that of original drugs.

4) SHELF LIFE OF THE DRUG

Dravya like Ativisha (Aconitum heterophyllum), which gets easily infected by cankers, thus may be substituted by drug like Musta (Cyperus rotundus Linn).

5) PREPARATION FORM OF THE DRUG

Substitution can be done in the form of preparation in case of unavailable prepared material and which can be used in emergency conditions. Eg: In case of unavailability of Guduchi Sattva (aqueous extract of *Tinospora cordifolia*) Guduchi Swarasa (juice) can be used.

6) SEASONAL AVAILABILITY OF THE DRUG

Some drugs are available in specific season, so other drugs having same action can be used. For example: *Trianthema portulacastrum* can be used in seasonal absences of *Boerhavia diffusa*.

TYPES OF SUBSTITUTION^{7,9}

1) Substitution with totally different drug

Substitution with totally different drug which exhibit Similarity in Rasapanchaka & Therapeutic Effect. Here we can consider Bharangi (Clerodendrum serratum) and Kantakari. Bharangi has Tikta rasa and Laghu, Rukshaguna and has Kapha and Vatahara property. While Kantakari (Solanum xanthocarpum) has katuvipaka and ushnavirya. It has Glycosides – Verbascoside and Solasonin, solamargin, solasurine respectively. Both C. indicum and S. xanthocarpum have shown Antihistaminic activity. Both C. indicum and S. xanthocarpum are commonly used in respiratory disorders which are commonly associated with release of Histamines and other Autacoids.

2) Substitution of two different Species

Here we can consider two types of Gokshura. - *Tribulus terrestris* (Zygophyllaceae) and

Pedaliium murex (Pedaliaceae) *T.terrestris* has the chemical constituents like Chlorogenin, Diosgenin, Rutin, Rhamnase, and Alkaloid. While *P.murex* has Sitosterol, Ursolic acid, Vanilin, Flavonoids and Alkaloids. Both the species are proved for Nephroprotective, Lithotriptic, Diuretic and Hepatoprotective activities. If we analyse the clinical conditions where Gokshurais indicated i.e, Mutrakruchra, Mutraghata, Ashmari, Prameha etc, both *T. terrestris* and *P.murex* appear to be appropriate substitute.

3) Substitution of Species belonging to same family

The *Datura metal* and *Daturastramonium* can be considered here. Chemical Constituents are Alkaloids, Scopalamine, Atropine, Hyocyanine, Lyoscine. The Alkaloids are proved as Bronchodilatory and inhibitor of secretion of mucous membrane. The alcoholic extract of *D. metal* showed Antihelmentic activity. The Alkaloid

present in both the species are well proven Bronchodilators and also they inhibit the secretion of mucous membrane of the respiratory tract. Thus both *D. metal* and *D. stramonium* are beneficial for Respiratory tract disorders, while *D. metal* would be a better choice for Krimiharaas it is a proven Antihelmentic.

4) Substitution of Different parts of the plant

The root of *Sidacordifolia* and the whole plant of *Sidacordifolia* can be considered. Root has the chemical constituents such as Sitalindoside, Acylsteryglycoside. While the whole plant has Alkaloid, Hydrocarbons, Fatty acids, Ephedrine. Various extracts of the whole plant showed Anti-bacterial, Anti-oxidant, Hypoglycemic, Hepatoprotective and Cardio tonic activities. Though it is the root which is mentioned as officinal part of *S. cordifolia* in the classics as *Balya*, *Brumhana*, *Shotahara* etc, modern researches prove that even the aerial parts are also equally effective.

