



## Review Article

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### A REVIEW ON RELEVANCE AND IMPACT OF PRATINIDHI DRAVYAS IN CHIKITSA

Ahana A.K <sup>1\*</sup>, Prakash L Hegde <sup>2</sup>

<sup>1</sup>PG Scholar, Department of Dravya Guna, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India

<sup>2</sup>Professor, Department of Dravya Guna, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India

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#### \*Corresponding author

E-mail: krishna.a.nambiar@gmail.com

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#### ABSTRACT

Substitution of herbal drugs is a burning 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 review advocates similar action regarding *Pratinidhi Dravyas* (Substitute Drugs) 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 article throws light on the concept of Substitution given by our preceptors and analyze these with the relevance and impact in treatment aspects and the present day trend of substitution.

**Keywords:** *Pratinidhi Dravyas*, Rasa, Guna, Virya, Vipaka, Substitute drugs.

#### INTRODUCTION

India is facing an increasingly distributing trend of depletion of its natural resources, medicinal plants are one among them. It is need of hour to do intensive research to find alternatives for these resources. Plant resources especially medicinal plants are vanishing at level of threat. Most of time not enough attention is being given to find alternate sources or substitutes for many of these plants. India is blessed with its richest floras in the world. Even though the medicinal species have disappeared or threatened or extincted from our country, there are still hundreds of species which have highly medicinal properties that can be used as substitutes to those getting extinct.

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 principles to select substitute drugs is based on similarity of properties (*Rasa, Guna, Virya* and *Vipaka*) but most important factor is therapeutic action.<sup>1</sup> 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 Dravyas* had been dealt in

detail in the *Mishraka varga prakarana* of *Bhavaprakasha nighantu*<sup>2</sup> and *Abhava varga* of *Yogaratanakara*<sup>3</sup> and *Bhaishajya Ratnavali* has also compiled valuable information regarding *Pratinidhi Dravyas*.<sup>4</sup> 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 Sadrusheekriyate iti”*

According to *Abhava varga* 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 SUBSTITUTES<sup>1</sup>

- 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 SUBSTITUTION<sup>5</sup>

1. If any drug is unavailable, another drug with similar properties may be substituted and any drug which seems to be in 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 *Kataka* in *Nishakatakaadi Kashaya* should not be substituted. *Trivrit* in *Avipatti choornam* can never be replaced with another drug. *Haritaki* in *Agastya haritaki* should never be substituted.

## NEED FOR SUBSTITUTION<sup>6,7</sup>

### 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*, *Jeevaniya gana 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".<sup>8</sup>

### UNCERTAIN IDENTITY OF THE DRUG

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

### COST OF THE DRUG

*Kumkuma (Crocus sativus)* being costly herb is substituted by *Kusumbha (Carthamus tinctorus)*. 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.

### SHELF LIFE OF THE DRUG

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

### 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.

### 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<sup>7,9</sup>

### 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, Ruksha guna* and has *Kapha* and *Vatahara* property. While *Kantakari (Solanum xanthocarpam)* has *katu vipaka* and *ushna virya*. It has Glycosides –*Verbascoside* and *Solasoninie, solamargin, solasurine* respectively. Both *C. indicum* and *S. xanthocarpam* have shown Anti-histaminic activity. Both *C. indicum* and *S. xanthocarpam* are commonly used in respiratory disorders which are commonly associated with release of Histamines and other Autacoids.

### 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, Rhamnose, 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 *Gokshura* is indicated i.e, *Mutrakruchra, Mutraghata, Ashmari, Prameha* etc, both *T. terrestris* and *P.murex* appear to be appropriate substitute.

### Substitution of Species belonging to same family

The *Datura metal* and *Datura stramonium* 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 *Krimihara* as it is a proven Antihelmentic.

### Substitution of Different parts of the plant

The root of *Sida cordifolia* and the whole plant of *Sida cordifolia* can be considered. Root has the chemical constituents such as Sitoinoside, 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 proves that even the aerial parts are also equally effective.

