



Review Article

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PRACTICES OF PRATINIDHI DRAVYA (SUBSTITUTE DRUGS) IN AYURVEDA: A REVIEW

Haridev Prasad Yadav ^{*1}, Rashmi Shrivastav ², Bibhakar Thakur ³

¹MD Scholar, Department of Dravya Guna, R.G.G.P.G. Ayurvedic College & Hospital, Paprola, H.P., India

²Sr. Lecturer, Department of Dravya Guna, R.G.G.P.G. Ayurvedic College & Hospital, Paprola, H.P., India

³MD Scholar, Department of Rasa Shastra & Bhaishajya Kaplana, R.G.G.P.G. Ayurvedic College & Hospital, Paprola, H.P., India

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*Corresponding author

E-mail: haridevyadav22@gmail.com

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ABSTRACT

In herbal drug industry, the concept of substitution has long been practiced. Not only in the contemporary period but also in Vedic texts the original drug is at times replaced by some inferior herb. But, the major problem was lack of proper authentication, standardization and processing of substitute drugs in the manufacturing process of Ayurvedic proprietary medicine. Even now, it's widely seen that people consider the substitution of herbs owing to several purposes. The most popular one is for the production of Ayurvedic proprietary medicine in which unavailability of the intended herb leads them opt for substitutes. This is because with the growing trend of deforestation many herbs are at the brink of extinction and that has triggered herbalists to look for substitutes. . In manufacturing proprietary Ayurvedic medicine while considering substitution of a drug, the main ingredient should not be interfered. Similarly, some other reasons to look for substitute could be economical consideration and geographical inaccessibility This review article might be a reference in selecting appropriate substitutes wherever essential. It embodies the practice of substitutes all the way from Vedic period till the 21st century.

Keywords: Ayurveda, Substitution, Proprietary medicine, Deforestation

INTRODUCTION

Ayurvedic medicines have long been considered as Indian system of medicine that are largely derived from herbal sources from Indian subcontinent. Majority of such medicines have either been extinct or unavailable due to various reasons. Moreover, for the manufacture of a number of ayurvedic classical and patent drugs, it's mandatory to use the original herb or its close resemblance. Hence, it appears that study of Pratinidhi dravya (Substitute raw material) is quite necessary to make sure the proper documentation of ancient literary texts can be made. As per the Pratinidhi dravya (Substitute raw material) we understand the partial or whole replacement of the original drug with some other similar looking substance which is either free or inferior in chemical and therapeutically properties. Based on the Vedic and Ayurvedic text it is clear that Substitute Dravya (Drug) must satisfy two criteria- One, that the main ingredient of the Ayurvedic medicine should not be interfered. Next, it's pertinent to incorporate the relevant original or substitute drug to meet the quality of the product, e.g. *Cyperus rotundus* can be taken in place of *Aconitum heterophyllum*¹. But, in case of main ingredients of preparation the above law does not hold good which is the minor constituents can be replaced by others e.g. we cannot take another herb in substitute of the main ingredient Amla (*Emblica officinalis*) of Chyawanprash².

It is taken during preparation of formulation instead of original raw material when it is unavailable. Substitute is preferred to the similar pharmacodynamic properties of original drugs like Ras (Taste), Guna (Qualities), Virya (Potency of the herb), Vipaka (Special effect of the herb) or Karma (Action of the herb). It is the addition of an entirely different substance, sometimes morphologically similar or dissimilar but most of the time they are having similar pharmacodynamics properties.

In Vaidika kala (Vedic Period), Haritakusha (*Eragrostis cynosuroides* Syn *Desmostachya bipinnata*) or Arunadurwa or Arunapushpa or falguna is used instead of Som (*Ephedra Gerardiana*). Of the herbs used as substitutes of Som, the adequate evidence of Arunadurwa, Arunapushpa, falguna is not available.

Substitution of Ayurvedic drugs in classical texts

For the use of pratinidhi dravya (Substitute Dravya) we will be centered in ancient classical texts of Ayurveda where a number of references are available in which many dravyas (herbs) have been considered as pratinidhi dravya (Substitute herbs). Besides, we will be incorporating some practical aspects of the use of substitute drugs in contemporary period. Then, a comparison shall be made to analyze the mutual aspect of drugs mentioned in ancient ayurvedic texts and those used by various institutions currently.

Substitution of drug in Vedic Text: The main purpose of Soma was for havan (offering Practice) in Yagya (Hindu ritual). However, Kusha was substituted to the plant Soma in Vedic period. Some other herbs that fulfilled task of substitution of Soma were Arunapushpa, Falgun, Shyenhrit, Adaar, Arundurva and Harit Kush (*Desmostachya bipinnata*)³.

Substitutions mentioned in Samhita (Classical), books of Ayurveda

According to Charak it is clearly mentioned that in case if the original drug is not available or by some means there is chance of social unacceptability or fear in using the drug, then we can choose drug similar in nature⁴.