LIST OF PRATINIDHI DRAVYAS^{7,10}

DRUG	BOTANICAL NAMES	SUBSTITUTE	BOTANICAL NAMES
Chitraka	<i>Plumbagozeylanica</i>	Danti	<i>Baliospermum montanum</i>
Shikhari (Apamarga)	<i>Achyranthesaspera</i>		
Dhanvayasa	<i>Alhagicamerlorum</i>	Duralabha	<i>Fagonia Arabica</i>
Tagara	<i>Valerianawallichii</i>	Kushta	<i>Saussurealappa</i>
Murva	<i>Marsdeniatenacissima</i>	Jhingini	<i>Odina woodier</i>
Ahimsra	<i>Capparissepia</i>	Mankanda	<i>Alocasiaindica</i>
Lakshmana	<i>Ipomoea sepiara</i>	<i>Neelakanthashikha</i> (Mayurshikha)	<i>Adiantumcaudatum</i> <i>Celiosiaristata</i>
Pushkaramoola	<i>Inularacemosa</i>	Kushta	<i>Saussurealappa</i>
Utpala	<i>Nympheapubescens</i> <i>Nympheastellata</i>	Pankaja	<i>Nelumbospeciosum</i> <i>Nelumbonucifera</i>
Neelotpala	<i>Nympheastellata</i> <i>Nympheanouchali</i>	Kumud	<i>Nymphaea alba</i> <i>N.rubra</i> <i>N.edulis</i>
Ativisha	<i>Aconitum heterophyllum</i>	Musta	<i>Cyperusrotundus</i>
Shiva (Haritaki)	<i>Terminaliachebula</i>	Shiva (Amalaki)	<i>Emblicaofficinalis</i>
Nagapushpa (Nagakesara)	<i>Mesuaferrea</i>	Padmakesara	<i>Nelumbiumspeciosum</i>
Meda &	<i>Polygonatumcirrhifolium</i>	Vari (Shatavari)	<i>Asparagus racemosus</i>
Mahameda	<i>Polygonatumverticillatum</i>		
Jeevaka &	<i>Microstyliswallichii</i>	Vidarikanda	<i>Pueraria tuberosa</i> <i>Ipomoea digitata</i>
Rishabhaka	<i>Malaxismuscifera</i>		
Kakoli &	<i>Fritillariaroylei</i>	Aswagandha	<i>Withaniasomnifera</i>
Ksheerakakoli	<i>Liliumpolyphyllum</i>		
Riddhi	<i>Habenariaedgeworthii</i>	Varahikanda	<i>Dioscoreabulbifera</i>
Vriddhi	<i>Habenarialatilabris</i>		

II. DISCUSSION

Substitution of the herbs is the need of the hour with many medicinal plants becoming red listed. The most essential criteria for substitution are the Pharmacological activity rather than Morphology or Phytoconstituents. Substitution of herbs achieved many goals, though basic idea was to provide similar therapeutic effect as that of original drug. It provided a greater scope for the physician to utilize herbs that are easily available, cost effective and most appropriate for the clinical condition. Substitution is generally done when original materials are not available or if available in insufficient quantity. Substitute should have proven efficacy as near as original drug. To substitute a drug, Availability of the drug and Validation of Substitution are considered as important.

Ayurvedic concept based substitution differ the views of current botanical and pharmacy concept. The drugs should be assessed on the basis of their Guna-karma and further they should be evaluated. Regional substitution is the need of hour on the basis of synonym, homonym and its local usage. On the basis of Ayurvedic tools and current scientific base, assessment of proper Pratinidhi Dravyas may be possible. Same action like that of main drug is most important, to find out Substitute drug and Systematic researches are needed before finding the Pratinidhi dravya. The concept of Abhava dravya may not be applicable for single drug therapy, it can be applied in compound drug formulations where substitute drug can be used in scarcity of genuine drug. Substitutes should ensure availability, similar pharmacological action as the total effect of the yoga (formulation) should not be changed.

As the main requirement for an appropriate Pratinidhi Dravya is to possess similar guna that of original drug, the Abhava Pratinidhi Dravyas were compared on the basis of their Rasapanchaka and Rogagnata. Pratinidhi drugs serve to overcome the problem of unavailable drugs due to scarcity, rare or difficult to procure. This in a way helps to produce good quality herbal products and lend a support in conservation and sustainability of medicinal plants. With proper revalidation of existing documented examples there is always a scope to find out new substitutes for Abhava dravyas of today's time.

III. CONCLUSION

Substitution of the herbs is the need of the hour. The most essential criteria for substitution are

the pharmacological activity rather than morphology or phytoconstituents. Substitutes are of greater importance and efforts should be made for their systematic identification and evaluation by pharmacognostical and phytochemical studies. In the current scenario endangered plant list is increasing gradually, thus implementation of Pratinidhi dravya may be the right option.

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