LIST OF PRATINIDHI DRAVYAS<sup>7,10</sup>

DRUG	BOTANICAL NAMES	SUBSTITUTE	BOTANICAL NAMES
Chitraka	<i>Plumbago zeylanica</i>	Danti	<i>Baliospermum montanum</i>
		Shikhari (Apamarga)	<i>Achyranthes aspera</i>
Dhanvayasa	<i>Alhagi camerlorum</i>	Duralabha	<i>Fagonia Arabica</i>
Tagara	<i>Valeriana wallichii</i>	Kushta	<i>Saussurea lappa</i>
Murva	<i>Marsdenia tenacissima</i>	Jhingini	<i>Odina woodier</i>
Ahimsra	<i>Capparis sepiaria</i>	Mankanda	<i>Alocasia indica</i>
Lakshmana	<i>Ipomoea sepiara</i>	Neelakanthashikha (Mayurshikha)	<i>Adiantum caudatum</i> <i>Celiosia aristata</i>
Pushkaramoola	<i>Inula racemosa</i>	Kushta	<i>Saussurea lappa</i>
Utpala	<i>Nymphaea pubescens</i> <i>Nymphaea stellata</i>	Pankaja	<i>Nelumbo speciosum</i> <i>Nelumbo nucifera</i>
Neelotpala	<i>Nymphaea stellata</i> <i>Nymphaea nouchali</i>	Kumud	<i>Nymphaea alba</i> <i>N.rubra</i> <i>N.edulis</i>
Ativisha	<i>Aconitum heterophyllum</i>	Musta	<i>Cyperus rotundus</i>
Shiva (Haritaki)	<i>Terminalia chebula</i>	Shiva (Amalaki)	<i>Emblica officinalis</i>
Nagapushpa (Nagakesara)	<i>Mesua ferrea</i>	Padmakesara	<i>Nelumbium speciosum</i>
Meda &	<i>Polygonatum cirrhifolium</i>	Vari	<i>Asparagus racemosus</i>
Mahameda	<i>Polygonatum verticillatum</i>	(Shatavari)	
Jeevaka &	<i>Microstylis wallichii</i>	Vidarikanda	<i>Pueraria tuberosa</i> <i>Ipomoea digitata</i>
Rishabhaka	<i>Malaxis muscifera</i>	Aswagandha	<i>Withania somnifera</i>
Kakoli &	<i>Fritillaria roylei</i>		
Ksheerakakoli	<i>Lilium polyphyllum</i>		
Riddhi	<i>Habenariaedge worthi</i>	Varahikanda	<i>Dioscorea bulbifera</i>
Vriddhi	<i>Habenaria latilabris</i>		

## RELEVANCE &amp; IMPACT IN CHIKITSA

Most important criteria of *Pratinidhi dravya* is similar in indications and their therapeutic activities. To select a proper substitute, one has to not only seek overall similarities of *Rasa panchaka* but also test its therapeutic efficacy clinically. Acc. to *Ayurveda Sarasangraha*, the formulations contain one main drug and others supportive drugs. The formulation cannot be formed without the main drug hence, main drug cannot be replaced by any other drug. So list of *Abhava dravya* is given for supportive drugs in the formulation.

Balachaturbadra Choorna<sup>11</sup>

*Balachaturbadra choorna* is used in the treatment of pediatric complaints like fever, diarrhoea, cough, cold, asthma, nausea and vomiting.

## Balachaturbhadr Churna Ingredients: 10 g of each of;

- Ghana (Musta) – *Cyperus rotundus*
- Krsna (Pippali) – *Piper longum*
- Aruna (Ativisa) – *Aconitum heterophyllum*
- Srngi (Karkatasrngi) – *Pistacia integerrima*
- Ativisha – Red listed Medicinal plant.

As both *Musta* and *Ativisha* are present in the formulation, *Musta* can be Substituted double the quantity. The substitute will not exhibit desired effect of genuine drug.

Rasnaerandadi Kashayam<sup>12</sup>

The substitution of *Musta* (*Pratinidhi dravya*) for *Ativisha* (*Abhava dravya*) is most likely based on *Dravyaguna*. Probably *Ayurvedic* seers looked at the similarities at *Rasapanchaka* and *karma* levels of *Abhava-Pratinidhi Dravyas*, rather than their morphological similarity.

Dashamoola<sup>13</sup>

*Dashamoola* is the unique combination of 10 Medicinal roots which is widely used as *Shothaghna* for various systemic disorders. It is the major Ingredient in more than 200 formulations like *Dashamoolarishtam*, *Dashamoolakatuthrayam kashyam*, *Dashamoola rasayanam*, *Chyavanaprasham* etc. Procurement of authentic *Dashamoola* in the market is a herculean task, so the parts of these plants may be useful. Substituting with alternative

parts of the same plant when the intended parts can not be practically harvested. For example; instead flowers of *Bilva* (*Aegle marmelos*), use of unripe fruits has been suggested in *Bhaishajya Ratnavali*. Similarly use of *Salaparni* (*Desmodium gangeticum*) in absence of *Prshniparni* (*Uraria picta*), use of both root and whole plant for *Prshniparni*, whole plant of *Brhati*, *Kantakari*, and *Goksura* has been mentioned in *Nigantu Adarsha*. A comprehensive research needed to focus on identifying substitute species and also substitute parts that may be more available.

## 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 *gunas* to that of original drug, the *Abhava Pratinidhi Dravyas* were compared on the basis of their *Rasapanchaka* and *Rogaghnata*. *Pratinidhi drugs* serves 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.

## 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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