Substitutions of drugs in Nighantu (Ayurvedic Literature)

The following herbs are enlisted as substitute ones in Bhavprakash⁵.

Table 1: Herbs used as substitutes acc. to Bhavaprakasha

Meda(<i>Polygonatum verticilatum</i>)	Shatavari (<i>Asparagus racemosus</i>)
Mahameda(<i>Polygonatum cirrhifolium</i>)	Vidarikand (<i>Puereria tuberosa</i>)
Jivak(<i>Microstylis wallichii</i>)	Ashwagandha(<i>Withania somnifera</i>)
Rishbhak(<i>Melaxis acuminata</i>)	Varahikand(<i>Dioscorea bulbifera</i>)
Kakoli(<i>Roscoeia procera</i>)	
Kshirkakoli(<i>Paris polyphylla</i>)	
Ridhi(<i>Hobermaria intermedia</i>)	
Vridhhi(<i>Hobermaria acuminata</i>)	

In addition to this, some of the following herbs are found to have their substitutes in Bhaisajyaratnavali (Ayurvedic material medica 2)⁶.

Table 2: Herbs used as substitute according to Bhaisajya Ratnavali

Original	Latin Name	Substitute	Latin Name
Pushkarmool	<i>Inula racemosa</i>	Kutha	<i>Saussura lapa</i>
Amlavetas	<i>Hippophae salcifolia</i>	Chukra	<i>Remax vesicarius</i>
Kumkum	<i>Crocus sativus (Inula)</i>	Kusumbha	<i>Schlechera oleosa</i>
Kasturi	<i>Moschus moschiferus</i>	Gandhashati	<i>Hedychium spicatum</i>
Kasturi	<i>Moschus moschiferus</i>	Nagarmotha	<i>Cyperus rotundus</i>
Kasturi	<i>Moschus moschiferus</i>	Kankol	<i>Piper cubeba</i>
Atis	<i>Aconitum hetrophylum</i>	Nagarmotha	<i>Cyperus rotundus</i>
Prishniparni	<i>Uraria picta</i>	Shalparni	<i>Desmodium gangeticum</i>
Swetachandan	<i>Santalum album</i>	Raktachandan	<i>Pterocarpus santalinus</i>
Swetachandan	<i>Santalum album</i>	Karpur	<i>Cinnzomom chomphora</i>
Mulethi	<i>Glycyrrhiza glabra</i>	Chavya	<i>Piper retrofractum</i>
Mulethi	<i>Glycyrrhiza glabra</i>	Dhatakipushpa	<i>Woodfordia fruticosa</i>
Chitrak	<i>Plumbago zeylanica</i>	Danti	<i>Biliospermum monatum</i>
Rasna	<i>Pluchea lanceolata</i>	Bandak	<i>Dendrophthoe falcata</i>
Nagkeshar	<i>Mesua ferrea</i>	Kamalkeshar	<i>Nelumbo nucifera</i>
Javitri	<i>Myristica fragrans</i>	Lavang	<i>Syzygium aromaticum</i>
Draksha	<i>Vitis vinifera</i>	Gambhari	<i>Gmelina arborea</i>
Tagarmool	<i>Velerina jatamansi</i>	Singhalimool	<i>Root of piper longum</i>
Ajmoda	<i>Carum roxburghianum</i>	Ajwain	<i>Trachyspermum ammi</i>
Murva	<i>Marsdenia tenacissima</i>	Manjistha	<i>Rubia cordifolia</i>
Talamkhana	<i>Asteracantha longifolia</i>	Gokshur	<i>Tribulus terrestris</i>
Jira	<i>Cuminum cymimum</i>	Dhaniya	<i>Coriandrum sativum</i>
Dhaniya	<i>Coriandrum sativum</i>	Saunf	<i>Foenieulum vulgare</i>

According to PV Sharma, one of the renowned scholars in Ayurveda has mentioned the following substitutes in his text Dravyaguna Vigyan Vol 5⁷.

Table 3: Substitute herbs in Dravya Guna (Ayurveda Materia Medica)

Pashanbheda	<i>Berginia ligulata</i>	Gorakshaganja	<i>Aerva lanata</i>
Sithauneyaka	<i>Taxus baccata</i>	Talisha	<i>Abies webbiana</i>
Kutaja	<i>Holarrhena antidysentrica</i>	Strikutaja	<i>Wrightia tinctoria</i>
Priyangu	<i>Callicarpa macrophylla</i>	Used in place of Priyangu	<i>Aglaiia roxburghii</i>
Amlavetas	<i>Hippophae salcifolia</i>	Revandchini	<i>Rheum emodi</i>
Mulethi	<i>Glycyrrhiza glabra</i>	Gunja	<i>Abrus precatorius</i>
Kutaki	<i>Picrorrhiza kurroa</i>	Trayamana	<i>Gentiana kurroa</i>
Ativisha	<i>Aconitum heterophyllum</i>	Prativisha	<i>Aconitum palmatum</i>
Rasna	<i>Pluchea lanceolata</i>	Mahabharivacha	<i>Alpinia galanga</i>
Arjuna	<i>Terminalia arjuna</i>	Kakubha	<i>Terminalia myriocarpa</i>
Nagkeshara	<i>Mesua ferrea</i>	Surpunaga(Rakta Nagkeshar)	<i>Mammea longifolia</i>

However, in practice it is seen that the following drugs are being used as substitutes of the original drugs given below:

Table 4: Substitute herbs in practice

Chirayita	<i>Swertia chirayita</i>	Kalmegha	<i>Andrographis paniculata</i>
Langali	<i>Gloriosa superba</i>	Kembuka	<i>Costus speciosus</i>
Vidanga	<i>Embelia ribes</i>	Vidanga	<i>E.Robust</i>
Daruharidra	<i>Berberis aristata</i>	Kalambak	<i>Coscinium fenestratum</i>
Sarpagandha	<i>Rauwolfia serpentina</i>	Types of Sarpagandha	<i>Rauwolfia canescen</i>
Akarkara	<i>Anacyclus pyrethrum</i>	Inferior quality Akarkara	<i>Spilanthes acmella</i>
Saral	<i>Pinus roxburghii</i>	Types of Saral spp	<i>Pinus nigra</i>

Substitution of drug and its different aspects

Of the dravyas(drugs) that are selected for the substitution of original drugs must satisfy a number of conditions. Therefore, it is worth mentioning some of the key features of certain qualities of the substituted drugs.

Reasons of Substitution of Drugs⁸

Non availability of Original drug: Many pharmaceutical and drug manufacturing companies are obliged to use substitutes of original drug due to the non-availability of latter. The main purpose is to add the components of their product either of the same or near same quality.

Extinction: Due to climate change and deforestation the negative impact on herbs has triggered much devastating effect and as a result we can see several herbs are already extinct or at the verge of extinction.

Economic point of view: Herbs are substituted in many of the regions keeping in view of their budget of expenditure in preparing medicines.

Properly not identified drug (Identification of the drug uncertain): When one is quite uncertain about identifying particular drug he might choose the herb having similar property. This is quite likely phenomenon.

Geographical distribution of drug: It is quite as a matter of fact that due to the variance in geography certain medicines are found to exist in tropical region whereas some other kinds are found in high altitude so in that case as well the substitution of drug is done.

Doctrine of signature⁹: By doctrine of signature of the drugs, it might correlate the drug of having standard active principle in it. So when a drug is mentioned as a doctrine of signature it is related to the high yield quality of that particular drug. Or it might at times fulfill certain criteria of choosing specific drugs. Moreover, there are certain criteria based on which substitution of ayurvedic drug is done.

Criteria for Substitution

In order for the substitution of any drug following criteria must have to be fulfilled:

Raspanchak (Pharmacodynamic Properties of herb): According to it, if a drug possesses the same characteristic based on Ras, guna, virya, vipak and prabhav with that of another drug then the other drug is qualified as a substitute of the former one. For example; Gorakshaganja (*Aerva lanata*) and Pashanbheda (*Bergenia ligulata*) showing similar properties in terms of Raspanchak the former could act as substitute of the latter¹⁰.

Consideration of the Species: If due to some reasons the particular species of genus is not available, then some other species can replace the drug. For instance, *Pinus nigra* can be substitute for *Pinus roxburghii*.

Drugs of the same family: On several occasions, drugs belonging to the same family are reversibly taken. E.g. *Berberis aristata* and *Berberis lysium* could be substitutes for each other where needed.

Context specific: Under this criterion it is worth noting that based on the action of similar drugs the particular substitute is chosen. That is in practice Amla (*Emblica officinalis*) is considered to have Rasayan (rejuvenative property) and at the same time Haritaki (*Terminalia chebula*), does possess similar kind of property so whenever the matter comes to longevity then if one is scarce the other is brought into practice.

Different parts of drugs can act as substitutes: A drug showing to have medicinal properties can be split into its parts and shall be used for the production of certain products. For instance Gambhari (*Gmelina arborea*) and Bel (*Aegle marmelos*) are such drugs whose parts are alternately used to exert the desirable medical action.

Risk and benefit of substitution

A number of potential threats are associated with the substitution of one drug with another but there is equally same amount of benefit it brings to everyone. On one hand it might pose the risk of losing consumer's confidence and on the other it could help consumer use some kind of similar product on account of substitution. So for the fear of risk of contamination, DNA barcoding has been the modern research line under which extensive study is being carried out¹¹.

CONCLUSION

From the above discussion, it's clear that substitution of herbal drug has been commonplace in herbal industry. Not only was the phenomenon seen in Vedic Period but also in today's contemporary practice many organizations are extensively doing it. The reason can be described in manifold. One, it is unavailability of particular drug. Then, it comes to economical consideration and some other could be geographical inaccessibility. This paper could be an impetus of standard herbal substitution of the relevant organizations which are engaged in production of herbal medicines. Besides, some further research can be done on account of variance in substitution inherent to particular locality.

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